Smart Growth America
Making Neighborhoods Great Together

Building Better Budgets

A National Examination of the Fiscal Benefits of Smart Growth Development

May 2013

Smart Growth America
Making Neighborhoods Great Together

Smart Growth America is the only national organization dedicated to researching, advocating for and leading coalitions to bring better development strategies to more communities nationwide. From providing more sidewalks to ensuring more homes are built near public transportation or that productive farms remain a part of our communities, smart growth helps make sure people across the nation can live in great neighborhoods. Learn more at http://smartgrowthamerica.org/.

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Table of Contents

Executive Summary ..... **ii**
An opportunity for municipal leaders iii

Introduction **1**

Reducing costs and raising revenue through smarter growth **2**

National findings **4**
1. Smart growth development costs one-third less for upfront infrastructure. 4
2. Smart growth development saves municipalities an average of 10 percent on ongoing delivery of services. 5
3. Smart growth development generates 10 times more tax revenue per acre than conventional suburban development. 6

Turning deficits into surplus 8
Smart growth development in rural communities 9

Conclusion **11**

Methodology **12**
Directions for future research 12

Appendix A: Summarized Case Studies **14**
City of Afton, MN 14
City of Champaign, IL 14
City of Charlotte, NC 15
City of Fresno, CA 16
Mount Pleasant, SC and Phoenix, AZ 16
Regional Infrastructure Scenarios 17
Sarasota County, FL 18
State of California 19
State of Maryland 20
State of Rhode Island 20
Cost of Sprawl—2000 21

Appendix B: Annual fiscal impacts of development scenarios **23**

Appendix C: Original case study of Nashville-Davidson County, TN **25**

Endnotes **46**

Executive Summary

Local governments across the country have compared development strategies to understand their impact on municipal finances. These studies generally compare two or more different development scenarios, and help local leaders make informed decisions about new development based on the costs or revenues associated with them.

Many municipalities have found that a smart growth approach would improve their financial bottom line. Whether by saving money on upfront infrastructure; reducing the cost of ongoing services like fire, police and ambulance; or by generating greater tax revenues in years to come, community after community has found that smart growth development would benefit their overall financial health. Many of these findings have been made publicly available.

No national survey has examined these savings as a whole until now. This report is the first to aggregate those comparisons and determine a national average of how much other communities can expect to save by using smart growth strategies.

Building Better Budgets: A National Examination of the Fiscal Benefits of Smart Growth Development surveys 17 studies that compare different development scenarios, including a brand-new study of Nashville-Davidson County, TN, commissioned specifically for this report.

The development scenarios included in our analysis are separated into two categories: "Smart growth development" is characterized by more efficient use of land; a mixture of homes, businesses and services located closer together; and better connections between streets and neighborhoods. "Conventional suburban development" is characterized by less efficient use of land with homes, schools and businesses separated and areas designed primarily for driving. While not all studies use these terms, the scenarios in each category share many of these defining traits. A detailed discussion of individual studies is included in the appendices of this report.

The report looks at the costs associated with each development strategy as well as its revenue potential. When compared to one another, we find:

1. In general, smart growth development costs one-third less for upfront infrastructure.

Our survey concluded that smart growth development saves an average of 38 percent on upfront costs for new construction of roads, sewers, water lines and other infrastructure. Many studies have concluded that this number is as high as 50 percent.

Smart growth development patterns require less infrastructure, meaning upfront capital costs, long-term operations and maintenance costs, and, presumably, cost for eventual replacement are all lower. Smart growth development also often uses existing infrastructure, lowering upfront capital costs even more.

2. Smart growth development saves an average of 10 percent on ongoing delivery of services.
Our survey concluded that smart growth development saves municipalities an average of 10 percent on police, ambulance and fire service costs.

The geographical configuration of a community and the way streets are connected significantly affect public service delivery. Smart growth patterns can reduce costs simply by reducing the distances service vehicles must drive. In some cases, the actual number of vehicles and facilities can also be reduced along with the personnel required.

3. Smart growth development generates 10 times more tax revenue per acre than conventional suburban development.
Our survey concluded that, on an average per-acre basis, smart growth development produces 10 times more tax revenue than conventional suburban development.

An opportunity for municipal leaders

Local leaders everywhere can use this information to make better fiscal decisions about development in their region.

The evidence presented in this report suggests improved strategies for land use and development can help local governments maintain and improve their fiscal solvency. As this report shows, smart growth development can reduce costs and in many cases increase tax revenue. This combination means that in some cases smart growth development can generate more revenue than it costs to operate.

These findings are true for any rural, suburban or urban community, anywhere in the country. Local governments throughout the United States are already facing unprecedented challenges in providing high-quality infrastructure and adequate public services to their residents on a tight budget. Choosing financially responsible development patterns can help communities across the country protect their fiscal health for generations to come.

Introduction

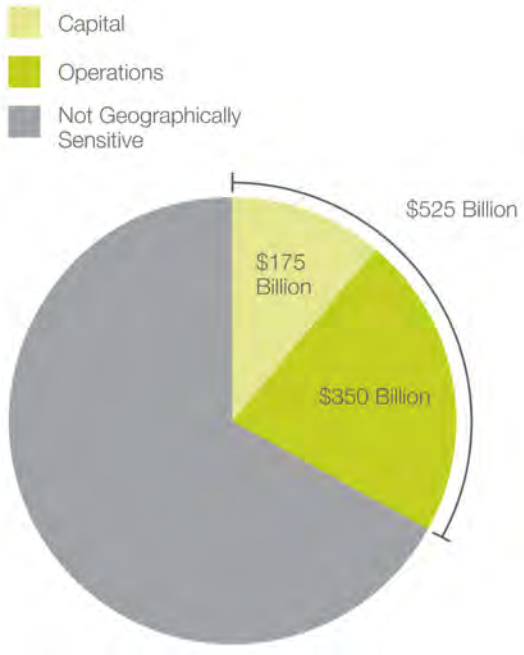
Development patterns have a huge effect on the finances of a town or city. The cost of infrastructure like roads and sewers, as well as services like fire departments, ambulances and police are major budget items for any municipality, and decisions about development patterns can raise or lower the cost of these services. These choices have significant implications for public budgets in communities everywhere.

In 2010, local governments in the United States raised and spent $1.6 trillion, representing more than 10 percent of the U.S. gross national product.[1,2] Of that, approximately one-third—$525 billion—was expended on projects and activities that are heavily affected by local development patterns (see Figure 1 below).[3] That means future decisions about where to build will have implications for one-third of a typical municipality's budget.

Decisions about where to build will have implications for one-third of a typical municipality's budget.

FIGURE 1

Portion of local budgets influenced by land use choices, nationwide



Of the $525 billion, $175 billion was spent on capital projects such as school buildings, roads and highways, water and sewer facilities, libraries and utilities.[4] The remainder—about $350 billion—was spent on operations for the provision of public services such as police and fire service, utility service, highways and water and sewer service. These services are crucial parts of local governments' work.

Meanwhile, budgets are tight and expectations are high. In nearly every community across the United States, local governments are struggling to balance their budgets. The Great Recession had a devastating impact on municipal finances, and many localities are still recovering.

Yet Americans still have high expectations about the local infrastructure and public services they receive—and with good reason. In contrast to higher levels of government, the infrastructure and services local governments provide are the meat-and-potatoes of everyday life.

This means many municipalities are looking for ways to save money and boost revenue. Some have considered new development strategies as an opportunity to do both.

Reducing costs and raising revenue through smarter growth

Over the past 40 years, local governments, academic researchers and others around the country have studied how land use decisions will affect municipal finances. These studies generally compare different development scenarios, and help local leaders make informed decisions about new development based on the costs and benefits associated with each.

Smart Growth America collected 17 such studies from across the country. These studies represent every comparison at any scale that analyzes the fiscal realities of smart growth compared with conventional suburban development for local governments. See Appendix A for greater details of the included studies.

Most of the studies compare two development scenarios (see Figure 2 below). While the terminology for these scenarios varied over the studies we surveyed, they all follow two general themes: One scenario includes buildings located closer to each other; more walkable neighborhoods; streets with better connections among destinations; a greater mix of home types; and more transportation options. We call this scenario "smart growth development." The other scenario often includes siting buildings farther away from each other; designing neighborhoods primarily for driving; creating a less-connected street system with longer distances between destinations; and providing fewer public transportation options. We call this scenario "conventional suburban development."

FIGURE 2

"Smart growth development" vs. "conventional suburban development"

Smart growth development

Conventional suburban development

The studies we have relied on for this report do have limitations. They do not provide a comprehensive analysis of all possible development patterns in all possible situations. In some cases they do not investigate the cost of specific services in great detail. In addition, our analysis would be stronger if more data were available. However, only 13 municipalities—seven cities, two regions, one state and a national summary—were available at time of publication.

In case after case, localities determined that smart growth development would reduce costs. In some cases the savings were modest, in some the savings were significant. Some studies found that in addition to reducing costs, smart growth development could increase public revenue, providing a double benefit to the municipality's budget.

In case after case, localities determined that smart growth development would reduce costs.

There is nothing especially new about these findings. Researchers have been reaching the same conclusion ever since the first *Cost of Sprawl* report was published almost 40 years ago.[5]

But in the last 10 to 15 years, as interest in smart growth has grown, the body of research about these strategies has increased—especially the research comparing the revenue and costs from smart growth development patterns with the revenue and costs from conventional suburban development patterns.[6] Throughout all of this research, the trend has held: Smart growth is a much better financial deal for local governments and taxpayers.

What has been lacking until now is a national average of what financial impact smart growth strategies can have on a municipality's bottom line. This report is intended to address that gap.

National findings

This report, prepared by Smart Growth America with the assistance of Strategic Economics, collected 17 case studies at varying levels of government that examine two development scenarios, which we refer to here as smart growth development and conventional suburban development.[7]

This report focuses on three financial aspects of those two strategies: the cost of upfront infrastructure, the cost of providing ongoing services, and the tax base created by additional development.

1. Smart growth development costs one-third less for upfront infrastructure.

Our survey concluded that smart growth development would cost an average of 38 percent less than conventional suburban development for upfront infrastructure. Some studies have concluded that this number is as high as 50 percent.

All development requires infrastructure to support and supply it. The studies included in this report primarily refer to roads, water lines and sewer lines, which account for most of the infrastructure cost associated with new development. Smart growth development patterns require less infrastructure, meaning upfront capital costs, operations, maintenance and, presumably, cost for eventual replacement are all lower. Smart growth development also often reuses existing infrastructure, lowering upfront capital costs even more.

- In Champaign, IL, a smart growth approach to future city development could cut the upfront cost of infrastructure from $123 million to $71 million—a savings of $52 million, or 42 percent over 20 years.[8]

- In Mount Pleasant, SC, and Phoenix, AZ, a smart growth approach for specific development projects could save between 32 percent and 47 percent in upfront infrastructure costs.[9]

- The State of Maryland found that following a smart growth approach would save approximately $1.5 billion per year statewide on new road construction through 2030—reducing overall costs by 28 percent and the costs to local governments by 60 percent.[10]

- In California, a smart growth approach could reduce infrastructure costs by $32 billion, or 20 percent, statewide through 2050.[11] The same study conducted a more detailed analysis of small-lot single-family developments and found that locating such a development in a smart growth location would cut the cost of infrastructure in half.[12]

- In rural areas with 10- to 40-acre ranchettes, the infrastructure savings associated with smart growth patterns are likely much higher, perhaps as much as 65–75 percent.[13,14]

The survey determined one-third savings in upfront infrastructure costs by compiling the estimated savings from case studies considering infrastructure costs.[15] The upfront savings figure is a conservative average reflective of available data on the matter. The case studies compared urban and suburban growth between a smart growth and a conventional suburban development. Case studies examining fiscal impacts of rural development scenarios were excluded because their geographic differences produced significantly higher savings, as noted in the final point above.

2. Smart growth development saves municipalities an average of 10 percent on ongoing delivery of services.

Our survey concluded that smart growth development saves municipalities an average of 10 percent on ongoing public services such as police, ambulance and fire service costs.

Many public services are sensitive to a community's pattern of development because the configuration of a community—and the way the community is connected geographically—profoundly affects service delivery. A smart growth pattern will, at the very least, save operating costs simply because service vehicles drive fewer miles. In some cases, the actual number of vehicles and facilities can be decreased, along with the personnel required to provide those services.

