

MOVEMENT AND PAUSE: TRANSIT BUILDINGS AS PUBLIC SPACE

by Li Sau Kei

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Photo courtesy of Singapore's Land Transport Authority

Transit architecture too often is defined only in terms of efficiency and flow overlooking the other important attribute of this typology: public space. Stations, terminals and hubs are a celebration of movement and pause, the coming together of people on the way to somewhere. This crafting of public space is not at odds with the engineering challenges of speed and flux; indeed it is complementary and necessary to the success of transit systems and the making of Greener cities. The article looks at great transit architecture in several cities, with a close look at the Singapore experience with its Mass Rapid Transit System. It makes the case that the question of how design services are procured for transit buildings speaks of the relative importance placed on efficiency and place-making.



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SUSTAINABLE CITIES

The issue of sustainable transportation in the 21st century is a focus of global environmental concern. As urban centres develop to meet the demands of expansion and growth, there is an ever-present conflict with allocation of space to meet various needs. This limited space is required for buildings to contain people and their functions, roads to transport people and goods, and green outdoor spaces for relief, oxygen and food. Most cities have already reached a state of congestion whereby to increase space for one would be a loss in space of one or both of the others. Buildings and outdoor spaces are desirable for the function and living of city inhabitants, and a balance of sufficiency between the two can be achieved for their well-being. Roads or spaces for vehicular transportation, on the other hand, do not inherently contribute to the well-being of city inhabitants.

Congested roads tend to be detrimental to the

urban fabric and life of the city, impede pedestrian movement and fluidity of urban spaces, and are a source of pollution and carbon emissions by way of vehicles. With growing population and affluence, there is a tendency for road space demand to increase, especially in newer parts of cities. In older heritage-protected areas, road space demand is limited by the tighter urban fabric, which needs to be conserved, although this does not mean a stop to road congestion.

The increase of road space is not limited to surface road-widening or new roads; flyovers, viaducts, underpasses, and tunnels are implemented as good urban solutions. However, these concrete structures tend to isolate and sterilise the space around them, causing an inability to bridge the gulf between them and buildings or people. Latter 20th century city planning tends to be car-centric, dictated by car travel and the scale of the urban environment

tends to be less pedestrian-friendly. The lack of ‘human scale’ environment found in older/historical parts of cities poses a problem for modern cities moving towards a new direction to evolve to a people-centric and pedestrian/bicycle-friendly state.

Efficient and affordable public transportation in urban centres plays a vital role in enabling city dwellers to travel via a comprehensive transit network. Public transport systems can be more efficient and convenient than private car transport, especially those with dedicated exclusive route-way. If the notion of private car ownership as a symbol of prestige or affluence can be dispensed with, private vehicular travel can be reduced to a minimum. A desirable urban model would be the minimisation of vehicular roads and streets to enable the development of effective public transport systems, generous pedestrian networks, cycle ways, and green and recreational spaces. Connectivity and integration of infrastructure with the built environment and circulation patterns are also key to its effectiveness. The provision of such infrastructure can enable the majority of urban dwellers to convert from sedentary car-driven habits to active walking, cycling and public transport user lifestyles. The quality of life will improve with a healthier population and decrease in traffic pollution.

MASS RAPID TRANSIT

Mass rapid transit systems—with the ability to

transport large volumes of people at rapid speeds and frequency—work efficiently for travel within large cities, inter-cities and inter-towns/regional centres/suburbs. Within this network, other transit modes such as trams, light rail and buses, and even bicycles can play important supporting roles. In Melbourne, Australia, the tram system has long been the main form of inner city transport where there is a shared road system between cars, trams and pedestrians, which effectively regulates the speed and volume of vehicular traffic in the city. The London Cycle Hire Scheme, popularly known as Boris Bikes and introduced in 2010 to London’s inner city, is steadily gaining momentum. London’s transit systems are considered to be at capacity and the provision of a cycleway network is on the pipeline, providing impetus for other cities to follow suit. The seamless transfer between modes of transportation and provision of support facilities such as car and bicycle parking must be effective in order to maximise commuter usage.

While rail corridors or routes are planned along existing urban corridors, and stations or stops are sited at nodes or areas with existing potential passenger catchment, the reverse can also happen in some cases. Part of the route for the Dubai Red Line was an undeveloped desert, but by the time the system was in operation, stations were serving new commercial and residential developments. By introducing new stations that can provide connectivity and accessibility to/from a wider catchment of people, the potential for urban

regeneration/revitalisation or urban intensification around station locations can be realised.

