WHICH ARE THE LARGEST? WHY PUBLISHED POPULATIONS FOR MAJOR WORLD URBAN AREAS VARY SO GREATLY

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Abstract: Lists of the world's largest urban areas according to population size are surprisingly inconsistent in standard reference sources. These even disagree about which area is the world's largest. In this paper we first review the differences found in the population reporting of the twenty largest world urban areas by several unofficial sources and by the United Nations. We then demonstrate that variations in the populations and rankings stem primarily from differences in concepts and definitions, not from bad census counts or lack of basic information about the individual urban areas. Three case studies, one for Tokyo, another for Mexico City, and the third for Chicago elucidate different concepts and definitions employed within each of these urban areas and how such differences can yield different population totals. For Tokyo we examine multiple concepts of metropolitan including two administrative definitions (city proper and metropolitan government), two official metropolitan areas, an alternative metropolitan area, and an urbanized area definition. For Mexico City, a similar analysis is performed to compare population totals derived from a metropolitan zone definition with totals derived from one based on a "mancha urbana" ("urban blob") approach. Conceptual issues related to the geographic building blocks of these two definitions are discussed. For Chicago we will first illustrate the standard distinction between a UA and an MA and second show how population and area totals vary for an administratively defined UA and an MA that uses townships rather than counties as building blocks. The paper concludes by presenting and discussing a new list of the world's largest metropolitan areas.

Introduction

This paper is focused on why lists of the world's largest urban areas differ so much. First it will illustrate the differences by comparing eight different lists of largest areas. Next, it will identify the chief reasons for the differences. The paper will look more closely at three major urban areas as examples, noting how the urban area definitions can affect measures such as population density and rate of growth. It will conclude by presenting a new list of major world metropolitan areas defined so far as possible by consistent criteria.

Differences among Sources

Table 1 compares the populations of the world's twenty largest urban areas according to eight different lists, labeled A through H. Six of these lists are from

Table 1. THE WORLD'S TWENTY LARGEST URBAN AREAS ACCORDING TO EIGHT DIFFERENT SOURCES
(Populations in millions. Some area titles are abbreviated. In some lists, date of data is approximate.)

Rank	A. Metro Regions demographia.com (2000)	B. Agglomerations citypopulation.de (2003)	C. Metro Areas R. Forstall (2001)	D. Metro Areas world-gazetteer.com (2004)	E. Urban Areas demographia.com (2000)	F. Urban Areas mongabay.com (2002)	G. Agglomerations un.org/esa/... (2000)	H. UAs/Cities citymayors.com (2003)
1	41.3 Tokyo	33.8 Tokyo	32.0 Tokyo	31.2 Tokyo	31.2 Tokyo	31.0 Tokyo	26.4 Tokyo	21.2 New York
2	22.9 Seoul	21.9 Mexico City	20.7 Seoul	30.4 New York	19.9 New York	29.9 New York	18.1 Mexico City	20.3 Mexico City
3	21.4 New York	21.8 New York	20.0 Jakarta	21.5 Mexico City	17.5 Mumbai	21.0 Mexico City	18.1 Sao Paulo	16.4 Los Angeles
4	21.0 Jakarta	21.7 Seoul	19.8 Mexico City	20.2 Seoul	17.3 Mexico City	19.8 Seoul	16.7 New York	16.4 Mumbai
5	20.0 Mumbai	20.2 Sao Paulo	19.5 New York	19.2 Sao Paulo	17.0 Jakarta	18.5 Sao Paulo	16.1 Mumbai	13.2 Kolkata
6	19.2 Sao Paulo	18.8 Mumbai	18.1 Sao Paulo	18.2 Jakarta	16.6 Sao Paulo	17.6 Osaka	13.2 Los Angeles	12.8 Delhi
7	19.1 Mexico City	18.1 Delhi	17.4 Mumbai	17.6 Osaka	16.9 Seoul	17.4 Jakarta	13.1 Kolkata	12.1 Tokyo
8	18.4 Osaka	17.5 Los Angeles	17.4 Osaka	17.4 Delhi	15.5 Osaka	16.7 Delhi	12.9 Shanghai	11.3 Buenos Aires
9	17.9 Manila	16.7 Osaka	16.7 Delhi	17.3 Mumbai	14.5 Manila	16.6 Los Angeles	12.5 Dhaka	10.2 Seoul
10	16.7 Shanghai	16.3 Jakarta	15.1 Kolkata	16.9 Los Angeles	13.3 Los Angeles	15.5 Cairo	12.4 Delhi	10.0 Sao Paulo
11	16.4 Los Angeles	15.6 Cairo	15.0 Manila	16.2 Cairo	12.2 Cairo	13.5 Manila	12.0 Buenos Aires	9.4 Jakarta
12	14.6 Kolkata	15.4 Moscow	14.5 Los Angeles	14.4 Kolkata	12.1 Kolkata	12.9 Buenos Aires	11.0 Jakarta	9.3 Karachi
13	13.9 London	15.0 Kolkata	14.2 Moscow	14.1 Manila	11.2 Buenos Aires	12.1 Mumbai	11.0 Osaka	9.3 Paris
14	13.8 Beijing	14.0 Manila	13.7 Buenos Aires	13.2 Buenos Aires	10.3 Delhi	12.1 Moscow	10.8 Beijing	9.2 Chicago
15	13.8 Delhi	13.9 Buenos Aires	13.7 Cairo	12.6 Moscow	10.1 Karachi	12.0 Shanghai	10.7 R.de Janeiro	8.5 Moscow
16	13.4 Lagos	13.1 Karachi	12.7 London	12.2 Shanghai	9.7 R.de Janeiro	11.4 Kolkata	10.0 Karachi	8.5 Istanbul
17	13.3 Cairo	12.5 Shanghai	12.5 Shanghai	11.6 R.de Janeiro	9.6 Paris	11.3 Cologne-Ruhr	10.0 Manila	8.2 Shanghai
18	13.0 Moscow	12.2 R.de Janeiro	11.3 R.de Janeiro	11.5 Tehran	9.0 Shanghai	11.3 Paris	9.9 Seoul	7.6 Washington
19	12.3 Dhaka	12.1 Dhaka	11.3 Paris	11.4 Paris	8.9 Istanbul	11.2 R.de Janeiro	9.6 Paris	7.5 Bangkok
20	11.5 R.de Janeiro	11.9 London	11.1 Istanbul	11.3 Cologne-Ruhr	8.7 Moscow	11.2 London	9.5 Cairo	7.4 Beijing

websites, whose addresses are given at the top of each column. List G is the United Nations Population Division's 2000 list, published in World Urbanization Prospects 2001, and also available online. List C is Forstall's own compilation as of 2001.

Of these eight lists, the UN's is the most widely used. For example, the New York Times Almanac, the World Almanac, and Infoplease.com all quote it rather than compiling lists of their own. Several of the lists acknowledge having drawn upon one another for parts of their data. Perhaps reflecting the lack of consensus on this topic, some major reference sources do not attempt to provide any ranked list of world urban areas, including the Britannica Book of the Year, Guinness Book of World Records, Statesman's Yearbook, and Whitaker's Almanac.

The table arranges the lists in descending order of the population of their largest urban area. For example, list A has Tokyo in rank one with 41.3 million people, while list H ranks New York first, at barely half that size, 21.2 million.

A total of twenty-nine urban areas appear in this table, in other words in the top twenty of at least one of these lists. Eleven areas appear in all the lists, and six more are in seven of the eight lists. Of these six, four are omitted from list H, which uses a mixture of urban area and city data, and seems to have overlooked the existence of Osaka and Manila entirely.

Seven other urban areas appear at least twice in the table, while five areas appear only once – Lagos, Tehran, Washington, Bangkok, and Chicago. Generally, of course, these areas do appear in the sources, just not in their top twenty.

Tokyo is ranked first on all the lists but list H, which ranks New York first and relegates Tokyo to seventh place. Three lists rank New York second, and another three

rank Mexico City second, while the remaining two lists put Seoul in second place. Thus, though there is a nearly total consensus on Tokyo as the world's Number One urban area, there are four major urban areas competing in these lists for the first two ranks.

Apart from rankings, the populations estimated for the urban areas by the different lists vary substantially. List A's twenty areas have a total of 354 million population, while list E's areas have only 282 million and list H's only 229 million. Moreover, list B finds thirteen urban areas in the world of at least 15 million, while lists A, C, and D each find eleven areas that large (not necessarily the same eleven, of course). At the other extreme, list H has only four urban areas over 15 million, and the UN list (G) has only five.

Why the Differences?

Thus, the substantial effort made to produce these lists has resulted in a wide range of outcomes. Some of the differences are due to variations in the reference date, which ranges from 2000 to 2004 in the different lists. During that period, most countries issued results of their 2000-round censuses; all of the lists used some 2000-round results, but several have not yet reflected all that are now available.

There also are a few countries that did not take a census in the 2000 round and have no national population register. Current estimates for their urban areas hence must be projections from past censuses. These are quite uncertain and vary greatly across sources. Lagos, Nigeria is the largest urban area affected by this uncertainty.

But the primary reason for the large differences between these sources involves the geographic definitions of the areas for which populations are given. At least six

different types of geographic area are represented in the eight lists. To illustrate this, table 2 lists the top twenty urban areas from the UN's 2000 list, and adds five additional areas listed by the UN below the top twenty. For each urban area, the table positions the UN's population estimate according to the type of geographic area to which it refers. The same analysis could be done for any of the lists, but we choose the UN's because of its wide circulation.

