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# Blue Creek Area Transportation Study

## Draft Executive Summary

Prepared For

City of Billings/Yellowstone County Board of Planning

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Executive Summary  
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## SECTION 1 – PROJECT OVERVIEW

### Introduction

The City of Billings / Yellowstone County Planning Department has commissioned a Transportation Study of the Blue Creek area. This document summarizes the planning analysis results and recommendations of the **Blue Creek Area Transportation Study**. The development of this study was based on a series of Working Papers that were prepared to document all of the transportation system evaluation, deficiencies analysis and alternative improvements analysis, as well as input received during the public involvement process.

This project was guided by a Project Guidance Committee (PGC) comprised of members of the City/County Planning Department, emergency service providers, the Montana Department of Transportation, and the general public. An extensive public involvement process was also implemented to obtain input from area residents, business owners, and developers.

### Project Guidance Committee (PGC) Members

Scott Walker, City/County Planning Department  
Lora Mattox, City/County Planning Department  
Sam Johnson, Yellowstone County Public Works Department  
Stan Jonutis, Montana Department of Transportation  
Bill Iverson, Area Resident  
Delores Terpstra, Area Resident  
Monica Weldon, Area Resident  
Dick Weldon, Area Resident  
Dick Schottlaender, Area Resident

### Project Purpose

The purposes of this study are: 1) to document and analyze the Blue Creek Area surface transportation system, including the roadway network and pedestrian/bikeway facilities; 2) to identify deficiencies of the existing transportation system; 3) to project future growth and expected transportation demands and system improvements; 4) to identify alternative transportation system improvements to meet existing and future deficiencies; and 5) to recommend a list of transportation system improvements together with planning-level cost estimates for implementation of improvements.

### Study Area

The extent of the study area for this project was determined with input from the PGC. Using Blue Creek Road as the spine of the study area, the study area boundary extends on the east as far as the Blue Creek watershed boundary. Although the Crow Indian Reservation boundary is utilized as the southeast extent of the study area, the PGC also suggested that Blue Creek Road itself be considered within the study area all the way to its intersection with Pryor Creek Road. The study area is shown in Figure 1.

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## Public Involvement Process

The Blue Creek Area Transportation Study was developed with considerable public and agency input. To allow ample opportunity for public involvement throughout the transportation planning process, the following actions were taken:

- Formation of a Project Guidance Committee consisting of representatives from government agencies, emergency service providers, and study area residents.
- Conducted two (2) general public meetings to gain input on current issues and deficiencies, and to provide input/comment regarding the study results.
- Conducted four (4) Stakeholder Meetings to gather study input that was focused on specific geographic areas of the study area.
- Study products (working papers and draft/final reports) were made available on line through the City of Billings' Web site.

