

The Evaluation of the Implementation of
Smart Growth in Chinese Official Plans:
a case study of Xuzhou City, China

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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ABSTRACT

This thesis addresses the cause and the extent of sprawl in China, how to deal with sprawl using smart growth in official plans. Sprawl is “haphazard growth or outward extension of a city resulting from uncontrolled or poorly managed development” (Merriam-Webster dictionary). The importance of dealing with sprawl is realized when one considers negative impacts of sprawl, including traffic congestion, air and water pollution, loss of natural habitat and farmland, a fiscal and social crisis in the cities, and inability of public services to keep pace with suburban growth. Despite the great potential of using North America’s smart growth to deal with China’s sprawl, it is very important to bear in mind the different situation in North America and China, such as the difference in the development pattern, transportation modes, living philosophy, land policy, and fiscal stimulation. This research examines how much of the smart growth is being implemented in Xuzhou’s Official Plan and what obstacles prevent some principles of smart growth from being used.

This research concludes that Chinese current policy and economic climate are favourable to the implementation of smart growth. Although some principles of smart growth have been embodied in official plans and planning policies, this research has illustrated that there are several challenges that planners and municipal leaders face in relation to the creation of a range of housing opportunities and choices, to the fostering distinctive and attractive communities with a strong sense of place, to the preservation of open space and farmland, to the establishment of cost-effective development decisions. Finally, the research identifies several recommendations to implement smart growth in China. The significance of this study for the planning profession is that by identifying opportunities and challenges to deal with sprawl using smart growth in China’ context, planners will be better able to formulate strategies, especially at the official plan level, that implement smart growth by targeting sprawl that currently impedes cities’ sustainable development. Through implementing smart growth, cities in China will be able to cope with growth while maintaining a high quality of life and fulfilling the goal of balanced environmental, social, economic, and land use priorities.

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DEDICATION

This research is dedicated to my family.

TABLE OF CONTENTS

| | |
|---|-----|
| LIST OF FIGURES | x |
| LIST OF TABLES | xii |
| CHAPTER 1 INTRODUCTION..... | 1 |
| 1.1 Context | 1 |
| 1.2 Purpose and Objectives of the Research..... | 2 |
| 1.3 Research Questions | 2 |
| 1.4 Significance of the Study..... | 3 |
| 1.5 Definitions | 4 |
| 1.6 Methodology | 4 |
| 1.7 Scope and Limitations | 5 |
| 1.8 Thesis Organisation..... | 5 |
| CHAPTER 2 REVIEW OF LITERATURE..... | 7 |
| 2.1 Introduction | 7 |
| 2.2 Definition and Performance of Urban sprawl..... | 7 |
| 2.3 Smart Growth in North America | 8 |
| 2.4 Contextual Difference between North America and China..... | 12 |
| 2.5 Urban Sprawl in China | 14 |
| 2.5.1 Urbanization in China..... | 14 |
| 2.5.2 Urban Sprawl Phenomenon | 15 |
| 2.5.3 Causes of Urban Sprawl in China | 24 |
| 2.5.4 Automobiles Bring Transition to the Urban Spatial Structure | 25 |
| 2.5.5 Sprawl and Food Security | 28 |
| 2.6 The Implementation of Smart Growth in North American Plans..... | 29 |
| 2.6.1 Smart Growth Audits..... | 30 |
| 2.6.2 Project Rating/ Recognition Programs | 32 |
| 2.7 The Current Understanding of Smart Growth in China..... | 32 |
| 2.8 Smart Growth in China’s Planning Policy | 34 |
| 2.8.1 The Planning System in China | 35 |
| 2.8.2 The Planning Regulation Guidelines (No.146) | 37 |

| | |
|--|----|
| 2.9 Conclusions | 41 |
| CHAPTER 3 METHODOLOGY | 43 |
| 3.1 Introduction | 43 |
| 3.2 Rationale for the Qualitative Approach..... | 43 |
| 3.3 Validity and Reliability in Qualitative Research..... | 44 |
| 3.4 Rationale for a Two-Method Approach..... | 45 |
| 3.5 Research Design | 46 |
| 3.6 Selection of a Case for Study | 47 |
| 3.7 Interviews | 49 |
| 3.8 Actors involved | 49 |
| 3.9 Ethical Considerations in Interviewing | 51 |
| 3.10 Scope and Limitation of the Research..... | 51 |
| 3.11 Conclusions | 52 |
| CHAPTER 4 A CASE STUDY | 53 |
| 4.1 A Brief Introduction to the City of Xuzhou | 53 |
| 4.2 Xuzhou’s Population, Economic, and Land Use Structure | 57 |
| 4.2.1 Population Structure Analysis of Xuzhou | 57 |
| 4.2.2 Economic Structure Analysis of Xuzhou | 59 |
| 4.2.3 Land Use Structure Analysis of Xuzhou | 61 |
| 4.3 Xuzhou’s Urban Form..... | 64 |
| 4.3.1 The Evolution of Xuzhou’s Official Plans | 64 |
| 4.3.2 Xuzhou’s Spatial Structure and Characteristics | 67 |
| 4.4 The Evaluation of Xuzhou’s Official Plan (1995 to 2010)..... | 72 |
| 4.4.1 Summary of the Official Plan..... | 72 |
| 4.4.2 Evaluation of previous Xuzhou’s Official Plan..... | 72 |
| 4.4.3 Barriers that the City Faced in 2006..... | 74 |
| 4.5 Summary of Current Xuzhou’s Official Plan (2007 to 2020) | 75 |
| 4.5.1 The City’s Goals and Development Policy | 78 |
| 4.5.2 City Vision and Scale | 79 |
| 4.5.3 Xuzhou’s Region Plan..... | 79 |
| 4.5.4 Xuzhou City’s Plan..... | 83 |
| 4.5.5 Xuzhou Transportation Planning..... | 86 |

| | |
|--|-----|
| 4.5.6 The Planning for Xuzhou Historic City..... | 87 |
| 4.5.7 Revitalization of the Inner City | 87 |
| 4.5.8 Environmental Protection | 88 |
| 4.5.9 Short-term Planning..... | 88 |
| 4.5.10 Implementation..... | 88 |
| 4.6 Conclusions | 88 |
| CHAPTER 5 FINDINGS | 90 |
| 5.1 The Cause and the Extent of Sprawl in China..... | 90 |
| 5.1.1 The Causes of Sprawl in China | 91 |
| 5.1.2 The Impact of Sprawl in China | 92 |
| 5.1.3 The Difference of Sprawl between China and North America..... | 92 |
| 5.2 Planning Policies in China and Smart Growth Strategies | 93 |
| 5.2.1 The Main Obstacles Today in Preparing Chinese Official Plans | 93 |
| 5.2.2 Recommendations to Improve the Process of Preparing Chinese Official Plans | 94 |
| 5.2.3 Policy and Economic Climate and the Implementation of Smart Growth | 95 |
| 5.3 The Evaluation of Implementation of Smart Growth in Xuzhou’s Official Plan..... | 96 |
| 5.3.1 Evaluative Framework..... | 97 |
| 5.3.2 Mixed Land Uses..... | 99 |
| 5.3.3 Compact Development | 101 |
| 5.3.4 Housing Opportunities and Choices | 103 |
| 5.3.5 Creation of Walkable Communities | 105 |
| 5.3.6 Distinctive and Attractive Communities with a Strong Sense of Place..... | 107 |
| 5.3.7 Protect the Environment and Resources..... | 109 |
| 5.3.8 Strengthen and Direct Development towards Existing Communities | 111 |
| 5.3.9 Transport Choices..... | 115 |
| 5.3.10 Decisions Making Development Predictable, Fair, and Cost Effective | 116 |
| 5.3.11 Encouraging Community and Stakeholder Collaboration..... | 118 |
| 5.4 The Limitation and the Future for the Implementation of Smart Growth in China..... | 120 |
| 5.5 Conclusions | 121 |
| CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS..... | 122 |
| APPENDIX | |
| APPENDIX A THESIS PROPOSAL | 126 |

APPENDIX B INTERVIEWEES FOR INTERVIEW (ORE # 14786)..... 130
APPENDIX C RECRUITMENT EMAIL..... 131
APPENDIX D INFORMATION CONSENT LETTER FOR INTERVIEW STUDY 132
APPENDIX E INTERVIEW QUESTIONS..... 135
APPENDIX F FEEDBACK LETTER 138
APPENDIX G INTERVIEW RESULTS 139
APPENDIX H A RECOMMENDED COMPREHENSIVE SMART GROWTH AUDIT
CHECKLIST WITH COMMENTARY 148
BIBLIOGRAPHY 154

LIST OF FIGURES

| | |
|--|----|
| Figure 2.1 The Evolution of Ring Road Model in Beijing in GIS | 16 |
| Figure 2.2 The Growth of State-level Science & Technology Industrial Parks from 1998 to 2006 | 17 |
| Figure 2.3 Comparison of Unauthorized Development Zones and Legally Developed Area in Cities and Towns in China in 2004 (Unit: km ²)..... | 18 |
| Figure 2.4 The Process Model of Suburbanization in China since the 1990s | 23 |
| Figure 2.5 Biguiyuan, Shunde, Guangdong, Epitomizing Chinese Large Scale Low-density Development..... | 24 |
| Figure 2.6 Along-traffic Development Mode..... | 26 |
| Figure 2.7 China Passenger Car Ownership per 1,000 Persons vs. GDP per Capita (1998-2006) | 28 |
| Figure 2.8 The Change of China' Farmland (Unit: 100 million <i>Mu</i>) | 29 |
| Figure 2.9 Relationship of Plans, Policies, Programs, and Regulation | 30 |
| Figure 2.10 Smart Growth Audit Process-activities and Outcome..... | 31 |
| Figure 2.11 Chinese Planning System..... | 35 |
| Figure 2.12 Scopes of Urban Planning..... | 38 |
| Figure 3.1 The Methodology of Constructivist Inquiry | 44 |
| Figure 4.1 The Location of Xuzhou City in China (left) and in Jiangsu Province (right)..... | 53 |
| Figure 4.2 Historic Relics in Xuzhou City | 54 |
| Figure 4.3 Pictures of Today's Xuzhou City..... | 54 |
| Figure 4.4 Xuzhou's Jurisdiction | 55 |
| Figure 4.5 Distribution of Fuels, Power, Minerals, and Metals in China..... | 56 |
| Figure 4.6 Xuzhou's Transportation..... | 57 |
| Figure 4.7 The Estimation of Xuzhou City's Population | 59 |
| Figure 4.8 The Analysis of Xuzhou's Geo-hydrologic Condition | 62 |
| Figure 4.9 Three Metropolises in Jiangsu Province | 63 |
| Figure 4.10 Land Use in Xuzhou's Official Plan (1995 to 2010) | 66 |
| Figure 4.11 The Evolution of Xuzhou City's Forms..... | 67 |
| Figure 4.12 The Location of the Original Xuzhou City (the Pink Area)..... | 68 |

| | |
|---|-----|
| Figure 4.13 Three Levels of Planning Boundaries in Xuzhou’s Official Plan (2007 to 2020) | 77 |
| Figure 4.14 Xuzhou’s Urban Development Boundary (the Red Line)..... | 78 |
| Figure 4.15 Xuzhou New District in Google Map (the Pink Area) and Its Detailed Plan | 79 |
| Figure 4.16 Xuzhou City-town System | 80 |
| Figure 4.17 Seven Planning Districts in Xuzhou City..... | 85 |
| Figure 4.18 Xuzhou Transportation Plan | 87 |
| Figure 5.1 The Retail Stores in a Main Street in a Residential Community in Xuzhou..... | 100 |
| Figure 5.2 The Allocation of Xuzhou Population Density | 102 |
| Figure 5.3 Roads’ Cross-sections including Sidewalk and Bicycle Lane | 106 |
| Figure 5.4 A Residential Community in Xuzhou | 109 |
| Figure 5.5 Analysis of Potential Land Use in Xuzhou | 112 |
| Figure 5.6 Alternative Plans (from left to right Plan-1, Plan-2, and Plan-3)..... | 114 |
| Figure 5.7 The Process of Evaluation in Xuzhou’s Official Plan (2007 to 2020)..... | 118 |

LIST OF TABLES

| | |
|---|-----|
| Table 2.1 Smart Growth VS Conventional Development: Comparison of Outcomes | 11 |
| Table 2.2 Rates of Urban Growth in China (1978–2006) | 14 |
| Table 2.3 Number of Chinese Cities by Size of Non-agricultural Population | 14 |
| Table 2.4 National Development Standard for Official Plans | 37 |
| Table 2.5 Land Use Structure in Official Plans | 37 |
| Table 2.6 The Analysis of PRG (No.146) | 40 |
| Table 4.1 The Change of Xuzhou’s Population from 1952 to 2005..... | 58 |
| Table 4.2 Migration Rate in Xuzhou from 1988 to 2002 | 59 |
| Table 4.3 The Evolution of Xuzhou’s Economy | 60 |
| Table 4.4 Xuzhou Regional Farmland Balance | 62 |
| Table 4.5 The Evolution of Xuzhou’s Official Plans | 67 |
| Table 4.6 Summary of the Evaluation of Planning Objectives of Xuzhou’s Official Plan (1995 to 2010)..... | 73 |
| Table 4.7 Land Use in 2005 in Xuzhou City (Population was 1.40 million in 2005) | 76 |
| Table 4.8 Land Use Plan of Xuzhou in 2020 (Population is Two millions in 2020) | 83 |
| Table 4.9 Land Use in Xuzhou Urban Planning Boundary | 84 |
| Table 5.1 Principles and Criteria to Evaluate the Implementation of Smart Growth in Xuzhou’s Official Plan..... | 98 |
| Table 5.2 Three Tiers in a Residential Community..... | 99 |
| Table 5.3 Residential Community Land Use Regulation | 100 |
| Table 5.4 Xuzhou City’s Population and Population Density in 2001 | 101 |
| Table 5.5 Land Use within Xuzhou’s Urban Planning Boundary | 111 |

CHAPTER 1

INTRODUCTION

1.1 Context

In China, modern urban planning has been applied since the end of the 1970s. In the last thirty years, it has played an important role in the construction of cities and enhanced their sustainable development in parallel with their constant and rapid economic development. However, rapid urbanization has deeply affected the construction of cities in China. China's urbanization and industrialization are unprecedented in terms of scale and complexity, with no parallel in other countries (Wu & Rosenbaum, 2008). It is expected that nearly 1.5 billion rural people will flood into cities between now and 2050. This phenomenon will be the largest migration in the world. Undoubtedly, it will affect all aspects of Chinese society and is already beginning to be a huge challenge to urban planners.

One of the outcomes of urbanization is the expansion of cities, which may bring on sprawl. Now in China, where resources are limited relative to the huge population, the results of sprawl are primarily that agricultural land is being encroached on in suburban areas; low density communities and industrial zones now occupy newly developed districts. This phenomenon is similar to the results of urban sprawl in North America, although the causes are different. How to control sprawl in order to let cities develop “smartly” is becoming a main planning issue in China.

In North America, smart growth was proposed in order to alleviate sprawl and has proved to be one of the most useful development patterns and management tools in urban planning (Hodge & Gordon, 2008). Many plans in North America have already embodied the principles of smart growth. These are good examples for China to learn from.

In China, official plans (*cheng shi zong ti gui hua*), which are at the top tier of the urban planning system, are statutory tools to control urban development and outline the general intended land use patterns of all cities. This research focuses attention on evaluating the implementation of smart growth in local official plans. Evaluating official plans is especially important because they are the primary documents that describe the overall long-term vision and goals for a community's future growth. Establishing smart growth as a principle in

official plans also provides a legal basis for the policies and regulations that will be used to implement smart growth.

To discuss the implementation of smart growth in Chinese official plans and examine how sprawl is being dealt with, the variation in spatial development patterns in China and North America and the two different types of sprawl should be borne in mind. North America's sprawl might not totally appear in China, while a type of diversified, more complicated and uncertain Chinese sprawl might emerge that cannot be dealt with just using by North America's smart growth. Consequently, research on smart growth in China should be done based on the context of this country. This paper uses as a case study, Xuzhou, which was one of the first cities to adopt the Planning Regulations Guidelines (No.146), to evaluate the implementation of smart growth in Chinese official plans.

1.2 Purpose and Objectives of the Research

The purpose of this research is to evaluate the implementation of smart growth in official plans in China. The ultimate goal of the research is to help establish a vision of an ideal community. The academic literature on this subject is sorely lacking in China, and thus, this research will fill a gap for planning professionals and officials. Four primary objectives provide the foundation for the research:

- To identify an evaluative framework that provides key factors relating to the study of smart growth in official plans;
- To chronicle the updating of the official plans of the city of Xuzhou and determine the primary barriers to those plans;
- To evaluate Xuzhou's Official Plan (2007 to 2020), using the framework identified; and,
- To use the information gathered by research to provide recommendations for the implementation of smart growth in China.

1.3 Research Questions

From the above research objectives, the following five research questions have emerged:

- What is the cause and what is the extent of sprawl in China?

- What is being done to implement smart growth in North America?
- Do planning policies in China embody smart growth strategies?
- How much of the smart growth contained in Xuzhou's Official Plan is being implemented? What are the reasons or obstacles preventing some principles of smart growth being used?
- What are the limitations to using smart growth in official plans in China and how can they be overcome?

1.4 Significance of the Study

Most Chinese cities have compact forms. Currently, however, sprawl has already occurred in some big cities where the economy and the number of private cars has increased rapidly (Huang & Casella, 2007). Once most of the middle class in China own their cars, the size of cities will grow exponentially. Therefore, there is an urgent need to do research about sprawl and how to deal with it in China.

This research contributes to the current hot issue of sprawl in China and, particularly, to the causes and the extent of that sprawl. This work diverges from other work in the planning literature by assessing the presence of smart growth principles in official plans when cities are faced with the increasing direct challenge of sprawl.

This work also contributes to the planning profession by identifying opportunities and challenges to deal with sprawl using smart growth in Chinese context, which is not totally like that of North America. Using this research as a base, planners will be better able to formulate strategies, especially at the official plan level, that implement smart growth by targeting sprawl that currently impedes cities' sustainable development. Through implementing smart growth, cities in China will be able to cope with growth while maintaining a high quality of life and fulfilling the goal of balanced environmental, social, economic, and land use priorities.

This research will be useful to two sets of users: a) other academics and development analysts who are concerned with the issue of urban sprawl in China and strategies to deal with this issue; and b) development policy makers ranging from municipal governments to

urban policy specialists. Planners and planning officials, especially those in Xuzhou City, should find the results of this study both timely and useful as they prepare new official plans.

1.5 Definitions

Evaluation: As Weiss (1998) defines evaluation as the “systematic assessment of the operation and /or outcomes of a program or policy, compared to a set of explicit or implicit standards, as a means of contributing to the improvement” of the activity. Here the paper focuses on evaluation of a planning policy, which is an official plan.

Smart growth: According to American Planning Association (1999), smart growth refocuses a larger share of regional growth within central cities, urbanized areas, inner suburbs, and areas that are already served by infrastructure. Smart growth reduces the share of growth that occurs on newly urbanizing land, existing farmland, and in environmentally sensitive areas. In areas with intense growth pressure, development in newly urbanizing areas should be planned and developed according to smart growth principles. Implementation of smart growth in this paper means carrying out smart growth principles in planning documents or in actual planning implementation.

Official plan: the official plan is a long-range, comprehensive, general policy guide for future physical development (Hodge & Gordon, 2008). An official plan is also called a master plan, official community plan, development plan, municipal plan, general plan, etc.

1.6 Methodology

The research followed qualitative procedures and was accomplished through a combination of a review of relevant documentation, interviews, and statistics. A case study was carried out to accomplish the above objectives. This case study investigates smart growth implemented in the subject area, and the planning and policy implications of those initiatives. The case site was selected because it was able to provide information that is rich and complex in detail, thus facilitating an in-depth examination.

In addition, data sources were studied in order to gain a deeper understanding of the issues surrounding the implementation of smart growth in official plans in the selected city, Xuzhou, as well as in China as a whole. A comprehensive review of relevant literature

involved books, journals, planning reports, newspapers, and the Internet. These proved to be valuable sources of information, providing further detail and background on the city.

Besides the above data sources, information relating to the role of official plans, and what constitutes success in the implementation of smart growth in official plans was also gathered through a series of semi-structured interviews conducted with planners, municipal officials, and provincial consultants. Semi-structured interviews provide the benefit of flexibility. A list of predefined questions was asked, with the interviewees free to add additional comments, and the interviewer free to pose additional questions after these respondents' answers. On the whole, interviewees were asked primarily the same set of questions, with the questions tailored to elicit elaboration in the responses. The questions were designed to gather information on four main themes: sprawl in China, especially in Xuzhou City, the role of official plans, smart growth in official plans in contemporary trends, and the idea of successful use of smart growth in official plans.

1.7 Scope and Limitations

The scope of this research is limited to the Xuzhou's Official Plan (2007 to 2020). This plan was selected because it is one of the first official plans to adopt the Planning Regulations Guidelines (No.146) that reflect the contemporary use of smart growth in Chinese planning. However, this official plan's relative newness may raise a limitation to the study. The project examined throughout this thesis represents a relatively short time period, and as such a discussion of its long-range impact and effectiveness is limited. Over all, the focus of this study was on the program/policy only. Included in the focus was an examination of the implementation of smart growth in official plans as a means to guide urban development.

A second possible limitation of this study is related to the qualitative research method. The selection of only a limited number of individuals to interview could potentially be prone to bias, or be unrepresentative. This potential bias was addressed through the use of a substantial number of planning documents to supplement the interview data.

1.8 Thesis Organisation

This thesis is organized into six chapters. Following this introduction, Chapter Two provides a review of the literature on the smart growth movement and official plans in both North

America and China and highlights the difference in the causes and the lack of available information on the Chinese side. Chapter Three summarizes the research methodology utilized in conducting this research and the interviews of participants. It also discusses the strengths and weakness of the chosen research method. The chronology of official plans of Xuzhou is provided in Chapter Four. The chapter contextualizes the trends that have characterized official plans in Xuzhou. Chapter Five provides an analysis of the findings, based on the interviews and document review, and highlights the city-specific challenges to the implementation of smart growth in China. Finally, Chapter Six presents the research conclusions and recommendations. Recommendations for planners, municipalities, and senior levels of governments on dealing with the implementation of smart growth in official plans are discussed.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction

Chinese cities perform very well in maintaining a compact development form (Chou, 2005.) However, sprawl currently has already occurred in some developed metropolitan areas. More and more attention has been paid to urban sprawl in China. Smart growth in North America has been proposed and is being used to deal with urban sprawl. Since urban sprawl brings the same social, economic, and environmental problems to any region, China should adopt North American best practices for its cities. Any discussion of the potential remedy for a problem starts with an understanding of the root cause. This chapter addresses the first objective identified in the introductory chapter which is to understand the cause and the extent of sprawl in China. This chapter also addresses two research questions identified in the introductory chapter which are: what is being done in the implementation of smart growth in North America? Do planning policies in China embody smart growth strategies? To answer those questions, this literature review will discuss the development of theory of smart growth in North America and in China, the implementation of smart growth in North American planning, and concepts similar to smart growth in Chinese official plans. In addition, the Chinese planning system and the Planning Regulation Guidelines also will be introduced in this section.

2.2 Definition and Performance of Urban sprawl

According to Merriam-Webster dictionary, urban sprawl first appeared in this dictionary in 1956. Its definition is “haphazard growth or outward extension of a city resulting from uncontrolled or poorly managed development.”

In North America, the label “urban sprawl” is generally attributed to urban growth that exhibits the following characteristics: a) low building and population density, b) discontinuity of the urban fabric or “leapfrogging”, c) separation of land uses and, therefore, d) dependency of people on the private automobile for their daily trips, and e) the waste of

agricultural land through fragmentation (Bourne et al., 2003.) In China, urban sprawl's major characteristics also include low density buildings on the edge of cities and the waste of agricultural land through fragmentation. But there are other forms of sprawl, such as large amounts of development zones, golf courses, university towns on the fringe of cities. The largest difference in the forms of urban sprawl between North America and China is: residential area is the primary form driving urban sprawl in North America, while in China it is development zones (Huang & Casella, 2007.)

Although the scope and characteristics of urban sprawl in North America and China are not the same, they are suffering the same unwanted byproducts of sprawl, which include traffic congestion, air and water pollution, loss of natural habitat, loss of farmland, dependency on petroleum, a fiscal and social crisis in the cities, inability of public services to keep pace with suburban growth. Hence, China can learn from North America's smart growth experience, which deals with urban sprawl.

2.3 Smart Growth in North America

It was only from the 1950s, with development of the Interstate Highway System, that the United State's pattern of sprawling and low-density residential development began to leapfrog away from the central city — a pattern that in the last fifty years has accelerated despite political rhetoric, energy crises, and fiscal distress. Sprawl requires significant development of new facilities and services, with accompanying abandonment and underutilization of existing facilities. Sprawl also increases development costs in the suburbs, diminishes the environmental factors needed to sustain viable economic growth, and requires the consumption of the large amounts of agricultural land, energy, and natural resources (Freilich, 1999.) Under these circumstances, there is a growing concern that these development patterns are no longer in the long-term interest of the cities, existing suburbs, small towns, rural communities, or wilderness areas. At the same time, attempts have been proposed in order to cure the symptoms of urban sprawl: environmental protection laws, concern with mass transportation, state and local growth management laws, city redevelopment programs, and advocacy planning.

The 1990s was a decade for renewed interest in land use reform. Smart growth emerged in the 1990s as a frontal assault on urban sprawl. Smart growth is one of the latest labels given

to efforts in battling urban sprawl. Smart growth, in general, is a broad, proactive policy-planning exercise that aims to integrate environmental protection, economic vitality, energy saving, social equity, and quality of life into comprehensive local or regional plans by using tools that control and direct where growth occurs as well as the form that development takes (American Planning Association, 1999; Lorentz & Shaw, 2000).

Smart growth is a vision under development, therefore there is no single definition of the concept (Onyschuk et al 2001); its meaning depends on context, perspective and timeframe. The expression “smart growth”, like that of “sustainable development”, is vague enough to be used by people holding very different opinions of what constitutes appropriate government intervention in urban change. In general, it denotes practices of planning, regulation, and construction that aim to economize on land, natural resources, and public monies by promoting greater densities, preventing leap-frog development, establishing an urban perimeter and restricting development to areas within that boundary (i.e., more infill development, intensification, re-urbanization), and fostering the reuse of brownfield sites, already serviced by public infrastructure.

There is consensus on the breadth and scope of smart growth which is defined by the American Planning Association (1999) as follows:

In contrast to prevalent development practices, smart growth refocuses a larger share of regional growth within central cities, urbanized areas, inner suburbs, and areas that are already served by infrastructure. Smart growth reduces the share of growth that occurs on newly urbanizing land, existing farmland, and in environmentally sensitive areas. In areas with intense growth pressure, development in newly urbanizing areas should be planned and developed according to smart growth principles.

The goal of smart growth is not to prevent growth; rather, at its core it means sensible growth. It recognizes that growth and development are both inevitable and beneficial. Furthermore, smart growth seeks to revitalize the existing built environment and, to the extent necessary, foster efficient development at the edges of the region, creating more livable communities (www.smartgrowth.org.)

In 1996, the Smart Growth Network outlined ten principles of smart growth in order to give some clarification to the term:

- Mixed land uses;
- Take advantage of compact building design;
- Create a range of housing opportunities and choices;
- Create walkable communities;
- Foster distinctive, attractive communities with a strong sense of place;
- Preserve open space, farmland, natural beauty and critical environmental areas;
- Strengthen and direct development towards existing communities;
- Provide a variety of transport choices;
- Make development decisions predictable, fair and cost-effective; and,
- Encourage community and stakeholder collaboration in development decisions.

(Tregoning, Agyeman, & Shenot, 2002)

Table 2.1 provides a comparison of smart growth and urban sprawl that further illuminates the principles of smart growth.

Smart growth strategies are primarily implemented by regional and local governments, although some require state/provincial support. Developers can implement some smart growth design features.

In the United States, smart growth mandates have been initiated at the state level in Maryland, New Jersey, Oregon, Rhode Island, Tennessee, and Washington (American Planning Association, 1999). In total, up to 39 states are characterized as supportive of smart growth (Lorentz & Shaw, 2000). Furthermore, in America nationwide, organizations that represent a wide range of interests have enthusiastically accepted and promoted the principles as guideposts for developing and improving America cities, towns, and neighborhoods. In Canada, Ontario completed the first stage of a Smart Growth Initiative in 2003 (Central Ontario Smart Growth Panel, 2003).

Table 2.1 Smart Growth VS Conventional Development: Comparison of Outcomes

| Smart growth topic | Specific consideration | Smart growth | Convention (sprawl) |
|---------------------------------------|---------------------------------|--|--|
| Land supply, land use, and urban form | Land consumption | Efficient use of land as a limited resource | Inefficient and excessive land consumption |
| | Directional focus of growth | Infill and redevelopment (maximum use of existing development areas) | Greenfield development (expansion into new/undeveloped areas) |
| | Density/intensity | Higher | Lower |
| | Urban form | Compact and contiguous | Scattered, dispersed, and leapfrogged |
| | Land use | Mixed; jobs-housing balance | Single-function and separated |
| Natural Resources and the environment | Values/ethics | Land as a resource, Sustainability | Land as a commodity; Satisfy market preferences |
| | Open space provision | Maintain, enhance, and expand | Provide when supported by market forces |
| | Open space locations | Proximate to all users; connected | Inaccessible, unconnected, includes “remnant” parcels or left-over pieces form plats |
| | Brownfield | Clean up and reuse | Abandon |
| Housing | Energy | conservation | consumption |
| | Values/ethics | Choice; diversity, affordability | Provide what the market will bear |
| | Location | Disperse in all locations, especially in city/activity centres | Predominantly in exclusive residential areas |
| | Type of unit; mixes | Wider variety; mixtures of types | Predominantly detached, single-family; rigid separation of types and price |
| Transportation | Cost | Sufficient for all incomes | Market fails to provide affordable units for all incomes |
| | Modes | Multiple modes | Automobile-dominant |
| | Road system and network pattern | Grid or network of streets | Hierarchy of arterials, collectors, and local streets |
| | Accessibility | Interconnectivity encouraged | Separation encouraged |
| | Predominant streets | Through streets with alleys encouraged | Cul-de-sacs and collectors |
| | Street pavement widths | Skinny; concept of street “diets” | Wide/excessive |
| | Pedestrian facilities | Routinely provided; workability encouraged | Generally not provided; walking not encouraged |
| Other infrastructure | Transit | Provide choices for use of transit | Densities are too low and patterns too spread out to provide transit |
| | Water and sewer | Timely and concurrent provision of systems | Use lowest cost means |
| Permitting processes | Funding consideration | Concern with unfair development costs; maximize existing investments | Public subsidies, extension of facilities without efficiency and equity considerations |
| | Modes | Focus on reforming procedures for greater timeliness, efficiency, and fairness | Multiple, uncoordinated processes; time consuming |
| Other | Goals | To facilitate new objectives | To frustrate unwanted uses |
| | Values/ethics | Concern for social equity and environmental justice | Not-In-My-Backyard; Citizens Against Virtually Everything |
| | | Regionalism | Parochialism |

Source: Jerry Weitz & Associates, Inc.2001.

Although smart growth provides social, economic, and environmental benefits, it does encounter some barriers. Some planners and politicians may take offence to the term smart growth and interpret it as an indication that what planners have been doing to date is dumb growth (O'Toole, 2000). Supporters of smart growth maintain that the concept is not intended to be an insult to the planners of the past, but rather a process to allow communities to make the smartest decisions possible regarding their future. Avin & Holden (2000) argues that smart growth's goal is to build a consensus about a future that fits the community's needs and resources. Others may see smart growth as a reincarnation of the same planning that has been taking place throughout the latter half of the 20th century (Lorentz & Shaw, 2000). In its defense, smart growth appears to be distinguishable from previous planning efforts in principle because of the increased emphasis placed on public participation. Other criticisms of smart growth include the effects of containing urban development on housing prices (Nelson, 2000), the difficulties of revising current planning legislation (American Planning Association, 1999), and the limitation of personal freedoms. O'Toole (2000) asserts that state implemented smart growth is a form of socialism – a taboo in American democratic society. In spite of its criticisms, smart growth is rapidly gaining popularity as a means improving urban development (Avin & Holden, 2000; Tregoning, Agyeman & Shenot, 2002).

2.4 Contextual Difference between North America and China

China is experiencing rapid urbanization. Will the same suburbanization that took place in America occur in China? How can China prepare for future urban sprawl using America's experience? To answer these questions, it is necessary to analyze several important differences between North American and Chinese contexts:

The Development Pattern: In North America, the development pattern is suburbanization with urban sprawl that is low-density as a result of the prevalence of the automobile (Rusk, 1999). In contrast, China is undergoing rapid urbanization with controlled spatial expansion that is high-density.

Transportation: The primary mode of transportation in urban North America is the automobile. The automobile was a necessary structural support for large-scale suburbanization in the US (Muller, 1981.) In China, public transit and the bicycle are the main means of transportation although the number of automobiles is increasing quickly each

year. However, it is needed to know that a emerging sprawl trend is being reinforced by the construction of major freeway links between cities and peripheral highways around them (Zhou & Logan, 2008).

Living Philosophy: Living in a suburban area is part of the “American dream,” in North America. Yet in China, cities attract most people because the quality of life in cities is much better than that in suburbs, and the government provides more privileges to the residents of cities (e.g., Hukou^① defines the identity of urban and rural residents). Many Chinese preference for the urban core results in a socio-spatial pattern similar to the European one, wherein, despite the presence of some upper-class suburbs, the inner city continues to have a highly heterogeneous social mix with significant and growing fashionable areas (Zhou & Logan, 2008). However, with the reformation of Hukou, the increase of private cars, the exacerbation of inner city’s environment, and the development of real estate, more and more people prefer to live in suburban areas.

Land policy: In North America, land can be owned privately and publicly indeterminately, while in China land belongs to the state according to the China’s Land Management Act, and all city policies are made based on this situation.

Fiscal stimulation: In North America, municipalities rely heavily on their property tax base because they typically have limited revenue generation capacity (Hodge & Gordon, 2008.) Hence, suburban governments welcome new residents moving into their boundaries. In China, land yields (income from land transfer fee, which normally are important funding means for construction and development) remain a steady source of fiscal revenue for local governments. In many districts revenues from land leases are the primary source of financing

^① A Hukou refers to the system of residency permits which dates back to the 1950s where household registration is required by law in mainland China. A household registration record officially identifies a person as a resident of an area and includes identifying information such the name of the person, date of birth, the names of parents, and name of spouse, if married. The Hukou system of household registration constrains migrations access to the urban labour market and to various services. Processors of a local Hukou receive preference in a job allocation, while temporary migration must rely on personal, family, and ethnic networks to find employment (Feng, Zou, & Ruan, 2002.) The Hukou (regulation) system that was use to control migration is now seen as long past its usefulness, a remnant of the old regime that needlessly obstructs migration’s integration into the city in a period when all agree that a growing urban labour force is needed (Logan, 2008.)

for local services (Zhou & Logan, 2008.) Thus, more land is consumed, the more money government will get. This land-consumption fiscal stimulation drives urban sprawl in China.

It is very important to bear in mind the different situation in North America and China when North America’s experience dealing with urban sprawl is learnt by China. Dealing with sprawl in China must be based on Chinese reality and practices.

2.5 Urban Sprawl in China

Urban sprawl in China currently is not evident. With the change of social-economic and urban expansion, it might be a barrier to achieving sustainable development.

2.5.1 Urbanization in China

The process of urbanization in China has accelerated since economic reforms in 1978 with economic increase. The urbanization rate increased from 17.9 per cent in 1978 to 43.9 per cent in 2006 (Table 2.2). At the same time, cities are expanding quickly with rapid increases in population (Table 2.3). According to the National Bureau of Statistics of China (2007), there were 333 municipalities, 2860 counties, and 41040 townships (towns) in 2006.

Table 2.2 Rates of Urban Growth in China (1978–2006)

| Year | Urbanization rate (%) | Year | Urbanization rate (%) |
|------|-----------------------|------|-----------------------|
| 1978 | 17.9 | 1995 | 29.04 |
| 1980 | 19.39 | 2000 | 36.22 |
| 1985 | 23.71 | 2005 | 43.0 |
| 1990 | 26.41 | 2006 | 43.9 |

Source: The National Bureau of Statistics of China, 2007

Table 2.3 Number of Chinese Cities by Size of Non-agricultural Population

| Year | Super-large cities >2 million | Very large cities 1-2 million | Large cities 0.5-1.0 million | Medium cities 0.2-0.5 million |
|------|----------------------------------|----------------------------------|---------------------------------|----------------------------------|
| 1949 | | 5 | 7 | 18 |
| 1978 | | 13 | 27 | 60 |
| 1995 | 10 | 22 | 43 | 192 |
| 2000 | 13 | 27 | 53 | 218 |
| 2006 | 37 | 80 | 106 | 59 |

Source: The National Bureau of Statistics of China, 1996, 1999, 2001, and 2007

2.5.2 Urban Sprawl Phenomenon

In less than two decades China's settlements have transformed from relatively compact, low-rise centers to sprawling metropolises with high-rise cores surrounded by suburban subdivisions and mega-malls along the US model. In addition, as formerly independent cities begin to fall within the penumbra of major cities, resemblance increases to the megapolises of Tokyo-Yokohama, New York-Washington, and the British Southeast. Although this is particularly the case for Beijing and Shanghai, many other metropolitan regions are also moving in this direction. (Zhou & Logan, 2008)

The rapid outward expansion of urban space is one of the most visible changes in Chinese cities in the last two decades (Zhou & Logan, 2008.) This phenomenon of growth at the edge of the metropolitan areas, according to Logan, is a natural process from the perspective of central place theory and density gradient laws, according to which development concentrates in zones where land is more available, less expensive, and newly accessible to public and private transportation. Enyedi (1992) believes that the main lines of urban development, including suburbanization, have been universal, not substantially different in socialist and market societies. Wand and Zhou (1999) echo this view, stating that many of the sources of suburbanization in China are the same as those found in the West. They believe that economic forces are universal, so even socialist countries cannot escape.

