



Centre for
Urban and
Community Studies

UNIVERSITY OF TORONTO

The North American Urban System: The Limits to Continental Integration

Jim Simmons and Shizue Kamikihara
with the assistance of Larry Bourne and
Irma Escamilla

Research Paper 205

Centre for Urban and Community Studies
University of Toronto
October 2006

ISSN 0316-0068; ISBN 0-7727-1449-5

The North American Urban System: The Limits to Continental Integration

Jim Simmons and Shizue Kamikihara,

with the assistance of Larry Bourne and Irma Escamilla

Research Paper 205

October 2006, viii, 59 pp.

ISSN 0316-0068

ISBN 0-7727-1449-5

Centre for Urban and Community Studies

University of Toronto

455 Spadina Avenue, 4th floor

Toronto M5S 2G8 Canada

Telephone: 416-978-2072

Fax 416-978-7162

E-mail: urban.centre@utoronto.ca

Website: www.urbancentre.utoronto.ca

The opinions expressed in this or any paper published by the Centre for Urban and Community Studies do not necessarily reflect the views of the Centre, or those of the University of Toronto.

Authors

Jim Simmons is Professor Emeritus of Geography and Planning at the University of Toronto, and currently a Senior Research Fellow at the Centre for the Study of Commercial Activity at Ryerson University in Toronto. He lives in Victoria, British Columbia, and keeps in touch through the web. His principal research interest, in addition to monitoring change in the Canadian urban system, is the changing commercial structure of cities and regions in Canada and abroad.

Shizue Kamikihara has a Ph.D. in Geography from the National Autonomous University of Mexico, and works as a researcher for the Centre for the Study of Commercial Activity at Ryerson University. She has also studied transnational agribusiness in Mexico and contract farming activity in Japan.

Abstract

The North American urban system, as defined here, includes the urban systems of Canada, Mexico, and the United States; with almost 400 urban areas, and more than 300 million people. The paper explores the variations within and among the three urban systems, with respect to the spatial distribution, economic base, income per capita, cultural origins, and government; and then examines the relationships among cities through trade, migration, and airline passenger movement in an attempt to understand the patterns of population growth. It is evident that this urban system is not fully integrated, nor is it closed to the rest of the world. The partial integration permits substantial variations among cities in the levels of income and sources of population growth, especially evident along the Mexican border.

Frontispiece: The North American Urban System



Table of Contents

PREFACE.....	VII
1. INTRODUCTION	9
2. THREE URBAN SYSTEMS.....	2
3. SPATIAL DISTRIBUTION AND VARIATION	8
The Urban Distribution	10
Economic Specialization	14
Income per Capita	17
Cultural Groups	20
Government	25
4. INTERDEPENDENCE	32
Trade Routes	33
Aggregate Patterns: Air Passenger Flows	36
Urban Networks: Migration Flows	39
5. GROWTH AND CHANGE	42
Population Growth Patterns	42
The Components of Population Growth.....	46
6. INTERPRETATION	52
Summary.....	53
The Future of the North American Urban System	55
REFERENCES	57
APPENDIX: CALCULATING INCOME PER CAPITA IN MEXICO	59

List of Figures

Frontispiece: The North American Urban System	iv
Figure 1: The Habitable Space	4
Figure 2: Economic Specialization	16
Figure 3: Income Per Capita	19
Figure 4: Culture Groups	23
Figure 5: Federal Transfers Per Capita to State and Local Government	30
Figure 6: Highways and Ports of Entry	35
Figure 7: Interdependence: Domestic Air Passenger Flows	37
Figure 8: Interdependence: International Air Passenger Flows.....	38
Figure 9: Interdependence: Migration Flows, 1995–2000	40
Figure 10: Urban Growth: Magnitudes	44
Figure 11: Urban Growth Rates	45
Figure 12: The Sources of Population Growth	47
Figure 13: Natural Increase.....	49
Figure 14: Net Immigration Rate.....	50
Figure 15: Net Domestic Migration Rate.....	51

List of Tables

Table 1: Three Countries.....	3
Table 2: Three Urban Systems.....	5
Table 3: Urban Definitions.....	9
Table 4: City Size Distributions (per cent of total)	11
Table 5: Stages in American Metropolitan Evolution (after John Borchert).....	13
Table 6: Economic Specialization.....	15
Table 7: Urban Income Per Capita and Its Correlates.....	18
Table 8: Defining Cultural Differences.....	22
Table 9: The Impacts of Government on National Urban Systems	27
Table 10: Spatial Redistribution by the Public Sector.....	28
Table 11: Transportation Flows	34
Table 12: Urban Growth Rates and Their Correlates (Population Growth Rate, 1990-2000) .	43

