

Uneven Urban Landscapes: Built Investments in Indiana's Metropolitan Regions, 1990–2001



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Current research at the Center is focused on investment strategies to enhance the quality of life in Indiana communities, and this report is one result of that ongoing research. For more information about the Center or the research reported here, contact the Center at 317-261-3000 or visit the Center's Web site at www.urbancenter.iupui.edu



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EXECUTIVE SUMMARY

Regular investments in buildings and infrastructure—the built investment—of metropolitan regions are often signs of economic strength and developmental progress. These investments create built environments in our metropolitan areas that support the residential lives of citizens and the economic life of the region’s businesses, agencies, and other organizations. Most importantly, the patterns of built investments during the past decade establish, for better or worse, the potential for future economic development in the state.

Yet, despite the importance of built investments, very few data sources give analysts the opportunity to track the comparative progress of the various construction activities in metropolitan areas. Using a proprietary database purchased from F.W. Dodge, a division of McGraw Hill Information Services, the Center for Urban Policy and the Environment (Center) has begun to measure built investment in different metropolitan areas. Earlier the Center reported on patterns of built investment in Central Indiana and documented trends relative to the nation.¹ These analyses identified several potential trouble spots when construction patterns in the entire 44-county Central Indiana region were compared with similar trends in the United States. This report expands those analyses to include all 11 metropolitan areas in Indiana, and examines trends relative to those in the nation. A close look at built investments in Bloomington, Elkhart-Goshen, Evansville, Fort Wayne, Gary, Indianapolis, Kokomo, Lafayette-West Lafayette, Muncie, South Bend, and Terre Haute provided an interesting and rarely seen picture of construction activities in the major urban regions of Indiana.

During the 12-year period from 1990 through 2001, the buildings and infrastructure in Indiana’s 11 metropolitan statistical areas (MSAs) received \$79 billion (in current dollars) of investment. These investments were made in the course of nearly 300,000 individual projects. The volume of investments was linked to the total population and the population density of the state’s MSAs—high population density was closely associated with higher levels of built investment per square mile. For most MSAs, residential investments made up nearly half of all built investments, and for all MSAs, residential construction added more than half of all square footage created by construction activities.

A closer look at the composition of built investment (e.g., private residential, private nonresidential, and public) reveals several interesting patterns. When compared with U.S. trends since 1990, most Indiana MSAs showed comparatively strong

¹ Nunn, S. (2001, June). *Built Investment in Central Indiana and the United States, 1990–1999: Some Troubles Ahead?* (Issue Brief). Indiana University–Purdue University Indianapolis, School of Public and Environmental Affairs, Center for Urban Policy and the Environment; and Nunn, S. (2001, March). *Patterns of Built Investment in Central Indiana, 1990–1999* (Technical Paper). Indiana University–Purdue University Indianapolis, School of Public and Environmental Affairs, Center for Urban Policy and the Environment.



performance in residential investment trends during the period. However, from the perspective of private nonresidential investment trends, their performances were less robust. Indiana's MSAs demonstrate uneven patterns of commercial and business built investments, with some strengths in Bloomington, Elkhart, Fort Wayne, Gary, and Indianapolis, but some significant weaknesses in Evansville, Kokomo, Muncie, South Bend, and Terre Haute. It is also somewhat alarming that Indiana MSAs almost uniformly underinvest in public infrastructure relative to national trends. A surprising set of results emerged from the Gary MSA, which regularly exceeded U.S. trends in residential, nonresidential, and public investments.

The 11 MSAs also were compared in terms of location quotients for total square footage added during 1990 to 2001. The location quotients (LQ) measured relative concentrations of particular kinds of building square footage added in comparison with all MSAs. (See page 15 for a more detailed explanation of the LQ.) For example, the Kokomo MSA added a much higher proportion of laboratory space than the other MSAs. Elkhart added proportionally more manufacturing space than other MSAs. In Indianapolis, there were proportionally higher concentrations of square footage added to warehouses, transport facilities, and laboratories. These LQ measurements also were used as an indirect indicator of the diversity of square footage added to each MSA's built environment—MSAs were considered more diverse if they added higher proportions of several different categories of built investment. By this measure, Lafayette, Muncie, and South Bend demonstrated higher concentrations of a larger number of different kinds of constructed space than the other MSAs. For example, compared with all other Indiana MSAs, the South Bend MSA added proportionally higher shares of square footage for commercial, manufacturing, education, cultural facilities, health buildings, government buildings, and zoological facilities.

The built environments created during the past 12 years in each of Indiana's metropolitan regions are fundamental building blocks for future economic success. From this perspective there are some bright spots, but some warning signs as well. The Gary MSA, for example, was the only Indiana MSA to exceed U.S. construction trends throughout the 1990s, with proportionally higher investments in government and educational facilities. Also on the positive side, residential construction was strong in all of the state's MSAs, but this strength was counter-balanced by weaknesses in the nonresidential built investment patterns of several MSAs. It is possible that some of these MSAs are creating plenty of residential spaces, but far fewer spaces for production and employment. This appears to have occurred in



Evansville, Kokomo, Muncie, and Terre Haute. State and local government agencies in these metropolitan regions might want to focus more intensively on economic development incentive programs in the next few years to augment private nonresidential construction trends. It also appears that governments throughout the state's metropolitan regions should reassess their public infrastructure investment policies, insofar as nearly all of them lagged behind public investment trends at the national level. An increase in public investments might be required to maintain the economic viability and competitiveness of the state's metropolitan landscapes.

This report examines built investments in the 11 Indiana MSAs during 1990–2001, using an innovative proprietary database. It is organized into several sections that are aimed at answering basic questions about (a) the volume and composition of investments into the built environments of these MSAs, and (b) a comparison of construction trends in each of the Indiana MSAs with trends in the United States.

After an introduction explaining the importance of built investments to the future development prospects of the state, the way in which the analyses were conducted are discussed. Following this, the amount and kinds of investments are compared for all Indiana MSAs in order to develop a picture of investments from 1990 through 2001. Next, the trends in the Indiana MSAs are compared with U.S. trends to determine how well the state's metropolitan regions have done during the past 12 years compared with the nation. Finally, the report concludes with a summary and discussion of the public policy implications of the findings.





INTRODUCTION

Buildings and infrastructure compose the built environment. People, businesses, governments, and other organizations constantly invest in this built environment through new construction and the renovation or rehabilitation of existing structures and systems.

In the private sector, the results of built investments include most residential dwellings, commercial and office buildings, manufacturing and industrial facilities, warehouses, entertainment venues, and various other buildings and structures. The public sector invests heavily in the construction of educational institutions, governmental offices and facilities, laboratories, water and sewer networks, transportation systems, airports, and other buildings and infrastructure systems. Nonprofit organizations build churches, housing, office buildings, museums, and other facilities needed to support delivery of nonprofit services. Working together in complex and interconnected ways, these components of the built environment create the quality of life for metropolitan regions and make possible the basic operations of social, political, and economic systems.

How Built Investments Create Future Spaces for Production and Residences

Investments in buildings and infrastructure establish a foundation for future development. One of the important characteristics of the built environment is, in fact, its endurance: It is long lived, with buildings and infrastructure systems that last for decades. This is both good and bad news for the economic and social systems that are supported through built investment. On one hand, the longevity of buildings and infrastructure means they can deliver services to citizens, consumers, and residents for a long time. On the other hand, the capacity and ability of buildings and infrastructure to deliver these services degrade over time and require additional investments to remain efficient and effective. Buildings typically have long useful lives during which they might accommodate a variety of different activities, ranging from industrial production to administrative office work to homes. Similarly, infrastructure systems are comprised of miles of networks and massive nodal facilities that are modified regularly to make room for growth of population and businesses. Both buildings and infrastructure must be built, renewed, and rebuilt constantly to keep pace with changes in the economy, consumer demands, citizen preferences, and public service responsibilities. Thus, in an important way, the built environment creates the ways and means for future growth and development of social and economic systems. What is built today affects tomorrow's potential for economic growth and the future quality of life of the people and institutions residing in a metropolitan region.



Brief Profile of Indiana Metropolitan Areas

Buildings and infrastructure systems therefore have longstanding effects on the health and future of cities and their metropolitan regions. This means it is important to identify the components of built investment, as well as to understand the changing levels of investment in the built environment of Indiana's metropolitan areas. Indiana has metropolitan statistical areas (MSAs) in Bloomington, Elkhart-Goshen (hereafter, Elkhart), Evansville, Fort Wayne, Gary, Indianapolis, Kokomo, Lafayette-West Lafayette (hereafter, Lafayette), Muncie, South Bend, and Terre Haute. In 2000, these 11 MSAs were home to two-thirds (4.1 million) of Indiana's 6.1 million residents.² And from 1990 to 2001, the state's metropolitan regions received \$79.1 billion of built investment out of the \$103 billion invested in the entire state (see Table 3 on page 9). The state's metropolitan regions therefore hold fully two-thirds of the people and absorbed three-fourths of total built investment in the last 12 years. So not only do these 11 metropolitan areas contain most of the state's population, they also host the vast majority of economic activity. Future economic growth in Indiana will depend largely on what happens in its urban regions, and what happens there will be heavily influenced by the built environment of each metropolitan region in the state. Examining built investments within the Indiana MSAs can therefore provide a framework for assessing the future growth and development prospects of the entire state.