Urban sprawl in China is primarily driven by rapid increase of low-density development zones, golf courses, university towns, and single family houses at the edge of cities (P03, P04). Compared to cities in North America, most of which develop at low density, Chinese cities maintain a compact development form. Their main problem is that cities develop in a disorderly fashion (P01, C01): many developments happen in the form of successive rings radiating out from the core, such as the development of Beijing (see Figure 2.1). At the same time, planning management cannot catch up with the speed of city development (P01). Hence, it is observed that many urban sprawl phenomena in China, such as development zones, university towns, golf course, and low-density communities, happen rapidly on the fringe of cities.

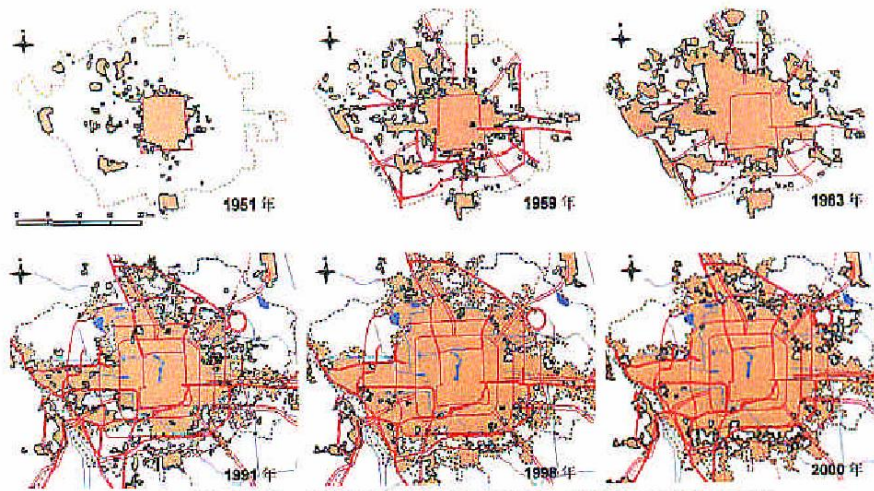


Figure 2.1 The Evolution of Ring Road Model in Beijing in GIS

Source: Wu & Liu, 2005

2.5.2.1 Development Zones

A development zone in China is a district of concentrated industrial activities supported by the governments' preferential economic and revenue policies (P04). Development zones include Economic Development Zones, Industrial Development Zones, Science and Technology Industrial Parks, etc. The goal of development zones is to accelerate industrialization, stimulate economic development, increase local revenue, and thus benefit social development and urban construction through agglomeration economies. One of the main sources of agglomeration economies is the pool of skills available to firms in a metropolitan region. Another advantage of agglomeration economies is the knowledge spillovers from the investment in research and development and in technological extension services provided by firms (Yusuf & Nabeshima, 2008).

In late 1984, China's central government approved a first group of development zones in 14 coastal cities to provide preferential policies for foreign investors. According to a statistic report from the Ministry of Land and Resources of the People's Republic of China, in 2004 there were 52 National Economic and Technological Development Zones. The average number of industries per kilometre is 61, and the average industrial output per square kilometre is 2,300 million Yuan. The numbers of companies in the state-level science and technology industrial parks reached 45,828 in 2006, nearly triple that of 1998. The production in 2006 was more than eight times than that in 1998. Those development zones

were not only developed at a high standard, but also solved the problems with retraining farmers and farmers' well-being. This success has led many local governments to attempt to repeat the experience on their home turf.

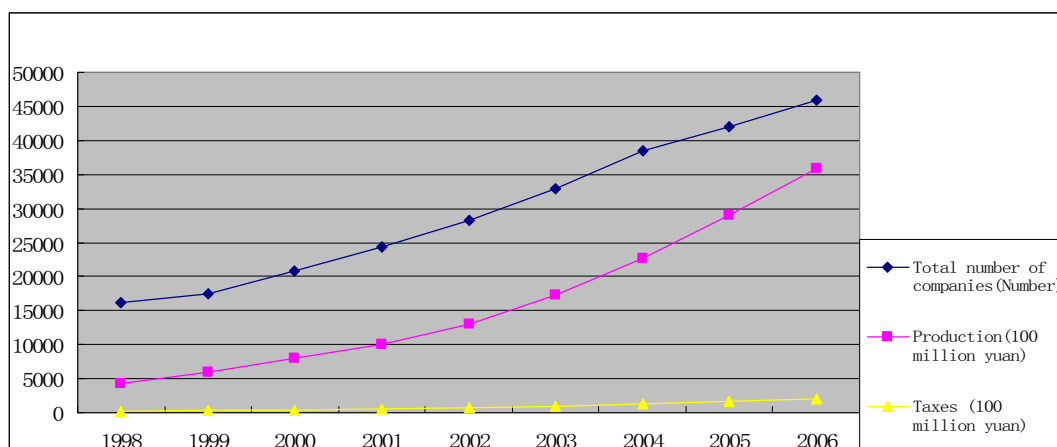


Figure 2.2 The Growth of State-level Science & Technology Industrial Parks from 1998 to 2006

Source: Above numbers were collected from the website of China Science and Technology Statistics (<http://www.sts.org.cn/sjkl/gjscy/data2006/2006-3.htm>). The above chart was made by the author.

Since 2000, thousands of development zones, which are seen as “attractive cakes” and useful tools, have been set up by different levels of government, who are thirsty for new investment and revenue. Urban land was allocated by the government at low or even no cost^② to end users and without regard to the relative value of different locations. As a result, for example, large industrial zones continued to be built within cities in spite of environmental factors that were well known at the time. Most of development zones, built at a very low density or on recently occupied pieces of illegally acquired land on the fringes of cities and towns, were set up in farmland, natural environment areas, and even in scenic reserves. In 2004, the total area of development zones nationwide was 38,600 km². In the same year, the total legally developed area in nationwide cities and towns was 30,400 km², which was less than the area of development zones. These astonishing numbers show one of the characteristics of Chinese sprawl: it is driven by the increase of industrial land.

^② The lower land transfer prices tend to occur at low levels of governments.

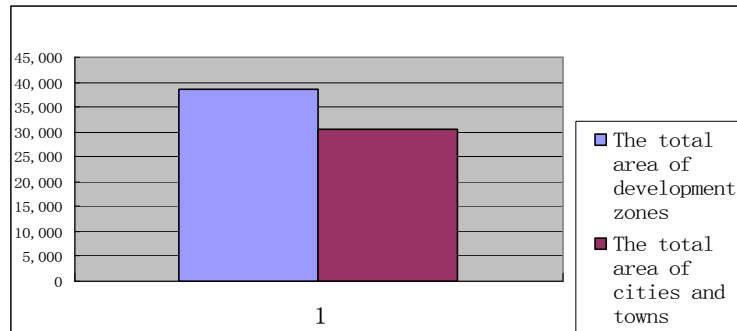


Figure 2.3 Comparison of Unauthorized Development Zones and Legally Developed Area in Cities and Towns in China in 2004 (Unit: km²)

Source: Numbers were collect from the website of the Chinese National Development and Reform Commission (http://www.ndrc.gov.cn/xwfb/t20070419_130504.htm). The chart was made by the author.

Huge negative effects come from these unauthorized development zones. Firstly, the reduction of farmland, scenic reserves, and ecological reserves results in the directly decrease of crops and the waste of land resources. Secondly, the occupation of farmland causes great damage to farmers' interests. Land disputes are among the most common problems in the countryside with many farmers losing their most essential resources to the construction of factories, roads, or other general infrastructure projects. Farmers who have had their land illegally seized are usually inadequately compensated or sometimes do not receive due payment. These farmers, stranded and in desperate conditions, harbor grudges against local governments and become elements of social unrest. Thirdly, competition between different jurisdictions intensifies: in order to attract investment to development zones, some local governments supply very cheap land or even give land to developers for free. The distorted price of land harms the market and worsens the economy and social stability. Finally, over-development of industrial zones may lead to financial risks since many depend on bank loans.

Land is a most important national resource in China. Because of its huge population, China's land resources are scarce and the nation faces land constraints. Hence, it is very important to control land resources. The campaign to stop the development zones from overheating and to protect farmland was first launched in February, 2003. The first step was to establish the exact number of development zones. Also in 2003, the Ministry of Land Resources stepped up project reviews and inspections to ensure the nation's policies are being carried out. A total of 4,150 projects have since been suspended. On July 18, 2003, 5658 zones were found

and in August, 2004, 6866 development zones were found. Unauthorized development zones were cancelled and the land reclaimed for its original purposes. According to incomplete statistics from the Ministry of Land Resources, 70 per cent of 6,866 development zones across the country were found to have illegally acquired land or were left unused (<http://www.mos.gov.cn/Template/article/display0.jsp?mid=20040810005512>). In 2007, according to the Chinese National Development and Reform Commission (http://www.ndrc.gov.cn/xwfb/t20070419_130504.htm), 1568 development zones occupying in total 9949 km², were defined by the State Council. At the same time, plans to build zones on a total of 24,900 km² of land, accounting for 64.5 per cent of the total area of development zones in 2004, have been chopped. More than 1,300 km² of land have been returned to agricultural use. The second step was to establish strict regulations for the way development zones are set up. Those regulations stipulate that each town can only own one development zone, and that no development zones located in water supply reserve areas, scenic reserves, natural parks, and environmental sensitive areas will be allowed.

The campaign to stop the development zones from occupying farmland is the first official war against urban sprawl.

2.5.2.2 Golf Courses

The first golf course in mainland China was built in 1984 in Guangdong Province. From then on, many golf courses have been built, especially in the last ten years. In January, 2004, the Ministry of Land Resources announced that there were ten golf courses approved by the Ministry. However, according to the Chinese Golf Course Guides edited by the Guangzhou Golf Forum, there were a total of 168 golf courses in 2003 and they covered 252 km². In 2006, there were over 300 golf courses, according to statistics on the Chinese Report Website (<http://www.chinahyyj.com>).

The Chinese Golf Association proposes to build golf courses on wasteland. However, the proposition does not restrict site selection. Some golf courses are built on farmland instead of wasteland. Due to the fact that the development and land use of golf courses is not administered by a certain ministry or department, local governments have the power to make plans to build golf courses. The lack of regulations for the development of golf courses results in the out-of-control increase of such courses. Some were built on leased farmland,

some on natural land. Most courses do not qualify for inclusion in local land use plans and official plans. This kind of unauthorized development challenges the authority of those plans and the administrative departments of land use and planning.

The development of golf courses in China combines with real estate projects, which include expensive gated communities. For example, in a two-square kilometre golf course, one third of the land can be used to build at least 300 single-family houses. Normally a 300-square metre house can be sold for 1.5 million Yuan if one square metre's price is five thousand Yuan. A single family house close to a golf course becomes a selling point in those real estate projects.

On January 10, 2004, the State Council announced plans to suspend the development of golf courses in order to regulate and inspect such projects. Two main purposes are intended: the first is to suspend new golf course development; the second is to investigate whether already built golf courses are consistent with local land use plan and the official plan. On December 12, 2006, the Ministry of Land Resources and the Ministry of National Development and Reform Commission announced the Category of Restricted Land Uses, a regulation that includes use for golf courses.

The campaign against illegal golf courses and to protect land resources reflects the urban sprawl issue that is gaining more and more attention in China.

2.5.2.3 University Towns

A university or college town is a community that is dominated by its university population. The motivation for developing a university town is to supply a place for a university's development and to share the educational resources. The site selection for a university town should be defined through a comprehensive evaluation of the potential city's social, economic, cultural, educational, and technological situation. The size of the university town needs to be consistent with the needs of a university or several universities. However, in China, since 2000, some inappropriate cities have also constructed or are going to construct university towns in order to stimulate the local economy. University towns have become a new type of urban sprawl.

Since the establishment of regulations on the transaction of commercial land, land can only be sold by auction, bid, or public sell. Hence, the possibilities for illegal land transformation have been decreased. However, some developers have found out a new way to get cheap land: a university town development. In China, educational land is much cheaper than commercial land. Some governments see the development of a university town as a strategy to expand urban space; some governments that are short of revenue use a university town development to obtain otherwise untouchable land, which is often given to developers at very cheap prices or even for free. As a reward, developers build educational facilities for that local government. The downside of this procedure is that some part of the land will be transformed into real estate projects, which will be sold at commercial prices (P02).

In 2003, research by the Ministry of Land Resources investigated Chinese university towns. According to the statistic, there were more than 50 university towns that are built or being built. Half of that development illegally used farmland just as many illegal development zones did.

There are two distinct problems with the development of university towns in China. Firstly, the scale of a university town, normally several square kilometres, is larger than that of an ordinary development zone. Secondly, many real estate projects exist in a university town. Those real estate projects, which are illegally developed on the cheap educational land instead than on commercial land, seriously affect the stability of the land market: governments give land to developers cheaply which promise to develop a university town cheaply. At the same time, developers use the land as security to get additional loans in the form of development capital. In this vicious circle, therefore, developers get more and more land and use it to get more and more money.

Unregulated development of large-scale university towns has side effects, which are that farm land is wasted and the environment is destroyed. For example, several universities in Shenyang City used two square kilometres of illegally acquired rural land, including prime farmland, to build a university town and relocated 300 farmers. That seriously harmed the farmers' interests. According to a report of National Audit Office of the People's Republic of China in June 2005, four university towns occupied 87 km² of land in 2003, just half of which was used for education. Five per cent was instead for real estate projects and golf courses, and the rest was empty. If university towns continue to be developed

indiscriminately, the result will be loss of farmland and environmental resource and therefore rampant sprawl.

2.5.2.4 Low-density Communities at the Edge of Cities

Until the 1980s, the term “suburb” typically referred to agricultural towns outside of cities. It is only in the past 20 years that cities have spilled over their traditional boundaries and created a large transitional space whose residents have predominantly urban occupations (Zhou & Logan, 2008). Wang and Zhou (1999) point to institutional changes and infrastructure investments associated with market reform in China as factors that unleashed suburbanization in its current form. With the increase of citizen’ incomes, sophistication of the real estate market, and the development of a highway system, suburbanization has increased in Chinese cities, especially in metropolitan areas. A suburban single family home in low density neighborhood offers privacy, more space, personal control, green garden, and a long-range real estate investment than many people prefer over home in high density neighborhood in the city (Hodge & Gordon, 2008). At the same time, large scale urban renewal and reconstruction in the central cities since the 1980s have force the relocation of many city residents to suburbs. More and more low-density communities, normally named villa projects, and gated communities at the edge of cities, which meet the need of the housing market, have been built for a growing class of car-driving homeowners (Zhou & Logan, 2008).

In December, 2005, the Ministry of Land Resources and the National Development and Reform Commission promulgated Guidelines to adjust China’s industrial structure. In this document, villa real estate projects were restricted. In May, 2006, all villa projects were suspended in order to clear the villa market. In December, 2006, the Ministry of Land Resources and the Ministry of Land Resources and National Development and Reform Commission promulgated the Category of Restricted Land Uses, including land use for golf courses. In March, 2008, the Ministry of Land Resources proclaimed that a ban on land allotment for building villas will be strictly implemented.

The country cannot afford construction of large villas to meet the demand of a few high-end customers while sacrificing the interests of the majority (Zhou & Logan, 2008). Governments at various levels were urged to immediately halt the approval of land sales for villa

construction. In respond, many local governments have given the green light to luxury-housing estates that do not use the word "villa."

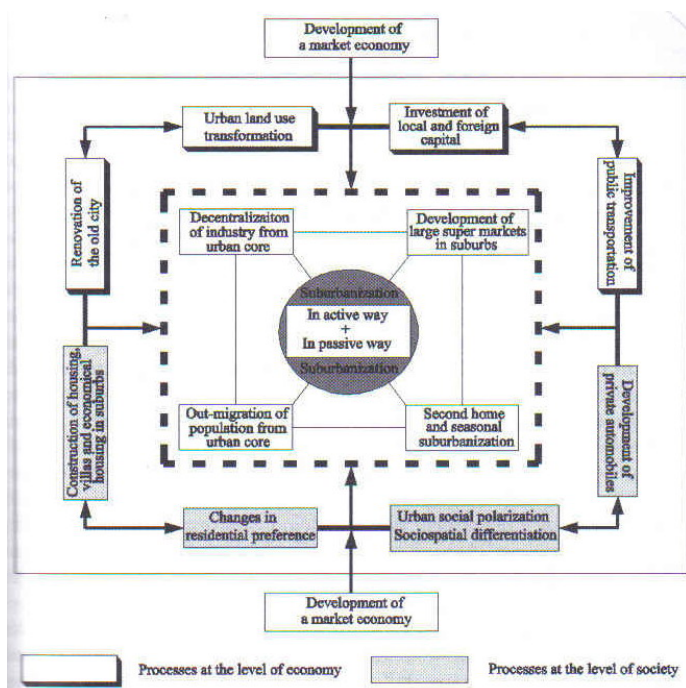


Figure 2.4 The Process Model of Suburbanization in China since the 1990s

Source: Feng, 2004.

However, the explanation of "villa" is still not defined by any authorized organization. The implementation of above regulations about controlling villa is in a dilemma. Thus, low-density communities quickly developed the edge of cities cannot be curbed.

Local governments' subjective action stimulates urban sprawl. Since land yields remain a steady source of fiscal revenue for local governments, the fiscal imperative drives local governments to keep acquiring more and more land: from the former forms of development zones, golf courses, to latter form of university towns. In response, the State Council, the Ministry of Land Resources, the Ministry of Construction, and the Ministry of National Development and Reform Commission have promulgated different regulations to deal with occurred authorized land uses in development zones, golf courses, and low-density communities. There is still no regulation to deal with illegal land use in university town. In the future, other inappropriate, even illegal forms of land use may also occur under the

unchanged fiscal system (P01). It is urgent to use planning policies to restrict local governments' impulse to consume more land.



Figure 2.5 Biguiyuan, Shunde, Guangdong, Epitomizing Chinese Large Scale Low-density Development

Source: Google Earth

2.5.3 Causes of Urban Sprawl in China

The following factors might cause urban sprawl in China:

Market forces: With its quick pace of industrialization and urbanization, China is facing a sharp conflict between land supply and demand. Inner cities face traffic congestion and air pollution. In contrast, there are the profit-making potential and amenities of suburban area locations offering “greenfield” sites that are cheaper than redeveloped areas, especially “brownfield” sites, within cities (Squires, 2002.) Therefore, developers prefer to develop on the fringe of cities.

Competition among cities and districts: All land remains state owned, and developers are dependent upon municipalities releasing land through a dual system of either long-term leases or direct administrative allocation. In principle this gives government very strong control over land use, but in practice the local state’s weak planning capacity and hunger for revenue and foreign investment undermine this power (Wu, 1998; Zhang, 2000). To compete with neighboring jurisdictions and to attract capital, investment and technology from outside the region, local jurisdictions often offer investors cheap or even free land, a practice that was rife along the east coast early in China's economic reform and opening-up (Yusuf & Nabeshima, 2008). City governments hope for increased economic activity, tax revenue, and

jobs. Competition among cities results in increasing numbers of development zones, university towns, and golf courses. Illegal land transaction has evolved into a controversial issue in China. Furthermore, in many districts revenues from land leases are the primary source of financing for local services. Districts within the same city are now rivals for private investment. They compete with one another for the revenues that can be raised by selling development rights within their jurisdiction. It is crucial to improve land use efficiency and protect arable land.

Economic priority: In the 10th Five-Year Plan (2001 to 2005), the people-first concept was put forward. However, in day-to-day working, some local governments still keep their eyes glued on economic growth, especially the Gross Domestic Product (GDP) increase at the municipal level. Thus, they devote less attention to the development of society, people, and the environment and more to financial growth. In the name of developing the local economy, different means have been employed by local governments to dodge the law or relevant regulations concerning land use. Some local governments place a lopsided emphasis on economic development and sell farmland at very low prices to attract investment. Some equate urbanization and industrialization with the acquisition of suburban farmland. Some encourage farmers to sell or rent their land collectively. In a word, the pursuit of “political achievement” by some local officials has stimulated urban expansion or even sprawl.

The automobile: In today’s China, the automobile industry is one of the main industries that stimulate the increase of GDP and the development of the National Expressway Network is taking place. The trajectory of recent urban development shows that urban space increases with the increasing car-owner ratio.

The causes of urban sprawl in China are not totally similar to those in North America. According to Gregory D. Squires (2002)’s analysis of North America sprawl, government housing policies and the private housing industry shaped and perpetuated a dispersed urban form. However, the above mentioned pressures from market forces, competition among cities, and the automobile are the same, the automobile being particularly critical (Rusk, 1999.)

2.5.4 Automobiles Bring Transition to the Urban Spatial Structure

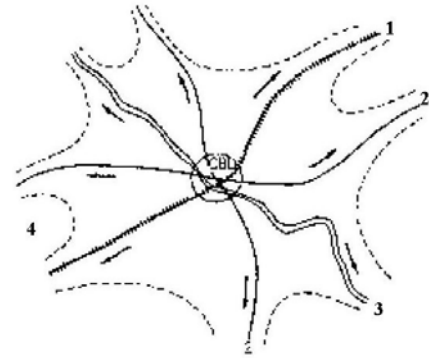
In China, urban sprawl is currently driven by local governments’ actions: the construction of development zones, golf courses, university towns, and low-density communities. In the

future, automobile will be a critical factor of urban sprawl. Just like David Rusk's (1999) discussion in "the sprawl machine," automobile has been a particularly important factor in urban sprawl.

Figure 2.6 Along-traffic Development Mode

Notes: 1-railway, 2-highway, 3-river, 4-a city's growth boundary

Source: Ding, 2005



Among all factors affecting urban spatial structure, the transportation mode of residents is crucial (see Figure 2.6). The advancement of transportation, including the prevalence of automobile and rapid transit, has driven suburbanization. The vast

expansion in automobile use is one of the momentous effects on the form of cities (Hodge & Gordon, 2008). Transportation improvement has made it possible for cities to develop over a broader region, and prompted rapid dispersion of the urban form along highways in many directions. The shopping centre and the industrial park, two auto-oriented facilities and common elements in the fabric of North American cities, signaled a reorientation of major community functions away from a single dominant centre (Hodge & Gordon, 2008). Hence, urban form has evolved from being centralized to dispersed.

Chinese citizen incomes keep increasing with the country's rapid economic development. China is now the second largest auto market in the world and the automobile industry is currently becoming a mainstay for the whole economy. According to the Chinese Association of Automobile Manufacturers, the output of automobiles in China in 2007 reached 8.5 million units, including 4.8 million passenger cars^③. Car consumption potential is huge in China. The passenger car segment, the main driver of China's overall vehicle sales, has maintained rapid expansion over the past years and will continued to increase rapidly for a long time.

^③ An automobile or motor car (usually shortened to just car) is a wheeled passenger vehicle that carries its own engine or motor. Most definitions of the term specify that automobiles are designed to run primarily on roads, to have seating for one to eight people, to typically have four wheels, and to be constructed principally for the transport of people rather than goods.

Growth in China's auto industry will mainly be spurred on by the following three factors:

The increasing GDP per capita of China enables broader private car ownership. From the experience of developed countries, when the average GDP per capita is between 3000 to 10000 US dollars, automobile consumption is in a rapid development stage. According to the National Bureau of Statistics of China, China's GDP per capita in 2007 was approximately \$ 2,460 and is approaching a level that will enable broader private car ownership. The GDP per capita in more urbanized areas of China, such as Shanghai and Beijing, surpassed \$8,500 and \$7,000 in 2007. The rising GDP per capita will increase purchasing power and may lead to higher private automobile ownership in China.

Preferential government policies are designed to promote the growth of China's auto industry. The central government has adopted a number of legislative measures intended to spur the growth and development of China's automotive industry: tariffs and tax incentives, which promoting the use of domestically manufactured automotive products, and regulations that encourage the use of more fuel efficient automobiles. Both measures will accelerate the demand for automobiles and auto parts manufactured in China.

The growth of the Chinese highway system stimulates and facilitates transportation by automobile. Statistics from the Ministry of Communication of China show that the total length of highways and other major roadways in China increased 105.6% between 1998 and 2006, from 1.1 million kilometres in 1998 to 2.2 million kilometres in 2006. The growth of China's highway infrastructure will stimulate growth in China's auto industry as it will make transportation by automobile easier.

In the future, urban planners will give priority to accommodating to the car in China. The development of automobile manufacturing greatly affects people's lifestyle and urban form: on the one hand, the development of the automobile industry stimulates economic development and makes movement convenient; on the other hand, the change in traffic modes/journey has a huge effect on urban form. The prevalence of private automobile may lead to rapid expansion of cities, even sprawl.

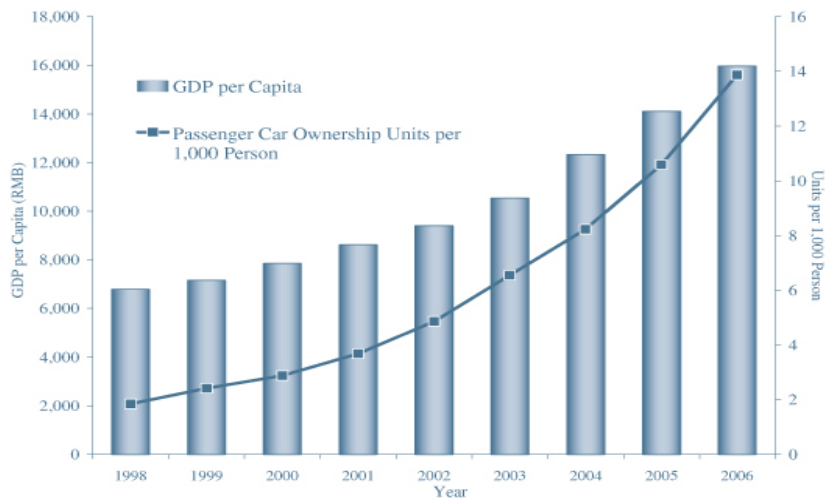


Figure 2.7 China Passenger Car Ownership per 1,000 Persons vs. GDP per Capita (1998-2006)

Source: National Bureau of Statistics of China (<http://www.stats.gov.cn/tjsj/ndsj/2007/indexeh.htm>)

2.5.5 Sprawl and Food Security

From the above analyses, it is very clear that the primary motivation to deal with urban sprawl in China is to protect land resource, especially farmland. The quantity and quality of farmland directly relate to national food supply security. In 2006, China's food supplies amounted to 0.5 billion tons, which seems a huge number. However, the amount per capita is only 380 kilogram, far less than the worldwide average. In order to ensure food supplies, China has adopted very strict land use management policies with a bottom-line amount of farmland, which is 1.8 billion mu.^④ At the same time, there are many land use regulations. For example, if land approved for development remains unused for more than two years, it should be recovered by the government according to laws and regulations; if the land remains idle for more than one year and less than two years, land developers should pay a 20 per cent non-usage fee; policy makers have started to track the speed and scale of new land supply in non-agricultural sectors annually to control the land supply and boost overall macro-economic control.

^④ Mu is a Chinese unit. One Mu equals to 666.66666666 square metres.

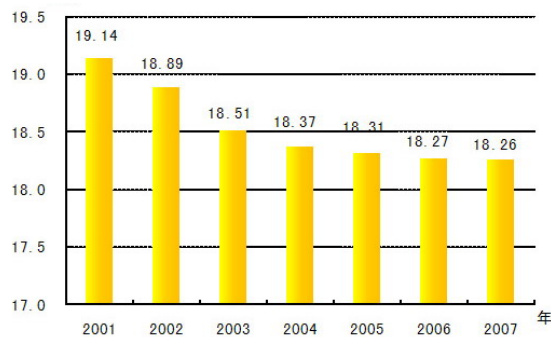


Figure 2.8 The Change of China' Farmland (Unit: 100 million Mu)

Source: The Ministry of Land and Resources P.R.C

(http://www.mlr.gov.cn/zwgk/zfgw/zfwj/200804/t20080416_101261.htm)

Although the growth of many development zones, golf courses, university towns, and low density communities at the edge of cities has been suspended or controlled, other types of land occupation, which may lead to urban sprawl, will appear in the context of rapid urbanization. Urban planners and officials need to do research in advance to guide cities' development towards more reasonable forms to prevent urban sprawl.

North America's sprawl might not totally appear in China because of the above mentioned differences. Urban sprawl in China might have a distinct complexity and uncertainty. It cannot be dealt with within the perspective of North American smart growth. Dealing with sprawl in China must be based on Chinese reality and practice.

2.6 The Implementation of Smart Growth in North American Plans

Many efforts have been made to implement smart growth principles in North America (see Figure 2.9). One approach is named the smart growth audit, and has been used to describe these efforts to conduct a thorough review of comprehensive plans, policy documents, zoning and other regulations, and even budgets to determine how they contribute to or detract from smart growth forms of development; the second approach is named project rating/recognition program, which involves the creation and use of rating systems that define specific smart growth aspects of proposed projects (Porter & Cuddy, 2006).

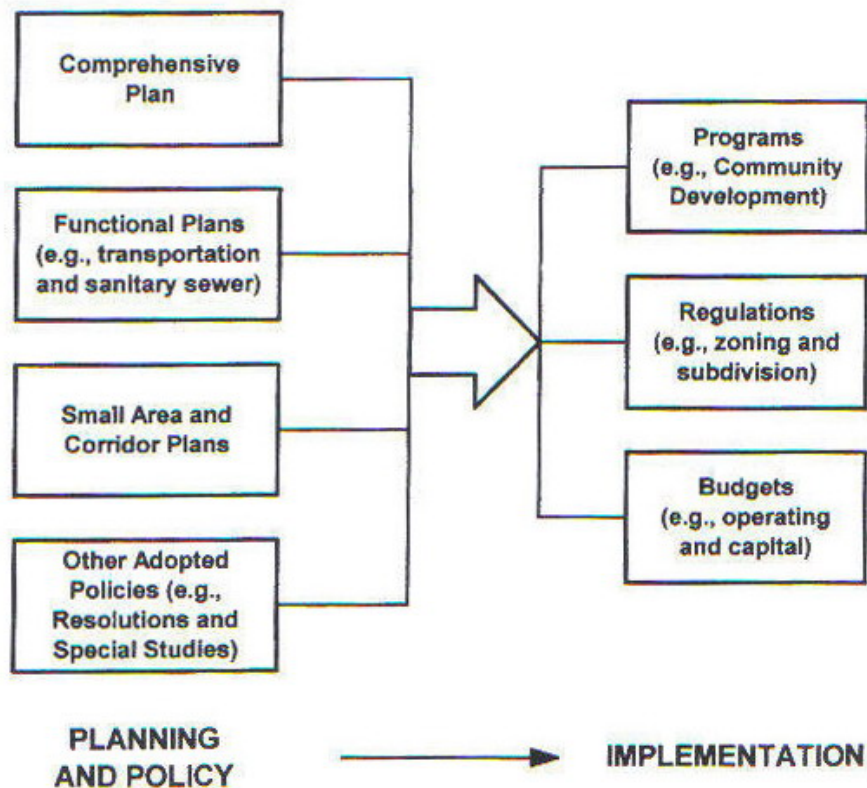


Figure 2.9 Relationship of Plans, Policies, Programs, and Regulation

Source: Weitz & Waldner, 2002

2.6.1 Smart Growth Audits

The term “smart growth audit” was first coined in 1999. A smart growth audit can be defined in its most basic form as any systematic inquiry that seeks to evaluate existing plans, policies, and practices against accepted principles of smart growth. The ultimate goal of the smart growth audit is to change these existing plans, policies, and practices so that they promote accepted principles of smart growth (Weitz & Waldner, 2002.)

A smart growth auditor focuses first on plans and policies, second on the programs, regulations, and budget that relate to development and community building (see Figure 2.10), and use generally accepted principles of smart growth as benchmarks for evaluation.

The sequential seven-step method for conducting a smart growth audit is to define smart growth in the context of the target community; to decide whether to conduct an audit; to determine the scope and content of the audit; to select an auditor and decide who will review

the audit; to choose or develop a checklist for evaluation; to compare the contents of all or selected documents with the evaluation criteria; to implement the recommendations of the smart growth audit and monitor progress. This research uses a similar model when evaluating the implementation of smart growth in Xuzhou's Official Plan (2007 to 2020).

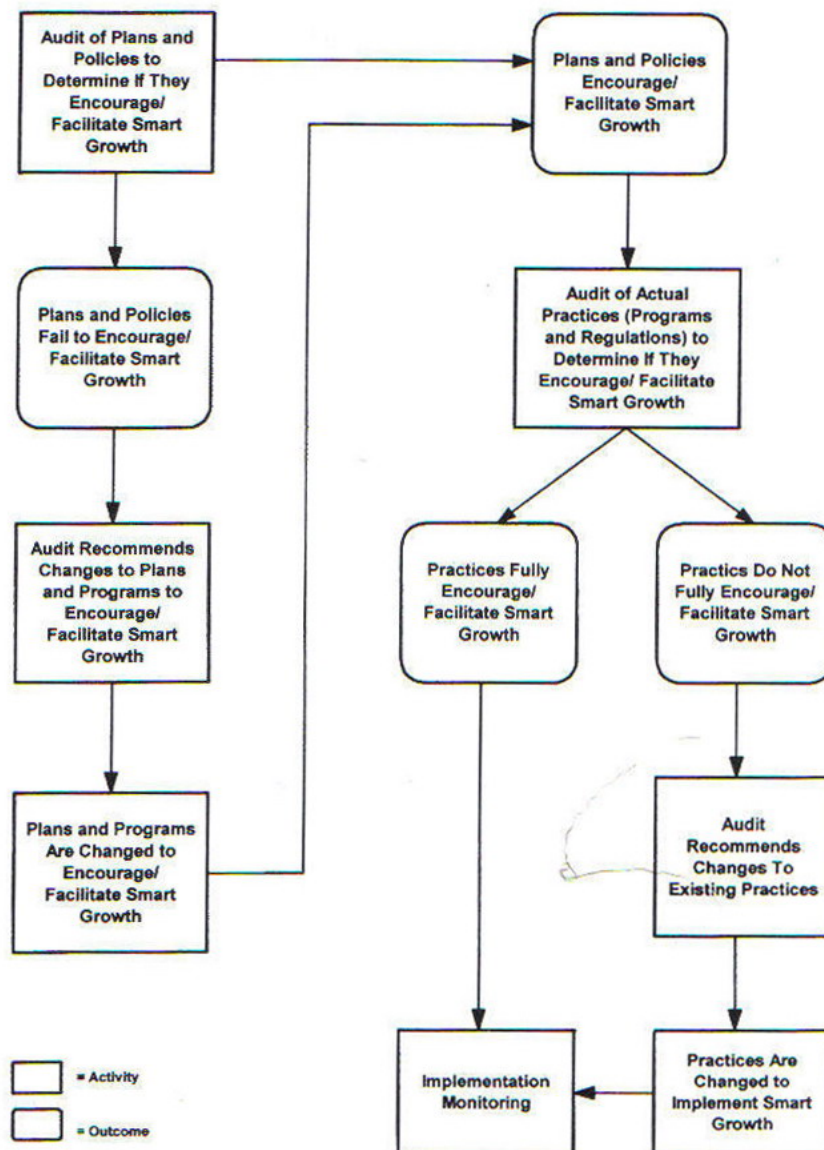


Figure 2.10 Smart Growth Audit Process-activities and Outcome

Source: Weitz & Waldner, 2002

2.6.2 Project Rating/ Recognition Programs

In America, most project rating programs started in the late 1990s, when smart growth principles became known throughout the nation. The goal of these programs is to assist developers and builders who are “doing the right thing” to obtain community acceptance and official government approvals for their projects (Porter & Cuddy, 2006.) All of these programs establish standards by which to determine how well development projects satisfy smart growth principles. By 2006, project rating or recognition systems as a means of encouraging smart growth practices in development had been formulated by more than a dozen organizations across the America, such as Washington Smart Growth Alliance, San Francisco’s Greenbelt Alliance, Vermont Smart Growth Collaborative, the Sierra Club, etc.,.

