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The Hub and the Place

An international study of the processes and stimulants of large transport hubs and the effects on urban developments in the UK, China and India
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Report for Royal Institution of Chartered Surveyors

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This international study examined the decision making in the planning and delivery of mega rail infrastructure projects in the UK, China and India with a focus on railway transport hub development and their surrounding environments. We predominantly explored how these projects are conceptualised and implemented and the rationale for their development. The study involved three mega rail infrastructure hubs: King’s Cross St Pancras Railway Station (London, UK), Guangzhou Railway Station (Guangzhou, Pearl River Delta (PDR), China) and Karkardooma Railway Station (Delhi, India).

Above all, the study findings underlined the importance of developing an explicit approach to the relationship between two elements in the analysis of development processes:

1. The **actors (or agents)** involved in the development process and their strategies, interests and actions. In particular, a distinctive set of actors was identified in each setting that were paramount in driving the development process of both the transport hub (the node) and the surrounding area (the place). With diverse objectives (social, political, environmental and economic), the strategies and actions of those actors, e.g. investors, developers, landowners, public agency planning officers, politicians and community groups and their active involvement were critical in making the search for solutions to the development challenges possible. The local authorities and Argent, the property developer, are most evident in Kings Cross, with Argent playing the role of a network ‘broker’ negotiating with the local authorities on behalf of the landowners. In the PRD, the monopolistic powers of state institutions such as the Ministry of Railways (MOR) cannot be overlooked. In India, the role of the state is evident as the main actor on the Delhi metro megaproject. The role of the Delhi Metro Rail Corporation (DMRC) was also highlighted as a powerful parastatal government agency with the absolute power for the metro construction and operation.

2. The **structure of decision making** which is framed through the organization of economic and political activity and of values about land, property, buildings and environments. Relationships between project actors across the three megaprojects were found to be mostly dynamic and multi-scaler in that they exist across multiple levels (central, regional, local and megaproject level) with power struggles to influence the project outcomes. Inter-actor relationships took several forms across the case study projects: ‘communicative’ in King’s Cross, ‘fragmented authoritarianism’ in the Pearl River Delta and Delhi. In addition, the **timelines of decision making** at multiple, interdependent, and interwoven levels was critical in driving the development of the three transport hubs. For example, the development at King’s Cross Central was facilitated by timely decision making at the intersection between land-use planning and the wider infrastructure system planning. In the case of Guangzhou Railway Station and the wider PRD development, the project was energised by the involvement of actors who are empowered in such an environment to influence the process positively in their favour.
The findings also identified an individualistic set of drivers associated with the development process in each setting following the consideration of the context-specific nature of the transport hub, its location and its political and economic environments as follows:

- A supporting political context was critical in the development of the three megaprojects. In the case of King’s Cross, two significant political factors were catalyst to the development, mainly the deregulation and privatisation of British Rail and the introduction of the Channel Tunnel Railway Act of 1996 and the decision to relocate Britain’s first high speed railway, the Channel Tunnel Rail Link (CTRL), from London Waterloo rail station to St. Pancras. In the case of PRD, due to the hierarchical structure of governance, the lower level and higher level city officials using their Guanxi network, bargain for influence to add benefits for these cities in the proposal and, due to the MOR’s limited budgeting at the time, were able to push for their desired rail routes to be put forward. In the case of Karkardooma, the construction of the Delhi metro infrastructure has received unequivocal support from all parts of the government which was instrumental in driving the project forward, against the multitude of challenges often experienced by public sector projects in India.

- A favourable economic context is also paramount. In King’s Cross, ‘neoliberalism’ and privatisation are key drivers with profit seeking private investors involved in creating representative public spaces in the urban core. The office market recovery since the early 1990s has also encouraged the development at King’s Cross, with office space assuming the largest share of the government which was instrumental in driving the project forward, against the multitude of challenges often experienced by public sector projects in India.

- The importance of the availability of private-sector finance and opportunities for overseas investments is evident in King’s Cross with the involvement of profit-seeking ‘venture’ developers largely driving the project, an example of which is Argent, armed with the BT Pension Fund. A similar scenario could be observed in the case of the Delhi metro with the government rigorously seeking foreign capital and expertise. This indicates ample opportunities for foreign investors seeking to invest in the UK and India’s growing portfolio of mega projects. To the contrary, in the Guangzhou Railway Station and the wider PRD development, autocratic high-level state orders represent a barrier for non-state actors to invest in state-owned projects. While the potential to involve foreign and private investors is supported by the provincial governments, it is not welcomed by MOR which enjoys great power and a monopolistic dominance in railway construction projects and their operations. This may represent a barrier to overseas, and indeed non-state actors’, investments in China’s transport hubs development projects.
Finally, the study produced a number of recommendations formulated as transferable lessons learnt to decision makers involved in the development of mega rail infrastructure projects as follows:

• **Hub development as a ‘social process’:** For planners to play an effective role in driving hub developments as vehicles for economic, social and environmental sustainability, they need to understand the functioning of project networks and to establish adequate understanding of prominent actors and their strategies, interests and actions as well as the social networks that underpin decision making and shape individual and organisational behaviours.

• **Timeliness and networks of decision making:** A network decision broker is needed to coordinate and manage the interdependent decisions made by a range of diverse stakeholder actors. Acting on behalf of central government, the broker’s role is to manage the network of stakeholder decision makers, identify complementarities in interdependent decisions and to choreograph timeliness in these decisions.

• **Sustainable urban development through TODs and LVCs:** For funding mechanisms that effectively integrate transport and land use, such as Transit Oriented Developments (TODs) funded through Land Value Capture (LVC) schemes, to play a fundamental role in building a sustainable urban environment, all the actors involved such as policy makers, local authorities, transport agencies, land owners, property developers and local communities should engage in collaborative value co-creation by integrating mutually beneficial resources to optimise the return on such developments. By contributing to value creation through land use and development density changes, or through investment in transport, local authorities and transport agencies will particularly benefit with the cost of financing the transport investments significantly recouped.

• **Politics and transport hub prominence:** The study identified that existing prominent hubs have the leverage to attract more development and expansion and enable them to become even more prominent. The effect of this is for existing transport nodes to increase in size and for nodes of lower prominence to remain small and perhaps reduce in prominence over time. This is undesirable and needs government intervention, independent from the lobbying of existing prominent nodes, to resolve.

• **Government investment and private sector returns:** Our research has shown that the development of an infrastructure hub has a powerful effect on the property around the hub. The ability of the state to gain state benefit from private sector property investment returns on sites not owned by the rail infrastructure provider is worthy of attention.

• **Packaging risk and benefits for private sector investors:** Increasing private sector awareness of development opportunities has the potential to attract additional overseas investment. The government could play a key role in this, identifying the potential ‘ripple effect’ of future hub development and employing appropriate agencies to carry out the role of investment identification and marketing. This may overcome the problems associated with opaqueness and the complex nature of those investment opportunities.

• **Eigenvector effect:** Connecting existing hubs to other hubs already prominent in network terms creates a significant ‘eigenvector’ effect on pedestrian traffic flows. There is therefore the potential for the creation of a planning zone within this radius that recognises the effect on land use and development potential. This planning zone could offer concessions in terms of change of use, development densities and high rise development to developers. In exchange, developers would be required to pay a levy reflecting the benefits accruing from the infrastructure investment by government.

• **Delivering social infrastructure through transport infrastructure partnerships:** There is potential for the setting up of partnerships which combine a portfolio of investment opportunities and returns associated with the achievement of a number of policy objectives in relation to social infrastructure.
1.0 Introduction

Ambitious plans for the development of transport hubs and their surrounding areas have become more prevalent throughout the world. A diverse and complex set of factors drives these projects and produces distinct patterns of development at particular time periods. This international comparison of mega rail transport hubs’ infrastructure projects aims to answer the following core research questions:

1. What drives the development process of mega rail infrastructure projects and produces distinctive patterns in particular periods?

2. What are the individualistic redevelopment challenges associated with the development process? This requires the consideration of the context-specific nature of the transport hub, its location, and its social, political, and economic environments in order to adequately account for local peculiarities.

3. In terms of actors and their relationships, how does the process encourage or restrict the search for solutions to the redevelopment challenges? Actors (or agents) are those involved in the development process and their objectives, strategies, and activities, e.g. governments, investors, developers, landowners, local authority planning officers, politicians, and community groups. On the other hand, relationships are concerned with the structure of decision-making, framed by the organisation of economic and political activity associated with land, property, buildings, and environments, as well as the context in terms of the institutional setting.
The Hub and the Place

This international study has examined 3 selected mega rail infrastructure projects in the UK, China, and India, examining the process and key drivers. We will look at how these projects were conceptualised and implemented and the rationale for their development. Table 1.1 (see below) lists the basic urban characteristics of the 3 case-study projects. Each case study particularly examined the following aspects:

1. Local context in terms of history, urban formation, and the political environment.
2. The state and regulatory institutions’ involvement in transport hub strategy.
3. Project decision making in the planning and implementation of the transport hub.
4. Forms of investment, finance, and investor activity, including local capacity in terms of expertise and finance, as well as opportunities and difficulties for overseas investors.
5. The development of land adjacent to the transport hub, including a discussion of the key agents in land, property, and development within and adjacent to the hubs and the variable land and property requirements and the built forms which comprise hub development.

The report is structured as follows:

- **Section 1:** Introduction
- **Section 2:** King’s Cross St Pancras Station and the development of Kings’ Cross Central—London, UK
- **Section 3:** Guangzhou Railway Station and the development of the Pearl River Delta (PRD) transport hubs—China
- **Section 4:** Karkardooma Metro Station, the Delhi Metro, and Transit-Oriented Development (TOD)—Delhi, India
- **Section 5:** Conclusions and lessons learnt; these are particularly in relation to:
  - Economic and political environment
  - Issues about sustainability (sustainable transport and land use)
  - Local capacity in terms of expertise and finance
  - Opportunities for overseas investors

As outlined above, 3 sections pertain to each of the case-study projects. A final discussion section concludes the report by capturing lessons learnt for the stakeholders involved.

### Table 1.1 Basic urban characteristics of the 3 case-study projects

<table>
<thead>
<tr>
<th>Country</th>
<th>King’s Cross St Pancras Railway Station</th>
<th>Guangzhou Railway Station</th>
<th>Karkardooma Railway Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>City, Region</td>
<td>London, South East, UK</td>
<td>Guangzhou, Pearl River Delta, China</td>
<td>Delhi, India</td>
</tr>
<tr>
<td>City Population</td>
<td>14,620,400 million [2014]</td>
<td>14,000,000 million [2014]</td>
<td>24,000,000 million [2015]</td>
</tr>
<tr>
<td>Region Population</td>
<td>12–19 million</td>
<td>40 million</td>
<td>21.7 million</td>
</tr>
<tr>
<td>Urban Area</td>
<td>1600 km²</td>
<td>3,843.43 km²</td>
<td>1113 km²</td>
</tr>
<tr>
<td>Urban Density</td>
<td>4,800 pop/km²</td>
<td>1,708 pop/km²</td>
<td>14,684 Pop/Km²</td>
</tr>
<tr>
<td>Economy (Trend)</td>
<td>Economic growth at 3.3% per annum</td>
<td>Economic growth at 8.4% per annum</td>
<td>Economic Growth at 8% per annum</td>
</tr>
<tr>
<td>World City Status</td>
<td>Alpha-level full service world city</td>
<td>Beta world city</td>
<td>Alpha-level world city</td>
</tr>
<tr>
<td>Status In National Urban System</td>
<td>National capital, largest city in UK</td>
<td>Largest city and capital of China’s Guangdong Province; the 3rd largest city in China</td>
<td>National capital, 2nd largest city in India</td>
</tr>
</tbody>
</table>
2.0 Case Study 1: King’s Cross St Pancras Station and the development of King’s Cross Central, London, UK

2.1 Introduction

In a ceremony attended by Queen Elizabeth II, St Pancras International reopened in November 2007, becoming the terminus for passengers arriving from Paris and Brussels on the high-speed rail link. The highly acclaimed refurbishment of the station was an important catalyst for the regeneration of the King’s Cross area. King’s Cross St Pancras station is a major international rail station, a strategic hub for rail services and a centre of urban renewal and transformation within central London in the form of the 67-acre King’s Cross Central project, labelled as ‘the biggest inner city redevelopment in Europe’ and a significant example of planning strategies for securing London’s dominance as a centre for global financial capital.

Widely considered as a striking example of rail-station area redevelopment ‘mega projects’, an indication of ‘roll-out neoliberalism’¹ and an embodiment of ‘urban renaissance’² planning agendas, the development of King’s Cross is unique, compared to other central London station-area redevelopments in the 80s, and according to Bertolini (1998) its transformation cannot be explained purely as a real-estate strategy, as he explains:

‘The location here of the Channel Tunnel Rail Link (CTRL) interchanges means that a much more evolved approach, dealing with both urban and transport complex development issues is needed’ (Bertolini, 1998: 177).

¹ Neoliberalism in the case of King’s Cross is explained by Peters (2009) as the situation in which ‘the pursuit of various public interest goals, such as providing a safe and efficient transportation system, or creating representative public spaces in the urban core, is handed over to private or privatised profit-seeking actors’ (Peters, 2009, p. 178).
² The term ‘urban renaissance’ is defined by Peters (2009) as to ‘encompass any redevelopment effort aimed at making inner cities more attractive places to work, live, study, or engage in entertainment and recreation by revitalizing a centrally located, transit-accessible urban location … also taking into account improved urban design quality and mixed land uses, as well as a greater environmental sensitivity and commitment to urbanity in the planning and implementation of these “new megaprojects”’ (Peters, 2009: 163–4).
The King’s Cross area enjoys access to the best public transport network in London (London Plan, 2004). As well as the international interchange of the CTRL, the site is serviced by 6 underground lines, 3 mainline rail stations, and a total of 17 local bus routes. A 2004 Transport Assessment (TA) prepared by Arup (2004) has shown that ‘there was a morning peak hour capacity from inbound rail and London Underground services of around 306,300 passengers into the King’s Cross area, of which 73% was being used on average’. On the whole, the 2004 TA projected that the proposed transport network would accommodate the development trip demands and outlined plans to decrease the necessity to interchange, as ‘65% of National Rail passengers at the time were interchanging to or from London Underground services’, increasing the pressure on the transport hub (Arup, 2004).

In addition, King’s Cross Central provision of 400,000 m² of commercial space was to create a new ‘commercial cluster’ and enable the accessibility of the area to a substantial number of future employees without a need to interchange (Arup, 2004).

2.2 About King’s Cross, London

The City of London, an ‘Alpha-Level Full Service World City’, is a centre for neoliberal transformations, changing from an ‘industrial’ to a ‘post-industrial’ city. An important aspect of these transformations for London has been the strengthening of financial capital dominance in the substantial shift from manufacturing to service-based activity (Holgersen and Haarstad, 2009). This shift is nowhere more clearly observable than in the development of King’s Cross Central.

King’s Cross is located in the northern side of central London and enjoys exceptional underground and surface-railway transport connections. Located in the London Borough of Camden and adjacent to the Borough of Islington, the area has often been considered a ‘Cinderella’ district (Edwards, 2009), in particular rejected by large businesses. King’s Cross was an important industrial hub in the Victorian era with the historic King’s Cross Station first opening in 1868 and referred to as Britain’s largest covered infrastructure for a considerable length of time (Parissien, 1997).

Figure 2.2 The railway lands in King’s Cross

Image source: https://www.kingscross.co.uk/development

3 Including the Circle, Hammersmith and City, Metropolitan, Northern, Piccadilly, and Victoria lines.
4 This categorisation is based on the GaWC Inventory of World Cities (1998) in which the cities of London, New York, Paris, and Tokyo are considered the leading Alpha-level global cities in the world, with Hong Kong, Singapore, and 4 other cities completing the Alpha-group of ‘full service world cities’. This group is followed by 10 Beta-level ‘major world cities’, e.g. Sydney and Toronto. A group of about 35 Gamma-level ‘minor’ world cities completes the list, including Beijing and Shanghai (www.lboro.ac.uk/gawc/citylist.html).
However, the station suffered an extended period of decline in its use up to 1966, when the Department of Transport developed proposals to close it and demolish parts of the building (Lansley and Durant, 2011).

However, the demolition project was halted due to considerable public opposition and petitions by conservationists, leading to the station being placed, in 1967, on the Grade I list of buildings of special architectural and historic interest. But although the station was rescued, its deterioration continued (Bradley, 2007). Another proposed plan for the restructuring of the whole King’s Cross area, including St Pancras station, was developed by the government in the 80s but subsequently failed due to local resistance and difficulties linked with the 1987 property crisis (Mazzoni, 2001). By the late 90s, the ‘railway lands’ at King’s Cross had experienced severe decay particularly due to the limited investment in the railways and had degenerated into a compilation of warehouses, railway sidings, abandoned buildings, and contaminated land. The railway land became associated with unhealthy living conditions, poverty, crime and prostitution. By the 80s, and with an ageing stock of commercial buildings dating back to the 19th Century, King’s Cross had become the cheapest area for office rental in central London. Buildings constructed in the area during the 1900s were all either social housing or public buildings; the British Library is a striking example. The area housed a dense population of predominantly working-class social housing tenants and a unique variety of local businesses—almost all non-corporate—which benefitted from affordable, yet well-connected, premises.

The catalyst for change came in 1996 with the government’s decision to reroute the CTRL from Waterloo to St Pancras station. In 1994 Waterloo Station was temporarily functioning as the first international terminal. Following considerable debates and wide-ranging disputes, St Pancras was selected in 1996 as the exclusive London terminal for international high-speed rail services (Gourvish, 2006). The decision to locate London’s international rail terminal at St Pancras provided the opportunity to transform the semi-derelict station as well as an impetus for the generation of the entire run-down area surrounding it (Faith, 2007).

### 2.3 State and regulatory institutions in the development of King’s Cross St Pancras Station

The main local planning authorities for King’s Cross St Pancras are Camden and Islington, functioning in a planning policy framework with which they are subordinated to the Greater London Authority (GLA) and the British Government.

In 1996 a published Strategic Guidance for London Planning Authorities (RPG 3) identified King’s Cross as one of 5 ‘Central Area Margin Key Opportunities’. The guidance stated that a mixed-use development should be pursued with most commercial uses and highest densities closest to the rail stations, and the provision of residential and community facilities that would sustain and redevelop neighbouring local communities. In addition, planners were asking for an area of ‘distinctive identity’ that enhanced the historic and conservation features of the site.

The 2004 London Mayor’s spatial development strategy, ‘The London Plan’, also sought to strengthen the role of the Central Activities Zone, of which King’s Cross is a part, as ‘the core location for international business and finance and as a national transport node’ (paragraph 5.25). The strategy identified King’s Cross as one of 6 Opportunity Areas in central London. The strategy also outlined expectations for mixed-use developments within such Opportunity Areas and maximising residential and non-residential densities. The development potential of King’s Cross is mentioned specifically in Paragraph 5.37:

*King’s Cross has the best public transport accessibility in London. … Its central location and unique public transport accessibility offer particular scope for high density business development, as well as housing. … The development framework should draw upon the historic features of the site to create a truly sustainable business and residential community, reliant on minimal use of cars.*

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5 Mixed-use developments are defined by Suzuki et al. (2015) as a “pattern of development characterized by a mixture of diversified land uses, typically including housing, retail activities, and private businesses, either within the same building space [e.g., vertical mixing] or in close proximity [e.g., horizontal mixing]” (p. xiv).
On their part, the London Borough of Camden’s Unitary Development Plan in 2000 also emphasised the importance of the King’s Cross Opportunity Area, as Paragraph 13.3 of Chapter 13 notes:

*It is widely recognised that the Opportunity Area is one of the few remaining major development opportunities in inner London and is certainly the major one in Camden.*

The plan underlines the significant development opportunities facilitated by the area’s exceptional public transport network, and outlines the council’s objective to achieve a balance between several factors, among which are to ‘bring significant regenerative benefits to surrounding communities’ development of new market and affordable housing’ and ‘potential for low energy buildings with sustainable transport links’.

