

# Exploring Urban Growth Management Insights from Three Cities

**June 15, 2008**

Urban Development Unit  
Finance, Economics and Urban Department  
Sustainable Development Network



**Document of the World Bank**



**QUITO  
(Ecuador)**



**XI'AN  
(PRC)**



**HYDERABAD  
(India)**

## ACKNOWLEDGEMENTS

This report was produced under the supervision of Laszlo Lovei, FEU Director, Abha Joshi-Ghani, Sector Manager, and Mila Freire, Senior Advisor, FEU and Task Manager of this work. Analytical work, write-up and consultations were carried out by PADECO Co., Ltd under the leadership of Douglas Webster<sup>1</sup> as Urban Growth Management Expert and Christopher Rose as Transport Specialist and Study Coordinator.

The work was conducted between June 2006 and May 2008. The final discussion in the World Bank took place in March 2008. The report includes five chapters. In addition to the Executive Summary, Chapter 1 provides an introduction to the study and analytical framework. The individual city cases are described and discussed in Chapters 2, 3, and 4, respectively. Full, unabridged city reports are also available.

Many people were involved in the production of this report. Christine Kessides prepared the first proposal, terms of reference and initiated the selection of consultants. A steering committee with Bank staff reviewed the proposals, refined the outline and selected the cities which were eventually used in analysis. The steering committee was chaired by Mila Freire and included Daniel Hoornweg, Richard Beardmore, Robert Buckley, Songsu Choi, Catherine Farvacque-Vitkovic, and Madhu Raghunath. Peer reviewers were Alexandra Ortiz, Richard Green, Arjun Altaf, and Ellen Hamilton. Daniel Hoornweg and Madhu Raghunath provided extra assistance in reviewing the various contributions and in identifying sources of information at the local level.

The team is appreciative of the effort made by the consultant's team and the collaboration of the city authorities in Quito, Xi'an and Hyderabad as well as local researchers and experts who contributed to the analysis with data and specific insights.

---

<sup>1</sup> Dr. Douglas Webster is Professor in the Global Institute for Sustainability and the School of Global Studies at Arizona State University in Tempe, Arizona, USA.

## **ABBREVIATIONS and ACRONYMS**

ADB	Asian Development Bank
BOT	Build Operate Transfer
BRT	Bus Rapid Transit
CBD	Central Business District
ESCAP	United Nations Economic and Social Commission for Asia-Pacific
ETDZ	Ecological and Technological Development Zone
EUR	Extended Urban Region
FAR	Floor Area Ratio
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GoAP	Government of Andhra Pradesh
GoI	Government of India
GHMC	Greater Hyderabad Municipal Corporation
HA	Hectare
HTDZ	High Technology Development Zone
HUDA	Hyderabad Urban Development Authority
ITC	Information Technology Center
ITDP	Institute for Transportation Development and Policy
LRT	Light Rapid Transit
MCH	Municipal Council Hyderabad
MDMQ	Municipio de Distrito Metropolitano de Quito (Municipality of the Metropolitan District of Quito)
MEAD	Municipal Engineering Administration Department
MR	Metropolitan Region
MRT	Mass Rapid Transit
NMV	Non Motorized Vehicle
PPP	Public Private Partnership
PTC	Xi'an Public Transport Company
RMB	Ren Min Bi (Chinese Yuan)
SEZ	Special Economic Zone
SOE	State Owned Enterprise
TVE	Township and Village Enterprise
USD	United States Dollars
XETDZ	Xi'an Economic and Technological Development Zone
XHTDZ	Xi'an High Technology Development Zone
ULCA	Urban Land Ceiling Act
WB	World Bank

## CONTENTS

EXECUTIVE SUMMARY .....	vi
1. INTRODUCTION.....	1
1.1 Overview .....	1
1.2 Objectives and Approach.....	2
2. COMPARATIVE ANALYSIS .....	3
2.1 Background.....	3
2.2 Urban Growth Dynamics.....	4
2.3 Lessons Learned .....	29
3. CONCLUSIONS AND RECOMMENDATIONS.....	33
3.1 Summary of Comparative Analysis.....	33
3.2 Key Points and Recommendations .....	36
3.3 Policy Implications .....	38

### Tables

Table 1. Comparison of Key Policy Themes .....	ix
Table 2. Comparison of Key Challenges .....	ix
Table 3. Poverty Incidence in three cities 2001 .....	5
Table 4. Annual Increase in Motorization .....	10
Table 5. Vehicle Ownership per 1000 People.....	10
Table 6. Relationship between GDP Growth and Car Ownership.....	18
Table 7. Comparison of Key Policy Themes .....	36
Table 8. Comparison of Key Challenges .....	36

### Figures

Figure 1. Tension Between Opposing Centrifugal / Centripetal Forces .....	3
Figure 2. Demographic Growth Rates 1991-2001 .....	5
Figure 3. Demographic Growth Rate Trends.....	5
Figure 4. Quito Economic Structure (2006).....	7
Figure 5. Population Densities by Urban Category .....	9
Figure 6. Peri-Urban Density Change 1991-2001: Hyderabad, Quito and Xi'an .....	9
Figure 7. Incidence of Poverty .....	15
Figure 8. Economic Structure .....	16
Figure 9. Xi'an Economic Structure (2003).....	16
Figure 10. Urban Density Change 1991-2001: Xi'an and Hyderabad.....	17
Figure 11. Urban Density (Built Up Contiguous City).....	17
Figure 12. Variation of Public Transport Network Density in Xi'an.....	18
Figure 13. Income Distribution.....	22
Figure 14. Suburban Density Change 1991-2001: Hyderabad, Quito and Xi'an .....	24
Figure 15. Key Drivers of Urban Form.....	26
Figure 16. Ease of Urban Redevelopment (Looseness of Urban Fabric).....	27

### Maps

Map 1. Locations of the Study Cities.....	1
Map 2. Quito Spatial Dynamics .....	8
Map 3. Xi'an Spatial Dynamics .....	20
Map 4. Hyderabad Spatial Dynamics .....	23

**Annexes**

Annex 1: Quito Case Study.....	43
Annex 2: Xi'an Case Study.....	66
Annex 3: Hyderabad Case Study .....	89

## EXECUTIVE SUMMARY

This Study explores urban spatial growth patterns in three middle-sized Metropolitan Regions (MRs) in three world regions: Quito, Ecuador in Latin America; Xi'an, China in East Asia; and Hyderabad, India, in South Asia. The objective of the analysis is to understand how rapidly-growing urban agglomerations are adapting (or have been adapting) in terms of land conversion, provision of infrastructure, public finance and environment concerns. Looking at each case individually, the study tries to identify cross-cutting issues and discuss the main challenges and opportunities faced by rapidly changing urban centers.

The framework used in the study gives great importance to the association between cities and form, and the concept of efficient cities from the view point of (i) reduced consumption of energy, (ii) human time savings, (iii) protection of fertile agricultural land, (iv) minimization of local emissions and carbon footprints, (v) innovation and livability associated with vital neighborhoods, and (vi) delivery of accessible affordable housing.

### Insights by City

#### Quito

Quito has much to offer in terms of physical planning. Of particular interest are the following:

- (i) **Multi-modal city concept:** The "**palm and finger**" strategic plan for the metropolitan area is an intelligent attempt to maintain the core city while encouraging a number of strong nodes in outlying areas. It mimics a multi-nodal structure to avoid overcrowding of the city core and advocates aligning transportation infrastructure to the proposed structure.
- (ii) **Growth boundary:** Quito's growth (service) boundary policy seems to have a positive impact in limiting urban sprawl in the eastern valleys.
- (iii) **Squatting:** Illegal settlements (*invasiones*) and squatting are increasingly rare. They are no longer supported by the community. Quito's experience shows that the rapid proliferation of squatter areas typical of many developing countries can be slowed, while simultaneously improving living conditions for low-income people. The "secret" to success is the coupling of increasing shelter or enhancing supply policies in conjunction with tough sanctions against squatting.
- (iv) **Rapid Transit Systems:** Quito, like other Latin American cities such as Bogota and Curitiba, illustrates the success of busway systems on dedicated corridors, and their potential to be upgraded to LRT systems as demand increases.
- (v) Quito is starting to demonstrate the benefits of innovative **financing** mechanisms to fund catalytic infrastructure. The new international airport near Checa, which will open in 2010, is being developed as a self-financing BOT by Quiport S.A. The metropolitan government, through its *Empresa de Desarrollo Urbano de Quito* intends to develop the LRT system utilizing a Design to Build BOT format.
- (vi) **Cultural heritage as an asset:** From a design and heritage preservation perspective, the restoration of Quito's historical core, the world's best example of colonial Spanish architecture and designated as UNESCO's first heritage site in 1978, has been an outstanding achievement.

- (vii) **Green space:** Quito has been successful in preserving a high percentage of green space (over 50% of the metropolitan region) through several instruments, from slope protection to formal parks.

### **Xi'an**

Xi'an, to a significant extent, reflects the characteristics of the Chinese urban development model. Important learning from Xi'an includes:

- (i) **Urban Form: High Density.** Xi'an shows that de-densification and sprawling peri-urban development is not an inevitable outcome of urbanization. Xi'an continues to develop at high densities and sprawl is minimal. The outcome reflects public policies that have encouraged industry to locate in Special Economic Zones (SEZs) contiguous to the built up area, and to develop these zones at higher densities than is the norm in China.
- (ii) **Slums:** There are few slums in Xi'an, despite the fact that Xi'an is not one of China's wealthier cities. Sub standard housing (primarily run-down walkups in the inner city and "farmer" housing on the periphery) represents less than 12% of the housing stock. This is due to a combination of supply side incentives for affordable housing, intolerance of squatter settlement, low population growth, past controls on in-migration (*hukou*), high levels of home ownership facilitated by easy access to finance.
- (iii) **Special Economic Zones (SEZ)** play a major role in city-building. SEZs in Xi'an cover a significant percentage of the land area and account for an even larger percentage of economic output. The advantage of a SEZ led modular approach to city building is that it expedites investment and ensures high level of master planning and infrastructure provision.
- (iv) **Dynamics:** Xi'an, has significantly reshaped itself by moving large-scale public complexes. For example, Xi'an's municipal government will shortly relocate from the walled city to the new suburban center in the XETDZ to the north of the city, creating a viable economic base and function for this new suburban center.
- (v) **Ring roads and urban form:** Xi'an illustrates the power of ring roads in shaping urban form. When the city core is congested (in this case by the walled city) and radial road development does not keep pace, location of new activities, e.g., hotels, high-end residential communities, and knowledge clusters –is increasingly taking place near the developing third ring road.
- (vi) **Urban limits:** Xi'an's peri-urban development is partly shaped by the existence of *basic protected agricultural zones*. Although often enforced mechanistically, these zones preserve fertile agricultural land and serve as an alternative to growth or service boundaries..
- (vii) **From top down to market-based mechanisms:** Growth of property rights and neighborhood based civil society is changing the urban redevelopment context. New mechanisms to redevelop urban areas on a win-win basis, such as land readjustment, will be needed.
- (viii) **Land regulation:** Gains from the mass transit system in Xi'an will not be realized unless Floor Area Ratios (FARs) are better aligned with stations. Currently, Xi'an has low variance in its FARs. Regardless the increased demand for floor space around the mass transit stations.
- (ix) **Mono vs multi-nodal city:** Xi'an opens the question of whether all metropolitan regions need a strong CBD. Xi'an may not need one, given the relatively limited role that business and professional

services play in the city's economy. An alternative would be a multi-nodal city with specialized nodes that provide unique services and functions, from entertainment to finance.

## **Hyderabad**

The dominant lesson from Hyderabad is the need for *adaptation*, especially in the face of fast-changing and overwhelming national and global threats and opportunities. Key points include:

- (i) **Exploiting the ITC potential:** Hyderabad has benefitted (compared with competing Indian metropolitan regions) from the national government's policies toward Information Technology Centers (ITC). Through strong local political leadership Hyderabad is now competing with Bangalore for ITC investment. Although hampered by the low infrastructure investment facing all Indian cities, Hyderabad has turned this into an advantage by faring better than other Indian cities under trying conditions. In other words, Hyderabad was able to adapt to benefit from both a threat, the constraining national environment for city building (outplaying its rivals), and an opportunity in terms of ITC development - leveraging the existence of high level talent.
- (ii) **Innovative Financing:** Hyderabad is a leader in innovative urban finance in India, as exemplified by the financing of the soon to be constructed elevated mass transit (rail) system. This behavior was motivated by the severe lack of finance available for public urban infrastructure in India through normal government channels.
- (iii) **Connectivity and urban form:** Although Hyderabad has (correctly) made a decision to build the Outer Ring Road as the major shaping element of the extended urban region, the city has also recognized the need for radial road construction, to balance the centripetal forces that will be unleashed by the new Outer Ring Road, enabling development to extend outwards from the core city to the Outer Ring Road (ideally in a phased manner), proposing to borrow from the ADB for the radial system.
- (iv) **Urban Land Ceiling Act:** Hyderabad demonstrates that nationally imposed urban policy frameworks can have serious negative consequences on individual metropolitan areas, the Urban Land Ceiling Act being a prime example.
- (v) **Promoting density and avoiding congestion:** The decision to build an extensive elevated mass transit system is in line with the need to unlock the congested core of the system, together with extremely high land prices, and incipient mass transit solutions. To benefit from density, infrastructure must *capitalize on density*. The elevated train will do this. However, the full impact of mass transit in Hyderabad will be limited by the tightness of the urban fabric and inflexibility in land markets.
- (vi) **Environment:** Hyderabad's authorities are recognizing the urgency to pay attention to environmental issues. Urban pollution is decreasing, partly due to the shifting of the economic structure (away from heavy industry) partly because of good public policies, such as reforestation and replanting, restoring remaining lakes and protecting cultural and historic assets. Given the importance of ITC activities, the city depends on talent and good amenities. Improving the attractiveness of the city together with better transportation give Hyderabad a good base to explore tourism activities.



## Comparison of Cities

Table 1 compares policy themes found across the three cases. The common features are mainly three: (a) retention of density within the urban area; (b) pursuit of mass transit (which helps maintain density); (c) ring road development which acts as a centrifugal force if supported by radial development. Other key policy themes show less similarity across the cities.

**Table 1. Comparison of Key Policy Themes**

	Quito	Xi'an	Hyderabad
Adaptation Under Threat			**
Airport Cluster Development	**		**
Deployment of Catalytic Infrastructure		**	
Fertile Farmland Protection		**	
Green Space Provision	**		
Growth Service Boundary Implementation	**		
Heritage Preservation	**	*	
Innovative Finance	**		**
Low Income Community Upgrading	**		
Low Income Housing Supply / Slum Minimization		**	
Mass Rapid Transit	*	**	**
Multi-Nodal / Strong Nodes	*	*	
Retention of Density	*	**	**
Ring Road Development		**	**
Special Economic Zone Development		**	*
Strategic Planning	**		
Strong CBD	**		

\* = Less significant, \*\* = Very Significant

## Challenges

Table 2 compares the challenges faced by the three metropolitan regions. The common concerns include (a) constraints on urban development and infilling, traffic congestion and long commutes indicating the need for mass transit to take advantage of high density development. Personal security is only highlighted as a challenge for Quito, whose spatial form is more influenced by housing preferences than the other two cities.

**Table 2. Comparison of Key Challenges**

	Quito	Xi'an	Hyderabad
Inadequate Infrastructure Funding	*		**
Negative or Weak National Urban Policy Frames		*	**
Congestion / Long Commutes	*	*	**
Non-Sustainable Fiscal System		**	
Constraints on Urban Development / Infilling	*	*	**
Personal Security	*		
Scattered Industry	**		
Wastewater Treatment	**	*	

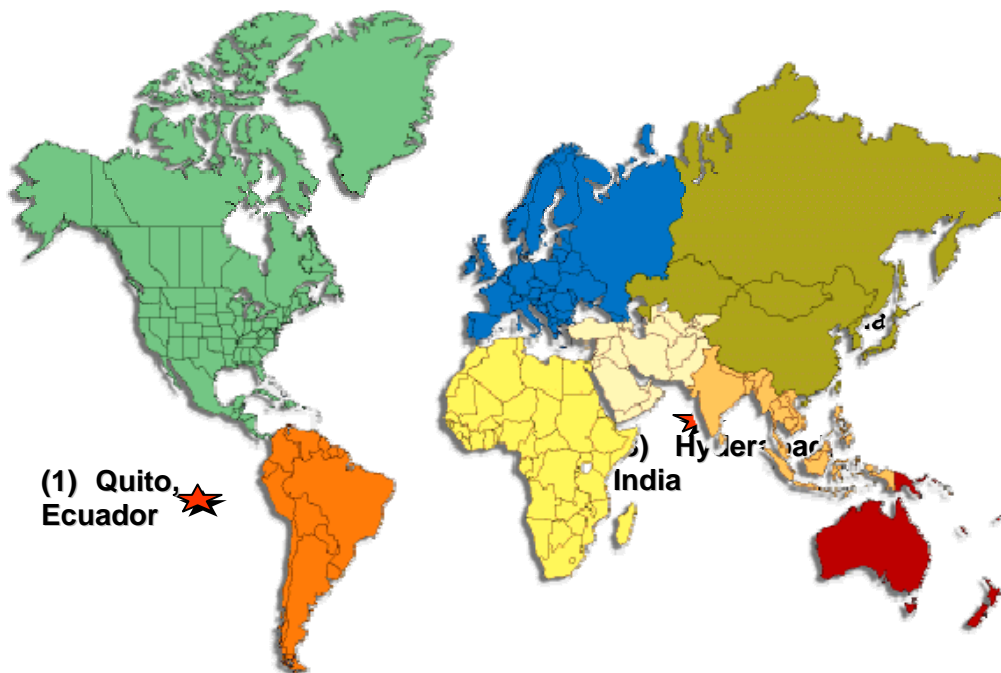
\* = Less significant, \*\* = Very Significant

## 1. INTRODUCTION

### 1.1 Overview

This Study explores urban growth patterns in three metropolitan area in three different world regions: Quito, Ecuador in Latin America; Xi'an, China in East Asia; and Hyderabad, India in South Asia. It is an “on-the-ground” exploration of the drivers underlying urban expansion dynamics. The report follows-up the analysis of the urban expansion on 120 cities (authored by Angel, Sheppard, and Civco,<sup>2</sup>). That analysis indicated that urban expansion in the last 10-20 years has been land intensive, with the demand for built-in space increasing twice as fast as the urban population. Extrapolating the past trends, the same report suggested that in the period between 2000 and 2030, while the urban population is projected to double, the urban land (or built-in land) would triple. The consequences of such behavior in terms of infrastructure costs and impact on environment have not been quantified but suggest that the affected cities may not be able to afford the increase in infrastructure investment.

**Map 1. Locations of the Study Cities**



The chosen metropolitan areas are medium-sized areas, containing from three to seven million people. They fall within the population categories (500,000 to five million) that will absorb most of the world’s incremental urban population by 2050.<sup>3</sup> The three cities are representative of urban dynamics within their respective world regions. They are not known in the literature as “best practice” such as Curitiba, Brazil, or Qingdao, China, but are known for solid city performance, benchmarked against regional averages. Each city is at different position of the rural- urban transition. Hyderabad is just

---

<sup>2</sup> Angel, Shlomo, Stephen Sheppard, and Daniel Civco, *The Dynamics of Global Urban Expansion*, Washington: The World Bank (Transport and Urban Development Department), 2005

<sup>3</sup> See the UN Population Fund’s “State of World Population 2007” for more information. This document can be accessed online here: <http://www.unfpa.org/swp/2007/english/introduction.html>.

entering the fastest phase of the rural-urban transition; Xi'an, representative of Chinese metropolitan areas, is mid-way through the transition, while Quito, typical of Latin American urban systems, has virtually completed its role in the rural-urban transition.

All three regions are land-locked and away from navigable rivers. Two are at high elevation: Quito at 2,800 meters and Hyderabad at 541 meters. Being land locked has increased the development challenges of these regions but has not hampered their economic growth.

In economic terms, all three cities have been relatively successful in the last five years, Xi'an and Hyderabad considerably more so than Quito. Xi'an and Quito grew less than the average for both China and Ecuador, possibly because their land-locked status. Other factors may have played a strong role, e.g., more entrepreneurship in Guayaquil than in Quito, and Xi'an's high levels of pollution, harsh continental climate, and a reputation for less vitality than other Chinese cities.

In all cases, Foreign Direct Investment (FDI) has played a minor role in development, distinguishing these cities from their coastal peers, where large-scale export oriented manufacturing is likely to blossom; and from true world cities, e.g., Shanghai and Mumbai, that attract international real estate developers and global retailers to a greater extent.<sup>4</sup> None of the three metropolitan areas are penetrated by expressways, an unusual situation. It is unclear whether this will remain the norm; Vancouver, Canada is an example of a middle-sized developed metropolitan area that functions without freeways penetrating the core city. All three metropolitan systems benefit from some form of metropolitan-scale governance although the actual structures and processes vary widely.

## **1.2 Objectives and Approach**

The *objective* of this Study is to understand the urban growth patterns and trends of the three cities and to draw lessons on how to better manage the spatial growth of metropolitan areas in developing countries.<sup>5</sup>

*Framework:* The report is based on the premise that cities' objective is to maximize the efficiency of land use. Land is the only finite input of a city and how a city manages land impacts on the way the city grows and provides for its population. Efficient land use does correlate with lower energy consumption and emissions; shorter travel times; affordable housing; and cost-effective delivery of services.<sup>6</sup> The report argues that to maximize the benefits associated with land use efficiency, gains need to be leveraged through better design and vitality-inducing land uses. Metropolitan land efficiency is characterized by: (i) relatively high densities (which will vary by geographic, demographic and cultural contexts), (ii) high variance in urban densities (expressed ideally in transit-oriented sub-center development), and (iii) corridor-oriented "necklace" peri-urban development. Metropolitan land efficiency is important because

---

<sup>4</sup> Hyderabad's role as a leading global ITC city explains relatively limited FDI into Hyderabad – ITC out-source economies generate less FDI per unit of output than export-oriented manufacturing cities.

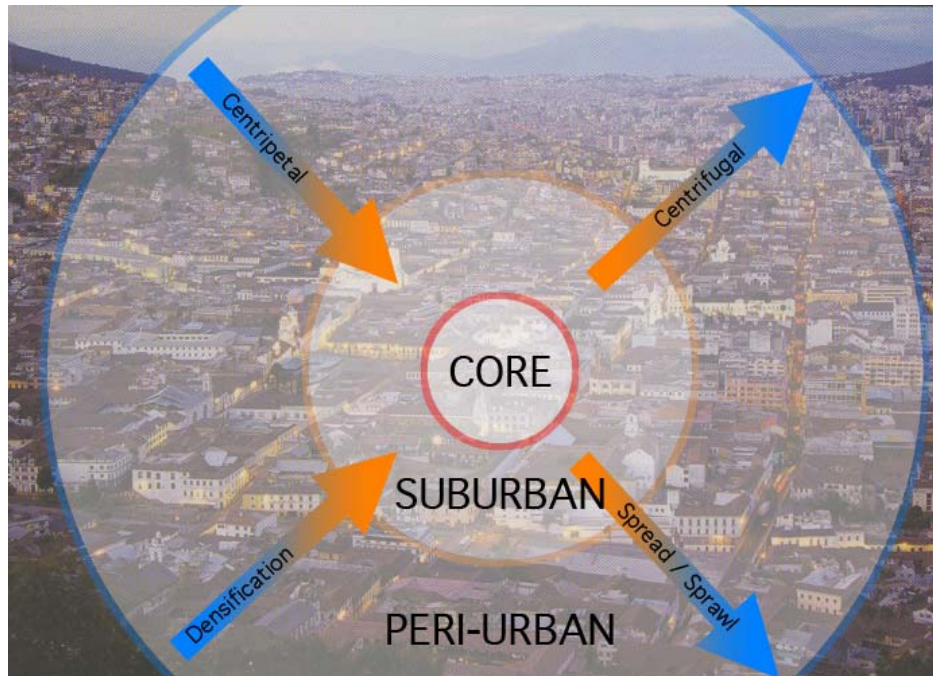
<sup>5</sup> On the ground analysis of the three metropolitan case studies involved data collection based on an indicators template, key informant interviews, spatial mapping of key dynamics, and field observation by urban experts. For detail on methodologies deployed, indicators utilized, and findings of this work, see: (i) PADECO, *Exploring Urban Growth Management in Three Developing Cities: City Report – Quito Ecuador*, Tokyo and Washington: PADECO/World Bank, 2006, (ii) PADECO, *Exploring Urban Growth Management in Three Developing Cities: City Report – Hyderabad, India*, Tokyo and Washington: PADECO/World Bank, 2007, and (iii) PADECO, *Exploring Urban Growth Management in Three Developing Cities: City Report – Xian China*, Tokyo and Washington: PADECO/World Bank, 2007. Abridged versions of these reports are included as Annexes to this Report.

<sup>6</sup> As an example, the State of California, USA, estimates that improved land efficiency, i.e., smarter growth, not taking into account improvements in buildings and manufacturing process efficiencies, will contribute 15% to reduced emissions and energy consumption objectives by 2020. This is based on realistically achievable smart growth objectives, not an ideal urban settlement pattern. (California recently introduced ambitious greenhouse-gas emissions legislation, which will reduce greenhouse-gas emissions to 1990 levels by 2020.) "Environmental Policy: Arnie's Uphill Climb", *The Economist*, June 23 2007, pp 35-38.

of the large gains that can be realized through: (i) increased energy efficiency, (ii) reduced loss of human time, (iii) lower emissions – including green-house gases, (iv) reduced loss of high fertility (*Class I*) agricultural land, (v) self-financing high ridership mass transit, (vi) lower unit infrastructure costs, (vii) more affordable accessible housing, and (viii) lower logistics (distribution) costs.

In addition to land use efficiency, the urban growth dynamics can be looked through the lens of the tension between spread or sprawl (or leap-frogging development) - *centrifugal* forces; and densification, often around nodes or sub-centers, including Central Business Districts (CBDs) - *centripetal* forces.

**Figure 1. Tension Between Opposing Centrifugal / Centripetal Forces**



[Background Image of Quito]

The study identifies *outcomes* and *drivers* of the urban expansion. Drivers are classified as (i) market, (ii) policy, and (iii) technology based. Many policy drivers work through the market in the form of pricing, e.g., congestion pricing, tiered-pricing of basic public services. Urban markets for land and property reflect consumer preferences, an important concern of the analysis in all three metropolitan case studies. Finally, the form of the three regions is shaped by changes in technology, new forms of mass transit and new technologies utilized by individuals and firms, in particular, new types of communication devices.<sup>7</sup>

## 2. COMPARATIVE ANALYSIS

### 2.1 Background

Given the differences across data, definitions and context in the three cities, all comparisons should be used with caution. For example, the concept of “suburban” and “peri-urban” varies in different economic, geographic, and cultural contexts. This section focuses on similarities and differences in outcomes across the three cities, including drivers of urban economic and spatial development, spatial distribution of poverty and economic activity, challenges ahead.

<sup>7</sup> Kluth, A., "The New Oases: Nomadism Changes Buildings, Cities, and Traffic, *The Economist*, April 12 2008, pp 9 - 11 (in Special Report on Mobile Telecoms)

The three cities have common characteristics in terms of their position across urban cases:

- Xi'an, once the world's largest city (during the Tang Dynasty - 618-907) and China's capital for over 1,600 years, has recently re-emerged on the world scene since the discovery of the *terra cotta warriors* in 1974, reinforced by the opening up of China to international tourism in the early 1980s.
- Quito its setting high in the Andes and particularly the designation of its Spanish colonial center as a UNESCO world heritage site in 1978, have captured the world's attention.
- Hyderabad's recent high profile on the world stage is due more to its present performance and future potential, namely the rapid growth of its high-technology ITC economy (services account for 72% of Hyderabad's economic output) since the 1990s. Along with Bangalore, Hyderabad is regarded as the center of India's information technology (IT) driven development miracle.

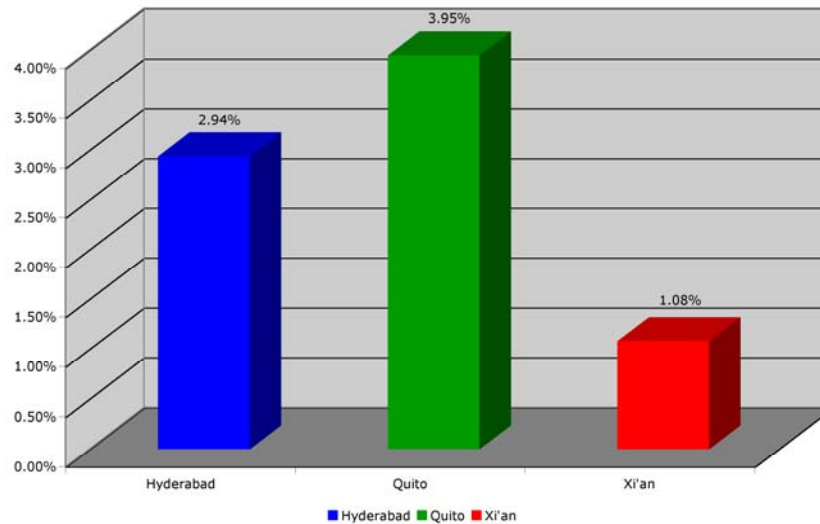
Like middle-sized and large metropolitan systems worldwide, the three cities are affected by global forces. For example, all are more open to the world than they were three decades ago. Hyderabad is the most obvious in this regard, the primary market for its ITC outsourced services are developed countries, particularly the United States. Xi'an's software industry is increasingly benefiting from foreign direct investment (including joint ventures) e.g., Microsoft, with the foreign market growing quickly, especially for specialized products, such as internet security software. Similarly, Xian's aerospace industry is increasingly dependent on the fate of contracts with Boeing and Airbus as it moves toward increased civilian aircraft production. Quito is no exception. The fate of petroleum corporate headquarters, its cut flower industry (for export), and tourism, are highly dependent on aspects such as trade agreements and aviation access.

## **2.2 Urban Growth Dynamics**

### ***Quito***

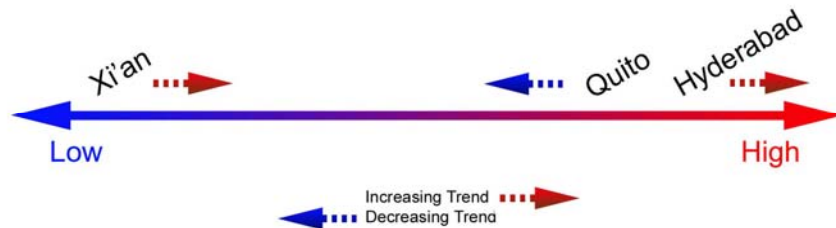
Of the three cities, Quito is the most mature city in terms of the rural-urban urbanization transition. Its current population is 2,105,431 (2005). It experienced hectic population growth in the 1980s, typical of Latin American cities in that decade; this growth slowed, but remained at a high 3.95% per annum during 1991-2001.

**Figure 2. Demographic Growth Rates 1991-2001**



Much of the city's periphery was shaped by the rapid growth in the last three decades, although the core city, particularly Mariscal (the Entertainment and Lifestyle District) and the CBD changed significantly as well. From 2001-2005, demographic growth slowed to 2.17% per year. Current forecasts indicate that growth will slow even more to 1.93% per year during 2000-2020. This is in sharp contrast with the other two cases (see figure 3)

**Figure 3. Demographic Growth Rate Trends**



Much of Quito's urban fabric is characterized by low-income areas, particularly to the south of the historical colonial district, but also in North-West suburbs. On average, GDP per capita is low ( \$3,536, 2005) and inequality high, a situation typical of Latin American cities; 30% of the people live below poverty line, which is the highest percentage of the three cities.<sup>8</sup>

**Table 3. Poverty Incidence in three cities 2001**

	Xi'an	Hyderabad	Quito
<b>Urban</b>	5.9%	23.0%	28.7%
<b>Peri-Urban*</b>	16.6%	N/A	28.7-61.3%**

\* Officially defined as rural in the Xi'an case but functionally peri-urban. In the Quito case it includes suburban.

\*\* There is a wide variance depending on the specific area measured e.g., Quitumbe, La Argelia

<sup>8</sup> However, because poverty lines are calculated relative to national norms and expectations, it does not necessarily follow that there is a higher rate of poverty in Quito than in Hyderabad; Hyderabad officially defines 23% of its population as being in poverty.

The poverty incidence is higher in the South of the Metropolitan Region. Residential landscapes are not uniform within low-income areas. In southern Quito, the built environment is composed of permanent buildings in mature neighborhoods, whereas toward the periphery, up-graded informal neighborhoods are the norm, often the up-grading facilitated by "regularization".

In these areas, densities are higher than on the furthest reaches of the periphery - the product of in-filling and residents adding second stories to buildings. In emerging neighborhoods on the outer periphery, poverty rates tend to be higher (in some areas of Quitumbe, poverty levels are as high as 61%), neighborhood land use patterns are patchy, with considerable vacant land; tenancy is often undocumented or falsely documented by middlemen who exploit the situation. Densities have increased later as residents add second stories to buildings.

In Quito, **poverty tends to be spatially concentrated**, more so than in South Asian cities such as Hyderabad where the poor are more likely to be interspersed throughout the urban fabric. Similarly, in Quito, upper-middle and upper class areas, such as Cumbaya, tend to be quite homogenous in terms of socio-economic characteristics and the built environment while middle class areas in places such as Calderon are also relatively homogenous.

**Migration** has played an important role in shaping Quito's urban form. Migrants normally locate at the edge of the city, hence driving peripheral growth. Migration peaked in the 1970s and 1980s in Quito, with large-scale squatting (*invasiones*), particularly in the northwest (Calderon) and south of the city.

At present, Quito metropolitan area is **growing much slower**, especially in relation to the forecasts made ten years ago. The slow down in rural migration to Quito and the relatively slow-down of the metropolitan area is due to three factors: first, rural migration is slowing down, in part because of the reduction in the size of the rural population and the income differentials; second, international migration, especially from Spain and the USA is more attractive than that towards Quito; third, within Ecuador Guayaquil has become the largest city, having performed much better than Quito in economic terms and attracting more migrants than Quito itself.

#### *Economic Drivers and Urban Growth*

Quito's economy is the most diverse of the three cities. This has to do with the fact that is the capital of the country, as well as the finance and corporate headquarters (petroleum)<sup>9</sup>, remittances (3 million of Ecuador's 15 million citizens live abroad, tourism (which could be much more important with improved security), and a surprising amount of manufacturing for a land-locked city (although declining in employment terms). Industry represents only 23% of Quito's economy. Services account for almost 80% (Figure 4): commercial services accounting for 29% of output, government 20%, and other functions including tourism, construction,<sup>10</sup> and personal services 28%.

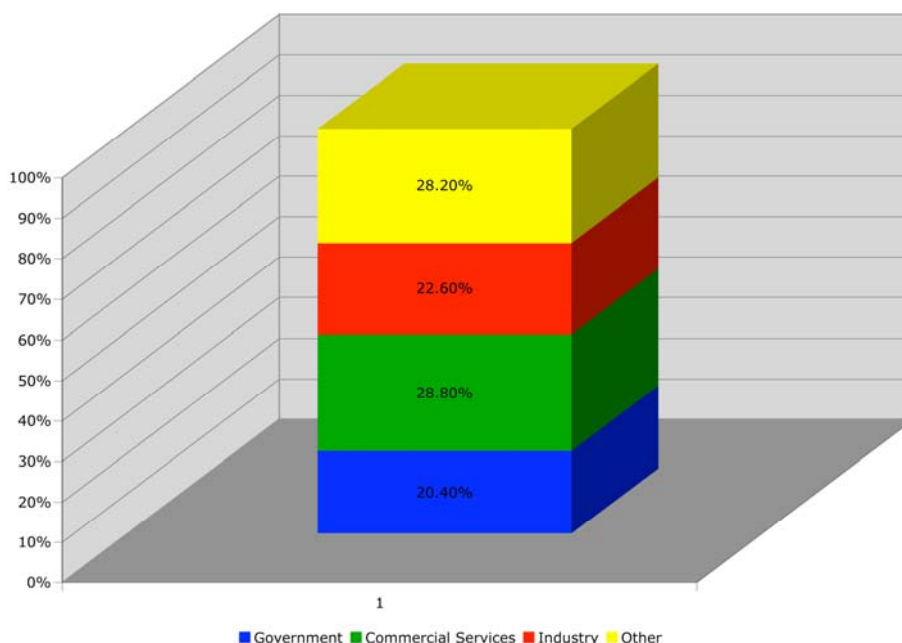
---

<sup>9</sup> Ecuador is now a member of OPEC.

<sup>10</sup> Quito is currently undergoing a construction boom, dollarization, which was completed in 2000 (the US dollar is now the official currency, replacing the former currency, the sucre) has made mortgages easier to obtain – construction has regained, and surpassed, 1997 highs. In addition, building is being driven by "grey money" from Colombia, and by the desire of locals to have material assets in a relatively unstable political and economic environment.



Figure 4. Quito Economic Structure (2006)



Quito's economy is more diversified than the other cities. Hyderabad is dominated by ITC; Xi'an by software/aviation in Xi'an, but there is not a single sector driving the growth of Quito. Manufacturing employs about 85,000 people,<sup>11</sup> but this is scattered throughout the metropolitan area, although there is some concentration in the south of the city.

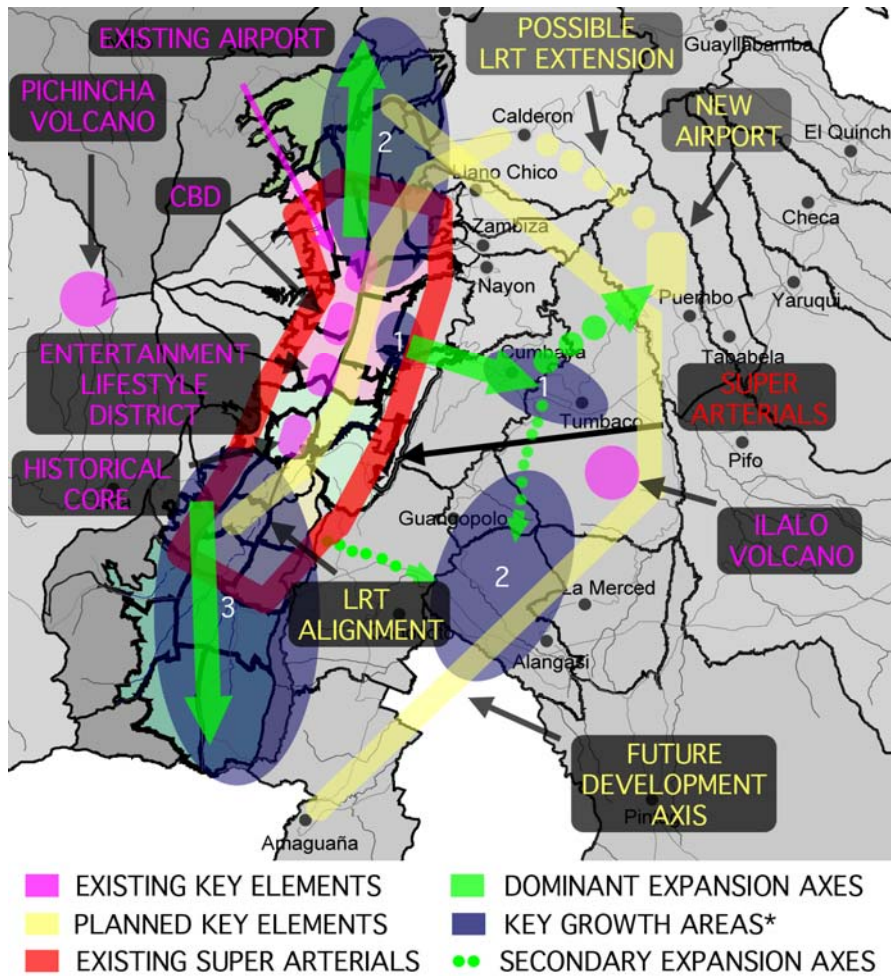
Quito's urban economy is likely to become specialized over time. Current plans call for the construction of a science/industrial park, logistics center at the new airport to the northwest (see Map 2), which could create a significant airport cluster. More importantly, Quito has the geographic and cultural endowment to become one of the world's leading **amenity** cities (tourism, second home sales, retirement, footloose knowledge industry), perched high in the Andes on the side of the Pichincha Volcano, with an historical core that contains the world's best colonial architecture, a population that speaks Spanish, and relatively close proximity to the United States.<sup>12</sup> The disadvantages of Quito's remote location are more than offset by the advantages of its spectacular setting. Increasingly the metropolitan government and national tourism ministry recognize this potential, however, a major roadblock to Quito becoming an amenity city is lack of security. If Quito becomes an amenity economy (as places such as Bangkok and Prague have succeeded in becoming), it will be core-reinforcing, especially in the historical core and the Mariscal Lifestyle District, the latter currently being upgraded.

<sup>11</sup> Total employment in manufacturing, construction, and utilities is 187,000 people (2001). Accurate data on manufacturing employment is not available. However according to the Chamber of Industry for Pichincha Province (*Camara de Industriales de Pichincha*), its 480 members employ 63,500 people (2006); and they estimate total manufacturing employment to be between 75,000 and 100,000.

<sup>12</sup> Quito was declared the first urban World Cultural Heritage site by UNESCO in 1978.



Map 2. Quito Spatial Dynamics

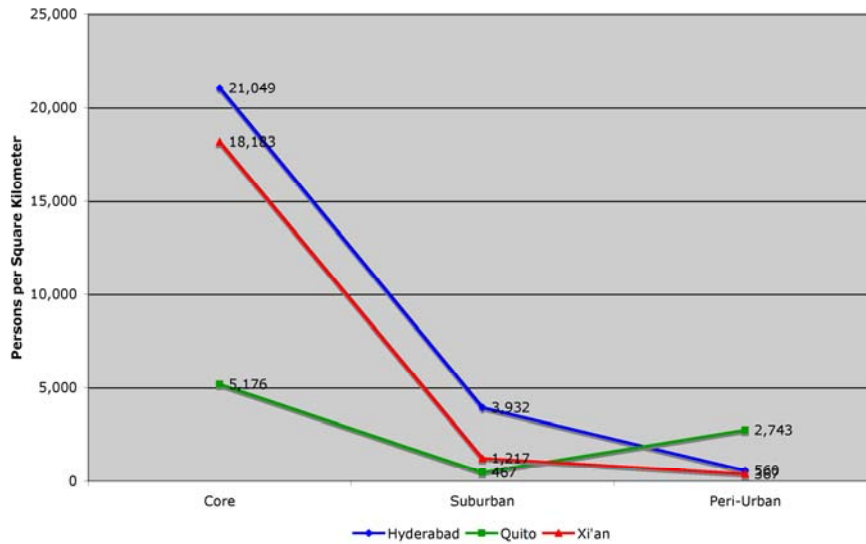


\*1. High Income Area 2. Middle Income Areas 3. Low Income Area

*Densities and Urban Growth Dynamics*

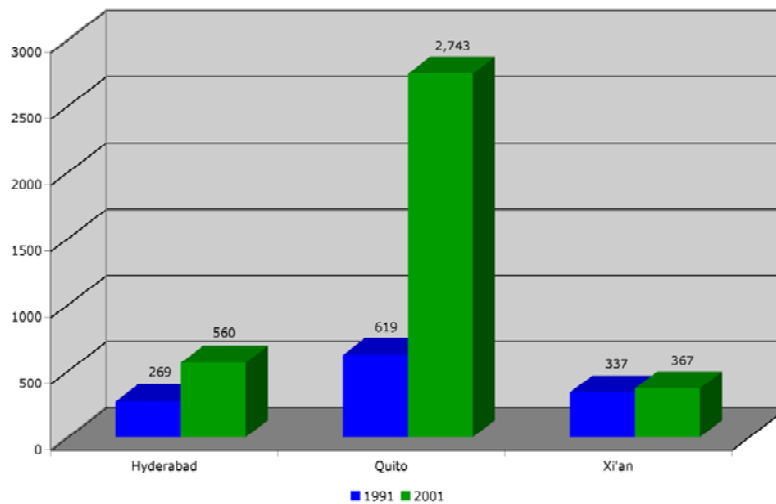
Figure 5 compares the population densities of the three cities by urban category (core, sub urban, peri-urban). Quito has, until recently, followed the trajectory of a monocentric city, driven by land market forces, with a strong (but shifting) CBD and contiguous development and urban expansion. Over time, increased sub and peri-urbanization have led to an incipient multi-nodal form which begins to emerge. Typical of monocentric built form, densities in Quito core city are relatively high (5,176 persons per Km<sup>2</sup>) – along the same density as Curitiba and Caracas — but drop off fast especially in the poor southern part of the city, where densities can fall below 500 persons per Km<sup>2</sup>. Densities are higher in the upper-middle and middle class suburbs in the valleys (officially classed as peri-urban) where densities are 2,743 persons per square kilometer. Ironically, the poor areas, especially informal squatter areas, exhibit the lowest densities, although density tends to increase once these areas are formalized (mainly through land titling) and infilling and densification occurs.

**Figure 5. Population Densities by Urban Category**



Peri-urban areas are gaining density at the fastest rate in Quito, explained by the rapid growth of the east valleys (Cumbaya - Tumbaco and Los Chillos). However, the increase in densities is largely explained through relatively fast population growth, i.e., increases in the built up area, rather than denser site scale development. People are moving to the lower elevation valleys (approximately 400 meters lower) because the climate is deemed more favorable and healthier, and relatively flat land is available to facilitate development.

