

A COMPARATIVE REVIEW OF NEW TOWN DEVELOPMENT: BELGIUM AND JAPAN, and the BRITISH INFLUENCE

*B.B.SIMAN and **T.TODA

This paper describes the infrastructure and layout aspects of one of the most famous cases of new towns in Continental Europe, that of Leuvain-La-Neuve in Belgium. At the same time it describes the role private railway companies played in the development of Japanese new towns, and the rise and decline of a fundamental layout concept, that of the Kinrin Centre. The research is based on data analysis, site visits and interviews with planners. It concludes with the comparison between the functional concepts of new towns in both systems and the role infrastructure facilities played in it. The importance of energy saving in heating infrastructure in Lovain-La-Neuve is also highlighted, especially as regards its impact on layout. The emphasis on encouraging the use of public transport to save energy and reduce costs of infrastructure is also examined.

As regards the Japanese case, this paper will not describe a specific major new town, because of the restriction on space. Instead it will present lessons from Senri, Senboku and Tama new towns as illustration of relevant points.

I. Introduction

The question of infrastructure provision for new towns has resulted in many different alternative solutions devised by planners, according to the concepts and visions of those planners regarding the settlements they designed. Infrastructure provision for new towns was not only governed by matters of land ownership, direct commercial interests and forecasts of population growth. It was governed, at least at the stage of conception, by ideas about layout design, traffic priorities and, especially in Europe, savings in energy through reducing the amount of heat lost from individual buildings, as well as from the settlement as a whole. This required dense urbanisation. However, cultural factors, such as the European perspective on the 'nearness to the ground' rather than high rise apartment buildings, in a housing compound, dictated alternative solutions to the dense, high-rise model. Functional perspectives on new town developments also differ according to the visions of planners. The following study will indicate the importance of these factors in designing new towns, using cases from Japan and Belgium.

*Member of JSCE, Senior Architect-City Planner, Sumitomo Trust Research Institute, Osaka

** Member of JSCE, Dr.Eng., Associate Professor, Department of Transportation Engineering, Kyoto University

II. Louvain-La-Neuve, Belgium:

An example of a multi-functional new town

A. The Context:

The new town of Leuvain-La-Neuve is situated about 30 Km to the South of Brussels, in the Plateau of Lauzelle. It was the product of the typical political situation in Belgium reflected in the struggle between the two ethnic communities: the Flemish and the Wallon. In 1968 it was decided that the old Catholic University of Leuvain (Dutch-speaking) should be split, and a new French-speaking university created.

B. Planning

Planners were faced with a choice: either to build a university campus for the new university, or creat a new town in which the university is integrated. They chose the latter solution. Therefore Leuvain-La-Neuve was conceived of as a new town, with a multi-functional nature ranging from university to housing, as well as research and development of a 'science park' type of activities related to high-tech industries. It is, therefore, not a 'bed new town', but a town with its working and living communities, as well as a commuter population.

The long-term objective was to have a balanced population of 50000 inhabitants, with a maximum of 15000 students. The area of the new town (university and urban development) was

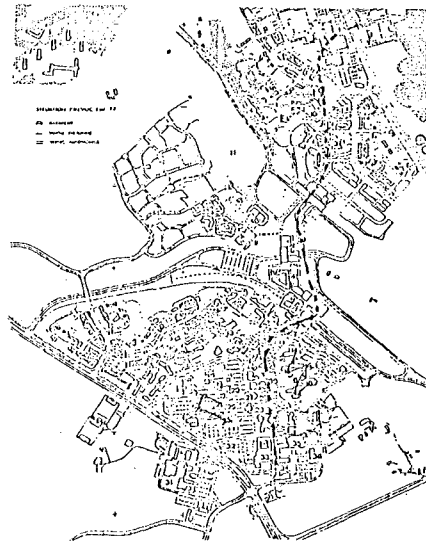
KEY TO MAP

The map shows the layout of Louvain-la-Neuve (some 10 miles to the South-East of Brussels). This site is served by a major motorway and a new railway linking it to the Brussels-Luxembourg line. It is not a new town in the political sense but a planned unit development within a rural area undergoing gradual urbanization.

