TOD, volumetric TOD, Destination, Public Space and Community Cohesion

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Abstract

Transit Oriented Development (TOD) has become an urban planning and design policy and practice approach to deliver sustainable transport through the world. TOD as infrastructure contributes to urban liveability in determining way of life and well-being of the inhabitants of a city. Urban liveability can be understood as a perceived notion of well-being and social cohesion among residents of an urban area. TOD has been hypothesised to create gentrification. Does gentrification impact negatively on social cohesion in high density TOD-led cities? We address this question by deploying an exploratory difference in differences qualitative analysis of the relationships between measures of involuntary residential displacement and 'built environment' indicators. These are proxies for 'gentrification' and 'social cohesion' respectively. This investigation examines displacement indicators before and after the opening of three new MTR stations in 2014, using a control neighbourhood which has an existing station. It also analyses BE dimensions related to social cohesion such as 'destinations' and 'public space provision'. The displacement indicators have variable trajectories when details are compared. There is limited evidence of systematic displacement, although there are other more prominent and dynamic changes in those destinations. The provision of new public space is associated with the most dynamic changes. From a placemaking point of view, further detailed study to better understand the role of development drivers of gentrification is required.

Keywords: MTR station, Social Cohesion, Community Destination, Public Space, Urban Regeneration

Introduction

The liveability of high-density cities, such as Hong Kong characterized by dense high rises tightly sandwiched between green hills and waterfront has become a contemporary challenge. Hong Kong is a public transport led high density city. In Hong Kong, public transportation, the MTR system account for more than 40% of trip to work. Such a high intensity infrastructural service determines the way of life and well-being of Hong Kong's inhabitants. The MTR Corporation is famous for the financial and operational success of the 'rail-plus-property' (R+P) model (Cervero & Murakami, 2009). R+P as Transport Oriented Development (TOD) achieves sustainable transport objectives (Cervero & Kockelman, 1997). Whereas early understanding of urban liveability was defined by physical characteristics such as infrastructure provision, later conceptions involve more complex psychological and cultural perspectives. Urban liveability has become a perceptual notion of well-being and social cohesion. Urban liveability and urban sustainability are meshed, the former being a constituent of the latter. Within these lenses R+P/TOD projects and associated new station-led urban regeneration have been criticised for inducing gentrification (He, et al., 2018). Displacement - an involuntary housing mobility - is defined as the main characteristic of gentrification processes. Gentrification is often characterised as involving the influx of higher-income households, changes to population composition of neighbourhoods, and the displacement of lower-income individuals (Padeiro, et al., 2019), thus reducing social cohesion.

Social cohesion refers to positive social relationships; a cohesive community contributes to the wellbeing of all its members. Since redevelopment must create higher investment value from the land developed to cover the cost of demolition, such projects seek to increase Floor Area Ratio (FAR) and maximize Gross Floor Area (GFA) with a larger proportion of private residential development than public development. This phenomenon may have an impact such as the displacement of low-income community and trigger transit-induced gentrification which may induce a series of social issues, one of which is the reduction of social cohesion in local communities. Social cohesion is attracting considerable attention among policy makers across the world. The global recognition of its importance comes against a background of rising sentiments backed up by evidence that growth is not being equally shared. 'Cohesive' and 'sustainable growth' are highlighted as development strategies, especially in those cities with rapid urban development. Sustainability is no longer considered merely environmental or economic concerns, but also incorporates social and health dimensions. In previous studies, the relationship between BE and social capital, and social cohesion relationship have been reviewed (Mazumdar, et al., 2018) yet the definition and measurement of social cohesion in relationship to BE dimensions is only emerging. Most of the research has been conducted in European and American cities, which leaves a research gap in high-density Asian cities dominated by public transport.

This paper aims at exploring the inter-relationships between displacement indicators and the different BE dimensions of social cohesion in a high-density city. The aims of this investigation are first, to understand how new TOD station development affects those BE dimensions that contribute positively or negatively to social cohesion. Second, it is to investigate which socio-demographic changes that are theoretically related to displacement and social cohesion, occur after announcement and opening of new stations. The research field is narrowed to new MTR stations in Hong Kong. Findings of this research could inform future research and urban design principles in (re)development of new MTR station areas.

1. A review of relevant concepts and studies

Over the last decade, evidence has been accumulating on the relationship between social cohesion, as the combination of social capital, social inclusion, and social mobility, on outcomes such as health, educational attainment and association between social institutions and economic wellbeing.

1.1. Gentrification

In recent years researchers and policy promoters have contended that TOD could result in gentrification and the displacement of low-income group. TOD initiative involves and trigger processes that can changes spatial configurations, accessibility levels, change in affordability and social filtering. Much of the TOD literature is focused on maximizing ridership (Ibraeva, et al., 2020) and less on building cohesive communities. Displacement undermines social cohesion by reducing social mixing. The contribution of TOD to displacement is still unresolved (Padeiro, et al., 2019) and little is known about high density city dominated by public transport.

