

A Dynamic Fiscal Impact Analysis for
Madison County, Montana, and the Madison Valley Rural and Alder Fire Districts

December 2010



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In partnership with:



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Introduction

Rural counties throughout the West are over-stocked with vacant subdivision lots. In Madison County, the focus of this study, there are 4,000 vacant subdivision lots and certificate of survey parcels in the unincorporated county. In Teton County, Idaho, 7,000 vacant lots remain to be built-out. In Colorado, Archuleta County has nearly ten thousand vacant lots near the town of Pagosa Springs. And on the other side of the continental divide there are hundreds of even more rural, water-less, foothills subdivisions lying completely untouched near San Dunes National

Monument and Crestone in the San Luis Valley.

As amenity-driven rural development patterns have unfolded over the past few decades, it has become clear that rural settlement is pushing further and further from towns and highways and reaching further into the country-side on county roads.

Recent studies and observations in the field of fiscal impact analysis have verified that compact development patterns,

Rural counties throughout the West are over-stocked with vacant subdivision lots.



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closer to towns and highways is far more efficient than the dispersed development patterns that are more common.

According to a recent study by RPI Consulting, the inventory of 7,000 vacant platted subdivision lots in Teton County, Idaho would strain the county government with a \$1.9 million annual shortfall for county operations and a \$15.5 million shortfall for county infrastructure and capital investments. Due to longer drives on county roads, new houses on vacant lots farther than three miles out on county roads would account for only 18% of the inventory, but disproportionately cause 50% of the shortfall.

Beaverhead County, MT has also undertaken a fiscal impact analysis of future land use pattern scenarios. Beginning with the Sonoran Institute's Growth Model, they developed an alternative scenario in which prime agricultural lands have limited residential density and the same number of residential units are accommodated near towns and closer to infrastructure. This allowed RPI Consulting to compare fiscal implications of the future development patterns under the status quo vs. the alternative scenario. The study found that the more scattered, status quo development pattern costs 46% more than the compact, alternative scenario for roads and 14% more for law enforcement. Because of their commitments 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 more compact alternative scenario.

Headwaters Economics undertook a comprehensive study of the costs-benefits of conserving large acreages of Plum Creek Timber Lands that were being liquidated

and potentially sold for private development in Montana. This 2009 report found that residential development in the remote locations of those lands would lead to long drives on inadequate gravel and dirt county roads and require upgrades and routine expenses that would not be covered by revenues it generates. Conservation of Plum Creek Land was shown to be a fiscal winner for county government.

Summary of Findings

In Madison County, the inventory of vacant platted lots and certificate of survey lots makes the residential development pattern plainly visible on a county parcel map. It is also obvious that Madison County has a propensity to attract residents and residential building activity and is likely to do so in the future. This study addressed the following questions for services and facilities provided by Madison County and by two of its fire districts.

How many vacant subdivision lots and certificate of survey lots are in unincorporated Madison County?

The county currently has a vacant lot inventory consisting of over 1,500 platted lots approved by the county and over 2,400 certificate of survey lots that were created without county review.

How much driving is occurring on county roads now and how much could occur if vacant lots are built-out?

The rural travel demand model shows that about 75,000 vehicle miles are traveled on county roads on average each day in Madison County. If the 4,000 vacant lots build-out, it will result in about 70,000 additional vehicle miles traveled (VMT), nearly

doubling the amount of travel occurring on county roads today.

Lots greater than a mile out increase costs of maintaining service levels disproportionately compared to the revenues they generate.

How much does each residential unit cost and generate in revenue?

The county collects a per unit surplus for homes that have no impact on county roads or are built less than one mile out a county road. If the home is constructed more than eight miles out, the deficit is nearly \$3k per year. As the length driven on county roads increases, so does the per unit deficit.

Any newly constructed unit on a county road will cause a shortfall for maintaining service levels for capital facilities and for implementing the roads capital improvements plan. A residential unit one mile out a county road causes a slight per unit shortfall of \$142, while a unit more than eight miles out causes a shortfall of more than \$24,000. The difference is a direct result of the additional driving on county roads generated by further-out residences.

What are the fiscal implications of the build-out of vacant lots?

If vacant lots are built on, the county will experience an operational shortfall of \$1.5 million dollars annually . This accounts for a surplus of \$450K generated by lots that are less than one mile or less out a county road. Lots greater than a mile out increase costs of maintaining service levels disproportionately compared to the revenues they generate.

The county is facing a total combined capital shortfall greater than \$12.3 million. Ninety-two percent of this shortfall from the cost of maintaining capital facilities and infrastructure originates from units that are more than 3 miles out a county road.

Development Trends and Travel Demand

Unincorporated Development Inventory

Assessor records are the most reliable source for a geographically specific land use inventory. According to the assessor's records, the county contained 6,600 residential units, 5,191 located in unincorporated Madison County. In the past two

Figure 1 - Development Inventory

Total County Residential Units	6,600
Housing Units in Municipalities	1,409
Housing Units in the Unincorporated County	5,191

Source: Madison County Assessor Data

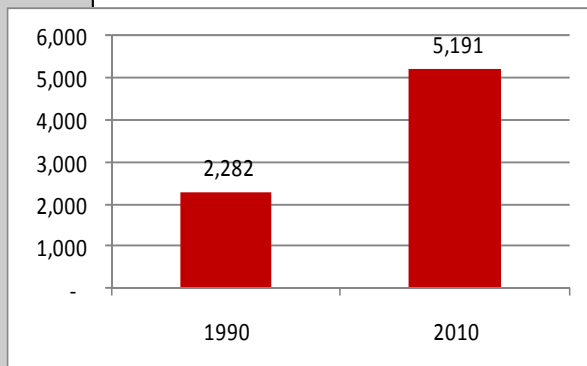
decades, residential units in the unincorporated county grew by more than 125%.

Currently the unincorporated county contains 175,736 sq. ft. of non-residential floor area, mostly consisting of general commercial and warehousing.

How many vacant lots are there?

The county currently has a vacant lot inventory consisting of over 1,500 platted

Figure 2 - Housing Unit Growth 1990-2009



Source: U.S. Census, Madison County Assessor Data

lots and over 2,400 certificate of survey lots that were created without county re-

In the past two decades, residential units in the unincorporated county grew by more than 125%.

view.

How much driving on county roads could occur?

Rural Travel Demand Modeling

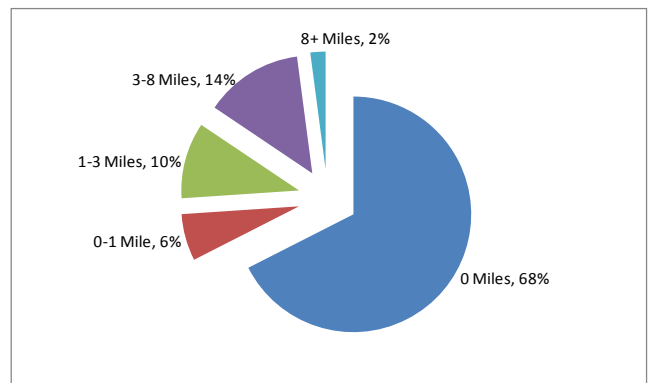
A significant portion of Madison County's budget is tied directly to driving patterns,

Figure 3 - Vehicle Miles Traveled (VMT)

	Development Inventory	Daily VMT
Residential Units Impacting County Roads	1,672	69,006
Non-Residential ft ² Impacting County Roads	175,736	5,851
Total VMT Impacting County Roads		74,857

including road construction and maintenance and traffic enforcement and accident response. Given the impact of driving on county government costs, it is essential to estimate the relationship of the quantity and spatial distribution of development in the county to the amount of driv-

Figure 4- 2010 Housing Units by County Road Drive Distance



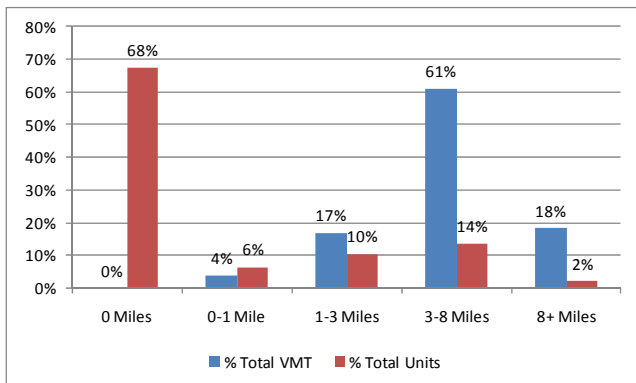
Source: Assessor Data, GIS Data, Rural Travel Demand Model (Appendix A)

ing. For the most part, off-the-shelf transportation models are designed for urban transportation systems and are extremely data intensive. To reflect the realities of rural transportation systems, RPI Consulting has developed and refined a rural transportation model specifically targeted at estimating impacts of development on county roads. See Appendix A for a description of the data and methodology.

