Natrona County Fiscal Impact Analysis

Impact of Development Patterns on Public Service Costs

9/2012

Commissioned by the Sonoran Institute
Contact:
John Heyneman
Sonoran Institute Wyoming Field Office
21 N. Main St.
Sheridan, Wyoming 82801
307-675-1970
jheyneman@sonoraninstitute.org
www.sonoraninstitute.com
www.sonoraninstitute.com/NatronaCounty

Performed by RPI Consulting
Contact:
RPI Consulting
Gabe Preston, Managing Partner
1911 Main Ave Suite 224
Durango, CO 81301
www.rpiconsulting.org

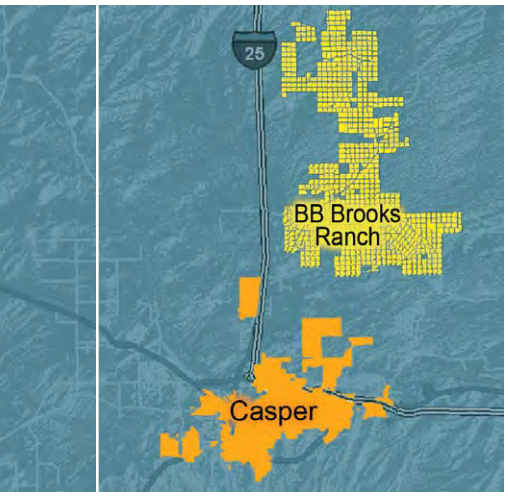


Table of Contents

Abstract

This study examines the fiscal impact of three types of residential development common in the American West: Ranchette, rural exurban, and metro infill. The focus area of the study is Natrona County, Wyoming, which shares many attributes with other counties in the American West. Each of the three development types has its own set of characteristics which affect how costly it is for a county to provide services and infrastructure to that development. Primary among these characteristics is the associated Vehicle Miles Travelled, or VMT, of a particular development. The VMT provides a mathematical description of a development's distance from existing service and community centers. The capital and operations costs of certain spatially dynamic county services, such as fire, police, ambulance, and road and bridge services, are affected by a development's VMT. Other non-spatially dynamic services – such as treasury and assessor's services – are not affected by a development's VMT. Using these metrics and others, this study calculates the Natrona County Government's costs for each development type. These costs are then compared to the associated revenues that are generated by subdivision development. The result is a clear picture of the budget gaps created by each housing development type. Metro infill creates a small budget gap with 68% of operations costs and 90% of capital costs covered by revenues. Rural exurban creates a large budget gap with 10% of operations costs covered and 31% of capital costs covered. Ranchette creates the largest budget gap, with 8% of operations costs and 25% of capital costs covered. Recommendations on how to avoid large budget gaps and encourage metro infill development are included, in detail, at the end of this study.

Introduction

The preference for country living dates back to the agrarian roots of the United States. In the West, where land is plentiful and populations are relatively sparse, this lifestyle has flourished. Whether for the rural or mountain setting, or for the ability to have livestock and farm on a small scale, the demand for rural residential property is well established. The evidence is visible around most sizeable towns and cities, where residential lots of various sizes and configurations extend to the edge of the commuter shed.

Managing this type of growth has become an important part of governance throughout the West, and Wyoming is no exception. To incentivize rural development, the Wyoming legislature has used the long-standing Real Estate Subdivision Act W.S. § 18-5-303. The Act allows review exemptions for any development that includes lots that are greater than 35 acres in size, and for decades has made it easier to bypass county or community review in the creation of rural developments, many of which are quite far from urban or commercial centers.

In an important change to the Act, adopted in 2008, Wyoming State Legislature granted counties the authority to override the 35-acre exemption provided by the Wyoming Real Estate Subdivision Act. Using this authority, counties can require developers to submit a subdivision plat for developments with more than 10 lots sized up to 140 acres. Natrona County is one of four Wyoming counties that has adopted this authority, and now has the power to review this type of development.

There are several impacts to consider when a new development is proposed, including effects on shopping patterns, wildlife habitat, and community identity. From the county government perspective, particularly in the current economic and political climate, first and foremost among considerations are the fiscal responsibilities associated with any development. That is to say, how much will it cost the county to create and maintain infrastructure and services, and how much of the cost will be covered by revenues generated by the development.

In this report, commissioned by the Sonoran Institute, and performed by RPI Consulting, we set aside the other issues which surround exurban development and focus solely on the county government costs and revenues associated with development in Natrona County. Throughout the study, it will be helpful to become comfortable with the terminology and concepts used within.

First, the study defines three types of development, common in the American West and Natrona County as well: **Ranchette**, **rural exurban**, and **metro infill**. The definition of these development types is explained in detail later in the "Development Types" section of this document.

The costs of these development types are determined, in large part, by the **vehicle miles traveled**, or VMT, associated with each development type. The VMT is the amount of road travel associated with a community, and it is an accurate tool in the effort to determine the costs associated with a particular development type.

Some county services are **spatially dynamic**—as the developed area of a county grows, so do costs associated with these services. Some examples are fire, police, and road and bridge services. Other services are **non-spatially dynamic**. These are services like the county treasurer, and other departments that are centrally-housed, in the county courthouse for example.

VMT and spatially-dynamic county services are directly related. A higher VMT is associated with greater costs to the county's spatially-dynamic services, whereas VMT will not affect non-spatially-dynamic services. This report takes these concepts into consideration, in detail, as it discovers the costs related to the three development types.

Costs, as they pertain to each development type, are also affected by **Level of Service** and **Proportionate Share**. The level of service (LOS) is the amount of service each type of housing unit requires. For example, a higher level of service is likely to cost more, whereas a lower level of service costs less. Proportionate share is the amount of service that can be attributed to a particular characteristic of a development.

For example, residential developments don't use 100 percent of any particular county government service – they use a proportionate share of that service, while commercial developments will have a correlating proportionate share of that service. Taken together, Level of Service and Proportionate share

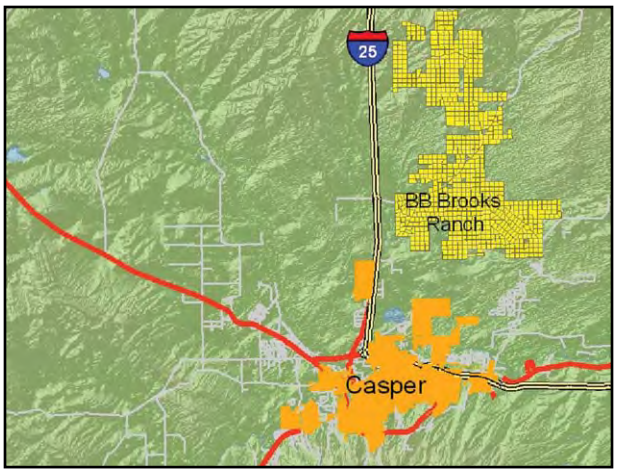
play a role in determining how much of County expenses can be attributed to a particular development.

The above concepts all play a part in accurately determining a development's costs. Each concept, and its role in determining costs, is described in more detail within the main body of the study.