Preface

This paper compares the amount, concentration, location, and characteristics of urbanization across North America; including Canada, the United States of America (United States), and Mexico. For the most part, it consists of simple description, together with some speculations about the causes and implications of observed differences. Nowadays, a description of the urban geography of a region essentially portrays the human geography of that region – the population and economy – but without the distractions introduced by the institutional actors (e.g., governments and corporations), since we have relatively little information about government expenditures or taxes, or corporate organization and investment, at the spatial scale of the metropolitan area.

The originality of the paper lies with the choice of geography. North America is seldom analysed as a single unit – although Murayama (1984) has explored the interdependence of Canada and the United States, and Richardson et al. (2006) discuss the effects of globalization on the three countries. The latter illustrates the most common approach to continental urban systems that simply compares national systems of cities. Occasionally individual cities are treated globally, in the literature on “Global” or “World Cities” (Sassen, 1991; Taylor and Knox, 1995). Our interest in a study of North America derives from the division of the continent into three countries, and the effect of that political division on their urban systems, and on the relationships among them. Throughout the paper we attempt to differentiate the patterns observed for all three urban systems and those that vary among them. From a broader viewpoint, the paper explores the limits of globalization, since it measures the economic and social variations among three neighbouring urban systems that persist despite the well-publicized global processes for integration and convergence. In part, globalization processes combine to frustrate continental cooperation.

As will be seen, the United States is by far the largest and most dominant entity, with more than two-thirds of the continental population and an even higher proportion of economic activity. It is also an extremely insular nation, with remarkably little concern for relationships with its immediate neighbours. Public controversies and studies of urbanization in both Canada and Mexico, in contrast, tend to focus on relationships with the United States rather than with each other or the continent as a whole. Canada has one-tenth the population of the United States, although for the most part, it shares the language, culture and economy of the United States. Mexico has a much larger population than Canada – equivalent to one-third that of the United States – but it is much poorer, and Spanish-speaking, with a significantly larger indigenous component, so it is

also culturally distinct. Although Canadian cities hug the American border, most Mexican cities are spatially separated from the United States by several hundred kilometres of desert.

This unlikely trio of nations and urban systems has been thrust together by geography and, more recently, by a negotiated trade agreement (the North American Free Trade Agreement, or NAFTA) that is slowly integrating the three economies. The ongoing economic relationships between Canada and United States are supposed to provide a model for this larger process of integration. At the same time, migration among the three countries has been strongly discouraged, especially from Mexico to the United States. And there has been relatively little institutional penetration: there are, for example, no continental political institutions that regulate or coordinate development, nor are there formal mechanisms to transfer funds from rich regions to poor. It is unlikely that the highly disparate size, influence, and political priorities of the three countries will ever permit the level of economic, political, and demographic integration that characterizes Europe.

Nonetheless, we describe the urban system of North America as a way to explore the nature of the similarities, differences, and interdependencies among these countries. The report will reveal the substantial differences in the three urban systems, and especially in the way that political factors exaggerate the differences.

In this enterprise we have been helped by many colleagues. Todd Gardner of the US Bureau of the Census, Carlos Anzaldo Gomez of Conapo in Mexico, and Larry Bourne at the University of Toronto provided the data for the migration maps. Larry Bourne, Irma Escamilla, and Jill Wigle provided detailed comments on the text. Over the years, we have also explored the variations among national urban systems with numerous colleagues in the IGU Commissions for Urban Studies. We would also like to express our appreciation for the work of the three statistical agencies and various data librarians who have made this material accessible on the web. All the empirical research was done from our office in Victoria, British Columbia.

