Re-thinking the Hong Kong Tramway as a Rooted but Future Orientated Form of Sustainable Transportation

By Dr. Hee Sun (Sunny) Choi, Mingyu Cui

Figure 1

Annual number of passenger in tramway											
Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Passenger	83,942	82,009	82,347	84,383	82,783	78,960	74,053	72,282	66,251	64,854	64,758

Table 1

Agenda 21 is a non-binding action plan of the United Nations focused on sustainable development and the outcome of the Rio de Janeiro Earth Summit from 1992. In it, transport was identified as a key aspect of sustainable development, and reframed the discussion by acknowledging that while transport promotes economic and social development, adverse issues such as air quality, noise, and safety issues that impact negatively on economic productivity and overall quality of life need to be mitigated against (OECD, 1995).

As Hong Kong's most sustainable form of public transportation, the tramway has been in operation across the northern districts of Hong

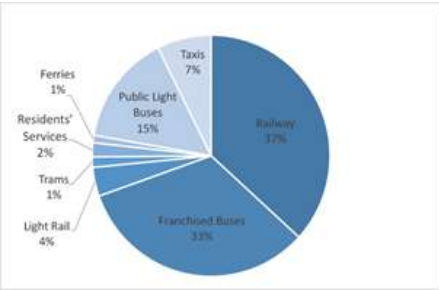

Table 2

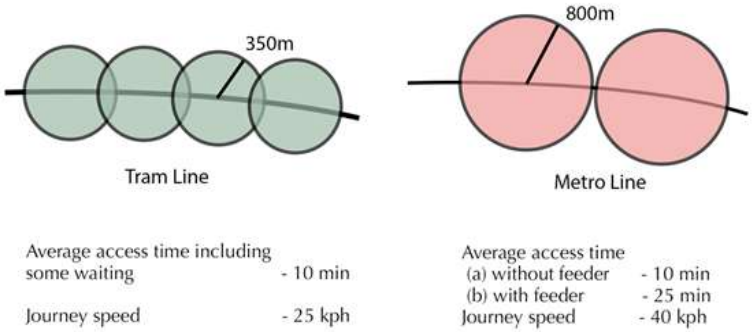

Figure 2

Kong Island (see figure 1) for more than a hundred years (Hong Kong Tramway, 2019). With the continued development of public transportation, including the mass transit railway (MTR) line running directly below the tram route, and some inherent restrictions in how the tramway can be used and accessed, the tramway in Hong Kong is facing a questionable future with passenger figures falling (see table 1).

Whilst the Hong Kong government has recently stated that "trams perform an important supplementary function on the North Shore of Hong Kong Island" (Transport and Housing Bureau, 2017), the question of how they fit into the future of Hong Kong is less clear. For example in the document Hong Kong 2030+ (Planning Department), the vision for Hong Kong for 2030 and beyond includes no specific planning and design strategies for development of the tramway.

Based on the data for daily public transport patronage (Table 2), the preferred options for journeys in Hong Kong are the mass transit railway (MTR) and the bus, with the tramway only serving 1% of journeys. However, studies have shown that although the percentage of usage for the tramway is small, it can provide a useful and appropriate service to fill the gap in capacity and journey distance between the bus and the MTR, at a construction expense of about a tenth of a metro system. (Topp, 1999). Tram stops are more closely spaced than MTR stops, with a distance between tram stops in the range of 400-600m and MTR stations spaced at 800 metres or more. (Figure 2).
Looking at the typology of the tram stop and its relationship to the vehicle roadway, there are seven different types within the tram network, including variations from two to eight vehicular lanes (see figure 3) of street layout on the current tramway road, with the number of car lanes from two to eight. On the narrower roadways from two to five lanes there tends to be a shared lane for both trams and vehicles.

