Chapter 3.0: Affected Environment

This chapter describes the baseline (existing) social, economic, and environmental conditions for the project area that may be affected by the alternatives presented in Chapter 2.0. This chapter sets the background for the discussion of impacts in Chapter 4.0.

Statistics, plans, maps, and aerial photos from Missoula County and the City of Missoula were gathered and reviewed to illustrate the issues that exist around the project area. **Figure 1-3, page 1-4** shows the general project area.

The project area is the area that would be directly affected by the construction of a build alternative. The project area includes US 93 from south of Hayes Creek Road in the south to the Reserve Street/US 93 interchange in the north and areas north of US 93 near Blue Mountain Road and south of US 93, including the Miller Creek area. The project area is located in the southern part of Missoula County and the City of Missoula. US 93 is the major north/south travel route between Lolo and areas further south and Missoula. When assessing potential indirect and cumulative impacts, the focus area varies in size depending upon the resource evaluated.

3.1 Land Use and Zoning

This section describes general land use categories and zoning designations within the project area. This area includes portions of Missoula County and the City of Missoula. The project area lies almost entirely within the Missoula County Wastewater Facilities Service Area (see **Figure 3-18, page 3-61**) which coincides with the Urban Growth Area, as identified in local plans.

Sources for this section include area comprehensive and growth policy plans, development plans, information on current planning efforts from the Missoula County Office of Planning and Grants (OPG), and information contained in scoping letters. Both the City of Missoula and Missoula County have adopted subdivision and zoning regulations in accordance with Montana state law (MCA 76-1-601 et seq). A discussion of current land use and zoning within the project area is summarized in the sections below.

3.1.1 Existing Land Use

Missoula County is approximately 2,600 square miles and is 25th in the state for land area. Approximately 90 percent of land in the county is classified as agricultural land (includes corporate timberland) or public forest land. County land ownership falls under federal, corporate, private, state, and Confederated Salish and Kootenai Tribal (CS&KT) lands, as shown in **Table 3-1**. More than 50 percent of the land in the county is managed by state, federal, or tribal entities, and approximately 45 percent is under private or corporate ownership, primarily Plum Creek Timber.

Table 3-1
Missoula County Land Ownership

Land Ownership	Percent
Federal	43%
Corporate	26%
Private	19%
State	6%
CS&KT	6%

Source: *Missoula County Growth Policy*, August 2002.

Privately owned land within Missoula County is being developed at a very fast pace. The number of acres in approved subdivisions increased by 12,206 acres between 1990 and 2001; 10,682 acres of this total were in subdivisions outside of the Missoula city limits, but within the urban growth area. According to the *Missoula County Growth Policy*, the urban area accounted for nearly three times more lots and acres than any other area in the county between 1996 and

2001. Most of the subdivision applications resulted in residential developments, with some lots being designated for commercial or industrial uses. New developments planned in the Miller Creek area are predicted to increase the residential population to 7,250 and the Miller Creek area residential dwelling units to approximately 3,000 by 2025.

Census data also indicate that both the City of Missoula and Missoula County are experiencing rapid growth. Population increases between 20 to 30 percent are expected in Montana and Missoula County by 2025. The projected population growth will mean a continued need for local housing, services, and facilities. This will guide future land use decisions in the City of Missoula and Missoula County. Because Missoula is located within a valley and development is topographically constrained, it is likely that the development activity will continue to occur near existing communities and in areas that are undeveloped or used for agricultural production.

The project area has land within both City of Missoula and Missoula County jurisdiction (see **Figure 1-3, page 1-4** for these boundaries). The following general land use categories are present within the project area and are shown on **Figure 2-3, page 2-5** and **Figure 3-1** along with future development plans:

- Light Industrial
- Commercial/Retail
- Rural/Agricultural
- Residential
- Undeveloped Open Space

Along US 93 within the project area there are clusters of retail and commercial developments, including, but not limited to, car-related businesses, numerous storage units, family-owned retail sales, commercial services and sales, and construction-related industries. Along both sides of US 93 there is single-family residential development interspersed with undeveloped land. A commercial development located east of Blue Mountain Road has been constructed in 2004 includes an 80,000-square-foot building for Loren's House of Carpet, and a 40,000-square-foot building with additional expansion capacity for other commercial businesses. Much of the land between the highway and the Bitterroot River south of Blue Mountain Road is undeveloped open space and used for informal fishing access.

Within the Miller Creek area, located south and east of the river, there are large portions of land currently undeveloped with some single-family residences in a rural/suburban setting. The majority of this undeveloped land is planned to be subdivided for residential lots with small pockets of commercial development. This area would be annexed by the City of Missoula after plans are approved by City of Missoula and Missoula County planning boards. Northeast of Linda Vista Boulevard are the Linda Vista Golf Course and open space used as hunting grounds for a private retriever club.

South of Miller Creek, much of the land is vacant and undeveloped. However, residential development has begun south of Miller Creek near the south "Y" intersection, where Lower Miller Creek Road intersects the south end of Upper Miller Creek Road.

3.1.2 Existing Zoning

The purpose of zoning is to establish districts where allowed land uses are defined and regulated. Portions of the project area have not been zoned by the City of Missoula or Missoula County. Land that is zoned within the project area falls under the *Missoula County Zoning Resolution* adopted in January 2001 and the *Missoula City Zoning Ordinance, Title 19 (*September 1999). There are 18 different zoning districts in the project area that have uses stipulated by the *Missoula City Zoning Ordinance, Title 19* (September 1999). **Figure 3-1** identifies generalized zoning categories within the project area for the City of Missoula and Missoula County. The City of Missoula zoning classifications and designated uses are explained in **Table 3-2**.

