Station area developments in Tokyo and what the Randstad can learn from it

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This chapter starts by introducing the metropolitan areas of Tokyo and the Randstad before starting with the second part of this thesis, i.e. the analysis of how station area developments are planned and developed in Tokyo. This should provide the reader, who is unfamiliar with either one or both regions an idea of what the Randstad and Tokyo are about. This background information is necessary to fully understand to what extent the Randstad is able to learn from Tokyo regarding the development of station areas. First the Tokyo Metropolitan Area will be introduced by describing consecutively its geographical, socio-economical, morphological and institutional features. Afterwards, in a similar fashion the Randstad is described. In the third and final section both metropolitan areas are compared and some conclusions are drawn.
3.1 Tokyo

3.1.1 Geography
Japan consists of four main islands which are named Hokkaido (1), Honshu (2), Shikoku (3) and Kyushu (4). Tokyo is located on Honshu, the largest island of Japan, and is the largest among the three major metropolitan areas in Japan, i.e. Tokyo, Osaka and Nagoya (see figure 3-1).

There are various geographical boundaries of Tokyo each having a different size and number of the population (Cybriwsky, 1991). First, there is the so-called ‘Ward Area’ referring to the original central city of Tokyo. With a size of 621 square kilometres and a population of 8.8 million people this is the smallest definition of the Tokyo. The name ‘Ward Area’ is derived from the 23 wards governing central Tokyo. Until 1943 these wards constituted the city of Tokyo. Now they are separate self-governing municipalities each having their own major, council and the status of a city.
In 1943 Tokyo city merged with the Tokyo prefecture to form the current metropolitan prefecture also referred to as Tokyo-to, which is another name used for Tokyo. Prefectures are regional authorities comprising municipalities and are in charge of broader regional administration. Japan consists of 47 prefectures. The prefecture of Tokyo comprises an area of 2.187 square kilometres and has a population of approximately 13 million people. It is administered by the Tokyo Metropolitan Government (TMG). Yet, in another definition Tokyo is considered the area encompassing the prefectures of Saitama, Chiba, Kanagawa and Tokyo comprising an area of 13.557 square kilometres with a population of approximately 36 million people, which makes it the largest metropolitan area of the world in regards to population size (see figure 3-2). It contains the administrative units within 50 kilometres of central Tokyo. The latter definition is most commonly used for describing the metropolitan area of Tokyo called (Greater Tokyo Area (GTA)) and is used in this research when referring to Tokyo. There exists no single government unit for the GTA. Instead the four prefectures that make up the GTA cooperate informally regarding transport and land use matters. Last but not least a definition for Tokyo exists containing an even larger area and consequently population, i.e. the 'National Capital Region.' This area consists of the prefecture of Tokyo and its six surrounding prefectures and has a size of 36.890 square kilometres and a population of roughly 42 million people (Mitsui Fudosan, 2008). Similar to the GTA this area does not have its own government unit. Instead there is informal cooperation between the seven prefectures that are part of the National Capital Region.
3.1.2 Population and economic trends

Population

As of 2010 the population of the GTA comprises 35.6 million people (see figure 3-3) which is approximately 28% of the total population of Japan. Between 2000 and 2005 its population grew on average by 3%. On a prefectural level the Tokyo prefecture outpaced its surrounding prefectures and grew by 4.7%. As of 2009 the average population
density in the GTA was 3,200 persons per square kilometre, which was almost ten
times the national average (Ministry of Internal Affairs and Communications, 2010).
However, population densities vary considerably within the GTA. For example, the
Tokyo prefecture has an average density of approximately 6,100 persons per square
kilometre, while the average density in the Chiba prefecture is only 1,200 persons per
square kilometre. It is expected that despite a declining national population, due to
falling birth-rates and an ageing society, the population of the GTA will continue to
increase until the year 2015 (TMG, 2006).

Figure 3-3  Population growth of Greater Tokyo Area (in millions)

![Population growth of Greater Tokyo Area](source)

Source: Ministry of Internal Affairs and Communications, 2010.

**Migration**

The population growth, however, is not evenly distributed within the metropolis.
As figure 3-4 illustrates it is mainly the inner city areas that have managed to benefit
from this growth, while the suburban areas have seen a decrease in population. This
contrasts sharply with the reverse trend: city areas saw a decline in population. Thus
since 2000 the inner-city areas of Tokyo have regained popularity, particularly the
three inner-city wards of Tokyo (Chiyoda ward, Chuo ward and Minato ward) where
between 2000 and 2005 the population increased by 15% or more (TMG, 2006). The
TMG had introduced policies to promote housing in the central business districts\(^4\)
which may have contributed to this strong increase.

\(^4\) For instance, private developers that included housing in their development were awarded with an
additional floor area ratio.
Figure 3-4  Population changes in the Greater Tokyo Area

1995-2000

2000-2005

In 2009 the population migration between the Tokyo prefecture and its surrounding prefectures showed a total migration of 770,000 people; 413,000 people had moved in and 357,000 people had moved out, resulting in a net increase of 56,000 persons. This increase was much higher than that of its neighbouring prefectures, and has in fact been the prevailing trend since 1997 (see figure 3-5).

Figure 3-5  Net-migration (net-loss) by prefecture within the Greater Tokyo Area

Source: Ministry of Internal Affairs and Communications, 2010.
Demographic composition by age
Since the 1980s Japan has been experiencing a rapid decline in its population growth. Falling birth-rates and a rapidly ageing society are responsible for this decline. Regarding the latter, in 2010 23.1% of the total population of Japan consisted of people aged 65 years and over, which is the highest percentage in the world. It is predicted that by 2050 this percentage will have increased to 39.6 percent. Moreover, Japan has the highest average life expectancy in the world. In 2010, this was 86.4 years for women and 79.6 years for men (Ministry of Internal Affairs and Communications, 2010). In the GTA, the share of people aged 65 years and over accounted for 20.5% in 2009 (see figure 3-6).