1.2. Social cohesion

Community cohesion or social cohesion is complex to define. Social cohesion is usually related to three different meanings: Social exclusion/inclusion, Social Capital, and Social mobility. This research will focus on social inclusion and social capital dimensions.

- Social inclusion was first associated with poverty. More recently researchers describe it as the participation of individuals or groups in society: whether people can join activities and institutions, and access resources. These definitions have definite spatial accessibility and spatial distribution dimensions (Berger-Schmitt, 2000).
- Social capital, indicates people's willingness to cooperate for common ends: sharing their beliefs, level of trust, participating in community activities and getting sense of belonging as the basis of social cohesion (Berger-Schmitt, 2000).

In their review, Schiefer & van der Noll (2017) suggest that the three essential dimensions of social cohesion are: social relations, identification with a geographical unit and orientation towards the common good. A study on Asia (Stiftung, 2017) used the "social cohesion radar" as

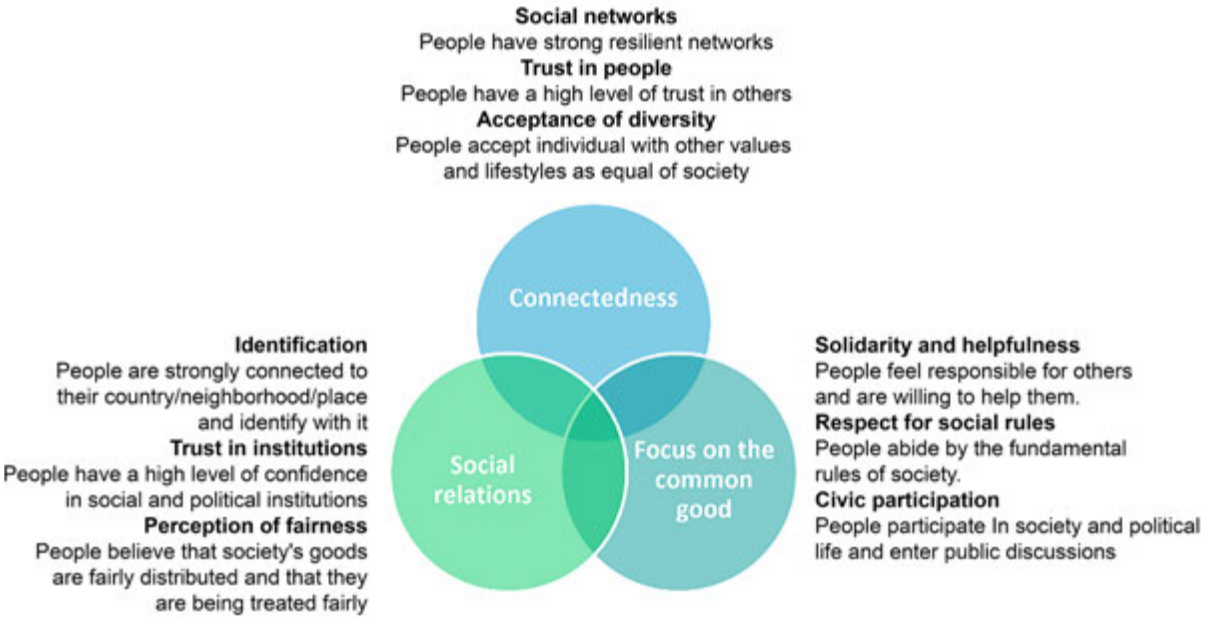

Figure 1: Social cohesion radar and their dimensions (source: Stiftung, 2017)

1.3. Social cohesion indicator

In the review of published research on social cohesion or social capital, it is noticeable that data collection methods highly relied heavily on self-report survey and questionnaire. Scholars used a great variety of what appears as standardized social cohesion measurement index (Dempsey, 2008; Bruhn, 2009; Liu, et al., 2017). The indicators measuring social cohesion dimensions are social relations, attachment and belongingness and orientation to common goods, such as participation and trust in the community. In general in social cohesion studies, especially in the large-scale survey, the linkage between people's opinion and how they perceive the BE is not discussed.

1.4. Built environment / TOD and social cohesion

Mazumdar et al., (2018) literature meta-review of the BE dimensions and social capital showed significant positive relationship between social cohesion and destination accessibility/walkability and overall BE dimensions. The overall dimensions of the BE are density, diversity, and design (See table 1).