- Charlotte, NC, concluded that the cost of serving a smart growth neighborhood is approximately one quarter of the cost per capita of serving a conventional suburban neighborhood.[16] Based on Smart Growth America's estimates, a smart growth approach could eliminate the need for two future fire stations in Charlotte, saving the city $13 million in capital costs and more than $8 million per year in operating costs.[17]

- In Champaign, IL, a smart growth development scenario for the city's future growth would cut service costs by 23 percent, or $19 million, over 20 years.[18]

- Fresno, CA, found that a smart growth approach would reduce service costs by nine percent.[19]

- A study of Nashville-Davidson County, TN, found a 13 percent decrease in service costs in a smart growth scenario.[20]

- The savings on services in rural areas are much higher, perhaps as much as 75 to 80 percent.[21,22]

The survey determined an average of 10 percent savings in service delivery costs by compiling the estimated savings from case studies considering service costs.[23] Service considered across

studies were not consistent, and levels of service and economic conditions vary. However, all case studies consistently demonstrated a cost reduction in delivery of services examined when pursuing smart growth development. The overall savings figure is a conservative, rough average of savings reflective of available data.

3. Smart growth development generates 10 times more tax revenue per acre than conventional suburban development.

Our survey concluded that on a per-acre basis, smart growth development patterns produce far more tax revenue than conventional suburban development. When we refer to tax revenue, we are typically referring to property taxes and sales taxes, and in some instances licensing fees and other small sources of revenue. Property tax in particular is an extremely important source of revenue for most communities. In a 2010 U.S. Census survey of local government budgets nationwide, 48 percent of revenue from municipalities' own sources came from property taxes, and 10 percent came from sales taxes, though the relative importance of these taxes varies across the country.[24]

- In Nashville-Davidson County, TN, a smart growth project in a brownfield location would generate twice as much revenue per unit—and 42 times as much revenue per acre—as a conventional suburban development in a greenfield location.[25] This study examined property tax from the project, sales tax likely to be generated by its residents, and other miscellaneous taxes generated by residents and businesses.

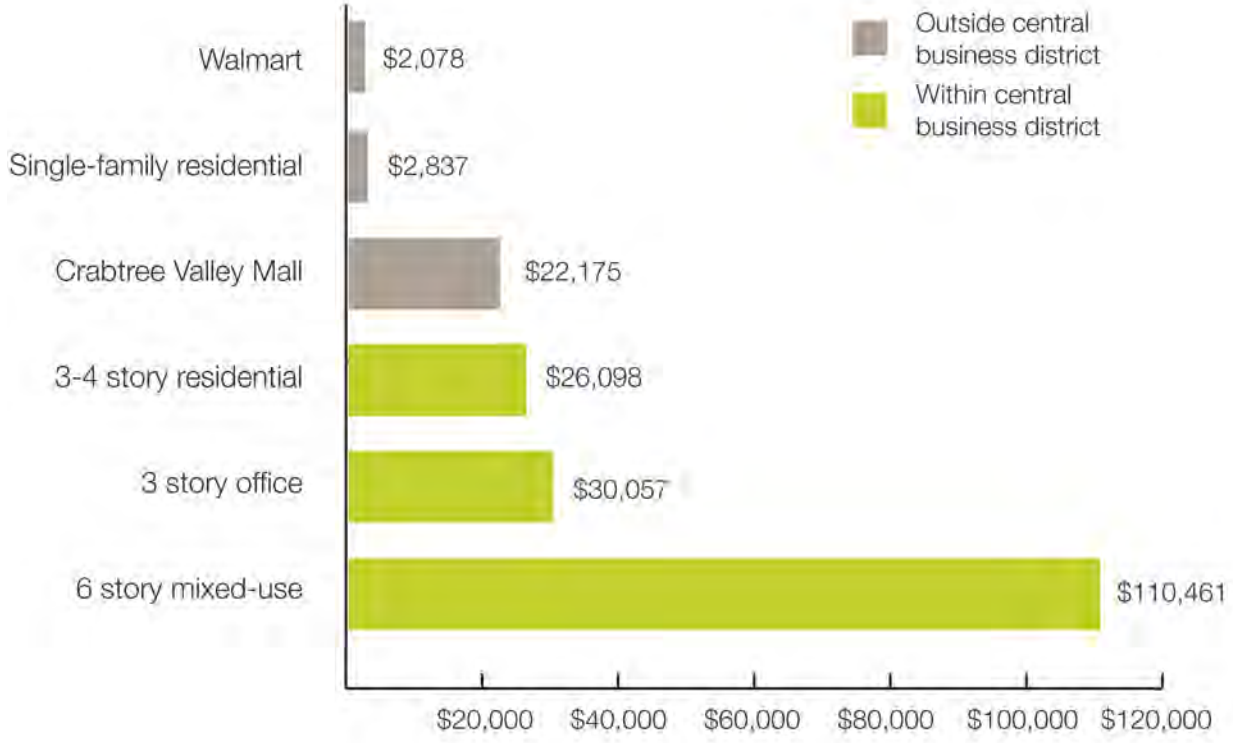
- Fresno, CA, concluded that a smart growth development strategy would generate almost one and a half times as much revenue per acre as a conventional suburban development scenario in greenfield locations. This conclusion holds despite the fact that the market for downtown development in Fresno is relatively weak.[26] This study examined property tax from the project and sales tax likely to be generated by its residents.

- Analysis by the statewide planning effort Vision California found that on a per-acre basis, smart growth development could produce three and a half times as much tax revenue as conventional suburban development.[27] This study examined property taxes from the new development, sales taxes likely to be generated by new residents, and miscellaneous taxes such as vehicle license fees from new residents.

- A study for Raleigh, NC, concluded that a six-story building downtown produces 50 times as much property tax revenue per acre as an average Walmart store (see Figure 3 on page 7). Even a three-story residential building produces more property tax revenue per-acre than a major shopping mall.[28]

FIGURE 3

Municipal property tax yield (per acre) in Raleigh, NC, 2011[29]



The studies typically included both residential and commercial development, though in some cases it was only one or the other. The per-acre measurement of tax revenue is extremely important because land is a precious commodity for every jurisdiction. It is true that in some cases the total dollar amount of tax revenue in conventional suburban settings can be very large, but those conventional suburban developments consume large amounts of land. Many cities in the United States have a constrained land supply and must husband their land resources carefully in order to protect their solvency. Increasingly, counties—especially counties in or near metropolitan areas—are also land-constrained. In addition, increasing the per-acre tax yield from property that is developed will reduce the pressure to either increase taxes or allow additional development on land that is currently used for low-density housing, agriculture or other activities important to a community.

The survey compiled the savings from case studies considering revenue and generated an average. Only the case studies that examined both property tax and sales tax were included.[30] While some case studies included fees and other small sources of revenue, these have only a minor impact on overall revenue. As mentioned previously, the majority of revenue for a municipality is generated through sales and property taxes. Case studies yielding extreme tax revenue differences between development scenarios were considered outliers, and therefore were not factored into the average.

Turning deficits into surplus

Smart growth development's potential for lower costs and higher revenue means this strategy can sometimes become a steady source of surplus for a municipality. These communities know firsthand:

- In Sarasota, FL, a smart growth residential project required $5.7 million in infrastructure while generating $1.98 million in property tax revenue per year, meaning it would take three years for the project to pay back its infrastructure cost. By contrast, a comparable conventional suburban residential project required $10 million in infrastructure while generating $239,000 in tax revenue per year, meaning it would take 42 years to pay back the conventional suburban infrastructure cost.[31]

- An analysis of Champaign, IL, found that a smart growth scenario generated a $33 million surplus to the city, while a conventional suburban scenario generated a $19 million deficit. This was true even though the conventional suburban scenario generated $19 million more in aggregate revenue over 20 years, yet its costs are so much greater as to negate any surplus. As with other studies, on a per-acre basis the smart growth scenario generated twice as much revenue than the conventional suburban scenario—about $48,000 per acre over 20 years compared with $23,000.[32] Revenues in this analysis included primarily property tax funds but also motor vehicle taxes, sales taxes, and other sources of tax revenue.

- A study of Nashville-Davidson County, TN, found that a smart growth development project downtown produced a net surplus of $1,930 per unit, or 48 times the surplus produced by conventional suburban development of $40 per unit. On a per-acre basis, the smart growth project produced a net surplus of $115,720 per year, or 1,150 times the surplus produced by the conventional suburban development ($100 per acre).[33] The tax revenue analyzed was mostly property tax, but also sales tax likely to be generated by the project's residents and other miscellaneous taxes.

The research does suggest that conventional suburban development can in some cases create a small operating surplus for local governments providing services. These operating surpluses are highly dependent on home prices, tax rates, impact fees, assessment districts and other factors that can vary greatly. As the Champaign example suggests, in many cases the only way that a jurisdiction can make up the cost of conventional suburban development is to target high tax producers, such as expensive homes.

Overall this analysis would be stronger if more data were available. Smart Growth America found only four municipalities that have studied the ability of different development patterns to generate a surplus. The fact that so few surveys are available clearly shows that more towns, cities, counties and states could benefit from taking a hard look at their development strategies.

Smart growth development in rural communities

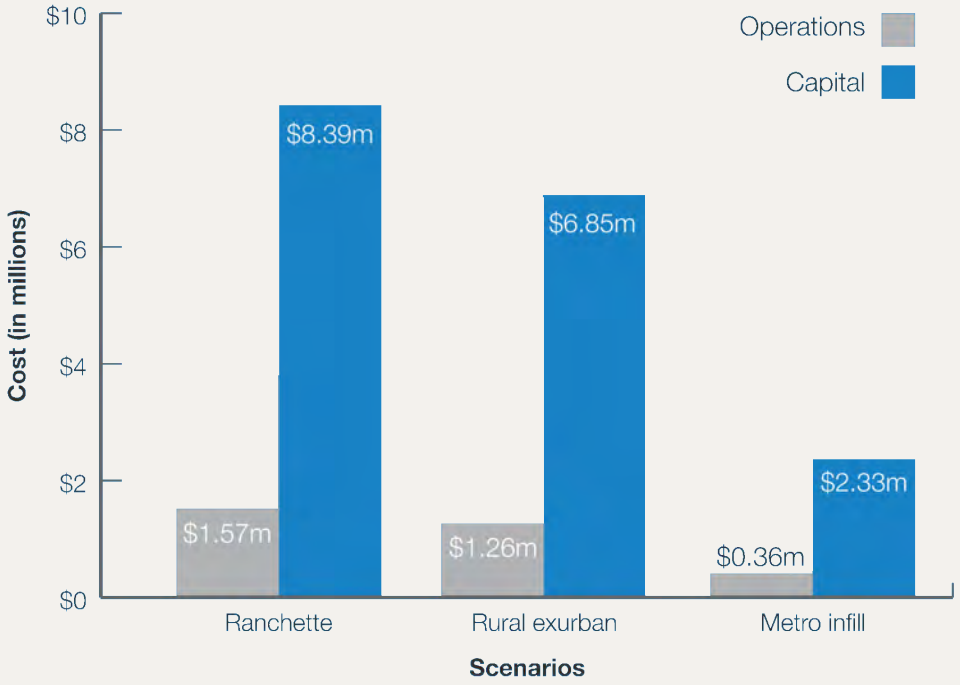
Most research comparing smart growth and conventional suburban development is based on the metropolitan context—comparing a suburb to a city neighborhood, for example, or different development scenarios within a suburb. But recent research suggests that the fiscal impact of smart growth is even more beneficial for rural areas.

RPI Consulting conducted three fiscal impact analyses for rural areas in the Intermountain West: Beaverhead County, MT; Gallatin County, MT; and Natrona County, WY. All three of these analyses yielded the same result: A smart growth approach would dramatically lower the cost of infrastructure and result in much higher revenues that cover more of the cost of both infrastructure and operating expenses.[34,35]

For example, Natrona is a county of 5,300 square miles with 75,000 residents, where Casper is the county seat.[36] RPI examined three different development scenarios, each of which would theoretically build 500 new homes in the community: A "ranchette" scenario in which the homes are built on 35-acre lots; a "rural exurban" scenario in which the homes are built on 6- to 10-acre lots; and a "metro infill" scenario in which the homes are built on one-acre lots located within or adjacent to existing cities such as Casper.