City Proper

For three of the twenty-five areas listed, the UN population refers to the city proper, without any suburbs. By city, we mean an administrative entity with specific boundaries, a municipal-type government, and a dominantly urban rather than rural character. A city may contain smaller municipal entities like wards or boroughs, but has overall governmental authority within its boundaries. Terminology of course varies from country to country; not every entity officially called a city meets our definition, and some large cities are officially known by other terms. For example, the "city" entity in London is the area administered by the Greater London Authority, divided into thirty-two Boroughs and the historic City of London. The latter area, with boundaries dating from medieval times, comprises only about a square mile at the center of the metropolis.

For urban areas as large as those we are discussing, the city proper is nearly always considerably smaller than the actual urban or metropolitan area. In other words, urban development has overflowed the municipal boundaries to a lesser or greater extent, forming suburban areas that are administratively distinct from the city proper. Hence the UN's estimates for Jakarta, Seoul, and to a lesser extent Tehran are substantially smaller

Table 2. UNITED NATIONS 2000 POPULATION ESTIMATES FOR 25 URBAN AREAS, BY TYPE OF GEOGRAPHIC AREA
(Populations in millions. Some area titles are abbreviated.)

Urban Area	City Proper	Administrative Area	Urbanized Area (UA)	UA (Administrative Boundaries)	Official Metropolitan Area	Municipality (China)
Tokyo			26.4			
Mexico City					18.1	
Sao Paulo					18.0	
New York			16.7			
Mumbai			16.1			
Los Angeles			13.2			
Kolkata			13.1			
Shanghai						12.9
Dhaka					12.5	
Delhi			12.4			
Buenos Aires			12.0			
Jakarta	11.0					
Osaka			11.0			
Beijing						10.8
Rio de Janeiro					10.7	
Karachi			10.0			
Manila		10.0				
Seoul	9.9					
Paris				9.6		
Cairo		9.5				
Moscow		8.4				
London			7.6			
Chicago			7.0			
Tehran	7.0					
Ruhr					6.5	

than those in some of the other lists. For example, six of the eight lists credit Seoul with from 22.9 million to 16.9 million, compared with only 9.9 million in the UN list, because they include suburban areas as well as the city proper.

Administrative Area

In many large urban areas, there is more than one level of administrative authority exercising some municipal functions. Sometimes these are set up with their own boundaries for specific purposes, for example regional planning. Often, existing administrative entities that include major urban areas acquire additional functions over time because they are conveniently situated to deal with a larger territory than the city proper. For example, in the Chicago area, Cook County, one of the 102 counties of the State of Illinois, exercises a good many regional functions for Chicago and the inner portion of its suburban area. The county nevertheless is considerably smaller than the Chicago urban or metropolitan area.

Three of the UN's populations are for entities of this type. For Manila the entity is Metropolitan Manila, a province-level subdivision of the Philippines comprising Manila and 16 other municipalities. While much larger than Manila proper, Metro Manila does not include all of the surrounding suburban development. Thus, six of the lists credit Manila with from 13.5 to 17.9 million people, versus only 10 million in the UN list.

For Cairo, the UN's population refers to just Cairo proper and the adjacent large suburban city of Giza. This definition excludes extensive additional suburban territory.

For Moscow, the UN's population includes four communities that are under the administration of Moscow but are not within its city limits. Two of these are not even

contiguous with Moscow itself. This arrangement whereby some smaller places are under the administration of a larger city is widespread in Russia and some of the other former Soviet Republics, and appears in some other countries as well. The Moscow urban area has millions of additional population in nearby suburbs outside this administered area.

Why would the UN choose to quote these populations for units evidently smaller than actual urban areas? The reason probably is that, with rare exceptions, the UN's policy is to use only data supplied officially by a country. For Jakarta and Tehran, at least, official data for an urban definition larger than the city have not been available. For Seoul, though official definitions do exist they may not have come to the UN's attention. For Manila, Cairo, and Moscow the data adopted by the UN do come from official sources and may appear at first glance to represent the whole urban area, though closer investigation quickly makes it clear that that is not so.

Urbanized Area or Urban Agglomeration (UA)

Urbanized areas (UAs) are recognized officially for census usage by a number of countries. For the United States, an Urbanized Area is a continuous area of high population density centered on a relatively large municipality or other urban community, and with limits not constrained to follow administrative boundaries. The U.S. definitions use density at the block and block-group level to determine the UA's extent, with 500 persons per square mile frequently used as the minimum density.

Analogous areas are defined for census use in Japan as Densely Inhabited Districts (DIDs), using census enumeration districts as building blocks but with a far

higher density requirement than the United States uses (4000 per square kilometer). Several countries in Europe and elsewhere define UAs on the basis of urban-type land use, generally allowing no gaps in urban use exceeding 200 meters.

This approach is the one favored by the UN, which uses the term Urban Agglomeration and would prefer to present all its estimates for this geography. However, only 11 of the 25 areas in table 2 actually refer to this definition, essentially because the data on this basis are not provided officially by the other countries.

Urbanized Area (Administrative Boundaries)

A few countries define UAs by a density or continuity method but then establish the UA boundary in terms of small administrative areas. This is the case with France, and Paris is the only example in this category in table 2. The communes, the minor administrative entities in France, are typically geographically quite small; and evidently the French statistics authorities believe it is most useful to provide UA data in terms of entire communes rather than establish a different geography ignoring commune boundaries. A definition in terms of administrative entities also has the advantage of permitting statistical comparisons using constant geography, whereas a precise UA definition changes over time.

If the Paris UA were defined without the constraint to administrative boundaries, by omitting the outer less densely settled portions of communes, the total UA population would probably not be very much less than the total shown, since rural population density in France is not very high. However, other data for the UA, especially its surface area and its mean population density, would differ substantially.

Official Metropolitan Area

A metropolitan area is conceptually different from an urbanized area. Generally it consists of a large urban nucleus together with adjacent areas with a high degree of economic and social integration with that nucleus. To assess the level of integration between nucleus and outlying areas, the most commonly used measure has been data on commuting to work. Virtually every metropolitan areas is geographically larger than its core urbanized area, and includes communities that are still physically separated from the main urban nucleus. Metropolitan areas therefore generally have considerably larger populations than their core UAs, and much larger surface areas.

Many countries now define metropolitan areas officially, including some that also define urbanized areas. However, the criteria used for official definitions differ widely, with the result that the resulting MAs are not necessarily very comparable across countries. A key aspect is the choice of building block for presenting the definition. The United States, for example, defines its metropolitan areas in terms of entire counties, while Canada's are established in terms of county subdivisions, which are generally much smaller than U.S. counties. The U.S. definitions make use of a commuting criterion of 25 percent of workers, while the Canadian requirement is typically 50 percent. Also, some countries publish more than one series of official MAs, for example Japan.

Definitions of metropolitan areas for a given city, depending on the standards or criteria adopted, tend to vary more widely than definitions of urbanized areas, where the physical extent of the area may be fairly readily documented. For defining metropolitan areas, the issue with the widest ramifications may be whether two neighboring urban

areas, originally quite separate but subsequently more closely related, should be considered two MAs or just one. For example, lists D and F on table 1 both include greater Philadelphia as part of the New York area. The Philadelphia urban area has more than five million people, so including it boosts New York's population to second position and not far behind Tokyo. The official U.S. metropolitan areas, however, continue to recognize Philadelphia as a separate MA.

Table 2 shows that the UN list has 5 areas whose populations refer to official metropolitan areas. These are evidently cases for which a population for just the urbanized area was not officially available to the UN. For Mexico City, the definition is in terms of the local administrative units termed municipios. For Sao Paulo and Rio, the definitions also are in terms of municipios, but in Brazil these units average much larger in extent than in Mexico and the definitions are fairly generous ones. For Dhaka the definition is officially described as Dhaka Megacity and appears realistic.

The Ruhr area listed on the final line of table 2 has been included because it is a good example of an additional source of variation among definitions. There is little consensus on what this particular area should include, either as an urbanized area or as a metropolitan area. This reflects the complexity of its historical development, involving major urbanization based on mining and manufacturing, which came about over a sizable territory, located close to long-established urban centers such as Dusseldorf and Cologne. With subsequent expansion of old and new centers alike, it has become difficult to decide whether separate and distinct urban areas still exist. Current population estimates for this urban area range from five or six million up to over eleven million.

It should be emphasized that these differences for the Ruhr are not due to any deficiencies in the German population records, but simply to the difficulty of deciding what standards are most appropriate for defining the Ruhr boundaries in a fashion consistent with the definitions of other major urban areas. The same is true of all the other areas in table 2 except Lagos, where the variation in estimates reflects uncertainty about growth since 1991, which was the most recent census.

Municipality (China)

Last but not least, the geography represented by Shanghai and Beijing differs significantly from that of the other urban areas listed. Like nearly all large Chinese cities, Shanghai and Beijing have two distinct administrative boundaries, neither closely comparable to those of cities in most other countries. In China, the boundaries of the city proper typically include a substantial rural surrounding area; at the population densities typical of much of China, this may add hundreds of thousands or even millions of primarily rural inhabitants to the city population total.