Later, towards the end of 2003, Camden and Islington Councils adopted a joint Planning and Development Brief for the Opportunity Area, which continued the call for a comprehensive regeneration scheme for this part of London. The new development was to provide a wide range of substantial physical, economic, social, and community benefits as well as enhance the area’s Victorian heritage through being intertwined in an exciting new urban composition.

### 2.4 Decision making in the planning and implementation of King’s Cross St Pancras Station

Bertolini (1998) highlighted the exclusive focus on London, particularly central London, for the implementation of station-area redevelopment projects, as opposed to other parts of the UK. Bertolini identified 2 distinct factors that had been encouraging most of the UK station redevelopment plans completed during the 1980s:

- **Privatisation**: British Rail (formerly ‘British Railways’ before 1965) was responsible for the operation of most of the rail transport in Great Britain between 1948 and 1997. In the 80s, and as part of the evolution and gradual privatisation of British Rail, the company had been explicitly pursuing a strategy of complementarity, in which revenues from property were used to finance operational investments as well as strengthen the company’s finances. This strategy was partly in response to the Labour government’s imposition in 1978 of ‘External Financing Limits’ on British Rail, further strengthened in the Thatcher era (Olsberg, 1990).

- **Innovative Venture Developers**: Profit-seeking ‘venture’ developers eagerly predicted the value that could be created from the release of railway lands and station air rights onto the property market. An example of this is the Rosehaugh and Stanhope Development (a joint venture between the 2 companies) who developed a number of stations in Central London, such as Ludgate, Broadgate, and Liverpool Street. The developer was also originally involved in King’s Cross.
During the 80s’ financial and property market booms, the interactions between the strategy of privatisation advocated by the government and the entry to the market by pioneering venture developers had largely shaped station-area redevelopment in Britain, and it mainly involved the development of office-only complexes on railway lands or station ‘air rights’\(^6\) within or neighbouring the City of London. Examples of such schemes included locations at the London stations of Blackfriars, Cannon Street, Charing Cross, Liverpool Street, Fenchurch Street, Victoria, and Ludgate. The strategy was largely profitable to British Rail. In the period of 1970–1989, for example, £1.6 billion was generated by British Rail’s property division, the British Rail Property Board (BRPB) (Edwards, 1991, cited in Riot, 2014). Most importantly, the impetus for station-area redevelopment in all the examples above was generated and driven by British Rail and the developers, underlining the limited role of local authorities in the process, while, as Bertolini (1998: 177) notes:

The apparently only possible role left to the local authority was that of trying to obtain, in exchange for planning permission, as many benefits for the local community ‘planning gain’ as possible.\(^7\)

The background to the development of the railway lands at King’s Cross stretches as far back as the 80s. Throughout the 80s and 90s, there were calls by community groups and several politicians for a major housing development on the site. In addition, it had long been recognised that great opportunities could be realised from combining the transport accessibility of King’s Cross with an exciting urban development project. However, British Rail’s plan for the new station to be tunnelled below the listed train enclosure of King’s Cross and the secrecy surrounding the whole development by British Rail had infuriated local residents and led to fierce opposition to the scheme.

Meanwhile, and following a competitive bidding process, British Rail appointed Rosehaugh Stanhope as the development partner for King’s Cross, previously British Rail’s partner at the Broadgate development. The London Regeneration Consortium (LRC) was formed between Rosehaugh Stanhope and the National Freight Corporation (later UPS Exel Logistics), the secondary landowner. Architects Foster and Partners were appointed as master planners.

The local planning authority, Camden Council, was working at the time on developing the content of a Planning Brief to guide the council’s negotiations with LRC. This was not an easy task and intense debates took place in 1987–90 among councillors, particularly in relation to the requirements for the development. Councillors were divided over the percentage of affordable housing vs. office space; with the council’s aspiration for a large-scale housing development standing in contrast to the mainly office-space development favoured by the developers.

In 1987, to support stakeholder consultation the King’s Cross Railway Lands Group (KXRLG) was formed with grant support from Camden Council, and it brought together a large number of stakeholders, such as residents’ associations, small and medium businesses, and conservationist and transport campaigners among others, to ensure that a variety of local demands were represented. KXRLG had vigorously sought to influence the development of the scheme, most notably generating alternative planning applications presented against the LRC application (Parkes, 1991, 2004). The project also suffered delays in 1991 due to inadequate environmental assessments underlined by the Environmental Commissioner, as well as increasing resistance by the local community and politicians.

The project collapsed in 1992 just as Camden was ‘minded to grant’ planning permission to LRC’s mostly office scheme. A number of factors contributed to the project’s misfortune, including:

1. The crash of the central London office market, which experienced enormous over-supply and falling demand in the early 90s. The combination of this and the rise in interest rates led many developers, including Rosehaugh Stanhope, the scheme’s developer, into bankruptcy and inactivity.

2. The strong opposition of affected groups to British Rail’s plan of tunnelling through South East London and under the Grade I-listed King’s Cross Station for CTRL had led to the scheme’s being scrapped as a result of fierce campaigning as well as cost-considerations.

This early collapse of the project may underline the vulnerability of such mega projects to the fluctuations of the globally connected local economies and real-estate markets (Peters, 2009).

Meanwhile, privatisation of the railways continued, with the Conservative government dividing British Rail in 1994 into a collection of various firms and franchised sections of the rail network on a regional basis. One company, Railtrack (subsequently Network Rail), was formed to manage and control the rail infrastructure network. Railtrack worked alongside a number of independent partly subsidised operators who bid for the franchises to operate the services. Railtrack, however, experienced significant financial challenges, including the rail disasters of 2001, which killed 42 people and injured hundreds of others, leading to the Labour government intervening and declaring Railtrack bankrupt in October 2001 (Haubrich, 2001). It was replaced by Network Rail, which owns and manages most of the rail network infrastructure in the UK.

\(^6\) Air-rights schemes are those in which buildings are constructed over an existing station. One of the first examples of this type of development was ‘Cannon Bridge’ above Cannon Street Station by Speyhawk. \(^7\) Planning obligations under Section 106 of the Town and Country Planning Act 1990 (as amended), commonly known as S. 106 agreements: are a mechanism which makes a development proposal acceptable in planning terms, which would not otherwise be acceptable. They are focused on site-specific mitigation of the impact of development. S. 106 agreements are often referred to as ‘developer contributions’ along with ‘highway contributions’ and the Community Infrastructure Levy. The common uses of S. 106 planning obligations are to secure affordable housing, to specify the type and timing of this housing, and to secure financial contributions to provide infrastructure or affordable housing (Source: Planning Advisory Service (2015), http://www.pas.gov.uk).
England, Scotland, and Wales. Network Rail is a ‘not for dividend’ company limited by guarantee from the government with no shareholders, thus applying its income to its own purposes. The railway sector was also a subject of heavy public investment and a change in rail regulation in the form of the Railway Acts of 2003 and 2005. The acts afforded more power to the state to intervene in rail activities with the Office of Rail Regulation (now called the Office of Rail and Road) exercising more control over the safety and economic regulation of Britain’s railways.

2.5 Financing King’s Cross
St Pancras Station

As well as being a cornerstone for the transformation of the King’s Cross area, the restoration and refurbishment work at St Pancras International formed an important part of the High Speed 1 (HS1) line project. The chaotic funding issues associated with HS1 had not affected the development of St Pancras, but influenced the way the station was managed. Initially, and following the privatisation of British Rail, a private consortium, London and Continental Railways (LCR), was responsible for the CTRL, which later became High Speed One Limited (HS1). Following a competitive tendering process, LCR was appointed in 1996 to construct and manage the line’s infrastructure, with the construction of CTRL initially financed as a Private Finance Initiative (PFI) with Railtrack (Haywood, 2009). However, the project experienced significant difficulties following the bankruptcy of Railtrack and the lower-than-expected revenues from the project, which jeopardised LCR, forcing the British Government to temporarily nationalise the project (Gourvish, 2008). The provision of public funding secured the investment needed for the HS1 project to progress, as well as the development of St Pancras. In 2008, the British Government sought to recapture the public funds invested in HS1 by privatising the entire line, including the operation of the stations at St Pancras, Ashford, Ebbsfleet, and Stratford (House of Commons, 2012). Five bidders entered the franchise auction, including Morgan Stanley, Goldman Sachs, Eurotunnel, Allianz Group, and a Canadian consortium (Borealis Infrastructure and Ontario Teachers’ Pension Plan) the latter of which won the franchise for £2.1 billion, thus securing a 30-year concession to manage HS1. The numbers of bidders and the large value of bids offered a clear indication of the growing interest in large infrastructure investments by financial funders who were increasingly attracted to the stable, long-term revenues generated by these projects (Riot, 2014).

Following the privatisation of HS1, St Pancras became part of a franchise arrangement within which revenues generated by the station would be part of the company’s income. Operationally, HS1 leases St Pancras to Network Rail, and Network Rail outsources day-to-day operational management of the station to Eurostar.

In addition, St Pancras could be considered a ‘reinvention’ in station planning in that the design of the station connects passenger flow to about 9000 square metres of retail space (Riot, 2014). The station is therefore designed not only to handle a large number of international passengers commuting on the high-speed line services, but also as a profit-generator for the franchise holder with the station attracting high-quality brands and retailers and becoming a venue for high-profile events. A survey by HS1 Ltd showed that 85% of users of St Pancras station belong to the socio-professional category ABC1 (HS1 Ltd, 2012). This apparent specialisation in St Pancras station, according to Riot (2014), may signal a form of ‘gentrification’ in the use of large railway stations with potential significant impacts on the evolution of their surrounding neighbourhoods. Indeed, a report by Network Rail (2011) found that ‘approximately one quarter of station users have no intention of catching a train and visit the station entirely for the shopping, cafés and restaurants’ (p. 15).

2.6 The development of land adjacent to the transport hub

2.6.1 Main actors

Bertolini (1998) underlined the ‘unique ambivalence of rail stations areas as redevelopment objects’, when he said:

Railway stations are very peculiar locations. On one hand, they are (or may become) important ‘nodes’ in emerging, heterogeneous transportation networks. On the other hand, they identify a ‘place’ a both temporarily and permanently inhabited portion of the city (p. 178).

The former railway land at King’s Cross (approximately 27 hectares of brownfield development land) is being developed by a single landowner, the King’s Cross Central Limited Partnership (KCCLP). The ‘ownership vehicle’ principally involves 3 groups: Argent (50%), LCR (36.5%), and DHL (formerly Exel) (13.5%) (Urban Land Institute, 2014).

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8 ABC1 are demographic classifications in the UK by the National Readership Survey (NRS) used especially for consumer targeting and consumer market research. Social Grade A are those individuals with upper middle class social status and higher managerial, administrative or professional occupations; Social Grade B are those with middle class social status and intermediate managerial, administrative or professional occupations; Social Grade C1 are those individuals with low middle class social status and supervisory or clerical, junior managerial, administrative or professional occupations. 9 Gentrification is the purchase and renovation of property in declining urban neighbourhoods by more affluent individuals, which subsequently results in the increase of property values in the area, although also the displacement of low-income households and small businesses.
More details of the 3 partners are as follows:

- **Argent King’s Cross Limited Partnership**: Owned by Argent property developers and Hermes Real Estate on behalf of the British Telecom Pension Scheme. Argent is the master developer and asset-manager for King’s Cross.

- **London and Continental Railways (LCR) Limited**: A property company owned by UK Government that specialises in the development and management of property assets associated with major rail infrastructure projects. Originally, the company was founded in 1994 as a privately-owned consortium with a contract signed by the UK Government to construct the CTRL. However, in 2007, after the completion of the CTRL and its rebranding as High Speed 1 (HS1), the company experienced significant financial difficulties with the Department of Transport taking direct ownership of LCR from 2009 onwards. LCR’s primary focus was on the regeneration projects at King’s Cross, in partnership with Argent and LCR, and The International Quarter, Stratford City, in partnership with Lend Lease. As mentioned previously, LCR was responsible for the delivery of HS1 railway, including the revival of St Pancras International.

- **DHL Supply Chain (Previously Exel)**: Owned by Deutsche Post—a provider of logistics solutions.

Other agents in the development of King’s Cross include local stakeholders, such as the King’s Cross Railway Lands Group (KXRLG), the King’s Cross Conservation Area Advisory Committee (KXCAAC), King’s Cross Business Forum (KXBF), and Cally Rail Group. Holgersen and Haarstad (2009), examining community and class conflict within the development, have classified agents according to their function and class interest (see Table 2.1).

Holgersen and Haarstad (2009) highlighted an important distinction between *urban space* as exchange value – with agents such as Argent, Exel, and LCR, aiming to maximise profit and capital accumulation through developing mainly office spaces – and *urban space* as use value, involving agents of non-accumulating interests, such as KXRLG and KXCAAC, who wish to enjoy the space to work and live.
### Table 2.1 Agents, functions, and class interests in the King’s Cross development

<table>
<thead>
<tr>
<th>Agent</th>
<th>Function</th>
<th>Class interest in built environment. Fixed capital – place</th>
<th>Class interest in general. Circulating capital – space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argent</td>
<td>Developer, financier, becoming landlord.</td>
<td>Long-term capital investment. As developer it hires construction capital and architects.</td>
<td>Owned by BTPS’s pension fund—defends private-sector workers’ pensions through capital accumulation.</td>
</tr>
<tr>
<td>Exel</td>
<td>Landlords</td>
<td>Short-term capital investment. Extracts land rent. In King’s Cross only as speculator.</td>
<td>Capitalist company that provides international shipping and logistics of documents and freight.</td>
</tr>
<tr>
<td>LCR</td>
<td>Landlords</td>
<td>Short-term capital investment. Extracts land rent. Also external effect as owners of nearby property.</td>
<td>Consortium—established to build the CTRL, earn money, and sell everything off. Must, through a ‘secret deal’, also share some profit with the state.</td>
</tr>
<tr>
<td>KXRLG</td>
<td>Community group</td>
<td>‘Use value’—in Lefebvre’s [1991] terms. Articulates a position of the dominated classes.</td>
<td>Non-accumulators, i.e. ‘labour’.</td>
</tr>
<tr>
<td>KXCAAC</td>
<td>Promotes conservation of historical buildings.</td>
<td>‘Use value’ in Lefebvre’s terms. Their interests contrast with the accumulators.</td>
<td>None</td>
</tr>
<tr>
<td>KXBF</td>
<td>Local capital, LB of Camden organised ‘Business Coordinator’.</td>
<td>Place to enhance production and sell products and services.</td>
<td>Capital in general. Also gaining from ‘trickledown effect’, though often limited geographical possibilities.</td>
</tr>
<tr>
<td>Cally Rail Group</td>
<td>Community/residential project.</td>
<td>‘Use value’. Homeowners might benefit economically.</td>
<td>None</td>
</tr>
</tbody>
</table>

Source: Holgersen and Haarstad (2009)

### 2.6.2 The variable land and property requirements

An inevitable spatial dilemma characterises the development of station areas, in which the expanding number of node- and place-associated (infra) structures compete for space and must be accommodated. These are needed to meet the needs of passengers using the station as well as those temporarily working, shopping, or permanently living in the location. This requires creativity in the planning, architecture, and engineering of these spaces to achieve win-win situations and minimise conflicts (Bertolini, 1998). As Bertolini (1998) argues:

*The property development ideal of maximum land exploitation and the transport development ideal of maximum infrastructure flexibility must find an improbable synthesis (p. 178).*

In the case of King’s Cross, property-transport coordination strategies have often been seen to be inadequate, with prioritisation of transport development (Bertolini, 1998). Indeed, the land surrounding King’s Cross was heavily occupied with engineering works related to the construction of CTRL until 2007.

Station-area developments often involve an upgrade in the accessibility as well as the activity profile of the location, with a rich ‘urban’ multifunctional mixed-use approach advocated in most situations. Multi-functionality is promoted since it not only facilitates the creation of lively, attractive, and secure areas but also improves transport, secures long-term increases in property values, and increases the centrality of the station in the life of the city (Bertolini, 1998; see Boxes 2.1 and 2.2 following).

King’s Cross Central is a 67-acre mixed-use development divided in 2 by a canal that spans from East to West. South of the canal are mostly office buildings; north of the canal includes housing, a University of the Arts campus, parks, plaza and restaurants. 40% (26 acres) of King’s Cross is allocated to open space comprising streets, parks, and squares. Table 2.2 and Figure 2.5 provide a summary of the key elements of the developments.

As Figure 2.5 illustrates, office space assumes the largest share of the development. Office space is considered the most cost-effective and profitable type of development, given the office-market recovery since the early 90s (KXRLG, 1989; Hamnett, 2005). This is in part due to the location of the site, close to the City of London, and next...
to an exceptional transport hub. Particularly, the office-based financial sector is of significant importance to London’s employment and economic growth, and official policy thus seems to spur this drive as a strategy to solidify London’s position as an international financial centre (London Plan, 2004). Among the occupiers of King’s Cross Central office spaces is Google’s UK headquarters.

The development impacts at St Pancras have been significant with retail rent increasing by 53% in Camden and 38% in adjacent Islington between April 2001 and January 2006 (Preston and Wall, 2008). In addition, in 2014, according to the Nationwide House Price Index (2014) Camden experienced the strongest growth amongst all London’s boroughs, with an outstanding 42% year-on-year increase in average house prices. Islington saw a 26% annual price change. As Preston and Wall (2008) noted: ‘St Pancras could exhibit more substantive socio-economic impacts, resulting in the centre of gravity of London activity moving northwards’ (p. 420).

**Box 2.1 Growth of employment around a station**

Several US studies have shown an increase in employment growth and the density of land use in the area surrounding a station, particularly commercial land residential developments (Cervero and Duncan, 2002). In fact, employment in US cities was found to grow 2.5 times greater in cities with stations than those without a station (Green and James, 1993). In the UK, a comparative example can be found in London’s Canary Wharf, where the major development of corporate office buildings is partly attributed to the Jubilee Line’s extension (Atisreal and Geofutures, 2005).
A number of research studies have found a positive correlation between the redevelopment of a station and the value of land surrounding it. For instance, a study by Network Rail (2011) showed that significant station improvements can lead to a 30% increase in property values in the immediate surrounding area. This is seen to be the result of 3 factors:

- The close proximity of land to the station increases its accessibility and thus its value as the monetised value of commuting time savings can be factored when valuing the real estate.
- Stations can provide access to high-value retail and commercial facilities, and hence the transport hub can encourage inward investment and increase the commercial potential of the area.
- Well-designed and aesthetically attractive stations can improve the surrounding environment, for example through the removal of physical barriers to movements in and around the station, improving the image of the area and increasing its commercial attractiveness with places for living and working, and it may result in the reduction of crime rates.

