



A Bureau of Business Research Report
From the University of Nebraska—Lincoln

The Impact of Growth on Quality of Life and Fiscal Conditions in Lincoln, Nebraska

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Executive Summary

While growth has moderated in the last few years, the 1990s were a period of rising employment and population in Lincoln, Nebraska. The city and metropolitan area experienced sustained and steady growth, roughly on par with the expansion of other mid-sized cities throughout the United States. The growth brought changes to the city, which raised questions about what benefits and costs might have resulted from these changes.

This following study by the UNL Bureau of Business Research¹ examines some of the implications of growth for Lincoln, Nebraska. The study examines how growth in the 1990s and early 2000s affected wages and poverty in the city, as well as how growth impacted the level of retail and services activity. The study also considers some of the costs of growth, such as increased commuting times. Fiscal issues such as changes in the tax revenues and in the need for public infrastructure that result from economic and demographic growth are examined.

Overall, the study finds that growth was accompanied by a number of benefits influencing both the standard of living and quality of life. These benefits should be considered in tandem with any costs of growth such as increased congestion and commuting times or any fiscal costs of growth.

Some of the main conclusions of the study are:

- Average **real** earnings per job grew 14.0% in Lincoln from 1990 to 2002 versus 11.1% nationally. Employment growth in Lincoln contributed to this faster growth in **real** earnings, where real growth refers to growth in constant dollars, i.e., after adjusting for inflation. We estimate that job growth in Lincoln from 1990 to 2002 helped Lincoln metropolitan area workers increase average **real** wages \$0.70 per hour.
- Employment growth also helped reduce poverty in Lincoln. We estimate that between 1,200 and 2,700 fewer persons were in poverty in Lincoln from 1990 to 2002 due to local job growth.
- Population growth increased retail options for Lincoln residents that helped Lincoln retain and attract more consumer spending and sales tax revenue per household. The City of Lincoln receives an estimated \$1.1 million more in sales tax revenue each year from additional sales retained in Lincoln or increases in real per capita income.

¹ The Bureau of Business Research thanks Lisa Darlington, Research Director of the Lincoln Partnership for Economic Development, for the location quotient and sales capture analysis used in this report.

- Incremental property tax revenues to the City of Lincoln due to the higher value of new housing units are similar to the costs of providing arterial streets, neighborhood parks and trails, and capital for police, fire, and library services to new households. Incremental tax revenues may even be higher once the sales tax revenue generated during new home construction is taken into account. Similar findings might be expected for other taxing jurisdictions that receive funding from property tax revenues (such as Lancaster County or the Lincoln School District), though this study did not specifically examine these jurisdictions.
- There are, however, additional capital costs for providing utility services such as water and wastewater to new households. A portion of these higher costs would be paid by new homeowners through hookup fees and the part of their monthly water and wastewater bill payments that is used to fund capital costs.
- While most growth in the Lincoln metropolitan area occurs in the City of Lincoln, other development patterns are possible. In particular, the Lincoln area could experience a pattern of leapfrog development where growth continues to occur within the metropolitan area but is concentrated outside the City of Lincoln in nearby cities or unincorporated places. Under such leapfrog development, spending requirements for arterial road construction could increase in the City of Lincoln even as the tax base to support that infrastructure does not grow.

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I. Introduction

Economic and demographic growth affects the standard of living, quality of life, and fiscal conditions in cities. Benefits can arise from a variety of sources, including rising wages, increased local choice in the retail and services sector, and an expanding tax base to finance government services.

This report by the Bureau of Business Research at the University of Nebraska—Lincoln analyses the affects of growth on Lincoln, Nebraska. The report examines recent trends in both Lincoln and in a group of similar cities around the nation. We study how growth in these cities relates to per capita incomes, wages per job, poverty rates, the level of retail and services activity, and commuting times. The report also draws on recent economic literature to estimate how much growth has contributed to real wages and the reduction of poverty in Lincoln.

The report concludes with analysis of the fiscal impacts of growth. The focus is the change in tax revenues and public infrastructure costs per household. Sales tax revenues are examined first to determine whether growth leads to rising levels of retail and services activity and taxable sales per household. The second part of the analysis estimates the relative property tax revenues of new and existing homes. Newer homes have higher property values on average, so the analysis also compares the incremental property tax revenue from new homes with recent estimates of the capital costs to build arterial streets and neighborhood parks and the costs to provide police and fire protection and library services to new homes.

Before examining the implications of growth, however, we examine recent developments in the Lincoln economy.

II. Recent Developments in Lincoln

While growth has moderated in recent years, the Lincoln area experienced sustained growth during the 1990s. Growth occurred both in terms of aggregate population and employment and also in terms of income per person. For example, total employment grew 26.9% in the Lincoln MSA (Lancaster and Seward Counties) from 1990 to 2002, the last year for which data on all employment (proprietors' as well as wage and salary employment) are available.

Population grew 19.0% during the same 12-year period, while per capita personal income grew 66.6% in Lincoln. After adjusting for inflation, this is a 20% increase in real per capita income, which is equivalent to a 1.5% annual increase. This income increase was driven in large part from growth in earnings from work. Earnings per job grew 57.3% from 1990 to 2002. This is a 14% growth rate after adjusting for inflation, an annual growth of 1.1%. Both figures suggest solid improvements in the standard of living.

Growth rates also are in line with those found in many similar-sized communities around the country. Table 1 below shows growth in population, employment, real (inflation-adjusted) per capita personal income and real earnings per job of 20 peer metropolitan areas (including Lincoln) from 1990 to 2002. These metropolitan areas were selected for comparison because each had a 2002 population between 200,000 and 450,000, and each area was either a state capital or the site of a major university.²

Employment and population growth rates in the Lincoln metropolitan area are in line with the mean growth rates identified in these communities. Per capita income growth and earnings per job, however, were well above the mean and median. Lincoln performed well relative to its peers in terms of income growth during the 1990 to 2002 period.

Lincoln also performed well relative to state and national averages. Lincoln's real per capita personal income grew 5.7% faster (20.7% versus 15.0%) than the nation's during the 12-year period and 3.1% faster than Nebraska's (20.7% versus 17.6%). Lincoln also performed well relative to the nation and state in terms of earnings per job. Real earnings per job in the Lincoln metropolitan area grew 2.9% faster (14.0% versus 11.1%) than nationally from 1990 to 2002 and 6.1% faster (14.0% versus 7.9%) than in Nebraska overall.

One important reason for income growth in Lincoln during the 1990 to 2002 period was the solid employment and population growth during the period. As is demonstrated in the next section, employment growth would be expected to lead to rising wages in a metropolitan area.

² The exception is Huntsville, Alabama, which was included due to major research facilities in the area.

