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REVITALISATION AN URBAN CENTRE: REVIVING KLANG BUS TERMINAL AS A CENTRIFUGAL FORCE IN CENTRAL KLANG

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ABSTRACT

The public transport system in Malaysia has been declining over the years. Bus stations which were once the hubs of networks since the development of roads and highways are now slowly being marginalised. The reduction of buses on the road is the result of a staggering increase in registered private cars by 32% since 2012 (SPAD, 2015). The role of bus stations as nodal points that influence pedestrian pathways and liveability of an urban context is not taken into account. This research aims to explore the former Central Klang bus terminal, proposing ways to improve the overall transportation network system surrounding the bus terminal and reveal the importance of the bus terminal in its built environment. A case study method was used to analyse the relation between a bus terminal and its urban context. The findings show that due to its well-connected location in the city, the Klang bus terminal can act as a catalyst for the urban rejuvenation of Klang town. If the terminal is designed well, with an efficient spatial layout and convenient user experience, the terminal will not only function as a transportation hub, but also as a community hub for the Klang residents.

1. INTRODUCTION

Klang town has been going through a transformation for years now, yet the issues are not resolved. The traffic congestion has been an issue for at least a decade. A new flyover above a congested round-a-bout; widening of main roads and relocation of the Central Klang bus station are a few of the measures implemented.

As described in The Star newspaper on 10 February 2009, "Klang folk are still upset over the relocation of the bus station away from the town". The relocation of the bus station situated along Jalan Pos Baharu to Jalan Meru has been a failure which was initially seen as a solution to solve traffic congestion in Central Klang. Demonstrations by public transport drivers were made due to low

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income generated at the near-empty Klang Sentral which has subsequently been forced to shut down, while bus and taxi services are now back at former Central Klang bus terminal.

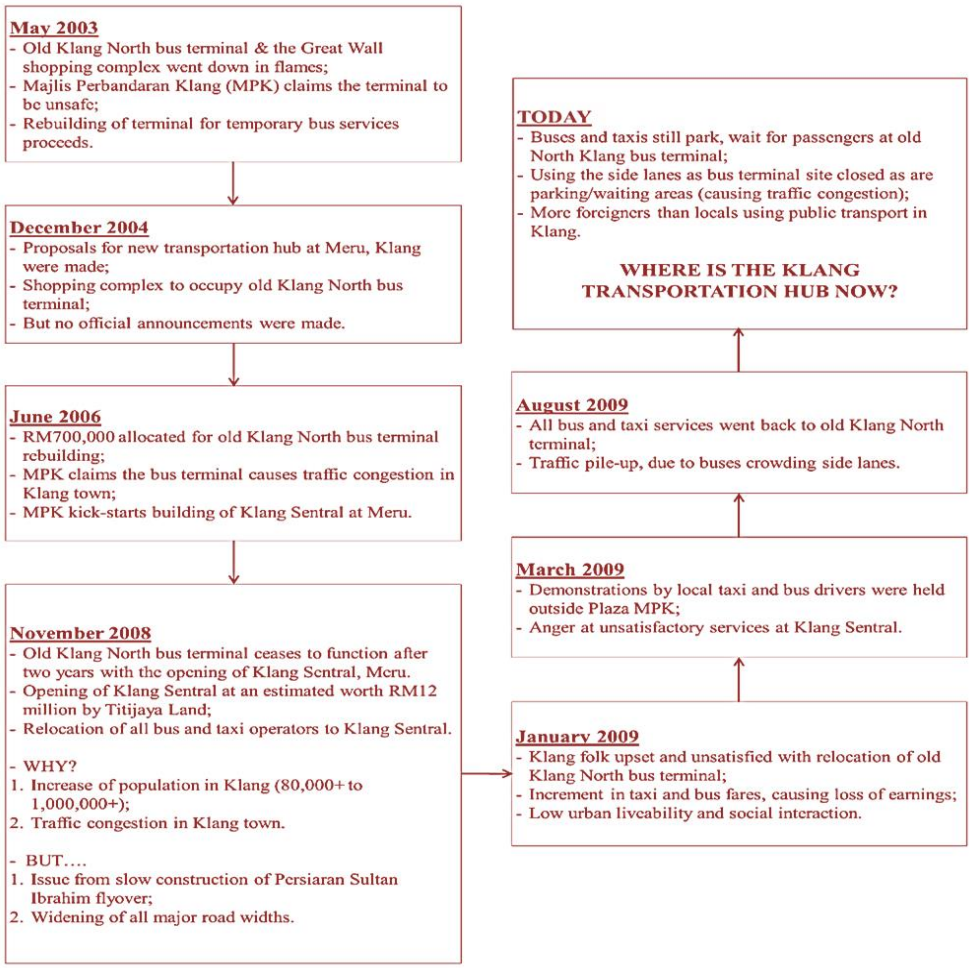

Figure 1: Timeline of incidents – old Central Klang bus terminal
(Source: The Star Online Article, 2003-2011)