The 11 Indiana MSAs are located generally in the central and northern parts of the state (see Map 1). The exception is Evansville, in the far southwest corner of the state. Several southern Indiana counties are metropolitan because they belong to the Louisville and Cincinnati MSAs along the southern state boundary, but they are not included in the examination of built investment reported here.³ Two Indiana MSAs have explicit cross-state linkages defined by the U.S. Census Bureau. Evansville includes one Kentucky county, Henderson, which is included as part of the Evansville MSA in this report. The two-county Gary MSA is part of the larger Chicago primary MSA, but only two of the Indiana counties in the Chicago primary MSA (Lake and Porter) are included in the built investment measurements used in this analysis. Altogether, the Indiana MSAs include 31 of the 92 counties in the state.

Each of Indiana's metropolitan areas has particular economic specializations that will influence and be affected by changes in the built environment. A recent analysis⁴ of all U.S. metropolitan economies classified Indiana MSAs

² Indiana Business Research Center. Data from the U.S. Bureau of the Census. (2000). *Census 2000*. Retrieved January 2, 2003, from the STATS Indiana Web site sponsored by the Indiana Business Research Center of the Indiana University Kelley School of Business, from <http://www.stats.indiana.edu/>

³ These counties are Clark, Floyd, Harrison, and Scott in the Louisville MSA, and Dearborn and Ohio in the Cincinnati-Hamilton MSA.

⁴ See pages 21–25 in Stanback, Jr., T.M. (2002). *The Transforming Metropolitan Economy*. New Brunswick, NJ: Center for Urban Policy Research Press.

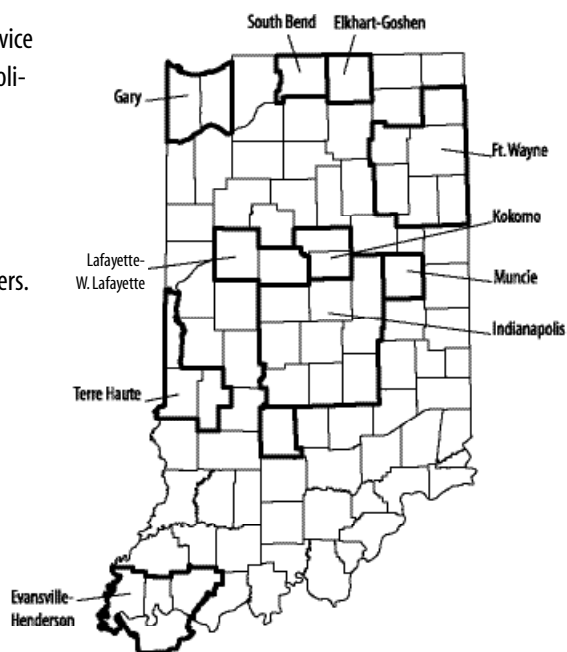


into the following three basic groups based on employment concentrations in 1990:

- At the top of the Indiana metropolitan hierarchy are three diversified service centers: Indianapolis, Fort Wayne, and South Bend. These “nodal metropolitan areas [produce] a variety of services . . . to large and small businesses and . . . corporations by headquarters and other administrative offices.”
- Seven Indiana MSAs are considered “production centers.” Muncie, Terre Haute, and Lafayette are classified as manufacturing and service centers. Gary, Evansville, Elkhart, and Kokomo are considered manufacturing centers.
- The Bloomington MSA was classified as a specialized service center with concentrations in government employment.

As will be shown later, built investment patterns in each MSA generally corresponded to these categorizations, although there were a few variations.

Map 1: Indiana Metropolitan Statistical Areas, 2000







HOW THE ANALYSIS WAS CONDUCTED

Two research questions guide this analysis. The questions are used to structure a descriptive view of what built investment during the past 12 years looks like in Indiana MSAs, as well as a closer examination of how investments in the state's metropolitan built environments compare with national built investment trends during the same period. These research questions are:

1. What is the overall volume and broad composition of built investment in Indiana's MSAs?
2. How do built investment trends in Indiana MSAs compare with the overall trends in the United States during the 1990–2001 period?

Two simple approaches are used to answer these questions. The first, an intrastate comparison, examines the Indiana MSAs on the basis of each one's built investments compared with the other MSAs in the state. The second approach examines the MSAs in comparison with national trends in built investment—this is considered a national comparison. Taken together, the intrastate and national comparisons create several measures against which the relative production of built investment in each of the 11 MSAs is assessed. The Indiana MSAs are examined from several different perspectives.

Intrastate comparisons are made in terms of:

- projects and amounts of current dollars invested,
- built investment per square mile,
- types and shares of square footage added, and comparative specialized strengths reflected by 12 years of built investments.

National comparisons are made in terms of:

- residential investment trends,
- private nonresidential investment trends,
- public investment trends.

What Will the Analysis Show?

By way of a quick preview, how do Indiana's MSAs compare in terms of these measures of built investment? Table 1 (see page 6) summarizes the more detailed examinations to follow. It offers a summary of built investment performance by each of the 11 MSAs. As would be expected, there are both high and low points, with MSAs showing strengths in some areas but weaknesses in others. It is interesting, for example, that 8 of the 11 Indiana MSAs compare favorably with U.S. trends



Table 1: Summary of Built Investment Performance in Indiana Metropolitan Statistical Areas by National Trends and Intrastate Measures

MSA	Comparison with National Trends, 1990-2001			Comparison with Intrastate Measures, 1990-2001			
	Public	Private Residential	Private Nonresidential	Investment per Square Mile	LQs* Greater than 1	Highest LQ*	2nd Highest LQ*
Bloomington	Much worse	Similar	Much better	Middle	Low (4)	Education	Health
Elkhart	Much worse	Much better	Much better	Middle	Low (3)	Manufacture	Zoo, animal
Evansville	Much worse	Better	Worse	Low	Low (4)	Health	Commercial
Fort Wayne	Better	Similar	Much better	Low	Middle (5)	Zoo, animal	Manufacture
Gary	Much better	Better	Better	High	Low (4)	Government	Education
Indianapolis	Much worse	Much better	Better	High	Low (3)	Labs	Transport
Kokomo	Better	Much better	Much worse	Low	High (6)	Labs	Manufacture
Lafayette	Much worse	Much better	Similar	Middle	High (6)	Zoo, animal	Health
Muncie	Much worse	Much better	Much worse	Middle	High (7)	Government	Zoo, animal
South Bend	Much better	Worse	Worse	High	High (7)	Government	Manufacture
Terre Haute	Better	Better	Worse	Low	Low (3)	Manufacture	Government

* "LQ" means location quotients, and measures the relative concentration or strength in a particular form of built investment, relative to the proportion of that built investment among all MSAs. See page 15 for a more detailed explanation.

Source: Summarized from Tables 3 through 11.

in residential built investment, suggesting that plenty of residential space is being created. However, in contrast, fewer Indiana MSAs show similar comparative strengths in private nonresidential investment. Terre Haute and Evansville, for example, show strong residential sectors, but weak nonresidential investment. This begs the question for some MSAs: Having found a good supply of residential spaces, will the places where people obtain jobs and work be equally accessible?

There are bright spots as well as possible future problems. One surprisingly strong performance in several measures of the built environment is the Gary MSA. It ranks behind only the Indianapolis MSA in total volume of built investment, and it shows evidence of trends stronger than those of the United States in all three categories of construction—public, private residential, and private nonresidential. Its primary weakness might be that its strengths appear to be based in built investment driven by government and educational facilities. Fort Wayne and Indianapolis also reflect general strengths. But on the negative side, several MSAs might face challenges in the next few years because of comparative deficiencies. Evansville, Kokomo, Muncie, South Bend, and Terre Haute appear to have weaknesses in private nonresidential built investment—an area crucial to economic growth because this category includes the creation of job-producing spaces such as commercial and



industrial facilities. Evansville and Terre Haute, in particular, also have low levels of investment per square mile and a less diverse array of built investment additions. It remains to be seen how the various strengths and weaknesses identified here among the 11 Indiana MSAs will play out during the next decade.