Table 1—Growth in Peer Mid-Sized Metropolitan Areas 1990-2002

Metropolitan Area	MSA Population 2002	% Change Population 1990-2002	% Change in Employment 1990-2002	% Change in Real PCPI 1990-2002	% Change in Real Earnings per Job 1990-2002
Lincoln, NE	273,853	18.99	26.91	20.70	14.02
Lexington-Fayette, KY	416,480	18.94	24.78	15.89	10.12
Reno, NV	365,166	40.89	37.08	15.75	9.94
Provo, UT	400,601	47.98	61.39	17.98	12.40
Salem, OR	358,206	27.99	27.63	10.21	10.33
Springfield, IL	204,153	7.55	9.90	14.52	11.68
Montgomery, AL	351,032	14.70	20.61	16.42	10.83
Burlington-South Burlington, VT	202,441	13.89	22.67	19.20	8.91
Champaign-Urbana, IL	214,786	5.74	8.97	13.61	6.80
Waco, TX	217,133	14.44	25.30	17.79	14.09
Topeka, KS	225,424	7.04	12.26	14.61	7.79
Gainesville, FL	237,033	23.15	29.64	9.60	1.83
Lubbock, TX	254,327	10.35	18.56	12.12	0.77
Fort Collins-Loveland, CO	264,036	40.97	61.83	29.81	20.34
Charleston, WV	306,544	-0.31	17.36	21.91	6.97
South Bend-Mishawaka, IN	317,790	6.93	11.07	19.33	16.47
Tallahassee, FL	324,955	24.41	28.72	15.49	10.28
Eugene-Springfield, OR	327,327	15.15	20.61	15.66	6.28
Huntsville, AL	353,015	19.93	17.03	7.90	4.95
Fayetteville, AR	366,988	51.98	61.90	15.13	17.42
Mean Growth		20.54	27.21	16.18	10.11
Median Growth		17.04	23.73	15.71	10.20

Source: www.bea.gov

III. Growth and Quality of Life in Lincoln

A growing economy in a metropolitan area influences the quality of life in a variety of ways. This section of the report examines a number of these influences by examining recent economic research and by comparing developments since 1990 in 20 peer metropolitan areas. We examine the relationship between growth and the following factors:

- Hourly wages
- Poverty rates
- Retail and service activity
- Commuting times
- Crime rates.

A. Wages

Lincoln experienced sustained employment growth from 1990 to 2002. At the same time, the Lincoln metropolitan area also experienced strong growth in per capita income and earnings per job. Research by Bartik (1991 and 1996) and others anticipates such a positive correlation between job growth and earnings per job (or hourly wages) over time.

Why is there a correlation? Bartik argues that *periods* of local job growth help workers (on average) to *permanently* upgrade their skills. Strong job growth implies a tight labor market, where workers are relatively scarce. In such a labor market, workers are able to get hired for a job in a higher-paying occupation than their previous work. This opportunity allows the worker to earn skills and remain in the higher wage occupation, even after the labor market softens. The greater level of skill permits the worker to enjoy higher wages permanently. Glaeser and Mare (2001) identified a related effect based on city size. They found a sustained increase in earnings for workers living in major metropolitan areas. The increase was sustained by workers even after these workers migrated to a smaller community, suggesting a permanent increase in skill level.

Even in a rapidly growing economy, however, only a portion of workers will get these new opportunities. There is, therefore, a need to estimate the size of the wage increases associated with local employment growth. Bartik (1991) estimated a 0.17% long-run increase in real hourly wages associated with a 1% increase in local employment. This increase was primarily due to workers moving up to higher paying occupations. Real hourly wages are an appropriate measure, as they account for any increase in prices. Other studies have tended to examine changes in nominal wages. Topel (1986), for example, estimated that a 1% increase in local employment led to a 0.5% increase in average weekly earnings. This figure, however, also reflects local price

increases (0.2% for each 1% increase in MSA job growth) and changes in the number of hours worked (.07% for each 1% increase in MSA job growth) as well as an increase in hourly wages.³ Adjusting for these, the Topel results would suggest real hourly wage increases of 0.23% for each 1% increase in local employment. Thus, Topel’s results are consistent with those of Bartik.

What level of real wage growth is associated with job growth in Lincoln? Based on the findings of Bartik, the 26.9% job growth in the Lincoln metropolitan area from 1990 to 2002 would have led to a 4.6% growth in real hourly wages during the period. Based on current⁴ hourly wage levels, this amounts to a \$0.70 per hour increase in real wages in Lincoln. (See Table 2.) For a full-time worker, this is the equivalent of a \$1,400 jump in real (cost-of-living-adjusted) annual earnings.

These estimates apply to workers on average, however. Not all workers would experience such increases. Further, research by Bartik (1991) indicates that the percentage of the real wage effect differed systematically for different groups. In particular, Bartik found that the impact of employment growth on hourly wages was larger in percentage terms for young workers, less educated workers, and for African-American workers. These workers might experience a larger percentage increase in their wages.⁵

Table 2—Employment Growth, Wages, and Poverty

Factor	Definition	Correlation
Real Hourly Wage Growth	Estimated Increase in Average Hourly Wages in Lincoln MSA Resulting from 26.9% Employment Growth from 1990 to 2002	\$0.70
Poverty Rate	Decline in Number of Persons in Poverty During 1990s Due to Employment Growth from 1990 to 2000	1,200 to 2,700 persons

B. Poverty

In addition to its impact on overall wages, job growth can influence the poverty rate. This is particularly true, given Bartik’s finding that younger and less educated workers experience larger than average wage increases (in percentage terms) in response to job growth. To examine this issue, we first calculated the correlation between job growth and poverty rates in our group of 20 peer cities. The correlation was -0.54, suggesting higher job growth was correlated with greater reductions in poverty.

Such a link also has been identified in recent economic research. Looking at the state level, Tobin (1994) found that a strong labor market was associated with a lower poverty rate. At the local

³ Bartik (1991) found that prices rise 0.2% for each 1% increase in local growth and that hours worked per week rise 0.07%.

⁴ According to the Bureau of Labor Statistics, the mean hourly wage in the Lincoln MSA was \$15.92 in 2003.

⁵ This is not necessarily a larger increase in terms of dollars, because younger and less educated workers typically have below average wages.

level, both Crandall (2004) and Bartik (1996) found that growth in local area employment led to a statistically significant decline in poverty rates.⁶

Job growth over the last decade would have helped reduce poverty in Lincoln. But how large was the effect? Crandall (2004) found that each 1% increase in county⁷ employment over a decade led to a 0.02 percentage point decline in the poverty during the 10-year period. Using this estimate, the 26.9% job growth in Lincoln from 1990 to 2002 would have lowered the poverty rate 0.54 percentage points. This is the equivalent of roughly 1,200 persons.

Bartik (1996) found a stronger effect over a two-year period. Bartik found that a 1% increase in metropolitan area employment led to a 0.29 percentage point decline in the poverty rate two years later. It is unclear, however, how long these effects found by Bartik would sustain beyond this two-year period. A conservative approach would be to assume that the effect lasted only two-years. Under this approach, 2.0% annual job growth in the Lincoln metropolitan area from 1990 to 2002 (or 4% growth every two years) would imply that annual poverty rates would be roughly 1.2 percentage points lower during the decade. This would represent roughly 2,700 fewer residents in poverty.

Overall, results indicate that growth in Lincoln helped reduce the poverty rate. Employment growth in Lincoln from 1990 to 2002 would have helped keep at least 1,200 residents (and perhaps as many as 2,700 residents) out of poverty during the period.

C. Retail and Service Activity

Rising wages and declining poverty clearly relate to the standard of living in Lincoln. Another quality-of-life factor is the availability of shopping and service opportunities in the community. Greater choice locally is advantageous on its own, but can particularly benefit the local community if it can allow local residents to shop or obtain services locally, rather than driving to nearby larger cities.

