

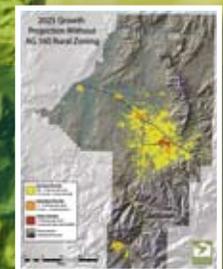
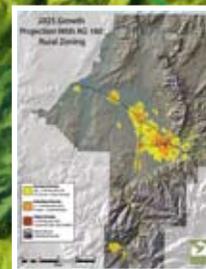
# Gallatin County, Montana FISCAL IMPACT ANALYSIS



RPI Consulting, LLC



geodata



**This report was prepared by the Sonoran Institute and RPI Consulting, LLC, with assistance from Geodata Services, Inc.**



Sonoran Institute  
Northern Rockies Office  
201 S. Wallace Ave, Suite B3C  
Bozeman, MT 59715  
[www.sonoraninstitute.org](http://www.sonoraninstitute.org)  
406.587.7331

The Sonoran Institute's mission is to inspire and enable community decisions and public policies that respect the land and people of western North America.

### Shaping the Future of the West



**For questions about the Fiscal Impact Analysis, contact:**

RPI Consulting LLC  
1911 Main Ave Suite 224  
Durango, CO 81301  
Gabe Preston  
[gabe@rpiconsulting.org](mailto:gabe@rpiconsulting.org)  
970.382.9886

RPI Consulting, LLC is a land-use consulting firm that specializes in combining an analytic approach with the needs and desires of the community during the planning process. RPI has worked with dozens of municipalities and counties, the State of Colorado, and federal land management agencies on projects ranging from long-term master plans, to tourism impact studies, to long-term fiscal outlooks.



**Alternative scenario growth modeling prepared by:**

Geodata Services, Inc. provides multidisciplinary spatial data for federal, state and local government agencies, industry and private organizations and individuals. We provide services in geographic information systems (GIS) data acquisition and conversion, spatial analysis, image analysis, database development, global positioning system (GPS) services, GIS needs assessment and 2D and 3D visualizations.

# GALLATIN COUNTY, MONTANA FISCAL IMPACT ANALYSIS

---

## Table of Contents

EXECUTIVE SUMMARY .....	5
INTRODUCTION .....	9
BACKGROUND .....	11
METHODOLOGY .....	12
Modeling Future Residential Growth Scenarios .....	12
Municipal Annexation .....	13
Modeling Existing and Future Traffic Levels .....	13
Fiscal Impact Analysis of Both Future Growth Scenarios .....	16
FINDINGS .....	17
Growth Modeling Findings .....	17
Traffic Modeling Findings .....	20
Fiscal Impact Analysis Findings .....	21
Roads Fiscal Impact .....	21
Law Enforcement Fiscal Impact .....	24
CONCLUSIONS .....	27

## Table of Figures

Figure 1: Population Growth Compared to Land Development .....	9
Figure 2: The Rising Cost of Maintaining Roads in Gallatin County .....	11
Figure 3: Average Trip Length for Western Montana Counties.....	15
Figure 4: Developed Acres, 2005 and Projected .....	17
Figure 5: Existing and Projected Housing Units in Unincorporated Areas .....	17
Figure 6: Vehicle Miles Traveled in Unincorporated Gallatin County .....	20
Figure 7: Vehicle Miles Traveled 2005, Business-as-Usual and Alternative Scenario.....	21
Figure 8: Road and Bridge Proportionate Share .....	22
Figure 9: Roads Operations Level of Service Derivations .....	22
Figure 10: Road and Bridge Level of Service 2005 .....	22
Figure 11: Road Improvements Not Included in the 2007 Impact Fee.....	23
Figure 12: Roads Capital Improvements Level of Service Derivations .....	23
Figure 13: Gallatin County Law Enforcement Incident Analysis .....	24
Figure 14: County Sheriff Proportionate Share of Demand .....	25
Figure 15: Gallatin County Sheriff Law Enforcement Level of Service .....	25
Figure 16: Sheriff's Operations Level of Service Derivations .....	26
Figure 17: Sheriff's Capital Facilities Level of Service Derivations .....	26
Figure 18: Road and Bridge and Sheriff Fiscal Summary .....	27
Figure 19: Alternative Scenario Cost Savings .....	27

# EXECUTIVE SUMMARY

Gallatin County's landscape of farm and ranch lands, open spaces, and vibrant communities add up to a quality of life matched by few places in the United States.

These attractions are leading to unprecedented growth in Gallatin County and a pattern of widely dispersed development which is straining, and in some cases quickly eroding, the very values that attract people and business to this place. In addition to the conversion of ranchlands and the loss of open space, these growth patterns are placing increasing fiscal burdens on the County.

Gallatin County is Montana's fastest growing county – in fact, its growth rate is in the top 3% of all counties in the United States. Since 1990, Gallatin County's population has grown by 73%; its annual growth rate has accelerated since 2000. If the County returns to these growth rates when the national economy rebounds, a result that many experts believe is likely, the County's population will more than double in size to almost 180,000 in the next 20 years.

The County's growth pattern has changed dramatically as its population has grown. In contrast with traditional patterns of growth, in which most development took place in the county's cities and towns, more and more homes are being built farther out into the countryside and converting land from farms and ranches into subdivisions. For example, while the populations of cities in the County grew by 98% since 1970, the population in rural areas outside of towns has grown by 239%.

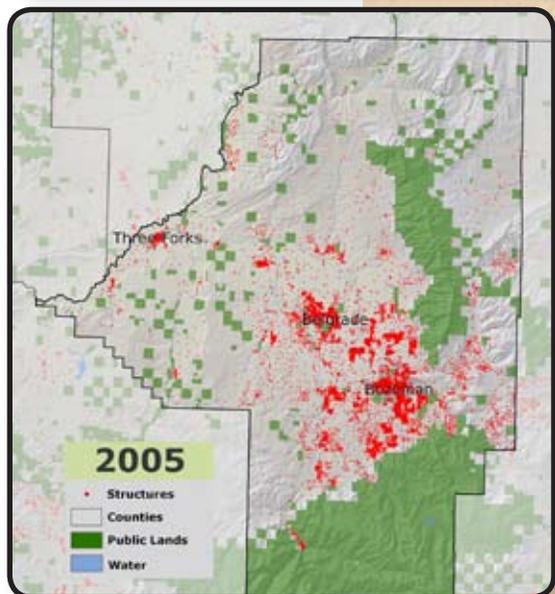
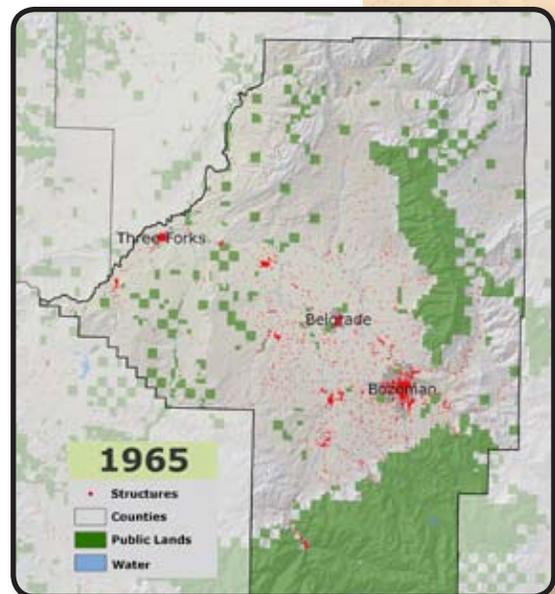
The final characteristic of recent growth is the rate of land development per home. While the population of Gallatin County grew by 133% between 1970 and 2004, the number of acres of land developed for homes grew by 271%. Gallatin County is developing rural land at a faster rate than ever before.

***Gallatin County is Montana's fastest growing county – in fact, its growth rate is in the top 3% of all counties in the United States***

In response to these trends, in 2006 the County Commissioners proposed a growth management plan that would limit residential growth in rural areas and direct most new homes to the edges and undeveloped portions of existing communities using a variety of incentives and regulations. The growth management tools chosen by the Commissioners include Neighborhood Planning efforts, a Transfer of Development Rights program, and Rural Zoning.

The rural zoning district, known as the AG 160 zoning district, limits new homes in rural areas to a density of one per 160 acres and allows for additional homes under a Rural Cluster Development

***While the populations of cities in the County grew by 98% since 1970, the population in rural areas outside of towns has grown by 239%***



provision. When homes are clustered away from prime agricultural soils and other natural resources, the permitted density increases to one per 40 acres.

Many studies have demonstrated that fiscal impacts to local governments (and thus to taxpayers) are reduced when widely scattered development is limited and development is instead encouraged to be more efficiently closer to infrastructure and services. This study builds upon that literature and compares the fiscal impacts to Gallatin County from two distinct future growth scenarios. The first scenario continues the dispersed development of the recent past. The second scenario models a development pattern that would result from adoption of the Commissioner’s growth management plan.

The analysis contained in this report is presented in three parts: 1) a **growth model** that projects the number and location of homes in 2025 under both scenarios; 2) a **traffic model** that calculates traffic levels resulting under each scenario; and 3) a **fiscal impact analysis** that projects the cost to the County government of providing road and law enforcement services under each scenario.

1. The **growth model** was created using the Sonoran Institute Residential Growth Model. This model uses recent development trends – from 1990 to 2005 – to identify the “drivers” that result in a particular pattern of growth. The model then uses these drivers to project the location and amount of development that can be expected between 2010 and 2025 in a “business-as-usual” scenario in which Gallatin County’s recent, prevailing pattern of growth is continued.

Analysts then created an “alternative” scenario based upon the AG 160 zoning district.

The alternative scenario amends the business-as-usual scenario by applying the density

limitations that would maintain the rural character of rural areas under the AG 160 zoning district. In those areas where the business-as-usual scenario projects more homes than the proposed zoning would allow, the model redistributes the applicable percentage of homes to the County’s existing growth areas. In other words, the model simulates the effect of the proposed zoning.