Jim Simmons and Shizue Kamikihara
Victoria, Spring 2006

1. Introduction

Most studies of systems of cities are national or regional in scope. There are both logical and practical reasons for this approach. Logically, national boundaries have severely restricted the flows of people, goods, money, and information across them. Thus, to a considerable extent, national urban systems can be viewed as essentially closed: closed to migrants, to some forms of trade, or to the operations of governments and national corporations. National boundaries mark the jurisdictional limits of legislation that taxes and redistributes funds and regulates almost every aspect of the economy. Increasingly, however, these restrictions and differences are being overcome. Money and information now move more freely. A few hundred corporations, operating in dozens of countries, generate most of the world's trade flows. Declining rates of population growth, better information, and cheaper transportation encourage labour force migration, even if governments disapprove. The extraordinary success of the European Union has provided a model for the spatial integration of national urban systems (Pumain and Saint-Julien, 1996; Knox and Taylor, 1995; Lo and Yeung, 1996). But is this model applicable, or practical elsewhere?

Outside Europe, the form and pattern and pace of spatial integration is still largely determined by national governments – despite increased international integration. This control is especially evident when integration involves an American government that simultaneously pursues economic and cultural integration in some sectors while fortifying barriers against other links: for example, yes to oil imports; no to Mexican migrants. Thus, we ask: what are the characteristics of the North American urban system and its component cities in the early 21st century? To what degree can it be called a continental urban system? Is it becoming more or less integrated over time? Are the proposed walls along the two borders significant symbols of isolation, or irrelevant blips in the process of continental integration?

The next chapter provides some preliminary information about the three countries, and their levels of urbanization. The chapters to follow describe the spatial distribution of cities and their characteristics, explore the patterns of interaction that knit the cities in each urban system together, and track the recent growth trends. A final chapter summarizes this material and provides an overall interpretation. Within each subsection of the paper, we provide continental comparisons based on the maps and tables, and then discuss each country in turn.

2. Three Urban Systems

The three countries differ profoundly in their physical and economic geography, as well as in their history, culture, and political institutions. The present-day urban systems have been constructed upon very different landscapes, and within the context of cultures and histories that have emphasized the alienation and conflicts among the three countries as much as – or more than – the commonality of location and origins. Both Canada and Mexico have been at war with the United States at various times during their history, and both countries harbour continuing resentments about their relationships with the United States. Table 1 and Figure 1 on the next two pages display a few of the measurable differences among the countries.

The three countries include an extraordinary range of climates and topographies – from deserts to rainforest to tundra, and from mangrove swamps to mountains. A central feature of the map and the table is the notion of the *ecumene* as the settled or livable space – defined as the land that supports agriculture or other high-density human settlement. The allocations of area to ecumene in Figure 1 are not done with great precision. The goal is simply to identify the extensive areas that are covered by desert, tundra or mountain, and are thus largely inappropriate for settlement. The ecumene helps us to understand the great variations in the number and size of cities among and within the three countries. For example, although Canada and the United States have approximately the same land area, only 12 percent of the former is classified as ecumene, compared to 57 percent of the latter, and 35 percent of Mexico. In Canada the climate and soils restrict settlement in the north, while a significant portion of Mexico is too dry to support agriculture. As well, each country has extensive areas of partial ecumene where agriculture is restricted to narrow valleys or irrigated zones. Climate and topography, and hence agriculture, have shaped patterns of urbanization across North America.

The economies of the three countries present some striking differences. Underlying much of the subsequent discussion is the much lower level of economic development in Mexico that results in levels of GDP per capita that are one-third those of the other two countries. Income differences within Mexico are much greater as well, and there is a massive informal economy that is largely unmeasured. The differences in level of development affect most other aspects of urbanization, including the population density of cities, the sectoral composition of the economy (more primary and secondary workers, fewer in commercial and public services), and the level of integration of the economy. The three countries also differ in the degree and type of international integration. Canada has the highest level of international trade, foreign investment, and

Table 1: Three Countries

	Canada	Mexico	United States
Population	30,007,000	97,483,000	279,584,000
Total Area (km ²)	9,012,100	1,959,200	9,157,600
Population per sq. km.	3.33	49.76	30.53
Ecumene*			
Population	26,421,000	70,923,000	238,543,000
Area	1,086,500	697,500	5,271,800
Core Region**			
Population	16,665,000	48,851,000	120,109,000
Area	166,500	272,300	1,344,800
Growth Rate, 1990-2000 (%)	9.9	20.0	13.1
Gross Domestic Product (GDP) (\$USb)	901.1	953.3	9,764.8
GDP/Capita (\$US)	\$33,300	\$9,800	\$34,900
Income per capita (\$US)	\$18,500	\$2,400	\$19,900
Government Expenditures (\$USb)****	145.1	189.7	1,767.6
Government Expenditures/GDP (%)	16.1	19.9	18.1
Government Expenditures/Capita	\$4,836	\$1,946	\$3,493
Exports/GDP (%)	45.5	38.2	11.2
Foreign Direct Investment/ GDP (%)	29.8	16.7	12.9
Economic Activity (Employment) (%)			
Primary	1.6	5.0	1.0
Infrastructure***	10.9	13.6	11.8
Manufacturing	13.7	22.3	13.2
Commercial Services	51.7	44.2	49.5
Public Sector	22.1	15.0	24.5
Major Cultural Groups (%)			
Francophones	21.8	NA	NA
Hispanic	0.7	92.4	12.5
Indigenous	3.4	7.1	0.9
Black	2.2	NA	12.3
Foreign-Born	18.2	0.5	11.3
Expatriates	3.6	8.7	4.4

