

# **Non-Fare Revenue Mechanisms of Railways in Asia**

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Research Paper

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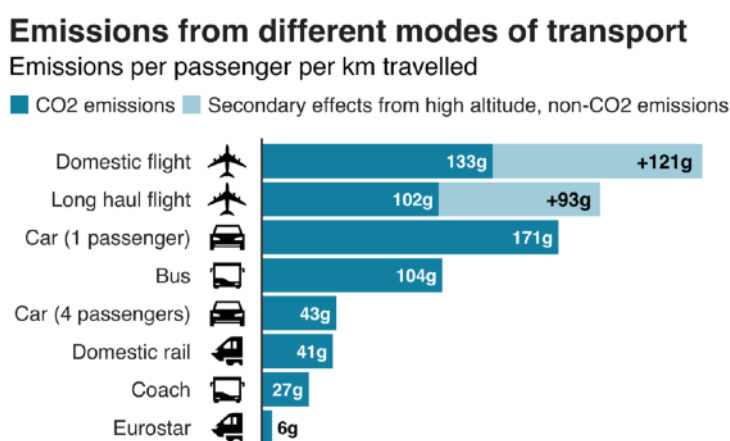
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# I. Introduction

With the advent of climate change, public transportation has become more important than ever. A ubiquitous part of many cities across Asia, subways and railways have a lower carbon footprint and are more efficient than private transportation.<sup>1</sup> The management and finance of these railway systems, though, typically differs across cities and countries. Whether these systems are publicly-operated or privately-operated, a common trend is the use of non-fare revenue mechanisms to supplement the income of train fare revenue.



**COMPARISON OF THE CARBON FOOTPRINT FROM DIFFERENT MODES OF TRANSPORTATION.  
(BEIS/DEFRA GREENHOUSE GAS CONVERSION FACTORS, 2019)**

Although each country has its own unique set of circumstances that have allowed its rail business to prosper, there are definitely lessons and systems that can be learnt and re-applied to other countries. Traditionally, non-fare revenue mechanisms consist of business diversification via real estate, retail, and services, which are designed to work in synergy with rail operations. In recent years, some governments have begun to shift from 50 years or longer rail concessions for private operators to a 5 to 10 year contracting model. The use of these short-term contracts have opened a new market of overseas expansions for existing rail operators in Asia.

This paper seeks to explore various ways that railways have utilised non-fare revenue mechanisms to supplement their income and diversify their business models. It then seeks to abstract best practice systems that can be applied to cities without railway systems, and changes that can be adopted by cities with existing railway systems. Lastly, we will look at Mobility as a Service, a budding new frontier of non-fare revenue mechanisms.

<sup>1</sup>Ercan, T., Onat, N. C., & Tatari, O. (2016). *Investigating carbon footprint reduction potential of public transportation in United States: A system dynamics approach*. Journal of Cleaner Production, 133, 1260–1276. <https://doi.org/10.1016/j.jclepro.2016.06.051>

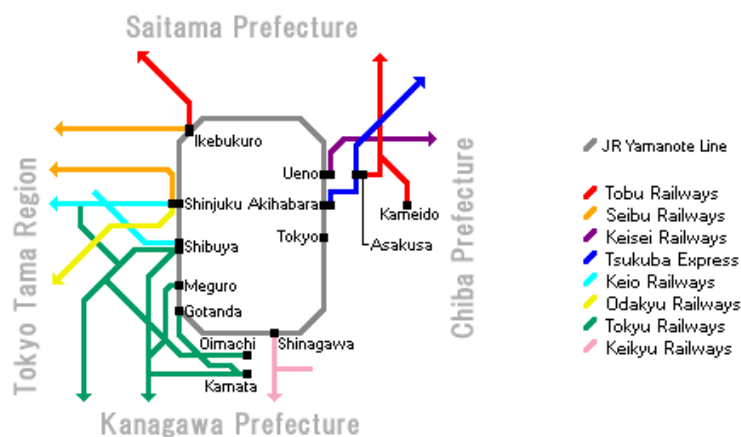
## II. Non-Fare Revenue Mechanisms

Public transportation can be seen as a form of public goods, an infrastructure that is often too expensive for the government to maintain on their own, and yet of important significance to the daily lives of citizens. In many cities across Asia, this has resulted in a railway system that is owned and operated by a partially-government owned company. Common examples include Hong Kong's MTR Corporation, Singapore's SMRT Corporation, and Taipei's Taipei Rapid Transit Corporation. These operators are typically given long-term concessions as well as the ability to own and operate the railway networks by the government.

Considering public transport's role as a public good, there is a delicate balance between keeping fares affordable for the people, and maintaining the financial viability of the railway system. In many cases, governments set and limit the maximum fare to prevent unnecessary profiteering off commuters. As a result, rail operators who are unable to make a substantial profit on fares are forced to search for alternative means to supplement and grow revenue.

### Real Estate Model

For this paper, the real estate segment of business consists of the development, selling and leasing of any residential, commercial, or retail space in and around the station area.



***WITHIN THE GREATER TOKYO AREA, A VARIETY OF PRIVATE OPERATORS COVER DIFFERENT SUBURBAN AREAS. (JAPAN-GUIDE, N.D.)***

In Japan, the government caps the fares that private operators can charge, and does not subsidise or fund private railway companies. In exchange, the government gives these

private railway operators indefinite concessions, the right to build and operate the railway for a certain period of time, over the areas that they were serving.<sup>2</sup>



**A CROSS-SECTION CONCEPT OF A TRANSIT-ORIENTED DEVELOPMENT PROJECT IN SINGAPORE.  
(HOUSING AND DEVELOPMENT BOARD, SINGAPORE, N.D.)**

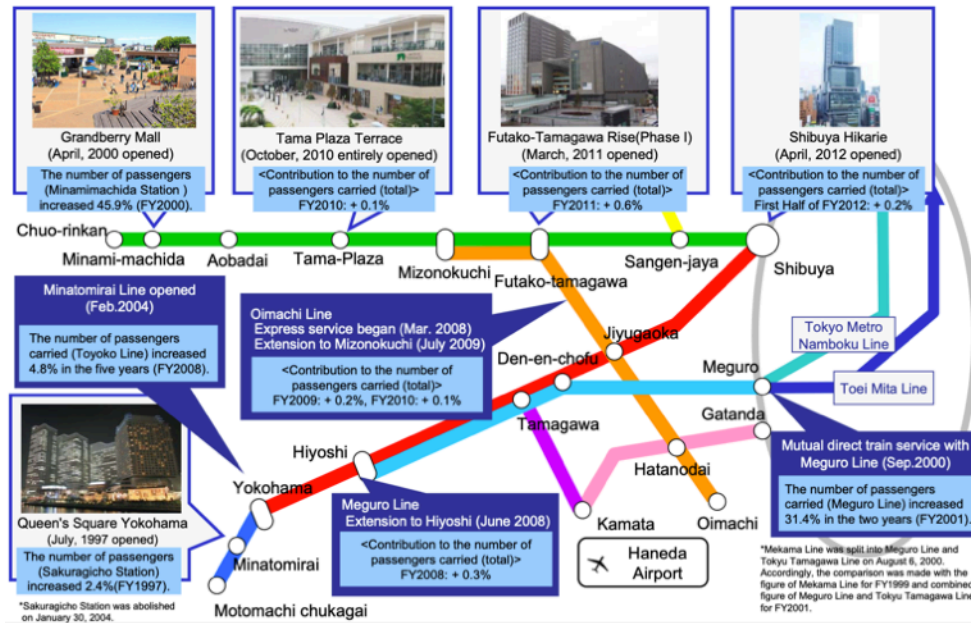
In 1955, the Tokyu Corporation, a private railway operator, began the Tokyu Tama Den-En-Toshi urban redevelopment project. The project consisted of building upscale residential neighbourhoods connected via urban rail to central Tokyo. Today, this project is a commonly cited example of Transit-Oriented Development, urban development revolving around public transportation. Tokyu Corporation's real estate development division now encompasses the building, leasing, and selling of residential, retail and commercial developments typically built around their rail operations. Some of Tokyu's more recent projects include the redevelopment of Futako-Tamagawa and Shibuya.<sup>3</sup> As of 2019, the real estate segment in Tokyu Corporation made up 29% of its profits (compared to transportation, which makes up 41% of its profits).<sup>4</sup>