In addition, most large Chinese cities now administer several primarily rural counties, or even smaller cities. Though reminiscent of the arrangement described earlier for Moscow, the Chinese administered areas are on a much vaster scale; in many provinces most or all of the counties are now under the administration of some city. These subordinate counties and cities continue to have their own governments and have not been annexed to the parent city proper, only placed under its administration.

Shanghai and Beijing are Special Municipalities with the status of provinces, and both include administered rural counties. The UN's populations refer to these special municipalities and hence are considerably too large to refer to the urban agglomeration.

However, these administrative peculiarities are only one aspect of the difficulties of arriving at comparable population totals for Chinese urban areas. The 1990 and 2000 census totals for cities include large populations of recent in-migrants whose official residence is still back in their province of origin, but current official population estimates for the cities omit a large share of these recent migrants, who number in the millions. Moreover, China's current rapid economic evolution is augmenting the urban component of some of the very densely settled rural environs of cities like Shanghai, raising the possibility that such areas should now be considered parts of the agglomeration or at least the metropolitan area. Thus, the Chinese cities represent not only an exceptional administrative pattern but certain conceptual issues not present for most of the other major urban areas. Not surprisingly these problems are generating a substantial academic literature.

How Different Boundaries Affect Demographic Data: Tokyo

Table 3 compares different definitions for three major urban areas, to illustrate how widely definitions can vary, and also how the choice of definition can affect such measures as population density and growth rate. For Tokyo, the table shows the city proper and the administrative area called Tokyo Metropolitan Government (Tokyo-to), which is larger than the city but includes only a small portion of Tokyo's suburbs (Figure

Table 3. POPULATION, AREA, GROWTH, AND DENSITY FOR 3 URBAN AREAS, BY DIFFERENT DEFINITIONS
(Population change based on last two censuses. For identification of areas shown, see notes.)

* Officially defined urban area	Population 1 July 2000	Area (km2) 2000 Census	Population per km2 1 July 2000	Annual Average -- Population Change	Percent Change
TOKYO (2000 and 1995 censuses)					
City proper	8,126,000	621	13,085	33,000	0.41
Administrative area	12,049,000	2187	5,509	58,000	0.49
Urbanized area *	28,228,000	3084	9,153	169,000	0.61
UA (administrative boundaries)	30,360,000	6657	4,561	165,000	0.55
Metropolitan area (1) *	34,488,000	13565	2,542	179,000	0.53
Metropolitan area (2) *	30,681,000	7631	4,021	170,000	0.56
MA, Forstall definition	31,821,000	8014	3,971	175,000	0.56
MEXICO CITY (2000 and 1995 censuses)					
City proper	8,616,000	1484	5,806	27,000	0.32
Administrative area	21,837,000	24743	883	352,000	1.68
UA (administrative boundaries) *	17,384,000	4136	4,203	222,000	1.32
Metropolitan area (1) *	18,497,000	7815	2,367	257,000	1.44
Metropolitan area (2) *	18,105,000	5482	3,303	246,000	1.41
MA, Forstall definition	19,525,000	7346	2,658	291,000	1.55
CHICAGO (2000 and 1990 censuses)					
City proper	2,899,000	588	4,930	11,000	0.40
Administrative area	5,384,000	2449	2,198	27,000	0.52
Urbanized area *	8,347,000	5498	1,518	152,000	2.01
UA (administrative boundaries)	8,355,000	7559	1,105	76,000	0.96
Metropolitan area (1) *	9,122,000	18679	488	92,000	1.06
Metropolitan area (2) *	9,336,000	21981	425	93,000	1.05
MA, Forstall definition	8,965,000	12028	745	90,000	1.06

1). The city's mean population density is quite high, more than 13,000 per km2 or over 30,000 per square mile.

The Tokyo urbanized area is given both with an exact definition (based on DIDs as described earlier) and with that definition adjusted to administrative boundaries (Figure 2). The exact definition has a density over 9,000 per square kilometer. Adjusting to administrative boundaries adds less than ten percent to the exact UA's population, but more than doubles the area included and halves the density.

Two official Tokyo metropolitan areas are shown (Figure 1). The first is the Major Metropolitan Area (MMA), defined very generously to include all communities that have at least 1.5 percent of their population commuting either to work or to school in the MMA's four central cities (Tokyo, Yokohama, and two less familiar places, Kawasaki and Chiba). This MMA definition is as of 1995 because the 2000 definition has not yet been published.

The second official MA is defined as the administrative units within fifty km of central Tokyo (Figure 1). It has a somewhat smaller population and a much smaller area than the MMA.

Finally, the table includes data for Forstall’s definition of Tokyo, using criteria applied so far as possible consistently across all major world urban areas. It is a little larger than the urbanized area using administrative boundaries, although the two definitions overlap (Figure 2).

Tokyo's population is growing slowly according to all the definitions. The more inclusive definitions all have rather similar rates. The rate for the urbanized area reflects

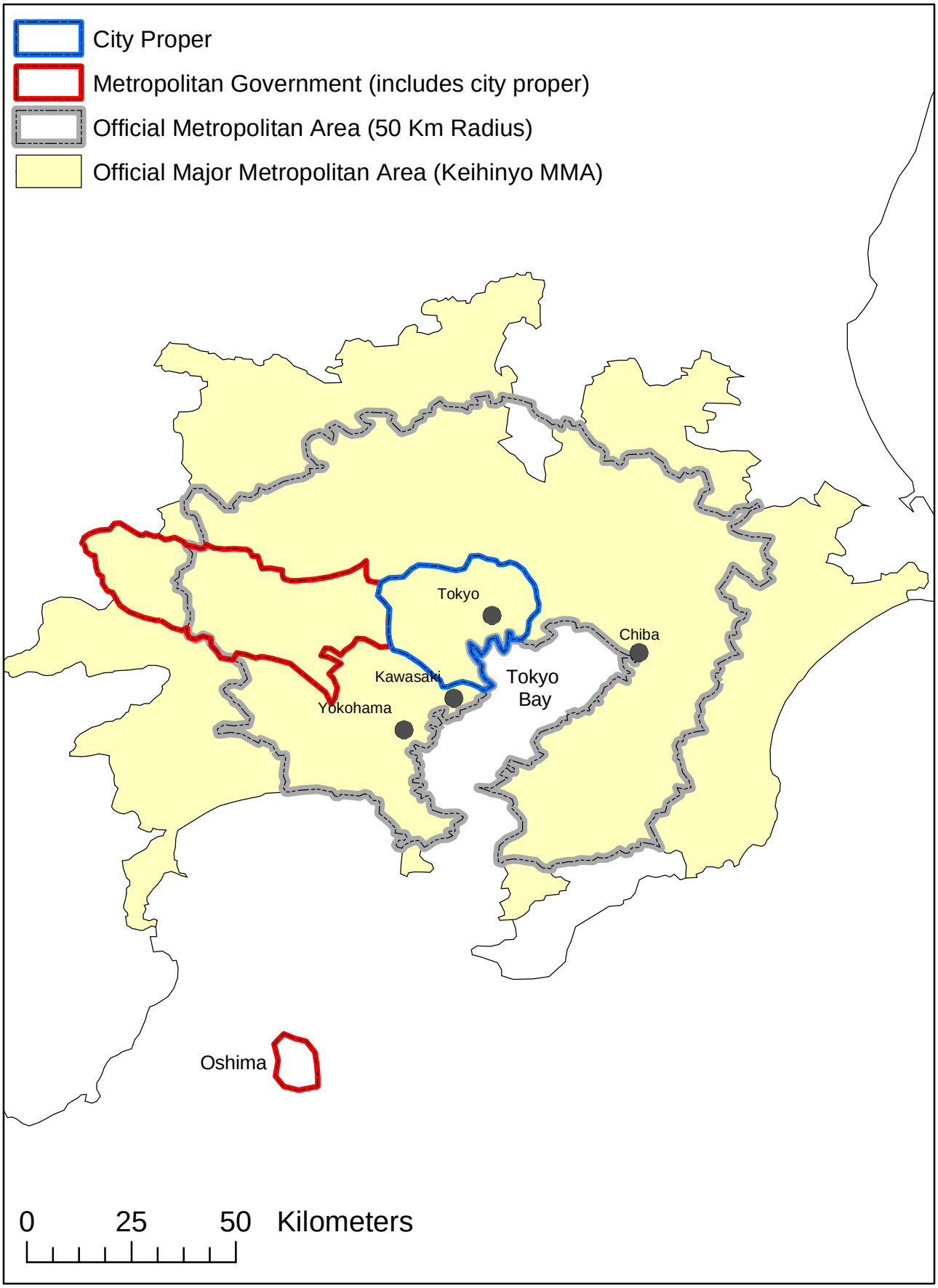

Figure 1. Official administrative and metropolitan definitions of Tokyo.