The process for establishing a project rating system to promote smart growth normally has seven steps: establish a credible organizational sponsorship; determine types of projects to be evaluated; determine criteria, standards, and a scoring system for evaluating projects; communicate the benefits of project evaluations; establish efficient procedures for evaluation and decisions; determine notification methods for organizational endorsements, and review and revise the process based on experience.

However, project evaluation systems are still in an experimental stage where procedures and measures are being invented almost “from scratch” – a situation that is perhaps a bit unsettling but certainly energizing for planners interested in creating their own locally based rating systems (Porter & Cuddy, 2006)

2.7 The Current Understanding of Smart Growth in China

Since 1978, China has made much headway in its economic development. However, it is also undeniable that the country was suffering from a series of problems, such as uneven development, uncoordinated development, and a weak capacity to achieve sustainable development. Specifically, the divide between urban and rural areas kept enlarging, the pressure on employment was intensifying, the gap between different regions was widening, the reserve of resources was diminishing, and the eco-environment was deteriorating. During this period, social development obviously lagged behind economic advancement.

From the 1990s, rapid urbanization has gone hand in hand with Chinese increased industrialization and led to the acceleration of outward urban expansion. All levels of government are aggressively pursuing the enhancement of GDP. The interaction of many sets of factors, including exploding urbanization, soaring global capital investment, and establishment of a land market by which land leasing and land selling are becoming one of the main sources for local government revenue are resulting in rapid urban expansion (Ma & Xu, 2004).

In 1999, the Chinese Land Act was enacted. It aims to protect farmland through strictly controlling settlement areas in cities and countries. From then on, controlling sprawl became one of the main challenges that cities face. Since 2000, Chinese environmentalists and planners have begun to pay attention to smart growth theory and its implementation in North America. Those researchers have introduced smart growth's background, principles, and effects from different perspectives, and are discussing its potential use in China, from controlling sprawl to influencing planning regulation and decision-making.

Smart growth is a comprehensive approach to the problem of sprawl. Some American cities' successful practices have encouraged Chinese researchers, planning professionals, and governors to regard smart growth strategies as a useful means to curb sprawl. According to Wang's (2003) introduction, smart growth deals primarily with four types of sub-problems: environmental degradation, decreasing investment within cities, exacerbating deficits for each level of government, and decreasing quality of life due to dependency on automobiles. Strategies of smart growth include preserving green space, environmental sensitive areas, and farmland, emphasizing the use of public transit, encouraging community collaboration, fostering the competitiveness of cities, making full use of existing urban land and infrastructure, encouraging mixed-use land, and all-types of housing choices in neighbourhoods.

Leuang (2005) deems that smart growth balances four different – and at times opposing – viewpoints: those of politicians, developers, urban households (the main consumers of development), and environmentalists. He goes on to explain that high density development

guarantees the highest revenue, which is important to governments with large budget deficits. Developers earn more money through market-accepted high density development through which the need for investment in infrastructure decreases. High density development results in more choices in the housing market than provided by low density development. Hence, low and middle income people can afford houses. Environmentalists are also satisfied because open space, farmland, and other environmentally sensitive areas are protected, although high density development does not benefit environmental improvement within cities.

In November 2003, Chou, the Vice Minister of the Ministry of Construction of China, published a paper reviewing the evolution of western urban planning theories since the 19th century. He mentioned smart growth, based on the balance of ecology, society, and economy, as the latest turning point in western urban planning theories. He describes that smart growth is a problem-oriented approach, which has three main objectives: each person benefits from the development; development balances the needs of the economy, society, and the environment equally; and inner cities increase their opportunity for investments that normally flow to new districts. He suggests that China can also learn from smart growth's compact development, mixed-use land, and public transit orientation. From that time on, smart growth has not only been discussed in academic circles, but it is also supported by governments and used in government decision-making.

However, smart growth developed in a North American context does not totally fit into a Chinese environment. It should be noted that the application of smart growth must be based on the reality and political environment in China and cannot be copied directly from North America.

2.8 Smart Growth in China's Planning Policy

This section briefly introduces the Chinese urban planning system and the content of Chinese official plans. The contents that conform to the smart growth concept used in official plans will also be identified.

2.8.1 The Planning System in China

According to the Chinese Urban and Rural Planning Act, which was promulgated by Order No. 74 of the President of the People's Republic of China on October 28th, 2007, the Chinese urban planning system normally consists of two tiers: the official plan and the detailed plan. The top tier is the official plan that outlines the general land use pattern of a city. The other tier, below the official plan, is the detailed plan, dealing with areas that face immediate development or are specified in the official plan. In order to identify and control different locations' land use function, scope, and capacity, big cities (population over 0.5 million), middle-size cities (population from 0.2 to 0.5 million), and small-size cities (population less than 0.2 million) can prepare further plans based on the official plan.

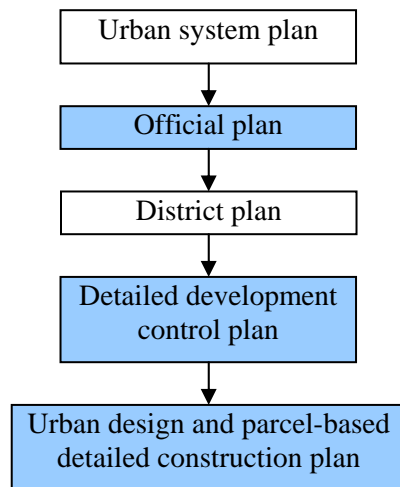


Figure 2.11 Chinese Planning System

Source: Yeh & Wu, 1998.

Note: Shaded plans are included in the 2007 Chinese Urban and Rural Planning Act

According to the explanatory notes for the Act, the official plan usually has a planning horizon of 20 years and should consider long-range development strategies. An official plan has regulations in its compendium^⑤, city region planning, central city planning, and compulsive content.

^⑤ A compendium of a city's official plan needs to identify the most important issue the city faces which will to be solved in the official plan. The compendium is a base to prepare the official plan.

Accordance with the Planning Regulation Guidelines (promulgated by Order No. 146 of the Ministry of Construction on October 28th, 2005), the content of the compendium includes the regional planning outline; the identification of urban boundaries; the identification of development areas, restricted development areas, and no development areas; population estimation; the scale and boundary of development areas; transportation strategies; the goal for major infrastructure and public facilities; and the development of a disaster-protection system.

The content of the regional planning section includes putting forward an urban- rural area development strategy; identifying goals and requirements for the preservation and usage for environmentally sensitive land, water resources, energy, and national and historical heritage sites; estimating the population in regional areas and the urbanization rate and identifying the population scale, function, spatial structure, and development standards in each city and town; proposing visions, land use scales, and development area boundaries for major cities and towns; identifying regional transportation strategies and principles for important infrastructures, such as transport, communication, energy, water supply, sewage, etc. identifying the urban planning boundary (*gui hua qu*) according to the needs of the city's development and the need to manage its resources; proposing how to implementation this plan.

The content of the central city planning section includes analyzing and identifying the city's function, vision, and development goals; estimating the central city's population; identifying the developed areas, the development areas, the restricted development areas, and the development forbidden areas; proposing its towns' development and controlling strategies; identifying the scale for the development area and the development area boundary; arranging development areas, farmland, and ecologically sensitive land reasonably; confirming the central city's spatial structure and standards for land use intensification; confirming the location and scale for public facilities in municipal and community levels; confirming the transportation and transit strategy and giving priority to transit development; making a green space system plan and defining the preservation boundaries for green land, lakes, and lakeshore; making a historic preservation plan and defining the preservation boundaries for historic blocks and historic buildings; researching the need for houses and formatting a housing policy strategy; defining residential areas' standards; making sure affordable houses

are constructed to meet the needs of middle- or low- income families; arranging the layout for important infrastructures, such as telecom, water supply, drainage, power supply, etc.

The content of official plans is largely dependent on the requirements of each local environment and the conditions of professional support. Not all official plans can include all aspects listed above, but generally an official plan should indicate the target size, the economic orientation and structure and the spatial structure of a city and adhere to the two standards, which are National Development Standard for Official Plans and Land Use Structure in Official Plans.

Table 2.4 National Development Standard for Official Plans

| Classification | Land use standard (m ² /person) |
|------------------------------|--|
| Residential area | 18~28.0 |
| Industrial area | 10.0~25.0 |
| Road and square | 7.0~15.0 |
| Green land | ≥9.0 |
| Including: Public green land | ≥7.0 |

Source: City Land Use Classification and Urban Planning Land Use Standard[®]

Table 2.5 Land Use Structure in Official Plans

| Classification | Land use structure (%) |
|------------------|------------------------|
| Residential area | 20~32 |
| Industrial area | 15~25 |
| Road and square | 8~15 |
| Green land | 8~15 |

Source: City Land Use Classification and Urban Planning Land Use Standard

2.8.2 The Planning Regulation Guidelines (No.146)

The political economy of a society defines the necessity for urban planning and delineates the measures to which urban planning can possibly resort (Yeh & Wu, 1999). In China, urban planning’s position, which has shifted from “translate the goal of economic planning into urban space” in a planned economy to “the need to provide public goods” in a market-driven

[®] City Land Use Classification and Urban Planning Land Use Standard was promulgated by Order No. 90 of the Ministry of Construction on March 1st, 1991.

society, indicates that the planning system reflects the overall socio-economy and political environment within which it operates. According to Shi (2006), urban planning in China has three relative scopes. The first, the smallest and the centred scope is as a policy tool; the second scope covers the effect of policy decision-making; the third includes what researchers study about planning. These scopes' relationship is as in Figure 2.12.

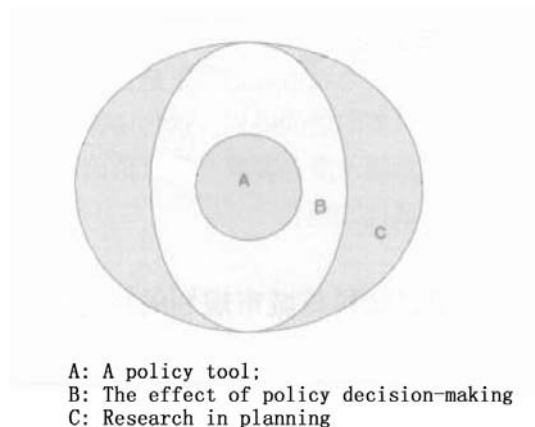


Figure 2.12 Scopes of Urban Planning

Source: Shi, 2006

Chinese Planning Regulation Guidelines (PRG) belong to scope A and determine the present direction all plans should take. The last version of PRG (No.14) was enacted in 1991. However, PRG (No. 14) no longer reflected the changes in the economy and in the role of governments with the rapid economic growth.

Nowadays, Chinese society is very different from what it was in 1991 as follows:

Firstly, the market-driven economy requires that planning not only accommodate market changes, but also to adjust them.

Secondly, the national government advocates the "Scientific Concept of Development"^⑦ which steers urban planning to focus on regional planning, promotes balanced growth

^⑦ Scientific Concept of Development means putting people's interest first and aiming at comprehensive, coordinated and sustainable development. The Communist Party of China (CPC) has advocated the "Scientific Concept of Development" since 2003, so as to ensure a greater boost to an overall development of the socialist economy, politics and culture and "building of a harmonious society" in the country.

between urban and rural areas, to preserve natural resources, and to boost a comprehensive, coordinated and sustainable development.

Thirdly, the vision of “building of a harmonious society” requires planning to ensure the public well-being and equity, coordinate different interests, and improve the built environment, public services, housing, and transportation (Yang & Min 2006).

Fourthly, in recent years, the national government has used planning as an important tool to guide development. The PRG must now coordinate many relative documents and policies.

Fifthly, urban planning has become a target for attack because it cannot solve many problems, which it was expected to, including the negative effects brought by rapid urbanization, excess development of industrial districts, etc. In fact, these issues are all related to planning but cannot be controlled by planning departments, which have only limited powers (Sun, 2006). PRG must be adjusted to solve these problems.

Last but not least, globalization facilitates the communication of planning theories. International planning theories and practices affect the development of Chinese planning.

The new version of PRG (No.146) was enacted in 2006 and modified the previous version in order to accommodate current socio-economic conditions. Much of the content of these Guidelines echo or are reflected in currently popular concepts of community building, such as smart growth, new urbanism, transit-oriented development, neo-traditional development, and conservation subdivisions. At the time of this research, smart growth in China is still mainly at the academic and policy formulation stage and has just begun to be formally implemented in municipal planning practice. The Guidelines utilized much of the rhetoric of smart growth to deal with barriers that many cities are facing in their attempt to address regional sprawl problems. The new version reflects the emerging trends in the planning field. Although PRG (No.146) did not include the term “smart growth,” many of the regulations embody the same meanings. Table 2.6 seeks to develop a clearer critical analysis of the rationale and objectives of the Guidelines in light of their increasing popularity in official plans.

Table 2.6 The Analysis of PRG (No.146)

| Topic | Description in PRG (No.146) | Principle of smart growth |
|--------------------------|--|--|
| Region | Coordinate the development between urban and rural areas | |
| Environment and resource | Resource-preservation and environment-friendly principle; Strictly protect sensitive areas which including prime farmland, scenic areas, wetlands, water-supply reserve, | Preserve open space, farmland, natural beauty and critical environmental areas |
| Land use | Define the boundaries of areas suitable for development, not suitable for development, semi-suitable for development; Define the boundaries of settlement area, ecological area, and farmland area; define blue line, green line, and purple line [®] . | Take advantage of compact building design Foster distinctive, attractive communities with a strong sense of place |
| Housing | Establish affordable housing policy and housing standard to ensure the requirements of low income families. | Create a range of housing opportunities and choices |
| Inner city | Establish principles and strategies to revitalize the inner city. | Strengthen and direct development towards existing communities |
| Transportation | Priority of development given to public transit | Provide a variety of transport choices |
| Public participation | Local government should encourage public participation when preparing plans | Encourage community and stakeholder collaboration in development decisions |

Source: the author

The following part of the new edition of planning regulations shows the differences with and improvement from the last version.

2.8.2.1 Public Participation and Equity

Compared to the last vision, the Guidelines (No.146) pay more attention to the right of people. Firstly, public participation is encouraged and emphasized. According to the last version, after plans are prepared by professional planners, they need to be published and showed to the public, that is, the public has the right to know. However, according to the

[®] Green lines are boundaries for all function of green land; blue lines are boundaries for lakes and rivers; purple lines are boundaries for historic blocks and historic buildings.

Guidelines (No.146), it is required that public participates in the planning procedure by being consulting and being shown to plans, and all the public comments need to be responded to. Secondly, the Guidelines (No.146) pay more attention to social equity by emphasizing low-income people's interest. It not only states the principle, but also includes detailed regulations to ensure low-income people's interests, including building density and height, an amount of green space, and public facilities are respected.

2.8.2.2 The Change of Planning Boundary

The last vision seldom mentioned the cooperation between a city and towns around it. The Guidelines (No.146) now emphasize the regional concept instead of the city's boundary and encourage harmonious development between them.

2.8.2.3 The Change of Focus in Planning

The last vision centered on economic development and focused on defining a city's scale and growth rate. According to the Guidelines (No.146), plans should set up a reasonable developing standard and focus on the preservation of resources and of the natural environment. That is a change in planning perspective.

2.8.2.4 The Change from a Technical File to a Public Policy Perspective

Plans guided by the last vision were guided by a technical perspective. However, plans made according to the new Guidelines (No.146) are public policies, which are used to adjust the spatial resources, guide the development of cities and towns, and maintain social equity, safe, and public interest (Yang & Min 2006).

New planning regulation is added to the Planning Act. This change will be implemented through all official plans.

2.9 Conclusions

The academic and practice-based planning literature demonstrates that smart growth has social, economic, and environmental benefits over sprawling development and practices under smart growth principles have been made in North America. The Planning Regulation Guidelines (No.146) in China have embodied smart growth principles, responding to the

concerns of the conventional approach to development through a set of principles aimed at guiding development and good planning practice. In the next chapter, methodology of the research used in the thesis is discussed.

CHAPTER 3

METHODOLOGY

3.1 Introduction

Chapter Three provides an overview of the research design and methods employed in this study. The research is based on a qualitative paradigm and its methodology consists in a case study and semi-structured interviews. This chapter discusses the strengths and drawbacks of these methodological approaches. The research proposal and interview questions are presented in Appendixes A and E.

3.2 Rationale for the Qualitative Approach

The qualitative approach is defined by Creswell as “an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting” (Creswell, 1994). The qualitative approach is different from the quantitative approach because it does not seek to test a theory or measure and analyze variables through statistical procedures. Unlike the quantitative paradigm which holds an “objective” worldview, a qualitative paradigm views reality as socially constructed and thus made up of multiple realities, including those of the researcher, the respondents, and the reader or audience. The qualitative researcher relies on these multiple voices and interpretations in reporting the study. This procedure can introduce sources of bias (Neuman, 1997); however, the researcher deals with this bias by making values explicit in demonstrating how the data was gathered and how the evidence is interpreted.

In qualitative research, an inductive logic prevails (Creswell, 1994). Conceptual categories are produced through interaction with informants to provide a rich, context-bound account, from which patterns or theories emerge to explain a phenomenon. The approach to inquiry of a qualitative approach is shown below in Figure 3.1 borrowed by Cuba and Lincoln (1989). They use “constructivist inquiry” to indicate a qualitative approach.

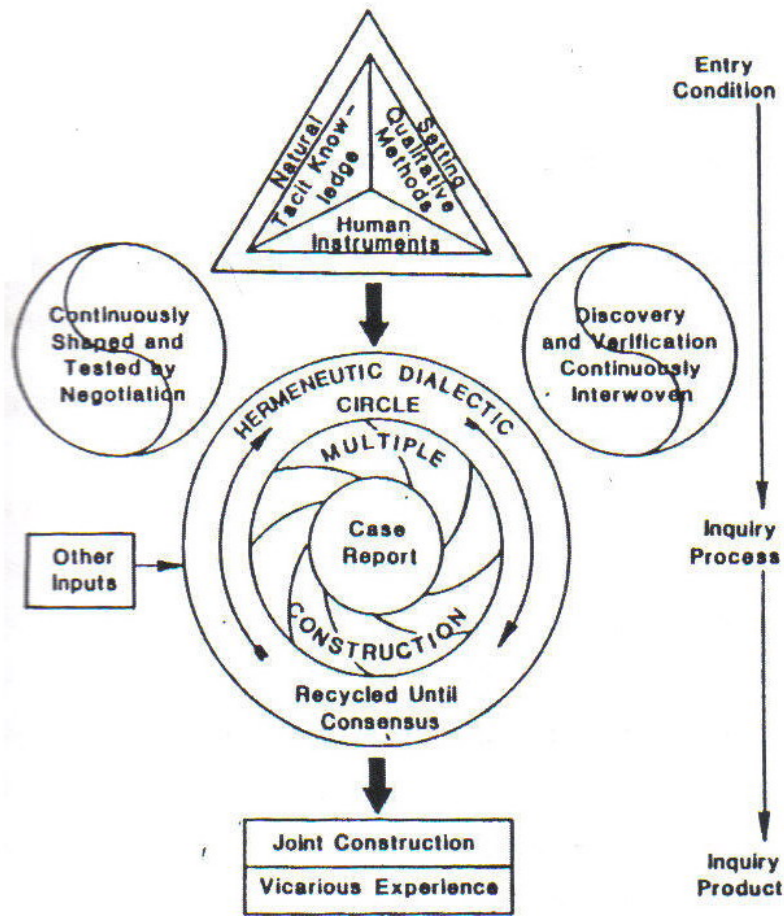


Figure 3.1 The Methodology of Constructivist Inquiry

Source: Guba & Lincoln, 1989.

3.3 Validity and Reliability in Qualitative Research

Although the qualitative methodological approach has been criticized for a lack of empirical rigor and nebulous criteria with which to judge the validity and reliability of the inquiry, its reliability is obvious: it reaches beyond the “what” (fact-based information) to the “why” (underlying reasons); allows us to probe for background issues; helps clarify and place in context, provides insights; and can be a rich source of information. Validity and reliability in qualitative inquiry can be heightened through re-testing the material of the study. Guba (1990) asserts that if human sensory and intellectual mechanisms cannot be relied upon, it is

essential that the “findings” of an inquiry be based on as many sources – of data, investigators, theories, and methods – as possible.

This research process has been labeled “triangulation”. Denzin (1978) has identified four basic types of triangulation: (1) data triangulation – the use of a variety of data sources in a study; (2) investigator triangulation – the use of several researchers or evaluators; (3) theory triangulation – the use of multiple perspectives to interpret a single set of data; and (4) methodological triangulation – the use of multiple methods to study a single problem or program. In this study, several data sources and two methodological approaches are used.

3.4 Rationale for a Two-Method Approach

This paper mainly analyzes past and present events in a city; hence it uses both a historical approach and a case study. The strengths and weaknesses of both approaches are discussed below.

Historical research has been defined as the systematic and objective location, evaluation and synthesis of evidence in order to establish facts and draw conclusions about past events (Borg, 1963). It attempts to find out what happened in the past and to reveal reasons for why and how things happened. Hill and Kerber (1967) have categorized the value of historical research as enabling solutions to contemporary problems to be sought in the past; throwing light on present and future trends; stressing the relative importance and the effects of the interactions that are found within all cultures; and allowing for the reevaluation of data supporting selected hypotheses, theories and generalizations that are presently held about the past. However, historic research is not based purely on the scientific method. For instance, the data used are seldom based on direct observation or experimentation. But historical research should share much of the discipline of the scientific method and of statistics.

A case study is uniquely appropriate when the focus is on a contemporary phenomenon within some real-life context. As Yin (1984) describes, a case study is a sound approach when “how” or “why” questions are being posed, and when the investigator has little control over events. The main strength is its unique ability to handle vast quantities of evidence in the form of documents, artefacts, interviews, and observation. However, the method has been criticized for its lack of rigour, its generation of little material for scientific generalization,

the length of time it takes to carry out, and the volume of material that it generates. Case studies, like experiments, are generalizable to theoretical propositions and not to populations and universes (Yin, 1984).

3.5 Research Design

After the available literature on smart growth in official plans was reviewed, several key objectives emerged that formed the basis of this research. First, to identify an evaluative framework that provides key factors relating to the study of smart growth in official plans; second, to chronicle the updating of the official plans of the city of Xuzhou and determine the primary barriers to those plans; third, to evaluate Xuzhou's Official Plan (2007 to 2020), using the framework identified; and, finally, to use the information gathered by research to provide recommendations for the introduction of smart growth in official plan making in China.

From the above research objectives, the following research questions have emerged:

- What is the cause and what is the extent of sprawl in China?
- What is being done to implement smart growth in North America?
- Do planning policies in China embody smart growth strategies?
- How much of the smart growth contained Xuzhou's Official Plan is being implemented? What are the reasons or obstacles preventing some principles of smart growth being used?
- What are the limitations to using smart growth in official plans in China and how can they be overcome?

This research was accomplished through the combination of a review of relevant documentation, interviews, and statistics on the implementation of smart growth in official plans. A case study approach and historic study allowed an in-depth investigation to meet objectives. The rationale for choosing the particular city will be discussed below.

A comprehensive document review, the main research method, was undertaken based on planning documents relating to the subject. These documents proved to be valuable sources of information, providing further detail and background on the program and current state initiatives. These sources were crucial for setting the context for the case study. Further

information was obtained during a series of conferences held locally for preparing the official plan in 2006. This information was primarily used for the background literature review. Finally, newspaper and journal articles dealing with sprawl and relating to smart growth in official plans were obtained from the selected city. These articles were valuable sources of background information on the city, in providing information on the subject issue, and in identifying key players to speak to in each city. The relationship between the five research questions and the chosen research methods is summarized in Table 3.1.

In addition to the review of relevant documentation, semi-structured interviews that provide complementary information were conducted with key players associated with the implementation of smart growth in official plans. Interviewees included planners, municipal officials, and consultants for Jiangsu Province. More information on the interviews and participants is provided below.

3.6 Selection of a Case for Study

As mentioned, this research took a case study approach. The case study site was selected because it was able to provide information that was complex and rich in detail, thus facilitating an in-depth examination. The study was designed to gain a depth of knowledge about a specific site that may lead to greater understanding of the larger issue.

The city of Xuzhou was chosen as a case study for several reasons. First, barriers to urban development in Xuzhou are found throughout China because of rapid urbanization, thus the recommendations for Xuzhou's Official Plan will benefit same-sized cities. Second, Xuzhou is one of the cities to adopt the Planning Regulations Guidelines (No.146) that reflect contemporary planning trends adhering to smart growth principles. The implementation of smart growth in Xuzhou's Official Plan may constitute an example for other cities. Finally, the researcher was involved in preparing this plan between 2003 and 2005. Thus the researcher had access to a wealth of information regarding this planning process.

Table 3.1 Relationship of Research Questions and Methods

| Questions/Method | Document Review | Semi-structured Interview | Statistics |
|---|---|---|--|
| What is the cause and what is the extent of sprawl in China? | Official documentation and researcher's opinions. | What causes sprawl in China? What is the impact of sprawl? What is the difference of sprawl between China and North America? | Using charts and graphs to express the rapid rate of urbanization. |
| What is being done to implement smart growth in North America? | Smart growth Audits Project rating / recognition Programs | | |
| Do planning policies in China embody smart growth strategies? | Analysis of the Planning Regulation Guidelines (No.146). | What do you view as the main obstacles today in preparing official plans? What are your recommendations to improve the process of preparing Chinese official plans? Are the policy climate and economic climate favourable to the implementation of smart growth in Xuzhou's Official Plan? | |
| How much of the smart growth from the Xuzhou's Official Plan is being implemented? | Review and analysis of Xuzhou's Official Plan. | Is smart growth being used in planning policies in China? Especially in Xuzhou's Official Plan? If yes, please explain them? | |
| What are the limitations to use smart growth in official plans in China and how can they be overcome? | | In your opinions, what is the future for the implementation of smart growth in China? | |

Source: the author

3.7 Interviews

Semi-structured interviews were conducted with key players in the selected city. Such interviews provide the benefit of flexibility. A list of predefined questions was asked, but the interviewees were free to add extra comments, and the interviewer was free to probe additional questions after responses. Spontaneous follow-up questioning provided a useful technique. The semi-structured interview allows an interviewee to answer on his or her own terms, yet still provides an element of structure to facilitate comparability (May, 1993). The interviewer must be careful not to steer the respondents in certain directions with follow-up questioning, as this could introduce a bias. Finally, the interviewer must be mindful of the fact that the responses represent only one person's opinion and account of reality (May, 1993). However, in the case of this research, the interview data was supplemented with a wealth of documentation, intended to overcome this limitation.

Ten interviews were conducted. The interviewees were asked primarily the same set of questions, with the questions designed to encourage elaboration in responses. The questions were designed to gather information on the role of official plans and what constitutes success in the implementation of smart growth in official plans. All information from the interviews has been kept confidential, with names and titles being replaced by codes. A sample of interview questions is available in Appendix E.

The bulk of the interviews took place over a three month period from January 2008 to April 2008. The same questions were sent to the email participant as were asked of other interviewees, with the request for additional comments as he/she felt appropriate. One interview lasted an average of forty minutes, during which, the researcher took notes.

3.8 Actors involved

Interviews were held with a variety of individuals, as shown in Table 3.2. The relatively small number of interviews can be justified in different ways. First, the main research method is to review relevant documents, while interviews are a complementary tool. Second, Xuzhou's Official Plan is an outcome of team work, that is, every planner involved in the program agrees with the plan and share the same philosophy. Third, the number of planners involved in Xuzhou's Official Plan is rather small. Normally each

aspect of the plan's creation was primarily the responsibility of one or two planners. For example, one planner focused on land use planning, one focused on transportation planning, and one concentrated on environmental planning. In the government sector, officials have corresponding roles. Thus, it is clear why the number of potential interviewees was limited. Finally, the Planning Regulation Guidelines (No.146) were enacted in 2006. Since then, official plans adopting the Guidelines (No.146) have also been limited. Although the number of interviews conducted is relatively small, the research includes an exhaustive document review, which has added substantially to the information gathered.

Table 3.2 Interview Design

| Position | Direction | Institute |
|--------------|--|--|
| Planner-1 | Project manager | China Academy of Urban Planning & Design |
| Planner-2 | Project coordinator | China Academy of Urban Planning & Design |
| Planner-3 | Historic Heritage and environmental protection | China Academy of Urban Planning & Design |
| Planner-4 | Land use | China Academy of Urban Planning & Design |
| Official-1 | Project coordinator | Xuzhou Bureau of Urban Planning |
| Official-2 | Land use | Xuzhou Bureau of Urban Planning |
| Official-3 | Regional planning | Xuzhou Bureau of Urban Planning |
| Official-4 | Transportation | Xuzhou Bureau of Urban Planning |
| Consultant-1 | Consultant | Minister of Construction in Jiangsu Province |
| Consultant-1 | Consultant | Minister of Construction in Jiangsu Province |

Source: the author

The participants can be subdivided into three groups. The first group includes the local planning department officials. They were able to provide comprehensive information on the city's official plans and discuss the primary constraints that their city has faced regarding sprawl and the implementation of remedies. They also are important in giving the issue a public side. The second group includes professional planners involved in Xuzhou's Official Plan. They provide understanding of the Guidelines (No.146) and how they have them act on the official plan. They also share personal opinions on their own experience of official plans. The third group includes provincial consultants. These people evaluate official plans; thus, their opinion is important.

3.9 Ethical Considerations in Interviewing

According to the University of Waterloo's policies, research involving human subjects must receive ethical clearance from the Office of Research Ethics prior to commencement. As required by this Department and the University, the interview component of this research was given full ethics clearance prior to the recruitment of participants for this study.

3.10 Scope and Limitation of the Research

The scope of this research is limited to the Xuzhou's Official Plan (2007 to 2020). This plan was selected mainly because it is one of the first official plans to adopt the Guidelines (No.146) reflecting contemporary Chinese trends that use smart growth. The focus was on the program/policy aspect only. Areas such as scientific and technical remediation were not discussed. The policy focus precluded the inclusion of technical aspects.

One of the potential limitations of this study may arise from the Official Plan's newness. The program discussed has only been in place for a year, and as such, possible evaluation of its long-range impact and effectiveness is limited. However, this research is intended only to capture the program at this moment in time and make recommendations on processes and ideas that may be used by other municipalities. The data and research on motivation, obstacles, and future opinions are not affected by the relative newness of the programs.

A second limitation is related to the qualitative research method. The selection of the limited number of individuals to interview could potentially have been prone to bias or be unrepresentative. However, the researcher made an attempt to include all key planners involved in Xuzhou's Official Plan. The potential for bias from the small number of individuals is also addressed through the use of a substantial number of planning documents to supplement the interview data.

3.11 Conclusions

The research design and methods discussed throughout this chapter form the basis for the case study presented in Chapters 4 and 5. The analysis in the case study draws upon the various methods discussed here. By drawing from a variety of sources, the case study, which will be discussed in next chapter, provides a detailed and informative picture of the issues Chinese metropolitan areas face when using smart growth in their official plans.

CHAPTER 4

A CASE STUDY

The issues in Xuzhou's urban planning relate to historic and contemporary development. In this chapter, the evolution of Xuzhou's population, economic, land use structure, and official plans in different times are introduced and analysed. The review of the city's evolution in different perspectives can show how the city has developed. Beside that, Xuzhou's Official Plan (2007 to 2020), an important planning document to guide the city development in the 20 years and to reflect the contemporary planning trend, is introduced in detailed.

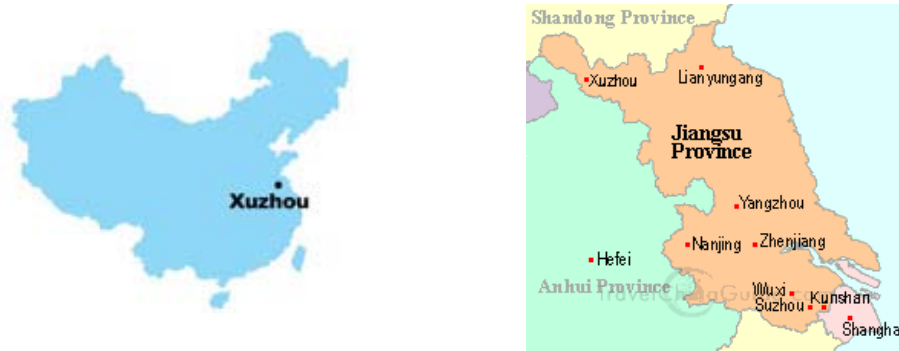


Figure 4.1 The Location of Xuzhou City in China (left) and in Jiangsu Province (right)

Source: the author

4.1 A Brief Introduction to the City of Xuzhou

Located in the east of China and in the northwest of Jiangsu Province, Xuzhou is the largest city of northern Jiangsu as well as its most ancient city. As the joining point of Jiangsu, Henan, and Shandong Provinces, the city boasts a most important geographic location that all the states of ancient China scrambled for. According to the Chinese Cities' Competition Report (2006), Xuzhou is the No. 34 competitive city in China.

History

Xuzhou has a 2500-year old city building history and was one of the first cities in Jiangsu Province. It is the original place to represent Han Dynasty (260BC-220BC) culture.

Thousands of years' history have blessed the city with profound culture and splendid historic treasures. These ancient cultural relics, together with the beautiful natural mountains and lakes in and around the city constitute much of Xuzhou's attractions.

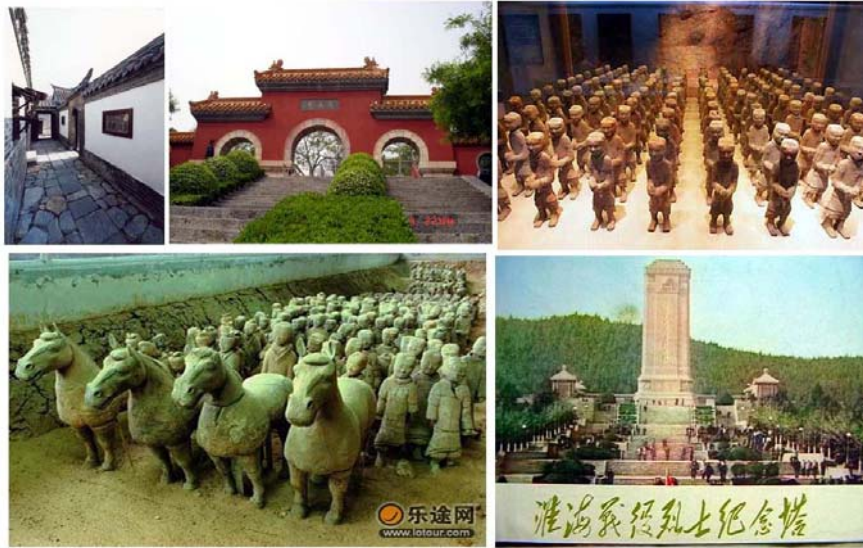


Figure 4.2 Historic Relics in Xuzhou City

Notes: upper (from left to right): Xuzhou Culture Museum, Xima Tai, Terra-cotta Warrior-1; lower (from left to right): Terra-cotta Warrior-2, War Hero monument.



Figure 4.3 Pictures of Today's Xuzhou City

Geography and Climate

Xuzhou is located in the southeast of the North China Plain. Plains and hilly land make up most of Xuzhou. The city has a mild climate with four distinct seasons. Precipitation here is lower than that for most Chinese cities.

Administration

The city was officially set up in 1945 and has come under the direct control of Jiangsu Province since 1953. The city nowadays has jurisdiction (Xuzhou Region) over four towns, Fengxian, Peixian, Tongshan, Suining, two cities, Pizhou and Xinyi, and five districts in Xuzhou City, Yunlong, Gulou, Quanshan, Jiuli and Jiawang. By 2006, it covered an area of 11,258 km² (120 km² as Xuzhou City's urbanized area) with a total population of more than 9.019 million (1.4 million as Xuzhou City's residents). The urbanization rate of Xuzhou Region is 35.5% in 2006.



Figure 4.4 Xuzhou's Jurisdiction

Source: Xuzhou's Official Plan (2007 to 2020)

Note: From the left to the right, the Town of Fengxian, the Town of Peixian, the Town of Tongshan, the City of Xuzhou, the District of Jiawang, the Town of Suining, the City of Peizhou, and the City of Xinyi. The light orange area is the City of Xuzhou, the research field.

Economy

The Economy of Xuzhou has developed rapidly since the economic reform in 1978. Now, Xuzhou is one of the nation's most important agricultural product bases; has rich mineral resources with more than 30 kinds of high-grade mineral resources; has machinery, foodstuffs, chemicals, electronics, and pharmacology industries; and has a vigorous service sector.