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<sup>2</sup>Chorus, P., & Bertolini, L. (2014). *Developing transit-oriented corridors: Insights from Tokyo*. International Journal of Sustainable Transportation, 10(2), 86–95. <https://doi.org/10.1080/15568318.2013.855850>

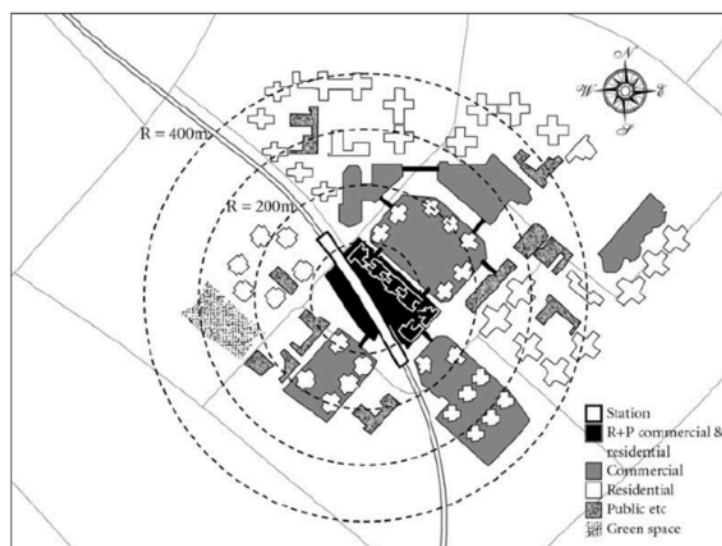
<sup>3</sup>Chorus, P., & Bertolini, L. (2014). *Developing transit-oriented corridors: Insights from Tokyo*. International Journal of Sustainable Transportation, 10(2), 86–95. <https://doi.org/10.1080/15568318.2013.855850>

<sup>4</sup>Tokyu Corporation. (2020). *Segment Information*. Tokyu Corporation. <https://www.tokyu.co.jp/ir/english/finance/segment.html>.



**VARIOUS TRANSIT-ORIENTED DEVELOPMENT PROJECTS BY TOKYU CORPORATION IN THEIR AREA OF OPERATIONS IN THE GREATER TOKYO AREA. (TOKYU CORPORATION, 2012)**

A key ingredient to the success of Transit-Oriented Development comes from the synergy between urban development and transportation. By building more desirable areas to live, it increases the number of residents, which in turn increases commuters and fare revenue. The construction of retail and residential developments around train stations further creates desirable neighbourhoods and boosts the price of real estate in the area. One major pre-requisite for such a system to work, however, is the indefinite concessions that Tokyu Corporation holds. The long-term interests and assured stakes inherent in these concessions were crucial to encourage the company to invest heavily in the areas it served.



**A MAP OF R+P DEVELOPMENT AROUND HANG HAU STATION, HONG KONG.  
(CERVERO, R. & MURAKAMI, J., 2009)**

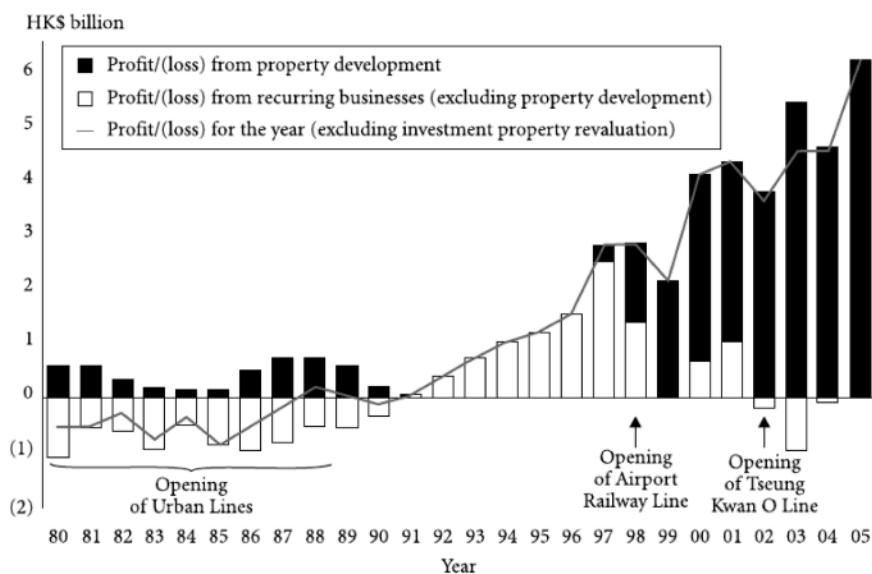
Hong Kong's MTR Corporation employs a similar, but simpler, model called the "Rail + Property" (R+P) model. The R+P model also seeks to develop land surrounding stations into real estate, but unlike Transit-Oriented Development, it only targets the land immediately around the station rather than the wider neighbourhood. This is as the R+P model was developed to cover initial infrastructural costs for the development of railways, rather than a means to supplement the income of the operator.<sup>5</sup>

Unlike Tokyu Corporation, a wholly privately owned company, MTR Corporation is a majority state-owned company. So, while Tokyu Corporation did not receive any subsidies from the government, MTR Corporation received a lucrative arrangement for land from the government. The Hong Kong government would sell the land around stations to MTR Corporation on what is known as a "greenfield basis", which is the price of the land at the current point without accounting for future developments. This meant that MTR Corporation would make a profit, as the development of a station on the land would make it immediately more valuable.<sup>6</sup>

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<sup>5</sup>Cervero, R., & Murakami, J. (2009). *Rail and Property Development in Hong Kong: Experiences and Extensions*. *Urban Studies*, 46(10), 2019–2043. <https://doi.org/10.1177/0042098009339431>

<sup>6</sup>Hung, W. (2014). *Transit Oriented Development and Value Capture – Hong Kong*. Hong Kong Polytechnic University, UNESCAP Regional Expert Group Meeting on Sustainable and Inclusive Transport Development and 2nd Asia BRTS Conference. [https://www.unescap.org/sites/default/files/1b.4\\_TOD%26ValueCapture\\_Hong%20Kong\\_HungWingTat.pdf](https://www.unescap.org/sites/default/files/1b.4_TOD%26ValueCapture_Hong%20Kong_HungWingTat.pdf)



**PROPERTY DEVELOPMENT HAS FORMED A MAJOR PART OF MTR CORPORATION'S PROFITS. (CERVERO, R. & MURAKAMI, J., 2009)**

Most commonly, MTR Corporation would put out tenders for commercial development on the land, contributing land rights and then engaging in a profit-sharing model with a real estate developer. Consequently, MTR Corporation would earn money from the leasing or selling of residential and commercial properties in that land, and use it to recoup the initial infrastructure costs and supplement its income. As of 2018, MTR's real estate segment made up 75% of its profits (compared to transportation, which makes up 16% of its profits).<sup>7</sup>

In both of these cases, it is clear that real-estate has become a major segment in their business, leveraging on the high value of real estate surrounding their stations. While profitable, one of the key enablers of this system is the ability to own and sell the land around stations. This would thus require that rail operators invest in operations on a long-term basis, and in turn require long-term rail concessions.