Growing population naturally will lead to more stores and service providers in a metropolitan area. But will faster population growth lead to more retail and service activity per household or per dollar of income? An affirmative answer could indicate that residents of the city are spending more income locally. This also would indicate an improved quality of life, as trips to nearby cities could be avoided. Further, growing retail or service activity per dollar of income also could indicate that a metropolitan area is attracting more shoppers from outside the area. Either outcome would have positive implications for local tax revenues, as is discussed later in the report.

In this section, we examine whether growth leads to a greater local capture of retail and service activity in the 20 mid-sized metropolitan areas using a technique called a *location quotient analysis*. The location quotient is the ratio of retail (or service) activity per dollar of personal income in

⁶ In a related article, Hoynes (2000) found that faster local employment growth was associated with shorter spells as a welfare recipient and lower levels of recidivism back onto welfare.

⁷ Similar results also were found for metropolitan areas.

each metro area relative to the ratio nationally.⁸ A location quotient value greater than 1 would indicate that a metro area had more retail (or service) activity per dollar of income than the nation. More generally, growth in a location quotient over time would indicate retail (or service) activity per dollar of income has risen more quickly in the metropolitan area than nationally. In other words, a growing location quotient indicates that a metro area is improving its capture of retail (or service) activity locally. This capture could reflect that a metropolitan area is retaining a larger share of the retail and service spending of metro area residents (rather than seeing that spending in nearby areas), attracting more spending from nearby communities, or both.

We compare change in location quotients from 1990 to 2000 with growth in population during the decade in the 20 peer metropolitan areas. The Fayetteville, Arkansas region is excluded from the retail analysis because it is the home region for Wal-Mart, Inc.

It was not possible to analyze a more current year because the system of industrial classification was changed around the turn of the century. Retail and service data from 2001 and 2002 were based on the Northern American Industrial Classification System, while data for the year 2000 and before were based on the Standard Industrial Classification System. The definition of the retail trade industry differs in the two classification systems, as does the definition of the services industry. Further, we used worker earnings as the principal measure of retail and service activity, again due to the change in the industrial classification systems.⁹ Location quotients therefore examined growth in retail worker earnings per dollar of personal income rather than retail sales per dollar of personal income.

Results in Table 3 indicate that there is a positive correlation between population growth and growth in the location quotients for retail trade. This is consistent with the notion that a growing metropolitan area will capture an increasing share of retail trade activity. Findings are more ambiguous for services, however. The correlation is negative for services in the 20 peer metropolitan areas. But this finding is sensitive to the inclusion of data for Reno, NV, where gambling is a large share of the services industry. Without Reno, the location quotient is 0.31.

**Table 3—Correlation between Population Growth and Location Quotients
Peer Mid-Sized Metropolitan Areas 1990-2000**

Industry	Location Quotient Definition	Correlation between Metro Area Population Growth and Change in Location Quotient
Retail Trade	Employee Earnings Per Dollar of Personal Income	0.21
Services	Employee Earnings Per Dollar of Personal Income	-0.11

⁸ Location Quotient (retail) = $\frac{\text{Retail Activity}_{\text{MSA}} / \text{Personal Income}_{\text{MSA}}}{\text{Retail Activity}_{\text{US}} / \text{Personal Income}_{\text{US}}}$

⁹ Retail and services sales from the 2002 Census are not yet available. 1997 Census data are organized according to the North American Industrial Classification System, while 1992 Economic Census data are organized using the Standard Industrial Classification System. Comparable data from the two Censuses are not available below the state level.

D. Concerns Regarding Growth and Quality of Life

Growth is accompanied by a number of concerns associated with the standard of living and quality of life benefits described above. One set of concerns is the fiscal considerations for local government. These issues are addressed in the last section of the report. Other concerns include: 1) consumption of land, 2) increased commuting, and 3) crime (Burchell et al., 2002). These concerns, which are discussed below, should be considered in tandem with the benefits for wages, poverty reduction, and increased availability of retail to provide a complete picture of how growth impacts local quality of life and the standard of living.

Consumption of land refers to the conversion of farmland, woodlands, or other green spaces into land for housing residential and commercial structures. Land that is developed typically is purchased at market values, but the concern arises that this land may have amenity value to the citizens of towns and cities (Beasley et al, 1986; and Ready et al., 1997) that is not captured in the market price of land. This amenity value is lost when acres of land are converted to other uses.

Increased commuting is another concern that parallels growth. As a city grows larger, workers may tend to be located further from their place of work, increasing the average commute to and from work. The magnitude of this problem depends on the distribution of businesses and housing. In particular, the impact of growth on commuting times may be modest to the extent that growth is concentrated in a single city rather than in a spread over a larger geographic area.

The issue of growth and commuting was investigated using the 20 peer metropolitan areas. We examined growth in average commuting times cited in the 1990 and 2000 Census in each metropolitan area and examined the correlation between population growth and growth in commuting times. Results are reported in Table 4. We found a small positive correlation of 0.10, supporting the expectation that commuting times rise with population growth.

Crime rates also may increase as metropolitan areas grow larger. This issue also was examined using the 20 peer metropolitan areas. Growth in population was compared with growth in crime rates from 1991 to 2001 as reported in the Uniform Crime Reports of the Federal Bureau of Investigations. As reported in Table 4, we found negative correlations between population growth and growth in crime rates, which does not support the expectation that crime rates will rise as mid-sized cities grow.

Table 4—Correlation between Population Growth and Commuting Times/Crime Rates Peer Mid-Sized Metropolitan Areas

Factor	Definition	Correlation
Commuting Times	Population Growth and Growth in Commuting Times as Reported in U.S. Census 1990 to 2000	0.12
Violent Crime Rate	Population Growth and Change in Violent Crime Rate 1991 to 2001	-0.25
Property Crime Rate	Population Growth and Change in Property Crime Rate 1991 to 2001	-0.28

IV. Fiscal Consequences of Growth

Previous sections considered the effects of growth on quality of life in the Lincoln metropolitan area and the City of Lincoln. This section considers the consequences of growth for the fiscal health of the City of Lincoln. Growth impacts the local fiscal situation in a number of ways: growth in taxable sales per household, growth in property values, and the public capital costs required for new households.

In terms of sales tax, employment and population growth in a metropolitan area such as Lincoln are associated with both growing (wage) income and increased capture of retail and services activity. Both factors lead to growing sales tax revenue on both a per capita and per household basis. This implies additional sales tax revenue available to fund public services in Lincoln.

Growth in population and employment in Lincoln also will be associated with growing property tax revenue and capital costs for city government. New housing units typically have higher property values because the units are newer and are more likely than existing housing units to be detached, single family homes. New housing units also require additional public capital to provide services...the new public infrastructure comes with new taxable property. This study compares the incremental property tax revenue generated by new housing units (due to higher than average property values) with the additional capital costs required by the City of Lincoln to provide services to these new housing units.

In Lincoln, these issues of incremental property values and capital costs are necessarily tied to the question of new residential and commercial real estate development. Lincoln has little capacity for net in-fill development of single-family homes and only a limited capacity for net in-fill development of multi-family units. Demographic growth therefore will require single-family and multi-family unit construction in new areas, presumably in areas slated for development on the fringes of Lincoln. New retail and service providers, as well as businesses of all kinds, also will find it advantageous to locate near this population. In considering the fiscal consequences of growth, we need to consider the fiscal impact of new commercial and residential units in new development areas.