Figure 3-1
Existing City of Missoula and Missoula County Zoning Classifications

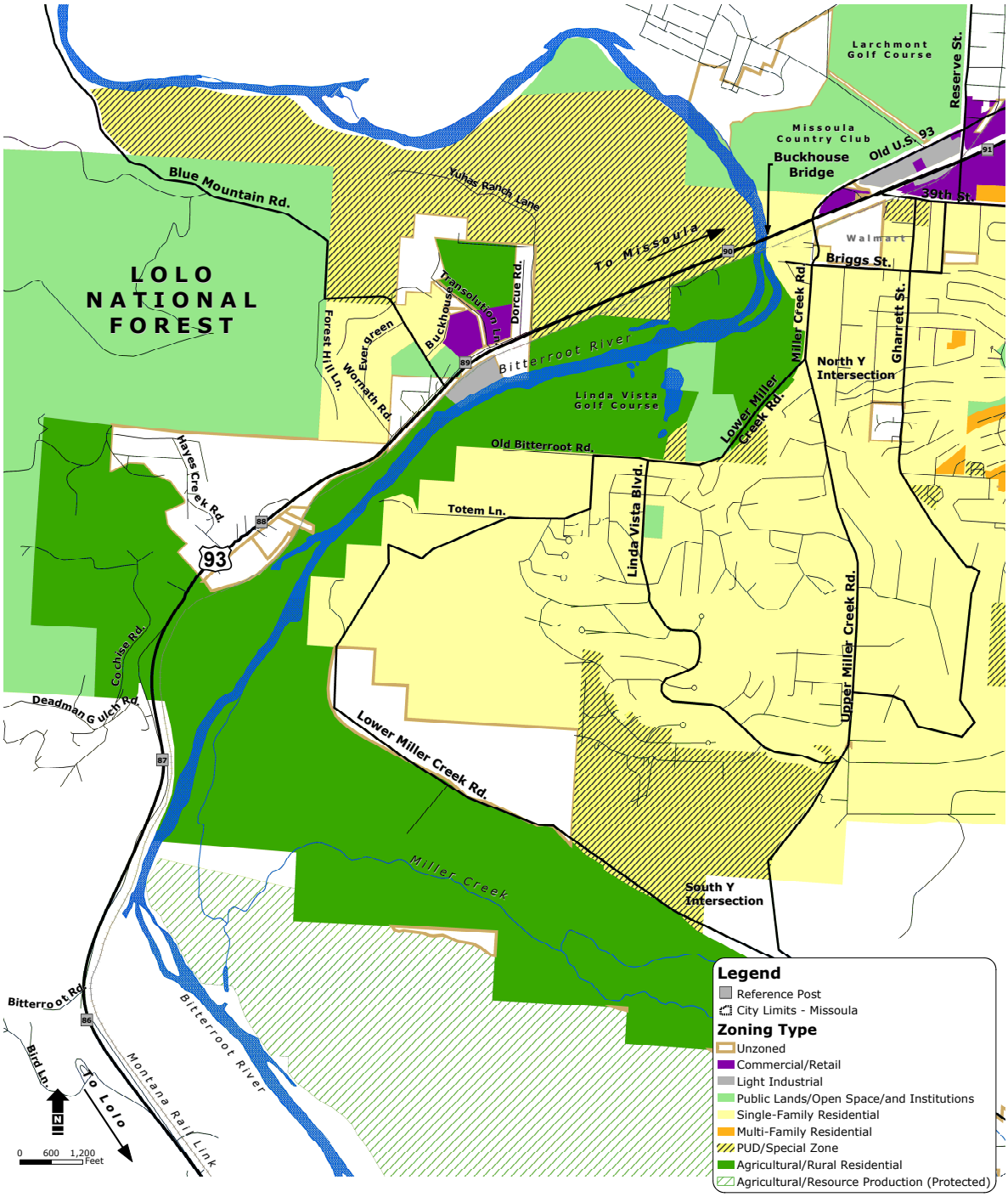


Table 3-2
City of Missoula Zoning Classifications and Definitions

Missoula Zoning Classifications	Definition
SRR	Semirural Residential—This district provides for low-density residential development of an open and rural character and provides for environmental protection of these areas that are fragile and cannot support more intensive activities because of natural conditions. Agricultural practices are permitted as currently exist.
RLD-1	Residential Low Density—Maximum density shall be one dwelling unit per acre with a minimum lot size of 40,000 square feet; clustered home sites and planned unit developments are encouraged to protect natural resources.
RLD-2	Residential Low Density—Maximum density shall be two dwelling units per acre with a minimum lot size of 20,000 square feet; clustered home sites and planned unit developments are encouraged to protect natural resources.
RLD-4	Residential Low Density—Maximum density shall be four dwelling units per acre with a minimum lot size of 10,000 square feet; clustered home sites and planned unit developments are encouraged to protect natural resources.
RR-I	Restricted One-Family Residential—Lot area shall not be less than 8,000 square feet per house.
R I	Residential, community residential facilities and one-family residential and accessory uses, libraries and parks; minimum lot area shall not be less than 5,400 feet.
R II	Two-Family Residential—Every residence or duplex shall provide a lot area not less than 2,700 feet per dwelling unit, overall lot area should not be less than 5,400 feet.
R III	Multiple Dwelling Residential—Every residence shall provide not less than 1,000 square feet for no-bedroom units, 1,500 square feet for one-bedroom units and 2,000 square feet for two-bedroom units, 2,500 square feet for three-bedroom units; overall lot area shall not be less than 3,600 square feet.
R IV	Multiple Dwelling Residential—Every residence shall provide not less than 1,000 square feet for no-bedroom units, 1,500 square feet for one-bedroom unit and 2,000 square feet for two-bedroom units, 2,500 square feet for three-bedroom units; overall lot area shall not be less than 3,600 square feet.
PUD	Residential-Planned Unit Development—A combination of land uses shall be permitted, including various residential types and commercial uses.
P-I	Open Space District—Includes floodplains, open land, public golf courses, and public parks.
P-II	Institutions District—Includes use permitted in P-I as well as some government and services buildings.
A	Residential—Minimum lot area shall not be less than 5,400 square feet.
C	Commercial—Some residential allowed.
CI	Commercial—Some residential allowed.
CII	Commercial—Some residential allowed, neighborhood commercial services permitted as well.
D	Industrial—Any uses permitted in the light industrial use district, permitted multifamily residential uses, loading and unloading space necessary.
SC	Shopping Center District—A retail business area comprised of one or more adjacent or adjoining commercial establishments.

Source: *Missoula City Zoning, Ordinance, Title 19* (September 1999).