The map illustrates the linear development of the University and town, which is centred along a main pedestrian street with arcades, side-streets and a succession of piazzas.



The map illustrates how the main linear pedestrian scheme runs from one part of the site to the other. It starts from No. 1 and progresses through Nos. 2 - 5 - 37 - 39 - 6 - 8 down to 36.



decided to be about 350 hectares.

The second strategic choice made by planners, after the decision to build a new town rather than a campus, was to build high-density, low-rise development pattern in order to house those 50000 people. They also decided that the maximum distance within the urbanised area should not exceed 2 Km. This is an element clearly designed to encourage pedestrian circulation.

The layout design followed similar concepts. The settlement's backbone is a long pedestrian artery along which community facilities are located. Therefore, Leuvain-La-Neuve is a linear settlement, with that artery as its main connecting element.

Access to buildings was designed in such a way as to be external by roads, as well as by an underpass and an underground railway station from Brussels. The time required from Brussels to the new town is approximately 30 min, thus encouraging the use of public transport rather than private cars. Housing consisted of double family housing, apartments and studios. The planners also designed the open spaces and sports facilities so that they can be used by the whole population, linking them by a pedestrian artery.

C. Road and Rail Provision

Internal road design is based on the Cul-de-Sac concept. Planners decided that this discourages the use of motor vehicles, because if one wants to use his car he will have to undertake a long trip by car going around the new town practically.

Therefore, it is much easier to go on foot or by bicycle. Except in the centre of the town, circulation takes place on a single-level transportation network. This feature minimises investment in infrastructure, especially that construction of artificial floors is not only expensive, but also requires lighting, maintenance and surveillance.

In so far as railways are concerned, the Luvain-La-Neuve station is a terminal station, linked with the main Brussels-Luxembourg-Basle. After two years of operation, the rate of use was 100% higher than expected by the railway company, and the number of carriages was doubled.

Through these two features, there has been a considerable saving in the investment needed for roads, aided by the existence of the backbone main pedestrian artery and the distance limit.

D. Housing

The strategic choice of planners was the high-density low-rise alternative. The 50000 inhabitants can, therefore, be housed in no more than 350 hectare within a radius of 900 meters. Along with the restriction decided by planners on walking distance, this has naturally resulted in reducing motorised circulation in favour of pedestrian and bicycle circulation.

The concept was to divide the project area into a large number of very small settlements designed by some 50 different architects, which also meant that a large number of contractors undertook implementation rather than one single large company. This discouraged cartel-formation, and led to a reduction in some sites of 30% of the

initially calculated cost by architects. Each group of dwellings consisted of the about seven 'town houses' of 120-200 sq meters. The opinion was (and has been proven) that the overall density of buildings and population achieved this way is similar to that of high-rise blocks separated by vast empty spaces. The average height for university buildings, for example, is three floors, which also reduces the use of elevators.

The impact of such a housing layout on infrastructure is interesting, since it reduces the need for cars, thus reduces roads, increases the reliance on pedestrian and bicycle circulation, and allows for a shift in commuting behaviour from using cars to rails because the walking distance from the station allows for such a shift. Moreover, in the cold North European climate, this layout provides for a shield against cold winds (in this case Northern wind), and improves the micro climate, since individual buildings can keep the heat.

E. Heating Infrastructure

Because of the high density aspect, it was possible to distribute the heating from a centrally operated plant with natural gas. The university, as developer, has concluded a long term agreement with the gas distribution company to place a ban on fuel-operated individual heating.

F. Sewage and Water Treatment

A dual sewerage system network is operated, with a 6-hectare artificial lake located at the lowest point of the developed area, which is '...providing an amenity at the same time as a regulation storage of water and and, through infiltration, a potential refilling of the underground water resource' (Laconte, p.171, 1980). The municipal and industrial waste is channeled to a sewage treatment plant located downstream in the valley.

G. Functional Aspects

The study of this new town is interesting from a functional point of view because it not only created a new town with an integrated university, but also a science park for research and development activities associated with high-tech industries. The new town authorities have applied very strict selection criteria for the firms which applied to be admitted to the site. This was so not only to allow those firms which have strong links to university work, but also to prevent polluting industries from locating there. Another philosophy was to encourage contacts between different people informally rather than procedurally, through locating most social facilities at less than 1 Km between those facilities and the science park area.

