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1 INTRODUCTION

1.1 Background

This Final Report has been prepared as part of the reporting on the economic planning services component of the current Territorial Development Strategy (TDS) Review – Hong Kong 2030: Planning Vision and Strategy (HK2030 Study) \(^1\). This report provides a summary of findings and recommendations for the four stages of work in this assignment:

Stage 1 – Land Use Typology

Stage 1 comprised three main tasks as detailed below:
- Task 1.1 – future economic structure and key economic activities
- Task 1.2 – property and land requirements for future economic activities
- Task 1.3 – review of existing land use typology

Stage 2 – Model Establishment

Stage 2 comprised three main tasks as detailed below:
- Task 2.1 – review of existing forecasting models
- Task 2.2 – preparation of a short / medium term forecasting model
- Task 2.3 – preparation of a long term forecasting model

Stage 3 – Floorspace Demand and Land Requirements for Reference Scenario

Stage 3 comprised three main tasks as detailed below:
- Task 3.1 – development of a reference scenario
- Task 3.2 – estimate of floorspace demand for reference scenario
- Task 3.3 – projection of land requirements for reference scenario

Stage 4 – Floorspace Demand and Land Requirements for Alternative Scenarios

Stage 4 comprised three main tasks as detailed below:
- Task 4.1 – development of alternative development scenarios and options
- Task 4.2 – estimate of floorspace demand for alternative scenarios
- Task 4.3 – projection of land requirements for alternative scenarios

1.2 Structure of the Final Report

This Final Report is set out in three further chapters and three appendices following this introduction. The coverage and purpose of each chapter is set out below.
- Chapter 2 on Land Use Typology:
  - identifies the factors which would determine the economic structure of Hong Kong to year 2030, focusing on the sectors identified as economic

\(^1\) Commenced in May 2001
drivers or “pillars” of the Hong Kong economy as well as structural and other factors affecting these sectors

o summarises the main implications for property, land use, location and infrastructure, examines international experience in these areas and makes comparisons with the Hong Kong conditions

o examines the adequacy of existing land use typology for employment related activities and recommends a new approach to land use typology with a view to meeting the changing property and land requirements of economic activities in the future

- Chapter 3 on Model Establishment:
  
o recommends the approaches for medium and long term forecasting of the demand for economic land uses
  
o considers the applications and limitations of the recommended forecasting approaches

- Chapter 4 on Floorspace Demand and Land Requirements:
  
o presents the selected forecasting models developed using the recommended forecasting approaches
  
o provides a summary of the forecast results prepared under the Reference Scenario and two alternative scenarios using the selected models and planning data provided by the Planning Department (as at May 2005)

- Appendix A contains the statistical requirements of the medium term models
- Appendix B provides historical data and data sources for the medium term models
- Appendix C presents the statistical performance of the medium term models

2 See 2005 Policy Address for core economic sectors
2 LAND USE TYPOLOGY

2.1 Scope and Coverage of Land Use Typology

A simple two-step process has been used to identify the scope of land uses to be addressed for economic planning – see Figure 2.1.

Figure 2.1 Scope of Land Use Typology for Economic Planning

<table>
<thead>
<tr>
<th>All Land Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclude all Non “Economic” Land Uses</td>
</tr>
<tr>
<td>All “Economic” Land Uses</td>
</tr>
<tr>
<td>Exclude Economic Land Uses Covered by Other Studies or Direct Land Reservations</td>
</tr>
<tr>
<td>Economic Land Uses for HK2030 Study</td>
</tr>
</tbody>
</table>

Land use reservations for the overall HK2030 Study will cover all sectors of land use activity. However the economic planning studies firstly excludes all non “economic” (i.e. employment) activities. Thus the land use typology developed here will exclude residential, open space, green belt, country park, marine or similar uses.

Of the remaining economic or employment uses, the focus is on the main activities in the industrial and service sectors. There are a number of specific exclusions for which land use reservations are made directly or have been covered in other studies. These exclusions include:

- public sector uses such as government offices (except where Government is a tenant of the private sector), public facilities such as markets, fire stations, hospitals, clinics, community facilities, public recreation facilities, etc.
• cultural or similar other civic uses except where these are provided as part of private commercial development
• airport, port and related uses which are the subject of separate studies
• hotels and other specialist tourist facilities which are the subject of separate sector or individual studies
• retail, retail services and related entertainment facilities which are the subject of individual reservation studies (see HKPSG Chapter 6), except where they form part of integrated commercial developments
• agriculture, fisheries and related uses
• mineral working areas
• specialised facilities for utility users including powers stations, sewage treatment facilities, etc.
• passenger transportation and related uses

Secondly, this study refers throughout to a “land use typology” which will be used in the HK2030 Study for land use forecasting and reservation purposes only. It should be clearly noted that it is not the purpose of this typology to provide a categorisation of uses for land use zoning as provided in Outline Zoning Plans or for development control purposes. This much more detailed typology is not required for strategic planning and land reservation purposes and it is expected that detailed land use zoning could be carried out on the existing (or a future revised) basis within the broader typology which is set by the present studies.

2.2 Economic Structure and Trends

2.2.1 Overview of the Hong Kong Economy

GDP in Hong Kong has grown steadily since the 1960s (Figures 2.2 and 2.3). In 1998, Hong Kong experienced a deep recession as a result of the Asian financial turmoil. In the period from 1991 to 1997, the average GDP growth in Hong Kong was 5% per annum in real terms. In 1998, the economy contracted by 5%.

The road to economic recovery from the Asian financial crises in late 1990’s has been bumpy. Hong Kong experienced deflation from 1998 to 2004. Following the strong rebound in 2000, the pace of economic recovery was dampened by a slowdown in the global economy in 2001 and 2002. In early 2003, Hong Kong was hit hard by the outbreak of severe acute respiratory syndrome (SARS) disease which virtually shut down many economic activities in the second quarter of the year. This unprecedented event was followed by a rebound in late 2003 and 2004, marked by thriving exports and offshore trade, vibrant inbound tourism, a return of consumer confidence, and visible rebound in investment. Notwithstanding any other exogenous shocks, the Hong Kong economy is expected to sustain reasonably steady growth to the medium to long term, building on the strong and comprehensive economic expansion in 2004.
Figure 2.2  GDP (1961 to 2004)

Data source: C&SD (26 August 2005 figures); 2003 & 2004 figures are provisional figures

Figure 2.3  Real GDP Growth

Data source: C&SD (26 August 2005 figures); 2003 & 2004 figures are provisional figures

In 2004, Hong Kong’s share of aggregate world GDP was 0.4%. The United States, the Mainland of China, Japan, India and Germany were the largest contributors to aggregate GDP, their shares being 21%, 13%, 7%, 6% and 4% respectively.
Hong Kong’s per capita GDP was US$23,667 in 2004. This was significantly lower than countries such as the United States (US$39,934), United Kingdom (US$35,460) and Australia (US$30,445). Within Asia, Hong Kong’s GDP per capita was the third-highest, next to Japan (US$36,574) and Singapore (US$24,740).

2.2.2 Structure and Development of the Hong Kong Economy

The economic structure of Hong Kong since the Second World War can be conveniently analysed in three distinct phases. They are:

- export-led industrialisation from early 1950s through the 1960s
- broad based development in the 1970s
- Hong Kong-China economic integration from 1980s onwards

From the early 1950s, Hong Kong embarked on its export-led industrialisation relying on imported raw materials which were processed by a cheap but productive local labour force. The expansion of manufacturing was the driving force of the economy in these early years. The main manufacturing industries during this early period were textiles, clothing, plastics and toys.

After 1973, the Oil Crisis triggered a period of recession and protectionism in the developed countries. In addition, competition from other newly industrializing countries in Asia such as Korea, Taiwan and Singapore intensified. The base of manufacturing industry was diversified in the 1970s to keep Hong Kong abreast of the growing competition and challenges from around the world. The relative importance of textiles fell, while that of electronics, clocks and watches rose. There was a shift from labour intensive and simple products to more technology-oriented and sophisticated products. However, the contribution of manufacturing industry to gross domestic product (GDP) still declined from 31% in 1970 to 24% in 1980.

Part of the reason for the relative decline of manufacturing was the phenomenal growth of the finance and business services sector. The finance and business sector increased its contribution to GDP from 15% to 23% between 1970 and 1980. The expansion was a spin off from the worldwide development of the financing industry (which ushered in the globalisation of capital markets) and innovative changes in financial services, made possible by new electronic and telecommunication technology.

From the early 1980s the economy received further stimulation from economic reforms in China. Initiated with the “Open Door” policy in the late 1970s, the China economic strategy shifted its focus to rapid export-led growth. Four Special Economic Zones (SEZs), namely Shenzhen, Zhuhai, Shantou and Xiamen were established in 1980. Hainan Island later joined the ranks of SEZs in 1988. In April 1984, another fourteen coastal cities were declared “open” to foreign investments. These areas were used by the Chinese Government as testing grounds of new policies and reforms in order to lure foreign technology, know-how and capital to modernise productive capacity in China. Numerous incentives e.g. tax breaks were offered to foreign enterprises. China has experienced phenomenal economic growth in this period of time, particularly in the Pearl River Delta (PRD) area.

Continued economic liberalisation was bolstered by China’s accession to the World Trade Organization (WTO) in late 2001 with full compliance by late 2006. Whilst the pace and impact of economic reform may be uneven for different sectors, the WTO effect on China’s economic and trade growth is expected to be significant. In 2004, China became
the World’s third largest merchandise exporter and importer of goods (total trade value reached US1,155Bn), after the United States (US2,345Bn) and Germany (US1,632Bn)³.

The Closer Economic Partnership Arrangement (CEPA) between the Chinese Mainland and the Hong Kong Special Administrative Region governments (CEPA I) was signed in June 2003 and implementation began on 1 January 2004. The free trade agreement essentially brings forward World Trade Organization (WTO) commitments to support the integration of Hong Kong and the Mainland economies, easing trade in goods and services, and facilitating investment. A key focus is to improve Hong Kong’s access to Mainland services’ markets. CEPA offers easier market access to a wide range of service industries, either by relaxing equity and capital requirements for foreign investors, offering early liberalisation or by opening up sectors not included in the WTO accession.

Initiated with the “Open Door” policy in the 70s, through to current WTO accession, the PRC economic strategy has focused on rapid export-led growth and encouraged foreign investment to access channels to overseas markets, technology and managerial expertise. Geographically, the economic growth of the PRC was initially concentrated in the Pearl River Delta (PRD). The momentum is spreading with the Yangtze River Delta (YRD) becoming another economic engine serving the global economy. The combination of policy reform in PRC and geography has had profound implications for the Hong Kong economy over the last 20-30 years. It stimulated a new era of economic growth and structural change in Hong Kong for the following reasons:

- Hong Kong manufacturers started to relocate labour-intensive and low value-added production processes to Mainland China allowing them to concentrate more fully on product research and development, marketing, finance, design, packaging and quality control functions in Hong Kong. As the manufacturing base in South China improves, many of these activities are now carried out in the Mainland
- with extensive trading linkages and good transportation and communication infrastructure, Hong Kong has become a transhipment centre through which Chinese goods could be channelled to other countries and vice versa
- as China actively searches for markets and technologies for their products, Hong Kong became the main supplier of machinery, manufacturing and marketing expertise and entrepreneurial management skills essential to China’s modernisation programme
- Hong Kong acts as the gateway through which the world’s investment can travel to China and vice versa.

Apart from the China factor, Hong Kong has also benefited from the rapid economic development of the Asia Pacific region. Thus, for example, the central location and excellent communication links have enabled Hong Kong to become a major centre for Asia Pacific regional headquarters of multi-national corporations.

By 2003, structural change in Hong Kong had reached the point where over 85% of GDP and employment comes from the service sector (Figure 2.4 and Table 2.1). The largest contribution comes from three primary sectors: Wholesale, Retail, Import/Export Trades, Restaurants and Hotels; Finance, Insurance, Real Estate and Business Services; and Community, Social and Personal Services. All indicators of the future point towards a continued dominance of the service sector.

³ Data source: WTO
In summary, the territory’s economy has undergone fundamental structural change. Initially based on light manufacturing, Hong Kong’s economy is now service oriented. The principal hub functions that Hong Kong now engages in include a financial and business centre, a trading centre, a transport and communication centre, a centre for professional and technical expertise and a base for industrial services and high tech industry.

Hong Kong’s economic policy initiatives respond to the challenges presented by structural change, globalisation and integration with the Mainland. Recent Policy Addresses clearly
see Hong Kong’s future wealth being closely tied to that of the PRC (Box 2.1). The strategic direction of the HKSAR’s economic development is clear:

Box 2.1: Chief Executive Policy Addresses

2004 - “…leveraging on the Mainland, engaging ourselves globally, capitalising on our advantages, strengthening our core industries, deploying new knowledge and new technologies and moving up the value chain.”

2005 - “…Hong Kong must leverage on the staunch support of the Mainland, engage ourselves globally and develop into a world city providing quality services.”

2.2.3 Implications for Property

The broad implications of economic restructuring since the 1980’s are twofold, the demand for office accommodation and storage has increased steadily over the years whilst the demand for flatted factories has ceased to grow since the early 1990’s (Figure 2.5).

Figure 2.5 Demand for Selected Property Products (1974 to 2003)

At the end of 2003, there were 9.5 million sq m IFA of private offices and 21.5 million sq m IFA of General Industrial Uses – which comprises private flatted factories, private industrial/offices and private storage – in Hong Kong. These traditional office and industrial property products are reasonably well utilised by a wide range of conventional economic activities in the service and manufacturing sectors. The vacancy rates of these premises maintained at a low level of about 11% at the end of 2003. It should however be noted that a significant share of industrial floorspace is no longer used for industrial activities. The inflexibility of the current planning policies and buildings and lands restrictions has discouraged the use of industrial premises for other uses.
2.2.4 Pillars of the Hong Kong Economy

The 2004 and 2005 Policy Addresses stressed the need to consolidate four core industries - the “pillar” industries expected to drive Hong Kong’s future development:

- financial services
- producer services – including trading, professional services and other producer services
- logistics
- tourism.

There is growing recognition of the need to promote and support new economic activities ranging from high value (technology) manufacturing to cultural and creative industries and the need to promote local community economies to provide more job opportunities for the people.

These sectors are set to drive the long term demand for “economic” land and property and where the most radical changes are taking place in the use of labour and property. This study has focused its work on long term future developments in these “sectors” by analysing the factors which have driven their growth and, more importantly, will shape further change. It is these factors which in turn will inform the debate about the need for a modern land use typology.

2.3 Key Issues for Economic and Land Use Change

The analysis of the core economic sectors in Working Paper 1 highlighted some of the key factors affecting economic and land use change, many of which are common to all or several of the sectors.

2.3.1 Implications of Continued Industrial and Service Sector Restructuring

Restructuring has continued to dominate the industrial and, now in particular, the service sectors in Hong Kong as it has done in most of the major economies and finance centres worldwide. In the industrial sectors, the adoption and spread of new technologies have stimulated the restructuring and transformation of various activities as companies seek to cut down operating costs.