How much driving is occurring today?

Residential development generates 92% of the driving on unincorporated county roads. The average daily driving caused per dwelling unit in the unincorporated county is 12.8 VMT, with an average trip length on county roads of 1.3 miles.

Figure 5 - Total VMT vs. Houses by County Road Drive Distance



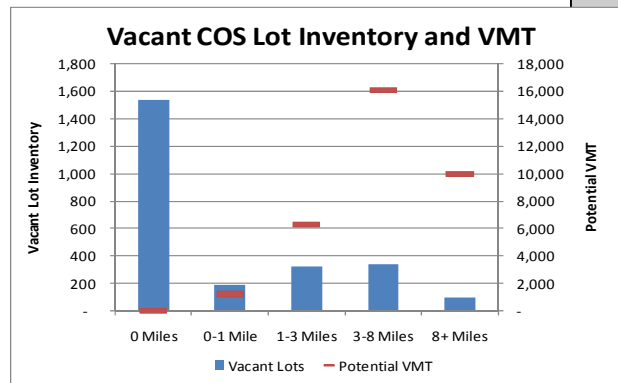
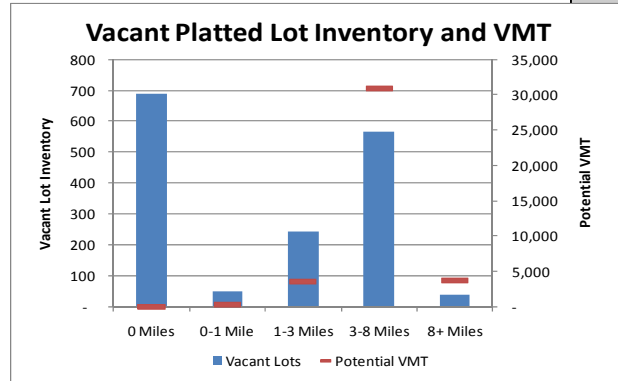
Source: Assessor Data, GIS Data, Rural Travel Demand Model (Appendix A)

If the 4,000 vacant lots build out, it will result in about 70,000 additional VMT, nearly doubling the amount of travel occurring on county roads today.

Most of the driving that occurs on county roads is generated by residents that are three to eight miles out a county road. However, units that are more than eight miles out county roads make-up only 2% of the total units, but generate 18% of the VMT on county roads. A disproportionate

contribution to total travel holds true for houses between three and eight miles out county roads as well. On the other hand, homes that are less than one mile out

Figure 6 - Subdivision Build Out and VMT



Source: Assessor, GIS Data, Rural Travel Demand Model (Appendix A)

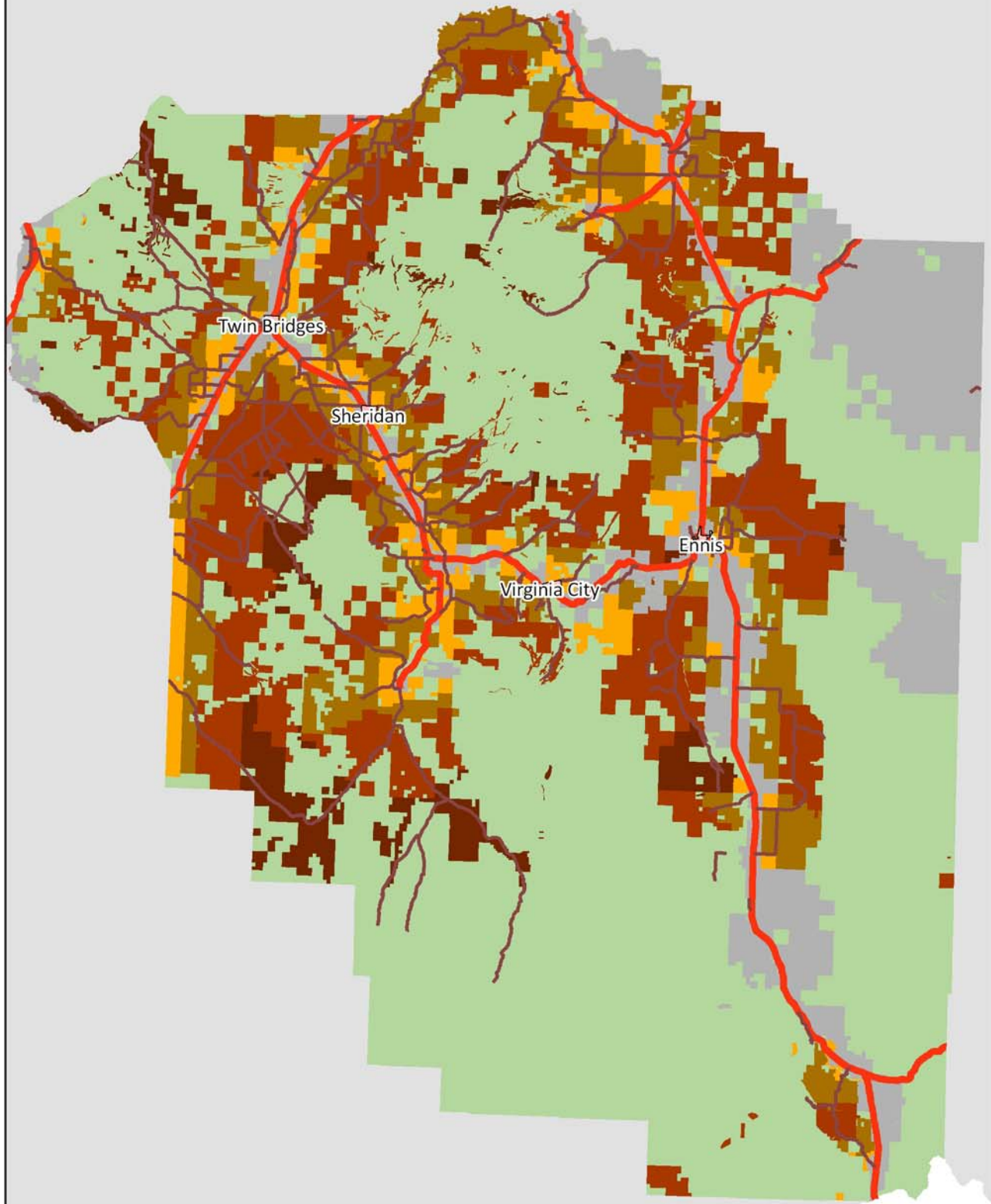
county roads make up three-quarters of the total units but only generate 6% of the vehicle miles traveled on county roads.

How much driving could occur if vacant lots are developed?

If the 4,000 vacant lots build out, it will result in about 70,000 additional VMT, nearly doubling the amount of travel occurring on county roads today. Residences further out county roads will contribute significantly more to the total amount of driving than those that are less than a mile out county roads or those that directly access state highways.

This analysis differentiates between platted lots approved at some time by the county and contained the County's GIS subdivision layer and parcels that have been given a Certificate of Survey (COS) but were not reviewed/approved as a subdivision by the county. The county currently has a vacant subdivision lot inventory of over 1,500 platted lots and over 2,400 COS lots. If all vacant platted lots were built out, VMT on county roads would increase by over 38,000 VMT. Similarly, if all vacant COS lots were developed the road system would experience an additional 33,000 VMT.

Map 1 - Madison County Travel Demand Model



Level of Service

Road and Bridge Department Level of Service

Increased driving and traffic is one of the most noticeable effects of growth. The previous section projected VMT on county roads associated with future growth on vacant lots. This section estimates the cost of maintaining the current level of service on county roads for new housing units.

Figure 7 - Road Department Level of Service Costs, 2008.