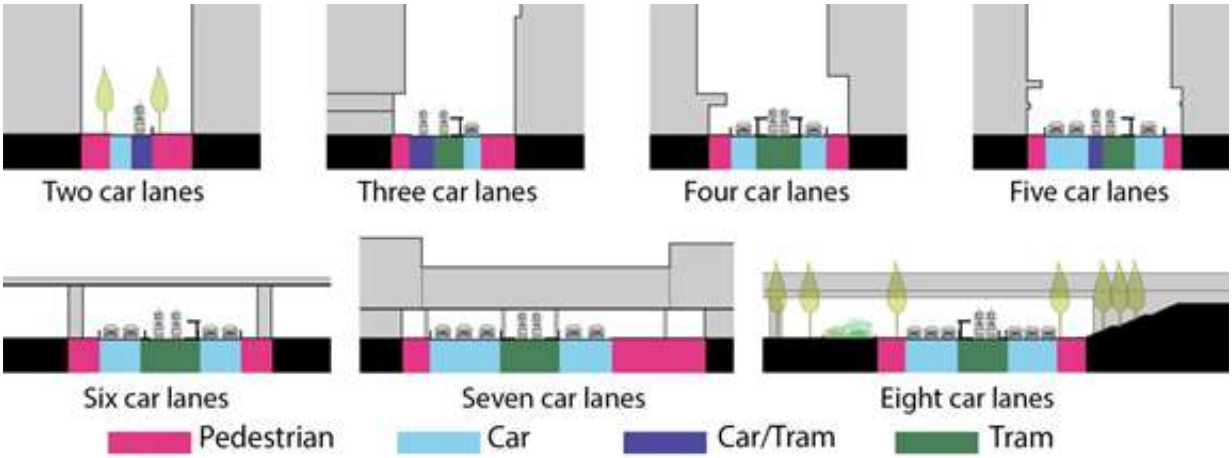

Figure 3

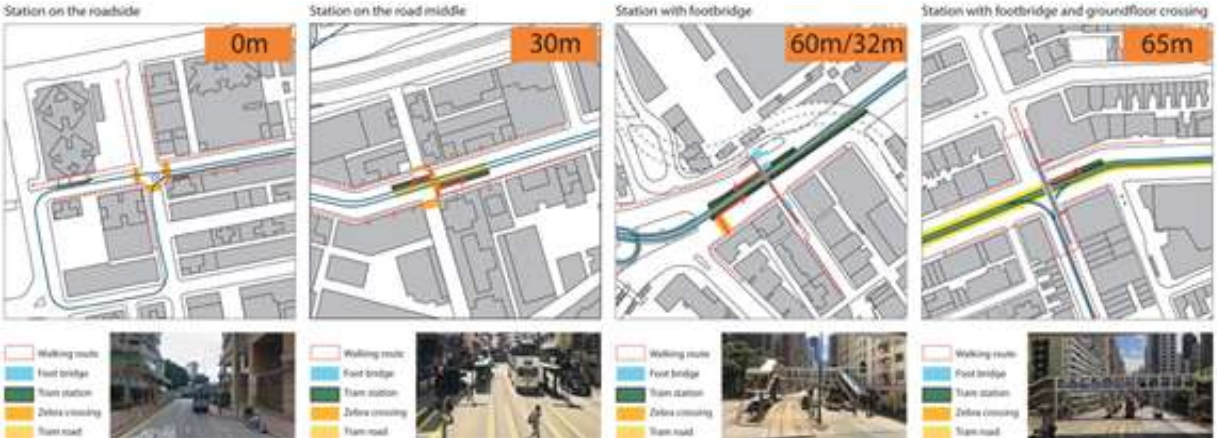

Figure 4

Considering the platform position and how it is accessed, there are currently four different types of tram station. Firstly by entering directly on the roadside from the pavement, secondly using a zebra crossing to enter stations in the middle of the road, using a footbridge to enter and using both footbridge and zebra crossing to access(see Figure 4). And we had measured the average distance that people need to walk to the stations. Figure 4 indicates that the footbridge requires the longest walking distance, 65 meters on average which is

