

URBAN PLANNING STUDY

FOR

CROSSROADS NORTH LOCATED IN  
C/S 2776 AND LOTS 4A-4B OF  
BERGQUIST SUBDIVISION

BILLINGS, MONTANA



MARCH 25, 2011  
PROJECT NO. 09051.03

---

## TABLE OF CONTENTS

<b>LAND CHARACTERISTICS</b> .....	<b>2</b>
<b>Geology, Topography, and Soils</b> .....	<b>2</b>
<b>Effects on Agriculture</b> .....	<b>2</b>
<b>Historic Sites</b> .....	<b>3</b>
<b>Wildlife</b> .....	<b>3</b>
<b>PUBLIC SERVICE EVALUATION</b> .....	<b>4</b>
<b>Water Service</b> .....	<b>4</b>
<b>Sanitary Sewer Service</b> .....	<b>7</b>
<b>Stormwater Management</b> .....	<b>9</b>
<b>Solid Waste</b> .....	<b>12</b>
<b>Parks and Recreation</b> .....	<b>13</b>
<b>Schools</b> .....	<b>13</b>
<b>Public Safety</b> .....	<b>13</b>
<b>Fire Service</b> .....	<b>13</b>
<b>Police Service</b> .....	<b>14</b>
<b>Emergency Medical Services</b> .....	<b>14</b>
<b>TRANSPORTATION ANALYSIS</b> .....	<b>15</b>

---

## LAND CHARACTERISTICS

### Geology, Topography, and Soils

The topography of the study area is generally flat with eastward slopes of less than two percent. Steeper eastward slopes occur locally adjacent to the irrigation lateral along the west boundary of the site. The study area exhibits a combination of Keiser silty clay loam (Kc), Bew silty clay loam (Bm), Haverson-Hysham loams (Hh), McRae loam (Mn), Hysham-Laurel loams (Hx), and other soils in small areas.

The limitation ratings provided by the NRCS are defined as: “Not Limited” being soil has features that are very favorable for the specified uses. “Somewhat Limited” being soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. “Very Limited” being soils have one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures.

The NRCS data indicates the following limitations for development of dwellings with and without basements and small commercial buildings. Bew silty clay loam is rated as very limited for the construction of dwellings and small commercial building due to shrink-swell potential. The Haverson-Hysham loams are very limited due to flooding, which is consistent with the floodplain delineation of Five Mile Creek. The Bew silty clay loam and Haverson-Hysham loams make up approximately 45 percent of the site area. The majority of the remaining site soil types are not limited.

Construction of local roads and streets within the site are generally classified as “somewhat limited” by the NRCS due to frost action and to a lesser degree, flooding. The Bew silty clay loam soils are very limited due to low strength and shrink-swell.

Portions of Tract 2-D of Certificate of Survey No. 2776 Amended are located within the floodplain of Five Mile Creek. The floodplain and floodways of the creek are shown on the Floodplain exhibit in Appendix A. Riparian shrub and freshwater emergent wetlands were also identified in the Five Mile Creek floodplain. No development is allowed within the floodway of Five Mile Creek, while development within the floodplain fringe requires floodplain permitting.

A zoning map and USGS quad map are included in Appendix A.

### Effects on Agriculture

The study area is currently in agricultural production consisting of primarily small grains and pasture. This is typical of the area on the fringes of the community prior to commercial and residential development. Area crops are generally irrigated. Development of this area will result in a reduction in agricultural production of these products unless areas are irrigated further out in the valley. Based on data from the 2008 Growth Policy Update for Yellowstone County and City of Billings, there are approximately 77,850 acres of irrigated cropland in Yellowstone County. Developing this parcel will create a minimal (0.058 percent) decrease in irrigated production acres.

According to the NRCS soils survey, approximately 47 percent of the site is considered Prime Farmland if irrigated and an additional 1 percent is considered farmland of statewide importance.

### Historic Sites

The Montana State Historic Preservation Office (SHPO) was contacted for a records search within the township, range, and sections in which the project is located. The Cultural Resource Information System (CRIS) report shows that the Billings Bench Water Association (BBWA) canal is present within the search area (24YL0161, 24YL1532, 24YL1382) as well as two historic residences in Section 15 (24YL1731, 24YL1730). Based on examination of the project site, no structures or residences within the project are located in Section 15 and the main BBWA canal does not pass through the site. A lateral of the BBWA canal is present along the west boundary of the site, which appears to only serve the subject property and empties into Five Mile Creek.

There are structures located within Tract 2-D of Certificate of Survey Number 2776 Amended that appear to be greater than 50 years old. Based on correspondence with SHPO, it is their position that any structure over fifty years of age is considered historic and is potentially eligible for listing on the National Register of Historic Places. If any structures are to be altered and are over fifty years old we would recommend that they be recorded and a determination of their eligibility be made.