***Future growth was projected under two scenarios: a “business-as-usual” scenario that continues recent growth trends, and an “alternative” scenario that simulates the effect of Gallatin County’s proposed AG 160 zoning district***





It is important to note that the model projects the same number of homes for each scenario. It does not limit the amount of growth that Gallatin County would experience. The difference lies in the distribution of homes over the landscape so that land use and fiscal implications of the proposed zoning can be understood.

2. RPI analysts used GIS software to create a **traffic model** that projects the amount of driving on County roads that would occur in each scenario. Only County road traffic was considered in the study, given that these are the only roads that fiscally impact the County. The traffic model was calibrated using the County's impact fee study.  $\text{Traffic} = \text{average trip length} \times \text{number of trips on County roads}$ . The result is expressed in Vehicle Miles Traveled, which represents one vehicle driving one mile.
3. The **fiscal impact analysis** incorporated the results of the traffic modeling. The operational and maintenance costs to the County of providing road and bridge services (day-to-day expenses) and capital improvements (capacity-increasing road improvements) are calculated by multiplying the current cost per Vehicle Mile Traveled (as established by level of service standards) by the projected Vehicle Miles Traveled. In other words, as Vehicle Miles Traveled increase, costs to the County increase. Alternatively, if the County chooses to keep costs constant as Vehicle Miles Traveled increase, levels of service will likely decline.

***The more compact growth pattern of the alternative scenario could save the county over \$53 million between 2010 and 2025***

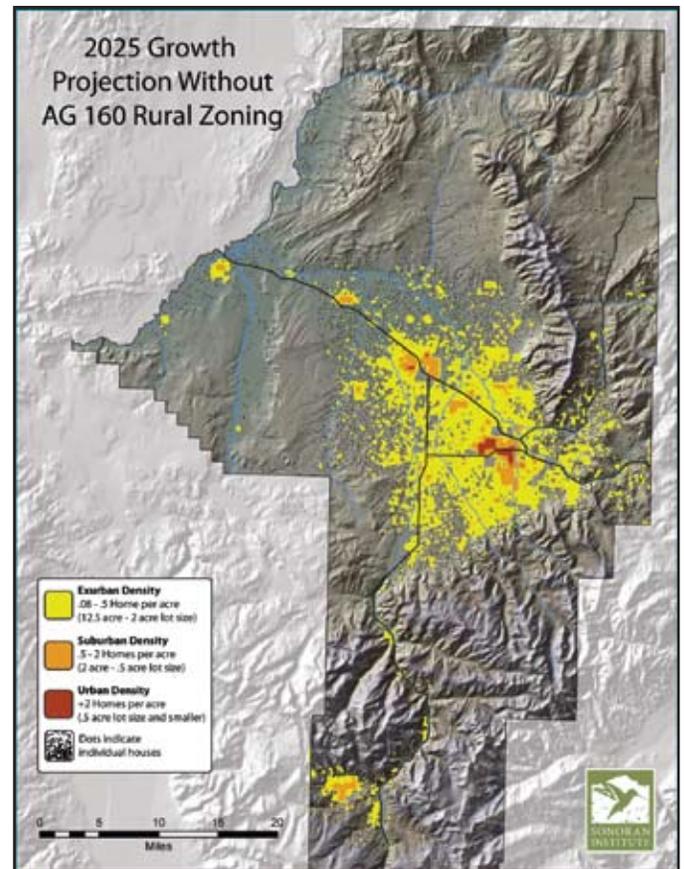
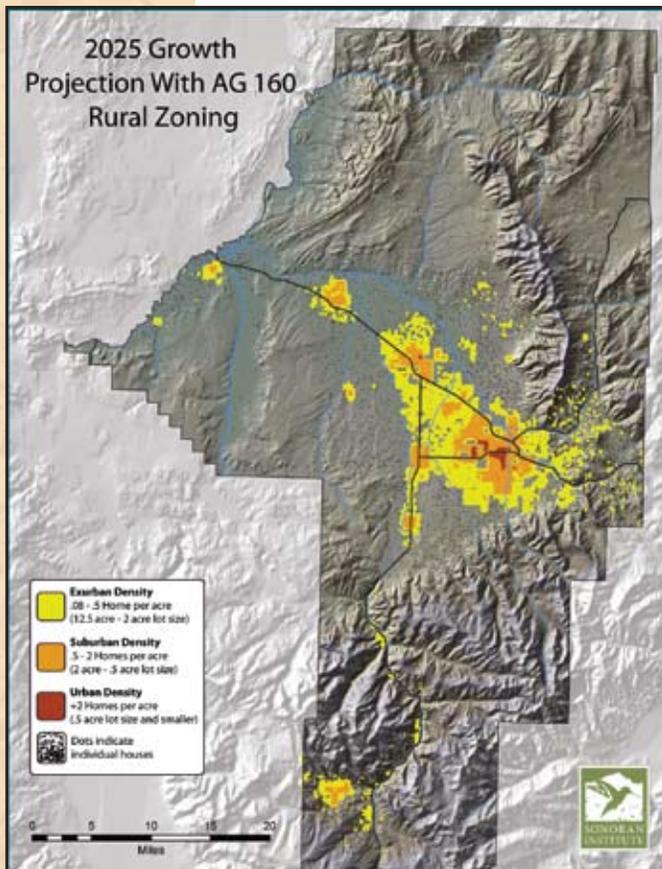
The report's major findings follow the same structure: **1) how much land will be developed under the two scenarios; 2) how much traffic will result; and 3) the implications of each scenario in costs borne by the County's taxpayers.** The key findings are:

1. The alternative scenario, incorporating rural zoning and encouraging development in and near existing communities, resulted in a much more compact development pattern by the year 2025 than the business-as-usual pattern, which continued the dispersed development patterns of the recent past. The difference was dramatic; the area of land developed under the business-as-usual scenario is 137,493 acres, compared to 98,533 in the alternative scenario.

2. Under the business-as-usual scenario, Vehicle Miles Traveled will increase more than the projected increase in housing units, reflecting that dispersed rural residential development results in significantly more driving. In contrast, the increase in traffic under the alternative scenario would be 42% less than the increase in housing units, reflecting much shorter trips. In sum, directing the majority of future housing units close to municipalities results in dramatically reduced traffic loads on county roads.
3. Maintaining the current level of service for Gallatin County roads and bridges and sheriff's services from 2010 – 2025 will cost nearly \$88 million under the business-as-usual development pattern. Under the alternative scenario, the combined costs for road and bridge and sheriff's services in the same period will cost nearly \$34 million.

When these two areas of County expenditures are totaled, and then contrasted under the two scenarios, the implication of more consolidated versus more dispersed growth is particularly stark. The alternative scenario— resulting in less sprawl and thus significantly fewer miles of new roads required to be constructed and maintained, and dramatically reduced traffic load on County roads as County vehicles and County residents make shorter trips— is projected to save the county over \$53 million between 2010 and 2025.

	ROAD COSTS	SHERIFF COSTS	ROADS AND SHERRIFF COMBINED COSTS
Business-as-Usual Scenario	\$70,385,700	\$17,356,600	\$87,742,300
Alternative Scenario	\$20,184,000	\$13,735,800	\$33,919,800
Alternative Scenario Costs Savings	\$50,201,700	\$3,620,800	\$53,822,500



# INTRODUCTION

Gallatin County, Montana, offers some of the grandest landscapes and most attractive communities in the country. Its diverse economy, mountains and rivers, vast public lands, farms and ranches, sweeping vistas, recreational opportunities, and pleasant towns continue to attract people and businesses. With growth comes more opportunity for employment and commerce, and cultural attractions. It also comes with an ever increasing demand on local governments to provide services to its citizens. These demands are forcing local leaders to deal with challenging budgetary pressures and land use conflicts.

Gallatin County is Montana's fastest growing county – in fact, its growth rate is in the top 3% of all counties in the United States. Since 1990, Gallatin County has grown by 73%; its growth rate since 2000 has been even faster. If the County continues to grow at these rates, it will more than double in size to almost 180,000 people in the next 20 years.



In addition to rapid growth rates, Gallatin County exhibits sprawling patterns of growth. In contrast with traditional patterns of growth, in which most development took place in the county's cities and towns, more and more homes are being built farther out into the countryside and converting land from farms and ranches into subdivisions. For example, while the populations of cities in the County grew by 98% since 1970, the population in rural areas outside of towns has grown by 239%.

The final characteristic of recent growth patterns is that more land is being developed per home. While the population of Gallatin County grew by 139% between 1970 and 2004, the number of acres of land developed for homes grew by 271%. Growth in Gallatin County is proceeding at a rapid rate, is taking up more land than ever before, and is spreading far out into the countryside.

