American Comparative Urban Analysis: Looking at the Past to See the Future

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Civic leaders in metropolitan St. Louis reacted with alarm to the release of the 1990 Census data. While the region grew by 67,000 people over the decade of the 1980s, there was a net out migration of over 95,000. This was at least a somewhat better outcome than the 1970s when the region had a net population loss of over 50,000. It became obvious St. Louis was having trouble holding on to people. There followed a spate of regional analyses and recommendations by national experts including a Citistates Report and a MARC Study.[2] None of these reports produced a substantive regional response.

One initiative prompted by the regional anxiety has at least had viability if not significant impact. The St. Louis Metropolitan Planning Organization, East-West Gateway Coordinating Council (EWG),[3] published in 1992 a compilation of data on American metropolitan areas titled *Where We Stand* (*WWS*). It released updated editions in 1996, 1999, and 2002. The series of reports provide robust comparative data on indicators of the region's standard of living and relative standing among peer regions. The eight domains in the reports cover the multidisciplinary areas of population dynamics, regional economic vitality, leadership and governance, individual and family well-being, education, crime, and urban form and quality of life. In total, *WWS* applies 104 different indicators.

The original edition of *WWS* recorded data for 29 comparison regions selected because of their similarity to metropolitan St. Louis. The three successive editions measure St. Louis against 34 peer regions. The criteria employed to establish the peers are population, proximity, and economy. More specifically, the peer regions have a population of at least 950,000 and that region either is within 500 miles of St. Louis or it has a similar economic function (*WWS*, p.14, 2002). EWG liberally applies this last criterion so that the comparison metropolitan areas include Boston, Los Angeles, Miami, New York, Philadelphia, San Francisco, and Seattle.

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[1] Larry Handlin, Senior Research Specialist, Jeffery Roorda, Graduate Research Assistant, and Paul Werner, Student Assistant of the Public Policy Research Center staff contributed to the data collection and analysis developed in this research project.

[2] The Citistates Group completed a report for the St. Louis Post-Dispatch in 1997 (http://www.citistates.com/reports.html) and the Metropolitan Area Research Corporation completed a study in 1999 (http://www.metroresearch.org/maps/region_m)

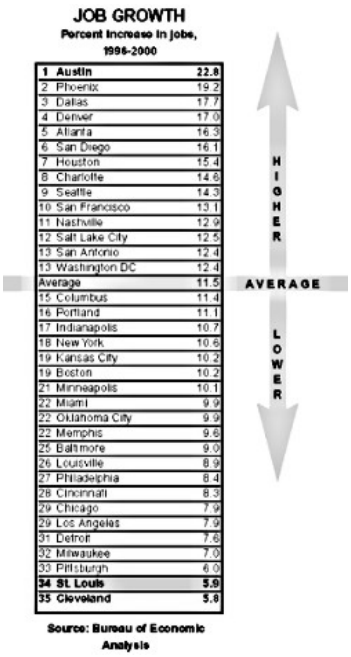
[3] In February 2004 the Board of Directors of East-West Gateway Coordinating Council changed the name of the organization to East-West Gateway Council of Governments.

While EWG's primary role is transportation planning, it is one of the few organizations in metropolitan St. Louis that has a regional function. The City of St. Louis and seven county governments in the Missouri-Illinois region founded it in 1965. Of the 21 voting members on its Board of Directors, seven are chief elected officials from county and municipal governments in Missouri and seven are chief elected officials from county and municipal governments in Illinois. Consequently, the organization's professional staff works in a highly political environment.

The stated purpose of the initial report was to stimulate a regional conversation about where St. Louis stands in relation to other metropolitan areas. In the tradition of Carroll Wright and William F. Ogburn,[4] *WWS* records indicator data without interpretation (Cobb and Rixford, 1998). As EWG has released successive reports, it has incorporated modest description of changing conditions in the St. Louis region. Each report consists of pages of tables rank ordering the metropolitan areas on each indicator (Figure 1). EWG presents the data without analysis of the relationship among the indicators or trends in metropolitan rankings. There has been to this point no external analysis of EWG's reports.

Two aspects of *WWS* that make an illustrative case study for the application of indicators in examining the conditions in political jurisdictions are 1) the use of indicator data to establish a ranking, and 2) the metropolitan area as the geographic area of analysis. The use of indicators has considerable precedent but this paper raises two methodological questions when applying them to compare metropolitan areas: how to present data comparing metropolitan areas and how to analyze data comparing metropolitan areas.

