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9. INITIATIVES



v. Local Road: It is the basic road network within a neighbourhood and a local slow movement that provides frontages for higher density buildings. It has only one lane in each direction and could be the only one lane shared road, e.g.: Jalan Dhoby, road within the residential area, service road at commercial area.

3.3 Promoting Pedestrian, Cyclist and Motorcyclist

3.3.1 Promote Pedestrian and Cyclist

Pedestrian and cyclist can share the same route in the limited ROW, therefore, the blueprint promotes build on-site vehicle and pedestrian and cyclist circulation systems that are safe, convenient, attractive and comfortable for pedestrians.

The pedestrian and cyclist connectivity strategies are:

- i. Enhance pedestrian and cyclist spaces and develop comprehensive networks of facilities by improving existing spaces and introducing new one to connect key locations in the City.
- ii. Create a city centre that safe for pedestrian and cyclist and easy to navigate with coordinated signage.

3.3.2 Promote Motorcyclist

The blueprint aims to provide comfortable and safety environment to motorcycle riders with provision of their own lane without sharing with other auto vehicles to avoid any accident.

3.4 Applying the Blueprint

This blueprint guides the transition of the Iskandar Malaysia's roads toward a more multi-modal, walk able, low carbon future by enforcing laws, promoting public education campaign and providing encouragement of walking, bicycling and transit use. As the Iskandar Malaysia areas continue to develop and change, these and other considerations should be revisited continually.

4 DESIGN PRIORITIES AND PARAMETERS

4.1 Design Considerations

The establishment of standard design criteria for all users is important to produce a successful, attractive and safe road to all modes of transport. The following design dimensions and parameters shall be considered and used where appropriate for road design.

4.1.1 Public Transport

Public transport passengers are among the most efficient users of road space. Safety, security and comfort are needed at waiting areas, as well as efficient cross streets and convenient access to transit stops. Design parameters for transit are covered by various documents available from the Ministry of Transport. Figure 4.1-1 provides simple spatial dimensions for buses and trams.





Figure 4.1-1: Transit Design Dimensions (meter)

4.1.2 Bicycle and Pedestrian

The safety of bicyclists must be considered during design by providing bicycle facilities in the pedestrian realm in the form of cycle tracks or within the travelled way as bicycle lanes or yield lanes. Besides, all roads must be safe and pleasant for pedestrians of all ages and abilities.

4.1.3 Motorcycle

Due to high risk of accident and limited lane for motorcyclist, motorcycle lane should be provided to improve traffic flow, motorcycle security and to encourage more responsible riding. Figure 4.1-2 shows motorcycle design dimension for motorcyclists.



Figure 4.1-2: Motorcycle Design Dimensions (meter)



4.1.4 Auto Vehicles

The accommodation of auto vehicle traffic is important to the continuing growth of Iskandar Malaysia. The following design factors contribute to speed management and should be incorporated into the road design process as suitable in urban areas:

- Lanes of appropriate width without excess.
- On-street parking.
- Tight curb return radii at junctions and elimination or reconfiguration of high-speed channelised right turns.
- Spacing of signalised junctions and synchronisation of signals.
- Vertical shifts, such as raised pedestrian crossings and junctions.
- 'Gateway' elements and other appropriate devices.
- Curb extensions.
- Bicycle facilities.
- Paving materials with texture (crosswalks, junctions) detectable by drivers as a notification of the possible presence of pedestrians.

4.2 Design Methods

4.2.1 Universal Design

Universal Design accommodates all potential users in the design process by promoting approaches and solutions that can benefit everyone. Among examples from the universal design are the provision of urban Braille for impaired users and understandable signage for all users, local and international.

4.2.2 Vertical Separation

Pedestrian and vehicle dominant spaces across the road right-of-way will be separated vertically. Both road users; pedestrians and vehicle drivers should give and take as well as alert with the spaces such as the traveled way. Similar treatment applies to transit and bicycle facilities depending on their location within the road right-of-way. The discrepancy in vertical elevation is illustrated in Figure 4.2-1 below:



Figure 4.2-1: Pedestrian and Vehicle Vertical Separation

4.2.3 Vehicle Speed

Vehicle speeds need to be maintained through safe street design, education and the enforcement of policy concerning other road users. A network speed approach can be adopted in urban areas with suitable traffic control devices such as signal control junctions. Table 4.2-1 below shows the recommended operating speeds of vehicle:



6 ROAD DESIGN ELEMENTS

6.1 Introduction

This chapter provides a set of standards for road design element, including junctions, traffic calming, cross sections and dimension tables. All designs must be referred to ATJ guideline. This blueprint covers state priority and limit particular operations only under road operations. It also addresses operational signal design, pavement marking and regulatory signage in separate documents.

6.2 Road Composition

Dimensions of the road edge and the travelled way are provided for pedestrians, bicyclist, motorcycle riders, transit users, auto vehicle drivers and median.