There are ten different zoning classifications in the project area that have uses stipulated by the *Missoula County Zoning Resolution*, January 30, 2001. **Table 3-3** explains the County zoning classifications and designated uses.

Table 3-3
Missoula County Zoning Classifications and Designated Uses

Zoning Classification	Designated Use
C-RR1	Residential—Provides for a transitional low-density residential district between urbanized areas and agricultural areas.
C-RR2	Residential—Promotes a single-family residential environment in areas served by adequate public facilities. Planned unit developments and planned variations are encouraged to further the intent of this district.
C-RR3	Residential—Provides for moderate-density, single-family housing in areas served by adequate public facilities.
C-A3	Residential—Provides for low-density residential development of an open and rural character in areas and provides for environmental protection of these areas that are fragile and cannot support more intensive activities because of natural conditions.
C-A1	Open and Resource Lands—Protects open lands not capable of supporting urbanized development due to natural conditions. Encourages continued use of land for recreation and natural resource production.
ZD-43	This is a citizen-initiated zoning district approved in 2002. There are three sub-districts with permitted uses: residential, commercial, and agricultural. The residential zone contains ± 18 acres, commercial ±18 acres, and agricultural ±38 acres.
ZD-18	This is a separate zoning designation established by the County in 1971. Permitted uses include single and multi-family residences, churches, commercial uses, libraries, parks and playgrounds, and schools.
C-P1	Public Lands and Institutions—Provides for major public lands and quasi-public buildings and uses, including existing land reserves.
C-I1	Light Industry—Accommodates light manufacturing, processing, fabrication, repairing and assembly of products or materials.
ZD-39	This is a separate zoning designation established by Missoula County in 1975. Permitted uses include, but are not limited to, single-family residence, schools, churches, parks, libraries, community halls and planned unit development.

Source: *Missoula County Zoning Resolution*, January 30, 2001.

3.1.3 Future Land Use

Future land use conditions for the project area are derived from the following locally adopted plans:

- *Missoula Urban Comprehensive Plan*, 1998 update
- *Missoula County Growth Policy*, August 2002
- *The 1997 Miller Creek Area Comprehensive Plan Amendment*

The *Missoula Urban Comprehensive Plan*, 1998 update, is used as a guide to plan for general growth and development occurring within the urban area. The primary objective of the plan is to manage growth and future development while meeting objectives for housing projects, business and economic activity, and public infrastructure. Land use designations provided by the *Missoula Urban Comprehensive Plan*, 1998 update, are used as guiding principles. Neighborhood plans or zoning requests should be in substantial compliance with this guidance. The plan defers to the local neighborhood plans for a guide to site-specific development.

The *Missoula Urban Comprehensive Plan*, 1998 update, discusses a planning tool that would "identify areas that are appropriate for location of urban types of development." These "urban growth areas" are projected to follow capital (sewer and water) infrastructure improvements. The location and availability of these infrastructure services act as determinants for areas appropriate for urban growth. The urban growth area boundary designated by the City of Missoula coincides with the Wastewater Service Area Boundary. The City of Missoula Wastewater Service Area Map, November 2001, shows the boundary for existing and future sewer infrastructure and

includes the Miller Creek area. New development in the Miller Creek area is occurring as far south as Miller Creek and portions of this area have been platted and approved.

Historically, zoning has primarily taken place in response to individual requests and market demand, which has resulted in fragmentation. The *Missoula Urban Comprehensive Plan*, 1998 update, seeks to rectify this and aims to make future land use more "cohesive." Major principles set forth in the plan applicable to future land use in the project area include:

- Protect fragile natural resources and maintain current level of agricultural activity.
- Cluster new development to distinguish between urban and rural areas.
- Install Neighborhood Commercial Areas to allow the suburban area to function as an independent neighborhood. The community also benefits from the reduction of motorized travel, which occurs with locating commercial areas within neighborhood residential areas.
- Establish development standards and encourage public involvement in pre-application process.

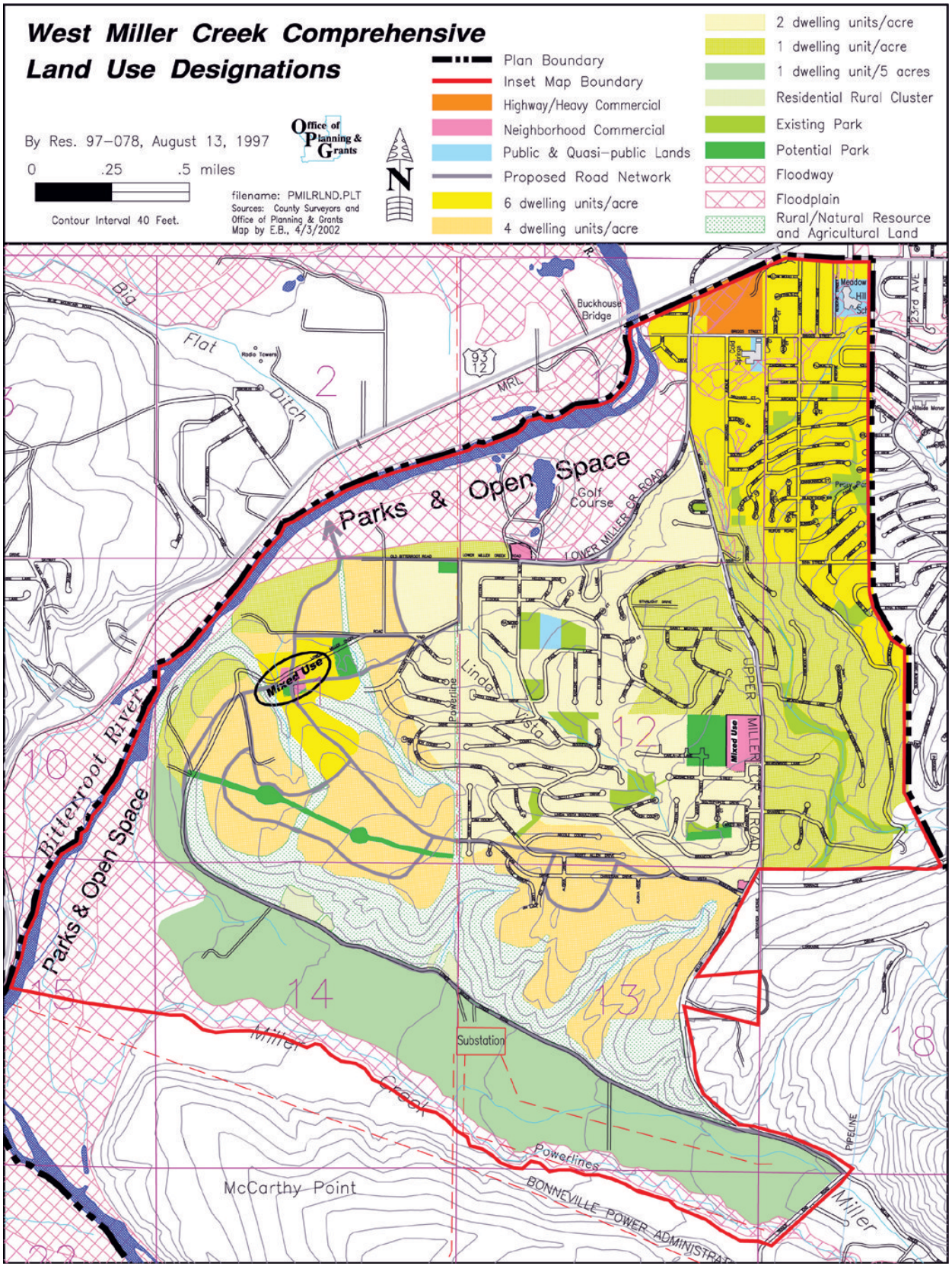
The *Missoula County Growth Policy* was prepared in August 2002 by the City of Missoula and Missoula County to meet requirements outlined in state law, provide a framework for continued planning efforts in the City of Missoula and Missoula County, and provide guidance for subdivision regulation and review. The plan outlines the guiding principles, goals, and objectives for the community. A guiding principle is to protect critical lands and natural resources while enhancing human resources. The goals and objectives are discussed for the natural environment, development patterns and land use, the County's economy, housing, local services and facilities, transportation, emergency services, and recreation resources. Regulatory, policy, fiscal, and educational planning tools were established to implement the plan. Also included are the implementation strategies reviewed and adopted by the City of Missoula and Missoula County through the various comprehensive and area plans.