Annual Operations and Maintenance Costs Per VMT	\$23
Capital Facility Costs Per VMT	\$50
Road Upgrade Cost per VMT	\$197
Average Annual O&M Cost per Housing Unit	\$294
Average Capital Facility Cost per Housing unit	\$639
Average Road Upgrade Cost per Housing Unit	\$2,519

Source: Tables in this section, Travel Demand Model (Appendix A), Assessor Data, Madison County Capital Facility Inventory

Level of service (LOS) is defined as “the cost of maintaining a specific standard of services and infrastructure.” The level of service for roads operations includes, for example, the amount of money expended each year to grade county roads, remove snow, and fill potholes. If the county chooses to provide these same services at the same standard in the future, it will have to increase its capacity in step with the rate of growth in VMT.

Because demand for county roads is generated by driving, houses that generate more VMT have higher costs.

Level of service analysis consists of two main components:

1. Operations and Maintenance: the ongoing day-to-day expenses of running the county road and bridge department and maintaining current conditions on county roads. Operations and maintenance expenses are expressed annually.
2. Capital Facilities: the one-time expenses associated with increasing the capacity of infrastructure and capital facilities to keep up with demand (e.g. land, buildings, vehicles, roads, bridges).

Operations and Maintenance

Each home in Madison County generates more or less driving largely based on its location. Residents located further from towns drive further for each trip to work, the grocery store, and other destinations in the community. Because demand for county roads is generated by driving, houses that generate more VMT have higher costs.

Figure 8 - Road and Bridge Departments Budget

	2007	2008	2009	Mean
Total Expenditures	\$1,735,698	\$2,479,104	\$2,437,426	\$2,217,409
Operational Expenditures	\$1,384,493	\$2,124,279	\$1,508,856	\$1,672,543
Capital Expenditures	\$351,205	\$354,825	\$928,570	\$544,867

Source: 2007-2009 Madison County Audits report

Figure 7 shows that the \$1.6 million in average spending on operations and maintenance on county roads generates a per household cost of \$294 (using an average daily VMT of 12.8 per unit reported in the previous section).

Capital Facilities

Capital facilities include the county road department's shop and garage, snowplows and maintenance vehicles, and office equipment. As traffic increases, maintenance schedules fill up and improvement projects mount. The county will need to add capacity to its maintenance fleet and facilities to meet increased demand. Figure 11 shows the value of current capital facilities and the cost per daily VMT in 2009.

Figure 9 - Roads Facilities and Improvements per VMT, 2009

Facilities and Equipment	
Road and Bridge Equipment	\$2,993,697
Road and Bridge Facilities	\$633,837
Total	\$3,627,534
Cost per Daily VMT	\$50
Capacity Upgrades	
Bridge Upgrades	\$13,175,292
Total	\$23,275,292
Cost per Daily VMT	\$197

Source: Road upgrade costs obtained from the 2010 Madison County Road and Bridge Evaluation Reports, Great West Engineering. Cost per VMT is based on the projected traffic for 2030

The county recently conducted a Road and Bridge plan (by Great West Engineering, 2010). This plan outlines maintenance schedules and capacity improvement needs. For the purposes of this fiscal impact analysis, it is assumed that the capacity improvements will occur over a 20 year planning horizon. Based on the cost estimates in the Road and Bridge plan and traffic projections in this plan, the planned improvements will cost about \$197 per VMT.

Law Enforcement Level of Service

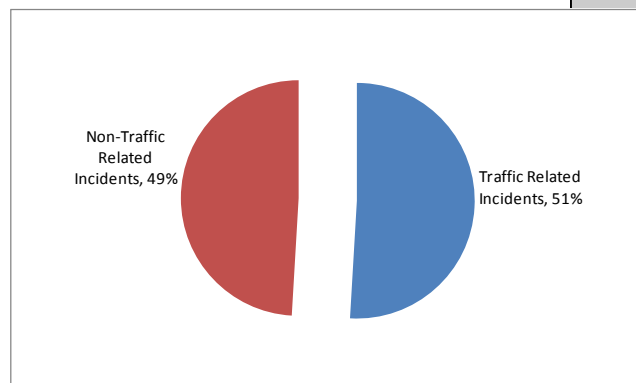
According to the county's incident report, half of the activity at the Sheriff's department is related to traffic enforcement and

safety, with the other half dedicated to non-traffic public safety. Because traffic influences demand for law enforcement, development patterns resulting in more driving create more demand for traffic enforcement and accident response.

Proportionate Share

Madison County conducts annual event surveys that detail all the calls-response related activity of the Sheriff's Department. The year 2009 data show that 51% of the department's efforts were directed towards traffic enforcement with the remaining 49% dedicated to general law enforcement.

Figure 10 - Public Safety Traffic Proportionate Share: 2009 Incident Breakdown



Source: Madison County Sheriffs Office

For the non-traffic related incidents, a service hour demand analysis (Appendix C) shows that 81% of that demand originates from the residential sector and 19% from the commercial sector.

Level of Service

The level of service for public safety includes, for example, the cost of maintaining adequate response times, levels of traffic patrol and accident response times. If the county chooses to provide these same services at the same standard in the

future, it will have to increase its capacity in step with the rate of growth in VMT and housing units.

Figure 11 - Law Enforcement Level of Service 2009

Traffic Enforcement	
Annual O&M Costs per Daily VMT	\$10
Average Annual O & M Costs per Residential Unit	\$128
Capital Facility Costs per Daily VMT	\$10
Average Capital Facility Costs/Residential Unit	\$128
Non-Traffic Public Safety	
Annual O & M Costs Per Residential Unit	\$139
Capital Improvement Costs per Residential Unit	\$110
Total Law Enforcement	
Average Annual O & M Cost per Residential Unit	\$267
Average Capital Improvement Costs per Residential Unit	\$238

Source: Tables in this section, Travel Demand Model (Appendix A), Assessor Data

Operations and Maintenance

The mean annual sheriff’s budget averaged 2007 through 2009 just over 1.5 million dollars. Figure 13 shows that given the proportionate share factors cited above, it costs \$267 annually to maintain the current level of service for a typical residential unit accounting for both traffic and non-traffic public safety. The traffic related portion of these costs are \$128 annually per residential unit.

Figure 12- Law Enforcement Operations and Maintenance Level of Service Costs

	2007	2008	2009	Average
Non-Traffic Op. Expenditures	\$646,732	\$731,832	\$769,517	\$716,027
Traffic Op. Expenditures	\$671,183	\$759,501	\$798,611	\$743,098

Sources: 2007-2009 Madison County Audits

Capital Facilities

The sheriff’s department has nearly \$600k invested in vehicles and equipment and has plans to retrofit a new facility for nearly one-half million dollars. Figure 13 shows that the current value of capital facilities and planned improvements averages to \$238 per residential unit, of which the traffic related portion is \$128. These capital costs are one time costs that accrue when the residential units are built and occupied. If the costs are not covered then the county will experience a decline in level of service for law enforcement capital facilities.

Figure 13 - Capital Inventory

Facilities	\$848,294
Equipment	\$597,967
Total	\$1,446,461

Source: Madison County Capital Facility Inventory

General Government - Centrally Located Services

Not all local government services are sensitive to the location of development or traffic patterns. For example, the county commissioners, county assessor, and public health nurse all work in centrally located offices, and are not affected by the location of their constituents. These services are called “Centrally Located” services.

Figure 14 - General Government Level of Service

O&M Cost per Housing Unit	Capital Facility Cost Per Housing Unit
\$282	\$195

Proportionate Share

Demand for centrally located services (general government, health and social services) increases with the quantity of

If the county chooses to provide these same services at the same standard in the future, it will have to increase its capacity in step with the rate of growth in VMT and housing.

activity in Madison County. The demand for general government services is split between activities associated with residential land uses vs. non-residential land uses. This split varies widely between communities, depending on the relative quantities of commercial, residential, and governmental activity located in a particular county. For example, employment centers, where many workers may live outside the county and commute in to work every day, tend to have more demand for services that stem from commercial land uses in the county. Places where a sizable proportion of residents commute out of the county to work in adjacent population centers will have relatively more demand from residential land uses.

One reliable way to establish a planning level ratio between residential and non-residential demand is to evaluate the how much time people spend at home

...commercial and industrial land uses measured by time spent at work and commuting patterns, demand about 9% of all centrally located services.