BE dimensions	Operational definition
Density	Residential and employment density or their combination into "population" density
Diversity	Land for residential, commercial, recreational purposes in a shared non segregated manner, parks, green and open space also belong to the diversity dimension
Design	Street network patterns, street widths, speed limits, and the prevalence of cul-de-sacs, grid patterns as "traditional" vs multiple lollipop and cul-de-sacs as "conventional"
Destination	Walkability, accessibility to local destinations: proximity to a range of destinations inclusive of retail, sports, recreation, health clinics, hospitals, fast food, and others retail outlets

Table 1: BE factors metrics that related to social cohesion (Source: Mazumdar, et al., 2018)

The BE dimensions related to social capital are almost the same as the dimensions that are related to the success of TOD (Cervero & Kockelman, 1997). While originally developed to predict travel demand, the 3Ds framework has also been adopted by BE and health researchers in a variety of studies. For social cohesion, a key difference, is in the diversity dimension which includes parks and green and open space provision.

For brevity, we omit the overview of relationship between social cohesion and BE dimensions to be found in Dragolov, et al. (2013) and focus on outlining pathways to impacts.

1.5. Pathways to impacts

Mazumdar et al. (2018) delineate the pathways that are hypothesized to relate BE and social capital. The authors identify two different pathways: "activity-based" and "meaning-based."

1. The activity-based pathway: "The trust of a city is formed over time from many, many little public informal contacts . . ." Thus, walking activities, activities, repeated chance, and formal encounters facilitated by the BE can enhance social capital.

2. The meaning-based pathway emphasizes the role of perceptions in the creation of belonging, attachment, and social capital. Thus, for example, a sense of safety and low levels of vehicular traffic (Wood, et al., 2010) or green and open space (Maas, et al., 2009) can affect perceptions of area friendliness and helpfulness, triggering attachment processes.

In summary the role of the BE aiming at enhancing social cohesion, facilitate accessibility and activity and meaning based pathways or mitigate barriers to such pathways to impacts. Of importance are:

1. The role of density as threshold beyond which gains in social capital from better access to destinations, green and open space, etc. are offset by the loss of social capital from the presence of large numbers of individuals with minimal local ties.

2. The role of traffic speed on community severance and social exclusion: the layout, the speed or volume of traffic or other transport infrastructure design that inhibits access to goods, services, and people. Community severance has broader impact such as psychological effects of traffic and effects on quality of life, health and social cohesion (Cooper, et al., 2014).

According to Liu et al. (2017) the conceptual pathways that link BE impact to social cohesion in community is as show in Fig 2.

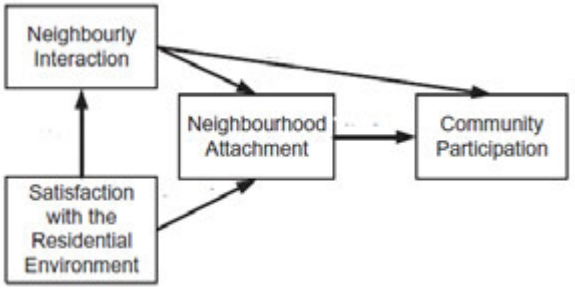

Figure 2: Diagrammatic pathways of the relationship between BE and Social cohesion (source: Liu, et al., 2017)

2. Case study, method and data

2.1. Case study selection

The case studies are selected in Hong Kong, a high-density city, to study the relationship between the new MTR, demographics and proxies of community cohesion. In Hong Kong, 90% of people use public transport whether MTR or buses as their commuting mode, 70% of the population and about 80% of the job opportunities are within a 500m reach of a MTR station. In the last six years several new MTR stations have opened. The Island line was extended to the west. The new South Island line was created from Admiralty to South Horizons. We focus on the Island line extension to facilitate comparison. The study areas are mature high-density mixed-use residential neighbourhoods and have similar density. Kennedy Town (KT), HKU and Sai Ying Pu (SYP) stations are located west of Central, the CBD area. The banding of verdant steep hilly terrain, the vibrant and vertical compact built-up and the flat continuous waterfront are typical of Hong Kong Island.

Figure 3: MTR stations case study (Yellow) and control (Red) (source: adaopted from Open Street Map, 2017)

Fig. 3. above shows, West to East, KT, HKU and SYP station on the north of Hong Kong Island. HKU and SYP station have exceptionally long corridors linking the egresses of the flat areas near the waterfront (north), through the MTR station corridors and lifts to the steep mid-level with slope of up to 1 to 4.

2.2. Methods and data

This study has been narrowed down to three main investigations:

- Gentrification as displacement: the common indicators defining gentrification include socio-demographics (e.g. population change, median income, median rent, median rent to income ratio, proportion with higher education, proportion of over 65s). We use the census data to track changes before and after the opening. According to the analytical framework, the longitudinal demographic character is intended to reflect the general make-up of the social dynamic and whether significant displacement took place. The spatial unit of analysis is the Town Planning Unit (TPU) which are detailed enough for the purpose of the study. This is a longitudinal study (2006, 2011 and 2016) from a few years after the formal announcement of the line extension (2002) to after the opening of the MTR stations (2014-15). We use a control station, North Point on the Island line, to capture difference in differences i.e. general difference from specific differences in the neighbourhoods of interest. The data set is from Hong Kong census and statistics department.