The key feature of Hong Kong’s industrial restructuring over the past 20 years continues to be the relocation of production functions across the boundary. However, whereas in the past these functions were mainly original equipment manufacturing (OEM), as the industrial base in South China becomes more mature, some lower value-added non-assembly activities such as quality control and data processing have also been relocated across the boundary. As has happened with globalisation of European and US manufacturing it is likely that the remaining Hong Kong companies will be transformed into original design manufacturing (ODM) operations. We have also seen that the number of multinational corporations (MNCs) engaged in the manufacturing sector has not only declined over time but, by 2004, the majority of the MNCs with regional headquarters in Hong Kong were now engaged in the distribution or financial and business services sectors. This is the transformation that MNCs have undergone in their home countries and this same restructuring will be a key trend in Hong Kong.

Hong Kong is now following the other major financial centres in restructuring through consolidation, acquisitions and merging activities in the financial and business services sector. This trend mirrors that of financial MNCs in New York and London and, as in
these cities, we have noted that small and medium institutions are expected to follow suit. Other global restructuring trends in the service sector are reaching Hong Kong as the labour/space-intensive and low skilled operations, in, for example, the telecommunications industry, are being relocated to cities like Guangzhou. The main impact on Hong Kong will be significant employment productivity changes which can also be expected to affect the demand for service sector floorspace.

2.3.2 Impact of Technological Change on Working Practices

As the economy moves further towards the service sector, distribution and the higher value added manufacturing processes, the principal technological change now affecting Hong Kong are the advances in Internet and telecommunication technologies. These have enabled companies to relocate some of their back office operations, such as data processing and customer services centres, to lower cost areas outside the CBD and to the PRD. In other countries such as the UK and USA this trend has resulted in the creation of specialised “call centres” - dedicated businesses and associated floorspace. Initially these have been in regions outside of higher cost city centre locations, however the trend has now widened to include the development of “call centres” located in different countries, with lower costs but also with adequate international communications infrastructure and a suitable pool of English language skills: India being a prime example. In Hong Kong it is still more the case of relocation of back office functions outside the CBD but the trend here is also likely to see increasing movement to the PRD where language skills are similar. Advancement in technologies has also allowed customers to access banking and other financial services through the Internet. In tourism, recent advances in telecommunications have allowed customers to purchase airline tickets on-line from airlines directly, reducing property demand from travel agents and airline ticket agents.

However, some of these technology drivers have worked in the opposite direction, for example, allowing the publishing industry to expand quickly through providing multi-media products and on-line publishing services which are expected to grow rapidly attributing to the high level of computer and Internet skills of Hong Kong’s population. Similarly Hong Kong’s competitiveness in the international economy has been enhanced by developments in IT and communications - accessibility of information was considered as one of the important factors in the selection of regional headquarters location by MNCs to Hong Kong. It is likely that future advances in IT will strengthen Hong Kong’s position as the preferred regional headquarters location in Asia for this growing cadre of international companies.

These technology trends will inevitably reduce the demand for labour and floorspace in the CBD of Hong Kong as the demand for branch offices and customer services centres falls. However, they may herald an increase in the demand for non-CBD “business” space - though the PRD can be seen as strong competition for this demand. The move to “homeworking” as has occurred in the West Coast of the USA or to “combined living and workspace” as has occurred in a fringe around Central London does not seem to have been borne out by the culture and environment of Hong Kong. Singapore has however introduced its “Technopreneur Home Office Scheme” which allows technology-based, knowledge intensive activities, which do not affect the character, ambience and environment of a residential area to register with the Government to carry on business from home. The business and social trend is now however moving away from teleworking internationally where it is seen to isolate workers, bring extra responsibilities for time management and, in some cases, increase unemployment. The main beneficiaries have been those living in remote areas of countries – a relatively unimportant issue in Hong Kong.
2.3.3 Changes in Productivity of Employment and Floorspace

These restructuring and technological change trends have had a significant impact on the productivity of employment and floorspace with sub-sectors such as financial markets and fund management services and insurance services showing a significant increase in floorspace productivity in the recent years. However, many companies in Hong Kong are still at an early stage of business process re-engineering and related improvements in productivity which means that an increasing rate of change can be expected in the medium to long term.

The increase in productivity is a result of two distinct factors. Firstly, Hong Kong’s industrial sectors have shown significant increases in labour productivity and floorspace productivity over the years, primarily because low value added activities have been moved to South China. Similarly, the advancement in technology, new management practices and the broadening of service offers have improved the efficiency of the transportation and logistics sector and reduced the demand for warehouses. It is primarily in the technology, media and other service sectors that productivity changes have occurred in situ and it is here that high productivity space developments in Hong Kong such as the Science Park and Cyber Port have been formed to help increase the added value and productivity of Hong Kong’s industry. Similarly the Applied Science and Technology Research Institute (ASTRI) is also geared to improving the performance of these high value-added sectors.

2.3.4 Impact on Human Resources

As Hong Kong evolves towards a knowledge based economy focusing on high value added activities and thereby demanding highly educated professionals, so there will also be constraints on economic development and the demand for land, property and human resources. For example, Hong Kong is facing an IT skills shortage as the demand for all levels of IT skills continues to grow. In the short-term, Hong Kong is seeking to address this problem in part, through the importation of overseas skills: notably through the Government’s Admission of Mainland Professionals Scheme. This is a similar strategy to that used by the US, UK and Germany. However, Hong Kong is also developing a longer-term strategy to improve the IT training infrastructure and to increase the supply of locally produced IT professionals.

Other key skill shortages include managerial and operational skills in modern logistics and investment in training, education and technology development is essential. There is also in this and other sectors, an important relationship between the labour markets of Hong Kong and the rest of the PRD. In the Mainland plants of the Hong Kong companies, Hong Kong workers are being replaced by the cheaper Mainland labour, even at the supervisory and management levels. Moreover, Mainland engineers and technicians are now also employed for simple product development and engineering design works. Thus the co-ordination between Hong Kong and Guangdong Government in the development of human resources is vital to Hong Kong’s future development.

2.3.5 Changing Cross Boundary Cargo and Passenger Logistics

The main issue has been the limited capacity of cross boundary facilities / strategic links and the lack of co-ordination among companies in the cross boundary freight transport industry. There is however broad consensus that these constraints will be addressed.

In the passenger sector, the 2003 Cross Boundary Travel Survey shows that Hong Kong residents who departed for the Mainland are increasingly making regular visits and that trips were mostly for leisure purposes and that many Hong Kong residents went to the
Mainland to spend their vacation in their own properties there, primarily in the Shenzhen and Dongguan areas. Nevertheless, the introduction of the Individual Visit Scheme in July 2003, which simplified visa application procedures for citizens of selected cities, has brought about an immediate surge in the number of Mainland visitors to Hong Kong; the majority of them came to Hong Kong for shopping and leisure purposes. The 2003 Cross Boundary Travel Survey also shows that the number of cross boundary workers and business trip makers had increased significantly over the years.

Experience here is similar to the experience of the Eastern European countries in the movement of goods and people into the EU countries following the liberalisation of their economies in the early 1990s. Apparent physical capacity constraints were quickly overcome through strategic investments by national governments, development agencies and the private sector. The greater constraints were regulatory and institutional – likewise for Hong Kong.

### 2.3.6 Institutional and Regulatory Change

As all developed economies have found, one of the most significant factors for economic change have been regulatory changes in the country concerned, in competing countries and, in particular, in world trading regulations. These changes can impact slowly but significantly over time such as the imposition of European Union trading regulations or suddenly such as the changes in monetary systems (for example, the introduction of the Euro) or telecommunications regulatory systems.

There are many such regulatory changes which are and will continue to affect Hong Kong. Examples of regulatory changes include:

- the freely convertible RMB in the Mainland
- the introduction of the Mandatory Provident Funds scheme and the health care reform currently being considered by the Government which has injected significant amounts of investment into the local financial market
- deregulation of Singapore’s financial system, presenting new competitive challenges for Hong Kong
- the Government’s “Admission of Mainland Professionals Scheme”
- the removal of the quota system in the garment and clothing industries
- the issuing of new television programme service licenses
- the introduction of sales tax
- Mainland’s liberalization of air services
- opening up of Macao’s gambling market

Although difficult to predict, most of these changes will have a significant impact on the development of the Hong Kong economy and ultimately on the demand for property and land. Indeed some changes in planning and property regulations can be expected to have a direct effect. In July 2001, the Town Planning Board announced the amendment of User Schedules for industrial zones, expanding the scope of uses permitted in the ‘Industrial’ (‘I’) zone to include IT and telecommunications industries.
2.3.7 \textit{Implications of China’s Entry to the WTO and CEPA}

Clearly the most significant external regulatory change, and the one that most affects cross boundary economic activity in nearly all sectors are China’s entry into the WTO in late 2001 and CEPA\textsuperscript{4} implemented in 2004 which brought forward WTO commitments. The WTO and CEPA effect has encouraged global players to use Hong Kong as their springboard for the China market and, at the same time, Chinese enterprises to set up new operations in Hong Kong aiming to get into the global market. Many Mainland companies are relying on Hong Kong’s financial institutions for funding and many professionals in Hong Kong’s business services sector need to travel regularly across the boundary and an increasing proportion of them relocate to the Mainland.

According to a recent Government study\textsuperscript{5} on CEPA’s economic impact, CEPA has brought considerable benefits to both business enterprises and the Hong Kong economy as a whole. The free trade arrangements have boosted the trading in goods. In 2004, more than 3,000 certificates of origin were issued under CEPA I, involving products with a total value of $1.15 billion which enjoyed tariff free treatment on importation into the Mainland. It is expected that the value of CEPA exports to the Mainland will increase by $1.2 billion in 2005, doubling that in 2004. For trading in services, more than 660 companies obtained the Hong Kong Service Supplier certificates in 2004, and many of them had already set up operation under CEPA I in the Mainland. Companies in the 18 sectors covered in CEPA I increased their capital investment in Hong Kong by $1 billion in 2004. The amount is expected to surge to $4.5 billion in 2005. Services receipts generated in 2004 as a result of CEPA I amounted to $1.6 billion and the amount is expected to reach $3.8 billion in 2005. Mainland residents made 4.26 million trips to Hong Kong in 2004 under the Individual Visit Scheme (IVS), accounting for 34.8% of all the Mainland visitors or 20% of total visitors. These IVS visitors have generated an additional $6.5 billion in tourist spending during the year. The study also estimated that about 29,000 new jobs have been and are forecast to be created for Hong Kong in the first two years of implementing CEPA I. Moreover, the measures under CEPA have attracted foreign investments to Hong Kong. Between end-August, 2004, when the new facilitation policy for Mainland enterprises to invest in Hong Kong and Macao took effect and end-December, 2004, 68 Mainland enterprises, or 42.5% of the total number for the year, were granted approval for coming to invest in Hong Kong. The amount of investment totalled US$470 million or 48.9% of the total amount for the year.

Overall it is clear that the WTO effect has stimulated and will continue to stimulate the growth of output and employment in Hong Kong’s trading, distribution, financial, business, tourism, technology and services sector and therefore the demand for employment land uses will grow as the volume of business through Hong Kong increases. However, international experience shows that there is likely to be a short-term impact but then a general levelling off of growth as China’s business environment and infrastructure improve. The WTO effect will undeniably intensify the competition between Hong Kong and other Chinese cities in the longer term. China will continue to liberalise the trading of commodities and foreign traders will be operating more efficiently in China. Whilst Hong Kong traders will be able to operate fully in the Mainland, potentially strong competition will come from other foreign companies. In particular WTO entry will create new

\textsuperscript{4} CEPA I and CEPA II

\textsuperscript{5} The economic assessment was conducted by the Commerce, Industry and Technology Bureau, in collaboration with the Trade and Industry Department, the Economic Analysis and Business Facilitation Unit, and the Census and Statistics Department in the fourth quarter of 2004 and the first quarter of 2005. The Hong Kong Tourism Board also provided useful input.
competitive pressures in the transportation and logistics sector. Significant investment is being injected to improve China’s infrastructure, i.e. roads, railways, ports and airports. The pattern of cargo movement in the region is changing and might impact negatively on Hong Kong’s transportation and logistics sector. For instance, direct links between Taiwan and China might be established, thereby reducing the volume of cargo travelling via Hong Kong.

In world tourism and business travel terms, many anticipate that Hong Kong will maintain its role as the Gateway to China and foreign investment will be attracted as a result of China’s entry into the WTO. To meet this growth, Hong Kong will need more tourism products and hotel accommodation to cope with the potential increase in business visitors, from both Mainland China and overseas.

2.3.8 Globalisation and Competition

All of the above issues and trends, and in particular the entry of China into the WTO can be seen as increasing globalisation of Hong Kong’s economy, not least as China’s economy globalises. This is the most significant underlying factor in the future of the SAR’s economy. More global players use Hong Kong as base for the China market but the effect is not limited to the relationship with China alone.

There is also a significant competitive effect in globalisation. For example, Singapore is Hong Kong’s main competitor for MNC headquarters location. Potential strong competition from globalising Chinese cities such as Shanghai has also been noted. Shanghai’s infrastructure, both hardware and software, has improved enormously in recent years, strengthening its role as the financial and business centre in China. Shanghai is also targeted to become one of the most competitive high tech production bases in Asia. Under the WTO commitments, China is obliged to improve its financial infrastructure, information transparency, rule of law and public sector services, and it is expected that Chinese cities such as Shanghai will continue to challenge Hong Kong’s status. This can be expected only in the medium to long term, however, since it will take some time for Chinese cities to fully integrate with the global economy.

2.3.9 Implications of Economic Restructuring

The beginning of this chapter identified three phases of the development of the Hong Kong economy since the Second World War culminating in the period of Hong Kong-China economic integration from the early 1980’s onwards. The changes between each phase have been marked by a significant structural shifts in each case. Within each phase there have been cyclical trends in output, employment, investment and the use of land but the underlying trends have been of steady predictable growth. Forecasting within these periods has been reasonably straightforward and reliable. Identifying when the structural shifts between phases happen has been more difficult although it has been possible to identify a structural change that has taken place in retrospect and the factors that have determined it.

Perhaps the most important conclusion from this analysis is that Hong Kong’s economy is now undergoing another long term structural shift in its role, associated with the globalisation of the world economy and, in particular, the globalisation of the economy of China implementing its membership of the WTO. In retrospect it is likely that the turn of the millennium will have proved to be the critical period of adjustment of the Hong Kong economy to its global economic role for China as a whole.

In practice this makes the early 2000’s a difficult period to use as a basis for forecasting. More specifically, as the analysis has shown, there is always significant uncertainty in
floorspace demand as a result of these structural changes in the past and this can be expected to continue.

Nevertheless floorspace forecasting methods can be set now which recognise these changes and are flexible enough to accommodate change as it occurs. Similarly the land use typology – for which we are forecasting – must be flexible enough to accommodate these structural changes. The first factor to recognise is that the most important structural change drivers are not occurring at the sectoral level. Rather, they are occurring within sectors themselves. It is therefore less useful to adopt land use typologies or forecasting methods that are mainly sectorally based.