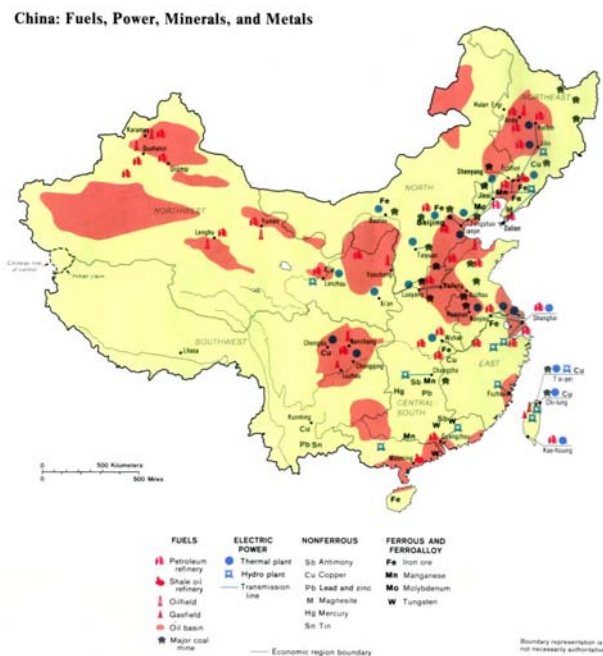


Figure 4.5 Distribution of Fuels, Power, Minerals, and Metals in China

Source: Xuzhou's Official Plan (2007 to 2020)

Between 1979 and 2000, the average GDP growth rate of Xuzhou was 11.5%. The GDP of Xuzhou in 2002 was 78.499 billion Yuan (10 billion American dollars).

Transportation

As mentioned, Xuzhou is located in a transportation hub connecting five adjacent provinces. It is known for a modern network of highways, railways, waterways, and civil aviation. The road network in Xuzhou extends in every direction. Highways directly connect to the provinces of Henan and Shandong, the neighboring city of Lianyungang, as well as the Chinese economic hub of Shanghai. It is the second important pivot of the

Chinese railway system: the Beijing-Shanghai Railway and the Longhai Railway intersect it. The Grand Canal runs through the city and provides convenience in water transportation. Flights in Xuzhou Guanyin Airport connect primarily to big cities of China as well as other cities abroad such as New York and Sydney.

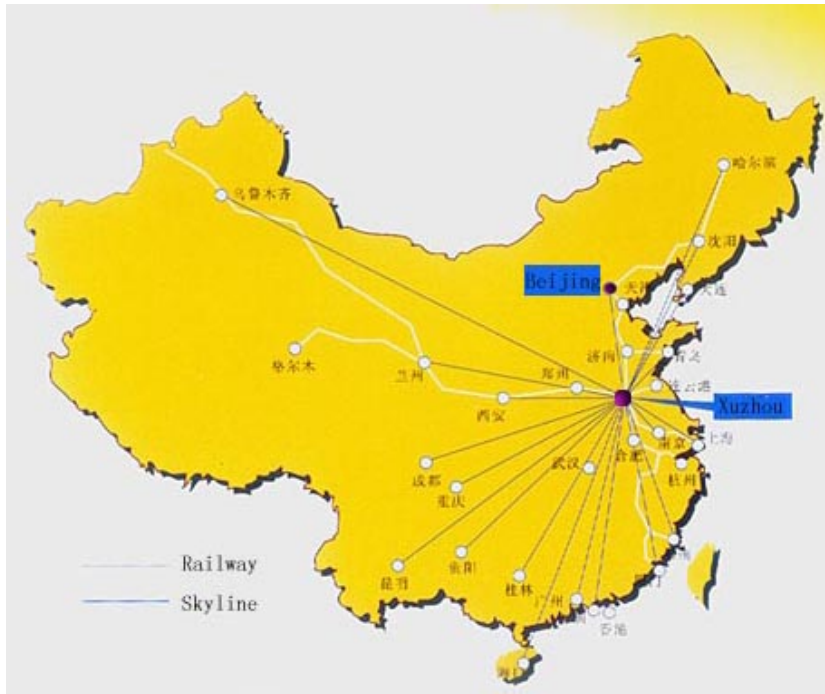


Figure 4.6 Xuzhou’s Transportation

Source: the author

4.2 Xuzhou’s Population, Economic, and Land Use Structure

The city’s population, economic structure, and land use structure have evolved jointly. In this section, the evolution of the above structures is introduced and analyzed.

4.2.1 Population Structure Analysis of Xuzhou

The 1952 to 2005 population[®] trend of Xuzhou City was similar to that experienced in the whole country. State policy has had a decisive impact on urbanization pattern.

[®] According to Chinese Official Plan Examination Regulation (No.31, promulgated by the State Council in 1999), the population in official plans includes people having local Hukou and people who reside in the city more than one year.

Generally speaking, One-child Policy, a strong policy of fertility control adopted around 1978, sharply limited the natural growth of the population. Though controls on rural-urban migration historically dampened growth from migration, the volume of movement has increased in recent years. The state's interest in social control appears to be giving way to concerns about the availability of cheap labour. The change of population from 1952 to 2005 is shown below in Table 4.1.

Table 4.1 The Change of Xuzhou's Population from 1952 to 2005

| Year | Birth rate (‰) | Death rate (‰) | Increase rate (‰) | Year | Birth rate (‰) | Death rate (‰) | Increase rate (‰) |
|------|----------------|----------------|-------------------|------|----------------|----------------|-------------------|
| 1952 | 36.87 | 12.46 | 24.41 | 1989 | 14.21 | 4.13 | 10.08 |
| 1957 | 36.84 | 7.62 | 29.22 | 1990 | 8.52 | 3.92 | 4.6 |
| 1962 | 39.7 | 6.61 | 33.09 | 1991 | 8.92 | 4.4 | 4.52 |
| 1965 | 25.1 | 5.5 | 19.6 | 1992 | 8.77 | 4.26 | 4.51 |
| 1970 | 25.9 | 5.9 | 20 | 1993 | 9.41 | 4.5 | 4.91 |
| 1975 | 17.02 | 4.69 | 12.33 | 1994 | 10.94 | 3.44 | 7.5 |
| 1978 | 10.92 | 4.56 | 6.36 | 1995 | 8.31 | 3.92 | 4.39 |
| 1979 | 13.17 | 4.54 | 8.63 | 1996 | 8.09 | 4.06 | 4.03 |
| 1980 | 16.13 | 4.74 | 11.39 | 1997 | 9.73 | 3.77 | 5.96 |
| 1981 | 18.29 | 4.71 | 13.59 | 1998 | 9.8 | 5.49 | 4.31 |
| 1982 | 17.53 | 4.54 | 12.99 | 1999 | 8.04 | 3.82 | 4.22 |
| 1983 | 13.5 | 4.21 | 9.29 | 2000 | 15.15 | 5.21 | 9.94 |
| 1984 | 11.9 | 4.16 | 7.74 | 2001 | 6.92 | 2.70 | 4.22 |
| 1985 | 11.78 | 4.2 | 7.58 | 2002 | 7.05 | 3.30 | 3.75 |
| 1986 | 14.42 | 3.91 | 10.51 | 2003 | 6.91 | 3.34 | 3.57 |
| 1987 | 16.59 | 4.09 | 12.5 | 2004 | 7.91 | 4 | 3.91 |
| 1988 | 15.39 | 4.17 | 11.22 | 2005 | 9.68 | 3.1 | 6.58 |

Source: Xuzhou Statistical Information Network (<http://tjj.xz.gov.cn/tj.asp?a=2&b=30>)

Xuzhou's urbanization is driven by rapid economic development. While the birth rate is controlled by the national policy, migration to the city and towns has been increasing, especially since the reform of "Hukou". As a regional centre, Xuzhou is expected to have an influx of high volume migration. However, there was much fluctuation in migration because Xuzhou attracts rural population while Xuzhou's own population is also attracted by larger and more developed cities. For example, the migration rate was 29.7‰ in 2001 and 8.2‰ in 2002. Currently, the increase of population primarily depends on migration.

In the past, because of the “Hukou” regulation, migration was primarily planned and controlled by the government. In recent years, migration has changed in response to changing economics, “Hukou”, and employment policies. Xuzhou’s population is expected to keep increasing following this series of reforms.

Table 4.2 Migration Rate in Xuzhou from 1988 to 2002

| Year | Migration rate (‰) | Year | Migration rate (‰) |
|------|--------------------|------|--------------------|
| 1988 | 20.8 | 1996 | 36.7 |
| 1989 | 44.2 | 1997 | 15.2 |
| 1990 | 27.5 | 1998 | 21.1 |
| 1991 | 27.2 | 1999 | 6.7 |
| 1992 | 30.6 | 2000 | 25.1 |
| 1993 | 27 | 2001 | 29.7 |
| 1994 | 11.6 | 2002 | 8.2 |
| 1995 | 39.6 | | |

Source: Xuzhou Statistical Information Network

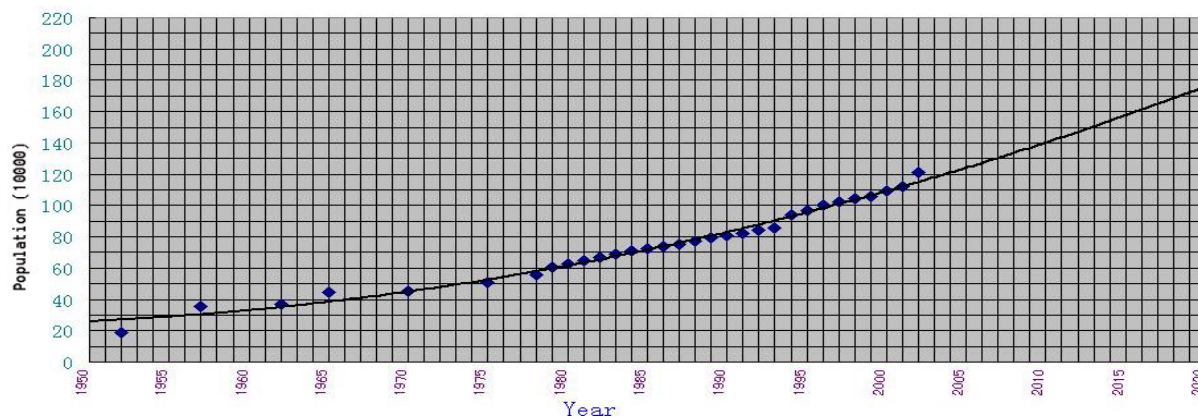


Figure 4.7 The Estimation of Xuzhou City’s Population

Source: Xuzhou’s Official Plan (2007 to 2020)

4.2.2 Economic Structure Analysis of Xuzhou

Xuzhou’s economy has increased rapidly and steadily since the economic reforms of 1978. The city’s GDP increased from 2.8 billion Chinese Yuan (RMB) in 1980 to 121.1 billion RMB in 2005. Table 4.3 reflects the evolution of Xuzhou’s economy.

Table 4.3 The Evolution of Xuzhou's Economy

| Year | | GDP (0.1 billion RMB) | GDP per capita (RMB/person) | The proportion of agricultural sector I | The proportion of industrial sector II | The proportion of service sector III | Industry structure |
|--------------------------------|---------|--------------------------------|---------------------------------------|--|---|---|-----------------------|
| 1949- 1979 | 1949 | 1.73 | 46 | 77.5 | 7.4 | 15.1 | I>II>III |
| | 1979 | 24.87 | 383 | 43.1 | 42.6 | 14.3 | |
| 1980- 1992 | 1980 | 28.86 | 436 | 39.5 | 45.4 | 15.1 | II>I>III |
| | 1992 | 162.15 | 1969 | 28.9 | 43.3 | 27.8 | |
| 1993 - 2005 - 2005 | 1993 | 221.89 | 2672 | 25.2 | 46.9 | 27.9 | II>III>I |
| | 1994 | 318.40 | 3797 | 25.0 | 46.9 | 28.1 | |
| | 1995 | 410.74 | 4848 | 24.5 | 45.3 | 30.2 | |
| | 1996 | 500.04 | 5846 | 23.1 | 45.3 | 31.6 | |
| | 1997 | 515.02 | 5966 | 21.0 | 46.2 | 32.8 | |
| | 1998 | 555.15 | 6370 | 20.2 | 45.8 | 34.0 | |
| | 1999 | 600.03 | 6845 | 18.9 | 46.4 | 34.7 | |
| | 2000 | 644.50 | 7266 | 18.4 | 45.6 | 36.0 | |
| | 2002 | 791.44 | 8763 | 16.9 | 46.4 | 36.7 | |
| | 2003 | 852.26 | 9401 | 15.8 | 49.3 | 34.9 | |
| 2004 | 1031.12 | 11596 | 15.7 | 49.6 | 34.7 | | |
| 2005 | 1212.15 | 13697 | 14 | 50.7 | 35.3 | | |

Source: Xuzhou's Official Plan (2007 to 2020)

An analysis of the Table 4.3 indicates that the evolution of Xuzhou's economy from 1949 to 2005 has had three main stages:

The first stage (1949 to 1979) spans from the foundation of the People's Republic of China to the economic reform of 1979. In the first a few years, industry, which had been destroyed by the war, developed little. After that, industry developed rapidly, supported by national policies. Characteristic of this stage is that the proportion of the agricultural sector decreased, while the ratio of the industrial sector increased rapidly.

The second stage (1980 to 1992) covers the economic reforms began in 1978 and last until 1992. The characteristic of this period is that agricultural sector proportion decreased steadily, the service sector proportion increased rapidly, and the industrial sector proportion changed little.

The third stage is from 1993 to 2005. Over this period, as in stage two, the agricultural sector proportion continued to decrease and the service sector proportion increased steadily and rapidly, while the industrial sector proportion increased rapidly. State sector

enterprises (representing the centrally planned economy) are being rapidly displaced by the private sector (representing a free market economy).

4.2.3 Land Use Structure Analysis of Xuzhou

Xuzhou is short of land resource. According to the statistics from the Xuzhou Land Use Department (2005), Xuzhou's farmland is only 687 m² per capita, which is lower than the 890 m² of the national standard per capita. Conflict between city development and protection of farmland is expected to happen in the future.

The advantages and disadvantages of Xuzhou's land resources are evident.

Advantages: Land is plentiful; the plain covers 82.5 per cent of the whole regional area, hills cover 13.35 per cent, water, 12.31 per cent; the exploitation of water resources still has a lot of potential. There are a variety of land types in this area; the topography of the city increases from west-north to south-east; in the middle is the Huanhe watershed.

Disadvantages: The city's urbanized area is increasing every year, as a result, farmland is being consumed; the increase in environmental pollution is leading to a decrease in crop production; urban sprawl into rural areas is rapidly increasing; the land use per capita in the inner city is relatively small, especially public green space.

Reserve land resources, 320 km², are primarily composed of subsidence land, 95.33 km²; hills, 58.67 km²; bottomland, 133.34 km²; and abandoned brickfields, 33.33 km².

4.2.3.1 An Analysis of Regional Land Supply's Potential

Land Use Plan: According to Xuzhou's Land Use Plan (1997 to 2010), in this period, the amount of farmland should not be less than 57.66 km²; farmland transferred to the development area should not be more than 16 km²; the amount of reclaimed land is 19.67 km²; the increase of farmland is 2.67 km². However, 16 km² is not enough for the rapid development of the city if it is still developing at the current growth rate. It is estimated that the city will increase by 45 km² between 2001 and 2020; that is, the city needs 29 more square kilometres' farmland.

Prime Farmland Protection: According to Xuzhou's Land Use Plan (1997 to 2010), the region's prime farmland covers 6094 km². However, in only two districts, which occupy

1480 km², has prime farmland been surveyed and classified as such; the other four districts do not have statistics or regulations.

Farmland Balance's Policy: Table 4.4 concerns the regional farmland balance (Xuzhou's Land Use Plan). It is possible through compact land use to add three square kilometer farmland to balance regional farmland less. As the city develop into more rural land, new areas can be developed as farmland to compensate for the lost of established farmland, thus creating a rural/urban balance in this region.

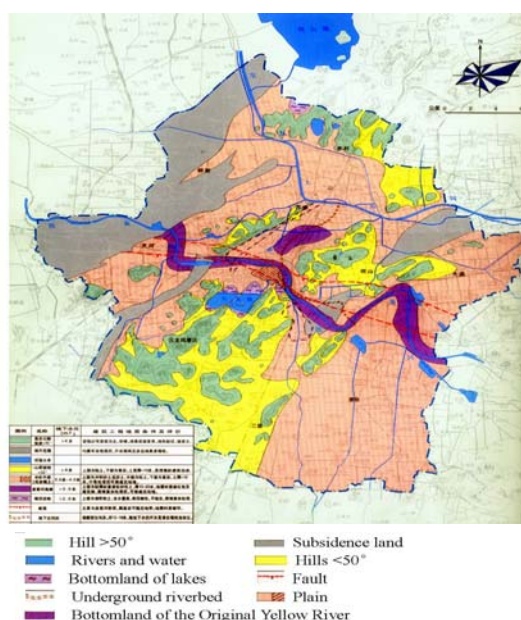


Figure 4.8 The Analysis of Xuzhou's Geo-hydrologic Condition

Source: Xuzhou Official Plan (1995 to 2010)

Table 4.4 Xuzhou Regional Farmland Balance

| | | | | |
|-----------|---|----|---|----|
| 2001—2010 | Total supplement farmland (km ²) | 71 | Adjust (km ²) | 30 |
| | | | Reclaimed (km ²) | 41 |
| | Total Decrease of farmland (km ²) | 68 | Developed (km ²) | 65 |
| | | | Reforestation of the cultivated land (km ²) | 3 |
| | Net increase of farmland (km ²) | 3 | | |

Source: Xuzhou's Land Use Plan (2007 to 2020)

4.2.3.2 The Current Land Use Problem

Xuzhou is a national transportation hub and the site of an unusually large military base. The land for exterior transit communications and the military has occupied large proportion of the whole area, 18 per cent in 2005. These two kinds of land use greatly affect the city's land use structure, which is a distinct character for Xuzhou city. As a big city, the minimum of Xuzhou' land use per capita should be 80 m² according to the national construction standard. Although statistically, its land use per capita appears to conform to the national standard. If these two kinds of land uses are not counted in the city's land use balance, the land use per capita is only 72 m².

4.2.3.3 Why the City Needs More Land

1. Municipal development is inevitable here. Xuzhou is one of the three metropolises in Jiangsu province (see Figure 4.9) and the city's development is strongly supported by the Provincial Government. Following the improvement of the Chinese investment environment and infrastructure, Xuzhou is developing rapidly and playing an important role in improving the economy of the northern part of Jangsu province. Thus, the city needs more land to consume.

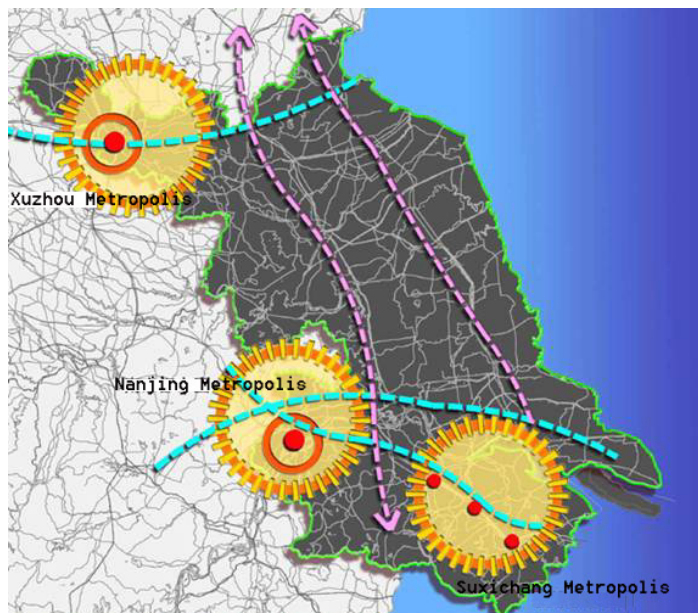


Figure 4.9 Three Metropolises in Jiangsu Province

Source: Xuzhou's Official Plan (2007 to 2020)

2. The city is undergoing rapid economic and social development. The Xuzhou government has planned goals for the city's economic and social development every five years. The spatial development and land use need to correspond to this economic and social development. However, the existing land use structure does not fit the plan for future ten to twenty years development in economy and society. Hence, the city needs a new development direction and spatial structure.
3. The population will increase correspondingly. The population of Xuzhou was 1.4 million in 2005. It is estimated that the population will increase to 1.56 million in 2010 and two millions in 2020. Since China has a strict land use standard per capita in its official plans, the increase of population will result in a corresponding increase of city land use.
4. The city's functionality needs to be optimized. As the political, economic, and cultural centre of the North Jiangsu province, on one hand, Xuzhou need to improve and intensify its functionality, for example, the functions of regional logistics centre, regional exhibition centre, etc.; on the other hand, in order to beautify the city's environment and alleviate the land use pressure on the inner city, the land area has to be increased.
5. The city must meet national standards. In 2005, Xuzhou's land use per capita was 86 m². In accordance with Chinese Standards of Land Use Classification and Plan and Xuzhou's reality, in 2010, the land use per capita is planned as 97.1 m², with an urbanized area totaling 151.4 km², which is 31 km² more than in 2005; in 2020, the land use per capita is planned as 90 m², with urbanized area totaling 180 km², which is 60 km² more than in 2005.

4.3 Xuzhou's Urban Form

In this section, the evolution of Xuzhou's Official Plans and Xuzhou's spatial structure will be reviewed and analyzed.

4.3.1 The Evolution of Xuzhou's Official Plans

1. Xuzhou's Construction before Economic Reforms in 1978

In 1950s, Xuzhou's government organized to prepare an official plan. The draft plan was proposed in 1957. Then after research, a series of revision were made to guide the city's construction. However, in 1960, the National Economic Planning Meeting announced the abandonment of urban planning. From 1966 to 1976, China entered the disastrous period of the Cultural Revolution (Yeh & Wu, 1998.) Urban planning was totally abandoned, planning institutions and organizations ceased to exist, and planning documents were discarded (Xie & Costa, 1993.) Buildings in Xuzhou City could be constructed on any available vacant site, which made for a disordered city.

2. Xuzhou's Official Plans (1980 to 2000)

Urban planning recovered and was re-established with the adoption of the economic reforms of 1978. In 1980, the Provisional Regulations for preparing Urban Plans and the Provisional Standards of Urban Planning were promulgated. They specified that the municipality was responsible for preparing urban plans. Xuzhou started to prepare its first official plan in August, 1977. In 1984, Xuzhou's Official Plan (1980 to 2000) was approved by Jangsu Province.

In Xuzhou's Official plan (1980 to 2000), the city's function was defined as a transportation hub, a commercial centre, and a regional city with coal and electric industries. The population of the city was 0.45 million in 1979 and was projected at 0.65 million in 2000. The scale of land use of the city was projected to increase to 35 km² in 1985 and 49 km² in 2000. The main development direction of the city was west and south. The spatial structure was formed with one city, two towns, and other villages.

Construction was focused on the central city and two satellite towns. In this master plan, five industrial zones, five warehouse zones, seven residential areas, and two cultural and educational areas were planned.

3. Xuzhou's Official Plans (1995-2010)

Regarding economic development, the Xuzhou government organized an official plan update to Xuzhou's Official Plans (1980 to 2000) and promulgated Xuzhou's Official Plans (1995-2010) in 1994.

In this edition, the city's function was defined as an important national transportation hub and a regional centre with many functions, such as commerce, transportation, energy

resources, finance, and tourism. As for city scale, the population in the city was 0.96 million in 1994; with an estimated growth to 1.5 million in 2010; urbanized land use was 83 km² in 1994, with an estimated increase to 150 km² in 2010. The land use per capita in 1994 was 86.21 m², with an estimated increase to 95 m² in 2000 and 100 m² in 2010. The city boundary included the city area, nine adjacent towns and countries, the airport and its airspace, and the water supply area. The main direction for development is east and south-east.

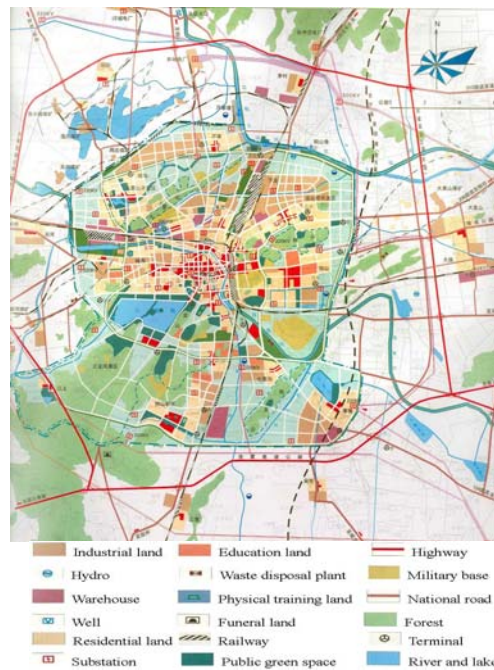


Figure 4.10 Land Use in Xuzhou’s Official Plan (1995 to 2010)

Source: Xuzhou’s Official Plans (1995 to 2010)

4. Xuzhou’s Official Plans (2007 to 2020)

In Xuzhou’s Official plan (2007 to 2020), the city vision is to be promoted as an important national transportation hub, a regional centre city, a national historic, cultural, and tourist city. The population of Xuzhou City is projected at 1.56 million in 2010 and 2 millions in 2020. In 2010, the urbanized area of Xuzhou City is projected to be 151.40 km² , 97.10 m² per capita; in 2020, 180 km² , 90 m² per capita. The main direction for future development is still to the east and south-east.

Table 4.5 The Evolution of Xuzhou's Official Plans

| | The city's function | Population Projections (million) | | Land use | | The main development direction |
|------------------------------|---|----------------------------------|------|----------|------------|--------------------------------|
| | | | | Total | Per capita | |
| | | 1950 | 0.06 | 12 | ----- | |
| Official Plan (1980 to 2000) | A transportation hub, and a commercial centre, and a regional city with coal and electric industries. | 1979 | 0.45 | ----- | ----- | To west and south |
| | | 1985 | 0.54 | 35 | 64.81 | |
| | | 2000 | 0.65 | 49 | 75.38 | |
| | | | | | | |
| Official Plan (1995 to 2010) | An important national transportation hub and a regional centre with many functions, | 1994 | 0.96 | 83 | 86.21 | To east and southeast |
| | | 2000 | 1.2 | 114 | 95 | |
| | | 2010 | 1.5 | 150 | 100 | |
| Official Plan (2007 to 2020) | An important national transportation hub, a regional centre city, a national historic, cultural and tourist city. | 2005 | 1.4 | 120 | 85.7 | To east and southeast |
| | | 2010 | 1.56 | 151 | 97.1 | |
| | | 2020 | 2 | 180 | 90 | |

Source: Xuzhou's Official Plan (1980 to 2000), (1995 to 2010), and (2007 to 2020)

4.3.2 Xuzhou's Spatial Structure and Characteristics

An analysis of Xuzhou's spatial structure and characteristics reveals how the city was shaped and also suggests solutions to those barriers the city faces today.

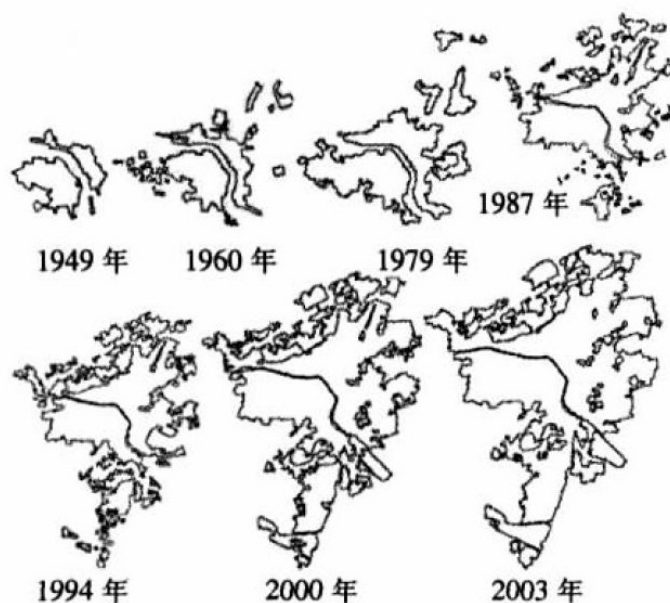


Figure 4.11 The Evolution of Xuzhou City's Forms

Source: Che & Ma, 2007

4.3.2.1 Xuzhou's Spatial Structure in Different Periods

The evolution of Xuzhou's spatial structure has had five main periods in the last two hundred years (Figure 4.11).

1. A Historic Walled City

When shipping, walking, and horse power were the primary transportation modes, the original small city had walls surrounding it. The boundaries of the original city were very clear. The north of the city it was the Original Yellow River, a historic river; to the south it was the current Jianguo Road; the east it was the current Mingzhu Road; and the west was current the Xian Road (see Figure 4.12).



Figure 4.12 The Location of the Original Xuzhou City (the Pink Area)

Source: the author

The current Xuzhou historic blocks were built two hundred years ago in the Qin Dynasty, the last dynasty. The original city grew circling the official residence and the Drum Tower. There was an axis running from north to south. An east-west axis intersected this main axis, defining the centre of Xuzhou. Another two north-south axes also ran across the east-west axis. Those axes shaped the city's original grid road system.

In this period of time, the city's development was promoted by its military status, transportation hub, and rich agriculture resources. Although the city was destroyed several times by wars or by the flood of the Original Yellow River, a new city was

always quickly rebuilt over the destroyed one. That history of Xuzhou shapes its distinct historic phenomenon: underground cities.

2. The Beginning Shape of “a Fingered Urban Form”

Since the construction of the Longhai and Jingpu railways at the beginning of the 20th century, the development of the city has jumped over the Original Yellow River and developed to the east. At the same time, development also happened along the railways, leading to the shaping of “a fingered urban form.” The developed area was not large, and vacant land and kailyards (gardens) were scattered throughout. Before the foundation of the People’s Republic of China (1949), Xuzhou’s rich mineral resources were not much exploited and Xuzhou was a consumer city. There were just seven main factories, each with over 100 hundred workers. The total developed area was 12 square kilometers. Infrastructure at that time was deficient. Floods happened often in the rainy season. There was just one mineral pitch road; the others were gravelled.

In this period of time, the construction of railways stimulated the development of the city. Those railways enhanced the city’s transportation status and dragged development to the east. The spatial form of the city was based on the original city and extended eastwards. The road system still maintained a grid shape (Xuzhou’s Official Plan 1995 to 2010).

3. The “Figured Urban Form” Shaped

Between the 1950s and 1970s, the spatial growth primarily occurred in the northern part of Xuzhou, but irregularly leading to the city’s “figured urban form” took shape. The development of Xuzhou city was driven by national investment in the city’s infrastructure. The northern “finger” developed as industrial zones, residential areas, and warehouses near to the railways. A western “figure” is established of office areas and residential areas; and institution located to take advantage of the nearly scenic areas.

At the same time, due to local lack of urban planning experience and government insistence that the highest priority was given to developing manufacturing facilities, residential area planning and the environment protection were neglected. Particularly during the Cultural Revolution period, the abandonment of urban planning resulted in poor city layout. For example, railway marshalling yards, the Jiuli Airport, and a tank training ground were located too close to the inner city; a steel plant, a paper mill, and a

rubber plant were located in the windward direction; a printing and dyeing mill and a pharmaceutical factory were located in scenic areas; many workers lived in the inner city, thus their daily commute stressed the transportation system to outlying working areas.

4. “Star Spatial Structure” Period

Since the end of the 1970s, the city has expanded to the north, west and south and infill began. The growth of the city benefited from China's Open Policy and the national focus on economic development. The city developed at an accelerated rate over this period. In 1990, the city's GDP exceeded 10 billion RMB for the first time. The GDP was over 20 billion RMB in 1993 and over 30 billion RMB in 1994. The city's developed area expanded to 87.77 square kilometre, and the population increased to 0.96 million in 1994.

5. The Period of Rapid Outward Expansion

The city's present wave of rapid outward expansion has occurred since the end of the 1990s. Jingshanqiao Economic and Technological Zone was built in the east of the city, and Tongshan Economic and Technological Zone in the south. At the same time, the Changjiang Delta's economy was booming because of the spillover from close-by Shanghai. The development of southern Jiansu Province, near Shanghai, is happening more quickly than that of northern Jiansu Province. To stimulate this growth, the provincial government has invested in extensive infrastructures for Xuzhou and provided important opportunities to the city. Its predominance in the national market and transportation has been intensified. Urbanization and industrialization have dramatically changed the structure of the city. In contemporary China, three functions of suburbs are found together in nearly equal proportion (Logan, 2008.) Large scale urban renewal and reconstruction in the central cities since the 1980s have forced the relocation of many city residents to suburbs. Luxury villas and gated communities have been built for a growing class of car-driving homeowners. And at the same time massive waves of migrants from other regions have been settled in peripheral areas.

4.3.2.2 Xuzhou's Spatial Characteristics

The city's spatial development is connected to transportation, the presence of water, and hills close by.

1. City's Development along Transportation

Xuzhou is located in a transportation hub; thus, the development of the city along railways, rivers, and highways is one of its characteristics. In the period when people depended on rivers for transportation, the original Xuzhou City boomed and prospered along its major rivers. With the development of technology, transportation improvements like railroads and automobiles have replaced river travel as a major form of transportation. The city started to jump over its ancient rivers and develop along railways. During the 20th century, railways were constructed in the east and south of the city. The advance of transportation is driving city development to the south-east.

2. City's Development along Water

Cities usually develop in relation to nearby bodies of water. In the ancient Xuzhou city, people depended on the rivers because many of the things they needed to survive could be found near them. From fresh water for cooking, drinking to edible plants, to animals they hunted for clothing and food. Yunlong Lake, which is located to the south of the original city and was as large as 5.8 square kilometers at that time, connected the city through a long bank. Many poems were written to praise the beautiful lake. The lake is still an attractive scenic area of the city. Development along water is still one of the main characteristics of the city.

3. City's Development in Harmony with Hills

There are 80 hills around Xuzhou City. Most of those areas, having not only luxuriant plants and distinctive rocks but also profound historical relics, have the potential to be developed for recreation. The Yunlong Scenic Area, shaped like a dragon, is a famous tourist destination. Quanshan National Forest Park, located in the south-west of the city, has luxuriant forest growth. Jiuli Mountain, an ancient battlefield located in the north-west of the city, is an important point in the ancient philosophical principles of *feng shui*, “wind and water”, which promotes harmony between various pairs of physical factors within a geographic framework related to the sun. As these hills surround the city, they form a spatial harmony, immensely pleasing to the eye and constitute to a pleasant atmosphere. The city's hills and water fit the *feng shui* theory nicely, thus the city is thought by many to be a perfect place to live.

Therefore, the future spatial development of the city should present its harmony with water, hills, and forms of transportation.

4.4 The Evaluation of Xuzhou's Official Plan (1995 to 2010)

This section discusses Xuzhou's Official Plan (1995 to 2010). The barriers and the motivation for the city development are analyzed in detail.

4.4.1 Summary of the Official Plan

The Official Plan (1995 to 2010) was enacted in 1996. Its main content is as follows.

City vision: Xuzhou will be shaped into an important national transportation hub and a regional centre with many functions, such as commerce, transportation, energy resources, finance, and tourism.

City scale: The population was estimated to be 1.2 million in 2000 and 1.5 million in 2010; land use would be 114 km² in 2000 and 150 km² in 2010.

Urban planning boundary: The urban planning boundary includes the city area, nine adjacent towns and countries, the airport and its airspace area, and the water supply area. The total area is 1150 km².

The city's main development direction: The main direction for development is to the east and south-east. The existing downtown is still a core area for development, which is separated from other districts by a greenbelt and is connected to them by rapid transit lanes.

4.4.2 Evaluation of previous Xuzhou's Official Plan

The conclusion of this evaluation of Xuzhou's Official Plan (1995 to 2010) is as follows and the summary of the evaluation is described in Table 4.6.