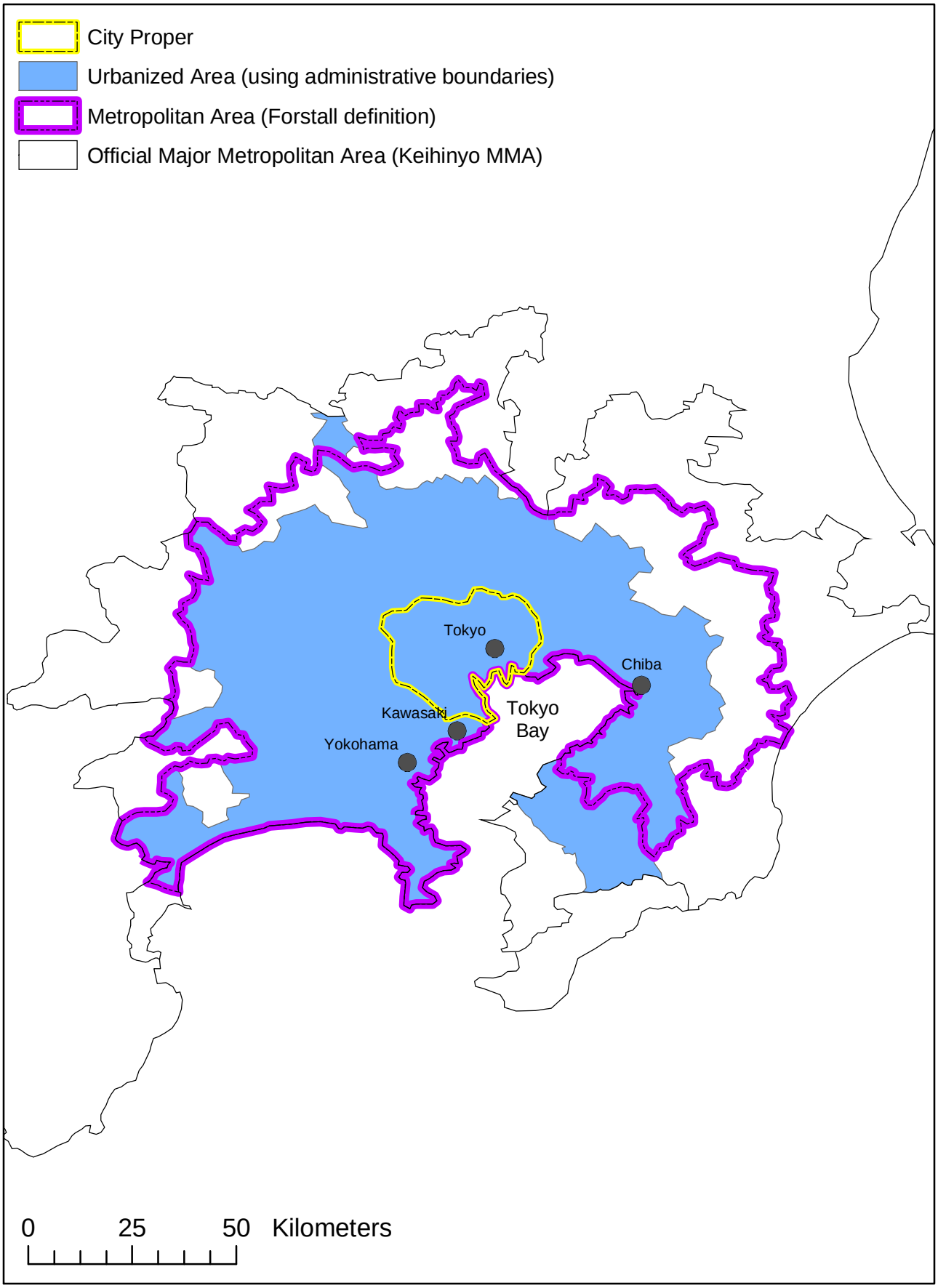

Figure 2. UA and Forstall MA definitions of Tokyo.

that it expanded geographically during the last intercensal period; for all the other definitions, the growth rates are determined using constant geography.

Different Boundaries for Mexico City

For Mexico City, the city proper corresponds to the Distrito Federal or Federal District, a state-level subdivision comprising 16 urban districts (delegaciones). Most of the Mexico City urban and metropolitan areas lie outside the Distrito Federal in the surrounding state of Mexico (Figure 3). As with Tokyo, the central city has a high density but a lower growth rate than the various definitions that include suburbs (Table 3).

In Mexico, an urban area or *area urbana* conceptually consists of a central city plus a contiguous area that has buildings and inhabitants, with land use being non-agricultural. The urban area extends up to limits where it is interrupted by non-urban land use, such as forests, fields, or water bodies.

This urban area concept is similar to the U.S.'s urbanized area. Operationally, it is defined in terms of contiguous units called AGEBs. An AGEB ("area geografica estadistica basica") is a small geographic unit built up from city blocks and has about 2,500 persons. This urban area definition implies tightly built-up urban territory that does not coincide with political-administrative boundaries. Because the area is so closely defined by its built-up quality, it is sometimes described by Mexican specialists as a "mancha urbana", an urban blot or smudge.

Mexico's basic administrative subdivisions are municipios. These are roughly comparable to counties in the U.S., but somewhat different in concept. A Mexican

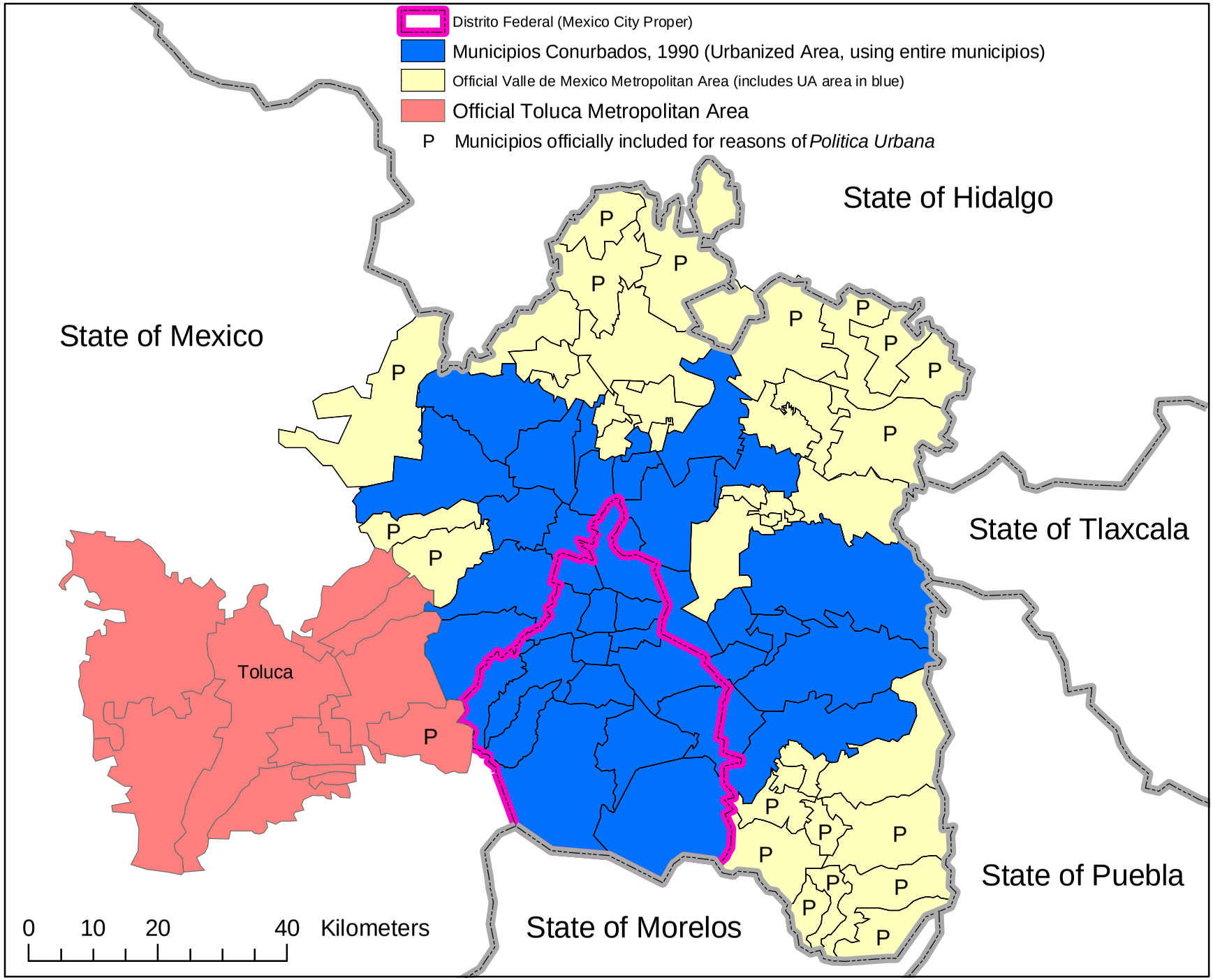

Figure 3. Mexico City and Toluca: Official definitions.

municipio is an incorporated unit having a government with various administrative offices and an elected President, although the largest urban areas extend over several municipios, most cities are located in one municipio, which serves as the city government.

In the Mexico City area, in addition to the Distrito Federal there are twenty-one municipios reached by the continuous urban area defined as described. Together these municipios comprise a definition of the urbanized area adjusted to administrative boundaries (Figure 3).

The municipios also are used officially to define metropolitan areas (*area metropolitana* or *zona metropolitana*). The outlying metropolitan municipios are identified as those that maintain an intense daily social and economic interchange with the central city. The concept resembles the U.S. metropolitan areas, but Mexico defines its MAs using additional criteria besides commuting flows.

The metropolitan zone of Mexico City has been officially defined based on 2000 census data to consist of the entire Distrito Federal plus fifty-eight municipios in the State of Mexico and one in the State of Hidalgo (Figure 3). This area's 2000 population totaled 18.5 million.