The relationship between the existence of a station and land values is, however, dissimilar for residential and commercial land, with the effect on residential land values spreading over a more extensive geographic area within a range of up to 3 miles from the station location, while the effect on commercial property is more narrowed, within walking distance or possibly half a mile of the station (Bowes and Ihlanfeldt, 2001; Debrezion et al., 2007).

The scale of the impact on commercial properties, however, tends to be greater than on residential properties, as Figure A shows.

Research has also shown that an unappealing station with poor-quality environment surrounding it may actually depress land value in the nearby vicinity (Bowes and Ihlanfeldt, 2001). This is mainly attributed to the noise from trains, pollution, and the unattractiveness of the station buildings, an example of which is the US city of Atlanta. This results in the occurrence of a ‘volcano’-shaped pattern of land values around a station, as illustrated in Figure B.
2.6.3 Financing and ownership of King’s Cross Central

The majority of the land in King’s Cross was owned by LCR and Exel, with pieces of the site also owned by British Waterways, Network Rail, Transco, and the London Borough of Camden. Since 2008, the KCCLP has been the single landowner developing the mixed-use scheme at King’s Cross. At an estimated total cost of £3 billion, which includes construction, professional fees, and interest costs, the partnership strategy has been to develop the site and not to retain it for the long term. In fact, by early 2013, more than 50% of the potential development and commercial plots had been sold or committed, raising working capital for the scheme.

The development was funded through a mixture of equity, senior debt, and recycled receipts, as follows (Urban Land Institute, 2014).

- Infrastructure at King’s Cross was funded through equity and recycled receipts. About £250 million equity funding has been invested since 2009 to construct new roads, new public spaces, and a new bridge across Regent’s Canal, canal-side improvements, and the Energy Centre and its associated district heating and distribution networks.

- A construction contract was signed with the University of the Arts to the value of £100 million for its new campus at the Granary Complex.

- Senior debt was used to fund the direct construction costs of the residential and office buildings reaching about £300 million since 2009. Urban Land Institute (2014) explains: This senior debt package, from four leading banks, provided loans for three commercial buildings, the final phases of infrastructure, and 272 apartments at King’s Cross. The facilities comprise a combined revolving credit and term facility of £75 million from Barclays Bank, an investment loan from Hypothenken Bank Frankfurt AG London, and two development loan facilities totalling £104 million from Deutsche Postbank AG and HSBC.

- £42 million of public funds was provided by the UK Homes and Communities Agency.

2.6.4 Decision-making in the implementation of King’s Cross Central

The late 90s

During the late 90s, the UK and London economies had been recovering from the economic turmoil of the previous years. Three important features of that period had a substantial influence on King’s Cross: (1) the CTRL Act of 1996, (2) the establishment of a local ‘partnership’ under the Single Regeneration Budget (Mawson et al., 1995), and (3) the Blair Government’s Greater London Authority (GLA) Act. More explanation as follows:

The CTRL Act of 1996: During the 90s a new alignment for the CTRL was developed by the consultancy, Arup, and approved by the government, leading to the Channel Tunnel Railway Act of 1996. The new route was to pass under the Thames downstream, between new stations near Bluewater (near the Dartford crossing) and at Stratford, and would arrive at St Pancras. The station was to be extended for the CTRL, including an elevated set of tracks. The catalyst for change for the King’s Cross area thus came in 1996 as a transport stimulus when a decision was made to relocate Britain’s first high-speed railway, the CTRL, from London Waterloo rail station to St Pancras. The landowners, then LCR and Exel (now DHL), were also motivated by the significance of upgrading and restoring the Underground stations as well as national mainline stations on the site due to be completed by 2007.

Equally unique were the financial arrangements put in place to fund the new railway. The Major and Blair governments, in keeping with Thatcherite new liberalism, were set firmly on privatising the railway. An agreement was made following a long period of extended negotiations with a private consortium, LCR, for the construction and operation of the new railway. The original shareholders of LCR were Bechtel (19%), Warburg (19%), Virgin (18%), National Express (17.5%), SNCF (8.5%), London Electricity (8.5%), Arup (3.5%), Halcrow (3%), and Systra (3%). Two important considerations were critical when reaching an agreement with LCR:

- Revenue from ticket sales was unlikely to lead to the profitability of the railway. Thus, a subsidy from the government was important.

- As part of the agreement, and in order to reduce the amount of the subsidy, LCR was granted development rights over the railway land in King’s Cross St Pancras, Stratford, and Ebbsfleet (near Bluewater). The deal was described as ‘the great railway give-away’ (The Guardian, 1996, cited in Holgersen and Haarstad, 2009) and was estimated at £5.7 billion. Edwards (2009) argued: The significance of this is that property development at King’s Cross was required to generate not just profit on development investment but also substantial revenues to LRC and government to help offset the costs of the railway.

The 67 acres of land forming King’s Cross Central is one of those areas of land given to LCR as a subsidy.
The second important influence was the establishment of the King’s Cross Partnership by the Government with £37.5m funding from the Single Regeneration Budget (SRB) to operate from 1996 to 2003 (Edwards, 2009). The partnership involved the railway companies and Camden and Islington Councils, and invited members of the community. Due to the issues associated with the delay in the CTRL funding, the partnership had little impact on how the project was developed. However, it is credited with funding training and education projects for the local community as well as changing the area’s image through the funding of street and façade improvements and heavy investment in CCTV.

The third significant stimulus from the 90s was the establishment of the GLA by the Blair government under the ‘strong mayor’ model. The independent Ken Livingstone, a former leader of the Greater London Council (GLC), was elected in 2000 as the first Mayor of London. This was initially seen by some as a great benefit to the local community in King’s Cross, given the GLC’s Community Areas Policy designed to protect local communities and small firms in areas such as King’s Cross from the expansive forces of the central office area. As it turned out, the GLA under Ken Livingstone actually established strong connections with the City of London and property interests. King’s Cross was designated in the London Plan as a northward Opportunity Area and extension of the Central Activities Zone (CAZ) (Mayor of London, 2008).

By resolving the planning uncertainties surrounding the King’s Cross area, the railway land was then subject to a huge regeneration and improvement scheme. The owners of the land have sought to realise the significant development value of the area, values mainly created by proximity to King’s Cross and St Pancras terminals, by the transformation of the area’s image through the work of the King’s Cross Partnership, and by the closeness to King’s Cross Central, Argent’s imminent and enormous development plan for the area.

The early 2000s and Argent involvement
A large proportion of the land in King’s Cross was owned by LCR Limited and Exel (now DHL), with parts of the land also owned by British Waterways, Network Rail, Transco, and the London Borough of Camden.

In 2000, the involvement of Argent commenced; a property developer with a large portfolio of urban regeneration projects and mixed-use development such as Birmingham’s Brindleyplace (Latham and Swenarton, 1999). The property developer proposed a sustainable regeneration project in partnership with St George, a housebuilding firm (part of the Berkeley Group). While St George withdrew from the project in 2004 as part of a portfolio-reduction strategy, Argent’s commitment to the project continued forming a joint collective ownership acquisition and development agreement with the landowners.

The agreement included a clause for the revaluation of the land upon completion of the CTRL and the attainment of planning permission. Upon valuation, Argent was to be given the option to purchase the land from the landowners or to form a collaborative partnership. A discount was to be applied to the price paid by Argent, subject to the value of the land, with the discount increasing in parallel with the rise in land value. This provided the incentive for Argent to optimise the value of the development while protecting LCR and Exel from having to agree to sell the land several years before the completion of the rail link.

The land surrounding King’s Cross was heavily occupied by engineering works related to the construction of CTRL until 2007. This allowed Argent a significant amount of time, about 6 years, to develop its master plan for the area and to engage with the local authorities (Camden and Islington), and various stakeholder groups. During this period, Argent produced several proposals for the area, in tandem with Camden’s preparation of a draft and then (with Islington) a final Planning Brief for the site (London Boroughs of Camden and Islington, 2004).

Pre-development and planning permission
To develop the King’s Cross Central master plan, Argent brought together a design team comprising its 2 previous partners on Brindleyplace: Allies and Morrison and Porphyrios Associates, as well as Townsend Landscape Architects. During the approval process, King’s Cross Development Forum was established to allow the developers to engage with the London Boroughs of Camden and Islington, the GLA, English Heritage, as well as local community groups. In May 2004, outlined planning applications were submitted to Camden and Islington. A large consultation had subsequently taken place, and the response was that ‘commercial office space should be reduced as a proportion of the development’ (Camden, 2005: 9).

Plans were later revised and Argent submitted an updated application in September 2005. The new plan included more open green spaces, provision of health and education facilities, sustainable energy solutions, more three- and four-bedroom family homes, and, after extended bargaining with English Heritage, new proposals for the retention of the Stanley Building, a workers’ housing block from the Victorian era. In December 2006 following 6 years of negotiations, planning approval for the main site was finally awarded. Planning permission for the ‘triangle site’, a north-eastern part of the main site, was secured in 2008. The development is a mixed-use high-density scheme of 50 new buildings and structures, comprising 20 historic buildings and structures, 20 new public streets, and 10 new public spaces. 40% of the outline plans were allocated to public spaces, up to 2,000 homes, 650 student housing units, and facilities for health care and education. However, the development remained dominated by office space, which raised concerns from local stakeholders feeling that it was likely to ‘squeeze out ‘traditional’ organised working class employment’ (Holgersen and Haarstad, 2009: 358).
It is also important to underline the innovativeness of the planning permission granted to Argent, in that it allowed 20% flexibility to vary the mix of uses within the total floor space, as follows:

Total permissible mixed-use development floor space use is 8 million sq. feet (740,000 sqm) across the site.
- Up to 4.9 million sq. feet (455,500 sqm) for offices
- Up to 494,000 sq. feet (46,000 sqm) for retail
- Up to 508,000 sq. feet (47,000 sqm) for hotels and serviced apartments
- Up to 2 million sq. feet (194,600 sqm) for homes

The remainder was to be dedicated to non-residential institutions and leisure.

This flexibility afforded to the developer allowed Argent to change plans in response to shifts in market demand and was an important strategy for the firm’s long-term profitability. As the Argent Chief Executive stated:

To avoid bankruptcy in the event of a crisis, plans allow for a shift in building for different types of uses ‘because crashes in the [different property] markets normally don’t come at the same time’ (interview, Chief Executive, Argent, reported in Holgersen and Haarstad, 2009).

The flexibility given to Argent, however, was criticised by KXRLG because it was under Argent’s control rather than the local authority’s, and therefore it could not be used by the local authority to ‘shift directions in the project according to changes in the social context’ (Interview, Planning Officer, Holgersen and Haarstad, 2009: 359). The King’s Cross planning process was thus seen to afford property-owners with the flexibility to maximise their economic return, but limited flexibility was allowed for changes to other types of stakeholders’ needs and requirements (Holgersen and Haarstad, 2009). This highlighted an important distinction between urban space as exchange value—with agents benefitting from the flexibility in accommodating market changes and aiming for office-space maximisation—and urban space as use value, comprising agents of non-accumulating interests who wish to enjoy the space to work and live.

In terms of housing, the King’s Cross development comprises 2,000 homes, 42% of which are affordable. This reflects the high importance placed on housing provision in gaining planning permission, with King’s Cross considered a ‘strategic’ housing site and in response to the Mayor’s strategy at the time of developing more housing, mainly affordable homes with good transport connections. However, Peters (2009) argued that many recent international urban renaissance initiatives, including...
King’s Cross, were in fact excluding or displacing vulnerable local residents. Edwards (2009) also made this point with specific reference to King’s Cross:

The composition of the [King’s Cross Central redevelopment] scheme, particularly its limited provision of affordable social housing to rent and its strong provision of corporate office space, has been the main source of conflict. … Regeneration is not seen as primarily a process serving the low- and middle-income people in whose name regeneration policy was developed: rather it is seen … as essentially a business activity aimed at growth and competitiveness (Edwards 2009: 23).

A judicial review was launched in February 2007 by the King’s Cross Railway Lands Group, challenging the site’s outlined planning permission. The group wanted the development to be scrapped and it protested about the plans to demolish several main buildings without sufficient grounds, suboptimal energy and environmental standards, the proportion of large office buildings to offices suitable for smaller firms and housing, and the percentage of affordable housing. The legal challenge was heard in the high court, but later rejected.

The development of the scheme began with early infrastructure work in June 2007, following the release of the land from the CTRL works and is set to continue until 2020. A joint partnership was formed in 2008 between Argent, London and Continental Railways, and DHL (formerly Exel) forming the Kings Cross Central Limited Partnership, becoming the single landowner at King’s Cross.

The Granary Complex has housed the University of the Arts, London, since September 2011 with Granary Square, becoming a popular destination for festivals and events. To date, several restaurants have opened, the Grade II listed Great Northern Hotel has been renovated and reopened in 2013, and several apartments and offices have now been occupied. Sustainability was an important consideration with 99% of heat demand being planned to be met by the Energy Centre and 79% of power demand offset by Combined Heat and Power (CHP) engines. The plan is to recycle 81% of public waste and provide 49,500 sqm of the public realm, c. 9000 sqm of green roofs, and 200 m of green walls.

The development was described as ‘One of England’s 20 Best Heritage-Led Developments’ by English Heritage for preserving King’s Cross rich industrial heritage. In August 2015, as part of the UK government’s asset and property sales programme, the Treasury and the Department of Transport have commenced the process of selling their 36.5% share in the KCCLP. Deutsche Post AG’s DHL parcel service is also selling its stake in the development.
2.7 Learning from King’s Cross St Pancras—United Kingdom

What do developmental patterns in King’s Cross St Pancras—particularly in relation to property development—tell us about the processes and stimulants of large transport hubs and the effects on urban development in the UK?

A combination of several factors was paramount to the development of King’s Cross Central, as follows:

a. **Timeliness of decision making:** Planning permission for the site of the King’s Cross Central development was delayed by the uncertainty surrounding the transport decisions over the location of the high-speed railway station. The decision to route the CTRL to St Pancras, coupled with the decision to upgrade King’s Cross Underground station, came first and subsequently had a substantial influence on the scope for, and timing of, the site development. It should be noted that the developers of the site did not have to contribute to either transport investments, which indicates that the site development constituted a broader economic benefit facilitated by the transport enhancements, beyond the benefits provided to transport-users (Frontier Economics, 2012). This timeliness of decision making at multiple, interdependent, and interwoven levels at the interface between land-use planning and the wider infrastructure-system planning facilitated the development at King’s Cross Central.

b. **Favourable political environment:** The UK government was pursuing paradoxical strategies of encouraging private-sector involvement in public-sector provision through deregulation and privatisation, while at the same time exercising its power to leverage the private sector into areas faced with significant economic and social challenges (Healey and Barrett, 1990). Particularly in the case of King’s Cross, the privatisation of British Rail meant that the company had been explicitly pursuing a strategy of complementarity in which revenues from property were used to finance operational investments as well as strengthen the company’s finances. This strategy was partly in response to the Labour Government’s imposition in 1978 of External Financing Limits on British Rail, further strengthened in the Thatcher era (Olsberg, 1990). The second significant political factor was the introduction of the Channel Tunnel Railway Act of 1996 and the decision to relocate Britain’s first high-speed railway, the CTRL, from London’s Waterloo rail station to St Pancras. This was the catalyst for change for the King’s Cross area and significantly motivated the landowners, then LCR and Exel (now DHL), to develop the railway lands to benefit from the outstanding transport accessibility brought by the CTRL and the significant upgrading and restoration of Underground stations as well as national mainline stations. In fact, the potential development of the site has influenced the design of the CTRL route with the alignment of the railway tracks positioned as far to the north as possible to enable the maximum land space for the King’s Cross Central development.

c. **Economic climate:** The UK was experiencing significant economic restructuring coupled with substantial spatial reconfigurations with complex land and property-value redistribution. Importantly, the collapse of the railway lands project in the early 90s demonstrated the susceptibility of these mega projects to the fluctuations of the globally connected local economies and real-estate markets (Peters, 2009). The office-market recovery since the early 90s has, however, encouraged the development at King’s Cross, with office space assuming the largest share of the development. Given the location of the site, close to the City of London and with access to an exceptional transport hub, office space was evidently the development with the most profitable return. London’s employment and economic growth is highly dependent on the office-based financial sector, and official policy thus seems to spur this drive as a strategy to solidify London’s position as an international financial centre (London Plan, 2004).

d. **Innovative Venture developers:** The availability of international finance with information technology has reduced the barriers that once restricted transnational capital movements with properties converted to securities that are tradeable in the international financial market (Healey and Barrett, 1990). In particular, profit-seeking ‘venture’ developers have eagerly predicted the value that can be created from the release of railway lands and station air rights on the property market. In the case of King’s Cross, the involvement of Argent, armed with the BT Pension Fund, was critical for the development of King’s Cross Central. Argent assumed a ‘broker’ function within the network of decision making, negotiating with Camden and Islington on behalf of the landowners.
3.0 Case Study 2: Guangzhou Railway Station (GRS) and the development of the Pearl River Delta (PRD) transport hubs, China

3.1 Introduction

The Guangzhou Railway Station (GRS) upgrade is part of China’s 10 mega infrastructure projects. The project is an integral part of the transport hub development programme in the Pearl River Delta (PRD) region to revive the region’s trade vitality and competitiveness in mainland China and throughout the whole of Asia, Russia, and India. The GRS will start construction in about Spring 2018. The GRS was first conceived in 2012 when the City Mayor of Guangzhou emphasised and prioritised the station’s upgrade planning process. Three years later, in 2015, in line with the plan to upgrade the PRD regional railway hub and integrate it with the national-level railway links, the planning process reached a step forward.

The background strategy underlining the project came from the National Development Strategy motto ‘Parallel Coupling’. Parallel Coupling centres on the notion of making the most of China’s ‘open-door’ policy, increasing the nation’s competitiveness in the global economic markets, see Table 3.1.
The GRS upgrade includes the building of at least 2 more terminals (East and Central) to complement the current North and South terminals. The newly upgraded GRS will be located in the centre area of the city, hence significantly decreasing travel and transit time. This will increase the city's and PRD region's connectivity and competitiveness in China and the South East Asia region. For this reason, several changes have been made to the existing station. Firstly, the number of transportation modes within the hub is increased to include the high-speed trains and their associated rail tracks. This means that the current land use of around 15.8 ha will be expanded to 25.3 ha. When finished, the main terminal building will consist of a south concourse, a waiting room, ticket booths, a secondary school, and a leather arts and crafts centre.

As well as the transport hub upgrade plan, the GRS upgrade also entails a development plan for the properties near and around the station area. Since the GRS area covers 3 different boroughs and 4 different main roads, this includes organising the acquisition of properties, land use, and supply. This controlled, large-scale renovation on the lands surrounding the station area accumulates to 269 ha in total. This is to include a new business centre, shopping areas, and residential accommodation in the master plan.

Figure 3.2 depicts the before-and-after master plan of the area surrounding the GRS in 2020. Figure 3.2A illustrates the generic master plan, showing the division of land usage for industrial, residential, and special usage and other transport modes. Figure 3.2B illustrates the detailed version of the master plan, detailing the current control and regulation situation in the area.

