

日本枢纽型 车站建设及 周边城市开发

胡昂 著
Ang Hu

THE CONSTRUCTION
OF HUB STATIONS
AND DEVELOPMENT
OF SURROUNDING
REGIONS IN JAPAN

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四川大学出版社

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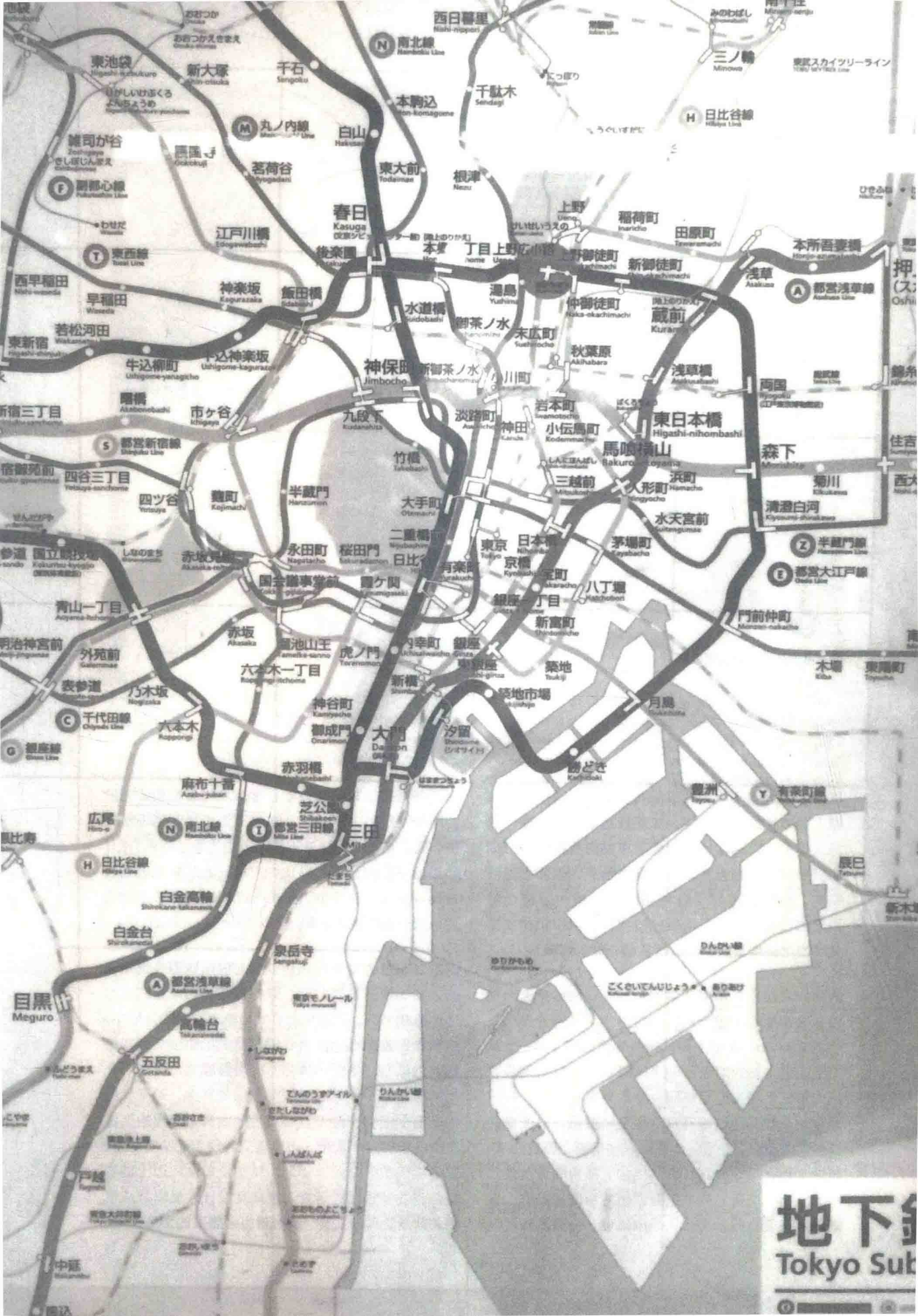
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地下鉄
Tokyo Subway