It also will be important to consider residential and commercial real estate development as a joint phenomenon. Sustained growth in commercial activity in a local area must be accompanied by growth in households. The households would provide both the workforce and (in the case of retail and service) the customers for businesses. This general point is particularly true in the Lincoln metropolitan area because in this area nearly all commercial and residential development occurs within the City of Lincoln, at least historically. This is not to imply that residential and commercial growth must occur in fixed proportion. In fact, this report argued earlier that growth in Lincoln has led to rising commercial activity per household relative to the nation. The point is

that it is not appropriate to consider the fiscal impact of new housing units and new commercial units separately, as they will grow together in Lincoln.

One implication is that it is not appropriate to look at the fiscal impact of new housing developments in an absolute sense—that is, to examine whether new housing units bring revenue that exceeds their annual capital and operating costs. The appropriate comparison is the fiscal impact of new housing units relative to existing housing units. Likewise, the fiscal impact of a new commercial property should be compared with the impact of existing commercial properties.

Overall, the following three fiscal consequences are considered:

- Growth in sales tax revenue per household in Lincoln
- Property tax revenue and capital costs associated with providing arterial roads, neighborhood parks and trails, fire, police, and library services to new housing units
- Water and wastewater capital costs and new housing units

The study does not address fiscal consequences to the Lincoln Public School District or to Lancaster County.

A. Sales Tax Revenue

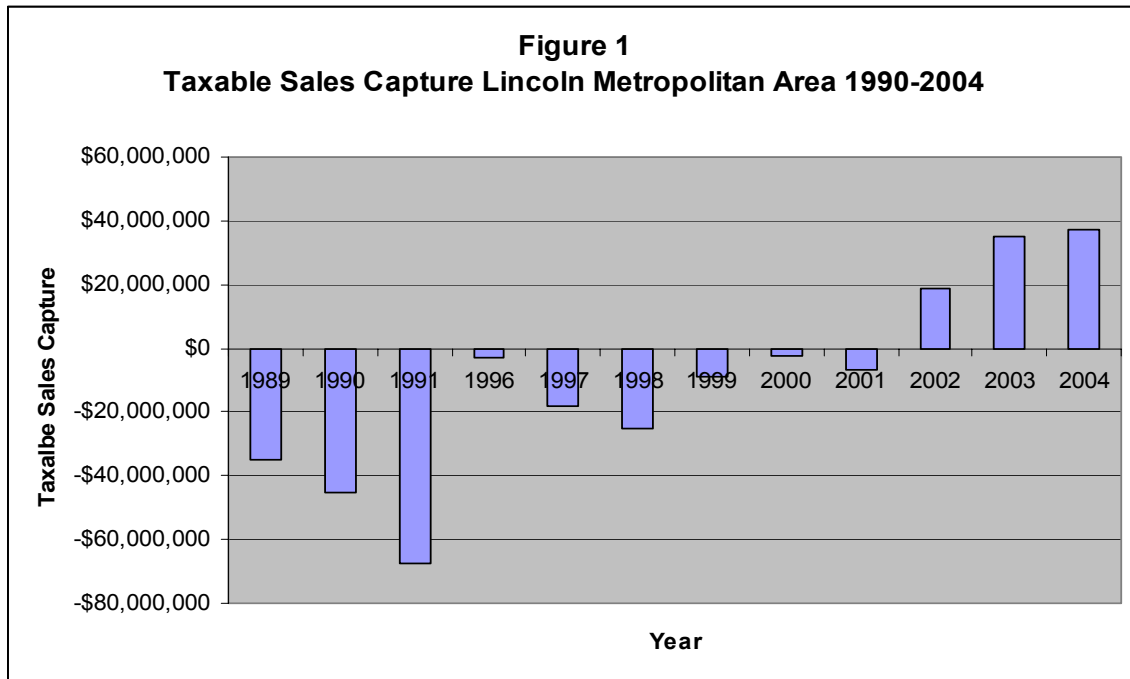
Demographic and economic growth will lead to rising sales tax revenue per household in Lincoln because of: 1) rising real wages (and incomes) per person and 2) increased capture of retail and service activity per dollar of income. The result will be increased local tax revenue to provide infrastructure and services to Lincoln households. To see an example, compare growth in taxable sales in Lincoln with growth statewide in Nebraska. Growth in taxable sales per person in Lincoln would be expected to exceed statewide growth simply because per capita income is rising faster in the Lincoln metropolitan area. Recall that real per capita income growth in Lincoln exceeded growth in Nebraska by 3.1% from 1990 to 2002. Per person taxable sales growth in Lincoln would be expected to be at least 3.1% greater. The gap would be larger because a growing area such as Lincoln would capture an increasing share of retail activity and, perhaps, services activity.¹⁰ This is in fact the case. Real (inflation-adjusted) taxable sales per person grew 15.2% in Lincoln from 1990 to 2002 versus 11.5% statewide. This is a 3.7% gap.

In this section, we examine an additional way of looking at the increase in sales tax revenue per person in Lincoln. We utilize the technique of sales capture analysis. Sales capture analysis compares actual growth in taxable sales with predicted growth. Predicted growth is a function of

¹⁰ This point is demonstrated in a statement the research team received from the local marketing director with Westfield Corporation, the operator of Westfield Mall in Lincoln: “Westfield Corporation is the largest retail property group in the world with 126 shopping centers in four countries (a total value in excess of \$32 billion). Therefore, Westfield Corporation is a business-savvy organization that thoroughly researches each community in which it intends to purchase a property. When researching communities, Westfield looks for cities with growth potential in areas that hold strong positions in geographic, retail, and economic diversity providing a consistent income. Typically, the properties are located in or near primary trade areas, anchored by long-term tenancies with major retailers with a wide cross-section of high quality specialty retailers and national chain store operators. Westfield searches for communities that it foresees as strong partners, as each party mutually benefits economically from the collaboration.”

population growth in a metropolitan area as well as the change in the average taxable sales per person in a large area such as a state or the nation. The capture of taxable sales could improve over time due to either: 1) faster income growth or 2) retaining or attracting spending to Lincoln.

We focus here on growth in total taxable sales. Roughly half of total taxable sales is due to sales activity in the retail industry, while the services industry accounts for nearly one-quarter. These areas were the subject of the location quotient analysis in Section III.D. Information on taxable sales per person in Nebraska was gathered from the Nebraska Department of Revenue. This statewide average was combined with population growth in the Lincoln metropolitan area to estimate predicted growth in taxable sales in the Lincoln metropolitan area. Actual taxable sales increases for the Lincoln metropolitan area then were compared with predicted sales to estimate the capture of additional taxable sales. Figure 1 shows estimate sales tax capture in Lincoln for each year from 1989 to 2004. The figure shows a fairly steady improvement in taxable sales capture during Lincoln’s period of growth since 1989. The Lincoln metropolitan area went from being a place that lost taxable sales at the beginning of the period to being a place that captured taxable sales at the end of the period.



What does this improved capture of taxable sales mean in terms of sales tax revenue for Lincoln? Table 5 shows actual taxable sales, predicted taxable sales, and taxable sales capture in 1990 and 2004 and the change in taxable sales capture during the 14-year period. Lincoln went from capturing less than its predicted taxable sales in 1990 to running a surplus in 2004. Lincoln improved its position in terms of taxable sales by \$82 million during the 14-year period.¹¹ Again, this occurred both because Lincoln had 1) income growth that exceeded the state average and

¹¹ This figure is robust. For example, if sales tax capture would have been compared based on the average for 1989-1991 compared with the average for 2002-2004, the difference would have been \$81 million.