### Table 3.1 Parallel coupling strategy

<table>
<thead>
<tr>
<th>Transportation Infrastructure</th>
<th>Cooperation Zone/Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parallel</strong></td>
<td>Connecting mainland China to the rest of Asia, Bangladesh, and India, to further develop economic relationships between countries to achieve global economic growth.</td>
</tr>
<tr>
<td><strong>Coupling</strong></td>
<td>Focusing on land bridges to connect China with Asia, Europe, Mongolia, Russia, the Chinese Archipelago, and Indochina to bolster international cooperation.</td>
</tr>
</tbody>
</table>

**Source:** Guangzhou Railway Planning Document (2015)

**Parallel coupling strategy**

**Centred on waterway and port transport hubs.**

**Land hub, connecting roads through international railways and motorways.**

**Connecting mainland China to the rest of Asia, Bangladesh, and India, to further develop economic relationships between countries to achieve global economic growth.**

**Focusing on land bridges to connect China with Asia, Europe, Mongolia, Russia, the Chinese Archipelago, and Indochina to bolster international cooperation.**

**Overall master plan of GRS’s surrounding area – before**

**Source:** Guangzhou Railway Planning Document (2015)
a. Development history and current rent/industry conditions in the area

The development of Guangzhou as a city dates back 2000 years. However, the development of the railway lines dates back to the year 1898. There are 3 different new rail routes built around the city. From then on, the railway development has taken central stage in the development of Guangzhou city itself. According to the Guangzhou Railway Planning Document (2015), there are 3 major reasons. These are:

I. The GRS is the main passenger transport hub in and out of the city
II. Guangzhou city serves as the main intercity traffic hub, and therefore the PRD region
III. Guangzhou city is a central trade area and the busiest city in the PRD region.

From the above, about 15 million people travel and transit through the GRS every day and about 1 million travel using the railways with 600,000 commuting to and from outside the city. There is an urgent need for an upgraded station to help with the organisation of this amount of passenger flow.

The overflow and chaos surrounding the passenger traffic also has a negative impact on the land rent value and businesses or asset values in the GRS area. For example, the rent value on lands directly across the GRS and towards the west of the station has been steadily decreasing, when compared to the north part of the station.

Therefore, with the GRS upgrade plan it is hoped that the land value will increase in the area with a more organised traffic flow and urban planning as well as land usage and density partitioning.

b. Current land usage, planned acquisitions and landscape

Firstly, according to the Guangzhou Railway Planning Document (2015), there are 884 official cases pertaining to the ownership status of the lands surrounding the GRS with the total area of 204.43 ha (Table 3.2). Currently, planning officials have processed 116 cases covering 137.62 ha of land. These lands include those with residential or office buildings and industrial ownership status.

Secondly, part of the GRS upgrade project is the redevelopment of the overall area landscape, i.e. to specifically increase green spaces around the station area. Currently, only 3.1% of total land used is dedicated to green-space developments. There is insufficient space for optimal and organised pedestrian flows. As such, the city does not have a prominent external image due to unorganised urban landscape history and insufficient greenery, which ultimately leads to an overall uncharacterised city identity.

Having illustrated the contextual backdrop behind the GRS upgrade, there are several institutional factors relating to the planning and processes from the conception to the execution of the GRS upgrade project. These will be described in the following sections.
3.2 About the Pearl River Delta, China

The PRD is situated in the south-eastern part of mainland China (see Figure 3.4 below). The PRD is located within the Guangdong province, with its 9 cities, 21 prefectures, and 121 counties. The capital city of the region is Guangzhou City, which has a history of over 2000 years. In the year 2005, Guangdong surpassed other regions to become the most populated region in China. According to the Guangdong Statistical Yearbook (2012), Guangdong’s GDP in 2011 was equivalent to the whole of the Netherlands. The region has the fourth highest GDP per capita in the whole of China.

The PRD region is one of China’s most vibrant economic regions and a major manufacturing centre. In numbers, PRD had the following statistics recorded in 2013 (HKTDC Research, 2015):

1. Real GDP of the PRD grew by an average of 9.4%
2. The PRD accounted for 53.7% of Guangdong’s population or 4.2% of China’s total population
3. The PRD accounted for 79.1% of Guangdong’s GDP or 9.3% of China’s GDP
4. The PRD accounted for 95.4% of Guangdong’s exports or 27.5% of China’s total export
5. The PRD accounted for 73% of Guangdong’s retail sales or 8% of China’s total retail sales of consumer goods.

Most of the industrial development within the PRD region comes from foreign capital. For example, Hong Kong accounts for more than half of Guangdong’s total exports. Further, the close proximity of 3 of PRD’s cities (Shenzhen, Dongguan, and Guangzhou) to Hong Kong attracted the most Foreign Direct Investment (FDI). Most of these FDI s are focused on heavy industry rather than property development.

Before the economic reform in 1978, most manufacturing outputs (primary and secondary industry activities) for import/export purposes were centred on the city of Guangzhou with its main port. However, after the economic reform other ports such as the Bohai Rim region (Beijing-Tianjin) and the Yangtze River Delta (Shanghai and Ningbo area) become more prominent and the PRD region’s Guangzhou, once dubbed ‘the Southern Gateway of China’, was somewhat forgotten (Ng and Xu, 2014). According to Hu and Lin (2011), this was due to the nature of the socialist industrialisation that did not work in the city’s favour at the time. There was a lack of resources, an inadequate transportation system, a predominance of unskilled labour, and a lack of funding from central government. This led to the development of a master plan to restructure the urban environment of the city region to increase its competitiveness. Table 3.3 lists China’s Major Economic Indicators for the year 2013.

### Table 3.2: Current land distribution and planned acquisition

<table>
<thead>
<tr>
<th>Ownership Agency</th>
<th>Number of Cases</th>
<th>Case Percentage</th>
<th>Current Used Land (ha)</th>
<th>Land Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military</td>
<td>5</td>
<td>0.56%</td>
<td>21.44</td>
<td>10.49%</td>
</tr>
<tr>
<td>Central Government Offices</td>
<td>19</td>
<td>2.15%</td>
<td>5.90</td>
<td>2.89%</td>
</tr>
<tr>
<td>Provincial Government Offices</td>
<td>47</td>
<td>5.32%</td>
<td>15.71</td>
<td>7.68%</td>
</tr>
<tr>
<td>City Government Offices</td>
<td>185</td>
<td>20.93%</td>
<td>65.97</td>
<td>32.27%</td>
</tr>
<tr>
<td>Railway Company Group</td>
<td>134</td>
<td>15.16%</td>
<td>46.64</td>
<td>22.81%</td>
</tr>
<tr>
<td>Private Companies</td>
<td>71</td>
<td>8.03%</td>
<td>17.15</td>
<td>8.39%</td>
</tr>
<tr>
<td>Collective Rural Land</td>
<td>94</td>
<td>10.63%</td>
<td>27.68</td>
<td>13.54%</td>
</tr>
<tr>
<td>Residential Area</td>
<td>328</td>
<td>37.10%</td>
<td>2.90</td>
<td>1.42%</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.11%</td>
<td>1.04</td>
<td>0.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>844</strong></td>
<td><strong>100%</strong></td>
<td><strong>204.43</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The competition faced by the PRD stemmed from at least 3 factors:

i. Intercity competition: the cities (or prefectures) within the PRD region have different historical backgrounds in terms of economic prominence and significance for China as a whole. For example, the city of Guangzhou had been known for its international port for more than 2000 years, while the city of Shenzhen was only beginning to become known internationally in the 80s (Ng and Xu, 2014). In between, there are also the smaller cities of Foshan and Zhuhai, both of which are near to Hong Kong and Macau. Both cities are competing to increase their tourism trade.

ii. Interregional competition: the PRD region has lost its attractiveness as a major international hub, firstly in terms of international waterway transport, and secondly in terms of intercity railway links to other hubs, such as the one in the Yangtze River Delta (Shanghai-Ningbo area) and the Beijing-Tianjin high-speed railway in the Bohai Rim.

iii. International competition: located in the south-eastern part of China, the PRD region faces competition from South East Asia. Without an effective intercity railway it is hard to transport both cargo and passengers around the vast area of the region, if compared to Singapore, for example, making the region less attractive for foreign investors.

Hong Kong and Macao are particularly important for the region to cultivate its international connections by encouraging foreign investors and investment capital into the PRD region and by facilitating access to the rest of Asia and the rest of the world for local businesses from the PRD region.

The development of the PRD transport hub and its impact on property and land values is an important focus of this report.
### Table 3.3  China’s major economic indicators (2013)

<table>
<thead>
<tr>
<th>Cities</th>
<th>Land area (sq.km)</th>
<th>Population (mn)</th>
<th>GDP (RMB bn)</th>
<th>GDP growth (%)</th>
<th>Per Capita GDP (RMB)</th>
<th>Added value of industry (RMB bn)</th>
<th>Retail sales (RMB BN)</th>
<th>Export (US$bn)</th>
<th>Actual FDI (US$ mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guangzhou</td>
<td>7,434</td>
<td>12.9</td>
<td>1,542.0</td>
<td>11.6</td>
<td>119,695</td>
<td>444.7</td>
<td>688.3</td>
<td>62.8</td>
<td>4,804</td>
</tr>
<tr>
<td>Shenzhen</td>
<td>1,953</td>
<td>10.6</td>
<td>1,450.0</td>
<td>10.5</td>
<td>136,948</td>
<td>579.5</td>
<td>443.4</td>
<td>305.7</td>
<td>5,468</td>
</tr>
<tr>
<td>Zhuhai</td>
<td>1,688</td>
<td>1.6</td>
<td>166.2</td>
<td>10.5</td>
<td>104,786</td>
<td>78.4</td>
<td>72.1</td>
<td>26.6</td>
<td>1,687</td>
</tr>
<tr>
<td>Foshan</td>
<td>3,848</td>
<td>7.3</td>
<td>701.0</td>
<td>10.0</td>
<td>96,310</td>
<td>387.3</td>
<td>226.4</td>
<td>42.5</td>
<td>2,521</td>
</tr>
<tr>
<td>Huizhou</td>
<td>11,158</td>
<td>4.7</td>
<td>267.8</td>
<td>13.6</td>
<td>57,144</td>
<td>142.3</td>
<td>85.8</td>
<td>33.3</td>
<td>1,834</td>
</tr>
<tr>
<td>Dongguan</td>
<td>2,465</td>
<td>8.3</td>
<td>549.0</td>
<td>9.8</td>
<td>66,109</td>
<td>242.6</td>
<td>148.7</td>
<td>90.9</td>
<td>3,938</td>
</tr>
<tr>
<td>Zhongshan</td>
<td>1,800</td>
<td>3.2</td>
<td>263.9</td>
<td>10.0</td>
<td>83,393</td>
<td>119.6</td>
<td>89.1</td>
<td>26.5</td>
<td>646</td>
</tr>
<tr>
<td>Jiangmen</td>
<td>9,541</td>
<td>4.5</td>
<td>200.0</td>
<td>9.8</td>
<td>44,546</td>
<td>69.7</td>
<td>90.4</td>
<td>14.0</td>
<td>923</td>
</tr>
<tr>
<td>Zhaoqing</td>
<td>14,856</td>
<td>4.0</td>
<td>166.0</td>
<td>11.5</td>
<td>41,479</td>
<td>80.7</td>
<td>49.3</td>
<td>4.8</td>
<td>1,241</td>
</tr>
</tbody>
</table>

Note: Statistics of value-added of industry cover all state-owned and non-state-owned enterprises with an annual sales revenue over RMB20 million

Source: China Trade Research (2009)

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### a. State rescaling in the making of city regions

The development of the PRD hub is associated with the politics of ‘reterritorialisation’, defined as ‘the reconfiguration and rescaling of forms of territorial organisation such as cities and states’ (Brenner, 1999: 431) to find advantages for the region in increasing its competitiveness (Li, Xu and Yeh, 2014). This arises in the form of rearticulating, reconstituting state spaces and jurisdictional structures, and signifies a critical alteration of state capitalism (Li et al., 2014).

The 2008 economic downturn made significant impact on the Chinese government’s overall spending policy. Around 4 trillion RMB (approx. US$ 600 billion) has been allocated to building new facilities—half of which are dedicated to upgrading the regional infrastructure, i.e. intercity rail services. Further, the PRD is an example of China’s ambitious effort to upgrade its underdeveloped railway system.

Under this new policy, the PRD hub is China’s ‘experimental lab’ for its market transition, export-oriented economy, and administrative restructuring (Li et al., 2014). There are 3 potential metropolitan areas in the PRD region as part of the long-term plan to increase the region’s market competitiveness internationally (Figure 3.5).
b. Entrepreneurialism in the making of city regions

Traditionally, the Chinese political environment has been hierarchical and centralised (Li, Xu, and Yeh, 2014). In this sense, economic policy and development has been administered with a prioritisation list through its area-based and sector-based administrative system.

However, state rescaling and administrative restructuring have one consequence, that is, urban entrepreneurialism (Xu and Yeh, 2005). Urban entrepreneurialism is a ‘more intense inter-urban competition and the conscious promotion of place-specific development strategies’ (Parkinson and Harding, 1995: 67). In this sense, a city has to adopt a more entrepreneurial mindset in order to stay at the top of the competition. In post-reform China, there are waves of decentralisation present due to individual states redefining themselves to cope with urban and regional development (Li et al., 2014).

In post-reform China, urban entrepreneurialism takes place through an inter-jurisdictional bargaining system (Xu and Yeh, 2013), in which each state negotiates and compromises the benefits and costs of participating in a proposed project. In other words, each state becomes...
In the case of the railway network planning in the PRD hub development, informal alliances between state governments and joint projects are used, albeit after a long period of negotiation. This involves historical contingencies and path dependencies in intergovernmental relationships by which existing institutional arrangements considerably restrain the trajectory and opportunities for development. In the PRD region, this type of relationship appears at four different levels: inter-ministry politics, interscaler relations, intercity politics, and state-market relations (Xu and Yeh, 2013). Chinese railways are all state-owned. They are operated, controlled and provided by the Ministry of Railways (MOR). Figure 3.6 illustrates the ad hoc institutional arrangements in developing a railway through province/ministry cooperation.

3.3 State and regulatory institutions in the development of PRD hubs

Inter-jurisdictional cooperation is a relatively new concept in China. In the PRD region itself, the cities are in fierce competition with one another in terms of attracting foreign investment and vying for economic growth. Cooperative partnerships as strategies to improve urban and regional governance have yet to be fully realised due to China’s disjointed policy framework (Wu, Xu, and Yeh, 2007). This is further emphasised by the division of authorities amongst different bureaucracies and economic decentralisation.

How state rescaling and urban entrepreneurialism influence the development of the PRD Hub will be discussed further in the following sections.
b. Inter-scaler relations

At this level, the complexity of the relationships is placed between the 16 railway bureaus and the 2 railway companies that the MOR owns, as these are operating locally and have been monopolised by the MOR. Although the local railway bureaus provide a sense of locality, the state governments still have to proceed via the central MOR to receive approval for an initiated railway plan. There is no standard protocol for cooperation and each project entails a different deal (Xu and Yeh, 2013). In an attempt to bridge the inter-scaler differences, a joint project company was set up as a vehicle to negotiate...
track-alignment and investment-allocation with low-level territorial and bureaucratic actors (Xu and Yeh, 2013). However, these negotiations were complex, due to the need for relocation, land-use changes, and cost/benefit ratios for contributing states.

c. Intercity politics

In China, cities are hierarchically organised into 5 levels: provincial, sub-provincial, prefectures, sub-prefectures, and counties (Xu and Yeh, 2013). In intercity politics, there is a hierarchy in terms of the ‘status’ a city holds. For example, a city with a provincial-level hierarchy like Guangzhou would have more power and politics to assert in the discussion than a county-level city. These statuses define 2 fundamental parameters in intercity cooperation (Xu and Yeh, 2013: 137). These are:

a. Different governments may not be on an equal footing in ranking. This will cause unbalanced political representation in the regional project. As an example, the first proposal for the railway upgrade put forward by the Zuhai government was overlooked and rejected because the provincial government failed to see the benefit. However, when Guangdong government became interested in the project, the proposal was given more priority.

b. Government relations are often re-articulated through a hierarchical structure, while lacking a mechanism to forge a horizontal collaboration. Here, the number of ‘Guanxi’ or close personal relationships with other state governments held by significant individuals within a certain state government plays a major role in facilitating a negotiation, for example when in 2003 the party secretary of Guangdong province and the railways minister agreed to speed up the development through the Province-MOR Agreement scheme (PMA scheme).

d. State-market relations

Due to the MOR’s monopoly in the track construction (all major train manufacturers are owned by the MOR) and service operations, it is hard for non-state investors – let alone the foreign investors – to take part in investing in and running the railway lines. This is somewhat detrimental for the MOR since non-state and foreign investment could relieve their financial burdens.

In sum, political factors are key because they reinforce the bargaining power. Administrative capital also counts, while sometimes cost-benefit analysis counts for nothing (Xu and Yeh, 2013: 143).

3.4 Decision-making in the planning and implementation of the PRD hubs

The development of an intermodal hub in a region is closely associated with the shaping of space economies as well as assisting the new urbanisation process development and city expansion (Zhang et al., 2010; Dai, 2011). Figure 3.7 illustrates a multilayer transport and logistics service model for the global trade hub.

There are 2 key functions of an intermodal hub (Hickman et al., 2015: 176):

I. As an important element of the multiple-link public transport journey (part of the internal interchange environment).

II. Providing the opportunity for hub-area development. High-density, mixed-use development around the hub can help support the redevelopment of city neighbourhoods, support patronage on public transport, and also improve vitality for the user’s experience in the hub (the external interchange environment).

In 2007, the NDRC in China announced 10 designated megacity regions, one of which was the PRD region. These regions are those that have the highest GDP per capita in terms of national output. Since most of the cities in the PRD region are port cities, there is the need for a transition into a multilayer regional global trade hub as part of a new form of port regionalisation (Rimmer, 1999). Table 3.6 (see below) lists several of the major infrastructure projects in the greater PRD region.

A major regional trade hub needs to be supported by at least 4 types of logistics and transport activities (Wang and Cheng, 2010: 104). These are:

I. Maritime transport that comprises the foundation of any major trade hub relying on or started from the large volume of shipments through water-borne transport to global destinations.

II. An effective land transport system that links up with its hinterland when the maritime hub is not dependent on transhipment.