Figure 1



Source: Where We Stand 1996

Applications of Indicators

Bauer's definition of indicators provides the namesake for *WWS* when he describes them as " . . . statistics, statistical series, and all other forms of evidence . . . that enable us to assess **where we stand** and are going with respect to our values and goals, and to evaluate specific programs and determine their impact." (Bauer, 1966, pg. 1) This definition includes three components: data, simple trend analysis, and more advanced program evaluation. Cobb and Rixford argue that indicators are inherently ineffective if only developed for descriptive purposes. They assert that indicators have meaning when they are analyzed (Cobb and Rixford, 1998). The U.S. Department of Health, Education, and Welfare included in an early definition of social indicators the principle that indicators create the means to assess whether conditions are getting better or worse (Carley, 1981)

[4] Wright became director of the Massachusetts Bureau of Statistics of Labor in 1873 and Ogburn was director of research at the Research Committee on Social Trends in the 1930s. They are leading figures in establishing at the state and federal level that statistical reports by government agencies should present data and trends but not interpret the data nor make policy recommendations.

Indicators have been used for well over 100 years to measure conditions at a national level. Late in the 19th Century both the labor and temperance movements in the United States collected statistics in an effort to influence national policy. (Cobb and Rixford, 1998) One of the earliest applications at the subnational level was a study prepared by the Russell Sage Foundation in 1914 on the conditions in manufacturing plants in Pittsburgh. Like *WWS* decades later, the expressed purpose of the Sage study was "…influencing public opinion and mobilizing people to press for reform." (Gahin and Paterson, pg. 348)

Up to World War II, indicator studies typically focused on one issue area (Sawicki and Flynn, 1966). The wave of indicator projects in the latter half of the 20th Century, however, turned to overall "quality of life" measures. Studies started to examine well-being from multiple perspectives: economic, social, and environmental (Kingsley, 1999).

WWS is uncommon in its use of indicators to compare metropolitan areas. Indicators often are used to describe an individual jurisdiction and there are a wide variety of applications of indicators to compare cities and nations. Most accessible are reports in the American popular press, especially business magazines. They are replete with comparative rankings of cities. A small sample includes Forbes Magazine's Best Places for Business and Careers, Money Magazine's Hottest Towns and Best Places to Live. Inc. Magazine's Top Cities for Doing Business, AARP Magazine's 15 Best Places to Reinvent Your Life. Each of these reports selects about 5 to 10 indicators and bases their ranking of regions on an average or an index. Some will just list the top 10 or 25 regions; others will rank all the regions available from the selected data sources. Often the methodology changes to come up with a fresh list each year (Kotkin, 2004)

WWS mirrors a series of 1970s studies produced by the Urban Institute (Flax, 1972). The Urban Institute compared the Washington, D.C. region to 17 other large metropolitan areas. A single indicator is applied in 14 categories or domains to measure different aspects of quality of life "...to aid urban planning and administrative decision-making by providing a more quantitative picture of many complex functional areas." (pg. 11) They aspire only to describe current conditions and how they have changed, not to explain why conditions exist, how they might be improved, nor to establish the value of any public program.

Their report applies three measures of Washington D.C. as a demonstration of what can be done with comparative indicators.

1. Comparing Washington with its past to determine if conditions are better or worse over time.
2. Comparing conditions in Washington to those in other large metropolitan areas using the most current data available.
3. Comparing Washington's rate of change with those of other large metropolitan areas to determine if it is improving or deteriorating at a faster than average rate.

Both the EWG and Urban Institute sets of reports use a selection of American metropolitan areas as a means of measuring one metropolitan area's relative performance. Both rank the metropolitan areas on a group of indicators. The Urban Institute report differs in separating the comparison regions into size groups in the indicator tables. Both primarily rely on data provided by federal government agencies although a few indicators

come from other secondary sources. The EWG reports differ primarily in the use of a large number of indicators for each domain.

In a more contemporary application Agostini and Richardson adapted the Human Development Index (HDI) of the United Nations Development Program for comparisons among U.S. cities (Agostini and Richardson, 1997). The HDI was developed in 1990 for comparing changing conditions of 130 national populations using three measures: life expectancy, adult literacy, and real percapita income (adjusted for purchasing power). Each indicator is indexed against fixed minimum and maximum values. The three resulting values are averaged to create the HDI for a particular nation. The nations are then rank ordered based on the index values.

Agostini and Richardson calculated a HDI for 25 U.S. cities.[5] They could not exactly duplicate the United Nations HDI because of a lack of data and a lack of variation. For example, they were not able to find adult literacy data disaggregated by city for many of the cities in their sample. Those cities for which they could find data had essentially no variation on that indicator. All had values in the high 90 percents. After consulting with the United Nations Human Development Report Office, the authors used several indicators to measure the domains of health, education, and income. Life expectancy, child mortality, and maternal mortality were applied as health indicators; mean years of school, 16-19 year old enrollment and graduation rate, and college and post-college graduates as education indicators, and real per capita income, distribution adjusted real per capita income, and incidence of poverty as income indicators.

