

# **An Examination of the Costs Associated with Residential Growth in Bloomington, Indiana**

August 2008

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for

the City of Bloomington Environmental Commission

**Acknowledgements:** This report was prepared in consultation with the Environmental Commission's Cost of Growth Committee: Kelly Boatman, Mike Litwin, Don Moore, and Heather Reynolds. Thanks to John Carter, Jeffrey Barlow, Dave Williams, Charles Winkle, Alisa Wood, Tom Micuda, Mick Renneisen, Dana Waxman, and John Callahan for providing data and

advice. Linda Thompson, Scott Robinson, Josh Desmond, and Raymond Hess, along with the wider Environmental Commission, provided insightful feedback that improved this report.

## **INTRODUCTION**

The purpose of this study is to begin to understand and quantify the costs associated with residential urban growth incurred by the city government of Bloomington. Urban growth can be defined as the increase in the size of the urban built environment.<sup>1</sup> Thus, residential urban growth would be the increase in residential homes in this built environment. With each new house that is added to the city, there are necessary costs associated with providing infrastructure to support it. Commonly assumed benefits of growth include increased tax revenue and increased job opportunities. Unfortunately, these benefits are rarely quantified and no costs are provided for comparison. To gain perspective on the costs of residential growth, this study looks at the capital costs associated with providing various forms of necessary infrastructure to the city. With this analysis, the Bloomington Environmental Commission hopes to better understand and incorporate into the decision-making process the costs associated with residential growth in the city. Such an understanding is a first step toward fully accounting for the impacts of growth, both positive and negative, on the City of Bloomington.

## **METHODOLOGY**

There is not one universally accepted method to analyze and quantify costs associated with growth. One approach is to break down growth related costs into costs for public facilities and infrastructure as well as environmental and social costs. This report focuses on public facilities and infrastructure costs because of their relative ease to quantify. In the report, the costs for public facilities and infrastructure are quantified using City of

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<sup>1</sup> Fodor, Eben. *Better Not Bigger*. New Society Publishers, 1999, pg. 21.

Bloomington capital outlays (i.e., city funds that are invested in these facilities and infrastructure). An increased demand for service caused by residential urban growth requires an increased capacity to provide those services through expanded infrastructure. Actual or proposed city capital projects are broken down on a per home basis, which tells us something about the cost, in terms of expanded public facilities and infrastructure that the city incurs for each new home added to the city. Data was collected with the help of numerous service providers in the city. The methodology of this study is modeled on the work of Eben Fodor of Fodor & Associates in a similar study done for the State of Washington.<sup>2</sup>

## **LIMITATIONS**

There are several limitations with this analysis of the costs of growth. First, it does not fully capture all costs incurred by the city. The study looks specifically at capital costs incurred by municipal government service providers. While this is part of the overall cost of growth, there are other costs, such as costs associated with decreased environmental quality and increased operation and maintenance, which are harder to quantify. In so far that these costs are excluded, this report tends to provide a conservative estimate of the costs of residential growth.

Also, there is the challenge of accurately pin-pointing those capital costs that are directly due to residential growth. In addition to growth, there are other factors, most notably increased demand by current residents, increased quality of service, and necessary maintenance to which capital costs can be attributed. Other influences on spending,

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<sup>2</sup> Fodor, Eben. *The Cost of Growth in Washington State*. Unpublished.

including the political make-up of the Mayor's office and City Council, can have a significant effect. Accurately attributing costs to growth, as opposed to other influences, is a fundamental challenge with this type of research.

A further limitation of this particular analysis is the availability of data within the city of Bloomington. Ideally, recently completed total renovation or upgrade projects would be analyzed to most accurately capture capital expenditure costs in association with growth. While information for some service providers was available, in other cases it was necessary to use projected future costs of projects. While such data is useful in understanding potential costs, they are not dollars spent (and thus might never be spent if project interests change).