III. A regional air transport hub or gateway that supports time-sensitive supply chains.

IV. Non-physical gateway dependent logistics that add value to the global trade through better supply-chain management.
A multilayer transport and logistics service model for the global trade hub

**Figure 3.7**


**Table 3.6**

<table>
<thead>
<tr>
<th>Connectivity</th>
<th>Infrastructure</th>
<th>Selected major Projects under Construction/Planning</th>
</tr>
</thead>
</table>
| **Within the Pearl River Delta region and Guandong Province** | Railways | • High-speed railways to Nanning, Guiyang, Xiamen and Maoming  
• Intercity railways linking the cities and major towns in the Pearl River Delta region  
• Metros of urban transits in Guangzhou, Shenzhen and Dongguan |
| | Expressways | • 1,110km of national network and 3,410 km of provincial network in the 12th Five-Year Plan Period |
| **Cross-boundary links in the Greater Pearl River delta region** | Railways | • Gunagzhou-Shenzhen-Hong Kong Express Rail Link  
• Hong Kong-Shenzhen Western Express Line |
| | Expressways | • Hong Kong-Zhuhai-Macao Bridge  
• Liantang/Heung Yuen Wai Boundary Control Point |
| **Cross-boundary links in the Greater Pearl River delta region** | Airport development | • The third, fourth and fifth runways of Guangzhou Baiyun International Airport and its neighbouring economic zone  
• The third runway of Hong Kong International Airport  
• The third runway of Shenzhen Bao’an International Airport |
| | Container terminals | • Phase three of Nansha Port in Guangzhou  
• The container ferry in Yantian Port and phase two of Dachanwan Port in Shenzhen |

Source: Invest Hong Kong (2014), p. 41
Depending on the level of economic wealth and prioritisation of expansion in the hub region, the 4 types of transport and logistics service are not equally important. There is the need for an adjusted and timely upgrade to conform to the current market situation of the region. Amongst others, these factors are (Wang and Cheng, 2010: 104):

I. The level of globalisation and trade.
II. The sophistication and efficiency of global trade organisations.
III. The level of wealth in the hub city in comparison with the region it serves.

The mix of transportation modes and their relative weights will be discussed in the following subsections.

**Domestic and International Connectivity: The Regional Railway Hub**

In the overall picture, the PRD region has a complete network for water, land, and air transportation. Currently, cities in the PRD region are interconnected by highways and railways. Improving the intercity railway network to include the high-speed rail link is part of the region's efforts to strengthen linkages amongst its cities.

The Outline of the Plan for the Reform and Development of the PRD (2009) stated that the intercity railway network would speed up and strengthen transportation linkages between the region’s West Bank and East Bank. According to the GRPD (2015), in 2013 passenger traffic in the PRD region reached 5.3 billion and contributed to 83% of the total passenger traffic of the province.

The most basic land transportation and logistics facilities that a hub city has are the development of a network of motorways (termed ‘expressways’ in China) (Wang and Cheng, 2010). Contrary to developing countries, the development of expressway routes is still considered to be the most efficient way to bring economic prosperity into a region in China. These expressways serve as the connection for trade transfers to and from port cities or hinterlands. However, with the growing numbers of container lorries and HGVs, a new mode of land transport is needed to complement this and to reduce the travel time.

The intercity high-speed railway network is the second level of sophistication and efficiency for global trade organisations (Wang and Cheng, 2010). Railway interchange hubs in China have different scales, ranging from super-large to basic hubs. This depends on the scale of the city where the hub(s) is located (critical geographical location) and the intensity of traffic flow.
Figure 3.8 illustrates a hierarchy of rail hubs in the PRD. The intercity railway in the PRD region was initiated by the Zhuhai city government in early 90s to revive and upgrade its existing cargo railway to increase goods-traffic efficiency between Zhuhai and Guangzhou. However, with the rail track having to go through several other states in between Zhuhai and Guangzhou, the plan was stalled for almost a decade with negotiations ultimately being taken to central government level. In 2008, the MOR upgraded the level of hierarchy of the rail hubs in the PRD region to be part of and eventually integrated with the national railway network.

There are 2 perceived benefits, namely transportation and economics. These are described in more detail as follows:

I. Transportation

Integrating the PRD West Bank with Guangzhou City, which should be the centre of the hub in terms of domestic as well as international transportation and transit. This increases the current goods and passenger flow in and out of the region, thereby reducing costs and time while increasing the efficiency and attractiveness of the region to foreign investors.

II. Economics

The economic benefits can be seen from the economic integration between the Western part of the PRD with Hong Kong and Macau Special Administrative Regions. With the ongoing upgrade to accommodate high-speed railways and bridges in the region, Hong Kong and Macau will fall within a reachable 3-hour commuting radius. This enhances the competitiveness of the PRD with countries in the Association of Southeast Asian Nations (ASEAN) and other economic zones in mainland China, such as the Bohai Rim and the Yangtze River Delta region. Sean Chiao, AECOM’s chief executive for buildings and places, said:

We can no longer think of the PRD with Hong Kong as the global gateway, but as an integrated megalopolis, with high-speed transport links bringing the cities together. Hong Kong needs to change its way of thinking from being a gateway or springboard to China to being a fully integrated part of this megalopolis. (Urban Land, 2014).
In post-reform China, cities and regions have been competing with each other for economic growth. It is said that interscalar relationships in state rescaling and entrepreneurialism are the basis for intercity railway-project decision making. Since China’s policy framework is disjointed, ‘fragmented authoritarianism’ has surfaced, due to economic decentralisation and functional division of authority among various bureaucracies (Xu and Yeh, 2013). As such, building a cross-jurisdictional intercity railway line is politically difficult. For this reason, informal alliances and cooperative partnerships between governments and joint projects are used.

In practice, the Chinese railways are state-owned and the state function is redefined by the imperative of market development (Xu and Yeh, 2013). However, any decisions on railway planning and investment have to be made through inter-ministerial networking between the NDRC and the MOR to negotiate and bargain towards a working consensus. These decisions include those involving: finance, planning, environment and land administration.

In addition, the networks of decision making for an intercity railway project are further complicated by the number of municipal city participants involved in the project. This creates a bargaining system (Xu and Yeh, 2013) that comprises a complex set of ‘Guanxi’ between actors in different functional groups and between different levels of governmental bodies.

In sum, project decision making is dependent on the relationships or ‘Guanxi’ held between:

**a.** City-level officials: the personal relationship network held in the bureaucratic system by a city mayor or a city party secretary can change a policy decision.

**b.** City-level officials and the provincial government. City status plays a key role in the project decision-making politics, since Chinese cities are hierarchically organised. Different city-level governments may thus not be on an equal footing with each other. Having a good relationship with the highest decision-making body in the provincial government will help sway the investment benefits to a city’s favour.

**c.** Provincial government and the NDRC–MOR: administrative capital plays a large role in project decision making (Xu and Yeh, 2013). To receive investment funding for the province (to boost the province’s position in the central government’s investment priority list) interscalar Guanxi held by the provincial government are important.
3.5 Financing the PRD hubs’ development

In theory, the funding of a hierarchical railway in China is planned according to a set of priorities. This is due to the differences in specifications of each passenger railway system in the country to fulfil a service tailored to the needs of each region. These priorities from a supply-perspective cover (Wang et al., 2012):

a. The best cost-effective distance as the ideal range of market coverage, and

b. The interval between stations or stops as a corresponding range for the best cost-effective operations. Of course, this also depends on the perceived speed of the railway in order to yield a competitive mode of transport in serving distant cities.

When the Guangdong government finally saw the importance of the Guangzhou-Zhuhai railway proposal, the provincial government began to lobby the plan to the central government. As a state-level project, the initial investment shares were divided between Zhuhai, Guangdong, and the MOR as major investors for the project, by 30%, 25%, and 40% respectively, Jiangmen13 also, albeit unwillingly, has a minor 5% (Li et al., 2014).

At this stage, a ‘Province-Ministry Cooperation’ (PMC) is applied. In addition to the PMC, a state-owned provincial investment arm was also established, called the Guangdong Provincial Railway Construction Investment Group (PRI) (Li et al., 2014). PRI in this sense is a vehicular organisation to accommodate (as a middle person) any negotiations between the MOR and the PRD cities affected by the project.

Before 2004, budgets for a new railway construction project were generated from a surcharge on freights (Wang et al., 2012). This was based on a special policy implemented in 1992.

In mainland China, **Foreign Direct Investment (FDI)** is defined as:

... the investments inside China by foreign enterprises and economic organisations or individuals (including overseas Chinese; compatriots from Hong Kong, Macau, and Taiwan; and Chinese enterprises registered abroad), following the relevant policies and laws of China, for the establishment of ventures exclusively with foreign owned investment, Sino-foreign joint ventures and cooperative enterprises, or for cooperative exploration of resources with enterprises or economic organisations in China. It includes reinvestment by foreign entrepreneurs of profits gained from the investment and the funds that enterprises borrow from abroad in the total investment of projects which are approved by the relevant department of the government. (China Statistical Yearbook, 2009: 761).

However, it was said that although the idea of inviting foreign and private investors is supported by both the Guangdong provincial government and the NDRC, it would be taken as an offence by the MOR (Li, Xu, and Yeh, 2014). This type of autocratic high-level state order reflects the barriers for non-state actors investing in state-owned projects. Although negotiations on route selection, station settings, expropriation of land, and more may be influenced by local governments, bottom-up efforts to introduce and sustain diversified investment sources are undermined by the power and monopolistic dominance of the MOR in railway construction projects and their operations.

---

13 In the late 90s, Jiangmen as well as Foshan had concerns in relation to the selection of the railway route, the position of the stations, and financing of the project. Foshan had concerns about the environmental impacts of the project, while Jiangmen, albeit contending with the need for the project, expressed a clear refusal to finance it (Li et al., 2014).
Table 3.7  
Capital investment for railway infrastructure (2000/09)

<table>
<thead>
<tr>
<th>Unit: Billion RMB Yuan</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital investment for railway infrastructure *</td>
<td>50.992</td>
<td>51.556</td>
<td>62.352</td>
<td>52.863</td>
<td>53.155</td>
<td>88.018</td>
<td>154.25</td>
<td>178.999</td>
<td>397.554</td>
<td>600.447</td>
</tr>
<tr>
<td>- MOR investment</td>
<td>45.554</td>
<td>45.391</td>
<td>53.877</td>
<td>49.046</td>
<td>48.936</td>
<td>74.33</td>
<td>130.092</td>
<td>149.241</td>
<td>246.378</td>
<td>460.792</td>
</tr>
<tr>
<td>- Local investment share</td>
<td>10.41%</td>
<td>11.94%</td>
<td>7.54%</td>
<td>7.22%</td>
<td>7.94%</td>
<td>15.55%</td>
<td>15.68%</td>
<td>16.82%</td>
<td>27.01%</td>
<td>23.26%</td>
</tr>
<tr>
<td>Cumulative debt of MOR *</td>
<td>335.46</td>
<td>371.836</td>
<td>396.809</td>
<td>399.178</td>
<td>459.083</td>
<td>476.752</td>
<td>640.077</td>
<td>658.706</td>
<td>868.395</td>
<td>1303.386</td>
</tr>
</tbody>
</table>

Sources: Calculated from the website of MOR, information on railway debts of various years, and relevant reports related to railway development and financing.

a) Capital investment for railway does not include investments for renovation and acquisition of rolling stock.

b) This includes firm investment outside the national railway system.

c) The debt does not include railway debts of local governments.

Source: Wang et al., 2012

Figure 3.10  
Financing and governance structure of MOR/CNRG-controlled Railway Project Development

Source: Wang et al., 2012
However, the timing of the PRD railway development put the MOR in a weak position, since the MOR had a shortage of capital due to focusing on other live projects at the time (the MOR’s overall budget was about 50 billion RMB at the time). Table 3.7 (see above) lists major capital investment for railway infrastructure in the period between 2000 and 2009. To overcome the budget shortage, the MOR had to find other sources of funding. This resulted in 3 different steps taken by the MOR (Wang et al., 2012: 5):

a. The first was the signing of the Province-MOR Agreement, or PMA, as a strategy for financing railway investment. The idea was that there would be separate PMA agreements for the different track portions of the project, when the China National Railway Group (CNRG) took control of the financing process on behalf of the MOR. The PMA thus confirms and legitimises the MOR and the CNRG in constructing the project and operating the services; also, the PMA defines the provincial share of the project capital in cash.

b. Secondly, the China Railway Investment Co. (CRIC), as a subsidiary of the MOR, acted as the financing arm of the project. The CRIC then issued bonds or borrowed money from the commercial banks on behalf of the project, since governments are not allowed to do so under the ‘Budget Law of China’ (Xu and Yeh, 2005).

c. Thirdly, according to the PMA all projects were deemed to be joint ventures, with the controlling share held by the CNRG on behalf of the MOR and the remaining shares divided between the states involved.

Figure 3.10 illustrates the financing and governance structure of the MOR/CNRG-controlled railway project development. The PMA, although monopolistic, was welcomed by the provincial governments in the PRD region, and of course other regions in China. This was due to the fact that it became a means of increasing a region’s connectivity and accessibility to the rest of the country, thus increasing the region’s competitiveness. Further, it became much easier to acquire land through the CNRG as the land-acquisition was used by local governments as part of their contribution to invest in the project (Wang et al., 2012).

3.6 The development of land adjacent to the PRD transport hubs

3.6.1 The land market in China

The land market in China has undergone significant change since the late 90s. This was driven by the politics and re-articulation of the state as well as the changing role of the state in land commodification. Traditionally in China, urban space is ‘an intricate venue engendered by the intersection of political elites, entrepreneurs, speculators, urban residents and migrant workers, and by the conjuncture of local transformation and transnational forces’ (Xu, Yeh, and Wu, 2009: 891). Before the 00s, the formation of land markets in China was mainly divided into 2 types:

i. Urban land → owned by the state

ii. Rural land → owned by the collectives

In this sense, the state has the right to confiscate rural land with the precept of public interest. Land supply is thus monopolised by the state for users via ‘administrative allocation’ (Xu et al., 2009). Three cities in the PRD region were exempt from this exercise, namely Guangzhou, Foshan, and Shenzhen. However, with the changing mechanism as an integral part of the changing post-reform urban conditions, the Provisional Regulations on the Granting and Transferring of the Land-Use Right over the State-Owned Land in Cities and Towns were enacted in 1990. Furthermore, the Land Administration Law was amended in 1998, and a Directory of Allocated Land was announced in 2001. This new law required that any land transactions for business purposes be transferred publicly and transparently, for example, through tendering, auction or quotation.

In 2004, the National People’s Congress amended China’s Constitution with the aim of protecting the lawful private property of citizens and to improve the land-expropriation system (Xu et al., 2009). A new property law was further adopted in 2007 to safeguard individual property rights. The property law required that recklessly destroying private properties to clear space for new major developments became illegal. The property law was part of an ongoing effort by the central Chinese government to ease tension and protect the urban disadvantaged, uprooted farmers, and displaced residents.

Since in China space-commodification is closely linked to state policies and regulations (Xu et al., 2009) land politics is thus constructed to reflect the growing interest in a stronger institutional capacity for directing capital investment in space. For example, in negotiating the proposed PRD railway plan, the local government of Zhuhai and Foshan opted to build the railway track in a new area north of the city, with the view that it would be a good prospect for future investment in real-estate development for the area and in expanding the city. Land income would be used to improve the urban infrastructure. In this way, accessibility is increased while opening up new venues for capital accumulation in urban investment, i.e. ‘using land to breed land development’ (Yeh, 2005).
Table 3.8: Land transitions in China: allocation, primary, secondary, market and illegal land-use activities

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (ha)</td>
<td>87,608</td>
<td>70,266</td>
<td>235,194</td>
<td>54,163</td>
<td>80,569</td>
<td>73,980</td>
<td>88,052</td>
<td>65,258</td>
<td>62,054</td>
</tr>
<tr>
<td>% in total land transaction</td>
<td>38.5%</td>
<td>17.2%</td>
<td>16.68%</td>
<td>8.32%</td>
<td>5.61%</td>
<td>2.98%</td>
<td>14.06%</td>
<td>4.36%</td>
<td>n.a.</td>
</tr>
<tr>
<td>2. Primary market</td>
<td>43,092</td>
<td>30,049</td>
<td>62,058</td>
<td>79,155</td>
<td>161,190</td>
<td>104,498</td>
<td>147,385</td>
<td>202,179</td>
<td>195,866</td>
</tr>
<tr>
<td>% in total land transaction</td>
<td>18.94%</td>
<td>8.34%</td>
<td>4.4%</td>
<td>12.16%</td>
<td>11.23%</td>
<td>4.21%</td>
<td>23.53%</td>
<td>14.78%</td>
<td>n.a.</td>
</tr>
<tr>
<td>2.1 Land Conveyance</td>
<td>43,092</td>
<td>30,049</td>
<td>62,058</td>
<td>45,391</td>
<td>48,633</td>
<td>90,394</td>
<td>124,230</td>
<td>193,604</td>
<td>100%</td>
</tr>
<tr>
<td>By negotiation</td>
<td>139,434</td>
<td>72.02%</td>
<td>129,083</td>
<td>71.12%</td>
<td>6,507</td>
<td>3.36%</td>
<td>4,338</td>
<td>2.39%</td>
<td>n.a.</td>
</tr>
<tr>
<td>By public tender</td>
<td>18,168</td>
<td>5.25%</td>
<td>9,773</td>
<td>5.38%</td>
<td>37,495</td>
<td>19.37%</td>
<td>38,316</td>
<td>21.11%</td>
<td>n.a.</td>
</tr>
<tr>
<td>By auction</td>
<td>28,843</td>
<td>105,438</td>
<td>10,128</td>
<td>17,556</td>
<td>15,552</td>
<td>8,773</td>
<td>2.89%</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>By quotation</td>
<td>4,921</td>
<td>7,119</td>
<td>4,176</td>
<td>5,599</td>
<td>17,023</td>
<td>5,583</td>
<td>5.83%</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>2.2 Land lease</td>
<td>7,330</td>
<td>15.06%</td>
<td>5,920</td>
<td>2.16%</td>
<td>129,308</td>
<td>12.01%</td>
<td>34,213</td>
<td>6.86%</td>
<td>21.17%</td>
</tr>
<tr>
<td>Transfer of use rights</td>
<td>7,290</td>
<td>14.98%</td>
<td>24,299</td>
<td>8.86%</td>
<td>63,347</td>
<td>5.88%</td>
<td>23,086</td>
<td>4.63%</td>
<td>67.19%</td>
</tr>
<tr>
<td>Leased</td>
<td>34,051</td>
<td>69.96%</td>
<td>244,121</td>
<td>88.98%</td>
<td>884,114</td>
<td>88.98%</td>
<td>885,532</td>
<td>88.98%</td>
<td>76.37%</td>
</tr>
<tr>
<td>Mortgaged</td>
<td>48,180</td>
<td>100%</td>
<td>29,623</td>
<td>100%</td>
<td>35,938</td>
<td>100%</td>
<td>18,554</td>
<td>100%</td>
<td>18.67%</td>
</tr>
<tr>
<td>% in total land transaction</td>
<td>21.38%</td>
<td>67.19%</td>
<td>76.37%</td>
<td>76.67%</td>
<td>81.6%</td>
<td>92.12%</td>
<td>59.52%</td>
<td>78.93%</td>
<td>n.a.</td>
</tr>
<tr>
<td>3. Secondary Market</td>
<td>7,330</td>
<td>15.06%</td>
<td>5,920</td>
<td>2.16%</td>
<td>129,308</td>
<td>12.01%</td>
<td>34,213</td>
<td>6.86%</td>
<td>21.17%</td>
</tr>
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</tr>
<tr>
<td>Leased</td>
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<tr>
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</tr>
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<td>67.19%</td>
<td>76.37%</td>
<td>76.67%</td>
<td>81.6%</td>
<td>92.12%</td>
<td>59.52%</td>
<td>78.93%</td>
<td>n.a.</td>
</tr>
<tr>
<td>4. Illegal Land Use on Record</td>
<td>25,120</td>
<td>52.14%</td>
<td>18,640</td>
<td>32.92%</td>
<td>22,728</td>
<td>63.24%</td>
<td>8,645</td>
<td>46.59%</td>
<td>12,792</td>
</tr>
<tr>
<td>Illegal occupation</td>
<td>12,118</td>
<td>25.15%</td>
<td>778</td>
<td>2.63%</td>
<td>926</td>
<td>2.58%</td>
<td>300</td>
<td>1.62%</td>
<td>2,263</td>
</tr>
<tr>
<td>Illegal transfer or sale</td>
<td>3,248</td>
<td>6.74%</td>
<td>2,774</td>
<td>9.36%</td>
<td>4,615</td>
<td>12.84%</td>
<td>2,524</td>
<td>13.6%</td>
<td>2,592</td>
</tr>
<tr>
<td>Others</td>
<td>7,694</td>
<td>15.97%</td>
<td>7,491</td>
<td>25.08%</td>
<td>7,669</td>
<td>21.34%</td>
<td>7,085</td>
<td>38.18%</td>
<td>4,666</td>
</tr>
</tbody>
</table>

The China Academy of Urban Planning and Design (CAUPD), which is positioned directly under the Ministry of Construction, oversees all the urban development in the country and is China’s leading planning policy advisor. The role of the CAUPD in the urban planning of the PRD hub development is further explored in the next subsection.