FIGURE 4

Capital infrastructure and annual operating costs for three development scenarios in Natrona County, WY[37]



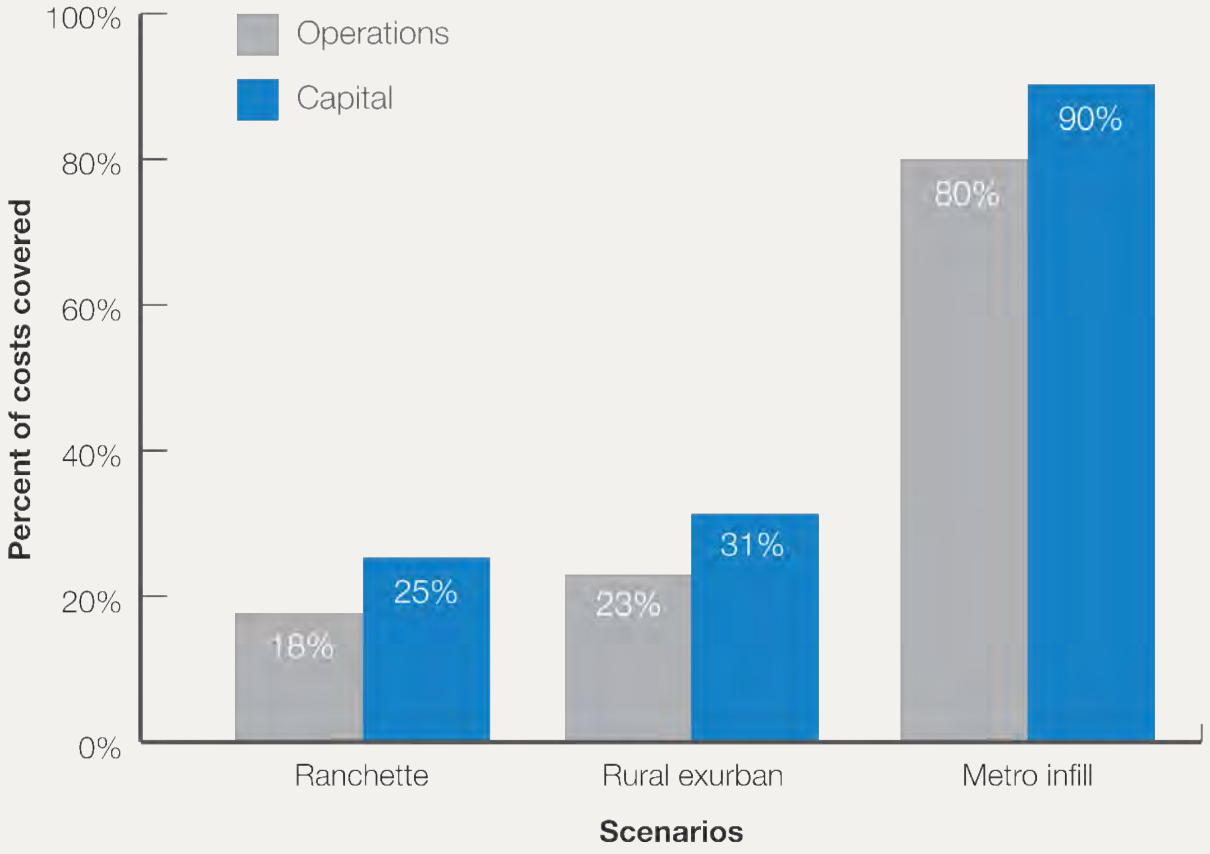
The results of the analysis were dramatic. On infrastructure, the metro infill scenario cost approximately one-quarter the cost of the ranchette scenario and one-third the cost of the rural exurban scenario (see Figure 4 on page 9).

On operating costs, the metro infill scenario would cost 23 percent of the cost of the ranchette scenario and 28 percent the cost of the rural exurban scenario.

In addition, projected tax revenue was significantly higher for the metro infill development scenario, which would cover 90 percent of the required capital cost compared with only 25–31 percent for the other two scenarios (see Figure 5 below). On the operating side, the metro infill scenario would cover 80 percent of operating costs compared with only 18-23 percent for the other two scenarios.

FIGURE 5

Percent of operations and capital costs covered by housing unit revenue contributions[38]



In other contexts a subdivision of one-acre lots might not be considered “smart growth.” But when compared to the rural sprawl scenarios that are characteristic of the Intermountain West, the financial advantages of even one-acre lots is enormous.

Conclusion

Smart growth strategies can help any town or city improve its finances. The studies included in this analysis constitute more than a series of one-time successes. Other communities can use these strategies to achieve similar results.

Smart growth development costs an average of 38 percent less than conventional suburban development for upfront infrastructure. This figure is conservative, and many communities could save even more.

Smart growth development saves municipalities an average of 10 percent on ongoing delivery of services as compared to conventional suburban development. The case studies included in our analysis consistently demonstrated this reduction in costs.

And smart growth development generates 10 times more tax revenue per acre than conventional suburban development. Smart growth development's potential for lower costs and higher revenues means that many municipalities can operate smart growth development at a surplus rather than a deficit. Every community is different and not all outcomes will be the same. However our research consistently demonstrates the financial benefit of smart growth strategies.

These strategies can improve public balance sheets for decades to come. With at least one-third of local government spending sensitive to the geographic patterns of development, that could amount to billions of dollars each year in savings for local governments nationwide.

Most important are the decisions each community makes about its financial future. Every community can use these national figures to inform their decisions about whether to grow in different, perhaps more beneficial, ways.

Methodology

The conclusions in this report are based on Smart Growth America's review and analysis of 17 different studies which compared smart growth development to conventional suburban development. The studies cover different geographical areas and scales (local, regional, state, national). Three studies (Mount Pleasant, SC and Phoenix, AZ; Regional infrastructure scenarios from *The Best Stimulus for the Money*; and *Cost of Sprawl—2000*) include more than one study area.

Appendix A provides selected summaries from these 17 studies. Appendix B provides detailed financial information across the studies. And Appendix C includes original research conducted by Strategic Economics for Smart Growth America on development scenarios in Nashville-Davidson County, TN.

Not all studies included research applicable to each conclusion. The conclusion that smart growth development costs one-third less for upfront infrastructure is based on the average savings of the studies from Champaign, IL; Mount Pleasant, SC; Phoenix, AZ; Sarasota County, FL, and the states of California and Rhode Island.

The conclusion that smart growth development saves taxpayers an average of 10 percent for ongoing delivery of services is based on the average savings of studies from Nashville-Davidson County, TN; Fresno, CA; Champaign, IL; and the national *Cost of Sprawl—2000* study.

The conclusion that smart growth development generates 10 times more tax revenue per acre is based on the average of studies from Nashville, TN; Fresno, CA; Asheville, NC; Champaign, IL; and the State of California.[39]

Directions for future research

This report and the underlying studies represent the best research available on the question of the fiscal impact of different development patterns. Because the research overwhelmingly points toward the same conclusions, we are confident that smart growth development is a better fiscal deal for local governments than conventional suburban development. However, the discussion about the fiscal impact of different development patterns would be strengthened by a future research focus on three items:

1. Cost of repair and replacement of infrastructure
If smart growth development requires less upfront infrastructure, then it is reasonable to assume that smart growth development requires less costly repair and replacement of that infrastructure. However, we could find no research addressing this question. While it is reasonable to assume a lower repair and replacement cost overall, the extent of the savings could depend on a wide variety of factors, including materials used, age of the infrastructure, the extent of use in different situations, and so forth. We would encourage research on this topic.

2. Cost of ongoing services
Our review of the literature and our new study of Nashville-Davidson County, TN, strongly support the idea that the cost of ongoing services associated with smart growth development is lower than

the comparable cost associated with conventional suburban development. However, we would note that most of the research has been focused on infrastructure, not services. We would encourage additional studies like the Nashville-Davidson County example to determine the comparative cost of delivering ongoing services under different development scenarios.

3. Cost of individual services

Although the overall cost of ongoing services is clearly lower, the existing research does not always unbundle these costs in a way that will help local governments identify how to maximize their savings. For example, as the Charlotte, NC, study shows, the savings associated with fire service are clear and easy to quantify. Savings for other public services are not always so clear. All other things being equal, the cost of policing, ambulance service, school transportation, snowplowing and any other public service provided via the use of vehicles will be lower if those vehicles travel fewer miles. But how can those savings be maximized? At what point can costs be saved not only by driving fewer miles, but by actually reducing the number of vehicles and drivers, which would presumably lead to much greater savings? We would encourage more specific research on these topics.

Appendix A:
Summarized Case Studies

Following are selected summaries of the case studies highlighted in this report. The case studies in this report represent every study at any scale that analyzes the fiscal realities of smart growth compared with conventional suburban development for local governments available for public use.

These studies include a variety of development types, scales and methodologies. However, all have one thing in common: They compare a smart growth–type development pattern to a conventional suburban-type development pattern. All come to the same conclusion: The smart growth scenario cost less overall and generated more revenue per acre than the conventional suburban scenario.

CITY SPECIFIC

City of Afton, MN

Strong Towns, a not-for-profit organization, conducted an analysis of a road project undertaken to serve a 40-unit conventional suburban development in Afton, MN, in 2009. Strong Towns examined the necessary initial capital improvement for the project weighed against the development's property tax revenues. For the purposes of the study, costs borne by developers were not considered. The City of Afton did not allocate funding toward capital improvements for the 40-property Afton Hills project; therefore, no portion of the development's tax revenues ($44,000 per year) funded the $354,000 cost of servicing infrastructure. Instead, the infrastructure is paid for entirely out of general tax revenues.

If 10 percent of the property tax revenues were allocated to infrastructure within the project—a typical figure nationwide—the payback period would be 79 years. Furthermore, local services would have to be decreased by an equivalent amount to free up the funds.

Taking a different approach to the same scenario, Strong Towns considered the project costs bonded over a 25-year period at an interest rate of 3 percent. In order to balance the budget in this scenario, an annual payment of $20,320 from the development would be necessary. This would consume 46 percent of the tax revenue generated by the project, which of course would have to be reallocated from the provision of services. The Strong Towns analysis provides a good example of the difficult choice local governments often face in deciding whether to use tax revenue to pay for ongoing services or infrastructure.

City of Champaign, IL

The consulting firm TischlerBise was retained by the City of Champaign, IL, to examine the fiscal costs and benefits of increasing the city's population by about 25 percent, from 75,000 people to about 94,000 people. TischlerBise examined two scenarios: one in which all growth would occur inside the city's current service area, and a second in which a considerable portion of the growth would occur outside the service area.

Each scenario assumed the construction of the same number of residential units, though the mix of housing types was different. The smart growth scenario assumed that 58 percent of the new

housing units would be either townhomes or multifamily units, while the conventional suburban scenario assumed a 50-50 split. The conventional suburban scenario could consume more than twice as much greenfield as the smart growth scenario—8,900 acres (or about 14 square miles) as opposed to about 3,900 acres (6 square miles).[40]

Over a 20-year period, the combined cost of operations and infrastructure for the smart growth scenario provided the city's taxpayers with a $33 million surplus. Over the same period, operations and infrastructure for the conventional suburban scenario left the city with a $19 million deficit.[41]

Each scenario provided the city with approximately the same amount of net revenue in operating costs for services—$83 million or so over 20 years. It should be noted, however, that the cost of those services is 23 percent or $19 million less in the smart growth scenario. The conventional suburban development generates the same amount of additional revenue, but this was only possible by providing larger suburban homes and attracting more affluent residents who would pay higher property taxes. In other words, Champaign would have to attract many more affluent residents in order to make up for the increased cost of providing services to sprawling neighborhoods.

The infrastructure costs for each scenario are where the big differences lie. Each scenario produced approximately the same amount of revenue from various capital funding sources—$21 million for the smart growth scenario over 20 years and $22 million for the conventional suburban scenario. But the infrastructure for the smart growth scenario costs only half as much to build—$71 million as opposed to $123 million. In other words, the additional cost of building the infrastructure to the same number of houses—but sprawled across six square miles of additional territory—is over $50 million.

City of Charlotte, NC

The City of Charlotte, NC, did a rigorous study to determine whether different street connectivity standards—and, by extension, a smart growth approach to development—could lower the cost of fire service. In 2008, fire service cost Charlotte taxpayers close to $90 million per year. Charlotte examined the cost of service per household in several existing neighborhoods and concluded: "By making the road network within a fire station's service area more connected…it is possible to slow the rate of growth of a fire department's annual cost and effect on a city budget without negatively affecting service capability."[42] The neighborhoods with greater street connectivity were also characterized by a more traditional and walkable development pattern including smaller housing lots in many cases.