Data Used in the Analysis

Given the importance of a region's built investments to social and economic development, it is surprising that there are almost no regular cross-sectional time series compilations of the volumes and types of construction activities taking place at the local level. Indeed, accurate built investment information for consistent comparative analysis is hard to find at the local level. However, a valuable element of this analysis is the use of a database with a spatially consistent, systematic set of estimated investments in the built environment. Time series information on built investment is drawn from a proprietary database assembled by F.W. Dodge (McGraw Hill Information Services) on all construction projects in these 11 metropolitan regions from January 1990 through December 2001. Dodge data track the cost and size of individual construction projects, but have not been used much in social science research. The Dodge data are collected nationally on a daily basis by reporters who visit architects, engineers, public agencies, planning and zoning boards, and other venues to gather information about construction projects. The data are compiled into regular summaries, entitled Dodge Market Reports, which are purchased by subscribers.

The data analyzed here are a special historical compilation drawn from information contained in the Dodge reports. The Dodge data include information about most construction projects in a geographical area (individual counties in each of the 11 Indiana MSAs in this analysis) for a specific time. This information includes the type, cost, and size of new construction, and additions and alterations to buildings and structures. However, they do not include information about capital equipment.⁵ Ownership is parsed into four groups: private, local, federal, and state. Construction type is divided into nearly 200 detailed categories (e.g., "manufacturing warehouse—rubber products"). For easier analysis, these categories are reclassified into the 17 broad construction categories shown in Table 2.

Table 2: **Broad Construction Categories Used for Dodge Data***

Commercial
Culture/recreation/religion
Education
Government
Health
Laboratories
Manufacturing
Parks/landscape/outside recreation
Power/gas infrastructure
Residential
Street infrastructure
Telecommunications
Transportation
Warehouses
Waste infrastructure (solid & liquid)
Water infrastructure
Zoological/animal facilities

* Note: The original Dodge data are divided into nearly 200 detailed categories (e.g., "manufacturing warehouse—rubber products"). For easier analysis, Center researchers grouped these detailed categories into these 17 broad categories.

⁵ Although McGraw-Hill's marketing information about Dodge data suggest that reporters catch every construction project in an area, it is possible that occasional projects are missed. Further, some project costs are logged into the Dodge system at early estimates that then change during the construction period. Thus, both the dollar volume and square footage metrics reported by Dodge are probably less than the true amounts. Nonetheless, no other widely distributed systems collect locally-based data on built investment. Accordingly, the estimates reported by Dodge should be considered the best available indicators of the general volume of building activity in metropolitan regions. In this context, the data are likely to underestimate the actual volumes of construction.





INTRASTATE COMPARISONS OF INDIANA MSAs

The 11 MSAs in Indiana, their population, density, and built investment profiles are shown in Table 3, organized by population size. As the list suggests, total built investment for the 1990–2001 period tracks metropolitan population very closely: the largest MSAs received the largest share of built investments. Indianapolis clearly captured the lion’s share of investment, followed by Gary, Fort Wayne, and Evansville. Indianapolis, Gary, and South Bend—the three Indiana MSAs with the highest population density—also have the highest density of built investment, at about \$10 million per square mile. For the remaining MSAs, investment per square mile ranges from \$2.3 million in the Terre Haute MSA to \$6.1 million in Elkhart. As the population density in the overall MSA drops, so does built investment intensity.

There are different ways to consider the per square mile investment estimates. It is possible that there is just less investment in the built environment of these metropolitan regions (e.g., Terre Haute, Evansville, Kokomo). But these estimates might also say something about urban sprawl—very low density development on the outer fringes of urbanized areas—because urban sprawl is believed to require higher levels of investment in infrastructure than high density

Table 3: Population, Density, and Built Investment, Indiana Metropolitan Statistical Areas, Various Years

MSA	Number of MSA Counties	MSA Population in 2000	MSA Square Miles	Population Density per Square Mile	Total 1990–2001 Built Investment (Current \$ millions)	Total Projects	Investment per Square Mile (Current \$ Millions)
Indianapolis	9	1,607,486	3,522	456	\$38,401	144,779	\$10.9
Gary	2	631,362	915	690	\$10,136	31,905	\$11.1
Fort Wayne	6	502,141	2,448	205	\$8,180	35,734	\$3.3
Evansville*	4	296,195	1,468	202	\$4,094	18,543	\$2.8
South Bend	1	265,559	457	581	\$4,606	14,770	\$10.1
Lafayette	2	182,821	905	202	\$3,375	13,123	\$3.7
Elkhart	1	182,791	464	394	\$2,834	13,284	\$6.1
Terre Haute	3	149,192	1,018	147	\$2,384	7,228	\$2.3
Bloomington	1	120,563	394	306	\$2,238	9,043	\$5.7
Muncie	1	118,769	393	302	\$1,403	4,636	\$3.6
Kokomo	2	101,541	553	184	\$1,402	5,184	\$2.5
Totals	32**	4,158,420			\$79,054	298,229	

* The Evansville MSA includes Henderson County, Kentucky. The Henderson totals are included in population and built investments. The net Indiana-only 2000 population and 1990–2001 built investment totals for the Evansville MSA are 251,366 people and \$3,655 million, respectively.

** Considering only those within the state, a total of 31 Indiana counties are part of these MSAs.

Sources: Population, county, and land area data adapted from U.S. Bureau of the Census. (2002). Census 2000 and City and County Data Book, 2000. Built investment data adapted from F.W. Dodge, special compilation, 1990–2001.



development.⁶ Thus, high investments per square mile might suggest that urban sprawl is more prevalent in an MSA (e.g., Indianapolis, Gary, and South Bend). However, it also is possible that built investment in areas of high population density is more expensive, thus increasing the dollar volume of construction. For example, assuming the same type of infrastructure is being built in a rural versus an urban setting (e.g., installation of wastewater lines in the city versus septic tanks in rural areas), construction might be more expensive in an urbanized built-out area inside a city than in a less developed semi-rural suburban area. Accurately calculating the relationship between built investment per square mile and population density would require additional analysis that goes beyond the scope of this descriptive report.

Considering these 12 years of built investment for the 11 MSAs in Indiana, a few other observations provide a broader picture of the production and renovation of built structures within the state's metropolitan areas:

1. There were 298,229 building projects during the period, which translates to approximately 25,000 built investment projects per year in Indiana metropolitan regions. This includes new construction, renovation, alteration, and addition activity, but does not include the many smaller residential projects or minor nonresidential modifications that do not seek or fail to obtain building permits. Just less than one-half of all projects occurred in the nine-county Indianapolis MSA.
2. The minimum estimated financial cost of these projects from 1990 to 2001 (in current dollars) was \$79.1 billion, or about \$6.6 billion of built investment per year in the 11 MSAs in the state.
3. Population density and investment per square mile are closely linked. It is interesting that the two-county Gary MSA, despite its general reputation as a declining industrial region, nevertheless generated the second highest volume (\$10.1 billion) of built investment—and the highest rate per square mile (\$11.1 million)—among all MSAs in the state during 1990–2001.
4. Because the MSA population is an important influence on built investment volumes, the Indianapolis MSA clearly dominates the level of built investment in the state. Nearly half of total 1990–2001 built investment in Indiana MSAs occurred in the Indianapolis MSA—48.3 percent or \$38.4 billion.

The Composition of Metropolitan Built Investments

Given these types of totals and volumes, what is the general nature of built investment put in place during the 1990–2001 period? A simple way to summarize the broad types of metropolitan built investment is to classify investments into three categories based on ownership and type of construction: private residential, private

⁶ See, for example, cost estimates in Table 15–2, p. 392, in Nelson, A.C. (2000). Growth management. In C.J. Hoch, L.C. Dalton, & F.S. So (Eds.), *The practice of local government planning*, 3rd edition. Washington, DC: International City Management Association.



nonresidential, and public. By doing this, the short answer to the question of the nature of built investment is that we are mostly building places in which people live.

As shown in Figure 1 (see page 12), the largest share of investments going into the built environment is typically residential capital, ultimately provided by private households. Generally, from 40 to 54 percent of built investments are residential. The exceptions to this are the Terre Haute MSA, where the construction of extraordinarily expensive major electrical power facilities in 1992–1993 and 1999 increased the share of private nonresidential construction, and the Muncie MSA, where only about one-third of built investment poured into private residential structures because of several large power and commercial projects in 1990, 1994, and 1999. The Bloomington, Muncie, and Lafayette MSAs reflected the largest shares of public investment, possibly because of the presence of major state universities, which absorb a substantial amount of construction linked to university operations.

As noted earlier, an interesting feature of the built environment is its longevity and durability. To maintain its usefulness for productive, supportive activities, buildings and structures must be modified regularly through additions or renovations. Thus, another dimension to the broader description of metropolitan built investment in Indiana is to examine how much new construction occurs compared with alterations or additions to existing fixed capital facilities. Higher shares of built investment used for alterations and additions mean that public and private decision makers are putting resources into modifying or otherwise changing the existing built environment rather than creating all new buildings and structure.

