Transit Oriented Development (TOD) Policies and Station Area Development in Asian Cities

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Abstract. Many metropolitan cities of Asia are planning and implementing extensive investment in mass transit network and thus, are now at the threshold of whether they become transit cities or car traffic saturation cities. Promotion of Transit Oriented development (TOD) policies will be a key to move forward to transit cities. TOD should consider: transit oriented regional growth management plan, station area zoning regulations (mixed-use, minimum density, maximum parking, etc.), joint development among local governments, transit agencies, private developers, institutional mechanism for the public and private cooperation in station area development. In this paper, the cases from the cities in Japan, United States and the Southeast Asia are examined including Toyama in Japan, Kuala Lumpur in Malaysia and Jakarta in Indonesia. In conclusion, the following are discussed as the factors for successful Implementation of TOD in Asian Cities. Shift from highway-based zoning to transit oriented zoning: Creation of institutional mechanism for the public and private cooperation in the station area development, balance between public benefit and private benefit, connection of transit service and affordable housing, and, multi-modal connection planning including walking.

1. Introduction

Metropolitan regions of Asian countries are facing serious urban problems, such as massive urbanization and huge Infrastructure demands for urban development, sprawl and motorization, deterioration urban environment, existence, expansion of informal settlements, increase of CO2 emissions, impacts of climate change, etc, and have to cope with Asian cities have to cope with triple urban environmental issues at the local, city-wide and global levels) at the same time (Figure 1).

Many metropolitan cities of Asia are planning and implementing extensive investment in mass transit network and thus, are now at the threshold of whether they become transit cities or car traffic saturation cities. Promotion of Transit Oriented development (TOD) policies will be a key to move forward to transit cities. These days it is widely observed that some of key characteristics of the new directions of sustainable development of cities are (OECD, 2012): dense and proximate development patterns; urban areas linked by public transport systems; and accessibility to local services and jobs.

It can be said that these characteristics of sustainable urban development are quite compatible with TOD policies. Yet, automobile oriented urban patterns have extensively been formed in the meantime when the governments vacillated due to the huge investment costs for the construction of
urban railways. Once the automobile-oriented city form is created, it has a lock-in effect and thus it becomes very hard to transform the city to mass-transit oriented patterns.

As a result, though mass transit modes are gradually introduced in many cities, the reality is that it is not easy to change the urban patterns themselves and realize the synergy potential in the transport sector. In particular, many mega cities of Asia are now at the threshold whether they can be transformed to transit oriented cities or automobile oriented entrenched traffic saturation cities.

In order to examine the possible path to transform the pattern of urban development from automobile-oriented to transit oriented, this paper firstly overviews the characteristic of urbanization of Asian cities in conjunction with TOD policies. Secondly, the cases from the cities in Japan, United States and the Southeast Asia are examined including Kanazawa Toyama and Tokyo in Japan, Denver and Portland in USA, Kuala Lumpur in Malaysia and finally, lessons towards the application of TOD policies are discussed.

2. Principles of TOD Planning and Implementation
There are many researches as well as policy documents to discuss about guidelines of TOD policies. Based on careful examination of existing documents, key issues of TOD policies are summarized in the Figure 1 (Ditmar and Ohland (2003), Curtis et al (2009), Thomas et al (2018), Salat and Ollivier (2017)).

Figure 1. Key Issues towards the application of TOD Policies

| (1) TOD Planning       | (2) Station Area Development                  | (3) Collaboration with Stakeholders and Community | (4) Value Capture |
|-----------------------|-----------------------------------------------|--------------------------------------------------|-------------------|
| - Density             | - Connectivity to surrounding neighborhood    | - Affordable Housing and Accessible Living       |                   |
| - Transit Accessibility| - Livable Public Space                        | - Mix Uses and Forms                             |                   |
| - Pedestrian friendliness| - Development surrounding the station area    |                                                  |                   |

The first principle is to promote the public transit area as inter-modal node to be revitalized. The second principle is to promote area around the station as a TOD hub vibrant and liveable for every walk of life while accommodating the affordable houses to let part of the population depending to public transport to have better access to the transit node. The third principle is to let people centered development to be enhanced and to compensate the private benefit of increase in land value to be redistributed for public service through land value capture.