As long as there will be no disturbance or alteration to structures over fifty years of age SHPO feels that there is a low likelihood cultural properties will be impacted. Therefore, a recommendation for a cultural resource inventory is unwarranted at this time. However, should structures need to be altered or if cultural materials be inadvertently discovered during this project we would ask that our office be contacted and the site investigated.

### Wildlife

Wildlife does exist on this property, with most of the habitants attracted to Five Mile Creek and the crop remnants. The Montana Fish, Wildlife, and Parks Department has commented in the past that developments in this area are in close proximity to good deer habitat. Based on that comment, the following statement has been added to nearly all new subdivision improvement agreements for new projects in the Urban Interface Area.

*“Existing subdivisions in similar habitat report considerable and on-going problems with deer damaging landscaped shrubs, flowers, and gardens. Potential homeowners should be made aware that they will likely have deer on their properties, and should be informed that unless they take steps to deter the animals (such as fencing their yards), they will likely have damage problems. They should be notified that Fish, Wildlife and Parks does not provide game damage assistance within these subdivisions, unless there is damage to commercial agricultural crops, or threat to public health and safety such as in the case of nuisance mountain lions.”*

The Montana Natural Heritage Program (MTNHP) was also contacted with respect to potential presence of species of concern. Based on the MTNHP search of the township, range, and section and surrounding 1-mile buffer, eight species of concern were observed in the area. These include Bald Eagles, Greater Sage Grouse, Yellowstone Cutthroat Trout, Spotted Bat, Greater Short-horned Lizard, Common Sagebrush Lizard, Western Hog-nosed Snake, and Milk snake. The Greater Sage Grouse and Sagebrush Lizard typically inhabit grassland and shrublands, while the Western Hog-

nosed Snake and Milk snake prefer dryer habitats. Though riparian areas exist near Five Mile Creek, these areas are generally limited to a close proximity to the creek, while larger riparian areas associated with the Yellowstone River are more likely habitat for brooding of Bald Eagles and existence of Cutthroat Trout.

## PUBLIC SERVICE EVALUATION

The study area is currently divided into large acreage tracts of 10 to 20 acres in size. Actual development plans may result in different use patterns than are predicted and more accurate assessment of the impact on City services can be submitted during future platting if necessary. Build-out of the entire project is estimated to take 6 to 12 years with service needs increasing incrementally over time. Three alternate plans have been prepared for the site and have each been evaluated.

In estimating the impacts on City services, the information used was consistent with that presented in the *Water and Wastewater Facilities Master Plan 2006* prepared for the City of Billings by HDR, Inc., HKM, Inc., and JGA, Inc. These include the following:

1. Single-family density (dwelling units/acre):	4
2. Multi-family density (du/ac):	8
3. Average day per capita water use (gallons per day - gpd):	219
4. Billings 2005 max. day water demand (million gallons per day - MGD):	43.2
5. Average day to maximum day water use ratio:	2.20
6. Maximum day to peak day water use ratio:	1.50
7. Average day per capita wastewater (WW) flow (gpd):	152
8. Average maximum month to average month WW flow ratio:	1.17
9. Billings 2000 maximum month average day WW flow (MGD):	7.33
10. Persons per dwelling unit:	2.3

The following assumptions were also made:

Wastewater flow in commercial districts is equal to the median of the unit-flowrate presented in Metcalf & Eddy, *Wastewater Engineering*, or 1,150 gpd per acre.

### Water Service

Water service to the subject property will be provided by a County Water District of Billings Heights (CWDBH) 12-inch main in U.S. Highway 87 and by an 8-inch main in Pemberton Lane. Extension of water service to the site will include a new 10-inch main from an existing stub in Pemberton Lane to main in U.S. Highway 87 near the southeast corner of Lot 4B of Bergquist Subdivision. Other mains within the proposed development are to be a minimum 8-inch diameter.

Currently, only Lot 4A, Block 1 of the site is located within the CWDBH service boundary. In order for water service to be extended to the remainder of the site, Lot 4B, Block 1 of Bergquist Subdivision and Tract 2-D of Certificate of Survey Number 2776 Amended must be annexed into the County Water District.