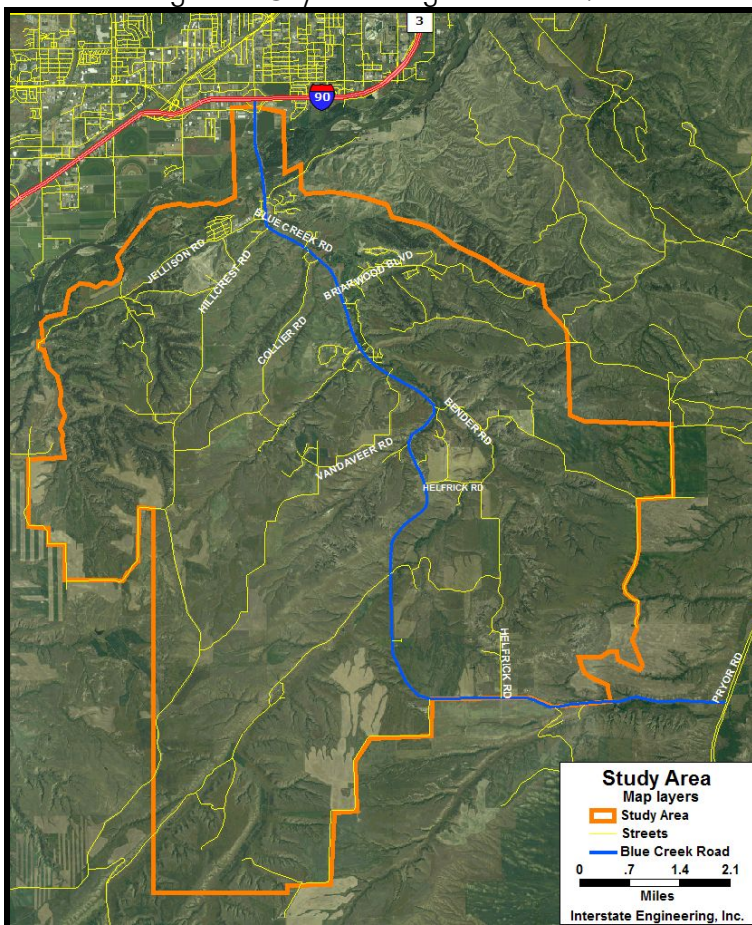


Figure 1 – Study Area

## SECTION 2 – EXISTING CONDITIONS

### Streets & Highways

The study area includes all or portions of 33 city streets, 60 county roads, and one State Secondary Highway. Blue Creek Road (MT S-416) runs approximately north and south

through the center of the study area for just under 15 miles. Blue Creek Road provides an arterial connection between Interstate 90 and Pryor Creek Road. Blue Creek Road is the only facility within the study area under the jurisdiction of the Montana Department of Transportation (MDT). Blue Creek Road is paved over its entire length and constitutes over half of the total miles of paved roads within the study area.

In total, 124.2 miles of roads exist within the study area. Not including Blue Creek Road, only 7.4 miles of paved roads exist within the study area. The remaining 88 miles of roads in the study area are gravel surfaced. Figure 2 shows surface types for roads within the study area.

**Traffic Volume**

Average weekday traffic volumes were evaluated on 5 different sections of Blue Creek Road and 8 roads intersecting with Blue Creek Road. Volumes were determined from a seven day count conducted November 1-7, 2007 by the City of Billings Traffic Division. Table 1 summarizes traffic volume counts taken within the study area.

**Table 1 - Traffic Count Summary**

LOCATION	2007 AVERAGE WEEKDAY TRAFFIC
Blue Creek Rd. south of Midland Rd.	9,400
Santiago Blvd. east of Blue Creek Rd.	700
Jellison Rd. west of Blue Creek Rd.	2,800
Hillcrest Rd. west of Blue Creek Rd.	900
Blue Creek Rd. south of Hillcrest Rd.	5,000
Collier Rd. west of Blue Creek Rd.	120
Briarwood Blvd. east of Blue Creek Rd.	2,300
Robindale Dr. east of Blue Creek Rd.	210
Blue Creek Rd. south of Robindale Rd.	2,700
Aqui Esta Dr. east of Blue Creek Rd.	240
Blue Creek Rd. south of Aqui Esta Dr.	1,700
Blue Creek Rd. south of Bender Rd.	1,300
Bender Rd. east of Blue Creek Rd.	200

**Crash History**

Three years of crash statistics were obtained from the Montana Department of Transportation for study area roads. The data includes crash information from 7/1/2004 to 6/30/2007, with data provided separately for state highways (Blue Creek Road) and for “off-system” roads (City and County roads). Within this three year time period, Blue Creek Road experienced a total of 37 crashes, with one fatal crash and 12 injury crashes (20 injuries). Three years of crash statistics on off-system roads shows there were a total of 27 crashes with no fatal crashes, and 7 injury crashes (8 injuries).