2) Lincoln was able to attract or retain more retail and service activity due to its growing population base.

Naturally, only a portion of these sales would occur in Lincoln, roughly 90% based on existing patterns. This implies a \$74 million increase in taxable sales in Lincoln. The associated increase in sales tax revenue would be \$1.1 million per year given a 1.5% local sales tax rate.

The key point with this \$1.1 million per year is that it would be additional revenue available to cover city government's capital or operating costs for Lincoln. The figure was calculated after removing growth in sales tax revenue resulting from increases in population and households in the city or resulting from global trends such as increasing levels of employment per household that are occurring throughout the U.S. economy. The \$1.1 million per year is available due to the income increases and improved retail and service capture associated with economic growth.

Table 5—Growth in Taxable Sales Capture Lincoln Metropolitan Area 1990 - 2004

	Actual Taxable Sales	Predicted Taxable Sales	Taxable Sales Capture
1990	\$1,549 Million	\$1,594 Million	-\$45 Million
2004	\$3,339 Million	\$3,301 Million	\$37 Million
Growth in Taxable Sales 1990 to 2004			\$82 Million

B. New Housing, Property Taxes, and Capital Costs for Arterial Streets, Neighborhood Parks and Trails, Fire, Police, and Library Infrastructure

i. Incremental Property Tax Revenue per Unit

The new commercial and residential development associated with economic growth further contributes to the tax base of Lincoln through property taxes. Table 6 below shows the levy rates pertaining to property located in the City of Lincoln for 2004. The overall tax rate is approximately 2% of the value of property. Table 6 also shows estimates of the average property tax payments for new housing units in Lincoln in 2004. Property tax payments were based on estimated assessed value of \$149,300 for new housing units.

How were these estimates of average assessed value derived for new housing units? The average values were based on data from the Realtors Association of Lincoln on the average price of new single-family detached and single-family attached housing units. Average values for each type of housing unit were weighted to produce the average value for new housing units overall. The weights were the share of new units that are: 1) single-family detached, 2) single-family attached, 3) duplex, or 4) multi-family. The shares were based on the average number of building permits issued by the City of Lincoln for each type of housing unit during the last five years (2000-2004).¹² This approach does not assume that all permitted housing units were eventually built, but just that the share built was the same for each type of housing unit. The result was the average property value for new housing units in the City of Lincoln in 2004. Property value and assessed value are not necessarily the same, however. We conservatively assume that assessed value

¹² Source: Lincoln/Lancaster County Planning Department (Updated January 13, 2005).

would be 90% of property value. The result was an estimate that the average assessed value of new housing units in Lincoln of 149,300 in 2004.

Table 6 also shows estimated property tax payments for existing housing units in Lincoln in 2004. These payments were based on the estimated average assessed value of residential real estate in Lincoln. The assessed value for residential property in tax year 2004 reported in the *Comprehensive Annual Fiscal Report Year Ended August 31, 2004* for Lincoln was adjusted for the total share of all assessed value due to sources other than real estate. The resulting total assessed value for residential real estate then was divided by the number of housing units in Lincoln. The total number of housing units in Lincoln in the 2000 Census was updated based on population growth in Lincoln from 2000 through 2004. The resulting estimate was that the average assessed value of existing housing units in Lincoln was \$86,900 in 2004.

Table 6 indicates that the City of Lincoln would receive an average of \$184 more in 2004 from new housing units than from the average existing housing unit. There are also substantial differences for other types of levies. Lincoln School District 1 would receive an average of \$819 more per unit from new housing units, while Lancaster County would receive \$174 more per unit.

Table 6—Estimated Property Tax Revenue per New and Existing Unit 2004

	2004 Levy Rate (per \$100)	Estimated 2004 Property Tax Revenue Per Unit		
		New Units	Existing Units	Increment
City of Lincoln	0.295	\$440	\$256	\$184
School District No. 1	1.3141	\$1,962	\$1,142	\$819
Lancaster County	0.2797	\$418	\$243	\$174
Education Service Unit No. 18	0.015	\$22	\$13	\$9
Community Technical College	0.0655	\$98	\$57	\$41
Lower Platte South Natural Resource District	0.0323	\$48	\$28	\$20
Railroad Transportation Safety District	0.026	\$39	\$23	\$16
Lancaster County Agricultural Society	0.002	\$3	\$2	\$1
Lancaster County Fairgrounds	0.0042	\$6	\$4	\$3
Public Building Commission	0.017	\$25	\$15	\$10
Total	2.0508	\$3,044	\$1,783	\$1,261

Table 7 illustrates the property tax revenues for the City of Lincoln during both 2002 and 2004. Revenue per new housing units exceeds revenue per existing housing units by roughly \$190 per unit in both years. The gap fell between 2002 and 2004, however, primarily due to significant increases in the value of existing housing units during the period.

Results for 2002 are presented in Table 7 in order to illustrate that higher incremental revenues from new housing units are persistent over time. Further, 2002 results were presented because this is the year for which capital costs estimates have been calculated per new housing unit for arterial streets and neighborhood parks and trails. The incremental property tax revenue from new housing units for 2002 would be useful for comparison with these capital costs.

Table 7—Estimated Property Tax Revenue per New and Existing Unit in the City of Lincoln 2002 and 2004

Year	Estimated Property Tax Revenue Per Housing Unit City of Lincoln		
	New Units	Existing Units	Increment
2002	\$426	\$229	\$197
2004	\$440	\$256	\$184

ii. Net Capital Costs per Unit

Capital costs associated with growth and new housing units include costs for buildings, roads, parks, vehicles, and other equipment that are directly used by residents and households or are used by government to provide services, such as fire or police protection. There are also capital costs associated with city-owned businesses such as utilities, but this issue is discussed in a later section.

Public capital such as new arterial roads, neighborhood parks and trails, and capital equipment for libraries and fire and police protection is available for use by residents throughout the community. For example, residents throughout Lincoln frequently may use a newly-widened arterial road in order to: 1) shop at a store or visit a health care provider located on that road or 2) work at one of these businesses. New fire and police stations or libraries built in connection with growth will be used by both new and existing households. In other words, the public capital is available for use by residents throughout the community.

There is, however, a tendency for the public and businesses to use nearby facilities most often. Further, users of public capital typically are not charged for use. Residents are not charged each time they use a city park. Business and households do not need to pay each time their vehicles travel on a road. A natural question is, therefore, how does the incremental property tax revenue that accompanies growth compare with the net costs for new public capital?

Two recent studies by Duncan Associates and Public and Environmental Finance Associates estimated the capital costs associated with growth on a per-housing-unit and commercial-property basis. The 2000 study *Infrastructure Finance Study: Capital Costs of Growth Memorandum* estimated per unit costs for the following types of public capital: arterial streets, neighborhood parks and trails, libraries, police, and fire, as well as municipal electric power, wastewater, and water utilities. The 2002 study *Lincoln Impact Fee Study for Arterial Streets, Water, Wastewater, and Neighborhood Parks and Trails* updated per unit capital costs for arterial streets and neighborhood parks and trails. Replacing 2000 costs with 2002 estimates where possible yields a net capital cost estimate of \$3,870 per single-family detached housing unit for arterial streets, parks, libraries, police, and fire (\$100 less than estimated in the 2000 study). Most of the \$3,870 figure was due to capital costs for new arterial roads. Net capital costs refer to the estimated capital cost requirements for each new housing units (the gross capital cost) less: 1) the amount of tax revenue from new households that would go to pay general revenue bonds that financed arterial streets, parks, library, police, or fire infrastructure or 2) outside revenue (such as state highway funds) attributable to new households that is used to pay for new infrastructure.