* The ecumene is defined as the area that supports agricultural settlement.

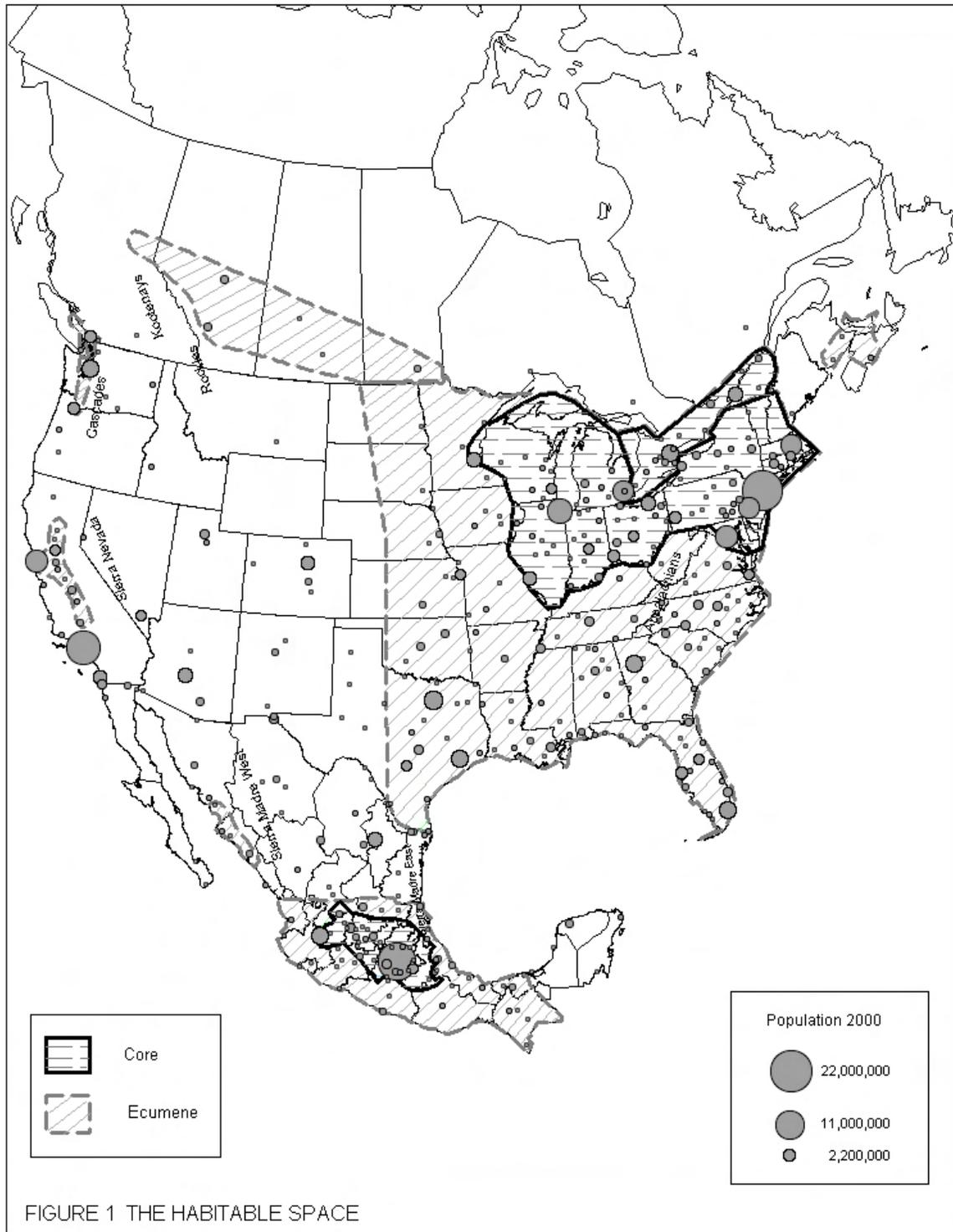
** The core is the heavily industrialized and urbanized region.