Table 1: Domestic Water Average Flow

	Population per unit	Alternate 1			Alternate 2			Alternate 3		
		Med. Density / Strip Commercial	Estimate Population	Flow Estimate (gpd)	Low to Med. Density Commercial w/ 5-Mile Creek Residential	Estimate Population	Flow Estimate (gpd)	Mixed Use	Estimate Population	Flow Estimate (gpd)
Residential Lots	3	120	360	78840	0	0	0	12	36	7884
Townhome/Duplex	2.5	14	35	7665	42	105	22995	122	305	66795
Multi-Family Apartment Units	1.5	0	0	0	0	0	0	80	120	26280
Commercial Area (acres)		3.215		3697.25	24.6		28290	10.3		11845
<b>Total</b>				<b>90,202</b>			<b>51,285</b>			<b>112,804</b>

The domestic water demand for the subject property is estimated based on the per capita water demand (219 gpcd) times the population density for the likely nature of the development (i.e. single-family, multi-family, commercial, etc.). Maximum day water demand is determined by applying a ratio factor of 2.20. Water demands from the subject property are summarized below:

*Average daily water demand*

Alternate 1:	90,202 gpd
Alternate 2:	51,285 gpd
Alternate 3:	112,804 gpd

*Max day average water demand*

Alternate 1:	198,445 gpd
Alternate 2:	112,827 gpd
Alternate 3:	248,169 gpd

*Treatment Capacity*

The capacity of the Billings water treatment plant when the improvements currently being constructed are completed is 60 MGD. The year 2005 maximum day water demand for the City of Billings is 43.2 MGD. Therefore, the maximum day water demand from the subject property (Alternate 3, being 0.25 MGD) would represent 1.5 percent of the remaining (16.8 MGD) capacity of the water treatment plant:

The *Water and Wastewater Facilities Master Plan 2006* study indicates that additional treatment capacity will be needed by 2014, and building a second water treatment plant near the Yellowstone River upstream of Canyon Creek was the recommended alternative.

*Storage Capacity*

The subject property lies within the Pressure Zone 2 East area of the Billings water system; the distribution and storage facilities within the pressure zone are owned and operated by the CWDBH. Water pumped to this zone is stored in elevated storage tanks and distributed to the users by gravity as water demand occurs. The existing total storage capacity for Zone 2 East is 3.98 million gallons (MG).

The amount of storage required is the sum of operational or equalizing storage (equal to 15 percent of peak day demand), emergency storage (equal to half of maximum day demand), and fire storage, which is per the Uniform Fire Code (UFC) and assumed equal to the residential requirement of 1,750 gpm for two hours, (210,000 gallons). Therefore, the volume of storage needed for the subject development would equal:

$$[(0.25 \text{ MG} * 1.50) * 0.15] + (0.25 \text{ MG} / 2) + (0.210 \text{ MG}) = 0.39 \text{ MG or } 390,000 \text{ gals}$$

The 2003 *Water System Needs Analysis County Water District of Billings Heights* study states that the current Zone storage volume requirement is 6.9-7.7 MG depending on calculation methods utilized. Therefore, Zone 2 East is currently 1.8-2.4 MG deficient. The study states that “because of the reliance of the City of Billings to provide finished water to the District, and because of the size of the City of Billings’ transmission mains and Walter Pump Station redundancy, the deficient storage values are not as critical as if the District relied on its own treatment and pumping facilities. However, any new reservoir constructed by the District should include operational and emergency storage capacities to add redundancy to the District’s system and to allow the District to grow.” Firm pumping refers to having redundant pumps and on-site backup power. As discussed below, the firm pumping capacity of Zone 2 (42.8 MGD), which is shared between Zone 2 and Zone 2 East, is greater than the current maximum day demand of Zone 2 (29.3 MGD). Therefore, the current capacity along with the surplus firm pumping capacity of 13.5 MGD is adequate to cover the increase proposed by Crossroads North. In addition, the 2003 *Water System Needs Analysis County Water District of Billings Heights* study placed the addition of new Zone 2 East storage facilities as one of the priority recommended projects.

### *Pumping*

Water to Zone 2 East is pumped from High Service Pump Station (HSPS) located at the water treatment plant and the Walter Pump Station can provide water to the zone. The combined capacity of these pump stations is 42.8 MGD with one pumping unit out of service at each station. The Zone 2 and 2 East combined maximum day water demand is 29.3 MDG. Therefore, of the 6.3 MGD of excess pumping capacity that currently exists (*due to limitations of Pump H2-3 not operable at higher pressures*), the maximum day demand from the subject property (0.25 MGD) represents roughly 4 percent of the available Zone 2 and Zone 2 East firm pumping capacity.

### *Distribution*

Adequate water pressure and the ability to convey required fire flows are dependent upon having adequately sized transmission and distribution mains. A water distribution system addition analysis for development of the previously proposed Sky Heights Subdivision was completed by Interstate Engineering, Inc. in June 2005. The Sky Heights proposed subdivision included Lots 4A and 4B, Block 1 of Bergquist Subdivision, which are both located within the planning study site. The Sky Heights Subdivision was most similar to the proposed Alternate 1. The analysis showed sufficient pressures and flows within the development; the analysis, however, must be revised for the future development plan as required by the District. Providing adequate pressure and fire flow is accomplished by connecting existing mains in Pemberton Lane and U.S. Highway 87 with a 10-inch diameter main will further strengthen the hydraulic conditions in and around the subject area.