The cities then were rank ordered for each domain and an overall HDI calculated. They developed and tested four hypotheses to understand the results. They examined whether city size, racial composition, industrial mix, or occupational mix of the workforce influenced the HDI. Correlation statistics showed that a high HDI correlated positively with the percentage of the population in white-collar employment and the percentage of the population that is Asia-American population and negatively with blue-collar employment and African-American population. Additional analysis determined that white-collar employment explained 75 percent of the variation in city ranking.

The extensive indicators literature identifies two particular characteristics of their effective application in jurisdictional studies. First of all, the indicators must be used as a measurement of some goal or value. Rather than just a description of conditions, indicators should be used to assess quality of life, sustainability, or some other norm. Secondly, the data must be analyzed to some degree. Whether it is creation of an index or a regression analysis to determine a causal variable, indicator reports that contribute to understanding conditions, not just knowing conditions, include analysis.

Presenting Quality Data

The Organization for Economic Co-operation and Development (OECD) does extensive work in the application of comparative indicators. OECD also contributes to evaluating the use of indicators. Its report *Quality Framework and Guidelines for OECD Statistical Activities* identifies seven dimensions of data quality (OECD, 2003). Applying these dimensions to an evaluation of *WWS*, there are some it meets the quality standards

[5] 22 of their 25 cities are the central cities for regions in the *WWS* reports.

and others on which either it fails or is challenged when applying indicators to compare metropolitan areas.

Accuracy is determined by the match between the population represented in the data and the actual population in the defined jurisdiction. All of the data in *WWS* comes from reliable secondary sources. Much of the data comes from U.S. government agencies including the Bureau of the Census, the Departments of Justice and Labor, and the Environmental Protection Agency. Other sources include the Brookings Institution, the Federal Reserve Bank and the National Center for Education Statistics. The metadata recorded in *WWS* identifies the source of the data and where necessary describes the data (e.g., crimes per 100,000 population).

Accessibility refers to the formats through which the data are available. Because of the large number of indicators and because they are not selected to calculate a summary measure, the primary format for distributing the *WWS* indicators is a hard copy publication of about 75 to 80 pages. The 2002 edition of the report also is obtainable on the EWG website in several .pdf files by groups of domains. The data are not available for comparing across groups of metropolitan areas or selecting specific indicators for comparison without manual manipulation. The availability in these formats limits the penetration the data can make into the community. For a report with the expressed goal of stimulating discussion among citizens of the region, neither the concept of a wide range of indicators with no summary measure nor the media through which they are distributed facilitate easy access.

Coherence requires consistency within a dataset, across datasets, over time, and across metropolitan areas. Within the *WWS* data sets there is no problem. Each of the indicators measures a distinct phenomenon. Consistency across datasets is problematic. There have been changes in application of the value scale. For example in 1996 infant mortality rate was listed with the metropolitan area with the lowest rate as 1 and the highest as 35. The value scale in that report ranked 'better' as lower numbers and 'worse' as higher numbers In the 2002 report, the scale was reversed and the metropolitan area with the most infant deaths before age one per 1,000 live births was listed as 1 and the least as 35. The value scale in that report ranked 'higher' numbers as 1 and 'lower' numbers at 35. This change in value scale affected a number of indicators.

Coherence across time also was compromised. In the earlier reports, where there were two or more metropolitan areas with the same score, the numeric ranking continued in ordinal rank based in alphabetic sequence. For example, in the 1999 report both Minneapolis and Kansas City had the same percent of their population under age 18 (26.6 percent). In the report Minneapolis was the 11th metropolitan area in the ranking and Kansas City was ranked 12th (in descending alphabetical order). In the later edition, tie scores were accounted for by ranking all the metropolitan areas with the same score with the same rank. For example, in the 2002 report, the table for the indicator population under age 18 had a maximum rank of 23 because of numerous repeats among the 35 regions listed. Atlanta, Indianapolis, Kansas City and Cincinnati had the same percentage of population younger than 18 (27.6 percent). While they were the 8th through the 11th metropolitan areas listed in the ranking, they were all scored 8 and the

next metropolitan area, the twelfth to appear listed, was ranked 9. The same was true for Charlotte, Cleveland, Philadelphia, and Austin, all ranked 16. This same change in determining ranking applied to all tables in the 1999 and 2002 reports. Any analysis comparing change in ranking over time was thwarted by this change.