**Figure 6. Peri-Urban Density Change 1991-2001: Hyderabad, Quito and Xi'an**



Quito's urban development context is unique. The city is located in a country with a small population and relatively abundant land, and much of the land on the edge of the city is low in fertility (often related to steep slope conditions) reducing its market value for non-urban uses. The geographic setting of Quito means that development to the east (of the core linear city) must jump to the lower elevation eastern valleys. This situation makes gradient analysis (of densities, as well as property values) less meaningful. To the north and south, relatively steep density gradients exist, especially to the south where topography represents less of a barrier (reflected in suburban densities, see Figure 5).

To the north, linear development is filling in the valley to the *Centro Del Mundo*, literally the equator. Along this corridor, densities and property values decline as one move outward. As noted in Figures 5 and 6, densities in the valleys (classified as peri-urban) are high relative to the urban core in comparison with the other two cities. Valley development mimics North American peripheral patterns in terms of physical development, commuting dependency, and lifestyles; however, it is at higher built-up densities than typical North American suburbia. In the urban core there is relatively little vacant land.

Quito has a strong north-south linear structure, defined by the Historical Core, the Mariscal Entertainment/Lifestyle District, the Central Business District (CBD), and the International Airport, which will shortly be replaced by a new airport to the north-west (Map 2). Only within the last fifteen years has development spread into the eastern valleys.<sup>13</sup> This shift represents a significant leap in the urban form of a city established in 1534, and characterized by north-south expansion for over 400 years.

#### Transportation and Urban Growth

Quito contains a strong north-south corridor currently served by trolley buses using protected *busways*. The three *TroleBus* north-south trolley bus protected corridors, operate near capacity carrying about 6,000 persons per hour in each direction.<sup>14</sup> Although the share of public transportation is falling in Quito, the busway system is operating at capacity at rush hour. One proposal being considered is extending the northern end of the LRT to the new airport near Checa; otherwise, all traffic to the new airport will need to pass through the already congested route through Cumbaya.

In Quito, 70% of trips are (2005) made by public transport – buses, including trolley buses operating in protected busways. However, in 1997, 80% of trips were made by public transport, reflecting the high number of private vehicles in Quito (142 per 1,000 persons in 2005), and the fact that the number of private vehicles on Quito’s roads is increasing by 7% per annum.<sup>15</sup> As shown in Tables 2 and 3 below, Quito is considerably further along the motorization trajectory than Xi'an, and especially Hyderabad, but still manages to capture a relatively high (albeit declining) proportion of trips by public transport.

**Table 4. Annual Increase in Motorization**

	% Growth	Period
<b>Xi'an</b>	14.10%	1990-2003
<b>Hyderabad</b>	12.00%	1993-2002
<b>Quito</b>	7.00%	1991-2005

**Table 5. Vehicle Ownership per 1000 People**

	#	Year
<b>Quito</b>	142	2005
<b>Xi'an</b>	18	2006
<b>Hyderabad</b>	5	2001

Although Quito has no expressways, it has increasingly relied on construction of super-arterials paralleling the spine of the north-south axis along the slope to the west and the valley to the east (see Map

<sup>13</sup> Locals refer to a "migration boom" to the eastern valleys in the 1990s.

<sup>14</sup> As of March 2008, the *TroleBus* system enjoys an impressive average weekday ridership of 236,696, with weekends averaging 169,349 per day. Visit <http://www.trolebus.gov.ec/> for more detailed *TroleBus* statistics.

<sup>15</sup> A major driver of motorization was the multi-thousand percent devaluation of the Ecuadorian currency before dollarization in 2000 – durable assets, such as vehicles, represented a hedge against devaluation and related inflation.

1) and tunnels through topographical obstacles, e.g., along the west side arterial and on the arterial connector between the CBD and Cumbaya and Tumbaco, to keep traffic flowing. Like most developing cities, flyovers are increasingly deployed as a cost-effective means to increase traffic capacity, particularly along super-arterials.

Quito's new airport is being constructed near Checa to the north-east of the city. Facilities for perishable cut flowers and high value vegetables may be expected at the new airport as well as the usual complement of hotels, vehicle rental facilities, logistics facilities, and time-sensitive manufacturing. Because Quito currently lacks formal industrial estates this represents a real opportunity to consolidate manufacturing, despite resistance from the Chamber of Industry that argues consolidation of manufacturing will be too expensive for its members. Local planners appear to have dramatically underestimated the spatial magnetism of the new airport, indicating that it will draw only 80,000 additional residents to the Checa area.<sup>16</sup>

### *City Building*

In Quito, housing preferences/choice (or lack of choice for the poorest) is a major driver of the city's spatial form. The upper-middle class live either in secure condominiums on the east side of the Central Business District (with impressive views of the valley) or in Cumbaya and Tumbaco below this ridge – depending on their household life stage, and lifestyle preferences. As prices per square meter of floor space are relatively similar in these two elite areas, the choice comes down to household preference structures. The city's demographic growth is fueled by relatively poor in-migrants who predominantly settle in the south of the North-South axis core city, currently particularly in Quitumbe. The middle class tends to live to the north, in Calderon, or in the lower status southeast valley area of Los Chillos. The power of residential location to shape the city is partly explained by the high GINI coefficient compared with Hyderabad and Xi'an, a product of much greater household income and wealth inequality, which is reflected in the spatial pattern. The relatively wealthy yield much power in shaping the structure of the city, pushing the poor to the less desirable areas.

The economic diversity of Quito shapes the city. Manufacturing is scattered, and so is tourism, split between the colonial core and the Mariscal entertainment and lifestyle area, while construction activity (12% of the city's GDP) is spread widely across the metropolitan area as a whole, although the nature of construction obviously varies widely, e.g., building of luxury high-rise construction on the east side of the CBD, luxury malls (such as the new San Luis Mall, which is becoming the de facto center of formerly center-less Los Chillos) to upgrading of squatter dwellings on the southern periphery of the city, especially in communities which are being legally normalized. In sum, employment is spread spatially to a significant extent, although the CBD continues to stand out as an employment center. The result is that transportation infrastructure and residential location play a relatively greater role in shaping the city than employment patterns than in the other two case study cities.

It is too early to know whether Quito will continue to retain its strong core, or will grow into a multi-nodal city with strong nodes around the new airport, Cumbaya, Tumbaco, etc. The phasing of the LRT will play a strong role in this regard - the sooner it is implemented, the stronger will be the centripetal forces that it exerts on the metropolitan region's structure. If delayed too long, it will be difficult to combat growing valley development and multi-nodalism. Furthermore, the fate of the old (current) airport site could play an important role, if used aggressively to create a new urban node (as in the case of Hong Kong's former international airport in Kowloon) in the future of Quito's urban structure.

---

<sup>16</sup> The Consultants estimate that demographic growth in the Checa area over 20 years is likely to be at least 200,000 additional area residents (over the without airport scenario).

Quito is the most monocentric of the three cities. It has the most distinct downtown characterized by a banking cluster, headquarters of domestic and multi-national corporations (particularly related to the petroleum industry), offices of international organizations, shopping malls and high-end condominiums. Its downtown is strengthened by a clear functional role, unlike "artificial" CBDs that governments and public-private ventures are trying to create in many cities around the world. However, even in Quito the growth of valley communities is starting to challenge Quito's monocentric – linear structure.

Considering the role of urban planning, Quito is based on state planning of land use; the Spanish carefully laid out the colonial core in the sixteenth century based on the prevailing best planning practices of the day. Quito's mid-twentieth century development was guided by the Garden Plan of 1947, which significantly explains much of the urban structure (especially roads and parks) south of the colonial city (Mariscal, the CBD).

*Growth Boundalry:* Of considerable interest from a growth management perspective are the impacts of Quito's growth (actually service/utility) **boundary**. Because it is not known what would have happened without the boundary, it is difficult to judge its effectiveness. However, based on interviews, and the growing popularity of inner city condominiums, it would appear to be having some effect in discouraging development in the valleys beyond the growth boundary. Nevertheless, some people continue to buy houses in the valleys beyond the growth boundary, and paying at least \$35 USD to fill a water tank.

Another problem in Quito is the disconnect between metropolitan scale planning and local building codes, zoning, and floor area ratios. The "palm + finger" metropolitan plan in Quito appears first-rate, the plan advocates a strong core reinforced by the LRT, plus a few strong outlying nodes (in Tumbaco, Los Chillos, Center of the World, etc.) to facilitate pubic and private transportation, reduce utility provision costs, and create higher density urban environments. However, existing *Coeficientes de ocupacion de suelo* (COS or Floor Area Ratios) and zoning, *Coeficientes de uso de suelo* (CUS) in the core city, interpreted by the administrative zone offices, often contradict the primary objectives of the strategic plan.

In terms of green space planning, Quito is well endowed, with close to 50% of land in the metropolitan region in green space, including city parks and protected areas in mountain slopes at the edge of the city.

**Heritage planning** is very important in Quito, both for cultural reasons and basis of tourism activity. Utilizing Inter-American Development Bank loans, international technical advice, and the UNESCO designation, the physical revitalization of the historical core has been effective. Public space investment, such as restoration of cobbled roadways as well as activities like authentic repainting of exteriors, have been undertaken efficiently. However, in terms of creating a strong underlying socio-economic base, outcomes to date are more problematic. Wealthier households from the north and valleys are infrequent visitors to the historical core, the retail hinterland of the historical district continues to be the south of the city. Bureaucratic obstacles make redevelopment of individual houses into boutique hotels very difficult.

### *Spatial Equity*

In Quito, housing costs are higher than they need to be because of institutional and too stringent regulation. Low FARs, building code requirements, delays and irregularities in issuance of permits lead to double the cost of the lowest cost housing unit in Quito. As a corollary, 30 to 40% of Quito's population is unable to purchase housing in the market, despite the availability of mortgage credit.<sup>17</sup>

---

<sup>17</sup> It is relatively easy in Quito to obtain a loan for less than \$100,000 USD, if income to support repayment of the mortgage can be proven.

**In Quito, low-income housing is particularly prevalent**, and growing fastest in the south of the city, where squatter settlements continue to be built, albeit at a slower rate than in the 1980s and 1990s. Increasingly informal settlements in Quito are being regularized. The metropolitan government is encouraging developers to provide low cost housing units (\$20,000 USD or less while planning to construct basic infrastructure (site and services) ahead of squatter settlement. Substandard housing in Quito is associated with lower densities: one-story buildings and vacant lots.

The rise in GINI coefficients, together with greater diversity of property types -- detached suburban houses, villas, live-work loft units, bachelor apartments)-- is leading to greater differentiation in Quito's spatial pattern. High-income households have been the pace-setters in terms of location and highest status. In the 1950, the wealthy moved from the colonial center to the *Mariscal* area (which became the CBD), in the 1980s, they moved to the valleys, with valley development accelerating sharply in the 1990s. Of late, luxury condominiums on the east side of the existing CBD (north of Mariscal) overlooking the Tumbaco valley have become fashionable. The options are mostly between inner-city condominium and lower density suburban living in the Tumbaco area.

However, much of the elite is returning to the core city, while middle-income households are locating at the suburban areas of Los Chillos and Calderon. This reflects the abundance of land on the periphery and the barriers prohibiting densification in the core city.

#### *Governance and Fiscal Challenges*

Quito's metropolitan government (*Municipio de Distrito Metropolitano de Quito*, or MDMQ), administers the contiguous built-up areas which spread through nine administrative zones each headed by a mayor). However, urban services are only guaranteed to areas within the designated *growth boundary*, which is geographically adjusted after every census. Technically, it is a *service boundary*, in that urban development can legally occurred beyond the boundary, but without metropolitan trunk (network) services.

The Administrative Zones is a form of deconcentrated governance within the Metropolitan level holding the real power. However, lack of alignment between the metropolitan scale and the local building bylaws hamper synergies across the territory. For example, Quito good metropolitan structural planning, manifested in the Quito's "*Palm and Finger*" *Metropolitan Structure Plan* is often undermined by conflicting micro regulations, such as FARs (Floor Area Ratio) known as *Coefficientes de Ocupacion de Suelo* (COS) established by the sub-administrative divisions.

Quito is emerging from an economic crisis, associated with national economic and fiscal problems that accumulated before dollarization in 2000. The impacts of this fiscal crisis are manifest throughout the metropolitan area, notably in the lack of urban transport infrastructure across main points (e.g., CBD and Cumbaya), which might have prevented the traffic jams between the lower valleys and the Core City.<sup>18</sup> The city projects a rapid increase in revenues and expenditures, but public resources over the next decade will not be enough to finance the necessary infrastructure included in the Metropolitan Structure Plan (new arterial roads, tunnels, etc.) or the proposed Light Rail Transit system. Basic infrastructure such as a wastewater treatment system is also required in line with the expected continued growth. While most of the city is served with sewerage system, waste treatment is practically non-existent and waste is dumped into the river system.

To cope with the fiscal problems, the metropolitan authority has launched a strategy to attract private investment to finance public infrastructure. For example, the new airport, to open in 2010, is financed on

---

<sup>18</sup> This may turn out to be a "blessing in disguise" if it slows valley development until the LRT is completed.

a BOT concession basis. <sup>19</sup> The *Empresa de Desarrollo Urbano de Quito*, a semi-autonomous corporate arm of the metropolitan agency, is trying to finance the LRT system through BOT. The metropolitan agency strategy is the establishment of Corporations (*Empresas*) to undertake priority capital investment and operational functions. The most important is EMDUQ the Metropolitan Corporation for the Urban Development of Quito (*Empresa Metropolitana de Desarrollo Urbano de Quito*), many others have been created with the objective to create public-private partnerships (private firms can invest in the *Empresas*) and to improve management by creating private sector type organizations. However it is still not clear whether this strategy will be successful. To date, virtually no private resources have been attracted by the *Empresas*. In addition, the *Empresas* may disconnect from the legitimate metropolitan government, becoming less responsive to the needs of urban stakeholders.

One of the biggest decisions facing the MDMQ is the fate of the existing airport site, which will no longer be required for aviation uses after 2010. Although current plans call for construction of an extensive urban park, the land is so strategically located that it could, in principle, fund much of the needed urban infrastructure to implement the *Metropolitan Structure Plan*. Since approximately 50% of the metropolitan area is already in green space and redevelopment of the airport area would reduce peripheral development pressures, a case can be made for use the site to create a relatively high density urban sub-center along the proposed LRT line.

On the revenue side, Quito's situation is somewhat unique. National income taxpayers can earmark up to 25% of their owed income tax to the Life for Quito Corporation (*Corporacion Vida para Quito*).<sup>20</sup> The Life for Quito Corporation, to date, has focused on environmental protection and redevelopment of neglected areas of the urban fabric.

### *Xi'an's Story*

#### *Demographics, Dynamics, and Urban Growth*

Xi'an was one of the four most important capitals of the ancient world (along with Cairo, Athens, and Rome) and the largest city in the world from 618 to 907. It was the capital of 11 imperial dynasties and two peasant regimes. While many urban historians regard Xi'an as the first truly global metropolis, it has lost much of its cosmopolitanism since then, being a relatively mediocre performer, within the China's Interior Region urban system, relative to Wuhan or Chengdu.

Xi'an's current population is around 7.4 million inhabitants (2005). Population growth has been modest (1.5% a year during 2001-2005) although higher than the annual 1.08% registered between 1991 and 2001. This increase reflects the rural-urban transition (migration is still increasing) and the benefits of economic revitalization in the 1990s, based on more privately owned and managed, and higher technology, economy. Xi'an's population growth is expected to be around 1.5-1.7% annually over the next ten to fifteen years, slightly lower than the other Chinese metropolitan areas.

---

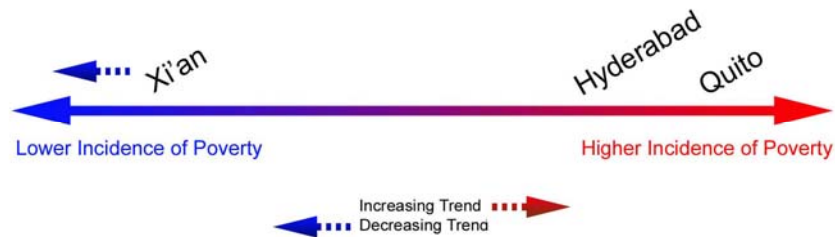
<sup>19</sup> The new Quito International Airport is being designed and built by Quiport S.A., a group consisting of the Aecon Group, Andrade Gutierrez Concessoes S.A. (Brazil), the Airport Development Corporation (Toronto, Canada) and HAS Development Corporation (Houston, USA). Quiport S.A. will be responsible for all airport operations under the terms of its 35-year concession. The project cost is estimated at between \$413 million USD and \$591 million USD and is scheduled for completion in 2010. Finance was obtained from Export Development Canada (EDC), the Inter-American Development Bank (\$75 million USD), the Export-Import Bank of the United States (\$70.2 million USD), and the Overseas Private Investment Corporation (\$200 million USD).

<sup>20</sup> This mechanism is a product of lost faith in the national government by Quito's taxpayers.



**Poverty rates are much lower** than in the other two cities: about 5.9% in the urban area, 16.6% in the peri-urban areas, and 12.1% for the overall Municipality (2002).<sup>21</sup> Furthermore, poverty rates are declining (Figure 7). Using housing conditions as surrogate for poverty in Xi'an yields a similar figure. 12%. The lower incidence of urban poverty in Xi'an is explained by high rates of economic growth over a long period of time, constraints on migration (the *hukou* system) and relatively equal income distribution. In Xi'an, the poor are found mainly in the peri-urban areas, e.g., workers in labor intensive factories living in rented rural collective housing, or close to the city center. These workers often live in more than 30 year old walk-up apartments, in old industrial areas. Poverty is often associated with late middle-aged individuals (and couples) who were laid off during the major economic restructuring of the late 1980s and early 1990s, and who now live off the state unemployment stipend and/or low paid service employment. Current stipends in Xi'an for those who were laid-off through re-structuring are approximately 560 RMB per month (about \$79 USD) per person, such stipends were in the range of 260 RMB per month in the early to mid 1990s when such layoffs peaked.<sup>22</sup> The vast majority of the young (20-40 years old) who were laid off have found new well-paid employment.

**Figure 7. Incidence of Poverty**



Net in-migration will probably peak over the next ten years, and along with envelopment of neighboring towns, associated with the physical spread of the city, currently accounts for virtually all net demographic growth. As migration peaks, Xi'an's population will eventually level off, certainly before 2050. Notably, the role played by migration in Xi'an's urban demographic growth increased from 16% to 45% between 1990 and 2003 in the case of the core urban area; 7% to 38% in sampled suburban areas, and 8% to 21% in sampled peri-urban areas. Envelopment is now the main driver of demographic growth in Xi'an, and as would be expected, this is especially the case in suburban and peri-urban areas. Unlike most large Chinese metropolitan areas, Xi'an has a large Moslem population, predominantly located within the walled city near the Bell Tower. However, ethnic identity is not a significant shaper of urban form in Xi'an, unlike Hyderabad.

#### *Economic Drivers and Urban Growth*

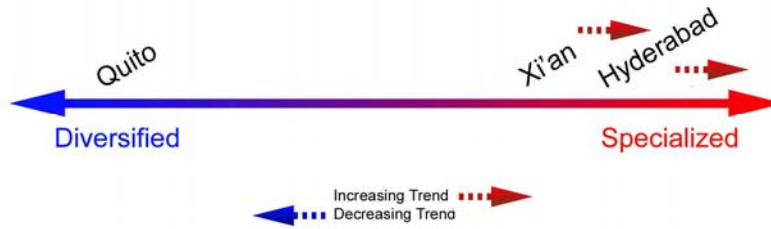
Xi'an's economy is more specialized than Quito, but less so than Hyderabad. Xi'an's economy is based on a mix of manufacturing (aviation; intermediate goods equipment, e.g., pipe and oil patch equipment and electrical generation/transmission manufacture; heavy vehicles; and textiles), high tech and education (it is one of the three leading software centers of China and one of the three leading post-secondary educational centers), tourism (based on the terra cotta warriors and other Tang Dynasty attractions), and surface logistics and transportation (it is an important railroad junction).

<sup>21</sup> In 2002, Chinese poverty lines were 865 RMB per capita per year for rural areas (covering most of Xi'an's peri-urban area) and, 2,160 RMB per capita per year for the officially urban area.

<sup>22</sup> The basic stipend for laid-off workers varies slightly among Chinese cities, based on the cost of living.

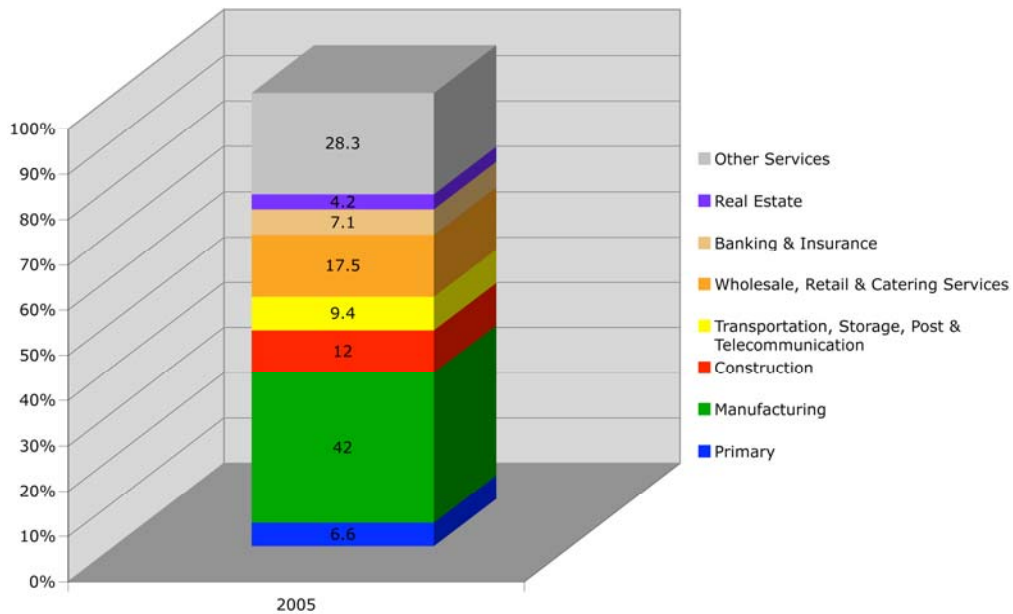


Figure 8. Economic Structure



Xi'an is still predominantly a manufacturing city (Figure 9, but the economy is quickly restructuring to one based on education and hi-tech (the knowledge cluster), and the linkages between the knowledge cluster and aviation manufacturing. Xi'an is the third most important higher education centre in China.

Figure 9. Xi'an Economic Structure (2003)



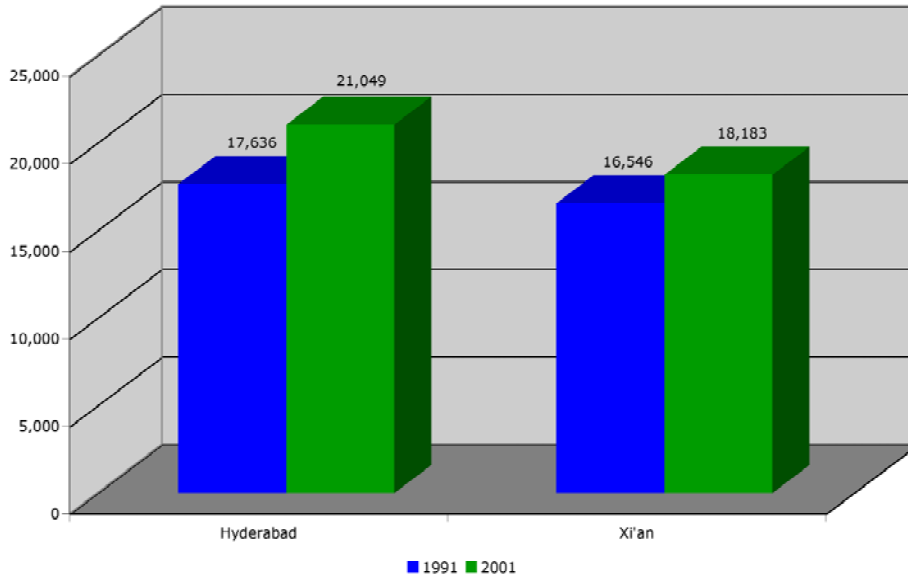
Densities and Urban Growth Dynamics

Xi'an's overall Metropolitan Density is 13,395 per square kilometer. Core urban densities can reach 18,000 persons per Km<sup>2</sup> but they rapidly drop off at the edge of the city. This can partially be explained by the fact that Xi'an was one of the last Chinese cities to develop urban land and property markets.

In Xi'an, as well as Hyderabad, high densities are explained by the high value of land, which encourages intensive development, as well as by dependence on walking and bicycling, and the relative lack of peri-urban large-scale manufacturing. Urban densities continue to remain high. Figure 10 shows that densities increased between 1991 and 2001. Data indicates that although densities are now stabilizing in Xi'an, they are not dropping significantly, in fact, may be continuing to increase.<sup>23</sup>

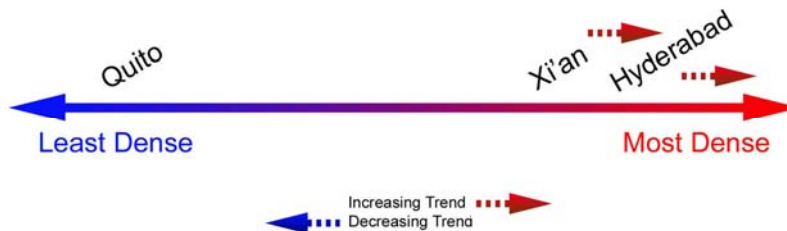
<sup>23</sup> Using a somewhat different spatial definition (the *city proper*), data from the, *China Urban Statistics Yearbooks (2001 and 2006)*, indicate that Xi'an's density remained approximately the same between 2000 and 2005, declining slightly from 13,503 to 13,395 persons per square kilometer.

**Figure 10. Urban Density Change 1991-2001: Xi'an and Hyderabad**



Xi'an's suburban development is complicated by a dualistic property rights regime (i) rural collective land that tends to be developed at lower densities, and (ii) land that has been officially urbanized and is the site for high-rise development, plus an increasingly enforced *basic protected agricultural land*, keeping overall suburban densities lower. China's urban development policy framework makes large-scale urban redevelopment easier, taking some of the pressure off the periphery. Figure 11 shows the trends in urban density for the three cities with Quito at the opposite end to both Xi'an and Hyderabad, which are continuing to densify.

**Figure 11. Urban Density (Built Up Contiguous City)**



*Transportation and Urban Growth*

In 2000, 55% of trips in Xi'an were by walking or bicycle; in 2007, this value dropped to 33%. The still high reliance on walking and bicycling in Xi'an is explained by the high density of the city, which contributes to short trip length and by the lack of modern transportation systems. 23% of residents use buses, somewhat above the Chinese urban mean, which is under 20%. About 22% of trips are private vehicles, 5% by motorbike, 6% by taxis, and close to 11% by private vehicles. Xi'an has only 18 private vehicles per 1,000 population (2006) but growth of private vehicles is rapid, it was approximately 14% per year from 1990-2003 and may be higher at present.

In all studied three cities, **the rapidly increasing use of private vehicles** is a major concern to city authorities. The table below illustrates the potential for private vehicle growth in developing country cities. In broad terms, there is a significant increase in car ownership as GDP increases above US\$3,000/capita. Quito’s GDP is now above this figure while Xi’an is below, suggesting the potential for high car growth in that city if adequate alternative transport measures are not in place. Car ownership to disposable income ratio in Xi’an is 10.1, compared to 8.05 for Beijing and 0.9 for Shanghai.

**Table 6. Relationship between GDP Growth and Car Ownership**

City	Kuala Lumpur	Bangkok	Quito	Jakarta	Manila	Chengdu	Xi’an	Ho Chi Min	Hanoi
Year		1993	2006	1994	1996	2000	2006	2002	2001
Mbike/1000 person	173	136	-	118	8	54	-	377	302
Car/ 1000 person	230	142	142	74	85	43	18	12	8
GDP/person	\$8,970	\$5,614	\$3500	\$3,034	\$2,455	\$2,800	\$1200	\$1,000	\$990

There are shortfalls in the coverage of public transport within Xi’an. Figure 12 illustrates the variation of public transport network density.

**Figure 12 Variation of Public Transport Network Density in Xi’an**

There is a notable fall in public transport density within the urban area from inside the city wall (3.84km of PT length per sq. km) to the area beyond the 2<sup>nd</sup> Ring Road (0.18km/sq.km). This is despite the high population density in this latter area -- 6,000 persons per sq. km – a figure equivalent to downtown Quito, which is well served by public transport.

Xi’an demonstrates that unless public transport coverage is maximized, the prospect of increasing private motorized transport is inevitable.



In addition, Xi'an does not yet have a mass rapid transit system. However, construction will soon start on a north-south line and a line from the city center (walled city) to the south-west to the High Technology Development Zone. The lack of either freeways or rapid transit systems in Xi’an would appear to explain long commuting times, despite the compact urban form. For example, average one-way commute time in Xi’an is about 45 minutes, approximately 20 minutes higher than the mean for Chinese and United States cities.

Xi'an's core contains the largest walled city in the world—a feature that brings pride, and tourists, to the city. However, from a transportation and city building perspective it creates significant problems, making it very difficult for traffic to move through the core city. In the past, the orientation of flows in the city were east-west (paralleling the national railroad which passes through the city), but increasingly north-south flows are becoming equally important, resulting in traffic intersecting in or near the walled core.

This situation has resulted in Xi'an not establishing a true CBD. The subway system that is currently under construction provides a comparative advantage in accessing the walled city given the difficulties of access by road. On the other hand, the Third Ring Road is now becoming an important development axis, as businesses locate along the Third Ring Road and do not have to deal with problems associated with the walled city.

The transportation status quo in Xi'an is untenable. The rapid growth of private vehicles combined with lack of expressways and the existence of a large walled city in its core, makes the implementation of a rapid transit a very important decision. The status quo situation (no subway system) will likely lead to a hollowed out Xi'an with economic dynamism increasingly focused on the Third Ring Road.

In Xi'an, airport expansion at the same site northwest of the city, and improved expressway access to the airport is under construction. Xi'an's airport has not resulted in the expected planned rapid development of the Xian-Xianyang Corridor as shown in Map 3, which remains a slow growth, heavy industry dominated (e.g., petro-chemicals) Corridor. This situation is somewhat unusual and may be due to the reliance on rail transport, both for passenger and cargo services.

### *City Building*

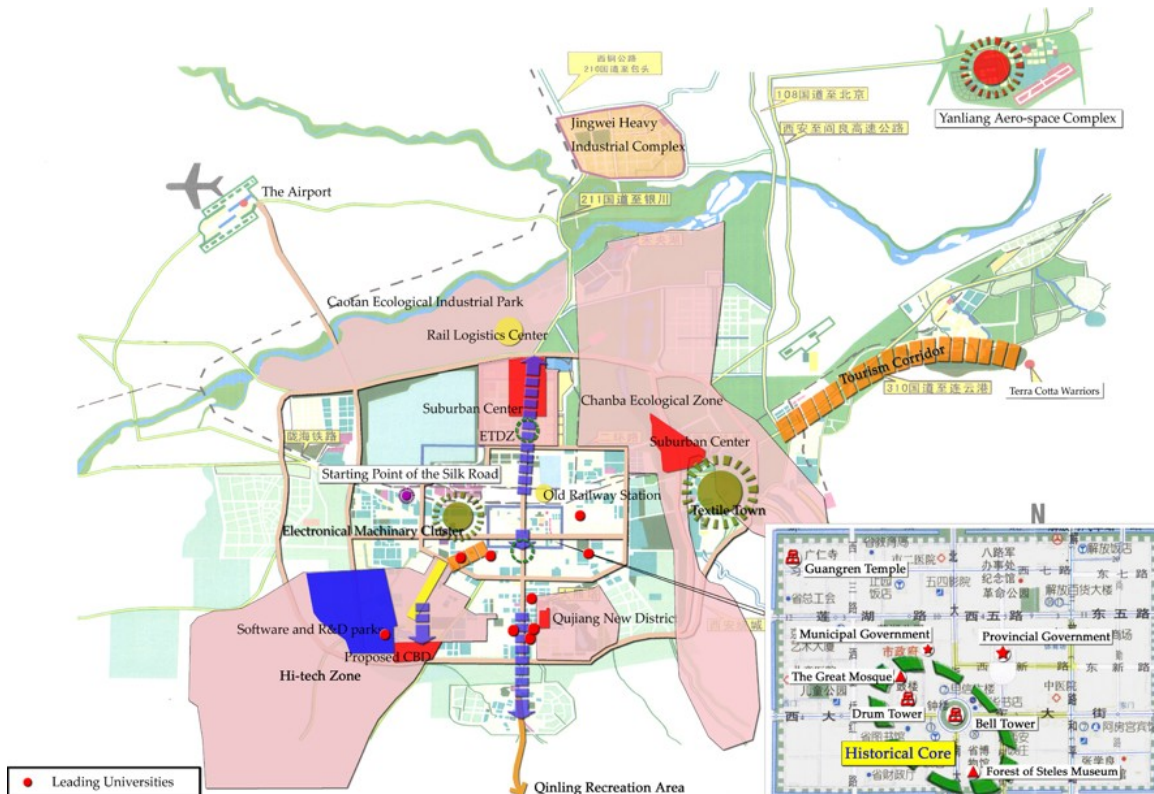
Xi'an's spatial pattern is shaped by the clustering economic activity, particularly manufacturing, in special economic zones. Map 2 shows the Xi'an High Technology Zone (XHTDZ), the Yanliang Aerospace City, Lintong Tourism City, the Xi'an Economic and Technological Development Zone (XETDZ). There are seven major economic development zones, the largest three alone accounted for 27.2% of Xi'an's GDP in 2003. Residential choices have had a lesser role in shaping the city, given to the relatively homogenous residential landscapes, although this is changing with the development of high end residential areas in the south of the city, e.g., Qujiang New District. Until recently, developers produced few housing options, given the narrow range of Floor Area Ratios (FARs) allowed by the Municipal and District Governments and the small lot development style imposed by local governments.

Unlike most Chinese cities, where the highest end residential development is close to the city center, in Xi'an the most valuable development is occurring in the southern part of the city, close to the knowledge cluster composed of leading universities and, to the immediate west, the XHTDZ. In addition, high-end peri-urban residential complexes are emerging in the Qinling mountain area (further south), where villa developments are springing up.

Xi'an has no CBD to speak of. There are several commercial centers, associated with special economic zones, with some ambiguity in the economic roles of each center. The XHTDZ, in conjunction with Greenland Property developers of Shanghai is attempting to create a "real" CBD to the southwest of the walled city, but whether it will attain such a lofty objective is open to question.

Xi'an has a long history of urban planning. Xi'an's radial road networks extend from the walled city, based on cosmological principles, planned centuries ago. However, the importance of spatial planning at the metropolitan level has waned since the "opening up" in the 1980s, replaced by the planning of special economic zones and the emergence of land and property markets. Territory within special economic zones is being planned more carefully, and is the object of much higher investment, whereas land outside these zones is more the object of tactical decision-making between the local government and developers at the site level. The introduction of land and property markets is contributing to a more differentiated urban environment, with different parts of the city acquiring more specialized functions and reputations.

Map 3. Xi'an Spatial Dynamics



Source: The Shui On Group

**Xi'an, has expanded module-by-module through the mechanism of special economic zones.** These special economic zones, semi-autonomous entities created by the Municipal Government, are planned with greater care than the metropolitan area as a whole, and because the land within these zones has been pre-approved for urban development, they can be expeditiously developed.<sup>24</sup> Furthermore, infrastructure within these zones is usually excellent, based on high infrastructure investment levels. Although zones may compete with each other and areas out of the special zones may become “orphan” areas lacking investment and planning/design attention. Lately, *inner-city* non-special zone areas are doing well through market-based, self-organizing processes, especially the financial-hotel district just outside the south gate of the walled city, and the petro business and services complex and residential area, just outside the north gate.

**Xi'an is a very compact/dense city.** At present 54% of the Municipality’s population lies within, or adjacent to the 40 square kilometer walled city. Floor area ratios are very homogenous across the city. Although densities are high, there are no real nodes or sub-center.<sup>25</sup> Greater flexibility in FAR would bring new opportunity in terms of public transportation and the possibility of rapid transit being self-financing. Key nodes on the two subway lines for which construction is now commencing, should have very high FARs or no FARs at all.

**Xi'an is often praised for its lack of urban sprawl.** Although commendable, this is largely a product of lack of interest by modern manufacturing companies, especially foreign ones. Peri-urban China, since the

<sup>24</sup> All have “one stop” services for investors.

<sup>25</sup> In Xi'an the mean FAR is approximately 1.8, with FARs rarely over 3.

1980s has largely been developed through the arrival of substantial flows of foreign direct investment. Market forces have led to Xi'an's relatively sharp edge of the built-up area, not planning policies per se. The concentration of much of the aerospace industry in Yanliang aerospace city, a satellite city to the north-east, may have also contributed to the sharpness of the city's edge, although many urban analysts criticize China's satellite cities for energy waste and fragmentation of labor markets. It appears that Xi'an's economy has largely leap-frogged the FDI export oriented manufacturing stage as it emerges as a leading knowledge, software, and tourism center, however, it will need to be alert for spillover based scatter especially to the south, attracted by the amenity of Qinling mountains, and due north with the development of the new Jingwei Heavy Industry Park, an outlier of the XETDZ manufacturing zone.<sup>26</sup>

In regard to green space, a significant problem in the Xi'an area is that small (100,000 – 500,000 population) satellite towns often do not value parks or do not see a need for large parks, given their relatively small size. However, when these outlying towns are enveloped, a prime source of Xi'an's demographic and physical growth, the land set aside for parks is too limited, yet acquiring additional park land is expensive once a community is enveloped.

**Tourism plays a significant role in maintaining the vitality of the city's core** with many tourist hotels and attractions located within the walled city. Although the terra cotta warriors and Tang Dynasty summer palace are located near Lintong, most tourists choose to stay in or near the walled city, again contributing to Xian's compactness. However, because of congestion, hotels are increasingly moving/investing outside the wall in locations that have better access to the Third Ring Road, e.g. the *Shangri-La, Sheraton, and Novotel*.

**One of the most challenging issues facing Xi'an is the redevelopment of the walled city.** Local officials would like to redevelop the walled city based on heritage. To facilitate this dynamic, the Municipal Government will move north to a new special development zone. The cost of such development would require government subsidies. Chinese cities such as Qingdao, which would like to redevelop its former German treaty port area are facing similar problems. It is obvious new mechanisms will need to be developed.

### *Spatial Equity*

**In Xi'an, 10-12% of the housing stock is sub-standard.** This is associated with low-quality walk-up buildings (6 – 8 floors) constructed just before and after the Cultural Revolution (1966-1976), and with some "farmers" housing rented out to low income workers. Substandard housing has lower densities than middle and upper class housing.. The relation between higher income and density applies even in the city core: middle-class people increasingly live in high-rise buildings (with considerably higher FARs).<sup>27</sup>

While income inequality in China (measured by the GINI coefficients) is lower than in Latin America, it is rising quite rapidly, reaching levels comparable to those in the United States. In the case of Xi'an, because economic take off occurred later than in most Chinese metropolitan areas, only recently one sees the emerging of a middle and wealthy class (see Figure 13). This dynamic is reflected in Xi'an's built environment, with different areas becoming known as better or worse places to live, and property values responding accordingly.

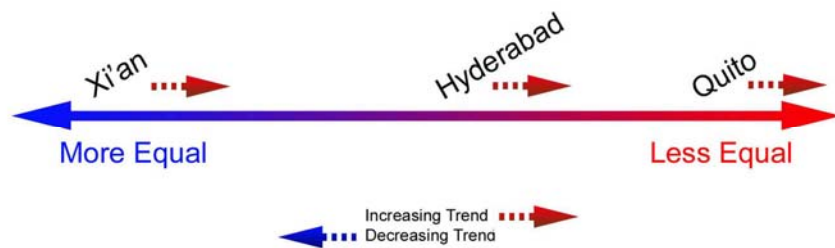
---

<sup>26</sup> However, the Jingwei Heavy Industry Park is less remote from the edge of the built up city as is often the case in Chinese metropolitan regions; it is likely to be enveloped by the contiguous city by 2015.

<sup>27</sup> Modern Chinese high-rises, associated with higher FARs, offer much more floor space per household – three to five times as much as old-style walk-ups, and on-site amenities such as day-care, pocket parks, and recreational facilities. The increase in FARs is associated with higher living standards, not lower.



Figure 13. Income Distribution



Socio-economic differentiation is not necessarily negative at city level. Cities need high-end neighborhoods to attract talent and investment, and different lifestyles are often expressed in different residential preferences. For example, in Xi'an, a relatively poor family could rent a room on the urban fringe or in a sub-standard inner city walkup. An upper-middle class family could live in a high-rise in the urban core or in Qinling Mountain area or in Qujiang New District, experiencing very different lifestyles.

#### *Governance and Fiscal Challenges*

**Xi'an's fiscal situation is typical of Chinese cities.** At least 25% of revenues are derived from sale of land leases. Since land can only be “sold” once, the city would need to develop a property tax system to fund the delivery of services and infrastructure investment. At present, the system of land sales creates an incentive for Xi'an Municipality to sell land to generate revenue, leading to a less compact development on the periphery which does not occur due to the low demand for land on the periphery which counteracts this dynamic..

Xi'an, like all China cities, receives very little in terms of transfers from the national government and much of the city revenues comes from business and land ventures. This partially accounts for the proliferation of SEZ, which contribute to multi-nodal structures, in Xi'an as well as most Chinese metropolitan regions. Fiscal information is difficult to obtain in most Chinese cities. Off-budget transactions are generally more important than those included in the budget.<sup>28</sup>

#### ***Hyderabad's***

##### *Demographics, Dynamics, and Urban Growth*

Hyderabad's population is about 6.4 million (2001) and is growing at a rapid 2.9% per year. Migration from the rural areas is expected to continue due to the successful ITC cluster, and the city may grow as fast as 3.6% per year between 2005 and 2020.<sup>29</sup> Hyderabad's demographic growth represents a major urban challenge, especially due to the substantial backlog of transportation and infrastructure that affects this city.

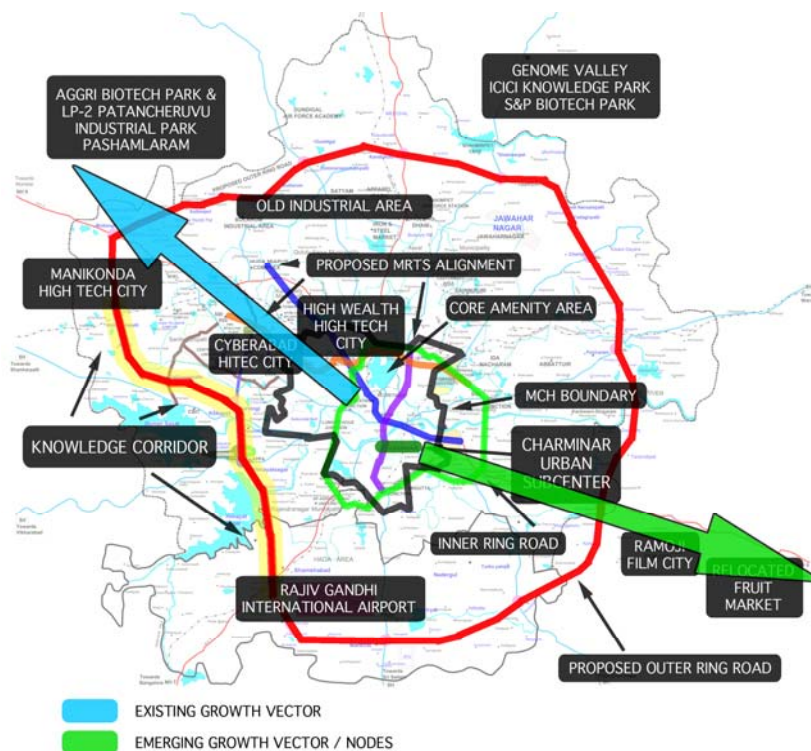
##### *Economic Drivers and Urban Growth*

Hyderabad is highly specialized in function as illustrated in Map 4 below, which highlights the main spatial dynamics and growth vectors.

<sup>28</sup> For more information on the relationship between Chinese urban fiscal systems and land use, see Webster, Douglas, Cai, Jianming, and Maneepong, Chuthatip, *Metropolitan Governance in China: Priorities for Action in the Context of Chinese Dynamics and International Experience*, Washington, World Bank, 2006

<sup>29</sup> India's cities are growing demographically slower than cities in most of the developing world, reflected in the overall level of Indian urbanization of only 30%, Ibid: UNFPA “State of World Population 2007”

Map 4. Hyderabad Spatial Dynamics



ITC activity is the overwhelming driver of the economy, accounting for 72% of output and driving the “modernization” of the north side of the metropolis, where the IT complexes, such as Manikonda High Tech City, are concentrated. In employment terms, the city is less specialized, a product of the great percentage of labor employed in traditional economic activities. Plans for a *Cyberabad Development Area* to the west of the city will contribute to a “knowledge corridor” along the western segment of the Outer Ring Road, reinforced by the new Rajiv Gandhi International Airport to the south which will be in operation in 2008 as indicated in Map 4. Current property prices currently clearly reflect the value of locations in the northwest quadrant of the metropolitan area, e.g., along the Bombay Road axis.