## Contracting Model

At its core, the relationship between the government and railway operators revolve around railway concessions. These concessions typically run for a prolonged time of 30 to 50 years, or even indefinitely. In many of these cases, the awarding of a concession would result in a monopoly over the area of operations. Even in cities where multiple

<sup>7</sup>MTR Corporation (2020). *Total Recurrent EBIT*. MTR Corporation. [https://www.mtr.com.hk/archive/corporate/en/investor/profit\\_en.pdf](https://www.mtr.com.hk/archive/corporate/en/investor/profit_en.pdf)



operators are allowed to operate, each line can only be held by one operator, and so that operator more or less holds a monopoly over that route. Unlike other services where the customer can simply choose a new provider, there simply isn't another option for commuters.

In recent years, a new form of railway concessions has come about, one based on shorter-term contracts of 10-15 years. Previously, train operators would own the entirety of the system, including rolling stock, trains, and other equipment. In this new contracting model, the government typically owns all the equipment and then leases out the equipment to the contracted rail operator. This means that operators simply provide the know-how and staffing, without having to heavily invest in the upfront infrastructural costs that come with running a railway. These contracts are then up for competitive bidding, with operators competing on price and service quality. <sup>8</sup>

In the long-term concession model, there is little incentive for the operator to do better as they have a monopoly over operations. However, in the short-term contracting model, poorly performing operators can lose out to better-performing competitors when a new contract is issued. For long-term concessions, the barrier to entry for new operators is also high due to the need for heavy investment into infrastructure. With the contracting model, though, the ability to lease the equipment makes it easy for new competitors to enter the market without the need for upfront infrastructural costs.

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<sup>8</sup>Didier, V., Johan, J., & Masja, S. (2009) *Development of railway contracting for the national passenger rail services in the Netherlands*. International Conference Series on Competition and Ownership in Land Passenger Transport. <http://hdl.handle.net/2123/5914>; Land Transport Authority of Singapore (n.d.) *New Rail Financing Framework*. Land Transport Authority of Singapore. [https://www.lta.gov.sg/content/ltagov/en/who we are/our work/public transport system/rail/new rail financing framework.html](https://www.lta.gov.sg/content/ltagov/en/who_we_are/our_work/public_transport_system/rail/new_rail_financing_framework.html); TfL Press Office. (2014, July 18). *TfL announces MTR to run Crossrail services*. Crossrail. <https://www.crossrail.co.uk/news/articles/tfl-announces-mtr-to-run-crossrail-services>; Transport for London. (2019, March 22). *TfL completes 'sale and leaseback' of Elizabeth line trains to 345 Rail Leasing Consortium*. Transport for London. <https://tfl.gov.uk/info-for/media/press-releases/2019/march/tfl-completes-sale-and-leaseback-of-elizabeth-line-trains-to-345-rail-leasing-consortium>.

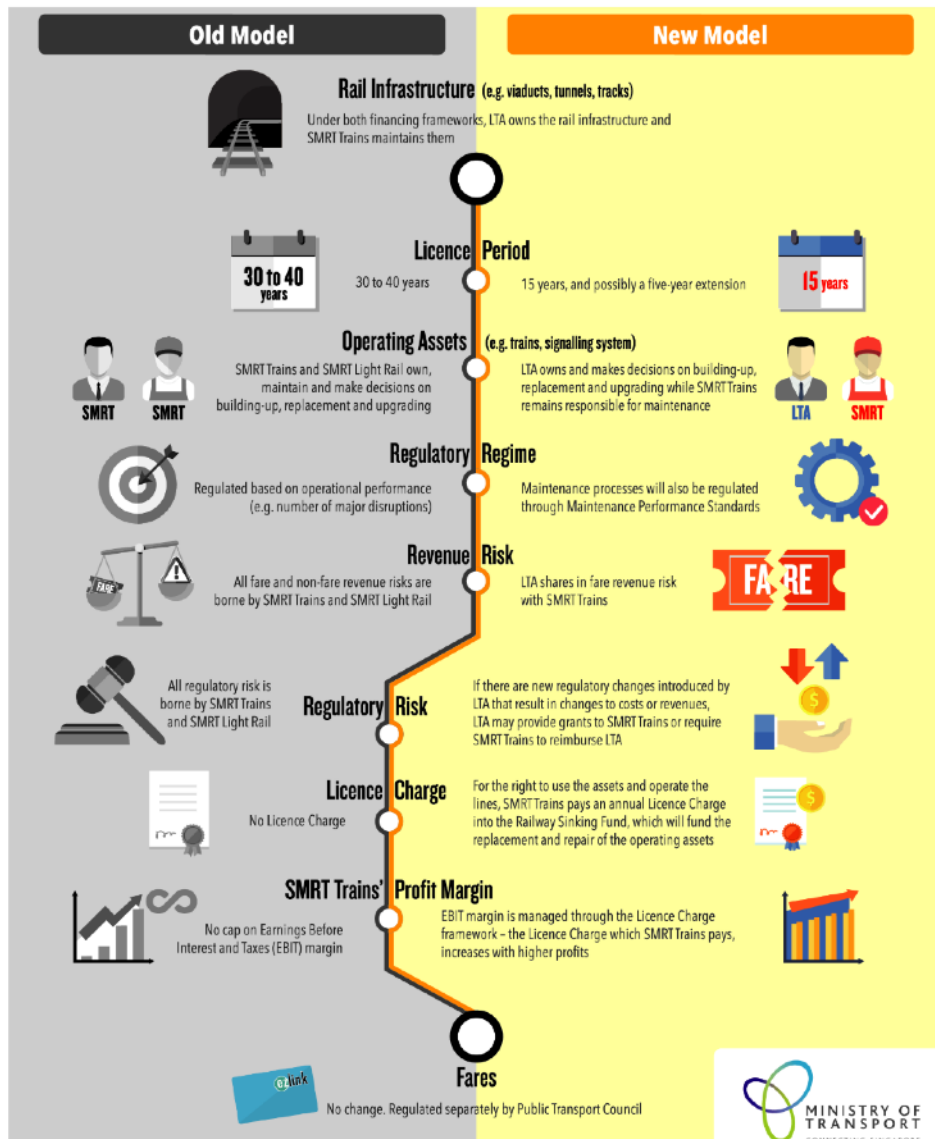
## Mainland of China and International Railway Businesses at a Glance

	MTR Corporation Shareholding	Business Model	Commencement of Franchise/ Expected Date of Commencement of Operation	Franchise/ Concession Period	Total Number of Stations	Route Length (km)
<b>Europe</b>						
TfL Rail/Elizabeth Line, United Kingdom	100%	O&M Concession	May 2015	8 years	Until End 2021: 31 Full line: 41	Until End 2021: 99 Full line: 128 998
South Western Railway, United Kingdom	30%	O&M Concession <sup>Note 4</sup>	August 2017	7 years	216	998
Stockholm Metro, Sweden	100%	O&M Concession	November 2009	8 years till 2017 and 6 years extension till 2023	100	108
MTRX, Sweden	100%	Open Access Operation	Initial service: March 2015 Full schedule: August 2015	Operating license is subject to renewal	7	462
Stockholm commuter rail, Sweden	100%	O&M Concession	December 2016	10 years	54	247
Mälartåg, Sweden	100%	O&M Concession	December 2021	8 years	46	1,060

**AN EXAMPLE OF MTR CORPORATION'S CONTRACTED OPERATIONS IN EUROPE.  
O&M (OPERATIONS & MAINTENANCE) THAT RUN BETWEEN 8 TO 10 YEARS.  
(MTR CORPORATION, 2020)**

Contracting models can be run on either a leasing model or a profit-sharing model. In a leasing model, the government would pay the operator a fixed sum to run the railway during the contract period to specified standards. The government would then keep all the fare revenue.<sup>9</sup> In this case, the rail operators have little to no risk as they are being paid a fixed amount for their services. Governments would then have to bear the fare revenue risk if the route is not profitable, although they have political incentive to do this as a form of social welfare. In a profit-sharing model, the operator would pay the government a fixed sum to lease the assets during the contract period and then split the fare revenue between themselves and the government. In this case, both parties carry the fare revenue risk, but the operator also stands to gain more if it can increase the number of commuters.