Secondly, it is therefore important to identify the cross sectoral factors which are likely to drive these structural changes. The consultants have particularly highlighted the following factors from the analysis:

- the continuing process of structural change which will itself make the demand for floorspace more difficult to predict
- technology and other changes leading to changes in productivity of floorspace and employment
- technological change leading to changes in the level and type of demand
- China’s entry to the WTO which will be the single most important factor in Hong Kong’s global economic role
- Hong Kong’s competitive position and the important role of property and land availability, quality and price in attracting investment – particularly in various new or special forms of economic uses for which site requirements have not been identified in the existing typology
- changes in institutional and regulatory regimes, including cross boundary changes
- human resources constraints which may restrict demand and will lead to floorspace being used in different ways.

For the purposes of the HK2030 Study, it is therefore most important to adopt land use typology and forecasting techniques which are:

- flexible
- cut across land use and economic sectors
- sensitive to structural change factors such as those above.

2.4 Changing Property and Land Requirements

2.4.1 Hong Kong Experience

The restructuring of the Hong Kong economy during the last decade has been the most critical factor affecting the property requirements of economic activities in the SAR. The process has taken place at a pace faster than what was previously anticipated. The rapid decline of the manufacturing sector, the strong growth of the service sector and the resultant changes in property requirements have been well reported in a number of completed planning and sector studies. The main findings of these studies are discussed below.
All economic indicators pointed towards a continued dominance of the service sector. This important economic trend has led to a surge in the demand for office accommodation, a decline in the demand for conventional industrial premises and the emergence of a number of new property products for both conventional and new economic activities. Key property development trends and development policies formulated in response to the changing property requirements are:

- **office decentralization** - significant office decentralisation from the CBD to non-CBD areas within the Metro Area has happened but there is limited potential for further decentralisation to non-metro areas. The CBD is expanding gradually but progressively became a less dominating office location. New office nodes are emerging along existing and future rail networks to provide a wider locational choice for office users. It is important to monitor the provision of offices, particularly in non-CBD areas in the Metro Area, in order to maintain the role and competitiveness of the CBD and to achieve a higher level of decentralisation to non-Metro Area.

- **new typology for industrial uses** - the nature of the demand for industrial and office property products is changing. Industrial and industrial related activities are becoming more and more management- and business-oriented. A significant proportion of industrial space is now devoted to office, storage and other non-production activities. There is also a rise in the aspiration for better quality premises with adequate supporting/ancillary facilities and an improved external environment. To increase the overall flexibility of the planning system and to broaden the range of uses permitted in industrial areas and the choice of premises available, a new typology for industrial uses was proposed and a set of new planning standards and guidelines for these uses was prepared in July 2003. Three broad categories of industrial uses were recommended:
  - Business Use – a mix of information technology and telecommunications industries, non-polluting industrial, office and other commercial uses are always permitted in new "business" buildings. The flexibility of uses in 'Business' zone enables the property market to more readily respond to the changing needs of the industrial/business sectors
  - General Industrial Uses (GIU) – comprise multi-storey factory buildings and Industrial-Office (I/O) buildings to accommodate a range of industrial and industrial-related activities
  - Special Industrial Uses (SIU) – include Industrial Estates, Science Parks, Business Estates, rural workshops and specialised buildings for special industries.

- **upgrading and restructuring of obsolete industrial areas (OIAs)** - industrial obsolescence has been a key area of concern in the planning of Hong Kong’s Metro Area. Industrial obsolescence has caused a waste of land resources since industrial premises/land cannot be used for other purposes under current planning and land policies. To stimulate the restructuring of OIAs, business nodes with Commercial or Business Use zoning have been proposed at a number of Metro locations. Large areas previously in Industrial zoning have been rezoned to Business Use, a more flexible zoning that allows for a mixture of clean manufacturing and office uses and which can more readily respond to the changing property needs of the industrial and business sectors. However, planning tools such as upzoning and the planning application system alone are not able to bring about changes effectively and a comprehensive approach to industrial area renewal and a more sustainable approach to the use of land resources and building stock
are needed. It is also noted that OIAs can be revitalised by rezoning to residential and other uses and introducing new types of uses such as cultural uses.

- **reduction of surplus of industrial land** - The decline in the demand for industrial premises over the last decade has created a reservoir of un- or under-utilised industrial floorspace and surplus land reservation. As a result, the potential surplus of GIU reservation has been rezoned for other uses over the years.

- **creation of a land bank for economic uses** - the rezoning of over 100 ha of industrial land to other uses has virtually exhausted most of the stock of undeveloped industrial land. In the absence of a long term strategy for the reservation of SIU land, the Government can only play a reactive role, in response to a policy initiative or an expressed demand. It was suggested that a land bank for long term industrial/business use should be established in order to better cater for possible future demand for SIU.

### 2.4.2 International Experience

For land reservation purposes, many cities, including Hong Kong, classify employment land conveniently into two broad categories: commercial uses (which include retail, hotel and office uses) and industrial uses. In some cases office uses are separated from other commercial uses. The land needs for special uses such as airports and ports are always considered separately by different approaches.

For forward planning and economic development purposes, there is a general trend for planning/economic development authorities to encourage the mixing of uses (commercial, industrial, residential and community uses) to achieve a number of planning/economic development objectives:

- to promote efficient use of land resources
- to fully utilise the capacity of infrastructure
- to enhance the vibrancy of employment areas
- to promote job balance
- to minimise the need to commute
- to facilitate the development of businesses by providing a wide range of economic incentives and assistance.

In many cities, commercial and industrial land demand projection is based on population and employment forecasts. Existing employment densities for different industry sectors, measured in terms of workers per floor area or land area, are analysed and future employment densities assumptions are applied for larger communities which have good data sources. The availability of economic and property data by industry sector is often a determining factor to the demand assessment approach adopted. Various demographic and economic factors are considered by economists when employment forecasts are produced. Projection methods are generally trend based when no good data is available and target based for long term forecasting. An econometric forecasting methodology is sometimes employed as a tool for assessing land demand. In some cases demand forecasts produced are adjusted to take account of factors such as technology change. Demand forecasts are revisited regularly to cope with changes. The typology for forecasting is very much dependent on the characteristics of different economic sectors in the use of property/land, as well as the availability of the required data. In the context of international experience (see Working Paper 1), we believe that Hong Kong has already
made the best use of data available to project land needs by analysing the characteristics of different economic sectors.

2.4.3 **Implications of Changing Property and Land Requirements**

The principal conclusion from the analysis of changing property and land use demands from economic activities is, as it has been for the last decade, the need for flexibility in use, both at the property and land level, to accommodate change. The changes which demand this flexibility exist at a number of levels in Hong Kong already:

- the need for flexibility in the use of buildings is highlighted in the experience of Industrial/Office and Business zoning and development and, in particular, in the flexibility needed to reuse old industrial and other (e.g. G/IC) buildings
- the need for flexibility in the use and reservation of land is highlighted in the need to reduce and rezone surplus industrial land
- the need for long term flexibility of reservation of land is highlighted by changing locational trends as activities relocate with the port and airport or across the boundary for example. Decentralisation trends in some sectors also need more flexibility in land use reservations.

Each of these issues can, to some extent, be addressed by a revised approach to the formation of forecasting and reservation typologies. Within the context of this report however, the focus is on strategic forecasting and reservation which reflects the demand for floorspace and land. The recommendations for a revised typology are based on this focus. It should be noted however that the application of a revised forecasting and reservation typology to the HK2030 Study scenarios should also consider:

- supply side factors included in the above such as landbanking, rezoning and locational factors
- the need to consider land use zoning and development control typologies and categories that must meet more detailed and short term development planning criteria.

A few factors mitigate against flexibility in that some activities have special requirements or constraints in their use of land or property. For example the need for environmental controls on some special activities will always be necessary and some high land value uses, in the CBD for example, may be fixed by reference to their location. Land use reservation in a high density, high land value context such as Hong Kong must be sensitive to these factors but international experience shows that there is now a relatively limited number of activities which must fall into these categories.

The analysis of the Hong Kong economy has shown that the changes which are likely to be most important for the future of the Hong Kong economy are not easily predictable, are structural and are not contained in one sector or one land use type. However it is clear that there will continue to be changes which will impact on the use of property and land. In these circumstances, international experience has shown that flexibility is best provided by a high level of integration of the land use typology used for forecasting and for reservation of land.

Hong Kong has already moved significantly in the direction of flexibility by recognising new uses such as Science Parks and Business Zones. All of these are more flexible in their recognition of new types of building use and the range of types of activity which can go on in these categories. However, Hong Kong’s planning system has tended to add
these typologies to existing categories rather than to integrate them to achieve more flexibility.

It is also the case that, internationally, planning systems have been more market responsive. Broader, more integrated categories of land use have been introduced to allow businesses to adapt to changing market conditions without the need to reapply for planning consents or other licences or to pay premiums for changing the way in which they use land or buildings. At the same time a greater onus is put on businesses to be willing to locate and develop alongside others which may be carrying on a very different activity, and may change that activity over time. It is not expected that the planning or other regulatory authorities should be expected to control these changes unless there is a significant environmental or other nuisance caused.

Much of this flexibility is achieved through the land use zoning and development control system by adopting a flexible zoning typology, but this is only possible if the initial land use reservation typology is as integrated as possible otherwise the zoning typology becomes too subdivided.

### 2.5 Land Use Typology for Employment Uses

#### 2.5.1 Existing Land Use Typology

Figure 2.6 illustrates the relationship between existing property products and the land use typology currently being employed for forecasting / reservation. In fact existing forecasting methods have already paved the way for a more simple and flexible land use typology for forecasting and reservation though these changes have had a very limited impact on the flexibility of the total stock of employment property products. The existing methods considered potential changes in economic activities and assumed enterprises will move to suitable premises to meet their needs.

This typology has been evolved during forecasting studies for OLDS and ILDS\(^6\) and other sector studies. Most of the forecasts were first prepared in the mid 1990’s and updated subsequently in the context of the TDS Review.

As mentioned above, the distinction between property products available in the market become blurred over the years. It is not uncommon for office occupiers to move to flatted factories and vice versa. Flatted factories are also commonly used as warehouses. Moreover, it is anticipated that new property products such as business buildings will emerge as a result of the current rezoning of industrial land to “OU(Business)” use.

The main problems of the present forecasting models for future requirements of office and industrial floor space are therefore that Hong Kong’s property products have become more mixed on the one hand and more specialized on the other. Thus present forecasting methods:

- do not recognise the overlap in important and changing markets, for example between lower grade offices and well-furnished industrial buildings

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fail to recognise that a significant portion of existing industrial floor space is occupied by non-industrial uses which is taking up much of the new demand

on the other hand there is no specific forecasting method for these emerging special land uses, such as Super Grade A offices, science parks and other special industrial uses.

These problems should be addressed by the new forecasting models as well as the new land use typology which recognizes these changes. Necessary actions could then be taken to rezone, reserve or produce sufficient land to meet the projected future land requirements and to cater for the market demand for a more flexible use of non-domestic floorspace.

Figure 2.6 Existing Land Use Typology for Forecasting

Existing Property Products | Typology for Forecasting | Typology for Reservation
---|---|---
Private Office (FA) | Private Office (FA) | Commercial Land (LA)
Private I/O (FA) | Private I/O (FA) | Industrial Land (LA)
Private Flatted Factories (FA) | Private Flatted Factories (FA) | Business Estate (FA)
Private Storage (FA) | Private Storage (FA) | G/IC Land (LA)
Government Offices (FA) | Government Offices (FA) | Special Industrial Uses Land (LA)
Special Industrial Uses (FA or SA) | Special Industrial Uses (FA or LA) | Special Industrial Uses Land (LA)

OLDS Econometric Forecasting Model
ILDS Econometric Forecasting Model
Policy Driven

FA: Floor Area, LA: Land Area
2.5.2 Implications of Changing Property Uses

The analysis has therefore shown that there are clear implications of these changes in property use for the land use typology to be reflected in the principles for:

- long term forecasting for the HK2030 Study
- land reservation for the HK2030 Study
- by implication, for land zoning and development control – though these are not the direct concern of this study.

Each of these are summarised below.

The implications for forecasting are that the robustness of forecasts will be improved if the typology adopted is as broad and integrated at the sector level as possible. The forecasts at least will be improved not by breaking down the typology into individual sectors but by focusing on modelling the effects of structural changes in institutional and regulatory factors or technological changes. The best land use typology for forecasting purposes would be a single “employment use” category to which the forecast is to be applied. The only uses which should be excluded would be those which have sufficient “independent use” characteristics that they would not be included in the broad forecast but would be the subject of “policy driven” independent forecasts or land reservations. These would be limited in their scope and number mostly including uses independently fixed in their scale and location by geographical or resource factors such as ports, airports, mineral workings and most large scale utility service operations. It would also include other public uses such as Government offices. This allows the forecast to focus on all of the remaining economic land uses, the main common distinguishing feature of which is that demand is “market driven”.

For land reservation purposes the analysis has shown that there is also a need for greater flexibility of the land use typology and that the sectoral divisions between different land uses are breaking down. Whilst it would be possible to continuously redefine the range of new and existing uses in land reservations, the consultants believe that a rigid sectoral reservation would restrict the market driven flexibility which is important to this process and therefore the widest possible use of some form of integrated “employment use category” for most market driven economic land uses would be the most useful.

It is also recognised that there may also be a need to accommodate within the typology some industries which exhibit characteristics that require a separate reservation by virtue of their functional and environmental characteristics including:

- location, which may be fixed with respect to other uses with which they must be co-located or must be reasonably accessible, or uses which may have to be located close to specific infrastructure facilities. Such uses may be defined in terms of their location (e.g. port related uses, CBD uses). In these cases a distinct reservation must be defined within the total of “employment uses”

- environmental characteristics, which mean that they cannot be located close to other activities. Many industries which are polluting fall into this category. Increasingly however, environmental controls over such activities and a reduction in their overall scale may reduce their impact on neighbouring uses and may mean that they can be accommodated in general employment zones. Mitigation measures such as buffering may also reduce the need for separate reservations or zones for such activities
distinct marketing characteristics. Some modern uses are now marketed as distinct zones from which other uses are excluded such as science parks, medical parks or the Cyber Port. Although many of these type of uses are the subject of special policy initiatives, in practice they are limited in scale by definition. Moreover, to a certain degree, they can serve as a substitute to conventional industrial/office developments as some of their potential tenants are currently using these conventional premises. It is thus difficult to separate the long-term demand of these “modern” economic uses which are mostly market driven uses, from other employment uses for reservation purposes

basic employment uses which are independently fixed in their scale and location by geographical or resource factors such as ports, airports, mineral workings and most large scale utility service operations. It has already been noted that forecasts for these uses are usually made independently, or are policy driven, and it would be expected that these uses would be excluded from general economic forecasts and reservations.