Finally, another system that is somewhat popular in China is the idea of ‘Land Banking’ (Xu et al., 2009), i.e. purchasing a large area of land where development opportunities have not yet arisen. However, there is not yet evidence that this kind of exercise is being undertaken as a part of land-acquisition for the purposes of the project.

Box 3.1 What is ‘land banking’?

The UK Land Registry [2016] offers the following definition of the strategy:

“Land banking means buying undeveloped land with the intention to split it up into smaller plots and then sell these plots on to buyers at inflated prices. The plots will sometimes be offered with the claim that the buyer will make huge returns on the investment if planning permission is granted at a later date. … the focus is on the ‘potential’ future value of the land against the current selling price. The land in question is often ‘green belt’ – farmland, parkland or open country which is protected from urban development by planning law. Alternatively it could be agricultural land where no development is ever likely to be allowed.”

Figure 3.11 New practices of land development since the late 90s in China

State land supply
Sources of municipal land banking

Collectively-owned rural land
State-owned leased land
Unutilized or state-owned rural land (state farm)

Land banking (government)

Urban primary land market
(Government & developer)
• Administrative allocation
• Urban land conveyance through negotiation, tender, auction, quotation, converting use right to investment share and short lease

Urban secondary land market
(among land users)
• Land trading
• Mortgaging

Collective land supply
Sources of collective land trading

Rural construction land

Allocated land and rural land

Land supply in the black market
Sources of black market land trading

Sporadic land trading
(Working units, collectives, farmers and developers)

Rural secondary land market
(among land users)
• Land trading
• Mortgaging

Project-based

Project-based

Source: Xu et al., 2009, p. 901.

14 http://blog.landregistry.gov.uk/what-is-land-banking/
3.6.2 Variable land and property requirements and built forms which comprise the hub development

Government-led strategic planning in China continues to play a vital role in terms of implementing economic and spatial restructuring in a region (Ng and Xu, 2014). In the case of the PRD, inter-state planning has played a major role in restructuring the economy and rebuilding the city image to upgrade the quality of the urban life. The example for the land and property development interface around the PRD hub can be seen from the cities of Guangzhou and Shenzhen.

Since Guangzhou is the provincial capital of Guangdong, so it is the centre of the transport hub. Since the economic reform in 1978 the urban growth in Guangzhou has accelerated, being one of the Chinese cities to benefit from it (Xu and Yeh, 2003). The city was granted special treatment in foreign economic policy (Cheung, 1999). This provided the city with an opportunity to reclaim its position as a commercial centre and entrepôt port (Wu et al., 2007).

At first, the rapid development of the inner-city part of Guangzhou resulted in a chaotic urban landscape crowded with an inadequate proportion of overfly highways and the number of cars and public transport. However, in 1980 the city incorporated 2 of its districts (Tianghe and Huangpu) and expanded the city’s boundaries, refocusing on developing land in urbanised villages. This facilitated relief from the pressure of land overuse in the old city boundary (Ng and Xu, 2014).

However, Ng and Xu (2014) also stated that the newly planned urban expansion had generated new problems. These were:

i. Different sets of planning standards—one applied for the old urban district and the other for new areas. For the 2 plans, there were differences in regulations for land-use densities, building densities, and floor area ratios. This means that when the new areas are already saturated, developers turn to opportunities within the old inner city.

ii. Spatial mismatch between residence and job types—long-distance travelling to and from work.

iii. Investments are prioritised for industries and infrastructure, not for public utilities in the new development areas, i.e. efficient public transports are only provided within the old inner city boundary.

To tackle this problem, the CAUPD set up a hierarchical order of spatial control. This was done by dividing the inner-city territory into 4 policy zones, each having different spatial regulations (CAUPD).
### 3.6.3 Impact on real-estate developments and land value

With the development of the hub in motion—some is already under construction—there are also some positive impacts on the development volume and land values in the areas adjacent to the hub cities. Table 3.9 compares Guangdong province real-estate trade indicators in terms of land development and the purchase of enterprise for real-estate development in the years 2008 and 2013. Compared to 2008, when the plan for the railway expansion was first agreed, the figures have increased significantly. Since 2013, real-estate indicators have been allocated their own section by the Chinese government as part of the yearly statistics report. This indicates that the NDRC’s 2008–20 railway network reform plan is having a significant impact, not only within the PRD region but also throughout the whole of China.

### 3.6.4 Impacts on environment

In China, the environmental discourses on development and planning are usually heavily infused with politics and power-relations. It is ‘a contested political act with material consequence about preserving and exploiting the environment’ (Xu, 2015: 2). Any environmental discourses that thus come to surface are highly dependent upon how a certain political regime makes sense of the phenomenon rather than simply the urgency involved (Xu, 2015).

In the case of the PRD hub development, the substantial land and fiscal demands of the project has typically resulted in some form of permanent alterations to the urban environment due to massive land encroachment, inner-city renewal, and new area development (Xu and Yeh, 2005). Environmentally, Xu, Yeh, and Wu (2009) claimed that irresponsible and uncontrolled massive land acquisitions reinforced market anarchy and disorder. It was an over-exploitation of resources, and, with the example of Guangzhou and Shenzhen, uncontrolled urban development leads to cities being spoiled, overcrowded and chaotic. The still authoritarian society serves as the lens to interpret environmental problems. Xu (2015: 5) categorised the lens into 3 contextual features:

I. A combination of an authoritarian political system and a neoliberal economic environment that lacks transparency.

II. The pressure imposed by urbanisation, as more than half of the country’s population now live in cities and the other half are highly dependent on major cities for their economic survival and livelihood.

III. A fragmented authoritarianism of China’s policy regime, in which the structure of spatial planning is highly fragmented—allocated to a range of different agencies and commissions. This causes an increase in cross-sector rivalries.

The 3 contextual features thus undermine the real question of how environmental discourses in development and planning should be tackled in the face of fierce competition between different institutional regimes.

#### Table 3.9 Guangdong province real-estate trade indicators

<table>
<thead>
<tr>
<th>Ownership Agency</th>
<th>2008</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land space pending development (10,000 sqm)</td>
<td>6606.10</td>
<td>4866.04</td>
</tr>
<tr>
<td>Land space purchased this year (10,000 sqm)</td>
<td>2639.40</td>
<td>2250.96</td>
</tr>
<tr>
<td>Transaction value of land this year (100 m RMB)</td>
<td>Not Cited</td>
<td>681.50</td>
</tr>
<tr>
<td>Total value of land purchased (100 m RMB)</td>
<td>504.90</td>
<td>981.77</td>
</tr>
</tbody>
</table>

#### Investment actually completed by enterprises for real-estate development by use

| Residential buildings (100 m RMB) | 2131.58 | 4530.63 |
| Office buildings (100 m RMB) | 99.52 | 337.27 |
| Houses for business use (100 m RMB) | 242.06 | 705.47 |
| Others (100 m RMB) | 476.07 | 916.23 |

#### Actual funds in place of enterprises for real-estate development

| Total actual funds in place this year (100 m RMB) | 3861.87 | 10472.94 |
| Domestic loans (100 m RMB) | 901.46 | 2143.59 |
| Foreign investment (100 m RMB) | 66.35 | 36.29 |
| Of which FDI (100 m RMB) | 56.03 | 31.87 |
| Self-raising funds (100 m RMB) | 1173.11 | 2798.34 |
| Others (100 m RMB) | 1720.94 | 5494.72 |


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3.7 Learning from Guangzhou Railway Station (GRS), Pearl River Delta (PRD) transport hubs, China

What do developmental patterns in the PRD region tell us about the processes and stimulants of large transport hubs and the effects on urban development in China?

A combination of conditions was paramount in the PRD region’s railway-development plan. These were:

a. **Economic climate** – The Chinese open-door policy introduced the country to the notion of globalisation and the international market. Many cities and regions in mainland China have since increased their competitive level against each other to gain prominence in the international market trade. The region has, however, failed to compete with others, e.g. the Bohai Rim and the Yangtze River Delta.

Further, since the handover of the Hong Kong SAR and Macau back to China, there has been an even greater pressure to redevelop the PRD region’s status as a transport hub—at least in the South East Asian market.

b. **Bargaining and favourable political situations** – As stated in previous sections, cities and regions in mainland China are divided by rank according to their importance in the governmental scale. Therefore, a lower-level city in this hierarchy would usually have less power to influence or propose a large-scale development in the regional level. It is not uncommon for large cities to have prominent voices in central government, causing a favouring towards successful economic areas becoming increasingly successful at the expense of other less prominent centres. In China, because of the hierarchical approach to cities, this effect seems to be exaggerated.

However, in the PRD region’s case, the lower-level city officials, using the Guanxi network, bargained for influence to add benefits for these cities in the proposal. The involvement of Guangzhou, a city of a higher political status, also accelerated the process. Further, although there were some disputes over the rail-route planning between the PRD region and the MOR, due to the MOR’s limited budgeting at the time it was then possible for the cities to push for the original routes put forward.

c. **Timeliness of decision making** – When the railway was first proposed by the Zhuhai government, the development plan was not prioritised by the MOR, the NDRC, or even the Guangdong provincial government. A few years later, it concurred with Guangzhou city’s desire to upgrade its overall urban infrastructure plan to increase the city’s competitiveness within the country. With this new development in progress, the appeal was then prioritised and the proposal was speeded through central government, the NDRC, and the MOR. This then allowed for an early start of the development on the master plan and construction to be finished by 2020.
4.0 Case Study 3: Karkardooma Metro Station, the Delhi Metro, and Transit-oriented Development (TOD), Delhi, India

4.1 Introduction

Karkardooma metro station is part of the Mukundpur-Shiv Vihar route in Phase III of the Delhi Metro. It will be the highest station in the network, standing at a height of 22m from ground level. The Metro's objective was to improve Delhi's chaotic transportation network, particularly reducing congestion, producing a cleaner environment and safer roads. Attaining the political and financial support of rival political parties, the Metro is being seen as the ‘Pride of Delhi’ and a catalyst for social transformation towards modernity and international competitiveness. It is also seen as an example of Indian ingenuity in tackling the challenges presented by its ever-growing population. The new station is about 12,000 sqm over 5 levels, with a further 12,000 sqm built for property development (Banerjee, 2012). Serving the areas of Karkardooma, Krishna Nagar, Gagan Vihar, Hargobind Enclave, Saini Enclave, and Jagriti Enclave, the metro station is expected to have 17,700 passengers per day and is scheduled to become operational by 2016 (DMRC, 2016). The project is currently at the design stages and is expected to be completed in the next 4 to 5 years.

The Metro and its Land Value Capture (LVC) financing mechanism has encouraged the introduction of a unique form of mixed-use developments, known as TOD representing a ‘new generation of major projects’ (Diaz Orueta and Fainstein, 2009). Karkardooma is the first TOD project to be approved by the government in December 2014.
Figure 4.3  Density of population (2011) NCT of Delhi

Numbers of persons per square km.

- 40,001 and above
- 30,001–40,000
- 20,001–30,000
- 10,001–20,000 (NCT of Delhi 11,427)
- 10,00 and below

Source: Ahmad et al. (2013) from Census of India (2011)
4.2 About Delhi

Delhi is the capital city of India. Delhi is also the historical and cultural centre of the country. It is currently the second most densely inhabited city and the second most densely inhabited urban agglomeration in India and the world’s third largest urban area. Under the Constitution of India’s 69th Amendment Act of 1991, the National Capital Territory (NCT) and its urban region have been given the special status of National Capital Region (NCR). The NCT of Delhi’s political administration is a Union Territory with its dedicated legislature, high court, and an executive council of ministers headed by a Chief Minister. New Delhi is jointly administered by the Federal Government of India and the local government of Delhi and is the capital of the NCT of Delhi. Characterised by significant socio-economic inequalities, Delhi’s population has grown dramatically over the last 20 years, reaching 24 million in 2015 (Bon, 2015). Initially forming as a walled city with a compactly restricted maze of streets, the city of Delhi evolved into a dispersed polynuclear morphology with a variety of residential and business districts and orbital travel patterns (Delhi Development Authority, 2003).

4.3 State and regulatory institutions in the development of the Delhi Metro and the TOD policy

There are 4 primary decision-making government institutions in the development of the Delhi Metro and in the drafting and implementation of the TOD policy:

- **Ministry of Urban Development (MoUD):** The Ministry of Urban Development is a national-level institution of the government of India and it formulates policies, sponsor and support programmes, coordinates the activities of various Central Ministries, State Governments and other nodal authorities, and monitors the programmes concerning all the issues of urban development in the country (Urban India, 2015).

- **Delhi Development Authority (DDA):** The DDA, established in 1957 by the government of India, is responsible for drafting the Delhi master plan and development of the city to provide housing, commercial and recreational space, and a social infrastructure for the city. The Authority’s mandate is broad—to promote and secure the development of Delhi and it is involved in almost every activity related to land, housing, and infrastructure in Delhi. DDA is also responsible for governing underutilized land parcels, large tracts of encroached lands, and unplanned settlements in the city.’ (Delhi Development Authority, 2015).

- **The Delhi Metro Rail Corporation (DMRC):** a joint venture company with equity participation from the government of India and the government of NCT of Delhi, which has been entrusted with the responsibility of implementation of the rail-based Mass Rapid Transit System for Delhi, NCR, and other metros (DMRC, 2015).

- **Unified Traffic and Transportation Infrastructure Centre (UTTIPEC):** DDA set up the UTTIPEC (Unified Traffic and Transportation Planning and Engineering Cell) in July 2008, ‘with a view to enhance mobility, reduce congestion and to promote traffic safety by adopting standard transport planning practices, capacity building, enforcement measures, road safety audits, traffic engineering practices and better organisational co-ordination for improved traffic management by efficient lane capacity and work zone management, utilities coordination, developing traffic culture and avoiding transport planning pitfalls in the NCT of Delhi. As per the notification, all transportation projects/transport engineering solutions in Delhi by any agency having road engineering/infrastructure implication would require clearance of the UTTIPEC (UTTIPEC, 2015). The Governing Body of UTTIPEC has representation from both government and private agencies.

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16 Source: http://urbanindia.nic.in/  
17 Source: Ref: http://www.dda.org.in/about_us/about_dda.htm  
18 Source: http://www.uttipec.nic.in/index1.asp?linkid=3&langid=1
4.4 Decision making in the planning and implementation of the Delhi Metro

The history and planning of the Delhi Metro dates back to 1970, when the Central Road Research Institute (CRRI) took up a study of the traffic and travel characteristics in Delhi. A combination of challenges plagued the transport system in Delhi, including:

1) Absence of a local train connecting the city. There was thus a complete reliance on road-based transport with roads shared between cars, motorcycles, buses, trucks, rickshaws and horse- or donkey-drawn carriages.

2) Orbital travel patterns, as opposed to radial travel patterns known in Europe and North America, creating diverse patterns of mobility.

3) Increased ownership of private motor vehicles, creating chaotic traffic conditions, extreme congestion, a high rate of traffic accidents, noise and air pollution (Chopra, 1994; Siemiatycki, 2006).

Added to this is a political environment with protracted jurisdictional contestation and power struggles between central, state and city governments over the control of urban mass rapid transport. Coupled with this have been funding shortages for large infrastructure projects and technical debates about the most suitable mode of transport for the city.

After years of studying various alternatives to address the worsening state of the city’s transport system, a Mass Rapid Transit system for the city was proposed. Various agencies, such as the Metropolitan Transport Team, the DDA, and the Delhi Urban Arts Commission (DUAC) suggested modifications to these recommendations.

Figure 4.4 A street view of Delhi

Image source: Bhattacharjee (2013)

Figure 4.5 The Delhi Metro

Image source: DMRC (2015)
After a thorough analysis of systems and required transit corridors, it was decided to commission a section of 65.1 km new length of Metro, with 13 km underground and 52.1 km on the surface (Siemiatycki, 2006). Planning for the Delhi Metro has taken around 30 years, due to jurisdictional tugs of war between the Central and Delhi Union Territory governments. While it received consent from both governments in 1995, rivalry and contestation continued concerning which government was worthy of political credit for its implementation and who should assume control of the system and its management.

In 1996, the DMRC, a government-controlled agency, was established as a joint venture between the Central government and the Delhi government, specifically for the construction of the Delhi Metro network. The DMRC assumes the majority of decision-making power over the metro construction and operation. The DMRC reports only to the MoUD, whose role is the coordination with other major stakeholders, ministries and agencies. The project was planned in 4 phases commencing in 1995 and ending in 2021. By the end of Phase III in 2016, 300 km of metro line are to be built. Phase IV of the metro is aimed to be completed by 2021 and will cover a 413 km route length (DMRC, 2003).

In 1998, with the objectives of reducing congestion, providing a cleaner environment and safer roads, the construction of the Delhi Metro project finally commenced. A combination of international and local funding sources were used to finance the project with 64% of the project cost provided by the Japanese Bank of International Cooperation, 33% provided by the Central and Delhi state governments, and 3% initially anticipated to be raised through property development (DMRC, 2003).

International expertise was sought in the planning, design and construction management of the Delhi Metro, with international firms from the US, Japan, France and Korea engaging in technology and knowledge-transfer partnerships with local firms, with the view of building the capacity for the local expertise to drive the development of later stages of the Delhi Metro project and other metro projects across the country.

The Delhi Metro constructions, despite experiencing the challenges often faced by public-sector organisations in India, was hailed by many as a benchmark in the efficient construction and operation of infrastructure projects with the project having been delivered on time and within budget. Indeed, the DMRC and its charismatic Managing Director, Dr E Sreedharan, were seen as national heroes scripting India’s new status as a world superpower (The Economist, 2006). The Metro was equally seen as a catalyst for social change towards ‘civility’ and an example of Indian ingenuity in tackling the challenges presented by its ever-growing population (Siemiatycki, 2006). The Delhi Metro boasts prestigious environmental credentials, including being recognised by the United Nations as the first metro rail and rail-based system in the world to achieve ‘carbon credits for reducing greenhouse gas emissions’ and helping in the reduction of pollution levels in the city by 630,000 tonnes per year (DMRC, 2014).
4.5 Financing the Delhi Metro

The Delhi Metro is a fine example of government-led development-based Land Value Capture (LVC) (see Box 4.1), a funding mechanism for urban mega projects not previously used by public-sector actors in India. The Delhi Metro has received overwhelming political and financial support from the national government with the DMRC given absolute power to acquire land deemed necessary for the development of the metro; a ‘special regime’ was needed with the DMRC positioned as a powerful agent ‘well insulated from normal politics’ (Bon, 2015; Delhi Metro Railway Operation and Maintenance Act, 2002). Along the route of the Delhi Metro, the appropriation of land was required for the project and was often undertaken with only marginal compensation. In what he termed the ‘physical destruction’ of the Delhi Metro, Siemiatycki (2006) recalled the blight of the disadvantaged community of Shahdrah, the illegal shanty towns spanning the Yamuna River, and other impoverished locations across the city that were subjected to forced expropriation, altering their way of life to pave the way for modernity in the form of the Delhi Metro. Indeed, the metro was seen as a catalyst for the revitalisation of communities and a driver for a more high-tech, formalised and service-driven economy, and thus seen as being in danger of driving a further chasm between the rich and poor members of Indian society.