- BE as destination & Community Cohesion: in Hong Kong, there are no community cohesion indicators that exist at TPU level; we use a BE proxy for social cohesion. This study extracts the local commercial business as an indicator of destination diversity, which according to the literature enable to infer change in people's attachment. The pathway to impact is that as popular local businesses (shops, restaurant, etc.) change or vanish, opportunities for walking to a destination and chance and formal encounter and walking may decrease, attachment to place and to community decrease and in turn decrease social cohesion. We survey the four areas using historical Google Street Views before and after the opening (2009 & 2017 or 2019). At street level, more than 1,100 premises were surveyed.

- Public open and green space are part of the BE diversity dimensions that are known to be conducive to pathways to social cohesion. We mapped the provision of green and open space directly associated with the MTR opening.

In this exploratory qualitative investigation, the data is analysed discursively.

3. Results

3.1. Demographic study-social relation

Fig. 4 below shows the compounded annualised rate of change for population, median monthly income, median monthly household rent and median rent to income ratio for KT, HKU, SYP, NP and Hong Kong (HK) from 2006 to 2016. We find that compared to the control

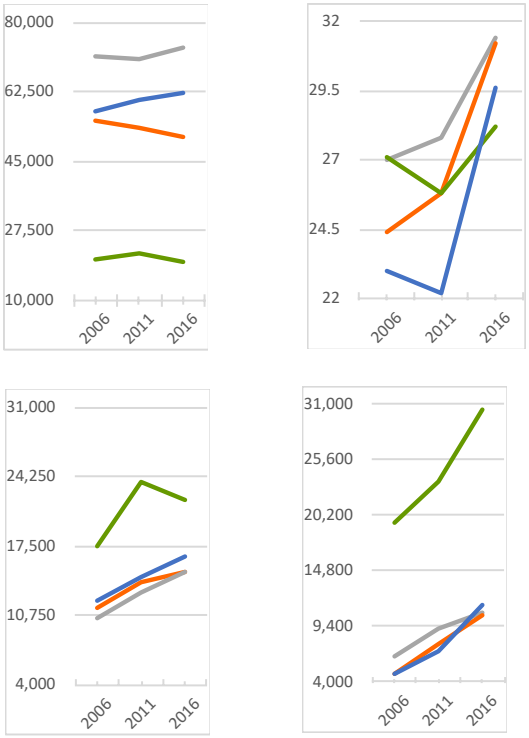

Figure 4: Compounded annualised rate of change, population rent/income ratio,income,rent over 2006 ,2011,2016 (source: HKSAR, Census and Statistics Dept)

station of NP, the areas with new stations do not show a unified trend indicating systematic displacement. Except for KT, HKU, SYP and NP have a lower population increases than HK. KT and SYP present similar increase in income, rent and rent to income ratio which are higher than the control. HKU shows changes that are like the control (NP) for income and rent, yet differ for rent to income ratio, % of over 65s and increase in post-secondary education (Fig. 5).