It should be noted that the range of such activities is limited and becoming fewer with advances in environmental technology and accessibility. For land reservation purposes the analysis suggests that some further subdivisions of an overall “employment land” category will be required, including some for shorter term land banking purposes, but these are relatively few and limited in their scope.

Finally, although zoning and development control issues are outside the scope of a land use typology for the HK2030 Study purposes it should be noted that the integrated, non-sectoral approach advocated for forecasting and most reservation purposes is far removed from the current Column 1 / Column 2 approach to OZP zoning categories and the development control system that allows movement between uses and rezoning. In practice many of the problems of the lack of flexibility in these areas, for example for re-use purposes, will continue to restrict industrial and business change. The use of a broader typology for strategic land use reservation will not however prevent more detailedzonings being used in OZP’s. Similarly the reservation of land in a broad employment category does not constrain the release of land for land administration purposes. Land administration and sales can continue to respond to market needs from within a broad “employment” land bank created under the HK2030 Study land use typology.

2.5.3 Principles for an HK2030 Study Land Use Typology

The following principles are therefore proposed as the basis for formulating a new land use typology to be used in the HK2030 Study:

- to maximise flexibility in the ability of different sectors to operate within any one category of the typology and of individual businesses to change activity within the category
- to integrate categories within the typology as far as possible in order to achieve this flexibility. The aim is to establish one broad “employment use” category in the typology to include as wide a range of market driven activities as possible
- to improve the accuracy of long term forecasting as far as possible by forecasting for a single “employment use” category within the typology and using subsequent disaggregations of that forecast to estimate requirements for other “selected” categories of land use required
- similarly, to undertake forecasting on a long term basis (say 10 to 20 years) before disaggregating for short term forecasts and using a monitoring system to review the effectiveness of models
- to identify “independent” categories of land use in the typology which are not subject to economic based forecasting but will be allocated on a policy driven or other forecasting basis

- to separate the land use typology used for the HK2030 Study forecasting and land reservation purposes from the land use categories used for zoning and development control purposes. However the broad land use typology for the HK2030 Study should not constrain the categorisation used for planning purposes

- the typology should only be used for long term reservation purposes and should not constrain land administration and land sales programmes ability to meet changing market needs.

**Figure 2.7** sets out in diagrammatic form how these principles can be applied for forecasting and reservation purposes. In this approach all “economic land uses”, as defined earlier in this report, are identified and so-called “independent” land uses which are allocated on a policy driven or other forecasting basis are separated from these for reservation purposes. The remaining market driven economic land uses are then subject to forecasting and a single forecast for all these uses can be made. However the forecast should also be capable of disaggregation for certain “selected” categories of land use from which separate reservations can be made as required.
2.5.4 **Recommendations: Towards a Land Use Typology for the HK2030 Study**

The land use typology that emerges from this approach and meets the principles set out above are a significant departure from present approaches. The optimal approach is to establish a two tier typology; one for forecasting purposes and a breakdown of this for reservation purposes. The broadest, most integrated, typology would be used for forecasting purposes, which could then be broken down into as few further categories as necessary thereafter for reservation purposes. After reservation land would then be zoned for plan making and development control purposes but this is outside the scope of this typology.

**Figure 2.8** sets out the proposed two tier typology for forecasting and reservation purposes which can be compared with the existing typology which was shown in **Figure 2.6**. The significant difference in the existing and the new typologies is the single “employment use IFA” category proposed for most forecasting purposes compared with the five categories used at present. This is intended to cover all “market driven” categories of employment land. The existing “independent” use categories such as government offices and other uses such as port and airport uses, which are “policy driven” rather than market driven, continue to be separately forecasted. For “modern” economic uses, such as science park, although many of them are initiated by the public sector, their long-term demand should form part of the market led demand for employment related floorspace due to the potential substitution between these two property products.

The typology for land reservation however also allows selected, more specific land uses such as “industry with special environmental requirements” and “CBD Grade A office uses” to be allocated from the integrated forecast. As the previous sections of this paper have argued these categories of land uses have some specific characteristics such as their polluting nature, locational, value or other characteristics and thus separate reservations should be made. However it should be noted that since all of these categories are market driven and the maximum amount of flexibility in use is required as few divisions as possible are recommended and the main land use category for market driven uses in the typology remains as a broad “General Business Land” category.

It should be noted that within this typology most of the existing Special Industrial Uses (SIUs) including most of the Industrial Estates uses and Business Parks would now fall within the General Business Land category for reservation purposes. It is argued that, although these uses are subject to policy initiatives such as land banking policies, they remain essentially market driven economic uses. Only where these uses have specific characteristics, such as the industries with special environmental requirements, would a separate reservation be made.

A recommended two tier typology for forecasting and reservation is shown in **Figure 2.9** showing the relationship between the two. The four blocks at the top of the typology include the so called “independent” derived categories and here there is a one-to-one relationship between the forecasting and reservation typology. Three principal independent groups of uses have been identified at this stage but a fourth category is shown of “other” independent uses which may be identified by the HK2030 Study during consultations on these recommendations. Any other categories added to this part of the typology however should meet the criteria of being policy driven.
Figure 2.8 Proposed Land Use Typology for Forecasting

**Existing Property Products**
- Private Office (FA)
- Private I/O (FA)
- Private Flatted Factories (FA)
- Private Storage (FA)
- Specialised Industrial Uses* (FA or LA)
- Government Offices / Other Government Uses (FA or LA)
- Independent Uses** (FA or LA)

**Typology for Forecasting**
- "Employment" Use (FA)
- Government Offices / Other Government Uses (FA or LA)
- Independent Uses (FA or LA)

**Typology for Reservation**
- CBD Grade A Office Land (LA)
- General Business Land (LA)
- Industry Land with Special Environmental Requirements (LA)
- G/IC Land (LA)
- Independent Uses Land (LA)

FA: Floor Area, LA: Land Area
* Specialised Factories / Warehouses, Industrial Estates, Science Parks and Business Parks
** ports, airports, utilities etc.
All remaining market driven uses are forecast initially in one integrated category of “employment use”. This forecast should then be used to derive a large scale “General Business Land” category for reservation purposes. However a small group of specific land uses should also be derived from this forecast to complete the land reservation typology. Two specific “selected” categories – “CBD Grade A Office Land” and “Industry Land with Special Environmental Requirements” – are proposed.

“CBD Grade A Office Land” has been identified for separate reservation because of the particular locational, quality of use (including Grade A and Super Grade A office) and value characteristics of CBD activities. A separate reservation would maintain these characteristics and restrict competition for land between these activities and lower value but less location dependent service, industrial or distribution activities. On the other hand a CBD Grade A Office Land reservation could be made in a similar (non CBD) location (eg. Quarry Bay) where these types of activities are willing to locate but where the supply of land in the CBD is limited.

“Industry Land with Special Environmental Requirements” is identified for separate reservation because of its particular environmental quality. Thus activities located here are market driven but must be segregated from other broader ranges of business activities on which they would impact. A set of standards would have to be drawn up for...
these activities and kept under review as technologies (both pollution making and pollution preventing) change. The level of segregation may vary and it may be possible to reserve some of this land within General Business areas with sufficient buffering and other design controls. Some will require complete segregation however. Some land use planning typologies used in other cities have broadened this category to include non polluting industry which however is space extensive and has a high proportion of production floorspace. These “Industry” or “Manufacturing” zones have typically been allocated to restrict the level of competition for land between these activities and broader business and office uses. To some extent, the OU (Industrial Estate) zoning has fulfilled this purpose in Hong Kong. We do not recommend that this approach should be used for “market driven” land forecasting and reservation in the current economic structure of the SAR but, again, a separate zoning could be created if required.

As noted above, there may be other categories of market driven uses which can be forecasted as part of the “Employment Use” forecast but for short term reservation purposes at least may require a separate reservation or land bank creation by virtue of their special nature. This might include for example a Science Park allocation (to be made in conjunction with a research or educational institution) or a “logistics park” (to be developed in conjunction with a transport facility). The typology is capable of further subdivision to meet these requirements if required.

This typology approach meets the principles set out and reflects the analysis of changing property needs, and is therefore recommended for consideration by the HK2030 study.

2.5.5 Implementation of the Land Use Typology for the HK2030 Study

To implement the new land use typology for forecasting, the aggregate “employment use” will be linked to the existing classification of property products in Hong Kong. As mentioned above, “employment use” will include property products for which the demand is primarily market driven. In ILDS and OLDS, we considered the demand for private offices, private flatted factories, private I/O and private storage was market driven and assessed the demand using an econometric forecasting approach. Housing Authority flatted factories and private specialised factories were however excluded in the forecasting model because at that time it was considered that their demand was primarily supply led and driven by public policies.

For the HK2030 Study, we propose to include Housing Authority flatted factories and private specialised factories as “employment use” as we feel that the demand for these property products is increasingly dependent on the performance of the economy, more than the supply of premises or public policies. Uses excluded will include employment uses within buildings/structures without an occupation permit, such as some informal industrial uses in rural areas. Given these uses are not, and will not be, mainstream employment uses in Hong Kong, excluding these uses in the forecasting model should not affect its performance significantly. The components of the proposed aggregate “employment use” for forecasting purposes are presented in Table 2.2.
Table 2.2 Components of the Aggregate Employment Use (Existing and Committed Supply)

<table>
<thead>
<tr>
<th>Uses</th>
<th>Property Products*</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>Private Offices</td>
<td>OLDS Forecast</td>
</tr>
<tr>
<td>Industrial</td>
<td>Private Flatted Factories</td>
<td>ILDS Forecast</td>
</tr>
<tr>
<td></td>
<td>Private I/O</td>
<td>ILDS Forecast</td>
</tr>
<tr>
<td></td>
<td>Housing Authority Flatted Factories</td>
<td>ILDS Forecast</td>
</tr>
<tr>
<td></td>
<td>Private Storage</td>
<td>ILDS Forecast</td>
</tr>
<tr>
<td></td>
<td>Private Specialised Factories</td>
<td>ILDS Forecast</td>
</tr>
</tbody>
</table>

*excluding uses within buildings/structures without an occupation permit

The demand for “employment use” will be assessed using the econometric forecasting approach recommended in Chapter 3. The projected demand will be matched with existing supply of property products to determine the additional land requirements (or surplus) for various economic uses.
3 MODEL ESTABLISHMENT

3.1 Scope

It is important to consider the current economic context in which demand forecasts are being prepared. The primary focus of the HK2030 Study forecasts is the long term – to the year 2030. As such, cyclical trends in floorspace demand, or in underlying GDP, employment or other indicators are not important and the modelling methods chosen should be able to “read through” these fluctuations. This however means that if the results of long term forecasts are used in current or short term contexts then this may be misleading to users. For this reason the consultants also considered short and medium term forecasting needs. More significant are major structural changes such as those which Hong Kong underwent in the 1980’s with the shift of manufacturing across the boundary to the PRC. It is difficult for long term forecasts to pick up future structural changes but they are very important to the forecast. For this reason it was recommended that long term forecasts for use in planning strategies such as the HK2030 Study should be more “vision” based, enabling the forecaster to ‘envision’ outcomes for GDP, population, employment etc. – under different scenarios – and therefore to forecast employment land needs which match those assumptions. This approach has been further examined and adopted for long term forecasting in this Chapter.

It should also be noted that it is clear from the recent data collected on key economic indicators and from consultations undertaken that Hong Kong is currently undergoing a further significant structural change associated with the globalisation of the world economy and, in particular, the increasing integration with the PRD economy. This affects not only trade patterns but also labour markets directly with a much more ‘open’ boundary. As a relatively small and highly open economy Hong Kong is particularly sensitive to these changes. As noted below this has meant that the current radical changes which the economy has undergone has made it a difficult point at which to prepare forecasts, with highly fluctuating variables being used in the forecasting models. Econometric models which performed satisfactorily five years ago are no longer able to cope with recent fluctuations in the data. This has meant that the consultants here:

- Adopted an alternative vision based, more direct and transparent form of long term model
- Have a smaller range of satisfactory econometric models for medium term forecasting
- Have had to make more qualitative judgments on a number of variables, taking account of past trends.

For each of these reasons it will therefore be even more important to closely monitor the forecasts and the variables used in them.

In applying the econometric model approaches tested in Working Paper 2 (WP2), it was discovered that, on detailed application and testing some of the statistical relationships tested were fragile for use in the medium and long term and with increasing instability of key economic data in Hong Kong in recent years, are becoming more so. The limitations of using one econometric modelling approach for 30 year land forecasts with the currently available unstable data were recognized and an alternative direct approach focusing on the key economic and land use relationships was adopted. In the case of short term modelling, as WP2 found, trend models were found to be the most effective but since
these do not use the same data or model forms as other approaches – and are not a focus of the HK2030 Study process – these are excluded in this Final Report. The medium term forecasting approach retains the econometric approach originally developed for this purpose in the ILDS and OLDS studies and provides continuity with this work.

In all cases the limitations of applying the medium and long term models are set out, and some sensitivity tests have been carried out. Given current levels of data instability it is emphasized that there will be a continuous need for updating, recalibrating and necessary reviewing the models and forecasts.

As set out in detail in Chapter 2, the forecasts produced here cover all “market driven” categories of employment floorspace. This market driven type of employment floorspace includes private offices, private industrial/office, private flatted factories, Housing Authority flatted factories, private storage, and private specialised factories. While the category of specialised factories may include industrial estates, science parks, and business parks, other independent uses such as ports, airports, and utilities premises are excluded.

3.2 Methodology for Medium Term Forecasting (10 to 15 years)

3.2.1 Key Issues for Medium Term Forecasting

The objective in this case is to develop a tool for predicting the demand for employment land uses in the medium term, i.e. for up to future 15 years. Given the longer timeframe, the effect of market fluctuations is less important. The attempt here is to read through market fluctuations and model the effect of economic factors on the demand for economic land uses. The philosophy of predicting the future based on past experience will apply. However, given significant changes are likely to happen within the longer forecasting period, the medium term modelling approach should be capable of identifying and considering new factors (such as structural changes) which have emerged or are expected to emerge over time.

We have selected a limited number of economic factors which may explain the medium term changes in the demand for employment land uses. The relationships between the factors are presented in Figure 3.1. The medium term modelling approach will be based on the economic theories which set out the dependency of the demand for economic land uses on these economic factors. Figure 3.1 also highlighted that the relationships between the factors are being influenced by a number of structural factors such as globalisation and technology change. The medium term modelling approach has considered the effects of these factors as far as possible.
3.2.2 **Recommended Modelling Approaches and Limitations**

We recommend the use of the Ordinary Least Square (OLS) Method for medium term forecasting. This approach, which assesses the relationship between dependent (explained) variables and independent (explaining) variables and predicts the performance of dependent variable based on the known performance of independent variables, is widely used in the field of natural and social sciences. In forecasting terms, this approach assesses the relationship between dependent and independent variables in the past, and forecasts dependent variable based on the projection of independent variables. This approach has been used in OLDS and ILDS for forecasting the demand for office and industrial floor space in the future 15 years.