It is widely recognized that these patterns of growth can lead to increasing costs to the taxpayer of providing public infrastructure and services. When subdivisions are built farther out of towns, they create more traffic on rural County roads, which creates the need for more roads, more expensive road maintenance, and higher costs for emergency services. Many previous studies show that a return

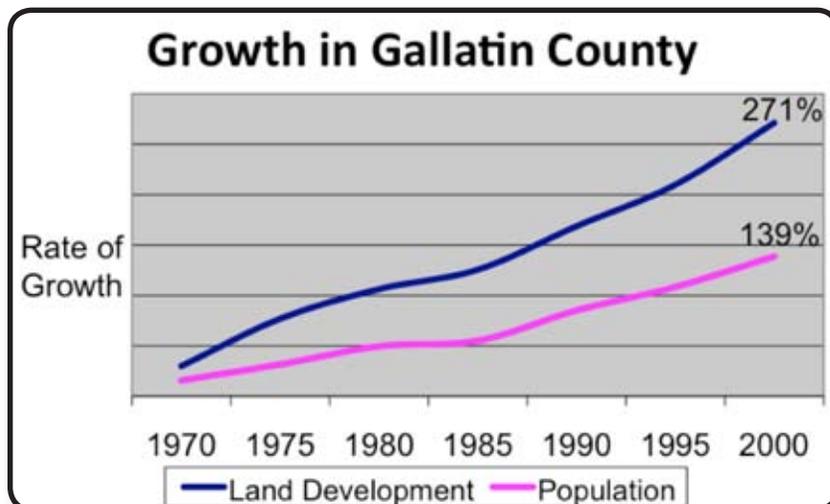


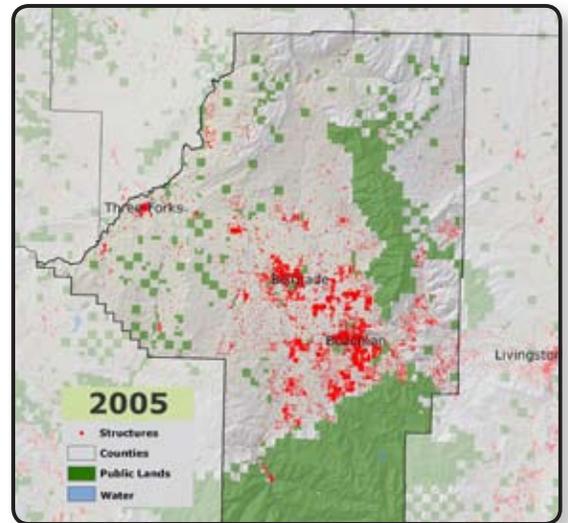
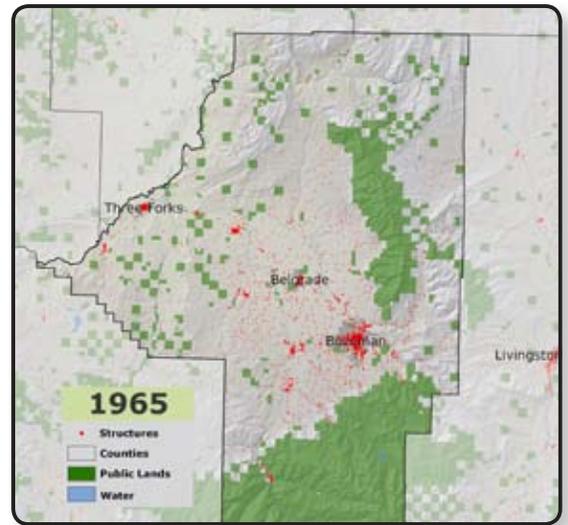
Figure 1: Population Growth Compared to Land Development

to past patterns of growth, in which most homes are built in towns in traditional compact neighborhoods, reduces the costs of providing public infrastructure and services, saving taxpayer dollars.

In 2006, the Gallatin County Commissioners responded to these trends by proposing a growth management plan that uses a combination of incentives and regulations to direct growth back to the County's cities and built-up areas such as Four Corners. The Commissioners' intent was to reduce the fiscal impacts of growth on county taxpayers, as well as conserve farm and ranch lands and other natural resources. Three years later, the Commissioners continue to ponder adoption of the proposal; this report is intended to inform the Commissioners' decision.

The report compares the fiscal impacts to taxpayers of two future growth scenarios: a "business-as-usual" scenario that continues the development patterns of the recent past, and an "alternative growth" scenario resulting from adoption of the growth management plan. The latter scenario, developed by Geodata Services, Inc., represents a projected distribution of future growth under Gallatin County's proposed rural zoning district, known as the AG 160 District. The AG 160 district limits home construction in rural areas and directs most new growth into the County's towns.

Rural Planning Institute LLC (RPI) assessed the taxpayer costs for County Road and Bridge services and Sheriff's Department services under the two scenarios. RPI uses a "spatially dynamic" analysis that uses Vehicle Miles Traveled (VMT), a measurement of the total amount of driving done by all the households in a given area, to calculate infrastructure and service costs.



The analysis summarized in this report sets out to answer two research questions:

1. Generally, how do evolving land development patterns represented by the business-as-usual scenario affect the costs of providing basic County road and law enforcement services in Gallatin County?
2. How would a future land use scenario projected under Gallatin County's proposed growth management plan affect the costs of providing basic County road and law enforcement services?

**In addition to rapid growth rates, Gallatin County exhibits sprawling low density growth.**



**Gallatin County is Montana's fastest growing county – in fact, its growth rate is in the top 3% of all counties in the United States.**

# BACKGROUND

While the first fiscal impact analyses date back to the 1970s, the land development boom of the 1990s rekindled interest in studying the implications of low-density development occurring in rural areas. While many reports argue that dispersed low density development costs more than a compact development pattern, fewer studies have included the quantitative analysis needed to yield tangible fiscal results.

■ The State of Maine Planning Office conducted a *cost of sprawl*<sup>1</sup> study yielding some tangible results at the national scale:

“Shifting just 25% of low-density development to more compact growth would save American taxpayers billions of dollars For example, we would save:

\$2.6 billion over 25 years (from 2000 – 2025) because 4.6 million fewer water and sewer hookups would be needed for single-family, detached homes;

\$110 billion over 25 years in road construction costs because the need for local roads would be reduced by 188,000 lane miles;

\$420 billion over 25 years in development costs because the average cost of a home would drop by \$16,000;

\$24 million/day in costs associated with the automobile because Americans would drive 56 million fewer miles each day

■ Recently, Denver Regional Council of Governments studied future development scenarios in the Metro Vision 2020 effort. They found that sprawling development would cost Denver-area governments \$4.3 billion more in infrastructure costs than compact smart growth through 2020<sup>2</sup>.

■ American Farmland Trust’s *Cost of Community Services* (COCS) studies, conducted dozens of times throughout the U.S. demonstrate repeatedly that on average, the tax revenues generated by residential development do not cover the costs incurred to local government from them.<sup>3</sup>

■ In 1996 Montana State University completed a COCS study for Gallatin County. It too showed that residential land uses in Gallatin County demand more costs to provide services than the revenues they generate. According to the study, while commercial and industrial land uses contribute more to the government budget than the costs incurred by them, residential land uses cost Gallatin County \$1.16 in services for every \$1.00 of revenues they generate.<sup>4</sup>

Recent advances in fiscal impact analysis of development patterns emphasize the impacts of increased driving associated with dispersed residential development compared to more compact development patterns. As part of its 2005 Master Plan<sup>5</sup>, Gunnison County, Colorado, contracted with RPI Consulting to evaluate the fiscal impacts of accommodating a fixed number of residential units under two land use patterns: a business-as-usual future with 10 to 35 acre subdivisions

accommodating future full and part-time residents and a “compact alternative” with density limitations in the rural reaches of the county and directed most future development to towns and economic activity centers. The sprawling business-as-usual land use pattern was found to cost

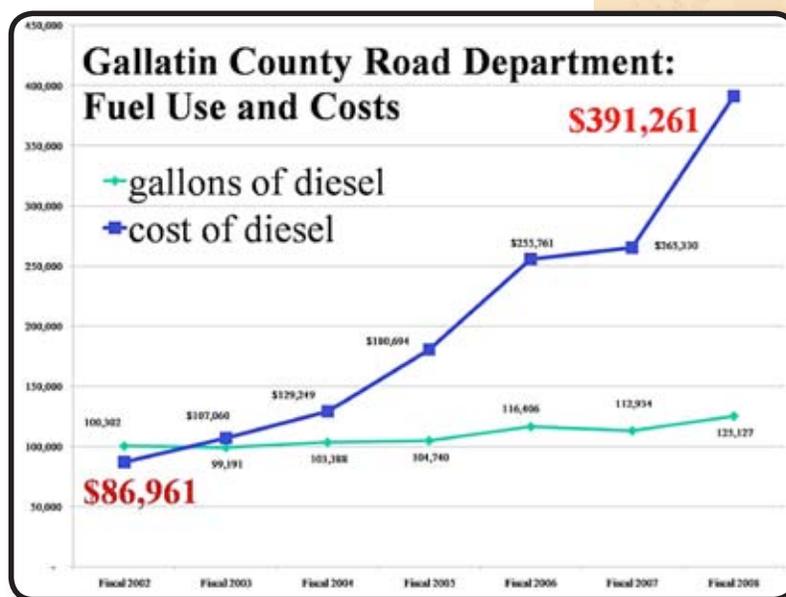


Figure 2: The Rising Cost of Maintaining Roads in Gallatin County

\$2.3 million more annually for basic county services than the compact alternative while capital improvement costs top \$17 million more under the business-as-usual scenario. These differences were entirely attributed to longer commutes and more driving associated with the business-as-usual land use pattern.

Gallatin County's neighbor, Beaverhead County, has also undertaken a fiscal impact analysis of future land use pattern scenarios. The Sonoran Institute produced a business-as-usual future growth scenario that predicts extensive development in rural areas on the County's best rangelands. The Beaverhead County Commission and Planning Board then developed an alternative scenario that limits residential density on ranchlands; homes predicted in those areas were redistributed to the County's existing growth areas. RPI

**While the population of Gallatin County grew by 139% between 1970 and 2004, the number of acres of land developed for homes grew by 271%**

Consulting then compared the fiscal implications of the two scenarios. The study predicted that the more scattered business-as-usual development pattern would cost 46% more than the alternative scenario for roads and 14% more for law enforcement. Because of their commitment to provide ambulance and EMS for motor vehicle accidents, rural fire districts also stand to save 44% on annual operations costs due to less vehicle miles traveled in the alternative scenario<sup>6</sup>

## METHODOLOGY

---

### Modeling Future Residential Growth Scenarios

The Fiscal Impact Analysis summarized in this report is based on future growth patterns projected by the Sonoran Institute Residential Growth Model. This growth model identifies, through statistical analysis, the "drivers" of growth. It then uses this information to predict the amount and distribution of growth into the future. For this report, the Model was run under a business-as-usual scenario and an alternative scenario using Gallatin County's AG 160 rural zoning district, which is part of the County's Growth Policy Implementation Program.

The premise of the Model is to capture information about on going development trends and use that information to project the amount and distribution of future residential development. In this process, data describing landscape characteristics are used to inform projections. The future projections are resolved to the quarter section level, where a quarter section represents a 160-acre subunit of the Public Land Survey System. This unit of analysis provides a reasonably precise view of potential residential development patterns useful to planners and decision-makers.