Daytime and night-time population
On a prefectural level there are large differences between the daytime and the night-time population in the GTA. These differences are most pronounced in the prefecture of Tokyo (see figure 3-7). As of 2005 the daytime population accounted for 14.98 million people, while the night-time population accounted for 12.416 million people (Ministry of Internal Affairs and Communications, 2010). The daytime population is thus 1.2 times (2.56 million) larger than the night-time population. This relatively large difference is caused by a daily inflow of commuting workers and students from neighbouring prefectures, in particular Saitama, Chiba and Kanagawa. Consequently, these prefectures show a reverse trend. For instance, in 2005 the daytime population of the Chiba prefecture was 0.9 times that of its night-time population. Figure 3-7 illustrates that during the period of 1975-2005 the daytime population of the Tokyo
prefecture increased faster than the night-time population. Consequently, this has widened the gap between the daytime and night-time population.

Figure 3-7  Changes in daytime and night-time population of Tokyo prefecture (millions)

Legend
- Daytime population
- Night-time population

Note: every five years a population census is carried out. However, at the time of writing this research the results from 2010 had not been released.
Source: adapted from Ministry of Internal Affairs and Communications, 2006.

Demographic composition by industry
In 2005 1.8% of the working-age population in the GTA (255,000 persons) was employed in primary industry, including agriculture, forestry and fisheries (see figure 3-8). This is relatively low when compared to the national average of 4.8%. Of the working-age population 27.4% (4.5 million persons) was employed in secondary industry, including mining, construction and manufacturing. This is also relatively low when compared to the national average of 31.7%. However, the share of the working-age population employed in the tertiary sector was relatively high when compared to the national average. As of 2005 67.9% (11.5 million persons) was working in commerce, transportation, communication, or services, while the national average was 61.7%. All together the GTA generated a labour force population of approximately 16.2 million people in 2005.

5 This is an average. Between prefectures there exist considerable differences.
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Figure 3-8  Employed persons by three industry sectors in Greater Tokyo Area (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>Primary industry</th>
<th>Secondary industry</th>
<th>Tertiary industry</th>
<th>Unspecified</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>61.7</td>
<td>31.7</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>67.5</td>
<td>28.6</td>
<td>3.9</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>67.1</td>
<td>28.6</td>
<td>4.3</td>
<td></td>
</tr>
</tbody>
</table>

Note: very five years a population census is carried out. However, at the time of writing the 2010 results had not yet been released.
Source: adapted from Ministry of Internal Affairs and Communication, 2006.

**Gross Domestic Product**

The regional income of the GTA was 1.590 billion Euros in 2007\(^6\) thereby accounting for approximately 32% of the Gross Domestic Product (at current prices) of Japan (see figure 3-9). At present Japan is the third largest economy in the world with a share of 8.7% (as of 2010) in the world economy (Price Waterhouse Coopers, 2011). Tokyo is the largest metropolitan economy in the world and its value is similar to national economies such as Mexico and Spain (Price Waterhouse Coopers, 2009). The Gross Domestic Product per capita of Japan was approximately 25.000 Euros\(^7\) in 2010 (International Monetary Fund, 2011).

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6 Most recent data available.
7 33.885 US dollars.
3.1.3 Railways

Railways play a vital role in Japan’s urban transit. Every weekday millions of commuters and students use the train to travel either to work or to school. In comparison to other countries the railway transport share of Japan far exceeds that of major European countries. The railway transport share in Japan is 29% against 6.6% in the UK, 8.1% in Germany and 9.8% in France (Eurostat, 2010; East Japan Railway Company, 2010).

In the GTA railways accounted for 53% of all transportation in 2008, while the share of cars accounted for 24% of all transportation (Ministry of Land, Infrastructure, Transport & Tourism, 2008).

The railway network in the GTA contains over 2,500 kilometres of railway tracks and is used by approximately 14.5 million passengers each day (JR East, 2010). In comparison, Germany’s railway network has around 6 million passengers per day and is considered the most heavily used railway network in Europe. The GTA is served by 30 railway operators running 121 individual rail lines including commuter rails, subways, monorails, and trams. Most railway lines are privately owned and operated, while some railway lines are jointly owned by the public and private sector. In addition, some of the subway lines are owned and operated by the TMG (i.e. Toei Metro), while others are operated by the private company Tokyo Metro whose shares are owned by the TMG and the national government. The current subway network consists of 13 lines of which 9 lines are operated by Tokyo Metro and 4 lines by Toei metro. East Japan Railways Company (JR East) holds the largest share in Tokyo’s railway network and accounts for nearly half of the volume of railway passengers carried in the GTA (see figure 3-10). Besides serving the GTA, JR East also operates trains (including high-speed trains) in the rest of north eastern Honshu. As such JR East is considered the largest passenger railway company in the world, serving 17 million passengers on a daily basis (JR East, 2010).