The OLDS and ILDS approach developed linear regression forecasting models based on both statistical performance and sound economic theories. This trend based approach identified factors which showed strong relationship in the past and assumed such relationship would continue in the future. To a certain extent, this approach is able to consider policy objectives by incorporating macroeconomic factors, such as GDP and employment, and their assumptions. However, this implies that the quality of the demand forecasts is highly dependent on the quality of the projection of the predicting factors. The main strength of the approach is that the models are relatively simple and explainable. The simplicity of the modelling approach allows users to review the models regularly to update the relationship between existing variables and to develop new models using new variables if they become important over time. However, the approach cannot explicitly
consider new factors which were not fully captured by official statistics, or new factors and changes in relationships which are expected to happen in the future.

A key issue for this kind of regression model is that the dependent variable is autocorrelated and many of the explaining variables are highly correlated. As a result a single equation model can only pick up a limited number of explaining factors. To consider more factors we need to develop more single equation models. The problem here is that the forecasts produced by these models often differ significantly and generate a very wide forecasting range which is not very useful to users. The limited number of explaining variables in a model also makes the model “black-box” to users although the relationship between explained and explaining variables may be proven to be strong in statistical terms.

One further important issue is that it has been increasingly difficult to identify OLS models which provide satisfactory statistical results – compared for example with the results of the similar models developed for the ILDS and OLDS studies in the mid-late 1990’s – due to the increasing instability of the independent variable data from the Hong Kong economy. As time series data for the period from 1997 to 2003 has been added to the forecasting models, the results have become significantly poorer. This is particularly the case for Hong Kong GDP data in this period and for employment data form the mid 1990s period which are the most important variables in explaining floorspace demand in the models recommended. Thus for example **Figure 3.2** compares the historic trend in Hong Kong GDP and floorspace demand since 1975 and it is apparent that there was a changing but relatively stable relationship. In 1998 however the fairly stable 5% GDP growth rate of the 1990’s gave way to a sudden 5% decline in 1998, stabilised 1999 around 3%, but then jumped again to growth of around 10% in 2000 before falling again to less than 1% growth in 2001. These fluctuations are amplified by considering year on year rates but can be explained in economic terms by what was happening in the Asian regional economy in particular, in 1998, 2000, 2003 and 2004. In an economy as open and relatively small as Hong Kong’s these fluctuations produce an instability which is particularly difficult to model. It is important to note however that these fluctuations are significant in the short term whereas the purpose here is to prepare medium and long term forecasts which are required to be able to “read through” this short term instability. Our approach therefore has been to exclude data which lie significantly outside the long term trend and this is applied to the data used for forecasting in Chapter 4 and to restrict the range of explanatory variables used where they may be subject to a high level of instability.
In this exercise, whilst trying to examine the range of economic factors affecting floorspace demand, we have tried to minimise the number of models by using a limited number of macroeconomic data which summarises a number of data as independent or explaining variables focusing on the factors shown in Figure 3.1 including GDP, employment, labour force and the performance of external economies. Thus, for the dependent or explained variables, we have used the aggregated demand variable, instead of the demand variables of individual property products as in short term models, to address the flexibility issue as identified in Chapter 2. The statistical tests for the selection of forecasting models are contained in Appendix A. It should also be noted however that the models recommended are highly reliant on data and forecasts for a limited number of important economic variables. These need to be kept updated by the relevant Government Departments - i.e. Census and Statistics Department on demographic data/projections and economic data, and Economic Analysis Division on economic forecast.

### 3.2.3 Recommended Medium Term Models

We have used the OLS Method to develop two forecasting models for medium term forecasting purposes, one to model the effects of the Hong Kong economy as a whole (indicated by the Gross Domestic Product of Hong Kong) and regional competition (indicated by Gross Domestic Product of Guangdong), and the other one to model the effects of population and employment growth in Hong Kong. The data used and its sources are contained in Appendix B.

As mentioned above, it has been increasingly difficult to identify OLS models which provide satisfactory statistical results due to the increasing instability of the independent variable data from the Hong Kong economy. Our approach therefore has been to test models which exclude the most unstable observations in the historic series. In this case...
we have recommended excluding observations which have a residual of larger than 2 standard deviations from the models to better reflect the long term trends and, as a result, improve the statistical performance of the models. In Model 1, 1997 and 1999 data were excluded, whilst 1978, 1992 and 1996 data were excluded in the Model 2. We also consider that the negative impacts of the SARS event and the strong rebound immediately following the incident are exceptional cases, and we recommend excluding 2003 and 2004 data in model development.

The equation of Model 1 developed based on 1978-1996, 1998 and 2000-2002 data is:

\[
TDC = -18525423 + 66939 \times (\sqrt{HKGDP}) - 236984 \times (\sqrt{GDGDP}) \]

Model 1

where

- TDC = Total floorspace demand for employment uses
- HKGDP = GDP of Hong Kong at 1990 prices in million HK$
- GDGDP = GDP of Guangdong Province at 1978 price level in 100 million yuan

Model 1 is developed based on the:

- positive relationship between the demand for employment uses and the Hong Kong economy – demand is generated from the requirements for accommodating economic activities and employment as a result of economic growth
- negative relationship between demand and regional competition – demand for employment uses declines as regional competition gets stronger, the positive effects of Mainland related economic activities and employment in Hong Kong is expected to be offset by the relocation of HK employment and economic activities across the boundary. Floorspace demand is expected to decline further as the mobility of HK people increases when infrastructure in the region improves and more HK people travel across the boundary for business.

Another model was developed based on 1978-1996, 1998 and 2000 data to cross check the accuracy of this forecasting approach. The back-trending test (see Chapter 4) shows that all projected values are within the 95% confidence interval, the error of about 1% is considered reasonable and acceptable. The statistical performance of both models is presented in Appendix C.

The equation of Model 2 developed based on 1979-1991, 1993-1995 and 1997-2002 data is:

\[
TDC = -39974860 + 4.86 \text{ Population} + 16.8 \text{ PE} \]

Model 2

where

- Population = Population of usual residents in Hong Kong
- PE = Persons engaged in selected sectors (HSIC 2 to 9)

Model 2 is developed based on the:
positive relationship between the demand for employment uses and employment level – demand for employment uses is directly related to the level of employment in Hong Kong.

positive relationship between demand and Hong Kong population changes – population growth will lead to an increase in labour supply, thereby increasing the demand for accommodation for potential jobs.

Like Model 1, another model, Model 2a, was developed based on 1979-1991, 1993-1995 and 1997-2000 data to cross check the accuracy of this forecasting approach. The statistical performance of both models is presented in Appendix C.

The back-trending test (see Chapter 4) shows that the projected values for 2001 and 2002 using model 2a fall outside the 95% confidence interval - the error of about 4% is considered too high and unacceptable. The error may be a result of a multicollinearity problem since the two independent variables (population and persons engaged) seem to be highly correlated. Although statistical tests confirmed that the two variables are correlated, the level of correlation is not as high as might be expected and, in economic theory terms, although the population is a determinant of persons engaged (through the labour force participation rate), it is also an important independent demand variable. The correlation coefficient $r$ is $+0.817$, which is significantly smaller than the correlation coefficient for Hong Kong GDP and Guangdong GDP ($+0.935$). Moreover, the projection of the two variables are produced by different parties (Economic Analysis Division$^9$ and Census and Statistics Department / Planning Department) using a different basis. We therefore believe that the error mainly comes from the failure of the model to reflect the situation where a sizeable proportion of HK residents are, and will be, working outside HK as job opportunities are provided by other economies (as shown in Figure 3.1), especially when transport infrastructure improves over time. This is an example of a structural change which the economy is now undergoing. In order to capture this change, in circumstances where limited data (on the proportion of HK residents working outside HK) is presently collected and therefore no “trend” is available, in this case we recommend using the Model 2a as a cross check and “qualitatively” adjusting the projection downwards to address the potential overestimation of demand for future employment uses in Hong Kong.

We recommend the use of both Model 1 and Model 2 to produce forecasts as both perform equally well. If however a single forecast is required (instead of, for example, using the two models to produce a range) then the two models could be combined by averaging the two sets of forecasts. In this way the results of the forecasts from the two models are equally weighted and a single forecast can be used to estimate land requirements.

3.3 Methodology for Long Term Forecasting (20 to 30 years)

3.3.1 Key Issues for Long Term Forecasting

The objective in this case is to develop a tool for predicting the demand for employment land uses in the long term, i.e. for up to 30 years in the future. Given the very long

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$^9$ PEs are assumed to grow at the same employment growth rates which were derived having consulted G Econ on the GDP growth rates and the employment growth for every percent of GDP growth
timeframe, the approach should be sufficiently "visionary" and scenario based. An important objective here is to assess the demand for economic land uses based on policy objectives. Although the explained and explaining factors identified for long term forecasting are similar to those identified for medium term forecasting, there are a wide range of factors that are currently undetermined and illustrated in Figure 3.3. The high level of uncertainty to be dealt with has rendered statistical relationship between various factors significantly less important. The focus is to develop a vision based approach, which is simple, transparent and explainable, uses existing situation as a baseline and draws on past experience to show the consistent underlying relationships. Unlike medium term forecasting approach which stresses the measurement of relationships between various factors by statistical techniques, the long term forecasting approach attempts to explain the underlying relationships to users as explicitly and transparently as possible.

**Figure 3.3 Path Diagram for Long Term Forecasting**

3.3.2 **Recommended Modelling Approaches and Limitations**

As mentioned in Chapter 2, land use demand for employment uses in overseas countries is most often calculated based on projected employment levels and worker density assumptions. In some cases the analysis is done at the sector level to consider the difference in worker densities of various economic sectors. The analysis is often
constrained by data availability. In some cases land use demand for employment uses is calculated directly from the projected population level. Drawing on international experience, we recommend the use of a simple model to calculate the economic land use demand from the projected employment level by applying worker density assumptions. At the same time we could cross check the applicability of the employment assumptions by examining its relationships with other key policy objectives, i.e. the population and economy assumptions. We will also identify the factors affecting all key assumptions, the relationships between them and set out how the assumptions are likely to be affected. Whilst the current situation will be used as a baseline for projection, the study of past experience may help reveal how the key variables have been affected by the identified factors. The approach for long term forecasting is summarised in Figure 3.4 below. The key to this approach is to interpret and present the vision objectively.

Figure 3.4  Approach to Long Term Forecasting
3.3.3 **Recommended Long Term Model**

We recommend using an alternative, qualitative approach to long term forecasting. This approach focussed on employment and worker density as the main drivers of employment land use demand but envisaged the setting of goals for employment and for a range of other factors and relationships which determine employment. These relationships, important to the setting of goals, include:

- Relationship between key variables (i.e. Population, Employment, Economy and Floorspace)
- Factors affecting population (natural growth & migration) – population policy, economy, employment etc.
- Factors affecting employment – labour supply (population & manpower), economic structure, labour productivity etc.
- Factors affecting economy – external factors such as world economy, regional competition (China factor) and internal factors such as economic policy etc.
- Factors affecting floorspace – economic structure, floorspace productivity.

Although not all of these factors are directly incorporated into the forecasting model, this goal setting approach requires research on these relationships and transparency of assumptions made before they are combined into a forecasting “equation”. These are set out below.

\[
\text{Floorspace} = \text{Employment} \times \% \text{ Employment Accommodated in HK’s Employment Land Uses} \times \text{Worker Density}
\]

Our recommended approach for the long term is in line with the international approach (employed in some UK, US, Australian cities) to assessing land demand / needs for employment uses in the long term where land demand is “calculated” from projected employment and worker density assumptions using some simple equations.
4 FLOORSPACE DEMAND AND LAND REQUIREMENTS

4.1 Planning Scenarios

Demand forecasts for employment uses have been prepared under three strategic planning Scenarios, the Reference Scenario (RS), and two alternative scenarios (see Working Paper 4 for development of the planning scenarios). The key planning assumptions under the reference scenario and the two “what-if” scenarios are presented in Tables 4.1 to 4.3.

4.1.1 Reference Scenario

Stage 3 of the HK2030 Study drew on the findings of Stage 1 (Agenda Setting, Baseline Review and Identification of Key Issues) and Stage 2 (Examination of Key Issues) to create a base for constructing possible development scenarios for the future. A RS was constructed on the basis of prevailing policies and socio-economic trends by the Planning Department to translate the long term vision targets into planning assumptions. The planning assumptions under the RS were subsequently revisited and reviewed after the completion of a public consultation exercise (HK2030 Study Stage 3 Public Consultation) carried out in the period from late 2003 to mid 2004. Demand forecasting in this report has employed the revised planning assumptions under the RS (as at May 2005), which considered both public views collected and the latest policies and socio-economic trends.

4.1.2 Alternative Scenarios: “What-if” Scenarios

“What-if” scenarios, i.e. alternatives to the RS, have been developed in view of the likelihood of unexpected changes. The planning parameters under the RS have been varied for assessing the potential impacts of the alternative situations. Response plans will be devised to respond to these situations as necessary.

Two “what-if” scenarios, which have direct implications for strategic development planning and are more likely to happen in the future, have been selected by the Planning Department for more detailed examination and quantitative assessment under Stage 4 of the HK2030 Study. To derive the two alternative scenarios, two key planning parameters on population and economic growth have been varied. These planning assumptions were employed for the preparation of demand forecasts and the estimation of additional land requirements for alternative scenarios.

The selected alternative scenarios are:

- **Low Population Growth Scenario (LPGS)** – a low population growth and steady economic growth situation. It is assumed that Hong Kong will move more rapidly towards a high-value added, non-worker intensive, knowledge-based economy, thereby maintaining the same level of economic growth under the RS. It is also assumed that some of the less skilled workers and more of the elderly population will retire to the Mainland and those who cannot afford the high costs of living will be displaced, resulting in a lower population compared with the RS. More workers are likely to live in the Pearl River Delta (PRD) and commute to Hong Kong to work, as a result of the future improvements in living conditions in the PRD and cross-boundary infrastructure. It is therefore assumed that there will be more cross-boundary workers, who are counted as employment but not resident population in Hong Kong.
- **High Population Growth Scenario (HPGS)** – a high population growth and high economic growth situation. It is assumed that Hong Kong will maintain high levels of economic growth to the long term. More jobs will be created and more people will be attracted to live in Hong Kong, compared with the RS.