#### *Densities and Urban Growth Dynamics*

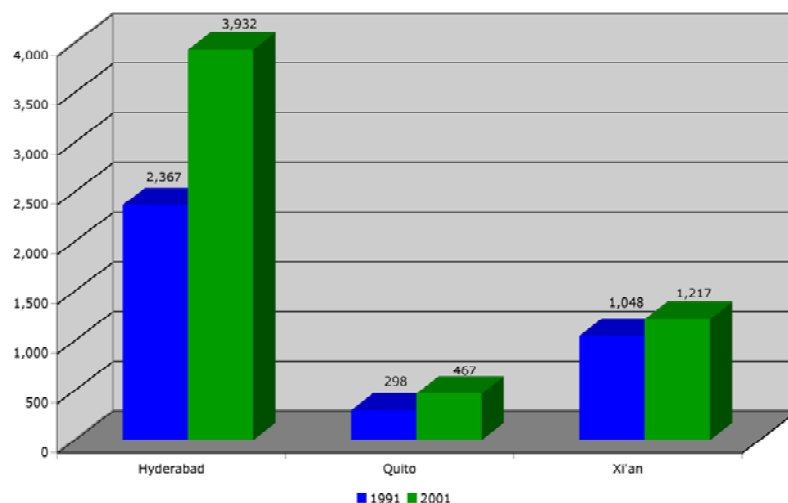
**The built up density in Hyderabad’s urban core is 21,046 persons per km<sup>2</sup>**, which is very high although less than Mumbai, Hong Kong, and Guangzhou .Hyderabad has peaks of density in some core areas but density gradients drop off fast in the suburban and peri-urban areas. The latter can be partially explained by very inadequate transportation infrastructure, which makes peripheral locations of much less value from a livelihood perspective. In Hyderabad, overall high densities can be explained by the very high value of land, limited accessibility, the dependence on walking and human-powered transportation (especially in the past), and the relative lack of significant peri-urban large-scale manufacturing. Urban densities continue to remain high over time in Hyderabad. Figure 5 indicates that densities increased between 1991 and 2001 in Hyderabad.

Of particular note in terms of urban form and densities is the importance of radial roads. Hyderabad's urban form is often described as star shaped because five corridors extend outwards from the core city along the major inter-city radials. Because the core is essentially completely developed, as peripheral areas are urbanized in Hyderabad, densities rise fast effectively transitioning from rural to urban, rather than producing especially distinct suburban environments. Thus, out of the three study cities, it is not



surprising that the highest and fastest rising suburban densities are found in suburban Hyderabad, as illustrated Figure 14. There is little potential to densify the existing city, partially explained by difficulties in large-scale land acquisition for urban redevelopment which relates to complex formal and informal land ownership and rights regimes, and past national policies, in particular the Urban Land Ceiling Act (ULCA) that had unintended impacts. Accordingly, the city expands outwards, replicating its basic structure, like the unrolling of a rug.

**Figure 14. Suburban Density Change 1991-2001: Hyderabad, Quito and Xi'an**



Hyderabad's edge, when converted from rural-urban uses tends to produce high densities whereas the case in Xi'an is less uniformly high density, with differences in property rights regimes and agricultural protection policies playing an important role.<sup>30</sup> In Hyderabad, the threat to the current quasi-equilibrium situations is congestion, which is becoming intolerable. The result is likely to be significant change in the city's structure, depending on the path of investment over the next 10-20 years. One scenario would be that mass transit relieves congestion as it has in Bangkok, another would be to orient the city towards the Outer Ring Road, which is being built. If the latter occurs, more differentiated suburban and peri-urban environments are likely to develop.

#### *Transportation and Urban Growth*

In Hyderabad, extensive plans for heavy and light rail transit have been developed over many years. However, a tipping point seems to have been reached in terms of implementation. Construction will start on the \$2.4 billion USD MRTS heavy rail system, 3 lines totaling 71 kilometers, in August 2008. It will be a BOT system, with subsidies from the national (30% of total costs) and state (10%) governments. Map 4 above identifies the route of the proposed system. It is expected that the system will be operational by 2012. Typical of Indian cities, Hyderabad is serviced by a well-developed commuter train system, the MMTS, essentially part of the Indian national railroad network. Construction of Phase II of the MMTS system will begin soon.

As in the case of the other two case study cities, Hyderabad lacks expressway systems. Current construction and investment priorities focus on the Outer Ring Road Project and ameliorative infrastructure, particularly fly-overs, to expand the capacity of roads within core Hyderabad. Average

<sup>30</sup> For detailed analysis and discussion of property development on the periphery of Chinese cities, see: Bertaud, A., Webster, D., Cai, J., Yang, Z., and A. Gulbrandson. *Urban Land Use Efficiency in China: Issues and Policy Recommendations*. The World Bank: Beijing, Washington DC. 2008.

one-way commute time in Hyderabad is close to one hour, which is very high by world standards not to mention by Indian metropolitan standards. For instance, the average commute time is 30 minutes in Mumbai and 45 minutes in Delhi. It would appear contradictory that very high commuting/trip times are associated with a dense city such as Hyderabad as one of the benefits of density is purported to be shortened commuting times. The explanation lies in the lack of modern urban transportation systems (be it mass transit or road capacity), creating massive congestion, and to a much lesser, and declining, extent by the fact that a significant number of journeys still use human-powered transportation. From Hyderabad's transport situation, it is possible to discern that infrastructure still needs to be implemented to capitalize upon density to yield benefits in terms of accessibility and human time.

Although data is not strictly comparable, Hyderabad is much more dependent on public transportation than Xi'an, typical of India-China urban modal splits. If MMTS rail service, buses, autos (nine passenger para-transit vehicles), and three-wheelers are grouped together, formal and informal public transit, i.e. para-transit accounts for approximately 85% of motorized trips, close to four times the Xi'an level. Out of that percentage, the formal component (buses and MMTS commuter trains) account for 44% of trips. Private vehicles account for approximately 12% of trips, which is virtually identical to Xi'an.

Hyderabad's motorization is just beginning; however, private vehicle ownership could swing upwards dramatically with the introduction of the Tata Nano urban car, which will sell for approximately \$2,500 USD. Mass motorization is likely to put considerable centrifugal pressure on Hyderabad, the core city is not in a position to handle a quantum increase in the number of vehicles. Despite current massive congestion, the level of motorization was only 4.8 vehicles per 1,000 population in 2001.<sup>31</sup> From 1993-2002 motorization grew at 12% per annum.

As noted, a new airport is being constructed at Shamshabad, directly south of the city. This airport will have a dramatic impact on the structure of the city, likely resulting in an incremental population increase of at least 500,000 people in the area over the next 20 years. In the case of Hyderabad, the airport cluster will be particularly important, given the dependence of ITC industries on air freight and international travel by skilled personnel.

### *City Building*

In the past, the northern around Durgam Cheruvu Lake was the high status area, near the seat of the government with key government offices located both to the south and northwest of the lake. Ethnic factors also affected spatial ordering with Hindus tending to live toward the north and Moslems toward the south – with socio-economic differentiation within both these populations creating finer grained distinctions. However, since the 1990s, with the dramatic rise of high technology activities the north of the city (reinforced, or explained by the existing nearby international airport) has become the center of the “modern” urban economy, manifest in fashionable hotels, retailing, and cafes. In other words, Hyderabad is becoming increasingly shaped by one industry. The construction of the new international airport to the south raises interesting questions, given that it is remote from the ITC clusters in the north. Will it drive investment in new high-tech activity in its vicinity, or will the south of the city be substantially bypassed as accessibility on the Outer Ring Road creates a western arc knowledge corridor, connecting the high tech north-west of the metropolis with the new airport?

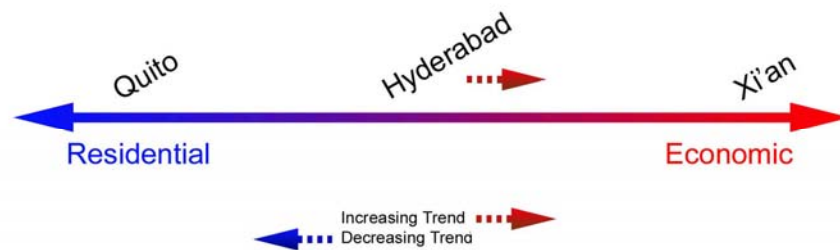
As in the other two case study cities, high-end peri-urban residential complexes are emerging, such as the Singapore Township area.

---

<sup>31</sup> More recent data is not available.

Hyderabad's town planning dates back to colonial-era town plans. However, official town and country planning has played a minor, and often negative role because of inappropriate policies, mechanisms, and standards, in shaping the city over the last several decades. The real drivers of Hyderabad's form have been economic forces associated with the ITC cluster. As indicated by Figure 15, economic drivers are much more important in shaping Hyderabad's urban form, however, less so than in Xi'an. Investment in transportation, however, will play an increasingly important role in shaping Hyderabad over the next few years.

Figure 15. Key Drivers of Urban Form



The Outer Ring Road, MRTS, and the Shamshabad airport will radically reshape the city's structure over the next 20 years, operating in conjunction with economic drivers. For example, three major SEZs are planned along the Outer Ring Road.<sup>32</sup> The increased looseness (flexibility) in the city's structure provided by transport investment may enable town and country planners to play a more important role as land is opened up on the periphery and the potential for density increases is realized in the core. However, town planning frameworks will need to be revised to better fit emerging Hyderabad urban realities. Rapid demographic increase and the expected continued expansion of the ITC industry will be the two most important other drivers interacting with transportation investment in shaping future Hyderabad's future growth.

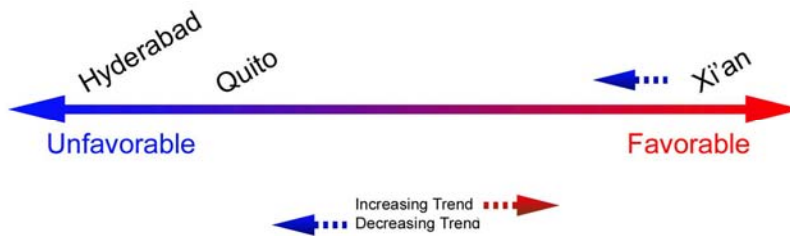
Hyderabad's town planning if assessed on paper is rational and impressive; but planning documents retain no real value unless they influence what happens on the ground. The planning challenge in Hyderabad is two-fold. One, given the dearth of urban infrastructure investment (less than one-seventh of that in Xi'an over the last two decades), there is little institutional or geographical space for planning. Severe congestion and finding space to build creates very high land prices – whether expressed through formal markets or informally through households holding on to property and land to which they have rights – so that the city evolves through a multitude of small plot incremental changes, within a structural frame that is renovated through the construction of flyovers. The existence of inappropriate legal frameworks, particularly the ULCA<sup>33</sup>, has exacerbated the situation by making large plot development difficult – a very different city emerges if the entire fabric is the result of small plot development. Vital cities are a product of large and small plot development. Slow moving judicial and administrative processes make large-scale land acquisition, even for public purposes, such as right-of-ways for transportation infrastructure, difficult. In sum, as indicated by Figure 16, there is little *looseness* or room for maneuver in Hyderabad's urban fabric. Redevelopment and in-filling are extremely difficult.

<sup>32</sup> Reflecting the dramatic ongoing restructuring of Hyderabad's economy away from heavy industry, the new special economic zones will specialize in less labor and pollution intensive, higher value goods such as pharmaceuticals (and other biotech), electronics, and apparel.

<sup>33</sup> The ULCA in Hyderabad is expected to be repealed this year following its repeal in Maharashtra. If repealed, it will have a direct impact on the middle class, provided there will be relaxations on FAR, thereby making apartments more affordable and freeing up large plots of land.

When rapid transit systems are built, they usually significantly reshape a core city, through market processes, but the impact may be less in Hyderabad, where there is less potential to quickly rework the built up urban fabric either because of the lack of vacant (or potentially vacant) land or the inability to redevelop currently built-up areas. Hence, the real opportunities in Hyderabad to shape urban growth patterns are located in the peripheral areas, which currently have relatively low populations and will grow much faster in absolute and relative terms than both Hyderabad's core and the peripheries of the other two case study cities. In particular, the "knowledge corridor" along the western arc of the metropolitan area is likely to become the new focus of Hyderabad's spatial dynamism. To the extent that Hyderabad's peripheral areas can be developed on a phased transit and infrastructure led basis outwards from the built up edge of the city or key suburban centers on the Outer Ring Road, the benefits of high densities could be retained, along with the sharpness of the edge of the city. At the same time, current high economic, social, and health costs associated with accessibility difficulties could be dramatically reduced.

**Figure 16. Ease of Urban Redevelopment (Looseness of Urban Fabric)**



In core Hyderabad, green space is limited and prospects of significant increases in green space are limited because of the high cost of land. However, on the periphery it should be possible to create more green space than is the case in the core city. In the extended urban region (EUR), 5.1 million seedlings have been planted in "waste lands". Hyderabad is a city of lakes – it once contained 400 – although many have been filled in. However, local authorities are increasingly attempting to preserve and clean up remaining lakes. Heritage planning is also beginning to be taken seriously in Hyderabad, which is significant because of the existence of several areas of high historical and cultural importance, such as the Charminar area, the Golconda Fort including surrounding tombs, Falaknuma and Chiran Palaces, and areas around Durgam Cheruvu Lake.

### *Spatial Equity*

In Hyderabad, poor accessibility effectively limits the supply of urban land from which one can reasonably commute to places of employment. One of the most serious problems facing poor people in Hyderabad is finding place to live.<sup>34</sup> According to official data, 21% of the population is estimated to live in slums. In Hyderabad, slums are dense, usually denser than residential areas occupied by households with higher incomes, in contrast to the other two case study cities.

Urban GINI coefficients in Hyderabad are lower than in many East Asian cities and virtually all Latin American metropolitan areas. However, as in Xi'an income inequalities are rising, given the dualistic (knowledge – non-knowledge sectors) nature of Hyderabad's economic growth. Hyderabad suffers, in income distribution terms, from the lack of widespread manufacturing which would provide an upward ladder for less educated urban residents, including migrants.

<sup>34</sup> Availability of mortgage finance can also be a problem, but the situation is improving in this regard.

Hyderabad is the most complex case in terms of understanding the spatial patterns of socio-economic classes, types of housing, and community characteristics. Its fabric is very fine-grained with pockets of high-end development in both the north and south of the city. However, the north, especially the northwest, is highly valued from a residential point of view, clearly reflected in property prices.

### *Governance and Fiscal Challenges*

The governance situation in Hyderabad is complex. The Hyderabad Urban Development Authority (HUDA), a legacy of the colonial period, as in other Indian urban centers, holds significant power over infrastructure delivery, but is essentially not politically accountable. Thus aside from the normal vertical hierarchy of governance, a dualism exists between the development authority and elected local governments. The problem has been compounded by the fact that middle and upper class residents increasingly “protect” themselves from poor service delivery, such as by building water storage tanks, and purchasing generators, thereby reducing the motivation of the middle and upper class constituencies to push for change in the delivery of basic services through political processes. For example, no metropolitan area in India delivers water to residential neighborhoods on a reliable basis for more than two hours per day.

The Greater Hyderabad Municipal Corporation’s (GHMC) revenue income (taxes, user fees, etc) has outpaced its revenue expenditures (personnel cost, operational expenses, repair and maintenance expenses, program expenses, administrative expenses, and finance expenses), leading to a revenue surplus each year in the period from 2001 through 2006. By contrast, the GHMC’s capital income, which comprises grants (87%) and bonds, debentures and unsecured loans (13%) has only exceeded capital expenditures in 2002 and 2004. Shortfall in capital income, to meet capital expenditure requirements for land development, infrastructure, slum upgrading is met through revenue transfers, usually from the state government (Andhra Pradesh).

Transport infrastructure projects have traditionally been financed through government funding mechanism – municipal funds allotted to the Municipal Council Hyderabad (MCH) and the HUDA. MCH has applied for additional funding from the Central government through the new Jawaharlal Nehru National Urban Renewal Mission (JNNURM) Program, which was recently established in anticipation of large scale urbanization in India, countering a previous relative neglect of urban areas. The program focuses on significantly upgrading the capability of 63 major cities in India. The MMTS Phase I was carried out under a cost sharing mechanism between Indian Railways and the Government of Andhra Pradesh (GoAP). Phase II will likely be funded in a similar fashion. Short-term and medium-term projects propose to use GoAP funds, except for the radial roads, which are proposed for loan assistance from the Asian Development Bank.

Driven by pressing needs Hyderabad, like Quito, is attempting to pursue more innovative finance for major projects. Several projects have been proposed that would involve public private participation (PPP) and/or BOT mechanisms. For example, the funding mechanism for the MRTS project will be a BOT system, with viability gap funding (40% of the total cost) from GoI and GoAP.

The basic principle underlying future financing of public transport projects is that there would be a subsidy in capital expenditure, but operational expenses are to be recovered through user fees so that the services can be sustainable in future. The tariff structure would recover operational expenses and the capital expenditure would be cross subsidized through real estate development on the adjacent plots to the public transit system routes, either on railway (government) land or on private land through a taxation measures.

## **2.3 Lessons Learned**

The following section summarizes the lessons that can be learned from each city before comparing all three cities.

### **2.3.1 Lessons Learned from Quito**

Much can be learned from Quito, surprisingly, because its planning officials and key stakeholders in the business community often perceive the city to be one which has been disappointing in terms of urban development. Important learning from Quito includes:

- (i) One of the most striking successes of the city has been its management of low-income communities, albeit helped by demographic factors, particularly slowing migration. Invasions (*invasiones*) and squatting are increasingly rare, an activity no longer supported or condoned by the overall community. Meanwhile, past squatter areas are slowly being regularized in terms of services and land tenure. Part of the success is due to more accessible private sector housing through finance and affordable products; however, approximately 30 - 40% of the population cannot afford to purchase market housing. They are increasingly being accommodated in higher density regularizing communities, through rental markets.

Quito indicates that rapid proliferation of squatter areas can be slowed, while at the same time living conditions for low income people improved, if supply enhancement programs and policies are implemented in conjunction with tougher sanctions against squatting. Implementing the latter measures alone obviously will not work.

- (ii) Quito's three north-south bus (trolley) ways have been a success in terms of public transportation, aided by the linear structure of the city. If the north-west transportation spine is successfully upgraded to a LRT system, Quito will be well positioned to maintain its strong efficient linear core.
- (iii) Quito is making progress in terms of innovative finance. The best example is the new international airport near Checa, which will open in 2010, being developed as a self-financing BOT by Quiport SA. The metropolitan government is currently attempting to develop the LRT system utilizing a Design to Build BOT format.
- (iv) From a design and heritage preservation perspective, the restoration of Quito's world respected colonial era historical core, designated as the first urban UNESCO heritage site in 1978, has been outstanding. Utilizing local resources plus loans from the Inter-American Development Bank, various instruments have proven effective, including design centers, painting of exteriors and restoration of public buildings. However, from an economic perspective, the restoration has been less successful. Small businesses attempting to operate in the area have been hampered by bureaucratic obstacles and inadequate market demand for their products and services.
- (v) Quito's growth boundary, really a service boundary appears to be having a beneficial effect in limiting urban sprawl in the eastern valleys. Not draconian because it is adjusted every five years, and is a service boundary rather than an absolute growth boundary, it appears to have had minimal impact on house and property prices, while at the same time discouraging unwarranted leap-frogging of urban development beyond the boundary.
- (vi) Quito's planners understand the importance of certain catalytic facilities in shaping the urban area, and / or reducing congestion, and, accordingly are relocating them. For example, the inter-city bus

terminal near the historical core is being located to the south of the city while the wholesale vegetable market is being located to the north, in Calderon.

- (vii) Creation of a new industrial zone at the new airport, although not innovative, represents good practice in terms of facilitating economic cluster effects, reducing environmental impacts (partially through lowering unit costs of environmental infrastructure), and reducing nuisance effects throughout the urban area.
- (viii) The "palm and finger" strategic plan for the metropolitan area is first-rate. It represents an attempt to maintain the linear core city while encouraging a limited number of strong nodes in outlying areas. It advocates aligning transportation and trunk infrastructure to the proposed structure. Its weakness is the failure, to date, of the MDMQ to align micro regulations on FARs, building codes with this strategic plan.

### *Challenges*

The challenges facing Quito are significant, including:

- (i) The need to establish a viable wastewater treatment system.
- (ii) The need to reduce the scatter of manufacturing activity, an issue that may be addressed to some extent through the new airport SEZ.
- (iii) Perhaps most significant in terms of land use and urban form, the fate of the existing airport site which will not be needed for aviation purposes post 2010. If used strategically, it could strengthen Quito's core linear structure and partially finance direly needed investment in trunk infrastructure such as the LRT and waste water systems.
- (iv) Most significant in terms of economic development, the need to take advantage of the city's world-class scenic and cultural environment to become a leading amenity-based economy in the Western Hemisphere. Such economic re-structuring would reinforce the role of the core city, particularly the old colonial core and the Mariscal district.

### **2.3.2 Lessons Learned from Xi'an**

Although not one of China's most successful metropolitan areas in economic terms, Xi'an to a significant extent reflects the successes, and shortcomings, of the Chinese urban development model to date. Important learning from Xi'an includes:

- (i) De-densification and sprawling peri-urban development is not inevitable. Xi'an continues to develop at high densities and sprawl is minimal. To a large extent this is the product of limited new investment in manufacturing, but also reflects public policies that have encouraged industry to locate in SEZs contiguous to the built up area, and to develop at high densities than is the norm for SEZs in China.
- (ii) Slums are not inevitable in developing cities. Despite the fact that Xi'an is not one of China's wealthier cities, there are few slums, while substandard housing (primarily run-down walkups and "farmer" housing on the periphery) does not constitute more than 12% of the city's housing stock. This outcome is the product of a number of factors including a strategy of supply side incentives for affordable housing, intolerance of squatter settlement, low natural population growth, past controls on in-migration, and high levels of home ownership facilitated by easy access to finance.

- (iii) Utilizing SEZs to develop a city is a viable strategy. SEZs in Xi'an cover a significant percentage of the land area and account for an even larger percentage of economic output. The advantage of a SEZ led modular approach to city building is that investment can be expedited and high quality master planning and infrastructure provision can be ensured. The disadvantage is that the SEZs may compete with each other for unique functions, such as being the CBD, or may duplicate functions to too great an extent, resulting in a repetitive modular city.
- (iv) Related to the foregoing, Xi'an, as do China cities in general, significantly reshapes itself by moving large scale public complexes. For example, Xi'an's municipal government will shortly relocate from the walled city to the XETDZ new suburban center to the north of the city, creating a viable economic base and function for the new northern suburban center, enabling it to compete with, while functionally complementing the XHTDZ to the southwest of the wall.<sup>35</sup>
- (v) Xi'an has successfully grouped most manufacturing in SEZs on the urban periphery, realizing fiscal, environmental, and economic benefits. However, unlike many Chinese metropolitan regions these SEZs are in or relatively close to the contiguous built-up city.
- (vi) Xi'an is increasingly learning that service clusters may be less amenable to special zone treatment than manufacturing. A financial services and hotel cluster is increasingly emerging just to the south gate of the walled city, while the petroleum services cluster is emerging just outside the north gate. Such organic growth of business, professional, and hospitality services, outside SEZs indicates that the SEZ model of city building does have limitations.
- (vii) Xi'an indicates the potent power of ring roads in shaping urban form, especially if the core is congested (in this case by the walled city), and radial road development does not keep pace. In Xi'an, businesses, hotels, high-end residential communities, and knowledge clusters are increasingly locating near the third ring road. Ring roads become especially strong drivers of peripheral growth when they are constructed before radial roads.
- (viii) Xi'an's peri-urban development is partly shaped by the existence of *basic protected agricultural zones*. Although often enforced mechanistically,<sup>36</sup> the existence of these zones offers a viable alternative to growth or service boundary policies in shaping peri-urban development.
- (ix) The existence of substantial heritage resources in Xi'an's walled city has exposed the limits to market-based redevelopment of some inner-city areas. It has become obvious that public subsidies to private sector actors will be needed to ensure high quality cultural redevelopment of the walled city.
- (x) Xi'an recognizes the need to develop a mass transit system as soon as possible, especially given the unique situation imposed by the walled city in the center of the metropolitan region. Construction will start shortly. The challenge will be to align land use (nodes) with the route network. Already, there are clear indications of the impacts of walled city congestion on private sector behavior, particularly in the hospitality sector. For example, the Shangri-La hotel is relocating to the XHTDZ closer to the third ring road, abandoning its current facility within the walled city.

---

<sup>35</sup> This strategy can backfire. For example, Qingdao, China moved its municipal government complex out of the old city to a new CBD. The old city is now seriously depressed.

<sup>36</sup> For detail on this topic, see: Urban Development Sector Unit, East Asia and Pacific Region, World Bank, *The Spatial Growth of Metropolitan Cities in China: Issues and Options in Urban Land Use*, Washington: World Bank, 2008



## *Challenges*

Xi'an faces several significant challenges, including:

- (i) The city lacks a CBD. It may not need one, given the relatively limited role that business and professional services play in the city's economy. However, it does need specialized nodes that provide unique specialized services and functions, from entertainment to finance.
- (ii) Commuting times are abnormally high despite uniformly high densities. The subway system will help address this issue provided routes and stations are aligned with high density multi-use nodes and reflected in FARs. However, the road network also needs improving, with higher capacity radial roads to complement ring road development.
- (iii) Xi'an's fiscal model, highly dependent on government land sales (actually long term leases) is obviously non-sustainable and encourages the over-leasing of land.
- (iv) Compared with Quito and Hyderabad, Xi'an (and Chinese cities as a whole) have been slow in adopting innovative finance for rapid transit, although this is not the case for toll roads.
- (v) With the introduction of property rights provisions in the Chinese constitution (in 2007) and the growth of civil society at the neighborhood level, redevelopment of urban areas in Xi'an is becoming more difficult. This means that new policy instruments will need to be developed to facilitate urban redevelopment that ensure current residents share equitably in benefits, such as land readjustment mechanisms, employed successfully in Japan.

### **2.3.3 Lessons Learned from Hyderabad**

The dominant learning from Hyderabad is the need for *adaptation*, especially in the face of fast-changing and potentially overwhelming national and global threats and opportunities. Arguably, Hyderabad has adapted to threats and opportunities better than any other Indian city. Learning from Hyderabad is as follows:

- (i) Hyderabad was able to differentially benefit (compared with competing Indian metropolitan regions) from the national government's favorable policies toward ITC.<sup>37</sup> Through strong local political leadership Hyderabad was able to position itself well to compete for ITC investment. Although hampered by the low infrastructure investment facing all Indian cities, the leadership was able to take action, both ameliorative, e.g., building flyovers, and longer term, e.g., building subways and facilitating development of economic zones for high tech activities. Hyderabad was essentially able to take a national weakness in terms of city building processes, policies, and finances and turn it to its advantage, leveraging the existence of high level talent.

Through this skillful positioning Hyderabad set off the drivers that explain many of the growth dynamics described above.

- (ii) Hyderabad is a leader in pioneering innovative finance in India, as indicated by the financing of its soon to be built elevated rail (MRTS) system. Hyderabad's urban leaders recognized that innovative finance was a must given the severe dearth of finance available for urban public infrastructure in India through normal government channels.

---

<sup>37</sup> For example, national customs formalities for the ITC sector are handled electronically, avoiding many of the inefficiencies that had hampered growth of the export manufacturing sector in India.

- (iii) Although Hyderabad has made a decision to build the Outer Ring Road as the major shaping structure of the extended urban region, it has also recognized the need for radial road construction, to balance the centripetal forces that will be unleashed by the Outer Ring Road, enabling development to extend outwards from the core city to the Outer Ring Road (ideally in a phased manner), proposing to borrow from the Asian Development Bank (ADB) to construct an improved radial road system.
- (iv) From the Hyderabad situation, it is clear that nationally imposed urban policy frameworks can have serious negative consequences on individual metropolitan areas, the ULCA being a prime example.
- (v) Through the construction of an extensive elevated train system, Hyderabad will be able to reduce congestion in the city's core, curb high land prices as well as incipient mass motorization.
- (vi) The case of Hyderabad clearly indicates that to benefit from density, e.g., through shorter commuter times, infrastructure must be put in place to *capitalize on density*. The elevated train system will do this. However, the full extent of impacts of mass transit in Hyderabad are difficult to predict given the tightness of the urban fabric and inflexibility in land markets.
- (vii) Local authorities responsible for Hyderabad are beginning to pay more attention to environmental issues. For example, urban pollution is decreasing, partly due to the changing economic structure (away from heavy industry), but also due to more effective public policies. Reforestation / replanting is occurring, and attention is beginning to be paid to preserving and restoring remaining lakes, areas of cultural and historic importance. Through such actions, combined with transportation improvements, Hyderabad is positioning itself to benefit from tourism in the future.

### *Challenges*

Despite Hyderabad's demonstrated adaptive capacities the city faces very serious challenges:

- (i) It is difficult to envision Hyderabad remaining globally competitive without significant increases in infrastructure funding.
- (ii) New planning mechanisms are needed that reflect current conditions, namely rapid demographic growth, fast-changing globally driven economic drivers, and rapid motorization. For example, stronger instruments need to be developed to acquire land for genuine public purposes such as right-of-ways and industrial zones. Much of this is outside the city's and even the State's control.
- (iii) The need to curtail private motorization, which will be exacerbated by recent development in low cost cars.

## **3. CONCLUSIONS AND RECOMMENDATIONS**

### **3.1 Summary of Comparative Analysis**

Key findings based on comparative analysis of the three cases include:

- Population growth rates of the three study cities can largely be explained by each MR's position on the rural-urban transition trajectory, although other factors play a mediating role, e.g., the successful restructuring of Xi'an's economy in the 1990s increased population growth relative to the expected trajectory, while substantial international out-migration, particularly to Spain, resulted in Quito's

2008 population being below the expected trajectory. Fast population growth is unsurprisingly associated with higher rates of peripheral development, along with rates of investment in manufacturing activity.

- Rates of poverty are more contextually defined and less simplistically associated with the level of economic development or a MR's position on the rural-urban trajectory. For example, Quito and Hyderabad have much higher poverty rates than Xi'an reflecting significantly more unequal income distributions (GINI coefficients). The poor neighborhoods increasingly live on the periphery in Xi'an and Quito – reflecting the new geography of urban poverty in developing cities. However, this pattern is less clear-cut in the case of Hyderabad where poor transport accessibility to /from the periphery contributes to mixing of poor throughout the city, and much greater contestation over land.
- Although based on a small sample, densities in the three case study cities remain high. In all three cases, the contiguous built up cities are maintaining or increasing density. However, the spatial patterns of density vary among the three MRs. Quito has historically been a monocentric city, with a clearly defined and important (albeit shifting) CBD, while Xi'an and Hyderabad tend to have relatively high consistent densities out to their edges, with ambiguous CBDs and sub-centers.
- The structure of each economy is very different. Quito's economy is very diverse with government, construction, manufacturing, tourism while Hyderabad's is increasingly highly specialized in IT functions. Xi'an is a middle case, although aerospace, software, and higher education increasingly dominate the urban economy. Common to all three metropolitan regions is a low dependence on FDI, explained by the fact that all three MRs are land locked, discouraging large-scale investment in manufacturing. The dominance of a limited number of economic pillars in Hyderabad and Xi'an is clearly reflected in the spatial structures of these cities, with large specialized districts associated with these economic clusters.
- All three cities have a form of metropolitan governance, although the form/processes varies widely from Quito's strong metropolitan government, the MDMQ, that exerts power through nine deconcentrated Administrative Zones, to Xi'an's Municipal Government, that, typical of Chinese cities, over-bounds the metropolitan region. Hyderabad has a dualistic government, with both an urban corporation (a legacy of colonial rule) and the civil government operating in parallel, at the metropolitan scale. Fiscal revenues are increasing rapidly in all three cases although in Quito, and especially Hyderabad, at a rate insufficient to meet pressing needs, particularly related to infrastructure. The result is increasing pursuit of innovative finance mechanisms by these two cities.
- Expressway systems do not penetrate any of the three MRs, while mass transit systems are just beginning to be built in all three cases. The result is that all three metropolitan regions are in race between congestion, which will drive peripheralization, and construction of balanced transportation systems, which will strengthen centripetal forces. In the meanwhile, as a cost-effective, but ultimately insufficient measure, all three cities are constructing flyovers / tunnels to increase the capacity of arterials and super-arterials. Ring roads are being built in Xi'an and Hyderabad which have the potential to become the most dynamic developmental axes in these cities.
- Xi'an and Hyderabad are in relatively early stages of motorization, while Quito is entering the middle stage, with 30% of trips by private vehicle in Quito, compared with 11% in Xi'an and 12% in Hyderabad. This represents an important opportunity, especially in the latter two MRs, it is much easier to move people from buses to rail mass transit than from private vehicles. The mode share of public mass rapid transit will be an important determinant of urban form in all three cities.
- Airports are prime shapers of extended urban region form throughout the world – often eclipsed as a driver of form only by CBDs. The new international airports that will open shortly to the south of

Hyderabad and to the north-east of Quito, will dramatically reshape these urban regions, probably more than forecast by local planners. New logistics, hotels, time sensitive manufacturing, clusters will appear.

- Residential development across the three MRs reflects past and current differential income distribution patterns, measured using GINI coefficients. Xi'an, which until recently had a relatively flat income distribution, is characterized by relatively homogenous communities. On the other hand, Quito, typical of Latin American cities, with a very skewed income distribution, has a high level of socio-economic residential and community differentiation. Hyderabad is a more stereotypical developing city with the poor interspersed at a fine-grain scale throughout the urban fabric.
- To the extent that we can generalize across the three MRs, inner city areas are becoming more extreme socio-economically, attracting both the rich and the poor (a trend that is clearly indicated by statistics in the case in Xi'an and Hyderabad), while suburban areas are becoming more homogenous, often associated with middle-income households. Peri-urban areas are increasingly the destination and home of recent migrants, usually poorer populations, interspersed with high-end communities in high amenity, e.g., scenic areas in the periphery.
- Although all three MRs have long urban planning histories, dating back centuries, even millennia, none are currently dominantly shaped by metropolitan scale land use planning. Rather current urban form, and associated densities, is primarily the product of infrastructure investment, demographic factors, particularly migration surges, changes in economic structure and growth rates, and changes (in the case of Xi'an) in property rights regimes. Master planning is important in some cases, e.g., Quito's Mariscal and CBD, Xi'an's special economic zones.
- All three MRs suffer from a lack of alignment between micro planning and building regulations (e.g., FARs) and metropolitan strategies.
- An increasingly important shaper of contemporary metropolitan form in developing country MRs is the creation of knowledge clusters. Although Quito's economy lacks a significant high-technology component, amenity industries, such as tourism, language training, and second homes have the potential to play a leading role in shaping form.
- In all three MRs, heritage areas are becoming more important in shaping urban form – particularly Quito (with its world heritage UNESCO designated Spanish colonial core and Xi'an, the capital of China for centuries).
- Although the amount of green space (meters per person) varies across the three MRs, with Quito much better endowed, in all three MRs, the prime green space issue is retention or creation of green space in the transition from rural to urban use on the periphery, or when major changes in land use occur, such as the planned abandonment of Quito's current airport.
- The incidence of sub-standard housing varies from about 10% in Xi'an to over 20% in Hyderabad and Quito (although comparability of sub-standard housing statistics is very unreliable. The relationship between incidence of sub-standard housing and level of economic development is not as close as would be expected. As previously noted, sub-standard housing is becoming increasingly associated with peripheral development. The result, clear in the case of Xi'an and Quito, is the poor increasingly live at lower densities than those who are better off.

Table 4 compares key policy themes adopted by the three study MRs and their level of management. Common features among all three cities include a retention of density within the urban area and to some

extent, pursuit of mass transit (which also serves to maintain density), but also ring road development which acts as an opposing, centrifugal force if supported by radial development. Other key policy themes are less common to all cities.

**Table 7. Comparison of Key Policy Themes**

	Quito	Xi'an	Hyderabad
<b>Low Income Community Upgrading</b>	**		
<b>Low Income Housing Supply / Slum Minimization</b>		**	
<b>Mass Rapid Transit</b>	*	**	**
<b>Innovative Finance</b>	**		**
<b>Strategic Planning</b>	**		
<b>Airport Cluster Development</b>	**		**
<b>Heritage Preservation</b>	**	*	
<b>Growth Service Boundary Implementation</b>	**		
<b>Fertile Farmland Protection</b>		**	
<b>Special Economic Zone Development</b>		**	*
<b>Retention of Density</b>	*	**	**
<b>Deployment of Catalytic Infrastructure</b>		**	
<b>Strong CBD</b>	**		
<b>Multi-Nodal / Strong Nodes</b>	*	*	
<b>Adaptation Under Threat</b>			**
<b>Green Space Provision</b>	**		

\* = Less significant, \*\* = Very Significant

Table 5 compares key challenges faced by the case study MRs and their level of concern. Common features among the cities include the constraints on urban development and infilling, though at different levels, as well as traffic congestion and long commutes indicating the need for mass transit infrastructure to take advantage of high density development. Personal security is only highlighted as a challenge for Quito, whose spatial form is more influenced by housing preferences than the other two cities.

**Table 8. Comparison of Key Challenges**

	Quito	Xi'an	Hyderabad
<b>Inadequate Infrastructure Funding</b>	*		**
<b>Negative or Weak National Urban Policy Frames</b>		*	**
<b>Congestion / Long Commutes</b>	*	*	**
<b>Non-Sustainable Fiscal System</b>		**	
<b>Constraints on Urban Development / Infilling</b>	*	*	**
<b>Personal Security</b>	*		
<b>Scattered Industry</b>	**		
<b>Wastewater Treatment</b>	**	*	

\* = Less significant, \*\* = Very Significant

### 3.2 Key Points and Recommendations

The three cities' case studies flowing from previous macro work on urban expansion, especially by Angel, Sheppard, and Civco raise a number of questions.

Because developed metropolitan areas, which are de-densifying at a much faster rate than developing metropolitan areas, were excluded from the analysis, cases of rapid de-densification have not been examined.<sup>38</sup> Two of the three metropolitan areas (Xi'an and Hyderabad) assessed have built up densities well over the global mean of 8,000 persons per km<sup>2</sup>, while Quito's core area densities are not substantially lower than the mean, i.e. close to 6,000 persons per km<sup>2</sup>. More importantly, none of the three metropolitan areas examined are de-densifying at a significant rate, they are not representative in this sense of developing cities as a whole, which are de-densifying at a moderate mean annual rate of 1.7% during the 1990s. Thus all three metropolitan areas examined are entering the 21<sup>st</sup> century with impressive performance in terms of density.

As argued above, the metric of persons per km<sup>2</sup> (the standard definition of density) may be misleading if a human well-being perspective is taken as it hides the significant gains made in many developing cities in floor space per urban square kilometer, largely associated with needed gains in quality of life. For example, floor space in the average Chinese housing unit has increased by 500% over the last 25 years, but the mean size of Chinese housing units, under 75 square meters, can hardly be termed wasteful.

Since urban population growth rates will fall dramatically – in some cases becoming negative – in most cities in developing countries by mid-century, or shortly thereafter, densities per se may not be as significant a factor in assessing future urbanization. More important may be issues such as: (i) urban accessibility, given its strong association with energy efficiency, human time savings, and livelihood opportunities, especially for the poor, and (ii) high fertility farmland *unnecessarily* lost, which is measured using a metric that takes into account expansion choices facing a city to identify *unnecessary* losses.<sup>39</sup>

To achieve the latter objectives means facilitating city development processes that will lead to metropolitan areas characterized by (i) sharper edges (between the rural and urban), (ii) more variance in densities reflected in strong sub-centers served by rapid transit, (iii) less proportionate use of private vehicles for daily commuting, and (iv) well-organized affordable communities, at reasonable densities, accessible by rapid public transit to a myriad of employment, educational, and leisure opportunities embedded in multi-nodal urban structures.

The following section represents a number of conclusions and recommendations made from the study of Quito, Xi'an and Hyderabad.

### Urban Densities

Urban *floor space densities*, especially residential have been increasing, improving living conditions. Population densities are stable or declining slowly, not at alarming rates.

---

<sup>38</sup> Based on the work of Angel et al, the population of developing cities will double from 2000 – 2030 (2 billion to 4 billion people), but the built-up area of developing cities will triple (from 200,000 to 600,000 square kilometers). On the other hand, although the population of developed cities will only grow 11% over the same time period, the space occupied by developed cities will disproportionately increase by 2.5 times (de-densifying at an average annual rate of 2.2% from a current base of approximately 3,000 persons per square kilometer), increasing the land area covered by developed cities from 200,000 to 500,000 square kilometers.

<sup>39</sup> Cities currently only occupy 0.3% of global land area, but 3% of arable land, if current coefficients hold, by 2030 cities could consume 5-7% of arable land. Thus the important metric is not the quantity of farmland lost, but the quantity of highly fertile land lost, and even more importantly the quality of high fertility farmland *unnecessarily* lost, i.e., the metropolitan area in question had better expansion options from an agricultural-urban land conversion perspective.

The prime issue is not one of human density but *distribution of activities and densities*. High densities are supportive of sustainable, energy and time efficient cities, but the *overwhelming objectives should be moderate to high densities associated with high-density variance expressed in nodes and sub-centers*. Such a density pattern can support highly efficient rapid transit oriented urbanization.

### Farmland Conversion

In the cases examined, especially Quito and Xi'an, farmland loss is not a priority issue. However, urban expansion needs to be aligned to avoid unnecessary loss of fertile (*Class 1*) agricultural land. For example, in the case of Xi'an, where urban expansion conflicts with *basic protected agricultural land*, patchy, inefficient (both from agricultural and urban perspectives) micro land patterns emerge that could be avoided if urban expansion vectors were better defined and implemented, away from prime agricultural land.

### Sub-standard Housing and Housing Affordability

The incidence of sub-standard housing is only roughly correlated with urban economic performance. From a spatial growth management perspective, much can be done to improve housing affordability and also household income generation potential. In virtually every metropolitan area of the world, land is more expensive in the center than in suburban areas, thus the market and/or government intermediaries can deliver peripheral land for affordable housing. The problem, illustrated by the Hyderabad case, is that land in peripheral locations is not accessible to income generation opportunities for poorer households. Effective growth management can make more such areas highly accessible through public transportation systems, thereby dramatically increasing the supply of affordable housing. The global trend toward multi-nodal cities is making achievement of this objective easier – in multi-nodal cities significant concentrations of employment opportunities are often closer to peripheral affordable land.

### Peri-urbanization

The three case studies indicate that the spatial form of a metropolitan area is very much influenced by its economic function. This is particularly true at the geographic extremes – the CBD and peri-urban areas. Cities with strong service functions, such as business and professional services, corporate headquarters, large-scale tourism, cultural and hospitality functions tend to have a greater need for a large CBD than those where such functions are limited. The latter may require only a modest CBD.

At the other extreme, rapid peri-urbanization can be driven by large-scale investment in manufacturing, such as coastal China or the Extended Bangkok Region in the 1990s, *or* be more the product of spillover and sprawl from the built up urban area, as in the Quito case. Policy and planning frameworks to guide peri-urbanization will, therefore, need to be based on very careful diagnosis of the drivers of peri-urbanization in the metropolitan area in question. Spillover processes need to be controlled through mechanisms that create edges (described above) while true manufacturing-based peri-urban systems should be addressed through policies that encourage more compact and agglomerated manufacturing districts.

## **3.3 Policy Implications**

The conclusions extracted from the paragraphs suggest the following policy issues:

- A prime concern of local governments, and planners should be the *distinction between urban and rural land*. However, measures to shape and guide the urban expansion will vary according to context; menu of instruments, as well as advantages and disadvantages including: growth

boundaries, service boundaries, agricultural and environmental services reserves, green wedges, and differential pricing mechanisms, particularly related to property and idle land taxes.