There are further limitations caused by imperfect data. First, one time period could not be assigned to analyze data, as the city is small enough that there are not major capital outlays every year, and there are discrepancies when vital data began being tracked. Second, there is variability in service area between service providers – for example the area served by water services is different than that of solid waste disposal. Additionally, this study treats all households in Bloomington the same; each house having an equal impact on the city infrastructure. Clearly size of home, location within the city, and numerous other factors make this untrue. This study looks at the aggregate level of effects.

Underlying most of the limitations mentioned above is the fact that the City of Bloomington does not track the costs of growth. Because growth is generally thought of

as positive, there has been little attention paid to the costs associated with providing for this growth. The need for careful tracking of growth-associated costs is thus an important take home message from this study.

## **POPULATION GROWTH**

To gain perspective on growth, overall population trends were first examined. The population in Bloomington rose from 60,633 in 1990 to 69,291 in 2000, an increase of 14.28% or 1.43% per year.<sup>3</sup> Projecting this rate of growth, the city population would be 75,453 in 2006 (Figure 1). During the same time, the number of households increased 26.14% or 2.61% per year from 20,983 to 26,468.<sup>4</sup> This growth rate yields an annual increase of 548.5 homes. This rate will be used throughout the report to predict post-2000 number of homes added per year. Projecting this rate would lead to 29,259 homes in 2006 (Figure 1). These rates were slightly above the national averages over this time period. Nationally, the population grew 1.32% per year, and the number of households grew 1.47%.<sup>5</sup> Persons per household in Bloomington dropped from 2.89 to 2.62, a 9.3% decrease,<sup>6</sup> while the national drop was 1.1%.<sup>7</sup> The trends of increased population and less people per home leads to a large number of homes – 5,485 – added to the city between the 1990 and 2000 census. Overall, the data illustrate that the city of Bloomington is growing in number of people and homes which necessitates expanded infrastructure to provide for that growth.

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<sup>3</sup> 2000 U.S. Census. United States Census Bureau.

<sup>4</sup> City of Bloomington Growth Policies Plan, pg. 101.

<sup>5</sup> 2000 U.S. Census. United States Census Bureau.

<sup>6</sup> City of Bloomington Growth Policies Plan, pg. 101.

<sup>7</sup> 2000 U.S. Census. United States Census Bureau.

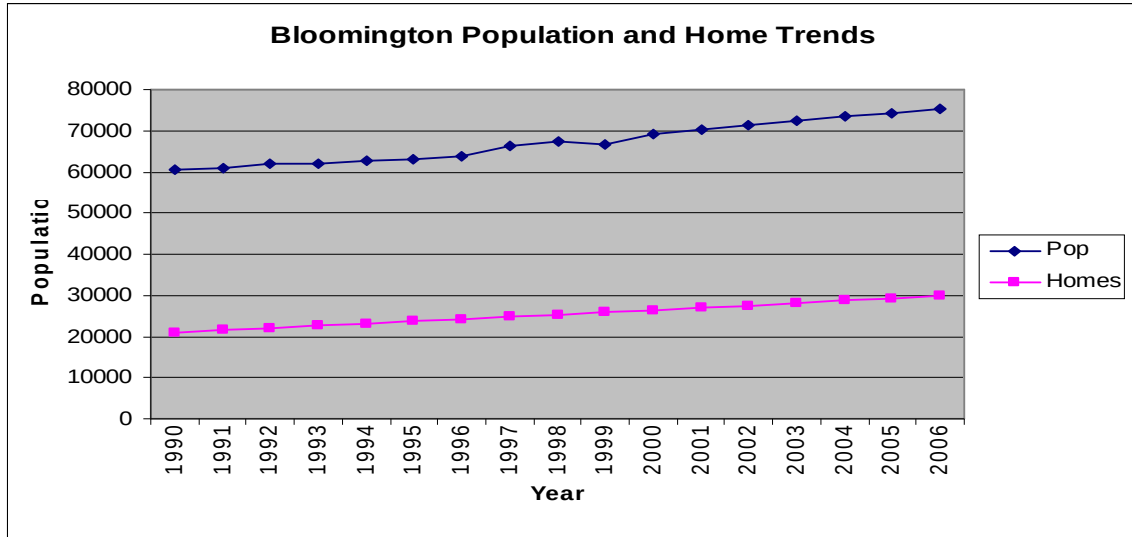


Figure 1. City of Bloomington Population and Home Trends (1990 – 2006).