III. MASS TRANSIT and DESIGN in JAPANESE NEW TOWNS : A CRITICAL REVIEW

A. Mass Transit

The functional concept of Japanese new towns is different from that of most European ones. Japanese new towns are created primarily as bed-towns rather than multi functional and self-sufficient settlements, although, more recently, some new towns (such as Tama) are aiming at promoting business zones within their boundaries. However, the main function was, and remains to be, the accommodation of commuter population working in a major urban centre. It is evident, therefore, that mass transit systems become inevitable, especially that private car commuting can lead to accute traffic and parking inconveniences to users, including the cost element.

This, as may be expected, led to an increasing interest in developing lines by private railway companies (leading to an increase in land value as well as providing a stable commuter population), and to the emergence of the problem of regulating subsidies granted for construction works.

The increasing interest in real estate was manifested in the rise of the share of revenue generated by real estate operations in the total structure of the revenue from 12% to 33% between 1965 and 1984 (although the peak was reached in 1970 with 41%). On the other hand, the share of railway operations in the total revenue structure declined from 57% to 53% in the same period.

In so far as the problem of subsidies was concerned, prefectures were willing to negotiate subsidies with railway companies, the volume of which had witnessed two phases, which are reflected in the two cases of Senri and Senboku New Towns.

1. The Case of Senri New Town and the Hankyu Railways Company

Up until 1973, the volume of subsidies granted by prefectures to railway companies was open to negotiations. In 1973, however, this was regulated through an administrative guidance relating to Senboku New Town and specifying the subsidisy rate at 36%.

Senri New Town, however, was planned and partly realised well before that date as the first new town in Japan. Therefore, the rate of subsidy depended on the outcome of negotiations. Moreover, the prefecture had to see to it that the transportation network was well-balanced in terms of accessibility and cost, both inside the new town as well as between Senri and the centre of the Osaka metropolis. The picture that emerged was a transportation network of rail,

underground train and bus services, the latter confined to local access, whereas the former two may be considered as rapid transit systems with the centre of Osaka.

The railway line and the bus services are owned by the Hankyu Railway Company, one of the larger private railway companies in the Kinki Region, with interests in real estates and quality retail department stores. The underground service is owned by what is called in Japan "Dai-San Sector" or the "Third Sector", which is a joint business arrangement between public and private bodies. Out of the total investment cost (gas, electricity, housing construction, neighbourhood centres etc. totalling Yen1900187453), Osaka Prefecture paid a share of 31.6%, whereas the rest was shouldered by both Hankyu and the Third Sector company. The resulting transportation pattern was one of an underground line starting from Senri Central Centre (Chu-o Centre) and a railway line starting from another sub-centre. This pattern, as will be explained later, had a tremendous impact on the subsequent evolution of Senri New Town, and on its planning and livelihood.

2. The Case of Senboku New Town

Because Senboku came after the Senri experience, the need was felt that some form of statutory rule is needed to govern prefectural contributions. As such, in 1973, the "New Town Railway Subsidy Regulation" came into effect. It provided that the rate of subsidy by prefectures should be fixed at 36% of the total construction cost of the railway line. As such, Senboku is connected to Osaka by a mixture of a private railway line (Nankai) and an underground line of the Third Sector.

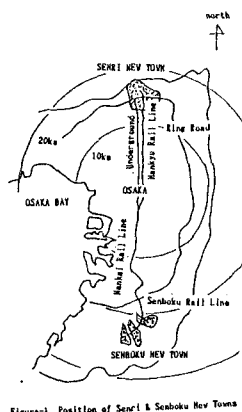


Figure-1 Position of Senri & Senboku New Towns

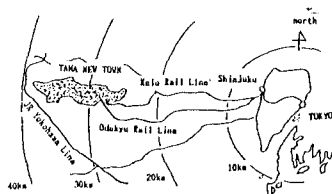


Figure-2 Position of Tama New Town

Table-1 Outline of Three New Towns

	Senri New Town	Senboku New Town	Tama New Town
Location	Osaka Metropolitan Area	Osaka Prefecture	Tokyo Metropolitan Area
Project Executive	Osaka Prefecture	Tokyo Prefecture & HUDPC	
Project Period	1964-1969	1965-1982	1969-1995
Area Size (ha)	1160	1557	3018
Project Method	Shin-Ju	Shin-Ju & Kikaku-Seiri	
Planned Population (ten thousand)	15	18	31