The plan has done well in controlling development standards and regulations, protecting the city's potential developing land. The plan has followed the principle of sustainability and embodied the balance of economy, society, and ecology through environmental protection, historic

preservation, and landscape preservation. The plan has had positive effect in guiding the city's construction, optimizing the city's functions, and improving its economic and social development. The city's image has improved due to the plan's strict control of the green space and scenic reserves. At the same time, the green system and green space possession rate per capita have been enhanced. However, Xuzhou faces new challenges and new problems under the rapid urbanization that comes with the improvement of its market economy system. Some features of the plan (shown in Table 4.6), have not adapted to the development of society and need to be adjusted. (Xuzhou's Official Plan (2007 to 2020))

Table 4.6 Summary of the Evaluation of Planning Objectives of Xuzhou's Official Plan (1995 to 2010)

| Indicators | Evaluated elements | Summary of evaluation comments |
|----------------------------------|-----------------------------------|---|
| Objectives of city construction | City's vision | Efforts need to be made to supplement and adjust the city's functions, and to clarify the city's key position as a centre in response to provincial policies. |
| | Population | The plan was made under the policy of the Chinese Urban Planning Act to "strictly control the scale of big cities and logically develop middle-size cities and small-size cities." The policy was later adjusted to "harmonious development of all cities." by the State Council in 2000. Thus, the scale of the city also needs to correspond to the updated policy. |
| | Urbanized areas | The distribution of population in a city area changes a lot with rapid urbanization and the improvement of transportation. The urban planning area needs to be adjusted. |
| Objectives of social development | Proportion of tertiary industries | The city's downtown should attract the service sector to meet the regional development standards. However, as a historic city, the downtown's underground has many historic relics, which need to be preserved according to the National Historic Act. Those historic relics restrict the possibilities of downtown revitalization. |
| | Transportation | The emphasis on public transit is insufficient. |
| | Eco-system | The emphasis on ecological development is insufficient. |
| | Urban development direction | The last plan brought forward a sound development policy, which was to develop to the east and south-east. However, the implementation is not detailed enough. The planned western industrial zones contrast to the city's main direction. Those developing conflicts need to be resolved. |
| | Urban form | The plan did not have enough land set aside for public facilities. As a result, the arrangement of mega-projects is inefficient; some projects go against the environmental protection policies; some are poorly situated, being remote from each other. Hence, there is a need to adjust inefficiencies in selecting sites for mega-projects. |
| Land use | Public facilities | The emphasis on public transit is insufficient. |
| | Historic areas | There is a conflict between historic preservation and development in the inner city. |

Source: Data was summarized by the author based on Xuzhou's Official Plan (2007 to 2020)

4.4.3 Barriers that the City Faced in 2006

The basic pattern of urban development during the recent decade in Xuzhou is outward expansion. Spatial patterns of development are rooted in a context of substantial economic restructuring. However, these spatial and structural changes exacerbate a number of social problems that have long plagued urban communities. Each of these trajectories of change, in turn, feeds back and nurtures the other. During the last decade, two major forms of economic restructuring have changed the face of urban communities. The growth of the manufacturing sector coupled with the growth of service positions – including high-paid producer service industries and low-wage personal services jobs – have fueled the development of the built environment at the expense of the natural environment. These economic shifts have stimulated the development of downtown office space, convention centres, and cultural facilities, where relatively well-off professionals work and play, and outward manufacture areas. Thus while the development of downtown and manufacture areas has proceeded rapidly, many historic, scenic, and natural environmental areas have deteriorated.

Downtown Development Pressures: The utmost problem in Xuzhou is the presence of many competing interest, including the residential, governmental, commercial, recreational, social, and cultural sectors, which are all located in the inner city. A broad range of activities are thus present in the same space. The city is increasingly confronted with problems resulting from high urban development expenses, traffic congestion, and, most seriously, pollution.

Land Use Restructuring: Land use is not well balanced: green space is only 5 per cent, which is very low compared to the national standard of 8 to 15 per cent; the ratio of commercial land use is also low; entrepreneurs lack space to develop in downtown area; residential density is very high. This inappropriate land use pattern is causing environmental degradation and decreasing the city's efficiency.

The Character of Xuzhou is Being Lost: Market forces are driving the revitalization of the existing city of Xuzhou, especially in the downtown area, while environmental protection is often ignored. Some projects are not implemented according to planning regulations; the need for space and green space is ignored, development is high density,

and the lack of harmony between historical buildings and modern buildings is resulting in the lost of Xuzhou's traditional character.

The City's Development Boundary Has Been Breached: In recent years, with the construction of highways and the airport in the south-east of the city, many projects have developed in proximity to these convenient transportation areas. The city boundary, which is identified in the official plan, has been breached.

Deterioration of the Environment: The national movement from rural to city is certainly a major demographic phenomenon, as Rees and Wackernagle (1996) suggest, a human ecological shift. Xuzhou is undergoing rapid urbanization. Now Xuzhou is a place where increasing numbers of people live and is a pre-eminent place of consumption. It requires large quantities of resources to maintain its infrastructure and industries, and to support its inhabitants. The end result of consumption is pollution, which not only has implication for climate change, but also leads to urban smog, deteriorates the environment, and has serious consequences for public health.

4.5 Summary of Current Xuzhou's Official Plan (2007 to 2020)

In this section, Xuzhou's latest Official Plan (2007 to 2020) is discussed. The barriers and the motivation for the city are analyzed in detail. Also, the contents of this official plan relative to smart growth principles, such as regional development, urban boundary, residential area development, transportation, and preservation to historic and scenic areas, are discussed in detail.

Urban planning in China has increasingly become an avenue through which capitalist urbanization is enhanced. At the start of the 21st century, Xuzhou's Official Plan contains the vision for the city's development over the next twenty years. This official plan therefore adopts language that espouses the benefits of economic competitiveness, yet as the same time, uses concepts similar to smart growth principles to address regional sprawl.

Table 4.7 Land Use in 2005 in Xuzhou City (Population was 1.40 million in 2005)

| No. | Land | Land use classification | Area (km ²) | Proportion(%) | Per capita (m ² /person) | |
|-----------------------|--------|-------------------------|---------------------------|---------------|-------------------------------------|------|
| 1 | R | Residential area | 32.9750 | 27.48 | 23.55 | |
| 2 | C | Public facility | 18.0980 | 15.08 | 12.93 | |
| | | Including | Administration | 3.2080 | 2.68 | 2.29 |
| | | | Business | 6.1810 | 5.15 | 4.41 |
| | | | Culture and entertainment | 0.8240 | 0.68 | 0.59 |
| | | | Sport | 1.4450 | 1.20 | 1.03 |
| | | | Sanitation | 0.8160 | 0.68 | 0.59 |
| | | | Education | 5.4240 | 4.52 | 3.88 |
| Other public facility | 0.2000 | 0.17 | 0.14 | | | |
| 3 | M | Industrial area | 26.4030 | 22.00 | 18.86 | |
| 4 | W | Storage | 1.9760 | 1.65 | 1.41 | |
| 5 | T | Exterior communication | 7.6010 | 6.34 | 5.43 | |
| 6 | S | Road and square | 13.1550 | 10.96 | 9.40 | |
| 7 | U | Other infrastructure | 2.1460 | 1.79 | 1.53 | |
| 8 | G | Green land | 5.8540 | 4.89 | 4.18 | |
| | | Public Greenland | 5.0270 | 4.19 | 3.59 | |
| 9 | D | Military | 11.7740 | 9.81 | 8.41 | |
| Total | | Urbanized area | 119.9820 | 100.00 | 85.70 | |

Source: Xuzhou's Official Plan (2007 to 2020)

Xuzhou's Official Plan (2007 to 2020) was prepared according to the Chinese Urban Planning Act, the Planning Regulation Guidelines (No.146), the Jiangsu Province Urban and Country Plan (2001 to 2020), the Xuzhou Metropolitan area Plan (2001 to 2020).

While Xuzhou's new Official Plan does not serve as a comprehensive regional plan and is only meant as a vision for the political boundaries of the municipal of Xuzhou, there is a noticeable focus on the regional context as a framework for introducing intensification.

Xuzhou's Official Plan refers to two main challenges to the city's future that underline the emphasis on smart growth. The first challenge concerns Xuzhou's economic future. The second challenge is the quality of the regional environment. The association between environmental protection and economical growth that is readily apparent in the Guidelines (No. 146) can be considered a corner stone of Xuzhou's Official Plan.

This Official Plan is composed of three parts: paper files, maps, and accessories (including explanation of the plans and statistics). The former two parts are statutory files,

which guide Xuzhou's urban development and construction. According to the Chinese Urban Planning Act, all construction activities relative to all kinds of land uses within the planning boundary must follow the plan. The Short-term Plan in this Official Plan (2007 to 2020) is defined from 2006 to 2010 and the Long-range Plan is from 2010 to 2020.

This plan has three levels of planning boundaries (see Figure 4.13). The largest one, 11258 km², is defined as the Xuzhou Regional boundary and Xuzhou region's administrative district; the middle one, 3126 km², is defined as the Xuzhou Urban Planning Boundary, including Xuzhou City's administrative district, the major water resource area, and Xuzhou's airport area; the smallest one, 553 km², is the urban development boundary (Figure 4.13), including land covering continuous public facilities and infrastructure. The statistics of Xuzhou's land use in Table 4.8 is calculated based on the urban development area.

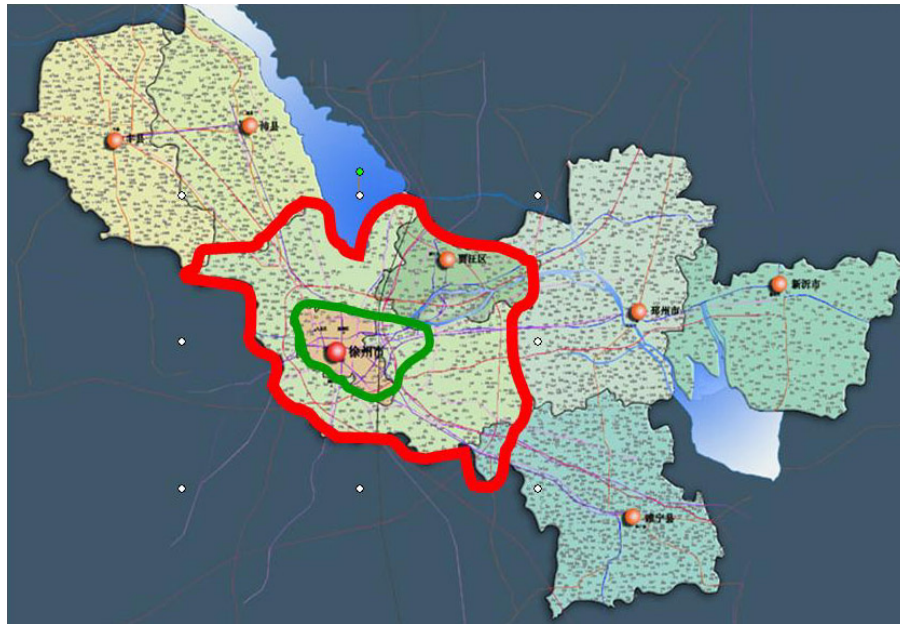


Figure 4.13 Three Levels of Planning Boundaries in Xuzhou's Official Plan (2007 to 2020)

Source: Xuzhou's Official Plan (2007 to 2020)

Note: 1. The biggest boundary is the Xuzhou Regional boundary, the red line is Xuzhou Urban Planning Boundary, and the green line is urban development boundary. 2. From the left to the right, the Town of Fengxian, the Town of Peixian, the Town of Tongshan, the City of Xuzhou, the District of Jiawang, the Town of Suining, the City of Peizhou, and the City of Xinyi.

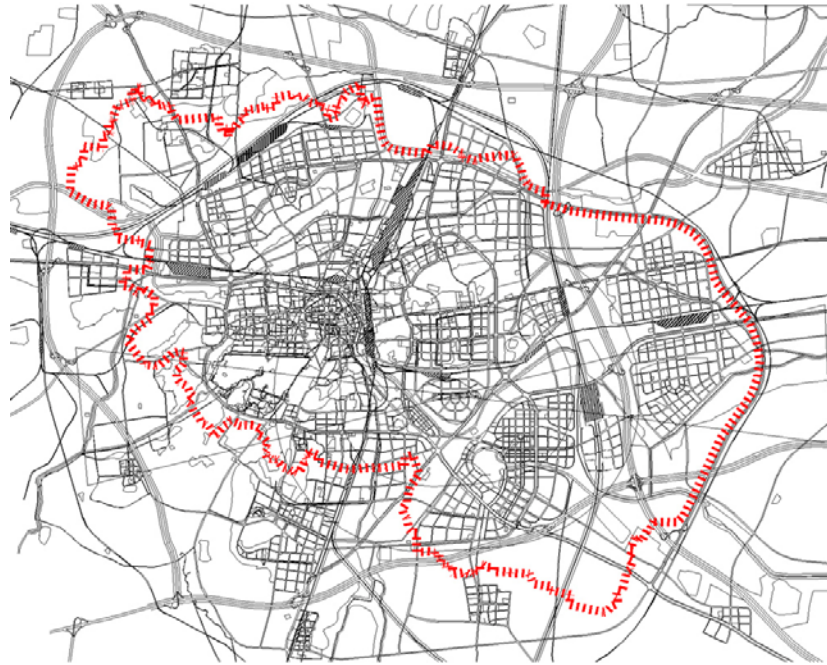


Figure 4.14 Xuzhou's Urban Development Boundary (the Red Line)

Source: Xuzhou's Official Plan (2007 to 2020)

4.5.1 The City's Goals and Development Policy

The city's vision in 2020 is that Xuzhou will not only be a prosperous, safe, beautiful centre city, but also be a place where historic heritage and modern civilization combine harmoniously. The city's economic goal in 2020 is for the Gross Domestic Product to be 390 billions Yuan. The city will fulfill modernization[®] by industrialization and urbanization. The city will also be a regional commercial and logistics centre based on the high-tech, chemical, and energy source industries.

The environmental development strategy is to carry out sustainable development, to strictly control all sources of pollution, to comprehensively deal with soil erosion, to control new land-use development, and to protect natural reserves, scenery, and historic districts.

[®] Modernization was understood as a natural process of diffusion of capital, technology, and social organization (Slater 1986.) Modern societies were understood to be urban, because cities served as the catalyst for the transformation of agricultural into industrial societies (Logan, 2008.)



Figure 4.15 Xuzhou New District in Google Map (the Pink Area) and Its Detailed Plan

Source: the left one was made by the author, the right one was collected from Xuzhou's New District Detailed Plan

City's main development strategy is the development of Xuzhou's New District (Figure 4.15). Through this district development, infrastructure standards will be promoted, living condition will be improved, public service will be enhanced, and the urban structure will be optimized; historic districts and scenic reserves need to be preserved: to develop the local distinct tourist industry, to protect ecological environment, and to fulfill the harmony between the human and natural environments.

4.5.2 City Vision and Scale

City vision: Xuzhou is to be promoted as an important national transportation hub, a regional centre city, a national historic, cultural and tourist city.

The population of Xuzhou City will be 1.56 million in 2010 and 2 million in 2020. In 2010, the urbanized area of Xuzhou City will be 151.40 km², 97.10 m² per capita; in 2020, 180 km², 90 m² per capita.

4.5.3 Xuzhou's Region Plan

The urbanization rate in Xuzhou Region is estimated to reach 46% in 2010 and 58% in 2020. The population will be 9.55 million in 2010 and 10 million 2020.

Spatial Structure: The spatial structure of Xuzhou Region is composed of a metropolitan area, a main development axis, and three corridors connecting cities and towns. The metropolitan area includes the City of Xuzhou and the Town of Tongshan (the pink area in Figure 4.16); the main development axis is the Xuzhou-Liangyungang axis (the blue horizontal axis in Figure 4.16); the three corridors connect Xuzhou and Fengxian, Xuzhou and Peixian, and Xuzhou and Suining.

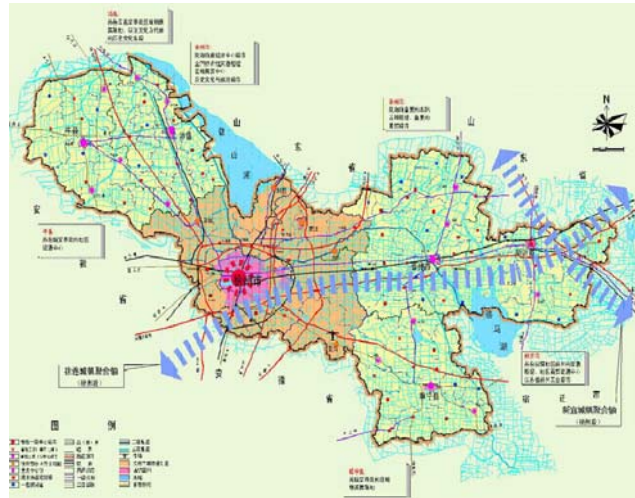


Figure 4.16 Xuzhou City-town System

Source: Xuzhou's Official Plan (2007 to 2020)

City-town System: The city-town system of Xuzhou Region is made up of four tiers: the Xuzhou metropolitan area that is the core of the system, five cities (towns), main towns, and ordinary towns (Figure 4.16). Xuzhou Region is intended to grow with economic and social development, and plans to “emphasize land use based on the whole harmonious development” to fulfill an efficient, compact, and sustainable spatial development. There are three types of accumulations in this region: industrial (industries accumulate to the city’s (town’s) industry areas), residential, and of rural (farmland and ecological reserves’ accumulation). Through the above arrangement, a function-clear and connected spatial system is shaped.

Land Use Management: Control of land uses and the speed of the transition from farmland to land under development should enhance land use efficacy, improve land use structure, and promote a functional development cycle. The government plans to

establish the evaluation system of the land; supervise the land transition mechanism; set up a land reserve mechanism; form an integrated land market.

Town and Village Development: The plan is also designed to encourage amalgamation of towns and villages and direct scattered residential areas to towns or cities, and forbid the construction of new residential areas outside city/town planning boundaries.

Farmland Preservation: Prime farmland represents 60% from the Xuzhou regional area. It provides for grain, cotton, and oil production. Prime farmland reserves will be clustered. Cities and towns will have enough reserve land for future development in the main development direction. Agricultural reserves shall be protected according to the Prime Farmland Protection Act (promulgated by the State Council on Dec. 24 1998) and not rezoned for other uses. It is forbidden to use the soil, to build houses, to mine, and to dump garbage in these areas. All activities relative to development must be adjusted through legal procedures.

Historic Heritage and Natural Reserve Preservation: Development in sensitive areas is to be strictly controlled to protect historical sites and relics, thus conserving the city's characteristic historic landscapes. The ecological environment will also be optimized to enhance sense of the place. The protected provincial scenic areas include the Yunlong scenic area, which is 62.5 km², and Malingshan scenic area, which covers 28.9 km². The relationship between preservation and development must be balanced. Encroachment and destruction of scenic areas are forbidden. Natural and natural linkage areas include the 3.70 km² Quanshan provincial natural reserve, the 83 km² Malingshan provincial natural reserve, the 38.05 km² Datongshan natural reserve, the 781 km² Weishanhu wetland reserve, and the 20 km² Aishan natural reserve. All development is forbidden in the above areas. Projects adjacent to these areas must not harm the reserve's environment. Sensitive areas' boundaries are to be clearly defined and their land use is monitored. The prime farmland in the agriculture reserve, the green land, and the water-supply reserve in sensitive areas cannot be developed. All activities in the above areas are to be controlled in order for them to maintain their original states. No cities and towns can develop in these areas and reforestation is encouraged, as is preservations of mineral resources and the ecological environment, through enhanced administration of mineral resources and the geologic environment.

Regional Transportation Planning: Xuzhou is a national railway hub for the Jing-Hu high speed railway and Longhai high speed railway. High level roads in Xuzhou will be constructed based on the national road system. The plan calls for a transportation system centred on Xuzhou City to foster the city's economic radiant effect, to conveniently migrate workers to cities, and to enhance urbanization and the integration of regional economy.

Other Infrastructure Planning: The energy source plan intends to take advantage of regional resources, complete Xuzhou's electricity structure, construct high capacity and low pollution electric units. As for regional water supply planning, the regional water supply system will be quickly extended to towns, while in the countryside no new water supply system will be permitted. According to national acts and regulations, all sewage funds produced by new projects will be collected by municipal governments in order to build sewage systems and sewage treatment plants. Small sewage stations can be built in residential areas far away from cities.

Ecological Structure: Mountains and lakes around Xuzhou are planned for together. Through building up ecologically sensitive areas, natural reserves, and ecological controlled areas, an ecological structure will be formed, that includes two lakes, two axes, three districts, four buffer zones, six mountains, and eight water systems. Lush, efficient, and beautiful greenbelts will be built among districts by making use of original farmland and rebuilding current rivers and mountains.

There are four types of ecological reserve in Xuzhou. The first type includes natural reserves, which are Datongshan natural reserve, Weishanhu wetland natural reserve, and Quanshan natural reserve; the second type is a water supply reserve, Zhanji water supply reserve; the third one is a scenic reserve, Yunlong scenic reserve; and the last is a scenic reserve, Yunlong scenic reserve. The fourth is composed of Natural Environment Parks, which include Jiuli, Dahuangshan, and Guhuanghe parks. Jiuli Natural Environment Park emphasizes the protection of Juli's historical and cultural resources in an outdoor setting and will be built in the wetland on a mining subsidence area. Dahuangshan Natural Environment Park protects the landscapes and special features of the natural region in which they are located and provide ample opportunities for activities such as swimming and camping. Guhuanghe Natural Environment Park is built in the Huanhe wetland.

4.5.4 Xuzhou City's Plan

The main development direction in the 2007 to 2020 planning period is to the east and south-east. Development in the west will be controlled. No development will be allowed to the south-west. The short-term objective is to focus on public services, infill, and the start-up of the New District in the east and east-south direction; the long-range objective is to focus on the New District development.

Table 4.8 Land Use Plan of Xuzhou in 2020 (Population is Two millions in 2020)

| No. | Land | Land use classification | Area (km ²) | Proportion (%) | Per capita (m ² /person) |
|-------|------|---------------------------|-------------------------|----------------|-------------------------------------|
| 1 | R | Residential area | 51.4550 | 28.68 | 25.73 |
| | | Public facility | 27.0619 | 15.08 | 13.53 |
| | | Administration | 1.2480 | 0.70 | 0.62 |
| | | Business | 11.7725 | 6.56 | 5.89 |
| | | Culture and entertainment | 1.2298 | 0.69 | 0.61 |
| | | Sport | 2.8234 | 1.57 | 1.41 |
| | | Sanitation | 0.9857 | 0.55 | 0.49 |
| | | Education | 8.2735 | 4.60 | 4.14 |
| 2 | C | Include | 0.7290 | 0.41 | 0.36 |
| | | Industry | 27.3208 | 15.23 | 13.66 |
| | | Industry-1 | 2.7441 | 1.53 | 1.37 |
| | | Industry-2 | 24.5767 | 13.70 | 12.29 |
| 3 | M | Including | 0.00 | 0.00 | 0.00 |
| 4 | W | Storage | 4.9962 | 2.79 | 2.50 |
| 5 | T | Exterior communication | 7.3735 | 4.12 | 3.69 |
| 6 | S | Road and square | 22.2507 | 12.40 | 11.13 |
| 7 | U | Other infrastructure | 3.9668 | 2.21 | 1.98 |
| 8 | G | Green land | 24.5988 | 13.71 | 12.30 |
| | | Public Greenland | 19.9394 | 11.11 | 9.97 |
| 9 | D | Military | 10.3696 | 5.78 | 5.18 |
| Total | | Urbanized area | 179.3933 | 100.00 | 89.70 |

Source: Xuzhou's Official Plan (2007 to 2020)

There are two core areas in Xuzhou city, which are separated by greenbelts and are connected by rapid transportation. One is the centre of the Inner City, functioning as a

commercial centre; the other is the centre of the New District, working as an administration and business centre. There are five other planned districts in the city. Seven greenbelts separating districts and the Yulong scenic areas need to be strictly protected.

The Inner City is the commercial, financial, and tourist centre. A series of development strategies are intended to adjust its land use structure, decrease the density of population and land, and shape three commercial cores along the Huaihai and Pengchegn road axes. Those strategies include protecting the green open space, adjusting development standards, arranging infill of the unused land, developing public transit, add more green space, and revitalizing the inner city. The central part of the inner city contains commercial and residential areas; the west part is residential and tourist; the north part is residential; the east part is military and residential; the south part is educational, residential, and ecological. The whole population in the inner city is 0.96 million, and the land covers 67.81 km².

Table 4.9 Land Use in Xuzhou Urban Planning Boundary

| No. | Classification | Area (km ²) | Proportion (%) | |
|-----|---------------------------------|-------------------------|----------------|-------|
| 1 | Land in Urban Planning Boundary | 553.510 | 100.0 | |
| 2 | Urban development area | 179.3933 | 32.41 | |
| 3 | Other land | 374.1167 | 67.59 | |
| | Including | Water | 24.453 | 4.42 |
| | | Arable land | 242.6397 | 43.83 |
| | | Forest | 106.215 | 19.19 |
| | | Village land | 0.809 | 0.15 |

Source: Xuzhou's Official Plan (2007 to 2020)

Functions of Districts (see Figure 4.17): Xuzhou's New District is an administrative and financial centre. Most development in the future 10 to 20 years in Xuzhou City will happen in this district. The New District will accumulate service industries and shape a new image of the city. The development of Xuzhou New District will be constructed in the east and south direction and follow the airspace requirement of the airport, starting from the Dalongkou reservoir. In the New District, the north part is residential, the centred part is administrative, financial, and educational, and the southern part is industrial. The population will be 0.22 million and land use will be 31.67 km².

Jinshaqiao District is a very important industrial zone, mainly focused on machinery industry, steel plants, and logistics. Bashan District's main function is residential and educational. Jiuli District is a comprehensive area combining entertainment, tourism, residential buildings, logistics, and industry. The East District mainly comprises light industry, export industry, storage, and residential areas. Development will leap the Jingfu highway to the east and shape an independent area. The functions of Jiuli District and Tongshan District need to harmonize with the Inner City and focus on commercial, education, residential areas.



Figure 4.17 Seven Planning Districts in Xuzhou City

Source: the author

Notes: 1 is Jiuli District, 2 is the Inner City, 3 is Tongshan District, 4 is Bashan District, 5 is the East District, and 6 is the Xuzhou's New District, and 7 is Jinshaqiao District.

Public Facilities Planning: Public facilities include commerce, entertainment, education, medicine, and sports facilities. They are divided into three levels, municipal, district, and residential. The total land devoted to public facilities is 27.06 km². Commercial land is also divided into three levels. The total land for public facilities is 11.77 km². The municipal commercial centre is located in the inner city.

Residential Area Planning: Community development standards must satisfy the need of different living conditions. The average residential land use per person is 26.06 m².

Building houses on farmland is strictly controlled. In accordance with the plan, there are 14 residential areas in the whole city, eight of which are in the inner city. The total residential areas make up 51.45 km², which are 29% of the whole city areas.

Industry Planning: Abandoned industrial sites are to be filled in and rehabilitated to decrease the industrial pollution. Industries will be relocated from the city centre to outer

areas. Existing industrial area will be upgraded by coalition, centralization, and closure. The new focus will be on developing industrial zones.

Green Space Planning: The surroundings of mountains and water systems will be integrated with the green system and a greenbelt created on the edge ecological areas with wedges of green land separating different districts and waters connected to the ecological system. The combination of mountains, rivers, parks, and green spaces will shape the city's green system. In the short-term, the percentage of green coverage in the urban area will be 33%. Public green land per capita is six square metres. In the long-range, the percentage of green coverage in the urban area will be 40%, with the public green land per capita being eight square metres. The strategy for developing public green land is to update 11 existing parks, covering 2.2 km²; to plan 19 new parks and a green space near avenues; to ensure that every citizen can arrive at at least one public green space over 3000-square-metres by walking just 10 to 15 minutes. The land of green space beside expressways and arteries will be over 10 metres wide, and the land for other roads will be over 5 metres wide.

4.5.5 Xuzhou Transportation Planning

Exterior communication is composed of 13 highways and local exterior roads, and a passenger transport system composed of seven passenger stations.

Transportation Strategy: In the inner city, public transportation, which helps to reduce air pollution and road construction for automobile, is the main traffic mode which benefits the historic and scenic areas. Districts are connected by bus rapid transit and expressways. A transit-oriented development policy is planned for new planned areas. The new transit system should mesh with the city's structure. Increased transit corridors and updated roads will support development in the east and south-east, which has the barriers of mountain, railway, and lakes. The optimized public transit system should increase public transit's user ratio to 25%-33% by 2020, the user ratio of bicycles should be 25% -28%, while automobile use should be 14% to 21%.

Every street owned by the city has been given one of four classifications: expressway, major arterial road, minor arterial road, and local road. The total area for the four types is 13.3% citywide.

To protect the Yunlong scenic reserve and the inner city's environment, current roads classifications are to be adjusted; for example, some main arterial roads need to be reclassified as minor arterial roads.

Figure 4.18 Xuzhou Transportation Plan

Source: Xuzhou's Official Plan (2007 to 2020)

Bus-only-lanes are planned for the bus rapid transit corridor. Bus stations need to be set



up in the interchange areas of exterior transportation, rail traffic and bus transit.

4.5.6 The Planning for Xuzhou Historic City

The city's distinct characteristics are shaped by military culture, profound Han culture, historic relics and buildings, surrounding mountains, lakes, and rivers. They are to be preserved strictly. Nine national and 22 provincial cultural relics, two underground culture relics, two historic blocks, and 71 historic trees need to be preserved strictly.

The plan preserves the axis of the historic city, which is 2.5 kilometre long, and adjacent historic relics. New buildings are to coordinate the areas' historic characteristics, with strictly controlled height, increased green spaces, and intensification of the axes.

4.5.7 Revitalization of the Inner City

The traditional commercial function of the inner city is to be emphasized to shape comprehensive blocks combining tourism, entertainment, and culture.

The revitalization of the inner city should focus on the whole environment and economic reinforcement. Administrators are encouraged to revitalize old residential areas through relocating pollutant industries; increase the entertainment, tourist, and commercial areas to add livability to the inner city; increase public green space through constructing two municipal-level parks and two green belts; decrease residential land use in order to decrease the population density in the inner city; adjust the road system to better connect inner traffic and exterior communication. Increase the road ratio in the planned area.

The revitalization of the inner city must protect the city's original characteristics, culture, and historic landscape; preserve historic blocks which house the Hubushan traditional community; and protect memorial and historic relics, military sites and landmarks.

4.5.8 Environmental Protection

Xuzhou uses its vast coal resources chiefly to produce cheap electricity; nearly all electricity generated in Xuzhou comes from coal-fired power plants. Coal-fired plants will continue to dominate the Xuzhou electricity sector in the future, but clean coal technologies should begin to reduce the environmental impact of burning coal in electrical power plants.

4.5.9 Short-term Planning

In the short-term (2007 to 2010), construction will focus on Xuzhou New District, which is 10 km². By 2010, the New District should be half finished. Land not scheduled for development will be controlled. The intended population in the short-term period is 1.56 million and the land use is 151.4 km².

4.5.10 Implementation

The plan encourages public participation to ensure an open, balanced process, and strengthen the quality and credibility of the Official Plan.

4.6 Conclusions

This chapter addresses the second objective introduced in Chapter One which is to chronicle Xuzhou's official plans and to determine problems that the city faces and

efforts that the government has made to improve the city's development. It is clear that many principles of smart growth are already emerged or embodied in its urban development policies. Next chapter will continue to talk about in what extent those principles have implemented in its official plan using the information gathered from interview and document review.

CHAPTER 5 FINDINGS

This chapter builds upon the previous chapters and addresses one of the objectives of this research which is to evaluate Xuzhou's Official Plan (2007 to 2020) using the framework identified. The interview data, in combination with the factors identified in Chapter Two and a review of relevant documentations, are used as a basis for this analysis.

This chapter has five sections. The first two sections, based on interview results, intend to find out the answers for the two research questions: what is the cause and what is the extent of sprawl in China? Do planning policies in China embody smart growth strategies? The third section, based on planning documents and a framework identified by interviewees, discusses the research question: how much of smart growth from the Xuzhou's Official Plan (2007 to 2020) is being implemented? Relative findings are integrated into categories that show how smart growth is being used in Chinese official plans. The fourth section, relying on interview data, talks about the research question: what are the limitations to the use of smart growth in China's official plans and how can they be overcome? The concluding section of this chapter summarizes the findings. This discussion provides the basis for the recommendations presented in the next chapter.

5.1 The Cause and the Extent of Sprawl in China

In this study, participants were asked to define the term "sprawl" first. Many of the respondents remarked that "sprawl" is a negative term and identified the definition as "haphazard growth or outward extension of a city resulting from uncontrolled or poorly managed development". Planner 01, however, had a different definition. He indicated that "sprawl in China is a dispersed development. This sprawling development could result in costly extensions to roads and utilities in every direction of a city and can be inefficient for commuters as well as for those providing commercial services."

In identifying whether there is urban sprawl in China or not, the general consensus amongst those interviewees is that "yes, there is sprawl." At the same time, participants all indicated that sprawl in present China was not everywhere and just happened in big cities, such as Beijing, Shanghai, Guangzhou. In Xuahou City, sprawl is not evident.

5.1.1 The Causes of Sprawl in China

As part of this study, participants were asked what the causes of sprawl in China are. The responses varied and included a number of different ideas and thoughts, with some mirroring those identified through the literature review included in Chapter Two, and some proving focusing on financial and institutional factors.

Planners 02, 03, and 04 and municipal officials 01, 02, and 03 observed that “rapid increase of development zones, golf courses, university towns, and low-density communities at the edge of cities have caused urban sprawl.” In addition, planner 03 viewed that automobile also caused sprawl. Official 04 mentioned the same opinion and he added that local governments’ motivation was one of the important reasons causing sprawl. Planner 01 had a different point of view and he indicated that deficiency in planning theories had caused sprawl. He elaborated by saying that,

The main problem in many Chinese big cities is developing in disorder: many developments happen in the form of successive rings radiating out from the core. At the same time, theories in city development and planning management cannot catch up with the speed of city development. (Planner 01)

Consultant 01, who had a different perspective regarding this issue, pointed out that economic and GDP priority and the current planned transportation systems had caused sprawl. He noted that,

Firstly, economic and GDP priority have caused sprawl phenomena. Local governments, who manage and control land resource, can sell farmland at very low prices to developers who prefer to invest in industrial zones, university towns, and low-density communities. This stimulated urban expansion or even sprawl. Secondly, the planned transportation systems, always set their goals to satisfy automobile development, stimulate city’s quickly outward expansion. (Consultant 01)

From participants’ responses, there are two main reasons for urban sprawl in China. One, identified by consultants and some officials, pertains to the economic, political, and institutional level. The other, identified by many planners, consists in the urban development pattern. Indeed, factors at the economic and institutional level drive local governments to set up all kind of low density development zones, university towns, golf courses, and communities, resulting in sprawl.

5.1.2 The Impact of Sprawl in China

As analyzed in Chapter Two, negative impacts often cited as being caused by sprawl in North America are: the needless destruction of open space and farm resources; the abandonment of housing and commercial structures, resulting in the deterioration of neighborhoods and commercial areas and increased tax burdens on remaining residents and businesses; the construction of new infrastructure and under-utilization of existing infrastructure, resulting in overly expensive maintenance costs; increasingly long commutes, resulting in unnecessary air pollution, wasted natural resources, and wasted time.

In terms of the impact of sprawl in China, the overwhelming consensus among interviewees was that it caused the destruction to farmland and natural environment. Apart from that, participants had a number of varied responses related to their research and work field. Planners and municipal officials emphasized different aspects of urban form, while consultants noted the impact of financial aspects. Planner 01 emphasized that sprawl will affect sustainable development and food security in China. Consultants and municipal official 04, who work in the transportation branch, remarked that daily commute caused traffic congestion. Consultant 01 pointed out that sprawl might cause finance problem. He noted that “the huge investment in infrastructure caused by excess consumption in land use.”

It is observed that the impact of sprawl in China and North America is largely similar, although there are two main differences. Firstly, sprawl in North America causes the abandonment of existing housing and commercial structures in inner cities. That situation does not happen in China. In Chinese cities, city centers and inner cities are still the places where people prefer to live because there are better education and health care facilities there (P02). Secondly, farmland protection in China is more important and urgent than in North America (P01, 02, 03 and C01, 02). Food security is one of the main concerns for the State Council and the most important motivation to fight against sprawl in China.

5.1.3 The Difference of Sprawl between China and North America

When participants were asked the differences between sprawl in China and North America, it is clear that respondents had two main opinions. First, planner 01 and 02, municipal official 01 and 02 considered that North America’s sprawl was in low-density communities, while China’s was in fairly high-density communities. Second, planners 03 and 04 and official 03

indicated that the sprawl patterns of the two countries were different. Planner 03 went on to explain that,

Although both sprawls have the same result, that is the destruction of built and natural environment, urban sprawl phenomena are different: low-density communities in North America, while low-density industrial zones, university towns, golf courses, residential areas in China. (Planner 03)

Besides, there are different responses to this topic. Official 02 viewed that China's urban sprawl was caused by population growth, which reflected China's rapid urbanization. Official 04 indicated that transportation mode in North America is different from that in China: "dependency on automobile is a main factor causing sprawl in North America. In China, dependency on automobile is not very serious because public transit is still an important transportation mode". This opinion can explain why sprawl has dominated North America over the last 50 years while sprawl in China just emerges. Consultants employed a more comprehensive perspective referring to differences in social, economic, land use system, and government organization. They concluded that rapid urbanization, investment from global capital, and plan-making attempting to satisfy local governments' needs should be considered.

5.2 Planning Policies in China and Smart Growth Strategies

In order to determine whether planning policies in China embody smart growth strategies, participants were asked to address three sub-themes: the main obstacles today in preparing Chinese official plans, recommendations to improve the process of preparing Chinese official plans, and the relationship between the policy and economic climate and the implementation of smart growth in official plans.