## GOVERNMENT EXPENDITURES

To gain perspective on total expenses incurred by the city, total government expenditures and capital expenses were examined. Total government expenditures from 1990 to 2006 rose an annual average of 3.23% per year, from \$32,658,034.47 to \$50,571,076.00 (in constant 2006 dollars, Figure 2).<sup>8</sup>

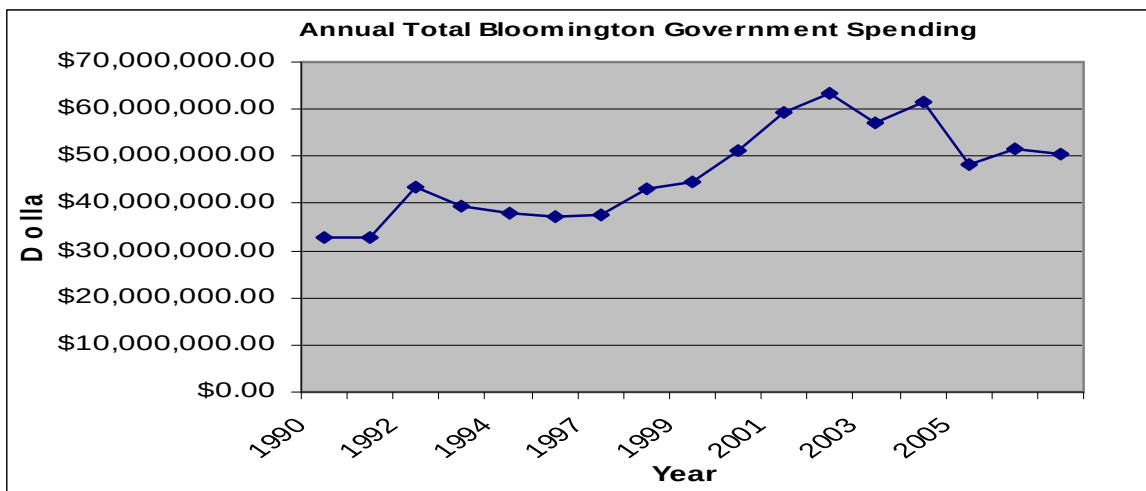


Figure 2. City of Bloomington Total Government Expenses (1990-2006) in constant 2006 dollars.

<sup>8</sup> City of Bloomington, Indiana Comprehensive Annual Financial Reports (1990-2006).

Over the same time period, 1990-2006, the city of Bloomington spent a total of \$135,650,021,<sup>9</sup> an average of \$7,979,413 per year, on capital outlays. Calculating a five year rolling average over the 1990-2006 time period shows that, like total government expenditures, capital outlays have tended to increase (Figure 3).

While correlation does not necessarily indicate causation and there are other influences on government spending besides growth, the similar trends in population, homes, and government spending over time (Figures 1-3) suggest that these factors are linked. This study does not attempt to assign all government expenditures to growth, but rather works to quantify expenses for adding infrastructure incurred by the city on a per-home basis.