In this application, the Growth Model used development trends from 1995-2005 to project the amount and distribution of residential growth in the business-as-usual scenario to 2025. The model found certain landscape characteristics accurately predict whether an undeveloped parcel is likely to develop in the future. The key factors driving growth, as determined by the model, include:

- Proximity to existing development
- Proximity to the existing transportation network
- Proximity to services, such as the airport
- Proximity to water, public lands, prime agricultural land and other natural resource amenities<sup>7</sup>

The resulting business-as-usual scenario represents a potential view of future development in Gallatin County given on going development trends and patterns. That is, if development trends from 1995 – 2005 continue, and no new land use regulations are enacted, this scenario is a representation of development patterns in 2025.

The density limits in the County’s proposed AG 160 zoning district were used to create the alternative scenario. Those regulations would limit the number of homes within the district to one home per 160 acres. The proposed regulations also contain a “Rural Cluster Development” (RCD) provision that allows for greater densities when homes are clustered away from prime farmland and sensitive areas such as wetlands. Under this provision, densities could be increased to one home per 40 acres.

To create the alternative scenario, the County’s proposed AG 160 rural zoning district regulations were summarized at a quarter-section resolution, and most quarter sections within the zoning district were limited to one home per 160 acres. In those quarter sections identified as likely candidates for the clustering provision, their capacity was increased to one home per 40 acres. Those quarter sections were primarily identified by their proximity to hard-paved roads, which is the primary criteria for the higher density limit.

If a quarter section’s predicted number of homes in the business-as-usual scenario exceeded the density limits of the AG 160 zoning district, those homes were redistributed to quarter sections identified as future growth areas by the County – those areas in and surrounding the County’s cities and built-up areas. For instance, if the business-as-usual scenario projected 10 homes for a particular quarter section that would be limited to one home under the AG 160 rural zoning district, the model redistributes the excess nine homes to a designated growth area (if the quarter section is identified as an RCD area, it would be limited to four homes and the model would reallocate six homes to a future growth area). The result is a representation of future development patterns that would result from the adoption of the AG 160 zoning district, in which homes would be limited in rural areas and development would be directed to future growth areas.

*It is important to note that the model projects the same number of homes for each scenario*

## **Municipal Annexation**

The Sonoran Institute contacted Gallatin County and city of Bozeman, Belgrade, Manhattan, and Three Forks land use planners to identify the geographic extent of land most likely to be annexed by 2025. These areas were identified based upon their proximity to existing local infrastructure and services, their proximity to planned infrastructure and services, land constraints, and projected growth through the 2025 time horizon.

Since roads and law enforcement are provided by municipal governments, the annexation areas would not cost the county directly. Traffic projections provided for each scenario reflect the fact that road costs to the County are zero for residential units projected to be annexed by cities. Because new units in the annexation areas would not cost the county directly, traffic projections only cover the unincorporated areas outside those areas.

Because the AG 160 rural zoning district concentrates more future development into the areas that are likely to be annexed, the number of units in the unincorporated county is substantially lower in the alternative scenario than under the business-as-usual scenario. That is, if the County adopts the AG 160 zoning district, the model projects that there will be more homes located within the County’s cities and fewer outside of them.

## **Modeling Existing and Future Traffic Levels**

Increased traffic is one of the most noticeable effects of growth. When someone builds a home on a residential lot, additional traffic is generated by that home’s residents. Incremental growth in residential land uses leads to incremental increases in traffic levels.

The most accurate way to measure traffic is to calculate daily Vehicle Miles Traveled, which is equal to one vehicle traveling one mile per day. The more VMT a

*The more Vehicle Miles Traveled a road system has to support, the more it will cost to maintain the current level of road service provided by the County*

road system has to support, the more it will cost to maintain the current level of road service provided by the County.

VMT directly relates to demand for road operations, maintenance, and capital improvements. While some natural forces contribute to road maintenance (water and erosion damage, etc.), the quantity of driving is the prime reason for road degradation over time. In addition to increased road costs, increased driving in the county will create the need for additional traffic enforcement and accident response to keep up with existing service levels. As evidence of this fact, Gallatin County's recently updated road impact fee support study (*Road Impact Fee*, TischlerBise, 2007) determines the future needs for new road construction using a level of service ratio of 1.3 lane miles per 10,000 VMT. This level of service quantity reflects the working assumption that 10,000 VMT will effectively consume 1.3 lane miles of high service roads.

RPI Analysts employed a travel demand model to estimate VMT from 2010 to 2025.

Constructing and calibrating the travel demand model involved three steps:

**STEP 1 -- Establish the destination and origin of residential trips.** The County road network serves as a local road and collector system that provides access from private property to and from the arterial system of state and federal highways and to and from the municipal streets systems. Once vehicles are on state or federal highways or connected to municipal streets systems, they generally do not directly affect county road and bridge or traffic enforcement costs.

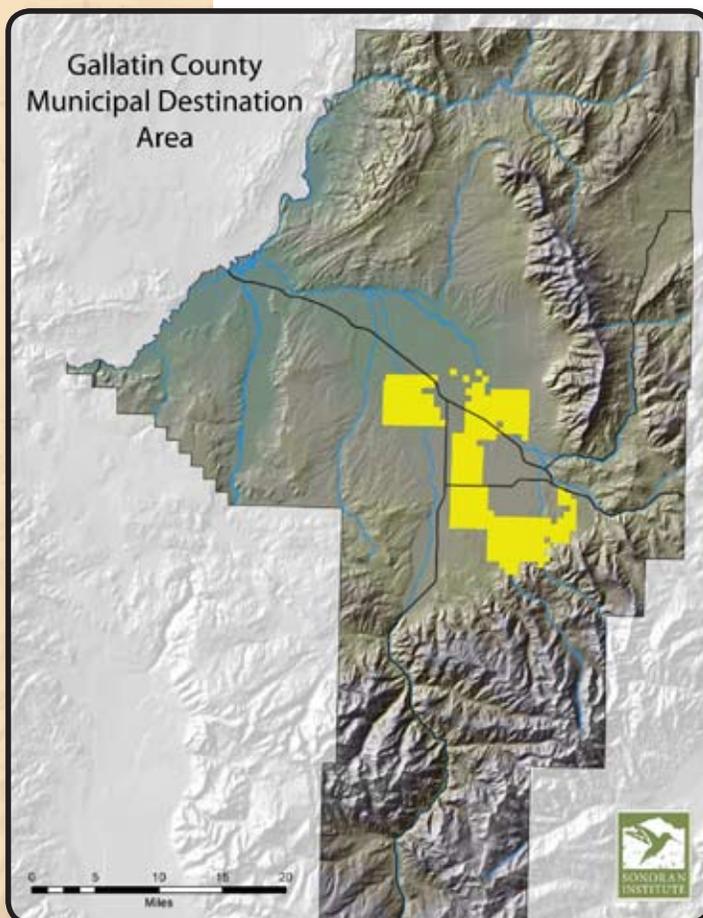
**MUNICIPAL DESTINATION AREA --** If a resident lives close enough, he or she will drive directly into town (mainly Bozeman and Belgrade) instead of first accessing a County road. The *Gallatin County Road Impact Fee Study* (TischlerBise, 2007, Figure 1.1) identifies the areas around Belgrade and Bozeman that are likely to exhibit this pattern. The impact fee report (TischlerBise, 2007, Figure 1.2) identifies 66 miles of county-maintained arterial roads (the highest volume county road) that serve traffic traveling between the properties in the nearby unincorporated

County directly to and from Bozeman or Belgrade.

These arterials are in the areas of the unincorporated County in which residents tend to drive directly into cities using a County road rather than the interstate or a state highway.

**HIGHWAY AND INTERSTATE DESTINATION AREA --** The maintenance field contained in the Gallatin County Roads GIS layer ([http://www.gallatin.mt.gov/public\\_documents](http://www.gallatin.mt.gov/public_documents)) identifies the agency responsible for upkeep of county roads (County, Municipality, State, Federal, private). Since the majority of the costs included in this study are maintenance-related, the roads were assigned to the jurisdiction in charge of maintaining the road.

**STEP 2 -- Calculate travel distance.** Using Community Viz GIS software, RPI analysts calculated the linear distance of each quarter section in Gallatin County to the nearest state highway or interstate. In addition, RPI calculated the distance to the nearest municipal boundary for each quarter section lying in the municipal destination area described above in Step 1. The key result from the analysis process is the 1.8-mile average length of trip on County roads needed to get to the nearest highway or municipality. This model performed well in Gallatin County due to the predominance of the grid-pattern transportation network in future growth areas. To verify the



accuracy of the travel distance modeling results, they were compared against the average trip length on county roads for three recent studies conducted by RPI Consulting in association with Sonoran Institute and Headwaters Economics for three other western Montana counties using more sensitive modeling techniques<sup>6</sup>. Figure 3 shows that Gallatin County falls in the middle of average trip lengths for Montana counties.

AVERAGE TRIP LENGTH - COUNTY ROADS		
COUNTY	MILES ONE WAY	SOURCE
Lake	1.3	Fiscal Impact of the Montana Working Forest Project on Lake County
Mineral	1.8	Fiscal Impact of the Montana Working Forest Project on Mineral County 2009, Headwaters Economics and RPI Consulting
Beaverhead	2.7	Fiscal Impact of Future Growth Scenarios, Beaverhead County 2007, Sonoran Institute, RPI Consulting
Gallatin	1.8	RPI Consulting's Travel Demand Model, 2009, Gallatin County

Figure 3: Average Trip Length for Western Montana Counties

**STEP 3 - Calculate vehicle miles traveled.** Daily vehicle miles traveled is the product of a quarter section's trip length times the number of trips from that quarter section. Based on 350 traffic studies summarized in the Institute of Transportation Engineers *Trip Generation 7th Edition*, single family dwelling units produce a daily average of 9.57 trips. Thus,

$(\text{quarter section trip length}) \times (\text{quarter section residential units}) \times (9.57 \text{ average daily trips})$	$= \text{VMT per quarter section}$
--	------------------------------------



## Fiscal Impact Analysis of Both Future Growth Scenarios

Determining the fiscal impacts of future development begins with establishing *a level of service*. A simple analogy serves to illustrate the concept of level of service. Suppose that you entered a restaurant with a small kitchen, two tables, and two waiters; you sit at one of the tables and begin dinner. You would expect, given the ratio of waiters to tables, that the service will be good.