The Mexican criteria allow for some municipios to be included for reasons of *politica urbana*, for example for planning purposes or to round out the metropolitan boundary to match an existing state boundary. There are 18 such municipios included in the zona metropolitana for Mexico City. They are labeled P on Figure 3. In Table 3, the second official MA shown represents the zona metropolitana defined on the basis of

specific geographic and statistical criteria, in other words excluding these *politica urbana* municipios.

Adjacent to metropolitan Mexico City on the west is another metropolitan area, developed around the city of Toluca (Figure 3). This has been one of Mexico's fastest-growing urban areas over the past two decades. In defining Mexico City for his own list, Forstall has concluded that Toluca's links with Mexico City are now so close that the two should be combined as a single metropolitan area (Figure 4). The Forstall definition matches the combined Mexico City and Toluca official definitions, excluding the *politica urbana* municipios.

Different Boundaries for Chicago

The various Chicago definitions are similar or larger in extent when compared with those for Tokyo and Mexico City. But they generally have much smaller populations, which means that they have far lower densities. The city of Chicago proper stretches along Lake Michigan and is virtually all included within Cook County, which, as noted earlier, exercises some metropolitan functions for the city and immediate suburbs (Figure 5). City and county have roughly the same areas as Tokyo city proper and metropolitan government, but their respective populations are less than half as large (Table 3). The Chicago city and county growth rates also are quite similar to the corresponding Tokyo definitions.

The Chicago urbanized area includes nearly all of Cook County and adjacent DuPage County, and extends into six other Illinois counties and two counties in Indiana

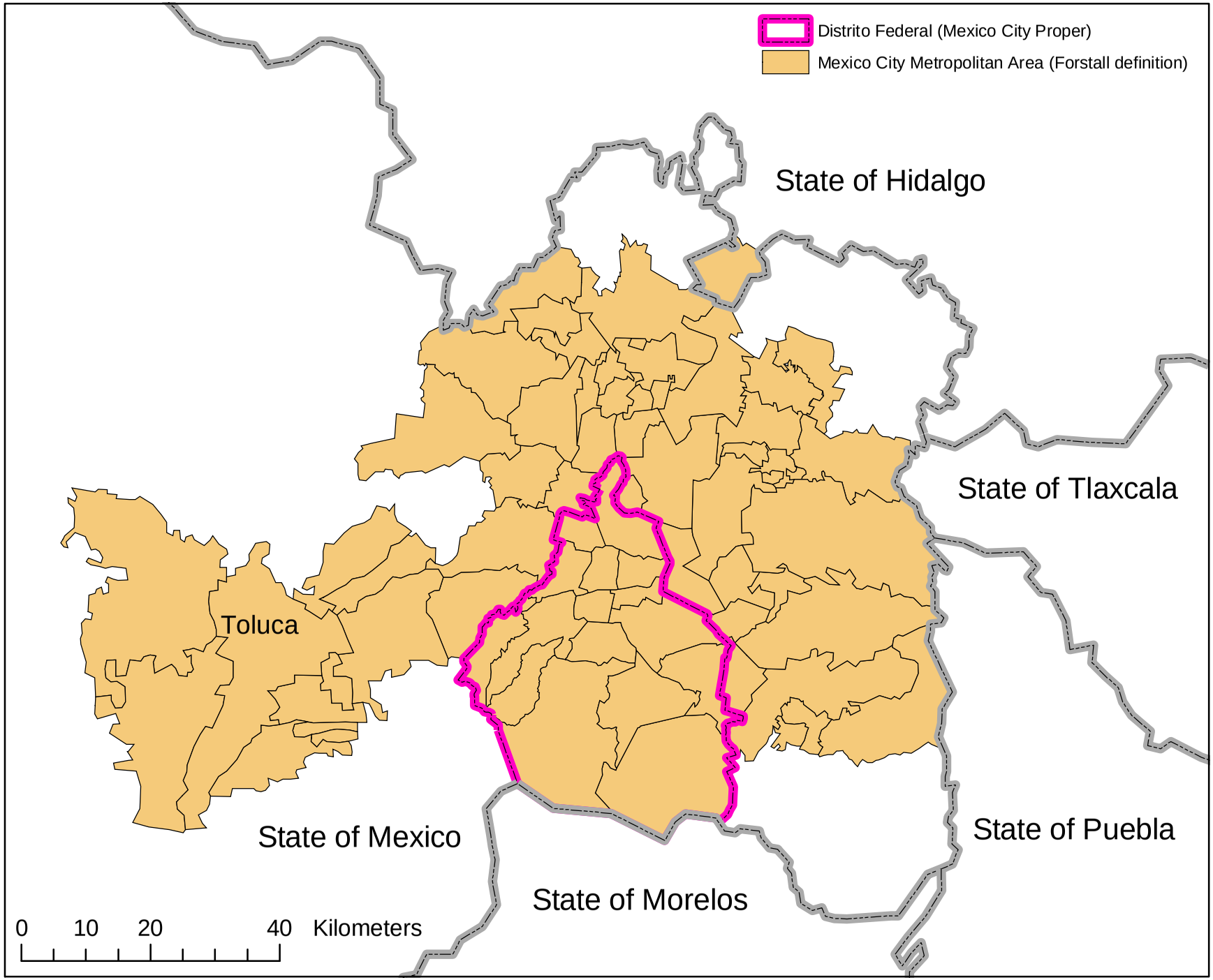

Figure 4. Mexico City: Forstall metropolitan area definition.

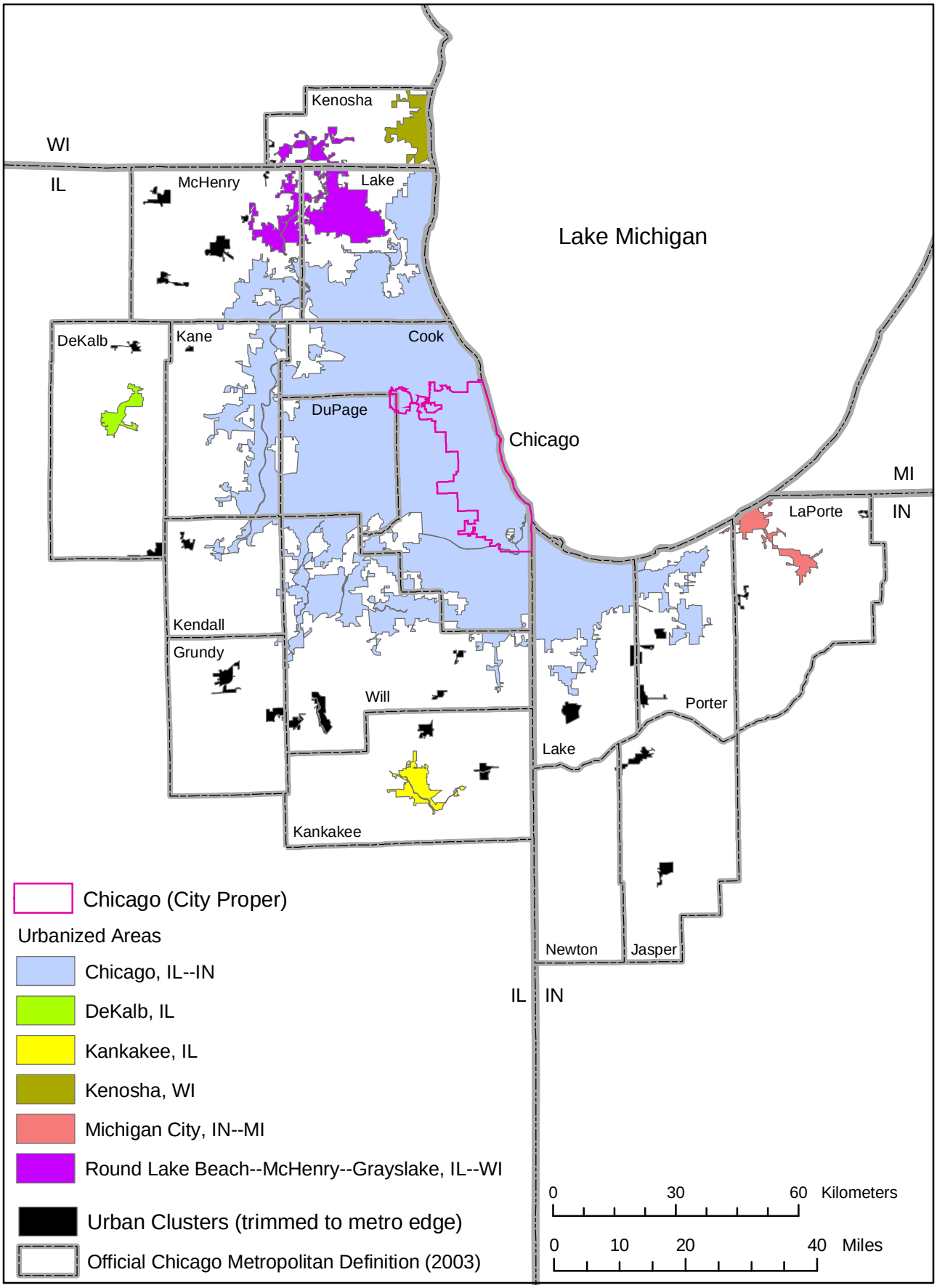

Figure 5. Official metropolitan and urbanized area definitions, Chicago region.

(Figure 5). At 5498 km2, it is more extensive than the UAs of either Tokyo or Mexico City.