In general, the primary goal is to manage growth in a proactive manner rather than a reactive manner. From this general goal more specific goals related to the areas discussed above were developed. These more specific goals are: identify where certain types of growth should or should not occur, encourage development to locate in areas where facilities are available, fully address impacts associated with development, encourage a land use pattern that facilitates use of all modes of transportation, concentrate commercial and residential development in areas where the transportation system can support it, provide accommodations for alternative modes of transportation, encourage a land use pattern that facilitates provision of emergency services, provide community recreation opportunities, locate recreation open spaces near existing and future development, and provide access to adequate community centers for local activities. The tools developed as part of the plan are then utilized to implement the plan.

Site-specific recommendations for future development in the project area are outlined in *The 1997 Miller Creek Area Comprehensive Plan Amendment* and are controlled by zoning ordinances and local and state environmental regulations. Citizens in the Miller Creek Valley collaborated with the Missoula County Office of Planning and Grants to establish neighborhood goals and design guidelines for their neighborhood. These goals and guidelines provide the basis for land use and transportation planning recommendations contained in **Figure 3-2**. As previously noted, an arrow on that figure designates a second access as part of the proposed roadway network.

One area of interest to local landowners within the project area is the area north of Old Bitterroot Road. The majority of this land is in the FEMA-designated floodplain/flood way. *The 1997 Miller Creek Area Comprehensive Plan Amendment* shows this area categorized as Parks and Open

Figure 3-2
West Miller Creek Comprehensive Land Use Designations



Space, and it would likely not be developed. The City of Missoula and Missoula County have zoned this area as low density, semirural residential. The designation provides for environmental protection of areas that are fragile and cannot support more intensive activities because of natural conditions. Currently, the area is used for agricultural/ranching purposes and contains rural residential development. The property immediately south of this parcel is categorized as one to four dwelling units per acre and is zoned for single-family residential. Development at a greater density or a change in land use is not expected to occur in this area, unless the property owner obtains a change in zoning.

The ongoing growth in the project area is occurring in a slightly different development pattern than specified in *The 1997 Miller Creek Area Comprehensive Plan Amendment*. Changes to the existing pattern of development include an addition to the current urban/suburban neighborhoods (Upper Linda Vista, Lower Linda Vista, Southpointe, and the Country Club Addition) of another neighborhood type - the neighborhood center. Three neighborhood centers are proposed within the project area. These are small-scale, mixed-use areas that contain higher-density residential and commercial development. These centers strive to reduce the dependency on automobiles for neighborhood residents. Homes would be situated closer together to maximize the preservation of open space. The density range is one to six dwelling units per acre. The plan recommends that urban development be limited after the area has reached 80 percent build-out.

The 1997 *Miller Creek Area Comprehensive Plan Amendment* incorporates area private development plans into the land use designations shown on **Figure 3-2**. These include the *Revised Development Plan, Maloney Ranch*, February 2003; the *Maloney Ranch: Miller Creek Area Transportation Study,* July 1996; and the *Twite Family Master Plan*. Development proposals in the Miller Creek area fall under three ownerships: the Maloney Ranch holdings (55 percent), Twite Partnership holdings (36 percent), and other landowners (9 percent) in the area. These make up the past, current, and future development plans leading to full build-out of the Miller Creek area by 2025.

Information regarding the Maloney Ranch conservation easements was originally documented in the *Maloney Ranch Conservation Easement Report* (Land and Water Consulting, Inc., December 1995). There are four large parcels that have been designated as conservation easements within the project area along the western boundary of the Bitterroot River. The parcels have tremendous open space value for the residents of the Miller Creek area. According to the report, the parcels create a unique setting for wildlife, open space, recreation and vegetation, riparian values, and wetlands. Protection of the areas will provide the community an opportunity to preserve these resources in perpetuity.