序

万小鹏 博士

成都市规划管理局总规划师

在日本的大城市里，几乎所有的轨道交通枢纽站点都不是单纯的交通节点。车站通过地下街或多样的行人连廊，将周边城市功能与车站自身相连，形成功能多样的“站街一体化”城市节点。事实上这种模式，有效地疏解了各枢纽站每天数十万甚至数百万的客流，不仅是治堵的良方，而且引领和支撑着城市可持续发展——其经验值得我们借鉴。

胡昂先生在日本东京大学留学期间，轨道交通为他每天最重要的出行手段，他对日本“站街一体化”的模式有着切身的体会。胡昂先生以日本 16 个城市枢纽型车站为对象，做了历时 4 年的实地调查，其间拍摄了丰富的现场照片并汇聚在本书中，对这些车站及其周边城市开发历程及其数据，以图文并茂的形式予以了呈现。本书从车站概要、历史沿革、车站文化、换乘线路、车站结构、站内商业及便利设施、与车站相连的地下商业街或通道的布局、车站出入口信息等方面做了系统梳理，全面清晰地介

绍了各枢纽型车站建设的科学规划与高度集成化的空间利用经验。本书还从车站周边土地利用现状分析、周边城市交通建设组织、周边代表性建筑介绍、周边地下空间分析，以及城市再开发及未来规划等方面，全面探讨 TOD 模式下日本枢纽型车站的周边市街开发的特点和做法。

目前我国各大城市的高速铁路与城市轨道交通建设进入新的快速发展时期，既有铁路的市域铁路化改造也势在必行。在加快发展城市轨道交通的过程中，应积极探索和推动适合我国国情的以轨道交通枢纽站点为核心“站街一体化”的发展模式。本书所介绍的日本多个城市的枢纽型车站的案例，对于我们的轨道交通枢纽建设与城市再开发具有重要的借鉴意义。本书对于从事城市轨道交通规划、城市规划、交通枢纽型公共建筑规划、车站及车站周边土地的复合开发等领域的研究、咨询及设计人员以及从事相关规划管理的人员，都有着极为重要的参考价值。

Preface

Doctor Wan Xiaopeng

Chief Planner of Chengdu Planning and Management Bureau

In large Japanese cities, almost all the rail transit hubs function beyond simple traffic nodes and connect with surrounding urban functions via underground streets or variegated pedestrian corridors to form urban nodes integrating station and street with multiple functions. In fact, this pattern can effectively relieve the pressure caused by tens of thousands and even millions of passengers every day. Therefore, this pattern, as a good solution to traffic jam, steers and supports sustainable urban development and can service as a feasible reference for us.

While studying in the University of Tokyo, the author took rail transit every day as an important way of travel and perhaps has had a personal experience with Japan's "station-street integration" pattern thereby. In the book, the author represents 16 Japanese urban hub stations by text and images after conducting a four-year field survey and taking countless pictures of these stations. This book makes a systemization regarding such aspects as station overview, history, station culture, transfer route, station structure, business and facilities inside station, layout of underground business street or passageway connecting with station and demographic information of station passenger flow, and explicitly introduces the scientific planning and highly integrated space utilization of the construction of each hub station.

This book also discusses the characters and practices of Japanese hub stations' surrounding street development under TOD mode from perspectives including analysis on current surrounding land use, organizing of surrounding urban traffic construction, introduction of representative buildings nearby, analysis on surrounding underground space and urban redevelopment and future planning.

Currently, every major Chinese city sees a rapid development in the construction of high speed railway and urban rail transit. At the meantime, the municipal railway reform of existing national railway is imperative. When accelerating the development of urban rail transit, it is advisable to seek for and boost a "station-street integration" development pattern that is suitable for China and takes rail transit hub station as the core. The cases of a number of Japanese urban hub stations in the book are worth learning for China's rail transit hub construction and urban redevelopment. This book is highly instructive to professionals in the research, consultancy and design of such realms as urban rail transit planning, urban planning, planning of traffic hub-type public building and the composite development station and surrounding land as well as to those dedicated to relevant planning management.