Fire departments measure their success based on response time—how quickly firefighters arrive at the scene of a fire or a medical emergency. In general, fire departments seek to arrive at the scene within five minutes after receiving an emergency call. This standard requires each fire station to serve a relatively small geographical area. However, a fire station's cost—construction cost of the station, purchase and maintenance of equipment and personnel—is fixed. In Charlotte, the average annual cost of a fire station—over a lifespan of 25 years—is about $4.2 million, including $2.4 million for salaries, while the initial construction cost of a fire station is about $6.5 million. Thus, if a fire station's service area has more households and activity centers—and they are linked by a well-connected street network—each fire station can serve more residents and the cost of fire service per household will be much lower.

Charlotte found that the number of households served by each fire station ranged from 6,000 to 27,000. Not surprisingly, the annual cost per household of fire service ranged from $740 (for a conventional suburban neighborhood) to $159 (for a smart growth neighborhood).[43]

In the study, Charlotte noted that in the early 2000s, after the city changed its subdivision regulations to require better street connectivity, response times were quicker for the first time since the 1970s. A rough calculation by Smart Growth America suggests that following a smart growth approach in building out Charlotte would eliminate the need for two future fire stations, meaning a savings of $13 million in upfront capital expenses and $8.4 million a year in operating expenses.

City of Fresno, CA

In preparing a new General Plan, the City of Fresno, CA, compared four different future development scenarios—one heavily weighted toward smart growth development, two weighted toward conventional suburban development and one "hybrid" approach.

The smart growth alternative called for 43 percent of new residential development and 71 percent of non-residential development in smart growth locations. This alternative increased the geographical size of the city by 27 percent.

The most conventional suburban alternative called for 25 percent of all new residential development and between 42 percent of non-residential development in smart growth locations. This alternative increased the geographical size of the city by 36 percent.

The conclusions included the following:

- The revenue per acre for the smart growth scenario is 45 percent higher than the revenue per acre for the most conventional suburban scenario—$2,300 versus $1,600 per acre.

- The cost of providing services in the smart growth alternative was about 9 percent less on a per-capita basis than the cost of providing services in the conventional suburban alternative.

- The smart growth scenario produced a bigger surplus for the city's general fund—$24 million per year using current levels of service. The smart growth scenario also performed better than the conventional suburban scenario using a higher, preferred level of service called for in the city's new General Plan.

Mount Pleasant, SC and Phoenix, AZ

Under a contract from the U.S. Environmental Protection Agency Office of Sustainable Communities, the civil engineering firm of Morris Beacon Design compared smart growth development patterns to conventional suburban development patterns on two different greenfield sites in two different parts of the country. Their conclusion was that a smart growth development pattern reduces infrastructure cost by between 32 percent and 47 percent.[44] This particular study

assumed that the developer, not taxpayers, would bear the cost of this infrastructure, but the overall point is clear: smart growth development does not require nearly as much infrastructure, no matter who pays for it.

The first example compared different development patterns for the 750-acre "Belle Hall" site in Mount Pleasant, SC, a close-in suburb of Charleston. The analysis compared two smart growth scenarios with two conventional suburban scenarios. Each pair compared identical amounts of development—800 units of residential and 700,000 square feet of non-residential in Belle Hall #1, and 1,410 units of residential and 700,000 square feet of non-residential in Bell Halle #2. The main difference in each case was density, though the smart growth scenarios also included other "smart growth features" such as better road connectivity. In Pair #1, the smart growth scenario was built to a residential density of 4.6 units per acre compared to 2.1 units per acre for the conventional suburban scenario.

In the Belle Hall #1 comparison—the case study of 800 residential units—the infrastructure cost for the smart growth scenario was approximately $33,000 per unit, compared with more than $51,000 per unit for the conventional suburban scenario.[45]

In the Belle Hall #2 comparison—the case study of 1,410 residential units—the infrastructure cost was about $19,000 for the smart growth scenario, compared with approximately $28,000 for the conventional suburban scenario.

The second case study involved a comparison between two development scenarios on the 575-acre Dove Valley Ranch property just north of Phoenix, AZ. The conventional suburban scenario consisted of the single-family neighborhood that was actually built. The smart growth scenario was a hypothetical alternative that included twice as many residential units, a wider variety of housing products, and several mixed-use town centers.

In the Dove Valley Ranch comparison, the smart growth scenario resulted in an infrastructure cost of about $25,000 per residential unit compared to about $47,000 per unit for the conventional suburban development that was actually built.[46]

COUNTY AND REGIONAL

Regional Infrastructure Scenarios

Over the past 25 years, more than 50 metropolitan regions in the United States have engaged in regional "scenario planning" processes that articulate and then compare different growth scenarios. In 2009, Smart Growth America issued *The Best Stimulus for the Money*, a paper produced by the Metropolitan Research Center at the University of Utah that analyzed regional infrastructure cost estimates of smart growth versus conventional suburban development scenarios in 14 different metropolitan areas between 1989 and 2003.

The report concluded that in every single case the smart growth regional scenario resulted in enormous savings in the cost of infrastructure required to serve new development in the region. The smallest cost savings was 15 percent. The largest savings was more than 100 percent—the smart growth scenario actually turned the overall cost into a regional surplus, because the need for infrastructure declined. On average, the infrastructure cost associated with the smart growth

regional scenario was approximately 60 percent less than the infrastructure cost associated with the conventional suburban regional scenario.

In most cases, the regional scenario actually compared three or four regional growth scenarios, rather than just two. In each metropolitan area, the scenarios compared the same increment of predicted growth, usually within a 20-year time horizon, but with different development patterns. In all cases, the different scenarios were created using different assumptions about the density of housing development, street connectivity, a mixture of land uses and other characteristics. that this report used to differentiate between smart growth development and conventional suburban development. The scenario we have referred to as the "conventional suburban regional scenario" is, in most cases, simply a continuation of existing or recent development patterns in the region.

The 60 percent figure is derived from comparing, in each case, the regional scenario with the most smart growth characteristics with the conventional suburban scenario that continues current trends. In metropolitan regions, hybrid scenarios containing some smart growth characteristics showed some infrastructure savings. Therefore, the savings trend was clear across the board.

- In metropolitan Denver, CO, a smart growth scenario of 4,100 persons per square mile reduced infrastructure costs by 80 percent over a 25-year projection. The conventional scenario of 2,000 persons per square mile required an estimated $5.4 billion investment in local infrastructure, while the smart growth scenario cost $1.1 billion.

- In metropolitan Gainesville, FL, the region could save $100 million over a 20-year period pursuing smart growth development as opposed to conventional suburban development. The conventional suburban regional scenario was projected to consume an additional 19.5 square miles, while the smart growth scenario consumed only 2.5 square miles over the same time period.

- Two scenarios analyzing growth within the state of New Jersey, one in 1992 and the other 2000, found smart growth could reduce infrastructure costs by at least $1.5 billion over 20 years. The savings were attributed to a 34 percent to 60 percent decrease in land consumption.

Sarasota County, FL

Urban3 in Asheville, NC, has done analyses in many cities around the nation comparing the per-acre tax yield of different types of development projects. This analysis has consistently found that smart growth development projects yield far more revenue per acre than conventional suburban development projects.

In the case of Sarasota County, FL, Urban3 also examined infrastructure costs and the payback period for that infrastructure. He found that a downtown smart growth development generates enough tax revenue to pay off infrastructure costs in three years, compared with 42 years for a somewhat similar suburban development.

To conduct this analysis, Urban3 compared a set of residential developments in downtown Sarasota built at 100 units per acre (357 units on 3.4 acres) compared with a complex of two- and three-story garden apartments built in the suburbs at about 11 units per acre (357 units on 30.6 acres). The downtown project generates $1.98 million in property tax revenue per year (almost

$600,000 per acre) as opposed to $239,000 for the suburban project (approximately $7,800 per acre).

When compared with the cost of infrastructure for each project, the financial bottom line moves strongly in the favor of the smart growth project. Using estimates generated by consultant James Nicholas in 1989, Urban3 estimated the infrastructure cost at about $16,000 per unit for the downtown project and $28,000 per unit for the suburban project—meaning the infrastructure cost for the entire project is $5.7 million per year for the downtown project and $10 million.

STATEWIDE

State of California

The State of California retained Calthorpe Associates and Strategic Economics to devise and analyze several growth scenarios out to 2050. The "Vision California" analysis concluded, in general, that a smart growth scenario reduced the cost to local governments of both infrastructure and ongoing operating expenses by 17 percent to 20 percent.[47]

Vision California analyzed four different statewide growth scenarios, ranging from a "business as usual" scenario, which included a significant amount of conventional suburban development, to a smart growth scenario that focused on walkable, mixed-use and higher-density neighborhoods.

These scenarios were built in two ways. First, three different "place types" characteristic of California were identified: fringe development, characterized by conventional suburban low densities and segregation of uses; suburban infill development, characterized by higher densities and some mixture of uses, often in the setting of an older community; and urban infill development, characterized by higher densities and a greater mix of uses.

For example, in the conventional suburban scenario, Vision California assumed approximately 70 percent of new construction would be single-family, while the smart growth scenario assumed that 63 percent of new construction would be multifamily.

This approach yielded two sets of results on fiscal impact, one at the place type level and the other at the statewide level.

"Place Type" Results
The Vision California analysis compared both revenues and cost from different place types on a per-acre basis and reached dramatic conclusions.

A comparison of infrastructure costs in the three place types also showed dramatic results. Vision California compared the cost of providing infrastructure to a "small lot single family" development—1,700-square-foot single-family home on a 5,000-square-foot lot. The analysis found that, on average, the urban infill place type could provide this infrastructure for half the price on a per-acre basis ($90,000 compared to $180,000). Even the suburban infill place type ($154,000) saves 15 percent on a per-acre basis.[48]

Statewide Results

The statewide scenarios assumed the creation of 8 million new households in California by 2050. Vision California did an analysis of four scenarios, including one smart growth scenario, one conventional suburban scenario ("business as usual"), and two in between. Compared with the conventional suburban scenario, the smart growth scenario provided significant savings on both infrastructure and annual operating expenditures.

On the cost of infrastructure, Vision California found that the smart growth scenario saved almost 20 percent—approximately $16,000 per residential unit as compared with $20,000 for the conventional suburban scenario.[49] This savings of $4,000 per household represents a savings of $32 billion for California over the 40 years between 2010 and 2050, assuming 2010 population growth projections hold.

The smart growth scenario also generated three and a half times as much revenue on a per-acre basis as the conventional suburban scenario—approximately $730,000 per acre over 40 years compared with only $207,000 per acre.

State of Maryland

As part of the overall "Plan Maryland," effort, the State of Maryland conducted an analysis to determine the impact of a smart growth approach on the statewide road construction costs over the next 20 years. The State Department of Planning compared two scenarios—a conventional suburban scenario that assumed a continuation of current trends and a smart growth scenario that assumed a maximum density of 3.5 units per acre in designated growth areas and a minimum density of 1 unit per 20 acres outside those growth areas.

The state determined that the smart growth scenario reduced the cost of constructing and maintaining local roads by 60 percent and state highways by 20 percent. The overall cost of building and maintaining roads and highways was reduced by more than $1.5 billion per year for 20 years.[50]

The smart growth scenario reduced the need for new local streets and roads from about 4,800 miles to about 1,800 miles. The construction cost was reduced from $20 billion to $8 billion—a savings of $12 billion, or $600 million per year—and the maintenance cost was reduced from $400 million to $160 million—a savings of $240 million, or $12 million a year.

The smart growth scenario reduced the need for state highways from 7,500 miles to 6,000 miles. The construction cost was reduced from $83 billion to $66 billion—a savings of $17 billion, or $850 million per year. Maintenance cost was reduced from $650 million to $520 million—a savings of $130 million, or $6.5 million per year.[51]

State of Rhode Island

In 1999, a consulting team retained by Grow Smart Rhode Island examined the state's then-sprawling development patterns and estimated the cost of continued conventional suburban development in comparison with a smart growth alternative. The conventional suburban development was simply an extension of the suburban development patterns that had characterized the state for the previous 50 years, while the smart growth alternative assumed that much of the state's future population growth would be located in existing cities that had been losing population in recent decades.