TRANSIT ARCHITECTURE

As modern mass rapid transport systems are being implemented around the world at a fast pace within urban centres as well as inter-city, transit architecture becomes increasingly commonplace.

This is not a new building form. The structurally expressive St. Pancras Station in London and Grand Central Station in New York, which opened almost 150 years ago, became the iconography for travel in that era. The architecture of these buildings is accentuated by incorporating ample daylight into the grand station halls.

Technological advancements made it increasingly possible for rail lines to be submerged underground within cities to conserve space for other uses. In cities where train lines exist at grade or in shallow cuttings, they divided the surrounding area, sterilised the land between, and caused a disconnection of the city’s functions on many levels. The underground systems were even more technically challenging to implement, and transit design tended to be engineering-driven. Architecture became more restrictive and ‘internalised’ with few exceptions; and

1 Paya Lebar Station: dramatic view along bridge spanning over centre trackway

A desirable urban model would be the minimisation of vehicular roads and streets to enable the development of effective public transport systems, generous pedestrian networks, cycleways, and green and recreational spaces.

2 Dubai: Sheikh Zayed Road transformation, 1990 to 2007 **3** Melbourne: the road is shared by tramway, vehicular lanes, bicycle lanes and green buffers
4 Public bicycles for hire adjacent to Flinders Street Station, Melbourne

expression became focused on station entrances, ornamentation and detail. Spaces were functional and serviceable at best, but otherwise uninspiring and formless, or circulation flow was poorly planned and not immediately legible for users.

With modern technically demanding systems, a resultant lack of development in architectural expression ensued in underground transit systems with few exceptions. Architects struggled with engineer-led solutions and applied a 'lipstick on the gorilla' approach; concealing the structure, systems and services behind a veneer of finishes.