Coherence in the presentation of data across metropolitan areas was generally less of a problem because the same 34 comparison metropolitan areas have been used since 1996. There are, however, some indicators, particularly crime statistics, for which data is not available for all 34 areas so the tables for those indicators are incomplete.

Credibility refers to the trust users have that the producer has prepared objective data. There are two issues affecting the credibility of *WWS*. In an effort to be both inclusive and open, EWG selects indicators to include in the report through a steering committee composed of volunteers from public agencies, non-profit organizations, and corporations. This approach avoids a threat of bias from a strictly internal staff process selecting the indicators. The size of the committee and their professional experience with indicators on the one hand guarantees a large number of in some cases disparate indicators and on the other a lack of rigour in developing an indicator project. The result is a mixture descriptive and outcome indicators that are informative but there is an absence of predictive, problem-oriented, or evaluation indicators.

What is disturbing about the sample of "peer" regions is the number of regions similar to St. Louis that are not included in the rankings and the number of regions dissimilar to St. Louis that are included. It is noteworthy that *WWS* establishes a lower-limit for population of peer regions but doesn't establish a population ceiling. The St. Louis metropolitan area with a 2000 census population of just over 2.6 million is compared to regions like Louisville and Oklahoma City with populations of just over one million as well as being measured-up against super-regions such as Los Angeles and New York whose populations eclipse nine million.

Moreover, there are a number of regions that are arguably more comparable to St. Louis than those examined in *WWS* that are excluded from the list of peer regions. The 2002 Public Policy Research Center (PPRC) report *The Economy of Metropolitan St. Louis* established criteria for determining similarity among metropolitan regions (Tranel, pp. 37-46, 2002). Those criteria included measures of income, industrial mix, population characteristics, and other variables such as unemployment rate. Two of the five metropolitan areas in the United States found to be most similar to St. Louis in the PPRC report are not included in the peer regions identified in *WWS*. They are the Newark PMSA with a 2000 population of 2,032,989 and the Oakland PMSA with a 2000 population of 2,392,557.

Interpretability is defined in the OECD guidelines as the ease with which the user may understand and properly use and analyze the data. While EWG has introductory and concluding comments with each report, there is no summary number. On its website EWG has a pop culture Top 10 List that provides descriptive comparison of some of the indicators, such as "We're Getting Older But Not Smarter" comparing the median age and adults with Bachelor's degrees indicators and "The Streets Might Be Safe, But the Highways Aren't" comparing the metropolitan crime rate and deaths from motor vehicle crashes.

In the trends section of the 1999 *WWS* report, data is presented on how much change there was in St. Louis since the 1996 release (Table 1). About 65 percent of the indicators were updated in the later report. Of the updated indicators, about 70 percent resulted in a change in rank for St. Louis. The average reader of the report can easily understand this interpretation of the data but it is not very useful for informing the user of changing condition in St. Louis. It only says how conditions have changed in St. Louis relative to other metropolitan areas. It says half the indicators improved and half got worse. Because the only analysis is of the change in ranking, not the change in the data reported along with the ranking, it doesn't inform how much better or how much worse and it implies that all indicators are of equal weight in assessing conditions.

Table 1
EWG analysis of Change

Change in Ranks 1996 to 1999	Number of Indicators	Number of Updated Indicators	Number of Changed Ranks	Type of Change Observed
Demographics	20	15	7	increase in 1; decline in 6
Economics	15	12	9	improvement in 4; decline in 5
Governance	9	2	1	increase in 0; decline in 1
Well-Being	15	9	8	improvement in 3; decline in 5
Education	10	3	3	improvement in 2; decline in 1
Crime	8	78	6	improvement in 5; decline in 0
Urban Form/Quality of Life	8	8	6	improvement in 4; decline in 2
Total	85	56	39	improvement in 19; decline in 20

An appropriate question for a comparative report is not answered in the analysis in Table 1: how much change there was in St. Louis compared to how much change there was in the other 34 regions. The debatable list of peer regions notwithstanding, a determination of the overall ranking among comparable metro areas is of great interest to those concerned with the future of metropolitan St. Louis. A good starting place, although perhaps less than an exact measurement of overall metropolitan standing, an average ranking calculated for the 35 regions in the *WWS* report. The Public Policy Research Center used the *WWS* data to create an overall ranking of metropolitan areas.

To reach meaningful conclusions about overall ranking from the data in *WWS*, some value judgments were necessary. In the most recent edition of *WWS*, all data is listed highest-to-lowest with the highest observation ranked as number 1. In other words, the metro area with the highest murder rate would receive a ranking of 1 just as the metropolis with the highest median income would receive a ranking of 1. In previous editions of *WWS*, rankings were arranged from best to worst where that conclusion was relatively clear (*WWS*, p. 7, 1996).