This analysis found that the need for infrastructure would be greatly reduced if the state adopted the smart growth model. Among other things, the consultants found that Rhode Island's rural towns, on average, required almost three times as much road length as the cities in order to accommodate the same population—16.5 miles per 1,000 housing units for the rural areas, compared with only 6.1 miles per 1,000 housing units in the cities.[52]

Using those statistics as a benchmark, the Rhode Island study found that following the conventional suburban growth model the state would require 228 additional miles of road, at a cost of $182 million, over a 20-year period. By contrast, using a smart growth model, the state would require only 130 additional miles of road, at a cost of $104 million. Adopting a smart growth approach would eliminate the need to construct 98 miles of road, saving $78 million—43 percent—in the process.

Overall the study found that smart growth development would result in savings of $242 million, or about 40 percent, for all types of infrastructure in the State of Rhode Island over 20 years.[53]

NATIONAL

Cost of Sprawl—2000

The most comprehensive national estimate regarding the cost of smart growth development compared to conventional suburban development is *The Cost of Sprawl—2000*, a 2002 update of the original 1974 study.[54] *The Cost of Sprawl—2000* is now 13 years old and the results were modeled on a national basis, meaning the estimates are general in nature.

The Cost of Sprawl—2000 compared two national growth scenarios between 2000 and 2025. The primary difference between the two scenarios was that, in the smart growth scenario, significant amounts of growth were allocated to core and inner counties in each region, rather than outer counties. Though this is a very coarse measurement of smart growth and sprawl, it is a good proxy because inner counties nationwide tend to feature more smart growth development while outer counties tend to feature more sprawling development.

The smart growth scenario does include a considerable amount of greenfield development—but much less than the conventional suburban scenario. For this reason, the authors of the report acknowledged that they may have underestimated the savings resulting from smart growth.

The study's conclusions included the following:[55]

- Compared with a nationwide conventional suburban development scenario, a nationwide smart growth scenario would reduce the volume of roads needed by 9 percent—from about 2 million lane-miles added to about 1.8 million lane-miles added. That would mean building approximately 8,000 fewer lane-miles per year for 25 years. Costs would be reduced from $928 billion to $818 billion, a savings of $110 billion, or about 10 percent, over 25 years.

- Compared with the conventional suburban development scenario, the smart growth scenario would reduce the cost of constructing water and sewer infrastructure by $12.6 billion, or about 6 percent of $190 billion total. Among other things, a smart growth

scenario would eliminate the need to construct 4.6 million sewer laterals in the United States over a 25-year period, or almost 200,000 sewer laterals per years. The total savings for roads and sewers combined would be approximately $122 billion over 25 years.

- Compared with the conventional suburban development scenario, the smart growth scenario would reduce the cost of providing local public services from $143 billion to $139 billion—a savings of $4 billion, or 3 percent. This is the net amount after taking into account revenues directly attributable to those services. These savings are much larger in the Northeast, Midwest and South, where low-density suburban development is more common, and less so in the West, where suburban development tends to be higher-density even when it consists of single-family homes.

Appendix B:
Annual fiscal impacts of development scenarios

This report is based primarily on existing studies, as well as a new case study for Nashville-Davidson County, TN, commissioned by Smart Growth America. These studies are neither comprehensive nor exhaustive. They do not represent every single jurisdiction or region in the nation, nor even every situation that a jurisdiction or region might find itself. The methodology differed from project to project, as did the exact nature of the development projects or projected growth prototypes in question. Different studies examined different types of infrastructure and different types of ongoing services provided by the local government.

The following table summarizes all of the case studies featured in this report.

		Cost of upfront infrastructure		Cost of services		Tax revenue		Notes
	No. of years	**Smart growth**	**Conventional**	**Smart growth**	**Conventional**	**Smart growth**	**Conventional**	
Afton, MN	1	n/a	$354,000	n/a	n/a	n/a	$44,000	Payback period of 79 years for road project
Asheville, NC[3]	1	n/a	n/a	n/a	n/a	$717,000/ acre	$54,000/acre	
Beaverhead County, MT	20	$640,600	$888,500	$40,900	$56,700	n/a	n/a	Road infrastructure, police service
Champaign, IL[1,2,3]	20	$71,000,000	$123,000,000	$82,647,000	$102,040,000	$48,400/ acre	$23,200/ acre	
Charlotte, NC	1	n/a	n/a	$159/capita	$740/capita	n/a	n/a	Fire service only
Cost of Sprawl—2000[2]	25	$994.5B	$1,116.8B	$139B	$143B	n/a	n/a	
Fresno, CA[2,3]	1	n/a	n/a	$1,371/unit	$1,566/unit	$2,300/acre	$1,600/acre	
Gallatin County, MT	15	$49,452,000	$14,181,000	$11,974,300	$14,265,600	n/a	n/a	Road and sheriff
Mount Pleasant, SC[1]	n/a	$33,000/unit and $19,000/unit	$51,000/unit and $28,000/unit	n/a	n/a	n/a	n/a	

	No. of years	Cost of upfront infrastructure		Cost of services		Tax revenue		Notes
		Smart growth	**Conventional**	**Smart growth**	**Conventional**	**Smart growth**	**Conventional**	
Nashville-Davidson County, TN[2,3]	1	n/a	n/a	$1,440/unit	$1,590/unit	$202,050/ acre	$4,720/ acre	
Natrona County, WY	1	$2,330,000	$8,390,000	$355,000	$1,565,000	n/a	n/a	
Phoenix, AZ[1]	n/a	$25,000/unit	$47,000/unit	n/a	n/a	n/a	n/a	
Raleigh, NC	1	n/a	n/a	n/a	n/a	$110,461/ acre	$2,078/acre	Property tax only
Regional Infrastructure Scenarios-Denver, CO	25	$44,000,000	$216,000,000	n/a	n/a	n/a	n/a	
Regional Infrastructure Scenarios-Gainesville, FL	20	$4,400,000	$9,200,000	n/a	n/a	n/a	n/a	
Regional Infrastructure Scenarios- New Jersey	20	$75,000,000 less than conventional	n/a	n/a	n/a	n/a	n/a	
Sarasota County, FL[1]	1	$16,000/unit	$28,000/unit	n/a	n/a	$582,618/ acre	$7,795/ acre	
State of California[1,3]	40	$16,000/unit	$20,000/unit	n/a	n/a	$730,000/ acre	$207,000/ acre	
State of Maryland	20	$400,000,000	$1B	n/a	n/a	n/a	n/a	Local roads only
State of Rhode Island[1]	20	$369,000,000	$611,000,000	n/a	$181,000,000 more than smart growth	n/a	n/a	

1 – included in infrastructure savings figure
2 – included in service savings figure
3 – included in tax revenue figure

Appendix C: Original case study

Fiscal impact analysis of three development scenarios in Nashville-Davidson County, TN

SUMMARY BY SMART GROWTH AMERICA

Summary

This study examines the relative fiscal costs and benefits of three development scenarios in Nashville-Davidson County, TN: an infill development project, a New Urbanist-style development project in a suburban location and a conventional suburban development in a suburban location.

The first scenario is **The Gulch**, a 76-acre infill project on a brownfield location including 4,500 housing units and 6 million square feet of retail and office space. The second scenario is **Lenox Village**, a 185-acre New Urbanist-style development in a greenfield location with 1,700 residential unit and 67,000 square feet of retail and office space. And the third scenario is **Bradford Hills**, a 185-acre conventional suburban development with 538 housing units and 39,000 square feet of retail and office space. Nashville-Davidson County is a combined city-county government and therefore has jurisdiction over both the most urban parts of Nashville and the most rural parts of Davidson County.

Smart Growth America hired Strategic Economics to calculate the net general fund impact of providing services on the residential component of each project. (Upfront infrastructure cost was not included in the analysis.) Conclusions included the following:

- **Infill development had lower service costs.** On a per-unit basis, Lenox Village had the lowest cost to provide services: $1,300 per unit per year. The Gulch cost $1,400 per unit per year. Bradford Hills had the highest cost of $1,600 per unit per year. Lenox Village and The Gulch cost 19 percent less and 13 percent less, respectively.

- **Infill development generated the most revenue per unit.** All three scenarios generated a revenue to the general fund, on a per-unit basis. The Gulch had by far the largest revenue, generating $3,370 per unit. That rate is more than twice as high as the Bradford Hills scenario, which generated $1,620 in revenue per unit. Lenox Village generated $1,340 in revenue per unit. (Revenue included property tax but also the sales tax likely to be generated by the project's residents as well as other miscellaneous taxes.)

- **Infill development generated the largest surplus.** On a per-acre basis, The Gulch generated $115,720 in net revenue - almost 1,150 times the net revenue generated by Bradford Hills ($100) and 148 times the net revenue of Lenox Village ($780). The Lenox Village project generated a surplus 7.8 times higher than that of Bradford Hills on a per-acre basis. These trends are similar on a per-unit basis as well.

Fiscal impact analysis

Strategic Economics was hired by Smart Growth America to prepare a fiscal impact analysis considering key operation and maintenance (general fund) categories for Nashville-Davidson County, Tennessee. The fiscal impact analysis compares revenues and costs between two "smart growth" developments with an equivalent "sprawl" development. This memorandum presents the findings from the fiscal impact analysis. The following section provides background information on fiscal impact analysis. The subsequent sections describe the development scenarios and results for the Nashville analysis.

Background

Typically, the purpose of a fiscal impact analysis is to help a city make decisions about specific development proposals or plans. The analysis presented in this memorandum is intended to provide more general information about the potential for different development patterns to impact a city's fiscal outlook. In order to ground the results in reality the analysis presented here is based on existing and proposed developments and on the fiscal factors of Nashville-Davidson County, Tennessee.

For all scenarios included in the analysis, Strategic Economics estimated the annual General Fund operations and maintenance (O&M) costs and primary sources of local revenues (property taxes, sales taxes, and other recurring revenues) that could be generated by the existing/completed communities or a build-out scenario of planned communities. It is important to note that the analysis focuses on impacts to the Nashville-Davidson Metropolitan Government's General Fund and not on other programs and services that are funded independently of the General Fund. Therefore, the analysis does not consider impacts to the provision of services provided outside of the General Fund or by other service providers, such as schools and utilities.

As with all fiscal impact analyses, the assumptions drive the results. Strategic Economics created its assumptions based upon all available data, input from city staff, review of market data, and appropriate standards.

Nashville-Davidson fiscal impact analysis

This section presents the development scenarios and results of the fiscal impact analysis for Nashville-Davidson County, Tennessee. The methodology and assumptions for the Nashville-Davidson analysis are included in an appendix to this memorandum.

The Nashville-Davidson fiscal impact analysis case study considered three development scenarios, as described in the following sections.

1. Bradford Hills

Bradford Hills is a primarily residential neighborhood located in southern Nashville-Davidson County, Tennessee. It is just west of Lenox Village, which is another development scenario used in the analysis and described in the following section. Bradford Hills was built out in the early 1990s and includes a total of 538 single-family detached homes and 39,000 square feet of nonresidential space on 185 acres.

Figure 1 shows the existing number of residential units and commercial square feet for Bradford Hills, and Figure 2 provides an aerial photograph of the neighborhood.