- *Infrastructure, particularly transportation, is “king” in shaping urban development and determining densities.* Utility infrastructure, particularly water supply and electricity are key urban shapers. The planning of transport routes, infrastructure trunk expansion, etc., is an act of urban form shaping.
- *Land use zoning does not work in shaping urban areas or limiting growth,* with the exception of a few strong states, such as Singapore. Zoning is best used as a backup mechanism as part of a *package* of growth management instruments.
- Urban redevelopment, often associated with densification, must be designed to *make it economically worthwhile for existing residents to co-operate.* Instruments to do this include equitable compensation and land readjustment. Of these, land readjustment is the most promising in that it gives existing land owners an equity stake in the new development, and the possibility of remaining in the same location in the city. In all three cities, existing eminent domain instruments to relocate residents, even for public uses (which is an inherently subjective concept at any rate) are becoming less effective.
- *Green belts not only do not work in establishing growth limits, but lead to inefficient land use patterns* as property developers, manufacturing firms, etc., must jump over them, necessitating longer journeys by commuters. Furthermore, green belts generally make little ecological sense cutting across, rather than following ecological systems. Because they are not flexible, green belts cannot be adjusted, meaning that they either over-confine the city, resulting in possible unwarranted increases in property, particularly housing, prices, or have to be abandoned, as is normally the case, reducing the legitimacy of public policies related to urban growth management.
- In high density developing metropolitan areas, parks with high edge: area ratios are preferable, offering green space access to more people. Wedge-based green space planning, including river edge and rail line parks, are especially valuable spaces in this regard. Quito, with its slope protection policies, which are increasingly being enforced, especially along the west side of the metropolis, is creating long perimeter green corridors, related to slope characteristics.
- Large metropolitan areas around the world are well-known for their signature parks, e.g., Central Park in New York, Stanley Park in Vancouver. Quito commendably contains such inner city large-scale parks, e.g., Carolina park in the CBD, Alameda Park in Mariscal. However, it may be wise to limit the numbers of very large square or rectangular parks in developing metropolitan areas. Such green space pattern can push development to the periphery. (On the other hand it may induce adjacent compensating dense high-rise development as in the case of New York’s Central Park.) The future use of Quito's old airport site brings this issue to the forefront. If effectively undertaken, green space provision can be a powerful instrument in shaping the growth of metropolitan areas.
- Given the foregoing, metropolitan development is most effectively undertaken in the context of *strategic urban spatial growth plans at the metropolitan-scale.* The key actors in formulating such plans, advised by informed stakeholders, should include land use planners, transportation experts, urban economists who understand the emerging economy, urban environmental experts who understand local ecological systems, and urban designers/landscape architects who understand the aesthetic potentials of areas, corridor alignments, etc.
- Once the strategic plan is formulated, which clearly indicates transportation system corridors / modes, green wedges, sub-center locations, land use planning should be aligned with the



transportation system, *essentially land use planning should become the dependent variable*. Most important is to align FARs to accessibility. A hierarchy of accessibility should be identified, e.g., (i) central station linking metropolitan and inter-city transportation, (ii) key subway and super-arterial intersections, (iii) key subway stations aligned with sub-centers. In undertaking this work, care should be taken to ensure that affordable housing (often at high densities) is amply available in high accessibility nodes. Capital planning, programming, and budgeting needs to be aligned with the strategic plan.

- Effective growth management means *emphasizing metropolitan accessibility, not mobility*. Not all road traffic needs to move quickly, in fact, selective congestion may be beneficial in discouraging development in some areas. Accessibility is the ability to move easily between the main activity points in the metropolitan area, places that offer housing, jobs, education, and culture / entertainment. This implies focusing resources on transportation systems, especially public, that join the key nodes, e.g., the CBD (if there is one), sub-centers, knowledge districts, and economic zones; ideally, over 80% of the population should live within 500-800 meters of a mass rapid public transportation stop.
- A common mistake of planners is to try to align where people live and work, this is simply impossible in today's world with multiple workers in households and frequent shifting of jobs. Rather the goal should be to concentrate jobs, housing, educational, and entertainment opportunities in a few nodes – people can move quickly, and energy efficiently, among the nodes, making the need to align workplaces and place of resident of the workers in the same node redundant.
- The creation of sub-centers in the built-up urban fabric is not easily achieved. As indicated above (2.5.4) *Mechanisms need to be put in place to facilitate development of sub-centers*. When land in the urban core becomes available, e.g., through moving factories to the periphery as in Xi'an or relocation of airports, such as in Quito, the freed-up land has enormous economic value, given its large plot size and often highly accessible location, In all such cases, the freed-up land should be viewed as an opportunity to restructure the city's urban form, not just as a land transaction that needs to meet financial and building code standards.
- *Decision-makers need to recognize the importance of shaping urban growth on the periphery, and ensuring a high quality built environment*. The urban edge is an opportunity in that the form being established will likely last for centuries; and city building is much less expensive than retrofitting the existing built city.
- One option is for the edge of the city to move outwards more or less at an even pace on all fronts. Because the edge of a city increases exponentially as it grows, this may not be good policy as new uses of land, e.g., a new international airport, a new high-technology zone, etc., require large amounts of land. Furthermore, such a strategy can result in mechanistic loss of fertile agricultural land. In most cases, the most effective strategy will be to orient peripheral urban growth to a few vectors, e.g., three to five, extending from the built-up city. Urbanization should be limited to these vectors, and particularly to nodes along these vectors (transit stops and expressway access points – which should be aligned). Such a pattern can be accomplished through appropriate phasing of infrastructure provision (utilities, water supply, electricity, feeder roads, fiber optics networks), and pricing mechanisms, such as impact fees. Transportation access should lead urban development, i.e., quality access should be in place before sub-centers are built, and, as a rule of thumb, nodes should be phased in sequence away from the built up city.
- Mass transit systems should serve corridors ahead of development (despite the fiscal costs incurred) to (i) *shape the periphery*, (ii) *establish transit rider-ship behaviors among new residents*, and (iii) *to*

*make peripheral areas attractive to lower income groups who are the most disadvantaged by poor access.* Parking lots for bicycles and private vehicles (cars and motorcycles) should be established near peripheral stations. However, provision of parking lots near transit stations in the core city and inner suburban areas is poor practice (despite its prevalence in many metropolitan areas) because it discourages high-density, high-FAR development near urban core and suburban stations, one of the key characteristics of effective growth management.

- One of the key, but controversial lessons from the three case studies is that emergence of unorganized under-served squatter settlements may be unnecessary, a matter of policy and political will. Although Xi'an's situation is somewhat unique, Xi'an lacks squatter areas and slums (although it has sizeable amounts of substandard housing in aging walkup buildings) largely because it has a set of policies in place to ensure that outcome. Large scale squatting is becoming rare in Quito, and significant numbers low-income areas are being "regularized" into denser, better served, more attractive and livable communities. In middle income urban areas, best practice is increasingly to implement hard bans on new squatters once supply side mechanisms are in place, e.g., provision of accessible affordable land in appropriate locations to developers who in turn agree to provide very affordable housing. Within this context, rental housing, for those who can not afford even a low cost house, will play a significant role – usually in peripheral communities – but ideally with good accessible to urban nodes.
- The ongoing trend, worldwide, toward multi-nodal cities is in the interests of the poor, in most cases such urban structure provides more locations to sell labor, services and goods, closer to place of residence.
- Urban growth management needs to be pro-poor in terms of its impacts. Although a traditional critique of growth management is that it can raise housing costs by restricting land, effective growth management can and should be highly pro-poor.
- High densities make services less expensive to provide; quality rapid transit delivered in a transit-oriented development framework enables governments and developers to provide significant amounts of low cost land for low cost housing that is very accessible, even if on the periphery, to economic, educational, and entertainment opportunities in multi-nodal cities.
- Within this frame, measures need to be taken to increase benefits to the poor. These can and should include reasonably priced transit fares (effectively financed through cross-transfers utilizing land value capture in key nodes) and feeder buses from poor neighborhoods to the nearest rapid transit station.
- A recent extensive study by the World Bank on urban land efficiency in China has indicated the importance of protecting agricultural and environmental services land in a common sense way.<sup>40</sup> For example, it is inefficient to protect isolated plots of farmland within the urban fabric, or vice versa, i.e., developing isolated urban patches within agricultural areas. Therefore, as vectors emanating from core cities are designated, it is important that they be aligned with areas of low agricultural and environmental services potential.
- Large-site development greatly facilitates the shaping of cities. For example, in Xi'an, development, especially outside the development zones, has been undertaken by a myriad of developers, resulting

---

<sup>40</sup> Bertaud, A., Webster, D., Cai, J., Yang, Z., and A. Gulbrandson. *Urban Land Use Efficiency in China: Issues and Policy Recommendations*. The World Bank: Beijing, Washington DC. 2008.

in overall poor quality environments in much of the city and communities lacking in focus. In Quito, the metropolitan government has identified the same problem, indicating that the city would benefit from larger site development, despite the high design quality of many individual affordable housing developments.

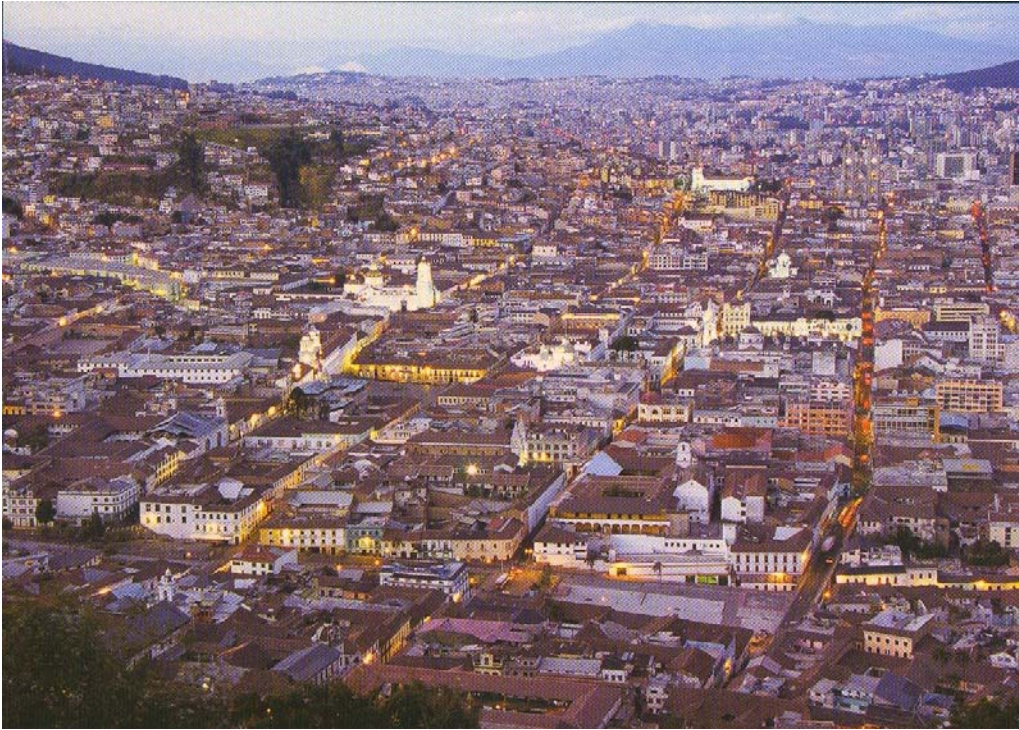
- Large site development may mean involvement of large-scale developers, but not necessarily so. In Quito, MMDUQ (the enterprise arm of the metropolitan government whose role include public-private partnerships) is assembling land in key (catalytic) locations, then releasing it to private developers who agree to operate within community-wide land use and design guidelines. In Xi'an, the Qugjiang New District is playing the same role.
- An easy means to increase the desirability of certain areas (and property values in such areas) is to encourage location of magnet services. In Xi'an, where such a high premium is placed on high quality children's education, a high quality middle school will almost invariably increase the desirability of a neighborhood, inducing desired objectives, e.g., higher population or local real estate investment. Although magnets vary from culture to culture, there is virtually always a type(s) of facility that will dramatically increase an area's desirability.
- One in six persons in the world now lives in a global household, i.e., is a member of a household directly involved in international household transactions through marriage, migration, remittances, and adoption.<sup>41</sup> In some metropolitan areas, such as Quito, the incidence of global households is much higher than the global norm, while in others, such as Xi'an it is lower, but growing rapidly.
- Global household behavior has significant implications for city building and growth management. For example, Quito's built up area and population is much less than forecast because would-be suburban and peri-urban residents live in Barcelona, Madrid, and New York. (The official population forecast for the MDMQ in 2020 was 3,314,000 in the 1990 census. The 2001 census had reduced the forecast 2020 population to 2,698,000, a decrease of 18.6%.)<sup>42</sup> Equally importance is the role of remittances. Driving down the street in any Quito neighborhood that is being "regularized", it is easy to pick out the houses financed by remittances – they stand out by their larger size, superior quality, and sometimes foreign design influences. Quito developers regularly sell homes in organized fashion in the United States and Europe. Colombian entrepreneurs buy significant numbers of high-end property units in Quito. Quito's colonial era, heritage protected center is increasingly the focus of international investment, e.g., wealthy members of the Latin American community in the United States seeking amenity property, establishing boutique hotels. These significant flows of money from international sources (be they remittances or investment by amenity seekers) can be channeled into regularization of neighborhoods, new city building on the periphery, urban redevelopment, and heritage preservation.

---

<sup>41</sup> PowerPoint presentation by Mike Douglass (Professor, University of Hawaii) at School of Global Studies, Arizona State University, November 2007.

<sup>42</sup> Source: Censo de Poblacion y Vivienda, Ecuador: Government of Ecuador, 2001.

***EXPLORING URBAN GROWTH MANAGEMENT  
IN THREE DEVELOPING COUNTRY CITIES***



***ANNEX 1***

***CITY REPORT - QUITO, ECUADOR***

## ABBREVIATIONS and ACRONMYS

BRT	Bus Rapid Transit
CAF	Corporacion Andina De Fomento (Andean Development Corporation)
DMT	Dirrecion Metropolitana de Transporte y Vialidad
DMTV	Land Management and Housing Bureau
EMDUQ	Empresa de Desarrollo Urbano de Quito
EMAAP	Empresa Metropolitana de Agua Potable y Alcantarillado
EMOP	Empresa Metropolitana de Obras Públicas
EMSAT	Empresa Metropolitana de Servicio y Administración de Transporte
EUR	Extended Urban Region
FN	Fundación Natura
LRT	Light Rail Transit
MBQ	MetroBusQ
MDMQ	Municipio del Distrito Metropolitano de Quito
MTTC	Metropolitan Traffic and Transport Commission
NGO	Non-Governmental Organization
NPO	Non-Profit Organization
PSP	Private Sector Participation
TDM	Transport Demand Management
TMP	Transport Master Plan
TOD	Transit-Oriented Development

## CONTENTS

	Page
<b>Demographic and Spatial Aspects.....</b>	<b>46</b>
<i>Basic Parameters .....</i>	<i>46</i>
<i>Demographic Growth and Population Density.....</i>	<i>47</i>
<i>Housing Characteristics.....</i>	<i>48</i>
<b>Urban Growth Management: Drivers and Spatial Processes.....</b>	<b>49</b>
<i>Current Drivers .....</i>	<i>49</i>
<i>Land Use and Spatial Elements.....</i>	<i>52</i>
<b>Transport .....</b>	<b>53</b>
<i>Planning Processes .....</i>	<i>53</i>
<i>Trip Patterns.....</i>	<i>54</i>
<i>Road Networks .....</i>	<i>54</i>
<i>Transport Initiatives and Strategies .....</i>	<i>55</i>
<b>Open Space.....</b>	<b>56</b>
<i>Classification and Status of Open Space.....</i>	<i>56</i>
<i>Conservation Strategies.....</i>	<i>57</i>
<b>Municipal Finance.....</b>	<b>58</b>
<i>Role of the Municipal Government .....</i>	<i>58</i>
<i>Expenditure Structure.....</i>	<i>59</i>
<i>Revenue Structure.....</i>	<i>59</i>
<b>Urban Growth Policy and Future Strategy.....</b>	<b>60</b>
<i>Spatial Dynamics.....</i>	<i>60</i>
<i>Key Drivers in Development .....</i>	<i>61</i>
<i>Policy Instruments.....</i>	<i>63</i>
<i>Scenarios for Urban Growth Management .....</i>	<i>63</i>
<i>Conclusions and Recommendations.....</i>	<i>65</i>

### Tables

	Page
Table 1 MDMQ Population and Growth 2001-20.....	47

### Maps

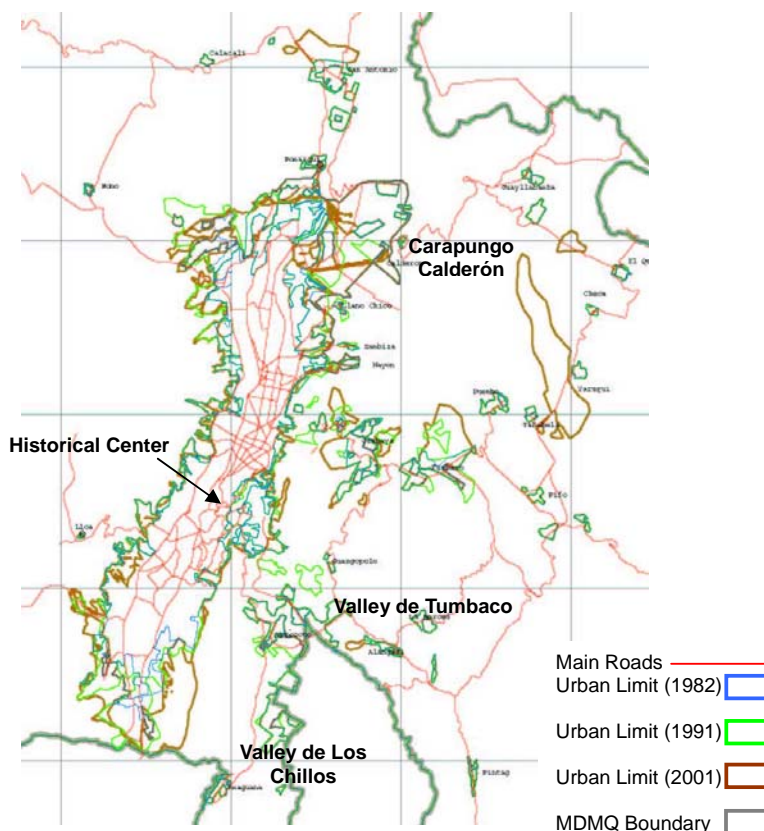
	Page
Map 1 Growth of Quito Urban Area .....	46
Map 2 Spatial Dynamics of Quito.....	49
Map 3 Location of Major Shopping Facilities .....	52

## Demographic and Spatial Aspects

### Basic Parameters

Quito is the capital and second largest city of Ecuador (Guayaquil being slightly larger). Quito is located at 2,800 meters (9,200 feet) above sea level and its topography and natural barriers have forced the urban built-up area's development to be highly linear, approximately 40-50 km in length, but only between four and ten kilometers wide. The entire Municipality of the Metropolitan District of Quito (MDMQ) is approximately 430,000 hectares (2006). It has a distinct and vibrant Central Business District (CBD)<sup>1</sup> delivering financial, retailing (3 major malls), residential (upper-middle class condominiums), international governance (United Nations), corporate headquarters (domestic and international), and government (Central Bank and Principal Court) functions.

Approximately three kilometers to the south is the well-defined entertainment and hotel district (Mariscal). The dynamic nature of Quito's urban form/function is well illustrated by Mariscal, which has since the 1980s, evolved into the entertainment and hotel district. A further two kilometers to the south-west is the world class historical core, the first city to be designated as a world heritage site by UNESCO, in 1978. Mariscal and the historical core are about 8 square kilometers in size, the CBD about 2.5. Five kilometers to the north of the CBD is the existing airport, Mariscal Sucre, which occupies 117 hectares of prime land, although urban encroachment has reduced its area over the last several decades. The airport is expected to move in 2009, freeing up 117 hectares of prime land in northern core Quito. This presents an important opportunity to define the character of the north side of the city.



**Map 1 Growth of Quito Urban Area**

<sup>1</sup> “T” shaped along Avenida Amazonas and Avenida Naciones Unidas (to the south of Avenida Amazonas). Each of the “T”s three prongs being approximately one kilometer in length.

Unlike most cities, most of Quito's suburbs are not directly adjacent to the city. They are located in the valleys, approximately 300 meters below Quito, separated by hills and ravines. These areas used to be summer or weekend getaways for Quito's wealthy, but with the development of roads and tunnels, the desire for space, and the limited affordability of Quito for the middle class, these areas are developing quickly. The increase in car ownership only furthers to support this trend. Some officials and stakeholders indicate that Quito is experiencing a hollowing out, whereby the middle income and some high income residents are moving out of Quito, leaving only the poor and wealthy in the urban built-up area.

In 2000, the MDMQ decentralized its administrative services and created eight administrative zones, which are defined as urban, peri-urban, suburban (valleys), rural and extended urban region (EUR). Area growth, both from in-migration as well as natural population is expected to occur in the areas as shown in the map above. The urban area grew 70.9% between 1981 and 2001 and the extended urban region has grown 60.5 % during the same period, demonstrating that the urban built-up area encompasses a greater proportion of the extended urban region.<sup>2</sup> From 2006-10, the growth should continue in the urban built up areas, as well as the suburbs. However, after 2010, development is projected to grow in the valleys in the east (following the opening of the airport), as well as the areas to the south, with some additional areas scattered on the northern fringes.

### ***Demographic Growth and Population Density***

As the city has spread, it has enveloped three former free-standing towns, Guapulo, Guamani, Cotocollao, although envelopment has played a relatively minor role in the city's population and physical growth. Based on projections from the last census (2001), Quito's current total population is approximately 2 million with 76 % classified as urban and a population density of 55.41 persons per hectare for the entire EUR, which is an increase of about 55% from 1982.<sup>3</sup> This trend speaks to the fact that Quito's topography is a constraint to outward growth. As shown in the table below, MDMQ's population grew almost 9 % between 2001 and 2005, with the majority of that growth observed in the suburban areas. Population is expected to grow another 34% to about 2.7 million in the entire MDMQ by 2020 with 71.1 % in the urban areas, 24.8 % in the urbanizable areas, and only 4.2 % in the non-urbanizable areas. Specifically, Quitumbe in the south shows the largest projected growth (71.58 %) in the urban area because it is the only barrier-free part of the urban built-up area. In contrast, population growth in the central north area of Quito (*Centro Norte*), where the CBD and Mariscal are located, is slow, about 1% per year. In the historical core, population growth is essentially zero.

**Table 1 MDMQ Population and Growth 2001-20**

ZONE	POPULATION						
	2001	2005	Growth since 2001	2010	2015	2020	Growth Expected from 2005-20
<b>URBAN</b>	<b>1,397,698</b>	<b>1,504,991</b>	<b>7.68%</b>	<b>1,640,478</b>	<b>1,777,976</b>	<b>1,917,995</b>	<b>27.44%</b>
Quitumbe	190,385	235,298	23.59%	291,439	347,581	403,722	71.58%
Eloy Alfaro (Whitout Lloa)	410,866	431,858	5.11%	458,119	484,403	510,706	18.26%
Manuela Saenz	227,173	227,151	-0.01%	227,124	227,097	227,069	-0.04%
Eugenio Espejo (Whitout Nayón and Zámbriza)	352,417	363,087	3.03%	376,218	389,275	402,510	10.86%
La Delicia (Whitout Nono, Pomasqui, San Antonio y Calacalí)	216,857	247,597	14.18%	287,577	329,621	373,988	51.05%
<b>URBANIZABLE LAND (FUTURE)</b>	<b>344,799</b>	<b>401,996</b>	<b>16.59%</b>	<b>487,363</b>	<b>571,807</b>	<b>667,964</b>	<b>66.16%</b>
Eugenio Espejo: Nayón y Zámbriza	12,637	14,661	16.02%	17,398	20,209	22,841	55.79%
La Delicia: Pomasqui and San Antonio	40,157	44,166	9.98%	47,822	49,582	49,125	11.23%
Calderón	93,989	113,374	20.62%	137,605	161,836	186,066	64.12%
Tumbaco	59,576	68,776	15.44%	80,276	91,776	103,276	50.16%
Los Chillos (Whitout Amaguaña and Pintag)	78,875	92,159	16.84%	109,678	128,164	147,564	60.12%
Airport (Without Guayllabamba)	59,565	68,859	15.60%	94,585	120,240	159,092	131.04%
<b>RURAL LAND (NOT TO BE URBANIZED)</b>	<b>99,704</b>	<b>100,780</b>	<b>1.08%</b>	<b>103,864</b>	<b>107,155</b>	<b>112,518</b>	<b>11.65%</b>
<b>DMQ</b>	<b>1,842,201</b>	<b>2,007,767</b>	<b>8.99%</b>	<b>2,231,705</b>	<b>2,456,938</b>	<b>2,698,477</b>	<b>34.40%</b>

Source: Censo de Población y Vivienda 2001; INEC. Unidad de Estudios; DMPT-MDMQ

<sup>2</sup> MDMQ and This Study.

<sup>3</sup> Censos de Población, IV, V y VI. 1982, 1990 y 2001. INEC



In the suburbs, growth will be high around the new airport (131%) clearly due to the increase in development, as it is now fairly rural. Also in the suburbs, Tumbaco, which is between the Quito urban built-up area and the new airport is expected to grow, as are the areas on either side – Los Chillos and Calderon. Migration from the rural areas to Quito exploded in the 1970s with most migrants locating in settlements in the peri-urban areas. This included locating on the hill and mountainsides and in the hazardous areas. However, in the past ten years, growth from migration has tapered off and population projections for MDMQ have been reduced as a result.

### **Housing Characteristics**

The greater diversity of property types (detached suburban houses, villas, live-work loft units, bachelor apartments, etc.), has resulted in increased socio-economic and lifestyle differentiation in the spatial pattern of Quito. The high income households have long been the pace-setters in terms of establishing the location of the highest status/valued neighborhoods. For example, the wealthy moved from the colonial center of the city in the 1950s and 60s to the Mariscal area (which became the CBD), then in the 1970s, started moving to the valleys. After Mariscal deteriorated in the 1980s, luxury condominiums on the east side of the existing CBD (north of Mariscal) overlooking the Tumbaco Valley became fashionable for the city's elite. Many of the Quito's elite are also returning to the core city, where the poor often live (to be near employment, etc.) renting rooms, living in squatter areas, etc. Meanwhile, the middle-income groups are increasingly being pushed out to the suburban areas (Los Chillos and Calderon). Thus the residential pattern that is emerging increasingly is one of the rich and poor living together in city centers, with homogenous suburbs ringing the city, with low-income squatter settlements emerging further out in the peri-urban areas, and a scattering of high-income gated communities in high amenity pockets.

Housing prices within the EUR have increased from US\$98.45 per m<sup>2</sup> in 2000 to 174.00 per m<sup>2</sup> in 2005.<sup>4</sup> However, location does not appear to be a major factor in pricing. Since living in a condominium on the edge of the CBD (in 8/12/16 storey building depending on development regulations),<sup>5</sup> or in a suburban house in Cumbaya costs about the same, location of the well-to-do cohort is based primarily on a lifestyle decision (In Cumbaya, a typical housing unit costs \$100,000 USD, compared with \$48,000 for the metropolitan area as a whole). Living in the valley, with its better climate associated with the lower elevation and garden-like atmosphere, involves a trade-off with congestion entering/leaving the core city. Furthermore, because utility services are not routinely provided beyond Quito's growth boundary, service delivery can be inadequate and/or expensive. Security of property and person is a major issue throughout Quito, and thus is a key factor in location and site design, reflected in urban design for the well-off, e.g., gated valley communities and highly secured inner city condominiums.

In terms of density, substandard housing in Quito is associated with lower residential densities than middle and upper-middle class housing, with the partial exception of some areas in the eastern valleys. Low-income settlements, which are becoming more prevalent in the southern zone of the city, are characterized initially by one-storey buildings and vacant lots. In these areas with vacant land within the contiguous city, infilling is definitely desirable to reshape the city. New development on the southern periphery of Quito (Quitumbe) is a mix of informal settlement and low cost market provided housing. Between 50-60% of Quito households can access a mortgage to purchase a home costing \$20,000-\$30,000 USD, which requires a monthly household income of at least \$300. Illegal settlements, which often occur in peri-urban areas, where agricultural land is illegally sold (land trafficking) and houses are constructed spontaneously, have recently been reduced due to a decrease in in-migration from rural areas. The Municipal Government estimates that there are about 80,000 houses in about 400 illegal settlements, which translates to about 16% of Quito's population.<sup>6</sup> The government is thus trying to encourage developers to provide low cost housing units (USD\$20,000 or less), while other programs attempt to construct basic infrastructure (site and services) ahead of squatter settlement. As of 2006, 140 neighborhoods amounting to 40,000 households have been legalized; however, there are still more than 250 neighborhoods that are still illegal – some are in process and others have been deemed as unable to be legalized.

<sup>4</sup> Cámara de la Construcción de Quito. 2006.

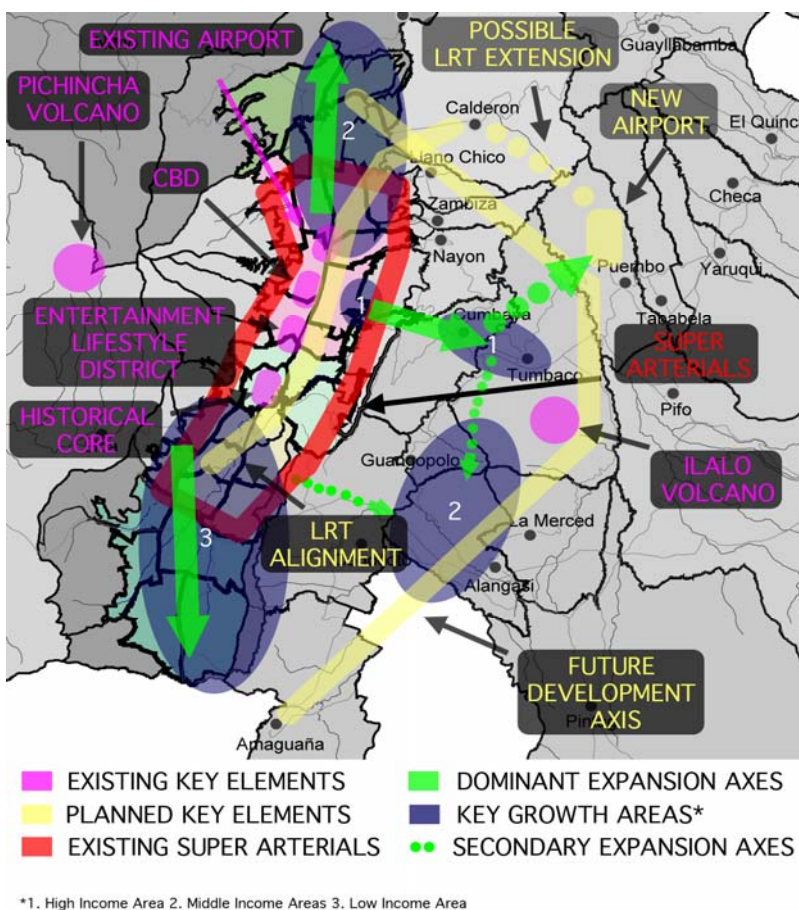
<sup>5</sup> Based on FARs or as known locally, *coeficientes de ocupacion de suelo* or COS.

<sup>6</sup> Assuming 1 family/house and 4 people/family.

## Urban Growth Management: Drivers and Spatial Processes

### Current Drivers

Quito is entering a new period of spatial dynamism. In contrast to the 1980s when spatial dynamics were driven by a migration/population explosion, the current dynamism is driven by new infrastructure investments, in particular the new airport under construction in the north-east area of the EUR (as shown on the map below) and the new tunnel connecting the core city with the valleys. A factor that plays a major role in the city's development is geography – physical urban development is limited to the valleys in the harsh Andean landscape (the city is located on the side of a volcano) and economic development options are constrained by its landlocked location. Other key factors shaping the city include extensive 8/12/16 storey condominium (apartment) developments in the core city, and a preference by many to live in the valleys for lifestyle reasons. Quito is currently experiencing both centrifugal (peripheralization) and centripetal (densification) forces, which are competing against each other. The following section describes the key elements that are driving Quito's spatial dynamism.



Map 2 Spatial Dynamics of Quito

### *National and Municipal Policies*

Significant in shaping Quito's urban form has been the impact of the national economic policies on the city's economy. Different urban economic growth rates and economic structures produce different urban forms and different preferences for peripheral versus core city development.<sup>7</sup> The overall weakness of the

<sup>7</sup> For example, a manufacturing city will see rapid growth of peri-urban areas, a tourism or financial services city will see stronger relative performance in inner city areas.

national government both technically and fiscally, combined with a trend toward fiscal decentralization including earmarking of personal taxes by individuals to local governments, has put more pressure on the Municipal Government to take a lead in urban policy and investment. Accordingly, the Municipal Government is playing a strong direct role in shaping the city. Their current emphasis is to bypass a sclerotic local civil service by creating corporate enterprises (*empresas*) to undertake a wide variety of urban functions, including broad-based area development within the city (*EMDUQ*), and function specific enterprises for transit, water delivery, garbage collection, etc. Although a number of plans (strategic, physical, governance) have been developed at the municipal level, including a strategic physical plan that calls for creation of urban nodes (especially in the valleys) and densification, implementation performance is more problematic. The problem is that detailed ordinances, such as Floor Area Ratios (FAR), (known as *coeficientes de ocupacion de suelo* or COS), frequently conflict with strategic level planning, or local officials use local ordinances to extract bribes or exert bureaucratic power, thereby slowing or inhibiting implementation of progressive strategic plans.

### Urban Economy

The city's economy was very much affected by the banking crisis in 1998-2000 that led to dollarization.<sup>8</sup> The crisis caused a flight to hard assets, particularly property, and made mortgage financing of housing much more feasible and accessible. Future payments and household incomes were much more predictable. It is estimated that about 50% of Quito households have existing or potential access to housing credit, and that about 60% of households can buy market housing (the 10 percentage point gap being accounted for by remittances, family and informal loans, etc.). Remittances are particularly important, totaling \$2.5 billion each year, twice the value of Ecuador's banana exports, and about 30% of total foreign earnings.<sup>9</sup> Remittances, particularly from Spain and the United States, are contributing to investment in property and city building which funds urban construction. Construction currently accounts for about 12% of Quito's domestic product, but is growing twice as fast as the urban economy as a whole. Other impacts have included the strengthening of Quito's CBD (for financial functions); upgrading and in-filling of informal and regularizing low income communities through increased remittance flows (the banking crisis accelerated out-migration), and an increase in demand for both high end core city condominiums and valley properties, partly the result of the flight to hard assets.

Quito's real economy is not particularly strong.<sup>10</sup> Being landlocked, Quito is at an obvious disadvantage as a manufacturing center, there are few manufacturing startups; many key manufacturing firms have a long history in the urban region and a substantial number are under stress. On the other hand, Quito has enormous potential as an amenity center (tourism, retirement venue, MICE,<sup>11</sup> education, including Spanish language, second homes, health tourism, international governance, corporate headquarters, aviation hub, etc.). MDMQ's GDP per capita in 2005 was US\$ 3,536,<sup>12</sup> and there is potential to become a high-performing amenity-driven city which would further increase the GDP. Such an outcome would favor densification, particularly in the historical core, hotel and knowledge districts. However, the poor state of public security (street safety) and lack of strategic intent on the part of the national and municipal governments to realize an amenity development strategy, has limited progress, although there is recognition that amenity-based development is the most promising economic route forward.<sup>13</sup> Quito already is facing high rates of poverty with approximately 60% of the population poor; unemployment at 9.3%; and underemployment at 53% of the labor force.<sup>14</sup> If Quito makes progress in becoming a leading Western Hemisphere amenity economy, it will have profound physical implications, providing both demand for, and

<sup>8</sup> The US dollar is now the official currency of Ecuador.

<sup>9</sup> The average price of a house purchased through remittances is \$30,000, but can be as high as \$60,000.

<sup>10</sup> Manufacturing accounts for about 13% of Quito's economy, government 9%, tourism 4%, commerce (retailing, services) 15%, and construction 12%.

<sup>11</sup> MICE: Meetings, Incentive Travel, Conventions, Exhibitions.

<sup>12</sup> Presentation on equinoccio 21 in Medellín, Colombia June 2006.

<sup>13</sup> Quito currently attracts approximately 700,000 international tourists a year, far below potential, which is estimated at five million or more.

<sup>14</sup> Although the majority of MDMQ's residents are poor, there is a strong middle class composed of at least 25% of the population, and a wealthy elite, about 5% of the population. About 10% of the population is in flux (and very sensitive to micro and macro conditions and shocks) between poor and middle class.

support to, investment in historical restoration and a robust CBD and lifestyle districts, links to the new airport, links to tourist attractions in the hinterland, etc., while at the same time generating investment by second home purchasers, expenditure by tourists, etc.

### *Bottom-up Land Development*

In the past, informal invasions of land, on which squatter housing would be built, often organized by mafia networks, which would then control large amounts of future in-fill land, appreciating in value, were important mechanisms of city building on the periphery. However, such invasions are becoming less important because of stronger enforcement of land and environmental (slope protection) regulations and less public sympathy. Nevertheless, the legacy is a large amount of land that is being or can be in-filled, and is or could be regularized in terms of land tenure and basic infrastructure provision. The result is that the poor live at much lower densities on the periphery (mainly to the south) of the core city than the middle and upper-middle classes, who live in mid-rise and high-rise condominiums, living in the core city. The middle and upper-middle class people living in the valleys live at overall low densities (Los Chillos and Cumbaya), generally lower than those of the poor communities in the core city because of leap-frog development, and in some cases large lot development, although there are many examples of relatively high density (at the site level) condominium developments, especially in Cumbaya.

### *Catalytic Projects*

As noted, catalytic projects are important in shaping Quito's urban form, both public sector initiated, e.g., the new airport (a BOT project) and the tunnel to the valleys (US \$43 million investment), as well as private, e.g., the new San Luis shopping mall in Los Chillos, which is becoming the de facto center of that formerly center-less valley community, given the lack of public leadership, planning frameworks/incentives or nucleated investment to create a true suburban core in that area.

### *Core City Investment/Disinvestment*

Quito's performance in revitalizing its urban heritage is relatively promising. Quito's downtown had deteriorated into a place for the destitute, and prostitutes; however, public investment in the historical core, in the amount of \$40 million, plus \$10 million yet to be spent appears to have made a significant difference. Both large firms are involved, e.g., the Swissotel chain has restored the historic Majestic Hotel as well as individual investments to restore heritage buildings for new uses, such as bed and breakfasts;<sup>15</sup> sales of restored apartments have also contributed to the area's revitalization. The funds administered by the Municipality have been used for urban upgrading, technical assistance for heritage restoration (with minimal success), low interest loans to individual restorers, and construction of parking lots, which are generating enough revenue to more than cover their capital costs. During the 1980s and 90s, Mariscal also suffered from disinvestment, but now Mariscal is starting to attract new investment, with lesser, but some, public investment, such as renovation of squares and churches playing a catalytic role.<sup>16</sup>

### *Private Developers*

Private developers are playing a key role in developing Quito, particularly in their ability to deliver high quality design in medium-rise buildings, in planned unit developments at an affordable price. For the lower middle class, several such developments are on the market in north Quito as well as along the road to the Middle of the World. A typical unit might cost \$600 per square meter or \$48,000 for an 80 meter unit. When much less expensive market housing, as low as \$20,000 per unit frequently found in the south, is included, market housing is accessible by, perhaps, 60% of the population,<sup>17</sup> aided by remittances. To qualify for a basic market housing unit, a household income of \$300 to \$400 per month is required; however, overly-stringent regulations, as well as capricious changing of regulations by site, and corruption,

<sup>15</sup> Rooms in these restored bed and breakfasts will cost between \$200 and \$300 per night.

<sup>16</sup> The well-to-do in Quito lived in the historical core 60 years ago, then migrated to Mariscal, then to Tumbaco – Cumbaya in the North-East Valley. As noted above, there is now some movement back to high-end condominiums in the core city.

<sup>17</sup> Informed estimates range from 40 to 80% of the population.

significantly add to the cost of basic housing, re-directing investment to poorer quality, lower density, irregular development, e.g., in-filling of communities being regularized.

### *Transportation Systems*

Quito has a well-developed busway system, three linear north-south routes, along which trolley buses travel benefiting from protected rights-of-way. The system has supported current levels of relatively high density in the core city (90-95 persons per hectare), but is now operating at capacity during rush hours. If the Municipality is not proactive in addressing the situation, market forces will lead to accelerated development of the valleys – beyond the 400,000 people expected to live in the valleys by 2020.<sup>18</sup> Although Quito has major super-arterials running along both the east and west sides of the core city (the Eastern Beltway running along the valley bottom and the Western Highway running along the western slope), it lacks expressways. So far, the urban area does not experience significant congestion, with a few exceptions, e.g., entering/leaving Mariscal, and moving between the core city and the valleys at rush hour. Of particular concern, is that the two valley communities are not well connected, except by the Eastern Beltway (indirectly), in part a product of the fact that the major hill Cerro Ilalo separates them, but equally the result of the fact that the main connecting artery is a two-lane “toll” road.

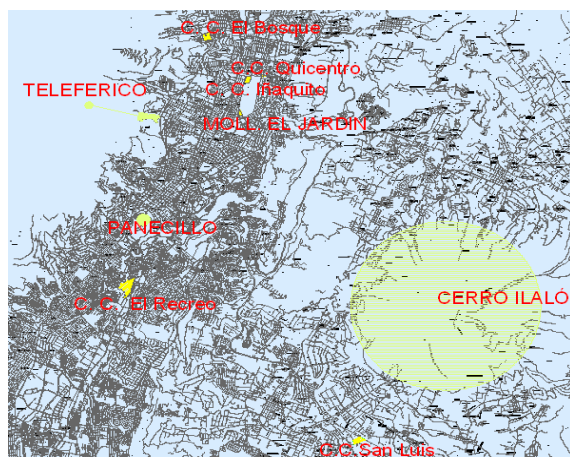
### *Land Use and Spatial Elements*

Out of a total 430,000 hectares (2006), about 27,000 (6.3%) of the MDMQ is defined as urban (built up) land. Although little of MDMQ’s land is able to be used for urban purposes due to its topography, the MDMQ significantly overbounds the actual urban and to-be urbanized city. The urban area has therefore increased six-fold in the past 30 years, although due to lower population growth, recent land expansion has been about 50% less than was projected when the Master Plan was developed in 2000.<sup>19</sup>

In terms of intra-metropolitan spatial dynamics, Quito has experienced large scale restructuring over the last 50 years, not only on its periphery but also in terms of the roles and built form of long-established areas. The following describes the key spatial elements that have been and continue to contribute to shaping and restructuring the city.

### *Shopping Malls and Public Parks*

Major shopping centers and malls have triggered nearby residential development, a process currently underway in the valley community of Los Chillos.



**Map 3 Location of Major Shopping Facilities**

This process has been driven by the recently opened San Luis shopping mall, and earlier manifested by the construction of a shopping center at the base of the current *Teleferico* (cable car) to the west of Mariscal, which spurred high end housing. It is now a residential area favored by expatriates, including the diplomatic community. Public parks are also important in defining the city’s structure, e.g., *Parque La Carolina*, *Metropolitano*, and *El Ejido*, *Alameda*, not surprising given the importance of the 1947 garden city plan in shaping the city in the third quarter of the twentieth century. There are 1,500 parks in Quito, most are small, and 5-7 hectares of park space per person.

<sup>18</sup> The population in Los Chillos has been growing (1990-2001) at 4.2% per year and in Tumbaco at 4.8%.

<sup>19</sup> Interview on 22 June 2006 with MDMQ Director of Strategic Planning.

### *Residential Areas*

From a socio-economic standpoint, residential definition is also high, e.g., the working class tends to live in the south side of the city, including the long established *Centro Sur* zone immediately south of the historical core. Given that Centro Sur is built out, its population growth is relatively slow, about 1.3% per year. However, further south, population growth is very fast; about 70% of population growth in the MDMQ has occurred to the south over the last two decades, driven by the fast growth of the lower income groups in Quito.

Southward development now extends to Quitume, which is by far the fastest growing zone in the city, its population increasing at an annual rate of approximately 10%. The middle class tend to live to the north and in the South-East Valley, Los Chillos. In Los Chillos, typical middle class housing sells for \$30,000 – 60,000. The upper middle class tend to locate in either (i) high-end condominium developments along streets, such as Avenida Gonzales Suarez on the northeast edge of the core city, adjacent to the CBD, along El Salvador, to the east of Parque La Carolina, and along Avenida 12 de Octubre, or (ii) in Tumbaco – Cumbayao in the North-East Valley. The starting price for housing in Cumbaya is about \$60,000, but \$100,000 and up is more typical. Since housing prices per meter for high-end housing are approximately the same in the core city and Tumbaco (\$800-\$1000 per meter or more), it is essentially a life-style decision. Of course, there are exceptions to the foregoing. For example, the largest invasion area in the 1980s is in the north-west area of the city, which is now being normalized.

### *Industrial Zones*

There are ambiguities in the structure of the built up city. Most startling is the lack of a clear industrial zone(s). The limited manufacturing sector, which employs about 80,000 people (the strongest cluster is agri-processing),<sup>20</sup> is increasingly scattered throughout the urban area, although there is still evidence of former more clearly defined zones to the north near the existing airport, and particularly the south (known for metal, wood, and food industries) of the city. The scatter of manufacturing firms and the lack of even a single formal industrial estate are unusual for an urban area as large as Quito. There is also lack of definition in less obvious ways, e.g., there is no clear zone where foreigners live, unlike most global cities. Additionally, the valley communities lack well-defined suburban centers, especially Los Chillos, which is essentially center-less.

Until recently, Quito's form could best be described as a long narrow strip 45-50 kilometers in length north-south, and no more than 7 kilometers wide east-west at any point. Such corridor development, in principle, is highly desirable. High accessibility and transportation energy efficiency can be achieved by linking nodes along such corridors. Ideally, and under consideration in the case of Quito, the airport, CBD, entertainment/hotel district (Mariscal), historical core, and the industrial and working class communities to the south could be linked by a north-south light rail (LRT) line. However, Quito is losing its corridor form as development spills over into the valleys (Tumbaco – Cumbaya and Los Chillos), abetted by the recent opening of a tunnel between the core city and the two valleys. Albeit, only one of two tunnels was constructed (creating severe bottlenecks at rush hour) and an adequate connecting road network has not been built at either end of the tunnel.