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8 Respective figures are of the following years; Japan (2009), UK, France and Germany (2007).
### Table 3.1 Major railways in the Greater Tokyo Area (as of 2010)

<table>
<thead>
<tr>
<th>Passenger line network</th>
<th>Passenger kilometres</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>km</td>
</tr>
<tr>
<td>JR East</td>
<td>1106,1</td>
</tr>
<tr>
<td>Tobu Railway</td>
<td>463,3</td>
</tr>
<tr>
<td>Tokyo Metro</td>
<td>195,1</td>
</tr>
<tr>
<td>Seibu Railway</td>
<td>176,6</td>
</tr>
<tr>
<td>Toei Metro</td>
<td>131,2</td>
</tr>
<tr>
<td>Odakyu Electric Railway</td>
<td>120,5</td>
</tr>
<tr>
<td>Tokyo Corporation</td>
<td>104,9</td>
</tr>
<tr>
<td>Keisei Electric Railway</td>
<td>102,4</td>
</tr>
<tr>
<td>Keihin Electric</td>
<td>87</td>
</tr>
<tr>
<td>Express Railway</td>
<td></td>
</tr>
<tr>
<td>Keio Electric Railway</td>
<td>84,7</td>
</tr>
<tr>
<td>Sagami Railway</td>
<td>35,9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2607,7</strong></td>
</tr>
</tbody>
</table>

*Source: JR East, 2011.*
There are 8 other major private railway companies (excluding the two subway companies) operating passenger services in the GTA. In contrast to JR East, these companies do not operate throughout the whole metropolis or beyond, but instead each have their own geographical territory within the GTA. The northern part is covered by Tobu railways, the western part by Seibu and Keio, the south western part by Tokyu and Odakyu, the southern part by Sotetsu and Keikyu, and the eastern part by Keisei (see figure 3-10). The foundation for at least a part of this geographical division was laid in 1938 by the so-called Land Transport Business Coordination Law. This law recommended consolidating all private railways in the southwest into one entity named Tokyo Kyuko Electric Railway (nicknamed Big Tokyu). In 1948 this company was broken up to create the current Keio, Odakyu and Tokyu Corporations. In a similar way railway companies in the northwest of Tokyo were consolidated resulting in the current Seibu Railway Company (Aoki et al., 2000).

It is quite common for railway operators in Tokyo/Japan to cooperate with their neighbours by offering through-train services between their respective networks. In some cases, this has resulted in five different railway operators using each other’s railway network. In practice this works as follows: when a railway operator enters the network of a different railway operator, the railway staff exits the train and is replaced by the staff of the other operator. The rolling stock itself is not replaced and continues until the final destination. However, the usage of the rolling stock is alternated to level out the usage of rolling stock between the different railway operators. An advantage of this is that passengers no longer need to transfer between networks of different railway operators. A disadvantage of this is that the network as a whole is more vulnerable; if a train is delayed this will affect a larger part of the network than when no through-train services are offered.
A persistent feature of trains in Tokyo and in other metropolitan areas is that they are often extremely crowded at peak travel times. It is quite common in Tokyo to find trains with congestion ratios of over 200%, meaning that these trains carry a number of passengers twice their capacity. These high congestion levels are caused by the enormous flows of passengers that commute daily from the surrounding prefectures to Tokyo’s 23 wards, in particular to the city centre (see figure 3-11).
The large daily influx of commuters can be explained by the fact that the majority of jobs are heavily concentrated around the centre of Tokyo, in particular the Central Business District, while a large part of the workers reside outside the centre (Kawabata, 2003). As figure 3-11 demonstrates commuting patterns in Tokyo are radially-oriented. This is inherent, as the next paragraph will illustrate, to the configuration of the railway network; in Tokyo a loop line (i.e. the Yamanote line) connects most of Tokyo’s urban sub centres, while commuter lines radiating outwards from one of these centres connect the suburbs.

### 3.1.4 Land use patterns
Besides being a dominant mode of transportation within the GTA, railways have also played, and are still playing, a pivotal role in shaping the urban structure of the metropolitan area. As figure 1-1 in chapter 1 demonstrates, railways have been determining the growth of Tokyo for decades. Especially after World War II when Tokyo was going through a period of large economic growth it was the railways that facilitated the development of Tokyo. The decisive factor in the transformation of the city layout, however, was the Great Kanto Earthquake of 1923, which encouraged many
people to move to the suburban areas in the western part of Tokyo. The development of these suburban areas went hand in hand with the development of the railway network. What greatly stimulated the integral development of railways and their surroundings was the fact that private railway developers owned the railway infrastructure as well as large parts of the areas around it.

In addition, the structure of the railway network in Tokyo has proven to be supportive of urban developments, particularly regarding the formation of the sub-centres (see figure 3-12). Tokyo’s railway network consists of several radial lines that run from the suburbs to the centre of Tokyo. The centre of Tokyo is connected by a circular loop line (i.e. the Yamanote line, owned and operated by JR East) on which all private radial lines, except the Chuo line, terminate. This structure created natural growth points at the intersections between the main radials and the circular loop (Sorensen, 2001).

These natural growth points are where the sub-centres are to be found. It is not a coincidence that sub centres developed around the terminal stations of the private railway operators. After 1906 when the Railway Nationalisation Act went into effect private railway operators were no longer allowed to use or build lines that could interfere with government lines.

The reason for this was that the government did not want to compete with private railway operators, as both the Yamanote line and the streetcar network within the loop were government-owned. Therefore private railway operators had to establish their terminals along the Yamanote line, and suburban commuters who needed to go to the

Figure 3-12 Structure of Tokyo’s railway network at the inner-city level
city centre had to switch trains here. The initial development of the sub-centres was thus largely the result of their location at the junction of private and public railways (Chorus, 2009).

