

Traditional urban infrastructure generally incorporates transportation and communications systems (SWA, 2011). Following this, transportation infrastructure is one of the major drivers of landscape change worldwide (Meyer and Turner 1994; Forman et al. 2003; Bürgi et al. 2004). Landscape fragmentation caused by transportation infrastructure has a number of effects on almost all components of landscapes, including aesthetic, ecological, historical, and recreational qualities (Canters, 1995; National Research Council 2002; Forman et al. 2003). As a result of increasingly fast high performance infrastructural development particularly highways that dissect through urban spaces, empty and leftover spaces would result. The spaces along and under elevated highways affect the way we experience the city. They disconnect neighbourhoods, produce undesirable views, and act as physical and psychological barriers making the pedestrian experience unpleasant (Trancik, 1986). Furthermore, the unclear territoriality of these spaces sometimes leads to land misuses such as dumping debris, abandoning of cars, or illegal activities. The inappropriate use of the vacant spaces under elevated highways can lead to social and economic problems in addition to being unsightly and lowering the value of adjacent properties (Halprin, 1966). Elevated highways are described as pieces of infrastructure which seldom attract people's affection and poses a constant provocation, although practical and financial reasons suggest to simply accept their presence. (Harnack and Cohler, 2011). Adding to this, Crisman (2012) stated that the resulting interstice, "a space that intervenes between one thing and another," often generates seemingly uninhabitable zones and problematic discontinuities in the

physical and social fabric. The author furthermore explained that these edges and leftover spaces are rarely considered worthy of design attention for they are ugly, ordinary and out of the way, they present difficult existing conditions and unglamorous realities. Of the many types of left over spaces, perhaps most challenging as described in various literatures are the linear cuts incised through the morphological continuity of the city by railway and highway construction.

The byproduct of massive infrastructural development particularly elevated highways often results in residual spaces considered as mere voids and lost opportunities. These Interstitial spaces they are often overlooked, and are often relegated as 'wastelands', 'derelict areas' and 'urban voids' as described by Doron (2000). They represent socio-economic abandonment and dereliction and are excluded from the ideal, as they run contrary to the dominant desired image of the city. Interstitial, dilapidated, dis-used and marginal sites punctuate the often highlighted and controlled formal public spaces, parks and the everyday spaces of the modern city. They are referred to in various literatures and discussions from the realms of architecture, planning, design and urban theory as 'lost space' (Trancik, 1966) 'terrain vagues' (Sola -Morales, 1995), 'dead zones' (Doron, 2000), 'the shadow' (Malterre-Barthes, 2011). These terms refers to the same or similar urban spaces as described by Shaw (2009) and that they are seen as vacant and meaningless as a result of their 'temporary absence of attributed function'.

Utilising The Under-Utilised: Way Forward for Kuala Lumpur's Infrastructural Interstitial Spaces

Studies and research in landscape urbanism field have focused on infrastructure as the most important generative public landscape. Mossop (2006) describes that these omnipresent urban environments have been considered and evaluated solely on technical criteria and somehow exempted from having to function socially, aesthetically, or ecologically. In a study by SWA Group (2011) it was highlighted that infrastructure as we know it, no longer belongs in the exclusive realm of engineers and transportation planners. It was also highlighted that in the context of our rapidly changing urban environment, infrastructure is experiencing a paradigm shift where multiple-use programming and the integration of latent ecologies is a primary consideration. Redefining modern infrastructure requires a multi-disciplinary team of landscape architects, designers, engineers, architects and planners to fully realise the benefits to our cultural, social and natural systems. Such a reexamination of infrastructural space

involves the recognition that all types of space are valuable, not just the privileged spaces of more traditional parks and squares, and they must therefore be inhabitable in a meaningful way. This requires the rethinking of the mono functional realm of infrastructure and its rescue from the argument of urban devastation to recognise its role as a part of the formal inhabited city (Mossop, 2006). New approaches and more sustainable design concepts for difficult spaces particularly under elevated highways and as well as complex transit interchanges must therefore be explored and examined.