## **Transport**

### **Planning Processes**

Strategic and master planning in Quito is fairly robust for a developing city and there has been relatively good continuity between mayoral administrations in that previous plans have been implemented by subsequent administrations. Sectoral plans typically fit within the Strategic Master Plan and the Mayor's initiatives and interests. However, Quito is experiencing a disconnect between planning and implementation, likely due to planning being undertaken by one organization, while implementation is undertaken by a different one, with little coordination regarding what is financially possible. The separation

---

<sup>20</sup> Led by firms such as Nestle and Confiteca.

was created largely during the movement to decentralize government and improve project implementation as the old structure (planning/implementation all in one department) was highly bureaucratic and resulted in long gestation periods between planning and implementation.

Continuity in transport planning since the inception of the Trolebus in 1995 has been consistent, which is an anomaly in comparison to other developing cities. To ensure future continuity, within the scope of the General Land and Territory Master Plan (2002-25), individual sectoral Master Plans have been created, including a Transport and Road Master Plan (TMP) which is developed by the Metropolitan Management of Transport and Highways (DMT).<sup>21</sup> The focus of the TMP has mainly been on public transport, including rolling out additional corridors and integrating those corridors and associated feeder routes into MetroBusQ, and further road development, including connections to the new airport and road extensions. However, from a planning perspective, there has been little focus on comprehensive urban mobility, which overlooks the fact that people can and will drive and that mechanisms should be undertaken (improving traffic management, implementing transport demand management measures) with this in mind. So while there have been strides in public transport, they have been reduced by the increase in private vehicles and the lack of a comprehensive mobility plan.

The majority of fees assessed on transport – registration, licensing, and fuel – are collected and kept by the National Government. In the case of registration and licensing, this has been legally transferred to the Municipality, but the National Police are unwilling to make the transition, as they would lose access to the revenue stream. MDMQ currently assesses a mobility tax that provides about \$2 million annually. But this is insufficient to support multiple transport programs and their implementation.

### **Trip Patterns**

Quito is a fairly monocentric city, with the majority of peak period trips focused on the north-central areas of Quito between the historic center and the airport. DMT estimates that there are about 470,000 trips per day made in private vehicles and they believe that this could increase by a factor of six by 2025. Additionally, due to the city's longitudinal form, the focus of the public transport system is along major north – south corridors, providing a good basis for a trunk and feeder public transport system. This has been done for TroleBus, Ecovia, and the Central Norte lines, with plans to create trunk lines on four additional roads. There is little understanding however of east – west trips and multi-trip patterns. As a result, many public transport passengers transfer at least twice, if not three times, per trip. If these trips are outside of the MetroBusQ service area, passengers must pay for each boarding, increasing the costs of the trip.

### **Road Networks**

There are 3,013 km of primary and secondary roads in the entire EUR (2001), a 20.6% increase from 1992 and a 59.1% increase from 1982. The 2001 road share (as a percentage of the overall urban area) is 10.33% for which Quito appears to be in line with other cities given its current economic status and geographical barriers of the region, although with the increase in car ownership, it is clear that capacity on many of the important roadways will be soon reached. This is problematic for all road users, including public transport, as there are only four additional planned exclusive bus lanes, which means that the remaining public transport users will not have a designated right-of-way.

Many settlements in Quito's peri-urban areas have created road rights-of-way during the development of the settlements, often due to planning by neighborhood organizations/ associations. In the illegal settlements, these are typically unpaved and will likely stay as unpaved until the settlements are legalized, although public transport still service some settlements. Legal settlements vary in their quantity of paved and unpaved roads. The Metropolitan Enterprise of Public Works (EMOP) has a program to pave the main access roads to the settlements, but not the roads within the settlements, due to limited resources and a feeling that internal roads are a responsibility of the community and zone administration. The EMOP estimates that there are about 1,000 km of unpaved roads within MDMQ, requiring about \$300 million in

---

<sup>21</sup> Overview of plan: [http://www.quito.gov.ec/DMT/dmt\\_inicio.htm](http://www.quito.gov.ec/DMT/dmt_inicio.htm)



investment. There is currently a \$30 million investment for urban upgrading and EMOP estimates that it will take another 3-5 years to cover the remainder.

### Transit Corridors

Quito adopted a 'Trinary Road' strategy based around bus transport to provide an affordable and efficient mass transit system. The concept is similar to that of other Latin American cities, and first introduced by Curitiba, whereby a major structural axis is identified as a trunk corridor and the physical form of the city and transport network can be developed around it, i.e. the trunk-and-feeder system. In such models, the highest levels of residential and commercial development are concentrated at the centre of the spine with diminishing densities to either side. Low rise residential development is preserved in the sectors between axes. The road hierarchy typically comprises one central street including exclusive bus lanes, and one-way arterial streets either side flowing in opposite directions. This system is termed as 'Trinary Road System', which integrates mass transit, highway, and land uses. The parallel one-way streets also define the perimeter boundaries of the structural axes.

**Figure 1 Latin American Trinary Road Model**



Source: IPPUC (Instituto de Pesquisa e Planejamento Urbano de Curitiba)



The structural axis contains the main transit corridor fronted with high rise (high density) mixed use buildings to both generate and attract trips. Beyond the structural axes are housing zones. Adoption of this model guides development rather than leaving it to the private real estate market reducing land speculation.

**Integration Terminals:** The BRT 'integration terminals' are large transfer points where passengers may transfer to and from feeder buses, high capacity bus units, and conventional buses. They are located at the end points of the trolleybus line. These have platforms 10 metres wide and 120 metres in length and occupy a total area of some 50,000 square meters, including 1000 square meters of administrative area, supervision, services and fast food, plus 2400 square meters of shop floors. The terminals receive approximately 56,000 passengers per day



The terminals have attracted new urban development, such as private commercial centres next to the terminals, although a specific study on commercial rents has not yet been made.

### Transport Initiatives and Strategies

Public transport in Quito and its metropolitan area consists only of buses. There is no rail transit and very little informal transport, except in the case of school transport, taxis, and some transport (buses, minibuses) in the peri-urban areas that are not served by regular public transport. The modal share of public to private



has dropped 10% in the past decade, such that in 1997 80% of passenger trips were made on public transport, whereas in 2005, only 70% of passenger trips are currently made using public transport. Lower use of public transport due to poor service or increased financial abilities, results in a greater dependence on private vehicles on a day-to-day basis. More private vehicles allow people to access destinations (jobs, homes, retail, etc.) located further away, which limits the urban structure for low density, private vehicle use rather than at higher density as needed for individuals and public transport. Additionally, more private vehicles results in increased congestion on regular streets, delaying regular buses, and ultimately causing more people to opt for private vehicles when they are financially able. City authorities are adopting the following methods to improve the transport system in Quito:

- Formulating a comprehensive plan to reduce private vehicle use and the resulting congestion
- Considering how to better manage parking, as well as mobility in and around four concentric zones in the Historic Center and CBD
  - In Zone 1, the Historic Center, they are in the process of eliminating thru traffic, except for public transport, and pedestrianizing the area
  - Zone 2 will be the focus of the new on- and off-street parking proposals to reduce private vehicle trips.
  - Zone 3 is expected to have Park N' Ride facilities for use by commuters.
  - Zone 4 is the remainder of the urban-built up area, with no real plans.
- Planning ways to improve coordination of private sector participation through
  - Fare collection: (EMDUQ decided to eliminate some of the technical specifications outlined by DMT/EMSAT and there is a possibility that the system will not be technically sustainable)
  - Light Rail Transit (TRAC), which is viewed by DMT/EMSAT as a medium-term proposal to replace TroleBus in 7-10 years, but EMDUQ is already preparing the concept document and consortiums have already formed for a proposed construction start in 2008-09.
- Planning for paving peri-urban roads
  - Once the settlements have been prioritized for legalization, DMT/EMOP should work with the zone and neighborhood associations (which are common) to identify the priorities of road paving. This ensures community participation, and builds a public-civil society relationship.
  - EMOP should review its standards for secondary and tertiary roads in the peripheral areas as standards can be lower than those set for urban or suburban secondary and tertiary roads meaning that pavement composition and materials can be of lower quality, the depth can be less, etc. to reduce the costs of paving the roads and therefore some of the burden of lack of financial resources.

## Open Space

### Classification and Status of Open Space

Open space in Quito can be defined quite broadly and can include forests, natural reserves, hazardous areas, parks (national, regional, metropolitan, district, neighborhood, playgrounds), squares, pedestrian walkways, road medians, rooftop gardens, and courtyard gardens. The first four are commonly found in rural and peri-urban areas, while the remainder is found in urban and suburban areas. MDMQ's total public open space area is 83,585 hectares, which covers 19% of the entire territory and 30.1% of urban area. Within this, the majority is designated as ecologically protected. Forests are protected under the Ministry of Agriculture and national nature reserves are protected under the Ministry of Environment. MDMQ has also designated a protection block both to conserve mountainside forests, as well as to limit the risks from the Pichincha volcano. Parks, gardens, and sports facilities located in the urban area account for 6% of the total open space. Residential development and agricultural activities are prohibited in the protected areas; however, MDMQ has designated some areas as ravine protected areas which allow some agricultural work as the ravines are considered less risky than the other areas.

In 2006, there were 2,200 parks in the urban area, making up a total land of 674 hectares. These are classified into four categories: neighborhood, sector, zone and city/metropolitan. If the 125 hectares of

parks planned by 2010 are implemented, accessibility of parks in MDMQ would increase to 8.5m<sup>2</sup>/habitant. These planned parks include 125 hectares at the present airport site<sup>22</sup> (to be redeveloped upon the new airport's completion in 2010) and 540 hectares for the Metropolitan Park designed for the southern area of the city.<sup>23</sup>

### *Illegal Settlements in Protected Areas*

Illegal settlements in ecologically protected areas began in the 1970s along the northern hillsides adjacent to the urban built-up area, namely in Pisullí and Jaime Roldos. These areas have since been legalized by MDMQ and in order to prevent further invasion of protected areas, MDMQ installed fencing and posted signs. Other protected areas such as ravines and riverbanks still have problems with illegal settlements. The ravines and riverbanks are protected to secure water resources as well as minimize the risk of landslides. EMAAP is responsible for these areas and has regulations for vacant areas, as well as setback distances (at least 10 meters). For existing houses, a three-year mitigation project was recently completed by EMAAP that either relocated houses or implemented mitigation measures to prevent landslides. Relocation occurred for 46 families who were moved to apartments in the city. Monetary compensation was given to 31 families and 87 risk mitigation measures were implemented. The remaining area was transformed into public open space including parks, observation decks, and green space once relocation was complete. EMAAP is currently undertaking Phase 2 and has identified 95 families in seven ravines who need to be relocated. Additionally, within the urban built-up area, there were illegal settlers in what is now Itchimbia Park. MDMQ relocated the most of them, although there are still a few houses remaining as they were able to be grandfathered because of the length of occupation.

### Conservation Strategies

Open space conservation and management is relevant in the context of urban growth management to (i) reduce the risk of natural disasters such as landslides, flooding, and earthquakes by prohibiting settlements in risky areas; (ii) provide shelters in urban areas in case of emergency; (iii) preserve and conserve natural resources particularly to prevent natural disasters; (iv) prevent urban sprawl in order to avoid creating less serviced settlements in the peri-urban areas;<sup>24</sup> (v) secure proper urban expansion plans formulated by responsible governments;<sup>25</sup> and (vi) improve the quality of urban life in providing accessible parks and other green space for inhabitants' recreation. Given Quito's topological character, it is especially prone to landslides and earthquakes and therefore, conservation and management of open space is especially pertinent. Strategies undertaken by city authorities to protect and conserve Quito's open spaces include the following:

- (i) The MDMQ's *Plan Quito Siglo XXI MDMQ Development Strategies to 2025 Territorial Plan*, the city's development strategy through 2025, includes a set of programs to appraise public space and built heritage. Those programs include the Urban Image Improvement of Squares, Avenues, and Streets and Metropolitan Park System, including Ilaló Park, Camino de El Inca Park (South), and Lumbisí Park. The infrastructure and service program covers river and ravine recovery.<sup>26</sup>
- (ii) *The Plan General de Desarrollo Territorial 2000-2020* is MDMQ's general plan, which indicates that it is necessary to conserve open space for heritage reasons states and in doing so, has to consider both the functional and technical aspects of the space, as well as how it will be used by residents.<sup>27</sup> Therefore, public open spaces should be given high priority as they provide areas for cultural

<sup>22</sup> While it is under discussion to redevelop the site as open space, with some development on the periphery, there are also some supporters who advocate using the land for denser development, given its close proximity to the city center.

<sup>23</sup> According to the comment by the EMDUQ (INNOVAR OUI), official, they purchased the land for park facilitation in the South side of the city. The interview took place August 9<sup>th</sup> 2006.

<sup>24</sup> Urban sprawl often happens in the area where the electricity, water supply, sewerage are not provided.

<sup>25</sup> Open space should be planned in accordance with the master plans of the entire city. If planned open space management was carried out, the government(s) would be better able to control city planning and urban form/growth.

<sup>26</sup> Plan Quito Siglo XXI MDMQ Development strategies to 2025 Territorial Plan, DMQ November 2001

<sup>27</sup> Plan General de Desarrollo Territorial. 2000-2020. Municipio del Distrito Metropolitano de Quito. Dirección Metropolitana de Territorio y Vivienda.

exchanges and socialization among urban residents. The open spaces should be designated as a complete system that relates, integrates, and harmonizes the diversity of areas, zones, and facilities of the city and the metropolitan area. The public open space includes following elements: (a) green areas and communal facilities that have been produced by land division; (b) pedestrian only areas; (c) areas for active and passive public leisure; (d) spaces in front of buildings and along road right-of-way; (e) parks, squares, atriums, canopies, and green areas; (f) areas and ornamental elements like water ponds; (g) provision of public services, urban furniture, signalization in the special protection areas; (h) areas that help preserve historical, cultural and artistic elements; (i) areas of ecological and landscape preservation and the natural elements of the city and their surroundings; (j) areas required to prevent and protect against risks; and (k) generally all the areas and spaces used and enjoyed by society.

- (iii) MDMQ's Public Space Program aims to restructure the elements of metropolitan space in order to enhance communication and socialization amongst citizens through leisure activities. Accompanying policies are to: (a) increase, recover, and maintain MDMQ public spaces to enhance citizen participation, socialization, leisure, and exercise; (b) eliminate the socio-territorial inequities by enabling the recovery or readjustment of public spaces as a complement to residential areas, especially in disadvantaged zones; (c) upgrade the urban image by taking an integrated approach for new developments, elements, or sectors of historical, architectural, symbolic and cultural value; (d) integrate urbanized and peri-urban illegal zones; (e) generate new forms and mechanisms of public space management, with greater efficiency in supply, maintenance, and control; and (f) establish self management and promote awareness among the citizens.
- (iv) The Environmental Master Plan (EMP) and the Environmental Sanitation Master Plan (ESMP) address natural reserves and hazardous areas and are parts of MDMQ's *Plan General de Desarrollo Territorial*. The objectives are to (a) reduce the negative impacts to the environment; (b) improve the quality of life; (c) develop environmental friendly practices; and (d) build conscientiousness and responsibility in the community with regards to the environment.

To create a comprehensive system of open space and ensure proper management, the public open space system should take into account both its immediate environment, as well as its links and impact on the environment as a whole. Moreover, facilitating use of and managing open space should consider community residents' needs and the availability of MDMQ's resources.

## **Municipal Finance**

### **Role of the Municipal Government**

In 2000, in order to enhance service delivery, strengthen management, and speed up processes, the MDMQ initiated major reforms to decentralize administration and service provision. MDMQ is currently decentralized into eight administrative zones, with an additional two zones expected to be added in the next few years in response to anticipated urban growth projections. In parallel to decentralization, services and operations were also decentralized into seven municipal enterprises, seven municipal corporations and four foundations with different degrees of autonomy for the installment of services. The MDMQ management and decision-making structure are organized in four levels: (i) policy and regulatory: Mayor and the City Council; (ii) advisory: Mayor's advisory body and the Metropolitan General Attorney; (iii) general management and coordination: local development management and territorial coordination; and (iv) local daily operations: zonal administration and municipal enterprises.

The third level, at which the Financial Management unit is located, has the mandate to provide managerial advice on the strategic direction of the MDMQ. It is responsible for coordinating with the Metropolitan Management and Planning Department as well as the core municipal operational areas such as land management, social and economic development, transport, education, and health. The financial requirements of each department are reflected in a medium-term budget which correlates to the main strategic directions of Equinoccio 21, the long-term plan that provides the main directives for the development of Quito through 2025.

MDMQ faced enormous challenges in 2000 when serious financial problems triggered the need for major changes. Credit to the municipality was suspended due to a non-performing loan of US\$3,205,278 to the National State Bank (Banco del Estado). The deterioration was compounded by poor performance in tax collection and a lack of updating the cadastre for more than a decade. The criticality of the situation led to the implementation of important reforms, including the organization of a new structure to calculate property taxes and fees, as well as the design of a program to recover medium- and long-term non-performing liabilities. In addition, the accounting systems within the municipality were strengthened, and a new computerized system, Integrated System of Financial Information (SIGEF), which was applied at the national level, led to improvements in data availability and financial information management. These reforms aimed to strengthen the financial management capacity of MDMQ, improve transparency, and facilitate the transfer of resources and associated obligations to a range of municipal enterprises. Six years after implementing these reforms, new challenges are now present and the municipality needs to continue to adjust to improve its financial performance.

### **Expenditure Structure**

MDMQ expenditures have increased significantly in the past six years, from US\$29.3M in 2000 to over US\$190M in 2005. This six-fold increase was mainly due to a large increase of 74% in municipal (infrastructure) investments, which are expected to continue to grow. In addition, current expenditures show a slower, but constant, increase of almost 22% during the same period. The two areas exhibiting the largest current expenditure increases are current transfers, with a six-year accumulated percentage increase of 32.5%, and personnel costs representing 27.4% of the total accumulated expenditures. The increases in current transfers are justifiably linked to the creation and consolidation of municipal enterprises and the transfers have averaged approximately US\$9M per year. The situation regarding personnel costs is less clear, because the municipality's financial reporting system classifies personnel and goods and services as current revenues and includes them as capital investments. Personnel costs classified under the current expenditure category, increased three times within a year, from US\$4.1M in 2000 to US\$ 12.2M in 2001. However, they then declined to US\$ 5.5M in 2002, when MDMQ implemented a policy to reduce the number of municipal employees. This apparent cost savings was offset when MDMQ began charging personnel costs to the investment category during this same year. By 2003, personnel costs for both categories jumped to US\$19.3M and by 2005 this amount more than doubled to US\$44.2M. This dramatic increase in overall personnel costs is most likely explained by the creation of municipal enterprises and corporations in 2002, which have high staff levels. Of particular concern is the peak in 2005 of the ratio between total personnel costs and current revenue, which reached 43.5% last year, compared to only 25% in 2004 and 16% in 2000.

MDMQ would benefit greatly from keeping better track of its expenditure programs and undertaking impact analyses and an integrated multi-year strategic investment plan that reflect the prioritized programs and projects as well as their sources of funding. Additionally, costs savings in the area of personnel can be achieved as follows: (i) reducing the number of obligations with personnel; (ii) implementing performance-based human resource management systems; (iii) Institutionalizing a municipal service career path; (iv) and introducing new operational manuals to specifically define the roles and responsibilities of municipal officers in order to enhance accountability and performance.

### **Revenue Structure**

MDMQ will have to make extreme efforts to meet its financial obligations, especially those from the increasing demand for infrastructure and services. This demand comes both from the growth of the population and area needing to be served, as well as the need to maintain and rehabilitate the existing and ageing infrastructure stock of the city. Revenue collection and administration are critical functions of the municipal finance department so that the municipality can meet the obligations of recurrent expenditures, capital investment, and debt service. After implementing the 2000 reforms, MDMQ duplicated its revenue collection in 2001 and continued to improve on a consistent basis through 2005. The increase in current revenue collected by MDMQ is largely based on the success it has achieved in increasing capital transfers (37.50%) and tax collection (27.14%) from the total current revenue collected during the past six years

(US\$808.86M).

The best performing item in current revenues is tax collection. It has raised approximately 54% (US\$219.56M) of the total revenue collected since 2000. Current transfers and charges and fees have also strongly contributed to revenues at 17% and 13.65%, respectively. This shows the high level of efficiency that MDMQ has achieved in collecting almost all taxes in the last three years, except on property taxes. Property tax collection failed to meet the target set during the last few years with MDMQ collecting less than 66% of planned taxes. On the other hand, commercial fee collection has always exceeded its target, by more than 69% during 2005, for example. This indicates that MDMQ is allocating greater efforts to taxing economic activities rather than real estate. This practice is risky as it may discourage the growth of economically productive activities and investments by the private sector. In addition, real estate and property taxes have the potential to bring in higher revenues and have the advantage being more stable and predictable.

MDMQ is in undertaking positive actions to strengthen tax and charge collection by improving the cadastre unit, updating cartography and data processing, exploring private sector participation on land valuing, and partnering with private banks to enhance and accelerate services. Additional areas to improve tax collection could include: (i) enforcing the use of market prices for real property valuations; (ii) strengthening tax collection at the administrative zone level; (iii) developing a comprehensive tax structure that provides incentives for local economic activities that will promote economic growth and employment; (iv) consolidating the number of taxes to reduce the administrative costs and allow the Tax Department to focus on collecting the more lucrative taxes; (v) designing and enforcing policies to enable data exchange among the tax collection management unit and other offices such as planning, general management and finance; (vi) implementing an integrated information system based on land registries which should facilitate data interchange with other systems such as the strategic planning unit, and administrative and finance unit as well as accelerate the implementation of a geographic information system (GIS) to facilitate the digitalization and integration of maps and data systems.

## Urban Growth Policy and Future Strategy

### Spatial Dynamics

Predicting likely future spatial dynamics is difficult in that a host of interacting variables are involved. For example, will Alternative Road Route 1 to the new airport be built? Will LRT Line 1 be built, and if so, when? What signals will the trend-setting upper-middle and upper classes send to the middle classes in terms of location i.e., low density living in the valley or higher density living in the core city? Will parking continue to be in short supply in the core city, driving investment in retailing to the valleys? High end retailing is not reviving as expected in the historical core. It has traditionally been the shopping area for workers from the south of the city. More affluent residents of northern Quito are not shopping in the area, in part because it is difficult to access, and particularly to park.

At the same time, it remains to be seen whether the new Municipal enterprises will be more cost-effective than the public enterprises they are replacing. The net effect of the Municipal Government's strategies, if implemented, will be densification, particularly through: (i) the construction of the LRT, particularly if the Alternative 1 Road Route to the new airport is constructed; (ii) restoration of the historic core; (iii) creation of suburban nodes in the valleys; (iv) raising FARs (COS) in the built up city; and (v) revitalizing Mariscal. Densification, however, has been driven more by the market than official policies. In fact, COS coefficients and height regulations limit buildings to 12 and 16 (the maximum) stories in even the highest density areas, and much less in most of the city. The increasing demand for apartments and higher density living can be explained by the changing of middle class preferences, driven by a desire to (i) have a greater security; (ii) avoid long-distance/time commutes; (iii) be closer to urban amenities; and (iv) avoid areas with poor civil/environmental infrastructure and services.

Quito's future spatial dynamics will also be strongly influenced by poverty, particularly in terms of peripheral development. Since the core city is essentially built out, the approximately 10% of land that is vacant is high in price. So, the poor have no choice but to build, or buy, housing in irregular or regularizing

communities on the periphery of the built up area, or if that alternative is unaffordable, to rent rooms in existing housing units. The lowest quality/least expensive housing (Type C) is located on the northern and southern peripheries of the city, especially the latter. In the case of the more affluent north, the lowest quality/ least expensive housing is on the west and east edges of the valley, often on less attractive terrain from a point of view of construction. Although over time irregular communities mature, and typical buildings are expanded vertically to 2-4 stories, they are characterized for long periods of time by low densities and large areas of vacant land.<sup>28</sup> However, as housing in legal, private sector built communities becomes more affordable to the poor, with improved finance mechanisms and remittances playing a key role, the situation will change. If bureaucratic procedures were streamlined, local developers argue that they could put such housing on the market for under \$10,000, perhaps increasing the percentage of households that could afford market housing by ten or more percentage points.

Scenarios are presented later indicating how different investment patterns and drivers might play out differently to create different spatial dynamics.

### **Key Drivers in Development**

Looking to the future, the development of Quito is likely to be driven by the following key drivers.

- (i) **New Airport:** The most important driver of change in physical form will be the new airport currently under construction. Although official estimates indicate that it will attract approximately 80,000 more people to the area than would otherwise have been the case; the net impact in terms of residential population in the environs of the airport may be in the range of 150,000 – 200,000.<sup>29</sup> Over the next decade, the new airport will become the major force reshaping the form of the Quito extended urban region. The new airport's demographic, economic, and physical impact will be enhanced by the construction of a science park, logistics complex, and free trade zone. If positioned correctly, it could become a significant aviation hub and logistics center in Latin America. Four alternative road routes from the new airport to the core city are being considered, which could significantly impact the spatial form of the northern half of Quito. It is recommended for urban expansion to occur between the current built up north end of Quito and the new airport.<sup>30</sup> Regardless of which route is taken, new urbanization will almost certainly occur north and south of the new airport.
- (ii) **LRT System:** The Municipality is currently calling for “design-to-build” bids, intended to elicit innovative proposals for financing, constructing, and operating an LRT system. The proposed route would connect new inter-city bus terminals at its northern and southern termini, removing inter-city bus traffic from the core city, and potentially reducing social problems in the historical core. If alternative road route 1 is chosen to connect the new airport to the core city, involving 32 bridges (hence the hesitation, given the costs of construction), a second LRT line could be built along or under the road (taking advantage of road civil works) to connect the north end of the Line 1 LRT system to the new airport. Alternative 1 would strengthen the core city relative to the valleys by channeling airport flows through the north end of the core city. The LRT system is critical to Quito's future form because motorization is growing rapidly, with approximately 25,000–30,000 vehicles being added to Quito's roads annually, while the roads and busway systems are at capacity. Hence, densification of the city core is dependent on construction of the LRT system. Other planned initiatives would support densification of the core city, in particular, construction of the planned wholesale vegetable market in Tambillon which would reduce the number of trucks on the road in the core city, as well as a new inter-city truck distribution center near the new airport, which would generate the same benefits, as well as the relocation of the inter-city bus terminal mentioned above.
- (iii) **Suburban Centers:** The metropolitan strategic physical plan calls for the development of three distinct suburban centers in the valleys. However, zoning and FAR regulations are not consistent with

<sup>28</sup> Since land costs are about equal to the cost of a one storey dwelling in a typical poor community in Quito, it is in the interest of inhabitants to add stories to their dwellings to effectively lower the cost of the land; however, they often lack capital to do so in the short run.

<sup>29</sup> Already population growth is rapid in the *Aeropuerto* zone, growing by 5.6% per year between 1990 and 2001.

<sup>30</sup> CORPAC (the PPP enterprise developing the airport) commissioned the study.

the strategic plan. Assuming modest policy framework changes, infrastructure investment (i.e., roads and the new airport) and market forces could be leveraged to produce distinct suburban centers. A large-scale green field development is likely to occur in Los Chillos, which could lead to a new urban center in the southeast valley, probably centered by, or near to, the recently opened San Luis shopping mall. In the north-east valley, Tumbaco is also likely to establish a more distinct center, driven by the nearby new airport. Cumbaya, which has a distinct (historical plaza) center, is likely to be focused around this emerging urban center, with high-end mixed development (gentrification) occurring within two kilometers of the plaza. Given supporting policies, the emergence of suburban centers would improve the quality of life, and transportation / energy efficiency for those living there.

- (iv) **New Development Axis:** A new development axis is likely to develop, arching through the east side of the valleys, connecting Calderon in the north, the new airport, the emerging valley suburban centers and Tambillo in the south. The new urban form of metropolitan Quito is likely to become more like a hand, with fingers pointing out from the core, than the current rectangular city. Another finger that is developing is to the north-west, to the “Center of the World”, the location of the equator. Continuous urbanization, including some industry, such as a large vehicle assembly plant and quarries, already exist along this corridor.
- (v) **Southward Expansion:** In addition to the more dramatic dynamics described above, the continuous southward push of the city, infilling the Tambillo area, and extending beyond, to Quitumbe, is likely to continue. There is ample land in the south of the city for at least 30 years of expansion at current rates, even without densification and compaction.
- (vi) **Relocation of Industry:** If the Municipal Government is able to successfully introduce its industrial relocation policy, virtually all manufacturing will be relocated in outer peri-urban areas and beyond within three years, opening up possibilities for infilling and new node creation in the core city. CONQUITO, a Municipal enterprise, is responsible for implementing this policy, but has yet to complete a feasibility study for new industrial zones/parks; meanwhile, the Municipal Ordinance requires all industry to move out of the core city within three years. There is much opposition to this policy from manufacturing firms, which argue that they do not have the financial resources to fund such a move.
- (vii) **Old Airport Site Redevelopment:** Depending on how the old airport site is redeveloped, it could be a significant agent of densification. It appears that the whole area will be redeveloped into a park based on the argument that the north side of the city is short of park space.<sup>31</sup> East-west roads would pass through or under (by tunnel) this proposed park, improving east-west traffic flows – a current concern in terms of congestion in much of the core city. However, a counter case is that the closure of the old airport creates a unique opportunity to create a new urban node in the north-south corridor, which could contain significant green space that would strongly support centripetal development forces, with the net effect of reducing peripheral land conversion. This is the planning route that Hong Kong took, when the former international airport at Kowloon was closed. Ironically, creating a large new park in the corridor on the old airport site may result in several times more loss of green space on the periphery, given that peripheral development will almost certainly be at a lower density than core city development. Furthermore, the middle class people who would live at the old airport site, if instead, move to the periphery, would likely live on the north periphery, which is most valuable in terms of intensive agriculture. Regardless of the redevelopment direction, raising height limitations, and diminution of noise pollution, provides an excellent opportunity for densification in the area of the old airport.
- (viii) **Private Developers:** Private developers are a progressive force in many ways, which are, contributing to more compact peripheral development by delivering affordable high quality designed walkup apartments in suburban areas. As noted, whether the effectiveness of private developers will be increased or decreased as agents of compact urbanization on the periphery as EMDUQ attempts to

---

<sup>31</sup> Utilizing mechanistic parkland per person ratios.

work with them to design high quality relatively large scale sites in contiguous peripheral areas is open to question.

### **Policy Instruments**

The following policies are utilized in Quito in order to cope with urban growth.

- (i) In 2000, a new Municipal administration began to implement an overall metropolitan spatial strategy called the “*palm plus fingers*” regional form concept (fingers extending north to the Middle of the World, two fingers to the two valleys, a finger extending directly south, and one extending north-east to the new airport site). Very importantly, they have established growth boundaries for the metropolitan area that do not prohibit physical development beyond these boundaries, but indicate basic urban services (e.g., sewers, piped water, garbage pickup) will not be put in place outside the boundaries. For example, in parts of Cumbaya, water is not available to some residential developments two days per week necessitating purchase of water at \$35. per house tank, and garbage pickup may not exist, or be unreliable. In addition, protection zones (*zonas protecciones*), designed to protect the fragile slopes in the Quito EUR are increasingly respected and enforced, due to increased public support, less population pressure, and more policing; the protection boundaries act as de facto growth boundaries, especially on the west side of the city.
- (ii) Another Municipal policy has been the creation of administrative zones (*zonas*), which are essentially local offices of the Municipal Government. Creation of the zones appears to have increased inefficiency and corruption, adding another layer to the bureaucracy, reducing the efficiency associated with *unicity* metropolitan governance. It is not clear if these disadvantages have been compensated by the zones bringing local government closer to the people.
- (iii) Various micro development tools shape the city, such as FARs or COS and land use zoning (known locally as *coeficientes de uso de suelo* or CUS). These coefficients are changed regularly, often for political reasons, and are the source of considerable conflict (and corruption) between developers and local officials, especially at the zone level. A “must build within two years” rule applies to all development approvals, but is frequently circumvented by the developer constructing a minor structure on the site.

### **Scenarios for Urban Growth Management**

There are several directions that Quito could take to manage its urban growth. Given the competing forces of densification and peripheralization, the city is undergoing a struggle for which the outcome will largely depend on the decisions made to respond to the aforementioned issues.

#### *Inaction*

The negative scenario would be the result of inaction, i.e., failure to implement many of the good ideas that are on the table now in Quito. Under this scenario, repositioning Quito to an amenity economy would not be pursued with intent, leading to a relatively poorly performing economy. The ranks of the poor would remain large and probably grow, resulting in low-density communities proliferating, primarily to the south. Given the physical constraints to core Quito growing east or west, increased congestion, and a busway system operating at capacity, if the LRT is not built further densification would be very difficult. If valley suburban nodes are not created, leap frog development will proliferate, well beyond existing levels, both in the north-east near the new airport and in the south-east valley, resulting in unnecessarily high levels of energy use, pollution, and expensive services. If an effective road link is not built from the new airport to the core city, Quito’s competitiveness will be further reduced, and valley roads, especially the tunnel connecting the valley to the core city will add to congestion.

#### *Amenity City of the Andes*



Quito, as a city with high amenity potential, could become one of the most important, and wealthiest cities, though not largest or fastest growing (in terms of population), in the Andean Region. Effective urban growth management could play a key role in realizing this outcome. Key strategies should include:

- (i) Development and implementation (by key private, public, and third sector stakeholders) of an amenity-led urban development strategy based on MICE, tourism, second home purchasers, retirees, education, medical tourism, culture, and international governance.
- (ii) Construction of the north-south LRT Line 1 to enable densification of the core city. This measure needs to be aligned with technical planning changes, e.g., an increase in FARs in many parts of the built up core city, especially to create high density development around LRT stations.
- (iii) Development of a model mixed use urban center on the old airport site, which would include a sizeable new park. This high density mixed used development would be constructed around the main LRT station serving the heart of the old airport site. The site would contain high quality housing for a variety of income levels, including innovative housing, e.g., loft live-work wi-fi equipped, highly secure units for young urban professionals.
- (iv) Develop an industrial park in peri-urban Quito, encouraging manufacturing firms to locate there. Moves by firms should be self-financing (as was the case in China) as the land that firms give up in the urban core would be more expensive than new land in the industrial park (land prices in the new industrial park should be kept as low as possible). The planned science park at the new airport might more appropriately be developed as an industrial park for industries creating high value: weight products, capable of utilizing air freight. Flowers are highly perishable; thus cities such as Quito that handle flowers efficiently are potential sites for some types of manufacturing dependent on JIT processes and air freight access to market.
- (v) Create a more investor friendly climate in the historical core for domestic and foreign investors wanting to authentically restore old buildings. At present, bureaucratic delays are significant and corruption adds about 20% to the cost of restoration - not counting the cost of time delays.
- (vi) Upgrade the Mariscal area through catalytic projects (as is currently being done in the case of historic squares, etc.), increased street security, etc. However, much will depend on the national investment climate, e.g., new investment by international hotel chains.
- (vii) Take measures to achieve consistency between the metropolitan strategic urban form plan (the *palm and finger* plan) and on-the ground regulations. In particular, align FARs (*COS*) with locations of designated urban, suburban, and peri-urban (e.g., “Middle of the World”) nodes.
- (viii) Particularly in the valleys, make infrastructure provision a prerequisite for permission for developers to build. Contiguous development along corridors, rather than leap-frog development, should be encouraged through such mechanisms. Community scale infrastructure should be paid for by developers (with costs passed on to consumers) through impact fees.
- (ix) Remove inappropriate building standards for basic housing, while fairly enforcing appropriate regulations and reducing corruption. This would reduce the price of market provided housing for lower income groups by as much as 50%, enabling the poor to buy housing in denser, better served, planned, neighborhoods, through market mechanisms.
- (x) Ensure that the new airport is directly connected to the core. Ideally, an expressway between the new airport and the core city should be created. If that is not possible, a road and LRT line from the north end of the city (Calderon) should be developed. Otherwise, airport traffic will clog the existing valley roads and particularly access between the valley and the core. If the latter occurs, through feedback processes, the overall competitiveness of Quito will be reduced, given the dependence of this land-locked city on aviation.

- (xi) Given the shortage of developable land, green space on sloped land should be made more accessible, to some extent substituting for green space in the core city's very limited flat land.
- (xii) Regularization designation and neighborhood upgrading programming (provision of basic infrastructure) should be extended, as quickly as possible, to all illegal settlements. Then, a hard policy should be introduced enforcing the ban on new illegal settlement. Densification of existing regularizing and illegal settlements should be encouraged by removal of excessive bureaucratic barriers, encouraging private developers to build very low cost housing, and continued improvement of community infrastructure.
- (xiii) Considerable high value agriculture exists, and is growing north of the city (cut flowers, specialized vegetables) Accordingly, infilling in both the core city and valleys should be encouraged. About 10% of land in the built up core city is vacant (*Centro Norte, Centro Sur, Manuelita Saenz* zones). In the north and south suburban areas, e.g., Calderon, vacant land appears to be closer to 25% of space. Developing the core city and immediate suburban peripheries at current densities could accommodate perhaps 300,000 people, obviously much more at higher densities.<sup>32</sup> If the valleys were developed contiguously, they could easily accommodate double their expected 2020 population of 400,000, i.e., 800,000. In other words, infilling of the core city and its immediate north and south suburban peripheries, and contiguous development of the valleys might accommodate 10-15 years of growth, at current demographic growth rates. Technical analysis of infill and contiguous development (compacting) scenarios should be undertaken.
- (xiv) The large-scale inflow of remittances into housing should be channeled to market housing in properly planned and serviced neighborhoods. This money can drive affordable high quality PPP (EMDUQ – private developers) large site development in infill areas and on the immediate contiguous periphery.
- (xv) Street crime is a major impediment of economic development and to fuller use of the city by residents. Although the basic cause of relatively high levels of street crime is poverty, in the short-medium run, measures can be taken to reduce such crime, such as street lighting, neighborhood patrols, and youth programming.

### **Conclusions and Recommendations**

Quito is in the enviable position of having limited demographic pressures, and good ideas, if implemented, to improve the future of the urban region, including strategic plans. Its physical setting is the envy of most cities in the world, which makes rapid economic development through an amenity-based strategy, under improved investment and business climate conditions, feasible. Such development would do much to reduce currently very high poverty levels that are associated with a wide range of impacts from street crime to low-density peripheral development.

Many positive initiatives have been undertaken with reasonable success, e.g., ongoing restoration of the historical core, regularization of informal (illegal) communities, implementation of a metropolitan boundary, enforcement of protection zones on sloped land. However, the national bureaucracy is sclerotic while the Municipal Government, which is the leading public sector actor shaping the city, is struggling to reform itself, with mixed success. Constraints and challenges are many. For example, on the ground actions (often shaped by personal interests) conflict with strategic thinking, and raising capital for catalytic projects is difficult because of high debt, macro economic and political conditions and risks. The next few years are critical. If Quito can realize strategies relating to transport, development densification/nodality and amenity potential, coincidental with revival of its urban economy, it could become a model Latin American city.

---

<sup>32</sup> Consultants' rough estimations.

***EXPLORING URBAN GROWTH MANAGEMENT  
IN THREE DEVELOPING COUNTRY CITIES***



***ANNEX 2***

***CITY REPORT – XI'AN, CHINA***

## **ABBREVIATIONS and ACRONYMS**

BRT	Bus Rapid Transit
CBD	Central Business District
ESCAP	United Nations Economic and Social Commission for Asia-Pacific
ETDZ	Ecological and Technological Development Zone
FAR	Floor Area Ratio
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
HA	Hectare
HTDZ	High Technology Development Zone
ITDP	Institute for Transportation Development and Policy
MEAD	Municipal Engineering Administration Department
MRT	Mass Rapid Transit
NMV	Non Motorized Vehicle
PTC	Xi'an Public Transport Company
RMB	Ren Min Bi (Chinese Yuan)
SOE	State Owned Enterprise
TVE	Township and Village Enterprise
USD	United States Dollars
XETDZ	Xi'an Economic and Technological Development Zone
XHTDZ	Xi'an High Technology Development Zone

## CONTENTS

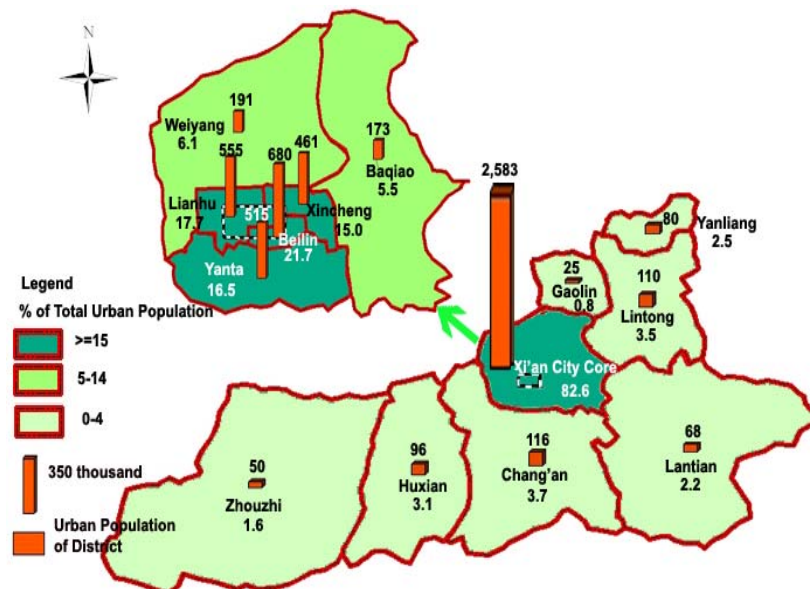
	Page
<b>Demographic and Spatial Aspects .....</b>	<b>69</b>
<i>Basic Parameters.....</i>	<i>69</i>
<i>Demographic Growth.....</i>	<i>69</i>
<i>Population Density .....</i>	<i>70</i>
<i>Household Characteristics .....</i>	<i>72</i>
<b>Urban Growth Management: Drivers and Spatial Processes .....</b>	<b>73</b>
<i>Current Drivers .....</i>	<i>73</i>
<i>Land Use and Spatial Elements.....</i>	<i>76</i>
<b>Transport .....</b>	<b>78</b>
<i>Planning Processes.....</i>	<i>78</i>
<i>Trip Characteristics.....</i>	<i>78</i>
<i>Road Network .....</i>	<i>79</i>
<i>Transport Initiatives and Strategy in Xi'an .....</i>	<i>80</i>
<b>Green Space, Parks, Environmental Services Land.....</b>	<b>81</b>
<i>Classification and Status of Open Space .....</i>	<i>81</i>
<b>Municipal Finance.....</b>	<b>82</b>
<i>Role of the Municipal Government.....</i>	<i>82</i>
<i>Expenditure Structure.....</i>	<i>83</i>
<i>Revenue Structure.....</i>	<i>83</i>
<b>Urban Growth Policy and Future Strategy.....</b>	<b>84</b>
<i>Spatial Dynamics .....</i>	<i>84</i>
<i>Key Drivers in Future Development.....</i>	<i>85</i>
<i>Policy Instruments .....</i>	<i>86</i>
<i>Scenarios for Urban Growth Management .....</i>	<i>87</i>
<i>Conclusions and Recommendations .....</i>	<i>88</i>
 <b>Tables</b>	
Table 1 Population Growth by Source .....	70
Table 2 Population Density by Jurisdictional Type .....	71
Table 3 Changes in Built-up Area Density: 2000–2005 .....	71
Table 4 Urban Redevelopment Impacts .....	72
Table 5 Value of Floor Space Completed .....	77
Table 6 Open Space: Urban and Peri-urban Areas.....	81
Table 7 Municipal Income & Expenditure: Open Space (2004).....	82
Table 8 2004 Local Government Revenues (Executed).....	83
Table 9 Municipal Government (on Budget) Revenue (Executed).....	84
 <b>Figures</b>	
Figure 1 Percentage GDP by Sector, 2005.....	73
Figure 2 Key Economic Clusters in Xi'an .....	74
Figure 3 Comparative FDI, 2005: Selected Cities.....	75
Figure 4 Floor Space of Buildings Under Construction.....	76
 <b>Maps</b>	
Map 1 Urban Population Distribution by District, 2003 .....	69
Map 2 Urban Spatial Dynamics: Xi'an .....	74

## Demographic and Spatial Aspects

Xi'an is the largest urban center in Northwest China. It is the geographical, but not population, center of the nation. The gateway to five provinces, Xi'an is the most important commercial and trade centre in the Northwest. Historically, its geographic orientation has been east-west, dating back to its glory days as the starting point of the Silk Road. Still today it is a key station on the main east-west railway across China. The United Nations Economic and Social Commission for Asia-Pacific (ESCAP) is coordinating planning and international cooperation to revive rail and road links to Central Asia and Europe, which would further enhance this east-west orientation.

### Basic Parameters

Xi'an Municipality has a population of about 7.4 million (2005), of which approximately 5.4 million live in the core city (city proper). Based on city proper data, Xi'an is the tenth largest city in China (2000).<sup>1</sup> However, as indicated by the relatively small population of the Municipality living outside the city proper (2 million) and by the fact that the wider Xi'an – Xianyang Economic Belt contains only 11.8 million people (2004 data), Xi'an is a relatively self-contained city rather than a component of a much wider urban system. This situation is in sharp contrast with coastal megapolitan areas, and several interior urban systems, such as Chengdu – Chongqing, and the Zhengzhou centered urban system. The compactness of Xi'an is illustrated by the fact that 83% of the population lives in the city proper, and 54% within, or adjacent to, the city's wall. The area within the wall is 40 square kilometers. Population density within the walled city is very high – over 40,000 people per square kilometer. Map 1 describes urban population distribution by District.