3.2 Farmland

The Farmland Protection Policy Act of 1981 protects Prime and Unique Farmland as identified by the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). The purpose of this act is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. It also assures that federal programs are administered in a manner that, to the extent practicable, will be compatible with government and private programs and policies to protect farmland.

Prime Farmland is defined as soil that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. Unique Farmland includes land that possesses the above characteristics, but is being used to produce livestock and timber. It does not include land already in or committed to urban development or water storage.

Farmland, other than Prime or Unique Farmland, that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops, is determined by the appropriate state or local government agency or agencies.

The NRCS field office in Missoula was contacted to determine soil types in the project area. All geographic and farmland classification data are available through the Soil Survey Geographic (SSURGO) Database. This annually updated database provides all soil classifications, including Prime, Unique, Statewide, and Local. SSURGO data show that there are 24 different soil types in the project area (the project area covers approximately 5,000 acres). Of all the soil types, one is classified as Prime Farmland if Irrigated and no soil types are classified as Unique Farmland (see **Figure 3-3**). Two soil types in the project area are classified as Farmland of Local Importance covering 462 acres, which is approximately 9 percent of the 5,000 acres of soils in the project area.

Table 3-4 lists the protected soils that are located in the project area. If an area is developed or is planned for development, it is not considered Prime or Local Importance. Some soils of Prime or Local Importance that are located in the project area are not currently in agricultural production.

Table 3-4
Protected Soils Located Within the Project Area

Soil Type	Type of Farmland	Acres*
Bigarm gravelly loam, 0 to 4 percent slopes	Prime Farmland if Irrigated	189
Grassvalley silty clay loam, 0 to 4 percent slopes	Farmland of Local Importance	120
Moiese gravelly loam, 0 to 2 percent slopes	Farmland of Local Importance	342
TOTAL		**651**

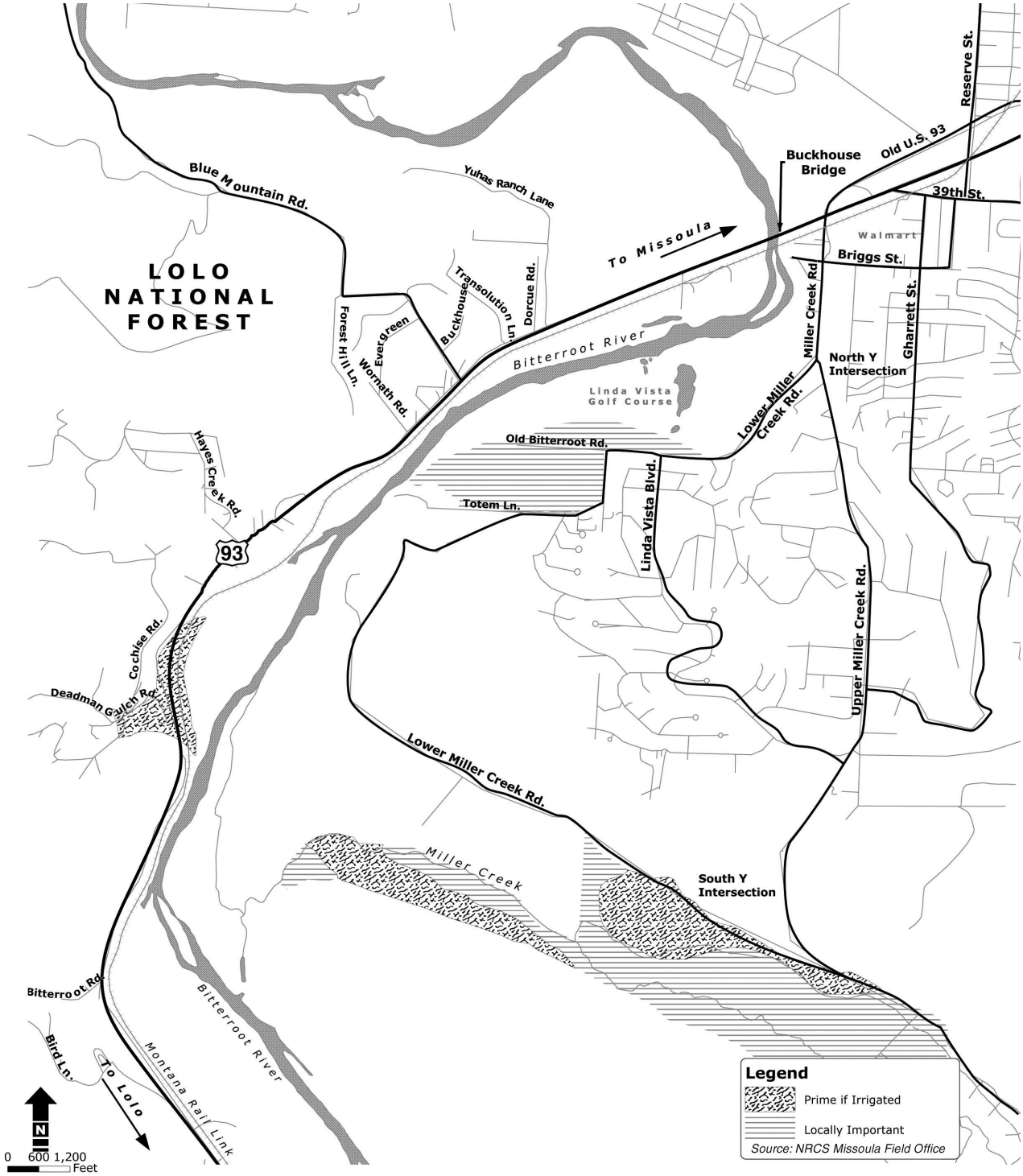
*Acreage rounded to nearest whole number.
Source: Montana Natural Resource Conservation Service, Soil Survey Geographic Data (SSURGO).

Within the project area, there are a number of large parcels used for ranching and agricultural production. Most farms and ranches on the floodplains of the Bitterroot and Clark Fork Rivers serve as hayland, pasture and calving or cover areas for livestock. Some parcels grow grain in rotation with hay or as a cash crop. A number of these areas have been classified as soils of Farmland of Local Importance. These farming operations contribute to the local character of the project area, and comments received at public meetings have stated that these areas are important to the local community.