5.2.1 The Main Obstacles Today in Preparing Chinese Official Plans

Participants had a number of responses to this question. Planners interviewed in this study were involved in several official plans. They can share similar obstacles in preparing official plans. Their consensus is the lack of public participation. Planner 01 went on to explain that,

In North America, the public has the right to vote. Hence, plan-makers and consultants are willing to listen to the public's opinions. While in China,

officials are normally appointed. There is almost no political channel to ensure public participation. (Planner 01)

In addition, planner 01 indicated that the lack of planning theories and insufficient review of plans impeded plan-making. Planner 02's opinion is popular in recent years' academic discussion. He mentioned that the weak coordination between official plan and land use plan and the weak legislative status of official plans were the main obstacles. He remarked that the time-consuming approval process had a negative effect on official plans' efficiency and planning management. Consultant 01 agreed with this perspective. Official 03 also responded,

That situation may lead to a very different development form for the city and increase the necessity to update the plans soon to catch up with the rapid development. In practice, Xuzhou city had a regulation to deal with this situation that stated that all important detailed plans of the city would be suspended when the official plan was prepared. However, it took five years to finish the whole process, so this regulation was not practical and was hard to fulfill in this circumstance although its intention was good. (Official 03)

Municipal officials, on the other hand, often considered this topic from a very pragmatic point of view because Xuzhou's Official Plan is the only official plan they were involved with. Consequently, they talked about barriers in plan-making related to Xuzhou's Official Plan (2007 to 2020). All municipal officials expressed the contrary between strict controls on the urbanized area of the city and rapid growth of the population. Besides, official 01 considered requirement for development. He noted that "a new official plan needs to satisfy the change of manufacture structure".

According to consultant 02, the greatest obstacle in preparing Chinese official plans is the lack of accuracy in the forecast of future conditions, leading to unclear relationships between the physical plan and social and economic factors in the community.

5.2.2 Recommendations to Improve the Process of Preparing Chinese Official Plans

Responses to this question can directly answer the above topic. Thus, the main recommendations are meant to enhance public participation (P01, PO2, P03, P04, C01, and C02). More detail will be analyzed in next section on *the evaluation of the implementation of smart growth in Xuzhou's Official Plan* as will propose to make the plan approval process more efficient (P04, O01, and C01). Associated with these improvements, planner 02 and

official 03 mentioned that enhancing plan-makers' professional ability would improve the preparation of Chinese official plans. Consultants 01 and 02 also pointed out that "in the process of plan-making and plan evaluation and monitoring, much emphasis should be put on experts' comments, not local governments' will." In addition, "currently there is a phenomenon that a newly appointed local government will prepare its city's new official plan which reflects the government's will." Consultant 01 believed it was not necessary to do that.

Finally, in terms of the content of official plans, planner 02 and official 02 offered the same opinion that "official plans have too much information. In fact, detail issues can be solved in next level plan." They concluded that "official plans should have more compatibility and flexibility."

5.2.3 Policy and Economic Climate and the Implementation of Smart Growth

Participants responded positively to this topic although they adopted different perspectives: planners expressed their ideas on planning policies, regulations, and standards; municipal officials focused on policies; and consultants offered their opinions at a broader and more general level.

Planner 01 had a unique perspective on the policy climate related to smart growth in China. He mentioned the differences in the land use system in North America and China. He went on to say,

The Chinese system of government has advantages in protecting land from urban sprawl theoretically: if farmland needs to be transferred to other uses, its land ownership has to be converted to the state first. Although some local government's illegal activities result in the sprawl of industrial zones, university towns, and low-density communities, such illegal conversion of land use is not a mainstream. (Planner 01)

Besides, he mentioned that the update of the Chinese Planning Act would benefit the implementation of smart growth in official plans. The Chinese Urban Planning Act was replaced by the Chinese Urban and Rural Planning Act on 1 January 2008. Planner 01 said "from the change of the name, it is observed that planning perspective is more focused on a regional scale and sustainable development rather than a city's scale."

In terms of the planning regulations, planners 02, 03 and 04 pointed out that the Chinese Urban Residential Community Plan Standards (2002), Planning Regulation Guidelines (No. 146), the Regulation for New Developing Housing Structure, and Chinese strict land use management policies would help the implementation of smart growth in official plans (more detail will be introduced in the section on *the evaluation of the implementation of smart growth in Xuzhou's Official Plan*).

Municipal officials all remarked that China's Concepts of Scientific Development, a national political policy, had a beneficial influence on the implementation of smart growth in Chinese official plans. Planner 02 explained that,

The goal of China's Concepts of Scientific Development is a harmonious development of economics, society and humanity. The goal will be achieved through people-oriented, comprehensive, coordinated and sustainable development. Its objectives include innovation and the principles of: balance between rural and urban development, balance development among regions, environmental and resource protection, balance economic and social development. China's Concepts of Scientific Development is much more sweeping in its goals than smart growth. (Official 02)

Consultants also deemed that smart growth can benefit Chinese cities in the current policy and economic climate. Consultant 02 noted that,

Yes. In the recent 20 years, Chinese urbanization rate was double the world's average rate. In the future 20 years, it is predicted that Chinese urbanization rate will still increase rapidly. Smart growth focuses on sustainable development in economy, society, and environment, renewal of existing communities and infrastructure, decreasing traffic and saving energy. Hence, it advocates a more efficient and compact development mode which meets the requirement of Chinese cities. (Consultant 02)

5.3 The Evaluation of Implementation of Smart Growth in Xuzhou's Official Plan

This research focuses on evaluating the implementation of smart growth in an official plan. Evaluating the official plan is very important because it is the primary document that describes the overall long-term vision and goals for a city's future growth patterns. If an official plan clearly articulates a locally accepted concept and principles of smart growth, it

will effectively improve understanding by participating community and citizens and encourage practices embodying smart growth principles. Furthermore, establishing smart growth as a principle in official plans also provides a legal basis for the policies and regulations that will be used to implement smart growth.

5.3.1 Evaluative Framework

In order to determine whether smart growth is being used in official plans in China or not, interviewees need a clear definition of how smart growth is being implemented in specific contexts. In considering this idea, it is important to note that there is no formula to implement smart growth. However, there are a number of principles that must be considered in the implementation of smart growth.

In this study, interviewees identified a ten-principle evaluation framework (see Table 5.1) proposed by APA, which is introduced in the literature review in Chapter Two. These ten interrelated principles sketch a broad view of hospitable, productive, and fiscally and environmentally responsible communities. Each principle has several criteria to determine how well the official plan satisfies smart growth principles. These criteria were selected by interviewees (see Appendix H). Most criteria are also used by many organizations, such as Greenbelt Alliance, Maryland Smart Growth, Northeastern Illinois, Vermont Smart Growth, and Minnesota Bonding Requests, to evaluate whether projects implement smart growth or not.

The evaluation employs a combination of measurable and subjective factors. Factors that can be expressed as measurable factors include proportions of different transportation mode and green space per resident. Other factors depend on more subjective judgments (e.g., a sufficient density and mix of uses to promote walking, biking, and transit use) (Porter & Cuddy, 2006)

Using the above criteria, the following evaluates the implementation of smart growth in Xuzhou's Official Plan (2007 to 2020).

Table 5.1 Principles and Criteria to Evaluate the Implementation of Smart Growth in Xuzhou’s Official Plan

| Principles of smart growth | Criteria |
|--|--|
| Mixed land uses | Land uses (e.g. housing, work, shopping, entertainment, recreation) are mixed within a neighborhood. What is the diversity of a project’s land uses within 10 minutes walk distance (around 500 metres)? |
| Compact development | What is the minimum net residential density? What is the population density? What are the plot ratio, gross density, and site coverage? |
| Create a range of housing opportunities and choices | What is the house portion in official plans? How are the mixed-income housing developments, which include units accessible to moderate-income working families and to households with lower incomes along with market-rate units in the same complex? Do housing and mixed-use proposals make an effort to address affordable housing needs of moderate-to low households as identified in the jurisdiction’s housing element (e.g. making a fixed percentage of the units affordable to these households or contributing land or other resources dedicated to such affordable housing)? Does the project provide for diversity in type and price of housing within the area where it is located? |
| Create walkable communities; | Are pedestrian features (e.g. sidewalks) available or will be provided? Are there internal paths, bikeways and sidewalks linking buildings or connecting with neighboring networks? |
| Foster distinctive, attractive communities with a strong sense of place | Will a sense of community within the development be promoted (e.g. by facilitating interaction among residents through diverse gathering places or by incorporating common spaces)? Do neighborhoods nearby connect to each other through public spaces and /or design features? Will a community’s character be respected (e.g. keeping with the local architecture, historical feature in design)? |
| Preserve open space, farmland, natural beauty and critical environmental areas | Does the project have UGB, boundaries of water, green space, public space, heritage areas, and roads? Does the project avoid development on wetlands, streams, shorelines and related buffer areas, working agriculture or forest land, on highly erodible or otherwise unstable soils, or on floodplains? |
| Strengthen and direct development towards existing communities | Preferred projects take advantage of existing public investments and do not require new infrastructure investments outside of trade or population centre. A project must be located within an existing “urban service area” as noted in a city’s general plan. |
| Provide a variety of transport choices | The proposed project should be planned “to integrate with existing street patterns, walkways and bicycle paths, and to provide easy connection to services and public transportation. The project should be pedestrian oriented.... To encourage innovative parking design, which reduces the amount of surface parking or the visual impacts by location and/or screening, or projects which use shared off-site parking” |
| Make development decisions predictable, fair and cost-effective | Public participation, the time to prepare official plans, execution of official plans |
| Encourage community and stakeholder collaboration in development decisions | Projects for which the developer has made a good faith effort to address neighborhood concerns will more easily receive a favorable review. The developer must make good-faith efforts to communicate with the surrounding neighborhood and city staff, including: Pre-design meetings with key city agencies Citizen and stakeholder participation is conducted early in the process, when involvement can create change. |

Source: This table was identified by interviewees from Appendix H.

5.3.2 Mixed Land Uses

Porter and Cuddy (2006) describe the principles of mixed land uses proposed in a North American background, where shopping malls have become suburban commercial and cultural centres after suburbanization and the decline in urban core activities. Mixed land uses advocated by smart growth will enable the creation of lively, interesting, and compact places where residents and workers can walk, bike, or make short vehicle trips to satisfy daily needs for services, products, and jobs.

In China, the spatial framework of residential communities was learnt from the western neighbourhood unit concept and the Soviet micro-district concept (Xu, 2004, Zhang & Wang, 1999). According to planners 02, 03, and 04, “the Chinese Urban Residential Community Plan Standards GB50180-93 (2002) have many requirements to encourage the mixed land uses in a community”. When a city’s official plan, including Xuzhou’s Official Plan, is prepared, those requirements, as described below, must be implemented.

First of all, a residential community is made of three tiers. From the largest scale to the smallest scale, those three tiers are a residential community, a residential micro-district, and a courtyard (see Table 5.2). Planner 04 explained,

On each level, regulations and classification of public facilities, including sanitary, recreational, commercial, financial service (such as banking), infrastructure, and administrative service, are made in detail. (Planner 04)

Table 5.2 Three Tiers in a Residential Community

| | A residential community | A residential micro-district | A courtyard |
|------------|-------------------------|------------------------------|-------------|
| Household | 10000–16000 | 3000–5000 | 300–10000 |
| Population | 30000–50000 | 10000–15000 | 1000–3000 |

Source: The Chinese Urban Residential Community Plan Standards GB50180-93 (2002)

Secondly, land uses in a residential community, a residential micro-district, and a courtyard are composed of four types (see Table 5.3): residential, public facility, transportation, and public green space. Each type of land should be designed in a proportion following identified qualitative regulations (P04).

Table 5.3 Residential Community Land Use Regulation

| Land Use | A residential community (%) | A residential micro-district (%) | A Courtyard (%) |
|-------------------|-----------------------------|----------------------------------|-----------------|
| Residential land | 50–60 | 55–65 | 70–80 |
| Public facilities | 15–25 | 12–22 | 6–12 |
| Road | 10–18 | 9–17 | 7–15 |
| Public green land | 7.5–18 | 5–15 | 3–6 |
| Total | 100 | 100 | 100 |

Source: The Chinese Urban Residential Community Plan Standards (2002)

Thirdly, public facilities should be set up within a certain walking distance (normally 500 metres for approximately 10-minute walk) in accordance with the Standards (2002) (P03, P04). For example, a kindergarten should be set up within 300 metres, an elementary school within 500 metres, a grocery store within 300 metres in a residential micro-district and within 500 metres in a residential community.



Figure 5.1 The Retail Stores in a Main Street in a Residential Community in Xuzhou

Hence, mixed land uses principles advanced by the Chinese Urban Residential Community Plan Standards (2002) ensure that residential communities have many functions, including housing, working, shopping, entertainment, and recreation.

Besides the above national regulations, when residential communities are planned in China, those following principles, which embody compact and mixed land uses, are implemented broadly.

Development density needs to increase with the control of the height of buildings; the height of building on adjacent roads is encouraged to increase; walkable communities are encouraged; communities composed of residential, commercial, recreational, and cultural areas are promoted; multi-function

complexes are encouraged, for example, the first floor for commercial function, upper floors for offices and residential areas. (Planner 02)

5.3.3 Compact Development

Compact development is one of the key principles of smart growth. Compared to low-density and suburban-style development, smart growth proposes to decrease the conversion of land for urban uses, thereby aiding conservation of environmental qualities of that land; reducing needs and costs for transportation by expanding travel choices; cutting requirement for other infrastructure.

Most Chinese cities have compact development forms because China has a huge population and at the same time the most important transportation modes are biking and public transit. Currently, Chinese cities have continually maintained one of the highest urban density levels in the world compared with many Western cities (Wang, 2005).

Table 5.4 Xuzhou City’s Population and Population Density in 2001

| Area | Population (million) | Population density (people/KM ²) |
|---------------------------------|----------------------|--|
| Xuzhou City’s jurisdiction area | 1. 625 | 15470 |
| Gulou District | 0. 265 | 40160 |
| Yuanlong District | 0. 224 | 52700 |
| Jiuli District | 0. 201 | 24700 |
| Jiawang District | 0. 496 | 7200 |
| Quanshan District | 0. 440 | 36920 |

Source: Xuzhou’s Official Plan (2007 to 2020)

Table 5.4 shows the population density in different districts in Xuzhou City. The population density, 15470 people per square kilometre, in the existing districts of Xuzhou City in 2001 was fairly high compared to that in Toronto, 3,939.40 people per square kilometre (http://www.toronto.ca/invest-in-toronto/pop_dwell.htm). According to the Xuzhou Bureau of Statistics, a different density exists in every district (see Figure 5.2). The central city’s population is as high as 40 thousand people per square kilometre. The main trend of the allocation of the population density is that population density decreases from the central city to outward areas (P03). People without Hukou primarily live near the urban boundary area because they can more easily to find jobs in those developing areas and can also find cheaper

places to live there (O03). The city has been simply diverted to peripheral settlements that mix peasants with working class migrants.

Besides the existing high density population in urbanized area, planners need to follow the City Land Use Classification and Development Standards GBJ137-90 when they prepare new official plans. In these Development Standards, land use per capita in a city is between 60 to 120 M². In Xuzhou's Official Plan (2007 to 2020), land use per capita is projected to be 89.7 M² in 2020.

In the U.S., Vital Communities Housing Coalition proposed to use smart growth to increase development density: project endorsements require minimum net residential densities of eight to ten units per acre for single-family homes and 10 to 25 units per acre for multifamily homes. In accordance with the Chinese Urban Residential Community Plan Standards, the maximum land use per capita is 47 M² for single-family homes and 26 M² for multifamily home, in an another word, the minimum net residential density is 27 unit for single-family homes and is 45 units for multifamily homes, which are far more compact than the U.S. standard.

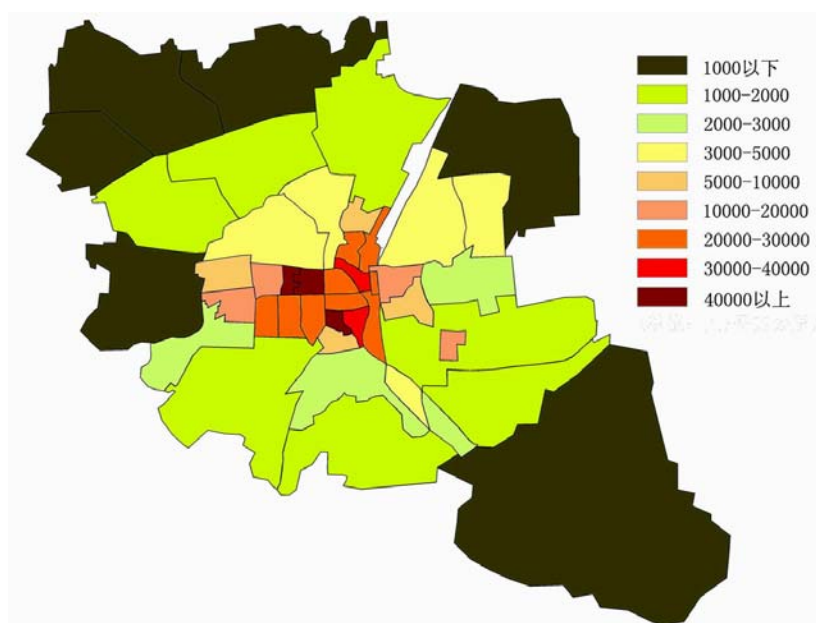


Figure 5.2 The Allocation of Xuzhou Population Density

Notes: Unit in the above figure is number of people per square kilometre

Source: Xuzhou Bureau of Statistics

Due to the limited land resources compared to China's huge population, planning policies of land use classification and residential community plan standard have regulations about compact development in order to improve life quality and decrease traffic congestion and pollution. The principle is used in a passive way because of the population pressure. Once city governments understand the efficiency of compact development in terms of smart growth benefits and urban containment, this principle can be a common strategy in later plans (P02).

5.3.4 Housing Opportunities and Choices

Smart growth promotes a greater diversity of home and neighborhood environments in order to overcome the tendency that the operation of housing markets tends to create housing enclaves for particular income groups. Housing policies attempt to meet the shelter demands of an increasing population and to establish welcoming rather than exclusionary neighborhoods and communities.

Chinese communities need to promote mixed-income housing development (P02 and P04). In the previous several decades, before the housing reform in China, housing was recognized as a welfare good: the state was responsible for housing provision. There was no distinct difference in people's living conditions. Chinese nationwide housing reform was launched in 1988. After that, the establishment of a housing market created new possibilities for housing production, thus easing the housing shortage. Since housing reform, the production of housing has been "commercialized" in the sense that housing is not substantially different from other commodities. As a result, people have greater freedom and flexibility in selecting housing location and many city residents have been able to purchase their apartments outright. Real estate development firms have been created with the mission of building for profit; land that was formerly simply allocated for new projects is now bought and sold (Logan, 2008.) Especially after the economic reforms in 1989, people's incomes were not equal anymore; therefore, different classes have begun to live in different places (Zhou & Logan, 2008).

In recent years, real estate developers have shown great zeal for developing large-size houses or apartments to make more profit; as a result, low income families' housing supply has decreased (P02). Migrant housing is concentrated in peripheral areas where private leasing of

substandard buildings and unauthorized construction are common practices (P04 and P02). The price of housing certainly plays a role, as the rent is more expensive inside the main urban area than in peri-urban areas. Land use is subject to more stringent control inside the urban core, while the supply of cheap peripheral rental housing is made available through converting local farmers' houses into rental housing.

In order to deal with this situation and especially to restrain large-size house development, the Ministry of Construction promulgated a regulation, "the Regulation for Developing New Housing Structures" on June 1st, 2006. Its main objective is that "More than 70 per cent of the land used for construction of urban housing should be designated for residential units which are less than 90 square meters." There is a move to provide adequate housing for low-income families, against the backdrop of surging housing prices. However, this strategy will be effective at the scale of a whole city; it might not help to increase the housing choices and types in a given community (P02 and P03).

The rapid increase in housing prices in many places was a result of a poor balance between supply and demand, and not just because of limited land supply. China's ten million low-income families' living space was less than ten square meters per person, accounting for 5.5 per cent of the country's households (P02). The central government low-rent housing guarantee policy took effect on December 1, 2007 to help these ten million low-income urban families (P04). According to this policy, priority in land allocation will be given to projects building mid- and low-price or small apartments.

In 2005, Xuzhou city's residential area was 32.97 km², which was 27.48 per cent of the whole city. In those areas, class one residential areas¹¹ was 0.34 km², class two was 31.67 km², and class three was 0.96 km². Similar income people live in the same community; there is rarely any mix of people of different income people in a community. In the residential plan of Xuzhou's Official Plan, there are guides for the residential density and standards for new residential areas: the total residential area will increase to 51.45 km² in 2020, which is 29 per

¹¹ Class one residential areas with housing less than three floors have comprehensive public facilities and infrastructure. Class two residential areas with high-rise buildings also have comprehensive public facilities and infrastructure. Class three residential areas are located in development zones or universities to accommodate single workers, teachers, and students.

cent of the whole city area; in the intensification of residential areas, building density needs to decrease and green space ratio needs to increase in the inner city; in new residential areas, the multi-level buildings' plot ratio is lower than 1.6, site coverage is lower than 30%; high rise buildings' plot ratio is lower than 3, site coverage is lower than 25%; the residential area per capita will increase to 25 m² in 2020. Other than the above regulations for residential areas, there is no strategy for mixed communities and provision for low-income families in Xuzhou's Official Plan. These aspects need to improve in the update of the official plan.

Although residential communities are required to meet national standards for providing low-income housing, there are still many aspects that need to improve to ensure that low-income families can move into policy commercial housing¹² (P02, P03, O02), that workers migrating from rural areas have places to live, that management in a residential community have different income housing choices (P02), and that there is public transit to the affordable housing on the edge of a city (P02), etc.

5.3.5 Creation of Walkable Communities

Walking and biking are important transportation modes in Chinese daily life. In all places, biking and walking are important. These characteristics are embodied in plans and design details: community service facilities are designed within a radius of accepted walking distance (as analyzed in the principle of mixed land uses); existing and proposed road cross-sections includes biking and pedestrian space; walking systems are designed in recreational and commercial areas; biking and walking lanes are designed in residential areas to offer residents different transportation choices.

The Chinese Urban Residential Community Plan Standards GB50180-93 (2002) have regulations in road cross-sections: a biking lane should contain three to four bicycles riding together and a side walk should allow two to five people walking together. The following road cross-sections (Figure 5.3) including sidewalks and biking lanes indicate the features of a walking community (P02, P03, and P04).

¹² Policy commercial housing, also called two-restriction housing appearing in 2008, and is a new type of housing for lower-income families. It has restrictions on the selling price of land and houses.

Planner 03 explained how these characteristics are embodied in the regulations of the in Xuzhou’s Official Plan. He cited that,

The 95 regulation on city green space proposes that green space should be within a walking distance of each citizen: the plan for street green space needs to ensure that every citizen can arrive at at least one public green space over 3000-square-metres by walking just 10 to 15 minutes. The 131 regulation on the plan for tourism districts proposes that walking systems should be built in the Xuzhou new district: The construction for... and walking systems should be fostered. The 66 regulation proposes building a pedestrian only block in Xuzhou’s inner city: the inner city is the commercial, financial, and tourist centre. A series of development strategies is intended to adjust land use structure, decrease the density of population and land, and shape three commercial cores along the Huaihai and Pengchegn pedestrian road axes. The 141 regulation proposes a key point about constructing recreational walking lanes to guide city designs: to build walking lanes along mountains, the Yellow River, and lakes. The 108 regulation proposes that the optimized public transit system should increase public transit’s user ratio to 25%-- 33% to 2020, that of bicycles should be 25% -- 28%, while automobile use should be 14% to 21%. (Xuzhou’s Official Plan (2007 to 2020))

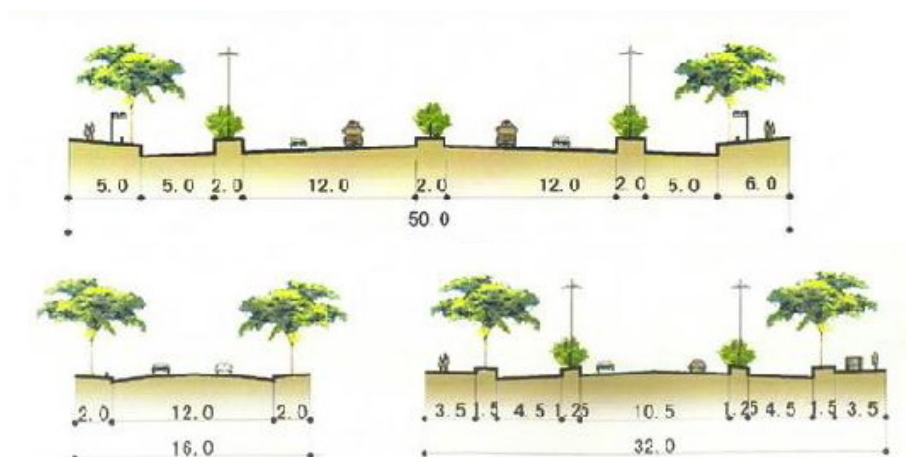


Figure 5.3 Roads’ Cross-sections including Sidewalk and Bicycle Lane

Source: Xuzhou New District Plan, 2007

5.3.6 Distinctive and Attractive Communities with a Strong Sense of Place

Smart growth aims to build and maintain distinctive places that create an identity residents and employees can value. Part of the distinctiveness of such places is their tie to the historic character of the community, represented in the architecture and civic spaces that form a living environment unique to the place.

China's Planning Regulation Guidelines (No.146) also propose the same concept of "distinctive and attractive communities with a strong sense of place" in its requirements for plans (P03): plans should be prepared based on the preservation of natural and cultural resources and the embodiment of a city's character. More detailed requirements include measures for preserving a city's historical character and that of traditional local areas; identifying historic blocks, boundaries for historic buildings, boundaries for all levels of cultural relics, and characteristic landscape districts and preservative strategies.

The contradiction between development and preservation of natural and cultural resources is considered one of the barriers that many cities face. In Xuzhou's Official Plan, this issue is dealt with in two ways: the first is to protect the existing natural and historic resources, the second is to intensify the sense of place in newly developing areas. Strategies to protect the existing natural and historic resources can be found in the planning document as follows:

No. 137: The revitalization of the city shall protect the city's original characteristics, culture, and historic landscape, especially the historic block that centers around Hubushan traditional community, memorial and historic relics, military sites, and landmarks. No.139: the objective of urban design is to create an ecological and historical garden city: take full advantage of the city's beautiful natural environment in urban design to combine natural and historic landscape. No.140: Principles of urban design should include respect of nature, history, and human beings: respecting nature means creating local characteristic landscapes through emphasis on the natural environment; respect of history means to create cultural civic space through emphasis on inheritance in culture; respect to human beings means to create space suitable for human scale and needs through emphasis on the sense of place. (Xuzhou's Official Plan (2007 to 2020))

Key principles in Xuzhou's Official Plan (2007 to 2020) to guide urban design and residential development to intensify the sense of place are summarized by planner 03 as follows:

- a). Urban design needs to respect the beautiful and distinctive hills surrounding the city. With these hills in the background, any plan must combine all sizes of parks and green spaces in streets and neighborhoods to shape the image of the city. At the same time, the use of local plants will help maintain the distinctive natural landscapes.
- b). The construction of the corridor connecting the existing city and the New District needs to create visual unity between two sides of the corridor, which include hills and the ancient Yellow River, as well as lakeshore landscapes and pedestrian precincts.
- c). The development of high-rise buildings will be affected by two different strategies: one is to encourage high-rise buildings to develop near the railway station, the Renmin Square, the New District, and the Bashan centre; the other is to limit the development of high-rise buildings in historical areas and near hills in order to protect those landscapes.
- d). Building height, shape, size, and appearance, especially in central areas, need to strictly follow the city's design principles.
- e). Four important landmarks that reflect the city's distinctive history and culture need to be highlighted. They are the Hubu Hill Area, the Yunlong Scenic Area, the Huaita Area, and the New District.
- f) In residential environments, sustainable communities that combine surrounding hills, water, historic structures, and existing buildings are to be developed. As communities develop, diversity in form will be pursued: the construction of residential areas needs to be adapted to their surrounding natural and built environment.
- g) The construction of residential areas needs to satisfy the needs of different people and different construction standards; although the main focus are middle-size apartments. The proposed construction standards for public facilities are higher than current standards. The amount of green space needs to increase, and the use of statues and logos can help to increase the sense of place.

Municipal official recommended a new built community (see Figure 5.4), which has its own distinct sense of place.



Figure 5.4 A Residential Community in Xuzhou

Xuzhou's newly developing areas have already been constructed following the above regulations (see Figure 5.4), while the emergence of gated communities (upper and middle class apartment complexes or villas surrounding by walls and protected by private security personnel) makes it impossible for nearby neighborhoods to connect to each other through public spaces and waking systems (P03 and C01).

5.3.7 Protect the Environment and Resources

Environmental concern has been placed at the crossroads with economic development. Such an intersection between preserving the regional environment and stimulating economic success is evident in the government's concern. Smart growth strongly discourages the setting of development projects in environmentally sensitive areas, prime farmland, and forested areas. Natural and resource areas are to be protected from urban sprawl that is not governed by smart growth principles that call for compact development adjoining or within already urbanized areas served by existing infrastructure systems.

These above concepts also appear in the Chinese Urban and Rural Planning Act: urban boundaries, development areas, restricted development areas, and no development areas need to be identified.

In China, attention has been paid to the research about Urban Growth Boundary that can help protect the environment. Concepts similar to UGB have been proposed in plans since 1980; for example, a belt road with a greenbelt encircling a city to define the boundary between that city and its rural area. However, that is not a comprehensive strategy because a greenbelt that separates the city and its surrounding areas not only cannot fulfill the goal to protect important natural resources and landscapes, but also cannot guarantee the city's sustainable development (Liu, 2005).

As mentioned in Chapter Four, all cities in their official plans should have an urban development boundary (*jian cheng qu* or *zhu cheng qu*) and an urban planning boundary (*gui hua qu*.) The main problem with those boundaries is that they are defined based on a planned economy and financial forecast; therefore, it is inevitable that some problems will arise when they are used in the reality of economic uncertainty. Another problem is that those boundaries are set by planners and local government to their own best advantage. This vague wording in the official plans on land's boundaries has no statutory weight. Many residents and developers do not realize their existence (P02). The government's investment in public services does not make clear mention of those boundaries. Therefore, they do not have any effect on the city's development except on its statistics (see Table 5.5). For example, each Xuzhou's official plan has its own urban development boundary and urban planning boundary. However, after five or ten years, they will be breached because the large influx of migrants produced by rapid urbanization need to live in the city, especially in its periphery where housing is often more affordable (O01). Hence, Liu (2005) believes that the two above mentioned boundaries do not function as an Urban Growth Boundary because they are not set up based on analysis of and research on regional eco-sensitive areas and important natural resources (P04).

Apart from those boundaries for the whole city, there are other boundaries inside the city to protect the environment and resources. According to the Planning Regulation Guidelines, "the development goal and layout of the green land system need to be defined....Green land must be demarcated by green lines and water must be demarcated by blue lines....Historic blocks and historic buildings must be demarcated by purple lines (P02, P03, and P04). In Xuzhou's Official Plan, those above mentioned lines are defined very well in maps and files and act to protect the environment.

Table 5.5 Land Use within Xuzhou’s Urban Planning Boundary

| No | Classification | Areas (km ²) | Proportion (%) | |
|----------|--|--------------------------|----------------|-------|
| 1 | Land within urban planning boundary | 553.510 | 100.0 | |
| 2 | Land within urban development boundary | 179.3933 | 32.41 | |
| 3 | Water and other land | 374.1167 | 67.59 | |
| | Classification | Water | 24.453 | 4.42 |
| | | Farm land | 242.6397 | 43.83 |
| | | Forest | 106.215 | 19.19 |
| Villages | | 0.809 | 0.15 | |

Source: Xuzhou’s Official Plan (2007 to 2020)

Xuzhou’s Official Plan is innovative in protecting those un-development areas’ environment. According to Xuzhou’s own situation, analysis of potential land use within the urban planning boundary is the norm. Lands are classified as areas best for construction, better for construction, and suitable for construction, sensitive areas, unstable subsidence areas, stable subsidence areas, fixed subsidence areas, mine areas, military bases, airspaces, water, roads, and railways (see Figure 5.5) This exploration can not only define the differences in environment, but also provides a strategy to manage those areas.

Planner 03 sums up “although Xuzhou’s Official Plan did well in protecting the environment, it also needs to do more, such as to confirm boundaries for prime land, forest, and ecological reserves in order to protect the natural environment and open spaces to achieve sustainable development.”

5.3.8 Strengthen and Direct Development towards Existing Communities

Smart growth calls for maximizing use of existing infrastructure or minimal extensions of infrastructure systems, including roads, water, and sewer systems, schools, and other public facilities. Sites remote from existing systems that require investments in new infrastructure or that rely on existing rural roads, wells, and septic tanks, are less favored due to their potential impacts on fiscal and environmental conditions (Porter & Cuddy, 2006).

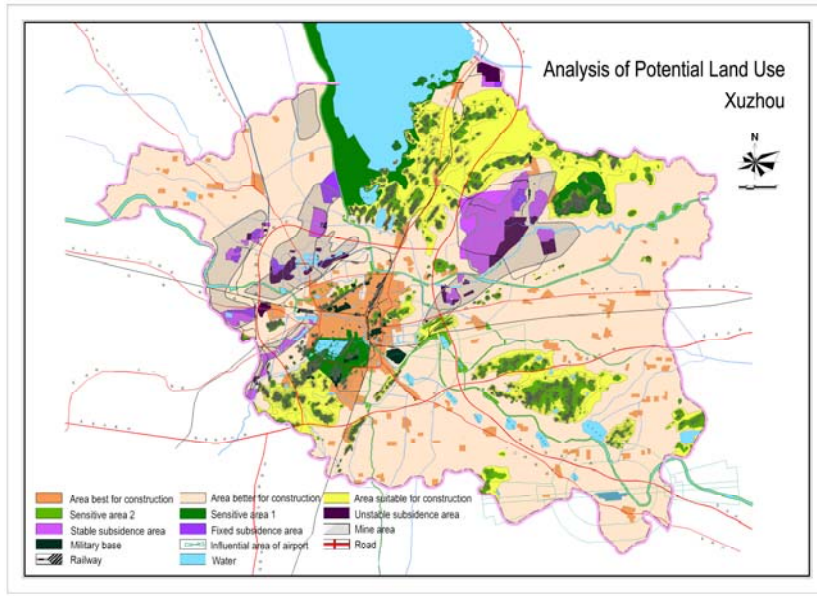


Figure 5.5 Analysis of Potential Land Use in Xuzhou

Source: Xuzhou's Official Plan (2007-2020)

In the case of Xuzhou, as well as most Chinese cities, existing communities are directly developed. Leaving brownfield lands empty for years before clean up is not a question in China (O01, O02). When a factory moves outside of an inner city, real estate developers will buy that place, clean it up, and develop it quickly because there are a lot of demands for land in the inner city. The main issue a city normally faces is shortage of land to develop (O02 and O03). The need for land is especially urgent in Xuzhou city.

Xuzhou's current inner city has a high density of people and buildings. In order to protect the environment and preserve the city's character, as well as to protect farmland, the city cannot afford to develop in the form of successive rings radiating out from the core. The leap frog development pattern, with a new district being built outside existing boundary, is a suitable local strategy for sustainable development.

5.3.8.1 Reasons for Leap Frog Development

In the last ten years, the economy of Xuzhou has developed rapidly, and its GDP increases over 10 per cent per year. The prosperous economy attracts more people to live in the city, and as a result, more land is needed to supply the rapid population growth over the next twenty years. However, the areas of the existing city cannot accommodate those people for the following reasons:

Part of the City is Protected from (Re) development because of Historical Preservation:

Xuzhou is a famous national historical city in China. However, in recent decades, many historic buildings and areas have been threatened and physically degraded by the impact of the urban development under the circumstance of the booming economy. Currently, new high density buildings have deeply affected the historical buildings in terms of the characteristics, height, and landscape. To balance the severe contradictions of preservation and development, more detailed preservative plans and regulations were made. Nowadays, from the layout and landscapes of Xuzhou, a lot of efforts can be found in historic preservation and a large portion of the inner city is protected from (re)development (O02).

The Existing City is Too Crowded to Accommodate More People: A national transportation hub and military bases are located in the existing city. The result of the two main characteristics of the city reflected in land use is evident: on one hand, transportation and military land occupies a large portion of the whole city, 17% totally; on the other hand, the scattering of these types of land uses affects the structure of the whole city. The statistics on land and population reflect the fact that the existing city is too crowded to accommodate more people.

Current Urban Space and Infrastructure Cannot Accommodate More People: In the existing city, population density is fairly high as mentioned in the previous section of “compact development”. A lot of industries and warehouses occupy the inner city, while the land available for commercial use is not sufficient. The fact that traffic jams in the inner city happen not only in peak hours is one of the evidence. Hence, land use functions in the inner city need to be upgraded, as well as infrastructure.

The city in the previous twenty years inefficiently developed in all direction surrounding the inner city (P01 and O02) Hence, there is a need to adjust inefficiencies in selecting sites for mega-projects and to adjust the future spatial structures and land use.

5.3.8.2 Options to Address the Problem

In order to develop into a regional central city, Xuzhou needs to provide enough land to support all kinds of different sectors; at the same time, the increased population needs to be accommodated in a new district, offering a high quality of life to the newcomers. Defining a development direction for the city is the most important thing for the city, which help it avoid

sprawl in all direction and promote spatial reconstruction. Then investment in infrastructure, transportation, and public facilities can be oriented this direction. This strategy benefits not only the city’s spatial structure, but also its fiscal administration (P01 and C02).