Table 8—Estimated Net Capital Costs and Incremental Tax Revenue per Housing Unit City of Lincoln 2002

	Capital Cost Per Housing Unit
Net Capital Cost Per New Single-Family Detached Housing Unit Estimated based on 2000 and 2002 Duncan Associates Studies ¹	\$3,870
Adjustment of Net Capital Costs per New Single-Family Detached Housing Unit to Cost for all New Housing Units (@ 85% ²)	\$3,290
Adjustments in Net Capital Cost Suggested by BBR	
Adjustment for Decline in Average Household Size (Share of New Housing Units Without Any Increase in Population) (@10%)	- \$330
Adjustment for Contributions of New Housing Units of Revenue to Fund New Capital Improvements for Existing Neighborhoods	- \$590
Net Capital Cost Per New Housing Unit Suggested by BBR	\$2,370
Sales Tax Revenue from Construction of Each New Housing Unit	\$900
Present Value of Incremental Property Tax Revenue for New Housing Units ³	\$2,000
Estimated Total Incremental Tax Revenue Per New Housing Unit	\$2,900

1 The 2000 study *Infrastructure Finance Study: Capital Costs of Growth Memorandum* estimated per unit costs for the following types of public capital: arterial streets, parks, libraries, police, and fire, as well as municipal electric power, wastewater, and water utilities. The 2002 study *Lincoln Impact Fee Study for Arterial Streets, Water, Wastewater, and Neighborhood Parks and Trails* updated per unit capital costs for arterial streets and parks.

2. Duncan Associates and Public and Environmental Finance Associates *Infrastructure Financing Study: Fiscal Impact Analysis Memorandum* (November 2000).

3. Incremental property tax revenue refers to the portion of property tax revenue from new housing units due to the higher assessed property value of new units.

The \$3,870 net capital cost was for each detached single-family unit. Capital costs are lower for other types of housing units such as duplexes or multi-family units. The \$3,870 figure must be adjusted downward to derive an estimate for all new housing units. The 2000 Duncan Associates Public and Environmental Finance Associates study *Infrastructure Financing Study: Fiscal Impact Analysis Memorandum* adjusted gross arterial streets, parks, libraries, police, and fire capital costs per single-family housing unit to a gross capital cost for all housing units. Average gross capital costs across all residential units were 85% of costs for single-family detached homes. Adjusting these net capital costs by the 85% ratio yields \$3,290 in net costs per new housing unit.

iii. Adjustments in Net Capital Cost per Unit Suggested by BBR

The Bureau of Business Research has identified several additional adjustments that should be made to estimates of net capital costs. First, net capital costs per new housing unit should be adjusted to account for declining household size (persons per household) in Lincoln. Declining household size implies that some new housing units are required in the city even if population

does not grow over time. Second, net capital costs should be adjusted to account for contributions of new housing units to the new capital improvements in existing neighborhoods.

Average household size in Lincoln declined from 2.40 persons per household in 1990 to 2.36 persons per household in 2000. This decline implied a growth in 1,250 households in Lincoln during the 1990s due to declining household size or roughly 125 housing units per year. The number of housing units in the City of Lincoln grew roughly 1,600 per year during the 1990s. Therefore, approximately 8% of new housing units in Lincoln in any given year were due to declines in persons per housing unit rather than population growth. In addition, there are a limited number of housing units each year that are razed to make room for commercial development (buildings and parking). Adding these to the 8% figure cited above, we assume that 10% of new housing units in the City of Lincoln in any given year are not the result of population growth.

New housing units built without population growth do not impose the net capital costs discussed above. As noted earlier, most of the \$3,290 capital costs per new housing unit are due to costs for arterial streets. These costs were based on the replacement costs for arterial street capital when adding new drivers to Lincoln's arterial streets during peak hour traffic. New housing units that do not add new drivers to Lincoln's arterial streets during peak hours will not increase capital costs.¹³ The capital cost estimate should be reduced 10%. Reducing the \$3,290 figure 10% would reduce costs \$330. This adjustment is noted in Table 8 above.

We also argue that a further reduction in net capital costs is appropriate because new housing units generate revenue that helps fund capital improvements that primarily benefit existing neighborhoods. We focus on capital costs for arterial streets, neighborhood parks and trails, police and fire protection, and libraries. In particular, the property taxes, wheel taxes, and state gasoline taxes paid by new households also help fund this infrastructure for existing neighborhoods.¹⁴

The largest contribution by new households to infrastructure in existing neighborhoods is through arterial streets. We examined the 2002-2007 Capital Improvement Plan for the City of Lincoln and identified annual costs for three project categories: 1) arterial/residential rehabilitation (Project 1); 2) upgrade built environment and traffic calming (Project 4); and 3) replace traffic signal equipment (Project 6). The average annual cost for these projects, which are funded by residual wheel taxes and state fuel taxes returned to local government, was \$6.6 million. We assigned two-thirds of these costs to payments generated by households and then divided by 95,000 occupied Lincoln households to yield a cost of \$46.50 per household per year. This annual amount has a present value over 20 years (at a 6% interest rate) of \$533. The annual capital costs for fire and libraries were similarly calculated from the Capital Improvement Plan to estimate a

¹³ New housing units may increase demand for arterial roads primarily near new developments rather than on arterial roads in existing neighborhoods. The arterial capital costs estimates made by Duncan Associates, however, included a 31% additional charge to account for a mismatch between highway capacity and traffic demand. This 31% adjustment easily accounts for the 10% adjustment discussed here.

¹⁴ New housing units also fund other capital costs of the city such as for urban development, Pershing Auditorium, and others. We will take the conservative approach and not consider these additional contributions; we will focus only on contributions to the same categories of arterial streets, neighborhood parks and trails, police and fire protection, and libraries.

present value of \$38 for library capital and \$19 for fire capital. Across all categories, the present value of annual capital costs were \$590, as is illustrated in Table 8 above.

Subtracting \$330 and \$590 from the initial \$3,290 figure yields \$2,370. This is the net capital cost per new housing unit for arterial streets, neighborhood parks and trails, fire and police protection, and libraries suggested by the Bureau of Business Research.

iv. Comparing Incremental Tax Revenues per Unit with Net Capital Costs

Results in Table 7 indicate that new housing units sold in Lincoln in 2002 would generate approximately \$197 more in annual property tax revenue for the City of Lincoln than existing housing units. This difference was due to the higher property value of new housing units. The increment for the year 2004 was \$184. If we take the midpoint of these two values, it roughly yields an increment of \$190 in additional property tax revenue per year for new housing units. This amount should be reduced roughly \$15 per year to account for special assessments paid by existing housing units in any particular year. The present value of the difference for the City of Lincoln over 20 years would be approximately \$2,000, assuming a 6% discount rate. This figure is reported in Table 8.