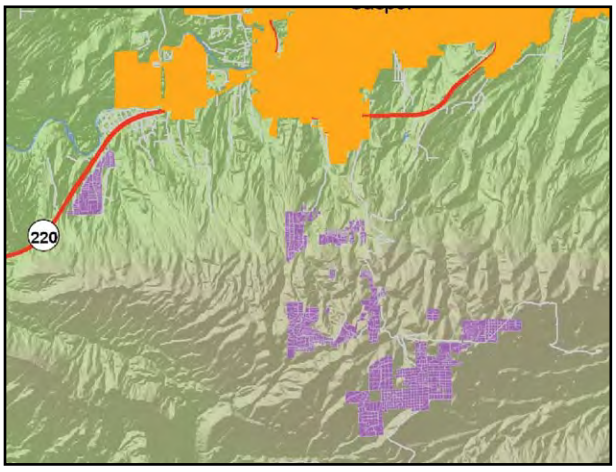
In order to determine how a development affects county budget, its revenues must be determined as well. Revenues are calculated based upon sales taxes, property taxes, and other revenue sources generated by the development, and then compared with costs to determine how a development affects the Natrona County budget.

The results provide a clear picture of each development type's costs. Ranchette, rural exurban, and metro infill developments all create budget shortfalls for the county, but ranchette and rural exurban developments create a much larger budget gap than metro infill developments. In the following pages this study goes into detail as to how big those gaps are, what the numbers are for each development type, and how those numbers were calculated.

The study also forecasts the effects of future growth by extrapolating existing costs to future costs. This is done by calculating the effect of building 500 new units of each development type. Based on historical growth patterns, this projection provides insight into approximately 10 years of growth in Natrona County.
The study concludes with recommendations for Natrona County that include methods to prepare for, and encourage, fiscally-smart growth now and in the future.



Picture 1: Ranchette development north of Casper, Wyoming.



Picture 2: Rural exurban properties south of Casper.

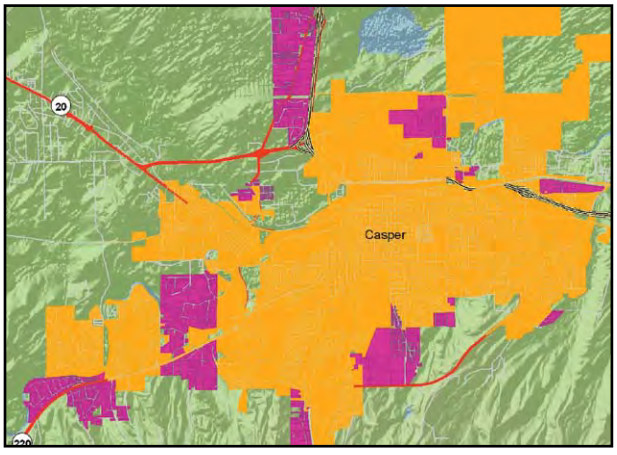
Development Types

Ranchette

The *ranchette* development type is the farthest away from municipal centers and generally requires long networks of county roads, and it is associated with a high VMT. The ranchette development type is exemplified by the BB Brooks Ranch development north of Casper.

As stated in the introduction, the Wyoming Real Estate Subdivision Act W.S. § 18-5-303 incentivizes this development pattern by exempting subdivisions with large lots—35 acres or more– from county subdivision review.

In other words, developments with smaller lots, less



Picture 3: Metro Infill development near Casper.

Picture 4: Example of typical ranchette subdivision

Picture 5: Aerial view of BB Brooks subdivision.

than 35 acres must be approved by the Natrona County planning board, while developments with larger lots have been historically allowed to forgo this process.

Because ranchettes offer plenty of space, they appeal to a specific market segment of buyers who value the privacy and the setting of a large rural property. Many ranchettes can accommodate livestock and hobby ranches. The 35-acre subdivision exemption, combined with developers' hopes of capitalizing on exurban development trends, has created a decades-long trend of 35-50-acre lot ranchland subdivisions.

The result is that there are more than forty thousand acres of ranchette developments in Natrona County, an area roughly double the size of Casper and its adjoining municipalities. At this time, less than 10 percent of ranchette lots contain a home. If the remaining percentage of ranchette lots are fully developed, they will represent a tenfold increase in the amount of ranchette units in unincorporated Natrona County.

Rural Exurban

Rural exurban developments exist between built-up urban centers and the edge of the commuter shed as defined by the limits of commuting distance into the city.

In the rural, small Western town context, rural exurban developments take two forms. Both forms have unique implications from land use and public services perspective.

1. Dispersed rural development: Lot sizes of 6-10 acres, ranging from town-sized lots to small hobby ranches/farms that are oriented around residential uses and rural lifestyles.

2. Rural centers: very small existing communities that are evolving from their original purposes. Rural centers typically contain community facilities or gathering places (post office, country store, school, café).

It is not unusual for exurban lots to be located several miles from towns or the nearest highway. Rural exurban development lots are often smaller than ranchette development lots, but can be equally remote, with equally high costs to the county due to increased impacts on county roads, traffic enforcement and accident response.

Rural exurban development lots are almost always smaller than ranchette lots, but can be equally remote, and have a high VMT.

An example of a rural exurban development in Natrona County is the Aspens subdivision on Circle Drive, about ten miles away from Casper county roads.

Picture 6: Example of rural exurban development

Picture 7: County roads like the one pictured above are often upgraded to create access to ranchette and rural exurban subdivisions.

Picture 8: Aerial view of Garden Creek subdivision on Garden Greek Rd.

Picture 9: Aerial view of rural exurban development near Casper.

Picture 10: Aerial view of metro infill near Casper.

Metro infill

Metro infill developments are on unincorporated county land, but are adjacent to cities or towns where workers can easily commute to and from work, school, or shopping activities. This type of community is commonly found on the edges of a city. They "fill-in" the gaps in and around city limits and provide relatively affordable lots, in sizes of about 1 acre, available for home sites.