FIGURE 1

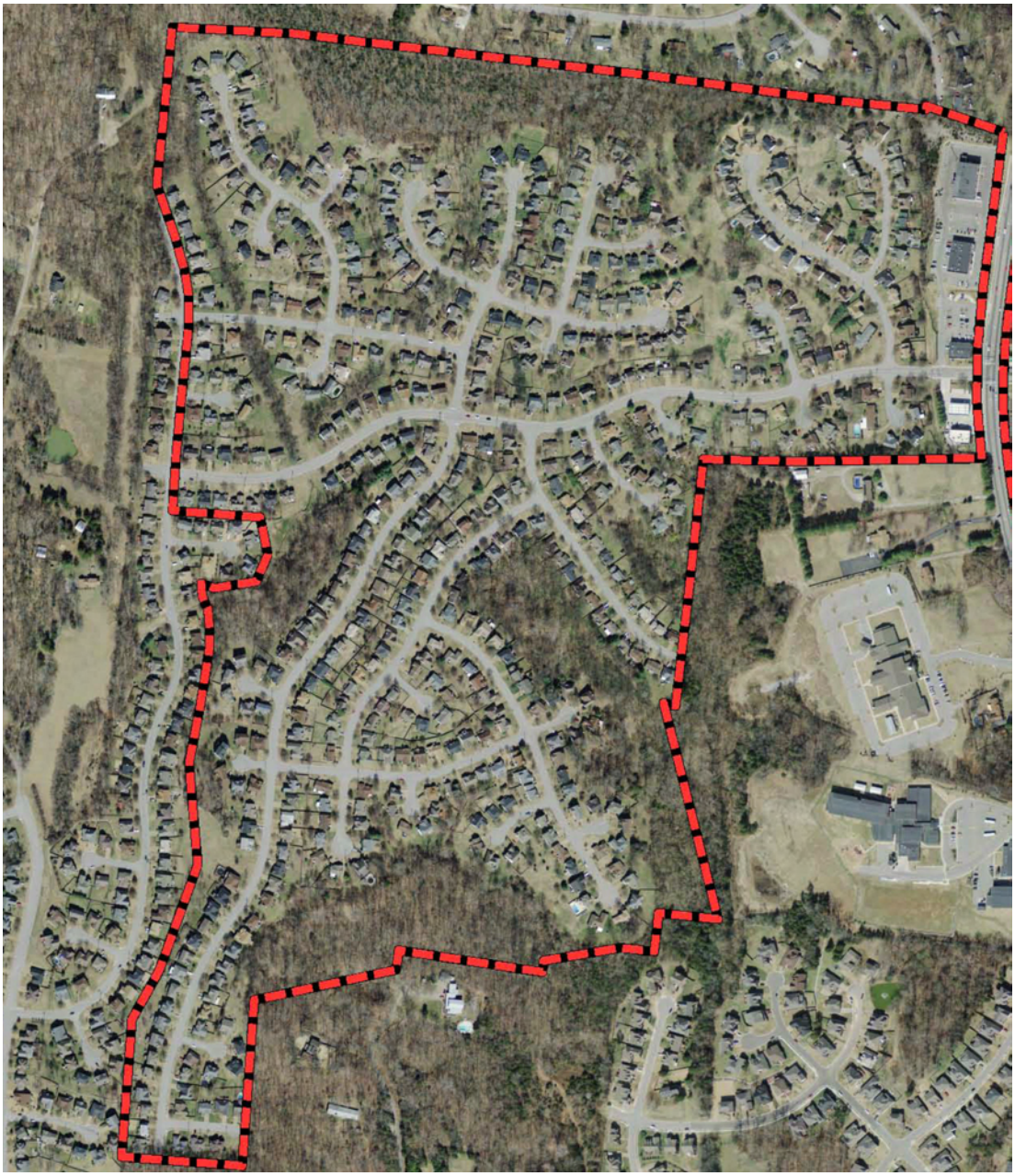
Land Uses, Bradford Hills

Land Use Type	Units / Square Feet
Residential	
Single Family Detached	538
Total Residential Units	538
Nonresidential	
Retail	17,835
Office	21,280
Total Nonresidential Square Feet	39,115

Source: Metropolitan Nashville Planning Department, 2012

FIGURE 2

Aerial photograph, Bradford Hills



Source: Metropolitan Nashville Planning Department, 2012.

2. Lenox Village

Lenox Village is a greenfield traditional neighborhood development (TND) located in southern Nashville-Davidson County, Tennessee, east of Bradford Hills, which is described above. Lenox Village is partially built out at this time. The master plan for Lenox Village includes 572 single-family detached units, 245 single-family attached units, and 898 multi-family units, as well as 67,000 square feet of nonresidential uses.

Figure 3 shows the total number of residential units and commercial square feet planned for Lenox Village, and Figure 4 provides an aerial photograph of the TND.

FIGURE 3

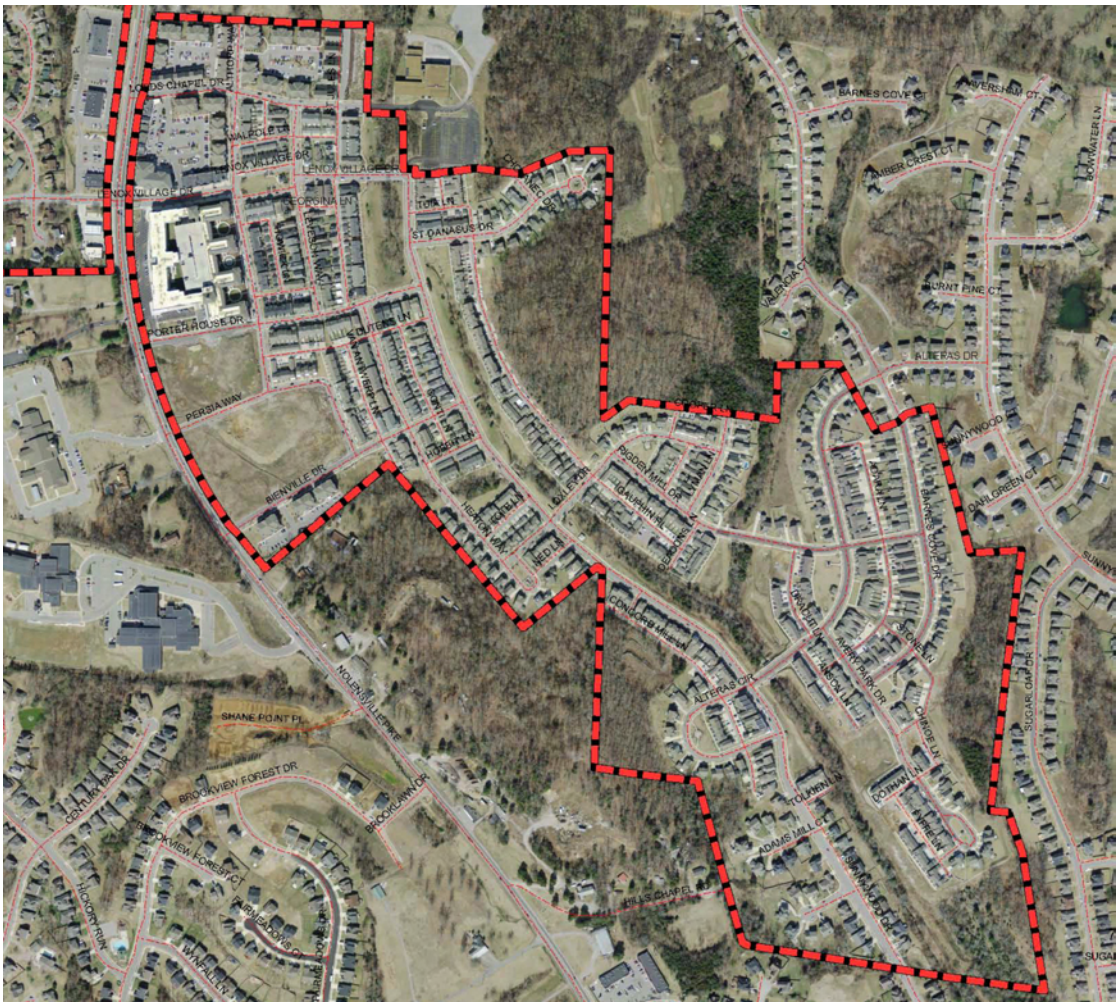
Land Uses, Lenox Village

Land Use Type	**Units / Square Feet**
Residential	
Single Family Detached	572
Single Family Attached	245
Multi-family	898
Total Residential Units	1,715
Nonresidential	
Retail	27,409
Office	4,000
Mixed Use	35,742
Total Nonresidential Square Feet	67,151

Source: Metropolitan Nashville Planning Department, 2012; Regent Homes, 2012.

FIGURE 4

Aerial photograph, Lenox Village



Source: Metropolitan Nashville Planning Department, 2012.

3. The Gulch

The Gulch is an infill mixed use neighborhood located on a former industrial site in downtown Nashville. The Gulch is the first neighborhood in the southern United States to be LEED Certified for Neighborhood Development.* The master plan for the area is composed of adaptive re-use projects and new construction, including high density residential buildings, office uses, and retail uses. The plan for the Gulch includes 4,552 multi-family units and over 6 million square feet of nonresidential uses. The Gulch is only partially built out at this time, with a total of 879 residential units already built.†

Figure 5 shows the total number of residential units and commercial square feet planned for Lenox Village, and Figure 6 provides a conceptual map of the project from the master plan.

FIGURE 5

Land uses, The Gulch

Land Use Type	Units / Square Feet
Residential	
Multi-family	4,552
Total Residential Units	4,552
Nonresidential	
General Commercial	110,530
Mixed Use (retail and office)	6,010,492
Total Nonresidential Square Feet	6,121,022

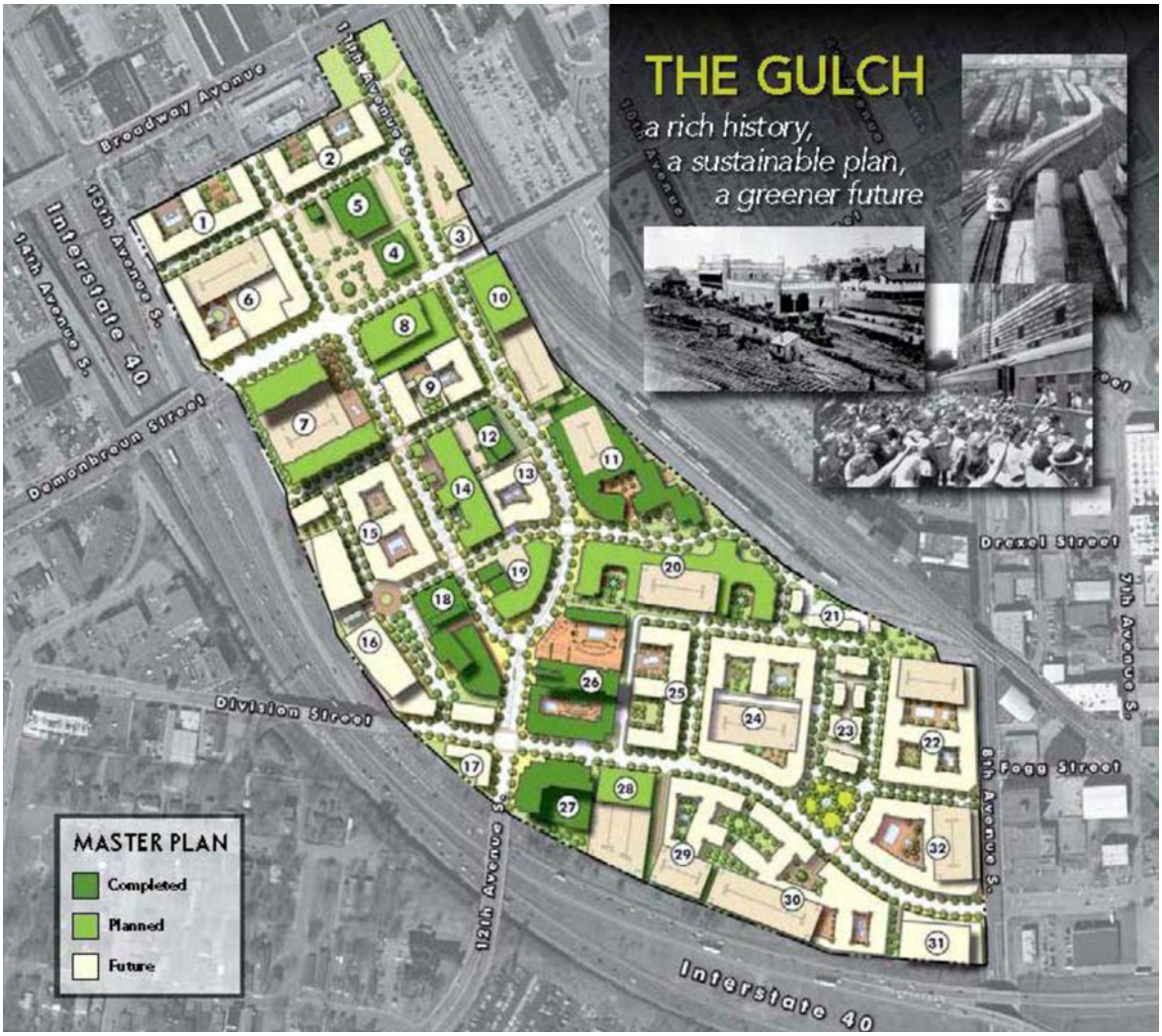
Source: Metropolitan Nashville Planning Department, 2012.