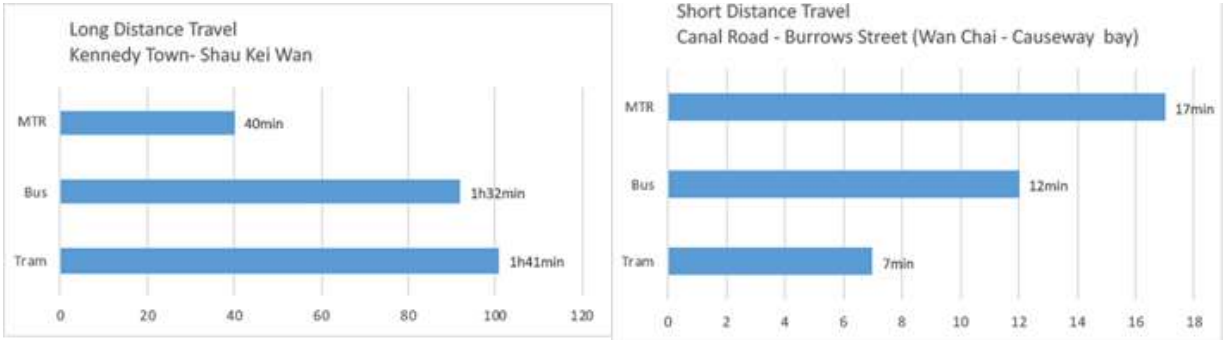

Figure 5

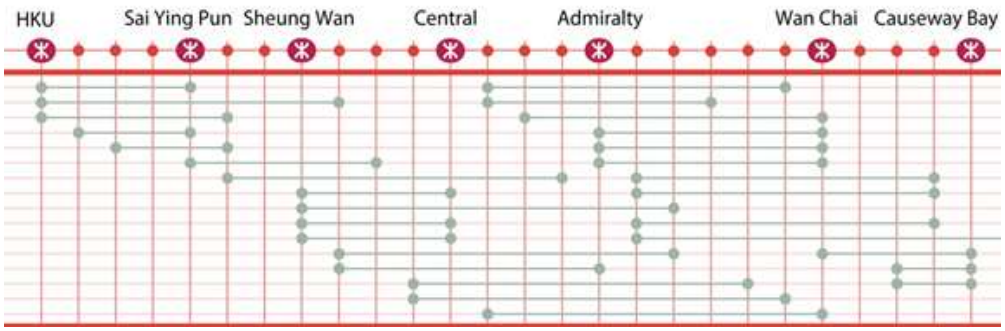

Figure 6

only about one or two minutes to reach.

A tram service is generally considered to be slow on a shared road (Flanhardt, 2018). From the public statistics, the highest speed the tram in Hong Kong can reach is 40 km/h, making it the slowest form of public transport when compared with the MTR (80km/h) and bus (100 km/h). From a research into travel time (see Figure 5), comparing the journey time taken on a longer journey route from Kennedy Town to Shau Kei Wan, the tram takes almost three times as much time as the metro and is 9 minute slower than the bus. However, when it comes to a shorter journey route from Wan Chai to Causeway Bay, the tramway is the fastest.

Figure 6 is a diagram that records thirty passengers from the Shek Tong Tsui terminus to the Causeway Bay terminus, recording which station they got on and off the tram. From this map, we can see that people are not likely to travel a long distance by tram. More than 95% of those recorded took a tram journey of less than 9 stops, or the equivalent distance of one