(residential) vs. at work (non-residential) and assign proportionate share accordingly. (See Appendix C for details on the service-hour methodology used to determine the proportionate share for centrally located county services and facilities.)

Residents living in the county demand about 91% of general government services, while commercial and industrial land uses measured by time spent at work and commuting patterns, demand about 9% of all centrally located services.

Level of Service Centralized for County Services

Operations and Maintenance

Because operations and maintenance costs for centrally located services are not sensitive to the pattern of new development, cost projections are based only on the number of forecast housing units, not the location. To calculate the average level of service per household, annual operations and maintenance expenditures for 2007-2009 are multiplied by the residential proportionate share (91%) and then divided by the number housing units in the county for each year. Overall, it costs \$282 per residential unit to provide

Figure 14 - Annual Operations and Maintenance Expenditures

	2007	2008	2009
Residential O&M Expenditures	\$1,595,655	\$1,929,385	\$2,028,539
Residential Units	6,502	6,600	6,600
Per Unit	\$245	\$292	\$307
Average/ Unit	\$282		

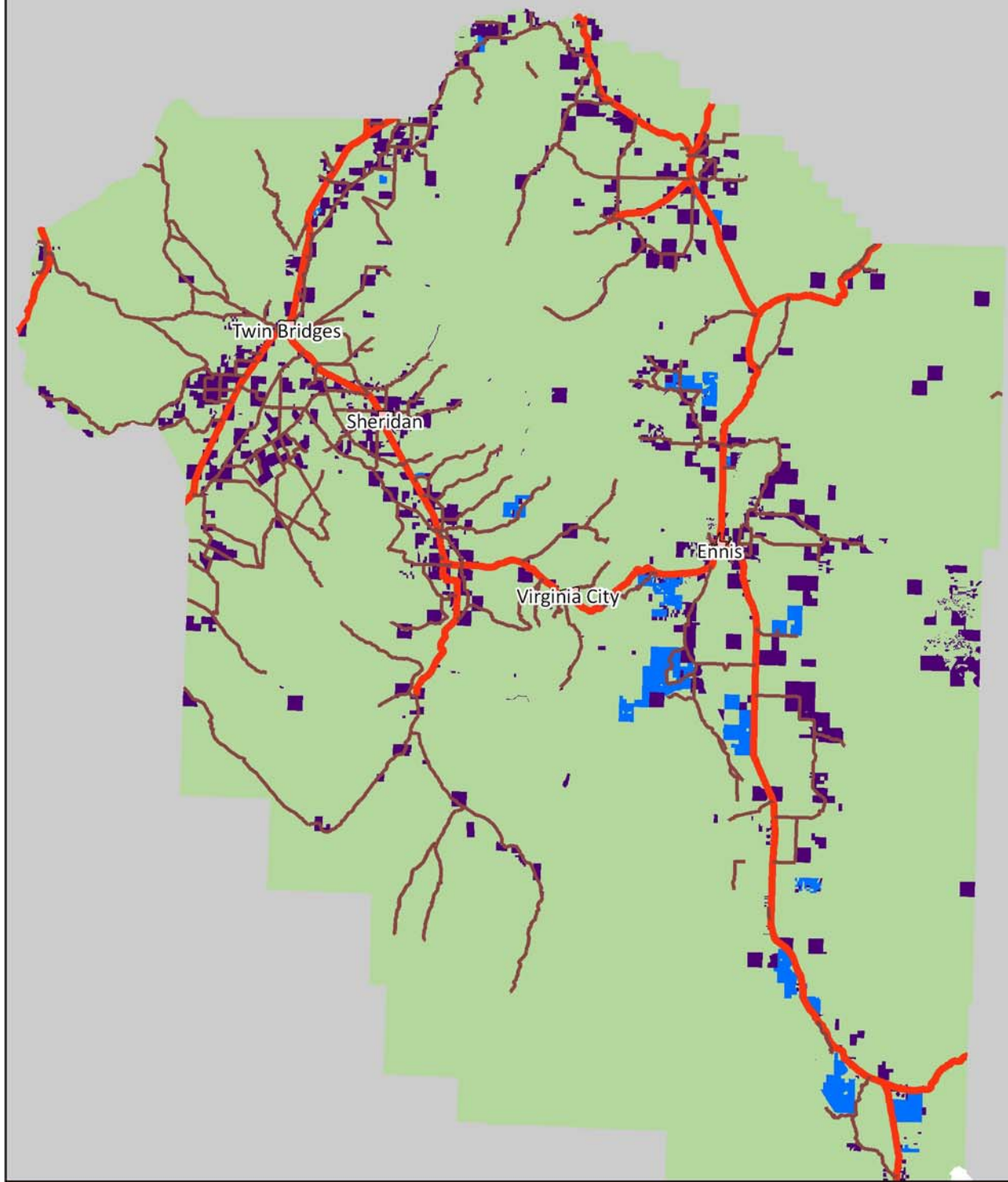
Source: 2007-2009 Madison County Audits, Assessor Data

annual operations and maintenance for centrally located services.

Capital Facilities

Expanding capital facilities is not an incremental process. Instead, new costs increase step-wise in large and infrequent increments. For example, the county may be able to accommodate some new growth without expanding the courthouse. But when a critical threshold is met, a significant investment must be made to add a new addition or renovate existing space to increase its capacity. In order to keep facility capacity in line with demand, the

Map 2 - Subdivisions in Madison County



- Platted Subdivisions
- COS Lots
- Towns
- County Roads
- State-Federal Highways
- Public and Non-Platted Land



county will need to make investments in capital facilities accordingly.

Capital facility level of service is calculated by multiplying the residential proportionate share by the current value of land buildings and equipment, and dividing by the 6,600 residential units in the county. It should be noted that unlike public safety and roads service levels, general government is assumed to provide service to all county residents not just those in the unincorporated regions. The bulk of this cost is born by the general government functions of the county that include services such as clerk and recorder, treasurer, planning department, and the county commission.

This approach for calculating level of service for capital facilities is an incremental expansion approach. This approach assumes that the current value of centralized county facilities per housing unit must be

Figure 15- Central County Facilities Assets

General Government Equipment	\$65,260
General Government Facilities	\$1,224,803
General Government Equipment Per Housing Unit	\$10
General Government Facilities Per Housing Unit	\$185

Source: Madison County Capital Facility Inventory, Assessor Data

maintained in the future or service levels will decline over the long-term. Maintaining the incremental expansion of centralized county facilities to meet future demands totals \$195 per residential unit

Social Services – Centrally Located Services

Because the services are centrally located, the geographic location of a property does

not tangibly affect costs for the County’s social service departments.

Demand for social services originates from the residential sector, so a proportionate share calculation is not necessary. Instead all cost are distributed to residential units.

Social Services Level of Service

If the county chooses to provide social services at the same standard in the future, it will have to increase its capacity in step with the rate of growth and housing units.

Figure 16– Social Services Cost per Housing unit

O&M Cost per Housing Unit	Capital Facility Cost Per Housing Unit
\$46	\$27

Operations and Maintenance

The social services operations and maintenance LOS is calculated by distributing annual, 2007-2009, operational expenditures to the 6,600 county housing units. On average,

Figure 17 - Social Services O & M Cost per Housing Unit

	2007	2008	2009
Residential O&M Expenditures	\$286,768	\$310,817	\$309,065
Residential Units	6,502	6,600	6,600
Per Unit	\$44	\$47	\$47
Three Year Per Unit Average	\$46		

Source: Madison County Audit, Assessor Data

erage, these departments spend nearly \$310k on operations and maintenance. This translates to an average per residential unit expenditure of \$46 per year.

Capital Facilities

The social services department utilizes \$16k worth of equipment and \$159K of facilities in order to provide services to County residents. This translates to a capital LOS of \$27 per housing unit.

Figure 18– Social Services Capital Facilities

Social Services Equipment	\$16,000
Social Services Facilities	\$159,728
Social Services Equipment Per Housing Unit	\$3
Social Services Facilities Per Housing Unit	\$24

Source: Madison County Capital Facility Inventory, Assessor Data



Revenues

Madison County's revenue comes from a variety of sources, including local taxes, fees and charges for services, interest on investments, and state and federal government grants and distributions.