The development of a cohesion design for the pedestrian realm is important because interaction occurs between its four zones, which are:

- Frontage Zone.
- Through Zone.
- Furnishing Zone.
- Edge Zone.

6.3 Standard Cross Section

The dimension tables and cross sections contain fixed values as have been organized according to the Iskandar Malaysia's land use context categories: National Regional Centre (NRC), Sub Regional Centre (SRC), Industry Centre (IC), Commercial Centre (CC) and Residential Centre (RC). Each category has its own geometric design criteria for road design based on land use context.

6.3.1 National Regional Centre Context

- It is a central of mixed use activity especially for pedestrians.
- Buildings are typically three stories and above with 1:4.5 to 1:9 plot ratio.
- The design of the building gives high priority for the comfort and safety of pedestrians.
- It provides design of realm, shade and landscape for pedestrian and public, within the area of Johor Bahru City Centre and Nusajaya.

6.3.2 Sub Regional Centre Context

- It is mixed use areas with medium levels of pedestrian activity.
- Buildings are typically two or ten stories and have 1:3.5 to 1:4 plot ratios.
- Its designs are similar to the city context, but some lower pedestrian volumes and realms dimensions are slightly narrower, within the area Kulai-Senai, Skudai, Pasir Gudang, Tebrau-Ulu Tiram.

6.3.3 Industrial Context

- It is the areas for large business and factories.
- Its designs are focus on pedestrian, landscape, safety and considering too on heavy vehicles.
- Example: Taman Perindustrian Desa Cemerlang, Pasir Gudang, Senai.



6.3.4 Commercial Context

- It is the areas which provide a variety of working, shopping and service options and convenience.
- Buildings are typically one to ten stories and have 1:1 to 1:4 plot ratio.
- Its designs are focus on pedestrian, low speed for automobiles, safety and on-road parking.
- Examples: Taman Molek and Taman Universiti.

6.3.5 Residential Context

- It is the areas which provide a variety of housing opportunities.
- Its designs are focus on pedestrian, landscape, low speed travel lane.
- Examples: Taman Mawar and Taman Tun Aminah.

6.3.6 Transit Dedicated Lanes

Transit accommodation may be provided on a road in the centre median or side travel lane.

6.4 Additional Road Types

Variations from the preferred cross sections may be permitted, along with unique, custom designed roads, provided as below:

6.4.1 One-way Road

It accommodates traffic moving in only one direction, and may be designed using the sample cross section by removing the median and one direction of travel lanes.

6.4.2 Shared Access Lane

It is a variation of the access lane as it provides a single wide lane that accommodates both directions of travel. Its width is a maximum of 5.0 m and minimum of 2.7 m. Itt is only used on very low volume roads.

6.4.3 Service Road

It is a road that used to enter commercial area or building lot. The different of the service road type is the provision of parking lot.

6.5 Designing for Pedestrians

As the most vulnerable road users, pedestrians need special care and consideration to identify potential issues and to design facilities.

6.5.1 Pedestrian Walkway

It is most justified at the community development area that results in pedestrian concentrations near or along the highways. Sidewalks should be included as a part of the construction but should be separated from the shoulder and have different requirements in different areas:

- a. Sidewalk in residential areas: It may vary from 1.25 to 2.5 m. It should be provided along both sides of roads but need to be provided on at least one side of all local roads.
- b. Sidewalk in commercial areas: It has greater length and should be provided along both sides of roads.



6.5.2 Pedestrian Crossing

It is located at junctions and mid-block to provide a high-quality pedestrian environment and ensure their safety. It shall be provided on all roads to accommodate pedestrian desire lines and must follow the spacing standards below:

- 120 m for national, sub regional and commercial areas.
- 150 m for residential area.
- 200 m for industrial area.

6.5.3 Crossing Design

It ranges from raised speed table style crosswalks to informal crossings.

- Maximum uninterrupted crossing distance shall not exceed 14 m to reduce crossing distance:
 - o Provide kerb extensions
 - o Narrow width of travel lanes
 - o Reduce the number of travel lanes
 - o Install refuge islands located within clearly visible areas
- Provide kerb ramps to accommodate the change in grade at the ends of crossings.
- Place in line with and at the same width as the adjoining walkway or kerb ramp.
- Typical width: 3 m, 5 m on Arterial.
- Vehicle stop lines 30 ahead of the crosswalk, 10 m ahead at mid-block crosswalks.

Pedestrian volume	Traffic Volume (1		
at peak hour	way) at peak hour	Type of Crossing	
< 50	< 100	Ordinary level crossing	
50 – 100	100 – 200	Signalised level crossing	
>100	> 2000	Overhead crossing/underpass	

Source: Arahan Teknik Jalan, JKR

Signalised crossings:

- Use fixed-time.
- Prioritise pedestrians over vehicle or provide exclusive phase.
- Provide dynamic timing (countdown) signals.
- Provide audible pedestrian signals.