*** Infrastructure includes construction, transport, utilities and communication.

**** Government includes education, health and public administration

Source: Statistics Canada. Census of Population, 2001; INEGI (Instituto Nacional de Estadística Geografía e Informática). Censo General de Población y Vivienda, 2000. Bureau of the Census. Census of Population, 2000.

Figure 1: The Habitable Space



immigration, while the United States is lowest; but these differences largely reflect the relative size of the economies. Mexico's international linkage patterns are unusual for their asymmetry: immigration is low, but emigration is high, and the reverse is true of foreign investment.

The varied geographies and histories of these three countries inevitably support three very different urban systems, as shown in the Frontispiece and described in Table 2. The Frontispiece identifies two main clusters of population in North America: one in the northeastern United States between Chicago and New York – and extending north into Canada – and another in Central Mexico, around Mexico City. One could also make a case for a California cluster, stretching from the Mexican border to San Francisco. At any rate, it is apparent that cities are not evenly scattered across North America, and this spatial distribution reflects both the geography of the ecumene and the historical evolution of the national urban systems that generated the core regions. (A later section of this paper explores recent growth trends – as indications of the urban system to come.) Note some of the distances: Mexico City to New York is more than 3,500 km, as is the distance from Vancouver to New York. Mexico City to Los Angeles is 2,600 km and Vancouver is 1,700 km north of that. These urban clusters are a long way apart. In contrast, it is only 2,500 km from Paris to Moscow.

Table 2: Three Urban Systems

	Canada	Mexico	U.S.A.
National Population (1,000s)	30,007	97,483	279,584
Urban Population (1,000s)	20,148	61,743	223,573
Per Cent Urban (%)	67.1	63.3	80.0
Change in Per Cent Urban, 1990-2000 (%)	1.8%	2.4	1.3
Largest City (1,000s)	4,653	18,397	21,200
Largest City/Urban (%)	23.2	29.8	9.5
Per Cent Urban in Core (%)	67.5	55.8	40.7
Number of Cities over 100,000	34	103	255
Average City Size (1,000s)	592.6	595.5	872.5
Growth Rate National Population (%)	9.9	20.0	13.1
Growth Rate Urban (%)	13.1	24.8	14.0

Population figures for Canada refer to 2001 and 1991, respectively. National totals for the U.S.A. exclude Alaska and Hawaii.

"Core" regions include Southern Ontario and Quebec for Canada; States within the Central Plateau, surrounding Mexico City in Mexico; and the old industrial belt in the US, stretching from Wisconsin to New Hampshire, and south to Maryland.

Source: Statistics Canada. Census of Population, 2001; INEGI (Instituto Nacional de Estadística Geografía e Informática). Censo General de Población y Vivienda, 2000. Bureau of the Census. Census of Population, 2000.

Although the number of cities and the total urban population reflect the relative size of the three countries, American cities absorb a larger share of the nation's population (percent urban) and are larger in population size on average. Mexico has the lowest proportion of urban population at present, but the urban population in that country is growing more rapidly than in the other two, both absolutely and relative to the population as a whole. Mexico City is proportionately larger and much more dominant within its urban system than either Toronto or New York.

Canada: The human geography of Canada has been restricted by the climate conditions that discouraged settlement to the north, and the boundary with the United States (established by treaty after the American Revolution) that prevented expansion southward. The settlement process has operated within this narrow band of habitable territory, proceeding from east to west, following the transportation system – ports, then rivers, then railways. It began with the Francophone settlements around the Bay of Fundy and along the St. Lawrence River, was accelerated by the flow of Loyalists from the United States into the Maritimes and Ontario after the American Revolution, and exploded into the Prairies following the construction of the railway in the 1870s. High birth rates in the Francophone province of Quebec until 1970 maintained the political importance of that province.