Agriculture is Montana's number one industry; the state is ranked second nationally in farm and ranch acreage with approximately 60 million acres in use. The Agricultural Census is conducted every five years, with the most recent survey in 2002. As of 2002, there were 641 farms in Missoula County, with an average farm size acreage of 403 acres. Between 1997 and 2002, the acreage of land in farms decreased approximately 1.5 percent.

Although statistics show the amount of land in farms in Missoula County has decreased (from 262,419 acres in 1997 to 258,315 acres in 2002), the market value of agricultural products sold has increased (from $8,022,000 in 1997 to $8,361,000 in 2002). According to the *Missoula County Growth Policy*, 2002, agricultural land uses contribute relatively little to the county's employment and economic base. Compared to other counties in the state, Missoula County ranked 52nd out of 56 for total agricultural receipts. Overall, less than 1 percent of the county's total net income is derived from raising livestock and crops.

Figure 3-3
Areas of Prime and Locally Important Farmland



3.3 Social Conditions

This section describes social characteristics of the region and project area, including the history, population, community facilities, public safety providers, and environmental justice. Information is derived from the US Census Bureau, *The 1997 Miller Creek Area Comprehensive Plan Amendment*, the *Missoula County Growth Policy,* 2002, and other regional and local sources.

3.3.1 History

In the early history of the region, the Salish Indians traveled from their homeland in the Bitterroot Valley north to Marias Pass to hunt buffalo. The Indians were known to camp in the Miller Creek Valley. The Kootenai Indians inhabited the mountainous terrain west of the divide, venturing only seasonally to the east for buffalo hunts. During the 1700s, the Salish, Kootenai, and Pend d'Oreille Indians shared common hunting and gathering grounds. With the signing of the Hellgate Treaty, their massive landholdings were ceded and the tribes now share the grounds of the Flathead Reservation. The Flathead Reservation is located north of Missoula and borders Flathead Lake. Today, over 7,000 members of the Salish, Kootenai, and Pend d'Oreille live on the reservation.

The first non-native homesteader to the area settled around 1864 in the area now known as the Maloney Ranch. Settlements during the following 100 years were primarily agrarian. From the 1920s to the 1950s, a cycle of settlement, relocation and a loss of population occurred. Homesteaders eventually moved to nearby towns but continued to work their land and created low-density suburban areas at the edge of town. Today, the development pattern is primarily suburban with a rural feel (*The 1997 Miller Creek Area Comprehensive Plan Amendment*). The first Linda Vista neighborhoods were platted in 1956.

3.3.2 Population

According to US Census Bureau data, the 2000 Missoula County population was 95,802. Missoula County experienced a 22 percent increase in population between 1990 and 2000, which amounts to an average annual growth rate for the period of 2.0 percent compared to the state's annual growth rate of 1.3 percent for the same period. During this period, the county ranked eighth in the state in terms of population change and was second in the state for population size, only behind Yellowstone. Census data indicate that the majority of the population in Missoula County (approximately 83 percent) lives within the Missoula urban area. However, lands outside the urban area have experienced the greatest proportion of population increase over the past ten years. The City of Missoula population grew by approximately 33 percent between 1990 and 2000.

The US Census Tract, which includes Lower Miller Creek, Linda Vista, and surrounding neighborhoods, experienced a 26 percent population increase between 1990 and 2000 (a change from 12,657 to 15,893 persons).

Population increases between 30 and 40 percent are expected in the state of Montana and Missoula County by 2025. New developments planned in the Miller Creek area are predicted to increase the residential population to 7,250 and the residential dwelling units to approximately 3,000 by 2025. This represents an increase of approximately 1,380 additional residents if the projects are developed as proposed (*Maloney Ranch: Miller Creek Area Transportation Study*, 1996). Population rates and projections are shown in **Table 3-5**.

The median age in Missoula County is 33. Trends show that the proportion of the population under 18 years of age has decreased and the proportion of the population 65 years and older

Table 3-5
Historical and Projected Population Changes

Location	1990	2000	% Change 1990-2000	2025	Projected% Change 2000-2025
Montana	799,065	902,195	12.9%	1,148,162	27.3%
Missoula County	78,687	95,802	21.8%	133,671	39.5%
City of Missoula	42,918	57,053	32.9%	*	*

Source: Montana Department of Commerce, NPA Data Services, Inc.
U.S. Census Bureau, 2000.
*Information not available.

has increased, which reflects similar trends across the nation. As the population increases, the demand for local services will continue to increase, especially services for the elderly.

3.3.3 Housing

The increase in population over the next 20 years will cause an increase in the need for housing. US Census Bureau data showed that the number of households in Missoula County increased 25 percent between 1990 and 2000. When compared to population figures, the data shows that the average household size is decreasing. The average household size in 2000 was 2.39 persons, down from 2.47 persons in 1990. Since the population is expected to increase approximately 39.5 percent in Missoula County over the next 20 years, an increase in housing units is projected. If the average household size in 2000 (2.39 persons) remains constant, the amount of housing needed to accommodate the 2025 population is approximately 55,929 units. This represents a 35 percent increase in housing units.

In 2000, Missoula County had a 93 percent housing occupancy rate. Approximately 7 percent of the total housing units were vacant; of those, 3.2 percent were for seasonal, recreation, or occasional use. The homeowner vacancy rate in the county was 1.1 percent in 2000, and the rental vacancy rate was 4.0 percent. The *Missoula County Growth Policy*, 2002, states that Missoula County is below the 5 percent rental vacancy rate, which is an indicator of an unmet demand for rental housing.

Approximately 62 percent of the Missoula County residents own their homes, compared to 69 percent for the state. Wages in Missoula County have not kept up with increases in housing costs. The 2000 median value of a home was $136,500 (an increase of 56.5 percent), while the household income increased by only 10 percent.