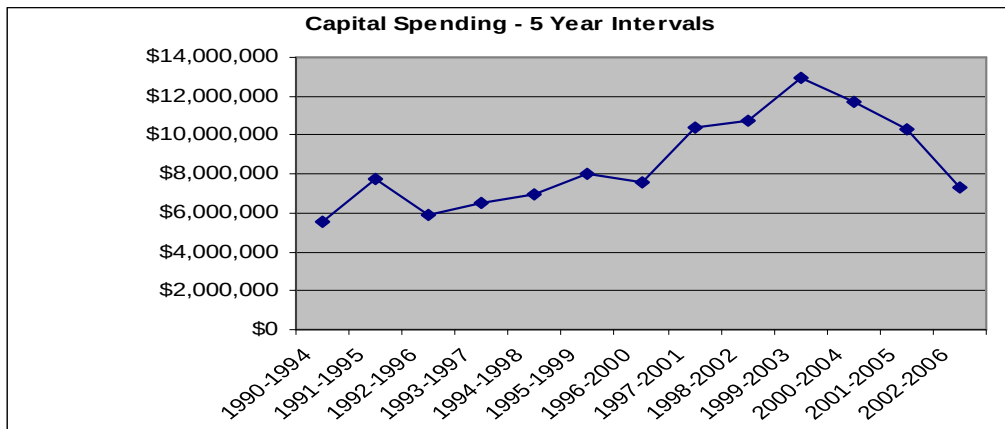


Figure 3. City of Bloomington Expenditures on Capital Outlays. Each point represents a 5 year interval (1990-2006).

## THE COSTS OF GROWTH

Fifteen main categories of public facilities required to serve urban growth can be identified<sup>10</sup> (Table 1).

**Table 1. Categories of public facilities required to serve urban growth.**

<sup>9</sup> City of Bloomington, Indiana Comprehensive Annual Financial Reports (1990-2006).

<sup>10</sup> Fodor, Eben. *Better Not Bigger*. New Society Publishers, 1999, pg. 87.

**Used in This Study**

- School Facilities (K-12)
- Transportation System
- Water Service Facilities
- Fire Protection Facilities
- Parkland, Open Space & Recreation Facilities
- Police Facilities

**Information Not Readily Available**

- General Government Facilities
- Sanitary Sewer System
- Storm Drainage System
- Corrections and Jail Facilities
- Solid Waste Disposal Facilities

**Service not Provided at City Government Level**

- Library Facilities
- Electric Power Generation and Distribution
- Natural Gas Distribution System
- Cable and Telecommunications Systems

This study includes six of the fifteen infrastructure categories. Other categories were not included in this study because information was not readily available or because they are not provided directly by the city government. For each facility, the ideal way to analyze growth-related costs is explained. Next, the categories are analyzed using available data from the city to calculate the one-time, per-home cost incurred by the city. Last, limitations of each particular analysis are discussed.

**SCHOOL FACILITIES (K-12)**

The costs of growth associated with school facilities can best be analyzed by looking at the building of new facilities or complete replacements. New school facilities need to be built largely as a function of growth – as population expands it becomes necessary to build new facilities to accommodate more students. Complete replacements can easily be analyzed based on the total service area and population serviced against the total capital costs. It is more difficult to categorize and analyze costs associated with expansions and renovations as they relate to growth, because these are less likely to be associated with an



increase in demand and more likely to be associated with standard maintenance or improved service. Capital costs will ideally include all building construction, land acquisition, planning and design, site preparation, paving and landscaping, playground equipment, furniture, computers, sports and gymnasium equipment, and library collections.<sup>11</sup>

Total capital costs for all Bloomington school construction are not available. Also, it is difficult to identify the exact costs incurred by the city because there are students who live within the city limits of Bloomington but attend schools outside the city limits, as well as students not living within the city limits who attend schools that are within the city limits. Because of these limitations the most recently completed school, Summit Elementary School, is used as a case study to illustrate the cost of growth associated with schools. All Bloomington school facility costs were acquired from John Carter, the Director of Planning for the Monroe County Community School Corporation (MCCSC).

The construction costs for Summit Elementary School were \$10,039,278.13 and the land costs were \$409,766.45 for a total cost of \$10,449,044.59 in 2006 dollars.<sup>12</sup> The student capacity for Summit is 600 students.<sup>13</sup> Based on a Bloomington-wide average number of students per household of 0.372 (10,879 students<sup>14</sup>/29,259 homes), 600 students represents 1613 households. This results in a per-household cost of \$6,478.02 (\$10,449,044.59/1613 households). A similar analysis could be conducted at each of

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<sup>11</sup> Fodor, Eben. *The Cost of Growth in Washington State*. Unpublished.