The Department of Environmental Quality (DEQ) requires that adequately sized distribution mains and hydrants be provided. Therefore, adequate pressures and fire protection can generally be said to be available for the subdivision.

Based on the above reviews, adequate water treatment, capacity and distribution is available at the present time for both average day and peak demand circumstances.

### *Financing*

The water system is an enterprise fund that utilizes fees for service to cover costs associated with operating the system. As a result of the connection to the CWDBH water main, the developers would be responsible for district annexation fees for portions of the site not currently in the District boundary, which are currently \$0.148 per square foot of the net lot area or \$218,633.00. The annexation buy-in fee typically increases annually. In addition to these costs, individual lot owners will also be subject to system development fees at the time of lot development. These fees depend on the water meter size.

### **Sanitary Sewer Service**

Wastewater collection from the subject property will be provided initially by extension of an existing 8-inch stub from the existing 10-inch main in Pemberton Lane.

**Table 2: Average Wastewater Flows**

	Population per unit	Alternate 1			Alternate 2			Alternate 3		
		Med. Density / Strip Commercial	Estimate Population	Flow Estimate	Low to Med. Density Commercial w/ 5-Mile Creek Residential	Estimate Population	Flow Estimate	Mixed Use	Estimate Population	Flow Estimate
Residential Lots	3	120	360	54720	0	0	0	12	36	5472
Townhome/Duplex	2.5	14	35	5320	42	105	15960	122	305	46360
Multi-Family Apartment Units	1.5	0	0	0	0	0	0	80	120	18240
Commercial Area (acres)		3.215		3697.25	24.6		28290	10.3		11845
<b>Total</b>				<b>63,737</b>			<b>44,250</b>			<b>81,917</b>

Consistent with the determination of the water demand, sanitary sewer flows are estimated based on the per capita wastewater flow (152 gpcd) times the population density for the likely nature of the development. The Maximum Month Average Day flow is computed using a ratio factor of 1.17. Wastewater flows from the subject property are summarized below:

Average daily water demand	
Alternate 1:	63,737 gpd
Alternate 2:	44,250 gpd
Alternate 3:	81,917 gpd

## Max monthly average water demand

Alternate 1:	74,573 gpd
Alternate 2:	51,773 gpd
Alternate 3:	95,843 gpd

*Treatment Capacity*

The capacity of the Billings wastewater treatment plant is 26 MGD. The year 2000 maximum month average day City wastewater flow is 7.33 MGD. Therefore, maximum month average day wastewater flows from the subject property (0.096 MGD) would represent 0.5 percent of the available wastewater treatment plant capacity:

$$[(0.096 \text{ MGD}) / (26 \text{ MGD} - 7.33 \text{ MGD})] * 100\% = 0.5\%$$

*Collection*

The City of Billings generally likes sewer mains to be sized with adequate capacity to convey design flows when flowing two-thirds full. The existing 10-inch sewer main constructed at a slope of a minimum 0.28 percent has a carrying capacity of approximately 408 gpm when flowing two-thirds full. Sanitary sewer design flows are typically equal to peak hourly flow conditions. Peak hour flows are estimated using a graph of the peak hour to average day wastewater flow ratio versus population as presented in Figure 1 of DEQ design Circular DEQ-2. Based on an estimated population of 540 persons, this ratio equals approximately 4.0. Therefore, the peak hourly flow from the subject area equals:

$$(56.9 \text{ gpm} * 4.0) = 228 \text{ gpm}$$

Therefore, the design wastewater flow from the subject property would use approximately 55.8 percent of the two-thirds full carrying capacity of the 10-inch sewer constructed at minimum allowable slopes.

DEQ requires that the internal collection system of a subject property be comprised of minimum 8-inch diameter collection mains. Eight-inch diameter collection mains flowing two-thirds full at minimum allowable slopes have a capacity of approximately 270 gpm. The per capita peak hour wastewater flowrate based on 152 gpcd equals:

$$[(152 \text{ gpcd} / (1,440 \text{ minutes/day})) * 4.0] = 0.42 \text{ gpm per person}$$

Therefore, the population tributary to any eight-inch sewer cannot exceed the capacity of an eight-inch sewer flowing two-thirds or a larger sewer must be used. The design population for an eight-inch sewer equals:

$$(270 \text{ gpm} / (0.42 \text{ gpm/person})) = 643 \text{ persons}$$

The subdivision wastewater flows ultimately travel to the Five Mile lift station. According to the City of Billings Water and Wastewater Facilities Master Plan 2006, peak hour dry weather inflow is only about 40 percent of the estimated lift station capacity. Upgrade of the Five Mile lift station has

been identified as a priority, as the service area has the most potential for growth within the City of Billings planning area.