The shares (proportions reflect share of total investment in each category) of built investment in additions, alterations, and new construction are shown in Table 4 (see page 13) for private nonresidential and public investment in the 11 Indiana MSAs.⁷ For private nonresidential construction, approximately two-thirds or more of the value of construction goes into new facilities, although this varies somewhat among the MSAs. Terre Haute had the largest share in new construction (due to the large investment in power plants), while South Bend had the smallest share, at 56 percent. Considering only public built investment, however, more than half of the cost goes into additions and alterations. This makes sense because many governmental facilities include large network infrastructure systems (e.g., water, wastewater, and highway systems) or major nodal facilities (e.g., educational buildings, treatment facilities) for which nearly all investments are considered additions or alterations. In addition, because of fiscal concerns, governments are less likely to build new facilities, instead relying on changes to existing structures. Many educational facilities and government buildings, for example, are much more likely to be expanded than replaced.

⁷ Virtually all residential investments reported in the Dodge data are reported as new construction. This undoubtedly underestimates the volume of renovation activity for residential housing stock. Reporters collecting the Dodge data from local sources are unlikely to discover the large amount of residential renovation or addition activity undertaken by homeowners and landlords because fewer building permits are obtained for such activities.



Figure 1: Shares of Current Dollars in Three Types of Built Investment, 1990–2001

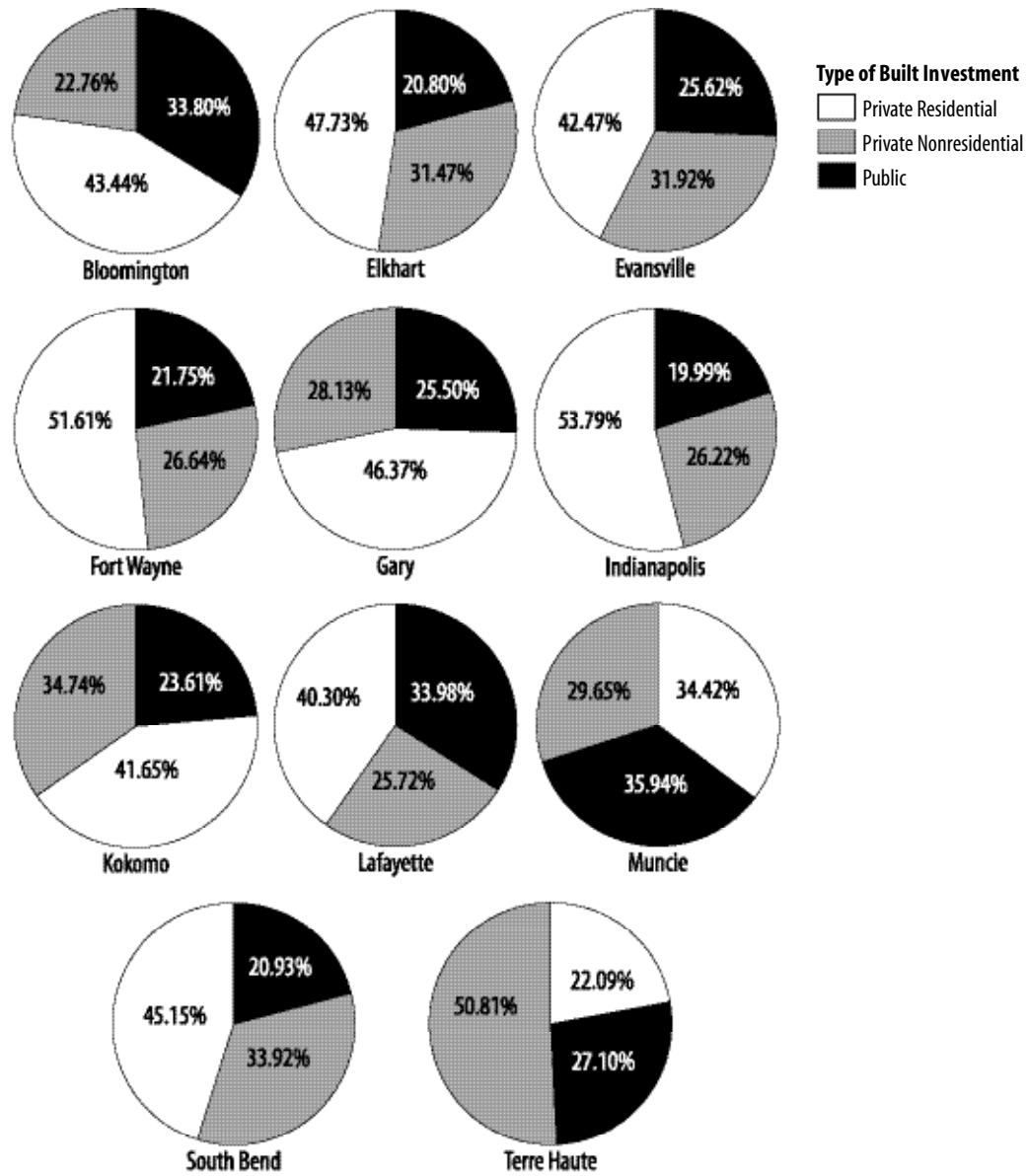




Table 4: Shares of Built Investment (in Current Dollars) in Additions, Alterations, and New Construction, Indiana Metropolitan Statistical Areas, 1990–2001

MSA	Private Nonresidential			Public		
	Additions	Alterations	New	Additions	Alterations	New
Bloomington	23.0%	9.5%	67.5%	16.2%	34.7%	49.1%
Elkhart	29.0%	7.8%	63.1%	36.6%	25.6%	37.8%
Evansville	24.0%	10.6%	65.4%	20.8%	40.1%	39.1%
Fort Wayne	20.7%	11.4%	67.9%	20.5%	36.2%	43.3%
Gary	11.0%	19.2%	69.8%	27.9%	35.8%	36.3%
Indianapolis	16.2%	15.5%	68.4%	27.2%	34.1%	38.7%
Kokomo	21.2%	8.1%	70.6%	36.2%	35.0%	28.8%
Lafayette	15.7%	21.7%	62.6%	25.9%	27.8%	46.3%
Muncie	21.5%	13.0%	65.5%	17.2%	45.8%	37.0%
South Bend	24.4%	19.2%	56.4%	20.8%	31.1%	48.1%
Terre Haute	9.1%	4.7%	86.3%	14.7%	40.8%	44.5%
Total—all MSAs	17.3%	14.4%	68.4%	25.0%	34.7%	40.3%

Source: Built investment data adapted from F.W. Dodge, special compilation, 1990–2001.

How the Physical Spaces of Indiana MSAs Changed

The investment of financial capital into the built environment translates into the addition of new or renovated spaces for residential, commercial, industrial, governmental, cultural, and other kinds of activities. The physical spaces for growth and development therefore change. Considering built investment from this perspective, how did the urban landscapes of these metropolitan regions physically change through the 1990–2001 period? This can be examined in two ways. One approach is to consider the general volumes of all newly constructed or modified spaces, while the other is to examine constructed space exclusive of private residential investment. The latter measure provides a better indicator of the built environment supporting economic development within each MSA.⁸

About 893 million square feet of new buildings or modifications were installed among the MSAs, as shown in Table 5 (see page 14). By far, the major focus of built investment is the addition of residential space. Approximately six of every ten square feet added was residential. This was the general rule among all the MSAs, with from 52 percent to 68 percent of square footage devoted to residential uses. Commercial buildings, warehouses, manufacturing structures, and educational facilities comprised most of the rest, although the relative size of added square footage

⁸ Another crucially important factor in support of economic development is, of course, public infrastructure. However, because so much infrastructure is in the form of networks (e.g., water and wastewater lines, streets, etc.), a square footage measure would not be meaningful. In any event, the Dodge data do not include information on square footage or number of miles of infrastructure added.