The primary tax revenue in Madison County is property tax. Property tax is based upon the locations, characteristics, and value of private land and improvements. According to the assessor's records, the mean value of unincorporated county lots with homes on them is \$589,000 per property.

Figure 19 - Revenues per Average Dwelling Unit

	Property Tax	Other Taxes	Intergovernmental	Total
General Fund	\$459	\$14	\$55	\$528
Planning	\$10			\$10
Road and Bridge	\$133		\$87	\$220
Public Health	\$41			\$41

Source: 2007-2009 Madison County audits, County Assessor data

The average values applied to the 2009 mill levies, exemption rates and tax rates, shows that the average home and lot brings in \$459 in annual property tax revenue for the general fund, \$133 for the

Figure 20 - 2009 Mill Levy

General Fund	0.05495
Road	0.01395
Bridge	0.002
Planning	0.00125
Public Health	0.002

Source: Madison County Assessor Office

road and bridge funds, and \$41 for the public health fund.

Madison County is relatively dependent on intergovernmental disbursements, with more than 15% of the analyzed funds originating from intergovernmental revenue.

Intergovernmental disbursements will generally increase with population and commerce. Therefore, these revenues are projected to accrue in proportion to the increase in housing units.

Figure 21 - Major Fund Expenditure Patterns

	Operations	Capital Outlay	Other
General Fund		6%	4%
General Government	44%		
Public Safety	42%		
Social Services	5%		
Road and Bridge Funds	76%	24%	
Public Health Fund	98%	2%	

Source: 2007-2009 Madison County Audits

Historic departmental spending patterns were used to establish the allocation of revenues among various county functions. For example, general fund expenditures are split between general government and public safety, 44% and 42% respectively.

Figure 22- Departmental Per Unit Revenue Contributions

	Operations	Capital	20 Year Capital
General Fund			
General Government	\$224	\$17	\$340
Public Safety	\$207	\$16	\$320
Social Services	\$40	\$1	\$20
Road and Bridge	\$167	\$53	\$1,060

Source: 2007-2009 Madison County Audits, Assessor Data

Multiplying the expenditure patterns by the per unit contributions yielded the contribution per unit by departmental activity and use.

Capital equipment typically has a lifespan of 20 years. To account for this annual per unit revenues are multiplied by 20 to capture the full contribution over capital life-span.

Cost-Benefit Analysis

The cost-benefit analysis requires the comparison of the costs and revenues presented in the previous sections for the vacant lots in the unincorporated county.

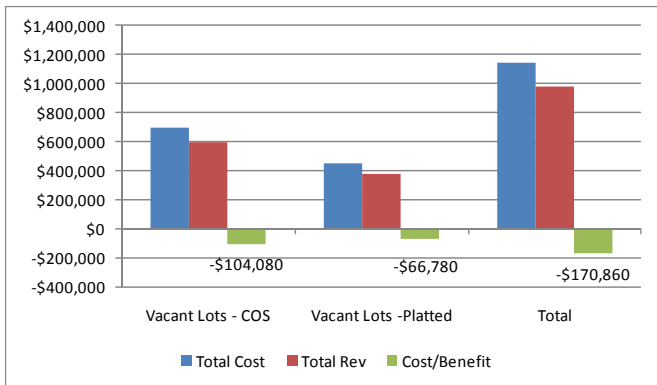
General Government Cost-Benefit

Because the services provided by the general government are not dependant on location, distance categories do not play a role in the cost-benefit analysis.

Operations

Because the per unit operational revenues are less than the per unit costs, the county is operating with a per unit loss. The shortfall that would result from the build out of vacant lots will total \$170k annually.

Figure 23– General Government Operations Cost-Benefit

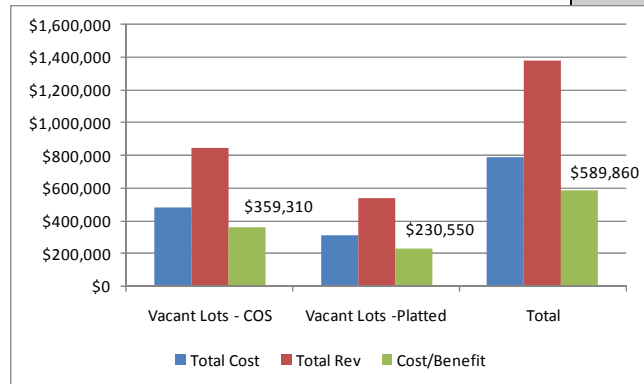


The shortfall that would result from the build out of vacant lots will total \$170k annually.

Capital

The County’s general government departments are operating with a capital per unit surplus. Over the build out horizon, this will result in a total surplus greater than half a million.

Figure 24 - General Government Capital Cost-Benefit



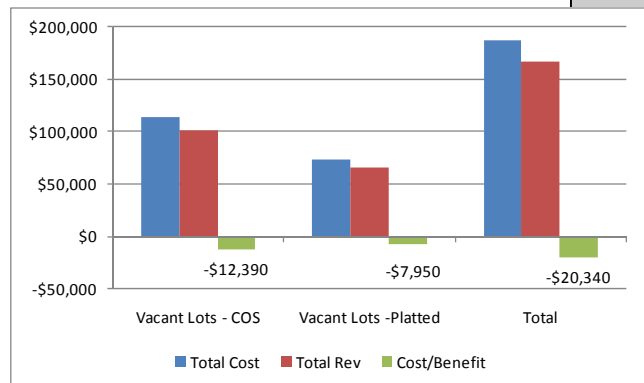
Social Services

Because the county social service departments are centralized services, vehicle miles traveled do not affect the cost-benefit analysis.

Operations

The social service departments are operating at a slight per unit deficit. The annual deficit that would result from the build out of vacant lots will total \$20k annually.

Figure 25– Social Services Operation Cost-Benefit



Capital

Because only a negligible amount of revenues is directed to social service capital expenditures, these departments have a

capital deficit. If the county wishes to maintain the current LOS it will need to increase funding for social service capital improvements. Buildout of vacant subdivision lots will generate a capital deficit of \$67,000, while COS lots would generate the need for an additional \$43,000 of capital investment to maintain the current LOS.

Road and Bridge Cost-Benefit

Because homes that are further out county roads result in more driving (vehicle miles traveled), there are higher cost of providing road and bridge services for dwelling units farther out county roads.

Figure 26 - Average VMT by Distance out County Roads

Miles Out County Roads	Average VMT per Unit
0-1 Mile	6
1-3 Miles	18
3-8 Miles	50
8+ Miles	100

Operations and Maintenance

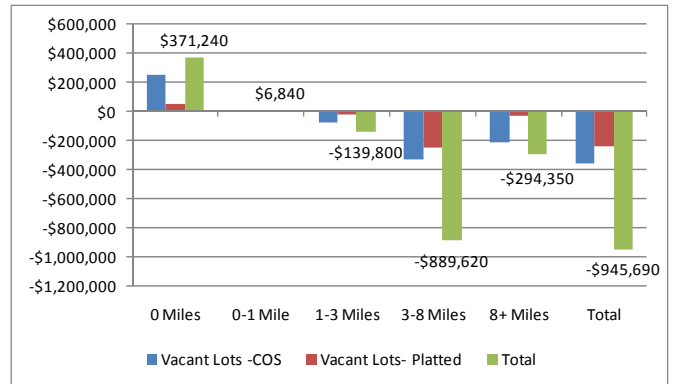
If all subdivided parcels were developed and current revenue and expenditure patterns remained static, the road and bridge department would experience an annual shortfall of one million dollars for maintaining the current level of service for road and bridge operations and maintenance.

Vacant subdivided lots greater than eight miles out a county road account for only 3% of total vacant lots, yet because of the amount of driving on county roads they generate, they are responsible for nearly one third of the potential operational and capital shortfalls.