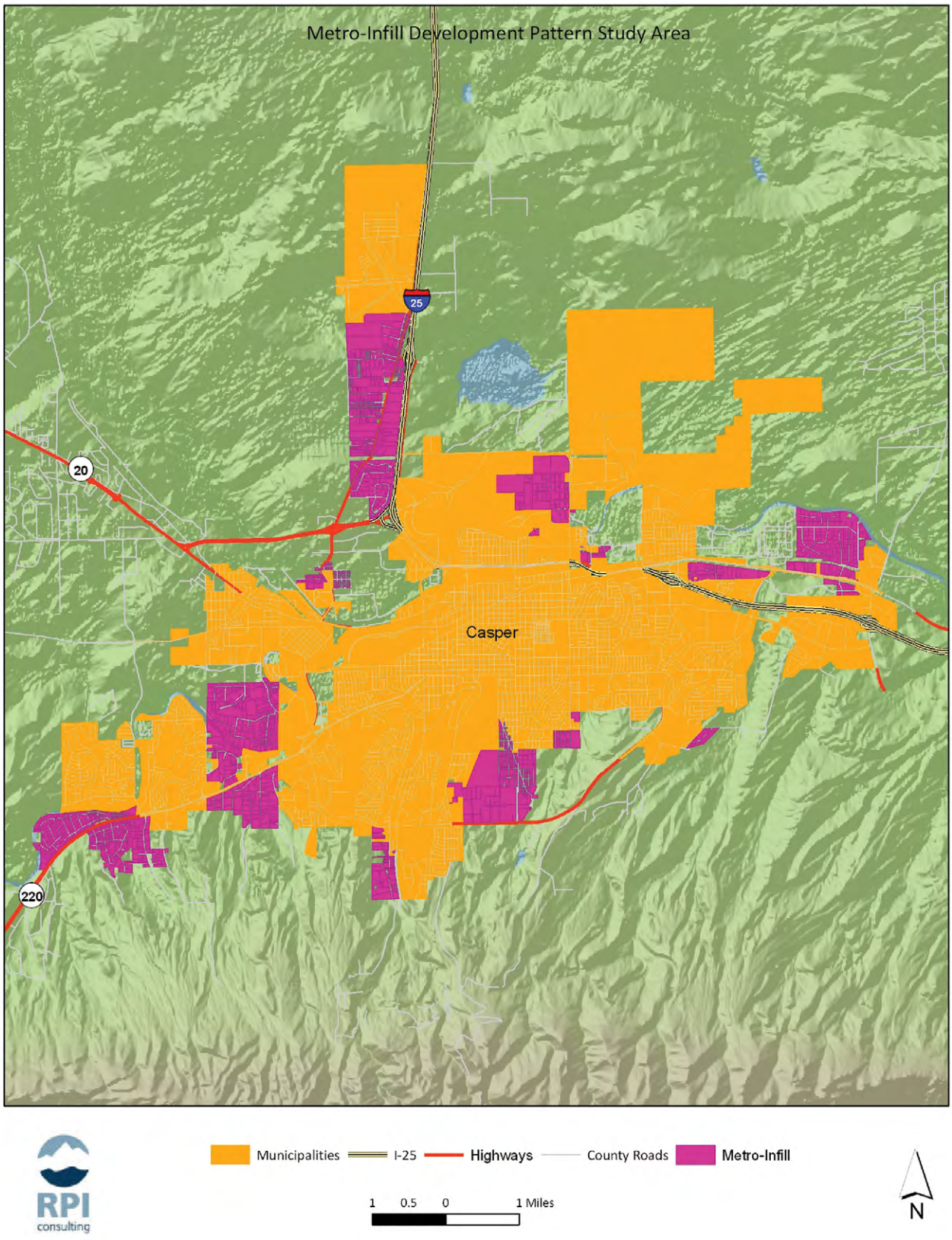
For an in-town worker who also prefers a more rural/large-lot setting, a yard, etc., but does not want to drive long distances to school, work, or shopping, these housing units represent the best of both worlds.

Metro infill developments have a low VMT because of their proximity to services and metropolitan centers.

Metro infill and annexation

The metro infill periphery can be of critical importance from a planning perspective. One of the fundamental functions granted to municipalities is the ability to permit the annexation of property into town limits. By law, however, a municipality can only annex property that is directly adjacent to city limits. It is common for several unincorporated subdivisions to directly abut a municipality, some of which are metro infill, and some of which are rural exurban. Typically, rural exurban developments are not large enough to warrant annexation for development purposes. A rural exurban subdivision can "landlock" the municipality from annexing in that direction.

County governments rarely oppose annexations. They relieve the county from providing some of the most expensive services: law enforcement and roads. Municipalities specialize in providing infrastructure and services for residential areas, so municipal residential development is inherently more efficient than development in unincorporated areas. With this in mind, counties can encourage metro infill development, then follow up by encouraging annexation. Cities and counties can also plan together to create a growth strategy that makes sense from both perspectives. This is a fiscally efficient strategy for counties because expenses like law enforcement and road maintenance can be dealt with more efficiently by a municipality.



Picture 11: Metro Infill areas are highlighted in purple, and municipal Casper areas are in orange.

Picture 12: Natrona County rural landscape and rangeland.

Level of Service and Proportionate Share

Level of Service

The idea of level of service will recur throughout this report. A simple analogy serves to illustrate the concept: 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 be good.

Now consider that you enter 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. Of course, the same happens with provision of government services and infrastructure.

If new growth is not accounted for in police, streets, fire, health, and other services while population is being added, we can expect to see a decrease in our overall level of service. Without proper planning, traffic would become less fluid, parks would become more crowded, wait times at health clinics would be increased and water use would be limited.

In this study, level of service is measured as spending on operations and capital expenses per housing unit. Capital expenses are the costs associated with government land, buildings and equipment. The operations costs are the costs associated with servicing and maintaining the development. We use proportionate share analysis to isolate the resources directed towards the residential sector in our level of service calculations.

Proportionate Share

Proportionate share is the fraction of the departmental costs that can be attributed to a particular housing unit, development, or neighborhood. Using the example of the restaurant, above, the proportionate share is akin to the amount of water refills required by one table vs another. One table may be quite thirsty and require a lot of water; they would have a greater proportionate share of the water-filling services at the restaurant.

In order to associate the costs of government services with different types of residential development, it is necessary to split the demand for government services 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 locale. Our study focuses on those costs that are associated with residential land uses.

Different developments have different needs in terms of proportionate share of county services. For example, employment centers where many workers live outside the municipality, and commute to work every day, tend to have greater demand from commercial land uses. Places where a sizable proportion of residents commute to work in adjacent population centers will see relatively more demand from residential land uses.

In this study, we use different methods to determine the proportionate share associated with each county service department. For general governmental departments we rely on a service hour methodology, where the proportionate share is calculated as a factor of employee time spent on residential versus non-residential issues. Public safety and fire departments rely on data related to service calls, which can be broken into residential or non-residential sources. The health and parks departments do not require proportionate share calculations because all demand for these services originates from the residential sector. Road and bridge calculations do not require proportionate share because demand is measured using vehicle miles traveled (VMT).

Existing Rural Travel and Demand for County Services

Existing Rural Travel (Vehicle Miles Traveled)

In any county, a significant portion of the budget is tied directly to driving patterns, including road construction, maintenance, traffic enforcement, and accident response. In addition, driving patterns are directly related to residential development patterns. This is where the metric, Vehicle Miles Traveled (VMT) comes into play.