Like most cities in the developing world, Kuala Lumpur has grown at a phenomenal rate driven primarily by the need to achieve economic wealth. The city has experienced rapid development which has left a city that is, in many respects, disjointed and lacking in spatial coherence in both visual and physical aspect. Described briefly in the Kuala Lumpur Structure Plan 2020, major road primarily highways and rail infrastructure has, in many places, effectively divided adjacent spaces and areas or neighbourhoods that remain physically close but virtually inaccessible to each other. Therefore, in a nutshell the development of major roads and rail infrastructures have disconnected links between adjacent areas causing lost and abandoned interstitial spaces. The author puts forth the argument in which it is worthwhile to examine the possibilities of utilising these so called lost spaces into an informal as well as formal spaces that could which benefit and serve as an urban reconstructor for the adjacent urban communities.

Case Study: Maju Expressway, Kuala Lumpur

The Maju Expressway (MEX) (formerly known as Kuala Lumpur-Putrajaya Expressway (KLPE) and KL-KLIA Dedicated Expressway) is an expressway network in Klang Valley, Malaysia. The 26 km (16 mi)-long expressway links the Kuala Lumpur City Centre with the Kuala Lumpur International Airport (KLIA) in Sepang, Selangor. The expressway has become a backbone of the Multimedia Super Corridor (MSC) area. It was constructed in 2004 and was completed in 2007.

Parts of the Maju Expressway (MEX) is elevated, primarily through the 1st and 4th interchange (refer Fig. 1). These parts of the expressway cuts through dense urban communities and neighbourhoods resulting in the presence of multiple interstitial spaces. Diverse in form, these spaces share the common conditions of enclosure, emptiness and abandonment. Along the expressway, these byproducts are enclosed by larged scaled infrastructural forms in contrasting scale to the void below.

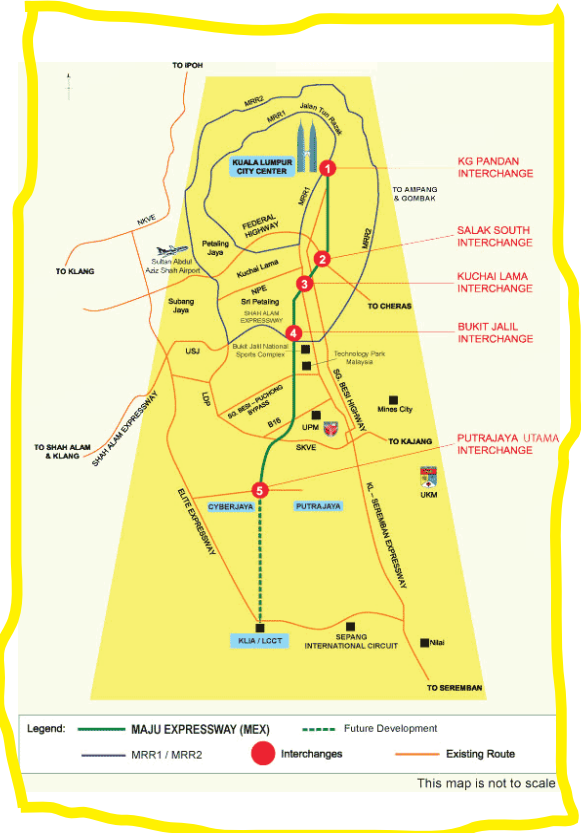


DIAGRAM 1: Map of The Maju Expressway (Source: <http://www.mex.com.my/>)

The Characteristics

Referring to Wall (2011) several key characteristics can be examined in relation to the features of interstitial spaces generally located between or under elevated highways: they are small, irregular and enclosed. These characteristics can be associated with the spaces present under several areas of the MEX expressway. In the case of MEX, the notion of Wall's characteristics were present, the spaces were indeed small, irregular and enclosed.