Consider entering the same restaurant a week later, with the same kitchen and the same two waiters, to discover that they have added one hundred additional tables and that the restaurant is packed with people. Certainly, after having been seated, you would expect a significantly decreased level of service from the two waiters.

The same happens with provision of government services and infrastructure. If local government does not increase the capacity of law enforcement, roads, fire, health, sewer and a host of other services while population is being added, we should expect to see a decrease in our overall level of service. Roads will be more congested and potholed, be cleared of snow less quickly, and be less safe. Level of service also allows the community to see where it stands in relation to other communities or even against national standards. It is a measuring stick from which the community can decide to increase, decrease, or maintain the quality of its existing services.

***The cost to taxpayers for providing road and law enforcement services is determined by multiplying the County's existing level of service—measured in cost per Vehicle Miles Traveled—by the total number of Vehicle Miles Traveled***

Providing road infrastructure is one of the top expenses for rural county governments. General wear and tear on the road system and the attendant maintenance requirements and the need for expanding the capacity and safety of the system both accompany increased traffic. Meanwhile, county law enforcement workload is directly affected by the increased need for traffic enforcement as is the local emergency management system.

The cost to the County of providing road and bridge services for both operations and maintenance (day-to-day expenses) and capital improvements (capacity-increasing road improvements) is calculated by multiplying the cost per VMT (as established by level of service standards) by projected VMT. In other words, as VMT increases, costs to the County increase. Or, if the County chooses to keep costs constant as VMT increase, levels of service will likely decline.

Increased demand for traffic law enforcement created by additional traffic is only one of many tasks driving the demand for law enforcement, as evidenced by incident reports (see proportionate share discussion on p. 21). Additional demands are placed on law enforcement by civil law enforcement incidents occurring throughout the county. In this study the level of service for law enforcement is expressed as a cost per VMT for traffic law enforcement duties plus the cost per housing unit for civil law enforcement attributed to residential property.

Future law enforcement costs are calculated as the product of the current level service for traffic law enforcement (cost per VMT) multiplied by the projected 2025 VMT plus the level of service for civil law enforcement (cost per housing unit) multiplied by the projected 2025 VMT. This allows the County to calculate future costs based on VMT under various alternatives, as well as differing numbers of residential units based on municipal annexation scenarios.

# FINDINGS

## Growth Modeling Findings

The alternative scenario resulted in a much more compact 2025 development pattern than the business-as-usual pattern, which continued the dispersed development of the recent past. The area of land developed under the business-as-usual scenario is 145,559 acres, compared to 103,667 in the alternative scenario. The number of homes in urban and suburban densities is 11,725 in the business-as-usual scenario, compared to 14,479 in the alternative scenario.

The number of rural homes projected in the business-as-usual scenario is greater than in the alternative scenario, which allocates more housing units into the cities of the county. Under the business-as-usual scenario, there are 28,115 homes projected in the unincorporated parts of the County; there are 23,100 in the alternative scenario. The business-as-usual scenario predicts 15,931 homes within the County's cities, compared to 21,664 in the alternative scenario.

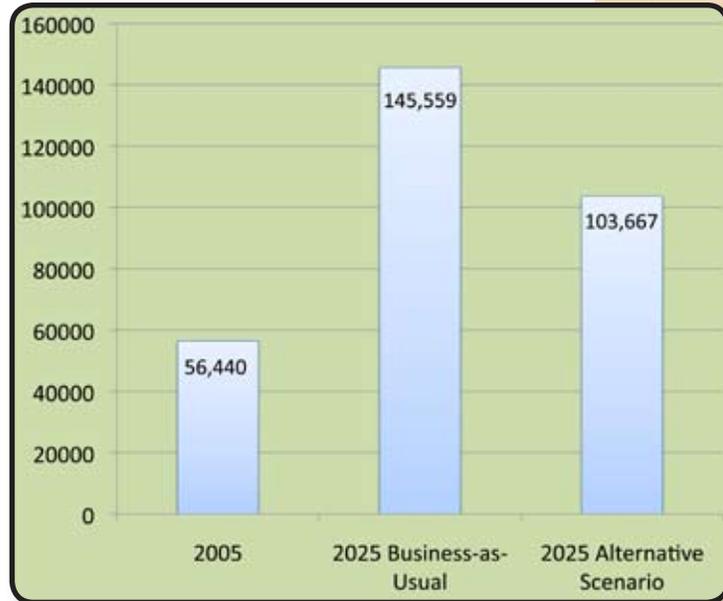


Figure 4: Developed Acres, 2005 and Projected

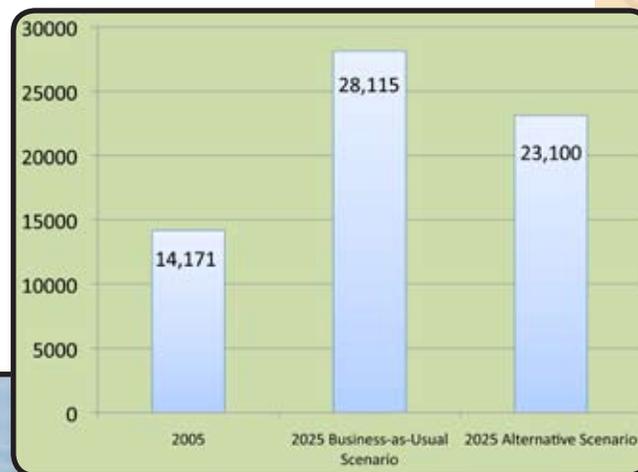
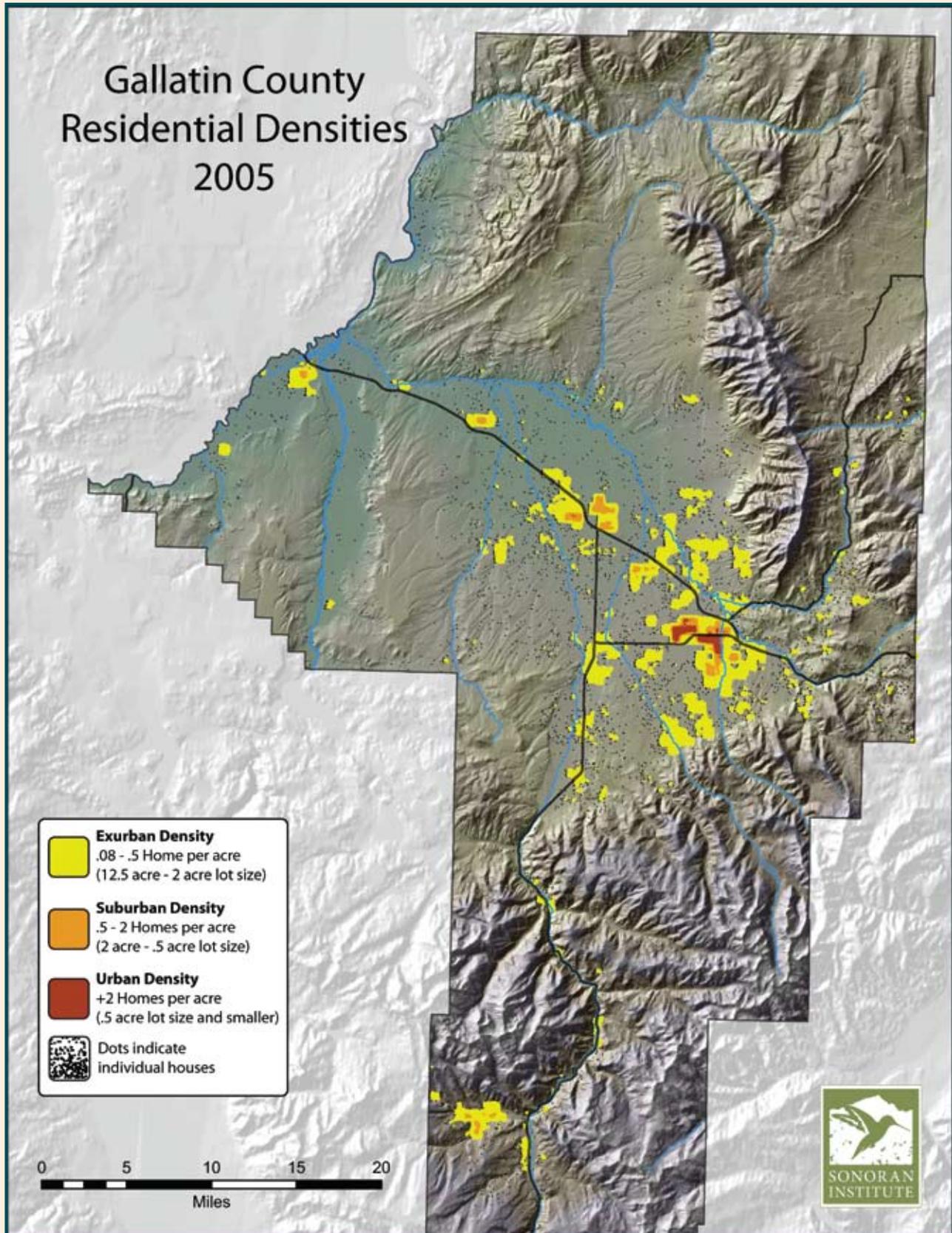