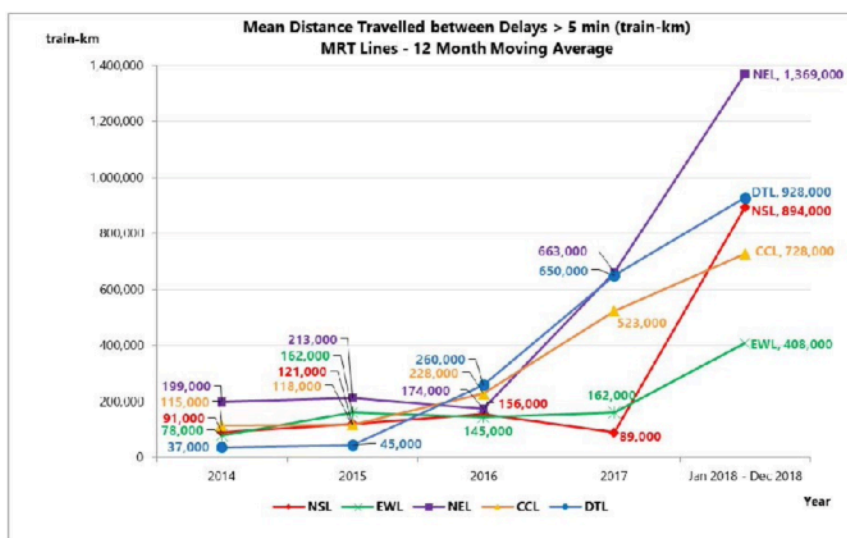
<sup>9</sup>AFP & The Local (2009, January 22). *Hong Kong firm wins contract to operate Stockholm's subway*. The Local. <https://www.thelocal.se/20090121/17044/>



**A COMPARISON BETWEEN SINGAPORE'S PREVIOUS LONG-TERM CONCESSION MODEL ("OLD MODEL") AND THE CONTRACTING MODEL ("NEW MODEL").  
(MINISTRY OF TRANSPORT, SINGAPORE, N.D.)**

Singapore currently employs the profit-sharing model, whereby the fees that operators pay to lease the rolling stock and equipment is pumped back into a sinking fund that is used for future upkeep and equipment purchases. The contract period is 15 years, with a 5 year extension option, a reduction from the previous 30 to 40 year concession. The new contract also involves higher penalties as compared to the previous concession system. Since the implementation of the new contract on most major lines in 2016, service reliability has improved drastically. The mean kilometres between failure (MKBF),

the cumulative distance run by trains before a major failure of 5 minutes or more, increased from 160,000 MKBF in 2016 to 1.4 million MKBF in 2019.<sup>10</sup>

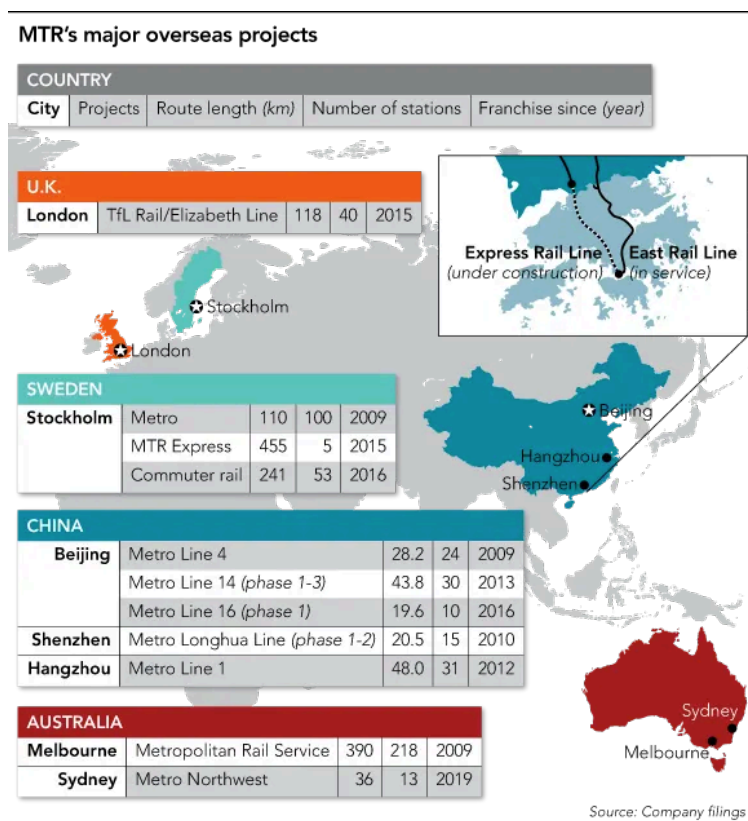


**COMPARISON OF MKBF BETWEEN 2014 AND 2018 ON 5 DIFFERENT RAIL LINES IN SINGAPORE. THE CONTRACTING MODEL WAS IMPLEMENTED IN 2016. (LAND TRANSPORT GURU, 2018)**

Beyond just rail operations, Singapore is also separately contracting out retail operations in station and advertising operations to separate companies. For the new Thomson East Coast Line, train operations are managed by Singaporean railway operator SMRT Corporation, retail operations are managed jointly by a consortium including Japanese railway operator East Japan Railway Company (JR East), and advertising operations are managed by Hong Kong media conglomerate Asiaray.<sup>11</sup> The separation of assets and operations has allowed foreign operators to come into the mix, applying competitive pressure to a market that was formerly largely restricted to only local competitors.