### Table 4.1 Population Assumptions (in million)

<table>
<thead>
<tr>
<th>Year</th>
<th>RS</th>
<th>LPGS</th>
<th>HPGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>6.8</td>
<td>6.8</td>
<td>6.8</td>
</tr>
<tr>
<td>2010</td>
<td>7.2</td>
<td>7.1</td>
<td>7.2</td>
</tr>
<tr>
<td>2020</td>
<td>7.8</td>
<td>7.6</td>
<td>8.0</td>
</tr>
<tr>
<td>2030</td>
<td>8.4</td>
<td>8.0</td>
<td>8.8</td>
</tr>
</tbody>
</table>

Source: Planning Department (as at May 2005)

### Table 4.2 Economic Growth Assumptions (% Real Growth)

<table>
<thead>
<tr>
<th>Year</th>
<th>RS-Hong Kong</th>
<th>Guangdong</th>
<th>LPGS-Hong Kong</th>
<th>Guangdong</th>
<th>HPGS-Hong Kong</th>
<th>Guangdong</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>3.2</td>
<td>13.0</td>
<td>3.2</td>
<td>13.0</td>
<td>3.2</td>
<td>13.0</td>
</tr>
<tr>
<td>2003-2010</td>
<td>4.0</td>
<td>10.0</td>
<td>4.0</td>
<td>10.0</td>
<td>4.0</td>
<td>10.0</td>
</tr>
<tr>
<td>2011-2020</td>
<td>3.5</td>
<td>8.0</td>
<td>3.5</td>
<td>8.0</td>
<td>4.0</td>
<td>8.0</td>
</tr>
<tr>
<td>2021-2030</td>
<td>3.0</td>
<td>--</td>
<td>3.0</td>
<td>--</td>
<td>3.5</td>
<td>--</td>
</tr>
</tbody>
</table>

Source: Planning Department (as at May 2005)

### Table 4.3 Employment Assumptions (in million)

<table>
<thead>
<tr>
<th>Year</th>
<th>RS</th>
<th>LPGS</th>
<th>HPGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>2010</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>2020</td>
<td>3.7</td>
<td>3.7</td>
<td>3.9</td>
</tr>
<tr>
<td>2030</td>
<td>4.0</td>
<td>4.0</td>
<td>4.4</td>
</tr>
</tbody>
</table>

Source: Planning Department (as at May 2005)

### 4.2 Medium Term Forecasting Assumptions and Results

Table 4.4 presents the projection of independent variables for year 2010 under the three planning scenarios. Medium term forecasts (for year 2010) have been prepared using the medium term models recommended in Chapter 3 and the projection of independent variables. Table 4.5 and Figure 4.1 summarise the medium term forecasts prepared using Model 1 and Model 1a and compare the forecasts with historical data. Table 4.6 and Figure 4.2 summarise the medium term forecasts for Model 2 and Model 2a. As discussed in Chapter 3, Model 2 failed the back-trending test and it is necessary to
“qualitatively” adjust the projection downwards to address the potential overestimation of demand for future employment uses in Hong Kong. This has been done by comparing the error term of about 4% in 2002 in the equation for Model 2a as a ratio which captures that effect and applying it, at the 4% level, to the use of Model 2. However this trend can be expected to grow continuously in the future, from 4% in 2003 to 5% in 2010 – this represents a slow but positive growth. The adjusted projection is presented in Table 4.7.

### Table 4.4 Projection of Independent Variables (Year 2010)

<table>
<thead>
<tr>
<th>Planning Scenarios</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>HK GDP (1,000 billion HKD, 1990 price level)</td>
<td>Guangdong GDP (100 billion yuan, 1978 price level)</td>
<td>HK Population (million)</td>
</tr>
<tr>
<td>RS/HPGS</td>
<td>1.24</td>
<td>8.37</td>
</tr>
<tr>
<td>LPGS</td>
<td>1.24</td>
<td>8.37</td>
</tr>
</tbody>
</table>

Source: Planning Department (as at May 2005)

### Table 4.5 Medium Term Forecasts (Model 1 and Model 1a)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand (million sq.m. IFA)</td>
<td>Demand (million sq.m. IFA)</td>
<td>Error (within 95% Confidence Interval)</td>
<td>Demand (million sq.m. IFA) under RS</td>
</tr>
<tr>
<td>2001</td>
<td>31.0</td>
<td>31.3</td>
<td>0.7% (yes)</td>
</tr>
<tr>
<td>2002</td>
<td>30.7</td>
<td>31.1</td>
<td>1.4% (yes)</td>
</tr>
<tr>
<td>2003</td>
<td>30.8</td>
<td>31.2</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>34.8</td>
<td>34.3</td>
<td>34.3</td>
</tr>
</tbody>
</table>

### Table 4.6 Medium Term Forecasts (Model 2 and Model 2a)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand (million sq.m. IFA)</td>
<td>Demand (million sq.m. IFA)</td>
<td>Error (within 95% Confidence Interval)</td>
<td>Demand (million sq.m. IFA) under RS</td>
</tr>
<tr>
<td>2001</td>
<td>31.0</td>
<td>32.1</td>
<td>3.6% (no)</td>
</tr>
<tr>
<td>2002</td>
<td>30.7</td>
<td>31.9</td>
<td>4.0% (no)</td>
</tr>
<tr>
<td>2003</td>
<td>30.8</td>
<td>30.8</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>37.3</td>
<td>36.7</td>
<td>36.4</td>
</tr>
</tbody>
</table>
Figure 4.1  Medium Term Forecasts (Model 1 and Model 1a) under RS


Model 1a (Based on 1978-1996, 1998 & 2000 data)
Figure 4.2  Medium Term Forecasts (Model 2 and Model 2a) under RS


Table 4.7  Medium Term Forecasts (Model 2) – Adjusted Projection

<table>
<thead>
<tr>
<th>Year</th>
<th>Adjustment Ratio</th>
<th>Demand (million sq.m. IFA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>RS</td>
</tr>
<tr>
<td>2010</td>
<td>5.0%</td>
<td>34.9</td>
</tr>
</tbody>
</table>

As recommended in Chapter 3, the results of Model 1 and Model 2 have been averaged to produce a single forecast as required by the Planning Department for the estimation of land requirements (Table 4.8).

Table 4.8  Medium Term Forecasts*

<table>
<thead>
<tr>
<th>Year</th>
<th>Demand (million sq.m. IFA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RS</td>
</tr>
<tr>
<td>2010</td>
<td>34.6</td>
</tr>
</tbody>
</table>

* by averaging the results of model 1 and model 2

4.3 Long Term Forecasting Assumptions and Results

4.3.1 Establish a Baseline for Projection - Past and Present Situation

In Chapter 3 we recommended a vision based approach to long term forecasting, which is simple, transparent and explainable, uses existing situation as a baseline and draws on past experience to show the consistent underlying relationships. Further projections and assumptions of key variables are therefore required. Such projections and assumptions are possible only when benchmarked against relevant past statistics. We have used 1980, 1990 and 2001 data as reference points, some other indicators were calculated using these data. Considering the unprecedented SARS event in early 2003 and strong rebound in late 2003 and 2004, we do not see the need to update the baseline situation and forecasting assumptions derived based on the past and baseline situation.

The general indicators (indicators prepared for the HK2030 Study to illustrate key trends, their definitions may be different from those used by C&SD) which can be used to explain the relationship between economic factors and the dependent variable to a greater or lesser extent are presented in Tables 4.9 to 4.11. Interpretations of the messages behind the above indicators are discussed in the following section.
### Table 4.9 General Indicators (Specific to Forecasting)

<table>
<thead>
<tr>
<th>Year</th>
<th>Employment (million people)</th>
<th>% employment accommodated in HK’s employment land uses</th>
<th>Worker density (sq.m. IFA per person)</th>
<th>Floorspace (million sq.m. IFA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>2.2 (1)</td>
<td></td>
<td></td>
<td>14.8 (4)</td>
</tr>
<tr>
<td>1990</td>
<td>2.7 (1)</td>
<td></td>
<td></td>
<td>26.2 (4)</td>
</tr>
<tr>
<td>2001</td>
<td>3.3 (1)</td>
<td>50% (2)</td>
<td>19 (3)</td>
<td></td>
</tr>
<tr>
<td>2003 (7)</td>
<td>3.0 (5)</td>
<td>--</td>
<td>--</td>
<td>30.8 (4)</td>
</tr>
<tr>
<td>2020 (RS/LPGS)</td>
<td>3.7 (5)</td>
<td>48% (6)</td>
<td>20 (6)</td>
<td>35.9</td>
</tr>
<tr>
<td>2020 (HPGS)</td>
<td>3.9 (5)</td>
<td>48% (6)</td>
<td>20 (6)</td>
<td>37.8</td>
</tr>
<tr>
<td>2030 (RS/LPGS)</td>
<td>4.0 (5)</td>
<td>47.5% (6)</td>
<td>20.5 (6)</td>
<td>38.7</td>
</tr>
<tr>
<td>2030 (HPGS)</td>
<td>4.4 (5)</td>
<td>47.5% (6)</td>
<td>20.5 (6)</td>
<td>42.5</td>
</tr>
</tbody>
</table>

(1) employment = labour force – number of unemployed people, data from C&SD
(2) estimated using 1999 employment figures
(3) estimated from SAPFEDII
(4) total demand for employment land uses, data from R&VD
(5) Planning Department’s estimates / assumptions (as at May 2005)
(6) Consultants’ assumptions
(7) baseline situation and forecasting assumptions derived based on the past and baseline situation were not undated to 2003 because of the unprecedented SARS event in early 2003 and strong rebound in late 2003 and 2004

### Table 4.10 General Indicators (Population)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>5.1 (1)</td>
<td>46% (2)</td>
<td>2.3 (5)</td>
<td>96% (4)</td>
</tr>
<tr>
<td>1990</td>
<td>5.7 (1)</td>
<td>48% (2)</td>
<td>2.8 (5)</td>
<td>99% (4)</td>
</tr>
<tr>
<td>2001</td>
<td>6.7 (1)</td>
<td>51% (2)</td>
<td>3.4 (5)</td>
<td>95% (4)</td>
</tr>
<tr>
<td>2003 (6)</td>
<td>6.8 (1)</td>
<td>51% (2)</td>
<td>3.5 (5)</td>
<td>86% (4)</td>
</tr>
<tr>
<td>2020 (RS)</td>
<td>7.8 (5)</td>
<td>51% (2)</td>
<td>4.0 (5)</td>
<td>95% (4)</td>
</tr>
<tr>
<td>2020 (LPGS)</td>
<td>7.6 (5)</td>
<td>51% (2)</td>
<td>3.9 (5)</td>
<td>97% (4)</td>
</tr>
<tr>
<td>2020 (HPGS)</td>
<td>8.0 (5)</td>
<td>51% (2)</td>
<td>4.1 (5)</td>
<td>96% (4)</td>
</tr>
<tr>
<td>2030 (RS)</td>
<td>8.4 (5)</td>
<td>49% (2)</td>
<td>4.1 (5)</td>
<td>97% (4)</td>
</tr>
<tr>
<td>2030 (LPGS)</td>
<td>8.0 (5)</td>
<td>48% (2)</td>
<td>3.9 (5)</td>
<td>100% (4) (7)</td>
</tr>
<tr>
<td>2030 (HPGS)</td>
<td>8.8 (5)</td>
<td>51% (2)</td>
<td>4.5 (5)</td>
<td>97% (4)</td>
</tr>
</tbody>
</table>

(1) mid year population, data from C&SD
(2) calculated from population and labour force figures (Labour Force Participation Rate = Labour Force / Population)

(3) labour force figures, data from C&SD

(4) calculated from labour force and employment figures (Employment Rate = Employment / Labour Force)

(5) Planning Department's assumptions (as at May 2005)

(6) baseline situation and forecasting assumptions derived based on the past and baseline situation were not undated to 2003 because of the unprecedented SARS event in early 2003 and strong rebound in late 2003 and 2004

(7) Under this scenario, in theory the employment rate would be 100% since the number of jobs recorded would be larger than the labour force. In practice, the employment rate would not reach 100% because (i) a higher number of non-residents would hold jobs in HK and (ii) a higher % of persons would hold more than one job

Table 4.11 General Indicators (Economy)

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP (1,000 billion HKD @2000 prices)</th>
<th>Per capita GDP (1,000 HKD @2000 prices)</th>
<th>% GDP generated from HK's employment land uses</th>
<th>Floorspace productivity (1,000 HKD per sq.m. IFA)</th>
<th>labour productivity (1,000 HKD @2000 prices)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>0.44 (1)</td>
<td>87 (2)</td>
<td></td>
<td>163 (3)</td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>0.85 (1)</td>
<td>148 (2)</td>
<td></td>
<td>260 (3)</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>1.32 (1)</td>
<td>197 (2)</td>
<td>50% (3)</td>
<td>21 (3)</td>
<td>358 (5)</td>
</tr>
<tr>
<td>2003 (5)</td>
<td>1.39 (1)</td>
<td>204 (2)</td>
<td>--</td>
<td>--</td>
<td>463 (6)</td>
</tr>
<tr>
<td>2020 (RS)</td>
<td>2.68 (6)</td>
<td>344 (2)</td>
<td>52% (3)</td>
<td>39 (4)</td>
<td>726 (5)</td>
</tr>
<tr>
<td>2020 (LPGS)</td>
<td>2.68 (6)</td>
<td>353 (2)</td>
<td></td>
<td>39 (4)</td>
<td>726 (5)</td>
</tr>
<tr>
<td>2020 (HPGS)</td>
<td>2.82 (6)</td>
<td>352 (2)</td>
<td></td>
<td>39 (4)</td>
<td>722 (6)</td>
</tr>
<tr>
<td>2030 (RS)</td>
<td>3.61 (6)</td>
<td>430 (2)</td>
<td>53% (3)</td>
<td>49 (4)</td>
<td>902 (5)</td>
</tr>
<tr>
<td>2030 (LPGS)</td>
<td>3.61 (6)</td>
<td>451 (2)</td>
<td></td>
<td>49 (4)</td>
<td>902 (6)</td>
</tr>
<tr>
<td>2030 (HPGS)</td>
<td>3.97 (6)</td>
<td>452 (2)</td>
<td>53% (3)</td>
<td>50 (4)</td>
<td>903 (6)</td>
</tr>
</tbody>
</table>

(1) GDP data from C&SD (22 Feb 2006)

(2) Calculated from GDP and population figures (Per Capita GDP = GDP / Population)

(3) Consultants' estimation

(4) calculated from GDP and floorspace figures and % GDP from HK’s employment land uses assumptions (Floorspace Productivity = GDP x % GDP from HK’s Employment Land Uses / Floorspace)

(5) Calculated from GDP and employment figures (Labour Productivity = GDP / Employment)

(6) based on 2004 GDP data from C&SD (26 Aug 2005) and Planning Department’s assumptions on GDP growth:

To 2010 2011-20 2021-30
RS / LPGS 4.0% 3.5% 3.0%
HPGS 4.0% 4.0% 3.5%

(7) Consultants’ assumptions

(8) baseline situation and forecasting assumptions derived based on the past and baseline situation were not undated to 2003 because of the unprecedented SARS event in early 2003 and strong rebound in late 2003 and 2004

4.3.2 Interpretation of Goals (Population, Employment and Economy)

In this approach the above economic factors and indicators can be interpreted to explain the macro-economic environment, increasing the transparency of the goals which have
been set. By understanding the economic relationships and interpreting these, the factors and indicators can be "projected" and therefore the dependent variables can be "forecasted" with regard to:

- **Population, labour participation rate, and employment rate.** The relationship between these factors depends on the relative growth rates of population, labour force, and persons employed. If the population grows faster than jobs available, then the unemployment rate is expected to increase (i.e., a declining employment rate). If, at the same time, labour is discouraged from working or seeking jobs, fewer would participate in the labour force.