In order to meaningfully compare the data for this analysis, all of the variables had to be looked at from best to worst. Although that requires a normative judgment in

some cases, the standard for reaching the best-worst determination is derived from the question, "Where would St. Louis like to be as a region?" Clearly, the answer is that it would be preferable to have the highest median income and the lowest murder rate. In other categories, such as units of local government, the best or worst ranking is not as clear. For those types of variables, the standard used was generally "bigger is better," although a salient argument could be made to the contrary.

Table 2
Overall average rank of MSA/PMSAs
Included in *Where We Stand*.

	METROPOLITAN AREA	OVERALL AVERAGE RANK
1	Seattle	11.04
2	Boston	12.16
3	Minneapolis	12.38
4	Denver	12.87
5	San Francisco	13.46
6	Austin	13.89
7	Washington DC	14.08
8	San Diego	14.63
9	Portland	15.94
10	Dallas	16.29
11	Atlanta	16.53
12	Kansas City	17.15
13	Houston	17.19
14	Columbus	17.24
15	Chicago	17.64
16	Salt Lake City	17.71
17	Phoenix	17.78
18	Indianapolis	17.90
19	Cincinnati	18.35
20	New York	18.40
21	Pittsburgh	18.44
22	Detroit	18.89
23	Milwaukee	19.19
24	Charlotte	19.26
25	Nashville	19.36
26	Philadelphia	19.41
27	St. Louis	19.69
28	Cleveland	19.73
29	Los Angeles	19.74
30	San Antonio	19.83
31	Baltimore	20.18
32	Louisville	20.37
33	Oklahoma City	21.90
34	Miami	22.74
35	Memphis	24.66

Applying this methodology, St. Louis is ranked 27th out of the 35 metro regions examined. Taking away the three most populous regions and the three least populous

regions (which pares the population range down to 1.2 million to 5.1 million), St. Louis ranks 25th out of 29 regions.

Population and demographic variables in *WWS* were not included in the process of determining an average overall ranking for the regions because population and demographic statistics tend to defy a best-to-worst rating. The ordinal rankings for the remaining 81 variables and the ordinal rankings by category are detailed in Appendix I.

The mean was used as the measure of central tendency in determining the average overall ranking. The mode would have been a fairly meaningless measure for the purpose of this analysis and the median wouldn't have provided the degree of variation necessary to distinguish "where we stand."

It must be acknowledged that the use of ordinal data is open to criticism in this context for two reasons. First of all, the use of ordinal rankings holds all things equal across all variables. There is no weighting scheme that reflects, for instance, that the "Gross Metropolitan Product" is a more meaningful measure of metropolitan prosperity than the number of "Utility Patents." Secondly, ordinal data by definition is insensitive to the degree of interval between observations. Miami's crime rate is nearly 1300 points higher than that of Memphis. Memphis is only about 370 points higher than San Antonio in crime rate. Yet, Miami, Memphis, and San Antonio are ranked 1-2-3 in crime rate despite the vast difference in the intervals between them.

Although the use of ordinal rankings to determine an overall average ranking is not a flawless method of determining where St. Louis rates among other metropolitan areas, the resulting data has some degree of credibility. Intuitively, one might expect to see Seattle, Minneapolis, and Denver at the top. Those metropolitan areas are commonly regarded as great places to live and models for regional vitality. Likewise, metropolitan areas including Memphis, Miami, and Baltimore might be expected at the bottom of the list based on anecdotal evidence. The challenges to urban renewal and regional prosperity in those metropolitan areas have been widely publicized. Having a statistical assessment of the data included in *WWS* hopefully creates more utility for stimulating discussion about where metropolitan St. Louis wants to be.

The basic purpose of the ranking scheme is to graphically display how St. Louis compares to the other metropolitan areas. Those at the top of the list purportedly are doing well, those at the bottom of the not so well, if indeed perhaps doing quite badly. But what does a rank of 1 – 35 really mean about the range of conditions in those metropolitan areas on the selected indicator. What is not done in *WWS* and what is not done in other comparison rankings is to calculate how much difference there is within the given indicator.

Data for 16 indicators was transcribed into an Excel spreadsheet for analysis. A limited number of the over 100 indicators were selected based on three criteria. The same indicator had to be used in both the 1996 and 2002 reports. There were 68 indicators that appeared in only one of the two reports. The data used in the two reports had to measure distinct time periods. For many indicators in the 1996 report, the data covered 1990 –1993 and in the 2002 report covered 1990 – 2000; the data covered overlapping time. Indicators were selected if the time covered by the data did not overlap.