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Prologue



城市的问题

在全球，发展中国家的城市正在以前所未有的速度增长。预测从 2000—2030 年，发展中国家新增城市化区域的面积，将达到 2000 年全球城市面积的总和。

一个不容争辩的事实是，发展中国家的城市正在不断蔓延（Sprawl）。这是一种均匀低密度、缺乏明确核心的非连续土地增长模式，可能导致交通不便、对机动车过度依赖、发展趋势难以控制等状况。曾在发达国家出现过的城市无限制蔓延现象，正在发展中国家重演。

城市蔓延不可避免地要消耗大量资源，随之产生的城市交通、能源与环境、社会等问题将日益尖锐。

随着经济急速增长、城市规模不断扩张，发展中国家机动车使用量正急剧增长。特别在中国、印度以及东南亚各国，有限的道路面积造成这些国家普遍存在极为严重的交通拥堵现象。尽管新增道路或道路阔幅等建设手段可以缓解一时的堵塞压力，但拓宽后会有更多的机动车进入，往往造成无解的恶性循环。据不完全预测，到 2050 年，仅中国的机动车保有量，就将达到 9 亿辆之多，相当于目前全世界机动车的总量。

伴随着收入的增加，发展中国家城镇居民郊区化问题也正在不断凸显。郊区化生活势必带来更大的机动车消费需求与能源消耗。随之而来的是一系列的负面影响，如环境空气污染和温室气体过量排放、城市通勤能源消耗过大、道路堵塞带来的能源浪费、城市时间效率低等，都将导致城市的竞争力低下。

城市规模的不断扩张，导致市民上班与上学距离与时间的增加，对于发展中国家无法购买汽车的城市居民而言，工作和受教育机会会受到极大制约，也会因此产生社会不公的问题，破坏社会均衡发展。

正是由于城市面临上述的种种问题，城市的可持续发展成为非常重要的全球化课题。据 NTT 数据经营所统计，轨道交通每运输 1 人 1 千米的能源

消耗，是巴士的 1/2，是私家车的 1/6。二氧化碳排放是巴士的 1/4，私家车的 1/9。轨道交通每运输 1 人的空间占有量，是巴士的 1/25，私家车的 1/120。因此重视城市公共轨道交通建设、发展紧凑城市（Compact City），是解决亚洲高人口聚集度、高密度城市环境的有效途径。

未来城市可持续发展战略中最重要的项目之一，是公共交通与土地利用的整合。在全球发达国家和地区的可持续发展城市中，几乎都能找到公共交通与土地一体化开发的案例，其中尤以日本和中国香港的案例最具代表性。事实证明，通过公共交通建设诱导商业、办公、住宅、公共设施等综合开发的模式，是实现城市可持续发展的重要手段之一。这种开发模式就是“TOD 模式”。

TOD 模式

TOD 是“Transit Oriented Development”的缩写，意指“以公共交通为导向的开发模式”。新城市主义代表人物彼得·卡尔索普（Peter Calthorpe）对 TOD 的定义是：适度的高密度住房，连同互补性的公共设施、就业、零售和服务业，集中布置在位于区域公交系统的关键点位置的混合功能区域。这里所指的公共交通包括火车站、机场、地铁、轻轨等轨道交通及巴士干线。TOD 模式是一种以公共交通站点为中心，周围进行高密度、土地混合开发、步行友好型的规划发展模式。

TOD 是新城市主义最具代表性的模式之一。TOD 理念是由卡尔索普在 1993 年出版的《下一个美国大城市》（The Next American Metropolis）一书中提出的，是为了解决美国城市的无限制蔓延而采取的一种以公共交通为中枢、综合发展的步行化城区，致力于减少对小汽车的依赖，采用更集约的土地开发模式，节约能源、创造更多的公共活动空间，为老人和儿童等各类人群提供便捷的服务。

TOD 是可持续发展的城市开发模式。TOD 理念提倡在交通枢纽周边开发各种城市服务设施、办公就

Urban Issues

The cities of developing countries around the world are developing at an unprecedented speed. It is estimated that between 2000 and 2030, the newly urbanized area of developing countries will reach the total area of cities in the world in 2000.