The metropolitan railway network of Tokyo consists of several sub-centres, each fulfilling a particular role in the railway and urban network. This is most clearly pronounced at the inner-city level where the sub-centres along the Yamanote line each have a specific functional profile. The area around Tokyo Station is the traditional Central Business District (CBD) of Tokyo and has as such an (inter)national function. Over 4000 companies, among them many (inter)national head offices, are located in the surrounding area contributing to approximately 20% of Japan’s Gross Domestic Product. Besides having a workforce of 240,000 people, the area attracts more than 700,000 visitors per day (Okada, 2006). The CBD is supported by seven sub-centres which play an important role for the GTA either as economic, cultural or entertainment centres (see figure 3-13). The station of Shibuya, for example, is a centre for the youth, which is most clearly expressed by the several department stores aimed at these groups. Shinjuku is a business centre and boasts many offices, while Ueno is a cultural node articulated by the many museums that are located there. The different characters of these centres gradually evolved over time and were historically determined by the types of activities that took place within these areas (Chorus, 2009). Besides these sub-centres several other nodes can be distinguished throughout the metropolitan area that either play a role on the local or the regional level. Exchange between the local and regional level takes place via the railway lines that radiate outwards from one of the sub-centres. Consequently, the metropolitan railway network of Tokyo seems to be growing in a coherent way towards a polynuclear network in which nodes complement rather than compete with each other. However, this is not yet supported by the urban structure as the majority of jobs and commercial facilities are situated within the city centre of Tokyo (i.e. roughly the area within the Yamanote loop line). In other words, the urban structure of Tokyo is rather monocentric despite government plans since the 1930s that focused on developing polynuclearity (Sorensen, 2001). These policies were potentially unsuccessful because, despite the promotion of a wide range of sub centres and satellite cities throughout the region, the government failed to stop promoting the development of the main sub centres (Ibid).
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Figure 3-13  Functional profiles of the metropolitan sub-centres of Tokyo

Legend
- Tokyo
- CBD
- Chuo line
- Shinjuku
- Shibuya
- Ueno-Asakusa
- Osaki
- Ikebukuro
- Kinshicho-Kameido

- Industry/culture & entertainment
- Fashion & Lifestyle
- Culture, art & tradition
- Research & Development
- Business
- Commerce

Note: the Waterfront Sub-centre (not displayed in this figure) focuses on industry, culture and entertainment.
Source: adapted by the author from TMG, 2002.

Tokyo’s railway-oriented urban structure is supported by a combination of government policies encouraging public transport use and discouraging car use (Cervero, 1998). Car usage in Tokyo is discouraged through several measures such as high parking fees, high taxes on vehicle ownership, and toll charges on all intra-urban and inter-urban highways. Furthermore, only a relatively small part of the originally planned highway system has been developed in Tokyo compared to other cities such as Paris, London and New York. For example, none of Tokyo’s planned three ring roads are completed (TMG, 2006). Therefore, all through-traffic is forced to go through the city centre. The result of this is that the main expressways are congested throughout a large part of the day. Last but not least, there are garaging requirements, which require anybody who wants to register a car to provide evidence of having an off-street parking space at their residence. Given the high land prices and the narrow roads there is little space available for off-street parking, particularly in central Tokyo.

The usage of public transport is encouraged in Tokyo/Japan by the national government through tax incentives. Most workers in Tokyo/Japan receive a tax-free commuting allowance from their employer. Car users also receive a tax-free commuting allowance. However, this is only a fraction of what the public transport users receive and is based on the individual’s travelling distance. In addition, trains and buses in Tokyo are extremely punctual (and thus reliable) and frequent (every 2 minutes during rush hour and every 5 minutes during off-peak hours). All together this makes public transport a more favourable option than the car.

9 However, at present there are discussions to introduce in some regions of Japan toll-free expressway segments on weekends and national holidays.
### 3.1.5 Government structure

Japan is a unitary state with two government levels: the national and the local government. There is no official government entity at a regional level. Local governments in Japan are two-tiered consisting of prefectures serving wider areas and municipalities serving local areas. There are 47 prefectures in Japan ranging in population from 12 million people (the Tokyo prefecture) to the Tottori prefecture with just 600,000 inhabitants. Also prefectures differ considerably in size; for instance, the Hokkaido prefecture covers an area of 80,000 square kilometres, while the Kanagawa prefecture covers an area little under 2000 square kilometres (Council of Local Authorities for International Relations, 2004). The GTA consists of the prefecture of Tokyo and its neighbouring prefectures Saitama, Chiba and Kanagawa. There is no official unitary governance structure for the GTA.

As of 2011 there are 1,724 municipalities in Japan which are subdivided into three administrative units: local cities, villages and towns (see figure 3-14). These units each have their own elected mayor and councils and are administered independently of the larger jurisdictions that they are situated in. In addition to these municipalities, the central and most populated part of Tokyo is divided into 23 self-governing units, also referred to as the 23 Wards. Other large cities are also subdivided into wards, but unlike Tokyo these wards do not function as independent administrative units. Last but not least, municipalities that satisfy a certain population size (i.e. 500,000 or more) are eligible for the status of 'Cabinet-Order designated cities' which gives them administrative and fiscal authority equivalent to those of prefectures. As of 2011 there are 19 of such designated cities (Ministry of Internal Affairs and Communications, 2011). In the GTA 5 cities have received such a status.
3.2 Randstad

3.2.1 Geography
The Randstad refers to the urban area in the western part of the Netherlands comprising the four largest cities of Amsterdam, Rotterdam, The Hague and Utrecht, and several other medium-sized cities grouped around a central open space called the Green Heart (see figure 3-15). The name ‘Randstad’ literally means ‘rim city’ and refers to the geographical pattern of cities located on the rim of the Green Heart. At the same time there is a rim to the sea coast and to the oldest sea dikes of Amsterdam and Rotterdam, which still define the outer boundaries of the central Randstad Area (Tummers & Schrijnen, 2000). Official boundaries for the Randstad do not exist, but it is generally considered to encompass a large part of the provinces of North Holland, South Holland, Utrecht and Flevoland. For pragmatic reasons in this research the Randstad is defined as the area comprising the administrative borders of the aforementioned four provinces. This is a broader definition for the Randstad than generally used. There is no single government unit for the Randstad. Instead cooperation takes place at three
levels: the city-region level, the so-called wing level and the level of the Randstad as a whole (see paragraph 3.2.5).