Based on the above reviews, adequate sewage treatment and collection capacity is available at the present time for both average day flow and peak flow circumstances.

### *Financing*

The sewer system, like the water system, is an enterprise fund that utilizes fees for service to cover costs associated with operating the system. Individual lot owners will be subject to system development fees at the time of lot development. These fees depend on the water meter size and are also subject to the franchise fee.

## **Stormwater Management**

As is the case for all new developments, Crossroads North will be required to meet the criteria of the City of Billings *Stormwater Management Manual*, which requires management of increased runoff flows in excess of historic conditions. Below are the general requirements for stormwater management procedures and methods as defined in the *Stormwater Management Manual*.

### **1.1 Stormwater Runoff Requirements**

*All stormwater originating on any proposed land development, roads, and all areas draining thereto shall be estimated as to rate of precipitation and to percentage of runoff in accordance with this Manual. Estimates of precipitation and runoff shall be the basis of a drainage plan which shall be prepared by a Professional Engineer, licensed in the State of Montana and which shall be submitted to the City Engineer's Office for review and approval.*

#### **1.1.1 General Runoff Requirements for the Entire City:**

*The following is a list of regulations that will be enforced for all construction/development/redevelopment projects throughout the City of Billings:*

- Under no circumstances shall runoff generated from a commercial or industrial site leave that site and drain to a neighboring property. Drainage to the public right-of-way, provided flows are not concentrated, may be allowed only with written approval from the City Engineer's Office.*
- Under no circumstances shall runoff generated from a residential site of two or less living units on a single lot drain from that site to a neighboring property. Runoff from these sites will be allowed to drain to the adjacent street right-of-way provided flows are not concentrated. Runoff will not be allowed to discharge to gravel alleys.*
- Natural drainages, such as depressions, swales, ditches, channels, etc. shall be preserved to the maximum extent possible.*

- *Illicit discharges (non-stormwater) are prohibited from discharging to any storm drain system. This includes wash water, interior building drainage water, irrigation water, etc. For a full list of illicit discharges, refer to Ordinance 28-100.*
- *Overland/ sheet flow to the City's storm drain system, including streets, is not allowed, unless approved by the City Engineer.*
- *Snow melt is considered stormwater runoff and melting snow runoff shall meet the requirements of this manual.*
- *Lands that lie within "flood hazard zones" as shown on the appropriate maps prepared by the Federal Insurance Administration, shall comply with the regulations of the National Flood Insurance Program.*
- *A parking lot may not impound more than 18 inches of stormwater runoff during the major event.*

### **1.1.2 General Runoff Requirements for Site Development:**

*The following is a general list of regulations, in addition to those of Section 1.1.1, that will be enforced for Comprehensive Drainage Plan (CDP) sites:*

- *The City requires the Rational Method be used for all developments 5 acres or less and the SCS Hydrograph method be used for all developments greater than 5 acres. The USGS Regression equations may be appropriate on very large, undeveloped sites.*
- *CDP sites must implement low impact development (LID) practices that infiltrate, evapotranspire, or capture for reuse the first 0.5-inch of rainfall from the 24-hour storm of their site's runoff. The runoff generated from this storm must be entirely retained on site. Low impact development is discussed in Chapter 7.*
- *CDP sites will be required to size their on-site storm drain facilities based upon the 50-year, 24-hour storm and the assumption of no discharge to the City's storm drain system.*
- *Even though CDP sites will be required to size their facilities based upon no discharge, CDP sites may be allowed a discharge to the City's storm drain system at a metered rate of the difference between post-development runoff and pre-development runoff provided LID requirements have been met per Section 3.6.*
- *All discharge connections from private sites to the City's storm drain system must have backflow prevention installed to prevent stormwater from within the City's storm drain system from surcharging to private property. Backflow preventers must be installed on-site and not within the public right-of-way. Minimum pipe diameter discharging to the City's storm drain system shall be 6 inches with a minimum slope of 1 percent.*

- *During construction, CDP sites will be required to implement and maintain temporary and permanent Best Management Practices (BMPs) in accordance with Chapter 6 of this Manual, the policies of the Environmental Affairs Division, and City Ordinance 28-100.*

### **1.1.3 General Runoff Requirements for Residential Lot Development:**

*The following is a general list of regulations, in addition to those of Section 1.1.1, that will be enforced for residential lot development:*