- **GDP, employment, and labour productivity.** Relative growth rates between GDP and persons employed is a result of value added of output which is also known as productivity of labour. For instance, if the economy focuses on more value-added production which is less labour intensive, the GDP growth rate will outpace that of persons employed. In other words, labour productivity will become higher. Data confirms an apparent trend to increasing labour productivity.

Key messages from the goals are:

<table>
<thead>
<tr>
<th>Key Assumptions</th>
<th>Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected employment is expected to grow faster than projected population</td>
<td>Encouraging the immigration of talents and professionals will support both population and employment growth. The number of cross boundary workers and worker to job ratio will increase over time to offset the expected decrease of labour force. Unemployment rate will maintain at the natural rate of unemployment.</td>
</tr>
<tr>
<td>Projected GDP is expected to grow faster than projected population</td>
<td>Hong Kong is becoming more prosperous over time</td>
</tr>
<tr>
<td>Projected GDP is expected to grow faster than projected employment</td>
<td>Hong Kong will focus on high value added and non-labour intensive economic activities</td>
</tr>
</tbody>
</table>

### 4.3.3 Key Forecasting Assumptions

When these relationships are analysed and understood a series of key forecasting assumptions need to be set - as set out in **Figure 3.4**. The relationships between "Population", "Economy" (i.e. GDP) and "Employment" assumptions and the demand for economic land uses are fixed by five key forecasting variables for which assumptions must be made qualitatively and quantitatively. These are as follows.

- **Labour Participation Rate.** With lower birth rates and longer life expectancy, an ageing population is anticipated. In 1996, the birth rate was 10 per 1000 but the figure dropped to 7.0 per 1000 in 2004. Therefore, the dependency ratio in Hong Kong is expected to be higher than the current level. However, the impacts on the labour participation rate are counteracted by longer school years, older age of retirement, and more active participation of females in the labour force. All these factors will contribute to the impact on the labour participation rate, which is likely to decline slightly from 51% in 2001 to an assumed 49% in 2030 under the RS.

- **Employment Rate.** It is anticipated that the rapid economic growth will generate sufficient jobs for the SAR and sustain a low level of unemployment rate of 5% until 2030. The number of jobs available will even be higher than the supply of labour
due to ageing of population. It is expected that the number of cross boundary workers and the worker to job ratio will increase over time.

- **Percentage of employment accommodated in Hong Kong’s employment land uses.** This refers to the size of the employed population which is working in “conventional” employment land use premises in Hong Kong. Considering the potential increase in job and worker mobility (as a result of continuous economic restructuring, globalisation, technology advancement, improvement of transport infrastructure and relaxation of cross boundary restrictions), the growing popularity of small-office-home-office (SOHO) and hot-desking working practices, the development of existing growth sectors such as logistics and tourism, as well as the policy to promote local community economy (i.e. retail and community services sectors), it is likely that more people will be working in the “unconventional” land use premises, although this effect is expected to be more limited in Hong Kong than internationally. This means more people will be working from across the boundary, working from abroad, working from home, and more people will be employed in the economic sectors which do not take up employment land as presently defined. As a result, the percentage of employment accommodated in Hong Kong’s employment land uses is expected to decrease, from the 2001 level of 50% to the assumed level of 47.5% in 2030.

- **Percentage of GDP generated by Hong Kong’s employment land uses.** Although the percentage of employment accommodated in Hong Kong’s employment land uses is expected to decline in the next three decades, the percentage of GDP generated by Hong Kong’s employment land uses is expected to move in the opposite direction. This is because most economic activities remaining active on Hong Kong’s employment land will be the higher value-added ones, for example, financial services, IT industry, and the more hi-tech businesses that usually require a smaller land area. At the same time, relatively low value-added and land-intensive industries such as manufacturing and storage will continue to relocate northward to the Mainland (although at a decreasing rate) to take advantage of lower land and labour costs. This will be promoted by future relaxation of cross boundary restrictions and improvement of cross boundary facilities, as well as the anticipated improvement of the financial and legal systems in the Mainland as a result of China’s entry to the WTO and CEPA (e.g. simpler procedures for setting up new businesses). The current level of GDP generated from Hong Kong’s employment land uses of 50% in 2001 is expected to increase to an assumed level of 53% by 2030.

- **Worker density.** Worker density is expected to decrease from the 2001 level of 19 sq.m. IFA per employee to 20 sq.m. IFA per employee by 2020 and 20.5 sq.m IFA per employee by 2030 (an annual growth rate of 0.25% over 30 years), to reflect the growing aspirations for a better quality and more spacious working environment as a result of the anticipated increase in prosperity, and our locational advantages to attract multi-national, high value added activities to Hong Kong. These activities are often accommodated in park type developments in other countries. The decrease in worker density may, to a certain extent, be offset by the continuous relocation of storage activities (which have a very low worker density at present) to the Mainland. This factor is unlikely to be as important in the manufacturing sector where significantly lower floorspace densities are reported in SAPFED II however, as most activities which could leave Hong Kong have already done so, and there is now relatively little manufacturing capacity left to restructure in Hong Kong as a proportion of all employment activities. These storage activities are largely serving local demand. Trend data also shows that the growth of IFA per worker is lower in the office based business and finance and import and export activities.
It should be noted that this forecasting method is relatively sensitive to the worker density assumption adopted (see Working Paper 3) and that therefore the change in average density assumed should not exhibit too significant a level of change on the most up to date surveyed information on the average density (currently at 19 sq m IFA per employee) available and that this should be regularly monitored. It has been suggested that since the worker density varies significantly between activity sectors, a more accurate estimate of future densities would be achieved by disaggregated assumptions for each activity which could be weighted by the employment and floorspace in each activity and combined into an average figure for all activities. However in testing this approach it is apparent that there is not a good fit in the activity categorisation between floorspace and employment without combining categories which, again, have a wide range of different densities at present. Moreover it would then be necessary to make individual judgments and assumptions about technological and other changes which are expected to affect worker densities in future for each of the activities concerned before an average “all employment activities” density could be estimated.

4.4 Summary of Forecasting Results

The medium and long term forecasting results are summarised in Figure 4.3. The results suggest a steady increase in the demand for employment uses to the long term, attributed to anticipated population and economic growth. The floorspace demand is expected to be growing at a slower pace in the long term under the LPGS, compared with the RS and HPGS.

However, it is important to note that the medium term and long term forecasts have been prepared using different methods, data, assumptions and, indeed with different medium and long term objectives - as set out in the introduction to this report. It is not therefore recommended that the forecasts are used on this combined basis. Although Figure 4.3 presents an integrated picture of the medium and long term forecasting results prepared, a single integrated forecast from the different approaches is not attempted. Whist an overall trend from the approaches can be discerned it is important to note that the two different approaches reflect the different concerns of the users. Thus the medium term forecasts focus on the relationship between the floorspace demand and the medium to longer term economic determinants of that demand, whilst the long term forecasts focus on the overall “scale” of the territory and the economy by considering demographic and labour force factors directly. Thus the use of the forecasting results is entirely dependent on the purpose of users and it is not logical to “combine” the results. The use of the forecasts in the HK2030 Study is the main objective of the present study and this should focus on the long term results for which intermediate year results are less relevant – but, where intermediate point data is required, it should still be read from the long term forecast. Where medium term land allocation issues are important the medium term forecasts are the most appropriate using annual data from the forecasts.
4.5 Disaggregation of Floorspace by Typology

WP3 presented our recommended approach to the disaggregation of floorspace. The assumptions for the disaggregation have been reviewed by the Planning Department in the light of public views collected from their Stage 3 Consultation. Factors that could affect the share amongst the three types of economic floorspace uses are summarised below.

4.5.1 Factors Affecting Office Demand

Under the vision of the HK2030 Study, Hong Kong’s role as an international financial centre and the “gateway to China” is expected to be maintained. Hong Kong will continue to attract foreign firms to set up their regional headquarters or offices here. “CBD Grade A Office Land” has been identified for separate reservation because of the particular locational, quality of use, and value characteristics of CBD activities. While currently the CBD is restricted to Sheung Wan, Central, Wanchai, Causeway, and Tsim Sha Tsui, it is possible that the geographical coverage of CBD may extend to other districts in the future.

It is observed that during the past decade, Grade A offices in the CBD take up about 8.6% to 10.3% of total floorspace demand, and an increasing trend is demonstrated. The increase in the share of high quality CBD offices may be linked to the economic restructuring process in the past decade which removed the demand for industrial uses and raised the demand for office accommodation at central locations. Considering the economic restructuring process is expected to continue in the future as speeded up by the recent integration of the China economy with the world economy, the share of high quality CBD offices in Hong Kong is expected to increase further in the future – to allow Hong Kong to focus on high value added economic activities (e.g. regional headquarters, financial services). The latest survey conducted by C&SD (June 2004) recorded a total of 3,609 overseas companies having established their regional operations in Hong Kong.
The number of regional headquarters increased from 966 in 2003 to 1,098; the number of regional offices increased by 12% from 2,241 to 2,511, both being all time highs. InvestHK initiatives have helped to maintain this growth and will continue to boost demand for high-grade offices.

The trend of concentrating high quality offices in the Central Business District and the intention to strengthen the CBD further by providing more high quality offices in the future are also shown in other major cities such as New York, London, Tokyo and Toronto (see Working Paper 3). In addition, the increase in the share of office uses amongst all business uses as a consequence of the economic restructuring process was also highlighted – the economic restructuring process in London started in the 1950/60s, since then the demand for offices has been growing faster than the demand for industrial uses. It should however be noted that the economic restructuring process in Hong Kong has been / is happening so fast that it is difficult to find a city that has comparable experience. In Tokyo, the mass corporate restructuring and office consolidation activities have resulted in huge demand for higher grade offices which have larger floor area. This experience is relevant to Hong Kong where businesses are enhancing their competitiveness through merging and acquisition.

Taking account of revised definitions of Grade A space during the period, this has been a steady expansion of the share and, assuming that the CBD expands as proposed in the OLDS strategy (which revealed office decentralization was not so important for Hong Kong), it is reasonable to assume that this share will continue to grow at the same rate.

As a result, the share of demand for Grade A CBD offices out of total floorspace demand has been projected, and the resulting figures are applied on to the total floorspace demand forecasts as described above to compute the floorspace demand for Grade A CBD offices floorspace. It should be noted the increase in the share of high quality CBD offices may be realized by both adding new office stock in the CBD and through extending the geographical coverage of CBD to cover other districts in the future.

Based on this method, it is expected that CBD Grade A offices will grow to approximately 13% of all employment floorspace by 2030 from present levels of about 10%, which can be translated into a demand of approximately 5 million sq m IFA under the RS (Table 4.12).

4.5.2 Factors Affecting Demand for General Business Accommodation

Acting as the “Mainland’s springboard to the world” is another important role of Hong Kong. Since 2003, the central government has introduced a series of new policies and measures to support Mainland enterprise seeking to access international markets and do business overseas. A draft policy was issued in 2004 with a focus on further liberalisation of the existing regulatory regime and increased autonomy for Mainland enterprises with regard to the use of their own foreign exchange funds. The signing of CEPA I and II in 2003 and 2004 has brought further benefits to the Hong Kong economy. 4.26 million Mainland resident trips were made and an estimated additional $6.5 billion tourist spending was generated in 2004 under the Individual Visit Scheme, with related

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impacts on the tourism sector and demand for accommodation. CEPA also facilitates the setting up of operations in Hong Kong by Mainland private enterprises. As advised by CITB, many of those already established here tend to be small and medium-sized enterprises demanding less prime locations. In this regard, it could be assumed that in future, there will be relatively higher demand for land for General Business uses, as compared to previous estimate.

4.5.3 Factors Affecting Special Industrial Floorspace

Regarding the category of Industry Land with Special Environmental Requirements, it is expected that by 2030 this will comprise only a very small sector of mostly high technology services which will, by 2030, not necessarily be polluting but may require sites where special treatment, security, or other measures have to be taken.

In Hong Kong these requirements are likely to be new and specialized, replacing the more broadly based “special industry” zoning. Increasingly such activities will be fewer and will not be defined by noxious nature of the activity itself but by the need for higher standards of segregated environment or by international quality standards for production of very specialized products such as those in the “life sciences”, medicine, environmental science or materials sectors.

In the case of “Industry land with special environmental requirements” this is not the same as the former definition of “special industry” – a more broadly defined category of policy driven land allocations through the former Hong Kong Industrial Estates Corporation. This new category will be a much smaller, market driven, category responding to the special segregated or environmental service needs of certain activities.

In practice, little of this type of activity, such as recycling, microbiological, aerospace and materials science production and research, presently exists in Hong Kong and therefore trends cannot be measured. In Hong Kong the demand for such space may grow out of developing expertise in communicable diseases, the activities on the Science Park, initiatives such as the Recovery Park, or other specialist activities currently accommodated by industrial estates. Allocations may, indeed, be in association with these existing or proposed facilities. In other countries these activities have been located within special secured government, military, health or other research installations or as part of Science Parks, hospitals, university or research institutes. Planning decisions for such facilities in other countries have therefore been taken on an individual case-by-case basis rather than by general land allocations.

In the past few decades, Hong Kong’s economy has been changing rapidly, from a manufacturing base to a logistics and hi-tech services hub. It is envisaged that there would be a growing demand for special industrial floorspace from the logistics sector and, less significantly, from some higher value-added industries. As understood from CITB, there has been a recovery in the take-up rate for land at the existing industrial estates. We could therefore assume that the share of accommodation for special industries in future would be about 13% by 2030.

In the light of the above new circumstances, the models have been recalibrated with new input data. The revised inputs are shown in Table 4.12.
Table 4.12 Split Factors for Disaggregation of Floorspace Demand

<table>
<thead>
<tr>
<th>Year</th>
<th>CBD Grade A Offices</th>
<th>General Business</th>
<th>Special Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>11.0%</td>
<td>77.0%</td>
<td>12.0%</td>
</tr>
<tr>
<td>2020</td>
<td>12.0%</td>
<td>75.5%</td>
<td>12.5%</td>
</tr>
<tr>
<td>2030</td>
<td>13.0%</td>
<td>74.0%</td>
<td>13.0%</td>
</tr>
</tbody>
</table>

Source: Planning Department (as at May 2005)

4.5.4 Disaggregation Results

The disaggregation results are presented in Table 4.13.

Table 4.13 Disaggregation Results (Demand in million sq.m. IFA)

<table>
<thead>
<tr>
<th>Year</th>
<th>CBD Grade A Offices</th>
<th>General Business</th>
<th>Special Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RS</td>
<td>LPGS</td>
<td>HPGS</td>
</tr>
<tr>
<td>2010</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
</tr>
<tr>
<td>2020</td>
<td>4.3</td>
<td>4.3</td>
<td>4.5</td>
</tr>
<tr>
<td>2030</td>
<td>5.0</td>
<td>5.0</td>
<td>5.5</td>
</tr>
</tbody>
</table>

4.6 Projection of Land Requirements

The requirements for additional employment land have been estimated by:

- comparing the forecasts of floorspace demand with existing floorspace supply of employment uses to determine the demand for additional floorspace; and
- converting the demand for additional floorspace into additional land requirements using a number of assumptions on planning parameters.