Table 5: Built Investment Square Footage (000) by Metropolitan Statistical Area, Selected Categories, 1990–2001

MSA	Residential	Commercial	Warehouse	Manufacture	Education	Culture, Recreation, Religion	Health	Transport	Government	Labs	Zoological/ Animal Facilities	Totals	Percent Absorbed by Residential
Indianapolis	261,999	60,490	45,996	14,192	20,437	11,039	8,774	6,137	2,234	2,993	420	434,711	60.3%
Fort Wayne	59,298	13,527	6,785	8,748	4,476	2,902	2,470	420	806	44	344	99,820	59.4%
Gary	63,796	12,971	4,536	4,291	5,986	2,823	2,154	753	1,273	153	86	98,821	64.6%
Evansville*	31,702	9,559	2,928	2,886	2,264	1,777	1,938	185	422	134	51	53,846	58.9%
South Bend	28,475	7,525	3,651	4,309	3,456	1,507	1,279	347	619	97	98	51,363	55.4%
Elkhart	21,909	5,224	4,085	6,907	1,779	784	775	130	93	19	186	41,891	52.3%
Lafayette	24,551	6,583	1,670	2,152	2,356	845	1,085	73	309	106	154	39,884	61.6%
Bloomington	16,227	2,895	682	740	1,731	734	697	140	30	3	10	23,889	67.9%
Terre Haute	10,658	2,021	771	2,025	1,588	409	456	182	243	40	17	18,410	57.8%
Kokomo	9,776	2,446	622	1,374	691	442	475	62	125	217	1	16,231	60.2%
Muncie	<u>7,789</u>	<u>2,793</u>	<u>1,229</u>	<u>315</u>	<u>869</u>	<u>446</u>	<u>359</u>	<u>97</u>	<u>214</u>	<u>13</u>	<u>33</u>	<u>14,157</u>	<u>55.0%</u>
Totals	536,180	126,034	72,955	47,940	45,633	23,707	20,462	8,527	6,367	3,819	1,399	893,022	60.0%

* The Evansville MSA includes Henderson County, Kentucky.

Source: Built investment data adapted from F. W. Dodge, special compilation, 1990–2001.

varied among the MSAs.⁹ As with the dollar volume of built investment, the amount of square footage added to the metropolitan areas of the state followed population size. Indianapolis added nearly one-half of all square footage during the 12-year stretch, again underscoring the economic dominance of the state's largest metropolitan area. Once again, the Gary MSA is somewhat of a surprise—its commercial landscape changed radically, with three times more commercial than manufacturing space added.

Excluding residential investment paints a different picture of the changing built environment in each of the Indiana MSAs, providing a simple view of how the basic economic landscape of each MSA evolved during the 1990–2001 period (see Table 6). The additions to the built landscape are predominately commercial, warehouse, manufacturing, and education. Considering all 11 MSAs, these four categories comprise more than 80 percent of square footage added through nonresidential built investment, although there are different points of emphasis among different MSAs. For example, warehousing activity appears stronger in Indianapolis than in other MSAs. Three MSAs stand out for comparatively higher shares of square footage placed into educational facilities—Bloomington (22 percent), Terre Haute (20 percent), and Gary (17 percent). Manufacturing generated the largest shares of square footage in Elkhart (35 percent), Terre Haute (26 percent), Fort Wayne (22 percent),

⁹ From the perspective of real estate development, many obvious factors are important in determining the volume and location of new and altered spaces added to the built environment. The conditions of existing built structures, the demand for particular kinds of commercial and retail space, the surrounding climate for economic growth and the overall business cycle, consumer preferences for residential and entertainment spaces, spatial shifts in population, the availability of financial capital, and many other factors all play a part in determining the provision of constructed space to a metropolitan region. Consideration of these factors goes beyond the intent of these primarily descriptive analyses, and therefore they are not considered specifically here.



Table 6: Shares of Total Square Footage (Excluding Private Residential), All Metropolitan Statistical Areas, 1990–2001

MSA	Commercial	Warehouse	Manufacture	Education	Culture, Recreation, Religion	Health	Transport	Government	Labs	Other	Total
Bloomington	36.8%	8.7%	9.4%	22.0%	9.3%	8.9%	1.8%	0.4%	0.0%	2.6%	100%
Elkhart	26.1%	20.4%	34.6%	8.9%	3.9%	3.9%	0.7%	0.5%	0.1%	1.0%	100%
Evansville	42.4%	13.0%	12.8%	10.0%	7.9%	8.6%	0.8%	1.9%	0.6%	2.1%	100%
Fort Wayne	33.3%	16.7%	21.5%	11.0%	7.1%	6.1%	1.0%	2.0%	0.1%	1.1%	100%
Gary	37.0%	12.9%	12.2%	17.1%	8.0%	6.1%	2.1%	3.6%	0.4%	0.5%	100%
Indianapolis	34.9%	26.5%	8.2%	11.8%	6.4%	5.1%	3.5%	1.3%	1.7%	0.7%	100%
Kokomo	37.6%	9.6%	21.1%	10.6%	6.8%	7.3%	1.0%	1.9%	3.3%	0.8%	100%
Lafayette	42.0%	10.6%	13.7%	15.0%	5.4%	6.9%	0.5%	2.0%	0.7%	3.2%	100%
Muncie	41.8%	18.4%	4.7%	13.0%	6.7%	5.4%	1.5%	3.2%	0.2%	5.2%	100%
South Bend	32.7%	15.9%	18.7%	15.0%	6.6%	5.6%	1.5%	2.7%	0.4%	0.9%	100%
Terre Haute	25.9%	9.9%	26.0%	20.4%	5.2%	5.9%	2.3%	3.1%	0.5%	0.2%	100%
All MSAs	35.2%	20.4%	13.4%	12.8%	6.6%	5.7%	2.4%	1.8%	1.1%	1.1%	100%

Source: Built investment data adapted from F.W.Dodge, special compilation, 1990–2001.

and Kokomo (21 percent). But it is also possible for small additions of square footage to affect economic success in a metropolitan region. In Kokomo, for example, the addition of 217,000 square feet of laboratory space during the 1990–2001 period—which was only slightly more than 3 percent of its total square footage—can be linked to innovations in the Kokomo industrial economy. We will examine this later in more detail.

Different Concentrations in the Addition of Built Spaces among MSAs

Looking at total square footage or shares devoted to specific kinds of structures does not reveal much about whether or how MSAs are becoming more or less specialized in different types of built investment. For instance, knowing that the Indianapolis MSA added 46 million square feet of warehouses—which was 27 percent of its nonresidential space additions from 1990–2001—tells us that lots of warehousing space was created. However, it suggests little about whether this was a comparatively high or low change to the built environment, given all other changes that occurred within the state’s metropolitan regions.

Another way to examine the allocation of square footage for particular types of built investment is to calculate the *location quotient* (LQ) of each building category for each MSA.¹⁰ In this analysis of built investment patterns, the LQ measures

¹⁰ Location quotients are a standard measurement used in local and regional economic analyses. This ratio is created by dividing a small area’s (e.g., a county’s) share of something (e.g., employment) by a larger area’s (e.g., the United States) share of the same activity. See Blair, J.P. (1995). *Local Economic Development: Analysis and Practice*. Thousand Oaks, CA: Sage Publications.



the ratio of a MSA's proportional share of its total square footage in a specific category (e.g., residential) to the ratio of all MSA's proportional share of that category. An LQ greater than 1 means that an MSA's share of, for example, residential space, is greater than the proportional share of residential space added to all of the Indiana MSAs during the period. These measures can be interpreted as simple indicators of strengths (LQs greater than 1) and weaknesses (LQs less than 1) in the creation of various kinds of built environment. In addition, beyond the emergence of specializations or strengths in particular types of built investments, it also might be important to have a balance of different types of investment—it might be better, for instance, to have LQs greater than 1 for several different types of built environment than a very large LQ for only one or two investment types.

The LQs for the 11 MSAs for square footage added in each built investment category are shown in Table 7. There are considerable differences among the MSAs in which types of built investment were added at proportionally higher shares than all MSAs combined. Bloomington, for instance, had a 1.41 LQ for education, meaning that the share of total square feet added to educational facilities was 41 percent greater than the

Table 7: Location Quotients* for Total Square Footage Added during 1990–2001, by Metropolitan Statistical Area and Category of Built Investment

Type of Built Investment	Bloomington	Elkhart	Evansville	Fort Wayne	Gary	Indianapolis	Kokomo	Lafayette	Muncie	South Bend	Terre Haute
Residential	1.13	0.87	0.98	0.99	1.08	1.00	1.00	1.03	0.92	0.92	0.96
Commercial	0.86	0.88	1.26	0.96	0.93	0.99	1.07	1.17	1.40	1.04	0.76
Warehouse	0.35	1.19	0.67	0.83	0.56	1.29	0.47	0.51	1.06	0.87	0.58
Manufacture	0.58	3.07	1.00	1.63	0.81	0.61	1.58	1.01	0.41	1.56	1.95
Education	1.41	0.83	0.82	0.87	1.18	0.92	0.83	1.15	1.20	1.31	1.76
Culture, recreation, religion	1.16	0.71	1.24	1.10	1.08	0.96	1.03	0.80	1.19	1.11	0.84
Health	1.28	0.81	1.57	1.08	0.95	0.88	1.28	1.19	1.11	1.09	1.01
Transport	0.61	0.33	0.36	0.44	0.80	1.48	0.40	0.19	0.72	0.71	0.99
Government	0.18	0.31	1.10	1.13	1.80	0.72	1.08	1.08	2.12	1.69	1.88
Labs	0.03	0.10	0.58	0.10	0.36	1.60	3.12	0.62	0.21	0.44	0.70
Zoological, animal facilities	0.27	2.83	0.60	2.19	0.55	0.61	0.04	2.45	1.48	1.21	0.86
No. of times LQ>1**	4	3	4	5	4	3	6	6	7	7	3
Highest LQ	Education	Mfg.	Health	Zoo, animal	Govt.	Labs	Labs	Zoo, animal	Govt.	Govt.	Mfg.