From briefly reviewing the two cases, two main conclusions emerge. The first is the important role played by the railway companies in the development of new towns in Japan. The second is determining strategic planning choices, in terms of accessibility, as being the provision of a mass rapid transit system between the new/bed town and the metro-centre where jobs are concentrated. In that sense, the principle of a rapid transit system introduced by Howard for the Garden City may be said to have been achieved in the three major new towns which were studied, although the scale of the proposed settlements by Howard (30000 inhabitants) vastly differs from the scale of the three Japanese new towns (Senri for example is four-fold that figure, 120000 inhabitants).

B. The Basic Design/Function Concept : The Neighbourhood Centre (Kinrin Centre)

The basic idea of the design and location of Neighbourhood Centres, serving a defined area with specific functions of public nature (shopping, schools, medical facilities etc) was first introduced in Senri New Town, the first new town to be planned and developed in Japan. This concept was borrowed from Harlow New Town, near London. In fact a description of Harlow's planning exists in Japanese.

In the Japanese case, a hierarchy of Neighbourhood Centres was established, consisting of two levels. The lower level is the local *Kinrin Centre* serving ca.10000 inhabitants with shopping facilities and one junior high school. The upper level is the big Neighbourhood Centre where usually a station exists providing accessibility to the metro-centre, and around the station, a variety of commercial developments takes place.

It may be argued that these two levels represent, at the same time, two stages of evolution in the maturity of the three new towns studied. The increased motorised mobility of residents, especially wives during the week and the family during the week-end, had led to the decline of the lower level (local) Neighbourhood Centre due to the extensive use of the Main Centre which provides for a wider range of goods and services, as well as creating the feeling of a "change of environment" for shoppers. Also the life style is changing, and housewives, who resided in the new town when they had little children whose children are now grown up and at school most of the day, are going to work (either part or full time) in the metro-centre. As such the most convenient shopping point is the Main Centre from which they take their trains to work. This has created a pattern of consumption concentrated in the Main Centre area, and away from the local *Kinrin Centre*. As such the three new towns studied are now moving from stage one (the Local Neighbourhood Centre) to Stage two (the expansion of the Main Centre).

C. The Provision and Planning of Green Space

This topic relates closely to the Japanese planning system, especially to the main territorial distinction in the zoning system, namely dividing the 'City Planning Area' (the basic territorial entity in the planning system) into 'Urbanisation Promotion Area (UPA)' and 'Urbanisation Control Area (UCA)'. The three chosen new towns span the range of options available to planners.

In the Senri case, The City Planning Act 1968, regulating this division was not in existence yet. As such, Senri was surrounded by a green belt to prevent its spread, since urbanisation in principle is anticipated in the area outside it at the same time that it provides recreational facilities for its inhabitants.

In the Senboku case, the new town territory was undeveloped and is designated as a UCA at present. Therefore, there was no need to create a green belt, since urbanisation is strictly controlled in the area surrounding the new town. The recreational function of green open spaces was then incorporated into the morphological fabric of Senboku itself. In other words, parks and green walkways alternate and penetrate the urbanised sections of the town.

Tama, on the other hand is a mixture. It is composed of two parts, one is declared as a UPA, and the other is a UCA. Therefore, the green belt technique was applied in some areas. On the other hand, the morphological integration of green open spaces with built up areas was employed in the UCA. In fact, for Tama New Town, a guideline was issued in 1974 which governed housing construction and financial

aspects of local government. It also stipulated that green space should comprise 30% of the new town territory. This is an interesting evolution in the way Japanese planners viewed the environment: along with the green space provision it was also decided that the projected population should be reduced. Those two elements reflected an increasing awareness of the importance of creating better environments qualitatively, an evolution that was accelerated by the pressure on resources created by the 'Oil Shock' of 1973.