VMT calculations, together with proportionate share and level of service calculations, make it possible to estimate the effects of different development patterns on county budgets. Using these factors, RPI Consulting has developed and refined a rural transportation model specifically targeted at estimating impacts of different types of development on county roads. (*See Appendix A for a description of the data and methodology.*)

Residential Land Use	
Average Trip Length on County Roads (miles)	3
Number of Average Daily Trips per Housing Unit	4.8
Average Vehicle Miles Traveled (VMT) per Unit (miles per day)	14.4
Number of Unincorporated Housing Units (2010)	5,663
Average Daily Residential VMT, County Roads (miles)	81,547
Non-Residential Land Use	
Average Trip Length on County Roads (miles)	0.4
Number of Average Daily Trips per 1000 sq. ft. of commercial space	3.2
Average VMT per Unit (miles per day per 1000 square feet)	1.3
1,000's sq. ft. Unincorporated County 2010	7,835
Average Daily Residential VMT, County Roads (miles)	10,029

Table 1: Existing rural travel in Natrona County, vehicle miles traveled on county roads (2010)

Using information about existing development in Natrona County, RPI's model estimates that residential and commercial land uses in the unincorporated county generate a combined total of 91,576 VMT per day. Residential land use is responsible for more than 81,000 VMT per day while non-residential properties create over 10,000 VMT per day. On average, each home in the unincorporated county generates 14.4 VMT, and has an average trip length on county roads of three miles (*see table 1*).

Existing Demand for County Services, 2010

In this report, we measure county services with respect to three factors: Number of housing units; commercial square feet; and daily vehicle miles traveled (VMT) on county roads. Because this report is concerned with the cost of residential development and the resulting impact on county government services, the costs associated with non-residential development are subtracted to avoid over-estimating the impacts of residential development.

We begin by assessing the current demand for government services, based on data from the 2010 census, and using RPI's rural travel demand model. In 2010, there were 33,807 housing units in Natrona County, 5,663 of which were in unincorporated regions of the county.

For the purposes of our study, we divide county government services into those that are provided to all housing units in the county, versus services that are provided only to units in unincorporated areas.

For example, since municipal residents receive fire and public safety protection from municipal departments, only unincorporated housing units are considered in our analysis of county fire protection and public safety services. And, although municipal residents sometimes receive county services, we limit our study to services provided to unincorporated portions of the county. Other county departments, such as general government, parks, and health, provide services to all units in the county.

Housing Units (Total County)	33,807
Housing Units (unincorporated County)	5,663
County Road VMT (miles per day)	91,576

Source: US Census Bureau, Rural Travel Demand Model

Table 2: Natrona County residential and traffic demand units.

Government Costs

For the purposes of this study, we examine the costs for the following county government departments:

- General Government (Clerk, Assessor, Development, GIS, Treasurer, Commissioners, Information Technology)
- Parks
- Health
- Public Safety
- Fire
- Road and Bridge

For each department, we determine what aspects of its services are spatially-dynamic and which are non-spatially-dynamic. For example, general government, health, and parks services are centrally located and therefore non-spatially-dynamic, and not affected by VMT.

Public safety, road and bridge, and fire protection costs are spatially-dynamic because costs are related to development distance out county roads. These services are affected by VMT.

Picture 13: Natrona County administrative offices

For both spatially-dynamic and non-spatially dynamic services, we determine the proportionate share of costs that can be attributed to residential land uses. We then calculate the average annual operations, maintenance, and capital costs for each government department per housing unit. This is the current level of service per housing unit for each department.

General Government Departments

General county government includes the following departments: Clerk, Assessor, Development, GIS, Treasurer, Commissioners, and Information Technology. General Government services include actives such as record keeping, permitting, and inspection services.

As development increases in a county, the workload for general government employees increases. If departments do not hire additional employees and provide them with required resources, service levels will decrease, slowing permit turnaround times and creating for longer waits for service.

The general government departments provide services to all residents and businesses in the county—including residents of incorporated towns and cities.

General government services are centrally located, so the costs of providing services do not vary depending on development types (ranchette, rural exurban, or metro infill), nor do they vary depending on the development type's associated VMT.

Proportionate Share

In order to determine the proportionate share of general government services that can be attributed to residential versus non-residential land uses, we use a service hour methodology. This approach estimates

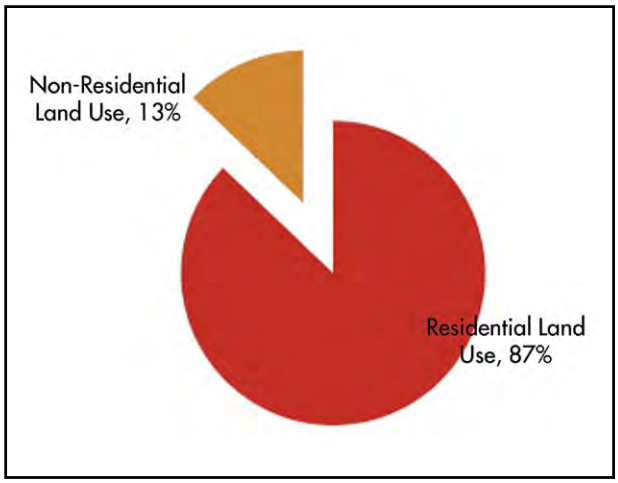


Figure 1: General government service hour proportionate share.

	Number of residents	Time at work (hours per week)	Time at home (hours per week)	Resident-hours at work per week	Resident-hours at home per week	Total # resident-hours per week
Residents working	40,222	40	128	1,608,880	5,148,416	-
Residents not working	34,286	0	168	-	5,760,048	-
Total	74,508	-	-	1,608,880	10,908,464	12,517,344
Percent of total hours				13% at work	87% at home	

Source: US Census Bureau

Table 5: Proportionate share calculation for general government services in Natrona County

how much time residents spend at home (residential) vs. at work (non-residential) and assigns proportionate share accordingly.

In aggregate, Natrona County working residents spend a total of 1.6 million hours at work and 5.1 million non-working hours per week. Non-working residents generate 5.7 million non-working hours per week (*see table 5, above*).

Operations

Next, we determine the operational costs of general government services per housing unit. Based on data from 2009 through 2011, the average annual spending on general government operations is $9.2 million.

According to our proportionate share analysis, 87% of this, or $8 million, can be attributed to residential land uses. Since there are a total of 33,807 housing units in the county, the general government operational costs per housing unit are $240 per year. (*See table 6, at right*).

Capital

General government capital costs per housing unit are $1,060. This is calculated from $41.1 million, which is the total combined value of the general government assets, including land, building, and equipment.

The proportionate share of this attributed to residential land uses (87%) is $35.9 million. This works out to $1,060 per housing unit for 33,807 housing units in the county (*See table 7, at right*).

Annual Average (2009-2011)	$9,198,000
Residential Share (87% of annual average)	$8,016,000
Housing Units (2010)	33,807
Per Housing Unit	$240

Source: US Census Bureau, Natrona County Audits

Table 6: General government department operations level of service

Land	$145,000
Buildings	$11,840,000
Equipment	$29,199,000
Total Capital	$41,184,000
Residential Share (87% of total)	$35,890,000
Housing Units	33,807
Per Housing Unit	$1,060

Source: US Census Bureau, Natrona County Audits

Table 7: General government department capital level of service.

Picture 14: A Natrona county road.

Parks Department

Service levels for parks departments typically reflect the quality of recreational facilities and programs offered by the department.