Table 3
Indicator Analysis

Indicators	St. Louis Data	Mean	Standard Deviation
Households	.07	.16	.13
Households Growth	-.24	.15	.65
Job Growth	.20	1.77	6.44
Earnings per Job	.17	.24	.11
Business Growth	-.70	.17	1.79
Minority Firms	.47	.50	.52
College Graduates	.01	.05	.14
Pupil to Teacher Ratio	.28	.07	.13
Spending per Pupil	.46	.47	.22
Education Spending	.06	-.05	.15
MSA Crime Rate	.22	.23	.10
Central City/Suburban Crime Ratio	-.21	-.01	.14
Infant Mortality	.28	.22	.10
Accidental Death Rate	.00	-.08	.14
Poverty Rate	.10	.08	.11
Local Government Spending	.27	.22	.07

And at least two indicators were included from each of the domains.

For each of these indicators the mean and standard deviation was calculated. Table 3 shows that for only one of the 16 indicators the score for St. Louis fell outside one standard deviation from the mean. The calculation in Table 3 does not refute the general claim in *WWS* that St. Louis is not doing as well as other metropolitan areas. For 14 of the 16 indicators, St. Louis is below the mean. But what this calculation does show is that St. Louis is not that much different from the other metropolitan areas. What the selected indicators show for the selected metropolitan areas is that they all have generally the same characteristics and they all generally have the same problems.

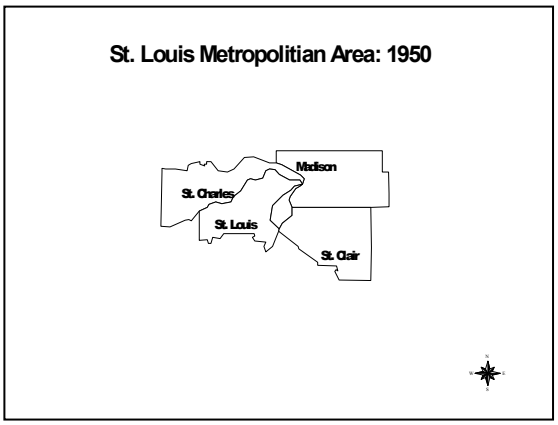
Relevance is determined by whether the users of the data find it covers the required topics and uses appropriate concepts. There is an objective and a subjective challenge to the relevance of the data in *WWS*. The objective challenge is caused by the growth of the metropolitan St. Louis area as well as the comparison metropolitan areas. While St. Louis has been stagnant in terms of population growth, physically it has grown considerably.

The geographic expansion of the metropolitan St. Louis area over the last 50 years is shown in maps 1 and 2. In 1950 the U.S. Census Bureau defined the St. Louis MSA to include the City of St. Louis (which is a coterminous county government), two Missouri and two Illinois counties. In both 1960 and 1970 the Census Bureau added one additional Missouri county to the St. Louis MSA. Two Illinois counties were added in 1980 and another Illinois county in 1990. In 1992, the Census Bureau added three Missouri counties.

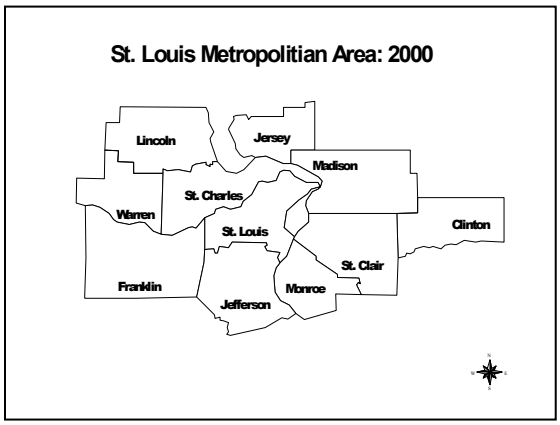
This trend continued over the decade of the 1990s. Over the course of the 4 *WWS* reports, metropolitan St. Louis was comprised of 12 counties. In-mid 2003, the Bureau of the Census released new definitions of metropolitan areas. The new definition for St. Louis added four counties, two in Illinois and two in Missouri. Of the comparison

metropolitan areas, 20 of the 34 grew by between one and eight counties as a result of the 2003 Census definition. Metropolitan areas are a fluid physical concept, complicating the comparability of indicator data over time.

Map 1



Map 2



Source: U.S. Census Bureau

Subjectively, there are very few individuals and organization in metropolitan St. Louis that function at the regional level. On the one hand this fills a critical information gap because there is no other resource that 'paints a picture' of the region. It creates information about the context in which most individuals and organizations function. But because very few have regional exposure or responsibility, the information is more interesting than it is useful.