Urbanized areas were first defined by the U.S. Census Bureau for the 1950 census to provide a more realistic separation of the urban and rural population surrounding large cities. Earlier censuses had relied on administrative status and boundaries to make the distinction. Under criteria revised for the 2000 census, a UA consists of a central city and surrounding thickly settled area, defined to encompass a core of census block groups or blocks that have a population density of at least 1,000 persons per square mile, and surrounding census blocks that have an overall density of at least 500 per square mile. A UA's total population must be at least 50,000.

Figure 5 also shows five other UAs within the Chicago metropolitan area, each defined by the criteria just described. The Round Lake Beach-McHenry-Grayslake UA just beyond the northern edge of the Chicago UA, and extending into Wisconsin, is largely suburban but is still separated from the main UA by some areas of low density. The other outlying UAs represent long-established small cities that have gradually become Chicago satellites over recent decades.

In past censuses separate UAs were recognized for the satellite cities of Elgin and Aurora (in Kane County) and Joliet (in Will County). These were merged with the Chicago UA in 2000, but their urban outlines can still be partly discerned because some lower-density areas continue to intervene between them and the main Chicago urbanized territory.

Starting in 2000, the U.S. Census Bureau also recognized smaller urban concentrations, defined by the same criteria as the UAs but having less than 50,000 total

population. These Urban Clusters (UCs), which are recognized for all clusters with at least 2,500 population, are shown for the Chicago area on Figure 5. A few represent outlying suburban developments, but most are pre-existing small towns, often now experiencing increased growth as Chicago satellites.

Besides the UA definitions, the census also reports Metropolitan Statistical Areas (MSAs) for Chicago and other U.S. cities. These metropolitan areas originated at the time of the 1950 census, and are defined with extensive Census Bureau input. Because they are established as a standard geography for all U.S. statistical agencies, their definitions are issued by the federal Office of Management and Budget. The MSAs are defined in terms of entire counties because these are the smallest geographic units for which most statistical series are available nationwide.

An MSA includes at least one UA, and its core counties are defined as those with at least 50 percent of their population in that UA. Under a revision of the criteria implemented in 2003, additional counties are included if at least 25 percent of their resident workers work in the core counties, or, rarely, 25 percent of the workers in the outlying county reside in the core counties. As areas are defined, provisions allow for merging them if they have substantial intercommuting.

In addition, a second metropolitan definition, the Combined Statistical Area, is recognized for certain cases where neighboring MSAs have commuting ties that are significant but not sufficient to justify outright merger.

The Chicago Combined Statistical Area comprises the 16 counties shown on Figure 6. It represents the combination of the Chicago MSA (comprising 14 counties), the Kankakee MSA (Kankakee County, south of Chicago), and the Michigan City MSA

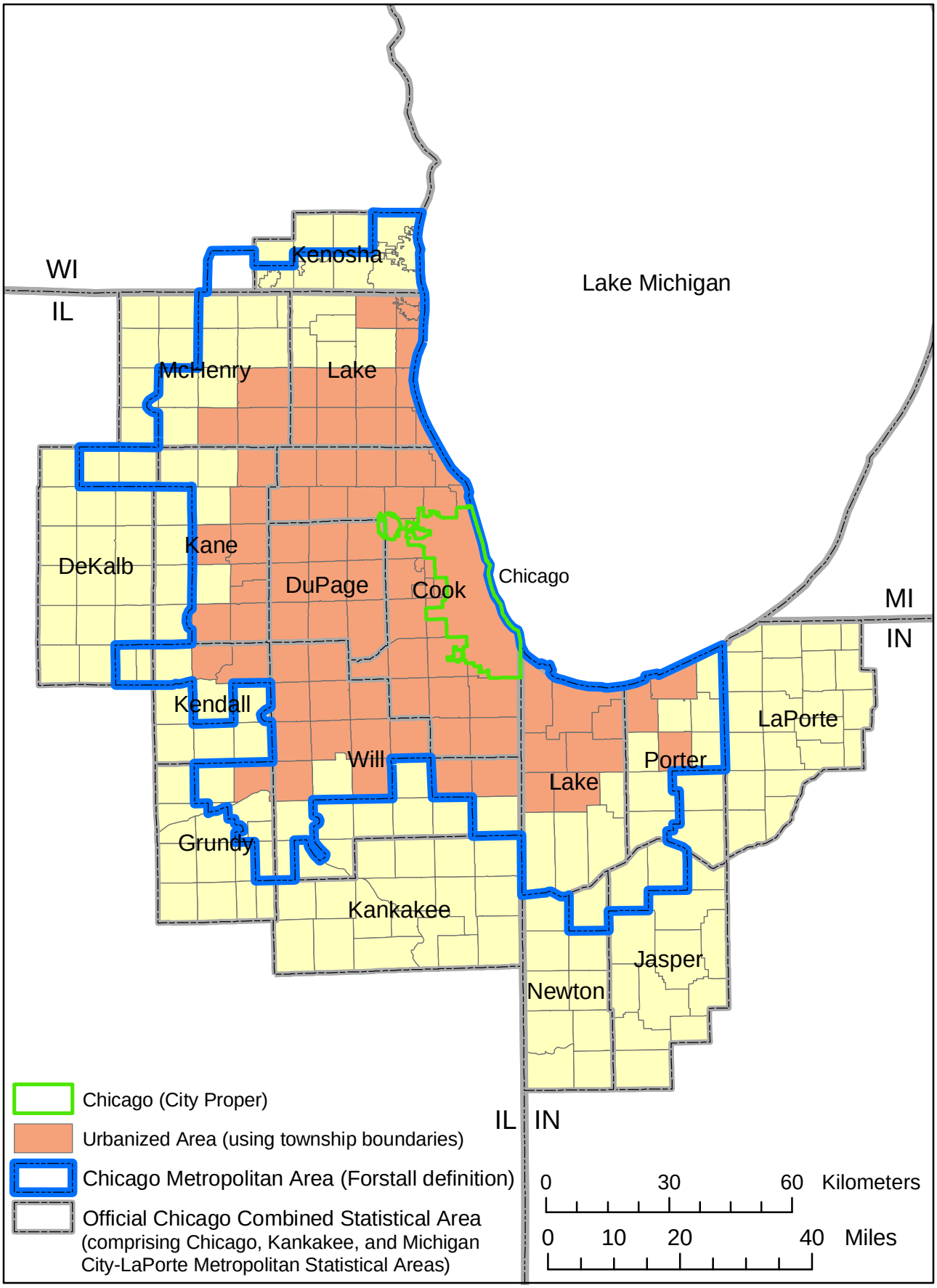

Figure 6. Metropolitan and urbanized definitions for Chicago.

(LaPorte County, Indiana). The two small outlying MSAs add just over 200,000 population to the metropolitan total, while increasing the area to nearly 22,000 km2 (Table 3).

Figure 6 also shows the Chicago UA generalized to administrative (township) boundaries, by including all townships that have at least half their population in the UA. Using the administrative version hardly changes the UA population, but increases the area substantially (Table 3). The UA using administrative boundaries had a growth rate of 0.96 in the last intercensal period, while the official UA grew by more than 2 percent annually. The administrative definition permits a comparison using constant geography, whereas the UA gain is for a moving definition and reflects significant geographic expansion, including the absorption of the outlying Elgin, Aurora, and Joliet UAs mentioned earlier. Both growth rates are useful, but it is important to recognize why they differ so greatly.

Finally, Figure 6 shows Forstall's definition of the Chicago metropolitan area, using township boundaries. It is somewhat more extensive than the UA but omits considerable portions of the official MSA counties.

By any metropolitan definition, Chicago's recent growth rates are nearly twice Tokyo's but considerably lower than Mexico City's. Numeric gain naturally is much less, since both those metropolises have much larger total populations than Chicago.

New Lists of Largest Areas for 2003

The comparisons in tables 2 and 3 were all presented as of 2000, partly to agree with available UN estimates. In late March, after this paper was well under way, the UN

issued its World Urbanization Prospects for 2003, with a revised list of the world's largest urban agglomerations. Along with an updating of the population estimates, a few of the UN's definitions for the largest areas have changed, but the details remain unavailable pending publication of the full WUP report. Probably the largest change involves the definition of Tokyo, for which the UN has probably obtained another official definition, larger than any of the earlier ones.

At the same time, Forstall has updated his own list of the largest metropolitan areas, also to midyear 2003. Table 4 compares the new UN list of the twenty largest urban agglomerations with Forstall's twenty largest MAs.

Criteria for the Forstall MA's

What are the criteria used to arrive at the Forstall definitions? Generally they reflect and implement the long-standing recognition that large urban areas have in common a high settlement density, an overwhelmingly nonagricultural economy, and a high level of internal integration. Thus, the definitions include the continuous urban area around a city, and additional communities if they are supported primarily by daily commuters to the urban area. This generally means that at least 20 percent of the outlying community's working residents commute.

Other criteria for bounding the MA must be applied with numeric cutoffs geared to the settlement pattern of the region around the MA. Generally, territory included has a significantly higher population density than areas further out. For example, in the United States, areas with less than 70 persons per square mile (or roughly 30 per km2) are excluded even if they have high commuting. That particular density criterion would have

Table 4. THE 20 LARGEST WORLD METROPOLITAN AREAS IN 2003: UN AND FORSTALL DEFINITIONS
(Populations in thousands estimated for 1 July 2003. Ranks below 20 not shown.)

