

# Designing Wayfinding at Bundaran HI MRT Station, Jakarta

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## 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.

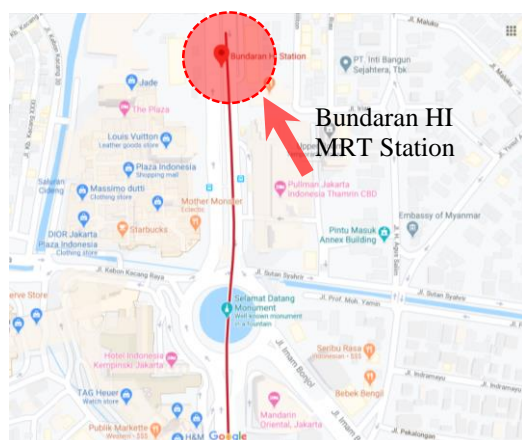


Figure 1. Bundaran HI MRT Station Location

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-a-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.

Table 1. Better Passengers Flow (Wilkinson, 2016)

STATION ELEMENTS	DESIGN RECOMMENDATION SUMMARY
Overall Station	Systems led 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 cards/ cashless payment/ tap cards.
Vertical movement elements	Appropriate location, variable escalator flows, escalator sensors.
Platforms	Elimination of obstacles and blind spots. Column free design. Platform screen doors.
Concourse	Arrangement of surface and lift/ escalator arrangements. Careful planning of ticket purchasing location.
Train Factors	Longitudinal versus traverse seating. 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.

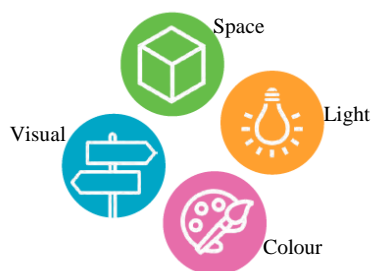


Figure 3. Key Elements of Wayfinding (Goh, 2018)

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

Delight: visual information embedded to Art-in-Transit installation and architectural feature, complimenting signage for wayfinding.

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. Faregates c. Escalators
3. Color	a. Color code b. Alphanumeric color
4. Visual	a. Art Design (Graphic) b. Signage Design

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

## 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.

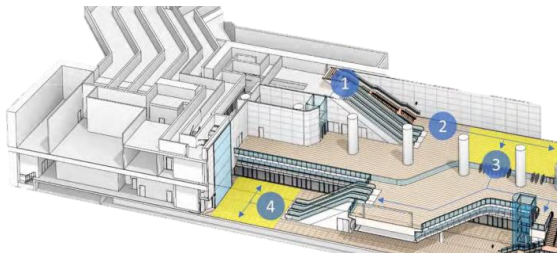


Figure 4. Wayfinding Within The Station Inbound ([https://www.lta.gov.sg/content/dam/ltaweb/corp/PublicationsResearch/files/ReportNewsletter/REthink\\_031018web.pdf](https://www.lta.gov.sg/content/dam/ltaweb/corp/PublicationsResearch/files/ReportNewsletter/REthink_031018web.pdf))

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

1. Entrance – access to *concourse*; connecting walkways escalators, lift, and stairs.
2. Concourse – Locating station amenities; Ticket Counter, top-up machines, information counter, faregates, shops, and toilets.
3. Faregates – Access to platform, lift, escalators, stairs. Connection to other lines; transfer/transit train.
4. Platform – Determine direction of travel; travel information, mapping system, and route diagrams.

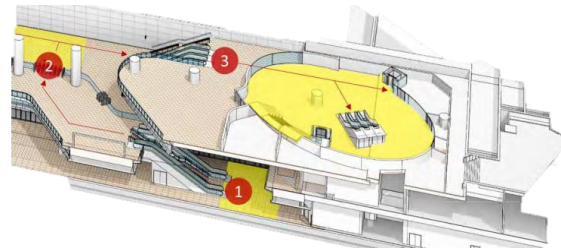


Figure 5. Wayfinding Within The Station Outbound ([https://www.lta.gov.sg/content/dam/ltaweb/corp/PublicationsResearch/files/ReportNewsletter/REthink\\_031018web.pdf](https://www.lta.gov.sg/content/dam/ltaweb/corp/PublicationsResearch/files/ReportNewsletter/REthink_031018web.pdf))

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

1. Platform  
Access to concourse; escalator, 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.

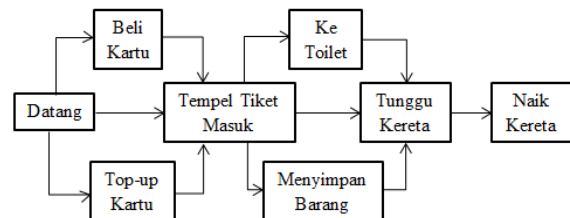


Figure 6. Passenger Inbound Activity Scheme (Aurelia, 2020)

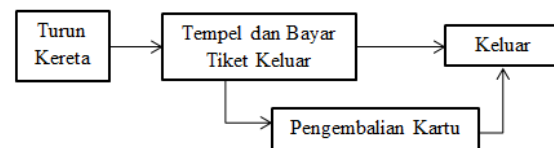


Figure 7. Passenger Outbound Activity Scheme (Aurelia, 2020)

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	Breifing 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	
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

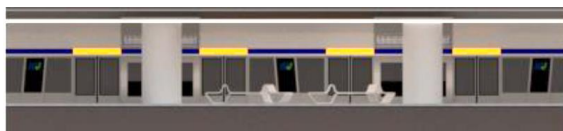


Figure 8. Platform Section (Aurelia, 2020)

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.



Figure 9. Platform Ambience (Aurelia, 2020)

The black floor direct commuters to the automatic doors. A unique bench put on the grey floor to avoid commuters who just getting out from the train.