In addition, the unusually large number of indicators featured in *WWS* allows a wide range of decision makers and regional citizens to find something relevant to their interest. Civil rights advocates, educators, health care administrators, and public safety professionals, among many others, all can find at least a few indicators in the tri-annual reports that inform them. But the majority of the indicators relate only to the general population. There are a few indicators in some of the domains that provide data by age or racial groups. For the most part, however, the data are not relevant to subpopulations, whether demographic, geographic, or special interest. Without disaggregating the data there is no ability to determine whether or not all residents of the region are equally affected by the conditions represented in the indicator. In most, if not all cases, there are modest, and sometimes severe, impacts on particular groups. Knowing these disparate impacts is important in determining the causes of the condition documented in the indicator, as well as appropriate action in response.

Timeliness refers to the time lag between collection of the data and its publication, to the time period for which the data is useful for consideration and action, and whether or not there is a publication schedule that is kept. There was a gap of four years between the first and second editions of *WWS* but since 1996 it has been published every three years. This publication schedule is both regular and frequent enough that the data presented generally represents current conditions for decision makers and metropolitan residents to consider.

So Where Do We Stand?

Where We Stand is an apt descriptor not only for the relative condition of metropolitan St. Louis compared to select other metropolitan areas, but also for the condition of using indicators for comparative jurisdictional depiction and analysis. There are two interests that must be accounted for in this type of application – the interest of the community in obtaining information that can direct as well as educate and the interest of academics in professional statistical standards. These two interests can be at odds and an active effort is required to resolve their differences. "Only by bridging the gap between the complexity of statistical methods, and the needs of users in having clear and understandable results, can official statistics be seen by public opinion as the most trustworthy source of information." (Giovannini, 2003)

These competing interests can be examined on four dimensions as shown in Table 4.

Table 4
Indictor Dimension Matrix

	PRESENTING DATA	ANALYZING DATA
Ranking		
Metropolitan Area		

The appropriateness of ranking A ranking scheme is at once useful and misleading. While it does utilize a valid method for comparing regional standing on indicators it can create a false impression that there is consequentially a significant difference between the region at the top of the list and the one at the bottom of the list in the condition represented by the indicator.

The usefulness of metropolitan geography Metropolitan geography continues to evolve, that is expand, particularly in the United States. Indictor reports should be updated to include the current geography in the data from previous reports in order for metropolitan areas to be validly compared over time. Metropolitan areas are the economic engines of the U.S. economy (DRI●WEFA, 2002) It is therefore critical to understand what can improve conditions in metropolitan areas. Their importance does not, however, excuse the challenge of compiling valid data to measure their changing conditions, especially data to measure them over time.

The complexity of presenting data The value of any comparative information is enhance by the number of the comparables and the degree to which they compare. A report on conditions in metropolitan St. Louis that compares it to one other metropolitan area is obviously not as useful as a report that compares it to 20 or 30. But if expanding the base of comparables means including metropolitan areas that differ significantly from St. Louis in the demographic composition of the population, the enhanced statistical validity can be negated by less useful policy implications from widely divergent metropolitan circumstances.

The necessity of analyzing data The methodological and comparative issues that were raised in the previous sections regarding the ordinal ranking of metropolitan areas across a wide range of topics and issues become apparent when specific topics of *WWS* are analyzed more closely. A good example of these issues comes to light when deaths from motor vehicle crashes by metropolitan area are analyzed using different criteria.

Table 5
Motor Vehicle Deaths, 1997

	1997							
MSA	Number of Counties	Square Miles	Population/ Square Mile	MV Deaths	MV Deaths/100K Population	MV Deaths/ 10 Square Miles	Rank 100K Population	Rank 10 Square Miles
Boston	5	3,388	1,138	284	7.4	8.4	16	6
Cleveland	6	2,706	824	191	8.6	7.1	13	8
Dallas	8	6,187	504	550	17.6	8.9	5	5
Denver	5	3,730	510	256	13.5	6.9	8	9
Detroit	6	3,896	1,147	595	13.3	15.3	9	2
Indianapolis	9	3,522	427	208	13.8	5.9	7	11
Memphis	5	3,006	360	241	22.3	8.0	1	7
Milwaukee	4	1,461	917	131	9.0	9.3	12	4
Nashville	8	4,111	277	227	20.0	5.5	2	13
New York	8	1,141	7,581	670	7.7	58.7	15	1
Oklahoma	6	4,247	243	194	18.8	4.6	3	14
Phoenix	2	14,573	195	517	18.2	3.5	4	16
Portland	6	5,192	345	221	12.3	4.3	10	15
San Diego	1	4,200	648	266	9.8	6.3	11	10
San Francisco	3	1,010	164	133	8.0	13.1	14	3
St. Louis	12	6,428	398	375	14.7	5.8	6	12
Sample Average	6	4,657	1,293	301	15.3	12.5		