- *During construction, residential lot development sites will be required to implement and maintain temporary and permanent BMPs in accordance with Chapter 6 of this Manual, Environmental Affairs Policies, and City Ordinance 28-100.*
- *Property owners may not significantly alter drainage patterns of their lot without approval from the City Engineer. The City Engineers Office will define “significant” on a case-by-case basis.*

#### *1.1.4 General Runoff Requirements for Subdivision Development:*

*The following is a general list of regulations, in addition to those of Section 1.1.1, that will be enforced for subdivision development which constructs streets and public right-of-way improvements:*

- *Stormwater runoff for streets within subdivisions shall be designed in accordance with Table 4-1.*
- *All subdivisions must evaluate the 100-year, 24-hour storm and ensure stormwater does not runoff subdivision at a rate greater than the natural conditions prior to subdividing land.*
- *Subdivisions must implement low impact development (LID) practices that infiltrate, evapotranspire, or capture for reuse the first 0.5-inch of rainfall from the 24-hour storm of their runoff. The runoff generated from this storm must be entirely retained on site. Low impact development is discussed in Chapter 7.*
- *All subdivisions will be required to evaluate and mitigate stormwater runoff entering (or having the future potential to enter) and leaving subdivision and site facilities as such.*
- *During construction, subdivisions will be required to implement and maintain temporary and permanent BMPs in accordance with Chapter 6 of this Manual and City Ordinance 28-100.*
- *Public storm drain mains and laterals must be inspected with a television camera, and the inspection video or DVD must be presented to the City for review. The stormwater system must meet City requirements prior to acceptance under the subdivider’s warranty.*

Based on the City of Billings *Stormwater Management Manual*, Crossroads North must implement low impact development practices that infiltrate, evapotranspire, or capture for reuse the first 0.5-inch of

rainfall from the 24-hour storm of their runoff. After the low impact development requirements have been met, Crossroads North will be allowed to discharge from the site at a rate not to exceed that historically discharged prior to development. Based on the site location and topography, the stormwater outfall location will be Five Mile Creek. Five Mile Creek is considered a primary outfall of the City of Billings stormwater system. The Holling Drain, which passes through the project site in pipe outfalls to Five Mile Creek within the site boundary. It is anticipated that the Crossroads North outfall location would coincide with the existing Holling Drain outfall.

## Solid Waste

Solid waste disposal will be provided by the City of Billings. The City collection and disposal facility has the necessary capacity to accept solid waste from this development. The Landfill Master Plan shows the landfill will be available for continuous operation at current growth rate projections until the year 2042. The total capacity of the landfill for its projected "life" is 20,000,000 tons. The landfill has currently had 4,000,000 tons of waste placed, which leaves 16,000,000 tons of capacity available. The City would provide once-a-week service. It has been said that as Billings develops there will be a need to hire additional employees and more trucks when this area becomes the City's responsibility. The Solid Waste Department estimates that the average Billings household generates about three 30-gallon containers of garbage a week; hence the 90-gallon residential containers that are utilized at each residence. The national average for garbage generation per household is about 4.62 pounds per day (EPA, 2007). The wastes from commercial activities can vary greatly; a scenario in which the commercial solid waste is the same proportion as the wastewater comparison between residential and commercial use is used to approximate the solid waste from commercial sites in the project area. Under this scenario, Alternate 3 (worst-case) would generate approximately 2,490 pounds per day or 1.2 tons per day which would equate to 454.4 tons per year or 14,086 tons during the remaining 31 year life of the landfill. This amounts to approximately 0.09% of the remaining landfill capacity. It is anticipated, that as our society becomes more conscious of sustainable living practices, this amount will decrease and subsequently the life of the landfill will be extended. A private hauler is currently serving portions of the area outside the current City limits. Consequently the City of Billings might not assume responsibility for the solid waste collection for up to 5 years under the provisions of MCA 7-2-4736, which states specifically:

*Preservation of existing garbage or solid waste service in the event of annexation. (1) A municipality that annexes or incorporates additional area receiving garbage and solid waste disposal service by a motor carrier authorized by the public service commission to conduct such service may not provide competitive or similar garbage and solid waste disposal service to any person or business located in the area for 5 years following annexation except: (a) upon a proper showing to the public service commission that the existing carrier is unable or refuses to provide adequate service to the annexed or incorporated area; or (b) after the expiration of 5 years, if a majority of the residents of the annexed or incorporated area sign a petition requesting the municipality to provide the service. (2) If a proper showing is made that the existing carrier is unable or refuses to provide adequate service to the annexed or incorporated area or, after the expiration of 5 years, if a majority of the residents sign a petition requesting service from the municipality, the municipality may provide garbage and solid waste disposal service to the entire annexed or incorporated area. (3) For the purposes of determining whether an existing motor carrier provides adequate service, those services provided by the carrier prior to annexation are considered adequate service.*