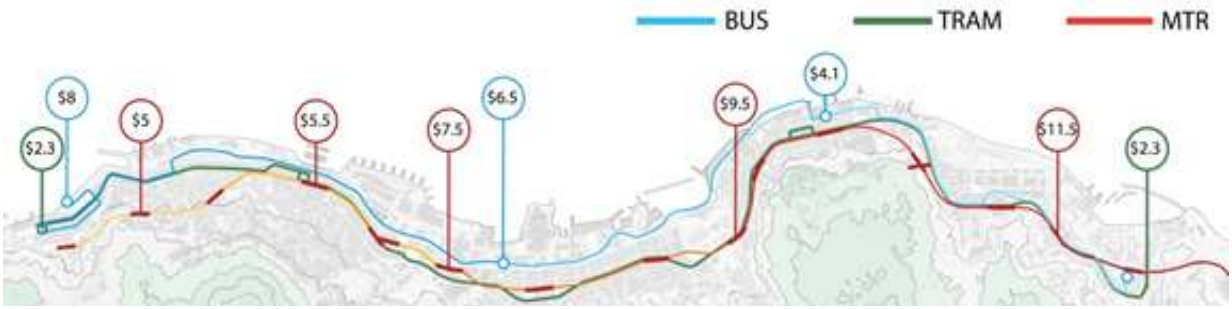

Figure 7

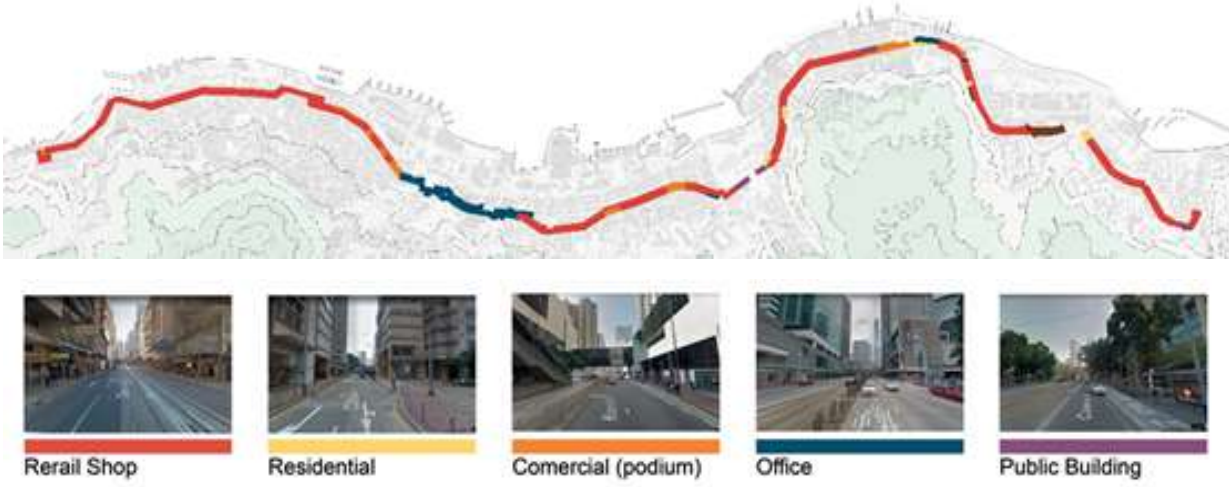

Figure 8

or two MTR station stops. Another notable point from the recording is how the tram stations that are near the MTR stations are the most popular arrival and destination points, which indicates how the two forms of transport are used together.

Together with these advantages over journeys of shorter duration, the tramway is also the cheapest form of transportation of the three types studied, at a price of HK$2.6 per adult journey, in comparison with a sliding price scale of HK$4.1-8 for the bus and HK$5-11.5 for the MTR (see figure 7).

3.2 Closeness

The tram station has a strong connection to the roadside and street frontage and this relationship is influenced by the building usage. The street frontage along the tramway can be categorized into five different spatial structures, including small retail shops, residential building without active frontages, commercial building with a podium, office building and public facilities (see figure 8). The areas with more active shopfronts and street level activities are more popular entry and egress points for the tram. This character of usage can offer an indication of how the tramway could be integrated into future planning to revitalize the atmosphere and economy of the streetscape, with the tramway increasing the quantity of passers-by at street level.

From the perspective of energy consumption, the tramway uses significantly less than a fuel-driven bus, and when you factor in the environmental cost of tunnel production, significantly less than the MTR also. If vegetation can be integrated along the tramway this can also improve the air quality along the street.

In the contemporary context of a renewed interest in sustainable transportation systems, and local revitalization, it is important to review how a tramway system may contribute to a revitalization of the street and new urban activity structures. In order to assess this, an analysis was made of two different sites:

1. Des Voeux Road in Sheung Wan. A dense urban area including a range of commercial activities including office space, retail and restaurants (see figures 9-10)

2. Queensway in Admiralty. A transport hub with a range of commercial activities, governmental departments and other institutional uses (see figures 11-12)

The data and analysis show that each of the tramway sites studied have fencing to separate the platform from the roadway, with pedestrian access to platform limited to a single narrow zebra crossing at Sheung Wan, and a pedestrian Bridgeway in Admiralty. separated with fencing from the adjacent roadways and pavements. From the perspective of closeness and betweenness, the tram stations are very well-oriented and structured, but the connectivity to the street and pedestrian access could be improved and increased.

5 Social value of Hong Kong Tramway

In order to better understand the social impact of the tramway, this research surveyed thirty-five tram users. This small sample indicated that the main users of the tramway are aged between 40 and 60, with more than 70% living on Hong Kong Island. The majority of those surveyed thought the tramway was cheap. When it comes to the frequency of use and the purpose of use, 60% of those surveyed used the tramway at least once a week, one-third of the people rarely use the tramway and 7% of people had only used the tramway once. Of those traveling, more than half were on a relatively short tram journey of less that 30 minutes in duration. As