The forecast of floorspace demand is first increased by 10% to reflect the normal level of vacancy rate in the property market. The adjusted demand figure is then compared with the stock of employment floorspace in 2003 to determine the floorspace demand to be met by new supply of employment uses. The additional floorspace demand is converted from IFA figures to GFA figures using an IFA to GFA conversion factor. The additional floorspace demand is then converted from GFA figures to additional land requirements in terms of net site area using an assumed plot ratio.

The planning parameters used for the estimation of additional land requirements are presented in Table 4.14. The additional land requirements are presented in Table 4.15. The additional land requirement by 2030 is estimated to be in the order of 293ha under the HPGS.
### Table 4.14 Assumptions on Planning Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>CBD Grade A Offices</th>
<th>General Business</th>
<th>Special Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>vacancy rate</td>
<td>10%</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>IFA to GFA</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>plot ratio(^2)</td>
<td>14</td>
<td>11</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Consultant’s assumptions taken into account Planning Department’s input as at May 2005. For vacancy rates, reference is also made to R&VD’s vacant stock from 1999 to 2003.

### Table 4.15 Land Requirements (on top of 2003 stock in ha) to Meet Project Demand

<table>
<thead>
<tr>
<th>RS</th>
<th>CBD Grade A Offices</th>
<th>General Business</th>
<th>Special Industries</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004 to 2010</td>
<td>7</td>
<td>22</td>
<td>84</td>
<td>113</td>
</tr>
<tr>
<td>2004 to 2020</td>
<td>12</td>
<td>29</td>
<td>108</td>
<td>148</td>
</tr>
<tr>
<td>2004 to 2030</td>
<td>19</td>
<td>49</td>
<td>146</td>
<td>215</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LPGS</th>
<th>CBD Grade A Offices</th>
<th>General Business</th>
<th>Special Industries</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004 to 2010</td>
<td>6</td>
<td>21</td>
<td>82</td>
<td>109</td>
</tr>
<tr>
<td>2004 to 2020</td>
<td>12</td>
<td>29</td>
<td>108</td>
<td>148</td>
</tr>
<tr>
<td>2004 to 2030</td>
<td>19</td>
<td>49</td>
<td>146</td>
<td>215</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HPGS</th>
<th>CBD Grade A Offices</th>
<th>General Business</th>
<th>Special Industries</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004 to 2010</td>
<td>7</td>
<td>22</td>
<td>84</td>
<td>113</td>
</tr>
<tr>
<td>2004 to 2020</td>
<td>14</td>
<td>47</td>
<td>124</td>
<td>186</td>
</tr>
<tr>
<td>2004 to 2030</td>
<td>25</td>
<td>87</td>
<td>181</td>
<td>293</td>
</tr>
</tbody>
</table>

\(^2\) The plot ratios are derived on the basis of the following: (a) plot ratios (PR) 15 under the Building Planning Regulations (BPR) for non-domestic developments in Hong Kong Island, (b) PR 12 for commercial zones in OZPs for Kowloon, (c) PR 9.5 for non-domestic developments in new towns and (d) PRs of industrial park type developments (i.e. PRs 1.5 and 2.5 of Science Park and Tseung Kwan O Industrial Estate respectively). For CBD Grade A Offices, the PR is derived by averaging (a) and (b). For General Business, the PR is obtained by assuming that 50%, 30% and 20% of the supply will be in the New Territories (PR 9.5), Kowloon (PR 12) and Hong Kong Island (PR 15) respectively. For Special Industries, the PR is the average of the PRs of the industrial park type developments in (d).
**APPENDIX A**

**STATISTICAL REQUIREMENTS OF MEDIUM TERM MODELS**

<table>
<thead>
<tr>
<th>Statistical Test</th>
<th>Purpose</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) t-statistics</td>
<td>evaluates the significance of each potential independent variable</td>
<td>prob t&lt;0.05 or t&lt;0.1</td>
</tr>
<tr>
<td>2) F-statistics</td>
<td>tests if the variances of the two variables are equal</td>
<td>prob F &lt; 0.05</td>
</tr>
</tbody>
</table>
| 3) Adjusted R-sq | measures the overall goodness of fit of the model | adj R-sq > 0.9: acceptable  
adj R-sq < 0.8: undesirable |
| 4) DW statistics | measures autocorrelation | DW > du; and  
DW < (4-du) |
| 5) Residual plots | measures population variance | No pattern in the spread of residuals.  
Normal Probability Plot shows a nearly linear pattern |
APPENDIX B  HISTORICAL DATA AND DATA SOURCES

Historical Data (Dependent Variable and Independent Variables)

<table>
<thead>
<tr>
<th>Year</th>
<th>1. Hong Kong GDP*</th>
<th>2. Guangdong GDP**</th>
<th>3. Hong Kong Population***</th>
<th>4. Hong Kong Persons Engaged****</th>
<th>Employment Floorspace Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,000 billion HKD at 1990 price level</td>
<td>100 billion yuan at 1978 price level</td>
<td>Million</td>
<td>Million</td>
<td>(IFA in million m²)</td>
</tr>
<tr>
<td>1978</td>
<td>0.25</td>
<td>0.19</td>
<td>4.7</td>
<td>1.6</td>
<td>12</td>
</tr>
<tr>
<td>1979</td>
<td>0.28</td>
<td>0.20</td>
<td>4.9</td>
<td>1.7</td>
<td>14</td>
</tr>
<tr>
<td>1980</td>
<td>0.31</td>
<td>0.24</td>
<td>5.1</td>
<td>1.8</td>
<td>15</td>
</tr>
<tr>
<td>1981</td>
<td>0.34</td>
<td>0.26</td>
<td>5.2</td>
<td>1.9</td>
<td>16</td>
</tr>
<tr>
<td>1982</td>
<td>0.35</td>
<td>0.29</td>
<td>5.3</td>
<td>1.9</td>
<td>17</td>
</tr>
<tr>
<td>1983</td>
<td>0.37</td>
<td>0.31</td>
<td>5.3</td>
<td>1.9</td>
<td>18</td>
</tr>
<tr>
<td>1984</td>
<td>0.40</td>
<td>0.36</td>
<td>5.4</td>
<td>2.0</td>
<td>20</td>
</tr>
<tr>
<td>1985</td>
<td>0.41</td>
<td>0.42</td>
<td>5.5</td>
<td>2.0</td>
<td>20</td>
</tr>
<tr>
<td>1986</td>
<td>0.45</td>
<td>0.47</td>
<td>5.5</td>
<td>2.1</td>
<td>22</td>
</tr>
<tr>
<td>1987</td>
<td>0.51</td>
<td>0.57</td>
<td>5.6</td>
<td>2.1</td>
<td>23</td>
</tr>
<tr>
<td>1988</td>
<td>0.55</td>
<td>0.66</td>
<td>5.6</td>
<td>2.2</td>
<td>24</td>
</tr>
<tr>
<td>1989</td>
<td>0.56</td>
<td>0.70</td>
<td>5.7</td>
<td>2.2</td>
<td>25</td>
</tr>
<tr>
<td>1990</td>
<td>0.58</td>
<td>0.78</td>
<td>5.7</td>
<td>2.3</td>
<td>26</td>
</tr>
<tr>
<td>1991</td>
<td>0.61</td>
<td>0.92</td>
<td>5.8</td>
<td>2.3</td>
<td>27</td>
</tr>
<tr>
<td>1992</td>
<td>0.65</td>
<td>1.13</td>
<td>5.8</td>
<td>2.3</td>
<td>28</td>
</tr>
<tr>
<td>1993</td>
<td>0.69</td>
<td>1.38</td>
<td>5.9</td>
<td>2.3</td>
<td>29</td>
</tr>
<tr>
<td>1994</td>
<td>0.73</td>
<td>1.64</td>
<td>6.0</td>
<td>2.4</td>
<td>29</td>
</tr>
<tr>
<td>1995</td>
<td>0.76</td>
<td>1.89</td>
<td>6.2</td>
<td>2.3</td>
<td>29</td>
</tr>
<tr>
<td>1996</td>
<td>0.79</td>
<td>2.09</td>
<td>6.4</td>
<td>2.3</td>
<td>29</td>
</tr>
<tr>
<td>1997</td>
<td>0.83</td>
<td>2.31</td>
<td>6.5</td>
<td>2.3</td>
<td>30</td>
</tr>
<tr>
<td>1998</td>
<td>0.79</td>
<td>2.54</td>
<td>6.5</td>
<td>2.2</td>
<td>30</td>
</tr>
<tr>
<td>1999</td>
<td>0.81</td>
<td>2.78</td>
<td>6.6</td>
<td>2.2</td>
<td>31</td>
</tr>
<tr>
<td>2000</td>
<td>0.89</td>
<td>3.08</td>
<td>6.7</td>
<td>2.3</td>
<td>32</td>
</tr>
<tr>
<td>2001</td>
<td>0.90</td>
<td>3.38</td>
<td>6.7</td>
<td>2.3</td>
<td>31</td>
</tr>
<tr>
<td>2002</td>
<td>0.91</td>
<td>3.76</td>
<td>6.8</td>
<td>2.3</td>
<td>31</td>
</tr>
<tr>
<td>2003</td>
<td>0.94</td>
<td>4.30</td>
<td>6.8</td>
<td>2.2</td>
<td>31</td>
</tr>
</tbody>
</table>

Note:  
* HK Annual Digest of Statistics (at constant (1990) market prices)  
** 2002 and 2003 data based on Guangdong Indices of GDP (廣東統計年鑑 2004)(From C&SD)(1978=100)  
*** HK Annual Digest of Statistics  
**** Quarterly Report of Employment & Vacancies Statistics (September data)
## Definition and Sources of Data

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floorspace Demand</td>
<td>Total demand for: Private Offices + Private Flatted Factories + Industrial/Offices + Housing Authority Factories + Specialized Factories + Private Storage floorspace (where demand = stock - vacancy)</td>
<td>sq m IFA</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hong Kong GDP</td>
<td>GDP of Hong Kong measured at 1990 prices</td>
<td>million HK$, 1990 price level</td>
</tr>
<tr>
<td>Guangdong GDP</td>
<td>Guangdong GDP</td>
<td>100 million yuan, 1978 price level</td>
</tr>
<tr>
<td>Hong Kong Population</td>
<td>Mid year population in Hong Kong</td>
<td>person</td>
</tr>
</tbody>
</table>
APPENDIX C  STATISTICAL PERFORMANCE OF MEDIUM TERM MODELS


Floorspace = -18525423 + 66939 \cdot \text{SqRtHKGDP} - 236984 \cdot \text{SqRtGDGDP}

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Coef</th>
<th>SE Coef</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-18525423</td>
<td>1596925</td>
<td>-11.60</td>
<td>0.000</td>
</tr>
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<td>\text{SqRtHKGDP}</td>
<td>66939</td>
<td>3402</td>
<td>19.68</td>
<td>0.000</td>
</tr>
<tr>
<td>\text{SqRtGDGDP}</td>
<td>-236984</td>
<td>31986</td>
<td>-7.41</td>
<td>0.000</td>
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</tbody>
</table>

S = 633934  R-Sq = 99.0%  R-Sq(adj) = 98.9%

Analysis of Variance

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>2</td>
<td>8.33301E+14</td>
<td>4.16650E+14</td>
<td>1036.77</td>
<td>0.000</td>
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<td>Residual Error</td>
<td>20</td>
<td>8.03745E+12</td>
<td>4.01873E+11</td>
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<tr>
<td>Total</td>
<td>22</td>
<td>8.41338E+14</td>
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</tr>
</tbody>
</table>

Durbin-Watson statistic = 1.72560

Residual Plots for Floorspace

- Normal Probability Plot of the Residuals
- Residuals Versus the Fitted Values
Model 1a (Based on 1978-1996, 1998 and 2000 data)

Floorspace = -18174281 + 65985 SqRtHKGDP - 224642 SqRtGDGDP

Predictor       Coef  SE Coef      T      P
Constant   -18174281  1824061  -9.96  0.000
SqRtHKGDP      65985     4079  16.18  0.000
SqRtGDGDP    -224642    42360  -5.30  0.000

S = 663784   R-Sq = 98.9%   R-Sq(adj) = 98.8%

Analysis of Variance

Source          DF           SS           MS       F      P
Regression       2  7.21713E+14  3.60857E+14  819.00  0.000
Residual Error  18  7.93095E+12  4.40609E+11
Total           20  7.29644E+14

Durbin-Watson statistic = 1.69707

Floorspace = -39974860 + 4.86 Population + 16.8 PE

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<th>Coef</th>
<th>SE Coef</th>
<th>T</th>
<th>P</th>
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<tbody>
<tr>
<td>Constant</td>
<td>-39974860</td>
<td>1840737</td>
<td>-21.72</td>
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<tr>
<td>Population</td>
<td>4.8554</td>
<td>0.4887</td>
<td>9.94</td>
<td>0.000</td>
</tr>
<tr>
<td>PE</td>
<td>16.825</td>
<td>1.422</td>
<td>11.83</td>
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</table>

S = 763301  R-Sq = 98.5%  R-Sq(adj) = 98.3%

Analysis of Variance

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<th>P</th>
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<td>7.22479E+14</td>
<td>3.61240E+14</td>
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<td>Residual Error</td>
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<td>1.10699E+13</td>
<td>5.82629E+11</td>
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<tr>
<td>Total</td>
<td>21</td>
<td>7.33549E+14</td>
<td></td>
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</table>

Durbin-Watson statistic = 1.59242

Residual Plots for Floorspace

- Normal Probability Plot of the Residuals
- Residuals Versus the Fitted Values

Floorspace = -41249269 + 5.38 Population + 16.0 PE

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Coef</th>
<th>SE Coef</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-41249269</td>
<td>1936361</td>
<td>-21.30</td>
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</tr>
<tr>
<td>Population</td>
<td>5.3811</td>
<td>0.5638</td>
<td>9.54</td>
<td>0.000</td>
</tr>
<tr>
<td>PE</td>
<td>16.037</td>
<td>1.459</td>
<td>11.00</td>
<td>0.000</td>
</tr>
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</table>

S = 743276  R-Sq = 98.5%  R-Sq(adj) = 98.4%

Analysis of Variance

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<th>MS</th>
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<th>P</th>
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<tr>
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<td>6.32802E+14</td>
<td>3.16401E+14</td>
<td>572.71</td>
<td>0.000</td>
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<td>Residual Error</td>
<td>17</td>
<td>9.39180E+12</td>
<td>5.52459E+11</td>
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<tr>
<td>Total</td>
<td>19</td>
<td>6.42194E+14</td>
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Durbin-Watson statistic = 1.76277