Annual Average (2009-2011)	$3,066,000
Housing Units	33,807
Per Housing Unit	$90

Source: US Census Bureau, Natrona County Audits

Table 8: Parks Department operations level of service

For example, a parks department providing a high level of service will be able to accommodate all local residents that play organized softball without difficult scheduling. As development occurs and more residents use parks facilities, parking lots fill up, trails become crowded, and programs cannot accommodate every resident.

Land	$5,039,000
Buildings	$2,251,000
Equipment	$2,536,000
Total	$9,826,000
Housing Units	33,807
Per Unit	$290

Source: US Census Bureau, Natrona County Audits

Table 9: Parks Department capital level of service

In Natrona County, road and bridge and parks services are managed by a single department. This analysis splits these services into two sections because road and bridge services are spatially-dynamic while park services are not.

Parks services are used by all residents of the county and LOS calculations are based on total housing units in the county. A proportionate share calculation is not needed for parks services because all demand originates from the residential sector.

Operations

Between 2009 and 2011 the Parks Department spent an annual average of $3 million on operations. This translates to an LOS of $90 per housing unit (*see table 8*).

Capital

The parks department uses a total of $9.8 million worth of land buildings and equipment to provide recreation services to Natrona County residents. The $9.8 million in capital facilities equates to $290 per housing unit (*see table 9*).

Health Department

Service levels for the health department are related to time and scope of services provided.

Decreases in health department LOS can lead to increased case loads for health department workers, longer wait times in clinics, and less health service options.

Governmental health services in Natrona County are provided by a joint county and city department. This analysis examines only county activities funded through the general fund, and includes only county- owned capital.

A proportionate share calculation is not needed for health services because all demand originates from the residential sector.

Operations

The Health Department spent an annual average of $1.9 million on operations between 2009 and 2011, providing an LOS of $60 per housing unit (*see table 10 opposite page*).

Capital

The county owns $8.2 million worth of land, buildings and equipment used to provide health services, an LOS of $240 per housing unit (*see table 11 opposite page*).

Annual Average (2009-2011)	$1,995,000
Housing Units	33,807
Per Housing Unit	$60

Source: US Census Bureau, Natrona County Audits

Table 10: Health Department operations level of service.

Land	$777,000
Buildings	$5,157,000
Equipment	$2,293,000
Total	$8,227,000
Housing Units	33,807
Per Unit	$240

Source: US Census Bureau, Natrona County Audits

Table 11: Health Department capital level of service.

Public Safety Department

The Natrona County public safety departments include the Sheriff's Department, Coroner, Emergency Management Department, and the Detention Center. Public safety LOS includes measures such as response time and crowding in the detention center.

If resources do not keep pace with development, jails become crowded and emergency response times become longer.

Call data shows that the Sheriff's Department spends a significant amount of time responding to traffic and vehicle related calls. Because traffic influences demand for law enforcement, development patterns resulting in more driving create more demand for traffic enforcement and accident response.

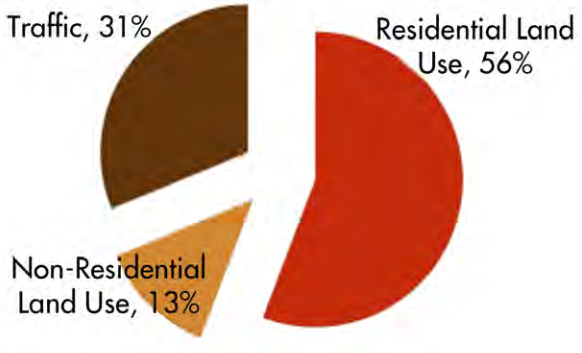
For the purposes of our study, Sheriff's Department demand for public safety services originates from unincorporated areas. LOS costs are measured in terms of unincorporated housing units and VMT occurring on county roads.

Proportionate Share

The Natrona County Sheriff's Department tracks and categorizes all calls to the department. 2010 and 2011 call data shows that 31% of department efforts were directed towards traffic enforcement and safety. 56% of the resources were directed towards residential land uses and 13% of the resources were directed at non-residential properties.

Operations

About one third (31%) of public safety resources are devoted to traffic, so level of service calculations include a traffic component. Natrona County public safety departments have an average annual operating



Source: Natrona County Sheriff's Office.

Figure 2: Public Safety proportionate share.

Annual Average (2009-2011)	$14,364,000
Residential Share (56% of annual average)	$8,014,000
Housing Units	5,663
Per Housing Unit	$1,420
Traffic Share (31% of annual average)	$4,490,000
Total County Road Vehicle Miles Traveled (VMT) (miles per day)	91,576
Spending Per Vehicle Mile Traveled (VMT)	$50

Source: US Census Bureau, Natrona County Audits

Table 12: Public Safety Department operations level of service.

cost of $14.3 million, $8 million is used to provide non– traffic services to housing units and $4.4 million is spent on traffic enforcement and safety (*see table 12)*.

Capital

The county public safety departments use a total of $27.2 million to provide law enforcement and safety services. $15.2 million is used to provide services to housing units in the unincorporated county, and $8.5 million is used for traffic enforcement and safety on county roads.

Combined building, land, and equipment values translate to a LOS of $2,690 per housing unit and $90 per VMT (*see table 13 at right*).

Land	$221,000
Buildings	$21,866,000
Equipment	$5,202,000
Total Public Safety Department Operational Costs	$27,289,000
Residential Share (56% of total)	$15,226,000
Housing Units	5,663
Per Housing Unit	$2,690
Traffic Share (31% of total)	$8,529,000
Total County Road vehicle miles traveled (VMT) (Miles per day)	91,576
Spending Per Vehicle Mile Traveled (VMT)	$90

Source: US Census Bureau, Natrona County Audits.

Table 13: Public Safety operations level of service.

Fire Department

The Natrona County Fire Department is responsible for providing fire protection and emergency response services to residents and businesses in the unincorporated county. As development occurs, the department is required to provide services to an increasing number of structures and vehicles.

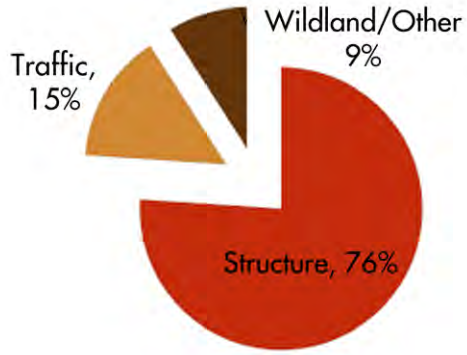
If operations budgets and capital facilities do not keep pace with development, an incremental erosion in the level of service will occur.

Similar to the Sheriff's Department, Natrona County Fire Department spends a significant amount of time and resources responding to traffic-related emergencies. More vehicle miles traveled means an increase in these calls, and increased expenses for the fire department.

Demand for county fire protection services originates from vehicles traveling on county roads in the unincorporated region of the county.

Proportionate Share

According to the Natrona County Fire Department,



Source: Natrona County Fire Department.

Figure 3: Fire Department Proportionate Share.