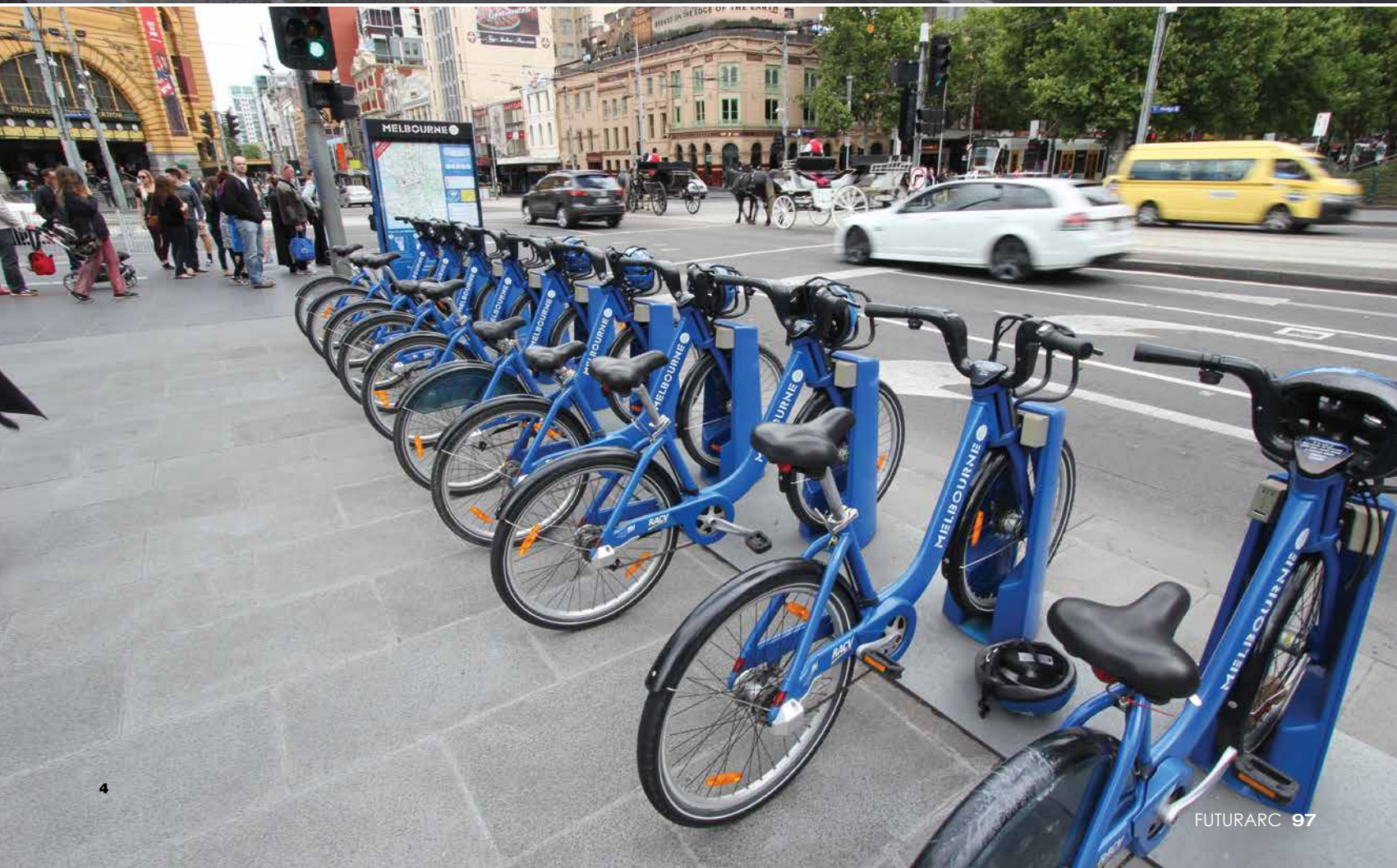
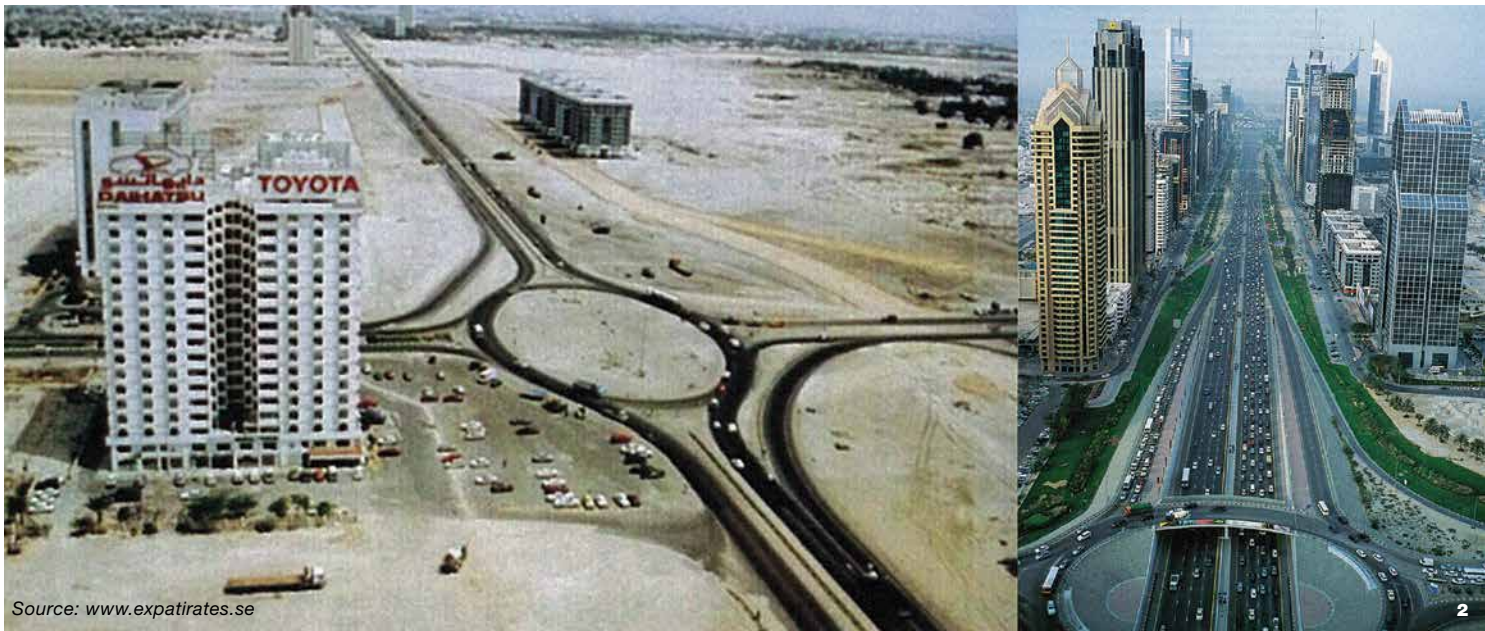
However, there are several recent examples of transit systems that have succeeded in redefining the notion of transit architecture, e.g., Bilbao Metro, Jubilee Line Extension (London) and Copenhagen Metro. In all of these new lines, there was strong direction and endorsement for a bold and intelligent architectural approach, which enabled designers to transcend the engineering constraints not by concealment, but integration with the architecture.