One of the indisputable facts is that cities of developing countries are sprawling ceaselessly. This is a non-continuous land growth mode marked by low density and lack of specific core, which may give rise to problems such as inconvenient traffic, excessive dependence on motor vehicles and uncontrollable development trend. The unrestrained sprawling of city that once occurred in developed countries is happening again in developing countries.

The sprawling of cities unavoidably consumes large resources, which subsequently leads to increasingly serious problems such as urban traffic, energy and environment and other social issues.

With the rapid development of economy and continuous expansion of the city, the number of motor vehicles in use is soaring in developing countries, especially in China, India and Southeast Asian countries, where limited road area has caused extremely serious traffic congestions. Although the pressure of congestion can be temporarily relieved by measures such as building new roads and widening existing roads, more motor vehicles will access the widened road, thus leading to an unsolvable vicious circle. According to a rough forecast, the vehicle parc in China will add up to 900 million by 2050, equivalent to the total number of motor vehicles in the world nowadays.

In the wake of growth in income, the issue of suburbanization concerning urban residents is increasingly noticeable in developing countries. Suburbanized life will definitely results in more consumption of motor vehicles and energy, followed by a series of negative effects such as air pollution, excessive emission of greenhouse gas, outrageous consumption of energy for commute, energy waste caused by congestion and low time efficiency in the city. These effects will reduce the competitiveness of the city.

The continuous expansion of the city increases the distance and time of commute. For city dwellers in developing countries who cannot afford cars, their job and educational opportunities are greatly restricted, which may further lead to social injustice and destroy the balanced development of society.

Due to the aforesaid problems confronting the city, sustainable urban development has become a crucial global issue. As indicted by statistics of NTT data

management, the energy consumed by rail transit in carrying a person for 1km is 1/2 of that consumed by bus, and 1/6 of that consumed by private cars, while the carbon dioxide it emits is 1/4 of that of a bus and 1/9 of a private car. The space occupied by rail transit in carrying one person is 1/25 of the space occupied by a bus and 1/120 of that by a private car. On this account, prioritizing urban public rail transit construction and developing compact city are effective approaches to tackle the problems of high population density and high-density urban environment in Asia.

One of the most important projects in the future strategy of sustainable urban development is the integration of public transport and land use. Among the sustainably developing cities of developed countries and regions, it is not difficult to find cases of development integrating public transport with land use. The cases of Japan and Hong Kong are most representative. As testified by the facts, the mode of comprehensive development by basing business, office, residence and public facilities on public transport construction is one of the powerful means of realizing sustainable urban development. This mode of development is called "TOD mode".

TOD Mode

TOD is the abbreviation for Transit Oriented Development, which means "a mode of development based on public transport". Peter Calthorpe, a representative of New Urbanism, defines it as concentrating residences with moderate density and supplementary public facilities, jobs, retail and service industry in the multifunctional area at the key point of regional public transport system. The public transport referred herein includes bus trunk lines and rail transit such as railway station, airport, subway and light rail. Centering on the public transport stations, TOD mode is a pedestrian-friendly mode of planning and development that carries out high-density and compound development of the land surrounding the stations.

TOD is one of the most representative modes of New Urbanism. The concept of TOD was initiated by Calthorpe in his 1993 book *The Next American Metropolis*. In order to cope with the unrestrained sprawling of American cities, a pedestrian city that centers on public transport and adopts compact land development mode is proposed to be built. It is dedicated to lessening dependence on cars, saving energy and creating more public spaces, and providing groups such as the old and children with convenient services.