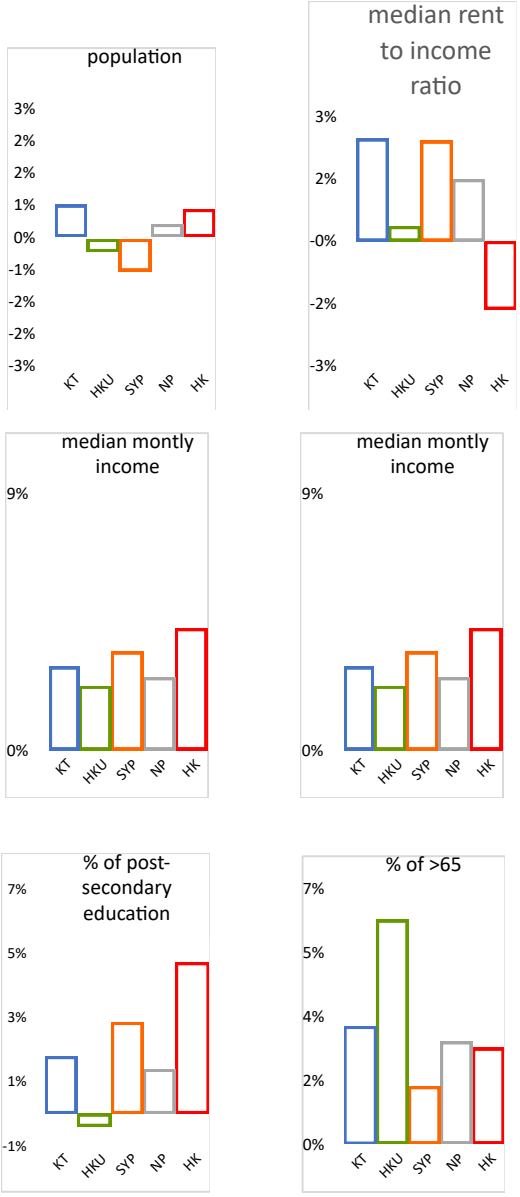

Figure 5: Compounded annualized rate of change for % > 65 and % of tertiary education (2006-2016) (source: HKSAR, Census and Statistics Department)

3.2. Street level destinations – as proxy for social cohesion.

In this section, we report the surveys of 1,100 premises at street level surveyed in 2009 and 2017-19 via Google Street Views. In average, about 60% of the premises changed: 46% in NP, 53% in SYP, 65% in HKU and 73% in KT Between the two periods, at least 91% of the categories matched which enabled a robust comparison. The number and type of premises are an indicator of destinations change which affects the self-identification of the communities. We need to be able to distinguish changes that are due to unobservable dimensions i.e. general trends that take place over the years whether or not a new MTR station is opening from the change that could be attributed to a station opening. This is the purpose of observing a control area such as North Point. To make the comparison meaningful we rebase the changes to NP as baseline.

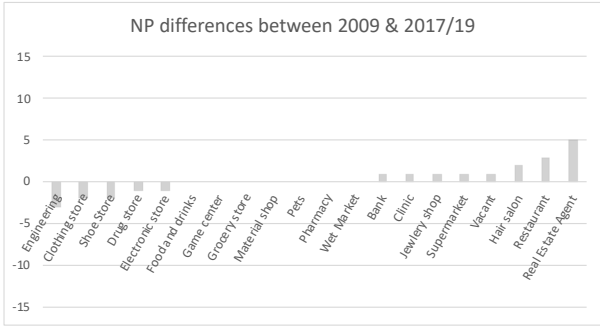

Figure 6: North Point - change in number and type of street premises 2009 & 2017/19 (source: Authors)

In NP, Fig. 6. shows that the rate of relative change, e.g. 3 restaurants added, in 2009, 26 restaurants vs 29 in 2017-19 and absolute change across all categories are moderate. There is spatial differentiation between main street and secondary street. Moderate change in main street and steadiness in secondary street. In the main street (e.g. King's Road): this is where change occur most, diverse shops like pet store, lighting store and travel agency are replaced by restaurants and hair salon. Restaurants are most likely to be chain restaurants, but independent restaurants are also created. Secondary street (e.g. Marble street): less change and independent restaurants replace various shops. Specialist clustering is also observed such as the pharmacy and clinic in Kam Hong Street.

In KT, Fig. 7 shows that there is almost three time more new coffee shops, restaurants, and bars than in NP. Contemporary restaurants and coffee shops are open along the waterfront, replacing grocery stores, material shops and clothing stores. Independents remains and destinations diversity increases. Vacant premises decrease. We also find evidence of spatial differentiation in KT, see Figure 11.

Figure 8 shows that HKU follows KT for Restaurant & Food and drinks yet differ with an influx of material shops. Grocery stores have decreased most. Similarly, HKU's diversity increases. Vacancy slightly decreases.

Figure 9 shows that SYP is most like KT. SYP's diversity increases. Vacancy slightly increases.

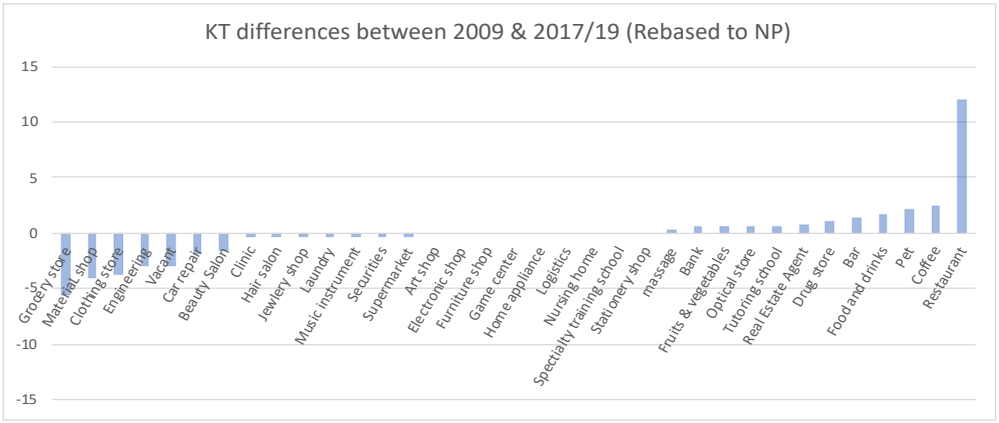

Figure 7: Kennedy Town - change in number and type of street premises 2009 & 2017/19 (source: : Authors)