Spaces under the MEX showcases the characteristics discussed by Wall (2011)

These spaces are made as small as possible, in order to balance with the need to minimise the area of land for the high capacity infrastructure while maximising the efficiency of the system. Through observation, it is also apparent that the available spaces under the structure are also irregular in form as they are definite to the forms of the above structure. The spaces are also enclosed on at least one side, and in this case it is clearly apparent that the space is dominated on one side by the expressway. The sense of scale between the infrastructural network and the human activity is a contrasting site to view. Human scaled activities present at this site remains insignificant if it was to compare with the function of the massive structure positioned overhead. The discontinuation between the interstitial spaces is furthermore accentuated by the contrast in scale between the structure and the adjacent neighborhood. Moreover, the massive form and high paced nature of the MEX intensifies the juxtaposition of

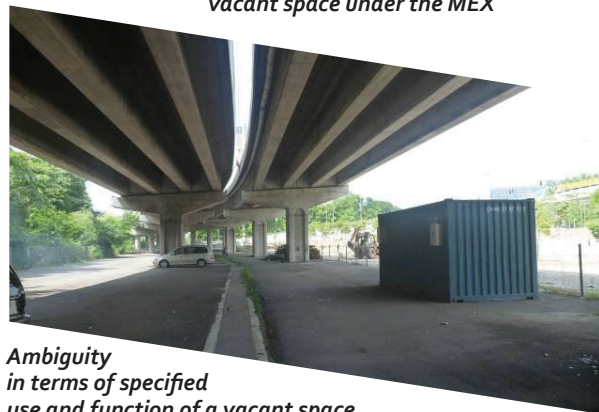
scale. In addition to the general characteristics of interstitial space as discussed by Wall (2011), the author furthermore highlighted that left over spaces also generally appears to be undefined in

The Issues and Challenges

The characteristics observed from the case of MEX puts forth several key issues and challenges, the fragmentary nature of these lines of infrastructure has sealed off a the urban fabric that has minimal connection to the adjacent spaces. As described by Sola-Morales (1995), these are spaces with unincorporated margins, interior islands void of activity, oversights, these areas are simply un-inhabited, unsafe, un-productive. In a nutshell, they are foreign to the urban system, mentally exterior in the physical interior of the city, its negative image, as much a possible



Definition of ownership of the vacant space under the MEX



Ambiguity in terms of specified use and function of a vacant space under the MEX

use, ownership, management and function. In the case of MEX, however, the ownership and management of the leftover spaces are clear as they are signages suggesting the ownership and management of the vacant space (fig. 4). But on the other hand, the vacant spaces still suggests ambiguity in terms of specified use as well as function. These leftover spaces projects a sense of abandonment and lost opportunities in contrast to the highly managed and planned infrastructure above it (fig. 5).



Wisma Indah Apartment

alternative. As described in the *KL Structure Plan 2020*, infrastructures has caused adjacent spaces and areas or neighbourhoods to be divided and that they remain physically close but virtually inaccessible to each other. This key issue is significantly apparent through the observation of the case study. The lack of continuity at the ground level in terms of support activities, scale as well as a definitive space function has caused severe fragmentation of adjacent spaces primarily effecting the areas of Wisma Indah Apartment and PPR Laksmana, Jalan Peel (Fig. 6 and 7). This physical

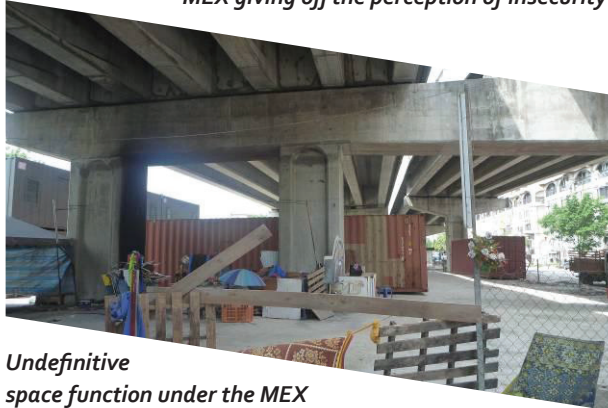
and visual fragmentation is furthermore intensified with the issue of ownership as well as permissible use. Adding to this, spaces under the MEX is primarily vacant and unused, this could to a certain degree be associated with potentials of unhealthy and illegal social activities Halprin, (1966). Adding to this Branas et al. (2011) these such spaces to the “incivilities” theory, suggests that physical incivilities, such as abandoned vacant lots, promote weak social ties among nearby residents and encourage crimes, ranging from harassment to homicide.