	UN Urban Agglomerations		Forstall Metropolitan Areas	
Name	Rank	Population	Rank	Population
Tokyo	1	35,000	1	32,450
Mexico City	2	18,700	3	20,450
New York	3	18,300	4	19,750
Sao Paulo	4	17,900	7	18,850
Mumbai (Bombay)	5	17,400	5	19,200
Delhi-New Delhi	6	14,100	8	18,600
Kolkata (Calcutta)	7	13,800	14	15,100
Buenos Aires	8	13,000	17	13,170
Shanghai	9	12,800	10	16,650
Jakarta	10	12,300	6	18,900
Los Angeles	11	12,000	13	15,250
Dhaka	12	11,600		10,960
Osaka-Kobe-Kyoto	13	11,200	9	17,375
Rio de Janeiro	14	11,200		11,650
Karachi	15	11,100	20	11,800
Beijing	16	10,800	19	12,500
Cairo	17	10,800	16	14,450
Moscow	18	10,500	15	15,000
Manila	19	10,400	11	16,300
Lagos	20	10,100		7,800
Seoul		9,700	2	20,550
London		7,600	18	12,875
Hong Kong-Shenzhen		7,000	12	15,800
TOP 20, UN		283,000		326,205
TOP 20, FORSTALL		274,400		345,020
Chicago		8,600		9,175

ludicrous results if applied in most of Europe, not to mention in India, China, or Japan. But MAs in those regions also can be bounded with population density as one of the criteria.

The Forstall MAs exclude areas with more than 35 percent of their working population engaged in agriculture. Evidently this criterion is of no use any more for drawing metropolitan boundaries in the U.S. or in most of Europe, but still has force in such countries as India, China, and Indonesia, and to some extent in Latin America.

No one set of numerical cutoffs can possibly work successfully applied worldwide; thus, a township with only 50 persons per km2 outside Chicago may be dominantly suburban demographically even though still mostly farmland, while a local subdivision in the outskirts of Kolkata or Dhaka may still be fully agrarian at 1500 persons per km2.

In a few cases, the Forstall list adopts an official definition for an MA, when it appears the result is very close to what a more detailed investigation would produce, or in some cases when local information is so limited that no better alternative is available.

It is quite possible that a knowledgeable specialist in each of the twenty largest areas would find cause to question Forstall's definition of his or her home metropolis. Comments on the definition offered, and possible alternative definitions that meet the general criteria described, are welcome and undoubtedly could improve the quality of the compiled list.

There are several things that these metropolitan areas are not. As already noted, they are not urban agglomerations but are conceptually somewhat larger. They are not worksheds or travel-to- work areas, defined solely on the basis of commuting, which

often would be larger because they have no population density constraint. They are not retail-trading areas, which typically are defined wall-to-wall so that every part of a region or country is included in some trading area, even if its links to any trading center are limited to occasional visits for shopping or medical service and do not involve significant daily commuting.

Finally, the MAs are not metropolitan regions. Although those who identify such regions do not always offer clear criteria, the definitions typically are a good deal larger than a single MA. They often include other MAs perceived as more or less closely related; but the posited links are not those of daily travel for work, but more specialized ones that may not even involve physical visits.

Likewise, these MAs do not in themselves fit the concept of a megalopolis, unless that term is taken as simply meaning a very large urban area. Whether any of them form part of a megalopolis would depend on the criteria adopted for defining that concept.

Comparing the UN and Forstall Lists

Seventeen of the twenty largest areas appear in both the UN and Forstall lists. The lists agree on Tokyo as the largest, but subsequent ranks often are very different. Thus Seoul, ranked in second position by Forstall, is not even in the UN's top twenty, because, as in their earlier list, the UN credits it with only its city-proper population. Forstall also ranks Hong Kong and London in the top twenty, replacing the UN's Dhaka, Rio, and Lagos.

As was true in the Table 1 comparisons, the UN's estimates tend to be considerably lower than Forstall's. For the total population of the UN twenty, the UN has

283 million, while Forstall has 326.2 million for the same list of areas, or about 15 percent more. It is normal for the MA definition of an area to have a little larger population than the urban agglomeration of the same area; for Tokyo, Mexico City, and Chicago, the MA totals range from 7 to 13 percent larger than the respective UA totals (Table 3).

Comparing the totals using the Forstall areas changes the picture considerably. The Forstall total for this set of areas is 345 million, while the UN credits the same areas with only 274.4 million. The difference of more than 25 percent reflects such aspects of the UN list as its omission of any Seoul suburbs. There also is a major difference between the two lists on Hong Kong, which Forstall combines with the adjacent city of Shenzhen as a single metropolitan area. The UN lists Hong Kong and Shenzhen as separate urban areas.

The 20 Largest MA's: Current Growth

The Forstall list is compiled to provide as comparable data as possible across the different metropolitan areas. It is interesting to look at current annual population growth rates for the MA's (Table 5). These rates are determined using constant geography, that is with earlier data referring to the territory included in the current MA definition. In reality, metropolitan areas, like urban agglomerations, expand geographically over time and add new population partly by incorporating existing settlements as they become suburbanized. Metropolitan growth rates based on moving geography would often be somewhat higher than shown. Compiling them in consistent fashion, however, would

Table 5. THE 20 LARGEST WORLD METROPOLITAN AREAS, 2003: DATA FOR FORSTALL DEFINITIONS
(Populations in thousands estimated for 1 July 2003. Ranks below 20 not shown.)

Name	Rank	Population	Average Annual Change, 2000-2003 Number	Percent	Area (km2)	Population per km2
Tokyo	1	32,450	213	0.66	8014	4049.2
Seoul	2	20,550	227	1.12	5076	4048.5
Mexico City	3	20,450	307	1.54	7346	2783.8
New York	4	19,750	120	0.61	17884	1104.3
Mumbai (Bombay)	5	19,200	472	2.53	2350	8170.2
Jakarta	6	18,900	225	1.21	5100	3705.9
Sao Paulo	7	18,850	289	1.57	8479	2223.1
Delhi-New Delhi	8	18,600	686	3.86	3182	5845.4
Osaka-Kobe-Kyoto	9	17,375	28	0.16	6930	2507.2
Shanghai	10	16,650	335	2.07	5177	3216.1
Manila	11	16,300	461	2.96	2521	6465.7
Hong Kong-Shenzhen	12	15,800	797	5.42	3051	5178.6
Los Angeles	13	15,250	205	1.38	10780	1414.7
Kolkata (Calcutta)	14	15,100	257	1.74	1785	8459.4
Moscow	15	15,000	103	0.69	14925	1005.0
Cairo	16	14,450	257	1.89	1600	9031.3
Buenos Aires	17	13,170	79	0.62	10888	1209.6
London	18	12,875	112	0.87	11391	1130.3
Beijing	19	12,500	301	2.49	6562	1904.9
Karachi	20	11,800	370	3.43	1100	10727.3
TOTAL, 20 METROPOLITAN AREAS		345,020	5844	1.72	134141	2572.1
Chicago		9,175	72	0.79	12028	762.8

call for redefining each MA at an earlier date using the same criteria as for the current date, a highly time-consuming procedure.

Measures of growth for MAs arguably represent a more accurate portrayal of an area's expansion than data for the urban agglomeration alone. This is all the more true as suburban development expands in metropolitan fringes beyond the continuous built-up area -- a phenomenon that now occurs in all large European and Western Hemisphere metropolises and is beginning to be evident around major Japanese, Chinese, and Indian cities as well.

Average annual population change ranges from a low of 28,000 in the barely growing Osaka MA up to an extrardinary 797,000 per year for Hong Kong-Shenzhen. Here most of the growth is occurring in Shenzhen, which has developed largely in the past 20 years as a major locus of export-oriented Chinese manufacturing. Next highest in amount of annual growth are Delhi, Mumbai, Manila, and Karachi.

The same five areas also have the highest current rates of annual growth, with Hong Kong-Shenzhen at 5.42 percent and Delhi and Karachi both at over 3 percent. The lowest rates, besides Osaka's 0.16 percent, are for New York (0.61), Buenos Aires (0.62), and Tokyo (0.66). Even at this low rate, Tokyo is currently growing by more than 200,000 a year, enough that if maintained will continue it as the world's largest MA for a number of years.

For all 20 areas together, annual growth totals more than 5.8 million, representing a rate of 1.72 percent per year. Nine of the 20 areas have higher rates than this average -- the three areas each in China and India, plus Karachi, Manila, and Cairo. Two of the

Latin American MAs, Sao Paulo and Mexico City, have rates slightly below the average, with Los Angeles next highest.

It may be surprising to find both Jakarta and Seoul appearing with still lower rates of growth. Both experienced rapid growth into the early 1990s, but then slowed sharply late in the decade.

The increase rate of 1.72 percent per year for the twenty areas may not seem especially high. What it does not reflect is the steady increase in the number of very large areas and their population. Inspection of the Table 5 data for 2003 population and annual growth since 2000 shows that in that three-year period, the number of MAs with at least 15 million has increased from 10 to 15, and the number with at least 20 million from one to three. At any size-level chosen, there continues to be a rapid increase in the number of very large MAs and hence in the total population living in such areas.

The Twenty Largest MA's: Area and Density

Table 5 also provides an estimate of the area (km2) and mean population density of each of the twenty MAs. The area estimates, though rough in some cases, provide an indication of the extent of each definition. In principle they refer to land area, although available data do not always permit excluding inland-water areas.