The present Klang bus station has been left to decay, but buses and taxis are now parking along the road at the side of the bus station. Important spaces which made up the transportation hub have been neglected, leaving uninhabited areas which nevertheless have potential to be a perfect public centre. This paper explores how the revitalisation of Central Klang bus terminal can contribute to be an urban catalyst for Klang town.

2. EVOLVING AN INTEGRATED BUS TERMINAL TYPOLOGY (PRESENT CENTRAL KLANG BUS TERMINAL)

Ever since a fire broke out at the bus terminal (Great Wall), the former Central Klang bus terminal has been operating at ground floor only right in front of the post office building (The Star Newspaper, 2003). Driveways are too small for both waiting areas and bus drop-off/pick-up areas, but it has enough entry points and visibility for users. The surrounding commercial lots are not integrated with the bus terminal which is key in activating the usage of the buses. The result of this was traffic congestions in central Klang which escalated to a proposal to shift the entire bus terminal north to Jalan Meru/Setia Alam naming it Klang Sentral.

Unofficial Government Proposal (2009): After the bus terminal was removed, Klang local

authorities unofficially revealed that the site was to be commercial development. An interview with the Klang authorities states their intent to sell the existing land to a private developer, but there was no official news announced. The intention was to transform central Klang into a more vibrant city centre without traffic congestions.

However, this was proved wrong, and a strike was held by local bus and taxi drivers. The result caused a major downturn in commercial activities in central Klang, and the public realm was lost due to a shift of an important centrifugal force.

Figure 2: On-Site Bus Terminal Design Intent (illustration by authors).

Figure 3: Present Day Bus Terminal Design (illustration by authors).

On-Site Implementation (Present Day): Buses and taxis are seen around its perimeter of the former bus station but not in the site (Figure 3). The perimeter is hoarded, making the site a vacant dysfunctional piece of land. Bus and taxi drivers have returned to operate at the site after the strike in the year 2009. As a result, traffic congestions has escalated in central Klang due to the scattered parking spots of buses blocking the main circulation (see photos in Figure 4).

3. LITERATURE REVIEW

Today, travelling is an everyday practice and connectivity of distant places has become a

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profound urban condition changing the perception of places and evolving the urban realm. Traffic arteries, along with parking lots, petrol stations and drive-ins, are powerful and insistent instruments of city destruction (Jacobs, 1993). Jacobs explains that good transportation and communication are not only among the most difficult things to achieve, and they have become a basic necessity in shaping the public realm involving human interactions and behaviour.

a) Taxis and buses parked around the bus terminal

b) Vacant bus terminal

c) Inactive Plaza MPK and surrounding shop-lots next to the Central Klang bus terminal

d) Underused pedestrian walkway to KTM (railway) station

Figure 4: Activities around the present-day bus terminal (photoed by authors).

Interchanges act as a linkage between one particular destination and another; an interconnection of different places and provide convenient access between them (Benfield & Gehl, 2010). Thus, the connection of such interchanges have a direct impact on a pedestrian network in a city, and an interchange has to be connected with the surrounding pedestrian street life (Alexander & Quinan, 1981; Mulders-kusumo, 2005). In terms of human interaction, interchanges create meaning for the city by providing gathering places, transitions between the public and private domains, moreover an arena for discourse and interaction (Trancik, 1986).

With economic growth, many cities in developing countries have begun to follow the trajectory

of motorisation, following in the footsteps of developed countries but at a faster rate (Cervero, 2013). Due to this, middle-income populations are shifting from public or non-motorised transportation to private automobiles. Although private cars give people more freedom and increase their opportunities, they also destroy the environment; to an extent, they kill all social interaction in the name of development (Alexander & Quinan, 1981).