**PPR
Laksmana, Jalan Peel**



**Poorly
illuminated spaces under the
MEX giving off the perception of insecurity**



**Undefinitive
space function under the MEX**

The Way Forward: Infrastructural Landscape

After careful examination of the case-study presented, it is clear that the spaces under the MEX possess such characteristics as so often described in various literatures pertaining the topic of left over spaces as a result from infrastructural development. The apparent situation calls for a reconsideration of the design discipline and paradigm as mentioned by Rico (2011), where the author argues that these spaces need to be critically assessed in terms of its spatial effects, biopolitical production as well as functional performance. Infrastructural landscape has been widely discussed throughout the latter half of the 20th century, with various terms coined to describe the emptiness associated with their low level of accessibility as well as the potentials that they open for designers (Lerup, 2000; Sola-Morales, 1995). Following this, proactive steps should be taken into consideration by landscape architects, architects, planners and designers alike. The challenges associated with these type of spaces should be view upon a different perspective. These spaces should be taken as opportunities to reimagine and reinstate the spaces as a form of urban connector. These interstitial spaces could be transformed into a space that supports human scaled activities as a direct contrast to the vehicular scaled activities right above it. Suggested approach such as designing the space to accommodate planned and unplanned activities could transform this space into a meaningful place with a sense of belonging and attachment.

One such example of creative use of interstitial space that can be applied as an approach to the spaces under the MEX can be seen in the from of Underpass Park

Conclusion

The process of rapid urbanisation brings along with it challenges; one of the challenges of urbanisation is mitigating the effect of marginalised interspaces and physical separation of spaces as a result from the rapid growth of high performance infrastructures. Trancik (1986) refers to these spaces as —lost spaces, which he defines as under-utilised spaces within the downtown area or undesirable areas that could potentially be redesigned to attract people. Some of these spaces include: unstructured landscape at the base of a high tower, surface parking lots, abandoned waterfronts, as well as spaces below an expressway. Based on the literature reviewed and comparison between the case study, the derelict spaces under the MEX put forth several key issues and challenges, these challenges should be viewed as opportunities to transform these spaces into a form of urban reconstructor and can be seen as an opportunity to overcome the issue highlighted in the KL Structure Plan 2020.

Examples and approach from successfully implemented project such as the Underpass Park in Toronto can be made as a benchmark in order to aid the aspirations of the currently ongoing Greater Kuala Lumpur/ Klang Valley Masterplan of rapid growth in parallel with upgrading the city's liveability. The issue of disjointed spaces which lacks in spatial coherence in both visual and physical aspect primarily caused by highways and rail infrastructure can be overcome. This conceptual paper has shed some light regarding this issue and put forth a worthy example of the problem. But perhaps more importantly, the question would be now how would landscape architects, architects, designers and planners respond to this issue and take into consideration regarding this often neglected piece of urban fabric.



Before



After

located in Toronto, Canada. Underpass Park transformed derelict and unused space beneath a series of overpasses into a unique community space. It is located under and around the Eastern Avenue, Richmond and Adelaide overpasses and is an exceptional example infrastructural landscape. The space was constructed in two phases, the first completed sections of the park are between St. Lawrence Street and Bayview Avenue. The second phase of the park, on the west side of St. Lawrence Street, is under construction and expected to open in summer 2014. Designed by landscape architects Phillips Farevaag Smallemberg, Underpass Park is part of an ongoing effort to transform interstitial urban spaces into valued public amenities. The design takes full advantage of the concrete beams and columns of the overpasses to create a unique and inviting community space as well as providing year round weather protection. This uniquely design space provides adjacent communities with a safe and conducive way to connect between the north and south sections of the surrounding neighbourhood.



Before



After

*Before and after, Underpass Park Project)
Transformation of intersitial space into a
meaningful and socially functional space.*