TOD is a sustainable urban development mode. The mode advocates developing a variety of urban service

业、零售商店和住房，促进公交和非机动化出行。通过城市公共交通与土地协同发展的模式促进城市形态与空间的行程，从而有效地降低私人机动车辆的出行。既减少了环境空气污染与温室气体排放，又增加了适合步行的公共空间，使人们的生活、工作、学习、娱乐和社交更具魅力，促进了城市的可持续性、经济的快速发展与社会包容性发展。提高城市竞争力，让城市更宜居。

TOD 是国际上具有代表性的城市社区开发模式。TOD 开发模式下，以公交站点为中心、以 400~800 米（约 5~10 分钟步行路程）为半径，形成一个汇聚工作、商业、居住、文化、教育等多功能于一体、土地混合使用的城市社区。社区边界距离中心的公交站点和商业设施大约 1/4 英里（约 400 米），适合步行交通，社区的布局也强调创造良好的步行环境，采用步行友好型设计（Pedestrian-friendly design），从而达到鼓励公交出行的目的。城市社区通过公共交通系统联系，最终实现各个城市组团紧凑型开发的有机协调模式。

TOD 是被广泛应用在城市开发中的模式之一。城市化进程中，许多城市都是沿着原有的城市边缘摊大饼式扩展，如东京、北京和成都这类单一中心的城市，就采用了这种同心圆式的扩张结构。这种形式发展到一定规模时，会受到自然环境、地域结构等因素的影响而发展受限，城市规模越大，限制性因素越强。而以公共交通枢纽为载体的 TOD 开发，使创造紧凑型城市空间、实现城市的精明增长成为可能。

另一些城市是发展新城或在原有的半城市化地区有选择地发展卫星城市，这也为 TOD 开发提供了大量的机会。尤其是在城市尚未成片开发的地区，通过先期对规划发展区的用地以较低的价格征用，导入公共交通后再出售基础设施完善的“熟地”，政府通常从土地“溢价回收”（Value capture）中获得收益，承担公共交通投资成本，同时支持 TOD 周边其他项目改善。

“TOD 模式”是宏观的规划理念，而“R+P 模式”就是微观的实施途径与方式。

R+P 模式

“R+P”是“Railway + Property”的缩写，意指“轨道交通建设与物业开发捆绑式发展模式”，通常简称为“轨道 + 物业”模式。

R+P 模式的基本观念。由公共轨道交通创造客流、诱发商业环境的改善、吸引房地产开发；而成熟的商业环境与房地产又能积聚更多客流，增加轨道交通的收益。优质的 TOD 模式开发必须要和站点周边紧凑的土地利用模式相结合，正是因为公共交通系统的有效运转需要稳定的客流支持。轨道建设与城市开发相互协作，形成可持续发展的良性循环。

R+P 模式的具体经营模式。通过建设轨道交通线路和车站作为公共交通工具来运营，然后开发车站站房内和车站上盖物内空间，修建商场和住宅等作为物业来出租或出售，由轨道交通公司承担全部的轨道交通建设成本。待轨道交通开通后，轨道交通公司除持有长期且有稳定性的轨道营运收入外，还可获取沿线一定规模土地的溢价收益和长期持有物业的增值收益，反哺其轨道交通建设前期成本投资，并以此承担轨道交通运营成本及设备更新等追加投资。

R+P 模式是一种必然的选择。纯轨道的投资和运营在全球来讲都是赚不到钱的，仅靠车票远远不能回收高昂的轨道交通建设成本与持续投入的运营费用。根据香港铁路公司（以下简称“港铁”）2015 年年报公布的财务报表，总利润 92 亿港币中，仅有 14% 是纯票务收入，而 86% 的来自非票务收入。轨道业务投资回报低、无法支撑轨道交通公司的持续经营，因此选择采用 R+P 模式、开展多元化经营是必然的结果。

R+P 模式的成功案例。就城市尺度而言，应用 R+P 模式最成功的两个城市是日本东京和中国香港，其轨道交通发展中最典型的特征就是轨道与商

facilities, offices, jobs, retail stores and residences, near traffic hubs so as to encourage more people to use public transport and non-motor. The collaborative development of urban public transport and land will contribute to the formation of urban form and space, and reduce the use of private motor vehicles. As a result, it not only alleviates air pollution and greenhouse gas emission but also creates more public space suitable for walking. It glamorizes people's life, work, study, entertainment and social activities. It promotes sustainability, boosts economy, and encourages social diversity. Furthermore, the mode improves the competitiveness and living conditions of the city.