The concept of development has got out of hand; massive built-forms, proportionately imbalanced buildings about human scale and lack of human articulation have lost the sense of intimacy (Alexander & Quinan, 1981). When approached on foot, these things overwhelm the senses, causing disorientation (Ewing, 2013). It is important that a city should be designed for the human scale creating great pedestrian environments as well as allowing for transit operation services (Benfield & Gehl, 2010).

Interchanges play a central role in public transportation and should be treated as primary and transportation lines as secondary (Alexander & Quinan, 1981). In urban planning, interchanges are to be mapped and given priority as a central connector which anchors the pedestrian street life. Acting as a node to a certain radius of a township, it is simpler to indicate transportation lines within the city as a connector in effect "connecting the dots" (Cervero & Bernick, 1998).

Interchange as the centre of city life has to be site driven; people and activities have to be mixed, and amenities provided categorised by necessity, optional, stationary and moving ones (Benfield & Gehl, 2010). Amenities as such defines a collective, centralised concept of public spaces that serve as a focus for group meeting and interaction (Trancik, 1986). Cervero gives examples of the assortment of activities combined with musings and conversations of residents sitting in a public square which adds colour and brings life into the community (Cervero, 2013).

Transit-oriented development (TOD) is both an old and new concept with roots in the streetcar suburbs and satellite rail towns that were developed throughout the Western world influenced by market trends and needs (Cervero, 2013). According to Cervero, the original purpose of TOD was to elevate transit to a "respectable means of travel outside the village", in this case, cities or towns (Cervero & Bernick, 1998). He further states that the nodal designs of TOD can be traced back to the earliest of rail suburbs of New York, where they form "string of beads" on a regional scale and communities that circulate the transit station on the neighbourhood scale (Cervero & Bernick, 1998).

For decades, trains have been regarded as a primary mode of transportation in many regional cities, linking one another via a linear line; and stationary points. The growth of communities has further dispersed homes into distant parts of cities where trains would be irrelevant as the main source of public transportation. At present, land development and public transportation infrastructure should occur hand-in-hand (Cervero & Bernick, 1998). Transportation lines are to be planned, gradually with many different lines that will meet at every interchange (Cervero & Bernick, 1998).

With the numbers of privatised cars rising, the park and ride concept has been adapted in many urban development concepts today, as a trend favouring all user groups. Currie has identified that the park and ride concept limits TOD opportunities, more so the usage of buses (Currie, 2006). Parking restraint policies would bring a reduction to road congestions in the city thus encouraging the use of public transports rather than private vehicles in the city of Amsterdam where the costs of public

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carparks are menacingly expensive, encouraging mobility via public transportation.

Local authority enforcement rules would then encourage public interaction, where walkability between transportation stops becomes safer in numbers (Alexander & Quinan, 1981). Recognising the ability of such enforcement, it is evident that neighbourhood scale communities are often dependent on micro-scale design that encouraged walking and land transportation which promotes community cohesion (Cervero, 1998). Bus transit-oriented development schemes are an option where communities do not want high densities, and also an interim step to building ridership, which makes rail transit more feasible (Currie, 2006). Buses and bus stops are flexible in adapting to the change of development in the market which is an advantage to urban planners compared to the rail system (Cervero, 2013).

Transportation has become a necessity in our daily lives, but it is evident that the role of the public transportation system in the city should shape the public realm in terms of human behaviour. The hierarchy of transportation modes has to be well linked to one another from the largest being the aeroplane transporting people regionally to land transportation on a local scale.

In a small town/city where local users are heavily dependent on land transportation, sources emphasise the importance of pedestrian-oriented planning in an urban context. The vast growth in numbers of vehicles and new highways in our nation have resulted in pedestrians as secondary to automobiles. Unfortunately, the cities in Malaysia hardly favour public interaction due to the lack of planning strategies empowering pedestrians into the development of the built environment. This results in a lack of public spaces which surround interchanges in the city thereby discouraging walkability from one transportation hub to another.

4. LESSONS LEARNT FROM OTHER TRANSPORTATION HUB SPACES

The system of public transportation – the entire web of aeroplanes, trains, boats, ferries, buses, taxis, mini-trains, carts, ski lifts, moving sidewalks – can only work if all parts are well connected (Alexander & Quinan, 1981).

4.1 SPACE ORGANISATION

Airports being the larger and serving a more important purpose in comparison to train and bus stations have a clearer transition from the entrance to the departure area. Airports segregate the checking area and amenities zone which is often shared with the waiting spaces. The departure lounge of the airport acts as a big waiting space which is accompanied by amenities, retail and entertainment for a longer period before heading to the gate lounge where they prepare to board their flights. Such space provides better comfort to the users, allowing flexibility in carrying out tasks while waiting for their flights.