* The Gulch official website. Available at http://www.nashvillegulch.com.

† Nashville Downtown Partnership. (2012). "Residential Report: July 2012, Downtown Nashville." Available at http://www.nashvilledowntown.com/_files/docs/residential-report-2012.pdf.

FIGURE 6

Proposed land uses, The Gulch



Source: Market Street Enterprises, 2010.

Results

Figure 7 shows the estimated net General Fund impact of the three development scenarios. In considering the results of the analysis it should be noted that Nashville-Davidson County has a tiered property tax rate and tiered service level depending on location. The General Services District (GSD) encompasses the entire County and pays a base tax rate. The Urban Services District (USD) was originally bound by the Nashville city limits when the Metropolitan Government was established, but has since been expanded by annexation. The USD has an additional tax rate and an "enhanced" level of service for some services. The Gulch development is the only one of the three scenarios that falls within the USD and therefore pays the higher property tax rate and receives additional services.

In addition to the higher USD property tax rate, The Gulch has established the Gulch Central Business Improvement District (GCBID), with a special assessment of $0.20 per $100 in assessed value to provide a further enhanced level of services to "help make the Gulch a clean, safe and vibrant urban neighborhood in which to work, live, shop and be entertained."[‡] The costs for services and revenues associated with the GCBID special assessment are not included in this analysis because they are not included in the General Fund.

- Both Lenox Village and The Gulch are expected to have a positive net impact on the Nashville-Davidson Metropolitan General Fund. The fiscal impact analysis indicates that at full buildout, The Gulch development could have a significantly positive impact and potentially generate $8.8 million a year more in General Fund revenues than in expenditures. At full buildout, Lenox Village is projected to have a slightly positive net impact (6 percent) on the General Fund. Bradford Hills is estimated to have a neutral impact (2 percent) on the General Fund.[§]

- On a per acre basis, The Gulch and Lenox Village developments are both estimated to have a significantly larger positive impact on the General Fund than Bradford Hills. On average, The Gulch development is expected to have a net positive impact of $116,000 per acre and Lenox Village is expected to have a net positive impact of $780 per acre, compared to $100 per acre for Bradford Hills. The Gulch's greater positive impact reflects the fact that while new development in the downtown is more expensive to serve on a per-acre basis than Bradford Hills or even Lenox Village, these expenditures are outweighed by the higher per-acre revenues associated with the much higher density development.

‡ The Metropolitan Government of Nashville and Davidson County. (2012, August). "Metropolitan Nashville/Davidson County FY 2013 Operating Budget. p. J – 96. Available at http://www.nashville.gov/Portals/0/SiteContent/Finance/docs/OMB/citizens_budget/budgetbook/fy13/fy13_final_budget.pdf.

§ Net revenue between +5 and -5% of total revenue is considered a neutral fiscal impact.

FIGURE 7

Net general fund impact of development scenarios

	Bradford Hills	Lenox Village	The Gulch
Housing Units	538	1,715	4,552
Acreage	185	185	76
Revenue			
Property Tax-GSD	$555,000	$1,473,000	$10,432,000
Property Tax-USD	$0	$0	$2,714,000
Sales Tax	$33,000	$106,000	$281,000
Other Recurring Revenues-GSD	$286,000	$723,000	$1,778,000
Other Recurring Revenues-USD	$0	$0	$151,000
Subtotal	$874,000	$2,302,000	$15,356,000
Per Housing Unit	$1,620	$1,340	$3,370
Per Acre	$4,720	$12,440	$202,050
Costs			
Per Capita Expenditures-GSD	$855,000	$2,158,000	$5,394,000
Per Capita Expenditures-USD	$0	$0	$1,167,000
Subtotal	$855,000	$2,158,000	$6,561,000
Per Housing Unit	$1,590	$1,260	$1,440
Per Acre	$4,620	$11,660	$86,330
Net Revenue	**$19,000**	**$144,000**	**$8,795,000**
Per Housing Unit	$30	$80	$1,930
Per Acre	$100	$780	$115,720
Net Revenue as percent of total Revenue	**2 percent**	**6 percent**	**57 percent**

Notes: Net revenue between +5 and -5 percent of total revenue is considered a neutral fiscal impact. Columns may not add due to rounding. Source: Strategic Economics, 2012.

Assumptions and methodology

General assumptions

Ongoing operations, maintenance, and service costs: The analysis evaluates the costs associated with providing ongoing city services such as police, fire, and operations and maintenance of infrastructure under the three development scenarios. The analysis does not assess the costs of capital improvements (i.e., new infrastructure and facilities) required to support development.

Static analysis of full development build-out: The analysis is "static," as opposed to "dynamic." It analyzes the annual fiscal impacts upon completion of development, rather than providing year-by-year estimates during construction.

General Fund impact: This analysis estimates potential impacts to the city's General Fund. The Nashville-Davidson Metropolitan Government pays for many of its departmental activities through fees for service or other sources that do not go through the General Fund. For example, school services are included in the Metropolitan Government's budget, but the expenditures are not paid for from the General Fund. Therefore the costs for providing school services and that portion of property tax revenues that are used to fund the services are not included in this analysis.

2012 dollars: The analysis is derived from the adopted budget for fiscal year (FY) 2012/13, and all outputs are reported in 2012 dollars.

General Services District (GSD) and Urban Services District (USD): The Nashville-Davidson Metropolitan Government has a tiered property tax rate and tiered service level depending on location. The General Services District (GSD) encompasses the entire County and pays a base tax rate. The Urban Services District (USD) was originally bound by the Nashville city limits at the time of establishment of the USD, but has since been expanded by annexation. The USD has an additional tax rate and an "enhanced" level of service for some services. The Gulch development is the only one of the three scenarios that falls within the USD and therefore pays the higher property tax rate and receives additional services.

Existing service population: To calculate certain costs and revenues on a per capita basis, an existing service population – or "daytime population" of residents and workers – must be established. For the purposes of this analysis, the residential population of the USD is included as 427,138, and the residential population of the GSD is included as a total of 626,681 (including the 427,138 in the USD), based on United States Census data provided by the Nashville Area Metropolitan Planning Organization. Employment within the USD is included as 456,810, and the total employment within the GSD is included as 631,938 (including the employment within the USD), again based on United States Census data provided by the Nashville Area Metropolitan Planning Organization.

Employee factor: Each worker is counted as producing 0.50 of the impacts of a resident for analytical purposes, since workers spend no more than half the time of a resident in the city, and are assumed to require fewer services in general (library, parks, etc.). This falls within industry-standard practices of counting employees as 0.25 to 0.5 of a resident for service needs.

Figure A1 shows the existing service population for the GSD and the USD.

FIGURE A1

Current Nashville-Davidson service population

Current Service Population	
Residents - GSD	626,681
Residents - USD	427,138
Employees - GSD	631,938
Employees - USD	456,810
Employee Factor	0.50
Total Service Population - GSD	942,650
Total Service Population - USD	655,543

Source: Census 2010 SF1 data for Blocks as modified by the Nashville Area MPO; InfoUSA (2012) as modified by the Nashville Area MPO; data provided by Nashville MPO.

Key land use assumptions

Figure A2, below, shows the key land use assumptions used to create the model. These land use assumptions were derived as follows:

Number of residential units and commercial square feet: These are drawn from the three development scenarios, as shown in the report's Figures 1, 3 and 5.

FIGURE A2

Key land use assumptions

	Units/Sq.Ft.			Value (per Unit / per sq. ft.)		
Land Use	Bradford Hills	The Gulch	Lenox Village	Bradford Hills	The Gulch	Lenox Village
Nonresidential (Square Feet)						
Commercial	39,120	2,110,530	67,150	$165	$253	$198
Residential (Units)						
Single-Family Detached	538	0	572	$191,350	N/A	$222,600
Single-Family Attached	0	0	245	N/A	N/A	$180,800
Multi-Family	0	4,552	898	N/A	$280,000	$119,900
Total	538	4,552	1,715			

Source: Colliers, 2012; Cassidy Turley, 2012; Nashville Downtown Partnership, 2012; Trulia, 2012; Strategic Economics, 2012.

Value per unit/per square foot:

- Commercial development: The value of commercial space ($253/square foot in The Gulch, $198/square foot in Lenox Village, and $165/square foot Bradford Hills) was estimated

using the income capitalization approach. In this approach to property valuation, a building's anticipated operating expenses are removed from anticipated operating revenues to derive net operating income; this net operating income is then divided by a "capitalization rate," which is the ratio of net operating income to the property sale value expected in the general real estate market. This calculation is shown in Figure A3. Strategic Economics estimated average commercial rental rates at about $1.92 per square foot for The Gulch, $1.50 per square foot for Lenox Village, and $1.25 per square foot for Bradford Hills, triple net**, based on local market reports for the Nashville area.

- Residential units: Estimated market values for residential units were based on recent sales in Bradford Hills, Lenox Village, and The Gulch. The pricing assumptions derived from the data are shown in Figure A4.

FIGURE A3

Pricing assumptions for commercial space

Assumptions		Bradford Hills	The Gulch	Lenox Village
Monthly Rent (NNN)	Per SF	$1.25	$1.92	$1.50
Vacancy	Percent	9.0%	9.0%	9.0%
Non-Reimbursable Expenses	Percent	3.0%	3.0%	3.0%
Capitalization Rate	Percent	8.0%	8.0%	8.0%
Estimated Value				
Gross Annual Office Income	Per SF	$15.00	$23.00	$18.00
Less Office Vacancy	Per SF	-$1.35	-$2.07	-$1.62
Less Non-Reimbursable Exp	Per SF	-$0.45	-$0.69	-$0.54
Net Operating Income	Per SF	$13.20	$20.24	$15.84
Capitalized Value	Per SF	$165.00	$253.00	$198.00

Source: Colliers, 2012; Cassidy Turley, 2012; Strategic Economics, 2012.

FIGURE A4

Pricing assumptions for residential units

Unit Type	Avg. Price/Sq. Ft.	Avg. Unit Size	Avg Price/Unit
Multi-family, The Gulch	$350	800	$280,000
Single-family detached, Bradford Hills	$89	2,150	$191,350
Multi-family, Lenox Village	$109	1,100	$119,900
Single-family attached, Lenox Village	$113	1,600	$180,800
Single-family detached, Lenox Village	$106	2,100	$222,600

Source: Nashville Downtown Partnership, 2012; Trulia, 2012; Strategic Economics, 2012.

** In a triple net lease, the tenant is responsible for a proportionate share of a building's property taxes, property insurance, and common area operating and utility expenses in addition to insurance, utility, cleaning and other costs associated with their own tenancy.

Jobs and population estimates

Many of the costs and revenues in the fiscal analysis were calculated based on the net increase in population and jobs resulting from build-out of the three development scenarios. In order to derive population and job estimates from the housing unit and square footage estimates of the potential development scenarios, Strategic Economics applied the following assumptions (summarized in Figure A5):

Single-family attached or detached household size: 2.52 persons per household, the current average household size for owner-occupied, detached or attached single-family units in Nashville, as reported by the 2011 American Community Survey.[††]

Multi-family: 1.55 persons per household, the current average household size for owner-occupied units in buildings with 5 or more units in the Nashville, as reported by the 2011 American Community Survey.

Jobs per square foot: 500 square feet per employee.

The total assumed resident and employee population for each development scenario, based on the residential household sizes and employment densities described above, are shown in Figure A6.

FIGURE A5

Service population assumptions

Average Persons per Household	
Single-Family Attached or Detached	2.52
Multi-Family	1.55
Square Feet per Employee	
Commercial	500

Source: U.S. Census Bureau, 2011 American Community Survey; Strategic Economics, 2012.

†† U.S. Census Bureau. (2011). American Community Survey 1-Year Estimates.

FIGURE A6

Estimated new service population associated with development scenarios

Land Use	Bradford Hills	The Gulch	Lenox Village
Commercial			
Employees	78	4,221	134
Employee Factor	0.50	0.50	0.50
Service Population	39	2,111	67
Residents			
Single-Family Attached	0	0	618
Single-Family Detached	1,358	0	1,444
Multi-Family	0	7,052	1,391
Subtotal	1,358	7,052	3,454
Total Service Population	1,397	9,163	3,521

Source: Strategic Economics, 2012.

Estimating revenues

This section summarizes assumptions for property tax, sales tax, and other recurring General Fund revenues.