TOD is the most representative urban community development modes in the world. In this development mode, with bus station as its center, an urban community within the radius of 400–800m (about 5–10min walking distance) is formed. It makes comprehensive use of the land, and conglomerates functions such as job opportunities, business, residence, culture and education. The rim of the community is about 1/4 mile (approximately 400m) away from the central transit station and commercial facilities, which is suitable for pedestrian traffic. The layout of the community also emphasizes on creating a favorable pedestrian environment with its pedestrian-friendly design so as to attain the goal of encouraging the utilization of public transport. Urban communities are linked by public transit system, finally realizing the organic coordination mode of compact development of city clusters.

TOD is one of the widely applied urban development modes. In the process of urbanization, many cities expand from their original rim. This concentric expansion structure is adopted by Tokyo, Beijing, Chengdu and some other cities with only one center. When it develops to a certain scale, this structure will be restricted by such factors as natural environment and regional structure. The larger a city is, the stronger its restrictive factors are. However, the TOD development, with public traffic hub as the carrier, makes it possible to achieve compact city space and smart urban growth.

Some cities expand by establishing new districts or selectively developing satellite cities in existing peri-urban area. This also provides opportunities for TOD mode. Especially in areas with small scale of urban development, a land requisition is made first at low price for planning and development, then "mature land" with sound infrastructure is sold after public traffic is led in so that the government can benefit from value capture to assume the cost of public traffic investment, and then support the improvement of other projects near TOD.

"TOD mode" is a concept of macro-planning, and "R + P mode" is the microscopic means of implementation.

R + P Mode

"R + P" is the abbreviation of "Railway and Property", which means "the development mode tying rail transit construction and property development." It is usually referred to as "railway + property" mode.

Basic concept of R + P mode. Public rail transit is utilized to bring traffic, so as to improve the business environment and attract the development of real estate. In return, mature commercial environment and real estate can accumulate more passengers and increase the revenue of rail transportation. The excellent TOD mode must be combined with the land-use pattern around the stations, as the efficient operation of public transit system requires stable passenger flow. The collaboration between rail construction and urban development leads to a virtuous circle of sustainable development.

Specific business model of R + P mode. The operation is based on the construction of rail transit lines and stations as a means of public transport, and then the space inside the station and below the roof is developed to build shopping malls and residence for rent or sale. The rail company bears all the costs for rail construction. After the rail transit is opened to traffic, the rail company will have a long-term and stable rail operating income, premium yielding from the land along the line to a certain extent, and the incremental profits from properties it holds for the long run, which are used to make up for the preliminary investments as well as the operating costs and additional investments in equipment replacement.

R + P mode is an inevitable choice. Investment in and operation of rail alone cannot make money the world over. High costs of rail construction and operating costs for continuous investment cannot be balanced merely with sales of tickets. According to the financial statements released in the 2015 Annual Report of MTR, only 14% of the total profit of HK \$ 9.2 billion came from fare revenue, while 86% from others. Due to the low investment return which cannot even sustain the continuing operation of rail companies, it is inevitable to adopt the R + P mode and carry out diversified operation.

Success cases of R + P mode. In terms of city scale, the two cities where the R + P mode are applied most successfully are Tokyo, Japan and Hong Kong, China. The most typical feature in rail transit development is the combination and coordination between rail and commercial and property development. The rail transit and property development are bundled in Tokyo and Hong Kong. The mode featured by virtuous cycle which combines transportation investment and operation with land development along the line is worth of learning from and popularizing.