On Bilbao Metro, the expression of the cavern engineering and compact entrance structures gives its identifiable architectural form. On Copenhagen Metro, the voluminous excavated internal form is exploited and accentuated with the use of light. On both these lines, the strong line-wide identity was easily achieved as the same architectural team designed all stations. The intention was to procure similar stations in order to provide a recognisable and legible transit system for users.

On the Jubilee Line, the engineering and architecture were integrated as a cohesive whole in many of the stations. The system components

were treated with an industrial design approach—modular standardisation but meticulously resolved and detailed. The commissioning of different architects for each station ensured the individual identity of all 11 stations, but there was also a line-wide identity born of common underlying philosophy and essential elements. The award-winning stations on the Jubilee Line Extension have made significant architectural contributions and proved the need for architects with the ability to lead the design strategy for stations in a progressive direction. The late Roland Paoletti, the driving force behind the architectural vision on the Jubilee Line Extension, believed: "to create a situation and allow heavy engineering, which was so often static and inhuman, to become instead resourceful and brilliant and active in response to architectural initiatives."

In Asia, the architectural design procurement process tends to be included as part of the engineering design procurement, design and construct package, or an all-encompassing design, construct and operate package for a whole rail line. Because of the public tendering process, more often than not, the lowest priced bid is selected and deemed to be the best value for public expenditure. The emphasis is on project delivery of a suite of stations rather than individual station design quality. In the case of an engineer-led design consultancy, low fees may lead to inadequate, lower quality or less experienced design resources provided for the project. The design product may suffer from inadequate resolution on the macro- and micro-scales and may lead to heavier construction costs and negative long-term urban impact. In the case of design and construct contracts, in order to





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achieve a low contract price, the most economical solutions are proposed, which are not necessarily the best architectural solutions.

In price-driven selection and procurement processes, the choice of the architect tends to be a minor consideration and accepted as part of the overall package. With the same designer on five or more stations at a stretch, the wrong solution can be a costly mistake with repeated cookie-cutter style for every station. Contextual responsiveness and expression can be overlooked and compromised when customised or even bespoke designs for each station are not made possible. Contract ‘packaging’ can impair the success of station identity strategy, i.e., stations under one contract by the same architect have similar identity, rather than a consistent line-wide identity, regional identity or unique station identity.

Case Study: Singapore

The North-East Line, opened in 2003, was procured through design and construct packages of a few stations each. A station’s provisional sum for the architectural finishes secured a consistently high quality of finishes throughout the line, but not the quality of architectural design. In general, the public spaces are reasonably attractive and there seems to be a similarity of design approach on all the stations, which is the concealment of the engineering behind a prescribed range of finishes. It is the artwork in each station, part of a successful consolidated art programme, which is relied upon to provide the stimulation for passengers.

The client desired an iconic design for Expo Station, an elevated station on the Changi Line. The internationally-renowned architect was selected on the back of their work on Bilbao Metro and Jubilee Line. The pair of climatically responsive, dramatic, overlapping roof forms provided the opportunity for a challenging structural resolution and meticulous attention to detail. The station is a clever integration of heavy engineering in off-form concrete at the lower level and cantilevered steel for the ‘floating’ roofs finished in glass, stainless steel and titanium.

The design procurement for Paya Lebar Interchange Station on the Circle Line was unique. Initial planning for the line was carried out by the Land Transport Authority (LTA) and the decision was taken to carry on with the design of this complex underground interchange, also one of the largest on the Circle Line, with the existing elevated East-West Line station. The design strategy embraced the expression of the engineering, a series of substantial columns splayed and forked to optimise support of the roof structure. The station represents a once-only situation whereby an experienced client, known for prescriptive and exacting requirements, ‘let loose’ a little and stood firmly behind the architect-led in-house design team. It was also a case of having the right people at the right time—no easy feat as the usual role within the client organisation is the management, not design, of transit projects.