<sup>12</sup> "Summit Elementary Cost Information" email from John Carter, MCCSC Director of Planning. Email 5/27/2008.

<sup>13</sup> "Summit Elementary Cost Information" email from John Carter, MCCSC Director of Planning. Email 5/27/2008.

<sup>14</sup> "Bloomington School Facility Cost and Size" spreadsheet from John Carter, MCCSC Director of Planning. Email 9/28/2007.

Bloomington’s schools where cost information is available. This number does not give a total per-home value for the city, but provides insight on the costs of growth associated with school facilities.

## **TRANSPORTATION SYSTEM**

Transportation costs ideally will include the costs for arterial and collector streets. Local streets generally should not be included, as these costs are most often born by the developer, not the city. It is also possible to include public transportation as a consideration. There are multiple ways to analyze transportation costs. One approach is to look at future transportation development plans, which contain cost projections as well as future population growth projections. The city of Bloomington has such a plan – the 2030 Long Range Transportation Plan. The “Cost Feasible” plan for Bloomington from 2006 to 2030 is \$101,007,944.00.<sup>15</sup> The drawback of this approach is that is difficult from the Long Range plan to know what project costs can be associated with growth as opposed to standard maintenance of existing transportation infrastructure.

Another approach, which is used in this study, is to look at past projects. The “Annual Operational Reports for Local Roads and Streets” from 1990 to 2006 were used to look at city expenditures on roads. To control for growth related costs versus maintenance costs, only projects that were characterized as “New Route,” “Major Widening,” or “Minor Widening” were used because they can be most closely attributed to growth.

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<sup>15</sup> 2030 Long Range Transportation Plan. Bloomington/Monroe County Metropolitan Planning Organization. 2006, pg. 101.

The total of these projects from 1990 to 2006 was \$37,279,029.84.<sup>16</sup> This excludes 1995 project expenditures because this report is not available. The average annual rate of increase in homes between the 1990 and 2000 census data was 548.5 homes per year. This rate yields 8,776 homes added from 1990-2006 (excluding the 548.5 homes that would be added in 1995). Distributing the \$37,279,029.84 for transportation projects related to growth across the 8,776 homes added to the city of Bloomington yields a one-time per-home cost for transportation of \$4,247.84.

### **PARKLAND, OPEN SPACE & RECREATION FACILITIES**

Costs of parkland, open space, and recreation facilities can either be assessed exclusively to residential use or to both residential and commercial use. Most use of parks is from residential users. It is also easy to make the case that businesses benefit from expanded parks and recreation spaces. However, for simplicity, all costs will be allocated to residential use in this report. Also, parkland, open space, and recreation facilities create the most ambiguity in terms of whether increased land acquisition and capital improvement is a function of population increase or demand from current population (perhaps in response to past population increases that removed greenspace). Thus, this analysis calculated a range for costs based on total land acquisition and capital improvements as well as on only those parks and recreation projects that can be directly attributed to growth, as determined in consultation with Bloomington Parks and Recreation Department Director Mick Renneisen.

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<sup>16</sup> Monroe County. "Annual Operational Report for Local Roads and Streets." 1990-1994 and 1996-2006.

Recent data on total costs of land acquisition and capital improvements were obtained from Bloomington Parks and Recreation Department Operations and Development Director Dave Williams. This data has been thoroughly tracked and thus provides an excellent indicator of total capital investment. This total is \$31,083,048.03 since 1993 (in 2006 dollars).<sup>17</sup> To access a one-time cost on a per-home basis, the number of homes added during this time is needed. Using the average annual home increase of 548.5 homes, we can obtain a 14 year total similar to the timeframe of the Parks and Recreation Capital Improvements Log. This yields a total of 7679 homes added. Dividing \$31,083,048.03 capital costs by 7679 homes produces a one-time per-home cost of \$4,047.80.