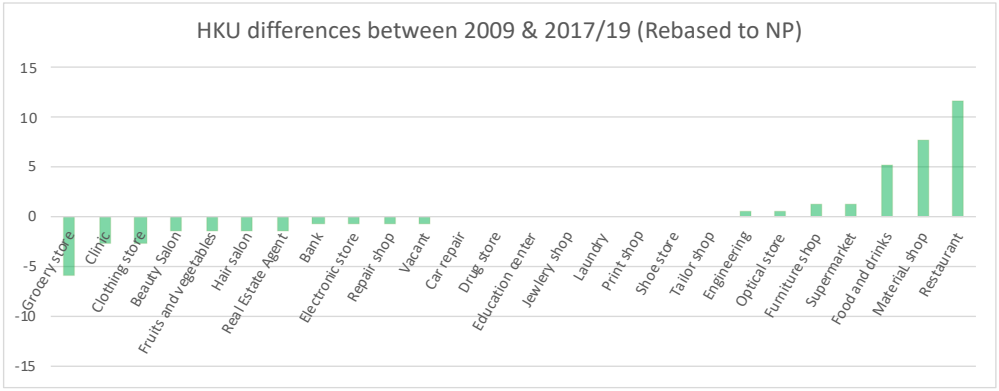

Figure 8: HKU - change in number and type of street premises 2009 & 2017/19 (source: : Authors)

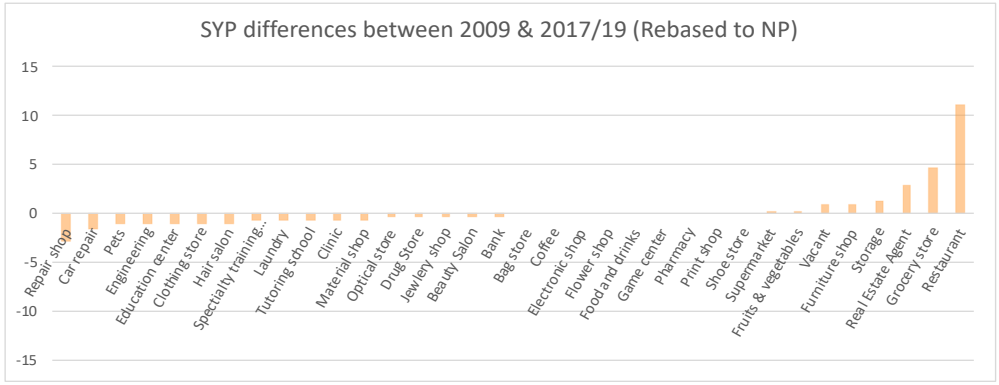

Figure 9: Sai Ying Pun - change in number and type of street premises 2009 & 2017/19 (source: : Authors)

Overall KT, HKU and SYP show a greater dynamic than NP, with the addition of a much larger number of restaurants and a far greater range, adding diversity to the existing destinations. Except HKU, there is general loss of repair and grocery shop. While a grocery shop can be construed as a place of interaction – it is less obvious as to how repair shops contribute, given the level of car ownership by HK household (≈14%).

3.3 Green and Open space changes

Existing research indicates that accessibility to a local destination has a significant influence on enhancing community cohesion. The definition of "destination" varies in different studies, it also includes green space, open space, local street, community centres or other institutional places and attracts people to go there. People interact with other neighbours on the way to or at "destinations", which in turn creates what is called "optional and social activities" in Gehl's theory (2011). However, a Hong Kong study points out that "informal connections" in Hong Kong contribute less significantly than formal organized connections, such as sports groups, religious group or community organizations (Chan, 2014). Yet, no consideration is given by Chan to BE dimensions known to impact on social cohesion.

The construction of KT's MTR station involved demolishing Kennedy Town swimming pool on Smithfield (Fig. 12) and relocating it near the

Figure 10: KT, mapping of open and green space associated with MTR opening (source: Adapted from Open Map)

The construction of KT's MTR station involved demolishing Kennedy Town swimming pool on Smithfield (Fig. 12) and relocating it near the HKU station egress next to Belcher Bay Park with the provision of a new indoor swimming pool and outdoor covered public space (Fig. 16). In KT, a new mini-bus station and new public spaces were created (Fig12, 14, 15). Both the mini-bus station and the public spaces are well integrated in the urban fabric creating a new surface connection between Smithfield and North Street. The existing sport fields and playgrounds and the new open spaces create a linear public space hinge between the hills and KT's flat and its compact built-up. The location of the MTR station egresses on Smithfield and North Road further activate Smithfield and the characterful Forbes Street and distribute pedes-

trian flows to North St. In KT the new station did not alter much the spatial accessibility configuration, yet the flow of pedestrians has been reconfigured (Fig. 10).