3.3.4 Education Facilities

Over the course of history, four schools have been built in the Miller Creek area. One school was near the Holloman farm (exact location is unknown). The Buckhouse School was located at the northeast corner of the Maloney Ranch and was later moved across the Bitterroot River to Hayes Creek. The other two schools were consolidated in 1919 into Cold Springs Elementary (*The 1997 Miller Creek Area Comprehensive Plan Amendment*). Cold Springs Elementary is located on Briggs Street approximately 0.4 mile east of Miller Creek Road. The average enrollment is approximately 400 students. Meadow Hill Middle School is located on South Reserve Street approximately 0.5 mile east of the intersection of Miller Creek Road and US 93. The school serves approximately 450 to 500 students. Typically, students from Chief Charlo and Cold Springs Elementary Schools feed into Meadow Hill Middle School. Chief Charlo is the newest of

the Missoula elementary schools with approximately 450 to 500 students. It is located east of the project area but draws students from neighborhoods within the project area.

School bus service to the Miller Creek area is provided by Beach Transportation and Valley Christian Schools Transportation Companies. Beach Transportation operates approximately 25 to 30 bus routes per day through the area, and each route is traveled in the morning, midday, and afternoon. The buses use Briggs Street and 39th Street for access to and from the Miller Creek area, making numerous stops in the area. The most commonly traveled roads are: Gharrett Street, Linda Vista Boulevard, Upper Miller Creek Road, Maloney Ranch Road, Lower Miller Creek Road, and Helena Drive. There is also a school bus transfer site located on Blue Mountain Road.

Valley Christian Schools Transportation has one bus route that serves the Miller Creek area, which is traveled in the morning and afternoon. The bus gains access to and from the Miller Creek area from US 93 via Miller Creek Road. Three bus stops are located in the project area. They are located at the intersections of St. Thomas and St. Francis, Timothy Court and Linda Vista Boulevard, and Linda Vista Boulevard and Jamie Ann.

There are no high schools in the immediate project area. Most students attend either Big Sky High School or Sentinel High School. Big Sky High School is located approximately one mile north of US 93 at 3100 South Avenue West and has approximately 1,300 to 1,400 students. Sentinel High School is located one mile northeast of US 93 at 901 South Avenue West and has approximately 1,100 to 1,200 students. Both schools are served by Beach Transportation bus lines and pick up students from the Miller Creek area.

No new school sites have been approved as part of the proposed developments in the Miller Creek area. The *Maloney Ranch: Miller Creek Area Transportation Study,* 1996, listed two proposed school sites and one recreation center site. The locations of these sites were not designated, and the planned developments for the area are limited to residential and commercial uses.

The University of Montana in Missoula has approximately 12,000 to 13,000 students. The University has a performing arts center, tennis courts, a swimming pool, track, stadium, field house and playing fields.

3.3.5 Community Facilities

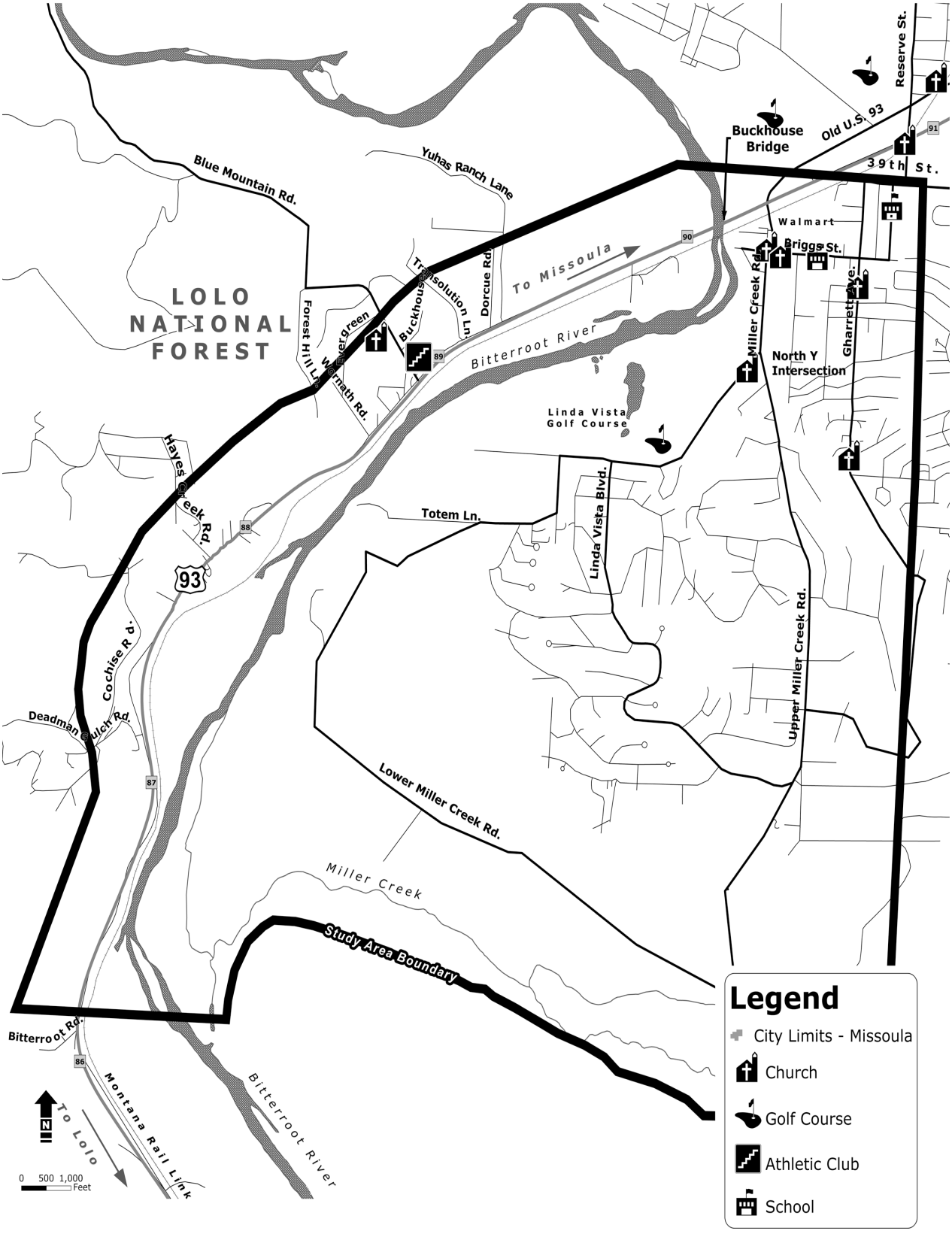
Community facilities in the project area are limited. The privately owned Linda Vista Golf Course is a nine-hole golf course open to the public located on Lower Miller Creek Road east of Linda Vista Boulevard and south of the Bitterroot River. The Missoula Country Club is a privately owned, 18-hole golf course located adjacent to Old US 93. The Larchmont Golf Course is a public facility that is also located adjacent to Old US 93.The Montana Athletic Club is located north of the intersection of Blue Mountain Road and US 93. The Montana Athletic Club has an athletic facility, physical therapy clinic, and day spa. Other community facilities, such as elderly care centers, hospitals, libraries, museums, police stations, and post offices, are located northeast of the project area within the City of Missoula.