Source: Xi'an Statistical Yearbook 2003.

**Map 1 Urban Population Distribution by District, 2003**

### Demographic Growth

Table 1 indicates that the demographic growth of the urban area, typical of Chinese cities, owes little to natural population growth (5% of growth). Rather, the city's demographic growth is almost equally

The immediate hinterland of Xi'an consists of Shaanxi Province plus South Shanxi (including Linfen and Yuncheng Municipalities), West Henan (including Sanmenxia Municipality), North Sichuan (including Guanyuan Municipality) and South Gansu (including Tianshui Municipality and Qingyuan Prefecture). For some functions in which Xi'an is specialized, such as wholesaling of vehicle components,<sup>1</sup> Xi'an's hinterland extends to the far reaches of northwest China.

<sup>1</sup> The 2000 population census is the last complete census of China; and the most recent accurate national count of actual (as opposed to registered) urban population.

explained by envelopment,<sup>2</sup> accounting for 50% of demographic growth, and in-migration: 45%.<sup>3</sup> Although the percentage of demographic growth explained by envelopment has remained constant, the role of migration has increased significantly while natural growth has declined from 34% in 1990 to 5% in 2003 because of the affects of the one child policy and changing family size preferences (especially by women). The high importance of envelopment in urban population growth is related to the fact that Xi'an is a compact city. Xi'an grows much more contiguously than almost all other Chinese metropolitan areas, resulting in high levels of envelopment because rural settlement tends to be denser nearer to the city.

**Table 1 Population Growth by Source**

	Growth Type	1990	2000	2003
Urban	Natural	34%	9%	5%
	Migration	16%	41%	45%
	Envelopment	50%	50%	50%
Sample Suburban	Natural	43%	34%	12%
	Migration	7%	16%	38%
	Envelopment	50%	50%	50%
Sample Peri-Urban	Natural	42%	41%	29%
	Migration	8%	9%	21%
	Envelopment	50%	50%	50%

Note: Sample Suburban is Baqiao, sample Peri-Urban is Huxian.

The prime source areas of migrants are nearby heavily populated provinces, with large poor rural populations, particularly Henan.<sup>4</sup> Other poor provinces sending considerable numbers of migrants to Xi'an include Hubei, Anhui, Hebei, and Shanxi Provinces. A second type of migrant flow is evident, Xi'an is attracting migrants and students from wealthier provinces, who are thought to come as entrepreneurs to take advantage of under-exploited economic and academic opportunities in Xi'an. Zhejiang migrants are the most numerous in this category (they are well known throughout China as entrepreneurial migrants), but other migrants that fall into this category include those from Jiangsu, Fujian, Guangdong, and perhaps Shandong. The major destinations for new migrants – the majority of whom are students – are Yangta District to the south, and Chang'an, further to the south.

The hukou (permanent residence regulations) system does not greatly impact Xi'an, particularly in terms of migration. The level of migration to Xi'an, relatively low by Chinese standards, is primarily a product of Xi'an's economy, not the hukou system. In fact, because Xi'an has a problem of attracting and retaining labor, which is increasingly in short supply, migrant labor is increasingly viewed as an asset rather than a problem.<sup>5</sup>

### **Population Density**

Given the high percentage of population living in the core city (near the wall), there is an abrupt difference in densities between the core city and the peri-urban area. This somewhat unusual pattern, a gently sloping density curve characterized by relatively high densities, ending rather abruptly and almost cleanly at the city's edge (like a European city) can be explained by the fact that since 1949 the city's development has largely been driven by State Owned Enterprises (SOEs) in textiles, intermediate machinery, etc., located near the city center (to the east and west of the walled city) during the time when land markets effectively did not exist. This east-west orientation of industry, correlated with the east-west rail line, resulted in a rectangular shaped city, although current spatial drivers are resulting in the city becoming a more "normal" square shaped.

<sup>2</sup> Envelopment is the process whereby a city expands outward, often octopus-like, surrounding and digesting peri-urban communities

<sup>3</sup> Chinese data on migration measures any movement by households (who stay at least 6 months in a new location) over any jurisdictional boundary (District, County, Municipal Provincial). Thus it measures intra-municipal movements as well as inter-municipal.

<sup>4</sup> Henan is the most populous province in China, and one of the poorest.

<sup>5</sup> For example, Wuhan is currently developing and implementing policies to retain migrants, a complete reversal of earlier policies in most Chinese cities. This change is driven by labor shortages in many Chinese cities.

Table 2 describes the demographic aspects of the foregoing pattern in detail. Gross population densities in the core Districts of Xi'an (Xincheng, Beilin, and Lianhu) are high by Chinese standards at 18,873 people per square kilometer. Furthermore, densities in the core Districts have remained virtually the same since 2002. Other Districts in Xi'an have experienced only a moderate growth in densities from 941 to 1,009 from 2002 to 2005. The more remote and very low density Counties (explained by weak peri-urbanization) have not changed density since 2002; 2005 densities in these counties are only 318 persons per kilometer, making Xi'an a remarkably stable city in terms of density.

**Table 2 Population Density by Jurisdictional Type**

	Area (sq.km)	Pop. Density (person/sq.km)			
		2002	2003	2004	2005
<b>Municipality</b>	<b>9,983</b>	<b>704</b>	<b>718</b>	<b>717</b>	<b>734</b>
Xincheng district	31	15,346	15,542	16,169	16,461
Beilin district	22	30,232	31,414	29,130	30,248
Lianhu district	38	15,262	15,531	13,928	14,256
<b>Core Districts</b>	<b>91</b>	<b>18,910</b>	<b>19,375</b>	<b>18,367</b>	<b>18,873</b>
Baqiao district	322	1,361	1,385	1,388	1,466
Weiyang district	261	1,501	1,537	1,558	1,613
Yanta district	152	4,011	4,404	4,602	4,991
Yanliang district	240	997	1,002	993	1,010
Lintong district	898	747	745	729	732
Chang'an district	1,583	571	578	582	591
<b>Other Districts</b>	<b>3,456</b>	<b>941</b>	<b>967</b>	<b>974</b>	<b>1,009</b>
<b>City Proper</b>	<b>3,547</b>	<b>1,402</b>	<b>1,439</b>	<b>1,421</b>	<b>1,467</b>
Lantian county	1,977	318	320	319	312
Zhouzhi county	2,956	211	212	215	215
Huxian county	1,213	466	469	451	450
Gaoling county	290	806	808	815	860
<b>Counties</b>	<b>6,436</b>	<b>319</b>	<b>320</b>	<b>318</b>	<b>318</b>

Source: Xi'an Statistical Yearbooks, 2002–2005.

National level data indicates that densities in the entire built up area of Xi'an have essentially remained constant from 2000 to 2005. As shown in Table 3, whereas the density of built up areas of major Chinese metropolitan areas decreased 15.1% (mean decrease) from 2000 to 2005, the density of Xi'an decreased only 0.8%.

**Table 3 Changes in Built-up Area Density: 2000–2005**

Cities	Built-Up Area Density		% Change
	2000	2005	
Tianjin	12,928	10,046	-22.29%
Zhengzhou	11,990	7,188	-40.05%
Beijing	14,895	7,237	-51.41%
Shanghai	17,058	13,761	-19.33%
Guangzhou	9,313	6,565	-29.51%
Wuhan	21,007	22,868	8.86%
Xi'an	13,503	13,395	-0.80%
Chongqing	14,567	9,707	-33.36%
Chengdu	9,856	9,803	-0.54%
Shenyang	18,196	13,230	-27.29%
<b>Mean</b>	<b>14,246</b>	<b>12,098.5</b>	<b>-15.07%</b>

Source: China Urban Statistics Yearbooks: 2001, 2006.



### **Housing Characteristics**

Xi'an's urban environment is relatively uniform in terms of design quality (lack of), local densities, mix of uses, etc. There are few distinctive neighborhoods and relatively low levels of socio-economic residential segregation. In part this reflects a relatively low GINI coefficient compared to other Chinese cities, partially related to significant state control of the urban economy, which is relatively positive from an equity point of view.<sup>6</sup> Over time, by 2003 urban incomes were 1.43 times suburban incomes, a slight decline from 1.51 in 1990. However, if we use the ratio of mean to median income as a crude indicator of income inequality, the ratio has increased in the core area from 1.08 in 1990 to 1.5 in 2003.<sup>7</sup> This indicates that the core urban area appears to be experiencing increasing inequality and is more unequal than the suburban area (1.22 ratio in 2003).

Housing prices have consistently risen since 2000 in the urban, suburban and peri-urban areas. However, prices are relatively low compared with other large Chinese metropolitan areas (in 2004 the median housing price in Xi'an's urban area was only 1,763 RMB per square meter). Notably, housing is considerably less expensive in suburban and peri-urban areas compared with the urban (core) area. In 2003, suburban housing costs (per square meter) were 59% of urban housing costs, while peri-urban housing costs were only 43% of urban housing costs.

Since economic take-off came late to Xi'an, and there is relatively limited capital for urban redevelopment (from both the public and private sectors) Xi'an has more substandard housing than most comparable Chinese metropolitan areas, with a few exceptions such as Zhengzhou. In Xi'an, redevelopment of substandard areas has been underway over the last decade, although high relocation / compensation costs are now seriously impacting urban renewal processes. As indicated by Table 4, as expected, substandard housing is mainly a problem in the urban area, although it exists as a lesser problem in suburban and peri-urban areas – in the form of run-down farmer housing, including housing associated with poorly performing or bankrupt TVEs. Table 4 below indicates that large-scale urban redevelopment (to replace substandard housing) has already occurred in the Xi'an urban area with 3.3% of the urban population (95,565 people) and 12.2% of the land area affected. This drops off to 1.5% of the population (35,242 people) and 0.9% of the land area in the suburban area, and further to 0.8% of the population (17,008 people) and 0.4% of the land area in the peri-urban area.

**Table 4 Urban Redevelopment Impacts**

	Population Impacted	Total Population	% of Pop Impacted	Area of Former Substandard Housing, (sq.km)	Total Area (sq.km)	% Formerly Substandard
Urban	95,565	2,877,148	3.3%	61.27	504	12.2%
Suburban	35,242	2,285,890	1.5%	27	3,043	0.9%
Peri-Urban	17,008	2,087,040	0.8%	25.23	6,436	0.4%

Source: Xi'an Statistics Yearbook (2004) & Xi'an Yearbook (2004)

For China, Xi'an's 12% of the urban land area in substandard housing is high. Several factors are through to explain this: (i) The existing hukou (registered) population were able to purchase work unit housing (where they lived) as housing was privatized in the early 1990s, (ii) rapid economic and employment growth generates incomes sufficient to enable most urban residents, including migrants, to purchase or rent some form of adequate housing, (iii) illegal building regulations are usually enforced, (iv) The strength of the hukou system (which is now essentially being dismantled) in the past discouraged excessive rural-urban migration, and (v) The existence of a dualistic land system in extended urban regions enables peri-urban rural collectives (including rural collective enclaves within built-up areas) to rent inexpensive housing.

<sup>6</sup> As late as 2003, only 28% of the urban economy was in the private sector; Xi'an was one of the last cities in China to become an open city: in 1992.

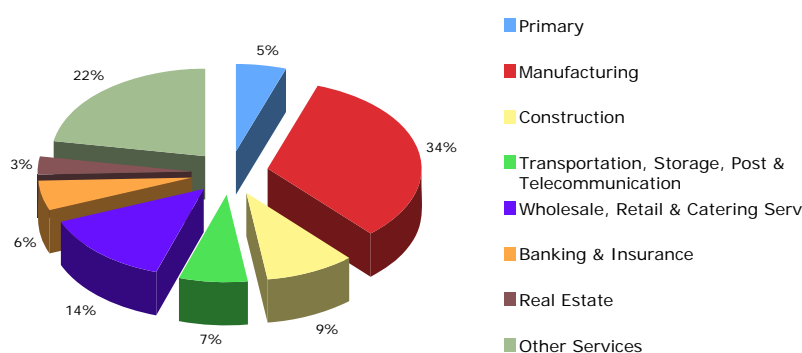
<sup>7</sup> A large differential between mean and median incomes often indicates a relatively small number of high-income households are pushing the mean up relative to the median, implying higher inequality.

## Urban Growth Management: Drivers and Spatial Processes

### Current Drivers

#### *Urban Economy*

Xi'an's GDP has been growing at approximately 13% annually since its economic opening in 1992. Its overall GDP was 127 billion RMB with a GDP per capita of 17,162 RMB per person in 2005. The GDP is forecast by the Municipality to grow at 11% annually over the 11<sup>th</sup> Planning period. Figure 1 indicates that Xi'an's economy is relatively diversified with total services accounting for 57.1% of the economy and manufacturing 42%. Within the service sector, education and research is the propulsive sub-component (as described above), not business and professional services, which are under-performing, relative to other large Chinese metropolitan areas.



Source: Xi'an Statistical Yearbook, 2006.

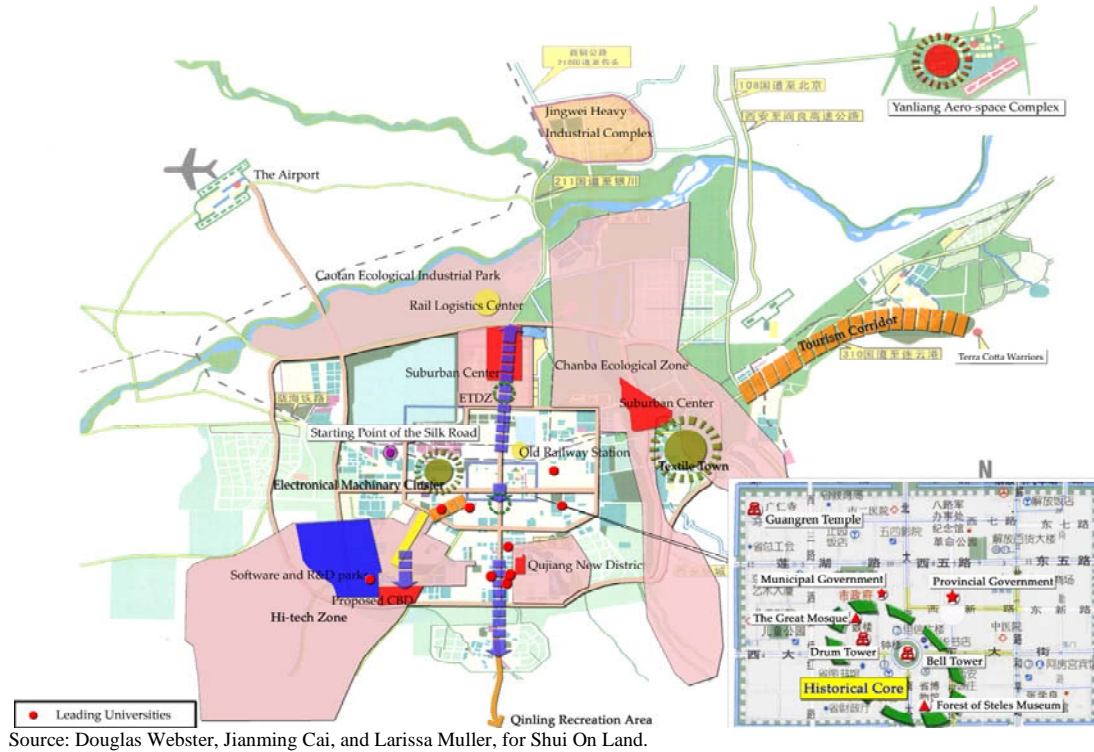
**Figure 1 Percentage GDP by Sector, 2005**

The two economic growth drivers are city building (real estate and construction) and the knowledge economy (education, research, IT, media, and arts). Although manufacturing (oil, gas and textiles) lost share of the GDP over the last ten years, it continues to make steady gains, growing from 11.3 billion RMB in 1995 to 22.6 billion in 2000, 31 billion in 2003, and 42 billion in 2005.

Xi'an's second economic growth driver includes the industries of aerospace, medical services, education and research, tourism and high tech. However, only in tourism, aerospace, software, and higher education, is Xi'an a leading competitive player in China. In other clusters, Xi'an is outperformed by one or more other Chinese cities. Xi'an is an international tourist destination, attracting 21 million tourists yearly. Increasingly important, Xi'an is also one of China's top five science and technology cities, based on the large number of high quality universities and research institutes, its national defense industries, and one of two nationally designated software export centers. The future performance of these three clusters, of which aerospace is the most difficult to forecast, will largely determine whether Xi'an displays mediocre or outstanding economic performance over the medium term.

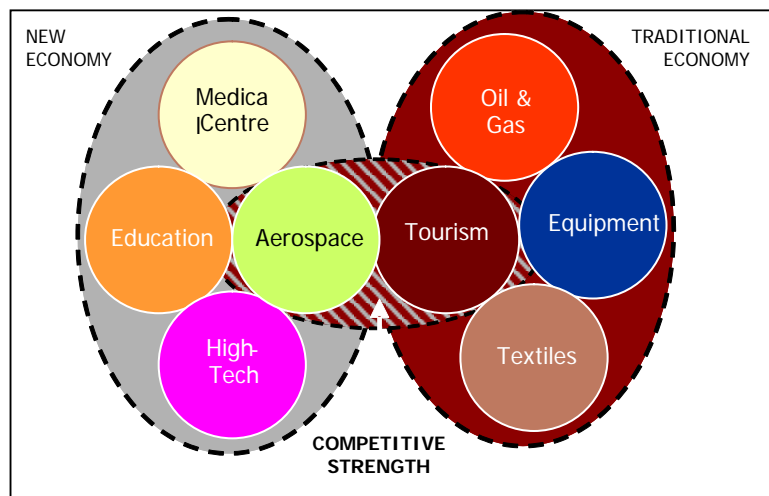
Unlike most Chinese metropolitan areas during the 1949–1970s period, Xi'an did not develop remote industrial satellite cities reflecting Soviet city planning practice and influence.<sup>8</sup> This historical factor has turned out to be a contemporary blessing. However, three significant satellite towns do exist: (i) Yanliang Aerospace City with a population of 120,000 (to the north-east); (ii) Lintong City, a tourist town to the east (the Terra Cotta warriors and the Tang Dynasty Summer Palace are nearby), and (iii) Xian Yang (to the north-east) where the airport is located, the latter a relatively stagnant heavy industry, especially oil refining, center / corridor. Map 2 describes the current spatial structure and dynamics in Xi'an. Surprisingly, the airport has not provided the development stimulus to the northwest corridor usually associated with airport zones in China, and elsewhere in the world.

<sup>8</sup> Industrial pollution was severe under planned economy conditions (a reflection of output biased incentive systems) necessitating the location of industrial complexes far from city centers in states such as the Soviet Union.



**Map 2 Urban Spatial Dynamics: Xi'an**

Although Xi'an's urban economy is still largely state driven, the knowledge economy is, to a large extent, reinforcing core oriented development, rather than fueling centrifugal forces. Most of the new economy (medical, high tech, education, and tourism) is core centered; this new core orientation is reinforcing the spatial dynamics of the old economy (textiles, intermediate machinery, and oil and gas headquarters), which also located in the core city.



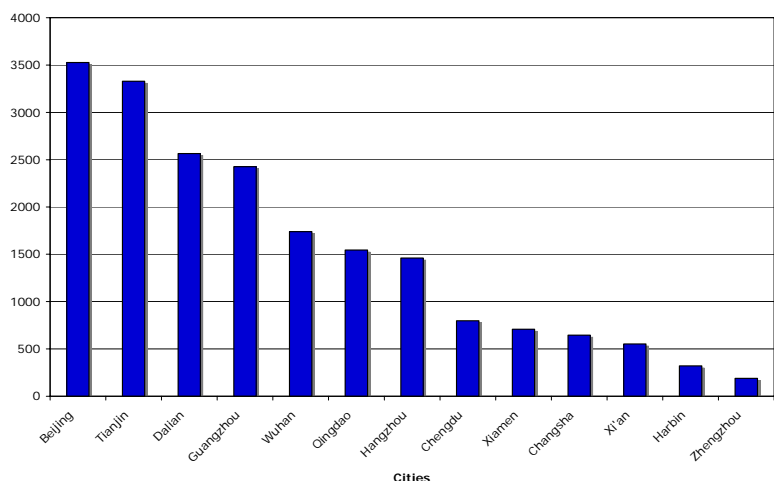
**Figure 2 Key Economic Clusters in Xi'an**

The strong centripetal orientation can be explained by walled city ambience and access to hotels in the case of tourism, proximity to the knowledge institutions (particularly leading universities) in the case of high tech, access to business and producer services in the case of the oil/gas cluster (located in the Weiyang area

just north of the city wall), historical railroad access in the case of textiles and machinery, and the slow dispersal of traditional industry relative to most other Chinese cities. The only strong driver of peripheral development is aerospace, located in Yanliang satellite city; and to a lesser extent, the airport corridor. However, even in the case of the aerospace, of the 200,000 new jobs forecast to be created by 2020, 80,000 will be in the core city. At present, several functions associated with the aerospace cluster, e.g., some avionics equipment firms, are located in the High Tech zone.

### Foreign Direct Investment

The lack of attractiveness of Xi'an to FDI has been a key factor shaping the city's structure both economically and spatially. In the post 1980s, when China opened up, FDI was not attracted to Xi'an: it was perceived as a land-locked, polluted, state-dominated industrial city.



This lack of FDI had a major impact on Xi'an's current spatial structure given that industrialization has been the main driver of peri-urbanization in urban China. FDI to Xi'an was only \$260 million USD in 2003 and rose to 500 million USD in 2004. However, as indicated by Figure 3, Xi'an's ranking vis-à-vis other Chinese cities in terms of FDI was still very low in 2005, despite the approximate doubling of FDI inflows between 2003 and 2005.

Source: China City Statistical Yearbook, 2006.

**Figure 3 Comparative FDI, 2005: Selected Cities**

Although Xi'an attempted to attract FDI since the 1980s, it had difficulties as noted above. In common with many other cities such as Harbin, its past industrial economy was largely the product of centrally commanded location decisions, for reasons of security, spatial equity, etc., rather than market forces. Thus when market forces were unleashed post 1980, cities such as Xi'an were often unattractive to FDI, as well as Chinese private capital, in many cases.

### Peri-Urban Characteristics

The peri-urban area is industrialized, with 57% of peri-urban GDP from secondary (manufacturing) activity – thus the weakness of the peri-urban economy is not primarily related to its economic structure per se, but rather to scale, i.e., the relatively low level of activity. Coastal peri-urban areas are even more highly driven by manufacturing, with the secondary component of the economy in many coastal peri-urban areas accounting for close to 70 per-cent of output. The lack of scattered peri-urbanization, combined with the centripetal bias of Xi'an's emerging economy, explains the city's compactness. Arguably, Xi'an's skipping the large scale mass production manufacturing stage may facilitate its jumping to a more high tech economy based on software, medicine, aerospace, etc., provided amenity constraints (that affect attraction of talent) can be addressed. Skipping the mass production manufacturing stage has set the stage for Xi'an to remain a compact city, provided appropriate planning mechanisms are deployed and enforced.

The result is that Xi'an's urban form, in contrast with Quito's, is largely the product of changing economic functions of the city, with important intra-urban form and land use consequences. In Quito, residential drivers and geographical constraints tend to be more important.

### Special Economic Development Zones

The close correlation between economic function and urban form in Xi'an has been reinforced by the fact that the city's development over the last 25 years has been driven by seven major special economic development zones. Essentially, these zones have replaced large-scale work units, the primary building blocks of the city during the planned economy period. The Xi'an High Tech Development Zone (XHTDZ), the manufacturing oriented Xi'an Economic and Technological and Development Zone (XETDZ), and the Aircraft Industry Zone) that together constitute 27.2% of the GDP of the Municipality.

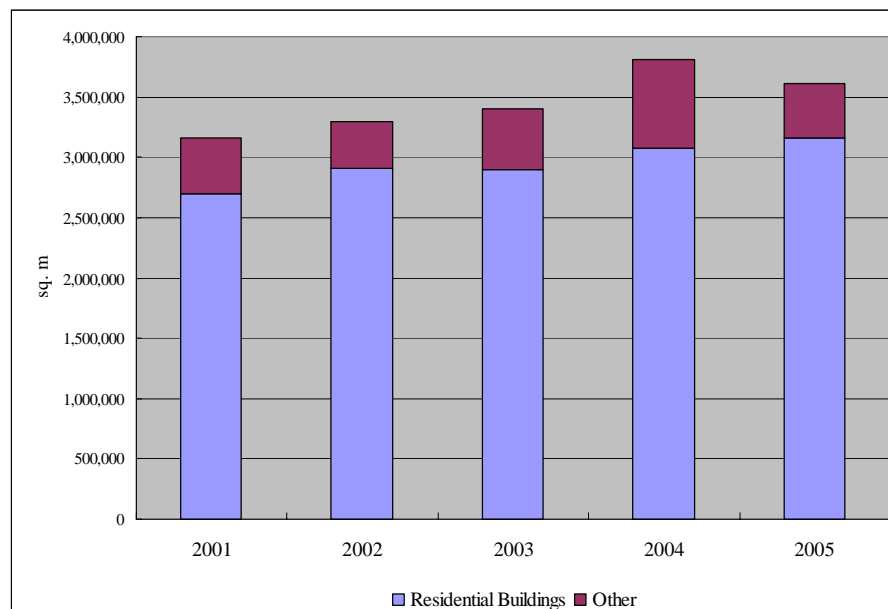
Special economic zones, quasi-autonomous institutions, created by the Municipality, have special strong powers to master plan, allocate land, and grant investment approvals, literally within days. This contrasts with the relatively weak spatial planning at the metropolitan level, which tends to focus on site development, rather than the macro strategic level. For example, FAR designation occurs at the detailed planning level – there are approximately 200 such detailed planning areas. Essentially, municipal planning functions being squeezed out by the powers of the special development zones.

The special economic development zones tend to compete with each other, thus the city is developing as a set of relatively un-coordinated modules, leaving “orphan” areas, not included in special zones to stagnate, although this is starting to change with the emergence of *self-organizing* spatial clusters in parts of the city. For example, each special zone attempts to create its own urban center, often resulting in duplication of function and dilution of each sub-center's importance.

### Land Use and Spatial Elements

#### Floor Area Ratio

Figure 4 describes the area of floor space under development by year since 2001. In 2005, approximately 88% of floor space under construction was for residential use, typical (slightly on the high side) for Chinese cities. Xi'an's consistent, but not spectacular, growth is reflected in the relatively modest increase (and absolute) level of construction (by Chinese metropolitan standards) between 2001 and 2005.



Source: Xi'an Statistics Yearbook (2002–2006)

**Figure 4 Floor Space of Buildings Under Construction**

If the value of floor space completed between 2001 and 2005 is assessed, as shown in the table below, rapid growth in value of the newly constructed urban fabric is revealed.

**Table 5 Value of Floor Space Completed**

Unit: Million USD	2001	2005	Annual Growth Rate, 2001–05
<b>Total</b>	449.3	998.5	<b>17.3%</b>
<b>Residential Buildings</b>	345.6	844.0	<b>19.6%</b>
<b>% Residential</b>	<b>76.9%</b>	<b>84.5%</b>	
<b>Other</b>	103.7	154.5	<b>8.3%</b>

Source: Xi'an Statistics Yearbook (2002–2006)

However, the value of non-residential property has grown at a much lower rate between 2001 and 2005 (8.3% per year per square meter compared with 19.6% for residential property). The explanation for this is partially related to significant improvements in the quality of residential buildings (relative to other types of property) reflected in higher prices per square meter – a China wide phenomenon. Another factor is that the demand for residential property is increasing faster than non-residential property for a variety of reasons, e.g., disposable income growth, the demand for larger units (average apartment size has increased 5 times over the last 25 years in China), migration, etc. Another important factor in the more rapid rise in the price of residential property is that it is more subject to speculation than non-residential property. There may also be a feedback loop involved, that is, as people spend more money on housing (particularly in core urban areas), they have less income left to consume that would drive non-residential property markets, in particular the market for retail property. Furthermore, the gap with commercial property appreciation narrows or disappears when high-end residential properties are removed from the comparison.<sup>9</sup>

### *Property Prices*

The highest priced residential property is found in the South of the city (driven by the development of Qujiang New District). This is a prime example of the mix of government and market driven dynamics in Xi'an. The Municipal and District Governments planned the Qujiang New District, but within a conceptual planning framework, actual development is being undertaken by the private sector. Qujiang New District therefore represents a relatively new development in Xi'an, i.e., the emergence of a distinctly superior, high-end area with better landscaping, design, etc. Ranked second and third respectively in terms of residential property price are the inner city and the XHTDZ to the south west of the walled city. Residential areas in both the inner city and XHTDZ provide easy access for high paid workers to work in the highly successful XHTRDZ, many in the software industry.

In the case of mixed-use development the inner city is the highest priced property, with the remainder of the city basically constant in terms of price per square meter. The much higher price of mixed-use property in the inner city (7,525 RMB per square meter compared with 4,930 RMB in the northern city and XHTDZ) reflects the fact that tourists base themselves in and around the walled city.<sup>10</sup> Furthermore, metropolitan residents still regard the walled city area as the place to shop, although this is being undermined by the emergence of shopping and entertainment areas, as well as specialized zones, such as the university and expatriate zones, more distant from the city center. There is a similar pattern to mixed-use property for retail and office property, with the highest prices being paid for inner city property. Not surprisingly, the XHTDZ ranks second in price for office property, given the white collar and high value added orientation of the software industry, while the City South area ranks second for retail property, explainable by the emergence of high end residential neighborhoods in the south of Xi'an.

<sup>9</sup> There are also data problems to consider. One is that affordable housing has not grown as quickly in price as more luxurious residential properties, which raise the average increase in residential property price. Another factor is that low-end retail is often incorporated into the residential market, e.g., shop houses (ground floor). Thus this dynamic component of the retail sector is caught under the residential data category.

<sup>10</sup> On an average day, there are 0.3 million tourists in Xi'an – it is mass tourism, primarily domestic, with relatively low daily tourism expenditures.



### *Walled City Redevelopment*

Of major concern is a situation that has developed in the walled city. It is not financially feasible for private developers, under market conditions, to redevelop the historical walled city based on a living culture model. Increased population in deteriorated worker housing from the 1960s and 70s, often informally modified, combined with increased informally-based neighborhood organization (growth of civil society) have dramatically increased the costs of relocation of existing residents. Current residents of the walled city value living there for several reasons, e.g.:

- (i) they are close to quality middle schools: an extremely important household location preference in China,
- (ii) many work in the building they live in (often informal businesses), or nearby,
- (iii) many residential and retail units have been rented out by the original owners at profitable rates, the owners (although they no longer live in the area) do not want to lose this income, and
- (iv) strong social networks exist among residents in many of the walled city's neighborhoods.

Even those who are willing to move, only want to do so if adequately compensated – many are awaiting a large scale high-end developer with deep pockets. This has affected the Municipal Government's plans to move 200,000 people out of the walled city core to undertake heritage-oriented restoration. The implication is that new mechanisms, such as land re-adjustment, for urban redevelopment need to be implemented in Xi'an.

## **Transport**

### **Planning Processes**

The Xi'an Urban Overall Development Plan (Master Plan 1995–2010) was developed in 1996 by Xi'an Urban Planning Bureau supported by Xi'an Urban Planning and Design Institute and approved by the government in 1999. It sets out a broad policy on land use development and transport infrastructure. As different bureaus and commissions share different transport responsibilities, Xi'an lacks an agency to plan as a whole. Typically this is a similar situation faced in Chinese cities as well as Indian cities, which lack an organization with responsibility for the entire transportation system.

Urbanization and rapid economic growth are forecast to continue to grow and a substantial increase in centrally located commercial activity is expected, so major redevelopment is planned in and adjacent to the city center. The Master Plan also describes the urban area as being supported by 11 peripheral satellite towns that will accommodate Xi'an's increasing population as well as industry relocated from the inner city and new industrial developments. Furthermore, the Urban Transport Plan forecasts daily trip-making to exceed 8 million person trips by 2010, including 2.4 million public transport trips and 2.3 million by bicycle. To accommodate this increase, the Plan proposes improvements to rail transport, prioritizing public transport, enhancing traffic management, and adopting new technology to support transport services.

### **Trip Characteristics**

On Xi'an's urban roads there is a high level of bicycle and public transport use at 33.6% and 23.5% respectively. The number of public transport vehicles per 10,000 people has increased from 3.21 in 1990 to 8.55 in 2003 with bus transport being particularly high for China. Private motor car use remains undeveloped as the city has a relatively low car ownership with only 18 per 1000 population. However, considering the low income level, car ownership appears to be popular. For instance, between 1900 and 2003, the average annual rate of increase in the motor vehicles in Xi'an was 10.8% including a 14.1% increase in small-sized passenger vehicles. Motorcycle registration has slowed within the past few years.

In 2003, the urban population of Xi'an made an average of 1.95 trips/day. This is relatively low. The majority of residents of Xi'an travel less than 7km per day, comprising over 85% of total transport volume. Comparing average trip lengths on an international scale, Americans in urban areas travel approximately

45km per day and Europeans 30–35km per day. While in many cities this could highlight a lack of travel mobility, this may simply reflect the highly compact nature of Xi'an and lack of a current need to make longer trips.

There are a high number of overlapping bus routes in Xi'an and high centralisation. According to the standards set in the “City Transport Road Planning & Design Standards”, the public transport density in Xi'an's urban region should reach 3–4km/km<sup>2</sup> and the outskirts should reach 2–2.5 km/km<sup>2</sup>. However, the existing density is currently much lower – at 0.18 km/km<sup>2</sup> outside the Second Ring Road and 0.22 km/km<sup>2</sup> for the entire urban region – indicating the level of improvement that is required to both road infrastructure and public transport services and the extent to which peri-urban dwellers are effectively cut-off.

### **Road Network**

On a national scale, China's road network is under-developed. High standard roads (above Class II) account for only 13% of the total road network. Around 1,100 km of roads exist per million inhabitants, which is considered low when compared to 25,300km for the United States. The road network in Xi'an is also under-developed in both quality and extent and in general, the condition of Xi'an's roads falls below national standards for arterial and secondary roads. The core urban road network of Xi'an City is based on the Tang dynasty grid network structure. It has gradually framework of two axes, three ring roads, and eight lines. The proposed Third Ring Road will complete the ring road system described within the Xi'an Master Plan and Transport Plan. It will serve as a high performance distributor to regional and truck traffic as well as local movements outside the Second Ring Road.

Table 6 compares road share (road area as a % of total urban area) for selected cities including Xi'an.

**Table 6: Road Share Comparison of Xi'an with International Cities**

City	Road Share as a % of Total Urban Area	Road Area Per Capita (m <sup>2</sup> /capita)
New York	24.1%	28.0 (1999)
San Francisco, United States	23.5% <sup>(5)</sup>	-
London, United Kingdom	16.6% <sup>(5)</sup>	26.3 (1999)
Tokyo, Japan	15.8% <sup>(4)</sup>	14.9 (1999)
Shanghai, PRC	12.6%	11.6 (2002)
Colombo, Sri Lanka	12.5% <sup>(1)</sup>	-
Beijing, PRC	11.4%	4.7 (2000)
<b>Quito, Ecuador</b>	<b>10.3%</b>	-
<b>Hyderabad, India</b>	<b>9.5%</b>	-
<b>Xi'an, PRC</b>	<b>7.9%</b>	<b>5.1 (2002)</b>
Singapore	6.0% <sup>(3)</sup>	-
Calcutta, India	4.2% <sup>(2)</sup>	-

Sources:

- (1) Colombo Municipal Council area only; Assumed 18.0m for average width of A&B class in CMC, and 9.0 m for average width of other class roads.
  - (2) <http://www.kolmetro.com/history.html>
  - (3) Land Transport Authority (2004) estimated based on Lane-Length data
  - (4) Tokyo 23 wards; Tokyo Metropolitan Government (2004)
  - (5) Tokyo Metropolitan Government Construction Bureau, White Paper on Tokyo Urbanization (2000)
- Mao (2003), Wuhan Metropolitan Transport Development Strategic Plan (2003)
  - Colombo Municipal Council area only; Assumed 18.0m for average width of A&B class in CMC, and 9.0 m for average width of other class roads.
  - <http://www.kolmetro.com/history.html>
  - Land Transport Authority (2004) estimated based on Lane-Length data
  - Tokyo 23 wards; Tokyo Metropolitan Government (2004)
  - Tokyo Metropolitan Government Construction Bureau, White Paper on Tokyo Urbanization (2000)

The table suggests that road share in Xi'an (as well as the other two studied cities) is relatively low and could not sustain a transport system that caters to high private vehicle demand. It follows that further densification without high regard for the transport implications would cause significant problems in mobility. At the same time, the case of Singapore (6.0%) helps to illustrate that a compact and successful transport network can be implemented at a relatively low proportion of road area, e.g. through an extensive



subway and multi-modal system in addition to pricing mechanisms that restrain private vehicle use. Conversely, India's city of Calcutta at only 4.2% road share (and a single and under-utilized north-south metro line) suffers significant congestion.<sup>11</sup>

By the end of 2003, the total road length within Xian city was 1,274km. This road length includes 44.9km of expressways, 128.5km of arterial roads, and 179.4km of sub-arterial roads. While the average road density for Xi'an is recorded at 5.5 km/km<sup>2</sup>, the highest road density is 9.2 km/km<sup>2</sup> within the area of the city wall: 9.3 km/km<sup>2</sup>. From the city wall to the Second Ring Road it is 5.7 km/km<sup>2</sup> and from Second Ring Road to the Third Ring Road it is 3.1 km/km<sup>2</sup>. The relatively high road density area within Ring Road I in the old urban city has mostly inferior grades of road and many level crossings resulting in a poor traffic situation. The density of the network outside this central area is unsatisfactory to accommodate the land uses expanding from the central area.

Xi'an is changing from an elongated city spread out along the east-west rail line to a square city as growth increasingly occurs to the north, driven by new manufacturing plant and particularly to the south driven by the new economy. Factories and past associations with heavy industry (to the west) and textile firms (to the east) tend to block or discourage development along the old east-west axis. It may be considered that in Xi'an increasing congestion in the city core will drive development toward the Third Ring Road – an area that is already attracting high land and property prices.

### ***Transport Initiatives and Strategy in Xi'an***

After years of under-investment in transport infrastructure and services, rapid urbanization in Xi'an Municipality has put pressure on the urban transport system, jeopardizing the city's productivity. City authorities are adopting the following methods to improve the urban transport system:

- Constructing a Third Ring Road and improving connector roads through international donor financial assistance;
- Encouraging decentralization by developing peripheral satellite towns, which together with the Third Ring Road will assist in decongesting the central area (though increase work trip distances from such areas to the central district);
- Planning a subway system for the dense city core, particularly to serve the north-south growth axis;
- Planning a Bus Rapid Transit (BRT) scheme to serve the established east-west axis across the central urban area and connecting to the Third Ring Road area;
- Maintaining pro-bus policy including subsidies to passengers and attractive fare levels;
- Considering the prohibition of motorcycles within the second ring;
- Integrating urban transit and countryside buses as a whole

Xi'an is currently at the stage of low private car ownership and use and is still developing a functional road hierarchy. With signs of congestion within Xi'an at such low levels of car ownership, a key issue for Xi'an and other Chinese cities is whether sufficient road space can be constructed to make a functional road hierarchy and accommodate even relatively modest volumes of car use.

Due to the low level of car ownership, traffic management methods to restrict private vehicle use are not yet being aggressively pursued in Xi'an though the advantages of developing a mass public transport system are recognized and being planned.

Implementation of mass transit systems before the inevitable 'explosion' of private motor car ownership (occurring in parallel with economic growth) is an effective strategy that could allow traffic management measures to also develop in a balanced manner. In this respect Xi'an is now pursuing not only rail systems,

---

<sup>11</sup> Particularly along the city's newly developing east-west axis and plans are currently being made for a second metro line. In this case, the restrictive affordability of the populous for metro fares to cover the system's operating costs is an important consideration in determining the sustainability of a large capital investment given the relatively low fares of competing informal modes.

but also Bus Rapid Transit technology as a more cost-effective system to either replace or complement subway lines.

## Green Space, Parks, Environmental Services Land

### Classification and Status of Open Space

Table 7 indicates that official public park green space designation occurs primarily in the urban area. Only 160 hectares in the peri-urban area are in official green space compared with 4,502 hectares in the urban areas. This speaks to the fact that public parks are not designated until land is formally converted from rural to urban land. Because the land quota system limits conversion of land, the incentive system works against including park land within urban conversion quotas – it becomes wasted land from an economic or fiscal point of view. In the urban area in 2005, 4,502 hectares (or 45 square kilometers) were official green space, or 3% of the area of the city proper, this is far below the Chinese standard set by the Ministry of Construction, that 8–15% of the built up area should be in green space. Standards for eco-cities are higher; to be an eco-city in China, the public green space per capita should equal 12 square meters and the percentage of green space in the built up areas should be equal to 38%.<sup>12</sup> Of the 45 square kilometers in official urban green space, 31% is officially designated as public parks. The mean sized park is relatively small (26.7 hectares), although parks are becoming larger, having increased from a mean size of 18.9 hectares in 1990.

**Table 7 Open Space: Urban and Peri-urban Areas**

	URBAN			PERI-URBAN		
	Total Area of Green Space (ha)	% in Public Parks	Avg. Area of Parks (ha)	Total Area of Green Space (ha)	% in Public Parks	Avg. Area of Parks (ha)
1990	3,542	9%	18.9	-	-	-
1995	5,603	15%	17.9	-	-	-
2000	4,116	31%	18.7	75	70%	5.3
2001	-	-	-	80	69%	5.3
2002	-	-	-	90	63%	5.3
2003	-	-	-	110	55%	4.5
2004	4,502	31%	26.7	160	39%	4.5
2004	4,502	31%	26.7	160	39%	4.5

Source: Xi'an Statistics Yearbook (1991/1997/2001/2005).

In the peri-urban areas, official park space is limited to small parks (mean size 4.5 hectares) in relatively small urban settlements, e.g., county level cities and smaller. Such centers often consider parks a luxury compared with other more pressing needs, and may have budgetary and land constraints in providing such parks. The limited budget available for green space provision in the Municipality is indicated by Table 8. Furthermore, local governments such as Counties do not receive revenue from green space, but receive substantial revenue from manufacturing (excise taxes, share of corporate taxes, etc.) Most explicit park budget is spent for facilities within public parks, e.g., children's play areas, public events venues, etc., rather than purchase of land, which would be too expensive to purchase, given green space budgets, at any rate. Provision of park land is dependent on other means, e.g., land that becomes available when government facilities relocate.

<sup>12</sup> In reality, such high standards for green space are incentives to inefficient land use. See Bertaud, Webster, Cai, et al, 2007

**Table 8 Municipal Income & Expenditure: Open Space (2004)**

Income (USD)		Expenditure (USD)	
<b>Total</b>	<b>1,446,497</b>	<b>Total</b>	<b>1,446,497</b>
<b>City Construction &amp; Maintenance Tax</b>	497,585	<b>Civic Projects</b>	924,758
<b>Water Fees</b>	42,271	<b>Parks &amp; Green Space</b>	152,174
<b>From Local Budget</b>	96,618	<b>Environment</b>	96,618
<b>Earmarked Improvement Funds</b>	398,551	<b>Other</b>	272,947
<b>Other</b>	411,473		

Source: Xi'an Statistics Yearbook 2005.

Peri-urban areas frequently contain large amounts of green space designated by national agencies. For example, in Xi'an's peri-urban area, 65,822 hectares of forest land has been designated. National Ministries that designate space off-limits to development include Forestry, Water, Agriculture, Culture, the Bureau of Heritage (a special Bureau), etc. In addition, international treaty obligations may come into play, e.g., there are 31 RAMSAR wetland protected areas in China, although none in the Xi'an extended urban region. National agencies usually work with, or at least consult, municipalities in designating protected land. In sum, much of the protection of land in the peri-urban areas is undertaken from a national line agency perspective (based on national policies in regard to water, the environment, archeological merit, etc.) rather than an urban physical development perspective.

When land in the peri-urban area is converted into urban use, the situation becomes more complex. Some of the nationally protected land may be converted into urban parks (which enjoy high protection),<sup>13</sup> some may remain in national jurisdiction, and some may be developed for urban purposes. In other words, the *transition period* from rural to urban status is highly important in determining both the fate of previously protected land and the spatial extent and distribution of urban parkland. The status of pre-existing green land is often in doubt and the Municipal Government (and lower level jurisdictions) play a key role in designating urban parks during the transition period. The fiscal pressures to convert pre-existing "rural" green space to urban built up land are enormous given the high dependence of Chinese urban governments on land lease revenues and taxes from urban land uses, especially industrial. During the land conversion (transitional) period, although it is important to have urban plans designating new urban parks, it is even more important to have a process in place that values green space. Xi'an is no exception in this regard, except that peri-urban pressures are relatively less, and its historical status creates special challenges.

Xi'an is unique in that it has large areas of land protected by the national government for archeological reasons. For example, considerable land to the north-west of the city wall (labeled blue on Map 2), cannot be developed for archeological reasons. In the peri-urban area, numerous historical, particularly tomb, sites exist, and are off-limits to development.

The most recent urban planning cycle in China (2006–2020) pays much more attention to provision of park space, environmental services, land, etc., in areas not yet urbanized, but that will be urbanized by 2020. Chengdu and Wuhan are leaders in this regard, Xi'an may be lagging behind.