Recently, Japanese municipal authorities (cities, towns and villages) resorted to some form of planning gain for the community in the form of public facilities provided by the developer. This tool is called the 'General Guidelines for Land Development (Takuchi-Kaihatsu Yoko)', which is not an Act, but a regulation of the municipal authority. It has proved to be very effective in securing roads, parks, schools and nursery schools.

The tool is applied by different municipalities differently depending on the scale of the project. In large metropolitan areas 30% of all municipalities in which these regulations are operational impose this planning gain on housing developments of a land area of 1000sqm. 40%, however, have tightened its application to 500sqm. Between 10-20% have even reduced the area requirement to 300sqm. There are extreme examples of application, such as Hirakata and Sakai cities where the regulations cover practically all developments. Senboku new town, for instance, is under the administration of Sakai city.

D. The New Town Management System

There are two main elements of management, one relating to before and after development, and the other to administrative competence.

1. The New Town Before and After Development

As appeared from the brief review of the sequence of development, the prefecture is the body in charge of acquiring land for and actually developing the new town. After construction, buildings are sold to different organisations and individuals, who manage their buildings or sectors with practically no control from the prefecture, nor do they do so within a specified overall framework. Companies, which bought buildings after the construction stage from the prefecture, can usually resell their properties after ten years. With escalating land prices (in a recent study Senri New Town was ranked first in the country in terms of the rate of growth in land prices) land becomes more valuable than the building itself. As such, companies have little qualms about reselling land, with buildings being

actually demolished for redevelopment by the new owners. There are no regulations, aside from the zoning system and building standards and few other measures, which control these activities. This creates the problem of lack of incentives for maintenance works.

2. Administrative Management

Japanese new towns do not have a 'New Town Authority' as such. Instead, the prefecture controls the works through a branch office, usually called 'Centre' (eg.Senri Centre, Senboku Centre etc.). However, the actual administrative jurisdiction, relating to territory and municipal services and day-to-day management, may be divided among several municipal authorities, rather than a single authority.

In the Senri case, the new town falls under the jurisdiction of two cities: Toyonaka-City and Suita-City. Tama New Town falls under the jurisdiction of four cities: Hachioji-City, Machida-City, Inagii-City and Tama-City. Senboku, however, forms part of two municipalities: Izumi-City and Sakai-City only.

It is not difficult to envisage the range of problems that such a situation is bound to generate. The social implication is rather evident: New towns tend to attract a higher earning cohort of the working population, whereas their surrounding areas may be poor and declining areas (such as the case in Senri and Senboku), creating social tension. The economic implication, on the other hand, is reflected in the lack of investment in new towns surrounded by problem areas because municipal authorities find themselves obliged to concentrate their spending on the problem areas rather than the new towns. This situation is further aggravated, such as in Senri, when the two municipalities administering one new town suffer from an income disparity, resulting in one authority being able to invest more in the part under its jurisdiction, and consequently, a situation emerges wherein one part of the new town is better off than the other; with the results being a difference in the level of maintenance and services provided.

IV. THE JAPANESE NEW TOWN : A CRITICAL EVALUATION

A. The Changing Functional Nature

The introduction and construction of railway lines into certain centres in new towns has led to a rather unexpected evolution in the process of maturity of Japanese new towns. As mentioned earlier there has been a progressive decline of local Neighbourhood Centres to the ever increasing advantage of the Main Centre where a railway station exists, such as the case with Senri-Chuo Centre (Main Centre) which has been

evolving for some time from a local centre to a major focal point not only for Senri, but for surrounding areas also. This has brought with it a major shift in the functional nature of a new town constructed as a bed town, since expansion means increasing commercial activities and an expanding job market within the new town. The same trend was noted in Tama, where information industries (software, computers etc) are moving in alongside retail. There has been an increasing concentration of population in Tama, triggered by the convenience of transportation (ca.40 min. to Shinjuku in the centre of Tokyo), and by relatively cheap initial land prices because of the application of the compulsory purchase method specified in the *Shin-Ju Ho* 1963.