Capital

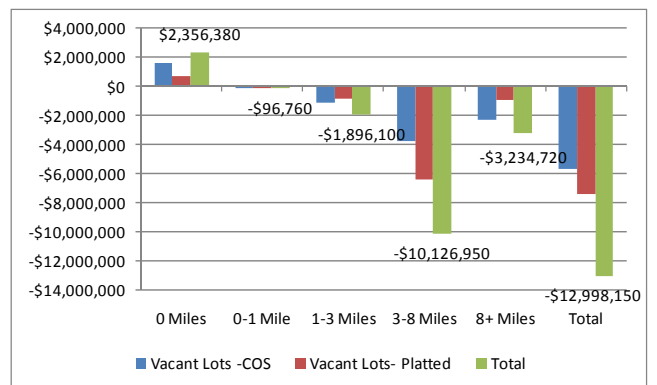
As with many rural western counties, the

Figure 27– Road and Bridge Operations Cost-Benefit



road and bridge department is facing a substantial capital shortfall. At build out the revenue shortfall of maintaining existing service levels and implementing the recently completed roads capital improvements plan could total nearly \$13 million. Local option tax revenues may help defray the operational and capital deficits. Over the past 3 years the road and bridge department has collected an average of half a million dollars per year in local option taxes. If this revenue stream remains

Figure 28– Road and Bridge Capital Cost-Benefit



Vacant subdivided lots greater than eight miles out a county road account for only 3% of total vacant lots, yet because of the amount of driving on county roads they generate, they are responsible for nearly one third of the potential operational and capital shortfalls.

static, the million dollar annual operational deficit could be reduced by 25% and the capital shortfall could be reduced by \$2.5 million.

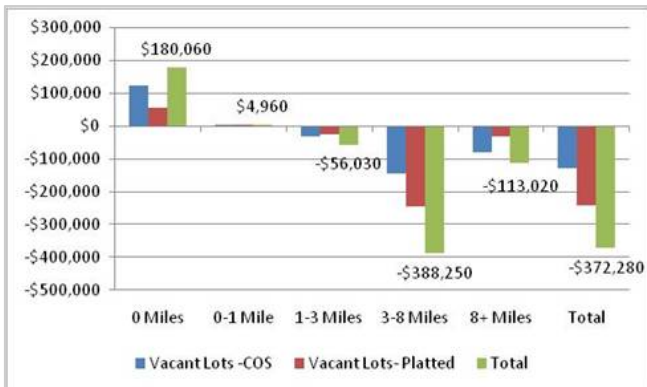
Public Safety Cost-Benefit

For the public safety departments, capital revenues exceed costs yielding a surplus. On the other hand, operational revenues do not exceed costs and generate an annual shortfall for maintaining levels of service.

Operations

Were the vacant lots to build out, revenues would fall short of covering the cost of maintaining the current level of service by over \$370,000 annually.

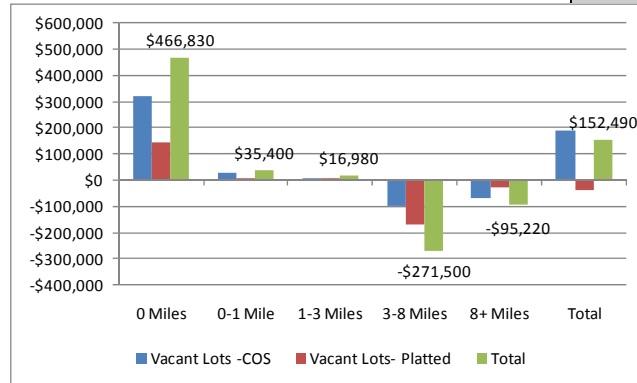
Figure 29– Public Safety Operational Cost-Benefit



Capital

If current revenue streams and spending patterns remain static, the public safety departments will experience a surplus of \$150,000 once build out has occurred. The public safety departments are operating with a capital surplus because a large proportional share of general fund property taxes are directed to public safety capital investments.

Figure 30—Public Safety Capital Cost-Benefit

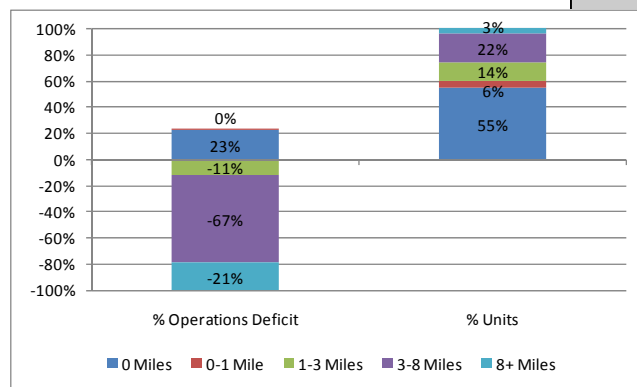


Combined Cost -Benefit

When all the departments are combined, build out of vacant lots within less than a mile of county roads would result in an annual gain of \$447,000 annually under today's revenue structures and a gain of more than \$4 million for capital improvements.

Due to the long drives on county roads to dispersed lots, the development of fewer of these home results in greater costs as drive distances increase.

Figure 31– Combined Operations Cost-Benefit



Operations

Were vacant lots to buildout, the county will experience an operational shortfall of \$1.5 million dollars annually . This includes a surplus of \$450,000 generated by lots

that are one mile or less out a county road. Lots greater than a mile out increase costs of maintaining service levels disproportionately compared to the revenues they generate.

Figure 32– Combined Operations Cost-Benefit By Distance Category

	Cost	Revenue	Shortage/Surplus
0 Miles	\$1,038,140	\$1,484,960	\$446,820
0-1 Mile	\$156,940	\$157,650	\$710
1-3 Miles	\$600,530	\$378,090	-\$222,440
3-8 Miles	\$1,924,940	\$604,540	-\$1,320,400
8+ Miles	\$506,050	\$92,180	-\$413,860
Total	\$4,226,590	\$2,717,420	-\$1,509,160

Capital

The county is facing a total combined capital shortfall greater than \$12.3 million. More than 92% of the shortfall originates from units that are more than three miles out a county road.

Figure 33– Combined Capital Cost-Benefit

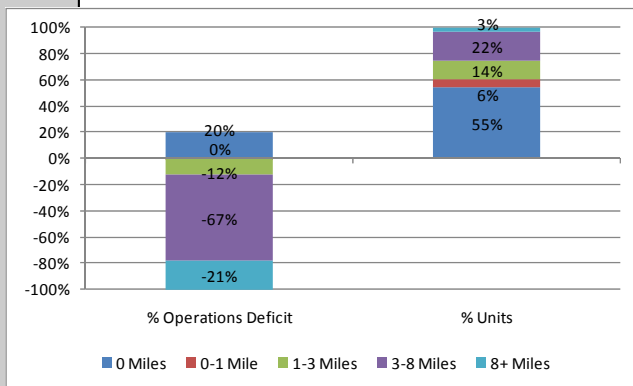


Figure 34– Combined Capital Cost-Benefit By Distance Category

	Cost	Revenue	Shortage/Surplus
0 Miles	\$738,040	\$3,823,560	\$3,085,520
0-1 Mile	\$439,430	\$405,920	-\$33,510
1-3 Miles	\$2,785,850	\$973,520	-\$1,812,330
3-8 Miles	\$11,848,260	\$1,556,600	-\$10,291,660
8+ Miles	\$3,551,020	\$237,360	-\$3,313,660
Total	\$19,362,600	\$6,996,960	-\$12,365,640

Per Unit Combined Cost-Benefit

A per unit cost-benefit is calculated by dividing the shortage or surplus by the number of units in each distance category. Subtracting the combined per unit costs from the combined per unit revenues presented in the LOS and revenue sections of this report completes the cost-benefit calculations.

Lots greater than a mile out increase costs of maintaining service levels disproportionately compared to the revenues they generate.

Operations

The county experiences a per unit surplus for homes on vacant lots that do not impact county roads or are built less than one mile out on a county road. As the length driven on county roads increases, so does the per unit shortage, and if the home is constructed more than eight miles out, the shortfall is nearly \$3,000 per unit annually.