To finance the Delhi Metro, the national government and the government of Delhi have financed the capital cost with budgetary support, as well as providing a sovereign guarantee to secure a loan from the Japan International Cooperation Agency (JICA). The flow of foreign capital was crucial to the project with the JICA assuming an important role as the main external financing actor of the project.

The need for financial returns was significant right from the start when the DMRC was established with property development—a vital instrument for the financial viability of the project. The view held by politicians and economists in Delhi was that the introduction of a metro station in a particular locality would subsequently increase the connectivity and attractiveness of the land surrounding the station, and hence increase its value. The DMRC was thus mandated by the government to use the capital gain resulting from this enhanced value of the land to finance part of its capital cost in the construction of the metro. In 1999 a property development division was created within the DMRC with responsibility for the real-estate projects. In order to finance approximately 11% of the construction cost of the first 2 phases of the project, the government leased to the DMRC several hectares of land owned by public agencies and ministries. The lease was for a period of 99 years and at a competitive intergovernmental transfer rate lower than the market rate. The objective was to encourage more flexible high-density mixed-use developments in an ‘influence zone’ spanning the metro route (Bon, 2015). The DMRC enthusiastically adopted the model termed ‘Rail + Property’, originally used by the Mass Transit Railway Corporation of Hong Kong. Under the model, the land is initially handed over to the DMRC and its price assessed before and after the construction of the metro infrastructure. The DMRC then recoups the increase in the value of the land by selling development rights to private-sector land-developers for residential, economic and commercial projects at a price much higher than the original price granted to the agency.
Box 4.1 What is land value capture (LVC)?

LVC is defined by Suzuki et al. [2015: xiv] as:

A public financing method by which governments:

a. trigger an increase in land values via regulatory decisions (e.g., change in land use or FAR\(^\text{19}\)) and/or infrastructure investments (e.g., transit);

b. institute a process to share this land value increment by capturing part or all of the change; and

c. use LVC proceeds to finance infrastructure investments (e.g., investments in transit and TOD), any other improvements required to offset impacts related to the changes (e.g., densification), and/or implement public policies to promote equity (e.g., provision of affordable housing to alleviate shortages and offset potential gentrification).

LVC establishes a clear link between creating value and capturing value, and has a better chance of success in places with premature property tax systems, as is the case in most cities in the developing world (Suzuki et al., 2015).

Financially, the metro was more successful as a stimulant for development than as a mover of people. (p. 286).

This approach is not unique to Delhi; in fact it is used increasingly in Asian cities such as Hong Kong, Singapore, Tokyo and Shanghai as a fund-raising instrument at the core of the Asian approach of: “the city pays for the city” (Bon, 2015). The approach creates high-density mixed-use spaces at the heart of the city where residential, commercial and economic activities coexist symbiotically, side by side in the newly created urban space.

To increase the profitability of the project, the DMRC has assumed the role of a property developer developing parcels of land it acquired along the route of the metro. For the first phase of the metro, the DMRC was mandated to generate about 7% of the total cost of the metro through property development, 4.35% for Phase 2 and 4.5% for Phase 3 (Bon, 2015). All revenue created from property development was reinvested in the construction of the metro. While revenue from property development was initially postulated by the government to account for a small percentage of DMRC capital with the project mostly financed by the government and soft loans, Bon’s (2015) analysis reveal that in some years revenue from property development has accounted for more than 40% of the total revenue generated from upfront payments received by the DMRC for residential projects with a 90-year lease period and commercial projects with a lease period of 30–50 years. Several of these property development projects are under construction or operational at the time of writing this report, including 5 residential, 15 commercial and one hotel project. According to Siemiatycki (2006):

\(^{19}\)Floor area ratio (FAR) is the ‘Ratio of a building’s total floor area to the size of the land on which it is built. The higher the FAR, the higher the density. Also referred to as floor space ratio (FSR) or floor space index (FSI).’ (Source: Suzuki et al., 2015)
The pursuit of property development has subsequently influenced the final alignment of the metro line with the route shifting as the DMRC searches for locations with opportunities to develop land for high-tech business centres, amusement parks and residential property. This, in return, has resulted in sharp increases in property prices along the route, in addition to land speculation by developers from the private sector (Shrivastava and Kumar, 2004).

Delhi has a complex governance structure and regulatory framework, due to the complex, interwoven and multiple layers of government stakeholders involved, including the national government, the Delhi government—which includes 3 municipalities—and the Delhi Development Authority (DDA). The DDA is a state enterprise that sits under the MoUD and is responsible for land management policies. The DDA vigorously restricted the part played by the private sector in housing development and infrastructure investment by pursuing the accumulation of a ‘land bank’ since the first master plan was published in 1961 (Ahmed and Choi, 2011). The DDA assumed ‘a quasi-monopoly’ over land in Delhi with land deliberately withheld and rarely disposed in the market, fueling land value escalation and land ‘sprawl’ just outside the DDA jurisdiction (Bon, 2015; Gladstone and Kolapalli, 2007).

However, an end to the DDA monopoly over land has recently come in the new land pooling policy (2013), the Delhi master plan (2021) and TOD policy which stipulates the involvement of the private sector in land development while leaving the DDA with control over planning procedures. The DDA was unsupportive of land ‘monetisation’ and the implementation of development-based LVC proposed by the DMRC and the transfer of land at the heart of the city to private developers. While the DDA had approved the land use for right of way, it has continually rejected plans proposed by the DMRC around change to land use for property development. While the DMRC was supported by the national government with a mandate to pursue property-development projects to finance its construction cost, it faced resistance from several lower government authorities, such as the DDA and the municipal governments, with statutory approval powers. In the absence of government guidelines clarifying the size, location or intended use of the land plots granted to the DMRC, the agency found it especially difficult to obtain approval for modification to floor-area ratio, changes to land use for property development, land tax issues and construction permits.

In 2008 and 2009 the dispute between the DMRC and the DDA was arbitrated by the MoUD, with 2 official documents published reaffirming the DMRC rights in pursuing LVC.
while at the same time clearly separating the operational (metro infrastructure) from the non-operational structures (real estate). The ministry has exempted the DMRC from seeking permission to initiate property-development projects, but the DMRC needed to seek approvals from the relevant local authorities in the locality. Local authorities often refused DMRC proposals for land-use changes to commercial use and such disputes have often taken 2–3 years to resolve, most likely through the courts rather than via negotiation and active discussion among the stakeholders. Indeed, local authorities using regulatory instruments tried to curb the monopolistic power of the DMRC—not over the land required for the construction of the metro, for which the DMRC enjoys absolute power under the Indian Railway Act, but over the real-estate element and its unclear regulatory framework.

In 2012 the central government issued new national guidelines sent to the secretaries of each state and all transport agencies in relation to the mechanism of LVC and the introduction of new planning regulation around metro megaprojects. The note proposed a new urban policy particularly focusing on the introduction of new tax revenues from the influence zones spanning the route of the metro through land-use densification, increase in the FAR, and prioritising mixed-use developments and an incremental annual increase in property tax. A Dedicated Urban Transport Fund was to be set up at the state, regional and municipal levels for the collection of these newly introduced taxes, with the revenue used to finance new transport and development projects.

4.6 The development of land adjacent to the Delhi Metro transport hubs

4.6.1 Inception of transit-oriented development (TOD) in Delhi

In spite of Delhi’s massive investment in the public transportation system of the Delhi Metro, public transport still remains a secondary mode of transport for the public (see Box 4.2 below). Only 3% of the population uses the metro and almost 3 times that number use private vehicles to commute distances between 4 and 10 km (RITES Transport Demand Forecast Study for Dept. of Transport, GNCTD, 2010). This has resulted in the ever-increasing growth of privately-owned vehicles in the city. In fact, Delhi has more private motor vehicles than Chennai, Mumbai and Calcutta combined (DMRC, 2004). Vehicular emissions contribute to 70% of the air pollution in Delhi and approximately 21 people die of respiratory diseases in the capital every day. Major arterial routes of the city are currently as low as 10 km/hour average speed in peak hours.

Box 4.2 Optimism bias and the Delhi Metro

In line with the findings of Pickrell (1989) and Flyvbjerg et al. (2003) that suggest that railway networks seldom meet their forecasted patronage, the ridership of the first phase of the Delhi Metro has significantly fallen below expectation. In 2004, the number of passengers was 115,000 per day, significantly below the original daily forecasts of 150,000 rides. By 2005 the forecasted number of passenger trips was revised downwards by the DMRC from 2.2 million per day to 1.5 million. However, in July 2005, a local newspaper reported that the Delhi Metro was being used by an average of 250,000 passengers per day, about 17% of the revised ridership forecast and 11% of the original forecast (Siemiatycki, 2006).

However, the ridership rate seems to have taken a turn for the better as the years progressed with daily ridership reaching 2.8 million in 2016.21

This has compelled the development authorities to look at formulating a TOD policy for the city of Delhi, the first of its kind in India. Delhi’s prime planning agencies, the DDA and the MoUD, set up a specialised cell named the ‘Unified Traffic and Transportation Planning and Engineering Cell’ (UTTIPEC) in July 2008. The main objective of this cell was to look into all traffic and transportation projects in Delhi and the NCR to ensure sustainability and efficiency, and to promote an enhanced public transport network over the years (Jaiswal et al., 2012).

Box 4.3 What is a transit-oriented development (TOD)?

TOD was defined by Suzuki et al. [2015: xv] as ‘a compact, mixed-use, pedestrian friendly development organized around a transit station. TOD embraces the idea that locating amenities, employment, retail shops, and housing around transit hubs promotes transit usage and non-motorized travel.’ A classic TOD neighbourhood often has as its centre a transit station such as a metro station, a train station, bus stop or a tram stop. This central transit hub is encircled by high-density development, with the lower-density development spreading outwards from the centre.

TOD, according to the UTTIPEC, is restructuring the city based on a mass public transit network and MRTS (Mass Rapid Transport Stations), which is defined as a system in which ridership is more than 30,000 phpdt (peak hour peak direction traffic). The idea of the introduction of the metro

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system in Delhi was to give people commuting by cars an option to use mass rapid transport so that congestion and dependency on roads would be reduced. However, it is observed that the car users have remained on the road and traffic has increased substantially. The commuters of the other big public transit system, i.e. the buses, have now moved to the metro because the buses get jammed in traffic. Hence, this has not really resolved the objectives with which the metro was introduced.

The UTTIPEC believes that the introduction of TODs, which will densify metro influence zones, will promote walkability to the metro and hence help mitigate traffic. It will also bring in high-value set-ups to the intense metro zone where workplaces will be located and people can walk to them.

In the draft policy issued by the DDA in December 2012, ‘Transit-Oriented Development’ is defined as ‘essentially any development, macro or micro that is focused around a transit node, and facilitates complete ease of access to the transit facility thereby inducing people to prefer to walk and use public transportation over personal modes of transport.

The Primary Goals of TOD are to:

i) Reduce/discourage private vehicle dependency and induce public transport use – through design, policy measures and enforcement.

ii) Provide easy public transport access to the maximum number of people within walking distance – through densification and enhanced connectivity.’

**Figure 4.7 Principles of TOD design and the related factors**

Source: Original based on draft policy issued by DDA, December 2012
4.6.2 The case of Karkardooma Metro Station and TOD

Karkardooma was the first TOD project to be approved by the government, in December 2014. As shown by the minutes of the meeting of the DDA, dated 12.12.2014, the proposal contained in the agenda some notes regarding ‘East Delhi Hub: Integrated development of 30 hectare land at Karkardooma based on TOD development norms – first TOD project’. There were 2 primary reasons for selecting Karkardooma as the pilot project for TOD, as follows:

1. Karkardooma fell within the Greenfield category with no existing social infrastructure or road networks. Almost 90% of the land of this 30 ha belonged to the DDA and was vacant. Therefore this site could be easily adopted to test out TOD policies for the Greenfield category without any issues related to land-acquisition or existing tenements.

2. The site not only housed old and new Karkardooma metro stations but also had very good connectivity to Vikas Marg Station and the new MRTS Line III that stretches from Yamuna bank to Anand Vihar Terminal. Also, almost 70% of the site fell within the 500 m influence zone of the 2 MRTS at Karkardooma. The Swami Vivekanand Inter-State Bus Terminal is 3.8 km away from the metro station. This made the site an important transport node.

As part of the approval during the DDA meeting of December 2014, Table 4.1 shows the area statement of the proposed land on which the development is to take place.

<table>
<thead>
<tr>
<th>Table 4.1 Area statement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Approximate Land Area</strong></td>
</tr>
<tr>
<td><strong>Area: sqm</strong></td>
</tr>
<tr>
<td>Overall DDA Land Area as per survey dated 2012 [to be reverified by lands department]</td>
</tr>
<tr>
<td>Land north of Vikas Marg [to be retained as bus terminal as per previous layout plan, Exhibit A1]</td>
</tr>
<tr>
<td>Existing G D Goenka School</td>
</tr>
<tr>
<td>Primary School Plot for Vikramshila Society [allotted vide TC decision dated 17.02.2014]</td>
</tr>
<tr>
<td>Developable Site Area for comprehensive TOD Scheme:</td>
</tr>
<tr>
<td>Land Area under mixed-use blocks</td>
</tr>
<tr>
<td>Land area under utilities</td>
</tr>
<tr>
<td>Land under roads and circulation [incl. pedestrian-only streets]</td>
</tr>
<tr>
<td>Land area under green/recreational Area</td>
</tr>
</tbody>
</table>

Source: Minutes of the meeting of the Delhi Development Authority dated 12.12.2014

The policy has put planned and unplanned development existing in Delhi into 3 broad categories:

- **Redevelopment/Infill** – Sites within the Intense/Standard TOD Zones which are within the Existing Urban Area of Delhi and suitable for development/redevelopment. Infill sites are empty sites within the Existing Urban Area which may have opened up for development. Redevelopment sites could be low-density areas with gross density less than 250 du/ha, shopping/commercial centre, industrial areas/clusters, resettlement colonies, unauthorised colonies, urban villages and Jhuggi Jhopari clusters (slums).

- **Greenfield** – Sites within the Intense/Standard TOD Zones which are in the Urban Extension Area of Delhi where provision of road networks, services, and social facilities has not yet taken place.

- **Retrofit** – In addition to TOD Transition Zones, sites within Intense/Standard Zones which have existing gross density higher than 250 du/ha may not be suitable for redevelopment, but may need retrofitting to meet the TOD Zone.

The vision for TOD encompasses 3 spheres of social, economic and environmentally sustainable development. This vision is called out to address 5 major parameters, which are: (1) Safety, (2) Clean and usable greens, (3) Ease of commute and access, (4) Civic pride, and (5) Democratic and transparent development (see Figure 4.7 above).
The land area around the Karkardooma site is primarily residential, with planned residential colonies surrounding the site. The design of Karkardooma as the pilot TOD project will adhere to maximum ground coverage of 40%, a maximum FAR of 400 and a maximum density of 2000 persons per hectare (PPH) and will try to implement these principles in the Greenfield site:

1. Pedestrianisation is the key parameter to the success of a TOD and has been given prime significance in the design of this pilot development. Pedestrians are placed in the centre of planning, as against roads or flyovers. This requires a paradigm shift, which is what the intention of the policy has been. UTTIPEC has defined a street-design guideline that calls for universal accessibility and street hierarchy to promote walkability. Wide pedestrian boulevards from various clusters of development have been planned to lead to the metro stations, which will enable people to walk or cycle comfortably under tree-lined canopies away from the chaos of traffic. These boulevards will also ensure that walkability is convenient in all seasons of the year, as summers in Delhi can be quite harsh (DDA, 2015).

2. The pedestrian boulevards intersect with the larger community greens that become pause points in the journey. These larger parks are planned to have a mix of activities and active ground-plane edges so that there will be eyes in the park at all times of the day (DDA, 2015).

3. Because of the planning norms, green spaces in any neighbourhood cannot form more than 15% of the total land area. Within that space there are currently concerns such as most being unused for most times of the day as they are surrounded by single use development or are simply walled off. The design aims to resolve this by providing green spaces that are more inclusive to a mixed-use development. This will make it easy for people to access this space and constant movement and footfalls will also make the space safe. Such a space can easily be used by all age groups within the society. Well-maintained, universally accessible public spaces bring a sense of civic pride and safety among citizens. Such spaces also bring a sense of inclusiveness and responsibility among people, which keeps them alert towards crime and in turn helps in keeping the space safe (DDA, 2015).

4. The built form around these open spaces and within each development cluster is designed to have an active ground plane that encourages activity and movement throughout the day. The current planning norms have given rise to large gated communities and wide roads with heavy traffic hinder the movement of people and discourage them from walking. There have been instances when people have had to use an auto-rickshaw only because there is no shorter access or there is a road full of traffic that cannot be crossed. Such situations have to be curbed and an effective way to do so is to reduce block sizes and create a hierarchy of roads that allows people to walk.

5. There is an attempt in the design to create a sense of identity and pride for the development through iconic buildings. While these buildings will definitely be striking in architectural character, the programme of such buildings has been worked out so that they remain immensely public in use (DDA, 2015).

6. Additionally, the design strives to be inclusive for all segments of the society. Over the years the growth of Delhi has seen the housing for lower classes being moved outward towards the fringes. This causes a long commute for people from these sections of society and, more importantly, does not promote a cohesive all-inclusive growth. UTTIPEC has critically studied the existing housing market consumers and the set of consumers that are particularly looking for housing. Studies have shown that the housing market is catering for a very small segment of consumers and most others are forced to either buy in the fringes or live in rental accommodation (DDA, 2015).

7. The Karkardooma site has a live context to it which comprises planned residential colonies, older village settlements, and some commercial development—both organised and unorganised. The design responds to its context. It does not wall off the planned community from this context but lets it interact and supports it by lending the transit mode accessible to these adjoining areas too. The pinnacle of the project is a signature 100-floor tower with other towers within the complex, reaching about 10–30 floors (DDA, 2015).