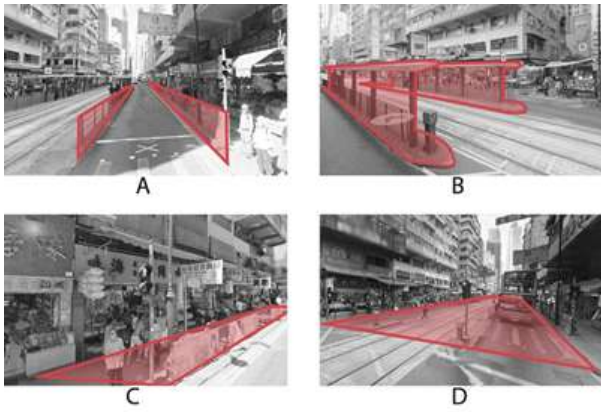

Figure 9

a negative point to the tramway some of those surveyed highlighted that the system was currently inaccessible for wheelchair users.

To the neighbourhood in Hong Kong, the tramway is not only a means of transport but also carries the collective memory of a generation. (Flanhardt, 2018), many people in Hong Kong are huge fans of the tramway and many societies have been set up, such as 'The Tram Club' and 'The Tram Chasers,' to share information and experiences of the tramway. There are special trams that are offer private functions, and also tour trams.

In summary, the tramway can be seen to have advantages in low energy use and pollution emissions, also the tramway can reduce the economic burden for government and citizens on low income as the ticket price and construction fee is lower than other forms of public transportation. However, the research, highlights some drawbacks and negative points for

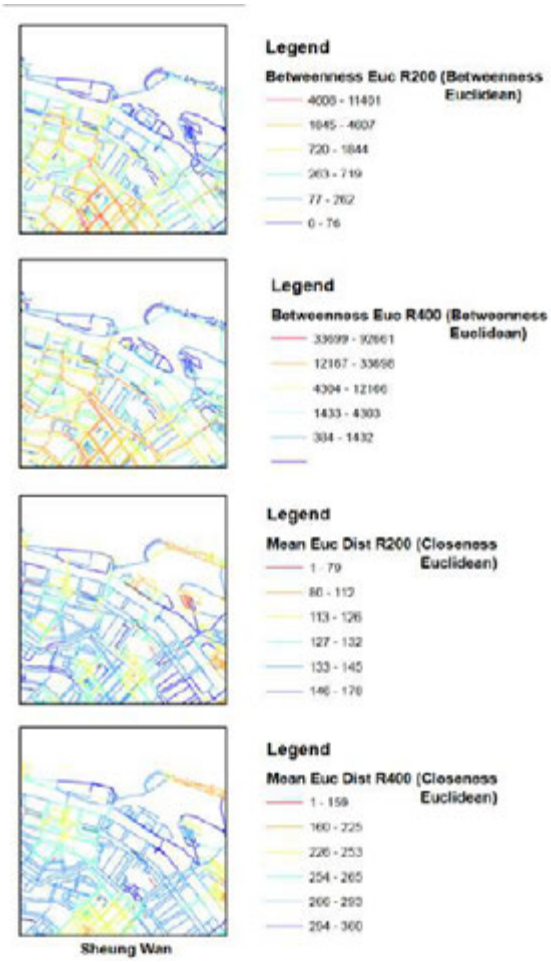

Figure 10

the current tramway system, such as bad street condition, inaccessibility for the the wheelchair bound and those with prams, and the current typology for tram stops has less potential for intergrating together with other functions and forms of transportation. is too simple that stations only serve people that get in or off the

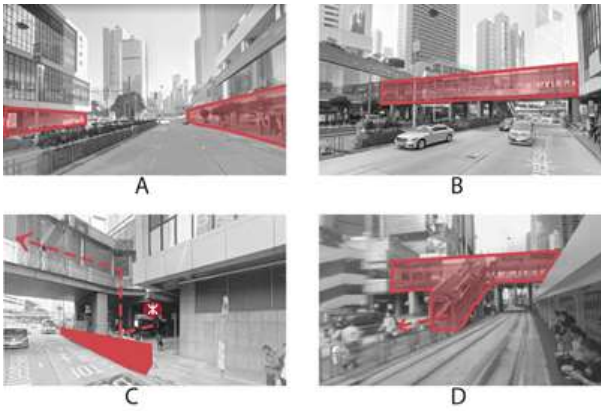

Figure 11

tram. Can there be a way to enhance the benefits of the tramway system whilst addressing its negative points. Figures 13 and 16 are two possible design solutions aimed towards doing this.