By comparison, waiting areas in local bus terminals are not emphasised and do not provide the same kind of experience to airports. The waiting time for regional buses can easily take hours, yet the waiting areas look like a typical bus stop. The difference of segregating an indoor and outdoor waiting area sets a different comfort level to users. Tackling the issue of unhygienic fumes and carbon monoxide from the buses, an indoor waiting area and proper platform demarcation is an ideal solution. The waiting time in a bus terminal can vary from a minute to several hours depending on schedule.

Therefore, activity pockets and pop-up booths can be implemented surrounding the waiting areas, giving comfort and convenience to the users when visiting the terminal.

4.2 USER EXPERIENCE AND FUNCTIONALITY

Amenities provided in all terminals cater for passengers who are either waiting for their ride or for those who just arrived. Airport amenities to cater for those who need a longer waiting time and spaces where they can carry out private tasks upon arrival from a long flight. This results in more retail outlets, restaurants and cafes among the waiting lounges and entrances. The Kuala Lumpur International Airport 2 (KLIA2) was designed as an airport cum shopping mall which allows passengers to dine, shop, rest and cleaned up before and after their flights. In this case, KLIA2 successfully incorporated the shopping mall culture with an airport which Malaysians are fond of.

On the other hand, train stations do not emphasise the amenities as compared to airports. Waiting areas at arrival and departure are lined along the linear track; amenities often provided at entrances accompanied by the ticketing areas and bathrooms. Waiting time for trains are usually quite consistent delays are rare unless there are occasional servicing and breakdowns. Bus terminals on the other hand, have the flexibility of creating multiple spaces for amenities as the waiting areas are more flexible and waiting time is not consistent. Terminal Bersepadu Selatan (TBS) of Kuala Lumpur is the perfect example where the bus terminal has very similar characteristics to the airport in terms of space planning and amenities allocation.

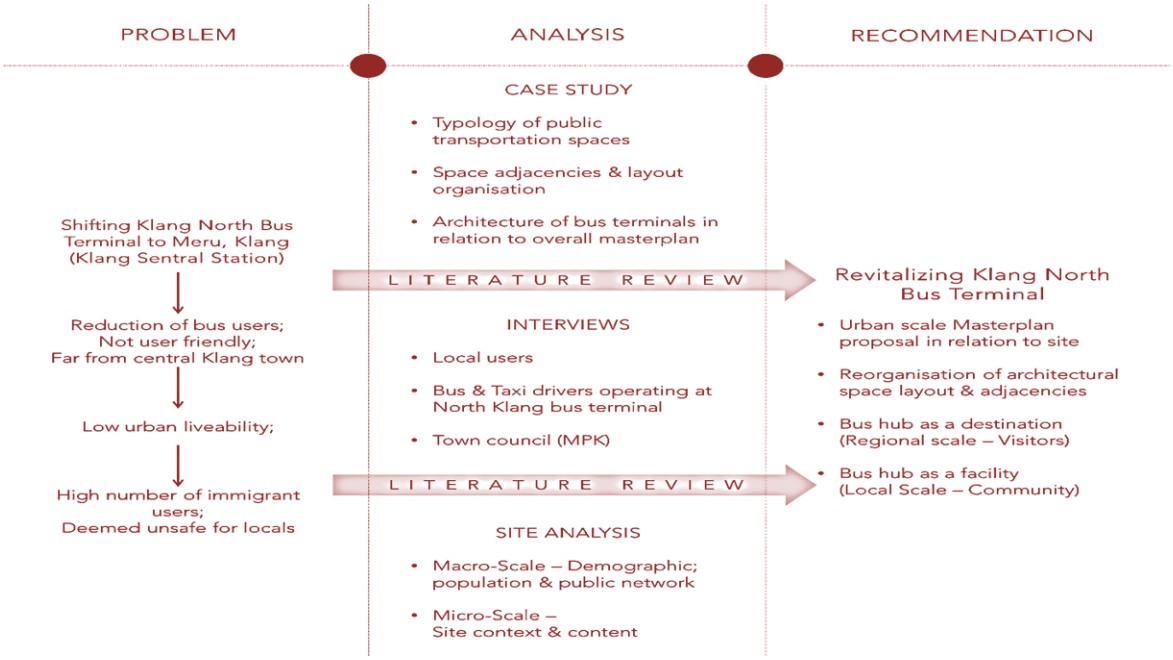

Figure 5: Research Methodology.