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### Existing Population & Employment

The Blue Creek study area lies south of the Billings urban area and is mostly rural in nature. Small pockets of commercial development exist in the study area; in the Blue Creek community area, in the Briarwood area, along Jellison Road west of Blue Creek Road, and near the Santiago Boulevard intersection with Blue Creek Road. As with commercial development, residential development in the study area is largely rural in nature with pockets of significantly denser residential development. Concentrations of residential development exist in the Briarwood area, the Cedar Park / Quanta area, Blain's Mobile Home Court, the Hillcrest area, and the Blue Creek Community area (Aqui Esta / Basin Creek). Outside these pockets of more dense residential development, residential population is scattered in isolated homes across rural portions of the study area.

The population of the study area is estimated to be between 1,600 and 2,000 residents. Estimates vary depending on the source of the information. Employment numbers for the study area are more difficult to estimate. The US Census Bureau does not publish employment by place of employment (only by place of residence). Based on the MDT travel model data available at the time of this study, retail and non-retail employment totaled about 150 employees in 2001.

### Land Use

The study area for this project totals about 56 square miles. While the bulk of lands within the study area are currently rural and used primarily as agricultural lands, pockets of dense residential uses and some commercial uses exist. More dense commercial and residential land uses are concentrated along the Blue Creek Road corridor. Only about one half of the study area is subject to land use zoning. Approximate areas for each land use zone represented within the study area are summarized in Table 2.

**Table 2 – Study Area Zoning Summary**

<b>ZONE DISTRICT</b>	<b>AREA - MI<sup>2</sup> (Ac)</b>
Public	1.48 (947)
Residential 150000	2.29 (1,466)
Residential 9600	0.42 (269)
Residential 7000	0.28 (179)
Residential Manufactured Home	0.19 (122)
Neighborhood Commercial	0.004 (3)
Community Commercial	0.02 (11)
Planned Unit Development	1.21 (774)
Controlled Industrial	0.05 (32)
Agricultural Open	8.88 (5,683)
Agricultural Suburban	0.39 (250)
District 14	3.37 (2,157)
District 16	1.16 (742)
Not Zoned	36.2 (23,168)

## SECTION 3 – FUTURE CONDITIONS

### Planned & Programmed System Improvements

Montana Secondary Highway 416 (MT S-416), or Blue Creek Road as it is commonly known, is the only state highway within the study area. One project is currently planned for MT S-416, a safety improvement project near the highway's crossing of Blue Creek. The MDT project will seek to reduce crashes on the highway curve just south of the Blue Creek crossing. Included is installation of a flashing beacon on the curve warning sign currently installed for northbound traffic, placing curve chevrons around the curve visible to both travel directions, and adding earth fill to reduce the slope of the embankment on the outside of the curve. Also included are guardrail end-treatment improvements for the Blue Creek bridge guardrail and the Yellowstone River bridge guardrail, further to the north. Other than the MDT project discussed above, no other specific projects are planned or programmed for the study area.

### Population & Employment Growth Forecast

Numerous sources were consulted to enable reasonable forecasts for growth in the study area. Consulted were US Census data for the years of 1990 and 2000, examination of aerial photography from 2005, data collected/developed for the creation of the Blue Creek Outdoor Recreation Plan, the Billings 2008 Growth Policy, and the MDT travel demand model for the Billings Urban Area. The available data yielded a wide variety of data and projections for the study area. It was determined that a reasonable estimate of growth was to assume growth of the study area at 1.5% per year for the next 20 years, or about an overall growth of 35%. Based on this estimate, it is forecasted that an additional 409 households will be established in the study area in the next 20 years (by year 2030). An examination of available, platted subdivision lots, subdivisions in the planning stage, and available water/sewer services resulted with a distribution of future household growth within the study area. Assumed growth within the study area is shown in Table 3.