The largest MAs in extent are New York, with nearly 18,000 km2, followed by Moscow with about 15,000. The London, Buenos Aires and Los Angeles MAs also have more than 10,000 km2, and it should be noted that Chicago's MA is larger than these, at 12,028 km2. At the opposite extreme, the MAs of Karachi, Cairo, and Kolkata all are estimated at less than 2000 km2.

The largest MAs in extent tend to be those with large populations in low-density surroundings, where agriculture has offered little barrier to metropolitan expansion. The smallest MAs in extent are either in dense agricultural regions (Kolkata, Mumbai, Manila) or adjacent to areas of very low population density into which urban development has not made much penetration (Karachi, Cairo). Also, other factors being equal, MAs are larger if so situated that they can grow in most directions without encountering natural barriers (New York, Moscow, London, Chicago), and smaller if mountains, desert, or the sea interfere with generally symmetrical expansion (Cairo, Mumbai, Manila, Hong Kong).

The mean population density for the MAs, that is the density of all 20 areas taken together, is 2572 per km2. Individual MAs, however, range from Karachi's density of 10,727 per km2 to Moscow's 1005 per km2. (The Chicago MA's mean density is even lower at 763.) The highest mean densities occur in the areas that have the least low-density suburban development (Karachi, Cairo, Kolkata, Mumbai). Among U.S. MAs, Los Angeles has the highest mean density, in contrast to its image as an unfocused sprawl; it has relatively less low-density fringe development than New York or Chicago, which are not hemmed in by mountains and deserts.

Mean densities, of course, provide only a limited portrayal of the actual densities at which most people live in these metropolises. Data for census tracts or similar small components, if they could be gathered for all or most of these areas, would provide a much more sophisticated portrayal, and might be expected to confirm that the highest local densities occur in developing cities with topographically restricted sites, such as Hong Kong and Kolkata.

Conclusion

This paper has made an effort to clarify the statistical portrait of the world's most populous urban areas, and to explain that differences between published lists of such areas are due primarily to differences in geographical definitions. We have described six types of definitions, and chosen Tokyo, Mexico City, and Chicago as examples for statistical comparisons and map portrayal.

Each type of definition has both advantages and disadvantages. In any major metropolitan area, the administrative central city is an important entity and well known locally, and statistical data for it are essential to its efficient operation. However, it rarely provides a good basis for comparisons with other large urban areas except on limited issues of municipal administration. Likewise, definitions based on administrative areas larger than the central city may be useful locally but offer little comparability with other areas and other countries. This is particularly true of administrative cities and municipalities in China because of their practice of including extensive rural territory.

Urbanized areas or urban agglomerations have been favored for comparisons by many, and continue to be preferred by the UN, whose list of major areas is the most widely circulated. UAs are easy to understand conceptually, and reasonably easy to define in comparable fashion provided detailed local maps and population data are available. However, they generally have only a limited range of statistical data available because their boundaries do not follow the administrative lines preferred by censuses. Censuses that use them redefine them at each enumeration, which may sharply affect population growth rates, requiring users to decide whether they are interested in growth

including geographic expansion, or growth within a constant boundary. UAs also do not capture urban and suburban growth taking place in the zone just beyond the continuous urban area, although such growth now contributes a significant share of the metropolitan growth of many urban centers, especially in the Americas and Europe.

We have pointed out that a definition that approximates the UA in terms of small administrative units may provide a useful statistical alternative, although not as precise and much more extensive in area than a pure UA definition.

Officially defined metropolitan areas typically have a wide range of data available from censuses and other government statistical series. But while they provide comparable definitions within a country, these are not necessarily comparable with the official definitions of other countries, even when terms like "metropolitan area" are used officially by both.

Finally, an independent definition of metropolitan areas reflects the advantage of reasonably consistent criteria applied across contrasting areas and countries. On that basis it may claim a higher level of comparability for statistical results. The main disadvantage of independent definitions is the large amount of time required to arrive at them, and the difficulty of securing all of the information about each major area that ideally should be available. In addition, of course, few data in terms of an independent definition will be readily available.

Perhaps the time will come when the UN or some other international body will be able to devote the effort and resources necessary to produce consistent high-quality lists of the world's major metropolitan areas and its urban agglomerations. If so, it is safe to

predict that the effort will depend in large part on the active cooperation of local authorities and academic institutions in the countries and cities involved.

NOTES FOR TABLE 3

These notes specify the definition and character of each administrative or geographic area listed in the table, with sources. Some additional information appears in the main text, including the criteria used for Forstall's MA definitions.

TOKYO

City proper: the ku area (comprising 23 ku or wards) of Tokyo-to; see next entry.

Administrative area: Tokyo-to, metropolitan government and first-order subdivision of Japan, embracing Tokyo proper and various other cities and minor administrative subdivisions.

Urbanized area: total of contiguous or nearly contiguous Densely Inhabited Districts (DIDs) extending outwards from Tokyo proper. A DID is officially defined as "an area which is a group of contiguous Basic Unit Blocks each of which has a population density of 4,000 inhabitants or more per square kilometer, or which has public, industrial, educational and recreational facilities, and whose total population is 5,000 or more within a [city or other minor administrative subdivision]." (Japan Statistics Bureau, Densely Inhabited Districts. Tokyo, 2002, II.) This publication provides 2000 population, area and boundary maps for each DID, and 1995 populations not adjusted for later DIDs redefinitions. It does not provide totals of contiguous DIDs, which have been identified and totaled for this study. DIDs separated by less than 1.5 km have been treated as contiguous.

UA (administrative boundaries): total of those minor administrative subdivisions whose main DID is part of the contiguous DIDs area defined as described above.

Metropolitan area (1): Tokyo Metropolitan Area, defined as areas within 50 kilometers radius from Tokyo municipal office (Japan Statistics Bureau, Statistical Handbook of Japan 2003; www.stat.go.jp/english/data/handbook/c02cont.htm, 13). The 50-km radius is officially adjusted to conform to the closest administrative boundaries; for a map, see the Major Metropolitan Areas publication cited below, 711.

Metropolitan area (2): Keihinyo Major Metropolitan Area (MMA), defined on the basis of total commuting to four cities, Tokyo (ku area), Yokohama, Kawasaki, and Chiba. A minor administrative subdivision is included if its number of resident workers and students aged 15 and over commuting to these cities is at least 1.5 percent of its total resident population. Subdivisions completely surrounded by qualifying territory also are included (Japan Statistics Bureau, Population of Major Metropolitan Areas (1995 Population Census, Analytical Series No. 8), Tokyo, 1999). The MMA publication for 2000 has not yet been published; the definition is as of 1995, with its population updated to 2000 for this study.

Census data: Japan Statistics Bureau, 2000 Population Census of Japan, Vol. 1, Total Population (Tokyo, 2002). Provides 1 Oct 2000 census population and area, and 1 Oct 1995 census population within 2000 boundaries.

MEXICO CITY

City proper: Distrito Federal.

Administrative area: total of Distrito Federal and Estado de Mexico; occasionally shown as representing a generous metropolitan definition.

UA (administrative boundaries): within the official Area Metropolitana de la Ciudad de Mexico, those municipios identified as having "continuidad urbanistica" with Mexico City proper (Mexico, Instituto Nacional de Estadistica y Informatica (INEGI), XI Censo de Poblacion y Vivienda, 1990, Area Metropolitana de la Ciudad de Mexico (AMCM), Sintesis de Resultados, Mexico City, 1991). No analogous definition seen yet for 2000.

Metropolitan area (1): table dated 24 Nov 2003 listing component municipios, 2000 census population, and area for individual Zonas Metropolitanas, produced jointly by Consejo Nacional de Poblacion (CONAPO),
Secretaria de Desarrollo Social (SEDESOL), and INEGI.

Metropolitan area (2): definition from same source, but excluding municipios designated (P.U.).

Census data: for 14 Feb 2000 census, www.inegi.gob.mex/ext/default.asp?c=701; for 5 Nov 1995 census, tables available earlier on the INEGI website, subsequently supplanted by publications.

CHICAGO

City proper: Chicago city.

Administrative area: Cook County, including virtually all of Chicago proper and many suburbs.

Urbanized area: Chicago, IL-IN Urbanized Area. Land area and 2000 census population from www.census.gov/geo/www/ua/ua_state_100302.txt. For official UA criteria: www.census.gov/geo/www/ua/uafedreg031502.txt.

UA (administrative boundaries): defined for this study, comprising Chicago city and all townships with at least half their 2000 population included in the official urbanized area.

Metropolitan area (1): Chicago-Naperville-Joliet, IL-IN-WI Metropolitan Statistical Area, defined by the Office of Management and Budget as of 6 Jun 2003. 2000 and 1990

population totals and component areas from U.S. Census Bureau, Census 2000 PHC-T-29, www.census.gov/population/www/cen2000/phc-t29.html. For criteria for defining MSAs: www.census.gov/population/www/estimates/00-32997.pdf.

Metropolitan area (2): Chicago-Naperville-Michigan City, IL-IN-WI Combined Statistical Area. Sources as in preceding entry.

Census data: 1 Apr 2000 and 1 Apr 1990 census data, and land area, from U.S. Census Bureau, 2000 Census of Population and Housing, Population and Housing Unit Counts, PHC-3-15, Illinois, 16, Indiana, and 51, Wisconsin (Washington, DC, 2003); also accessible in pdf at www.census.gov.