Figure 3-15  The Randstad

A distinctive feature of the Randstad is its polycentricity. Unlike many other metropolitan regions in the world the Randstad does not have one core city surrounded by suburban municipalities. Instead, it consists of several large cities that are connected to each other. There is not a dominant city in the Randstad, since national policy in the Netherlands has consistently avoided the creation of such a city (OECD, 2007).
Although Amsterdam is the capital of the Netherlands and an important centre for culture, finance and business services, it lacks several functions that would make it predominant. The Hague, for example, accommodates the seat of the national government and many international (legal) organisations such as the International Peace Court. Rotterdam is the home of the largest port in the Netherlands as well as in Europe and as such is the domicile of many industrial and trade activities. Utrecht is the central point in the national railway network and home of the headquarters of the Dutch Railways (NS). And last but not least, the national public radio and television are predominantly located in Hilversum and not in Amsterdam. As a result, not only Amsterdam, but several cities are fulfilling a prominent position in the Randstad.

### 3.2.2 Population and economic trends

**Population**

The Randstad contains a high proportion of the population in the Netherlands. As of 2010 the population of the Randstad (thus in this case the area covering the provinces of North Holland, South Holland, Utrecht and Flevoland) accounted for 7.78 million people (Centraal Bureau voor de Statistiek, 2011), which is a share of approximately 47% of the population. This proportion is considered high when compared to other metropolitan areas in the world. In addition, the Randstad has a population density of 845 persons per square kilometre as of 2009. This is almost double the national average. Within the Randstad, however, densities vary considerably. For example, the province of South Holland has a population density of 1239 persons per square kilometre which is the highest among the provinces in the Netherlands, while that of Flevoland is only 271 persons per square kilometre (CBS, 2010a). The annual population growth of the Randstad was 0.8 % in 2009. The highest growth occurred in the province of Flevoland with a population increase of 1.21%. The relatively weakest population growth occurred in the province of South Holland. As of 2009 the population has grown by 0.64%. The provinces of North Holland and Utrecht occupied an intermediate position with a growth figure of 0.81% (TNO, 2011). It is expected that the population of the Randstad will rise sharply in the future, despite moderate growth or even a declining population in other parts of the Netherlands. The Randstad is expected to see a population growth of 700.000 people up to the year 2025. Between 2025 and 2040 it is expected that the Randstad will experience a population growth of 200.000 people (Centraal Bureau voor de Statistiek & Planbureau voor de Leefomgeving, 2011).
Migration
The population growth, however, is not evenly distributed within the Randstad. As figure 3-17 shows, it is mainly the North Wing (Noordvleugel) of the Randstad that has managed to benefit from this growth. The North Wing is the metropolitan area consisting of the Haarlem and Ijmuiden conurbations in the west, Amsterdam in the centre, Almere in the east, and Utrecht in the south. This area has witnessed a relatively strong population growth, mainly due to both positive domestic migration and foreign net migration (see figure 3-17). A relatively modest growth has occurred in the South Wing (Zuidvleugel) of the Randstad, i.e. the metropolitan area stretching from Dordrecht in the south east to Leiden in the north, with Rotterdam and The Hague as its main centres. This is mainly because it has either seen negative domestic or foreign net migration or even both (see figure 3-17)
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Figure 3-17  Population and net migration changes in the Randstad 2005-2010

Negative growth (decline)
< 1% growth
(moderate growth)
1-2% growth
(average growth)
> 2% growth
(strong growth)

Double negative
Positive foreign migration,
Negative domestic migration
Negative foreign migration
Positive domestic migration
Double positive

Source: adapted by the author from CBS, 2010b.

Demographic composition by age
As of 2010 the share of people aged 65 and older in the Randstad was 14.3 % (see figure 3-18). This is slightly below the national average of 15% in the Netherlands and also slightly below the average of 17% when compared to other metropolitan regions in Europe (TNO, 2011). The share of the working population is 68% which is slightly above the national average and that of other metropolitan regions in Europe. The share of the child population is 18% in the Randstad which is the same as the national average. This is slightly higher when compared to other metropolitan regions in Europe. As figure 3-18 illustrates, the share of the people aged 65 years and older in the Randstad has increased since 1995. It is expected that this share will increase further and will account for 23% in 2040 (CBS, 2011b).
Demographic composition by industry

In 2005 2% of the working-age population in the Randstad (46,500 persons) was employed in primary industry including agriculture, forestry and fisheries (see figure 3-19). This is relatively high when compared to the national average. Of the working-age population 14% (469,400 persons) was employed in secondary industry including mining, construction and manufacturing. This is relatively low when compared to the national average. The share of the working-age population employed in the tertiary sector, however, was relatively high when compared to the national average. As of 2005 84% (2.9 million persons) was employed in commerce, transportation, communication, or services, while the national average was 81%. All together the Randstad boasted a labour force population of 3.42 million people in 2005.
Gross Domestic Product

The Randstad is also considered significant in economic terms. The regional income of the Randstad was 256 billion Euros in 2008 (TNO, 2011), which was 33% of the Gross Domestic Product of the Netherlands (see figure 3-20). At present the Netherlands is the 16th largest economy in the world with a share of 1.2% (as of 2010) in the world economy (Price Waterhouse Coopers, 2011). Amsterdam and Rotterdam, the two largest cities in the Randstad, are respectively the 109th and 110th metropolitan economy in the world (PricewaterhouseCoopers, 2009). The Gross Domestic Product per capita of the Netherlands was approximately 30,000 Euros\(^{10}\) in 2010 (International Monetary Fund, 2011).