<sup>10</sup>Lee, C. (2019, October 14) *Singapore's Railway Revival Bodes Well for Ruling Party, but Can It Last?* South China Morning Post. <https://www.scmp.com/week-asia/economics/article/3032573/singapores-mrt-railway-revival-bodes-well-ruling-pap-can-it>; Tan, C. (2019, February 12). *MRT Network Hits New Reliability Standard*. The Straits Times. <https://www.straitstimes.com/singapore/transport/mrt-network-hits-new-reliability-standard>; Khaw, B. W. (2016, May 30). *Speech by Mr Khaw Boon Wan Coordinating Minister for Infrastructure and Minister for Transport at the Second Joint Forum on Infrastructure Maintenance on 30 May 2016*. Ministry of Transport, Singapore. <https://www.mot.gov.sg/news-centre/news/Detail/Speech%20by%20Mr%20Khaw%20Boon%20Wan,%20Coordinating%20Minister%20for%20Infrastructure%20and%20Minister%20for%20Transport,%20at%20the%20Second%20Joint%20Forum%20on%20Infrastructure%20Maintenance,%20on%2030%20May%202016/>

<sup>11</sup>Abdullah, Z. (2019, August 28). *Retail and advertising operations to be outsourced on Thomson-East Coast Line*. The Straits Times. <https://www.straitstimes.com/singapore/transport/retail-and-advertising-operations-to-be-outsourced-on-thomson-east-coast-line>



**MTR CORPORATION'S OPERATIONS OUTSIDE OF HONG KONG. (NIKKEI ASIA, 2017)**

As a result of this system, Asian operators have also been allowed to expand their railway operations outside their home territory. Hong Kong's MTR Corporation has been successful at running multiple railway operations outside of Hong Kong. It currently operates lines in three Chinese cities, the London Elizabeth Line, the Stockholm Metro, the Melbourne metropolitan rail and the Sydney Metro.<sup>12</sup> As of 2018, MTR's international operations segment made up 6% of its profits (compared to domestic transportation in Hong Kong, which makes up 16% of its profits).<sup>13</sup>

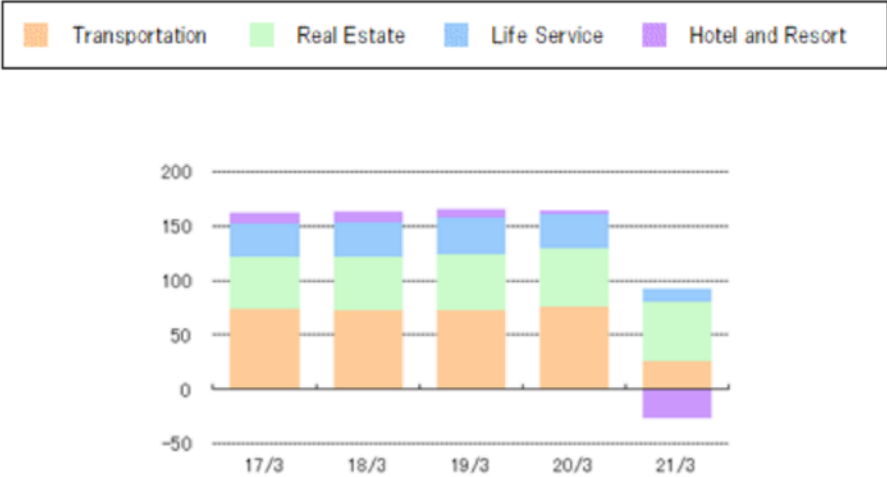
The contracting model is, of course, largely incompatible with the transit oriented development model by private operators. The former involves short-term contracts to keep operators on their toes and to compete based on price and service quality. The latter involves long-term investments, entrenching the railway operator's interests with lucrative financial developments around its operations. There are benefits and tradeoffs to both systems that we will discuss later in this paper.

<sup>12</sup>MTR Corporation. (2020). *ANNUAL REPORT 2020 MTR CORPORATION LIMITED 00066*. MTR Corporation. <https://www.mtr.com.hk/en/corporate/investor/2020frpt.html>

<sup>13</sup>MTR Corporation (2020). *Total Recurrent EBIT*. MTR Corporation. [https://www.mtr.com.hk/archive/corporate/en/investor/profit\\_en.pdf](https://www.mtr.com.hk/archive/corporate/en/investor/profit_en.pdf)

# Other Mechanisms

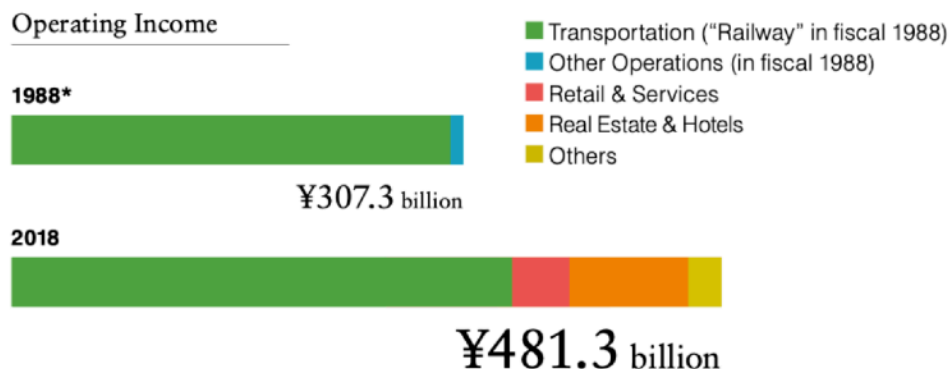
Apart from just leasing retail spaces, several Japanese operators also directly operate their retail and services operations. Typically, these railway operators manage these businesses to supplement different goals. For the purposes of this paper, the retail and services segment includes any consumer-facing business that is directly operated by the railway operator including retail, hotels, and entertainment.



**TOKYU CORPORATION'S EBITDA BY SEGMENT. (TOKYU CORPORATION, 2021)**

Tokyu Corporation operates their retail and services operations (termed as “Life Service” in their financial reports) to make their line a more liveable neighbourhood, in line with strengthening their focus on Transit-Oriented Development. This includes the operation of shopping malls, supermarkets, childcares, and insurance among other businesses. As of 2019, its retail and services segment makes up almost 25% of Tokyu Corporation’s profits (compared to transportation, which makes up 41% of its profits).<sup>14</sup>

<sup>14</sup>Tokyu Corporation. (2020). *Segment Information*. Tokyu Corporation. <https://www.tokyu.co.jp/ir/english/finance/segment.html>.



**JR EAST'S OPERATING INCOME BY SEGMENT IN 2018. (JR EAST, 2018)**

In comparison, operators like JR East focus on offering retail services as part of improving the commuter experience at their stations, using the “ekinaka” concept, an in-station retail experience, to increase convenience for its commuters. As of 2019, its retail and services segment only make up 8% of JR East’s profits (compared to transportation, which makes up 70% of its profits).<sup>15</sup> Another operator, Seibu, chose to focus on developing its hotel and leisure operations beyond the scope of its railway operations. Rather than relying on synergy between its transportation and hotel segment, the two operate almost independently of each other. As of 2019, its retail and services segment (consisting only of its hotel and leisure business) makes up 27% of Seibu Group’s profits (compared to transportation, which makes up 37% of its profits).<sup>16</sup>

The retail and services segment of railway operators is typically not as profitable as compared to the real estate segments. However, there could also be positive externalities on other segments as a result of maintaining the retail and services segment.

<sup>15</sup>East Japan Railway Company. (2018). *ANNUAL REPORT 2018*. East Japan Railway Company. [https://www.jreast.co.jp/e/investor/ar/2018/pdf/ar\\_2018-all.pdf](https://www.jreast.co.jp/e/investor/ar/2018/pdf/ar_2018-all.pdf)

<sup>16</sup>Seibu Group. (2020). *Analysis of Operating Results and Financial Position*. Seibu Group. [https://ssl4.eir-parts.net/doc/9024/ir\\_material\\_for\\_fiscal\\_ym31/88742/00.pdf](https://ssl4.eir-parts.net/doc/9024/ir_material_for_fiscal_ym31/88742/00.pdf)

## III. Analysis

We will look at these mechanisms from the perspective of the local government, and the perspective of the private railway operator.

### Real Estate

From the perspective of a private railway operator, the real estate model is a lucrative option. The ability to own and then sell land around the station helps to offset the infrastructural costs of constructing the line, and also subsequently provides a sustainable mode of income through leasing these developments. This gives the railway operator an assurance that the profitability of their business does not purely rely on whether they can secure commuters on the line. At the same time, the risk involved may be higher, as their infrastructural investment is no longer just the line but the surrounding developments. If both the line, and the commercial developments are left unused, then the potential for loss would be even higher.