* A location quotient is a ratio calculated as (MSA square feet of built investment type/total MSA square feet)/(total square feet of built investment type in all MSAs/total square feet in all MSAs). Ratios greater than one mean that the MSA has a greater share of that type of built investment than its share in all MSAs.

** LQs from .98 to 1.02 were considered similar, and LQs > 1.02 were considered higher.

Sources: Built investment data adapted from F.W. Dodge, special compilation, 1990–2001.



educational share of total space added to all Indiana MSAs. Bloomington can be profiled further as having strengths in residential, cultural, and health facilities. This might be expected in an MSA with the state's largest public university, which would generate high demand for these kinds of facilities. Bloomington's relative weakness in manufacturing (LQ = 0.58) suggests that the area is not yet starting to recover from the loss of the Thomson Electronics operations in the late 1990s.

Table 7 also shows the number of times that a MSA's LQ was significantly greater than one. A higher number of LQs greater than 1 suggests more diversity of built investment strengths during the 1990–2001 period. For example, compared with the other Indiana MSAs, South Bend demonstrated proportional strengths in the construction of commercial, manufacturing, education, cultural, health, government, and zoological facilities. In contrast, despite its high volume of built investment, the Indianapolis MSA had less diversity, with strengths in warehouses, transport facilities, and laboratories only. Using this measure, Elkhart and Terre Haute also had low levels of diversity in their built environment additions during the 1990s.

We can obtain potential clues about future economic performance by considering the types of built investments made in Indiana MSAs. It is possible that additions and changes to particular types of built environment in an MSA can have positive effects on economic outcomes. For example, in the Kokomo MSA, investments in building laboratory facilities generated more than 3 percent of square footage in the MSA, exceeding substantially the laboratory share in the other 10 Indiana MSAs (the next highest, Indianapolis, was only 1.7 percent of nonresidential square footage; table 6). The Kokomo MSA lab space LQ, 3.12, was the largest among Indiana MSAs. This is significant because Kokomo had a strong record of patent performance through the 1990s. In 1990, the Kokomo MSA ranked 46 among 317 U.S. MSAs in its rate of patents per 10,000 employees. By 1998, the Kokomo MSA had climbed to 26 in this ranking.¹¹ Additions to its stock of laboratory space might therefore have been a factor in Kokomo's overall level of patent productivity. In the same way, emerging strengths in built investments for some of the MSAs in the last 12 years might predict positive outcomes during the next 10 years.

¹¹ For background on the patent performance of Indiana MSAs, see Nunn, S. & Worgan, A. (2001, July). *Spaces of Innovation: Patent Activity in Indiana Metropolitan Areas, 1990–99*, (Technical Paper 01-C05). Indiana University–Purdue University Indianapolis, School of Public and Environmental Affairs, Center for Urban Policy and the Environment.





HOW INDIANA MSAs COMPARE WITH THE UNITED STATES

New construction, additions, and alterations to the built environment of Indiana MSAs occur within the broader framework of national construction trends. In the context of U.S. built investment activity, the 11 Indiana MSAs might follow closely or do better or worse than U.S. patterns. To assess how built investment within Indiana MSAs compares with national construction patterns, we used a base year approach to examine investment trends within each MSA's 12-year time series. These trends take 1990 as the base year and compare each year's investment with the level in 1990. Thus, 1990 as the base year is set to 100, and the subsequent years are interpreted as percentage changes from the base year.¹² After base year indices are calculated for the United States, the Indiana MSA trends are compared with U.S. trends for construction activity. Each year's built investment (in the United States and in each MSA) is divided by the 1990 investment to summarize the proportional change. Then we compared the changes each year for each MSA with the U.S. changes for that year. After comparing U.S. trends with MSA trends, tables 8 to 11 offer a qualitative judgment about each MSA's built investment trends during 1990–2001 in terms of whether it was much better, better, similar, worse, or much worse than the U.S. trend for that period.

Using this approach, then, how did the trend in total construction overall in the United States compare with total built investments in each of the Indiana MSAs during 1990–2001? In order to summarize the MSA versus U.S. differences, Table 8 (see page 20) shows the ratios of built investment changes in Indiana MSAs and the United States each year during 1990–2001. All ratios are 1 for 1990 because that is the base year for both the United States and the MSAs. For subsequent years, the ratios measure the difference between the MSA and the United States for that year. For example, the Bloomington-to-U.S. ratio in 1992 was 1.14, which means that Bloomington's change from 1990 to 1992 in total built investment was 14 percent greater than the change for the United States from 1990 to 1992. On the other hand, from 1990 to 1992, the Elkhart MSA's change in built investment was only 71 percent of the U.S. changes. The number of years during the period that construction activity in an Indiana MSA was better or worse than U.S. activity provides an overall assessment of the MSAs' built investment performance.

In total built investment, four Indiana MSAs appeared to do better than overall U.S. trends: Fort Wayne, Gary, Indianapolis, and Lafayette. At the other extreme, five MSAs seemed to do worse than U.S. trends. These comparatively weaker performers were Elkhart, Evansville, Kokomo, Muncie, and South Bend. In particular, annual

¹² A possible disadvantage to this approach is that if 1990 levels of built investment are extraordinarily high or low, the subsequent base year changes might be extreme. However, as shown in subsequent tables, this did not seem to be a serious problem for either the Indiana MSAs or for the U.S. trends.



Table 8: Comparison of Built Investment Trends, 1990–2001, Indiana Metropolitan Statistical Areas and U.S. Total

Ratios of MSA Trends to U.S. Total Construction Trend (base year = 1990)												
U.S.	Year	Bloomington	Elkhart	Evansville	Fort Wayne	Gary	Indianapolis	Kokomo	Lafayette	Muncie	South Bend	Terre Haute
100	1990	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
91	1991	1.00	0.51	0.76	1.03	1.16	0.89	0.96	1.02	0.53	0.78	1.08
97	1992	1.14	0.71	0.81	0.96	1.40	1.02	1.25	1.11	0.63	0.87	1.99
103	1993	1.33	0.70	0.86	1.02	1.17	1.08	0.77	1.20	0.57	0.99	3.40
113	1994	1.10	0.85	0.86	1.18	1.18	1.04	0.99	1.41	0.74	0.99	0.79
117	1995	1.18	0.69	0.99	1.14	1.13	1.05	2.18	1.12	0.54	1.04	0.94
129	1996	1.29	0.85	1.09	1.21	1.45	1.09	0.93	0.97	0.55	0.94	0.98
137	1997	0.91	0.74	1.07	1.17	1.35	1.00	1.11	1.04	0.45	1.11	0.57
148	1998	0.80	0.84	0.99	1.24	0.90	1.06	0.84	0.80	0.57	0.96	1.16
161	1999	0.90	0.78	0.91	1.20	1.01	1.11	0.98	1.05	0.47	0.82	2.86
172	2000	1.18	0.68	0.63	1.05	1.48	0.99	0.78	0.80	0.63	0.77	0.75
177	2001	0.71	0.60	0.69	1.01	1.03	1.15	0.56	1.59	0.26	0.84	1.26
*Better than U.S.		6	0	2	8	9	7	3	7	0	2	6
**Same		1	0	2	2	1	3	2	1	0	2	1
***Worse		4	11	7	1	1	1	6	3	11	7	4
Overall assessment		Better	Much Worse	Worse	Better	Much Better	Better	Worse	Better	Much Worse	Worse	Better

* Better = more than 1.02 of U.S.trend

** Same = from .98 through 1.02 of U.S.trend

*** Worse = less than .98 of U.S.trend

Sources: U.S.data adapted from U.S. Census Bureau. (2002). Annual Value of Construction Put in Place in the United States:1990–2001. Retrieved December 23, 2002, from the World Wide Web from <http://www.census.gov/const/www/c30index.html>

For Indiana MSA data, see Table 3.

changes in built investment since 1990 in Muncie and Elkhart never equaled or exceeded U.S.changes in any year, suggesting that these two MSAs might face serious challenges in creating and maintaining modern and competitive buildings and infrastructure systems. In the middle, doing slightly better than U.S.trends, were the Bloomington and Terre Haute MSAs.

Residential Built Investment Trends Were Strongest for Indiana MSAs

As shown earlier, total built investment is a combination of private residential and nonresidential structures and public construction of buildings and infrastructure. These three types of built investment are likely to perform at different rates, so it makes sense to separate investments into these three categories and compare each with the similar trend in the United States. Comparisons of the Indiana MSAs have suggested various strengths and weaknesses in their investments and additions of space. However, these strengths might be less evident when compared with U.S.



patterns. For example, when compared with other Indiana MSAs, the Kokomo MSA showed strengths in manufacturing and commercial built investments, but when compared with the rest of the United States, Kokomo's 12-year trend in nonresidential investments is considerably weaker.