---

## **Parks and Recreation**

The *Parks 2020 Plan*, a document prepared by Fisher and Associates, P.C., serves as the Billings Parks, Recreation, and Open Space Master Plan. The plan outlines the types of open space, parks, and recreation activities that currently exist in Billings. In addition, the plan gives a guide for future development. Furthermore, the City of Billings has requirements in place for development that also dictates the amount of open space as the area grows. It is expected that Crossroads North would have approximately 4 acres of open space or an equivalent payment made as cash-in-lieu depending upon the final subdivision configuration as determined through the platting process. A regional park is not planned for this site.

The City of Billings also has prepared the Heritage Trail Plan for a bike and pedestrian trail system that encourages development to include trail systems that further enhance open space. The plan calls for a multi-use trail along Five Mile Creek through the project area. The plan also designates Pemberton Lane as a primary bikeway along the project boundary.

## **Schools**

Currently, Crossroads North students would attend Independent or Beartooth Elementary, which, in 2010, had an enrollment of 297 and 414 students, respectively, with capacities of approximately 450 and 400 students. Middle school students would attend Castle Rock Middle School, which has an enrollment of 735 students with a capacity of 703 students. High School Students would attend Skyview High School, which had a 2010 enrollment of 1482 students and has a capacity of 1600 students. Based on 214 units at full build out of Alternate 3 (worst-case) and 0.7 students per unit, it is anticipated that approximately 150 students would be attributable to the Crossroads North development. As growth continues, it is likely that redistricting will continue over the incremental build out of Crossroads North thus allowing for the anticipated absorption of the students into the School Districts.

Current legislation prohibits the denial of development based on school capacities.

## **Public Safety**

Crossroads north, however, is partly located within the current City limits and portions not currently annexed are contiguous; extension of services to this region can be handled more easily than to noncontiguous tracts. In addition, the inclusion of commercial property should result in revenue enhancement that exceeds what is generally derived from residential uses.

## **Fire Service**

The Billings Fire Department currently serves the study area for portions within the current City limits and as part of the Billings Urban Fire Service Area (BUFSA) for the portions outside the current City limits. If annexed, the study area would continue to utilize the services of the City of Billings Fire Department and would not impose additional requirements upon the Fire Department and, in fact, would improve fire-fighting capabilities in the area by virtue of the extension of municipal facilities.

Fire protection for the study area has been provided by Fire Station No. 6. Fire Station No. 6 is located at 1601 St. Andrews Drive (approximately 2 miles from the study area).

Land use changes, budget modifications, actual and anticipated growth patterns, timeframes, changes in fire protection service management practices, and transportation and access conditions all affect long-range planning for proposed annexation areas. As each influence changes, its effect is entered into the ongoing fire service master planning process of the City of Billings Fire Department. As part of the Department's ongoing fire safety program, it first determines the causes of past fires to determine future corrective action, and then reviews new construction plans and specifications for compliance with fire safety features of the Uniform Building Code and the Uniform Fire Code.

According to City of Billings Fire Department 2009 annual report, data indicates an incident rate of approximately 96 incidents per 1,000 people (exact population data is not available). At this level of impact, the Fire Department could anticipate up to approximately 44 incidents per year based on Alternate 3 (worst-case) within the study area at full build-out based on the residential nature of the development. Typically, new developments fall below the average number of calls because newer construction techniques are used and the use of sprinklers in many of the mixed-use units should also lower the incidence and severity of calls to the area.

### **Police Service**

If annexed, the study area would receive police protection from the City of Billings Police Department. The City of Billings Police Department is located at City Hall in the Billings Central Business District (5 miles from the study area). Response time to the area would vary depending on the location of the mobile patrol unit in the general area at the time of need. If annexed, the study area would be included in an assigned area or beat for police officers. Police protection is already provided to portions of the site in Bergquist Subdivision, which is immediately adjacent to portions outside the City limits contained in Crossroads North. This means police officers would not need to substantially expand their service boundary to serve this development.

The City of Billings Police Department 911 dispatch center received, on average, 4,600 calls per month in 2007 according to the City/County Communications Center Activity statistics. The City of Billings Police Department has indicated that expansion of the City limits would have an impact on its manpower and budget. Response times would depend on the availability and location of patrols. Although an impact from the inclusion of this area is anticipated, the contiguous nature of the parcel and the ability to increase police staff incrementally as development occurs over time should help mitigate demands placed upon the department. It is again important to point out that data shows (with the exception of alarm calls) a lower than average dispatch frequency to newer developments.