Annual Average (2009-2011)	$2,129,000
Structure Share (76% of total)	$1,620,000
Structures	6,906
Per Housing Unit	$230
Traffic Share (15% of total)	$316,000
Total County Road Vehicle miles traveled (VMT) (miles per day)	91,576
Spending Per vehicle mile traveled (VMT)	$3

Source: Natrona County Fire Department, US Census, Natrona County Assessor.

Table 14: Fire Department operations level of service.

76% of the department's calls originate from structures, 9% are related to wildland fires, and 15% are generated from vehicles and traffic.

Operations

The Fire Department annually spends $230 per structure and $3 per VMT on operations. Between 2009 and 2011 the department spent an average of $2.1 million annually. $1.6 million went toward protecting structures and $316,000 was spent on responding to vehicle accidents (*see Table 14 opposite page*).

Capital

The Fire Department uses $3.2 million of land, buildings and equipment to provide fire protection services to county residents. The department has a capital LOS of $370 per structure and $5 per VMT (*see Table 14*).

Land	$525,000
Buildings	$462,000
Equipment	$2,336,000
Total Fire Department Capital Costs	$3,323,000
Structure Share (76% of total)	$2,528,000
Structures	6,906
Per Structure	$370
Traffic Share	$493,000
Total County Road VMT	91,576
Per VMT	$5

Source: Natrona County Fire Department, US Census, Natrona County Assessor.

Table 15: Fire Department capital level of service.

Road and Bridge Department

Increased driving and traffic is one of the most noticeable effects of growth. Level of service for road and bridge operations includes the amount of money spent 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 VMT growth rates. All demand for road and bridge services is measured in terms of VMT.

Operations

Each home in Natrona County generates more or less VMT 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 are associated with higher costs to the county government.

The 2009 through 2011 audits show that the Road and Bridge Department spent an average of $14.3 million annually on operations, equating to $160 per VMT (*see Table 16 at right*).

Annual Average (2009-2011)	$14,364,000
Total County Road Vehicle Miles Traveled (VMT) (miles per day)	91,576
Spending Per Vehicle mile traveled (VMT)	$160

Source: US Census Bureau, Natrona County Audits, Natrona County Assessor

Table 16: Road and Bridge Operations level of service.

Capital

The Road and Bridge Department uses $3.6 million in capital resources to operate and maintain the county's

Land	$141,000
Buildings	$1,150,000
Equipment	$2,321,000
Total	$3,612,000
Total County Road vehicle miles traveled (VMT) (Miles per day)	91,576
Spending Per vehicle mile traveled (VMT)	$40

Source: US Census Bureau, Natrona County Audits, Natrona County Assessor

Table 17: Road and Bridge Capital level of service.

transportation network. This equates to a $40 per VMT level of service (*see Table 17 on previous page*).

Incremental Paving

As development occurs along dirt roads it becomes necessary to pave roads to allow for increased traffic volumes, maintain safe roadways, and mitigate dust.

The county currently has 224,000 feet of paved roads. This equates to 2.5 paved linear feet per VMT on county roads. If the county wants to maintain existing service levels it will have to pave dirt roads in areas of new development.

The cost of paving varies depending on a number of criteria. If the county wants to maintain the current LOS future paving will cost $250 per VMT.

County Linear Feet of Paved Roads	224,000
Total vehicle miles traveled (VMT) miles per day)	91,576
Linear Feet of paved roads per Vehicle mile traveled (VMT)	2.5
Cost to Pave One Linear Foot of County Road	$100
Cost of paving per vehicle mile traveled (VMT)	$250

Source: US Census Bureau, Natrona County Audits, Natrona County Assessor

Table 18: Incremental Paving level of service.

Government Revenues

While per-unit level of service cost figures for each department are useful, in order to understand what the costs mean in the context of the larger fiscal picture, and discover budget gaps, we must compare the costs with revenues. Revenues in this section are presented on a per unit basis. We consider sales tax, property tax, and intergovernmental revenues.

Sales Tax

Sales tax revenues in Natrona County come from two sources, the county's 1% sales tax and state sales taxes remitted back to Natrona County. 31% of the state-levied 4% sales tax is transferred back to the jurisdiction where it was originally collected. The state and county rates create a combined rate of 2.24%.

According to data from the Bureau of Labor Statistics, the average household in the West spends 34% of annual income on retail goods. Based on a median household income of $51,735 from the most recent census of Natrona County, the average housing unit contributes $400 in annual sales taxes (*see Table 19 at right).*

Median Household Annual Income	$51,735
% Spent on Retail	34%
Annual Retail Spending	$17,600
Combined Sales Tax Rate	2.24%
Annual Sales Tax Contribution per household	$400

Source: Bureau of Labor Statistics, Wyoming Department of Revenue, Natrona County Audits, US Census Bureau

Table 19: Residential sales tax contribution.

Property Tax

Property tax is based on the locations, characteristics, and value of private land and improvements. Assessors records list the mean value of homes in the unincorporated Natrona County at $160,000.

Average Home Value	$160,000
Assessed Rate	9.50%
General Fund Mill	12
Fire Protection Mill	3
Annual General Fund Contribution	$180
Annual Fire Protection Contribution	$50

Source: Natrona County Audits, Natrona County Assessor

Table 20: Residential property tax contribution

The average housing unit in Natrona County contributes $180 towards the general fund and $50 towards the fire department (*see Table 20 opposite page*).

Intergovernmental Revenues

Intergovernmental revenues earned by county governments generally increase with population and commerce, according to generic state and federal disbursement formulas. Because we included state sales tax transfers in a previous calculation, our focus here is on non-sales tax revenues. Between 2009 and 2011 non-sales tax intergovernmental revenues in Natrona County averaged $5.6 million per year. Using the service hour proportionate share methodology introduced in the General Government section, residential intergovernmental revenues totaled $4.9 million, a $150 per-unit contribution.

Expenditure Patterns

Because the LOS cost analysis differentiated between operational and capital costs, expenditure figures from the 2009 –2011 audits were analyzed to identify which expenditures went to operational costs, and which went to capital costs. On average, 72% of revenues are spent on operations and 28% are invested in capital facilities

Annual Average Non-Sales Tax Intergovernmental Revenues (2009-2011)	$5,686,000
Residential Share	$4,955,000
Housing Units	33,807
Per Unit	$150

Source: Natrona County audits.

Table 21: Residential property tax contribution

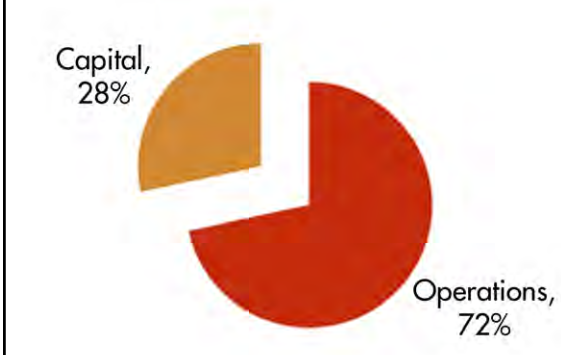


Figure 4: Operations and capital expenditure patterns.