Table 3 - Household Growth

Neighborhood	2005 Households	2005 Vacant Lots	Household Growth 2005-2030	Final 2030 Households
Aqui Esta - Basin Creek	94	48	45	139
Blains Mobile Home Park	193	N/A	-	193
Briarwood	298	106	200	498
Cedar Park - Quantana	103	15	30	133
Collier - Secret Valley	22	14	14	36
Hillcrest	59	72	50	109
Vandaveer	11	-	5	16
Remaining Rural Area	129	N/A	25	154
Briarridge	-	-	40	40
<b>TOTAL</b>	<b>909</b>	<b>255</b>	<b>409</b>	<b>1,318</b>

Employment growth within the study area is limited. It is assumed that household growth will drive growth of transportation needs and traffic volumes.

### Future Traffic Forecasts

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Utilizing the forecasts of household growth, estimates of future traffic volumes were formulated. The average trip rate of 10 trips per household was used to forecast daily traffic volumes on selected study area roads. Traffic volume on Blue Creek Road is expected to increase to 13,500 vpd just south of Midland Road, to 8,290 vpd south of Hillcrest Road, and to 3,220 vpd south of Robindale Drive. Connecting roads are also expected to increase in traffic volume, with Briarwood Boulevard increasing the most, from 2,300 vpd to 4,300 vpd. With the increase in traffic volume, impacts to intersection operations are expected along with increasing need for intersection improvements.

### **Identified System Deficiencies**

The identification of needs is broken down into three main categories: capacity/congestion, connectivity/circulation, and safety. Feedback from the Project Guidance Committee (PGC), the first general public meeting, and four stakeholder meetings were used to identify system deficiencies, real or perceived, and receive suggestions for improvements.

Key intersections were examined for level of service (LOS) and general traffic operations. Included with the analysis were queuing lengths, traffic delay, warrants for auxiliary turn lanes, etc. Each intersection assessed was analyzed according to Highway Capacity Manual (HCM) procedures implemented through the Synchro/SimTraffic software platform. Key intersections where traffic counts were obtained were assessed for current as well as future forecasted traffic conditions. For this project, LOS analyses have been performed for intersections and two-lane highway segments. While vehicle delay is the primary measure utilized to report LOS at intersections, percent time-spent-following is the primary measure to report LOS on Class II two-lane highways like Blue Creek Road.

The Montana Department of Transportation and City of Billings strive to maintain conditions of LOS C or better for streets, highways, and intersections. LOS D may be acceptable under some circumstances and doesn't necessarily mean an improvement project is required, reasonable, or feasible.

### **Blue Creek Road / Santiago Boulevard**

Under existing traffic conditions, the Santiago Blvd. approach to Blue Creek Road operates at level of service (LOS) B during both the morning and evening peak period. With increased future traffic, LOS for the Santiago Blvd. approach drops to LOS C during the morning peak and remains at LOS B during the evening peak.

### **Blue Creek Road / Jellison Road**

Under existing traffic conditions, the Jellison Road approach to Blue Creek Road operates at LOS B during both the morning and evening peak period. With expected increases in traffic volumes, LOS will drop to LOS C for both morning and evening peak periods.

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### Blue Creek Road / Hillcrest Road

Under existing traffic conditions, the Hillcrest Road approach to Blue Creek Road operates at LOS B during both the morning and evening peak period. With expected increases in traffic volumes, LOS will drop to LOS C for both morning and evening peak periods.

### Blue Creek Road / Briarwood Boulevard

Under existing traffic conditions, the Briarwood Boulevard approach to Blue Creek Road operates at LOS B during the morning peak period, and at LOS A during the evening peak period.

The MDT Montana Road Design Manual contains guidelines for when separate left turn lanes may or may not be justified. The Manual notes that left turn lanes may be justified based on traffic volumes, capacity analysis, or crash history. At this location, the MDT guidelines indicate this location currently has sufficient through, left turn, and opposing traffic volumes to justify a separate left turn lane. A schematic sketch of a left turn lane at this location is shown in Figure 2.