In addition to this property tax increment, there is also local sales tax revenue to consider. Sales tax is due on materials purchased to build new housing units in Lincoln. Contacts with the Home Builders Association of Lincoln indicated that materials for a new home comprise roughly 40% of sales price.¹⁵ We utilized the estimated value of the average new housing unit (includes multi-family as well as single-family units) in Lincoln in 2002, applied the 40% ratio, assumed local purchase of all materials, and applied the 1.5% local sales tax rate to yield an estimate of \$900 in Lincoln sales tax revenue for each newly constructed residential unit.¹⁶

Overall, the per unit tax revenue increment for the City of Lincoln matches or exceeds the capital costs per new housing unit for arterial streets, neighborhood parks and trails, police and fire protection, and libraries. This is found even without any exactions on housing developers. This conclusion may not hold for the utilities that the City of Lincoln provides such as water and wastewater. The results, however, may be instructive for other taxing jurisdictions, such as Lancaster County or Lincoln Public Schools, where revenue is tied to property values.

v. Annual Operating Costs Imposed by New Versus Existing Residential Units

The above results assume that incremental property tax revenue generated by new housing units is available to meet capital costs. This would not be true if, for example, there were substantially higher annual operating costs to provide services to new households.

¹⁵ Research by the National Association of Home Builders (Carliner, 2003) suggests a 30% share for building materials among the largest builders nationally. While this is lower than the 40% figure, we felt it was more appropriate to utilize estimates from local builders of all sizes rather than a national sample of the largest builders.

¹⁶ The \$900 per unit estimate is higher than the local sales tax revenue per average new residential unit of \$563 estimated in the 2000 study by Duncan Associates and Public and Environmental Finance Associates *Infrastructure Financing Study: Fiscal Impact Analysis Memorandum*.

Analysis presented in the 2000 report by Duncan Associates and Public and Environmental Finance Associates *Infrastructure Financing Study: Fiscal Impact Analysis Memorandum* argued that new units did have higher annual (non-capital) expenditures than existing units for police (\$18), fire (\$16), parks and recreation (\$21), and libraries (\$7). At the same time, health and welfare expenditures were \$24 less per year for new households than existing households. The net effect was that new housing had annual operating costs that were \$38 higher than existing housing units. The difference in demand for services was largely due to demographic differences between households.

This difference, however, should be adjusted. Recall, as argued above, 10% of new housing units do not represent additional population for Lincoln but rather smaller household size or replacement housing units. Property taxes paid by these 10% of new housing units, therefore, do not need to go to pay for additional services. As stated earlier, the average existing household generated \$229 in property tax revenue in 2002. 10% of this amount would be \$23 per new housing unit. This amount should be subtracted from the \$38 figures cited above, yielding a \$15 difference.

In summary, therefore, even accepting the conclusion by Duncan Associates that police, fire, parks and recreation, and library operating costs are higher for new housing units, each new unit only imposes about \$15 per year in higher city expenditures for services.

vi. Leapfrog Development

Additional residential development within the City of Lincoln will bring both new tax revenue and new infrastructure costs. Other development patterns, however, are possible in the Lincoln area. In particular, the Lincoln area could experience a pattern of leapfrog development where growth continues to occur within the metropolitan area but is concentrated outside of the City of Lincoln in nearby cities or unincorporated places. What would be the consequences of such leapfrog development for Lincoln?

The city naturally would have less tax revenue and fewer operating costs for providing services if growth occurs outside city limits. There also would be fewer capital costs for developing additional neighborhood parks, fire, police, and library infrastructure in the city. The effect on highway infrastructure for the city, however, is less clear. Residential and commercial development outside of the City of Lincoln likely would go hand in hand. This would not mean, however, that the new residents of outlying communities would necessarily work at the new businesses in these communities. Many residents would still commute to Lincoln for work, while many Lincoln residents would commute to jobs located in the leapfrog development areas. With leapfrog development, the requirement for highway infrastructure could grow for the City of Lincoln even as the tax base to support that infrastructure does not grow.

C. Water and Wastewater Utilities

Non-utility capital costs for arterial streets, neighborhood parks and trails, fire, police, and library services are just a portion of the potential capital costs. There are additional capital costs for utilities such as water and wastewater. These capital costs typically are met by ratepayers for these utility services. What do net capital costs look like for the case of municipally-owned water and wastewater utilities?

The *2002 Lincoln Impact Fee Study for Arterial Streets, Water, Wastewater, and Neighborhood Parks and Trails* also provided updated capital costs per housing unit for water and wastewater facilities. Net capital costs were estimated at \$5,484 for a single-family unit for water and wastewater. Net capital costs were gross cost estimates less the amount of tax revenue from new households that would go to pay existing general revenue bonds dedicated to water and wastewater facilities.

These costs for all single-family units differ from the costs for the average housing unit, including single-family attached and multi-unit housing units. We take 85% of the single-family unit capital costs. As is seen in Table 9 below, this yields an average capital cost of \$4,660 per housing unit.

Net capital costs also are reduced 10% in Table 9 to account for housing units constructed due to declining family size rather than an increase in population in the City of Lincoln. Much of the water and wastewater infrastructure built to accommodate growth are pumping stations, water supply infrastructure, water transmission infrastructure, or treatment facilities that primarily serve large portions of the city's systems. The key factor increasing these costs is total usage based on population. Reducing the \$4,660 figure by 10% would reduce costs \$470, as is indicated in Table 9 below.

We also argue that a further reduction in net capital costs is appropriate because new housing units generate revenue that helps fund capital improvements to replace existing water and wastewater infrastructure. These costs are funded by a portion of water and wastewater utility payments made by households.

We examined the 2002-2007 Capital Improvement Plan for water and wastewater and identified annual costs for three project categories for water: 1) water supply: treatment and transmission (Project 2); 2) replace transfer pump at Northeast Pump Station (Project 4c); and 3) selected replacement of mains (Project 6). There also were three wastewater projects that were primarily related to replacing existing facilities rather than to increasing capacity: 1) selected replacement or repair of wastewater facilities (Project 2), 2) selected replacement or repair of manholes (Project 4); and 3) collection system replacement and repair (Project 5). The average annual cost for all six of these projects was \$3.0 million. We assigned two-thirds of these costs to payments generated by households and then divided by 95,000 occupied Lincoln households to yield a cost of \$21.10 per household per year. This annual amount has a present value over 20 years (at a 6% interest rate) of \$240, as is illustrated in Table 9 below. Subtracting \$470 and \$240 from the initial \$4,660 figure yields \$3,950.

**Table 9—Estimated Net Water and Wastewater Capital Costs per Housing Unit
City of Lincoln 2002**

	Water and Wastewater Capital Cost Per Housing Unit
Net Capital Cost Per New Single-Family Detached Housing Unit Estimated based on the 2002 Duncan Associates Study ¹	\$5,480
Adjustment of Net Capital Costs per New Single-Family Housing Unit to Cost for all New Housing Units (@ 85%)	\$4,660
Adjustments in Net Capital Cost Suggested by BBR	
Adjustment for Decline in Average Household Size (Share of New Housing Units Without Any Increase in Population) (@10%)	- \$470
Adjustment for Contributions of New Housing Units of Revenue to Fund New Capital Improvements for Existing Neighborhoods	- \$240
Net Capital Cost Per New Housing Unit Suggested by BBR	\$3,950

1 The 2002 study *Lincoln Impact Fee Study for Arterial Streets, Water, Wastewater, and Neighborhood Parks and Trails* updated per unit capital costs for water and wastewater.