Canada has always been the most open of the three countries with respect to both trade and immigration. Over the years, expansion of the urban system was driven by the development of new commodities for export (staples) and the rapid inflow (or outflow) of immigrants. Such growth has varied widely over time and space, since it was relatively unconstrained by the pre-existing urban system: as a new economic base was established in a new region, an inflow of new immigrants provided the workforce. Although the ecumene was largely settled by 1910, the redistribution of population within the urban system continues, as will be evident later in this paper. The east-to-west sequence of settlement persists in differentials in growth rates, and immigration remains at a high level (currently equivalent to almost 1 percent of the population each year), and now feeds the growth of the largest cities, rather than the newly settled regions as in the past.

With less than 10 percent of cities in the North American urban system, the Canadian urban system is by far the smallest of the three countries, and Canadian cities are much more widely dispersed. Most cities are located within 300 kilometres of the American border. More than 60 percent of cities and urban population are concentrated in the narrowly defined core region in Southern Ontario and Southern Quebec.

Mexico: At the time of the Spanish conquest in 1521, Mexico had an estimated population of 20 to 25 million inhabitants, widely distributed throughout that part of the country south of the desert, but especially on the well-watered Mesa Central, which continues to support the core of the urban system. The largest settlement at that time – Tenochtitlan, the present Mexico City – had more than 250,000 inhabitants. Other smaller settlements were located wherever the landscape could support agricultural activity. Eighty years after the conquest, at the end of the 16th century, the Spanish had explored and conquered virtually all of the country, and imposed their administration on the various Indian groups. In this sense, the Conquest was simply a change in the colonial government for many regions of the country, rather like the transition of Canada from French to British control. However, the transition in Mexico was accentuated by the devastating impact of European diseases on the indigenous population. By the time the exploration and conquest was complete more than 90 percent of the native population had disappeared; and only one million remained. The Spanish were administering a landscape that was almost empty, and that was adjusted to their needs as it slowly refilled.

Unlike the other two countries, the structure of the Mexican urban system is essentially endogenous; in part predating the Spanish colonization, and in part the result of the natural increase of the population accumulated over the centuries. The isolation is not only spatial, as measured by

the distance from the other two urban systems, but also reflects the low levels of international trade and immigration. The great urban concentration around Mexico City is about 400 difficult kilometres from either the Pacific or the Gulf of Mexico (including a climb of two thousand metres); and almost 1,200 kilometres from the American border. Many other leading cities are clustered in the core region around the capital, while the peripheral cities are widely dispersed.

United States: The United States of America began as British (and Dutch) settlements along the East Coast of North America during the 17th century (Meinig, 1986). What is now the Southwest, including Texas and Southern California and the parts between, was developed as the northern fringe of the Mexican settlement. The initial American settlement frontier expanded inexorably westward, while bounded to the north by the Canadian border. The wave of settlers swept aside the resistance of the eastern Indians in the late 18th century, and overwhelmed the small French settlements along the Mississippi (culminating in the Louisiana Purchase in 1803), the Spanish settlements in the Southwest (the Mexican-American War in 1846), and the Plains Indians in the mid-19th century. By 1900, the settlement sequence was largely complete. A single national government controlled the central part of North America from the Great Lakes to the Rio Grande, although the effective political power was shared with the various states.

At present, the United States has ten times the population of Canada, and ten times the GDP of Mexico; and its political power on the continent remains largely unchallenged. The United States began as a British colony, exporting commodities and importing industrial goods, but the rapid growth of the national economy and tariffs on imports created an internal market that became not only larger, but more and more self-sufficient. At the same time, the high rate of economic growth supported waves of immigrants as settlement expanded westward.

During the 20th century, many of these traditional linkages with the rest of the world have gradually been reversed. Severe controls on immigration began in the 1920s to restrict the flow of immigrants from Asian countries and have continued into the present (with a variety of adjustments) to control the immigration of Mexicans. After the Second World War, a series of international agreements to permit free trade among nations reduced tariffs and increased the levels of imports and exports; as reflected in NAFTA, and more recently, massive imports from China. The implications of these changes for the American urban system have been profound. Manufacturing imports have weakened urban growth across the Industrial Belt, but fostered the growth of regions that produce for export: notably financial and other service centres in the East, and commercial cities and ports that serve the agricultural Midwest. Mexicans continue to flow into the United States despite the restrictions, and cities close to the Mexican border are among the fastest-growing urban centres in the country. The westward shift of population and economic activity continues, so that California and Texas are now the two largest states in terms of population; having supplanted New York, Pennsylvania, and Illinois, the dominant regions in the old economy.