Property tax

Assessed value: According to the Davidson County Assessor of Property, property taxes in Tennessee are calculated using an assessment ratio applied to the appraised, or market value for properties.[‡‡] To calculate assessed values, Strategic Economics used the market values shown in Figures A3 and A4 as the appraised values and then applied the appropriate assessment ratio. Figure A7 shows the total estimated appraised value for each land use alternative, by land use type. These values were based on units and square feet included in the development scenarios, multiplied by the per-square-foot and per-unit assumptions shown above in Figures A3 and A4. Figure A8 shows the total estimated assessed value for each land use alternative, by land use type. These values were based on the appraised values included in Figure A7, multiplied by the appropriate assessment ratio.

‡‡ Davidson County Assessor of Property. Available at http://www.padctn.com/estimatetaxes.htm#Tax_Calculator_Tool.

FIGURE A7

Appraised (market) property values of development scenarios, 2012 dollars

Land Use	Appraised Values		
	Bradford Hills	The Gulch	Lenox Village
Nonresidential			
Commercial	$6,453,975	$533,964,090	$13,295,898
Residential			
Single-Family Detached	$102,946,300	$0	$127,327,200
Single-Family Attached	$0	$0	$44,296,000
Multi-Family	$0	$1,274,560,000	$107,670,200

Sources: Strategic Economics, 2012.

FIGURE A8

Assessed property values of development scenarios, 2012 dollars

Land Use	Assessment Ratio	Assessed Values		
		Bradford Hills	The Gulch	Lenox Village
Nonresidential				
Commercial	40%	$2,581,600	$213,585,600	$5,318,400
Residential				
Single-Family Detached	25%	$25,736,600	$0	$31,831,800
Single-Family Attached	25%	$0	$0	$11,074,000
Multi-Family	25%	$0	$318,640,000	$26,917,600

Sources: Davidson County Assessor of Property, 2012; Strategic Economics, 2012.

Property tax rate: The Nashville-Davidson Metropolitan Government (Metro) has a tiered property tax rate and tiered service level depending on location. The GSD encompasses the entire Metro area and pays a base tax rate. As shown in Figure A9 the total property tax rate in the GSD is $4.04, which includes a portion for school operation and debt service. The portion of the GSD tax rate dedicated to general purposes is $1.96. The additional tax rate for the USD totals $0.62, for a total combined tax rate within the USD of $4.66. The portion of the USD tax rate dedicated to general purposes is $0.51.

FIGURE A9

Property tax rates (per $100 in assessed value), fiscal year 2012-2013

	Tax Rate
General Services District (GSD)	
General	$1.96
Schools General Purpose	1.40
General Debt Service	0.43
Schools Debt Service	0.25
Subtotal - GSD	$4.04
Urban Services District (USD)	
General	$0.51
General Debt Service	0.11
Subtotal - USD	$0.62
Combined USD/GSD rate	$4.66

Source: Nashville-Davidson FY 2012-13 Budget; Strategic Economics, 2012.

Annual property tax revenue: Annual property tax revenues are shown below in Figure A10. These values were derived by multiplying assessed values shown in Figure A8 by the property tax rates for general purposes shown in Figure A9. Because the other portions of property tax revenues are used for debt service and school services, Strategic Economics excluded those revenues in order to include only revenues dedicated to the General Fund municipal services.

FIGURE A10

Annual property tax revenues, 2012 dollars

Land Use	Bradford Hills	Lenox Village	The Gulch
Nonresidential			
Commercial - GSD	$50,600	$104,200	$4,186,300
Commercial - USD	0	0	1,089,300
Subtotal - Commercial	$50,600	$104,200	$5,275,600
Residential			
Single-Family Detached - GSD	$504,400	$623,900	$0
Single-Family Detached - USD	0	0	0
Single-Family Attached - GSD	0	217,100	0
Single-Family Attached - USD	0	0	0
Multi-Family - GSD	0	527,600	6,245,300
Multi-Family - USD	0	0	1,625,100
Subtotal	$504,400	$1,368,500	$7,870,400
General Fund Property Tax Revenue - GSD	$555,000	$1,472,700	$10,431,600
General Fund Property Tax Revenue - USD	0	0	2,714,400
Total General Fund Property Tax Revenue	**$555,000**	**$1,472,800**	**$13,146,000**

Sources: Nashville-Davidson FY 2012-13 Budget; Strategic Economics, 2012.

Sales Tax

Taxable sales assumptions: Figure A11 shows the taxable sales assumptions used to estimate sales tax revenues for the development scenarios. Strategic Economics calculated taxable retail demand based on the projected number of households, rather than the amount of new retail provided in each scenario, because new supply (i.e., new retail square footage) does not necessarily create new demand. To estimate taxable sales, Strategic Economics used assumptions for the percent of income spent on retail and the percent of retail expenditures that are both taxable and captured within Nashville-Davidson (Figure A11). The estimate for the percent of income spent on retail (30 percent) is a rule of thumb assumption for how much of a household's income is used for retail expenditures. The estimate for the percentage of retail expenditures captured and taxable in Nashville-Davidson is a fairly conservative assumption that 60 percent of those retail expenditures are taxable and take place within the jurisdictional boundaries of Nashville-Davidson. The estimate assumes that the retail expenditures making up the other 40 percent are either untaxable and/or take place outside Nashville (e.g. retail sales that take place across jurisdictional boundaries or on websites). The analysis assumed that new employees associated with the commercial development in each scenario would not contribute significantly to taxable sales, to avoid double-counting workers who also live within the metro area.

Sales tax rate: The Nashville-Davidson Metropolitan Government receives 2.25 percent of taxable sales made within the Nashville-Davidson boundaries.

FIGURE A11

Taxable sales assumptions

Average Annual Median Household Income, Nashville-Davidson	$46,141
Percent of Income Spent on Retail	30%
Average per Household Annual Retail Expenditure	$13,842
Percent of Retail Expenditures Captured and Taxable in Nashville-Davidson	60%
Average per Household Taxable Expenditures Captured in Nashville-Davidson	$8,305
Sales Tax Rate (Percent of Taxable Sales)	2.25%

Sources: U.S Census, 2011; Tennessee Department of Revenue, 2012; Strategic Economics, 2012.

Sales tax revenues: Sales tax revenues generated by residents were calculated by multiplying the number of households associated with each development scenario by the average per-household taxable sales captured in Nashville-Davidson ($8,305 per household), and then by the applicable tax rate. Tennessee state law requires that at least half of the local sales tax be allocated to schools. Metro allocates two-thirds of local sales tax revenues to schools (including schools debt service) and one-third to the General Fund.[§§] Therefore Strategic Economics estimated that one-third of the total local sales tax revenue estimated in the analysis would be allocated to the General Fund. The results are shown in Figure A12, below.

FIGURE A12

Annual sales tax revenue, 2012 dollars

	Bradford Hills	Lenox Village	The Gulch
Households	538	1,715	4,552
Estimated Taxable Retail Sales per Household	$8,305	$8,305	$8,305
Sales Tax Rate	2.25%	2.25%	2.25%
Total Local Sales Tax Revenues	$100,500	$320,500	$850,600
General fund portion of local sales tax	33%	33%	33%
General Fund Local Sales Tax Revenue	**$33,200**	**$105,800**	**$280,700**

Sources: Nashville-Davidson FY 2012-13 Budget; Strategic Economics, 2012.

Other Recurring Revenues

Calculating recurring revenue per capita: In addition to the revenues discussed above, Metro's General Fund receives smaller amounts of revenue from sources such as Charges for Current Services and intergovernmental transfers. Strategic Economics applied a service population factor

§§ The Metropolitan Government of Nashville and Davidson County. (2012, August). "Metropolitan Nashville/Davidson County FY 2013 Operating Budget. p. A – 28. Available at http://www.nashville.gov/Portals/0/SiteContent/Finance/docs/OMB/citizens_budget/budgetbook/fy13/fy13_final_budget.pdf.

to each revenue category, representing the relative proportion of revenues attributable to new residents (1.0) and employees (0.50). Figure A13 shows the per capita revenue generated per resident and per employee by source for the GSD. Figure A14 shows the results for the GSD, based on multiplying the per capita resident and employee revenues by the number of residents and employees associated with each development scenario. Figure A15 shows the per capita revenue generated per resident and per employee by source for the USD. Figure A16 shows the results for the USD, based on multiplying the per capita resident and employee revenues by the number of residents and employees associated with each development scenario.

FIGURE A13

Other recurring revenues assumptions – GSD

		Service Pop. Factors		Revenue Per Capita	
	FY 2012-13	Resident	Employee	Resident	Employee
Other Taxes, Licenses, an	$96,672,400	1.00	1.00	$76.81	$76.81
Fines, Forfeits, and Penalt	$11,514,300	1.00	0.50	$12.21	$6.11
Commissions and Fees	14,049,500	1.00	0.50	$14.90	$7.45
Charges for Current Servic	28,490,000	1.00	1.00	$22.64	$22.64
Intergovernmental	$75,154,100	1.00	0.50	$79.73	$39.86
Total Per Capita Revenues				**$206.29**	**$152.87**

Sources: Nashville-Davidson FY 2012-13 Budget; Strategic Economics, 2012.

FIGURE A14

Other annually recurring revenue, 2012 dollars – GSD

	Bradford Hills	The Gulch	Lenox Village
Residents	1,358	7,052	3,454
Employees	39	2,111	67
General Fund Revenue	**$286,100**	**$1,777,500**	**$722,700**

Sources: Nashville-Davidson FY 2012-13 Budget; Strategic Economics, 2012.

FIGURE A15

Other recurring revenues assumptions – USD

		Service Pop. Factors		Revenue Per Capita	
	FY 2012-13	Resident	Employee	Resident	Employee
Other Taxes, Licenses, and Permits	$8,305,500	1.00	1.00	$9.40	$9.40
Intergovernmental	$4,182,900	1.00	0.50	$6.38	$3.19
Charges for Current Services	1,062,100	1.00	0.50	$1.62	$0.81
Total Per Capita Revenues				**$17.40**	**$13.40**

Sources: Nashville-Davidson FY 2012-13 Budget; Strategic Economics, 2012.

FIGURE A16

Other annually recurring revenue, 2012 dollars – USD

	Bradford Hills	The Gulch	Lenox Village
New Residents	1,358	7,052	3,454
New Employees	39	2,111	67
General Fund Revenue	**$0**	**$151,000**	**$0**

Sources: Nashville-Davidson FY 2012-13 Budget; Strategic Economics, 2012.

Estimating expenditures

This section summarizes the methodology used to estimate major General Fund costs for both the GSD and USD.

Per Capita Expenditures

Strategic Economics applied a per capita model to estimate General Fund costs. In the model, certain General Fund costs are assumed to increase on a per capita basis as residents and employees are added in the development scenarios. Strategic Economics assumed that some costs are fixed and independent of population growth, but that some portion of each cost category is "variable", or dependent on the size of the service population. For example, fixed costs are those that do not vary with growth, such as administrative costs, and variable costs are those that do vary with growth such as the costs associated with the number of police officers or firefighters. For the purposes of this analysis, Strategic Economics assumed that 50 percent of General Government costs are independent of the size of the service population (Figure A17). This assumption is based on the premise that half of general administrative costs will not increase with new population. Other cost categories, such as public safety, are more closely tied to changes in population and therefore are assumed to have a higher level of variable costs (90 percent). The assumptions for fixed and variable costs are based on previous experience with fiscal impact analysis and industry standards.

As with the revenues calculated on a similar basis, Strategic Economics applied a service population factor to each expense category, representing the relative proportion of expenses attributable to new residents (1.0) and employees (0.50). Figure A17 shows the per capita expenses generated by residents and employees within the GSD. Figure A18 summarizes the costs associated with each development scenario for the GSD. Figure A19 shows the per capita expenses generated by residents and employees within the USD. Figure A20 summarizes the costs associated with each development scenario for the USD.

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Smart Growth America
Making Neighborhoods Great Together

Smart Growth America advocates for people who want to live and work in great neighborhoods. We believe smart growth solutions support thriving businesses and jobs, provide more options for how people get around and make it more affordable to live near work and the grocery store. Our coalition works with communities to fight sprawl and save money. We are making America's neighborhoods great together.

Smart Growth America is the only national organization dedicated to researching, advocating for and leading coalitions to bring smart growth practices to more communities nationwide. Visit us online at www.smartgrowthamerica.org.

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