Figure 11: KT, Smithfield Street, 2009, before MTR Station (Source: Google Street View) (Bottom Left)

Figure 12: KT, Smithfield Street, 2017, after MTR Station (Source Google Street View) (Top Right)

Figure 13: KT, new public space, Smithfield, 2020 (Second Right)

Figure 14: KT, new public space, North Road, 2020 (Third Right)

Figure 15, KT, new seating outside new HK chain coffee shop with expansive waterfront view, New Praya. 2020 (Bottom Right)

Figure 16: HKU, mapping of open and green space associated with the MTR opening (source: adapted from Open Map)

HKU is the University of Hong Kong's station. With more than 27,000 students in 2013, the HKU campus is probably one of the main reasons to extend the Island line. The campus is high up above mid-level. With the new station, small open and green spaces were added (Fig. 18) and a little was taken away by the Belcher egress (Fig. 17). HKU MTR's long corridors and lifts (Fig. 16) provide access from the flat area to the station but also to the campus, a very large "public space" with various amenities, which became a very well-used destination for locals and visitors at weekend. The campus is also a starting point for hikes to the Lung Fu Shan Country Park. The station's corridors and lifts reconfigure the topography of the Belcher, Shek Tong Tsui and the University's areas, making it into a volumetric bypass of the steep slope integrating Queen's Rd West, the University and the hills beyond.

Figure 17: HKU, Belcher 2009 & 2017, note the reduction in green space (source: google street view)

Figure 18: HKU Hill Rd and Whitty St. small open and green space were added (source: Authors)

Figure 19 New open space outside the new swimming pool, off HKU Belcher MTR (source: Authors)

Figure 20: SYP, mapping of open and green space associated with the MTR opening (source:adapted from OpenMap)

SYP station egresses have created a new set of well-integrated attractive urban oases, public open and green spaces with playground and football field located inside urban block (Fig. 21, 22, 23). They are just a step away, i.e. shielded from noise yet visible from busy streets. The lift gateway in Bonham Rd is marked by two large trees that frame the station and the drop off/bus stop (Fig. 25) which is well used as meeting point and other stationary social activities. The extended corridors and lifts make a new connection system between Bonham Rd at mid-level, the Centre Street Market and Sai Ying Pun Market (Fig. 24) which are

Figure 21: SYP, Ki Ling Lane Children's playground, between Des Voeux Rd West and Queen's Rd West (source: Authors)

Figure 22: SYP, Sai Woo Lane Playground, and football field (source: Authors)

Figure 23: SYP, Queen's Road West (source: Authors)

Figure 24: SYP, Centre Street Market (source: Authors)

Figure 25: SYP, Bonham Rd (source: Authors)

in the middle of the steep Centre St., and to the busy Queen's St. and Des Voeux Rd, the flat area. Centre street has street escalators. SYP Station elaborate a volumetric bypass as connectors bringing mid-level to second street and further to Des Voeux Rd.

4. Discussion

In Hong Kong, a high-density city with high level of MTR usage, as urban liveability has become a perceptual notion of well-being and social cohesion. Perception of access to sustainable transport impacts urban liveability and social cohesion and urban sustainability in general. Quantifying and understanding the detailed impacts of a new station on displacement remain challenging despite many studies, and much discourse associated with the topic. Most studies lack control cases and give too little attention to BE dimensions. This study corroborated the perception that the new stations have changed the dynamics of street level destinations, the most visible BE dimension of social cohesion (Mazumdar, et al., 2018). When compared to the control (NP) the case studies do show diversified change of greater amplitude in business premises at street level. This can be conceptualised as 'gentrification without displacement', or more specifically, as change in public transport accessibility level-induced commercial dynamism and mutation. Local premises (e.g. car repair workshops) have been replaced by boutique stores, new restaurants, chain shops. The communities' streetscapes have been altered – it remains to be seen if it should be construed as positive or negative impact on social cohesion. At the most fundamental level of displacement, as an involuntary housing mobility, the demographic, the quasi invisible dimension, the findings show large heterogeneity in the impact of new station which are at odds with the unified visibility of streetscape changes. These might be due to the difference in initial conditions for example the mix between relatively balanced public, subsidised and private housing mix (He, et al., 2018) around new station and structural demographic dynamic and others BE values already at play in each area. Our findings are aligned with recent research that does not show significant system-

atic displacement/gentrification related to TOD (Padeiro, et al., 2019). Neighbourhoods can gain new residents without necessarily losing existing ones. Existing resident might move anyway for different motives. In the cases investigated each new MTR station opening brought cohesive values through the provision of well-integrated open and green spaces that improves the connective structure of the existing public realm. Such place making provision creates novel synergies with the existing public spaces. Research indicates that these new public open and green spaces are where informal interactions between people also happens. They are an important component of the BE pathway to impact on social cohesion and urban liveability.