Implementation of the principles is expected that TOD development would enhanced the efficiency in public transport and mobility, while induced revitalization in the city center compensated the public services and redevelopment of affordable housing nearby the transit node. Those principles has a balance view points as TOD is potential to attract new investment in declining inner city while the implementation has to benefit the community as well.

In consideration of the above key TOD policies, we propose the following principles of TOD planning and implementation (Table 1).
| Table 1. Principles of TOD Planning and Implementation |
|--------------------------------|-----------------|-----------------|
| Institutions                 | Metropolitan    | Corridor        | Station Area                  |
| Sustainable land use and transport policy | Incentives for transit corridor planning | Station area zoning regulations |
| Planning/Design              | Transit oriented land use planning | TOD strategic plan (appropriate allocation of public transport connectivity, commercial activities, affordable housing, etc.) | Station area planning (mixed-use, connectivity with other transport modes, pedestrian oriented design, etc.) |
| Implementation               | Metropolitan governance | PPP | Joint development among local governments, transit agencies, private developers, Institutional mechanism for the public and private cooperation, Retrofit improvement of natural born-TOD informal settlements |

3. Case Studies
In this section, the case studies in the cities under different maturity of the application of TOD policies in Toyama, Japan, Kuala Lumpur in Malaysia and Jakarta in Indonesia are conducted in order to distill key factors for the successful implementation of TOD policies.

3.1. Toyama, Japan
Toyama city is a regional core-level city and the capital city of Toyama Prefecture. Through the annexation of neighbouring towns and villages in 2005, Toyama city became the 11th largest city in Japan in terms of area coverage. Though the administrative area is wide, the ratio of habitable land is 38.2% and almost 70% of the city area is covered by forest. Toyama city is regarded as a champion of compact city policies and named as one of model cities for District Energy Cities Initiative in the UN Climate Summit.

Toyama city has recently changed their urban development policies from expansive urban development to compact city policies under the strong leadership of the Mayor Masashi Mori and regarded as a champion of compact city policies in Japan. There are several issues behind this recent change of policies: the decline of city center, low density urban development, high dependency to automobiles, increase of administrative costs, ageing, increase of the emission of CO2, etc., which are commonly observed in small and medium-sized cities in Japan.

In order to cope with the problems mentioned above, Toyama city started compact city policies since Mayor Masashi Mori took office in 2002. In particular, TOD is a key policy of compact city policies of Toyama city. Toyama city’s basic policy is to strengthen public transportation including rails, LRT and buses and to concentrate urban facilities along public transport corridors (Figure 2). There are three main measures with regard to TOD in Toyama city: strengthening public transportation, regulating and guiding development and the revitalization of city center.

Toyama is one of the secondary capital city in Japan that change the strategy to compact city and promote public transport and TOD before the sprawl getting larger and difficult to manage by the municipal government. And the city has been successful in the program and even could branding herself in the global climate summit and the global champion of compact city.
3.2. Kuala Lumpur, Malaysia

Among the Southeast Asian cities, Kuala Lumpur is extensively promoting TOD policies. In particular, it is noted that Kuala Lumpur apply Transit Oriented zoning. The Transit zoning allow for higher density and compact development around the TOD area to attract investors to redevelop transit area and compensated high land price with other physical and monetary incentives.

Transit Planning Zones with additional FAR are designated the areas surrounding mass transit stations and it is stipulated that land use activities should be transit supportive; mixed use activities are encouraged within TPZ with street level activities to promote vibrancy and safety in the TPZ; higher intensity development to support the transit system; and good urban design that is pedestrian priority (Figure 3).

In this regards Malaysia has been successful in promoting permeable public space among private ownership boundary and informal sector to fill in the public space in the TOD area. Kuala Lumpur is a multi-nucleus city, in this regards the TOD area has been implemented to connect stations the CBD area. Highway and automobiles public transport is still predominant in connecting centers of satellite cities. People are still reluctant to give up private cars. Thus, it will takes time for the greater Kuala Lumpur to change the road base to rail base TOD.

Housing and welfare in Malaysia however is better in the sense that informal settlement and slum in the city center are relatively low. In this regards the attractiveness offered by Transit Oriented zoning is relatively has no resistance from the community and instead improve the pedestrian and non motorized accessibility to the housing enclave in the inner city.
3.3. Jakarta, Indonesia

As for station area planning, the case of Jakarta is interesting. In Jakarta, MRTJ (MRT Jakarta) which is an operating company of new MRT is proposing station area design guidelines to promote transit-oriented development around stations (Figure 4). MRTJ is the initial development of Jakarta rail base public transport improvement, the long awaited project. The first MRTJ project is in main corridor of Jakarta’s busiest CBD.