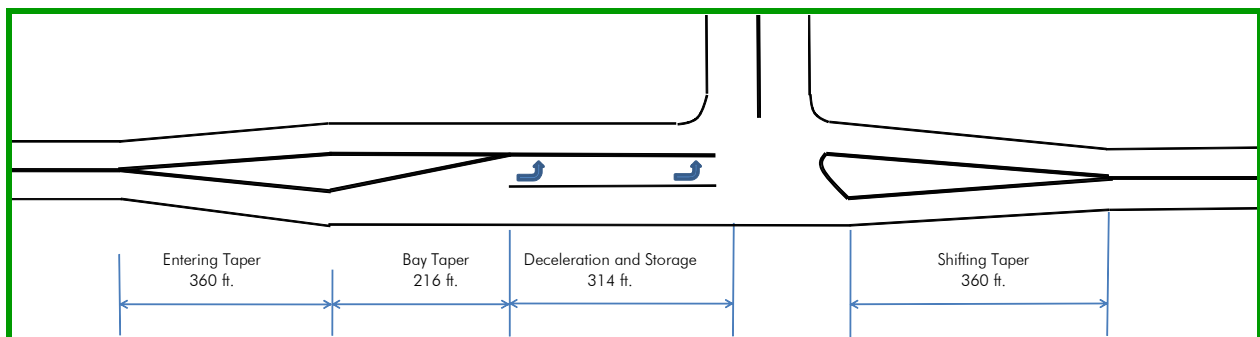


Figure 2 – Left Turn Lane Schematic, 60 mph Design Speed

### Blue Creek Road Corridor

Growth in the study area will bring corresponding growth in traffic volume for Blue Creek Road itself, just as it does for the key intersections. Traffic volumes on Blue Creek Road in the future are expected to exhibit the same characteristics as today's volumes, with similar increased volume in the northern portion of the Blue Creek Road, and similar peaking characteristics.

On Blue Creek Road just south of Midland Road, the peak hourly volume occurs during the evening, with a two-way volume of about 850 vehicles per hour (vph), or about 9% of the daily volume. With daily volume expected to increase to 13,400 vpd, the peak hour can be expected to experience 1,200 vph. With the 75/25 directional split typically experienced on this facility at this location, the roadway will carry over 900 vph in a single direction. An estimate of roadway operations on this segment of highway shows it will be operating at LOS D with a volume-to-capacity ratio of 0.43 under future traffic conditions.

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The HCM notes that LOS D describes a condition of “unstable traffic flow” where the two opposing traffic streams begin to operate separately at higher volume levels, as passing becomes difficult (if allowed). Even though passing demand is high, passing capacity approaches zero. Turning vehicles and roadside distractions can cause major shock waves in the traffic stream, as motorists are delayed in platoons (time spent following) for nearly 80 percent of their travel time.

## **SECTION 4 – IMPROVEMENT ALTERNATIVES**

Transportation deficiencies identified through public meetings, stakeholder meetings, Project Guidance Committee meetings, and technical assessments have been reviewed and potential improvement alternatives have been identified.

With assistance of the Project Guidance Committee, each identified deficiency and potential improvement alternative was reviewed. The review resulted with a list of 30 specific deficiencies or deficiency areas that, in turn, resulted with 13 separate preferred infrastructure construction projects. It should be noted that not all identified deficiencies resulted with an identified construction project. Many require further study or more detailed investigation to adequately determine a preferred solution. An example is walking routes and safety to Blue Creek Elementary School. It is beyond the scope of this area-wide transportation plan to identify individual routes and necessary improvements to develop adequate safe routes to school for the Blue Creek Elementary School. In this case, it was recommended that a separate Safe Routes to School study be conducted.

The resulting deficiencies and preferred solutions are tabulated in Table 4.