Cost and Revenue Summary

Costs

Table 22 is a summary of operational costs and capital costs to the Natrona County Government per housing unit. It includes non-spatially-dynamic departmental costs (general government, parks, public safety, health and fire), as well as spatially-dynamic departmental costs (public safety, fire, road and bridge).

For operational costs, The county spends $630 annually per housing unit and $210 per VMT. The county invests $4,280 in capital

	Operations	Capital
Non-Spatially Dynamic		
General Government	$240	$1,060
Parks	$90	$290
Public Safety	$240	$2,690
Health	$60	$240
Fire	$230	$370
Total spending per housing unit	$630	$4,280
Spatially Dynamic		
Public Safety (spending per vehicle mile traveled)	$50	$90
Roads (spending per vehicle mile traveled)	$160	$290
Fire (spending per vehicle mile traveled)	$3	$5
Total (spending per vehicle mile traveled)	$210	$380

Table 22: Summary: Costs to Natrona County government per housing unit or vehicle mile traveled.

infrastructure per housing unit and $380 per VMT. The total per-unit cost for any given unit is dependent on location. For example, the average housing unit is located three miles out a county road and generates 14.4 VMT per day. This average unit has an annual operations cost of $3,650, and requires a $9,750 capital investment.

Revenues

Each housing unit in Natrona County contributes a combined total of $780 in sales taxes, property taxes and intergovernmental transfers annually. $570 is used to fund operations and $210 is invested in capital resources. For planning purposes, capital equipment typically has a lifespan of 20 years. The per-unit capital contributions are multiplied by 20 to capture the full contribution over the capital lifespan (*see table 23*).

Cost-Benefit Analysis

The average housing unit does not generate enough revenue to cover the cost of providing services. On average, a house in Natrona County generates an operational deficit of $3,080 and a capital deficit of $5,550. These deficits are commonly subsidized by commercial and industrial property taxes, visitor sales tax revenues, extraction taxes and tourist industries (*see Table 24*).

Public safety and roads occupy the largest proportion of per unit costs. Figures 5 – 7 summarize per unit costs by percentage and department.

Operations	$570
Capital	$210
Capital Revenues, 20-year lifespan	$4,200

Table 23: Capital and operations contributions per housing unit in Natrona County.

	Costs	Revenue	Cost-Benefit
Operations	$3,650	$570	-$3,080
Capital	$9,750	$4,200	-$5,550

Table 24: Average housing unit cost-benefit.

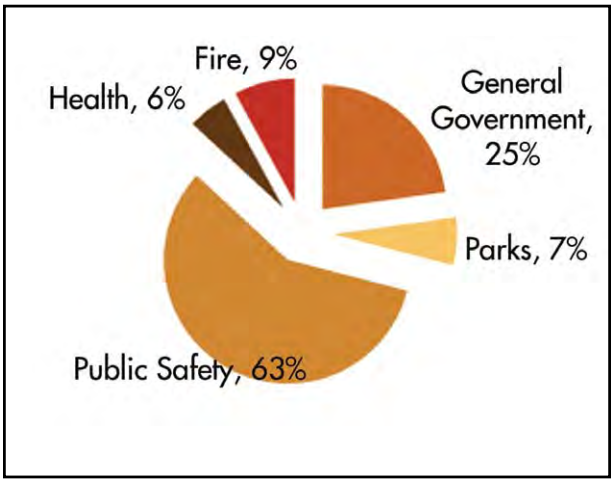


Figure 6: Capital static costs per housing unit by department.

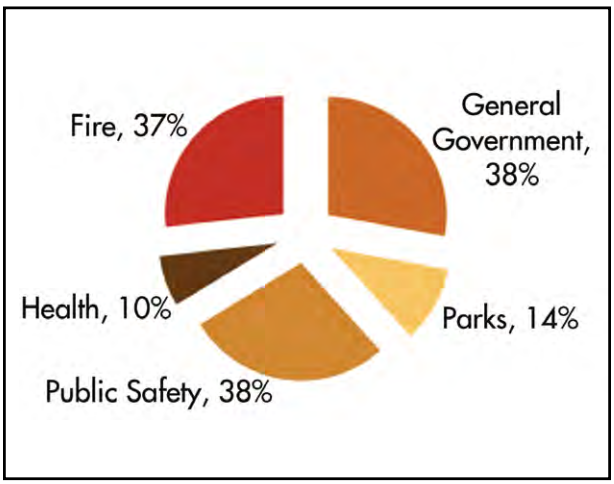


Figure 5: Current operations costs per housing unit, by department.

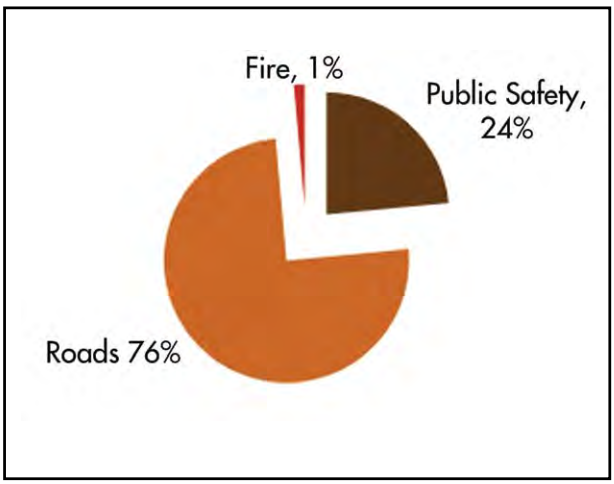


Figure 7: Operations and capital spatially-dynamic costs per vehicle mile traveled by department.

Vehicle Miles Traveled by Development Type

Because most ranchette properties were at one time used for agriculture, platted and developed lots are usually far from primary transportation corridors and municipal boundaries. As a result, residents of these properties drive the most on county roads.

The average housing unit in the ranchette scenario is 6.9 miles from Casper on a county road and generates 32.9 daily VMT (*see Table 25, at right*).

Housing Type	Average Miles of County Roads from Casper	Daily vehicle miles traveled
Average Housing Unit	3	14.4
Ranchette	6.9	32.9
Metro infill	0.2	1
Rural Exurban	5.2	24.8

Table 25: Vehicle miles traveled per housing, by housing type.

Rural exurban developments are also often in remote locations, but some are in rural centers that have existing transportation infrastructure. Therefore, residents of rural exurban subdivisions usually drive less than residents of ranchette subdivisions.

Rural exurban housing units are on average 5.2 miles from Casper county roads and generate 24.8 VMT.

Residents of metro infill developments drive the least, and have the lowest VMT, because the average housing unit is less than one mile from Casper a county road. Metro infill developments generate only one VMT per housing unit.

Development Type		Costs	Revenues	Cost -Benefit
Ranchette	Operations	$7,540	$570	-$6,970
	Capital	$16,780	$4,200	-$12,580
Metro infill	Operations	$840	$570	-$270
	Capital	$4,660	$4,200	-$460
Rural Exurban	Operations	$5,830	$570	-$5,260
	Capital	$13,700	$4,200	-$9,500

Table 26: Costs and revenues per housing unit by development type.