Projects that were directly attributed to growth (i.e. were coupled with specific development projects) were Olcott Park, the 1999-2000 improvements to Cascades Golf Course, Jackson Creek Trail, and Clear Creek Trail. The total cost of land acquisition and capital improvements for these projects was \$11,394,345.86,<sup>18</sup> yielding a per-household cost of \$1,483.83. These values - \$1,483.83 and \$4,047.80 – provide a lower and upper limit for the cost of growth for parkland, open space, and recreation facilities.

## **WATER SERVICE FACILITIES**

The ideal way to analyze water service facilities is by looking at a recently completed new project or complete renovation. Capital costs for a water service facility include water sources costs, storage reservoirs, pumping stations, and transmission and

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<sup>17</sup> “Capital Improvements Log Master (Bloomington Parks and Recreation Department)” spreadsheet from Bloomington Parks and Recreation Department Operations and Development Director Dave Williams. Email 10/10/2007.

<sup>18</sup> Ibid.

distribution piping. As there is not a recently completed new project in the city, water service facilities information was acquired from the recently completed City of Bloomington Utilities (CBU) Water System Capital Improvement Plan. Bloomington water service facilities are best analyzed by looking at capital outlays divided by the number of homes serviced.

On Monday, May 12, 2008, the Utilities Service Board approved Phase II and Phase III of Alternative A of the Capital Improvement Plan (Phase I is almost completed). The CBU Water System Capital Improvement Plan as approved on May 12 allows for an upgrade from 24 mgd to 30 mgd, with a possible future expansion to 36 mgd (a 12 mgd increase). The CBU plan makes a case that upgrades are needed in reaction to projected population increases between 2000 and 2030.<sup>19</sup> The cost of the overall plan (Phases I-III) is \$46,200,000.<sup>20</sup> CBU estimates that 40% of water goes to residential use,<sup>21</sup> so \$18,480,000 (40% of \$46,200,000) of the capital costs should be attributed to residential use. Using 1990-2000 growth trends, 16,455 homes will be added in Bloomington from 2000-2030 (548.5 per year). Distributing the \$18,480,000 across these 16,455 homes yields a per-home cost of \$1,123.06.

A limitation to note for the water service analysis is the fact that this is an improvement and expansion project, not a new project or complete overhaul. It thus becomes less clear how much of the project can be attributed to increased demand caused by growth instead of necessary maintenance. Another limitation is that this analysis is in terms of projected

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<sup>19</sup> City of Bloomington Utilities Water System Capital Improvement Plan, pg 1-1. January 2003.

<sup>20</sup> City of Bloomington Utilities Water System Capital Improvement Plan, pg. 8-6. January 2003.

<sup>21</sup> Ibid. Pg. 3-10.

costs, not dollars spent. There is no guarantee that all of the money appropriated will be spent.

## **FIRE PROTECTION FACILITIES**

Similar to the analysis for school facilities, we took a case study approach to calculating fire protection facility costs, using data from the most recently constructed fire department facilities. Fire protection facilities are assessed by the total capital costs of a facility divided by the number of homes the facility services. Capital costs for fire facilities include costs associated with building the station, acquiring the land, and providing the necessary equipment, including trucks and other vehicles as well as other equipment. Information on fire stations and areas serviced was provided by then-Fire Department Chief Jeffrey Barlow. In Bloomington, the most recent fire station, Station 2, was constructed in 1999. Station 2 serves the western portion of the City of Bloomington with an east primary boundary from Kinser Pike and four-lane Highway 37 down Kinser Pike, Monroe Street, Adams Street, Patterson Drive, to Rogers and Cherokee Drive, across open ground to Fullerton Pike and four-lane Highway 37.<sup>22</sup> This area contains approximately 4,400 residential addresses.<sup>23</sup>

The total capital costs associated with Station 2 are \$3,404,487.52. These costs include the cost of land, building construction, fire engine and ladder truck costs.<sup>24</sup> Distributing the \$3,404,487.52 capital cost over the 4,400 homes Station #2 serves yields a per-home one-time cost of \$773.75.