For governments, giving railway operators a long-term concession and selling the land around the railway for cheap is an attractive option. On one hand, the government does not need to be as heavily involved in the project, allowing the private sector to take the lead to develop on its own. It will, however, stand to lose out from the profits of the potential increase in land price around the development when selling the land for cheap. On the other hand, if it was entirely private-run, the government may have little control over the subsequent operation of the line. Poor public transport operations, and consequent commuter unhappiness, may in turn result in unhappiness towards the government for poor management. Such a scenario has happened in both Hong Kong and Singapore, where there was increased unhappiness towards the government for poor rail reliability. In both of these cases, the railway operators were partially government-owned. An in-between option may emerge where the railway operator is a government-owned or linked company. However, the caveat to such an approach lies in the risk that governments will have to take on.<sup>17</sup>

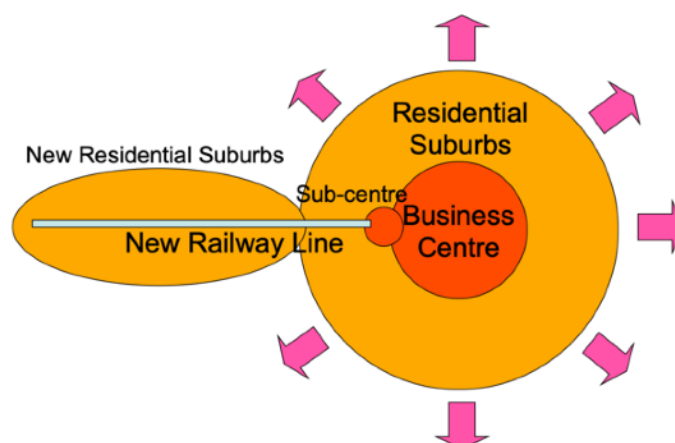
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<sup>17</sup>Chia, J. (2017). *Regulating Public Transport Fares in Singapore – What Can We Afford?* Lee Kuan Yew School of Public Policy, National University of Singapore. [https://lkyspp.nus.edu.sg/docs/default-source/case-studies/regulating-public-transport-fares-in-singapore.pdf?sfvrsn=4c3b960b\ \\_2](https://lkyspp.nus.edu.sg/docs/default-source/case-studies/regulating-public-transport-fares-in-singapore.pdf?sfvrsn=4c3b960b\ _2); Ng, J., & Lai, C. K. (2019, April 5). *Why we put up with MTR's poor service and rising fares*. South China Morning Post. <https://www.scmp.com/comment/letters/article/3004530/mtrs-near-monopoly-reason-hong-kong-puts-its-poor-service-and>; Soon, Weilun. (2015, October 30) *Privatisation of Public Transport May Have Gone Too Far ...* Business Times Singapore. <https://www.businesstimes.com.sg/transport/privatisation-of-public-transport-may-have-gone-too-far-mahbubani>.



From the perspective of commuters, the implementation of the real estate model would bring convenience and new residential options. The convenience of working, shopping, or living near a station would entice many potential residents. It would also bring in new developments to the city, which would help to improve overall quality of life.

Gentrification is a potential downside, with the construction and development of these facilities pushing affordable housing further away from the stations and dislocating the original residents, who may no longer be able to afford their apartments.



**FIGURE OF TOKYU CORPORATION'S CREATION OF THE TOKYU TAMA DEN-EN-TOSHI URBAN REDEVELOPMENT PROJECT OUTSIDE CENTRAL TOKYO. (TOKYU CORPORATION, 2017)**

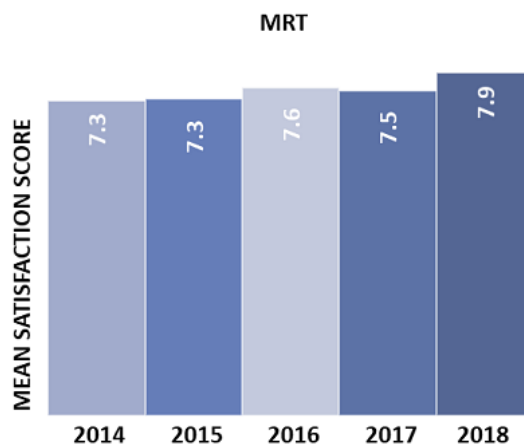
The real estate model is also most applicable for cities without an existing rail line, or those seeking to build new lines. In Tokyu Corporation's case, it built its developments through a suburban area on the outskirts of Tokyo. This is as it is a difficult and expensive process to secure land around existing stations, which have usually already been heavily built-up. One option is to increase the retail space within existing stations by taking advantage of unused liminal spaces and turning them into usable retail areas. For example, in the 2000s, Singapore's SMRT Corporation redeveloped underground areas in stations into usable retail space for leasing out.<sup>18</sup> However, the growth potential for station leasing is likely significantly smaller than major commercial spaces atop stations. Thus, the use of the real estate model is one of the financially sustainable ways to encourage private developers to take an interest in railway development, and for the development to be sustainably funded.

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<sup>18</sup>SMRT Corporation. (2017). *SMRT Corporation Group Review 2017*. SMRT Corporation. <http://groupreview.smrt.com.sg/milestones.html>

## Contracting Model

From the perspective of the government, a contracting model would provide greater control over service standards for railways. It would also allow for greater competition between providers, and in turn produce better service standards at more competitive prices. However, this would require far greater intervention on the government's part, as compared to just assigning a one-time long-term operator. The government now has to play an active part in the system, taking ownership of the assets and helping to facilitate the handover or transition between provider.



**COMMUTER SATISFACTION FOR RAILWAYS IN SINGAPORE INCREASED AFTER IMPLEMENTATION OF THE CONTRACTING MODEL IN 2016. (PUBLIC TRANSPORT COUNCIL, SINGAPORE, 2018)**

For many established cities with railways, the performance of their railways has become a key part of public perception of the government, even if they are not directly operated by the government. As previously mentioned, railways that perform poorly lead to a loss of political reputation. The perception of a monopoly by the long-term operator is also a cause of additional public unhappiness if standards do not improve.<sup>19</sup> Utilizing the contracting model would give the government more control over service standards. While the government needs to assume more risk by playing a bigger part in the railway ecosystem, it stands to gain in cost and performance improvements as well as a boost to its political reputation.

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<sup>19</sup>Ng, J., & Lai, C. K. (2019, April 5). *Why we put up with MTR's poor service and rising fares*. South China Morning Post. <https://www.scmp.com/comment/letters/article/3004530/mtrs-near-monopoly-reason-hong-kong-puts-its-poor-service-and>.



**COMPARISON OF PROFITABLE AND UNPROFITABLE LINES RUN BY JR HOKKAIDO.  
(NIPPON.COM, 2017)**

One key caveat is that a contracting model would require governments to take on a greater fare revenue risk. If employing a profit-sharing model, it may also face the issue of a lack of interested operators. The United Kingdom currently faces such a problem on several of its routes as they are simply unprofitable for the operator to run.<sup>20</sup> Train operations with Hokkaido, Japan, under the Hokkaido Railway Company (JR Hokkaido), are known to be extremely unprofitable, with around half of its lines making losses.<sup>21</sup> If governments use a leasing model, then they would have to assume any financial loss if the fare revenue is less than the leasing amount paid to the operator to run the route. Governments need to then decide if those lines are worth keeping afloat to serve people in the area, or to cut those lines to keep the system profitable.