Because of the important historic civic district location of Bras Basah Station, the LTA opted for an open competition selection process to secure

the best design for this station on the Circle Line. The winning design addressed two challenges—a positive reinforcement of the park space under which the station is partially sited, and the provision of daylight into the deep station. The solution is remarkably simple but challenging in its execution and dependent on one main element. In the park, a reflection pool with a glass bottom forms the station roof. The pool is an urban oasis in the enhanced park setting, reflecting the Singapore Art Museum (SAM) like a giant opaque sheet of mirror. From within, the pool is an enormous continuous skylight for the station and the cavernous circulation space is bathed in daylight. Other station service structures within the park are open-to-sky and discreetly low, thus minimising intrusive impact on the park.

Four suburban underground stations on the Circle Line—Bartley, Serangoon, Lorong Chuan and Marymount—demonstrate simplicity and clarity in the design strategy, and an honest approach to the use of the engineering to define space. Designed by the same team, the design vocabulary of each station is identical and, although constructed by different teams

5 St. King’s Cross Pancras Station provides interchange with London Underground, intercity and Europe rail networks **6** Canary Wharf Station, Jubilee Line: underground ‘cathedral’ with expressive structure **7** Stair tread detail in London’s North Greenwich Station is a replica of detail found in earlier stations **8** Perth, 2004: at grade main station and trackways alienate the north and south of the city **9** Art nouveau Metro station entrance in Montmartre, Paris





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Transit systems are built to last for generations of people, therefore the impact on the lives of people, whether positively or negatively, is widespread and long-lasting. Surely this is reason enough for the policy and decision makers to prioritise the expenditure of public funds to secure the best outcome for station design.

to varying degrees of finesse, the latter does not seem to have detracted from the design intent. The entrance design is a symbiosis of architecture and engineering, embracing daylight to accentuate form and space. Daylight filtering through the apertures is a way-finding device and at night, light from within glows through the apertures like 'lanterns' and the entrance becomes a beacon for the station. The concept is poetic and contextual; the analogy is the endemic Singapore rain tree, which through its expansive horizontal spread of branches, provides much-needed shade and filters daylight. For these station entrances, the cookie-cutter approach seems to have been successful because of the high quality of the architecture, made possible in part by strong client endorsement.

CONCLUSION

Mass rapid transit has become an intrinsic part of good forward-thinking city planning for sustainable growth. Mass rapid travel has become part of the everyday lives of city dwellers, therefore it is essential that city planners work together with transit planners to define strategies for integration of transit elements into the city fabric. These can be very different, addressing specific city needs, but should make positive

contributions to the city, reinforcing its place-making character and quality.

There is usually at least a 50-year lifespan on station infrastructure. Because the procurement of rail lines and stations is invariably engineering-led, it is easy to focus on the technical challenges and lose sight of the end-users who provide the reason for the existence of the system in the first place. Transit systems are built to last for generations of people, therefore the impact on the lives of people, whether positively or negatively, is widespread and long lasting. Surely this is reason enough for the policy and decision makers to prioritise the expenditure of public funds to secure the best outcome for station design. There is a misconception that there needs to be a generous budget for good architecture and it would be irresponsible at the expense of more important cost considerations, such as engineering works, when good quality finishes would suffice for the public. However, the main factors likely to affect the architectural design outcome are the choice of architects, procurement method, client vision and support, and judicious management of the budget.

Transit stations offer opportunity for unique architectural expression by way of its complex building form. It is a piece of infrastructure, yet

it is also a public building. It accommodates train systems and a vast amount of people, but the public users are transitory. Vital to its success is the enabling of efficient movement of people and trains and the support of essential services in order to enable these functions. The functionality of this building type cannot be compromised—efficient planning and spatial sizing, and legible clear direct public circulation are essential. But this is only achieving the fundamentals; the spatial quality and architectural expression of spaces can greatly enhance passenger experience. The station and its urban context should be treated as a public space, the making of place, providing for a daily uplifting experience in a stimulating environment for all city inhabitants alike.

"For the price of an underground ticket, you will see some of the greatest contributions to engineering and architecture worldwide."
— Roland Paoletti.

10 Bras Basah Station: SAM reflected on the pool
11 Marymount Station entrance **12** Chinatown Station at the North-East Line: calligraphic artwork is the only exciting feature in an unexpressive space
13 Expo Station: a deliberate iconic gesture



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