Figure 5: Existing and Projected Housing Units in Unincorporated Areas

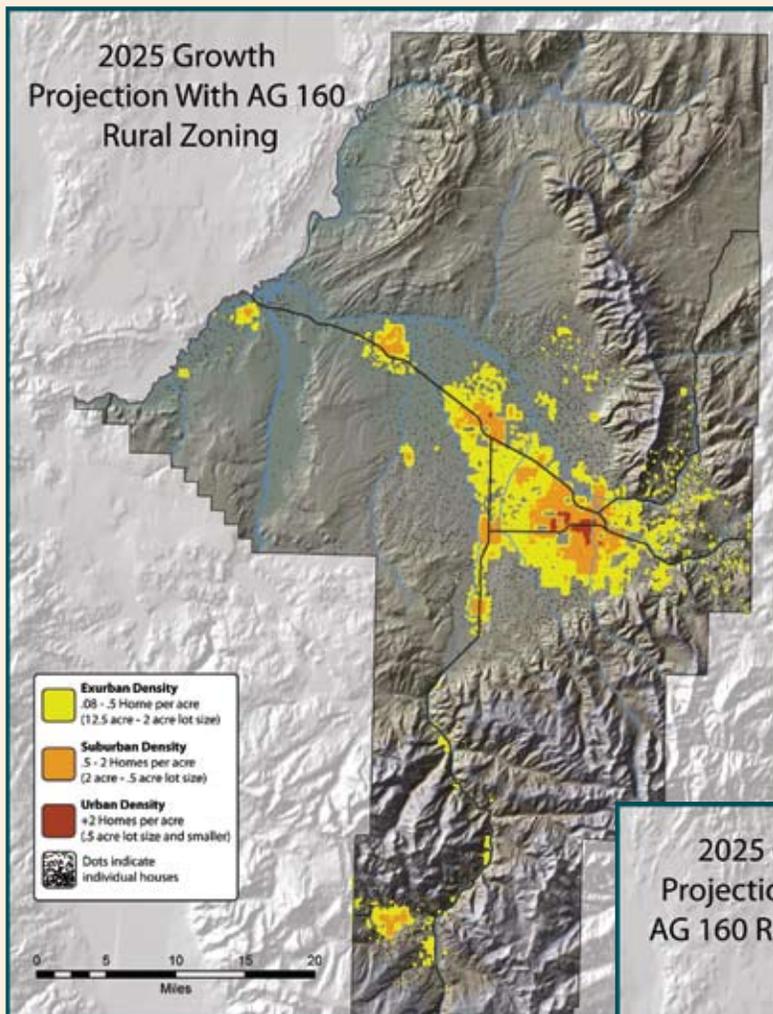
Source: Sonoran Institute Rural Growth Model, 2005 U.S. Census population and housing unit estimates.



# Gallatin County Residential Densities 2005



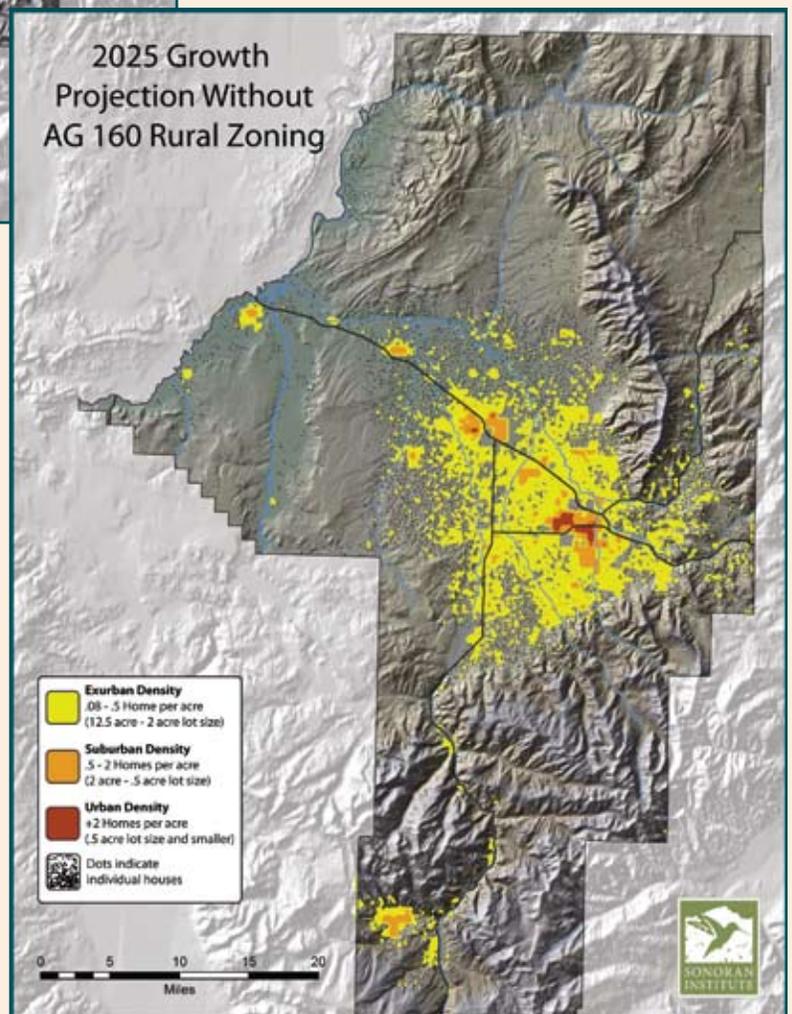
## Alternative Scenario



*The alternative scenario resulted in a much more compact 2025 development pattern than the business-as-usual pattern*

*The Growth Model projects two future Gallatin County growth scenarios: a business-as-usual scenario that continues recent growth patterns, and an alternative scenario that simulates the adoption of the County's proposed AG 160 rural zoning district*

## Business-As-Usual Scenario



## Traffic Modeling Findings

The traffic modeling results show significantly more driving under the business-as-usual development pattern than in the alternative scenario. The business-as-usual scenario would result in a 117% increase in driving on county roads attributable by residential development from 2010 – 2025, while development under the alternative zoning scenario would result in only a 15% increase in driving on county roads in that period.

**The traffic modeling results show significantly more driving under the business-as-usual development pattern than in the alternative scenario**

Under the business-as-usual scenario, VMT will increase more than the projected increase in housing units, confirming that dispersed rural residential development results in more driving. Meanwhile, the increase in

traffic under the alternative scenario would be 42% less than the increase in housing units. Clearly, directing most of the future housing units close to the municipalities results in shorter drive distances on county roads.

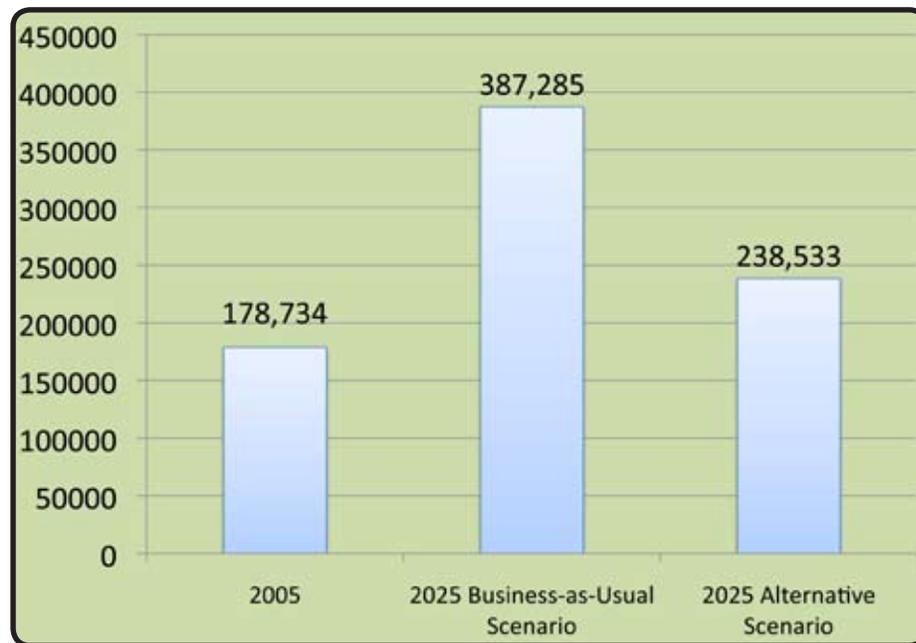


Figure 6: Vehicle Miles Traveled in Unincorporated Gallatin County

Source: RPI Consulting's Travel Demand Model for Gallatin County



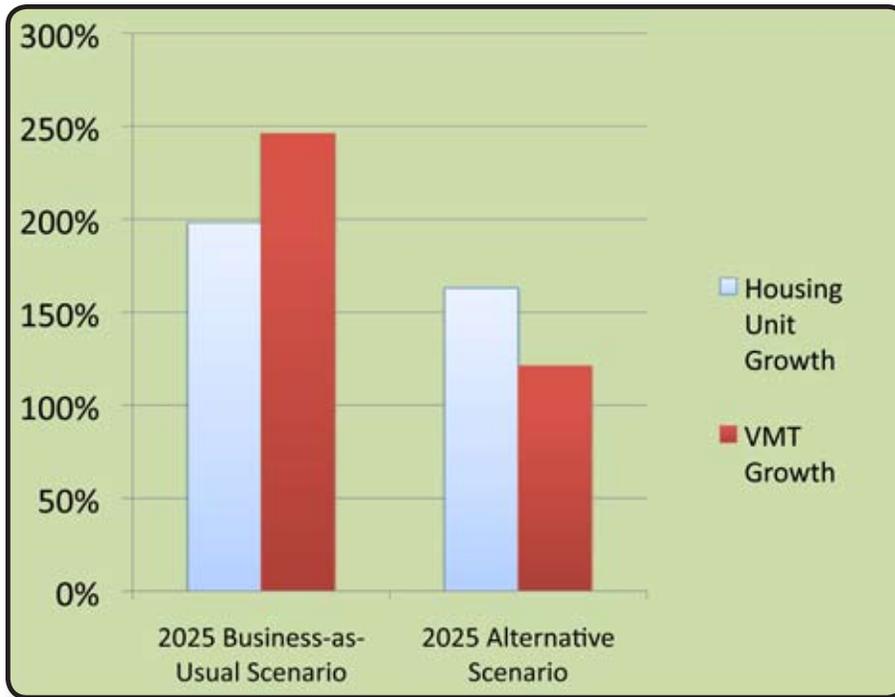


Figure 7: Vehicle Miles Traveled 2005, Business-as-Usual and I 60 Zoning Scenario

## Fiscal Impact Analysis Findings

### Roads Fiscal Impact Findings

The traffic modeling results are used as a basis for determining the fiscal impacts stemming from County road and law enforcement services under the two scenarios. The costs are assessed in two categories: operations and maintenance and capital improvements.