From the perspective of railway operators, the use of a contracting model poses a challenge for entrenched domestic operators, with the entrance of new competitors on both the overseas and domestic fronts. Without having to invest heavily in the upfront infrastructural costs, new operators would face lower barriers to entry, with the majority of their expenses spent on human resources. Operators would have to compete on price and service quality when fighting for contracts, and would enjoy less stability than they would with a long-term contract.

<sup>20</sup>Ford, J. (2018, January 29). *Rail: Frustration Grows with Britain's Fragmented Network*. Financial Times. <https://www.ft.com/content/d82848ca-f7ba-11e7-88f7-5465a6ce1a00>.

<sup>21</sup>Brasor, P. (2019, May 11). *JR Hokkaido confronts the harsh realities of financing rail lines in depopulated areas*. The Japan Times. <https://www.japantimes.co.jp/news/2019/05/11/national/media-national/jr-hokkaido-confronts-harsh-realities-financing-rail-lines-depopulated-areas/>

Operators will also have to plan their initiatives around their contract term, instead of scheduling long-term plans. In order for the contracting model to be sustainable, the government has to take over the role of planning for long-term renewal and upgrading of the assets, in line with its new position as owner of the fleet.

For contracting models that use leasing, there is little fare revenue risk for operators. Since operators are paid a fixed amount to run a railway line, even if the line is unprofitable or ridership is low, the operator will get paid the same amount. Thus operators do not have to worry about running unprofitable routes, simply having to abide by the terms of the contract.

For railway operators in cities that have hit saturation, and have little room for continued sustained growth, the contracting model may open up new markets overseas for expansion. This allows operators to continue expanding past geographical limitations, and access new markets that were once inaccessible.

Another potential issue is the over-fragmentation of the contracting system, as seen in the United Kingdom. On top of winning the operations contract, a railway operator in the United Kingdom would also have to lease the rolling stock from a private company and then lease the usage of the tracks from a separate private company. This complicated system has led to profiteering and collusion between the various private companies, and the diffusion of responsibility has meant that no one party can make meaningful change.<sup>22</sup> Nevertheless, this problem can be overcome with a single operator being given responsibility for the operation of the railway, and the leasing of assets being a part of the short-term contract they are awarded.

While the contracting model is incompatible with the real estate model, the government can still create retail spaces within the stations themselves. It could then lease out the retail space to retail management companies to manage, with the profit supplementing non-fare revenue. Unlike in the real estate model, where only railway companies reap the profits from retail management, this hybrid system means that the government could also profit from the leasing out of retail spaces.

The contracting model is thus most applicable to cities with an existing railway system. While governments may have to negotiate the transition from a long-term concession-based one into a contracting model, it stands to benefit from improved service standards and reduced costs. However, this model will be challenging to apply for cities seeking to develop railway lines as the government would have to take on all the upfront costs of purchasing and developing railway infrastructure.

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<sup>22</sup>Ford, J. (2018, January 29). *Rail: Frustration Grows with Britain's Fragmented Network*. Financial Times. <https://www.ft.com/content/d82848ca-f7ba-11e7-88f7-5465a6ce1a00>.

	<b>Real Estate Model</b>	<b>Contracting Model</b>
<b>Used In</b>	Japan, Hong Kong	Singapore, Stockholm, London
<b>Concession / Contract Duration</b>	Long-Term (35-50 years, Indefinite)	Short-Term (5-10 years)
<b>Government Control over Service</b>	Limited (Depends on Concession)	Stronger Control (Can be updated during each contract)
<b>Fares</b>	Railway Operator (Typically)	Government, Railway Operator, or Profit-Sharing (Depends on contract)
<b>Government's Role</b>	Setting Fares & Awarding Concession	Setting Fares, Awarding Contracts, & Owning Assets
<b>Operator's Role</b>	Investing, Developing, & Operating Railway & Real Estate	Operating Railways using Leased Assets from Government
<b>Government Pros &amp; Cons</b>	Hands-off. Operator Handles Most Operations & Risk.  Lack of Control over Service Standards.	Greater Control over Service Standards. Lower Operating Costs from Competition.  More Hands-on. Need to Own Assets. Increased Fare Revenue Risk.
<b>Operator Pros &amp; Cons</b>	Stability (Long-Term). Incentive to Invest in Long-term Development. Reaps the Profit of Real Estate Business. Pseudo-Monopoly.  Has to Assume Higher Risk.	Low Barrier to Entry for New Markets. Ability to Expand Overseas. Leasing Model Leads to Low Fare Revenue Risk.  Increased Competition to Operate Railways. Unable to Run Non-Railway Operations.
<b>Suitability</b>	Cities without an Existing Railway	Cities with an Existing Railway

## IV. Future Development: Mobility as a Service

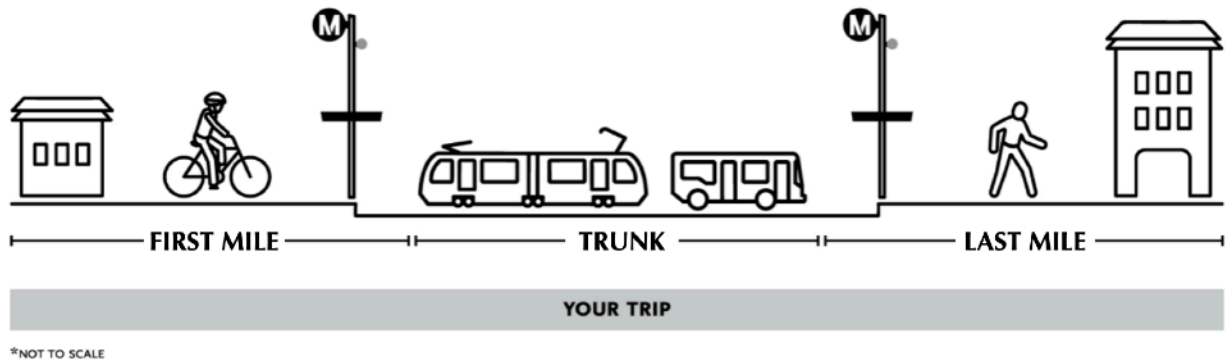
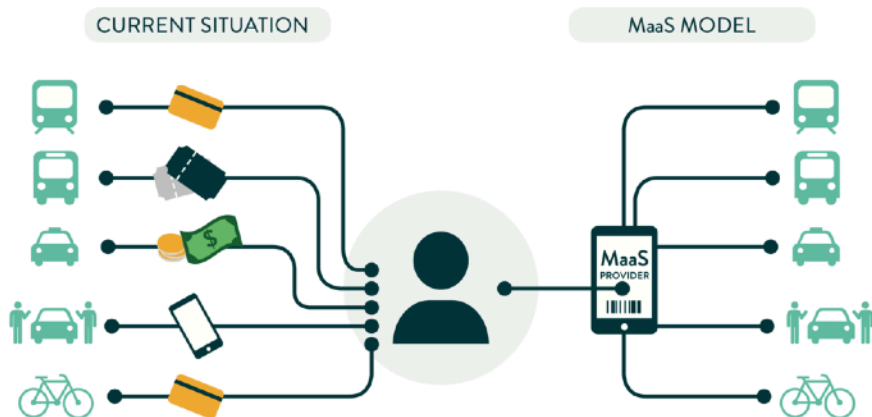


ILLUSTRATION OF A TYPICAL COMMUTE. (METRO, N.D.)