Table 4 - Deficiencies and Resulting Preferred Solution Alternative

PROJ. #	SPECIFIC DEFICIENCY/LOCATION	DEFICIENCY	DEFICIENCY TYPE*	DEFICIENCY PRIORITY	PREFERRED SOLUTION ALTERNATIVE	COST (1,000's)	COMMENTS	RESULTING PROJECT SOLUTION
1	Hillcrest Rd. / Blue Creek Rd. Intersection	Sight distance	S/LOS	1	Eliminate/reduce crest vertical curve on Blue Creek Rd. south of intersection & add southbound right turn lane onto Hillcrest.	1: \$365 2: \$62	Needed to maintain speeds for uphill grade on Hillcrest.	1: Reconstruct Blue Creek Road to eliminate crest vertical curve. 2: Construct southbound right turn lane from Blue Creek Road to Hillcrest Road.
2	Jellison Rd. / Blue Creek Rd. Intersection	Sight distance	S	1	Trim vegetation (trees)	\$9	Sight distance inadequate for heavy trucks	Trim or remove trees to improve sight distance around curve on Blue Creek Road.
3	Speed Limit on BCR - Yell. R. to Blue Ck.	Side street delay, numerous accesses	S/LOS	1	Construct right turn/deceleration Lane(s)	\$339	Need project to improve access safety with posted speeds.	Construct continuous right turn/acceleration/deceleration lane for northbound Blue Creek Road from Santiago Blvd. to Old Blue Creek Road.
4	Blue Creek Rd. - Briarwood Blvd. to Midland Rd.	Capacity for future traffic volume	LOS	1	Right turn / deceleration lanes near Blue Basket, plus left turn lane at Briarwood Blvd.		Need system-wide improvements to handle higher volumes	See above right turn/deceleration lane project. Left turn lane at Briarwood Blvd. is separate project.
5	Santiago Blvd. / Blue Creek Rd. Intersection	Side street delay	LOS	1	Build separate right and left turn lanes on approach to Blue Creek Rd., and add right turn/deceleration lane on Blue Creek Rd.	\$69		Widen Santiago Blvd. approach to Blue Creek Road to add separate right turn lane.
6	Willow Dr. / Blue Creek Rd. Intersection	Side street delay	LOS	1	Build separate right and left turn lanes on approach to Blue Creek Rd.	\$52		Widen Willow Drive approach to Blue Creek Road to add separate right turn lane.
7	Blue Basket	Speed, mixed with right turn traffic slowed/stopped on roadway	S/LOS	1	Construct northbound right turn/deceleration lane on Blue Creek Rd.	N/A		See above continuous northbound right turn / deceleration lane on Blue Creek Road from Santiago to Old Blue Creek Road
8	Blue Creek Rd. at Blue Creek Bridge	Narrow, curved bridge	S	1	Re-align highway & replace bridge	N/A		N/A - Consider if/when Blue Creek Road is totally reconstructed.
9	Blue Creek Rd. - Jellison Rd. to Yellowstone River Bridge	Passing in two way left turn lane	S	1	Construct right turn/acceleration / deceleration lane along Blue Creek Rd. in Blue Basket area	N/A	Distance from Jellison to Old Blue Creek Road is 1,560 ft. Total ROW varies 120-160 feet.	See above continuous northbound right turn/acceleration/ deceleration lane on Blue Creek Road from Santiago to Old Blue Creek Road
10	Yellowstone River Bridge	Passing zone not appropriate this location	S	1	Additional study for passing zone	\$5	Only passing zone between Midland Road and Vandaveer Road.	Conduct passing study on Blue Creek Road in area of Yellowstone River Bridge
11	Blue Basket - School Bus Stop	Inappropriate location	S	1	Secure property easement for school loading/unloading, and sign/mark pedestrian crossing.	N/A		No-cost project for school district and City
12	Yellowstone River Bridge	Lack of Bicycle Lane	S	1	Improve access to existing bicycle/pedestrian facility on bridge.	\$12	Guardrail will be re-positioned with MDT safety project 11/09.	2009 Safety project (MDT) will amend guard rail for easier access.
13	Jellison Rd. / Blue Creek Rd. to Land Fill	Road not adequate for land fill traffic	M	1	Reconstruct to improve structural section and improve maintenance	\$975		Reconstruct Jellison Road from Blue Creek Road to Land Fill Road
14	Briarwood Blvd. / Blue Creek Rd. Intersection	Speed mixed with left turn traffic stopped on roadway, and congestion/delay on Blue Creek Rd.	S/LOS	2	Construct southbound left turn lane on Blue Creek Rd.	\$310		Widen Blue Creek Road to add southbound left turn lane at Briarwood Boulevard intersection.
15	Blue Creek Rd. - Study Area Length	Lack of passing zones	LOS	2	Additional study for passing zones	\$30		Conduct passing study on Blue Creek Road
16	River Front Park / Blue Creek Road	Speed, mixed with left turn traffic stopped on roadway. On-highway parking during "events" presents hazard.	S	2	Construct southbound left turn lane on Blue Creek Rd. at Riverfront Park entrance, and provide increased parking opportunities within park	\$254	Need increased enforcement of on-highway parking prohibition.	Widen Blue Creek Road to add southbound left turn lane at Riverfront Park Access intersection