The case of MRTJ the government of Jakarta had been successful to arrange better pedestrian and underground connectivity to the adjacent building in the corridor. The challenge is relatively low in the corridors of relatively developed areas such as CBD in the case of MRTJ. The new zoning plan to allow for public connectivity and space in private land boundary has been studied and devise which may change the urban landscape and connectivity along the MRTJ corridors. Despite the city wide challenge of other TOD corridors development MRTJ corridors seems to benefit from the rebound of the attractiveness of the area in the near future.

Other part of the city may pose different issues in implementing the TOD zoning plan. The large part of TOD area of Jakarta are still characterized by segregated urban tissue with enclaves of medium to high income housing surrounded by urban kampongs and informal housing neighborhood livelihoods. This type of urban area is the most likely prone for relocation or replacement being voluntary and non-voluntary due to increasing attractiveness of the land and economic value of the area.

In this regards government regulation intervention has to be prepared for retrofitting the informal settlement to allow for equal compensation and benefit of the TOD development. Especially to benefit the part of community in need for public transportation and to benefit from the close proximity to the stations. However, the effect of a more equal benefit for every walk of life in
the development of the TOD area and corridors remain to be seen to be applied in different corridors which passed through the region with low income housing and informal sectors.

Jakarta is considered late in developing the massive inner-city rail based public transport. The urban sprawl of Jakarta had posed problems of commuters from satellite new towns in the Greater Metropolitan Area. The growth of the city economy as capital city as well as the biggest economic growth centers in Indonesia attract people to reside in transient condition as migrant workers as well as commuters that fill in the space in the informal settlement and kampong. The TOD in Jakarta is facing the situation of located in this area potentially to affect involuntary gentrification in their development.

![Figure 4. Station Area Guidelines for MRT in Jakarta](Source: MRTJ)

4. **Conclusion**

Countries are different in their texture of urban tissues as well as social layers that constitute urban realm, thus the implementation of TOD area as means of increasing the connectivity of different part of the cities, being living space and working space that contribute to the quality of live of the general population.

The case of Toyama as secondary capital city it is considered medium city that had realize that they need to change earlier before the sprawl is too late to handle. Japan as a country is famous with rail base public transport in several major cities as well as connecting the Sunbelt region with regional railway connectivity as early as 1960s. TOD development is central to the policy to revitalize the city center, enhancement public transport as well as the development of TOD as part of Toyama decision to innovate to public transport oriented and TOD area development had benefited her as a global low carbon and compact cities.

Kuala Lumpur has been successful in applying Transit Oriented Zoning and affect improvement in the urban design in the city center with no resistant from the communities. In fact, the inner city
of Kuala Lumpur has been improving in non motorized mobility with improvement in pedestrians’ connectivity and permeability in public facilities.

Jakarta has been successful in developing TOD Zoning Plan and TOD area of Jakarta MRT or MRTJ, the collaboration and mutual benefit has been devise among stakeholders in the zoning plan to connect sub-surface and above ground connectivity and pedestrian access between blocks as private owned public space begins to be realized as beneficial contribution for all. However, the implementation of TOD policies in the area with urban kampongs and informal settlements remain to be seen as the role of government to intervene to pursue public and community interest remain to be seen in the near future.

In this paper, some good practices of the application of TOD policies in different countries are examined. In conclusion, following are pointed out as important issues for the implementation of TOD in Asian cities:

1. Transit oriented land use plan
2. Station area zoning regulations (mixed-use, connectivity, density, parking, etc.)
3. Joint development among local governments, transit agencies, private developers
4. Institutional mechanism for the public and private cooperation and value capture in station area development
5. Connection of transit service and affordable housing
6. Retrofit improvement of informal settlements which are natural born TOD

In all TOD cases the context and issues facing the municipal government is quite similar with certain degree of difference in the past dependence issues urban issues that have to be tactically deal with. However, it seems the 6 principles of TOD development that have been proposed early in this paper have covered the strategic issues that could be adjusted by municipal government to their own urban development context.

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