\(^{10}\) 40.973 US dollars
3.2.3 Railways

In the Randstad railways play a rather limited role. Railways accounted for 11%\textsuperscript{11} of all transportation, while the share of cars accounted for 69% of all transportation, leaving a share of 7% for other modes of public transport and 13% for the slow modes of transportation such as bicycles, motor cycles and walking (PBL, 2009). For commuting the railway share is slightly higher, i.e. a share of 17% against a share of 67% for the car, and 8% for other modes of public transport. Regarding the mobility between large cities and the mobility between large and medium-sized cities, public transport (including railways) plays a much larger role. In the former case public transport accounts for 46% of all transportation, while it accounts for 36% in the latter (Ibid, 2009).

Figure 3-21 illustrates the railway network of the Randstad. The Randstad has in total 121 stations and consists of a railway network of 670 kilometres (PBL, 2009). When this is set off against the number of inhabitants in the Randstad the railway network is considered one of the most underdeveloped of all metropolitan areas in Western Europe (OECD, 2007). Other polycentric regions in Western Europe such as the Flemish Diamond (Brussels-Antwerp-Gent) and the Rhine-Ruhr area (Cologne, Dusseldorf, Dortmund, Essen, Duisburg, and Bonn) are denser in terms of railway metres per inhabitant and have more stations. The railway network of the Randstad, however, is much more intensively used. In fact, in terms of railway usage the Netherlands as a whole is ranked number one in the European Union, which can largely be explained by its low amount of railway tracks per capita (CBS, 2009).

\textsuperscript{11} These figures are based on the Mobility Research Netherlands (Mobiliteitsonderzoek Nederland) 2004-2006.
NS is the main user of the railway network in the Netherlands and the exclusive operator of the hoofdrailnet\textsuperscript{12} (main railway network) in the Randstad. It holds this right until 2015\textsuperscript{13} when the current concession expires. The remainder of the railway network, the railway network not belonging to the hoofdrailnet, is operated by other railway operators.

\textsuperscript{12} The hoofdrailnet largely coincides with the sections where domestic rapid express trains (the so-called intercity (IC)) trains are being operated.

\textsuperscript{13} In November 2011 the minister of Infrastructure and the Environment announced that after 2015 the NS is allowed to continue its concession for another ten years (i.e. 2015-2025).
Besides domestic services NS also operates the domestic part of international passenger services and high speed railway services for which it cooperates with other European railway operators. For example, in case of the high speed railway service to Paris NS is responsible for the domestic part (i.e. the section between Amsterdam and Brussels), while NBMS (the national railway company of Belgium) runs the Belgium section and SNCF (the national railway company of France) runs the section from the French border until Paris. Furthermore, NS managed, as a result of the opening up of railway markets in Europe, to win concessions for the operation of bus and train services in other European countries such as Great-Britain, Germany and the Czech Republic. As of 2010 NS has managed 381 stations in the Netherlands and carried on an average working day 2.3 million railway passengers in the Netherlands. NS is an important public transport carrier occupying a share of nearly 50% of the total public transport market in the Netherlands (Nederlandse Spoorwegen, 2011).

In the provinces of South Holland and Utrecht a regional light rail system is also in operation. In the province of South Holland this is jointly done by the municipal transportation companies of Rotterdam (RET) and The Hague (HTM), while in Utrecht this is done by a private railway operator. Furthermore, in the cities of Amsterdam and Rotterdam a subway system of respectively four and five lines exist, which are operated by their municipal transportation companies. Last but not least, in the four largest cities of the Randstad (Amsterdam, Rotterdam, The Hague and Utrecht) trams are, or in the case of Utrecht will be, operated.

Approximately 40% of jobs in the Netherlands are situated in the Randstad (Ruimtelijk Planbureau, 2006). As is illustrated by figure 3-22, the daily urban system in the Randstad is predominantly taking place on a regional scale. People commute mainly from the surrounding municipalities to the central cities of especially the four largest cities of the Randstad (i.e. Amsterdam, Rotterdam, The Hague and Utrecht). Only the city of Amsterdam shows a somewhat different pattern as here also people from more remote areas (i.e. from the municipality of Utrecht) commute to Amsterdam. Based on figure 3-22 it seems fair to conclude that the Randstad should not be considered as one labour market. Instead it consists of several regional labour markets that are linked to each other by commuting flows between the central cities.
3.2.4 Land use patterns

Railways have played a limited role in shaping the urban structure of the Randstad. New housing areas have been located close to many highways, but have not been adequately connected to public transport. Areas around highways have had a competitive edge against station areas regarding the choice where to develop in the Randstad/Netherlands as real estate can be developed here against lower costs. In addition, there are fewer landowners involved, financial contributions do not need to be paid for regional facilities\(^{14}\) (bovenwijkse voorzieningen) such as road connections to major highways, and along highways there is usually plenty of space available to develop (Railforum, 2004). In station areas, on the other hand, space is usually limited, landownership is fragmented and often expensive infrastructural improvements are required. In recent years, however, more policy attention has been given to preserving the outlying areas, the densification of inner-city areas, and the more efficient usage of public infrastructure (see for instance Provincie Noord-Holland, 2010; Provincie Zuid-Holland, 2010). Although this has shifted the emphasis from the outlying areas to the already urbanized areas, station areas have benefitted little from this. For