PROJ. #	SPECIFIC DEFICIENCY/LOCATION	DEFICIENCY	DEFICIENCY TYPE*	DEFICIENCY PRIORITY	PREFERRED SOLUTION ALTERNATIVE	COST (1,000's)	COMMENTS	RESULTING PROJECT SOLUTION
17	Blue Creek Road - Entire Length	Need deer warning signs	S	2	Further study for additional signing.	\$10		Conduct detailed crash study to define need for additional signing.
18	Gravel Roads - Study Area	Road surface condition	S	2	Require paved surfaces for newly constructed subdivision roads, increase maintenance frequency for gravel roads.	N/A		Proposed subdivision regulations will require paving of appropriate new roads.
19	Blue Creek Rd. - South of Cormier Road	Road width & abrupt shoulder edge	S	2	Narrow travel lanes to provide "shoulder", eventually acquire additional ROW and widen roadway lanes and shoulder to current standards.	\$7,597	Length is 4.15 miles. +/- 60 ft. or ROW exists this section.	Reconstruct Blue Creek Road from Cormier to Pryor Road to provide shoulders and in-slopes and out-slopes that meet current design standards.
20	Briarwood Subdivision	Secondary access necessary	C	3	Construct secondary access between McMasters Road and Coleen Drive.	\$5,885	Developer funded - required by City/County Planning.	Construct extension of McMasters Road to Colleen Drive to provide secondary connection...will be required of developer(s) with further planning within Briarwood Subdivision.
21	Cedar Park Subdivision	Secondary access necessary	C	3	Provide secondary access by extending Santiago Blvd. to Blue Creek Road.	\$645	Extend Santiago Blvd. to Blue Creek Rd. to intersect opposite Jellison Road	Construct extension of Santiago Boulevard to Blue Creek Road opposite Jellison Road intersection to provide secondary connection.
22	Blue Creek Community	Safe Route to School	P	3	Multi-use trail along Blue Creek, with connection(s) to Blue Creek School - implement Heritage Trails Plan.	N/A		Encourage implementation of Heritage Trail Plan components to provide non-motorized school routes. Conduct separate Safe Routes to School Study for Blue Creek Elementary School.
23	Briarwood Subdivision	Safe route to Blue Creek School / future school in Briarwood Subdivision	P	3	Multi-use trail along Blue Creek, with connection(s) to Blue Creek School - implement Heritage Trails Plan.	N/A		Encourage implementation of Heritage Trail Plan components to provide non-motorized school routes. Conduct separate Safe Routes to School Study for Blue Creek Elementary School.
24	Community Wide	Lack of multi-use trails	P	3	Implement Heritage Trail Plan	N/A		N/A - Encourage implementation of Heritage Trail Plan components to provide non-motorized facilities.
25	Briarwood Blvd.	Lack of marked on-street bike path	P	3	Stripe bike path along Briarwood Blvd.	N/A	Is in the works now.	Project is programmed.
26	Blue Creek Road	Lack of marked on-street bike path	P	3	Implement the Heritage Trail Plan by constructing off-highway multi-use trail in Blue Creek Rd. corridor from Yellowstone River Bridge to Blue Creek Community.	N/A		Encourage implementation of Heritage Trail Plan.
27	Community Wide	Lack of transit access	M	3	Revise MetTransit "charter" to allow service to Blue Creek Area, and construct park-n-ride near Blue Basket.	N/A		MetTransit service requires change of "charter". Pursue with separate study on feasibility/demand for transit service.
28	Blue Creek School Entrance	Safety for pedestrians at access	S	3	Revise on-site circulation to improve ingress/egress from school property.	\$12	Need to conduct Safe Routes to School Study.	Needs to be addressed with Safe Routes to School Study.
29	Blue Creek Road @ Blue Creek Elem. School	Traffic speeds	S	3	Increased enforcement	N/A		Suggest increased enforcement...also recognize that speed zoning in study area seems appropriate based on speed studies conducted with this Plan.
30	Study Area	Lack of secondary arterial connection Across Yellowstone River.	M	3	Extend Hillcrest Road to provide connection to Duck Creek Road & Yellowstone River Bridge.	\$14,284		Reconstruct Hillcrest Road, Keller Road, and Fritz Road to provide paved arterial connection between Blue Creek Road and Duck Creek Road.