5. METHODOLOGY

The research used case study method (Groat & Wang, 2013) to analyse three existing bus terminals in Klang Valley: Pudu Sentral, Terminal Bersepadu Selatan and Putrajaya. The case studies were analysed and compared using three key variables from the findings of the literature review: terminal network linkage (how strategic is the bus terminal in relation to its urban context), spatial layout (space organisation inside the terminal) and user experience/functionality (environmental

comfort, safety, providing relevant experience to the community). Figure 5 provides the research framework.

6. RESULT

Table 1 shows the comparison of 3 bus terminals. The terminals were first analysed in terms of distributing the arrival/departure platforms, ticketing areas, waiting areas, carparks and amenities provided. Then these spaces in the bus terminals are examined in detail by analysing the functionality and user experience.

Table 1: Case studies analysis of bus terminals

Variables	Pudu Sentral	Terminal Bersepadu Selatan	Putrajaya Sentral
Terminal network linkage (surrounding context)	***Pros :*** - Located in the middle of a **transport web** (between Masjid Jamek & Pasar Seni) and central urban area of Kuala Lumpur; - Kuala Lumpur **link bridge** leads to the terminal.	***Pros :*** - **Direct train connectivity** (KTM-LRT-ERL) which is walking distance; - Built along the main Sungai Besi highway for **easy vehicular access.**	***Pros :*** - Built in between **two main cities,** acting as the **main terminal**. - **Direct link** to main highway to Kuala Lumpur (NKVE).
	Cons : - **No** direct **pedestrian connectivity** from nearest LRT stop (Plaza Rakyat); - **No shaded walk paths** at ground floor leading to bus terminal.	***Cons :*** - Temporarily serves all regional buses which connect the Kuala Lumpur users to entire Peninsular Malaysia **(over populated bus parking area).**	***Cons :*** Only **linked** to **one train station** (ERL railway line); Very much **dependant on automobile vehicles** and no pedestrian connectivity.
Spatial layout	***Pros :*** - Many numbers of **government agencies** and amenities; - **Indoor waiting areas.**	***Pros :*** - Clear demarcation of **space division** in floors; - Indoor waiting areas; - **All pedestrian movements** (drop-off, link bridge, ticketing) located at one floor	***Pros :*** - **Easier navigation around terminal** (horizontal space arrangement – ground floor).
	Cons : - **Unhygienic basement** bus pick-up and drop-off area; - **Mosquito** breeding ground due to poor drainage maintenance.	***Cons :*** - More **security** needed to monitor safety due to all spaces are on different floors.	***Cons :*** - **Lack of amenities and retails** although act as the main hub; - Encourage **more vehicular usage,** - causing more fumes and heat from car engines. - **Unsafe** to walk around, no proper blockade from platforms to waiting areas. -
User experience & functionality	***Pros :*** - Users able to **run errands** and make use of amenities; - **Community-driven** and serves surrounding's needs (Muslim prayer room).	***Pros :*** - **No human traffic congestion** on every floor; - **No fumes and noise pollution** from buses to waiting areas (outdoor and indoor).	***Pros :*** - As **main terminal interchanging** to KLIA and KLIA 2; - Ample carpark **for park and ride** users; - A starting point for **electric vehicles** (electric buses introduced).
	Cons : - **Low ceiling** causing congestion and appear stuffy; - **Overcrowding of retails**, causing lack of waiting areas – overcrowding of non-bus users causing carpark congestion.	***Cons :*** - Larger terminal space and individual floor character which requires more **navigation moving around.**	***Cons :*** - Warm and stuffy waiting area due to open platform concept; - Large **open carparks with no shade** provided.