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<sup>22</sup> Information obtained from Bloomington Fire Department Chief Jeffrey Barlow. Email 10/10/2007.

<sup>23</sup> Information obtained from City of Bloomington GIS Specialist Chuck Winkle. Email 11/21/2007.

<sup>24</sup> Information obtained from Bloomington Fire Department Chief Jeffrey Barlow. Email 10/10/2007.

## **POLICE FACILITIES**

Police facility costs can best be found by taking facility cost, land cost, and necessary equipment divided by the number of households serviced. This information cannot be assessed accurately in Bloomington because the current police headquarters was built in the 1950s and created with the intention to be City Hall, for which purpose it served until 1998. Thus, the capital costs associated for the city cannot be assigned to police use. The reuse of the building is an excellent example of the city using its resources in a fiscally responsible manner. It is important to note, that like all facilities, future development may necessitate expansion of police facilities.

To gain some perspective into the cost incurred by police facilities, the department's total capital budget for 1990-2006 was examined to try and capture the costs associated with purchasing new police cars and other major capital outlays that increased service demand would necessitate. Taking the total capital budget, \$4,335,915 divided by the projected number of new households added in the same time-period (1990 – 2006), 9324.5, yields a per-household cost of \$465.00. It is important to note that not all capital costs can be associated with growth and this number is intended only as a rough estimation.

## **DISCUSSION**

Based on six service categories of municipal services, the total one-time per-home cost of development in Bloomington found by this study ranges from \$14,571.50 to \$17,135.47 (Table 2). As discussed above, our analysis is incomplete, as information for all service categories was not available and many simplifying assumptions were made.

Table 2. Costs, Per New Home Added, Attributed to Six Categories of Infrastructure and Service Needs

<b>Service Provider</b>	<b>Cost per New House</b>
School Facilities	\$6,478.02
Transportation System	\$4,247.84
Parkland, Open Space & Recreational Facilities	\$1,483.83-\$4,047.80
Water Service Facilities	\$1,123.06
Fire Protection Facilities	\$773.75
Police Facilities	\$465.00
<b>Total</b>	<b>\$14,571.50-\$17,135.47</b>

Still, the estimated costs provide evidence of the real costs associated with residential growth. Assuming that growth is necessarily economically beneficial is unwise practice. It is advisable to quantitatively analyze both the benefits and costs of growth related projects and decide if they are beneficial to the citizens of Bloomington.

Growth can have positive impacts on the city. Potential benefits of residential growth include a broader tax base and enhancement of cultural amenities such as libraries and parks.<sup>25</sup> While these impacts can certainly be viewed as beneficial for the community, the actual positive impact is often not understood. These benefits are often articulated in qualitative terms, without any quantitative analysis. A common myth is that growth provides needed tax revenue while lowering the individual tax burden.<sup>26</sup> The logic is that a broader tax base will lead to a smaller tax burden on individuals because there will be more taxpayers to cover city budget costs. However, a study conducted by Harvard economists Alan Altshuler and Jose Gomez-Ibanez finds that new development does not cover costs, but rather that the increased population generates less revenue for local government than the costs associated with providing infrastructure to the additional residences.<sup>27</sup> Because costs exceed benefits, tax rates actually increase as population

<sup>25</sup> Edwards, Mary. "Community Guide to Development Impact Analysis." [http://www.lic.wisc.edu/shapingdane/facilitation/all\\_resources/impacts/analysis\\_intro.htm](http://www.lic.wisc.edu/shapingdane/facilitation/all_resources/impacts/analysis_intro.htm)

<sup>26</sup> Fodor, Eben. *Better Not Bigger*. New Society Publishers, 1999, pg. 39.