Operations and maintenance costs are the ongoing day-to-day expenses of running a County department, expressed annually. These are the regular bills, the payroll, the utility and facility and equipment maintenance expenses, training, administration, regular road maintenance such as grading, re-graveling, chip seal, painting, plowing, debris removal, and other minor repair.

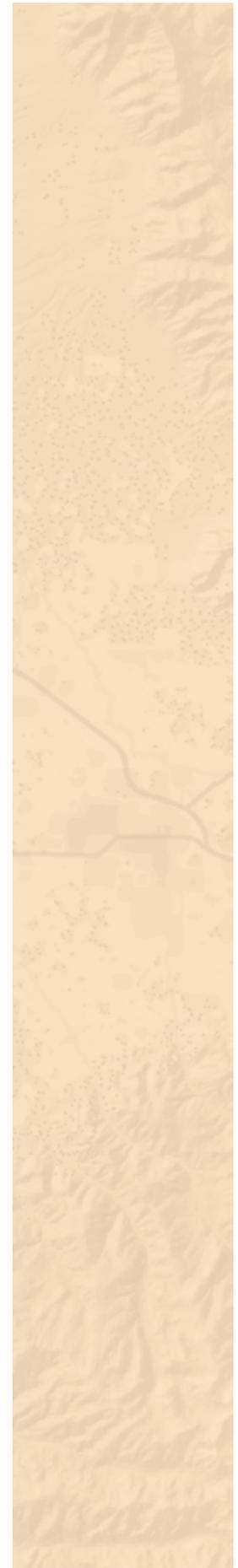
Capital facilities costs are the one-time expenses associated with increasing the capacity of infrastructure and capital facilities to keep up with demand. These include new building construction or additions, durable vehicle and mobile equipment purchases, improvements to the condition of the county road system, and other investments that increase the capacity of the road or sheriff's department. Road system upgrades include construction of new major roads (arterials), intersection upgrades and frontage road improvements, and road surface upgrade projects.

#### Proportionate Share

Proportionate share is a fiscal impact analysis concept that assigns costs equitably to the land uses that cause the increase in demand. Since this analysis focuses on fiscal impacts of residential development, the purpose of the proportionate share adjustment is to subtract out the fiscal impacts of future non-residential development and obtain only residential fiscal impacts.

According to the *Gallatin County Road Impact Fee Study* (TischlerBise, 2007, Figure 7), non-residential traffic makes up a little less than half of the total traffic on unincorporated Gallatin County roads and is expected to continue to do so in the future.

The residential proportionate share of future operations and capital improvements costs for roads and bridges is 53%.



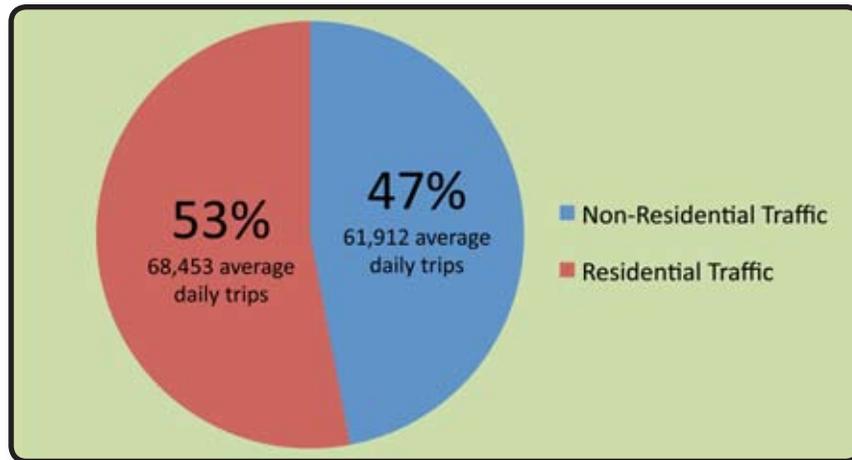


Figure 8: Road and Bridge Proportionate Share

Source: Gallatin County Road Impact Fee Study (TischlerBise, 2007, Figure 7)

### Operations and Maintenance

According to the itemized mean expenditures from the 2004-2006 Gallatin County budget ([www.gallatin.mt.gov](http://www.gallatin.mt.gov)), it costs about \$3.3 million annually to provide the operations and maintenance now offered by the county road and bridge department.

This annual operations cost was then adjusted to reflect only residential costs by multiplying it by 53%, the residential proportionate share. Given the 2005 VMT, actual annual costs, and the proportionate share, it costs \$9.65 annually to provide road maintenance for each average daily vehicle mile traveled. This represents the operations and maintenance level of service (LOS) for Gallatin County roads.

$$[\text{average annual operations costs} \times 53\% \text{ residential share}] \div 2005 \text{ residential VMT} = \text{operations LOS}$$

Figure 9: Roads Operations Level of Service Derivations:

	AVERAGE ANNUAL OPERATIONS AND MAINTENANCE	LEVEL OF SERVICE (ANNUAL COST PER VMT)
Road Operations	\$2,4475,860	\$7.34
Bridge Operations	\$779,300	\$2.31
<b>TOTAL</b>	<b>\$3,255,160</b>	<b>\$9.65</b>
	CAPITAL IMPROVEMENTS	LEVEL OF SERVICE (COST PER DAILY VMT)
Road and Bridge Facilities and Equipment	\$11,729,154	\$35
Road and Bridge Improvements 2006-2025	\$26,108,500	\$202
<b>TOTAL</b>	<b>\$37,837,650</b>	<b>\$237</b>

Figure 10: Road and Bridge Level of Service 2005

### Capital Facilities

Three categories of capital investment are necessary to increase the capacity of the county roads system to keep pace with projected increase in vehicle miles traveled.

#### Roads System Improvements • Maintenance Facilities • Equipment

##### Road System Improvements

The *Road Impact Fee Study Update Gallatin County*, is based on \$22.5 million worth of capital improvements to major arterial roads that are attributable solely to future development. According to the information presented in the impact fee calculation matrices in the 2007 impact

study (Figures 10 & 11), each new average daily VMT generated by future development in the County will cost \$164 in major arterial road improvements (a one time cost).

Although the recommended road impact fee calculations excluded them, the 2007 impact fee report contains an extensive capital improvements needs analysis conducted by the Western Transportation Institute that included \$26.1 million of other improvements needed because of both existing and future development through the year 2025 (*Road Impact Fee Study Update Gallatin County, Appendix C, Figs 1-2 and 1-3*). These improvements consist of necessary intersection improvements and road surface upgrades.

MAJOR ROAD PROJECTS	\$9,375,000
ROAD SURFACE UPGRADE PROJECTS	\$16,733,500
TOTAL PLANNED IMPROVEMENTS 2005-2025	\$26,108,500

Figure 11: Road Improvements Not Included in the 2007 Impact Fee

To account for \$26.1 million in county road improvements needed through 2025 that were not included in the impact fee calculations, RPI analysts used a cost allocation methodology designed to proportionately assign the cost of road improvements made necessary because of existing and future development. The additional \$26.1 million not included in the impact fee calculation add an additional \$36 to the capital improvements cost for a total of \$202 per VMT. The design year for the \$26.1 million portion of the plan is 2025, so this calculation used the business-as-usual VMT projections from the travel demand model. Western Transportation Institute and TischlerBise employed a straight line traffic growth trend projection methodology based on past trends in the impact fee study, so the business-as-usual VMT for 2025 represented the most appropriate traffic projection upon which to base the level of service calculation.

### Maintenance Facilities, Equipment, and Bridges

As traffic increases, maintenance schedules get full and improvement projects mount. The county will need to add capacity to its maintenance fleet and facilities to meet increased demand.

Given the current county road VMT and the nearly \$12 million current replacement value of the road maintenance buildings and grounds, equipment, and bridges (*Gallatin County Finance Department 2006 Schedule Of Fixed Assets*), it will cost \$35 for each additional daily VMT to maintain the current level of service in the future. Without this proportionate investment, the level of service will decline as the County grows.

In total, it will cost \$237 per vehicle mile traveled to maintain service levels for roads capital improvements (paving and planned improvements) and roads equipment and facilities. This means it costs about \$2,370 in one-time costs of providing roads capital facilities for a home one mile down a county road (which produces about 10 daily VMT).

$$\begin{aligned}
 & \{[(\text{current value of mobile equipment} + \text{current value of buildings}) \times 53\% \text{ residential proportionate share}] \div 2005 \text{ VMT}\} \\
 & + [(\text{capital improvements costs for both existing and future growth} \times 53\% \text{ residential proportionate share}) \div 2025 \text{ business-as-usual VMT}] \\
 & + \text{major road improvement costs due to future development only from impact fee study} \\
 & = \text{capital improvements cost per VMT}
 \end{aligned}$$

Figure 12: Roads Capital Improvements Level of Service Derivations

## Law Enforcement Fiscal Impact

While the Sheriff's Department is responsible for traffic enforcement on county roads, the majority of Sheriff's law enforcement services are civil incidents not tangibly affected by traffic resulting from future development. Isolating the proportion of the Sheriff Department's law enforcement services that is affected by development patterns from those that are driven by household totals and growth in commercial and other non-residential land uses requires a proportionate share analysis.

### Proportionate Share

As noted above in the roads analysis, proportionate share is a fiscal impact analysis technique designed to assign costs according to the land uses that cause the increase in demand. Since this analysis focuses on fiscal impacts of residential development, the purpose of the proportionate share adjustment is to subtract out the impacts of future non-residential development on the County's fiscal circumstances and obtain only residential impacts.