6.1 KEY POINTS FOR BUS TERMINAL DESIGN

Learning from these case studies, a summarised comparison reveals some do's and do not's to inform the revitalisation strategy for the Central Klang Bus Terminal:

1. **Strategic location** is crucial in ensuring transportation connectivity of a terminal hub. This includes;
   - Placing bus terminal in a web of transportation in the city.
   - Direct access to the nearest highway access.
2. **Pedestrian connection** between terminal hub to nearest train stations encourages usage of a bus terminal, therefore;
   - Link bridges and shaded paths allow pedestrians to travel comfortably via walking.
3. Bus terminals equipped with **proper facilities and amenities** alongside waiting areas.
   - Local bus terminals – government agencies and local facilities;
   - Regional bus terminals – retail, cafes and restaurants (longer waiting areas).
4. **Airport spatial layouts** prove to be an ideal example for a bus terminal;
   - Terminal Bersepadu Selatan spaces have similarities with an airport layout and proven to be more uniform.
5. **Segregation** of vehicular activities from pedestrianised activities, is this;
   - Prevents air (fumes) and noise pollution caused by vehicles;
   - Heat generated from buses do not affect users;
   - Safety of users is ensured and not jeopardised by the moving traffic.
6. Designing bus pick-up and **drop-off areas at the ground or above ground**, not at the basement. Bad examples are such as;
   - Pudu Sentral basement as drop-off area proved to be unhygienic and dirty;
   - Damp odour and dingy looking areas;
   - Attracts unwanted pests (mosquitoes, rats and cockroaches).
7. **Private vehicles** access to the terminal is as important as pedestrian access, thus park and ride podiums with direct access to terminal needs to be provided.
8. **Community-driven hub** rather than another transportation hub. This will enable to cater to the surrounding community, giving identity to the hub.

6.2 CENTRAL KLANG'S TRANSPORTATION HUB

6.2.1 THE BUS TERMINAL & CITY

In Figure 6, area number 1 shows an example of the northern side of Klang where there is no overlapping of public transportation and house are more concentrated along the Klang River. Residents there depends on private vehicles to help them travel around Klang which shares the same issue at area number 2 of Jalan Tepi Sungai. Most of these residential zones are surrounded by minor roads, which do not lead buses to pass through them.

Area number 3 indicates Raja Mahadi and Bukit Kuda Schools which is a busy area during the weekdays but do not have direct access to local buses. Due to the danger of walking in an unpedestrianized path, students are picked up from the schools via private vehicles although the walking distance to the Klang bus terminal is only less than 600 meters away.

The Central Klang Bus Terminal is situated at number 3 which is at the middle of a web of transport which connects both North and South of Klang via two bridges (Jalan Tengku Kelana and Kuantan-Kuala Lumpur highway). The diagram above also shows the integration of three main transportation hubs (bus terminal; KTM station and future LRT station) in a 500 metres radius.

Pedestrian paths are linked to both KTM and LRT stations as the concentrated commercial area are also situated in that circle.