The next frontier of non-fare revenue for railway operators may be Mobility as a Service (MaaS). A typical commuter’s journey could involve taking a bus from home to the station, then the train to a station close to the office, and then a taxi from the station to the office. The bus and taxi segments, are known as first and last mile connectivity, while the train segment is known as the trunk connectivity. Each of these segments currently function completely separately.<sup>23</sup>



COMPARISON OF CURRENT INDIVIDUALISTIC SYSTEM TO AN INTEGRATED SYSTEM USING MAAS. (INTERNATIONAL ASSOCIATION OF PUBLIC TRANSPORT, 2019)

The idea of MaaS is to unify the whole journey into a single end-to-end experience. Through a single app, a commuter can book every segment of his journey and pay through the same app. MaaS focuses on integrating various public transportation options

<sup>23</sup>Deloitte. (2017, January 23). The rise of mobility as a service. *Deloitte Review*, 2017(20), 112-129. <https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/consumer-business/deloitte-nl-cb-ths-rise-of-mobility-as-a-service.pdf>

(including trains, buses, ride-sharing, and bike-sharing options) together to make for a seamless journey and encourage commuters to switch from private cars to public transit.

	Whim Urban 30 €59,7 / 30 days	Whim Weekend €249 / 30 days	Whim Unlimited €499 / month	Whim to Go Pay as you go
Public transport	HSL 30-day ticket	HSL 30-day ticket	Unlimited HSL single tickets	Pay as you go
City bike	Unlimited	Unlimited	Unlimited	Not included
Taxi (5km)	€10	-15%	Unlimited	Pay as you go
Rental car	€49/day	Weekends	Unlimited	Pay as you go
	<a href="#">Read more</a>	<a href="#">Read more</a>	<a href="#">Read more</a>	<a href="#">Read more</a>

**AN EXAMPLE OF MAAS PRICING IN HELSINKI, FINLAND. (VENTURE BEAT, 2019)**

Payment can come in two forms. The first is the traditional pay-as-you-go method, where people pay for what they use, and the second is the subscription method, where people pay a fixed amount per month. The subscription method aims to apply the ‘Netflix model’ to transportation, a single payment that gets commuters rides on buses, trains, taxis, or bike-sharing: everything a commuter needs to get from Point A to Point B.

The big challenge of MaaS is bringing the various players together, since many of these companies have traditionally been competitors in the market. To cover the whole journey, it requires companies to integrate their services with other companies, or to expand into new market segments.<sup>24</sup>

Singapore’s current public transit model is similar to MaaS. With a single card (a digital stored-value card, or a contactless credit card), one can take buses and trains for a single integrated fare.<sup>25</sup> It also offers a subscription model, where for SGD\$128 (around JPY10,000), a commuter can take unlimited bus and train rides throughout the whole of Singapore for a month.<sup>26</sup> Hong Kong’s MTR Corporation also offers similar passes that

<sup>24</sup>Zipper, D. (2020, August 5). *The Problem With ‘Mobility as a Service’*. Bloomberg Citylab. <https://www.bloomberg.com/news/articles/2020-08-05/the-struggle-to-make-mobility-as-a-service-make-money>

<sup>25</sup>Ministry of Transport, Singapore. (n.d.) *Fares & Payment Systems*. Ministry of Transport, Singapore. <https://www.mot.gov.sg/About-MOT/Land-Transport/Public-Transport/Fares-Payment-Systems/>

<sup>26</sup>TransitLink. (n.d.) *Adult Monthly Travel Card*. TransitLink. <https://www.transitlink.com.sg/adult-monthly-travel-card/>

integrate rail and bus fare on a specific route within a single monthly subscription price.<sup>27</sup>

Japan has been investing into MaaS, with local governments partnering with private companies to tackle issues such as transportation for the elderly.<sup>28</sup> Collaboration between rail operators is not a new concept in Japan, where it is not uncommon to find through-train services between various operators for the convenience of commuters.<sup>29</sup> Additionally, the idea of MaaS can work well with the Transit-Oriented Development model if rail operators operate buses or bike-sharing services in the areas that they serve. Leveraging on autonomous vehicles to serve first and last-mile connectivity is also looking to be feasible as the technology continues to advance.

A future with MaaS is not as far-fetched as it seems, since many of the puzzle pieces are already available. Ultimately, the work boils down to getting these pieces to fit together.

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<sup>27</sup>MTR Corporation. (n.d.) *MONTHLY PASS EXTRA*. MTR Corporation. [http://www.mtr.com.hk/en/customer/tickets/monthly\\_pass\\_extra.html](http://www.mtr.com.hk/en/customer/tickets/monthly_pass_extra.html)

<sup>28</sup>Government of Japan. (2020, November 30). *Japan Is Innovating Mobility As A Service And Creating A \$61 Billion Market*. Forbes. <https://www.forbes.com/sites/japan/2020/11/30/japan-is-innovating-mobility-as-a-service-and-creating-a-61-billion-market/?sh=51a98e602d87>

<sup>29</sup>Ito, M. (2014, March). Through Service between Railway Operators in Greater Tokyo. *Japan Railway & Transport Review*, (63), 14-21. [https://www.ejrcef.or.jp/jrtr/jrtr63/pdf/14-21\\_web.pdf](https://www.ejrcef.or.jp/jrtr/jrtr63/pdf/14-21_web.pdf)



## V. Conclusion

In the changing global environment, the way we think about public transportation has changed drastically. Transportation is more than the most efficient method to get people from Point A to Point B. Rather, ideas such as Transit-Oriented Development have injected the concepts of liveability and quality of life into the discussion about transportation. Transit-Oriented Development not only improves the lives of those who reside around stations, but also helps to increase ridership on train lines by attracting more residents to the area. This allows railway operators to benefit twofold: one from the sale or leasing of properties around stations, and the second from the increase in fare revenue from increased commuters. Railway companies can then continue to grow their profits despite having fares capped by governments.

Beyond traditional methods of ownership and concessions, a new, more flexible, method of operating railways has begun to emerge. The contracting model allows operators to enter new markets without heavy upfront investments in new infrastructure. Instead, they take over the management of existing assets. This concept seems to mirror the popularity of co-working spaces, where companies lease virtual offices, and cloud kitchens, where restaurants just lease a kitchen space to run delivery operations out of. By bringing competition into a space that has traditionally been run like a monopoly, governments can enjoy the benefits of a competitive market that results in improved service at reduced costs. Railway operators can also benefit from expanding their businesses beyond borders, moving into overseas markets that they were once locked out of.

Whether Mobility as a Service becomes the next evolution of transit remains to be seen. While the customer experience will benefit from a unified end-to-end system, getting various competitors to collaborate is a difficult feat. Railway operators may be more willing to expand into new fields to cover the first and last mile connectivity options, as compared to having to share profit margins. However, difficulties remain. Even though Japanese operators have connected their lines to provide through-train services for commuters, fares for each section are calculated separately. Thus, even though the journey has been made more convenient for commuters, the cost remains just as expensive. Nevertheless, the boom of ride-hailing services such as Grab, Didi Chuxing, and Gojek throughout Asia has shown that there is a strong interest in a convenient end-to-end service.<sup>30</sup>

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<sup>30</sup>ABI Research. (2018, September 4). *16 Billion Ride-Hailing Trips Completed Globally in 2017 - 24 Billion Trips expected in 2018*. ABI Research. <https://www.abiresearch.com/press/16-billion-ride-hailing-trips-completed-globally-2017-24-billion-trips-expected-2018/>

Whether public transit can integrate into something as seamless as MaaS will depend on the willingness of private operators to cooperate with one another. However, if successful, the increased convenience of MaaS would reduce a reliance on private cars and in turn increase ridership on public transit, allowing society to transition to a more environmentally and financially sustainable form of transportation.

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