8. The Karkardooma project was awarded to National Buildings Construction Corporation Ltd. (NBCC), a Government of India Enterprise, in December 2014. NBCC is a government-owned Construction Company that has been executing projects in various fields including road infrastructure, healthcare, institutions, commercial projects, airports and industrial projects. The total cost of the project is estimated to reach Rs 4,500 crore with work on site planned to start in 2016. NBCC will be responsible for organising the marketing and sales of the properties, revenues from which will be kept in an escrow account managed by a high-level board with representatives from both the DDA and NBCC. NBCC will be paid charges for project management, a certain fee on construction cost, a fee for managing sales and marketing. The surplus amount will be the property of the DDA (Banerjee, 2015).
Apartments
Plotted/Planned
Unauthorised
Slum/JJ colony

Residential
Commercial
Public
Industrial
Recreational
Unknown

Source: Minutes of the meeting of the Delhi Development Authority dated 12.12.2014

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<table>
<thead>
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<th>Figure 4.10</th>
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<tr>
<td><strong>Entry to existing Karkardooma metro station</strong></td>
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<td><img src="image1" alt="Image" /></td>
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<tr>
<td><strong>Construction of new Phase III metro line</strong></td>
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<td><img src="image2" alt="Image" /></td>
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<td><strong>New interchange metro station at Karkardooma under construction</strong></td>
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<td><img src="image3" alt="Image" /></td>
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<td><strong>Existing school on Karkardooma TOD site</strong></td>
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<td><img src="image4" alt="Image" /></td>
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<td><strong>Unauthorised development around the site</strong></td>
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<td><img src="image5" alt="Image" /></td>
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<td><strong>Platform of existing Karkardooma Metro station</strong></td>
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<td><img src="image6" alt="Image" /></td>
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<td><strong>Vacant DDA land of Karkardooma TOD site</strong></td>
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**Image source:** Courtesy of Supriya Thyagarajan
4.7 Learning from Karkardooma Metro Station, Delhi, India

What do developmental patterns in the metro mega project—particularly in relation to property development—tell us about the processes and stimulants of large transport hubs and the effects on urban development in India?

A combination of several factors was paramount to the development, as follows:

a. The prominence of key actors – This case study underlines the role of the state as the main actor on the Delhi metro mega project. The role of the DMRC was also highlighted as a powerful parastatal government agency with the absolute power for the metro construction and operation. An ad hoc structure of governance (Bon, 2015) was created around the DMRC for the successful completion of the metro on time and to budget. The property side of the development where revenue was generated from the land granted to the agency through the LVC mechanism was also profitable, albeit resulting in disputes and disagreements with other government agencies over the management of these public land resources.

b. The intertwinement of multiple governing structures – Institutional fragmentation and cascading government structures are common in the governance of Indian cities, but they are most pronounced in Delhi. The central government intervenes directly in the management of land in the city, with the state and municipal governments also having their say on how public land resources should be managed. This has created several challenges in the implementation of the project, particularly in relation to the LVC funding mechanism. Conflict among public-sector actors remains an issue in India, with tugs of war over who has the decision-making power over the development of land around major rail projects. In addition, the minimal stakeholder consultation in the development of these mega infrastructure projects may jeopardise their legitimacy in the long run.

c. The need for unequivocal political support – The metro mega project was initiated from the pressing need to modernise and address the chaotic transportation issues in Delhi. The construction of the Delhi metro infrastructure has received unequivocal support from all parts of the government. This is in contrast to the property development part of the project which was marred by disputes and competition among state agencies, each with a different vision of how the urban space should be developed.

d. A favourable economic environment and availability of finance – There has been substantial institutional change in India, particularly the involvement of private sector actors and international finance in the development of infrastructure mega projects. Policymakers and planners in India also seem to be keen to observe international development models and subsequently adapting them to India’s unique socio-economic and political context. For instance, the borrowing of the LVC funding mechanism termed ‘Rail + Property’ from Hong Kong is a good example of ‘transnationalization of policy’ (Stone, 2004). In the case of the Delhi Metro LVC, the Indian government used it as an experimental ground for the new policy before applying it to the country at large. These new planning processes continue to be led by the state, albeit with inbuilt mechanisms to partner with the private sector at national and international levels. In fact, in its quest to fund the considerable cost of its mega projects and the substantial technological abilities needed, India is rigorously seeking foreign capital and expertise.
5.0 Conclusion

5.1 Cross-case findings

This section outlines a number of main findings from an international study of decision-making in the planning and delivery of mega rail infrastructure projects in the UK, China and India, with a focus on railway transport hub developments and their surrounding environment. The purpose of the study was to capture transferrable lessons learnt for the decision makers involved.

An individualistic set of drivers associated with the development process was identified in each setting following the consideration of the context-specific nature of the transport hub, its location and its political and economic environments. This enabled consideration of local stimulants in the development of the transport hubs.

5.1.1 The prominence of key actors

Distinctive patterns in the development process, particularly project actors and their relationships, encouraged the development of the transport hub. In particular, a distinctive set of actors (or agents) was identified in each setting who were paramount in driving the development process of both the transport hub (the node) and the surrounding area (the place). With diverse objectives (social, political, environmental, and economic), the strategies and actions of those actors, e.g. investors, developers, landowners, public agency planning officers, politicians, and community groups and their active involvement, were critical in making the search for solutions to the development challenges possible. The local authorities and Argent are most evident in King’s Cross in the UK. The role of the ‘broker’ is also evident in King’s Cross with Argent negotiating with Camden and Islington on behalf of the landowners. In the PRD, the monopolistic powers of state institutions such as the MOR cannot be overlooked. In India, the role of the state is evident as the main actor in the Delhi Metro mega project.

The role of the DMRC was also highlighted as a powerful government agency with the absolute power for the metro construction and operation.

5.1.2 The intertwining of governance and relationships

Relationships are concerned with the structure of decision making which is framed by the organisation of economic and political activity and of values associated with land, property, buildings and environments. Relationships in King’s Cross could be seen to adopt a ‘communicative’ approach (Healey, 1992) to planning in which the government has clearly blended its strategy with those of multiple non-governmental actors. In the case of China it is largely ‘authoritarian’, albeit with a fragmented approach to spatial planning and multiple agencies and commissions involved, leading to cross-sector competitions. In India, institutional fragmentation and cascading government structures are evident in the development of the Delhi Metro. The central government, the state and municipal governments are in a tug of war over the control of public land resources and their management. In addition, the limited stakeholder consultation in the development of these mega infrastructure projects may threaten their long-term credibility.

Across the 3 case studies, relationships between project actors are mostly multi-scaler in that they exist across multiple levels (central, regional, local, and megaproject level) with power struggles to influence the project outcomes (Delaney and Leitner,1997). An observation of inter-actor relationship shows the dynamism and evolving nature of these relationships. Indeed, these relationships are not static, but span a long period of time as the project moves across its different developmental stages.
5.1.3 The timeliness of decision making

The timeliness of decision making is paramount to the development of the 3 projects, and decision making processes at multiple, interdependent and interwoven levels have driven the development process and produced distinctive patterns in particular periods. For instance, the development at King’s Cross Central underlines the importance of timeliness of decision making at the interface between land-use planning and the wider infrastructure-system planning. Uncertainty surrounding the decisions over the location of the high-speed railway station delayed planning permission for the site of the King’s Cross Central development. The site development was reignited by the decision to route the CTRL to St Pancras, coupled with the decision to upgrade King’s Cross Underground station. In the case of GRS and the wider PRD development, it was the involvement of actors who were empowered in such an environment to influence the process positively in their favour. After years of futile attempts by the Zhuhai government, it was the Guangzhou city’s interest in the project, a city with higher rank in terms of ‘status’ that accelerated the development process.

5.1.4 Supporting political context

The context, in terms of the institutional setting, is also critical. Indeed, an inter-actor relationship ‘does not occur in a ‘vacuum’ but is increasingly influenced by the specificity of the national and local context’ (Bertolini, 1998). Context is seen as ‘socioeconomic environment which presents problems as well as opportunities’ to actors interacting in an effort to build a ‘capacity to act’ (Stoker, 1995: 274). Bertolini (1998) refers to it as ‘context in action’ providing some actors with power while removing it from others. In the case of King’s Cross, two significant political factors were catalysts to the development. First, the UK government’s pursuit of strategies encouraging private-sector involvement in public-sector provision through deregulation and privatisation of British Rail. The companies then pursued a strategy of complementarity, in which revenues from property were used to finance operational investments as well as strengthen the companies’ finances.

The second significant political factor was the introduction of the Channel Tunnel Railway Act of 1996 and the decision to relocate Britain’s first high-speed railway, the CTRL, from London Waterloo rail station to St Pancras. This was the catalyst for change for the King’s Cross area and significantly motivated the landowners, then LCR and Exel (now DHL), to develop the railway lands to benefit from the outstanding transport accessibility brought by the CTRL and the significant upgrading and restoration of Underground stations as well as national mainline stations. In the case of PRD, due to the hierarchical structure of governance the lower-level and higher-level city officials in the PRD, using their Guanxi network, bargain for influence to add benefits for these cities in the proposal. Further, although there were some disputes over the rail routes’ planning between the PRD region and the MOR, due to the MOR’s limited budgeting at the time it was then possible for the cities to push for the original routes put forward. In the case of Karkardooma, the construction of the Delhi Metro infrastructure has received unequivocal support from all parts of the government. This unequivocal political support and commitment was instrumental in driving the project forward, against the multitude of challenges often experienced by public-sector projects in India.

5.1.5 Favourable economic context

New trends have been observed in the production of urban space, closely related to fields in urban studies such as ‘Urban entrepreneurialism’ (Harvey, 1989) and the ‘neoliberal city’ (Hackworth, 2007). At the time when the development of King’s Cross was underway, the UK was experiencing significant economic restructuring, coupled with substantial spatial reconfigurations with complex land and property-value redistribution. In King’s Cross ‘neoliberalism’ fostered ‘the pursuit of various public interest goals, such as providing a safe and efficient transportation system, or creating representative public spaces in the urban core, is handed over to private or privatized profit-seeking actors’ (Peters, 2009, p. 178). The office-market recovery since the early 90s has particularly encouraged the development at King’s Cross, with office space assuming the largest share of the development. Official policy was in favour of such development as a strategy to solidify London’s position as an international financial centre (London Plan, 2004). Economic drivers in the case of the PRD were mainly the Chinese open-door policy and its drive towards globalisation and internationalisation, coupled with increased competitiveness among Chinese cities against each other to gain prominence in the international market trade, with the PRD region’s prominence declining against other regions such as the Bohai Rim and the Yangtze River Delta. This was reinforced by pressure to redevelop the PRD region status as transport hub to facilitate better integration of the Hong Kong SAR and Macau. In the case of the Delhi Metro, the borrowing of the LVC funding mechanism termed ‘Rail + Property’ from Hong Kong is a good example of how policymakers and planners in India are observing international development models and subsequently adapting them to India’s unique socio-economic and political context. India is undergoing significant institutional change, particularly the involvement of private-sector actors and international finance in the development of mega projects. Albeit remaining mostly led by the state, these new planning processes have inbuilt mechanisms to partner with the private sector at national and international levels.
5.1.6 The challenges of multifunctionality

The functional challenges associated with the station-area development should not be overlooked. Achieving multifunctionality is not easy, since it requires an imaginative combination of what Bertolini (1998) calls ‘providing orientation’ and ‘letting it happen’ and addressing both profitable and non-profitable elements of the development. This has successfully been achieved through mixed-use development in King’s Cross and is the aspiration of the TOD policy in Delhi. In China, a less explicit link between transport hub development and property development can be observed. However, as the development of the hub projects are in full swing, with some already under construction, there are also some positive impacts on the development volume and land values in the areas adjacent to the hub cities, with real-estate indicators now allocated in their own section by the Chinese government as part of its yearly statistics report since 2013. This indicates that the NDRC’s 2008–20 railway network reform plan has had a significant impact, not only within the PRD region, but also throughout the whole of China.

5.1.7 The availability of finance and opportunities for overseas investments

According to the OECD (2006), US$ 53 trillion is needed globally for new infrastructure between 2007 and 2030. Indeed, the development of transport hubs is an expensive endeavour, given the technical complexity and the multiple and sometimes conflicting requirements that need to be met. This study was particularly concerned with the forms of investment, finance and investor activity in hub development, including local capacity in terms of expertise and finance, as well as opportunities and difficulties for overseas investors. In the case of King’s Cross, the availability of international finance as well as the involvement of profit-seeking ‘venture’ developers largely drove the project with the involvement of Argent, armed with the BT Pension Fund, critical to the development of King’s Cross Central.

To the contrary, in the GRS and the wider PRD development, autocratic high-level state orders represent barriers for non-state actors to invest in state-owned projects. While the potential to involve foreign and private investors is supported by the provincial government and the NDRC, it is not welcomed by the MOR, which enjoys great power and a monopolistic dominance in railway construction projects and their operations. Thus, it can be argued that while opportunities for overseas investments abound in the development of UK transport hubs, there are restrictions to overseas and indeed non-state actors’ investments in China’s transport hub development projects. In the case of the Delhi Metro, the availability of international finance was pivotal and the government rigorously sought foreign capital and expertise. This indicates ample opportunities for foreign investors seeking to invest in India’s growing portfolio of mega projects.

5.1.8 Sustainable transport and land use

Across the world, there are strong calls for the alignment between land-use strategies and transportation objectives and strategies and enhancing the quality of the environment. Across the 3 case-study projects, concerns about sustainable transport and land use are evident. In King’s Cross Central, for example, 99% of heat demand is planned to be met by the Energy Centre and 79% of power demand is offset by CHP engines. The plan is to recycle 81% of public waste and provide 49,500 sqm of the public realm, c. 9000 sqm of green roofs and 200 m of green walls. On the other hand, the Delhi Metro boasts enviable environmental credentials, such as being the first metro project in the world to be registered with the United Nations (UN) as part of the Clean Development Mechanism earning carbon credits by preserving energy through using advanced technologies, such as regenerative braking systems, on the metro trains. The metro has also been certified by ISO 14001 for environmentally-friendly construction, becoming the second metro in the world to achieve this following the New York City Subway. Other technologies, such as rainwater-harvesting and solar panels, are in use in several stations of the Delhi Metro. The TOD policy for land use also includes the 3 domains of social, economic and environmentally sustainable development, promoting safety, clean and usable green spaces, ease of commuting and access, civic pride, and democratic and transparent development (see Figure 4.7 above). In China, the drive towards sustainable transport can be observed; particularly the city of Guangzhou in PRD, which became the first Chinese city to be awarded the International Sustainable Transport Award in 2011, with previous winners including London, Paris, and New York.
5.2 Recommendations

What have we learnt from an international comparison of rail infrastructure redevelopment mega projects in the UK, China and India?

The study produced a number of recommendations formulated as transferable lessons learnt to decision makers involved in the development of mega rail infrastructure projects as follows:

- **Hub development as a ‘social process’**: The primary finding of this report is that railway transport hub development and their surrounding environment is fundamentally a ‘social process’ and that the success of this development process hinges on the effectiveness of the relationships among the actors involved. The study argues the importance of developing an explicit approach to the relationship between two elements in the analysis of development processes: (a) The agents involved in the development process, and (b) The relationship among these actors through the structuring of decision making. For planners to play an effective role in driving hub developments as vehicles for economic, social and environmental sustainability, they need to be competent in understanding the functioning of project networks and to establish adequate understanding of prominent actors and their strategies, interests and actions as well as the social networks that underpin decision making and shape individual and organisational behaviours.

- **Timeliness and networks of decision making**: The success of the development of an infrastructure hub and the associated property development clearly is related to the successful coordination and timeliness of decision making by a wide range of diverse stakeholder actors. This could be observed, to a greater or lesser extent, across the three case studies. The problem is essentially that key strategic decisions are fragmented and the management of these networks of decision making actors is not effectively carried out. A network decision broker is thus needed. In addition to the issue of coordination and management of interdependent decisions made by a range of diverse stakeholder actors, there is an issue about the timeliness of interdependent decisions in relation to each other. Clearly there is a function here for an agency acting on behalf of central government to manage the network of stakeholder decision makers. Its role would be to identify complementarities in interdependent decisions and to choreograph timeliness in these decisions.

- **Sustainable urban development through TODs and LVCs**: Funding mechanisms that effectively integrate transport and land use will play a fundamental role in building a sustainable urban environment. In particular, Transit Oriented Developments (TODs) funded through Land Value Capture (LVC) schemes are growing in popularity. A sustainable urban environment is created through higher densities of a mixture of housing, retail, amenities and businesses surrounding the transport hubs thus encouraging walking and reducing dependence on motorisation. For such mechanisms to be effective, all the actors involved such as policy makers, local authorities, transport agencies, land owners, property developers and local communities should engage in collaborative value-co-creation (Vargo et al., 2008; Grönroos, 2011) by integrating mutually beneficial resources to optimise the return on such developments. By contributing to value creation through land use and development densities changes, or through investment in transport (Suzuki et al., 2015), local authorities and transport agencies will particularly benefit with the cost of financing the transport investments significantly recouped.
• **Delivering social infrastructure through transport infrastructure partnerships:** In addition to the benefits noted above, clearly there is potential for the setting up of partnerships which combine a portfolio of investment opportunities and returns associated with the achievement of a number of policy objectives in relation to social infrastructure. Put simply, commercial organisations could be attracted through beneficial planning regimes and LVC opportunities to provide transport infrastructure as well as social infrastructure—schools, hospitals, etc. We envisage this to involve a group of investors rather than a single risk-bearing entity.

• **Politics and transport hub prominence:** The study identified that a particular hub’s ability to attract political support relates to the leverage that local politicians can exert centrally. Existing prominent hubs have the leverage to attract more development and expansion and enable them to become even more prominent. This is predominantly evident in China where transport hubs sit within a context where there is a very marked hierarchy of cities. The effect of this is for existing transport nodes to increase in size and for nodes of lower prominence to remain small and perhaps reduce in prominence over time. This is undesirable and needs government intervention, independent from the lobbying of existing prominent nodes, to resolve.

• **Government investment and private sector returns:** Our research has shown that the development of an infrastructure hub has a powerful effect on the property around the hub. In all of our case studies the state has funded the transport infrastructure but a large proportion of the returns on property investment are harvested by private sector entrepreneurs. Whilst transport infrastructure providers in the UK, such as Network Rail and Transport for London, are currently seeking actively to exploit returns on property development associated with the land in their ownership in order to contribute to the cost of rail infrastructure development, little seems to have been done to gain state benefit from private sector property investment returns on sites not owned by the rail infrastructure provider.

• **Packaging risk and benefits for private sector investors:** Increasing private sector awareness of development opportunities has the potential to attract additional overseas investment. The government could play a key role in this, identifying the potential ‘ripple effect’ of future hub development and employing appropriate agencies to carry out the role of investment identification and marketing. This may overcome the problems associated with opaqueness and the complex nature of those investment opportunities.

• **Eigenvector effect:** Connecting existing hubs to other hubs already prominent in network terms creates an ‘Eigenvector Effect’\(^\text{22}\) (Ruhnau, 2000) on pedestrian traffic flows. The effect of the increased demand for retail, residential and commercial office space is felt within a radius which is dependent upon the type of accommodation, but of around 0.25-0.50 miles from the entrance to the transport infrastructure hub with improved prominence. There is therefore the potential for the creation of a planning zone within this radius that recognises the effect on land use and development potential. This planning zone could offer concessions in terms of change of use, development densities and high rise development to developers. In exchange, developers would be required to pay a levy reflecting the benefits accruing from the infrastructure investment by government.

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\(^{22}\) Eigenvector is a measure of network centrality which gives more weight to nodes if they are connected to influential nodes. It is based on the premise that ‘how central you are depends on how central your neighbours are!’
6.0 References


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