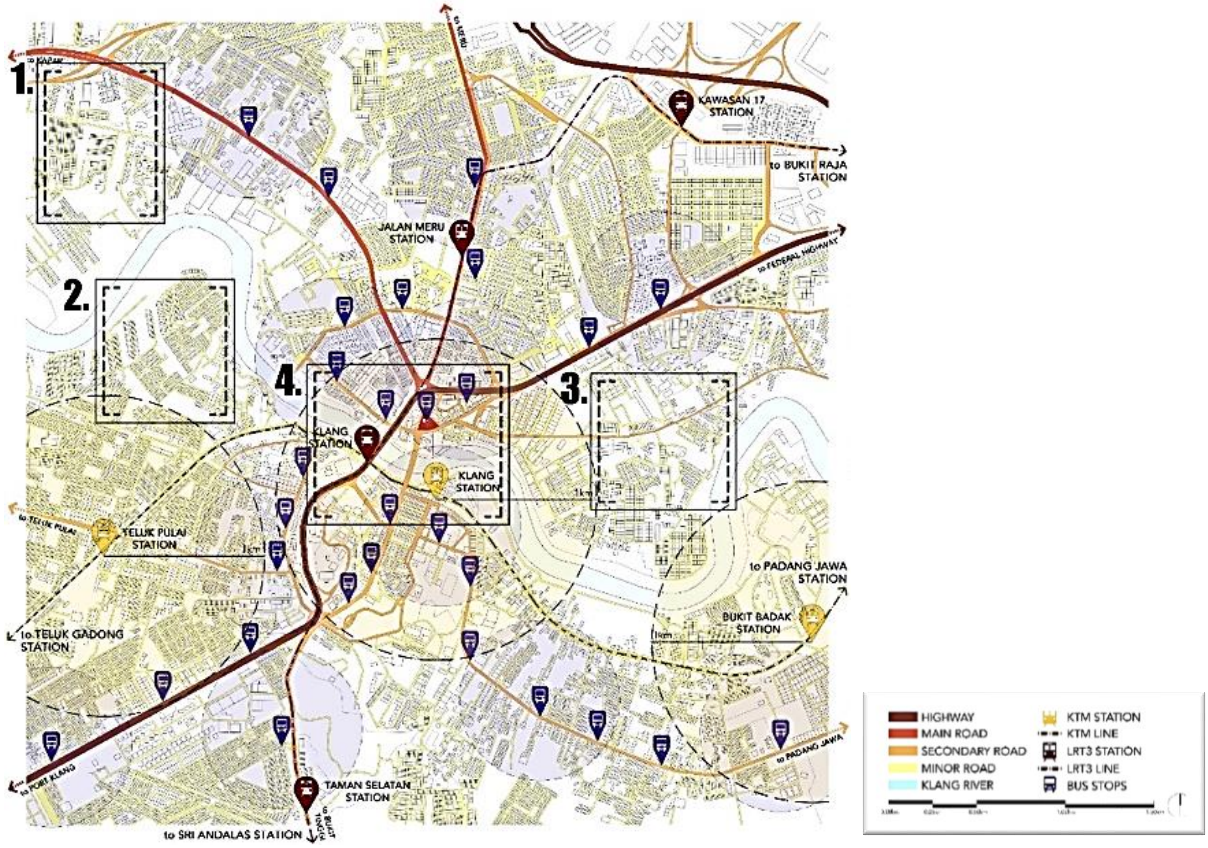

Figure 6: Five-kilometer radius Klang network plan (illustration by author).

6.2.2 SURROUNDING INFLUENCES (URBAN ISSUES)

Traffic congestions have been a constant issue in Klang, and the large number of vehicles travelling in and out of Klang is causing unfriendly pedestrian streets. Walkways are reduced to cater for more carparks, roads are widened to create more lanes and uncivilised users double-parking indicates the importance of vehicles over pedestrians. Local municipality's efforts in relocating the bus terminal did not reduce but increased the usage of vehicles in Klang.

The absence of the bus terminal resulted in **low usage of the commercial area** around it. A transportation hub marks the centre in activating its surroundings, and instead of taking the bus to Klang central, users prefer to drive and park near the KTM station before taking the train to other city centres. The Kota Bridge and Jalan Tengku Kelana pathway have been built long ago, however, the high number of traffic surrounding central Klang have made road crossings almost impossible. Unclear zebra crossings, unfixed link bridges and unshaded pavements also contribute to this low walkability issue.

7. DISCUSSION: REINVENTING THE BUS TERMINAL

The bus terminal should be the core of a neighbourhood; connecting adjacent cities to a town. Taking precedence from the case studies and the site itself, the individual components of the Klang Central bus terminal have been identified as an entrance, urban gateway, facility area, and a meeting place.

At an urban scale (Klang Valley region), the revitalisation of the Klang Central bus terminal could be considered as an entrance statement to the city. Being the focal transportation hub, visitors and local users would be able to identify the bus terminal as the urban gateway or transition point between neighbourhoods/cities.

Local bus terminals are often equipped with amenities/facilities which allows users to run errands and carry out daily tasks. The main Klang post office is currently at the original bus terminal site which caters for daily users in Klang but has been reduced in numbers throughout the years due to the shifting of the bus terminal in the year 2009.

The reinstatement of the original Klang Central bus terminal would then need secondary spaces such as government agencies, retail and public landscape areas to improve the attraction. These spaces allow the bus terminal to be a meeting place for locals and visitors travelling to central Klang. As a result, the bus terminal would be regarded as an identity hub which Klang is currently missing in terms of revitalising the local context and connecting one city to another.