6 Conclusion

In conclusion, the Hong Kong tramway has a long history of over one hundred years within the city and the community, and similarly to the star ferry has become part of the identity in Hong Kong. Whilst there are design challenges to be faced in making the narrow tramway accessible for all, including wheel chair users and those with pushchairs, once this can be overcome the tram has the potential to be both rooted and future-oriented.

The Tram offers a useful alternative in Hong Kong, particularly for short journeys, where the data proves that there are both cost and time savings over other forms of transport. It helps to protect the environment by reducing the urban pollution caused by fuel-driven cars, taxis and buses, and offers the cheapest form of public

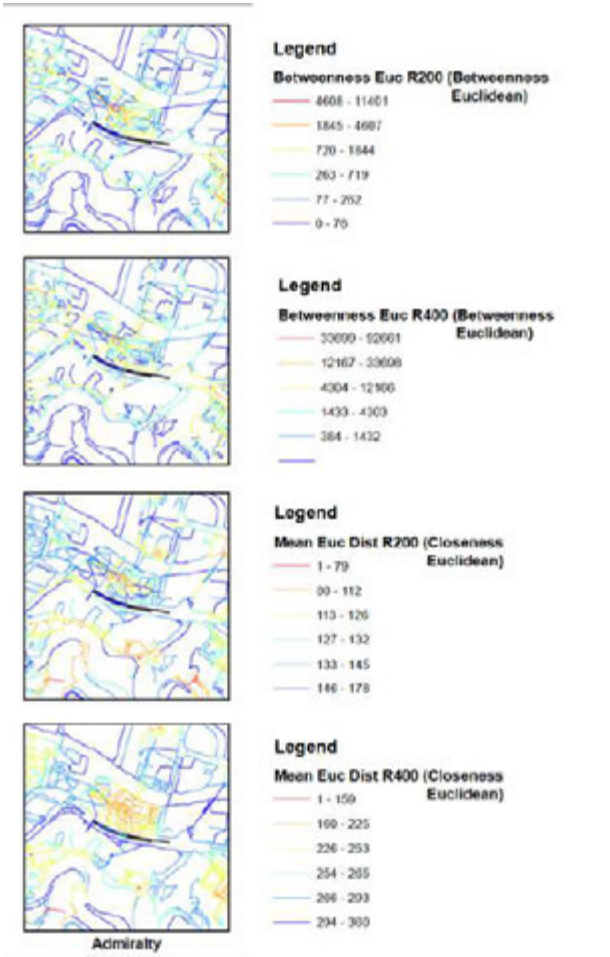

Figure 12

transport for those on a low income. As part of a sustainable design strategy the tram can form part of a redesigned urban space that is more accessible and walkable. In this way the tramway can become an important component of the development of a more sustainable Hong Kong.