Accurate assignment of residential development's share of the future costs of running and expanding capital facilities at the Sheriff's Department required a two tiered analysis:

**STEP 1 -- Calculate the portion of incidents that are traffic related:** According to a query of the Gallatin County Sheriff's Department records division and the Montana Department of Transportation accident records, about 14% of the incidents for Sheriff Department law enforcement and protection are related to traffic. Since the roads analysis concludes that 53% of future traffic is residential traffic, it follows that of the 14% of total incidents related to traffic, 8% are related to residential traffic.

GENERAL TRAFFIC STOPS	2,228	8%
MOTOR VEHICLE ACCIDENTS	1,814	6%
MAJOR TRAFFIC RESPONSES (DUI AND GRAND THEFT AUTO)	221	1%
NON TRAFFIC LAW ENFORCEMENT CALLS FOR SERVICE	25,399	86%
RESIDENTIAL TRAFFIC ENFORCEMENT	2,259	8%
NON-RESIDENTIAL TRAFFIC ENFORCEMENT	2,004	7%

*Figure 13: Gallatin County Law Enforcement Incident Analysis*

Sources: Gallatin County Sheriff's Department Records Division

**STEP 2 -- Calculate the residential proportionate share for civil responses.** The non-traffic portion of the demand for law enforcement can be further analyzed by estimating the portion of that demand originating from residences versus commercial or institutional land uses. This is a

standard methodology for estimating proportionate share for public services arising from the residential population versus the demand arising from commercial and government economic activities. Using this ratio to further disaggregate the non-traffic portion of demand for law enforcement yields the proportionate share of demand represented in Figure 14.



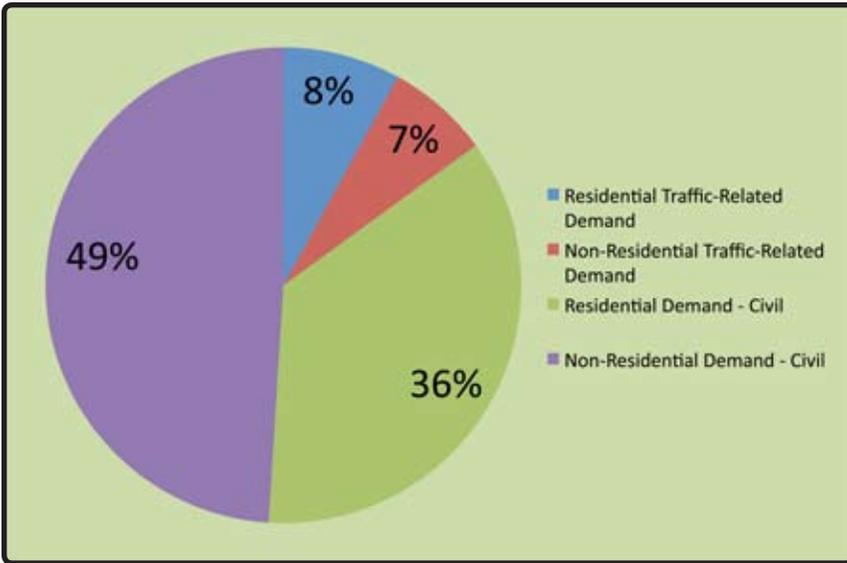


Figure 14: County Sheriff Proportionate Share of Demand

Sources: Gallatin County Sheriff's Department records division, Bureau of Economic Analysis, Census Bureau.

### Operations and Maintenance

SHERIFF OPERATIONS AVERAGE ANNUAL COST 2004-2006	
Traffic Related	\$499,000
Non-Traffic	\$2,976,240
SHERIFF OPERATIONS LEVEL OF SERVICE	
Traffic Related (COST PER VMT)	\$1.48
Non-Traffic (COST PER HOUSING UNIT)	\$76.22
Sheriff Facilities and Equipment	\$6,931,090
SHERIFF FACILITIES AND EQUIPMENT LEVEL OF SERVICE	
Traffic Related (COST PER VMT)	\$2.95
Non-Traffic (COST PER HOUSING UNIT)	\$177.50

Figure 15: Gallatin County Sheriff Law Enforcement Level of Service

The mean annual Sheriff's Department law enforcement budget is nearly \$3.5 million for 2004-06. Given the proportionate share factors cited above, it costs \$1.48 annually for O&M and about \$2.95 in one-time capital facilities and equipment expansion costs to maintain the current level of service per daily vehicle mile traveled. For one household one mile down a county road (about 10 Daily VMT), the cost would be \$14.80 annual for operations and \$29.50 in one-time capital improvement costs to maintain the current law enforcement level of service for driving on County roads.

$\{[\text{average annual operations costs} \times 8\% \text{ residential traffic share}] \div 2005 \text{ residential VMT}\}$ <p>= traffic enforcement operations LOS</p> $+ \{[\text{average annual operations costs} \times 36\% \text{ residential-civil share}] \div 2005 \text{ residential VMT}\}$ <p>= residential civil law enforcement operations LOS</p>
--

Figure 16: Sheriff's Operations Level of Service Derivations

## Capital Facilities

Law enforcement capital facilities investments expand the capacity of buildings and increase the mobile equipment and vehicle fleet to meet future demand. Maintaining the current level of service is a matter of incrementally expanding these core capital assets to meet future demand. This calls for an incremental expansion methodology defining the level of service as the current ratio of traffic and housing units to the current inventory of these basic law enforcement capital facilities.

$$\begin{aligned} & \{[\text{value of buildings and mobile equipment} \times 8\% \text{ residential traffic share}] \div 2005 \text{ residential VMT}\} \\ & = \text{traffic enforcement operations LOS} \\ & + \{[\text{value of buildings and mobile equipment} \times 36\% \text{ residential-civil share}] \div 2005 \text{ residential VMT}\} \\ & = \text{residential civil law enforcement operations LOS} \end{aligned}$$

Figure 17: Sheriff's Capital Facilities Level of Service Derivations



### FOOTNOTES

1. [www.state.me.us/spo/landuse/docs/CostofSprawl.pdf](http://www.state.me.us/spo/landuse/docs/CostofSprawl.pdf), Maine State Planning Office, 1997
2. [www.environmentcolorado.org/reports/fiscalcostofsprawl12\\_03.pdf](http://www.environmentcolorado.org/reports/fiscalcostofsprawl12_03.pdf)
3. [www.farmlandinfo.org/farmland\\_preservation\\_literature/index.cfm?function=article\\_view&articleID=28415](http://www.farmlandinfo.org/farmland_preservation_literature/index.cfm?function=article_view&articleID=28415)
4. [www.gunnisoncounty.org/dept/gis/index.php?Comprehensive\\_Plans:CB%26nbsp%3B%26amp%3B\\_GUNNISON:Appendices](http://www.gunnisoncounty.org/dept/gis/index.php?Comprehensive_Plans:CB%26nbsp%3B%26amp%3B_GUNNISON:Appendices)
5. [sonoraninstitute.org](http://sonoraninstitute.org)
6. [sonoraninstitute.org](http://sonoraninstitute.org)
7. [www.montana.edu/wwwlgc/documents/haggerty-1996.pdf](http://www.montana.edu/wwwlgc/documents/haggerty-1996.pdf)

# CONCLUSIONS

Summarizing the 2010 – 2025 fiscal implications of the two scenarios requires the multiplication of the levels of service for roads and law enforcement (above) by the projected new residential units and VMT projections established in the growth projections for each scenario.

Maintaining the current level of service for operations and maintenance of Gallatin County roads under the business-as-usual development pattern will cost almost \$21 million in operations costs accumulated over the course of 2010-2025, compared to about \$6 million under the alternative scenario. Road improvements and new road and bridge facilities and equipment from 2010-2025 will cost \$49.5 million under the business-as-usual development pattern compared to \$14.2 million under the alternative scenario. This means that the alternative scenario is expected to save the county over \$50 million, equivalent to a 71% cost discount.

	2010-2025 Costs (Business-As-Usual)	2010-2025 Costs (Alternative)
<b>ROAD AND BRIDGE</b>		
Annual Operations	\$20,933,700	\$6,003,000
Capital Improvements	\$49,452,000	\$14,181,000
<i>Sub Total</i>	\$70,385,700	\$20,184,000
<b>SHERIFF</b>		
Operations	\$14,265,600	\$11,974,300
Capital Improvements	\$3,091,000	\$1,761,500
<i>Sub Total</i>	\$17,356,600	\$13,735,800

Figure 18: Road and Bridge and Sheriff Fiscal Summary

The difference between future Sheriff’s Department costs for the business-as-usual scenario compared to the alternative scenario is less because only 14% of the Sheriff’s Department’s demand is affected by increased vehicle miles traveled (see proportionate share discussion). Maintaining the current level of service for Gallatin County law enforcement under the business-as-usual development pattern will cost \$14.3 million in operations costs accumulated over the course of 2010-2025, compared to \$12 million under the alternative scenario. To maintain the capacity of the Sheriff’s Department facilities and equipment to accommodate residential growth through 2025 will cost \$3.1 million under the business-as-usual development pattern compared to \$1.7 million under the alternative scenario. This means that the business-as-usual development pattern is about \$3.6 million more expensive to serve with the current law enforcement level of service than the alternative scenario for operations and capital improvements combined.

**The alternative scenario would save taxpayers almost \$54 million, a 61% cost savings from 2010-2025, compared to the business-as-usual land use patterns**

Combining the costs from the Sheriff and Road and Bridge Departments indicates that the alternative scenario would save taxpayers \$54 million, a 61% cost savings from 2010-2025 compared to the business-as-usual land use patterns.

	ROAD COSTS	SHERIFF COSTS	ROADS AND SHERRIFF COMBINED COSTS
Business-as-Usual Scenario	\$70,385,700	\$17,356,600	\$87,742,300
Alternative Scenario	\$20,184,000	\$13,735,800	\$33,919,800
Alternative Scenario Costs Savings	\$50,201,700	\$3,620,800	<b>\$53,822,500</b>

Figure 19: Alternative Scenario Cost Savings