There were three alternative plans prepared to deal with Xuzhou’s socio-economic development and land use situation. The indicators included areas of the district, geographic situation, accessibility, exterior communication, connection to its original city, effectiveness of the boundary, environment, and the usage of Jinghu’s highway. Finally Plan-1 was chosen because Plan-1 provided more development space, better transportation situation, and better connection with the original city compared to the other two plans.



Figure 5.6 Alternative Plans (from left to right Plan-1, Plan-2, and Plan-3)

Source: Xuzhou’s Official Plan (2007 to 2020)

5.3.8.3 What Triggers the Leap Frog Development?

The development of the new district in Xuzhou is a mega project, which is acting as a catalyst in the development of the region. Currently in China, a city’s “leap” development is motivated by of the construction of the local city hall.

The relocation of a city hall¹³ cannot only change the location of an official area and improve the working environment; in a deeper sense and from a profounder angle, it can also

¹³ Currently, in China, the cause of a city’s leap-frog development is the relocation of city halls. Usually an original city hall is located in a prosperous downtown. After relocating it, this place can be developed as a commercial district. The new city hall will act as the core of a new district and exert its radiation effect to promote economic and social development. The relocation of a city hall not only can improve the official working environment; in a deeper sense and profounder angle, but also can reconstruct the fabric of the city and bring new change for the city’s economic and social development.

reconstruct the fabric of the city and bring change for the city's economic and social development.

The old centre of Xuzhou is densely populated and traffic-jammed. To relieve the increasing population and transportation pressures, a new district must be planned and constructed as part of a long-range development. Driven by the relocation of the city hall, the new administrative centre will act as the core of the new district and stimulate economic development and city construction, and finally fulfill the goal of harmonious development among city districts.

The new development district should serve the region and local areas. This new district should also act as a catalyst for regional development. The main functions of the planned new district include office areas, commercial districts, large-scale exhibition industries, research and development centers (R&D), high-end tourism spots, and residential areas.

To sum up, a city's need for leap frog development should not be criticized automatically, especially for a city with high residential density. The city's situation must be analyzed first to see if the city really has to do it. In this process, economic evaluation and alternative plans need to be considered very carefully. In the current Chinese context, a leap-frog development pattern may be a good strategy to help big cities break their development bottleneck.

5.3.9 Transport Choices

Transportation choices receive plenty of attention in smart growth because the proliferation of traffic congestion in many cities. The strategies emphasize the promotion of public transit and encourage walking, biking, and street connectivity. The purpose is to highlight streetscapes as civic amenities and to reduce the negative visual impacts of parked cars (Porter & Cuddy, 2006.)

Most of the above ideas are echoed in Xuzhou's Official Plan according to municipal official 04.

No. 107 in the plan is a transportation development strategy: public transit is to be the primary transportation mode in the inner city in order to protect historic blocks and the Yunlong scenic reserve. Bus rapid transit (BRT) systems and expressways are planned to connect the inner city and other districts.

Transportation-oriented development (TOD) is being adopted to facilitate the New District development and inner city's renewal. The road system should be in harmony with the city's form. The weak part in the whole existing transportation system is in the east and southeast of the inner city, where roads need to cross a railway, water, and hills. Roads there need to be updated to support the city's development strategy, which calls for expansion to the east and southeast. No. 108 stresses optimization of the existing transportation structure with an increased ratio of public transit in the transportation structure. In 2020, the ratio of public transit should be 25% to 33% of the transportation structure; the bicycle ratio 25% to 28%; and the automobile ratio 14% to 21%. As for parking, the main strategy is described in No 120: planning, implementation, and management of parking should follow relative national and local standards. (Xuzhou's Official Plan (2007 to 2020))

In this plan, transport choices are provided with the focus on public transit that will benefit a compact city form. However, there is no regulation relative to surface parking and other forms of parking in this plan as smart growth proposes. The reason is that the proportion of private cars in Xuzhou is still quite low compared to the population. For example, according to the information from the Xuzhou Statistical Information Network (<http://tjj.xz.gov.cn/>), the numbers of private cars is only 39,500 in 2006, although the rate of increase is very high at 32.4%. From North America's experience, with the development of big box stores in the fringe of a city, parking, especially surface parking, will become a major problem. Hence, the parking strategies need to be improved in following plans.

5.3.10 Decisions Making Development Predictable, Fair, and Cost Effective

The following section describes the process of updating Xuzhou's Official Plan (2007 to 2020) that took five years from beginning to final approval.

In March, 2002, Xuzhou's government gave the responsibility for updating Xuzhou's Official Plan to the China Academy of Urban Planning and Design. In June, 2003, the compendium of the Plan was approved by the Minister of Construction. In December, 2003, Xuzhou's Official Plan was approved by the Xuzhou Municipal People's Congress Standing Committee. At the same time, planning maps and files were exhibited to inform the public and encourage their input. In January, 2004, the Provincial Construction Department held a

meeting to discuss the Plan. Finally, in November, 2007, Xuzhou's Official Plan (2007 to 2020) was approved by the State Council. The updating to reflect a new vision of the city took a long time.

The three following main reasons explain why the plan took so long. The first important reason is that the Planning Regulation Guidelines were promulgated in October, 2005. The plan needed to be adjusted to adapt all contents of the Guidelines. The second reason is that the plan included the administrative boundary adjustment of Xuzhou City. That adjustment needed to be coordinated with the Land Use Department and reported and approved by the Ministry of Land Resources – another long process. The third reason is that the process for examining, evaluating, and approving official plans is also very long and involves many steps. The State Council took nearly three and half years to approve the plan (P02).

Not only Xuzhou's Official Plan, but also many official plans require several years to prepare. This complicated, time-consuming process is a problem characteristic of the planning system (C01 and P02) and might raise some problems. Firstly, in this time of rapid urbanization, statistics on cities and the situation they face change very quickly. For example, the statistics used in the plan were first collected in 2002 and 2003. Many circumstances the city faced at that time had changed by the time the plan was finished. Many premises of official plans change; the implementation of these plans therefore no longer harmonize with the objectives the plans originally defined. Hence, many statistics and many analyses also needed to be updated and revised based on the changed situation. Secondly, before the plan was approved, there was no land to develop: all planned development land in the last official plan was used (O02). Last but not least, the city's spatial reconstruction might be affected. For example, it was proposed to develop the city to the south when its official plan was prepared. However, a mega project was developed in the north of the city while the official plan was still under evaluation by the local people's congress. That situation may lead to a very different development form for the city and increase the necessity to update the plans soon to catch up with the rapid development (O03 and P02).

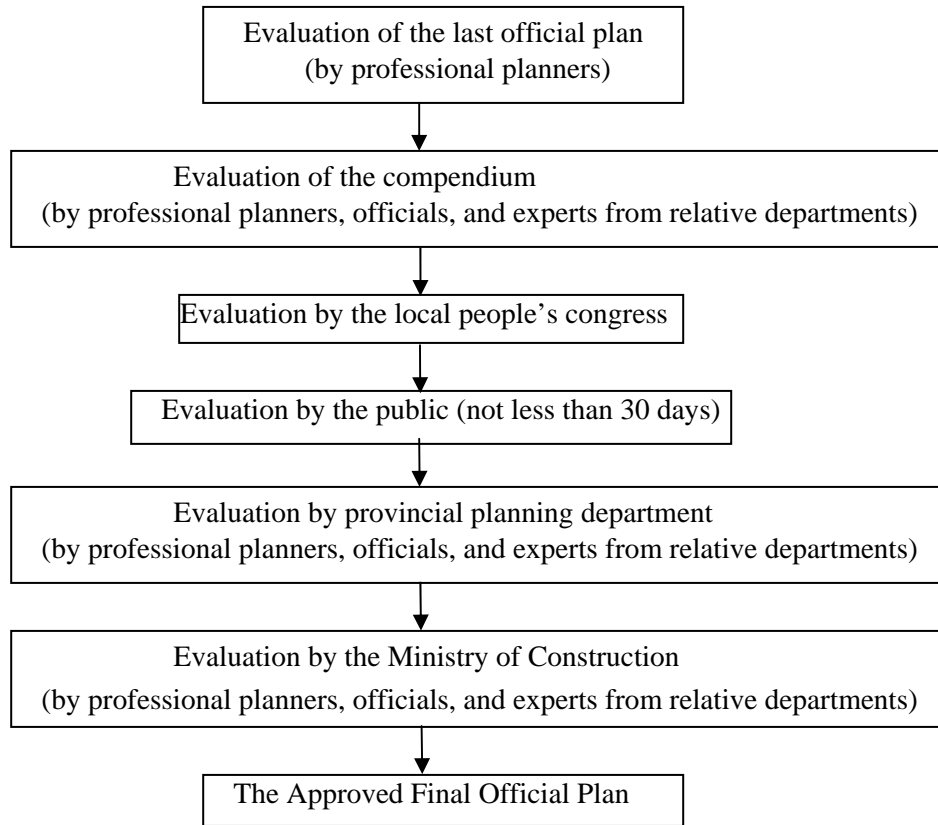


Figure 5.7 The Process of Evaluation in Xuzhou's Official Plan (2007 to 2020)

Source: the author

Hence, the decision making need to be reformed: not only in the improvement of government's efficiency, but also the reform of evaluation process and standards.

5.3.11 Encouraging Community and Stakeholder Collaboration

Smart growth welcomes input from citizens, especially direct participation in planning. In China, most plans' preparation and evaluation is carried out internally, i.e., within the planning organisation, municipality, and higher levels of planning departments. In-house staff usually only prepare and assess plans that adhere to national standards (e.g., plan conformance (Talen, 1997)). There is seldom any involvement of external people such as community groups. Internal staff, composed of academic experts, officials, and professional planners, often have a comprehensive and sound understanding of the Planning Act,

regulations, policies, resources, and project context. However, the Chinese experience confirms what Palys (1997) noted as important considerations—personal bias, as well as organizational politics and culture, which may affect those internal evaluators and monitors. For example, in Figure 5.7, the process of evaluation in Xuzhou’s Official Plan comprises several steps. In the process of preparing Xuzhou’s Official Plan (2007 to 2020), only two, which were evaluation of Xuzhou’s Official Plan (1995 to 2010) and evaluation of alternative plans, of the seven evaluations were performed using clear indicators. Other evaluation processes were not so clearly structured. The public normally could not attend evaluation meetings except during the 30 day official public evaluation process.

In Xuzhou’s Official Plan, community participation is regulated: No. 196 “There must be an official channel for public participation. Monitoring can be carried out by local administrative departments, by local people’s congresses or their standing committees, and by the public. Illegal constructions need to be treated harshly.” However, this community participation exists almost entirely in documents. Nowadays, the concept of public participation is discussed more than acted on. There is still no suitable way for citizens to become involved in the preparation of official plans.

The above analysis casts light on the implementation of smart growth in Xuzhou’s Official Plan (2007 to 2020). Some principles of smart growth already existed in Chinese official plans, such as mixed land use, compact development, a walkable community, strengthening and directing development towards existing communities, transportation choices. The implementation of some principles needs to be improved, such as distinctive and attractive communities, protecting the environment and resources, improving the development decision making process, and increasing community participation. At the same time, some concepts, such as infill and leap-frog, need to be understood based on different development contexts in China.

Table 5.1 The Evaluation of Implementation of Smart Growth in China

| Principles of smart growth | Already have | New in planning regulations | Need to improve | Have different meanings |
|--|--------------|-----------------------------|-----------------|-------------------------|
| Mixed land uses | ● | | | |
| Take advantage of compact building design | ● | | | |
| Create a range of housing opportunities and choices | | ● | ● | |
| Create walkable communities; | ● | | | |
| Foster distinctive, attractive communities with a strong sense of place | | ● | ● | |
| Preserve open space, farmland, natural beauty and critical environmental areas | | ● | ● | |
| Strengthen and direct development towards existing communities | ● | | | |
| Provide a variety of transport choices | | ● | | |
| Make development decisions predictable, fair and cost-effective | | | ● | |
| Encourage community and stakeholder collaboration in development decisions | | ● | ● | |
| Infill (brownfield) | | | | ● |
| Leap-frog development | | | | ● |

Source: the author

5.4 The Limitation and the Future for the Implementation of Smart Growth in China

The following section takes a brief look at limitations to the use of smart growth and the future for the implementation of smart growth in China.

When participants were asked the future for the implementation of smart growth in China, the lack of understanding of this topic by three municipal officials was exhibited in the responses obtained from this study. Other participants, except Planner 01, have positive responses to the future implementation of smart growth in China although they showed

different interests in different aspects. Planner 02 identified the future implementation of smart growth in the aspect of transportation: “to promote the use of TOD and BRT especially when fuel price increases.” Planner 04 showed the interest to use smart growth to improve urban forms.

Consultant 01 viewed that the implementation of smart growth closely related to energy and resources. He went on to say,

In using smart growth, city development strategies in China should be made based on the reality that the country is short of resources compared to its huge population. In order to utilize limited energy and resources efficiently, those strategies need to focus on quality improvement of inner cities instead of focusing on quantity improvement of outward expansion. (Consultant 01)

However, Planner 01 remarked that Chinese city development has already embodied most smart growth principles compared to North American urban development. He viewed that in terms of compact development, mixed land uses, walkable communities, development towards existing communities, and transport choices Chinese cities have done very well and cities in North America can learn from Chinese experience.

5.5 Conclusions

Based on these findings, Chapter Five provides an illustration of the cause and extent of sprawl in China, of Chinese planning policies that embody smart growth, of the implementation of smart growth in Xuzhou’s Official Plan, and of the future of smart growth in China. In summary, Chinese big cities currently having compact urban form and mixed land uses, face sprawl or will face urban sprawl in the near future. Hence, the implementation of smart growth strategies in city’s official plans will has a positive impact especially in term of public participation and development decision-making. Chapter Six presents a summary of the research conducted and outlines recommendation and opportunities for further research.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

This research has addressed all research objectives and questions through displaying both the causes of urban sprawl in China, as well as the challenges of urban sprawl. Equally significant, this research has shown that Chinese planners are making efforts trying to overcome these obstacles through implementing strategies similar to smart growth in official plans. Several lessons can be learned from the case study provided in Chapters Four and Five. These lessons may be of use for other municipalities considering urban sprawl problem. The knowledge gains from the case study city can be formulated into recommendations for planners, municipalities, and higher order government.

Recommendation for Planners

Periodical Reviewing Plans

Smart growth is a strategy to deal with planning problems North America faces. It is based on negative impacts of urban sprawl and proposes corresponding methods to improve the situation. Chinese urban planners can and should learn from this process of reviewing previous plans in depth.

Currently there is a dilemma in planning in China. At present, there is no theory like smart growth, as it is understood in North America, to deal with Chinese urban sprawl. Insufficient review of plans before they are implemented, coupled with very rapid urban growth means that planners are, at best, playing “catch up.” Evaluation and monitoring of plans and policies have not usually been a priority. The governments and the planners keep preparing plans to catch up with rapid urbanization; normally they just repeat what they did before and have no time to improve flawed or outdated practices (Sun and Zhou, 2003). They also realize the difference between plans and their implementation. The situation is that no matter what the results of plan implementation, new plans will be prepared soon. Due to the lack of reflection, planners can only judge plans’ effectiveness and failure or success based on public response to their work and the respect (or lack of respect) they are offered (Zhang, 1996). Furthermore, urban planning is often a target and is seen as responsible for many unexpected urban issues

that are actually caused by a series of social and economic problems (Baer, 1997). Hence, there is an urgent need to improve plan review.

Suggestion to deal with this situation is to build up a review system. Through the implementation of this system, planners can enhance their professional skills and share valuable working experience.

Emphasis on Urban Design

Many principles of smart growth, such as promoting mixed land uses, establishing walking communities, and creating a sense of place and attractive communities, tend to create a harmonious built environment for citizens. This concept is especially important for Chinese cities with high density populations. Planners need to emphasize urban design and add more details to the built environment in order to improve quality of life. Chinese mainland cities also can learn from urban design in such modern high density cities, as Hong Kong and certain Japanese cities.

Recommendation for Municipalities

Managing Undeveloped Area within the Urban Planning Boundary

In current Chinese official plans' regulations, land use investigation, analysis, and evaluation are based on the goal of selecting suitable land for development. There is no regulation of undeveloped land (Liu, 2005). Generally speaking, the environment and resources within the urban development boundary can be protected well, but those areas that are between the urban development boundary and urban planning boundary cannot be protected well under the current planning and land use system. In this research, the protection of these undeveloped areas in Xuzhou's Official Plan (2007 to 2020) is a good innovation. Through analyzing potential land use within the urban planning boundary according to a city's own situation, land is classified. This exploration can not only define the differences in environment, but also provides a strategy to manage those areas.

Public Participation

In China, most information in official plans and detailed plans can be obtained from a planning administrative department, as there is a procedure for the application. It has been observed that if a city's planning information is more open, its planning efficiency is higher,

as for example, was the case in Shenzhen City. To encourage public participation, especially in evaluation and monitoring, on the one hand, planning information can be uploaded to planning administrative websites, making it easier for the public to get relevant information; on the other hand, the public should be encouraged to attend all levels of evaluation meetings. Encouraging public participation can also be started at the monitoring and evaluation phases of the plans. Monitoring and evaluation, important management tools in urban planning that have great potential to assist many planning practices, should be carried out during the whole process of plan preparation and implementation (Sun, 2002). Although acts and regulations calling for monitoring and evaluation were lacking before 2006 in China, many efforts have been made to reform evaluation and monitoring in recent years. The Urban and Rural Planning Act, which effected on 1 January 2008, contains a whole section on monitoring. Monitoring should be carried out for the whole process of plan preparation, approval, implementation, and amendment. These regulations strongly support and guide public monitoring in practice. The Planning Act also contains policies and regulations on plan evaluation. It requires the public to be involved in the evaluation at different stages. The result of evaluation and strategies dealing with the plan needs to be open to the public.

Recommendations for Senior Governments

Reform in Official Plan's Approval Process

One of the overriding comments from those interviewed in the case study city was the need for reforming the time-consuming plan approval process. Currently, most cities' official plans need at least five years to be approved. Hence, the reform of approval process can not only improve government's efficiency, but also benefit to city development.

Suggestions for improving plan approval process for senior levels of government include setting up a time frame to official plan's approval process for different types of cities and enhancing the communication between senior governments and local municipalities during the approval process.

Supervision of Local Governments in Converting Farmland

The government's main motivation for overcoming urban sprawl in China is to protect farm land and ensure food security. In North America, government or private land trusts have to

buy farmland at competitive price or purchase the development rights of farm land in order to keep it from development. In comparison, the Chinese system of government has advantages in protecting land from urban sprawl theoretically. The implementation of the China's Land Management Act in 1998, which regulates land-use changes, shows that China's central government has tended to recentralize land management from the previous decentralized pattern. Although sometimes these attempts face restriction because of the dual systems of land ownership, resulting in urban sprawl, such illegal conversion of land use is not a mainstream. With enhancing the system for supervision of local governments, it is believed that these situations will be rectified.

This thesis provides an in-depth examination of urban sprawl in China and evaluates the implementation of smart growth in Chinese official plans. The core purpose of smart growth is to achieve a sustainable development pattern in order to save land and energy and preserve natural and historic heritage. The paper shows that these main principles of smart growth are not actually new to China: some have been adopted in planning policies; some have been carried out in planning practices. Planners in North America have spent several decades to find solutions to their forms of urban sprawl. It is hoped that planners in China can take less time to find out suitable solutions to Chinese urban sprawl and help their cities develop sustainably.

APPENDIX A THESIS PROPOSAL

The Evaluation of the Implementation of Smart Growth in Chinese Official Plans: a case study of Xuzhou City, China

Background

In China, modern urban planning has been applied since the end of the 1970s. In the last thirty years, it has played an important role in the construction of cities and increased their sustainable development in parallel to their constant and rapid economic development. However, rapid urbanization has deeply affected the construction of cities in China. China's urbanization and industrialization are unprecedented in terms of scale and complexity, with no parallel in other countries, according to an economic analysis released by The Hong Kong and Shanghai Banking Corporation (HSBC). It is expected that nearly 1.5 billion rural people will flood into cities between now and 2050. This phenomenon will become one of the largest migrations in the world. Undoubtedly, it will affect all aspects of Chinese society and is beginning to be a huge challenge to urban planners.

One of the outcomes of urbanization is the expansion of cities, which may bring on sprawl. Now in China, where the resource is limited relative to the huge population, the results of sprawl in urban are primarily that agricultural land is being encroached on suburban areas; low density communities and industrial zones now occupy the newly developed districts. This phenomenon is similar to the result of urban sprawl in North America, although the causes are different. How to control sprawl in order to let cities develop smartly is becoming a main issue in planning in China.

In North America, smart growth was proposed in order to alleviate sprawl and has proved to be one of the most useful development patterns and management tools in urban planning. Many plans in North America have already embodied the principles of smart growth. Those are good examples for China to learn from.

In China, the official plan (cheng shi zong ti gui hua), which is at the top tier of the urban planning system, is a statutory tool to control urban development and outline the general land use pattern of the city. This research focuses much attention on the evaluation of implementation of smart growth in local official plans. Evaluating the official plan is

especially important because it is the primary document that describes the overall long-range vision and goals for the community's future growth patterns. Establishing smart growth as a principle in the official plan also provides a legal basis for the policies and regulations that will be used to implement smart growth.

To discuss the implementation of smart growth in the Chinese official plan and examine how sprawl is being dealt with, the variation in spatial development patterns in China and North America and the two different sprawls' scopes should be borne in mind. North America's sprawl might not totally appear in China, while a type of diversified, more complicated and uncertain Chinese sprawl, might emerge that can not be dealt with just using North America's smart growth. Consequently, research on smart growth in China should be done based on the context of the country. This paper uses as a case study, Xuzhou, which was one of the first cities to adopt the latest Planning Regulations Guidelines (146), to evaluate the implementation of smart growth in Chinese official plans.

Purpose and Objectives of the Research

The purpose of this research is to evaluate the implementation of smart growth in official plans in China. The goal is to help establish a vision of an ideal community. The academic literature on this subject is sorely lacking Chinese information, and thus, this research will fill a gap for planning professionals and officials. Four primary objectives provide the foundation for this research:

- To identify an evaluative framework that provides key factors relating to the study of smart growth in official plans;
- To chronicle the updating of the official plans of the city of Xuzhou and determine the primary barriers to those plans;
- To evaluate the Xuzhou's Official Plan (2007 to 2020), using the framework identified; and,
- To use the information gathered by research to provide recommendations for the implementation of smart growth in official plans in China.

Research Questions

From the above research objectives, the following five research questions have emerged:

- What is the cause and what is the extent of sprawl in China?
- What is being done to implement of smart growth in North America?
- Do planning policies in China embody smart growth strategies?
- How much of the smart growth contained in the Xuzhou's Official Plan is being implemented?
- What are the reasons or obstacles presenting some principles of smart growth haven't being used?
- What are the limitations to using smart growth in official plans in China and how can they be overcome?

Methodology

The research followed qualitative procedures and was accomplished through a combination of a review of relevant documentation, interviews, and statistics. A case study was carried out to accomplish the above objectives. The case study investigates smart growth implemented in the subject area, and the planning and policy implications of those initiatives. The case site was selected because it was able to provide information that is rich and complex in detail, thus facilitating an in-depth examination.

In addition, data sources were studied in order to gain a deeper understanding of the issues surrounding the implementation of smart growth in official plans in the selected city, as well as in China as a whole. A comprehensive review of relevant literature involved books, journals, planning reports, newspapers, and the Internet. These proved to be valuable sources of information providing further detail and background on the selected city.

Besides the above data sources, information relating to the role of official plans, and what constitutes success in the implementation of smart growth in official plans was also gathered through a series of semi-structured interviews conducted with planners, municipal officials, and provincial and national consultants. Semi-structured interviews provide the benefit of flexibility. A list of predefined questions was asked, with the interviewees free to add additional comments, and the interviewer free to pose additional questions after these respondents' answers. On the whole, interviewees were asked primarily the same set of questions, with the questions tailored to elicit elaboration in the responses. The questions

were designed to gather information on four main themes: sprawl in China, especially in Xuzhou City, the role of official plans, smart growth in official plans in contemporary trends, and the idea of successful use of smart growth in official plans.

Possible Outcomes

This work will identify opportunities and challenges to deal with sprawl using smart growth in Chinese context. Using this research as a base, planners will be better able to formulate strategies, especially at the official plan level, that implement Chinese smart growth by targeting sprawl that currently impede cities' sustainable development. Through implementing smart growth, cities in China will be able to cope with growth while maintaining a high quality of life and fulfilling the goal of balanced environmental, social, economic, and land use priorities.

Usefulness of the Research and User Groups

This research contributes to the current hot issue of sprawl in China and, particularly, to the causes and the extent of that sprawl. This work diverges from other work in the planning literature by assessing the presence of smart growth principles in official plans when cities are faced with a direct challenge of sprawl.

This research will be useful to two sets of users: a) other academics and development analysts who are concerned with the issue of urban sprawl in China and strategies to deal with this issue; and b) development policy makers ranging from municipal governments to urban policy specialists.

Suggestions for further research will be articulated from this work. Planners and planning officials, especially those in Xuzhou City, should find the results of this study both timely and useful as they prepare new official plans.

Timetable

- January 2007 to November 2007: Canada, literature reviewing and data collection
- December 2007 to February 2008: visit to China, fieldwork period (data collection and interviews)
- December 2007 to August 2008: Canada, writing of thesis

APPENDIX B INTERVIEWEES FOR INTERVIEW (ORE # 14786)

| | Date | Code | Position | Institute |
|----|-----------|------|--|--|
| 1 | 2008.1.10 | P01 | Planner (Project manager) | China Academy of Urban Planning & Design |
| 2 | 2008.1.15 | P02 | Planner (Project coordinator) | China Academy of Urban Planning & Design |
| 3 | 2008.1.18 | P03 | Planner (Heritage and Environmental protection) | China Academy of Urban Planning & Design |
| 4 | 2008.1.20 | P04 | Planner (Land use) | China Academy of Urban Planning & Design |
| 5 | 2008.1.22 | O01 | Planning Official (Project coordinator) | Xuzhou Bureau of Urban Planning |
| 6 | 2008.2.20 | O02 | Planning Official (Focus on Land use) | Xuzhou Bureau of Urban Planning |
| 7 | 2008.2.21 | O03 | Planning Official (Regional planning) | Xuzhou Bureau of Urban Planning |
| 8 | 2008.2.23 | O04 | Planning Official (Transportation) | Xuzhou Bureau of Urban Planning |
| 9 | 2008.2.24 | C01 | Consultant | Ministry of Construction in Jiangsu Province |
| 10 | 2008.2.25 | C02 | Consultant | Ministry of Construction in Jiangsu Province |

APPENDIX C RECRUITMENT EMAIL

Dear Sir or Madam,

I am Xiaoyan Chen. This email is an invitation to consider participating in a study I am conducting as part of my Master's degree in the School of Planning at the University of Waterloo under the supervision of Professor Pierre Filion. The purpose of this research is to examine the implementation of smart growth in official plans in China. The interview will focus on four main themes: sprawl in China, especially in Xuzhou City, the role of Chinese official plans, smart growth in official plans in contemporary trends, and the idea of successful use of smart growth in official plans.

Participation in this study is voluntary. It will involve a telephone interview of approximately 40 minutes in length. You may decline to answer any of the interview questions you feel you do not wish to answer. Further, you may decide to withdraw from this study at any time without any negative consequences by advising the researcher. All information you provide will be considered confidential and will be grouped with responses from other participants. Your name will not appear in any thesis or report resulting from this study, however, with your permission anonymous quotations may be used. There are no known or anticipated risks to you as a participant in this study.

This project was reviewed and received ethics clearance through Office of Research Ethics at the University of Waterloo.

Your opinion will be important to this study. I very much look forward to speaking with you and thank you in advance for your assistance in this project.

Yours Sincerely,

Xiaoyan Chen

School of Planning

Faculty of Environmental Studies

University of Waterloo

x13chen@fes.uwaterloo.ca

APPENDIX D INFORMATION CONSENT LETTER FOR INTERVIEW STUDY

Dear Sir or Madam,

This letter is an invitation to consider participating in a study I am conducting as part of my Master's degree in the School of Planning at the University of Waterloo under the supervision of Professor Pierre Filion. I would like to provide you with more information about this project and what your involvement would entail if you decide to take part.

The purpose of this research is to examine the implementation of smart growth in official plans in China. My research focused on what the cause and the extent of sprawl are in China and how to implement smart growth in Chinese official plans. A case study of Xuzhou City is carried out to accomplish my research. I believe that because you are actively involved in Xuzhou's Official Plan and have rich professional planning experience, you are best suited to speak to the various issues, such as sprawl in China, the role of official plans, smart growth in official plans in contemporary trends, and the idea of successful use of smart growth in official plans.

Participation in this study is voluntary. It will involve a telephone interview of approximately 40 minutes in length. You may decline to answer any of the interview questions if you so wish. Further, you may decide to withdraw from this study at any time without any negative consequences by advising the researcher. With your permission, the interview will be tape-recorded to facilitate collection of information, and later transcribed for analysis. Shortly after the interview has been completed, I will send you a copy of the transcript to give you an opportunity to confirm the accuracy of our conversation and to add or clarify any points that you wish. All information you provide is considered completely confidential. Audio recordings and paper notes will be kept for one year in a locked office at the UW and then confidentially destroyed while electronic, de-identified data will be kept indefinitely on a password-protected computer. Your name will not appear in any thesis or report resulting from this study, however, with your permission anonymous quotations may be used. There are no known or anticipated risks to you as a participant in this study.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact me by email at x13chen@fes.uwaterloo.ca. You can also contact my supervisor, Professor Pierre Filion at 001-519-888-4567 ext. 33963 or email pfilion@fes.uwaterloo.ca.

I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. However, the final decision about participation is yours. If you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes of this office at 001-519-888-4567 ext. 36005 or email ssykes@uwaterloo.ca.

I hope that the results of my study will be of benefit planning professionals, as well as officials because the academic literature on this subject is sorely lacking Chinese information.

I very much look forward to speaking with you and thank you in advance for your assistance in this project.

Yours Sincerely,
Xiaoyan Chen
Master Candidate in Planning
Faculty of Environmental Studies
University of Waterloo
x13chen@fes.uwaterloo.ca

INTERVIEW CONSENT FORM

I have read the information presented in the information letter about a study being conducted by Xiaoyan Chen of the School of Planning at the University of Waterloo. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted.

I am aware that I have the option of allowing my interview to be tape recorded to ensure an accurate recording of my responses.

I am also aware that excerpts from the interview may be included in the thesis and/or publications to come from this research, with the understanding that the quotations will be anonymous.

I was informed that I may withdraw my consent at any time without penalty by advising the researcher.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. I was informed that if I have any comments or concerns resulting from my participation in this study, I may contact the Director, Office of Research Ethics at 519-888-4567 ext. 36005.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

YES NO

I agree to have my interview tape recorded.

YES NO

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.

YES NO

Participant Name: _____ **(Please print)**

Date: _____

APPENDIX E INTERVIEW QUESTIONS

Pre-Amble

As I mentioned when we spoke earlier, I am conducting research on the implementation of smart growth in official plans as part of my Master thesis in planning at the University of Waterloo. I am interested particularly in what the cause and the extent of sprawl are in China and what the limitations to using smart growth in Chinese official plans are.

I will be asking you questions on sprawl and smart growth. I have chosen as a case study of Xuzhou's Official Plan. This situation may provide some context to the discussion, but I am equally interested in any broader perspective your experience may provides.

You may decline to answer any questions, and you may end the interview at any time.

Do you have any questions before we begin?

1. Participant Introduction

a. Gender:

- Male
- Female

b. How long have you worked as a planner?

c. Could you tell me a bit about your background and the work you are doing now?

- Planner
- Official
- Consultant

d. What was your involvement in Xuzhou's Official Plan? What is your own experience with official plans? Have you involved in any other official plans?

- Land use planning
- Greenland planning
- Transportation planning

- Infrastructure planning
 - Other
- e. How long have you involved in Xuzhou's Official Plan?
- Less than six months
 - Six months to one year
 - More than one year

2. Historical Context

- a. Can you describe for me the development barriers at the time Xuzhou's Official Plan was prepared (especially in land use and population)?
- b. What causes sprawl in China? Is there sprawl in Xuzhou?
- c. What is the impact of sprawl in China, especially in Xuzhou?
- d. What is the difference of sprawl between China and North America?
- e. What do you view as the main obstacles today in preparing official plans?
- f. What are your recommendations to improve the process of preparing Chinese official plans? (think legislatively, economically etc.) Follow-up: what are your thoughts on Planning Regulation Guidelines (No.146)?

3. The understanding of smart growth in China

- a. What is your understanding of smart growth?
- b. Is smart growth being used in planning policies in China? If yes, Please explain them?
- c. What principles of smart growth are being or are not being used in China? Why?

4. The implementation of smart growth in Xuzhou's Official Plan?

- a. Please describe Xuzhou official plans' function in the city's development.

- b. Are the policy climate and economic climate favourable to the implementation of smart growth in Xuzhou's Official Plan?
- c. How much of smart growth is being implemented in Xuzhou's Official Plan?
- d. What have been the motivating factors for your city to pursue smart growth policy?

5. Future trend

In your opinions, what is the future for the implementation of smart growth in China?

Conclusion

Is there anything you would like to add to what we discuss?

May I contact you again if I need clarification on any of your answers?

Closing

Thank you very much for your time and your perspectives; your input is greatly appreciated. When the final results of the research have been prepared, I will send you an executive summary of my findings.

Thank you again.

APPENDIX F FEEDBACK LETTER

Dear Sir or Madam,

I would like to thank you for your participation in this study. As a reminder, the purpose of this study is to examine the implementation of smart growth in official plans in China. The information collected during interviews will contribute to a better understanding of sprawl in China, the role of Chinese official plans, smart growth in official plans in contemporary trends, and the idea of successful use of smart growth in official plans in China.

Please remember that any information pertaining to you as an individual participant will be kept confidential. Once all the information are collected and analyzed for this project, I plan on sharing this information with the research community through seminars, conferences, presentations, and journal articles. If you are interested in receiving more information regarding the results of this study, or if you have any questions or concerns, please contact me by email address listed at the bottom of the page. If you would like a summary of the results, please let me know now by providing me with your email address. When the study is completed, I will send it to you. The study is expected to be completed by August 2008.

As with all University of Waterloo projects involving human participants, this project was reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. Should you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 001-519-888-4567, ext., 36005 or email ssykes@uwaterloo.ca.