When evaluating these per unit costs, however, it is important to remember that a significant portion of water and wastewater utility revenue goes to fund capital costs for the system.¹⁷ For example, in 2004, 52% of water and wastewater system revenue went to cover direct operating expenses, while the remaining 48% was available for debt service according to the City of Lincoln's *Comprehensive Annual Fiscal Report for the Year Ended August 31, 2004*. While this has changed in recent years, in 2002 most of such remaining revenue had not yet been committed to existing investments to expand water and sewer capacity. In particular, the equivalent of 31% of revenue was still available. New housing units also pay hookup fees to join the water and wastewater service. The main point being that new and existing households regularly make significant contributions to capital investments in water and wastewater.

¹⁷ This point was reinforced for the case of utilities in general in a statement the research team received from the local customer relations manager of Aquila Corporation, the natural gas utility in Lincoln: "When communities grow and utility providers (such as natural gas, electric, telephone and cable) can add new customers, all of the ratepayers benefit. Why is this? As the utility adds revenues from new residential and commercial customers, it can spread its fixed costs over more units of sales. Thus, growth helps keep utility rates lower for all the ratepayers. Over time, all utilities' costs of labor, materials, and general expenses will increase. Without growth, existing ratepayers would shoulder the entire burden of increasing costs."

V. Summary

Our results identify significant benefits from economic growth in Lincoln, including growing wages, reduced poverty, and greater retail and service options. These benefits should be considered in tandem with any costs of growth such as increased congestion and commuting times or with any fiscal costs of growth.

In terms of fiscal issues, growth leads to increased sales and property tax revenues to the City of Lincoln per household. Both wage growth and increased capture of retail spending contribute to increased sales tax revenue per housing unit. Increased property tax revenue per housing unit occurs because new housing units on average have a higher assessed value. The incremental property tax revenues to the City of Lincoln per new housing unit are similar in magnitude to the net capital costs for providing arterial streets, neighborhood parks and trails, police and fire protection, and libraries to each new unit. There are, however, additional capital costs for providing utility services such as water and wastewater to new households.

References

Bartik, Timothy J., 1991. *Who Benefits from State and Local Economic Development Policies?* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Bartik, Timothy J., 1996. "The Distributional Effects of Local Labor Demand and Industrial Mix: Estimates Using Individual Panel Data," *Journal of Urban Economics*. 40: 150-178.

Beasley, Steven D., William G. Workman, and Nancy A. Williams, 1986. "Estimating Amenity Values of Urban Fringe Farmland: A Contingent Valuation Approach: Note," *Growth and Change*. 15 (Fall): 70-78.

Burchell, Robert W., George Lowenstein, William R. Dolphin, Catherine C. Gallery, Anthony Downs, Samuel Seskin, Katherine Gary Still, and Terry Moore, 2002. *Cost of Sprawl – 2000*. Transportation Research Board, Transit Cooperative Research Program, Report 74 (2002). Washington, D.C.: National Academy Press.

Carlner, Michael, 2003. "New Home Cost Components," *Housing Economics*. March: 7-11. National Association of Home Builders.

Carndall, M.S. 2004. "Employment Growth, Social Capital, and Spatial Determinants of Poverty Change." Master's Thesis, Oregon State University. Corvallis, Oregon.

Comprehensive Annual Fiscal Report Fiscal Year Ended August 31, 2004 City of Lincoln Nebraska. Accounting Division of the Department of Finance, City of Lincoln.

Duncan Associates and Public and Environmental Finance Associates, 2000. *Infrastructure Financing Study: Capital Cost of Growth Memorandum* (September).

Duncan Associates and Public and Environmental Finance Associates, 2000. *Infrastructure Financing Study: Fiscal Impact Memorandum*. (November).

Duncan Associates and Public and Environmental Finance Associates, 2002. *Lincoln Impact Fee Study for Arterial Streets, Water, Wastewater, and Neighborhood Parks and Trails* (October).

Glaeser, Edward L., and David C. Mare, 2001. "Cities and Skills," *Journal of Labor Economics*. 19(2): 316-342.

Hoynes, Hilary W., 2000. "Local Labor Markets and Welfare Spells: Do Demand Conditions Matter?" *Review of Economics & Statistics*. 82(3): 351-368.

Ready, Richard C. Mark C. Berger, and Glenn C. Blomquist, 1997. "Measuring Amenity Benefits from Farmland: Hedonic Pricing vs. Contingent Valuation." *Growth and Change* 28 (Fall): 438-458.

Tobin, J. 1994. "Poverty in Relation to Macroeconomic Trends, Cycles, and Policies," in *Confronting Poverty: Prescriptions for Change* (S. H. Danziger, G.D. Sandefur, and D. H. Weinberg, Eds). Cambridge, MA: Harvard University Press.

Topel, Robert, 1996. "Local Labor Markets," *Journal of Political Economy*. 94: S111-S143.

Appendix 1: Data for 20 Peer Mid-Sized Metropolitan Areas

City	MSA Population 2002	% Change Population 1990-2002	% Change in Jobs 1990-2002	% Change in Real PCPI 1990-2002	% Change in Real Earnings per Job 1990-2002	% Change in Rate of Bachelor's or Higher 1990-2000	% Change in Poverty Rates 1989-1999	Change in Violent Crime 1991-2001	% Change in Commuting Time 1990-2000
Lincoln, NE	273,853	18.99	26.91	20.70	14.02	19.52	-1.00	2.12	10.19
Lexington Fayette, KY	416,480	18.94	24.78	15.89	10.12	17.51	-1.23	-26.36	12.49
Reno, NV	365,166	40.89	37.08	15.75	9.94	14.22	1.29	-25.44	11.71
Provo, UT	400,601	47.98	61.39	17.98	12.40	20.33	-6.05	-20.14	10.20
Salem, OR	358,206	27.99	27.63	10.21	10.33	14.39	-1.54	-32.23	17.42
Springfield, IL	204,153	7.55	9.90	14.52	11.68	28.37	0.63		11.14
Montgomery, AL	351,032	14.70	20.61	16.42	10.83	17.38	-2.89	-25.10	14.33
Burlington-South Burlington, VT	202,441	13.89	22.67	19.20	8.91	19.95	-0.71	12.48	-3.22
Champaign –Urbana, IL	214,786	5.74	8.97	13.61	6.80	12.84	0.42		12.41
Waco, TX	217,133	14.44	25.30	17.79	14.09	15.13	-4.10	-38.47	15.86
Topeka, KS	225,424	7.04	12.26	14.61	7.79	19.71	0.32	-14.62	8.57
Gainesville, FL	237,033	23.15	29.64	9.60	1.83	10.91	-2.51	-25.41	14.84
Lubbock, TX	254,327	10.35	18.56	12.12	0.77	4.32	-2.49	183.74	6.11
Fort Collins- Loveland, CO	264,036	40.97	61.83	29.81	20.34	22.45	-2.90	-30.57	13.56
Charleston, WV	306,544	-0.31	17.36	21.91	6.97	20.03	-1.93	19.20	19.79
South Bend- Mishawaka, IN	317,790	6.93	11.07	19.33	16.47	23.76	-0.40	47.74	12.14
Tallahassee, FL	324,955	24.41	28.72	15.49	10.28	13.01	-2.34	-32.27	20.56
Eugene Springfield, OR	327,327	15.15	20.61	15.66	6.28	14.99	-2.20	2.19	9.82
Huntsville, AL	353,015	19.93	17.03	7.90	4.95	13.75	0.06	79.09	9.16
Fayetteville, AR	366,988	51.98	61.90	15.13	17.42	30.13	0.09	44.86	13.40