## Municipal Finance

### Role of the Municipal Government

Economic and financial strategizing falls under the aegis of the Xi'an Municipal Government, which has done well in terms encouraging economic growth as of reflected in the 13% annual economic growth rate the Municipality has experienced since 1992.

<sup>13</sup> Urban parks are one aspect of Chinese Urban Master Plans that are highly protected, approved by People's Congresses at the Municipal and Provincial levels, and by the State Council.

### Expenditure Structure

Financial analysis is limited by the fact that it is impossible to obtain information on off-budget expenditures. In fact off-budget revenue can only be estimated through other means (land sales data, the gap between all on-budget revenues and expenditure, etc.). However, it is known that in Xi'an, and almost all Chinese cities, most locally-financed infrastructure is paid from land lease revenues (off-budget). Large scale catalytic infrastructure may involve the national and provincial governments, or private financing, e.g., BOT for expressways.

### Revenue Structure

The table below describes in detail actual local government revenues, excluding off-budget revenues, such as land lease revenues, the latter generally constituting 25% or more of the official revenues.

**Table 9 2004 Local Government Revenues (Executed)**

Main Categories (10,000US\$)	2001	2002	2003	2004	2005
Total	67,629.1	72,547.6	88,003.6	103,940.7	104,052.4
Fund Budget	5,461.1	6,741.8	9,738.3	12,982.0	13,526.6
Ordinary Budget	62,134.9	65,805.8	78,265.3	90,958.7	90,525.8
Value Added Tax	9,720.9	11,001.2	12,697.8	12,098.7	12,145.0
Business Tax	17,726.7	22,514.7	27,940.6	34,660.6	27,539.2
Enterprise Income Tax	6,681.3	4,232.7	4,323.2	4,897.8	6,171.4
Refunds: Enterprises' Income Tax	0.0	0.0	0.0	0.0	-24.9
Individual Income Tax	5,894.1	2,678.1	2,599.8	3,059.9	3,666.5
Resources Tax	19.1	20.9	20.5	20.1	15.4
Tax on Adjustment of the Orientation of Investment in Fixed Assets	137.7	78.4	25.9	0.0	0.0
Tax on City Construction and Maintenance	3,394.6	4,360.4	5,236.8	6,028.9	7,796.8
Tax on Real Estates	3,053.1	3,650.6	4,177.7	4,544.4	3,436.3
Stamp Tax	548.0	659.7	947.3	1,131.5	1,495.8
Tax on Use of Urban Land	906.3	1,171.6	1,403.5	1,470.9	1,177.9
Land Value Added Tax	99.4	84.8	75.0	39.3	623.1
Tax on the Use of Vehicles and Ships	170.4	224.0	229.7	260.1	356.4
Slaughter Tax	5.1	4.7	0.0	0.0	0.0
Banquet Tax	15.3	0.9	0.0	0.0	0.0
Agriculture Tax	635.5	1,618.0	1,544.4	1,120.5	0.0
Tax on Special Agricultural Products	230.6	150.7	0.0	0.0	0.0
Tax on the Animal Husbandry	0.0	0.0	0.0	0.0	0.0
Tax on the Occupancy of Cultivated Land	442.3	741.3	926.3	1,409.2	1,746.1
Contract Tax	1,088.8	1,901.7	2,194.0	3,881.5	5,210.5
State-owned Assets Profit	267.0	119.9	1,309.9	2,489.7	1,904.6
Subsidies to Loss-suffering State-owned Enterprises	-1,295.1	-1,674.4	-375.0	-603.9	-24.8
Income from Administrative Fees	3,051.3	4,309.2	5,853.6	6,017.8	7,256.8
Penalty and Confiscatory Income	3,100.5	3,315.1	3,495.8	3,941.3	4,854.5
Revenue from Use of Land and Sea Area	7.4	7.3	4.7	15.0	23.1
Special Revenue	4136.84	3742.87	3086.35	3793.35	3842.5
Other Revenue	2097.95	891.43	547.46	682	1313.76

Source: Xi'an Statistics Yearbook (2002-2006).

As indicated by the table below, budget revenues have been increasing at approximately 9% during this decade. This means that revenues have not kept pace with Municipal GDP growth, which has averaged approximately 13% since 1992 – a trend that continues to the present. In other words, Municipal fiscal revenues are economic growth inelastic, an undesirable situation. The table indicates that revenue from land taxes constituted approximately 12.5% of on-budget revenues in fiscal 2005. Because land taxes have been growing at a slightly faster rate than overall revenues (11.8% during this decade), their share of on-budget revenues has increased from 11% to 12.5% over the decade. However, if we include land lease revenues (off-budget), assumed to be in the range of \$250 million USD in fiscal 2005 in Municipal fiscal revenues, land development related revenue accounts for approximately 29% of Xi'an's revenue basis. In other words, the city-building process is highly important in terms of generating Xi'an's revenue, even without a property tax. However, because city-building, especially on the periphery, entails high costs to the Municipal Government (developers do not pay impact fees, so the Municipality is responsible for providing access roads, sanitation infrastructure, etc., essentially from land lease revenues), it is not clear that land revenues cover real costs of city-building, especially assuming a longer term perspective that takes into account the costs of maintaining infrastructure systems. The system is obviously non-sustainable in that land lease revenues are essentially a one-off source of revenue (afterwards the land that the government sells is in the secondary market). Of course, this issue can be corrected at will through introduction of a property tax, etc., enabling policy frameworks would need to be put in place by the national government.

**Table 10 Municipal Government (on Budget) Revenue (Executed)**

Unit: Mil. USD	2001	2002	2003	2004	2005	Annual Growth Rate 2001–2005
Tax on City Construction and Maintenance	33.95	43.60	52.37	60.29	77.97	18.1%
Tax on Real Estates	30.53	36.51	41.78	45.44	34.36	2.4%
Tax on Use of Urban Land	9.06	11.72	14.04	14.71	11.78	5.4%
Land Value Added Tax	0.99	0.85	0.75	0.39	6.23	44.4%
Revenue from Land Taxes	74.53	92.67	108.93	120.83	130.34	11.8%
Total Municipal Revenues	676.29	725.48	880.04	1,039.41	1,040.52	9.0%
As % of total	11.0%	12.8%	12.4%	11.6%	12.5%	

Source: Xi'an Statistics Yearbook (2002–2006).

## Urban Growth Policy and Future Strategy

### *Spatial Dynamics*

#### *The Urban Core*

The intended redevelopment of the Walled City into a tourist zone, and height and planning constraints, is pushing office functions outside the wall. This is especially the case immediately outside the South Gate where the Chang'an Metropolis Centre is being built, and north of the Second Ring Road on Weiyang Road, which constitutes the northern spine of the city. Furthermore, the barrier effect of the Walled City is encouraging non-tourist transportation movement and urban development along the Second and Third Ring Roads, and the outer Beltway.

To the north, the XETDZ is repositioning itself, attempting to change from an area dominated by production alone, to a more integrated community with extensive housing, shopping, and business services. To effect this change, advocated by the national government, a new town (Suburban Sub-Center) is proposed directly north of the Weiyang Road business corridor described above. The centre piece of this development will be the relocation of the Municipal Government which will directly employ 20,000 employees; but with multiplier effects, this could add up to 40,000 households to the area, depending on the extent to which Municipal Government employees shift their residences. Further driving development to

the north is the planned development of a Logistics Center (inland container terminal) to the northeast of the planned Suburban Sub-Center and the future High Speed Rail (HSR) station. The latter, to be located about two kilometers north of the proposed Suburban Centre, is scheduled to start operations before the end of the decade.

The Provincial Government is trying to invigorate the northwest airport corridor, based on the concept of a Xi-Xian Economic Integration Zone in Weiyang District of Xi'an and Fenghe District of Xianyang Municipality. This corridor is being supported by new infrastructure development, including a new expressway link between the new Logistics Centre, the XETDZ, and the airport.

### *The Periphery*

Peri-urban development has been very limited, even when the effects of the floating population are taken into account; however, this appears to be changing. Slow growth in the peri-urban areas is explained by past lack of demand for sites for privately owned manufacturing activity outside the city proper, unlike coastal cities where firms developed extensive peri-urban areas in search of migrant labor, lower priced large plots of land, and relatively less local government bureaucracy.

The city proper's growth rate is 3.1%; nonetheless, peri-urban growth is starting to occur, in the shape of an upside down "T", i.e., in a broad arc around the southern third of the city's perimeter, plus along the northern axis (to Jingwei Heavy Industrial Park). Growth rates are very high along this "T", reflecting low base urban populations. The broad band of rapid peri-urbanization across the southern arc of the city is growing the fastest and accounts for the majority of peri-urbanization in absolute terms. High-end residential and economic activity is gravitating to the south supported by the University and Research Institute area, the High Tech Zone, and the new CBD.

The only administrative area in the northern arc of the city that is growing fast is Gaolin County, growing at 22.1%. Its rapid growth is driven by rapid development of heavy truck manufacturing and petro-chemical equipment manufacturing consolidation (from Xi'an's hinterland), and associated large-scale worker housing developments, in the Jingwei Heavy Industrial Park.

Both the incipient suburbanization (to the south) and peri-urbanization (to the north) is more of a spill-outwards process than the FDI driven peri-urbanization in coastal cities which is much less functionally and geographically related to the existing city. Population growth to the east and west is slow. New urban growth is also slowed by high levels of protection rightfully accorded ecological and archeological heritage in Lintong.

### **Key Drivers in Future Development**

Looking to the future, Xi'an's spatial development is likely to be driven by the following key drivers:

- (i) **Software Cluster:** The emergence of a strong software cluster in the XHTDZ to the immediate south west of the walled city ranks second in China in terms of HTDZ employment. It accounts for one-fifth of Municipal GDP and 280,000 jobs and has 70,000 residents. The XHTDZ has become so dominant that it is constructing a "new CBD" in the zone. Within the XHTDZ, software development is especially important and is expect to grow rapidly, with the value of production increasing from 4.9 to 30 billion RMB between 2003 and 2020, and employment increasing from 40,000 to 200,000.
- (ii) **Ecological and Technological Development Zone (ETDZ):** As indicated in the map below, the ETDZ consists of two components: a suburban center close to the northern wall, where the Municipal Government will move from the walled city, and the Jingwei Heavy Industry industrial zone further north, emerging as a center for the manufacture of heavy vehicles and oil field equipment.

- (iii) **Tourism:** Tourism has emerged as a major component of the economy, centered on the walled city and the Terra Cotta Warriors and the Tang Dynasty Huaqing Lake Summer Palace sites near Lintong to the east. Tourism is contributing to pressures to redevelop the city's historic core and has driven the creation of the Lintong Tourism Corridor, defined by an expressway that connects the city to the Terra Cotta Warriors site, thus creating a centripetal impact.
- (iv) **Oil Industry:** The continued strength of the oil industry (Xi'an is the third most important petroleum support cluster in China), given rapid rise in global petroleum prices, is driving the Weiyang Business Corridor located immediately north of the wall's north gate.
- (v) **Business Sub-Center:** The organic, or self-organizing, rise of a business sub-center, anchored by the Chang'an Metropolis financial complex and two five-star hotels, immediately outside the South Gate of the wall.
- (vi) **Qujiang New District:** More typically, the late emerging high end residential district in Qujiang New District along the southern arc of the beltway (Third Ring Road), explained by its proximity to the university and research district, the XHTDZ, and civic and leisure facilities, is being developed under a special economic zone model. A typical flagship neighborhood (including residential and entertainment functions) is planned for the Qujiang New District.
- (vii) **Aerospace City:** The growth of a large aerospace economy in Yanliang Aerospace City employing 60,000 workers and housing 100,000 residents, anchors peri-urban development to the northwest of the built up city. However, this state enterprise anchored cluster zone is facing strong competition from emerging aerospace centers such as Harbin (Embraer) and Tianjin (Airbus), as it attempts to restructure toward more international joint ventures, more emphasis on civil aircraft, etc.

### **Policy Instruments**

Policy plays a role in Xi'an in several ways, as identified below:

- (i) Some current policy instruments such as the basic agricultural land protection and land quotas appear to actually *encourage scatter and leap-frogging on the periphery*. Land protection measures create quilt-like agricultural and urban landscapes while land quotas encourage targeting of rural collective villages (which are inherently scattered) for land conversion. Guidelines of the Ministry of Construction also encourage misuse of land in the peripheral area, in particular the guideline that 15–25% of land should be in industrial use. This is a reflection of the fact that industrial land, until 2005, was priced far below market value (sometimes given away), and the priority placed on production (rather than consumption) during the pre 1980s command economy period.<sup>14</sup>
- (ii) On the other hand, other policy guidelines encourage dense development. The Ministry of Construction has developed standards for overall urban densities. The most important is that new urban development should be at a density of approximately 10,000 persons per square kilometer. In Xi'an this guideline may play a positive role, by exerting pressure on the city to avoid extensive areas, or even pockets, of low density development.
- (iii) Perhaps the most important public policy shaper of land use on the periphery of Xi'an is the role that special economic zones play. As noted, Xi'an's land use and urban form is especially affected by the decisions made by managers and planners of special economic zones. In Xi'an, with the exception of the Yangliang Aerospace City, special economic zones have generally been built contiguous to the built up city, this is especially true in regard to the XHTDZ and the XETDZ.

In the case of Xi'an, the freed-up industrial land (brownfield sites) is often used for residential use, partially accounting for the increasing high residential densities in the core city. Not only does it remove polluting industries from the core, freeing up the land for high-density tertiary or residential uses, but the whole

<sup>14</sup> For more details on wasteful use of urban industrial land in China, see: Bertaud, Webster, Cai, et al, 2007.

process was self-financing. Xi'an uses special economic zones and infrastructure to structure outward expansion. *Basic protected agricultural land provisions* also shape outward expansion at the micro level. However, in the case of Xi'an, roads alone appear to have less impact in inducing urban development. Because infrastructure is more carefully planned within special economic zones, at the micro level, infrastructure plays a more active role in shaping urban form within special economic zones than outside them, where development patterns are more the product of a myriad of developers acting in a non-coordinated way, with site and feeder infrastructure often following development. Xi'an is not a leader in developing new policy mechanisms, such as land re-adjustment. Rather, it has used existing mechanisms to shape the city. However, consistent with Chinese practice, there is an expectation for Xi'an to adopt new mechanisms from 4 sources: (i) best practice in other cities (particularly nearby second tier cities such as Chengdu and Wuhan), (ii) new policies and practices introduced by the national government, (iii) global best practice introduced by international organizations, including the World Bank, and (iv) leading property developers.

### **Scenarios for Urban Growth Management**

There are several actions that Xi'an could consider taking to improve its urban growth management performance – some require changes in national frameworks, while others do not. Given the fact that the city's physical structure is strongly driven by economic drivers and the dynamics of the economy are spatially centripetal, the opportunity exists for Xi'an to become even more energy, human time, and land conversion (minimizing agricultural land loss) efficient. Key strategies to achieve greater land use efficiency in the short to medium run would include:

- (i) A clearer spatial development strategy for the city as a whole is needed. This strategy would clearly define suggested FARs at a city-wide scale, with high FARs being aligned carefully with subway stations (especially intersection stations). A 500–700 radius around stations is suggested for high FAR designation. Significant levels of mixed use development should also be encouraged around key transit stations.
- (ii) Xi'an is an excellent case to implement growth boundary policies on a demonstration basis. Because it has been growing contiguously, peripheral development pressures are limited, and because it has a history of compactness and high densities, the “shock” to local stakeholders would be less.
- (iii) Introduce new redevelopment mechanisms, both for the core city and the periphery that provide more benefits to existing residents, both for equity reasons, and to expedite appropriate urbanization processes (urban redevelopment, in-filling, high density peripheral development).
- (iv) Xi'an is likely to designate more green space, especially in the periphery, by 2020. It should avoid green belts that create inefficient land use and instead create green wedges, preferably following ecological features and contour such penetrate from the periphery into the city. Also, given the high densities that prevail, parks should have as high an edge-to-area ratio as possible.
- (v) Make amenity improvement a strategic priority given Xi'an's economic strategy to excel in software, aerospace, tourism, etc. In other words, align economic and spatial / built form strategies.
- (vi) Formulate a high quality redevelopment plan for the walled city that would include appropriate mechanisms to implement the project, e.g., land re-adjustment, private-public co-operation.
- (vii) Accelerate implementation of mass transit lines 2 and 3, downgrading the priority of line 1. Attempt to offer rapid transit alternatives to the private vehicle as early in the motorization trajectory as possible, so that people make travel habits and residential location decisions based on transit networks.
- (viii) Improve planning for nodal development, in particular the northern Business / Municipal Government Suburban Center, and the new “CBD” in the High Tech Zone. Co-ordinate the planning of the northern Suburban Center with the emergence of the Weiyang petroleum headquarters corridor to avoid a “dead” strip between these two nodes.



- (ix) Raise the quality of neighborhood design, utilizing out-of-town (including international) developers as trailblazers.
- (x) Improve the tourist product as a means to support high quality redevelopment of the walled city and parts of the Qujiang New District. For example, establish night markets, well interpreted walking/tram tours, craft workshops, period theatre and re-enactments, etc.

### **Conclusions and Recommendations**

Xi'an is attractive from an urban form perspective in many ways, e.g., relatively high densities, lack of peri-urban scatter, compactness, etc. However, its failure to create a more differentiated vital urban system and deliver amenity is significantly constraining its future development prospects. The latter shortcoming reflects the fact that consumer preferences are not yet significantly reflected in built form. The Municipal Government will continue to play an unusually strong role in shaping Xi'an through special economic zone processes. However, the future quality of the city will largely depend on consumer power and preferences, and the quality of work undertaken by property developers. Upgrading of planning/construction mechanisms, e.g., FAR policy, design processes involving the public and private sectors, land readjustment, is needed to facilitate more effective shaping of the city; a challenge facing Chinese urbanization as a whole. Because Xi'an will not have a strong CBD, a justifiable policy (multi-nodal cities have advantages in terms of less congestion, easier access to employment, spatial equity, etc.), special efforts will need to be taken to make the Sub-centers as vital, high in design quality, and functionally focused, as possible.

As indicated by the Xi'an case, Chinese cities contain both areas that are highly planned, the special economic zones, and areas that are developing more organically, such as the business clusters emerging just outside Xi'an's North and South gates. Economic function determines the overall spatial pattern of Xi'an to a significant extent, much more so than, for example, in Latin American cities such as Quito, where residential dynamics of the rich, the middle class, and the poor play a much more dominant role in shaping urban form. In Xi'an the rise of the software and tourism clusters are contributing to the strength of centripetal forces, while the lack of FDI is manifest in a relatively subdued level of peri-urban development. In general, the role of the state is declining in city building, whereas the role of private property developers and civil society is increasing. The latter is indicated by the important role of organized local residents in determining the fate of urban redevelopment, especially within the walled city. As the market economy becomes more important, the impacts of more inequitable income distribution are being manifest in physical form, even in a city such as Xi'an, which came late to the market economy.

***EXPLORING URBAN GROWTH MANAGEMENT  
IN THREE DEVELOPING COUNTRY CITIES***



***ANNEX 3***

***CITY REPORT – HYDERABAD, INDIA***

**ABBREVIATIONS AND ACRONYMS**

AP Transco	Andhra Pradesh Transmission Corporation Ltd
BRTS	Bus Rapid Transit System
CAGR	Compounded Annual Growth Rate
CBD	Central Business District
CDA	Cyberabad Development Authority
CDP	City Development Plan
CTTS	Comprehensive Traffic and Transportation Study
GDP	Gross Domestic Product
GoAP	Government of Andhra Pradesh
GoI	Government of India
HDA	Hyderabad Development Area
HITEC	Hyderabad Information Technology Engineering Consultancy City
HMA	Hyderabad Metropolitan Area
HMDA	Hyderabad Metropolitan Development Authority
HMR	Hyderabad Metro Rail
HMWSSB	Hyderabad Metropolitan Water Supply and Sewerage Board
HUA	Hyderabad Urban Agglomeration
HUDA	Hyderabad Urban Development Authority
INCAP	Infrastructure Corporation of Andhra Pradesh
IPT	Intermediate Public Transport
IT	Information Technology
ITES	Information Technology and IT enabled services
ITS	Intelligent transportation System
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
KL	Kilo Litre
MCH	Municipal Corporation of Hyderabad
MP	Master Plan
MRTS	Mass Rapid Transit System
MT	Metric Ton
NH	National Highway
NHAI	National Highways Authority of India
NUTP	National Urban Transport Policy
O&M	Operation and Maintenance
ORR	Outer Ring Road
PCU	Passenger Car Unit
PTS	Public Transport System
Rs.	Indian Rupees
RTA	Regional Transport Authority
SCB	Secunderabad Cantonment Board
SH	State Highway
SPV	Special Purpose Vehicle
TR&B	Transport Road and Bridge Department
TSM	Transportation System Management
ULBs	Urban Local Bodies
UMTA	Unified Metropolitan Transport Authorities
ZDPs	Zonal Development Plans

## CONTENTS

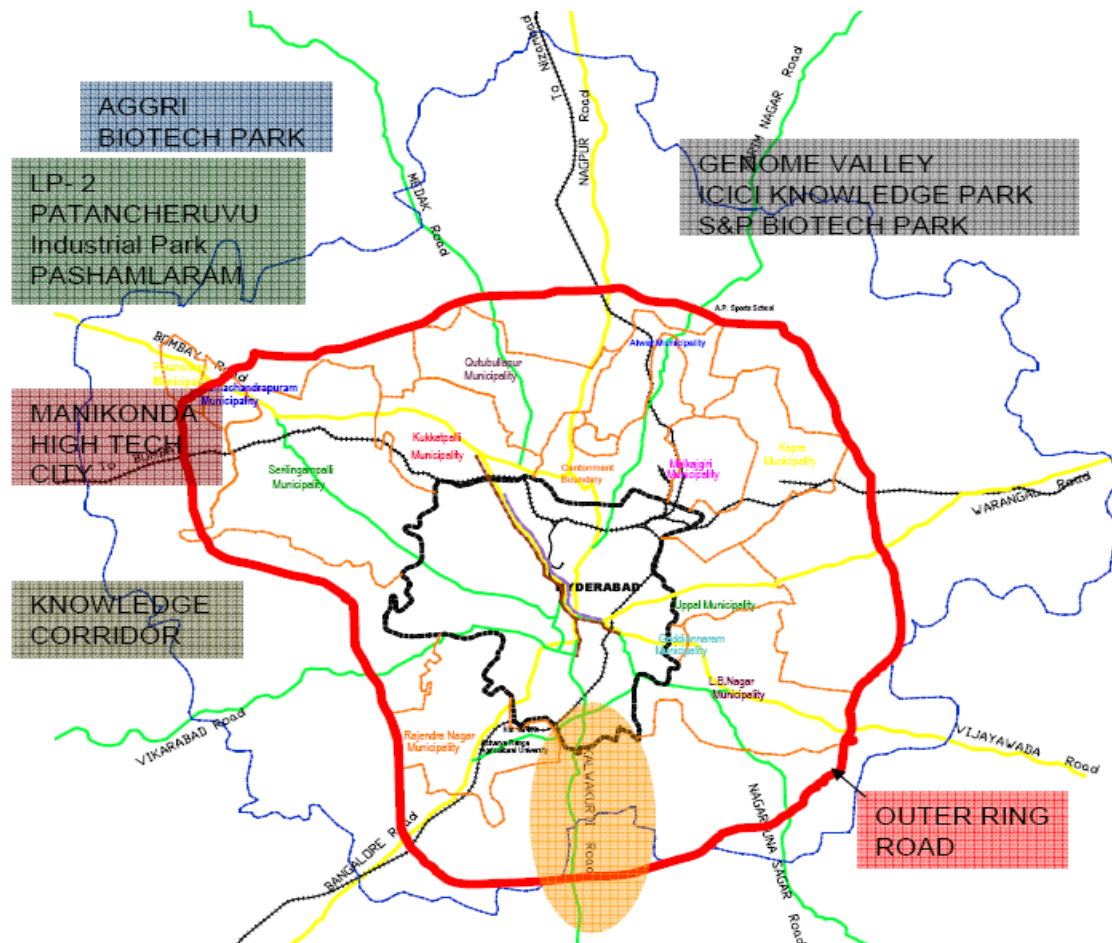
	Page
<b>Demographic and Spatial Aspects .....</b>	<b>92</b>
<i>Basic Parameters .....</i>	<i>92</i>
<i>Demographic Growth.....</i>	<i>93</i>
<i>Population Density.....</i>	<i>94</i>
<i>Housing Characteristics.....</i>	<i>94</i>
<b>Urban Growth Management: Drivers and Spatial Processes .....</b>	<b>95</b>
<i>Current Drivers .....</i>	<i>95</i>
<i>Land Use and Spatial Elements.....</i>	<i>97</i>
<b>Transport .....</b>	<b>100</b>
<i>Planning Processes .....</i>	<i>100</i>
<i>Trip Characteristics .....</i>	<i>100</i>
<i>Road Network.....</i>	<i>101</i>
<i>Transport Initiatives and Strategy.....</i>	<i>102</i>
<b>Open Space.....</b>	<b>103</b>
<i>Classification and Status of Open Space.....</i>	<i>103</i>
<i>Conservation Strategies .....</i>	<i>103</i>
<b>Municipal Finance.....</b>	<b>105</b>
<i>Role of the Municipal Government.....</i>	<i>105</i>
<i>Expenditure Structure.....</i>	<i>105</i>
<i>Revenue Structure.....</i>	<i>106</i>
<b>Urban Growth Policy and Future Strategy.....</b>	<b>107</b>
<i>Spatial Dynamics.....</i>	<i>107</i>
<i>Key Drivers.....</i>	<i>107</i>
<i>Policy Instruments.....</i>	<i>108</i>
<i>Scenarios for Urban Growth Management .....</i>	<i>109</i>
<i>Conclusions and Recommendations .....</i>	<i>111</i>
 <b>Tables</b>	
Table 1 Population Growth Rate and Density in HMA .....	94
 <b>Figures</b>	
Figure 1 Modal Split .....	101
 <b>Maps</b>	
Map 1 Hyderabad and Its Growth Centers .....	92
Map 2 Hyderabad's Growth Areas.....	95

## Demographic and Spatial Aspects

### Basic Parameters

Hyderabad is the capital of the State of Andhra Pradesh and is the sixth largest urban agglomeration (UA) in the country. Located on top of the Deccan Plateau, Hyderabad is 1,776 ft above sea level and is noted for its natural beauty, temples, mosques, works of art and artifacts. It has in the past decade and a half established itself as a center for Information Technology (IT) industries and accounts for 10% of IT exports of the country. The setting of new IT ventures in the city and the upcoming international airport will place Hyderabad as a regional hub in Southern Asia.

Regionally, Hyderabad occupies a strategic position. It lies on the junction of several important national and state highways and trunk, air and rail routes, which link it with other metropolitan centers and key centers of importance in the country. The well-developed national, state and regional railroad network crisscrossing the city improved the access of Hyderabad to a number of key growth centers within and outside the State.



Source: This Study

**Map 1 Hyderabad and Its Growth Centers**

The Hyderabad Metropolitan Area (HMA), also known as the Hyderabad Development Area (HDA) under the jurisdiction of the Hyderabad Urban Development Authority (HUDA), covers an area of 1,905 km<sup>2</sup>.<sup>1</sup> The HMA consists of three distinct areas:

<sup>1</sup> Since the SCB and the Osmania University are being administered separately, the HMA is essentially 1,865 km<sup>2</sup> in area.

- (i) **Core.** Municipal Corporation of Hyderabad (MCH) comprises the old city of Hyderabad and Secunderabad. This constitutes the core of the HMA and is spread over an area of 172 km<sup>2</sup>.
- (ii) **Sub-urban.** Greater Hyderabad Municipal Corporation (GHMC), having come into existence very recently (April 16, 2007) includes the MCH and 12-peripheral municipalities.<sup>2</sup> The GHMC is spread over an area of 625 km<sup>2</sup> and include 12 municipalities.<sup>3</sup>
- (iii) **Peri-urban.** The peri-urban area of Hyderabad includes several villages and Gram Panchayats. This area has four special development areas located within it, which are governed by independent development authorities. These are:
  - Cyberabad Area under the jurisdiction of the Cyberabad Development Authority (CDA) spread over an area of 52 km<sup>2</sup>;
  - Hyderabad International Airport under the jurisdiction of the Hyderabad Airport Development Authority (HADA) spread over an area of 469 km<sup>2</sup>;
  - Secunderabad Cantonment under the jurisdiction of the Secunderabad Cantonment Board (SCB) and spread over 40.1 km<sup>2</sup>; and
  - Osmania University under the jurisdiction of the university spread over an area of 3.4 km<sup>2</sup>

Since the Government of Andhra Pradesh (GoAP) instituted GHMC as a functioning entity in April 2007, the total land area of the HMA increased almost three times to approximately 6,000 km<sup>2</sup>, covering an additional 600 revenue villages. In the next decade development is largely anticipated in the GHMC area, with a subsequent likely spillover to the enlarged HMA only.

### **Demographic Growth**

As per the Census 2001, the population of the Hyderabad Urban Agglomeration (HUA) was pegged at 5.53 million and accounts for approximately 75% of the total urban population of the State. The HUA also exhibited a decadal growth rate of 32%, which makes Hyderabad the fastest growing metropolitan city in the country.

The HUA has indeed shown a sharp increase in population in the last two decades. A key feature of demographic growth in HUA is that most of the growth occurs in the surrounding areas (sub-urban, i.e. MCH and the surrounding 12 municipalities). The population of the HUA witnessed a significant increase in the decade 1981–91, from 2.8 million to 4.3 million, registering a growth rate of 58% or 4.38% compounded annual growth rate (CAGR). The increase in 1991–2001 was relatively less (5.5 million in 2001), registering a growth rate of only 27% or 2.49% CAGR. The substantial increase may be attributed to the fact that between 1981 and 1991 Hyderabad emerged as a major industrial and commercial center and the thrust given to the economic development of the region fuelled this growth.

The population growth in MCH's surrounding municipalities was significant between 1981 and 1991 at 147% as against 42% in the MCH area, and 58% in the HUA for the same period. This period witnessed a slow densification of loosely built up areas along major transport corridors of the city, mainly the radial roads. Between 1991 and 2001, the population growth in surrounding municipalities stood at 66% as against 19% for the MCH area and 29% for the HUA area, showing a trend towards stabilization. This period witnessed a saturation of MCH, spill over of growth from the MCH to the immediate surrounding municipalities, mainly in terms of residential and rapid densification of areas around Industrial Sites in the periphery of the sub-urban.

Since 2001, the population growth rates have stabilized and both the Draft Master Plan (Hyderabad 2020) and the City Development Plan (CDP) expect a growth rate of 36.80% for the years 2011 to 2021.<sup>4</sup>

<sup>2</sup> Nine of these Municipalities were added to the MCH area in 1991, a tenth was added in 2001 and two have been added recently in April 2007.

<sup>3</sup> The Secunderabad Cantonment Area, Osmania University and other areas, though part of this zone, are governed independently.

<sup>4</sup> When the figures for the latest changes in the territorial jurisdiction are adjusted, a 33% growth rate emerges.

According to the projections of the Draft Master Plan, the HMA will accommodate a population of 9 million in 2011 and 13.6 million in 2021.

### **Population Density**

The growth rate and the process of densification is the highest in the sub-urban areas, i.e. the 12 surrounding municipalities. While the increase in population in the core has reduced substantially, the increase in the periphery is particularly acute. The population density in the periphery, though low, has shown a sharp increase in the last decade – from 2,367 persons per km<sup>2</sup> in 1991 to 3,932 persons per km<sup>2</sup> in 2001 – while the densification pattern in the core was comparatively low. What assumes significance is that the peri-urban areas having the lowest density of population have recorded the highest growth rate.

As indicated earlier, most of the growth in HMA occurs in the surrounding municipalities (ranging from 56% to 103%) while the population growth in the MCH area is only 19.3%. All municipalities have grown by more than 50% compared to MCH and Secunderabad Cantonment Area. Furthermore, the densification pattern has shown a positive trend in the past decade. While the core densification occurs at a much slower pace, the sub-urban and the peri-urban areas indicate a rapid densification pattern. The Draft Master Plan for the HMA suggests a similar densification pattern for the future development of the city. The plan concentrates on the sub-urban areas where 60% of the land is vacant and the development controls and guidelines aim at the development of this area.

**Table 1 Population Growth Rate and Density in HMA**

Area	1981–91 Decadal Growth %	1991 Density Person/ km <sup>2</sup>	1991–01 Decadal Growth %	2001 Area in km <sup>2</sup>	2001 Density Person/ km <sup>2</sup>
MCH Area	41.57	17,636	19.34	172	21,049
12 Municipalities	147.40	2,367	66.10	452.9	3,932
Secunderabad Cantonment	25.85	4,261	21.10	40.17	5,160
Osmania University	-23.28	3,562	10.40	3.4	3,932
Other areas of Urban Agglomeration (13 OG) + 2 Census Towns	89.6	1426	-42.01	109.6	826
Total- Urban Agglomeration	58.2	5,723	28.5	778.17	7,354
Other areas not included in Urban Agglomeration (Ghatkesar, Medcharl and Rural areas)	33.20	269	108.60	1,127	560
<b>HUDA Area</b>	<b>56.30</b>	<b>2,497</b>	<b>33.60</b>	<b>1,905*</b>	<b>3,335</b>

Source: Draft Master Plan and Analysis.

\* Since the SCB and the Osmania University is administered separately, the total area under the HUDA jurisdiction is 1,865 km<sup>2</sup>.

### **Housing Characteristics**

Urban GINI (household income distribution) coefficients in Hyderabad are lower than in most Latin American metropolitan areas, but are rising rapidly, given the dualistic (knowledge – non-knowledge sectors) nature of Hyderabad's economy, which significantly suffers, in income distribution terms, from the lack of widespread manufacturing – which provides an upward ladder for less educated urban residents, including migrants.

In terms of income distribution, for the core and sub-urban areas of Hyderabad, the majority of households have a monthly income between Rs. 5,000 – Rs. 10,000, followed by income of Rs. 2,000–5,000 (26.8%). For the peri-urban area, the income level is much lower. 45% of households have incomes of Rs. 2,500–5,000, followed by 40% of households with incomes of Rs. 5,000–10,000. Hyderabad, slums in the built up area are dense, usually denser than residential areas occupied by households with higher

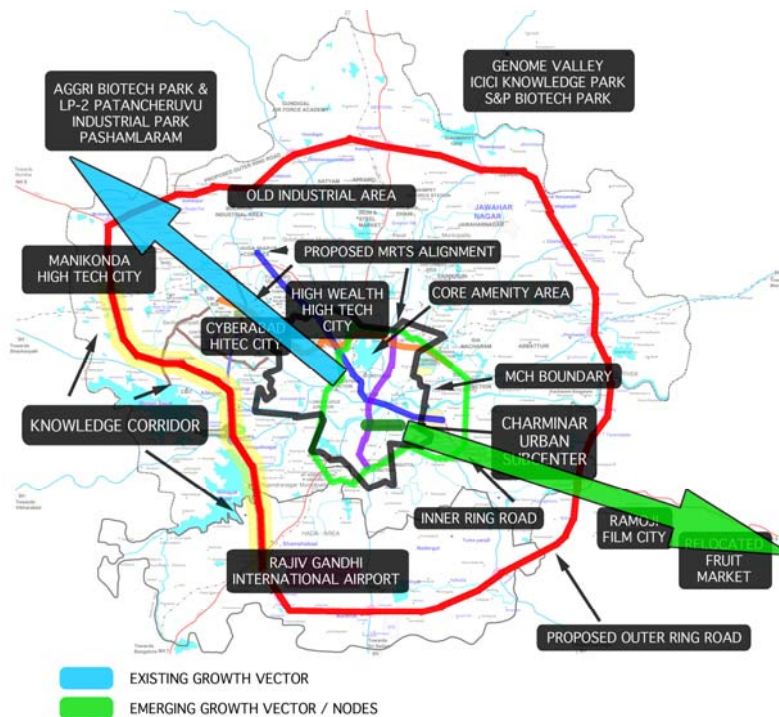


incomes. The city core has a total of 794 slums spread over 9.11km<sup>2</sup>. In comparison, there are only 33 slums identified in the surrounding nine municipalities (data available only for the nine municipalities); however, these ‘pockets’ as indicated in the income levels above are often poorer than those in the urban core. According to the Census 2001, 21% of the total population in the HUA live in slums (as per GoAP estimates, the slum population is pegged at approximately 34% of the total population of the HUA). The GoAP through its various plan fund allocations and programs has been addressing the problems of slum improvement and upgrading. At the metropolitan level it is important that the local bodies increase the availability of serviced land for housing the urban poor by raising resources from the private sector. Incidence of ‘External Betterment Charges’<sup>5</sup> and ‘Premium FAR’<sup>6</sup> are the two tools quoted by the Draft Master Plan to raise resources for urban infrastructure development — this approach may enable cross subsidization of infrastructure for the urban poor.

## Urban Growth Management: Drivers and Spatial Processes

### Current Drivers

Cities are the product of decisions and actions of government policy makers, planners, developers/builders, and consumers. In the case of Hyderabad, the city’s structure is being determined more and more by economic drivers and less by the government and religion.



Map 2 Hyderabad's Growth Areas

<sup>5</sup> External betterment charges are defined as the tax payable on account of an increase in the value of land resulting from the execution of a development scheme. The levy of a betterment tax is subject to the following: Where as a consequence of execution of any development scheme, the market value of any land in the area comprised in the scheme which is not required for the execution thereof, has in the opinion of the authority, increased or will increase the authority is authorized to levy on the owner of the land or any person having an interest therein a betterment tax in respect of the increase in value of the land resulting from the execution of such a scheme. Such increase in value shall be the amount by which the value of the land on the completion of the execution of the scheme estimated as if the land were clear of buildings, exceeds the value of the land prior to the execution of the scheme estimated in like manner, and the betterment tax shall be one-third of such increase in value.

<sup>6</sup> The concept of Premium FAR is introduced to enable the owners/promoters to avail extra FAR on payment of fee subject to regulations and procedures.



In the past, the near north around the lake was the high status area, near the seat of government. At the same time, a second spatial ordering driver existed based on religion with Hindus tending to live toward the north and Moslems toward the south – with socio-economic differentiation within both these populations creating finer grained distinctions. However, since the 1990s, with the dramatic rise of *high technology*, the north of the city (reinforced by, or explained by the existing nearby international airport) has become the center of the urban economy, fashionable hotels and retailing, cafes, etc

### *Urban Economy*

Hyderabad is not only the administrative capital, but also the economic and financial capital of Andhra Pradesh. It is the largest contributor to the State's gross domestic product (GDP), state taxes and excise revenues and has reached high levels of commercialization and monetization. The GDP, at current prices, of Hyderabad has grown from Rs.101,230 million in 2000–2001 to Rs.152,020 million in 2004–05. GDP, at constant prices of 1999–2000, has grown from Rs.101,230 million in 1999–2000 to Rs.127,130 million in 2004–05. In terms of growth, GDP at current prices has grown at a compounded annual growth rate (CAGR) of 10.7% over the five year period (FY2000 to FY2005). In real terms, GDP (at constant prices of 1999–2000) has grown at a CAGR of 6.9% over the five year period. The above rapid growth in GDP has resulted in increased per capita income, at current prices, which has grown from Rs.22,777 in 1999–2000 to Rs.32,789 in 2004–05 at a CAGR of 9.5%. In real terms, the per capita income during this period has grown at a CAGR of 5.7%. The Consumer Price Index (CPI) for industrial workers in Hyderabad has risen at a CAGR of 5% during the five year period.

The aforementioned statistics are indicative of HMA's rapid transformation – not only in terms of the urban economy, but also in terms of occupational profile. The occupational profile has changed in the last decade or so with the primary and secondary sectors declining and the tertiary sector emerging as the main employment generator. Recent trends indicate a shifting trend towards the tertiary sector and employment on account of the emergence of IT and knowledge based industries in the region. The number of workers employed in the primary sector is very low as the area is largely urban. Over the past couple of decades, Hyderabad's economy has shifted from a primarily service city to a more diversified profile (comprising trade, commerce, industry, transportation, storage, communication and construction sectors). While the manufacturing sector (pharmaceuticals, electronic goods, and other industrial products), especially the pharmaceutical industry is expected to play a dominant role even in future, the tertiary or service sector has increased over recent years with a significant proportion of new jobs across a whole range of activities. Of late, the service sector has emerged as the single largest employer and will continue to grow as the dominant sector in the future considering the developmental initiatives planned in the region. The sector contributed to more than 72% of the total city's workforce in 1991 due to the development of IT sector and bio-technology related services.

IT is the overwhelming driver of the urban economy, accounting for 72% of output, steering the "modernization" of the north side of the metropolis, particularly the north-west, where the IT complexes (such as Manikonda High Tech City) tend to be concentrated. Plans for a *Cyberabad Development Area* to the west of the city, if implemented, will contribute to a "knowledge corridor" along the western, outer ring road, reinforced by the new airport to the south.

### *Governance*

Governance is another driver of Hyderabad – a more complicated one. With the transformation of the "state" and rapid changes in the development paradigms namely privatization and public-private participation, governance and the appropriate balance between various institutions in the government and the market will be a major determining factor in Hyderabad's development. Hyderabad's governance is key in its efficient development and growth management, which will not only steer the development process in a sustainable manner, but will also adopt a proactive stance towards tackling the negative impacts of rapid urbanization. Hyderabad

India follows a system of three tier planning and governance at the federal, state and the local level. Urban development is a state subject and the state Urban Development Department is responsible for urban

governance and management in urban local bodies (ULBs) of the State. Within the larger gamut of state government departments, local bodies and parastatals the following are involved in controlling the urban development of Hyderabad Metropolitan Area, namely the GHMC and the Hyderabad Urban Development Authority (HUDA). The HUDA, a legacy of the colonial period, as in other Indian urban centers, holds significant power over infrastructure delivery, but is essentially not politically accountable. Thus aside from the normal vertical hierarchy of governance, a dualism exists between the development authority and elected local governments. The problem has been compounded by the fact that middle and upper class residents increasingly “protect” themselves from poor service delivery (by building water storage tanks, purchasing generators, etc.), reducing the motivation of the middle and upper class constituencies to push for change in the delivery of basic services. (For example, no metropolitan area in India delivers water to residential neighborhoods on a reliable basis for more than two hours per day.)

### *Real Estate Market*

In conjunction with the urban economy, Hyderabad’s real estate market has been a key driver in its development for the last decade. The unparalleled IT boom has sent real estate prices skyrocketing and with an increasing number of IT companies heading toward the Andhra Pradesh capital and the city gaining the prestigious \$3 billion Fab City Project, Hyderabad has started growing in leaps and bounds. Additionally, the new International Airport scheduled to be ready by 2008, the completion of the Outer Ring Road with satellite townships, and the proposed Mass Rapid Transit System (MRTS) will place Hyderabad as the most sought out destination for real estate developers

The real estate market in the Hyderabad Metropolitan Area is considered not to be driven by people purchasing for self occupation, rather the sharp increase in the property values is a result of excessive speculation on account of the IT boom in the city. It was understood that a typical parcel of land in a period of one year undergoes transaction at least three times, thereby reinforcing the ‘land for speculation’ aspect of the real estate. When the bubble bursts, prices will tumble, causing the real estate market to collapse. This is an area of concern and the planning policies and strategies need to address this issue. In parallel, what the city is witnessing is a movement of people towards the periphery (also facilitated by the fact that the core is saturated) where the IT sector is located. For instance, current property prices clearly reflect the value of locations in the northwest quadrant of the metropolitan area, e.g., along the Bombay Road axis (IT development area). The immigrants to the city also prefer to stay close the IT hubs, as a result large scale housing has come up in the periphery.

### **Land Use and Spatial Elements**

#### *Trends in Urban Development*

The city of Hyderabad has largely developed around the Musi River, a tributary of the Krishna River. With the formation of the state of Andhra Pradesh in 1950, the city witnessed rapid development and the city became multifunctional in character with haphazard growth and irregular pattern of circulation. To address the negative effects, the development plan of 1975 was notified to cater to the urban growth requirements of 172 km<sup>2</sup> of area under the MCH. Between 1975 and 1985 the city witnessed a boom in terms of developmental activities and the following were undertaken:

- (i) Constitution of the HUDA and the HMA where a Master Plan was prepared for a larger area of 1,905 km<sup>2</sup> guiding the urban growth in the aforesaid area.
- (ii) Development of an internal ring road was undertaken in the early 1980s. During this time period and a trend that continued till the late eighties was the slow densification of the loosely built areas along the major transport corridors.
- (iii) Parallel development of two major townships as major investments by the HUDA steered the course of development on either sides of the NH9. The establishment of Vanasathalipuram spread over 162 ha steered the development towards Vijayawada in the southeast and the establishment of Ramachandrapuram over 81 steered urban growth towards the northwest along the NH9 towards

Mumbai. The major objective was to decongest the core of the city center.

From 1990 to 2001, the economic profile of Hyderabad underwent a transition whereby the traditional manufacturing sector was replaced by the knowledge based sector particularly IT and IT Enabled Services (ITES) along with the biotechnology sector. The government policies promoted this sector through a series of initiatives and programs. The establishment of the HITEC City; proposed international airport at Shamshabad; and the Biotechnology Park were some of the initiatives that were initiated and finalized during this time period.