Finally, further research is needed on:

- How to measure social cohesion accounting for built environment dimensions

- How the MTR's volumetric implementation reshapes radically or not, local accessibility that affect an aging society and the way spatial and social interaction may change?

- How different types of development e.g. office-led mixed-use development or housing estate refurbishment, or URA's regeneration affect displacement, street level premises and open and green space provision differently and how these in turn impact on social cohesion and urban livability.

Bibliography

1 Berger-Schmitt, R., 2000. Social cohesion as an aspect of the quality of societies: Concept and measurement, Manheim: Centre for Survey Research and Methodology (ZUMA), Social Indicators Department.

2 Bruhn, J., 2009. The concept of social cohesion. In: The group effect. Boston, MA: Springer, pp. 31-48.

3 Cerin, E. et al., 2013. Socioeconomic status, neighborhood characteristics, and walking within the neighborhood among older Hong Kong Chinese. Journal of aging and health, 25(8), pp. 1425-1444.

4 Cervero, R. & Kockelman, K., 1997. Travel demand and the 3Ds: Density, diversity, and design. Transportation Research Part D: Transport and Environment, 2(3), pp. 199-219.

5 Cervero, R. & Murakami, J., 2009. Rail and Property Development in Hong Kong: Experiences and Extensions. Urban Studies, 46(10), p. 2019–2043.

6 Chan, E., 2014. Are informal connections a functional alternative to associational life in enhancing social cohesion? Findings from Hong Kong. Social indicators research, 119(2), pp. 803-821.

7 Cooper, C., Fone, D. & Chiaradia, A., 2014. Measuring the impact of spatial network layout on community social cohesion: a cross-sectional study. International Journal of Health Geographics, 13(1), p. 11.

8 Dempsey, N., 2008. Does quality of the built environment affect social cohesion?. Proceed-

ings of the Institution of Civil Engineers-Urban Design and Planning, 161(3), pp. 105-114.

9 Dragolov, G. et al., 2013. Social Cohesion Radar Measuring Common Ground: An international Comparison of Social Cohesion Methods Report, Gьtersloh: Bertelsmann Stiftung.

10 Ewing, R. & Cervero, R., 2010. Travel and the Built Environment. Journal of the American Planning Association, 76(3), pp. 265-294.

11 Gehl, J., 2011. Life between building : using public space. Washington D.C.: Island Press.

12 He, S., Tao, S., Hou, Y. & Jiang, W., 2018. Mass Transit Railway, transit-oriented development and spatial justice: the competition for prime residential locations in Hong Kong since the 1980s. Town Planning Review, 85(5), pp. 467-493.

13 Ibraeva, A., de Almeida Correia, G. C. & Antunes, A., 2020. Transit-oriented development: A review of research achievements and challenges. Transportation Research Part A: Policy and Practice, Volume 132, pp. 110-130.

14 Liu, Y., Wu, F., Liu, Y. & Li, Z., 2017. Changing neighbourhood cohesion under the impact of urban redevelopment: A case study of Guangzhou, China. Urban Geography, 38(2), pp. 266-290.

15 Maas, J., Van Dillen, S., Verheij, R. & Groenewegen, P., 2009. Social contacts as a possible mechanism behind the relation between green space and health. Health & place, 15(2), pp. 586-595.

16 Mazumdar, S., Learnihan, V., Cochrane, T. & Davey, R., 2018. The built environment and social capital: A systematic review. Environment and Behavior, 50(2), pp. 119-158.

17 Padeiro, M., Louro, A. & da Costa, N., 2019. Transit-oriented development and gentrification: a systematic review. Transport Reviews, 39(6), pp. 733-754.

18 Rogers, S., Gardner, K. & Carlson, C., 2013. Social capital and walkability as social aspects of sustainability. Sustainability, 5(8), pp. 3473-3483.

19 Schiefer, D. & van der Noll, J., 2017. The essentials of social cohesion: A literature review. Social Indicators Research, 132(2), pp. 579-603.

20 Stiftung, B., ed., 2017. What Holds Asian Societies Together? Insights from the Social Cohesion Radar. Gьtersloh: Verlag Bertelsmann Stiftung.

21 Wood, L., Frank, L. & Giles-Corti, B., 2010. Sense of community and its relationship with walking and neighborhood design. Social science & medicine, 70(9), pp. 1381-1390

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