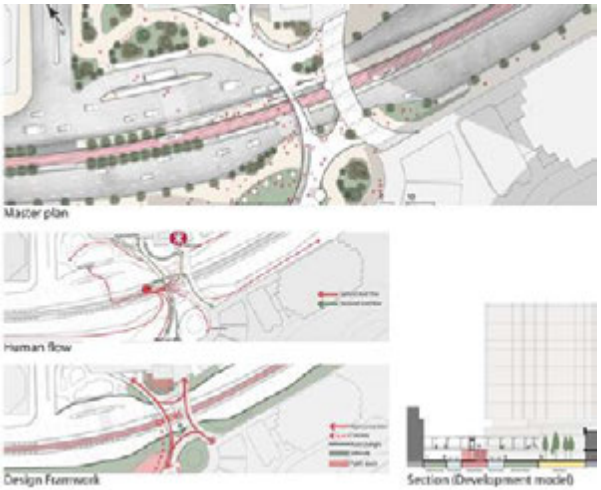

Figure 13 Admiralty Masterplan

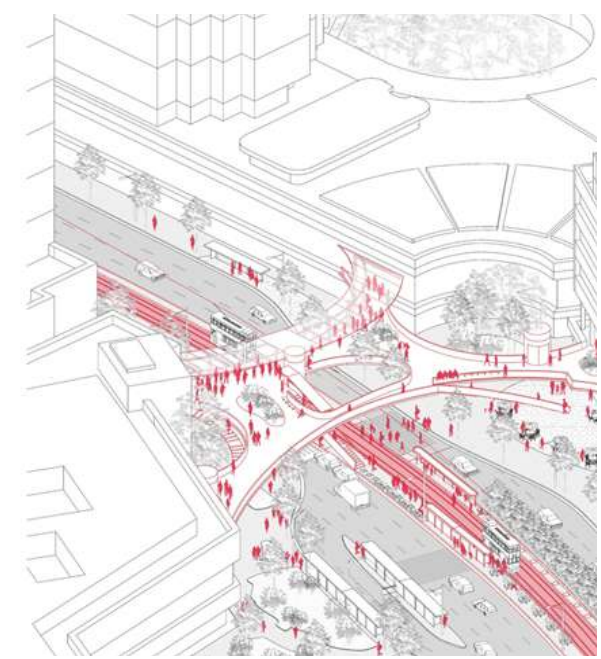

Figure 14 Admiralty Design Proposal

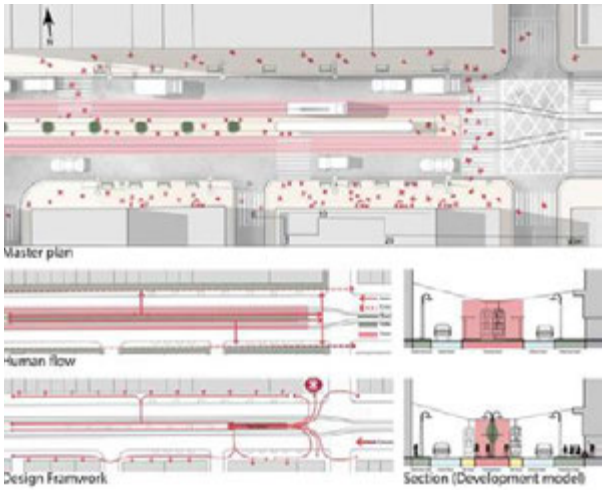

Figure 15 Sheung Wan Masterplan

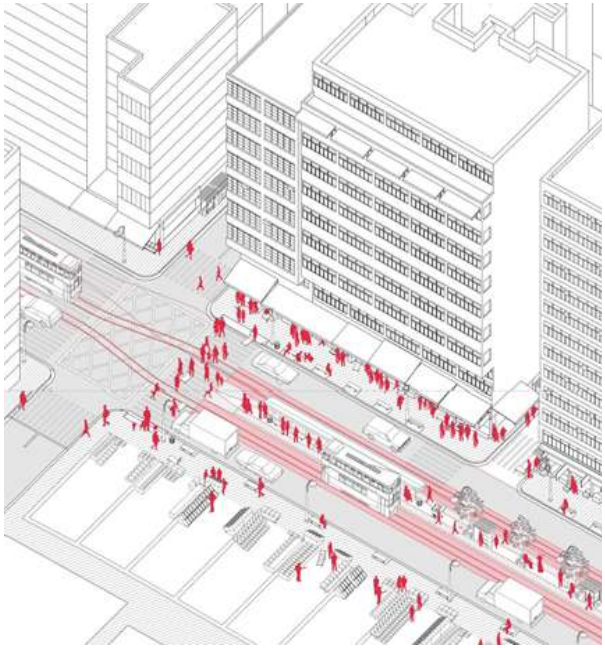

Figure 16 Sheung Wan Proposal

Dr. Hee Sun (Sunny) Choi's Biography:

Hee Sun (Sunny)Choi Following higher education at RMIT in Melbourne, the AA School and UCL in London, Dr Sunny Choi completed her PhD in urban design at Oxford Brookes University and conducted Post-doctoral research at Oxford University. A specialist in digital infrastructure, cultural identity and environmental sustainability, she has practiced as an urban designer and architectural designer in the UK, Hong Kong and in Seoul, South Korea, and within the design and master planning department of the United Nations Headquarters in New York. Currently she is working as an editor of U+U journal, adjunct assistant professor at Polytechnic University of Hong Kong and founding partner at CHOI-COMER ASIA Ltd, and architecture and urban design practice and research lab in Hong Kong.

Mingyu Cui's Biography

Minyu Cui is a research assistance in the Faculty of Architecture at the University of Hong Kong. She received a bachelor's degree in Urban Planning from Zhengzhou University and master's degree in Urban Design from the University of Hong Kong. She is interesting in urban design strategies, sustainable urban development and public urban infrastructure. Her current research is about urban design and public realm design impacts on livability and vitality.

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