These observations may confirm a trend of transformation of Japanese new towns from single to multi-functional urban settlements.

This functional change naturally causes a change in morphology, which is marked by a physically distinct centre in relation to residential sectors.

B. Demographical Implications

There are three distinct problems associated with the maturity of the three towns which were studied:

- i. There is a concentration of middle-aged and aged population, mainly comprising those who settled first in the area. Therefore, the age mixture does not reflect a wide cohort.
- ii. Consequently, primary schools are suffering now, since most of the school population is now in the secondary educational bracket.
- iv. There is also a problem relating to health centres and their use. Moreover, the inclination to use motor vehicles has encouraged a modest trend towards using the main new town hospital rather than the local health centre.
- v. The problem mentioned earlier of selling land after ten years with no or little restrictions is causing land prices to further escalate, thus restricting accessibility to new town housing markets.

V. A REVIEW of THE BRITISH INFLUENCE

Clearly, the main influence lies in the concept of creating a totally new community outside existing urban centres. Moreover, the specific design impact of Harlow new town on the first of Japanese new towns, Senri, (the Neighbourhood Centre) had far reaching consequences on the thinking behind new towns in Japan. Senri, being the first, created many rules which were followed subsequently to varying degrees. In so

far as the Neighbourhood Centre concept is concerned, it was followed almost completely in most new town in the early period.

But this influence was deemed to fail in producing positive elements because of the peculiar impact and role of private railway companies in the property and housing markets, and more essentially, because of the reliance on mass transit systems for the home-work commuter journey. This element is enhanced by the typical Japanese pattern of carrying out urban development operations in station plazas for commercial purposes. Therefore, when railway companies chose one Neighbourhood Centre as a location for their stations, urban development followed transforming the centre into a major focal point and activity area. With the motorisation and working wife, local Neighbourhood centres declined.

Land assembly is another area of comparison, since the reliance on compulsory purchase measures in Britain could not be employed in Japan for cultural reasons. By the same token land readjustment (Kukaku-Seiri) was extensively employed.

As to management, it may be argued that no influence was exerted. There was no autonomous development corporation, which dissolved and transferred its assets. Instead, the previously outlined fragmented organisational pattern emerged, with assets being sold free hold to private and autonomous public corporations.

IV. CONCLUSIONS

Direct comparisons, between new towns in Japan and Europe, may be very difficult to achieve. Comparative research into this area must be aware of the differences in nature, function, concepts, design and contextual elements. Therefore, comparative research into this area must look at each system with a different set of elements, which are peculiar to that system, in order to be able to extract general conclusions regarding new town developments.

The first interesting observation relates to scale. Planners in the case of Leuvain-La-Neuve thought of 50000 people, those of Senri, for example, of 120000. The nature of demographical spread and problems relating to the limited supply of land dictated these elements, as well as, of course, the geographical spread of the labour market.

Equally interesting is the emphasis, in both cases, on railways as means of mass transportation. But accessibility in Belgium for commuters depends also on the motor car. Therefore, the aim of planners was to REDUCE the use of the car, rather than concentrate on railways. This contrasts with the emphasis placed in new towns in Japan on rail transport to job centres.

As to design, planners of Japanese new towns seemed to favour the hierarchy offered by the Kinrin Centre concept. It can be argued that there is no dominant design concept in European new towns in general, certainly not in Belgium. Architects and planners apply different ideas to different projects, such as the linear, high-density low-rise, cul-du-sac model of leuvain-le-Neuve.

In terms of management, most new towns were initiated by public bodies (between 1961 and 1977 public bodies developed 85.7% of the total acreage of all new towns in that period, comprising about 80% of all projects). In the Belgian case, however, the developer was private (the university), which acquired cheap loans from the state (at an interest rate of 3.18p.a. including capital payments). The British case shows more similarity with the Japanese case in terms of the involvement of the public sector through the several new town development corporations.

Another element, mentioned earlier is the functional character of Japanese new towns as bed-towns, as contrasted with multi-functional and self-reliant communities in Europe in general. In the Leuvain-La-Neuve case there was a particular emphasis on energy saving at a town scale, rather than an individual building only. This is one of the most important observations as regards that new town.

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