Average VMT rates are used to calculate the spatially-dynamic portions of costs to Natrona County per housing unit (*see Table 26, above*).

Ranchette developments have the highest costs per housing unit; annual operations cost of $7,540 and one-time capital cost of $16,780. Rural exurban developments have an operations cost of $5,830 per housing unit, and capital costs of $13,700 per housing unit. Metro infill developments have the lowest costs per housing unit; $840 operations cost and $4,660 capital cost.

Accounting for revenue contributions, ranchette developments generate an operations shortfall of $6,970 per housing unit and a capital shortfall of $12,580 per housing unit. Rural exurban developments have budgetary shortfalls of $5,260 per housing unit for operations and $9,500 per unit for capital outlays.

Metro infill developments have the smallest budgetary shortfalls; $270 per housing unit for operations and $460 per housing unit in capital shortfalls.

Cost-benefit Analysis of Future Developments

This analysis shows that future costs and revenues to Natrona County will vary depending on the type of developments that are built in the years to come.

Using our estimated average costs and revenues per housing unit, we can estimate the fiscal impacts to the county budget that would result from future growth. Based on past growth trends, we can reasonably expect about 500 new housing units in unincorporated Natrona County over the next 10 years.

Table 27 (*below*) and Figures 8 and 9 (*opposite page*) summarize the hypothetical costs and revenues for the addition of 500 units in each of the three development types.

The ranchette scenario results in the most vehicle miles traveled and is the most expensive. If 500 ranchette units were built, it would cost the county $3.7 million in annual operations and $8.4 million one-time capital costs.

These 500 units would generate $285,000 in operating revenues and $2.1 million in capital revenues leading to an annual operations shortfall of $3.4 million and a one-time capital shortfall of $6.3 million.

Five hundred new rural exurban units would generate a significant loss for the county as well. These units would have an operating cost of $2.9 million while generating only $285,000 in operating revenues, creating a shortfall of $2.6 million. 500 rural exurban units would generate a one-time capital shortfall of $4.7 million.

The operations cost of 500 metro infill units metro infill is $420,000, creating a relatively small operational deficit of $135,000. 500 metro infill units would generate $2.1 million in capital revenues and require $2.3 million in capital investment, leading to a one-time capital shortfall of $230,000.

Capital contributions from housing units in the ranchette scenario only cover 25% of total capital costs, rural exurban properties cover 31% of capital costs while revenues from metro infill properties cover 90% of required capital investment.

	Costs	Revenues	Cost-Benefit
Ranchette			
Operations	$3,780,000	$285,000	-$3,495,000
Capital	$8,410,000	$2,100,000	-$6,310,000
Rural Exurban			
Operations	$2,940,000	$285,000	-$2,655,000
Capital	$6,890,000	$2,100,000	-$4,790,000
Metro infill	$420,000	$285,000	-$135,000
Operations	$2,330,000	$2,100,000	-$230,000
Capital			

Table 26: Costs and revenues per housing unit by development type.

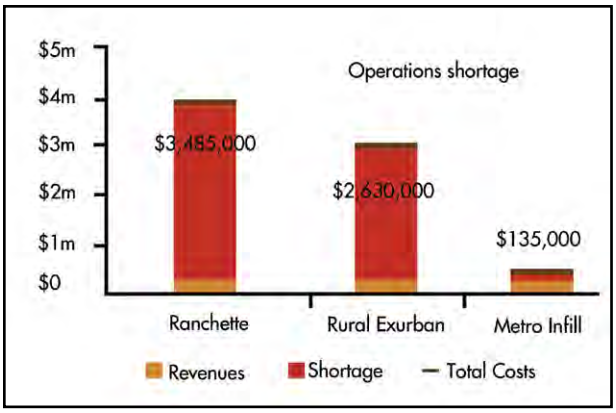


Figure 8: Operations shortages for each type of development in a 500-unit build-out scenario.

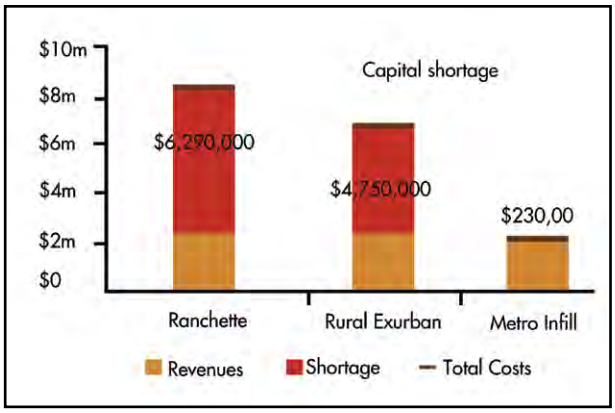


Figure 9: Capital shortages for each type of development in a 500-unit build-out scenario.

Appendix A

RPI has designed a custom rural travel demand model as an alternative to traditional models, which are mostly designed for urban systems and are extremely data intensive. RPI's model uses ESRI software, Spatial Analyst, and Community Viz extensions.

For this study, GIS data sources included the Natrona County GIS department, and the Natrona County Assessor.
Programming Steps/Rules:

1. Parcels or lots (and their daily trips) were associated with 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, but some traffic from existing and future units will directly access state highways if they are adjacent to them.

Mathematics: The key result from the analysis is that it calculates the length of trips 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 an adjusted daily average of 4.8 trips, in and out. We found a similar result in our analysis of Natrona County.

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

Recommendations

This analysis illustrates the significant impact that development patterns have on service costs. Development located away from primary transportation corridors and municipal infrastructure costs more than development located along highways and in close proximity to cities.

Counties should recognize the substantial impact of development patterns. Solutions for increasing service costs will vary by location; the first step is acknowledging that some properties cost more than others. Many counties across the West are taking proactive steps to preserve agricultural land, keep service costs low and incentivize smart, compact growth. Wyoming state laws provide local governments with a number of tools to help counties achieve desirable growth patterns.

- Exercise the ability to review 35-acre-plus developments, as allowed under Wyoming State Law and as adopted by Natrona County. Coordinate land use planning and development with the county's cities and towns to create incentives for either the annexation of subdivisions when appropriate or development of subdivisions that have the potential for annexation in the future.
- Create incentives that direct development closer to cities and towns, for example: impact fees that require developers or prospective home buyers to pay for the true cost of providing services to their specific type of development.
- Designate remote areas as limited service and infrastructure districts, and educate owners and buyers about these limitations.
- Establish a zoning ordinance that encourages municipal infill and discourages ranchette and rural exurban subdivisions.
- Allow citizens to vote on where the public should invest in capital improvements.

Commissioned by the Sonoran Institute
Contact:
John Heyneman
Sonoran Institute Wyoming Field Office
21 N. Main St.
Sheridan, Wyoming 82801
307-675-1970
jheyneman@sonoraninstitute.org
www.sonoraninstitute.com
www.sonoraninstitute.com/NatronaCounty

Performed by RPI Consulting
Contact:
RPI Consulting
Gabe Preston, Managing Partner
1911 Main Ave Suite 224
Durango, CO 81301
www.rpiconsulting.org