<sup>27</sup> Altshuler, Alan A. and Jose A. Gomez-Ibanez. "Regulation for Revenue: A Political Economy of Land Use Exactions." Brookings Institute.



increases, as each new home creates a larger gap between costs and tax revenues. An illustration of this can be found in DuPage County, IL (a suburban Chicago county), where property taxes increased over a 20-year period despite large population increases.<sup>28</sup>

Another consideration is how growth related costs are paid. Most taxes are broadly distributed across the population. In other words, all citizens contribute. When infrastructure must be expanded to meet the needs of a new development, the cost is born by all taxpayers while most benefits go to the new development, not to all community members. An important question arising from cost of growth analysis asks: is the distribution of costs equitable? As growth continues, are residents of the community continuing to receive the same ratio of benefits to contributions? Should they be? Such questions should be considered when analyzing the costs and benefits of a growth related project.

There are steps the city can take to more accurately understand the costs of growth incurred by the city. One is to complete the public facilities inventory called for in the 2002 Bloomington Growth Policies Plan. The inventory is a priority for the city Planning Department in 2008. This analysis will help determine if current facilities are satisfactory for current service levels, and how these current facilities will be impacted by further growth.

Additionally, a comprehensive community impact analysis would go a long way to quantify the costs and benefits of growth, socially and environmentally as well as

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<sup>28</sup> DuPage County Development Department, Planning Division. "Impacts of Development on DuPage County Property Taxes." October 1991.

economically. A community impact analysis provides a framework for addressing growth by creating a process to comprehensively evaluate consequences of development on the community. It does so by providing extensive documentation of anticipated economic, fiscal, environmental, social, and transportation impacts of a particular development on the community.<sup>29</sup> Such a quantitative, empirical examination will help planners and government officials make more informed, better decisions related to new development and its impact on Bloomington.

Once a community impact analysis has been conducted, one way to address costs that exceed benefits of growth is through impact fees. Impact fees are single payments required to be made by builders or developers at the time of development approval and calculated to be the proportionate share of the capital cost of providing major facilities to the development.<sup>30</sup> Such fees help to encourage developers to incorporate capital costs incurred by the city into their planning process. Many communities have implemented impact fees for slightly differing reasons. Major themes for implementation include shifting the fiscal burden from existing taxpayers to the occupants of the new development, better synchronization of the construction of facility capacity with the arrival of new development demand, and subjecting development decisions to the discipline of a form of pricing mechanism.<sup>31</sup> Evidence suggests that impact fees help foster smarter development. A study conducted in DuPage County, IL examined the effects of impact fees on growth. The study, conducted from 1977-1992, showed the impact fees implemented by the county slowed residential development by more than

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<sup>29</sup> Edwards, Mary. "Community Guide to Development Impact Analysis."

[http://www.lic.wisc.edu/shapingdane/facilitation/all\\_resources/impacts/analysis\\_intro.htm](http://www.lic.wisc.edu/shapingdane/facilitation/all_resources/impacts/analysis_intro.htm)

<sup>30</sup> Frank, James E. and Paul B. Downing. "Patterns of Impact Fee Use." *Development Impact Fees*. American Planning Association, 1988, pg. 3.

<sup>31</sup> Ibid. Pg. 17.

25%.<sup>32</sup> The study concluded that impact fees lead to more efficient growth because developers must take into account public infrastructure costs.<sup>33</sup> In other words, impact fees help to encourage only development in which community benefits truly outweigh community costs. Knowing the costs and impacts of development on a project by project basis and implementing impact fees to help when costs exceed benefits can lead to more effective decision-making and planning for the city and help foster responsible, sustainable development.

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<sup>32</sup> Skidmore, Mark and Michael Peddle. "Do Development Impact Fees Reduce the Rate of Residential Development?" *Growth and Change*. Vol 29, Fall 1998, pg. 383.

<sup>33</sup> Ibid. Pg. 394.