- (i) The IT boom started in 1993; with the establishment of the HITEC (Hyderabad Information Technology Engineering Consultancy) City. This prompted several information (IT) and Information Technology Enables Services (ITES) to set up operations in the city. A further boost was given with the demarcation of the special development area, the Cyberabad Development Area in 2000–01.
- (ii) The parallel establishment of the HADA area catering to the comprehensive development of the International Airport at Shamshabad and its environs.
- (iii) The carving out of the Budh Purnima Project area as a major public recreation and open space area as a major node.
- (iv) Relocation of the wholesale fruit market from Moharanjahi Market in old Hyderabad to the Gadianaram Municipality in the outskirts on the NH9, the main objective being the decongesting of the city core. This once again shifted the course of development towards the southeast.
- (v) In the same time period, the State Urban Development Strategy was finalized and the Mega City Project was initiated, under which several infrastructure provisions and upgradation projects were undertaken.
- (vi) For the first time ever the concept of conservation of heritage areas was brought in through the inclusion of the heritage and conservation regulation within the urban planning and management system.
- (vii) The setting up of Singapore Residential Township in the far-flung Ghatkesar route on the Warangal Highway towards the east emerged as a self contained city. Development on this route is visible all over with many residential and commercial ventures arising rapidly around areas close to the township.

In the current decade, the one major intervention, which has spurred the development in the sub-urban zone and is ultimately responsible for connecting the sub-urban area, is the Outer Ring Road. The ORR is designed to provide connectivity in the sub-urban areas, therefore opening these areas and spurring growth outside the core. Furthermore, it has set off a real estate boom. Along with the formation of the GHMC, certain far-flung areas have suddenly sprung into prominence, Shadnagar being one of them. This small town, approximately 20 km from the international airport is now connected by the ORR and is situated along the periphery of the new HUDA area. The town has emerged as an attractive real estate destination.

#### *Draft Master Plan (Hyderabad 2020)*

The current Draft Master Plan is largely a land use based spatial plan, which outlines provision for land requirements for an anticipated population of 13.6 million to be accommodated in the year 2021 in the HMA. Being a spatial plan, the Draft Master Plan does not lay much emphasis on the evolving policy statements. In particular, the Plan proposes the following:

- (i) **Residential.** The Draft Master Plan adopts a policy of reasonably high densities in the core and the sub-urban areas so that the cost of providing services becomes affordable while avoiding over congestion. Furthermore, it has provided for an additional area of 286 km<sup>2</sup> for residential

development.<sup>7</sup> The Draft Master Plan computes the total land requirements for the projected population of 13.6 million. Of the approximate, 1,692 km<sup>2</sup> that has been allotted for development till 2021, the residential requirement as per the current densities is computed at 327 km<sup>2</sup> as against the current utilization of 214 km<sup>2</sup> – the additional residential requirement is approximately 113 km<sup>2</sup>.<sup>8</sup> These residential requirements have been worked out on the basis of a gross residential density of 55,000 persons per km<sup>2</sup> in the non-MCH areas and 25,000 persons per km<sup>2</sup> in the MCH area; the rationale being that the sub-urban area can accommodate a sizeable future population and the sparsely built up areas in this zone will get densified. Thus the Draft Master Plan provides for a residential zone of more than 500 km<sup>2</sup> in the non-MCH areas (MCH area has no scope for further infilling). The residential zone as per the Draft Master Plan is over designed by 53% and an extra area of almost 286.40 km<sup>2</sup> is provided with the objective that there will be no requirement to convert agricultural or conservation area land uses into residential land use. The development rules and regulations have been designed accordingly. Currently the area within MCH is saturated with a dense population. The major residential areas are spilling over into their vicinity – largely in the vicinity of the existing work and residential areas. Kukatpalli houses one of the largest housing colonies and Serilingampalli, LB Nagar, and Hayatnagar are major growing residential areas.

(ii) **Industrial and Manufacturing.** The Draft Master Plan does not encourage the establishment of any further manufacturing industries in the HUDA area. As such the Draft Master Plan does not earmark any further area for industrial development. Presently, the economic activities related to manufacturing and associated facilities<sup>9</sup> are concentrated in the clusters indicated below. These interventions have not only contributed to the economic growth of the city but are also responsible for triggering development in the surrounding areas. The major manufacturing zones are found to occur in:

- Ramachandrapuram and Patancheru on the NH9 towards Mumbai in the northwest;
- Balanagar and Sanathnagar on NH9;
- Industrial Development Area Bolaram in the northwest;
- Jeedimetla;
- Cherlapalli, Mallapur, Nacharam and Moula Ali in the northeast in close proximity to NH9 to Vijayawada and the SH to Warrangal; and
- Chandulal Baradari and Kattedan on the NH7 in the south towards Bangalore.

(iv) **Commerce and Trade.** The Draft Master Plan provides for a large chunk of land for retail and wholesale commercial zones. While the residential zone allows for almost all-commercial activity, commercial zones are proposed mainly to indicate the reservations of large-scale sites for commercial centers of higher order. A review of the previous Master Plan implementation revealed that much of the land reserved for commercial development was converted to residential and other uses (the over reservation of the residential land use in the Draft Master Plan addresses this issue) – this is primarily on account of a high demand for the land for investments. The current Master Plan, therefore reserves land in the commercial land use category mainly for the large district centers. Five such centers have been proposed on major road networks to serve different parts of the city.

(iv) **Multiple Use Zone.** A new category introduced with the objective of allowing mixed land use (of compatible uses defined in the zoning regulations), thereby allowing a degree of flexibility in land allocations. Additionally, the Master Plan also poses the same as an incentive to the owners of the

<sup>7</sup> In the previous Master Plan commercial Zones were proposed and earmarked for the development of higher order commercial centres, however an evaluation of the land use revealed that many of these sites have got converted into residential sites, as there has been a high demand for undeveloped plots, largely from the point of view of speculation. As a result the large parcels of land were registered without the development of basic services and facilities.

<sup>8</sup> The area under residential land use is low in 2000, as the previous plan had not anticipated the sudden boom in development; thereby a low demand for residential use. The sudden demand has resulted in conversion of other allocated land uses to residential, primarily commercial land. To avoid this conversion, the revised Draft Master Plan stipulates a larger parcel of land for residential.

<sup>9</sup> It may be noted here that the last decade and a half has not seen a major fillip to the manufacturing sector as the government's policy to decongest the city centre does not allow for any further activities in these areas.

polluting and hazardous industries located in the city to utilize their land for a variety of uses. The Draft Master Plan earmarks many of the industrial areas within the city as 'Multiple Use Zone'.

The Draft Master Plan emphasizes a strategy of marginal densification in the core area from 48,000 per km<sup>2</sup> gross residential densities to 55,000 per km<sup>2</sup> and an intense densification of the periphery i.e. the 12 municipalities; suggested GRD of 25,000 per km<sup>2</sup> from the existing 7,000–8,000 per km<sup>2</sup> in 2001. It brings out the fact that 60% of the land in the periphery is vacant and needs to be utilized. As per the Master Plan calculations, the existing built up areas in the sub-urban can easily accommodate a sizeable future population. The land utilization plan therefore focuses on the densification of the plotted development in the sub-urban zone. It may be noted here that the revised draft Master Plan apart from detailing out the land use building and layout regulations, does not specify any other tools to achieve the prescribed densities in the core and the sub-urban area. This should ideally be detailed out in the implementation tools and techniques, which as has been mentioned earlier is a missing link in the plan preparation process. It is recommended that the Master Plan be broken up into program and project packages to facilitate implementation of the overall policies and strategies.

The Draft Master Plan therefore prioritizes rapid growth in the surrounding municipalities with a controlled growth in the core area, i.e. the 172 km<sup>2</sup>. Considering the current growth patterns, it advocates clustering of developed areas for a compact development instead of a sparse development, which is currently being witnessed. The future expansions are to be accommodated within or around the current developments in conjunction with the development of the transport corridors.

Growth in non-core areas is currently driven by residential settlements primarily on account of the close proximity to Hyderabad. At the same time, industrial growth has been hampered by expensive real estate. The residential growth occurring in the periphery is creating demand for service delivery /infrastructure development in the surrounding municipalities. For the Draft Master Plan to achieve its strategy of achieving varied densities in the various zones of the HMA, it will have to ensure improved infrastructure, overall skills availability, good quality educational institutions and active political support in the sub-urban and the periphery.

## **Transport**

### **Planning Processes**

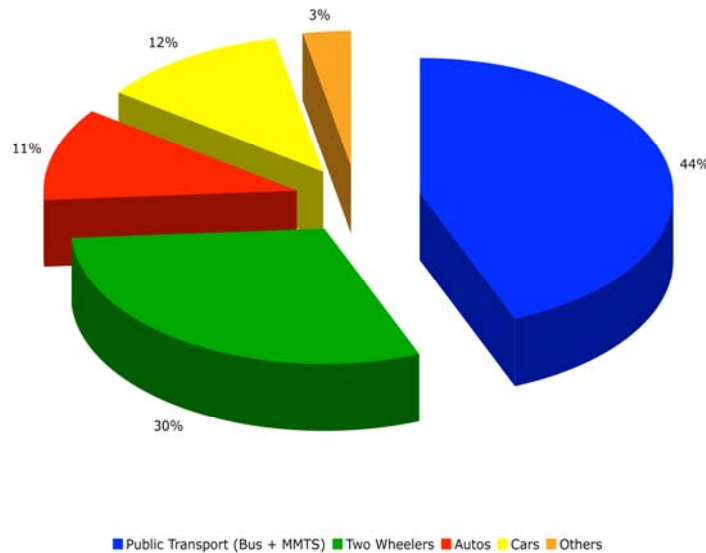
No single agency is solely responsible and accountable for transport planning and traffic management in the city, which gives rise to overlapping of functions and spatial and functional fragmentation. Public agencies in Hyderabad associated with planning and providing transport services comprise:

- (i) GHMC formerly MCH – municipal functions and infrastructure development (other than water and sewerage);
- (ii) HUDA – implementation of the Master Plan and development of infrastructure in the HMA;
- (iii) Infrastructure Corporation of Andhra Pradesh (INCAP) – Outer Ring Road Project;
- (iv) Transport Road and Bridge (TR&B) Department / National Highways Authority of India (NHAI) – certain city roads forming part of their network;
- (v) Police Department – law and order and daily traffic management;
- (vi) Andhra Pradesh State Road Transport Corporation (APSRTC) – public transport (bus network); and
- (vii) Hyderabad Metro Rail (HMR) – newly formed for planning, executing and operating the Mass Rapid Transit System (MRTS).

### **Trip Characteristics**

The urban core has a dense network of transport facilities. These include road network, sub-urban railway

and MMTS lines, bus and an intermediate public transport system (IPTS).<sup>10</sup> Hyderabad's rapid growth has not witnessed a commensurate provision of an efficient, reliable and comfortable public transport system, which has consequently resulted in an increase in personal vehicles. Bus service is extensive and frequent, though very crowded during peak hours. Accessibility to bus routes is high. Autos provide a good paratransit system with a high service level. The MMTS use is not very high because of low frequency and due to this there is heavy dependence on private vehicles, which increases congestion during peak hours.



**Figure 1 Modal Split**

There are about 2.2 million vehicles on the roads with an increase of about 0.2 million each year; 7.5 million trips occur in the city every day with the share of public transport trips being 3.3 million (44%). The figure on the left provides a breakdown of the modal split in the city. It is estimated that the total number of trips will be 14 million by 2011, 21.8 million by 2012, and 28.5 million by 2021. The current modal share of public transport (including bus, MMTS and autos) is around 55% of 7.5 million trips made every day. The spatial distribution of travel indicates different trip patterns for different modes.

Public transport is used for the greatest number of trips. 2-wheeler trips are very high in the core area, high between core and sub-urban area, especially between core and north-west. Car trips are high between sub-urban and core area and in between sub-urban areas. Trips by autos are high in the core followed by the suburbs. Auto trips between peri-urban and sub-urban/core occur mostly along the primary roadways. Bus trips are high for inter-zone and intra-zone travel. Travel for longer distance – peri-urban to core (to/from residential areas) mostly takes place by buses. On the major travel corridors, the peak hour flow is in the range of 9,000 passenger car units (PCU). Mixed traffic conditions and bad lane discipline add to the reduction of lane capacity and thereby reduction in travel speeds.

### **Road Network**

The city has a radial and orbital form of road network, but the network is dense and congested due to narrow roads, encroachments, and high volume of pedestrian and slow moving vehicles. The area under roads is 9–10% in the MCH area with insufficient pedestrian and other road infrastructure facilities. Growth of the municipalities surrounding MCH and a concentration of activities in MCH has resulted in heavy radial flows to the central core, which has limited carrying capacity. Substantial external-to-external flow occurs through the core area because of absence of proper bypass facilities. These accentuate the traffic congestion problem in the core and surrounding areas. Traffic volume along the major highways in the peri-urban area shows a dual peaking nature, with the morning peak being between 10–11 AM and the evening peak between 5–6 PM. The morning peak carries about 7% traffic and evening peak about 8%.

Three National Highways, NH9 (east – west), NH7 (south – north) and NH202 (connecting Hyderabad to Warangal) pass through the city center. Five State Highways SH1, SH2, SH4, SH5 and SH6 start from the city center and diverge radially connecting several towns and district head quarters within the State. In addition, three major district roads connect the city as well as a ring road on boundary of the MCH in the south connecting NH7 on the Bangalore side and connecting SH5, SH2, NH202 and NH9 on the Vijayawada side. The linkage to the other radial roads exists only inside the city.

<sup>10</sup> IPTS includes 3 and 7-seater auto-rickshaws (autos).

### **Chronology of Transportation Developments**

The major transport corridors that link the major and upcoming developments are described in Table 2 below.

**Table 2: Chronology of Transportation Developments**

Studies and Developments	Year (completion)	Value (Rs. million)	Status
<b>Short term projects</b>			
Installation of new traffic signals at 100 junctions	2008	80	In progress
Upgradation of existing signals at 100 junctions	2008	30	In progress
Road markings at 400 junctions	2008	60	In progress
Junction improvement work	2008	150	In progress
<b>Medium term projects</b>			
Parallel and slip roads	2011	1,650	Sanctioned
Rail over bridges and rail under bridges	2011	360	Sanctioned
Bridges over river Musi	2011	85	Sanctioned
Flyovers	2011	720	In progress
Outer Ring Road Phase I	2008	4,400	In progress
Outer Ring Road Phase II	2010	41,600	Sanctioned
Radial roads	2010	25,190	Sanctioned
<b>Long term projects</b>			
MRTS (Metro) Phase I	2013*	84,820	Sanctioned
MMTS Phase II	2012*	3,569	Sanctioned
BRT	2013*	5,920	Sanctioned

Source: GHMC. (\* estimated)

### **Transport Initiatives and Strategy**

In 2005 the GoAP formed a Committee to devise policies for traffic and transport improvement. An Action Plan for the short, medium and long terms was drawn up based on the Committee's recommendations. The following are the salient points of the approved Action Plan.

- (i) The short term plan is envisaged to improve the traffic flow situation over the next couple of years through a multi-phased implementation of traffic systems management (TSM) and road network development, consisting of the installation and upgrading of traffic signals, provision of road markings and junction improvements.
- (ii) The medium term plan is envisaged to provide better connectivity between outer and core areas and consists of road widening, construction of link roads, improving connectivity across Musi river, provision of Road Over Bridges and Road Under Bridges and flyovers, and construction of Outer Ring Road (ORR) and radial roads.
- (iii) The long term plan is envisaged to provide efficient public transport, such as Mass Rapid Transit System (MRTS), expansion of MMTS and Bus Rapid Transit System (BRTS), along the main travel corridors and the aforementioned developments so that the traffic load on the roadways is reduced.

Additional recommendations include: (i) transport, land use policy measures; (ii) promotion of discipline among drivers and road users; (iii) pollution control measures; (iv) monitoring and analysis of traffic and transport changes.

A transport development fund is also proposed. Contributions would come from the following: (i) fines from traffic rule violations; (ii) cess from sale of petrol and diesel; (iii) luxury tax on hotel rooms; (iv) vehicle tax on vehicles sold in the city; and (v) a tax on city employee salaries.

## Open Space

The rapid pace of development in Hyderabad has also affected the manner in which the State has undertaken protection and conservation of open spaces and heritage buildings/monuments – key representatives of natural resource and the region’s heritage. It is a commonly recognized feature that preserving the past is an essential part of creating livable and sustainable cities, conserving the city’s historic built and cultural heritage enriches the city and the quality of life. The accompanying rise in land values and pressure of high density urbanization is a key factor determining the policies available to protect historic property and prevent the disruption of the traditional urban fabric.

### Classification and Status of Open Space

Open space defined in the Draft Master Plan is land between and around buildings. Open lands are identified for particular purposes like conservation and recreation and represent many different elements in the landscape, including greens, quadrangles, lawns, pathways/walkways, groves, wooded areas, fields, and sensitive areas. The current land use allocation for open spaces is 840 ha and constitutes 0.45% of the total area. There are three agencies involved in conserving open spaces: the GHMC, HUDA, and AP Forest Department. The GHMC is responsible for the conservation of open space within the MCH jurisdiction and the HUDA is responsible for the same with its jurisdiction. Within the HUDA jurisdiction, large areas of land belong to the AP Forest Department and are declared as reserve forests.

The GHMC develops and maintains parks in various colonies of the city in areas earmarked for the designated purpose. There are 1,163 such colony parks/open spaces in GHMC. Out of these, about 982 were developed as tree parks and the remaining 181 were set aside for colony parks. Some of the undeveloped parks are encroached upon and the rest of them are under dispute. The GHMC incurred Rs. 24 million in FY2004 on development and maintenance of parks accounting for 0.61% of its annual revenue expenditure.

In addition to parks, the city of Hyderabad has a large number of imposing architectural masterpieces and rich heritage both natural and manmade water bodies. Under Regulation 13 (1) of the HUDA Zoning Regulations, 1981, the HUDA has notified for conservation six heritage precincts covering certain historical locations of environmental importance as well as heritage structures owned by private agencies. Focus was also given to protect rock formations and hillocks, which are unique to the city. It is proposed to develop these areas as “no development zones” so as to preserve the rich cultural heritage of the city. The AP Urban Art Commission in 1981 notified six conservation areas in the city covering pockets around historical areas, street facades, water bodies and valleys; and in 1984, the Hyderabad Conservation Study, listed 137 historical buildings besides archaeological monuments for conservation.

It is also significant to note that in terms of preserving the city core, the AP Tourism Development Corporation is currently undertaking the Char Minar Pedestrianization Project, which involves restructuring the historic precincts with the provision of civic amenities, introduction of Heritage Walks, pedestrianization and beautification of Laad Bazaar, widening of ring roads, restoration of Patthargatti facades and a comprehensive signage system for Charminar precincts and restoration of Char Kamans.<sup>11</sup>

### Conservation Strategies

Through the Andhra Pradesh Vision 2020 document the State Government framed policies to facilitate environmentally sustainable development in the State. Further, more environmental advantages will be converted into economic benefits. This will include developing eco-tourism, attracting the investors for clean environment and converting degraded lands and open spaces in urban areas into parks. Broadly, the policies cover the following objectives: (i) clean and green cities, villages and industrial areas; (ii) conservation of natural resources as part of planning, implementation and monitoring; (iii) development of are-wide standards; and (iv) decentralized monitoring and enforcement with the active participation of

<sup>11</sup> This project has run into a roadblock and has not progressed due to non-participation of the local shop owners.



stakeholders.

Additional open space conservation programs are also underway. Recognizing the importance of preserving open spaces, city-level agencies have undertaken the following projects:

- (i) **Hyderabad Green Belt Project.** During the period 1994–2000, HUDA implemented the Hyderabad Greenbelt Project with funding from the Netherlands Government aimed at developing sustainable bio-mass development and exploitation in around the twin cities of Hyderabad. As a part of this project, plantation and extensive greening was undertaken along roadsides, open lands, industrial estates and residential colonies covering an area of 5,687 ha.
- (ii) **Green Hyderabad Environment Program.** As a follow up of the Hyderabad Green Belt Project, HUDA undertook the Green Hyderabad Environment Program (2002–06) with assistance from Netherlands Government to scale up its earlier activities. The program consisted of two components – Urban Greening and Integrated Lake Treatment in the entire HMA.
- (iii) **Urban Greening Program.** Under the Urban Greening Program, an area of 1,384 ha was undertaken for afforestation of waste lands, community lands, reserve forest land, homestead planting, greening of residential colonies and green belt along roads margins in 2001. The program spread over a period of four years and targets greening of 12,100 ha of open space. Since its inception, the HUDA has undertaken afforestation over an area of 10,612 ha by planting 9.56 million seedlings.
- (iv) **Parklands.** The GHMC has developed and maintains play grounds, outdoor stadiums, indoor stadiums, and swimming pools. These parklands provide for additional open space in the city and help preserve the city's environs. The parklands are meant for the active open air recreational parks, playgrounds, sports facilities and other outdoor activities. Identified in the HUDA Draft Master Plan, the parklands are located around the city's water bodies.
- (v) **Heritage Fund.** The GoAP has sanctioned an amount of Rs.5 million to HUDA for the Heritage Fund to promote urban heritage conservation in the city and this Heritage Fund provides technical assistance to owners of heritage buildings in maintaining them through the Indian National Trust for Art and Cultural Heritage (INTACH), which provides technical support in planning, architecture design and advisory services to HUDA and GHMC.
- (vi) **Heritage Conservation Committee.** Under a Government Order (GO Ms. No. 416, MA & UD (H) Department, dated August 12, 1996) the State constituted a Heritage Conservation Committee (HCC) under Regulation 13(2) of the Zonal Regulations 1981, amended in 1995 to enable the notification of Heritage Buildings and Heritage Precincts. The HCC consists of eminent citizens, architects, engineers and environmentalists. Consequently, a Memorandum of Understanding (MOU) was signed on September 4, 2001 between the INTACH and the State to abide by the principles of protecting, conserving, and preserving notified heritage structures.

Additional strategies for open space and heritage conservation include:

- Providing necessary information and skills for teachers to develop their own heritage awareness programs and heritage education material for students;
- Motivating teachers to use appropriate resource material in class room teaching and playing an effective role in sensitizing children about their heritage;
- Establishing Heritage Clubs in schools;
- Conducting City level workshops on the importance of conserving heritage monuments;
- Providing property tax benefits for heritage buildings; and
- Providing awards and incentives for conserving heritage monuments.

## Municipal Finance

### Role of the Municipal Government

Local self government institutions (LSGIs) – GHMC, Hyderabad Metropolitan Water Supply and Sewerage Board (HMWSSB) and HUDA – in Hyderabad have been pioneers in urban reforms and undertaken major initiatives to improve service delivery in the city. An assessment of these agencies focuses on the fiscal assessment of the GHMC (MCH and surrounding municipalities), HMWSSB, and HUDA. The fiscal assessment of the three agencies is carried out on the Revenue Account (current/operations income and expenditure) and the Capital Account (income and expenditure on asset creation). Assessment of the respective organization's finances was for a period from FY01 through FY06 (referred to as the assessment period).

While these municipal bodies are service organizations, efficient management of municipal finances is imperative to service the urban populace. Key sources of revenue consist of taxes, charges, and state transfers; and key items of expenditure are staff salaries, establishment charges, and operation and maintenance of infrastructure.

### Expenditure Structure

Expenditure is broadly classified into: (i) Personnel Cost (salaries, benefits and other allowances, and terminal benefits); (ii) Operational Expenses; (iii) Repair and Maintenance Expenses; (iv) Program Expenses; (v) Administrative Expenses; and (vi) Finance Expenses. Features of the expenditure structure of the three organizations comprise:

- (i) **GHMC.** Total expenditure of GHMC has risen from Rs.2,636 million in FY02 to Rs.4,431 million in FY06 at a CAGR of 14%. Contingencies and operation and maintenance (O&M) expenditures accounted for 62% of the total expenditure of GHMC with establishment (staff) expenditure at 38% of the total expenditure. Over the years, contingency and operation and maintenance expenditure has shown highest increase with a CAGR of 18% whereas establishment (staff) expenditure grew at a CAGR of 6%.
- (ii) **HMWSSB.** Total expenditure was Rs. 2,932.30 million in 2006 and has grown at a CAGR of 16% and comprises power cost at 38%, staff costs at 34%, maintenance cost at 21%, and administration cost at 6%. Power costs witnessed a sharp rise at a CAGR of 22% and staff costs increased at a CAGR of 9%.
- (iii) **HUDA.** Total expenditure, which was Rs. 295.26 million in 2005, has grown at a CAGR of 36% and comprises staff cost at 42%, contingencies at 28%, maintenance cost at 18%, others at 10% and interest cost at 2%. There was a sharp increase in contingencies with a CAGR of 140%, staff costs increased at a CAGR of 6%, and repair and maintenance increased at a CAGR of 31%.

In terms of recovering costs of services, the average cost of water supply and sewerage is Rs.14/kl and the recovery on service is Rs.10/kl indicating a 71% recovery. Similarly, the cost of solid waste management services is about Rs.1,100/MT while the recovery is Rs.600/MT (including Rs.200/MT from bulk garbage collection charges) indicating a 55% cost recovery.

The GHMC has performed well in applying its funds and managing expenditure – the proportion of establishment costs to total RE has reduced from 46% in FY01 to 35% in FY06. An improved expenditure management is also witnessed for HMWSSB and HUDA, which is a significant move in terms of introducing performance efficiencies in the management of services. However, the transition to full cost recovery of services is yet to take place due to the restriction on regular and commensurate tariff revision.

### **Revenue Structure**

Revenue income comprises of tax sources, non-tax sources, and assigned revenues (including grants). Salient features of the Revenue Income of the three organizations comprise:

- (i) **GHMC**. The Revenue Income (RI) of GHMC grew at a CAGR of 18% between FY2002 and FY2006. Income from own sources accounts for about 62 percent of revenue income, and has increased at a CAGR of 17%. Major items<sup>12</sup> of own-source comprise property tax<sup>13</sup> (35% RI) and town planning<sup>14</sup> (11% RI). Income through assigned revenues (surcharge on stamp duty, entertainment tax and profession tax) contributes 35% of RI and has increased at a CAGR of 19%. The GHMC also receives revenue grants and compensations (growing at 12% CAGR) from the State Government under various heads – while certain items are fixed and are transferred on a quarterly basis, other grant heads are for specific purposes and transfers are ad hoc in nature.
- (ii) **HMWSSB**. The RI for HMWSSB has increased substantially from Rs.1,420 million in FY02 to Rs.2,878 million in FY06, at an increase of more than 100% and at a CAGR of 19%. The major sources of income include water and sewerage cess and new connection charges, which together contribute 97% of the RI. The increase in the HMWSSB's RI is due to improved efficiencies in generation of bills, water distribution, and consequent collection efficiency. There has been substantial increase in new connection charges by 95% (in FY03) and 57% (in FY05) due to provision and streamlining of new connections. The revenue collection efficiency of the HMWSSB has increased substantially during the assessment period and averaged above 85% of the demand<sup>15</sup>.
- (iii) **HUDA**. The RI for HUDA has increased substantially from Rs.230.2 million in FY01 to Rs.411.6 million in FY05, an increase of about 79% at a CAGR of 15.6%. The major sources of income include development charges, which contributes 53% of the total RI.

Ultimately in terms of revenue realization, the GHMC has constantly maintained an operating ratio (OR) less than unity (averaging at 0.65), this has largely been possible because of property tax collections (at ~75% collection performance) and town planning revenues. On the other hand, the OR for HMWSSB was greater than unity indicating a poor performance in terms of revenue management – this is attributed to the shortfall in full cost recovery where ~70% of the cost of service is recovered through water charges.

With regards to the maintenance and reporting of accounts, the MCH and HMWSSB follow a double-entry commercial accounting system and financial reporting codes are updated annually, with interim up-dates when required. It is supported by a user manual and organized training of municipal accounts staff, which substantially streamlines financial accounting and reporting. The GHMC has given a commitment in the MOA signed between GoAP and MoUD to undertake further reforms in future, which will ensure improvements in the financial management of the GHMC.

<sup>12</sup> The sections contributing tax income include General Taxation, General Administration, Communication and Engineering, Education, Town Planning, Public Health and Estate Department. The General Taxation section is the largest revenue generating section and collects among other taxes, property tax and advertisement tax. Other sections collect charges and fees, as per the rules, towards services rendered by GHMC.

<sup>13</sup> At an aggregate level, the average property tax demand per property is Rs.2,469 per annum. According to the Demand Collection Balance (DCB) statement, there were 469,846 property tax assessments in MCH during the year 2001, which increased to 553,800 in the year 2006; indicating an annual growth of 4.45%. The collection performance of the current demand of property tax was commendable at ~75% during the last five years.

<sup>14</sup> Due to the implementation of the Building Regularization Scheme (BRS) for all unauthorized constructions, MCH realized Rs.65.8 million during FY01. This was a major initiative undertaken by the MCH to increase its revenue.

<sup>15</sup> The monthly average collection has increased from Rs.76.1 million in FY01 to Rs.146.8 million in FY06. The maximum collection efficiency was 96% in FY05.

## Urban Growth Policy and Future Strategy

### Spatial Dynamics

Hyderabad's planning if assessed from a paper documents perspective is rational and impressive; but, of course, planning documents are of zero value unless they influence what happens on the ground. The planning challenge in Hyderabad is two-fold. One, given the dearth of urban infrastructure investment (less than one-seventh of that in Xi'an over the last two decades), there is little institutional or geographical space for planning. Severe congestion, finding space to build, etc., creates very high land prices (whether expressed in markets or through households holding on to property and land to which they have rights, formal or informal) so that the city evolves through a multitude of small plot incremental changes, within a structural frame that is being patched up with flyovers, etc. India's commendable democracy makes large-scale land acquisition, even for public purposes, such as right-of-ways for transportation infrastructure, difficult. When rapid transit systems are built, they usually significantly reshape a core city, through market processes, but the impact may be less in Hyderabad, where there is less potential to quickly rework the built up urban fabric either because of the lack of vacant (or potentially vacant) land or the inability to redevelop currently built-up areas.

Hence, the real opportunities in Hyderabad are located in the sub-urban and peri-urban areas, which currently have relatively low populations and will grow much faster in absolute and relative terms than both Hyderabad's core and the peripheries of the other two case study cities. In particular, the "knowledge corridor" along the western arc of the metropolitan area is likely to become the new focus of Hyderabad in terms of spatial dynamism. To the extent that Hyderabad's peripheral areas can be developed on a phased (outwards from the built up edge of the city), transit and infrastructure (water, sewers, feeder roads, parks, etc.) led basis, the benefits of high densities could be retained, along with the sharpness of the edge of the city, while at the same time current high economic, social, and health costs associated with accessibility difficulties could be dramatically reduced.

The city is currently developing towards Shamsabad and Shadnagar in the south and the southwest, on account of the proposed location of the new international airport at Shamsabad. The sub-urban is indeed likely to experience higher growth due to new initiatives in this area. This raises interesting questions, given the new airport's remote location from the IT clusters in the north. Will it drive investment in new high-tech activity in its vicinity, or will the south of the city be substantially bypassed as accessibility on the outer ring road creates a western arc knowledge corridor, connecting the high tech north-west of the metropolis with the new airport? Nonetheless, this significant development is envisaged not only to trigger further growth in the sub-urban area but is also expected to further decongest the city center. It may therefore be concluded that the south as well as the southwest close to the proposed international airport clearly will emerge as the future growth axes. The State's move to replace HUDA with Hyderabad Metropolitan Development Authority (HMDA) by increasing the area under its jurisdiction to 6,852 km<sup>2</sup> with the merger of parts of five adjoining districts will further boost the growth in these directions. In the near future, Hyderabad's expansion is not just confined to western suburbs like HITEC City, Madhapur and Gachibowli, which saw substantial activity over the last one decade. Areas near the upcoming international airport, Fab City, Hardware Park and those on Warangal and Vijayawada highways are also turning into hotspots.

### Key Drivers

While the core city of Hyderabad has become saturated, current developments are ongoing in the sub-urban areas. One of the major developments, which are likely to impact the distribution of the future population as well as travel patterns, is – as mentioned above – the international airport at Shamsabad. Other key drivers of city developments are:

- (i) ***International Airport at Shamsabad.*** Located at the southern part of the city, this airport will attract considerable employment and play a major force in reshaping the city. It has already triggered the development of real estate in the already developing counter magnet, Shamsabad.

- (ii) **Apparel/Industrial Parks.** A product-specific industrial area –‘Apparel Export Park’ for garment and leather goods manufacturers and exporters is proposed at Gundlapochampally. Another ‘Apparel Park’ is proposed at Mamidpalli, close to the HADA area. The “Fab City” project for manufacture of computer chips is being established near Mahesaram, on the Outer Ring Road and near the International Airport. The ICICI Knowledge Park and Bio-Technology Park located in Turkapally will further determine future travel patterns.
- (iii) **Convention Centre.** An Integrated Convention Centre and Golf Course Complex are being proposed at Manikonda village adjacent to Indian School of Business. The key components of the project include a Convention Centre with a plenary hall for a capacity of 3,000–5,000 people and an 18 hole International Championship Pro-Golf course, with villas and premium residential facilities to host international golf events. A new Cricket Stadium is also proposed at Uppal, near the crossing of NH202 and ORR.
- (iv) **Special Economic Zones (SEZs).** The ongoing Outer Ring Road (ORR) project around Hyderabad will infuse growth in the peri-urban areas. Three SEZs are planned in close proximity to the ORR: Tellapur on the western part, Jawhar Nagar in the eastern part and Nadergul on the southeastern part. These SEZs will have a residential component and will influence growth in the surrounding area because of access from the ORR.
- (v) **Integrated Townships and Other Development.** A large development – Manikonda (residential, commercial, and industrial) – is emerging adjacent to the ORR on the western side, close to the the Himayat Sagar. Further west of the Himayat Sagar and Osman Sagar, a large township – Chevalle – is proposed, which will have access through the ORR. Developments are also emerging along the Vijaywada Road and Warrangal Road (one of the large developments is in Turkapalli area and access to these developments is through the Vijaywada Road). On the southern side, developments are emerging around Shamsabad and Maheswaram (it is expected that development will occur further south along the Bangalore highway). On the northern side, development is occurring along Nagpur Road between Medchal and ORR. Large scale development is also envisaged between Nagpur Road and Mumbai Road, in the Narsapur area.

The aforementioned drivers are spatially distributed along the National Highways and the ORR. The connectivity through the radial roads to the major roadways is envisaged to provide accessibility to the major developments.

### **Policy Instruments**

The key planning instruments for the Hyderabad Metropolitan Area and the Hyderabad Urban Agglomeration are the Master Plan and the City Development Plan, respectively.

- (i) The current Master Plan was prepared by the HUDA in 1980 and largely dictated the urban growth and policy directions for the HMA. Detailed Zonal Development Plans (ZDPs) were also prepared during 1983–95 by updating the land use of the area and provided detailed classification of land uses and zoning regulations for the respective zones. The ZDPs are currently in force and form the basis for the urban development in the city comprising land conversion, use, and conservation and recreation areas. The ZDPs provide guidance in issuing planning permissions based on the Floor Area Ratio (FAR) and permitted densities and demarcates area for public and semi-public uses and other amenities. Though the ZDPs do not provide long-term or strategic directions for city planning, they however, guide the current developments in the city.

The Draft Master Plan 2020 for the 1865 km<sup>2</sup> prepared by the HUDA has a particular spatial focus on focuses on development interventions in the area of the airport. It advocates clustering of developed areas for a compact development instead of a sparse development, which is currently being witnessed. It promotes a corridor development, but with adequate precautions in the form of controls, access and services. This underlines the need for an environmentally

sustainable planning through appropriate planning for services and industrial areas. The future expansions are to be accommodated within or around the current developments in conjunction with the development of transport corridors. While the current Draft Master Plan is yet to be finalized, the HUDA, on account of the expansion in its jurisdiction and changes in the administrative set-up in terms of the formation of the GHMC, has already called for an expression of interest for the preparation of a Master Plan for the new area extending beyond 6,000 km<sup>2</sup>.

- (ii) The City Development Plan (CDP), initiated as a part of the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) comprises sectoral plans for the identified sectors for a time horizon of 20 years outlining policy framework and investment interventions to achieve the vision for the city 'as an inclusive and futuristic city providing high quality services with universal access including the poor. It will be a slum free, citizen friendly, well-governed and environmental friendly city.' Towards achieving this vision the CDP prioritizes the key sectors for investments and reform initiatives. While doing so the priorities and programs of the national and state governments including the international developmental trends and Millennium Development Goals (MDGs) were considered. The main sectors addressed by the CDP are: Water Supply; Sewerage; Solid Waste Management; Traffic and Transportation; Storm Water Drainage; Urban Poverty reduction; and Urban Renewal.

While the Master Plan may be interpreted as broad based land use plan document, the CDP emerges as a document outlining the strategic policy and investment interventions to achieve the vision as defined in the Master Plan. The current Draft Master Plan is largely a land use based spatial plan, which outlines provision for land requirements for an anticipated population of 13.6 million to be accommodated in the year 2021 in the HMA. Being a spatial plan, the Draft Master Plan does not lay much emphasis on the evolving policy statements. The CDP outlines sector specific vision and detailed strategies covering policy level planning, reforms, institutional strengthening, service augmentation and delivery and service delivery aspects.

### **Scenarios for Urban Growth Management**

The urban growth in HMA is undergoing a transition where the core is fully saturated and the growth is likely to take place in the sub-urban and the peri-urban zones. The Government has made concerted efforts to decongest the city centre and disperse the economic activities outside the core and there is a need to outline a coordinated strategy to disperse economic activities in a sustainable manner. This would require a proactive approach by the concerned authorities towards controlled development in the surrounding 12 municipalities. While the Draft Master Plan does outline initiatives, development controls and guidelines towards achieving a balanced growth in the sub-urban and the peri-urban, an effective plan implementation, monitoring and evaluation mechanism needs to be institutionalized. This in turn needs to be coupled with enhancing the capacities of the concerned authorities to be able to discharge their new roles and responsibilities. This is only possible when it is facilitated by change in legislation in the respective acts, and devolving the required financial resources. While the GoAP, through the setting up of the GHMC and the HMDA, is positioning itself to not only address the institutional and policy level issues for the larger area, it is also envisaging a larger level spatial plan for the new HMA. Key strategies to achieve more efficient urban growth management would include:

- (i) Integrate the spatial aspects with infrastructure and basic service provision, which is currently being handled through two parallel processes vis-à-vis the Master Plan and the CDP and through multiple agencies. This needs to be done in conjunction with the relevant service provider. The current Plan does not detail out a clearly defined institutional mechanism, financial and manpower resources and evaluation and monitoring mechanisms to ensure that all plan provision are implemented in a time bound manner. The planning agency should work in conjunction with the sectoral and line agencies to develop sectoral plans. These should be annexed with the Master Plan and the respective agency be made responsible and accountable for its implementation.

- (ii) Initiate coordinated and comprehensive development planning in the sub-urban area and the peri-urban area. The comprehensive development will also address the issue of open space and water body conservation, and conservation of heritage buildings. While there does exist a mechanism for undertaking conservation activities, addressing encroachments is a critical issue. Planning a policy for the economically weaker sections (EWS) and advocating a socially inclusive physical plan will help address the tenure security of the EWS, long-term housing for the urban poor, as well as the process of gentrification.
- (iii) Address the issues of governance, institutional framework, reforms and capacities (already identified by the various planning interventions, namely the CDP and the Draft Master Plan) to address urban growth management in the HMA.
- (iv) Currently there is a multiplicity of institutions that handle transport issues in the city. The Action Plan proposes formation of an UMTA, which will be useful in coordinating various transport related development in the city area that consists of: (i) determining tariff structure and instituting a common ticketing system for various mass transport modes; and (ii) undertaking functions of planning and management of the transport systems, where a dedicated cell<sup>16</sup> may be created for data storage, periodic transport demand modeling and monitoring effectiveness of the undertaken projects (the function of training could be undertaken through professional bodies, under guidance from UMTA).
- (v) Public transport services should assist movement of people from outer areas to the core and this function can be served by the MMTS and MRTS; the BRTS can serve the core area. If MMTS services are improved (higher frequency) and feeder bus services are provided along with intermodal transfer facilities and parking, a large proportion of the intended MRTS users can be captured by MMTS. The MMTS improvement is far cheaper compared to the construction of a new MRTS. BRTS lines serve mainly the core area, circular in arrangement, with one line along the MRTS corridor; the common portion with MRTS may be eliminated. The ORR and radial roads do not have provision of exclusive public transport and a reservation of right of way for future provision of transit along these facilities will be beneficial. Auto rickshaws cause traffic congestion in the core area because of the nature of operation and these may be disallowed in the core area – autos can form an important feeder service to the bus stops for both BRTS and the regular bus service. Similarly, the 7-seater autos can be restricted from providing competitive service to buses, and instead can be encouraged to operate on the secondary roads in the peri-urban areas, as a feeder to the buses.
- (vi) Since there are plans for traffic signalization, improvements in major junctions, area traffic control (ATC) may be implemented over time. Even though the Action Plan addresses vehicle emission and certification process, a more proactive step would be to encourage vehicles with alternative fuel. Government initiative of tax reduction can encourage usage of alternative technology vehicles.
- (vii) Heritage conservation needs to be addressed in order to create awareness a level of awareness for heritage monuments. A policy should be developed in order to ensure the availability of funds for heritage conservation and address the impact of escalating urban land prices and the effect on converting heritage sites.
- (viii) While existing sources of financing in terms of infrastructure bonds, multi-lateral development banks, and financial institutions would be tapped for capital investments, the key to sustainable service delivery is long-term full cost recovery initiatives. The CDP lays out strategic initiatives that the GHMC (and other agencies like the HMWSSB) would undertake to maintain fiscal discipline, the key areas of improvement comprise: (a) valuation of assets and liabilities; (b) drawing up of opening balance sheet; (c) complete migration to double entry accounting system

---

<sup>16</sup> The proposed planning cell can be encouraged to design pilot projects and these can be implemented and showcased nationally/internationally to demonstrate best practices. Time series study on safety and safety audit of busy corridors can be taken up to demonstrate best practice.

and production of financial statements; (d) preparing an outcome budget; (e) undertaking complete revamp of the public financial management system including internal controls; (f) improving the e-governance system in place; (g) Undertaking property tax reforms – implementation of change in tax assessment of property tax, up-dation of property tax records, extension of property tax regime to all properties, elimination of exemptions, and full migration to the GIS systems; and (h) undertaking user charges reforms – introduce user charges wherever not presently levied and revising existing user charges to recover full operation and maintenance (O&M) cost recovery within a reasonable timeframe.

### **Conclusions and Recommendations**

Hyderabad, given its booming high tech economy, is becoming increasingly integrated with the global economy, both at corporate and household levels; the implications for city building are enormous. Hyderabad's economies are now driven by high technology and knowledge industries, functions that are labor rather than capital intensive, which have resulted in a changing occupation profile not to mention rising land prices.

In terms of peripheral land conversion processes, Hyderabad is quite efficient, essentially replicating the urban fabric (which can be viewed as a set of repeating modules) as the city moves outwards. However, this pattern and dynamic is changing as Hyderabad becomes wealthier, more economically specialized (in IT), and income disparities increase. For example, high technology zones, hotel/café clusters, and gated communities are rising. These new nodes affect land use around them, reflected in substantially higher property prices. Moreover, the lack of infrastructure investment limits accessible land, resulting in a lack of “looseness” in the urban fabric, which would improve the probability that planners could effect change. It is very difficult to redevelop (retrofit) Hyderabad's core.

Hyderabad has a dualistic government, with both the urban corporation (a legacy of colonial rule) and the civil government operating, to some extent in parallel, at the metropolitan scale. Fiscal revenues are increasing rapidly although at a rate insufficient to meet pressing needs, particularly related to infrastructure. Revenue generation mandates in Hyderabad more closely resemble mainstream global urban norms, although realization of these revenue mandates is another matter.

Under a recent GO (MS No. 274 MA April 24, 2007) the GoAP has expanded the jurisdiction of HUDA as the first step towards the constitution of the Hyderabad Metropolitan Development Authority (HMDA). Once the HMDA is constituted the HUDA will be incorporated in the HMDA. The decision of expanding the HUDA jurisdiction stems from the fact that in the last few years Hyderabad has emerged as one of the most important Indian cities. Consequently, the physical growth of Hyderabad is rapidly overflowing beyond the former jurisdiction of urban development authorities. The expansion now made therefore brings under HUDA's purview the extensive development activity and real estate projects that are taking place outside the earlier jurisdiction of HUDA. Thus, while the HUDA with a much larger area is a planning and coordinating body, the municipalities basically manage urban basic services – they have different functions. This arrangement in itself is one of the key reasons for inadequate service delivery outcomes in the HUA. The overlapping arrangement in functions, roles and responsibilities of the institutions not only results in gaps in service delivery maintenance and operation but also results in poor accountability.

The absence of an effective coordination mechanism, amongst municipal, metropolitan and state level agencies has implications for orderly spatial development and growth. With the establishment of the GHMC and the HMDA, the government should ensure coordinated infrastructure provision, equitable local economic growth, a comprehensive development management system, effective and efficient service delivery and expenditure effectiveness. There is an urgent need to ensure spatial and functional integration of service delivery process through innovative institutional arrangements for achieving better service outcomes. There is a need for widespread reform in governance and service delivery framework with a focus on metropolitan integration and co-ordination. It is envisaged that once operational, the HMDA and the GHMC will help in addressing these issues of multiple agencies, overlapping roles and unclear functions.