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\(^{14}\) With the enactment of the Land Development Act (Grondexploitatiewet) in 2008 the municipality got more means to ask a private developer for a contribution.
instance, in the metropolitan area of Amsterdam only 25% of the new housing plans are projected within station areas\textsuperscript{15}, while the majority is planned elsewhere within the existing urbanized area (see figure 3-23). Offices show a better picture with 50% of the offices being planned within station areas (Goudappel Coffeng et al., 2011).

\textbf{Figure 3-23} Planned residential developments within the metropolitan region of Amsterdam

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure3-23}
\caption{Planned residential developments within the metropolitan region of Amsterdam}
\justify
\textit{Note: the circles represent the station areas, the red areas the new residential developments, and the dark red areas the residential areas that are located within the station areas.}
\justify
\textit{Source: Goudappel Coffeng et al., 2011.}
\end{figure}

Stations in the Randstad/Netherlands occupy important locations within cities, but they are not considered the main centres. This is because most railway stations in the Randstad/Netherlands are situated near the city centre, rather than being located in the centre itself. Many station areas in the Randstad/Netherlands lack a clear functional profile and host similar functional programmes within their station areas. Only a few stations have managed to attract specific functions to their areas. For instance, The Hague is the seat of the national government and many of the national ministries are located around the central station of The Hague. In a similar way a considerable number of law firms and banks have concentrated around the station of Amsterdam South, which is considered the international business location of the Netherlands.

Despite the lack of a clear functional profile, station areas differ from each other in terms of accessibility and spatial programme. NS has used these differences to make a categorization for its stations in the Netherlands. The stations are divided into six

\textsuperscript{15} i.e. the area within a radius of 800 metres from the station.
categories based on their relative position to the city centre and the type of access (i.e. high speed train, rapid or local express) they provide (see table 3-2).

Table 3-2  Station types Dutch Railways (NS)

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of stations in the Netherlands</th>
<th>Average number of departing trains per hour</th>
<th>Average number of passengers per day</th>
<th>Average number of jobs within 1000 metres distance of a station</th>
<th>Average number of dwellings within 1000 metres distance of a station</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Main stations in large cities</td>
<td>6</td>
<td>49</td>
<td>97.000</td>
<td>18.600</td>
<td>8.900</td>
</tr>
<tr>
<td>2 Main stations in medium-sized cities</td>
<td>30</td>
<td>20</td>
<td>23.000</td>
<td>6.200</td>
<td>8.000</td>
</tr>
<tr>
<td>3 Suburban railway stations with node function</td>
<td>12</td>
<td>18</td>
<td>16.000</td>
<td>7.300</td>
<td>6.600</td>
</tr>
<tr>
<td>4 Stations in small villages or towns</td>
<td>127</td>
<td>6</td>
<td>3.400</td>
<td>1.800</td>
<td>4.000</td>
</tr>
<tr>
<td>5 Suburban railway stations without node function</td>
<td>98</td>
<td>7</td>
<td>2.200</td>
<td>1.600</td>
<td>5.100</td>
</tr>
<tr>
<td>6 Station in rural area</td>
<td>100</td>
<td>4</td>
<td>1.200</td>
<td>500</td>
<td>1.300</td>
</tr>
</tbody>
</table>


When the spatial programmes of the above-mentioned station types are looked at in detail the following characteristics can be identified. Type 1 and type 2 stations are the rapid express (called intercity in the Netherlands) stations. Most of these stations are situated near or close to a city centre. Around these stations the functional mix is much stronger when compared to the remaining urbanized area. In addition, a relatively large number of jobs can be found around these station areas. Also around the other
station types (type 3-6) densities stand out when compared to the average densities to be found in the remaining urbanized areas. Densities are, however, less high when compared to the type 1 and 2 stations. Around the type 3 stations a relatively large number of jobs can be found. The remaining stations (i.e. type 4-6) predominantly have a residential function (Planbureau voor de Leefomgeving, 2010).

Within station areas the number of jobs has increased more rapidly than elsewhere within the existing city. However, the share of station areas in the total job growth has declined due to rapid increases at the urban fringe. Around stations the housing stock increased by 10% between 1996 and 2008. However, the increase outside station areas was larger at 12%. Between 1996 and 2008 employment grew by 22% within a 500 metre distance of a station. This was more than the growth occurring at a distance of 500-1000 metres, but less than the average growth of 30% for the rest of the Netherlands (PBL, 2010). The employment growth differs per station type as well as the type of economic sector in which this growth has taken place. Overall, most stations show a decrease in the number of jobs in the manufacturing sector, while the number of jobs in the public sector (government, education and health care) has increased considerably in the Netherlands, followed by other commercial services (i.e. other than retail) and retail. The relatively highest job growth has occurred around suburban stations with a node function (i.e. the type 3 stations) and around stations in rural areas (see figure 3-24).
Figure 3-24  Employment growth per station type according to economic sector, 1996-2008

3.2.5 Government structure

The Netherlands is a unitary state with three tiers of government: the national, provincial and municipal government. Provinces serve the sub-national level, while municipalities serve the local level. There are 12 provinces in the Netherlands ranging in population from 387,000 inhabitants in the province of Flevoland to 3.5 million inhabitants in the province of South Holland (as of 2010). Also the provinces differ considerably in size. For instance, the province of Utrecht covers an area of 1,450 square kilometres, while Friesland (a province in the north of the Netherlands) covers an area of approximately 5,740 square kilometres (CBS, 2011c). The Randstad lies within four of these provinces: i.e. the province of North Holland, South Holland, Utrecht and Flevoland. There is no unitary governance structure for the Randstad.