\*DEFICIENCY TYPES:  
S=Safety  
LOS=Capacity  
C=Connectivity  
P=Pedestrian and/or Bicycle Path  
M=Mobility

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## **Qualitative Environmental Assessment of Improvement Alternatives**

Construction projects that involve physical construction (road widening, new construction, etc.) may also have environmental impacts. Impacts may be to the natural environment (wetlands, endangered species, prime farmlands, etc.), or may be to the man-made environment (acquisition of right-of-way, demolition of structures, relocation of population, etc.). While it is not within the scope of this study to outline all possible environmental impacts or to develop an environmental assessment, individual projects will be examined for significant environmental impacts that may be a “fatal flaw” and prevent the project from moving forward.

Some of the identified projects will involve roadway widening, typically for construction of auxiliary turn lanes. Some of those will also require acquisition of right-of-way. None of these projects involve demolition of any residential or commercial structures and, are all considered without “fatal flaws” in this respect. Some of the projects listed involving roadway widening may impact sensitive natural areas such as wetlands. While some projects will require environmental documentation, none appear to be fatally flawed such that they aren’t viable projects from an environmental standpoint. Most projects identified can be completed with minimal environmental impacts.

## **Estimates of Probable Construction Cost of Improvement Alternatives**

Planning level cost estimates were developed for projects, whether they involved physical construction or additional studies. Cost estimates included costs for major construction elements such as asphalt, earthwork, utilities, right-of-way, etc. Cost estimates also include costs of engineering and construction as a percentage of construction costs, and included a 20% contingency. Costs for each project were provided previously in Table 4.

## **SECTION 5 – PREFERRED IMPROVEMENT ALTERNATIVES**

### **Preferred Alternatives and Priorities**

Upon formulation of the final list of projects that resulted from identified deficiencies, it became necessary to assign priorities. Rather than prioritize individual projects in a sequential order for implementation, it was decided to identify priorities by geography. Working with the Project Guidance Committee, it was determined that the area along Blue Creek Road between the Yellowstone River bridge and Hillcrest Road should be the highest priority. Improvements on Blue Creek Road at Briarwood Boulevard, Riverfront Park, widening Blue Creek Road south of Cormier Road and improved gravel road maintenance were identified as second tier projects. While non-motorized projects, road reconstruction and paving to improve area access to Duck Creek Road, and including transit service to the area were identified as third tier projects.