Yours Sincerely,

Xiaoyan Chen

Master Candidate in Planning

Faculty of Environmental Studies

University of Waterloo

x13chen@fes.uwaterloo.ca

APPENDIX G INTERVIEW RESULTS

| Interview questions | P01 Planner (Project manager in CAUPD) | P02 Planner (Project coordinator in CAUPD) | P03 Planner (Heritage and Environmental protection in CAUPD) | P04 Planner (Land use and population in CAUPD) |
|--|--|---|---|--|
| Can you describe the development barriers at the time Xuzhou's Official Plan was prepared? | The basic pattern of urban development during the recent decade in Xuzhou is outward expansion. Spatial patterns of development are rooted in a context of substantial economic restructuring. However, these spatial and structural changes exacerbate a number of problems that have long plagued urban communities: downtown development pressures, land use development in disorder, the character of Xuzhou is being lost, the city's development boundary has been breached, deterioration of the environment, transportation congestion. | Downtown development pressures, land use development in disorder, the character of Xuzhou is being lost, the city's development boundary has been breached, deterioration of the environment, transportation congestion. | Downtown development pressures, land use development in disorder, the character of Xuzhou is being lost, the city's development boundary has been breached, deterioration of the environment, transportation congestion. | Downtown development pressures, land use development in disorder, the character of Xuzhou is being lost, the city's development boundary has been breached, deterioration of the environment, transportation congestion. |
| Is there sprawl in China? | Yes. Urban sprawl just happens in big cities, such as Beijing, Shanghai, Guangzhou. | Yes. But urban sprawl is not evident in China because 1) governments control city development and land use scale; 2) There are a lot of technical requirements to low-density communities; 3) The inner cities are attractive because of their advantages in education and health facilities. China's sprawl, normally happens in 2 million population cities, is rapid high-density outward expansion. | Yes. For example in Xuzhou, city develops rapidly and former scenic areas on the edge of the city are surrounded by built environments. Those scenic areas are isolated from the natural environment. Hence, eco-environment, city character, and scenes are destroyed. | Yes. Urban sprawl just happens in big cities. |
| What causes sprawl in China? | Chinese cities maintain a compact development form. Their main problem is developing in disorder and all directions: many developments happen in the form of successive rings radiating out from the core, such as the development of Beijing. At the same time, theories in city development and planning management can not catch up with the speed of city development. At the same time, some governments' illegal activities result in development zones, university towns, and low-density communities happen rapidly on the fringe of cities. | Development zones: the downside in this procedure is that some part of the land will be transformed into real estate projects, which will be sold at commercial price. With the economy development, some primary industry in cities who have sprawl might relocate to less-developed areas. The issue might alleviate. University towns: Two factors stimulate the increase of university towns. On one hand, universities want more land to enlarge campus scale. Otherwise these universities will move | Xuzhou is under rapid urbanization. Automobile is the mainstay for China. Rapid increase of low-density development zones, golf courses, university towns, and single family houses at the edge of cities. | Low-density development zones, golf courses, university towns, and single family houses at the edge of cities. The Competition among cities. |

| | | | | |
|---|--|--|---|---|
| | | <p>to other cities who can offer more land. On the other hand, building a university town is a direct strategy to increase land use for governments. In reality, the output of a university town is far more less than its input.</p> <p>Low-density communities on the fringe of cities.</p> <p>There is still no regulation to deal with above illegal land uses. In the future, other inappropriate, even illegal forms of land use may also occur under the unchanged fiscal system.</p> | | |
| What is the impact of sprawl in China? | The city in the previous twenty years inefficiently developed in all direction surrounding the inner city results in sprawl. Sprawl will affect sustainable development and food security in China. | The encroachment and even destruction to farmland and natural environment. | Built environment's rapid expansion. The destruction of natural and heritage environment. The conflict between built and natural environment. | The encroachment and even destruction to farmland and natural environment. |
| What is the difference of sprawl between China and North America? | There is the difference of sprawl between China and North America. In China, cities are under compact (high-density) development while disorder. In North America, many city forms are not compact (low-density). | Urban sprawls phenomena and population density are different. Many Chinese cities develop more "smartly" than North American cities. China's city expansion is like that in Japan. | Urban sprawl phenomena are different: low-density communities in North America while low-density industrial zones, university towns, golf courses, residential areas in China. Both sprawls have same result that is the destruction of built environment to natural environment. | Urban sprawls phenomena are different: low-density communities in North America while low-density industrial zones, university towns, golf courses, residential areas in China. |
| What do you view as the main obstacles today in preparing official plans? | The research of planning theories is not enough. In the circumstance of rapid urban growth, insufficient review of plans has been done before they are implemented. Public participation is not enough. In North America, the public has the right to vote. Hence, plan-makers are willing to listen to the public opinions. While in China, officials are normally appointed. | The harmony between official plan and land use plan. The evaluation process of official plans is too long. For example, the State Council took nearly three and half years to approve Xuzhou's Official Plan. The legislative status of official plans is not strong. | Competing for their political and economic interest among districts in a city has negative impact on its official plan. Public participation is not enough. | Public participation is not enough. |
| What are your recommendations to improve the process of preparing Chinese official plans? | Enhance public participation. Hence, the enhancement of public participation can be not only through technical improvement (publishing plans in websites) but also through political reform. | <ol style="list-style-type: none"> 1. The need to enhance plan-makers' ability. 2. To encourage public participation, especially in evaluation and monitoring, on the one hand, planning information can be uploaded to planning administrative websites or be collected through questionnaires, | In China, currently most information in official plans and detailed plans can be obtained from a planning administrative department, as there is a procedure for the application. Opening planning information to the public can help to improve | Public participation. To make the plan evaluation process more efficient. The need to enhance plan-makers' ability, for example, Chinese planners have the |

| | | | | |
|--|---|---|--|---|
| | | making it easier for the public to get relevant information; on the other hand, the public should be encouraged to attend all levels of evaluation meetings. 3. Official plans have too much information. Detail issues can be solved in next level plan. | public participation. | knowledge of physical planning while have less economic and social knowledge because students in planning program in universities are trained to focus on physical plans. |
| Are the policy climate and economic climate favourable to the implementation of smart growth in Xuzhou's Official Plan? | The Chinese Urban Planning Act was in effect between 1 April 1990 and 31 December 2007. It was replaced by the Chinese Urban and Rural Planning Act on 1 January 2008. From the change of the name, it is observed that planning perspective is more focus on a regional scale and sustainable development. In official plans, many problems are intended to be solved in a regional area in order to harmony the development of a city and its surrounding cities and townships. The Chinese system of government has advantages in protecting land from urban sprawl theoretically: if farmland needs to be transferred to other uses, its land ownership has to be converted to the state first. Although some local government's illegal activities result in the sprawl of industrial zones, university towns, and low-density communities, such illegal conversion of land use is not a mainstream. | Yes. China has adopted very strict land use management policies with a bottom-line amount of farmland, which is 1.8 billion <i>mu</i> . The state pays a lot of attention in farmland protection and urbanized area control. The 97 Housing strategies are adapted in a whole city: "More than 70 per cent of the land used for construction of urban housing should be designated for residential units which are less than 90 square meters. | Yes. In recent 20 years, the price of agricultural products increases steadily. The state realizes the importance of farm land to the country's food security. The strict land use management policies in China are benefit to decrease the sprawl speed in Xuzhou. Planning Document 146. | The central government low-rent housing guarantee policy took effect on December 1, 2007 to help these ten million low-income urban families. Planning Document 146. |
| Is smart growth being used in planning policies in China? Especially in Xuzhou's Official Plan? If yes, Please explain them? | The core purpose of smart growth is to achieve a sustainable development pattern in order to save land and energy and preserve natural and historic heritage. Those concepts can be found in many Chinese planning regulations from the requirement of the Chinese Urban Residential Community Plan Standards to the Chinese Urban and Rural Planning Act. Smart growth is called "watermelon" (outside green skin means sustainability, inside red part means communism) in North America. The Chinese system of government has advantages in using smart growth to protect land from urban sprawl theoretically. | Mixed land use: Chinese communities normally have mixed land use according to the Chinese Urban Residential Community Plan Standards. Housing opportunity and choices: although residential communities are required to meet national standards for providing low-income housing need, there are still many aspects that need to improve in the issue of housing opportunity in China, such as how to ensure low-income families can move into policy commercial housing, how to ensure workers migrating from rural areas have places to live, how to provide management in a residential | Smart growth is being used in planning policies in China from the perspective of saving land resources. As a strategy to achieve sustainable development, smart growth is being used in protecting eco-environment: for example, the requirement to define boundaries of green lines, blue lines, orange lines, and purple lines in official plans; the definition of boundaries of scenic areas, eco-sensitive areas, and water sources. In the transportation aspect, smart growth's concept can be found in roads' cross-sections | Sidewalks and biking lanes indicate the characteristic of walking community The definition of boundaries of green lines, blue lines, orange lines, and purple lines. |

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| | <p>The plan of the new district has the concept of smart growth: defining a new district can avoid the city develop in disorder, protect environment, save investment in infrastructures. This strategy benefits not only to the city's spatial structure, but also to its fiscal administration</p> <p>The population of Xuzhou Region in 2020 was defined as 3 million by the local government. The number was decreased to 2 million by the State Council in order to achieve compact development, and avoid wasting land resource and destroying environment.</p> | <p>community having different income housing choices, and how to ensure the service of public transit to the affordable housing on the edge of a city.</p> <p>Walkable community: Chinese neighbourhoods normally include sidewalks and biking lane. Gated communities makes neighborhoods nearby cannot connect to each other through public spaces and waking systems.</p> <p>Environment: The requirement to define boundaries of green lines, blue lines, orange lines, and purple lines in official plans. Official plans must be approved by environmental department.</p> | <p>which include sidewalk and bicycle lane. Meanwhile, there is BRTs in many Chinese big cities. One of smart growth's principles is to create distinctive and attractive communities with a strong sense of place.</p> <p>Correspondingly, one chapter in Xuzhou's Official Plan focuses on the how to shape different landscape characteristics in different districts with detailed description in text and maps. China's urban planning has good tradition in compact land use. About mixed land uses, although there is no much description in Xuazhou's Official Plan, the principle is used popular in existing construction.</p> <p>Although residential communities are required to meet national standards for providing low-income housing need, there are still many aspects that need to improve in the issue of housing opportunity in China.</p> | |
| In your opinions, what is the future for the implementation of smart growth in China? | <p>Smart growth is a strategy to deal with planning problems North America faces. It is based on relative negative impacts of urban sprawl and proposes corresponding methods to improve the situation. Chinese urban planner and planning officials can and should learn from this process of reviewing previous plans in depth.</p> <p>Many principles of smart growth, such as promoting mixed land uses and creating a sense of place and attractive communities, tend to create a harmonious built environment for citizens. This concept is especially important for Chinese cities with high density populations. Planners need to emphasize urban design and add more details to the built environment in order to improve life quality</p> | To promote the use of TOD and BRT in current planning in the circumstance of fuel price increase. | Once most of the middle class in China own their cars, the size of cities will grow exponentially. Therefore, there is an urgent need to do research about sprawl and how to deal with it in China. | Many big cities in China expand in disorder. It is good to adopt smart growth principles in China to adjust urban forms. |
| Others | Chinese mainland cities' development strategies can learn from such modern high | Chinese mainland cities also can learn from urban design in such modern high | In the circumstance of rapid urbanization, most planners focus | |

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| | density cities, as Hong Kong and certain Japanese cities. In the management of automobile, experience of Hong Kong can be learnt from: automobile can be used in weekend, while public transit is used in week day. | density cities, as Hong Kong and certain Japanese cities. | more on plan-marking while less on planning theory research. In research in Smart growth is important to the China's future city construction. | |
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| Interview questions | O01 Planning Official (Project coordinator) Xuzhou Bureau of Urban Planning | O02 Planning Official (Focus on Land use) Xuzhou Bureau of Urban Planning | O03 Planning Official (Regional planning) Xuzhou Bureau of Urban Planning | O04 Planning Official (Transportation) Xuzhou Bureau of Urban Planning |
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| Can you describe the development barriers at the time Xuzhou's Official Plan was prepared? | <p>Urban planning's role in guiding city development is weakening: on one hand, plan-making focuses on spatial form's integrity and pays less attention to development impetus. Hence, city development is not as what it was predicted to and urban planning cannot guide city development efficiently. On the other hand, some plans can not be implemented because other factors. Hence, planning function is weakening.</p> <p>The infrastructure development of railway and airport does not assort with Xuzhou city development. As a regional infrastructure, the railways marshal occupies a large area in Xuzhou inner city, which has a negative effect to the city development and. The military airport blocks the city development to east because of an airspace requirement.</p> <p>The protection of eco-environment is not enough. Hills in the city are encroaching. Subside areas in north city are not redeveloped.</p> | <p>The growth of population, the increasing investment in Xuzhou inner city's renewal, the preservation of historic blocks and natural environment, and the need of new land and new buildings result in the need of the city's land use expansion.</p> <p>The city's is developing in disorder: many developments happen in the form of successive rings radiating out from the core. The city's efficiency deceases while citizens' living cost increases. New plans are needed to guide the city's development and adjust the form of spatial structure.</p> <p>New large manufacturing land is needed to accommodate factories from developed areas.</p> <p>Xuzhou's vision is a regional centre city in Xuzhou Metropolitan Area Plan and Jiangsu Metropolitan Areas Plan. Hence, the city needs a new plan to identify its land use scale and arrange its industries.</p> | <p>Xuzhou downtown development faces huge pressures: many competing interest, including the residential, governmental, commercial, recreational, social, and cultural sectors, are all located in the inner city. A broad range of activities are thus present in the same space. The city is increasingly confronted with problems resulting from high urban development expenses, traffic congestion, and, most seriously, pollution.</p> <p>However, economic situation in other cities' in Xuzhou Region is not good. Xuzhou's official plan needs to deal with the question how to harmony those cities development in order to alleviate inner city's development pressure.</p> | <p>Downtown development pressures, land use development in disorder, the character of Xuzhou is being lost, the city's development boundary has been breached, deterioration of the environment, transportation congestion.</p> |
| Is there sprawl in China? | Yes. Urban sprawl just happens in big cities not in Xuzhou. | Yes. | Yes. For example, the speed of Xuzhou's urban expansion is much quicker than that of its urbanization. City development is out of control and the environment is deteriorated. | Yes. |
| What causes sprawl in | Industrial zones and low-density | China already has urban sprawl | Rapid economic development, rapid | The increase of automobile. |

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| China? | communities. | which is caused by development zones, golf courses, university towns, low density communities on the fringe of cities. In Xuzhou, the above urban sprawl phenomena are not evident. | urbanization, and people's preference to live in suburban areas where they can have better living condition and less expensive houses. | Local governments' motivation. |
| What is the impact of sprawl in China? | The deterioration of farm land and natural environment. | The decrease of farm land and natural environment deterioration. The city in previous 20 years inefficiently developed in all direction surrounding its inner city. | Land use resource and energy are wasted. The deterioration of environment. | Daily commute causes traffic congestion. |
| What is the difference of sprawl between China and North America? | North America's sprawl is in low-density communities, while China's is in fairly high-density. | China's urban sprawl is caused by population growth and design standard increase. | North America's sprawl is caused by low-density communities, while China's by mixed increase of residential, industrial, and education land uses. | Transportation mode in North America is different from that in China. Dependency on automobile is a main factor causing sprawl in North America. In China, dependency on automobile is not very serious. |
| What do you view as the main obstacles today in preparing official plans? | <ol style="list-style-type: none"> 1. To adjust the city's scale. With Xuzhou's rapid growth in population, the city's spatial form will change. 2. New official plan needs to satisfy the change of manufacture structure: labor-intensive industries will locate in northeast city; high-tech industries will locate in south and southeast near universities; and manufacture organization centre will located in the city's New District. 3. The arrangement of regional infrastructure. 4. The plan of eco-environment which is related to sustainable development, especially how to deal with subside areas in the north city. Those above situation may lead to a very different development form for the city and increase the necessity to update the official plan soon to catch up with the city's rapid development | The contrary between strictly controls on city urbanized scale and the population rapid growth. | <p>The necessity to update plans soon to catch up with the city's rapid development.</p> <p>The evaluation process of official plans is too long.</p> <p>The city normally faces shortage of land to develop.</p> | The city normally faces shortage of land to develop. A city is a complexity, so it is hard to predict its development precisely. |
| What are your recommendations to improve the process of preparing Chinese official? | Xuzhou's Official Plan's approval process was complicated and time-consuming. Many circumstances the city faced at that time had changed by the time when the plan was | I do not have any comment on current plan-making procedure. As an important document to guide city development, an official plan should be supervised in its plan-making | Plan-markers should know their target city in depth. Research should cover each aspect of the city, for example, land use research, public facility research, population research, | ----- |

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| | finally finished. Hence, many statistics and many analyses also needed to be updated and revised based on the changed situation. Shortening the approval process can benefit planning management. | procedure. The current Xuzhou's Official Plan focuses in detail too much. It is good to identify development areas, restricted development areas, and no development areas in an official plan. However, allocation of land use should not be too in detail. Land use should have more compatibility and flexibility. | environmental research, infrastructure research, water system research, air-quality research, etc. | |
| Are the policy climate and economic climate favourable to the implementation of smart growth in Xuzhou's Official Plan? | Yes. Scientific Concept of Development is to ensure a greater boost to an overall development of the socialist economy, politics and culture and "building of a harmonious society" in the country. | To achieve sustainable development and a harmony society are an expression of smart growth in China. | Yes. Scientific Concept of Development pursues the same thing. | Yes. Scientific Concept of Development pursues the same thing. |
| Is smart growth being used in planning policies in China? Especially in Xuzhou's Official Plan? If yes, Please explain them? | Yes. For example, compact development, mixed land use, walkable community, etc. But it is observed that in recent years gated communities make neighbourhoods nearby cannot connect to each other through public spaces and waking systems. Leaving brownfield lands empty for years before clean up is not a question in China. | Yes. For example, the identification of development areas, restricted development areas, and no development areas in an official plan; the city structure that separated by green belts; the identification of green lines, blue lines, orange lines, and purple lines in official plans. Some principles of smart growth is not used. For example, few brownfield lands in Xuzhou. | From the layout and landscapes of Xuzhou, a lot of efforts can be found in historic preservation and a large portion of the inner city is protected from (re)development | The plan of the new district that benefits not only to the city's spatial structure, but also to its transportation system (alleviate the inner city's traffic congestion). |
| In your opinions, what is the future for the implementation of smart growth in China? | It is good to adopt smart growth principles in China to adjust urban forms. | ----- | ----- | |

| Interview questions | C01 Consultant Ministry of Construction in Jiangsu Province | C02 Consultant Ministry of Construction in Jiangsu Province |
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| Can you describe the development barriers at the time Xuzhou's Official Plan was prepared? | Like many big cities in China, Xuzhou's rapid outward expansion results in deterioration of the environment, the character of Xuzhou is being lost, urban spatial structure needs to be adjusted. | Deterioration of the Environment and the city character is being lost. Market forces are driving the revitalization of the existing city of Xuzhou, especially in the downtown area, while environmental protection is often ignored. Some projects are not implemented according to planning regulations; the need for space and green space is ignored, development is high density, and the lack of harmony between historical buildings and modern buildings is resulting in the lost of Xuzhou's traditional character. |

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| Is there sprawl in China? | According to the talk of the Minister of the Ministry of Construction, there is urban sprawl in China's big cities. Many developments happen in the form of successive rings radiating out from the core, such as Beijing. | Yes. But urban sprawl is not evident. |
| What causes sprawl in China? | 1) Economic and GDP priority in developing the local economy cause sprawl phenomena. Local governments can sell farmland at very low prices to attract investment to develop industrial zones, university towns, and low-density communities. The pursuit of "political achievement" by some local officials has stimulated urban expansion or even sprawl. This development is inefficiency. 2) The planned transportation system which satisfies automobile development stimulates city's expansion. | The city in previous twenty years inefficiently developed in all direction surrounding the inner city. |
| What is the impact of sprawl in China? | Low-density communities on the fringe of cities, single-function land use, shopping malls in the suburban areas, land use model dependent on automobile, the disappear of farmland and open space. The huge investment in infrastructure caused by excess consumption in land use. Traffic congestion caused by daily commute. | The encroachment and even destruction to farmland and natural environment. Traffic congestion. |
| What is the difference of sprawl between China and North America? | China's land use expansion is caused by three factors: rapid urbanization, investment from global capital, and plan-making oriented by satisfying local governments' need. | Different social, economic, land use system, and government management shape different sprawl phenomena: low-density communities in North America & low-density industrial zones, university towns, communities in China. |
| What do you view as the main obstacles today in preparing official plans? | This complicated, time-consuming evaluation process is a problem characteristic of the planning system. In the plan-making process, due to the rapid urbanization, incomplete legislation, and unbalance level of plan-makers, official plan will have some problems. | The vision of a city is normally too high. The land use scale of a city is normally too big. Inner cities renewal needs to be carefully considered. The blindness in reshape the natural environment. The blindness in investment in infrastructure to satisfy automobile. |
| What are your recommendations to improve the process of preparing Chinese official? | Firstly, it needs to identify plan-making principles: to pursue social equity, to balance economy and environment, to harmony regional development, to preserve natural and culture heritage, to maximize resource uses, to enhance a city's competitive ability. These principles need to be embodied in whole plan-making process. Secondly, plan approval process needs to be reformed. Plan approval process needs to adapt rapid urbanization. Thirdly, currently there is a phenomenon that a new appointed local government prepares its city's new official plan which reflects the government's will. Normally it is no need to do that. | Firstly, much emphasis in official plans should be put on compulsory contents. Secondly, in the process of plan-making and plan evaluation and monitoring, much emphasis should be put on expertise comments not local governments' will. Thirdly, much emphasis in plan-making should be put on close collaboration among different department and harmony between official plan and land use plan. Last but not least, public participation enhancement. As a statutory tool, official plans need to receive the public's advocacy and monitoring. Hence, planning information needs to open to the public. At the same time, the public's options need to be absorbed by planners. |
| Are the policy climate and economic climate favourable to the implementation of smart growth in Xuzhou's Official Plan? | Yes. Smart growth can benefit Chinese cities in current policy and economic climate because it advocates a regional development concept. Its principles deal with three most important issues that a city faces: spatial structure, land use model, and transportation. | Yes. In the recent 20 years, Chinese urbanization rate was double to the world's average rate. In the future 20 years, it is predicted that Chinese urbanization rate will still increase rapidly. Smart growth focuses on sustainable development in economy, society, and environment, renewal off existing communities and infrastructure, decreasing traffic and saving energy. Hence, it advocates a more efficient and compact development mode which meets the |

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| <p>Is smart growth being used in planning policies in China? Especially in Xuzhou's Official Plan? If yes, Please explain them?</p> | <p>Yes. Firstly, smart growth affects city development concept: urban expansion needs to be put in the whole regional eco-system and natural environment as important as built environment. Secondly, the trend of spatial increase should shift from outward expansion to inward update in order to protect natural environment. City development needs to focus on quality as well as quantity. Thirdly land use model in most Chinese cities is compact, high density, mixed used.</p> | <p>requirement of Chinese cities.</p> <p>Yes. Many principles are used in Chinese plans, such as mixed land uses, compact development, walkable communities; preservation of open space and farmland, direct development towards existing communities, provide a variety of transport choices, etc,. However, there are still some aspects that need to be improved, such as housing opportunity, public participation.</p> |
| <p>In your opinions, what is the future for the implementation of smart growth in China?</p> | <p>China is under rapid urbanization. Urban sprawl has already emerged in some big cites, especially coastal big cities. How to harmony the development of an inner city and its whole region is a planning challenge. Smart growth proposes a series of solutions, such as mixed land uses, compact development, a variety of transport choices, direct development towards existing communities, etc,. It has a beneficial effect on Chinese urban development. City development strategies in China should be made based on the reality that the country is short of resources compared to its huge population. Meanwhile, those strategies need to be adjusted to inside update focusing on quality improvement instead of blindly outward expansion focusing on quantity improvement in order to utilize its limited energy and resources efficiently.</p> | <p>Adopting smart growth principles, such as mixed land uses, compact development, public transit priority, has a beneficial influence on city development strategies in China. At the same time, these strategies need to be made based on a city's reality and problems. Through implementing smart growth, cities in China will be able to cope with growth while maintaining a high quality of life and fulfilling the goal of balanced environmental, social, economic, and land use priorities.</p> |

APPENDIX H A RECOMMENDED COMPREHENSIVE SMART GROWTH AUDIT CHECKLIST WITH COMMENTARY

| TOPIC | DOCUMENT | YES | NO | REVIEWER COMMENTS |
|---|--------------------|--------------------------|--------------------------|-------------------|
| Efficient Land Consumption: | | | | |
| Population and Employment Projections: Are they realistic in terms of regional and state projections? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: Population projections provide the basis for all other planning efforts, including projections of households, numbers of housing units, acreage needed for residential land use, job base, and community facilities and services. Population projections should not exceed any population projections for the jurisdiction published by a regional or state agency.</i> | | | | |
| Are housing unit projections based on a housing needs assessment? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Is the amount of future residential land use shown on the land-use plan based on calculations of the number of acres needed for each type of residential land-use category and prevailing or planned densities (e.g., 200 acres of R-1 vacant land at 3 units per acre = 600 units; 75 acres of MR vacant land at 8 units per acre = 600 units, etc.), based on reasonable projections of housing units by type? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Is the land-use plan efficient in terms of the amount of undeveloped land devoted to residential uses when compared with the projections of residential land needed? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: "Efficient" is defined here to mean that the amount of vacant acreage devoted to residential uses in the future land-use plan should be approximately equal to the projections of land needed for residential use based on the housing needs assessment. A smart growth land-use plan does not designate excessive amounts of future residential land use when they are not needed. Exceeding the projected residential acreage needs by more than 15 percent in the land-use plan (which can be shown by calculating the difference between existing residential land-use acreage and future residential land-use acreage shown on the plan) would probably be grounds for a finding that the plan is not achieving smart growth. Excessive residential acreage in a plan will encourage consumption of more land than is needed for residential uses and encourage residential development to spread out at lower densities than those suggested in the land-use plan.</i> | | | | |
| Direction of Growth (Inward, Not Outward) | | | | |
| Do land-use policies favor an inward "direction of growth" toward existing developed areas (where such areas exist), instead of promoting or favoring new development on the fringe of developed areas (i.e., "greenfield")? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Does the land-use analysis identify in quantitative terms (i.e., number of acres and preferably buildout potential in numbers of units) what the potential is for residential infill development? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Are there specific policies that promote and encourage infill development (where such areas exist)? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: Efficient land use, or smart growth, means that undeveloped land within built-up areas should be used rather than left vacant because infill development saves on the consumption of land at the urban fringe and often can make use of existing infrastructure (e.g., roads, water and sewer line capacity, etc.). Local governments cannot be smart about infill development unless they have made an inventory of vacant lands that can serve as infill development sites. A land-use plan is smart when it studies the capacity of residential infill land (currently vacant or underused), determines the capacity of that land for new residential units, and poses policies, strategies, and regulations supportive of development on infill sites.</i> | | | | |

| TOPIC | DOCUMENT | YES | NO | REVIEWER COMMENTS |
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| Direction of Growth (Inward, Not Outward) <i>continued</i> | | | | |
| Does the land-use plan contain an analysis of redevelopment potential? If it finds there is redevelopment potential, does the land-use analysis identify what the redevelopment potential means in terms of new housing units and square footage of nonresidential development? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Does the plan recognize the need to reclaim and reuse any temporarily obsolete or abandoned sites (TOADs) and to clean up and reclaim for future use any "brownfields"? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Density | | | | |
| Does the land-use element contain an analysis of developed residential densities and how they relate to planned densities and densities permitted by zoning districts? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: Cities and counties should calculate the built residential densities (i.e., number of units per acre) of recent developments to determine the average or prevailing densities being constructed. These figures on existing densities should be compared to the land-use plan for differences or inconsistencies. They should also be compared to allowable densities according to the various zoning districts in which the recent development is located. If actual (built) densities are much less than planned densities, or if actual densities are much lower than the maximum densities permitted by zoning district, residential development is not occurring efficiently with regard to land consumption and use of planned infrastructure. Smart plans bring actual (developed) densities in line with densities recommended in plans and allowed by zoning ordinances. In other words, if the number of residential acres consumed vastly exceeds the number of acres projected to be used during a given time period, residential growth has occurred inefficiently, counter to accepted principles of smart growth.</i> | | | | |
| Do land-use policies encourage the establishment of minimum (not just maximum) densities to promote the efficient use of lands designated for higher densities? Alternatively, does the plan address any findings that density allowances in the land-use plan and zoning district have been underutilized? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do land-use regulations establish minimum densities to promote efficient use of lands designated for higher densities? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: Underuse of residential lands, due to building at lower densities than planned and zoned, results in the land consumption for residential use that is faster than planned. Therefore more land is needed for residential uses, which probably means that land needs will be satisfied by removing more land from productive agricultural use at the urban fringe. One way to achieve more efficient land use for residential development is to establish minimum densities in areas where it is very important that planned densities be achieved (e.g., around transit stations or in areas master planned for sewer service).</i> | | | | |
| Do minimum lot sizes allow for urban-sized lots? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: City zoning ordinances should provide a significant portion of single-family zoning devoted to single-family development on lots of 5,000-6,000 square feet. Cities that provide zoning for urban lots should receive higher scores in a smart growth audit. (Also see discussion under "housing.")</i> | | | | |
| Is at least some of the residential land in the community planned and zoned for densities between eight and 15 dwelling units per acre, with even higher densities provided for in urban centers? | Comprehensive Plan and Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |

| TOPIC | DOCUMENT | YES | NO | REVIEWER COMMENTS |
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| Urban Form: | | | | |
| Does the land-use plan propose a sequential, phased pattern of future development in areas contiguous to developed areas so that a compact urban (or suburban) form can be obtained? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: Smart growth means that urban areas are expanded efficiently (only as much land is used as is needed) and in a pattern where new growth is contiguous to existing developed areas. To develop in a contiguous and compact form means that scattered development and sprawl can be avoided. Sequential development also provides for a better return on the public investment in public facilities, and it reduces the linear footage that facilities must be extended.</i> | | | | |
| Does the zoning ordinance zone much of the fringe land as exclusively agricultural (i.e., a holding category) or with a substantial minimum lot size that discourages single-family tract housing and preserves large sites for viable farm use? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: Smart growth means that land-use controls inhibit the scattering of low-density residential uses at the urban fringe—a condition that constitutes the epitome of sprawl. Many local governments in the metropolitan Atlanta region have “agricultural” districts, but they allow a minimum lot size of one acre. Minimum lot sizes need to be much higher (i.e., 10 acres is probably the smallest land area that can function effectively as a farm; preferably 25–40 acres) to discourage “exurban” development, “hobby” farms that are really residential tracts, “ranchettes,” and other forms of low-density suburban sprawl. In cases where large agricultural minimum lot sizes are not feasible, the smart growth auditor should look for other ways that the comprehensive plan and regulations discourage the consumption of agricultural lands on the urban fringe, such as a greenbelt or taxation policies.</i> | | | | |
| Land Use | | | | |
| Does the land-use plan designate areas, where appropriate, for mixed-use development? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do plan policies discuss opportunities, and encourage the mixing of land uses at the building, site, and neighborhood levels? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Does the local zoning ordinance provide at least one or more zoning districts that allow mixes of residential and commercial uses? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| If the community has a downtown, are residential uses allowed in the central business zoning district? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do the future land-use plan and zoning ordinance allow for compatible, small-scale neighborhood commercial uses (e.g., corner stores) adjacent to or within residential neighborhoods? | Comprehensive Plan and Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| Does the local zoning ordinance provide for traditional neighborhood development (TND)? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| Are home occupation regulations flexible enough to allow a wide variety of telework activities while maintaining the peace and quiet of the neighborhoods in which they are located? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: Mixing of land uses is a major tenet of smart growth. Plan policies and land-use regulations should provide for—and even encourage—mixed land uses, especially residential and commercial. Such mixtures allow people to work and reside in the same area, sometimes even in the same building. It is generally accepted that mixing land uses allows for walking more and reduces vehicle miles traveled, which can help to improve air quality and relieve traffic congestion.</i> | | | | |

| TOPIC | DOCUMENT | YES | NO | REVIEWER COMMENTS |
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| Jobs-Housing Balance | | | | |
| Does the comprehensive plan consider the appropriateness of balancing jobs and housing, both qualitatively and quantitatively? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do any small area plans or corridor plans for the community consider and integrate the notion of jobs-housing balance? | Subarea Plans | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do planned unit development (PUD) regulations provide for an appropriate mixture of housing and jobs, or do they result in predominantly single-family residential developments with no jobs nearby? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| <p><i>Commentary: The concept of jobs-housing balance (see separate tool description in the Georgia Quality Growth Toolkit) holds that communities should plan for a rough match between the number of jobs and the number of housing units. A desirable range is approximately 1.5 housing units for every job in the community. Plans should also investigate whether the characteristics of housing in the community match the needs of workers residing in the community and whether the types of jobs in the community match the skills of the resident work force (i.e., consider the “qualitative” aspects of balance). A quantitative balance of jobs and housing does not necessarily signal smart growth, especially if there are qualitative mismatches between jobs and housing.</i></p> | | | | |
| Open Space/Green Space | | | | |
| Does the plan establish a goal, policies, and implementation measures to set aside a certain percentage of total land area in the community as open space or green space? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do all (or most) zoning districts require a minimum open-space ratio (i.e., percentage of land area for each development that must be open space)? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do land-use regulations require developers to consider connecting open spaces and greenways to existing destinations and open space reservations? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| Are open spaces and green spaces accessible to all or most of the residents of the community? | Parks and Recreation or Green Space Master Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| <p><i>Commentary: Many cities and counties in Georgia have developed green space plans, which establish the goal of maintaining a minimum of 20 percent of the jurisdiction’s land area as green space. Smart growth plans establish a goal for green space acquisition and permanent protection, provide an inventory of obstacles to attaining the goal, and establish specific programs of implementation to meet the goal. Counties and cities that are not eligible to participate in a state’s green space program should nonetheless have goals, policies, and programs in place to acquire and preserve green space.</i></p> | | | | |
| Has the community considered funding measures, such as a special local option sales tax or a general obligation bond referendum for acquisition of green space? | Comprehensive Plan; funding components | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do local land-use regulations provide for “conservation subdivisions” or “cluster subdivisions” as a matter of right (versus requiring a conditional use permit)? | Zoning Ordinance and Subdivision Regulations | <input type="checkbox"/> | <input type="checkbox"/> | |
| <p><i>Commentary: Open space, conservation, and cluster subdivision practices are effective ways of setting aside green space and open space. Local regulations are not smart unless they provide for—and even encourage—these types of subdivisions. When clustering or conservation design are not allowed, developers subdivide land into individual lots that rarely preserve natural features and open space.</i></p> | | | | |

| TOPIC | DOCUMENT | YES | NO | REVIEWER COMMENTS |
|--|--------------------|-------------------------------------|--------------------------|-------------------|
| Housing (continued) | | | | |
| Does the comprehensive plan provide for a wide range of housing types (detached single-family, duplex, manufactured home, apartment, etc.)? | Comprehensive Plan | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Do the use provisions within at least some of the residential zoning districts allow for a wide range of housing types by right (versus requiring a conditional use permit)? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| Does the comprehensive plan meet the housing needs of all income levels, as determined by a housing needs assessment? | Comprehensive Plan | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| If the regional planning agency has established a fair-share allocation for the city or county that mandates a specific number of affordable housing units, does the comprehensive plan reflect that goal and provide for its implementation? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do local regulations allow for mixed-income housing developments? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| If the housing needs assessment identifies a need for multiple-family residences, does the zoning ordinance provide sufficient vacant land to meet future needs? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| Does the zoning ordinance allow for "accessory apartments" within single-family residential zoning districts? | Zoning Ordinance | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Are manufactured homes a use permitted outright in at least one residential zoning district? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| Are minimum lot sizes set low enough in at least one residential zoning district to provide for homeownership for all income classes? | Zoning Ordinance | <input type="checkbox"/> | <input type="checkbox"/> | |
| Does the local zoning ordinance provide flexibility for house sizes (e.g., does it allow small units versus establishing large minimum floor areas for all dwelling units)? | Zoning Ordinance | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: Exclusionary zoning is the opposite of smart growth. A community's zoning regulations are smart only if they provide reasonable and fair opportunities for diverse housing types and price ranges. Local governments can accomplish smart growth by reducing minimum lot sizes, eliminating or lowering minimum house sizes, providing for manufactured homes in one or more residential zoning districts, allowing accessory apartments, and encouraging apartment development where needed.</i> | | | | |
| Transportation | | | | |
| Does the comprehensive plan include a transportation element that addresses long-range needs for roads, sidewalks, bicycle paths, transit, freight movement, and water and air travel (where appropriate)? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: "Smart" comprehensive plans provide detailed assessments of travel needs via multiple modes.</i> | | | | |

| TOPIC | DOCUMENT | YES | NO | REVIEWER COMMENTS |
|---|------------------------------|--------------------------|--------------------------|-------------------|
| Transportation (continued) | | | | |
| Do local transportation policies provide for the maintenance of current roads and existing transportation systems before spending money on new ones? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do transportation policies and the future transportation system provide for local street networks (as opposed to the conventional hierarchical system of arterials, collectors, and local streets)? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do development regulations have some requirement to consider and if appropriate provide for new local streets at designated intervals (e.g., every 1,500 feet)? | Various land-use regulations | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: Over time, planners have learned that in addition to overreliance on automobile travel, a major cause of traffic congestion is the design of road systems. Conventional thinking, which is not considered smart growth, calls for local roads to empty onto collector roads that often empty onto a single (or a few) arterials. Because so few major routes of travel are available, traffic is concentrated on these few roads, resulting in congestion. Smart growth demands a road network with more than one means of through travel in any given area.</i> | | | | |
| Does the comprehensive plan provide for an analysis of local street standards and recommendations for reducing excessive right-of-way and pavement widths? | Comprehensive Plan | <input type="checkbox"/> | <input type="checkbox"/> | |
| Have street standards been revised to lower any excessive requirements for local subdivision streets? | Various land-use regulations | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: Many suburban street standards require excessive pavement widths for streets (e.g., from 29 to 36 feet). Smart growth means local streets are placed on a "diet" so that "skinny" streets result. Narrowing required pavement width (e.g., to 24 feet) reduces development costs and impervious surfaces, and may increase safety by lowering vehicle speeds.</i> | | | | |
| Are sidewalks required within new residential subdivisions? | Subdivision Regulations | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do land-use regulations encourage or require the provision of bike paths in accordance with a bikeway master plan? | Various land-use regulations | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do development regulations require the installation of a sidewalk along existing public streets abutting the development, where such sidewalk does not already exist? | Various land-use regulations | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do subdivision regulations allow the planning commission or local governing body to require the connection of subdivision streets to existing streets and the stubbing of streets to allow connections to future subdivision developments? | Subdivision Regulations | <input type="checkbox"/> | <input type="checkbox"/> | |
| Do land-use regulations encourage, if not mandate, the provision of interparcel connections between individual developments, where compatible? | Various land-use regulations | <input type="checkbox"/> | <input type="checkbox"/> | |
| <i>Commentary: Smart growth includes the objective of reducing reliance on major thoroughfares. Requiring driveways to connect with adjacent store parking lots, for example, is one way to reduce traffic on nearby thoroughfares.</i> | | | | |

Source: Weitz & Waldner, 2002

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