Figure 35– Per Unit Operational Cost-Benefit

	Deficit/Surplus	Units	Per Unit
0 Miles	\$446,820	2223	\$201
0-1 Mile	\$710	236	\$3
1-3 Miles	-\$222,440	566	-\$393
3-8 Miles	-\$1,320,400	905	-\$1,459
8+ Miles	-\$413,860	138	-\$2,999
All Lots	-\$1,509,160	4068	-\$371

Capital

Any newly constructed unit on a county road will cause a shortfall for maintaining service levels for capital facilities and for implementing the roads capital improvements plan. A unit one mile out causes a slight per unit shortfall of \$142, while a unit more than eight miles out causes a shortfall of more than \$24,000, which is a

direct result of the additional driving on county roads generated by further-out

Figure 36– Per Unit Capital Cost-Benefit

	Deficit/Surplus	Units	Per Unit
0 Miles	\$3,085,520	2223	\$1,388
0-1 Mile	-\$33,510	236	-\$142
1-3 Miles	-\$1,812,330	566	-\$3,202
3-8 Miles	-\$10,291,660	905	-\$11,372
8+ Miles	-\$3,313,660	138	-\$24,012
Total	-\$12,365,640	4068	-\$3,040

residences.

Will Vacant Lots Fill Revenue Gaps?

Since vacant lots generate property tax revenue, but almost no annual expenses or impacts on capital facilities, a full cost benefit analysis would be remiss not to examine the degree to which tax collec-

Figure 38—Vacant Lot Cost-Benefit 3-8 Mile Category

20 Year Operations Cost-Benefit, (1 home)	\$-29,180
Capital Cost-Benefit (one-time, 1 home)	\$-11,370
Annual Property Tax for 1 Vacant Lot (20 yrs)	\$6,300
# of Vacant Lots That Would Fill the Deficit	6.44

tioned for twenty years. The further out a house lies on a county road, the less revenues from vacant lots will be able to cover costs of developed units.

Lots that are vacant for too many years may be vacated for other plans or become severely devalued. Delinquent property taxes on troubled or foreclosed properties and the decline in prices for the overstocked inventory of vacant lots could reduce revenue collections. This would further hamper the ability of vacant lots to cover the difference.

Figure 37– Vacant Lot Cost-Benefit—Average Unit

20 Year Operations Cost-Benefit, (1 home)	\$-4,420
Capital Cost-Benefit (one-time, 1 home)	\$-1,870
Annual Property Tax for 1 Vacant Lot (20 yrs)	\$6,300
# of Vacant Lots That Would Fill the Deficit	0.8

tions on vacant lots can cover some of the deficits presented above.

It would require the accumulation of property taxes from one average vacant lots over twenty years to cover the county deficit generated by one house built and occupied for twenty years.

In contrast to an average lot, 1.3 miles out county roads shown above, a lot that is three to eight miles out county roads would require the accumulation of property taxes generated by 6.4 average vacant lots over twenty years to cover the shortfall generated by one house built three to eight miles out a county road and occu-

Fire District Dynamic Fiscal Analysis

Introduction

To evaluate fiscal impacts of future residential development patterns produced by the buildout of vacant lots in the unincorporated county, two fire districts were selected. Madison Valley Rural Fire District (MVRFD) was selected because it serves the largest population and is in close proximity to the town of Ennis. To provide a case study for the rural fire districts in the more rural parts of the county, the Alder Fire District was also included.

Proportionate Share

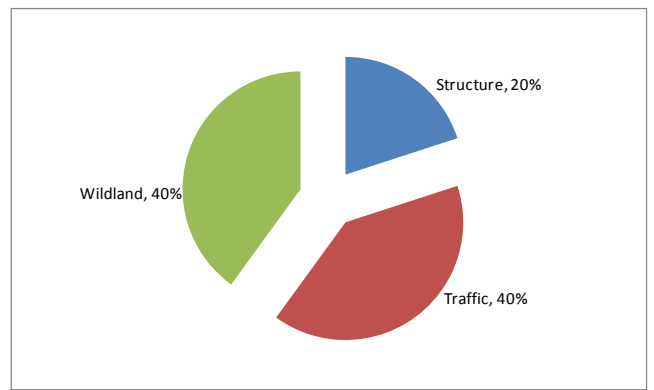
To determine the proportion of demand for fire district services related to increased traffic vs. growth in structures vs. wildland fires, it was necessary to conduct a proportionate share analysis. Proportionate share was established by analyzing incident records provided by the districts. Because motor vehicle accidents require both ambulance service and fire protection, multi-tasking rural fire districts are more affected by growth in traffic than is obvious at first glance.

To determine the connection between demand for district services and traffic, traffic oriented responses (motor vehicle fire and medical incidents) were isolated from fire protection responses and other medical responses.

Since the travel demand model results established the connection between development patterns and traffic, isolating the portion of resources dedicated to traffic response provides the analytical link between the fire districts and county development patterns.

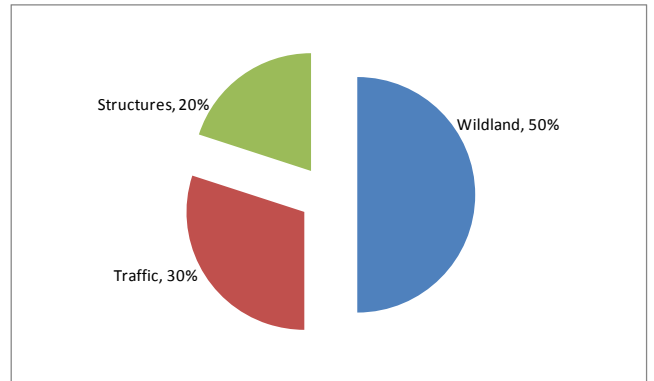
Both districts are responsible for structure protection in the wildland-urban interface, and are equipped and trained to fight wildland fires. In fact, 40% of MVRFD, and half of Alder responses are wildland fire related. The resources dedicated to wildland fire fighting were subtracted in order to calculate the level of service per structure.

Figure 39– MVRFD Proportionate Share



Source: MVRFD

Figure 40– Alder Fire District Proportionate Share



Source: Alder Fire District

Development & Traffic

Using GIS data and the Montana Department of Revenues assessor database, analysts compiled a comprehensive list of structures. This provides the data necessary to calculate the level of service per

structure under protection of the districts. Traffic was estimated using the travel demand model used previously in this report (methodology outlined in Appendix A).

Dynamic Fiscal Impact Study

In the fiscal impact analysis the level of service for structure protection is calculated separately from a traffic growth impact assessment.

Structure Protection Level of Service

Given the proportionate share discussed above, it costs the MVRFD \$24 dollars per year per structure to maintain operations and maintenance LOS, and \$804 dollars per structure for one-time capital facilities and equipment purchase.

Alder Fire District’s level of service expenditures are lower for operations and maintenance (\$45 per structure) and higher for capital facilities (\$2,993) compared to MVRFD. The increased per structure capital costs reflects a geographically limited service area.

Figure 41 - MVRFD and Alder Fire District LOS

	MVRFD	Alder
2007-2009 Average Operations Expenditures	\$225,920	\$22,486
Non-Traffic Operations Per Structure	\$24	\$19
Traffic Operations Per VMT	\$2	\$2
Average Operations LOS Per Structure	\$50	\$45
Total Capital Facilities	\$3,460,912	\$2,053,250
Non-Traffic Capital LOS Per Structure	\$361	\$1,778
Traffic Capital LOS per VMT	\$35	\$95
Average Capital LOS Per Structure	\$804	\$2,993

Source: MVRFD and Alder 2007-2009 Budgets, Capital Facility Inventories, land and building capital values for Alder Fire district were calculated using assessor data, and square foot construction costs from the Frenchtown Fire District Impact Fee Report prepared by Tischler-Bise 2008.

Fire District Property Tax Revenues

Both districts are primarily funded through property taxes. The 2009 mill levy for the departments were 12.22 and 17.34 for MVRFD and Alder Fire District respectively.

Figure 42– Fire District Revenue Summary

	MVRFD	Alder
Average Annual Revenues Per Housing Unit	\$102	\$145
Operational Revenues	\$92	\$61
20 year Capital Contribution	\$200	\$1,680

Source: Assessor Data

Fire District Cost-Benefit

A similar cost-benefit analysis shows that both districts are currently operating with per unit operational surpluses and capital shortfalls.