Because the creation of residential space is the primary focus of built investment, U.S. and Indiana MSA trends in private housing investments are compared first in Table 9. Surprisingly, with the exception of the South Bend MSA, all the other Indiana MSAs exhibited private residential investment trends roughly similar or better than U.S. trends during 1990–2001. Bloomington, for example, began the first half of the 1990s exceeding U.S. trends, but finished the 1997 to 2001 period far below U.S. levels. Similarly, Fort Wayne generally followed U.S. trends. In contrast, several MSAs that did compare unfavorably with overall U.S. construction trends

Table 9: Comparison of Built Investment Trends, 1990–2001, Indiana Metropolitan Statistical Areas and U.S. Private Residential

Ratios of MSA Trends to U.S. Private Residential Construction Trend (base year = 1990)												
U.S.	Year	Bloomington	Elkhart	Evansville	Fort Wayne	Gary	Indianapolis	Kokomo	Lafayette	Muncie	South Bend	Terre Haute
100	1990	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
87	1991	1.29	1.15	1.18	1.03	1.14	1.17	1.06	1.31	1.67	1.01	1.12
104	1992	1.27	1.27	1.26	1.08	1.20	1.09	1.24	1.50	1.43	1.18	1.18
118	1993	1.20	1.14	1.25	1.02	1.14	1.12	1.28	1.42	1.20	1.01	1.72
135	1994	1.19	1.19	1.15	0.91	1.13	1.08	1.60	1.19	1.07	0.95	1.27
129	1995	0.99	1.20	1.13	1.02	0.93	1.21	1.56	1.21	1.36	0.90	1.11
147	1996	1.23	1.44	1.02	1.00	1.10	1.20	1.60	1.19	1.18	1.00	1.00
151	1997	0.61	1.25	1.14	0.97	1.10	1.01	1.58	1.50	1.32	0.93	0.88
165	1998	0.61	1.32	1.22	1.25	0.91	1.15	1.46	1.22	1.21	0.80	1.10
183	1999	0.66	1.22	1.03	1.10	0.92	1.21	1.37	1.35	0.85	0.86	1.00
196	2000	0.63	1.41	0.95	0.85	0.84	1.18	1.18	1.15	1.69	0.78	0.96
203	2001	0.78	1.09	0.95	0.88	0.90	1.38	1.12	1.30	0.87	0.67	0.99
*Better than U.S.		5	11	8	4	6	10	11	11	9	1	6
**Same		1	0	1	3	0	1	0	0	0	3	3
***Worse		5	0	2	4	5	0	0	0	2	7	2
Overall assessment		Similar	Much Better	Better	Similar	Better	Much Better	Much Better	Much Better	Much Better	Worse	Better

* Better = more than 1.02 of U.S. trend

** Same = from .98 through 1.02 of U.S. trend

*** Worse = less than .98 of U.S. trend

Sources: U.S. data adapted from U.S. Census Bureau. (2002). Annual Value of Construction Put in Place in the United States: 1990–2001. Retrieved December 23, 2002, from the World Wide Web from <http://www.census.gov/const/www/c30index.html>

Built investment data adapted from F.W. Dodge, special compilation, 1990–2001.



actually did much better than the United States on private residential investment. Elkhart, Evansville, Kokomo, and Muncie—which rarely exceeded U.S. total construction trends—typically did much better than the United States in residential built investment. Thus, considering all Indiana MSAs compared with the United States, any weaknesses in built investment trends are generally not in the creation of residential structures.

Private Nonresidential Investment Trends in Indiana MSAs

Closer examination of private nonresidential investment trends, shown in Table 10, suggests why some of the MSAs compared poorly with U.S. trends in total built investment. The 1990 to 2001 trends in nonresidential built investments in Kokomo, Muncie, and South Bend rarely exceeded U.S. changes. Likewise, nonresidential investments in

Table 10: Comparison of Built Investment Trends, 1990–2001, Indiana Metropolitan Statistical Areas and U.S. Private Nonresidential

Ratios of MSA Trends to U.S. Private Nonresidential Construction Trend (base year = 1990)												
U.S.	Year	Bloomington	Elkhart	Evansville	Fort Wayne	Gary	Indianapolis	Kokomo	Lafayette	Muncie	South Bend	Terre Haute
100	1990	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
88	1991	1.50	0.55	0.59	0.98	0.97	0.84	0.97	0.90	0.28	0.34	0.59
83	1992	2.26	1.34	0.74	0.88	1.57	1.20	1.24	1.00	0.26	0.50	3.21
84	1993	3.50	1.31	0.85	1.14	1.01	1.00	0.33	1.35	0.24	0.98	7.58
90	1994	3.09	1.71	0.92	1.51	1.03	1.11	0.64	1.56	0.91	0.69	0.70
101	1995	2.83	1.10	1.50	1.13	1.60	1.12	3.24	1.40	0.28	1.07	0.57
110	1996	1.91	1.56	1.92	1.44	2.05	1.02	0.34	1.00	0.47	0.80	0.63
120	1997	2.41	1.52	1.10	1.47	1.08	1.08	0.49	1.00	0.44	1.13	0.27
133	1998	2.06	1.33	1.19	1.27	0.80	1.21	0.33	0.90	0.47	0.73	1.16
138	1999	2.02	1.89	1.21	1.33	0.73	1.33	0.46	1.09	0.40	0.68	7.15
150	2000	1.43	1.06	0.55	1.44	2.41	0.88	0.20	0.64	0.42	0.75	0.15
147	2001	0.60	0.93	0.58	1.30	0.63	1.07	0.17	2.69	0.16	0.79	1.92
*Better than U.S.		10	9	5	9	6	7	2	5	0	2	5
**Same		0	0	0	1	1	2	0	3	0	1	0
***Worse		1	2	6	1	4	2	9	3	11	8	6
Overall assessment		Much Better	Much Better	Worse	Much Better	Better	Better	Much Worse	Similar	Much Worse	Much Worse	Worse

* Better = more than 1.02 of U.S. trend

** Same = from .98 through 1.02 of U.S. trend

*** Worse = less than .98 of U.S. trend

Sources: U.S. data adapted from U.S. Census Bureau. (2002). Annual Value of Construction Put in Place in the United States: 1990–2001. Retrieved December 23, 2002, from the World Wide Web from <http://www.census.gov/const/www/c30index.html>

Built investment data adapted from F.W. Dodge, special compilation, 1990–2001.



Evansville and Terre Haute were not particularly strong. Bloomington, Elkhart, Fort Wayne, and Indianapolis appeared to be the only Indiana MSAs with comparatively strong performance in nonresidential built investment. So, from the perspective of the creation of commercial, industrial, laboratories, and other nonresidential buildings, the performance of Indiana MSAs is mixed—of the 11 metropolitan regions, five do not measure up to U.S. trends, and the remaining six are slightly better than the United States overall.

Public Investment Trends in Indiana MSAs Are Comparatively Weak

The third dimension of built investment examined here is public sector investment in new and modified buildings and infrastructure. When considering built investment, it is particularly important to focus on the construction of buildings and infrastructure that are publicly-owned because policy makers and public managers within a metropolitan region have some control over the amount and deployment of public built investment. Public construction activities, therefore, reflect directly and indirectly the desires of agents in the public sector to change public buildings and infrastructure systems in ways that support economic and social development. Public capital investment supports economic development activity in a variety of ways. For example, transportation, water, and wastewater systems fundamentally support the urban and regional metabolism—they enable the circulation of people, resources, and waste flows. To the extent that state and local officials direct public capital flows into metropolitan built investment, they have a hand in directing and controlling the direction and quality of economic growth and development within a region.

How did Indiana MSAs measure against national trends in public investments during 1990–2001? As shown in Table 11 (see page 24), the United States increased its public built investment trend each year after 1990, from 2 percent more in 1991 to nearly 80 percent more in 2001. Thus, although private residential and nonresidential trends fluctuated periodically in the United States overall, public investments grew every year, with no year falling below 1990 levels. In comparison, this was not the case for many of the Indiana MSAs, where public built investment performance was mixed. Elkhart, Evansville, Indianapolis, and Muncie showed much weaker public investment trends than the United States. In no single year did these MSAs show changes greater than the U.S. change. The Indianapolis MSA is perhaps surprising in this regard, given its otherwise comparatively strong trends in residential and nonresidential investment. The Bloomington and Lafayette MSAs also show weak public investment performance compared with the United States—only twice in 12 years



were their changes in excess of U.S.changes. This, too, is a bit surprising because both MSAs host Indiana’s major public universities, and would be expected to have fueled a public built investment trend above that of the United States. The five MSAs that reflected stronger public investment trends than the United States were Fort Wayne, Gary, Kokomo, South Bend, and Terre Haute. It could be that these five MSAs have greater demands for public investment (e.g., more public housing or more public facilities requiring investments). A more detailed analysis of the composition of public investments is needed to understand these differences.