As of 2010 there are 431 municipalities in the Netherlands of which 222 municipalities are situated within the Randstad (i.e. when defined as the area covering the provinces of North Holland, South Holland, Utrecht and Flevoland). However, an exclusive focus on the formal institutions in the Randstad will not give a complete picture of the government system in the Randstad. In addition, co-operative arrangements between municipalities play an important role in the Randstad as well as in other parts of the Netherlands. This takes place at three levels: the city-region level, the so-called wing-level and the level of the Randstad as a whole. Cooperation at the city-region level is the most developed, while it is most problematic at the Randstad-level (OECD, 2007). A city-region is a regional public body of several Dutch municipalities to which a number of statutory functions (such as to decide on tenders for running the concessions for the regional public transport system) are conferred under the so-called Joint Arrangements Act plus (Wet Gemeenschappelijke Regelingen plus). Usually a city-region consists of a large city and the surrounding municipalities that form part of the same daily urban system. In the Randstad there are four city-regions: the city-regions of Amsterdam, Rotterdam, The Hague and Utrecht. The city-regions are currently under debate as the present Cabinet (Cabinet Rutte 2010-present) wants to abolish this informal governance level.

A second level where cooperation takes place is at a level embracing several city-regions and municipalities. In the case of the Randstad this level is referred to as a wing: the North Wing and the South Wing. Both wings cover a surface larger than a city-region and do not necessarily have to fall within the boundaries of one province. At the wing-level both provinces and municipalities are involved thereby making it a combination of horizontal and vertical co-operation.

The third and last level of cooperation takes place at the level of the Randstad as a whole. The Randstad has developed some soft governance arrangements such as the OV Bureau Randstad (a public transport agency for the Randstad) but these partnerships do not have decision-making powers and seek to implement their ideas by making recommendations.
This brings the total number of government levels\textsuperscript{16} in the Randstad to six (see figure 3-25):

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure325.png}
\caption{Government system in the Randstad/ Netherlands (as of 2010)}
\end{figure}

\subsection{Conclusion}

In the previous sections the geographical, socio-economical, morphological and institutional features of both Tokyo and the Randstad have been compared. In this final paragraph all these features are compared to identify possible similarities and differences between the Randstad and Tokyo. An insight into this is considered important for understanding (at a later stage in this research) the possibilities and limitations of station area developments in Tokyo. In table 3-3 Tokyo and the Randstad are compared.

\textsuperscript{16} Excluding the water boards and municipal districts.
### Table 3-3  Comparison between Tokyo and the Randstad

<table>
<thead>
<tr>
<th></th>
<th>Tokyo</th>
<th>Randstad</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prevalent morphology</strong></td>
<td>Monocentric region, polycentric cities</td>
<td>Polycentric region, monocentric cities</td>
</tr>
<tr>
<td><strong>Population</strong></td>
<td>35.6 million (2010)</td>
<td>7.8 million (2010)</td>
</tr>
<tr>
<td><strong>Share of total population</strong></td>
<td>28% (128.1 million)</td>
<td>47% (16.6 million)</td>
</tr>
<tr>
<td><strong>Population density</strong></td>
<td>3200 persons/km² (2009)</td>
<td>845 persons/km² (2009)</td>
</tr>
<tr>
<td><strong>Average annual population growth</strong></td>
<td>3% (between 2000-2005)</td>
<td>0.6% (between 2000-2005)</td>
</tr>
<tr>
<td><strong>Percentage of GDP</strong></td>
<td>32% (EUR 5.015 billion)</td>
<td>33% (EUR 765.4 billion)</td>
</tr>
</tbody>
</table>
| **Public transport share in commuting** | 53% railways, 2% bus (2008) | 17% railways, 8% bus, tram and subway (2008)
| **Public transport share in all traffic** | 30% railways, 3% bus (2008) | 11% railways, 7% bus, tram and subway (2008)
| **Land use patterns**  | Railways playing a pivotal role in structuring urban developments | Railways playing a limited role in structuring urban developments |
| **Governance structure** | Unitary state with two levels of government: national and local government | Unitary state with three tiers of government: national, regional and local |

1 These figures are based on the Mobility Research Netherlands (2004-2006) and are considered to represent the current situation in the Randstad. In the report of the Planbureau voor de Leefomgeving (2009) it is not clear what is meant by ‘current’. It is therefore assumed that the figures represent the year 2008.

As table 3-3 shows, the most striking difference between Tokyo and the Randstad is the role railways play in 1) the daily activities of people’s lives, and 2) in guiding urban developments. Regarding the first aspect, the fact that more than 30% of all trips in the GTA are made by trains demonstrates how important railways are in people’s daily lives. Regarding the second aspect, railways have proven to be a consistent factor in guiding the urban development direction of Tokyo for decades. The Randstad, as table 3-3 demonstrates, cannot rely on such features. However, this does not mean that the Randstad cannot learn from Tokyo. On the contrary, Tokyo could provide a source of inspiration for the Randstad regarding how to develop its station areas. Before this can be explored it is necessary to understand how station areas are being developed in Tokyo, what planning instruments are used, and what roles the public and private sector play in this. This will be explored in the second part of this research.