### 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.



Figure 10. Faregates with Curvelinear Design (Aurelia, 2020)

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.



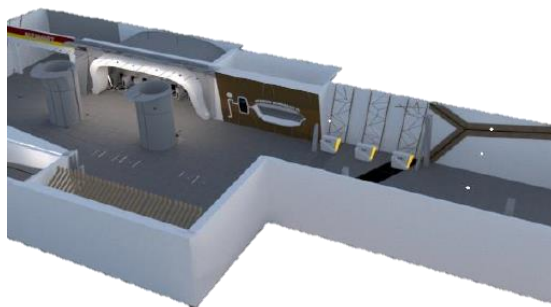


Figure 11. Concourse Design (Aurelia, 2020)

Table 4. Concourses Design Guideline

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

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.

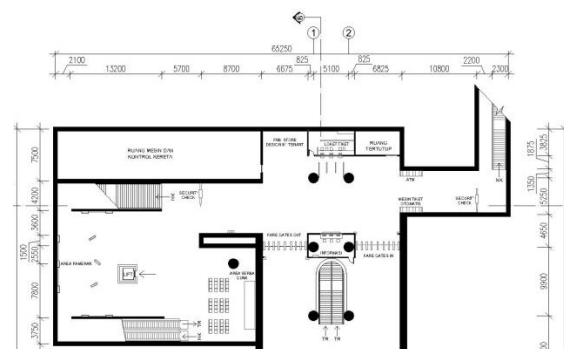


Figure 12. Furniture Basement Layout North Concourse (Aurelia, 2020)

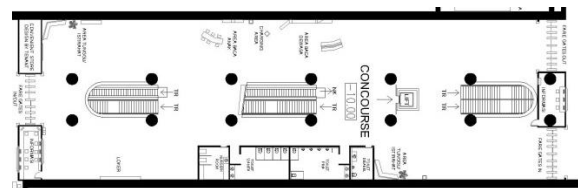


Figure 13. Furniture Basement Layout North Concourse (Aurelia, 2020)

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.

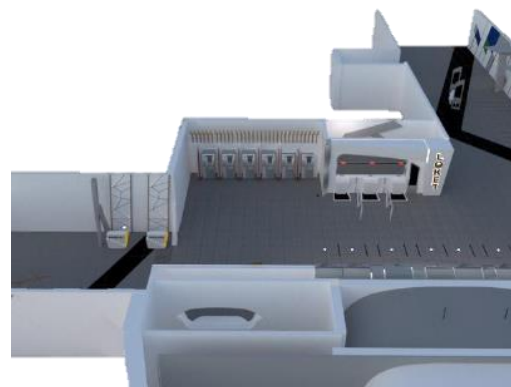


Figure 14. Concourse Area with ATM and top-up machine (Aurelia, 2020)



Figure 15. Ticket Counter Interior (Aurelia, 2020)

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.



Figure 18. Top-up Area (Aurelia, 2020)



Figure 16. Graphically Wall Treatment on Concourse Area (Aurelia, 2020)

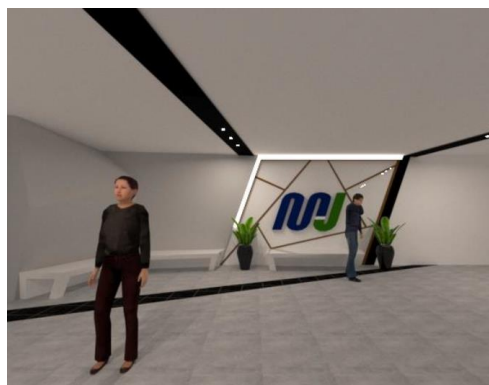


Figure 19. Seating Area (Aurelia, 2020)



Figure 17. Information Counter (Aurelia, 2020)



Figure 20. Kids Reading Area (Aurelia, 2020)

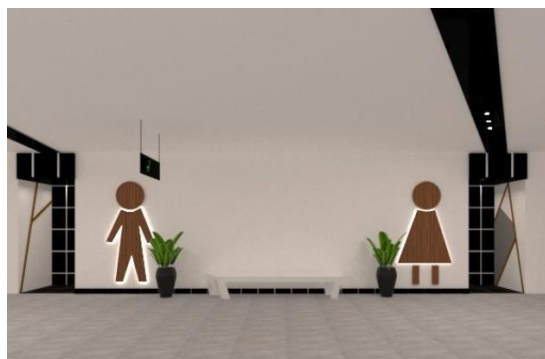


Figure 21. Toilet Entrance (Aurelia, 2020)

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



Figure 22. Repetitions Would Direct Commuters (Aurelia, 2020)

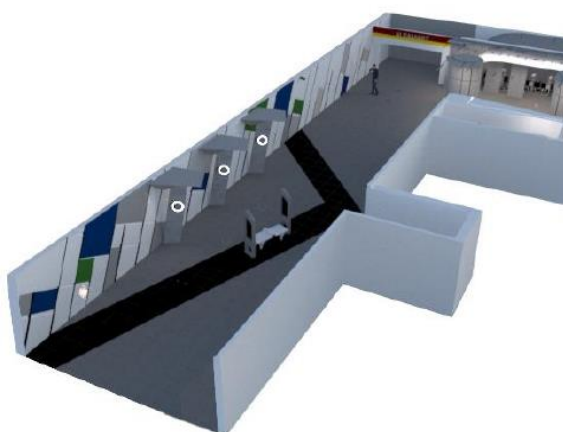


Figure 23. Entrance Design (Aurelia, 2020)

### 4. CONCLUSIONS

Designing Bundaran HI MRT Station as a public space, need to consider wayfinding to improve its 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.

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