Table 11: Comparison of Built Investment Trends during 1990–2001, Indiana MSAs and U.S.Public Construction

Ratios of MSA Trends to U.S.Public Construction Trend (base year = 1990)												
U.S.	Year	Bloomington	Elkhart	Evansville	Fort Wayne	Gary	Indianapolis	Kokomo	Lafayette	Muncie	South Bend	Terre Haute
100	1990	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
102	1991	0.54	0.19	0.56	1.11	1.48	0.55	0.83	0.84	0.38	1.56	1.47
108	1992	0.59	0.19	0.47	0.69	1.60	0.69	1.57	0.80	0.67	1.01	1.48
108	1993	0.75	0.25	0.52	0.73	1.31	0.99	1.23	0.91	0.65	1.07	1.22
112	1994	0.32	0.38	0.54	1.39	1.32	0.82	1.10	1.53	0.59	2.05	0.55
121	1995	0.82	0.26	0.51	1.31	0.95	0.67	0.81	0.87	0.52	1.54	1.20
130	1996	1.06	0.28	0.55	1.34	1.46	0.88	1.58	0.76	0.43	1.16	1.36
140	1997	0.75	0.19	0.97	1.23	2.26	0.83	2.28	0.69	0.18	1.78	0.64
144	1998	0.61	0.41	0.65	1.03	0.93	0.71	1.42	0.40	0.47	2.27	1.28
158	1999	0.79	0.15	0.58	1.18	1.53	0.66	2.01	0.77	0.44	1.15	0.39
166	2000	1.72	0.14	0.39	1.02	1.84	0.68	1.95	0.60	0.49	0.87	1.24
179	2001	0.57	0.21	0.52	0.89	1.78	0.73	0.71	1.26	0.14	1.69	0.95
*Better than U.S.		2	0	0	7	9	0	8	2	0	9	7
**Same		0	0	0	1	0	1	0	0	0	1	0
***Worse		9	11	11	3	2	10	3	9	11	1	4
Overall assessment		Much Worse	Much Worse	Much Worse	Better	Much Better	Much Worse	Better	Much Worse	Much Worse	Much Better	Better

* Better = more than 1.02 of U.S.trend

** Same = from .98 through 1.02 of U.S.trend

*** Worse = less than .98 of U.S.trend

Sources: U.S.data adapted from U.S. Census Bureau. (2002). Annual Value of Construction Put in Place in the United States:1990–2001. Retrieved December 23,2002, from the World Wide Web from <http://www.census.gov/const/www/c30index.html>

For Indiana MSA data, see Table 3.



CONCLUSIONS: BUILT INVESTMENT AND FUTURE DEVELOPMENT

The buildings and infrastructure systems constructed and placed into Indiana's 11 metropolitan regions during the 1990s have established the basis for economic growth and development during the first decades of the 21st century. Built investments from 1990 to 2001 have created the places where people will live, the buildings where people will work and produce services, the industrial facilities that will create goods, the networks that will allow the circulation of people and resources, and the centers of administrative work where plans and decisions about the future will emerge. In the past 12 years, Indiana's metropolitan centers have created and modified their respective built environments in a many ways, spending \$79 billion, and setting the stage for future growth in urban areas across the state. At the beginning of this report, Table 1 (on page 6) summarized an overall assessment of each MSA in Indiana. And the analyses just discussed have identified strengths and weaknesses in our metropolitan built environments that deserve some final commentary.

Three important themes emerged in considering the intrastate comparisons of the 11 Indiana MSAs. First, population size and density are important factors driving overall levels of built investment. This is not particularly surprising because more people in a given space require higher investment levels. But when standardized to investment per square mile, it is clear there are substantial differences among the MSAs, with a few—most notably Terre Haute, Evansville, Kokomo, and Fort Wayne—at the lower end of the distribution. This suggests that there might be efficiencies associated with increasing the density of physical development, and perhaps reducing urban sprawl. More simply, it could mean that more investment is needed in the urban landscapes of these metropolitan regions.

Second, investments in Indiana's MSAs during 1990 to 2001 revealed differences in comparative strengths in an important part of the built environment—private nonresidential construction. These are the built investments that expand and create new spaces for economic development and job growth. Some smaller MSAs showed evidence of emerging strengths (as compared with other Indiana MSAs) in commercial investment such as Evansville, Lafayette, and Muncie. During the next decade, these areas might expand their sphere of commercial influence in their respective spatial hinterlands. Higher amounts of manufacturing square footage in some MSAs—Elkhart, Fort Wayne, Kokomo, South Bend, and Terre Haute—also were suggested. Nonresidential investments in the Kokomo MSA



suggest possible comparative future strengths in manufacturing and laboratory space. The Indianapolis MSA is likely to remain the center of warehousing, transport, and laboratory investments.

Third, the balance of different types of built investment within a metropolitan region might improve the interconnections among different kinds of economic activities. Improved transportation and infrastructure can create better connections between newly added residential space, commercial and retail activity, and industrial facilities. Thus, assuming that diversity in built investments is reflected in proportionally greater additions of a larger number of different kinds of space, the location quotient analyses indicated that more diverse built environments were added in Kokomo, Lafayette, Muncie, and South Bend. Comparatively stronger built investment patterns for these MSAs in the 1990s might suggest the potential for more economic success in the 2001 to 2010 period.

However, comparative strengths within the state did not necessarily translate into national strengths. The intrastate comparisons of the 11 MSAs did not tell us how their built investment patterns compared outside the state, in the wider national framework. From the national comparison, two key themes emerge. First, comparisons with national trends suggest that for some Indiana MSAs, there might be an imbalance between residential and nonresidential development. Some places seem to be building more residential spaces without a parallel expansion of job-producing places. Several MSAs—most notably Evansville, Kokomo, Muncie, and Terre Haute—reflected better trends in residential construction than the United States overall, but worse trends in nonresidential investments. These differences might foreshadow challenges in balancing a proper supply of employment opportunities with the concurrent patterns of residential investments occurring in the metropolitan regions.

The intrastate comparisons of location quotients, however, suggested that a mismatch between residential and nonresidential development also can occur in the opposite direction. Imbalances between residential (low) and nonresidential investments (high) may exist in several metropolitan regions. From an intrastate perspective, Elkhart and South Bend had proportionally weaker residential space additions at the same time that they reflected some strengths in the addition of commercial and manufacturing space. These MSAs could face shortages in residential space if increased nonresidential development creates more employment opportunities, and the addition of residential space lags behind.

The second theme emerging from the national comparisons was that most of the Indiana MSAs showed evidence of comparatively weaker trends in public



sector investment in buildings and infrastructure. Lagging public sector investments are not a trivial matter. Much public investment is directed into our massive infrastructure systems for transportation, water, wastewater, parks and recreation, and sometimes telecommunications. In important ways, these networks create the means by which economic, social, and political actors become connected and interact to create goods and service, devise innovations, and simply improve the quality of living in a metropolitan area. From 1990 to 2001, the U.S. trend in public built investment increased continuously, while more than half of the Indiana MSAs did considerably worse than the United States. This included sub-par public investment trends in Bloomington, Elkhart, Evansville, Indianapolis, Lafayette, and Muncie. Because public infrastructure systems are needed to bolster and supplement social, political, and economic connections and activities in metropolitan regions, these findings suggest that too many Indiana MSAs have fallen behind in public built investment trends.

Finally, individual bright spots deserve some mention. The Gary MSA, despite its reputation as a seriously declining urban area, showed surprisingly positive results in many of the built investment measures noted here. Why this was the case merits some analysis. With the highest investment per square mile in the state, Gary was the only Indiana MSA that exceeded U.S. built investment trends in all three broad categories (residential, nonresidential, and public). It is possible that residential strengths in the area might be driven by spillover from Illinois workers moving into the non-Gary suburban areas of Lake and Porter counties. Wealthier suburbs outside the deteriorated Gary core also might be a force behind higher levels of commercial investment. Likewise, government and education were two key sources of built investment, suggesting some directed public sector attempts to improve the social, political, and economic prospects of the northwest region.

Monitoring the composition and levels of built investments in the major metropolitan areas of the state should continue. Intelligence gathered from this type of monitoring can help identify emerging strengths and weaknesses in the physical economic landscape of the state's cities. It will be these cities and their metropolitan fringes that drive economic development in Indiana in the next decades. Ensuring the health of the buildings and infrastructure that make economic growth and development possible should be an important objective of the private, public, and nonprofit sectors of Indiana society.