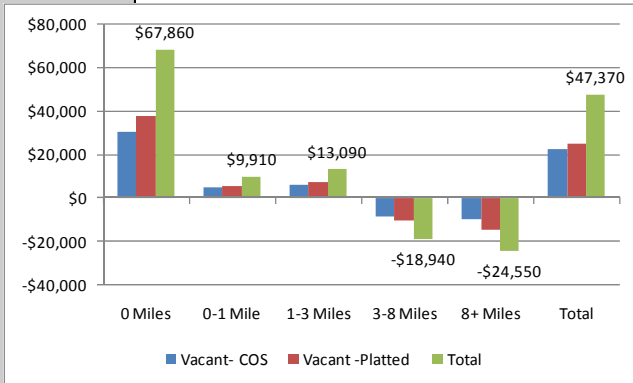
MVRFD Operations

The operational surplus will result in an annual total surplus of \$33K, once build out of vacant lots in the district has occurred.

Figure 43 - Operational and Capital Per Unit Cost-Benefit By Distance Category

	MVRFD		Alder	
	Operations	Capital	Operations	Capital
0 Miles	\$68	-\$161	\$42	-\$98
0-1 Mile	\$56	-\$369	\$30	-\$668
1-3 Miles	\$32	-\$784	\$6	-\$1,808
3-8 Miles	-\$32	-\$1,892	-\$58	-\$4,848
8+ Miles	-\$132	-\$3,622	-\$158	-\$9,598

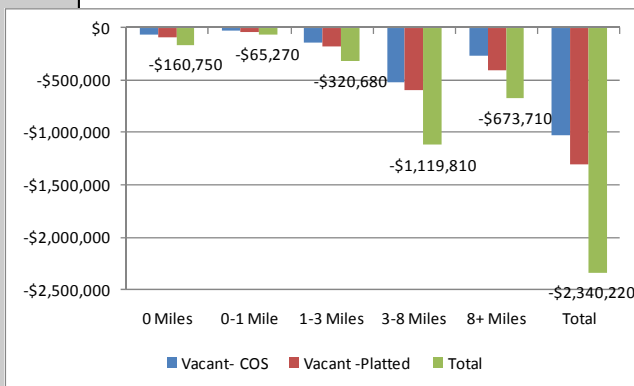
Figure 44—MVRFD Operational Cost-Benefit



MVRFD Capital

Once all vacant lots in the district have been developed the capital shortfall totals \$2.3 million.

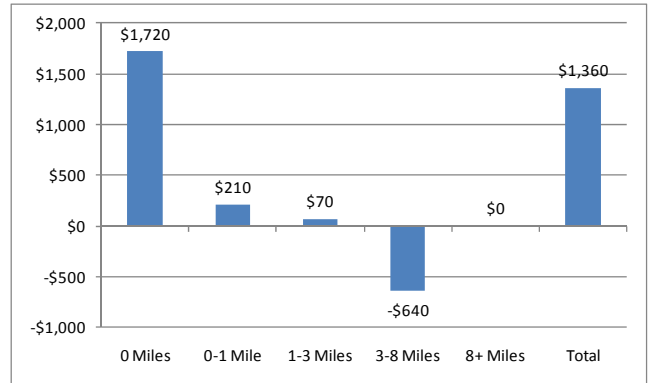
Figure 45—MVRFD Capital Cost-Benefit



Alder Operations

According to the mapping analysis, there are no vacant COS lots in the Alder district. The per unit operational surplus will lead to an annual surplus of \$1,300.

Figure 46—Alder Operational Cost-Benefit

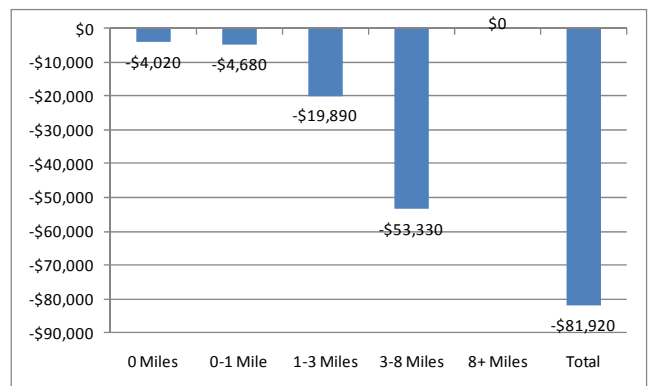


Alder Capital

Once build out of platted subdivisions has occurred, the Alder Fire District will have experienced a total shortfall of nearly \$82,000.

If the average unit is considered, property tax revenues from vacant lots are not needed to fill revenue gaps for MVRFD, and 0.7 lots are needed to make up for revenue gaps for Alder. However, again emphasizing the importance of location, a

Figure 47—Alder Capital Cost-Benefit



According to the mapping analysis, there are no vacant COS lots in the Alder district. The per unit operational surplus will lead to an annual surplus of \$1,300,000.

new structure built three to eight miles out a county road will require the revenue from 1.2 vacant lots in MVRFD and 1.7 lots in Alder.

Once build out has occurred , Alder Fire District will have experienced a total shortfall of nearly \$82,000.

Figure 43– Cost-Benefit Analysis with Vacant Lot Revenues

Average Structure	MVRFD	Alder
Operations Cost/Benefit Per New Unit	\$42	\$16
Capital Cost/Benefit Per New Unit	-\$604	-\$1,313
Total 20 Year Cost Benefit	\$236	-\$993
Vacant Lot Revenues	\$52	\$74
20 Year Contribution	\$1,040	\$1,480
Vacant Lots Needed	N/A	0.7
Structures 3-8 miles out		
Operations Cost/Benefit Per New Unit	-\$32	-\$58
Capital Cost/Benefit Per New Unit	-\$604	-\$1,313
Total 20 Year Cost Benefit	-\$1,244	-\$2,473
Vacant Lot Revenues	\$52	\$74
20 Year Contribution	\$1,040	\$1,480
Vacant Lots Needed	1.2	1.7

Conclusions and Planning Strategies

The findings from this study bring into focus the intrinsic connection between land use patterns and the fiscal realities of county government. Residential subdivisions further out county roads increase costs of maintaining service levels disproportionately compared to the revenues they generate. A development pattern is already in place, with 4,000 dispersed vacant lots throughout the unincorporated county. To avoid the shortfalls projected by this report, the county could adopt strategies to protect the fiscal health and level of service for the county.

Make growth pay its way, according to its location. Impact fees could be charged according to the relative impacts on capital assets based on the distance out county roads.

Prioritize and encourage future development closer to towns and state highways.

As future development applications are proposed, the county could develop policies to favor development that is accessible municipal and state roads. With 4,000 vacant lots, there is an adequate supply of rural building lots in Madison County for the foreseeable future, so existing inventories should supply demand for dispersed rural properties for many years to come.

Encourage redevelopment of fiscally infeasible platted lots and COS tracts.

In some cases, developers and land owners may be motivated to re-develop platted subdivisions to meet the current market. The county could adjust its land use regulations to accommodate creative redevelopment of obsolete subdivisions.



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Appendix A– Travel Demand Model

For the most part, off-the-shelf transportation models are designed for urban transportation systems and are extremely data intensive. Therefore, RPI produced a custom rural travel demand model. Creating the county travel demand model (using Environmental Systems Research Institute (ESRI) products) involved the use of Spatial Analyst and Community Viz extensions.

GIS Data Sources: Madison County GIS, State Assessor, Montana Department of Transportation

Programming Steps/Rules:

1. Parcels or lots (and their daily trips) were associated with the nearest point on a county road, which was attributed with the distance from highway using Spatial Analyst. This results in a known trip-distance for each parcel or lot along county roads to the nearest highway intersection.
2. Traffic from existing units initially accesses county roads if closer than but traffic will access state highways if adjacent to them.

Mathematics: The key result from the analysis process is that it calculates the length of a trip on county and/or state roads needed to get to the nearest highway, and onto the nearest exit or municipality. 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 9.6 trips (in + out).

Thus VMT per quarter parcel = (parcel trip length) X (average daily trips)

Appendix B– Service Demand Hour Proportionate Share

	Demand Units in 2000	Demand Hours/Week	Person Hours/Week
Total Residents	6,851		
Residents Not Working	3,742	168	628,656
Workers Living in County	3,109		
Residents Working in County	2,550	128	326,400
Residents Working Outside	559	128	71,552
		Residential Subtotal	883,504
		Residential Share	91%
Jobs Located in County	3,831		
Residents Working in Count	2,550	40	67,068
Non-Residents Working in	933	40	24,532
		Non-residential Subtotal	91,600
		Non-residential Share	9%
		Total	975,104

Source: U.S. Census Bureau, Bureau of Economic Analysis