### **Emergency Medical Services**

Both Billings Clinic at 2813 Ninth Avenue North and St. Vincent's Hospital at 1233 North 30th Street would provide routine and emergency medical services in the area. The hospitals are approximately 5 and 5.5 miles, respectively, from the study area. There are also emergency outpatient and walk-in treatment facilities at 760 Wicks Lane (1.5 miles from study area).

The ambulance service for the area would be provided by private industry (American Medical Response). The impact on City services, therefore, is expected to be minimal. American Medical Response indicated that the number of calls correlate with the type of development. Based upon current trends and the existing development, it is expected any increases in ambulance needs would be absorbed under the incremental growth processes that have been previously discussed. It is expected that most of the calls would be related to traffic issues as the area becomes more crowded, with more calls during the early morning and late afternoon.

The impact to the provider and their ability to provide timely service, as required by City ordinance, would become increasingly difficult with the expansion of the City limits. American Medical Response, with its existing locations, cannot meet response time requirements for the entire urban planning area. Just as has occurred with the Fire Department, American Medical Response will need to review new dispatch locations over time in order to maintain the required response times. As this service is provided through the private sector, free market enterprise will continue to dictate expansion needs.

As this area is annexed, this need should continue be analyzed and addressed as appropriate between the developer, The City of Billings and American Medical Response. For the sake of public safety, the ordinance should continue to be enforced as the City of Billings expands. If American Medical Response cannot meet the requirements of the ordinance, then it may be necessary to solicit service from other suppliers, provide a municipal service supplier or review the adequacy of the ordinance requirements.

## **TRANSPORTATION ANALYSIS**

A Traffic Impact Study was performed in 2007 for North Pointe Square Subdivision, Second Filing and Sky Heights Subdivision. North Pointe Square Subdivision, Second Filing was to be located on Tract 2-A-1 of Certificate of Survey No. 1965 Amended and the Sky Heights Subdivision was to consist of Lots 4A and 4B of Bergquist Subdivision. Neither subdivision has been recorded to date.

Peak hour traffic counts were performed at the intersections of Main Street/U.S. Highway 312 and U.S. Highway 87 and at Main Street and Pemberton Lane as part of the Traffic Impact Study. Bench Boulevard is located south of the U.S. Highway 87 at the intersection with Main Street/U.S. Highway 312.

Peak hour traffic counts for the morning at the intersection of Main Street/U.S. Highway 312 and U.S. Highway 87 generally consists of an influx of traffic from the smaller communities and rural areas such as Roundup, Shepherd, Huntley, and Worden into the City of Billings. The peak hour traffic counts at the intersection show approximately 650 vehicles heading into the City of Billings on Main Street, while about approximately 250 vehicles exit the city via U.S. Highways 87 and 312. The northbound traffic from Bench Boulevard was minimal.

Peak hour traffic counts for the morning at the intersection of Main Street and Pemberton Lane generally show the same trend of influx on Main Street from the outlying communities into the City of Billings. Traffic from Pemberton Lane primarily turns to the southeast onto Main Street from both the east and west sides of the intersection. Based on the counts from the west side of the

---

intersection nearest Crossroads North, 18 vehicles turned northwest on Main Street, 8 vehicles headed east on Pemberton, and 63 vehicles turned southeast onto Main Street.

The traffic trend for the afternoon peak hour is generally the inverse of the morning trend consisting of traffic at the intersection of Main Street/U.S. Highway 312 and U.S. Highway 87 exiting the City of Billings toward the outlying communities to the north and east. Approximately 825 vehicles exit the city via U.S. Highways 87 and 312, while approximately 300 vehicles enter the city via the intersection.

Peak hour traffic counts for the afternoon at the intersection of Main Street and Pemberton Lane generally show the same trend of traffic exiting the city on Main Street to the outlying communities. Based on the counts from the west side of the intersection nearest Crossroads North, 47 vehicles turned northwest on Main Street, 20 vehicles headed east on Pemberton, and 34 vehicles turned southeast onto Main Street. Traffic from the east side of the intersection consisted of 21 vehicles heading west on Pemberton, 10 turning northeast on Main Street, and 53 turning southwest onto Main Street.

The report recommends the installation of a traffic signal at the intersection of U.S. Highway 87 and Main Street, as the subdivisions are expected to substantially increase entering traffic volumes. These increases would be most significant during the weekday PM peak hour. As part of the Phase 2 Bench Boulevard project, the Montana Department of Transportation has approved a traffic signal and other intersection upgrades. A concept exhibit of the proposed intersection has been provided in Appendix A.

The complete traffic study and associated counts are provided in Appendix B. Please refer to the appendix for a more complete look at the existing traffic conditions at the site.