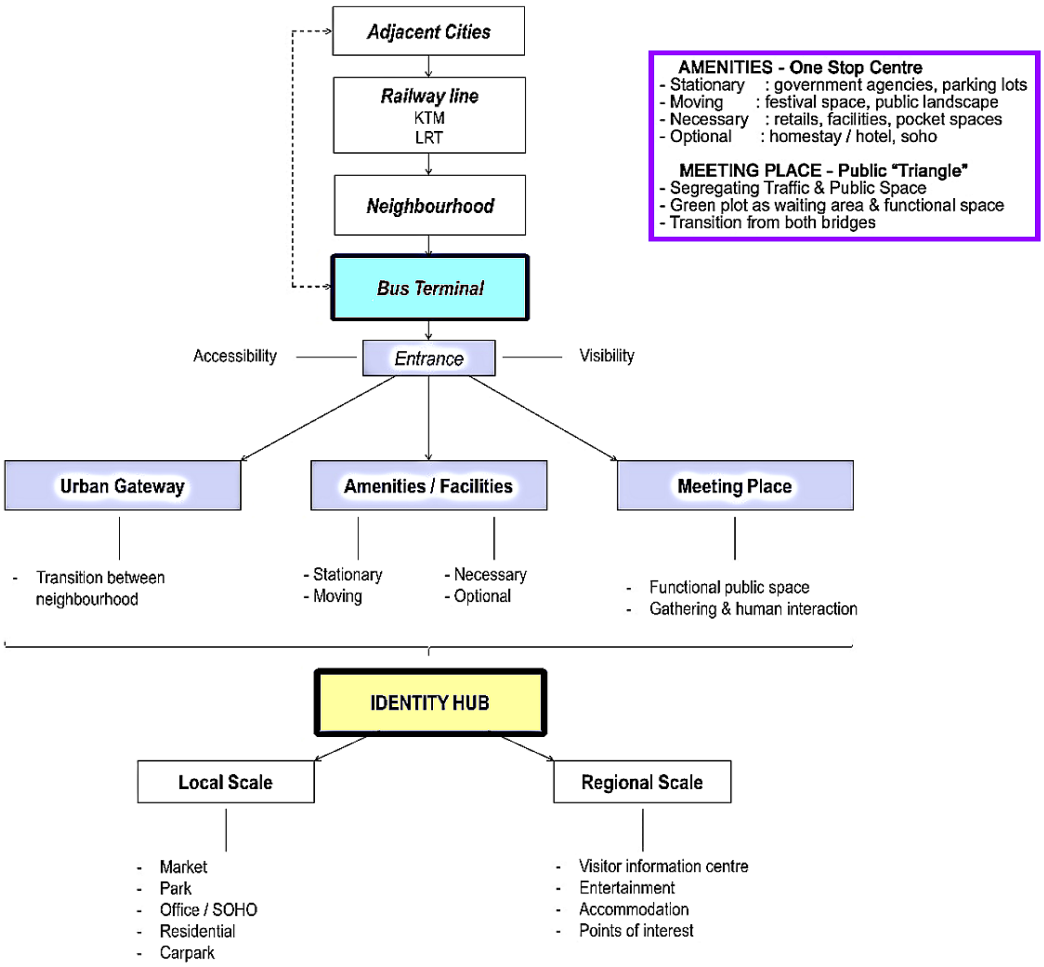

Figure 7: Creating an Identity Hub.

8. CONCLUSION

The revitalisation of the Central Klang bus terminal would improve urban connectivity at both local and regional scales of Klang. The legibility and importance of this transportation hub and the design of spaces in the hub are important in activating the central Klang region. Some concluding

observations from the investigation are:

- Connectivity from one mode of transportation to another is key to form an integrated urban context. In an era of increasing automobiles, the literature review highlights the importance of prioritising pedestrians while vehicles should come secondary. The public realm is key to create a smooth transition between the terminal and its surroundings.
- An airport is most effective in planning its main spaces with secondary spaces (amenities) accompanying it. Therefore in a big scale bus terminal design, the airport design guideline should be taken as precedence in the layout.
- Location plays an important role in linking different modes of public transport to ensure a web of linkages is achieved. Pedestrian connectivity is key in linking one mode of transport to another. Apart from the transition, vehicular movement/activities are to be designed with continuous visibility but separated from the public realm.
- Bus terminals can influence their surroundings through the public realm, walkability and activation of surrounding commercial lots. The site of the Central Klang bus terminal suggests connectivity and circulation within the local and regional context is important.
- Connectivity and circulation are important in activating the entire Klang region. The spatial layouts and connectivity within site are designed in relation to the overall location. The architecture of the bus terminal must ensure that connectivity and circulation are created, which reinvent a centrifugal force in central Klang.

It can be concluded that due to its strategic location in Klang town, the Klang bus terminal can act as a catalyst for revitalising Klang town. If the terminal is designed well, the terminal will not only function as a transportation hub, but also as a community driven-hub for the Klang residents.

9. DATA AVAILABILITY AND MATERIAL

Data involved in this study can be requested to the corresponding author.

10. ACKNOWLEDGEMENT

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