Pedestrian Refuges

- Minimum width: 1.8 m (typically 2.5 m, 3 m on Arterials)
- Extend median tips / noses past crossings at junctions.
- Crossing area to be flush (cut-through)
- Crossing may be off-set or angled to orient pedestrians to oncoming traffic.

6.5.4 Driveway Design

Driveways shall be designed to ensure pedestrians have the right-of-way over motor vehicles. Other guidance for driveway design includes:

- Orient driveways at 90 degree (right angles) to roadway.
- Design driveways as ramps, not as minor junctions.
- Ramp driveways up to pedestrian realm level.



6.5.5 Slopes and Grade

A maximum 1:50 cross slope should be provided on all surfaces in the pedestrian realm and road crossings to facilitate travel by wheelchair users, minimize tripping hazards, and provide positive drainage for hard surface.

- Longitudinal grades shall not exceed a maximum of 1:20.
- Longitudinal ramps may not exceed a maximum ramp grade of 1.12.
- Provide edge protection for ramps steeper than 1:20 or landings more than 1.3 m above the adjacent grade.

6.6 Designing for Transit Users

Transit user is the user of public transport, but the priority of design is given to buses by providing road layout for bus lane, transit stop and bus lay-by.

6.6.1 Bus Lanes

Bus lane is dedicated at the side median. Lane width for bus minimum is 3.5 m.

6.6.2 Bus Lay-by

Bus stops may be placed at junctions or mid-block depending on the route, transfers, passenger generations and destinations.

6.7 Designing for Bicyclist

This section addresses bicycle facilities and provides guidance to the location and bicycle parking. Refer to ATJ for standards and details on any bicycle requirements within the road design area.

Important design points include the following:

- Highlight bicycle facilities with colour pavement, especially at junctions and other conflict zones.
- Create bicycle facilities that are wide enough for a bicycle.
- Design to reinforce that bicyclist is to yield to pedestrian at all intersection points.

6.7.1 Bicycle Facility Type and Selection

Various bicycle facilities will be provided along the road by providing cycle track to encourage the using of bicycle in Iskandar Malaysia. Cycle track is reserved only for bicyclist, combined with pedestrian walkway, separated by the marking and separator and shall not combine with motor vehicle lanes.

6.7.2 Bicycle Facility at Junctions

Specific provisions for bicyclists are necessary at junctions, both major and minor, including driveways, by providing mark and specific colour bicycle lanes and advanced stop line (ASL) or bicycle box. Cycle crossings through main junctions shall be separated from vehicle lanes and its design with sufficient spaces are needed to accommodate bicyclists mixing with pedestrians.



6.7.3 Bicycle Parking

General design criteria for bicycle parking facilities are as following:

- Locate parking in furnishings zone, out of the through zone or driveways, on kerb extensions within 15 m of the main entrance or between buildings.
- Provide longer term bicycle parking in convenient, shaded, well-lit, and secure locations.
- Provide directional signage if parking is not readily visible to visitors.
- Bicycle lockers should be provided to encourage bicycle commuting.
- Bicycle racks are to be durable and securely anchored.

6.8 Designing for Motor Vehicles

The design of motor vehicle facilities, including u-turn design, lane transitions, access management, and on-road parking will be discussed as it ensure safety for all types of motor vehicles.

6.8.1 Travel Lanes

Various widths of travel lanes are depending on the road family and the specific land use. These widths are stated and illustrated on the standard cross sections shown in section 6.3.

6.8.2 Lane Transitions

Lane transmissions shall be minimized on urban roads to ensure a maximum pedestrian crossing distance of 14 m is maintained.

- Do not use lane transitions within junctions, but match entry and exit lanes and drop turn lanes.
- Maximum lane transition 1: 10.
- Tapers to turn lanes 1:2.

6.8.3 U-Turns

U-turns enhance motor vehicle traffic flow, facilitate access management and reduce left turn pressure at junctions. They may be used on Arterial and Collector.

- Locate before crosswalks.
- Signalise where there are two or more receiving lanes.

6.8.4 Access Management

Access management techniques shall limit vehicle movement; manage driver behaviour and support pedestrian, transit and bicycle design.

- Limit the size, quantity and frequency of driveways to reduce conflict points in the pedestrian realm.
- Construct alternate routes to disperse traffic.
- Limit turns onto and off of main roads.
- Manage access to construction sites and other temporary conditions.
- Design driveways and minor road crossings.

6.8.5 Frontage Lanes

- Frontage lanes are used to act as a portion of the pedestrian realm and speeds shall be managed accordingly.
- It is required when there is a parking demand on Arterial and Major Collector.
- It is essential to keep frontage lanes narrow to ensure slow travel speeds.
- Diagonal and perpendicular parking should be avoided along frontage lanes.