In the 2002 *WWS*, population normalized the number of motor vehicle deaths across the 35 selected metropolitan areas. In a recent press release from the EWG entitled the "Where We Stand Top Ten List", St. Louis was cited for a below average crime rate and an above average number of deaths from motor vehicle crashes with the caption "The Streets Might Be Safe, But the Highways Aren't". According to the data, St. Louis had 15.5 motor vehicle deaths for every 100,000 persons while the average for the 35 selected metros was 12.9. Was St. Louis really a more dangerous place to drive than 24 metropolitan areas ranked below it?

Being below average for the widely disparate set of 35 metropolitan areas was cause for further investigation and while total population was an important factor to consider, population density and the land area of the metropolitan area were equally important. Generally, it appeared from the *WWS* rankings that metropolitan areas with the highest populations had lower rankings and those with lower populations had higher rankings, suggesting that population density and the land area of the area was a

significant determinant in the ranking. To verify if this held true for St. Louis and a sample of selected metropolitan areas, data on motor vehicle deaths, land area, and population data were assembled in order to calculate whether the size of the land area and the density of population had an effect on the ranking by motor vehicle deaths. Data was collected for the individual counties of a sample of sixteen (16) metropolitan areas used in the original analysis. Including St. Louis, the top five (Memphis, Nashville, Oklahoma City, Phoenix and Dallas) and the bottom six (Boston, New York, San Francisco, Cleveland, Milwaukee and San Diego) were selected as well as two immediately above (Detroit and Denver) and below the average (Indianapolis and Portland).

Data for motor vehicle deaths by individual counties (1997) of each of the sample metropolitan areas was collected from the same source as the *WWS* table, Health and Health Care in the United States, 2nd Edition, 2000. (Data for individual counties was for 1997 and the metropolitan data as presented in *WWS* was for 1998.) Population estimates for 1997 were collected from archived files of the Federal and State Cooperative Estimate Program (FSCEP) and land area data was assembled from the U.S. Census Bureau Quick County Information. For each county in a metropolitan area the number of motor vehicle deaths was then calculated per ten square miles of land area and ranked from the highest to the lowest. Because of the wide range of population size (8,650,056 in New York to 1,030,195 in Oklahoma City) and land area (14,573 square miles in Phoenix to 1,010 in San Francisco) it would appear that more densely populated areas had higher rankings due to shorter driving distances, greater access to other modes of transportation such as light rail and buses and slower driving speeds due to higher levels of congestion. Conversely, metropolitan areas with large land areas would have more miles of highways and roads, faster driving times and lower levels of congestion. The new rankings based upon the size of the metropolitan area land area (motor vehicle deaths per 10 square miles) generally reversed the metropolitan area rankings.

From the Table 5 it can be seen that generally metropolitan areas that had been ranked below average when normalized by population were ranked above average when normalized by land area (motor vehicles deaths per 10 square miles). In addition, metropolitan areas that had been ranked near the sample average generally were ranked near the average under either ranking. This demonstrates the problematic nature of ranking widely disparate metropolitan areas in spite of the method and choice of normalization. Higher population densities mean more deaths per square mile in spite of shorter driving distances and more transportation options. A more appropriate unit of analysis would appear to be counties within each metropolitan area. This would seem suitable given the wide differences found at the metropolitan level and the range of densities and land area found across counties within an area. Again, this would be indicated by the disparity found in the above sample of metro areas, such as the population density (7,581.1 in New York to 164.1 in San Francisco), the number of counties (12 in St. Louis to 1 in San Diego) and the gross number of motor vehicle deaths (670 in New York to 131 in Milwaukee). The analysis of individual counties could provide a more meaningful ranking of "driving safety" given that areas with more similar densities and road conditions would be compared. Center cities would be compared to center cities and outer suburban counties would be compared more appropriately.

Comparative metropolitan analysis thus is a commonly used methodology for both quality and temporal measurement. Rankings have the potential to assess effectiveness for policy makers and at the same time provide the metropolitan population with accessible information. While substantial work has been done to develop a rigorous design for comparative analysis at other levels of geography, metropolitan areas are typically compared using indicators with little additional analysis. Both policy makers and the metropolitan population would benefit from having appropriate analysis of indicator data to accurately know where they stand.

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