There are eight churches in the Miller Creek project area, and more than 20 others northeast of the project area. **Figure 3-4** shows the location of community facilities.

3.3.6 Environmental Justice

On February 11, 1994, Federal Executive Order 12898: *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued to reinforce Title VI of the Civil Rights Act of 1964. The order requires federal agencies to incorporate Environmental Justice considerations into the National Environmental Policy Act (NEPA) planning process by

Figure 3-4
Community Facilities Located in Project Area



taking the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable, and permitted by law.

The purpose of the above regulations is to ensure that minority and low-income populations and minority-owned businesses do not receive "disproportionately high or adverse effects" as a result of federal actions. The term adverse effects includes, "all significant individual or cumulative health or environmental effects, including interrelated social and economic effects." If such effects are predominantly borne by a minority population or low-income population, or if those populations would suffer greater or more severe impacts than others, then the effects are disproportionate. As an entity utilizing federal funds for the proposed action, the Federal Highway Administration (FHWA) is responsible for successfully integrating Environmental Justice into its program and planning activities.

3.3.6.1 Minority Populations

The first step in Environmental Justice analysis is to identify whether or not minority or low-income populations are present in the project area. Identification is based on US *Census 2000* data, information from the US Department of Health and Human Services (HHS), and communication with regional and local entities.

Minority populations are those of ethnic and/or racial minorities. According to census data, race information is broken down into seven mutually exclusive categories: White, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, some other race, and two or more races. It is important to note that Hispanic is not listed as a race category and data pertaining to people of Hispanic origin is accounted for under ethnicity.

According to census statistics, the minority population of Missoula County was 6.9 percent and the Hispanic population was 1.6 percent. The City of Missoula documented slightly higher figures than Missoula County. The 2000 minority population for the City of Missoula was 7.4 percent and the Hispanic population was 1.8 percent. These figures provide a threshold for determining minority populations in the project area based on census boundaries (see **Table 3-6**).

Table 3-6
City of Missoula and Missoula County Racial and Ethnic Minority Percentages

Race	Missoula County	City of Missoula
White	94.0%	93.6%
Black	0.3%	0.4%
American Indian	2.3%	2.4%
Asian	1.0%	1.2%
Native Hawaiian	0.1%	0.1%
Other Race	0.4%	0.5%
Two or more races	1.9%	1.9%
Ethnicity	**Missoula County**	**City of Missoula**
Hispanic	1.6%	1.8%

Source: US Census Bureau, 2000.

Census boundaries are divided into tracts, block groups, and blocks. Blocks represent the smallest areas and are therefore most detailed in terms of minority population. Of the blocks located in Missoula County, approximately 18 blocks in the project area contain minority populations above the county average, and 15 blocks contain minority populations above the City of Missoula average.

The Blue Mountain Trailer Park, located across from Hayes Creek Road on the east side of US 93, has approximately 25 to 30 mobile homes. Census data show that 91 persons reside in the block containing the trailer park and that 4 persons are minority. The block contains one American Indian, two Hispanics, and one person of two or more races. The minority population is 4.4 percent, and is not higher than the city or county minority population averages.

Minority populations within the wider project area are located along Gharrett Street south of US 93. The predominant minority populations in this area are American Indian, Asian, and persons of two or more races. A large census block bounded by Maloney Ranch Road to the west, Lower Miller Creek Road to the north, and Helena Drive to the east contains approximately 500 people, of which 36 (7 percent) are minority. Asian and Hispanic are the highest minority categories in this block. The area to the north of US 93 along Old US 93 is primarily commercial and industrial. Thus, there are few residents in that area.

Missoula Measures is a Web site prepared and maintained by the Missoula City-County Health Department. The site contains data through 1999 on topics related to community health in Missoula County. A discussion of minorities in the Missoula area explains that American Indians in Missoula are a diverse mix, with more than 20 tribes from Alaska to the Southwest represented. Most Missoula American Indians are from Montana tribes, and many spend some time on reservations and some in Missoula. *Census 2000* indicates 2.3 percent of the population to be American Indian, although the Missoula Indian Center has estimated that 5 to 6 percent is more realistic. In terms of income, education, housing conditions, and employment, American Indians are at a greater disadvantage compared to the average Missoula resident.

Information regarding minority business enterprises within the project area is derived from the Disadvantaged Business Enterprise (DBE) program administered by the Montana Department of Transportation (MDT). According to the DBE Directory, there are no known minority- or woman-owned businesses in the project area.

According to Missoula County Public Schools, the majority of students fall within the ethnic category of "white/other." American Indian is the largest group among the ethnic minorities. They make up three percent to five percent of the total student population in the elementary schools and roughly three percent of the high school students.

According to *Census 2000* data, none of the census blocks in and adjacent to the portion of US 93 within the project area contain minority populations above 6.9 percent, which represents the Missoula County minority population average in 2000. Overall, minority populations are dispersed throughout the county. Contact with local sources did not indicate specific minority populations in the project area or within the potential area of impact, beyond what was indicated by *Census 2000* data.

3.3.6.2 Low-Income Populations

In addition to minority populations, regulatory guidelines require identification of any low-income populations in the project area. Executive Order 6640.23 and Department of Transportation (DOT) Order 5610.2 define low income as "…a person whose median household income is below the HHS poverty guidelines." These guidelines provide a formula based on the number of persons in a household or family and their annual income. The 2006 national poverty level, according to the HHS, was reported to be $20,000 for a family of four. This value was used as the low-income threshold for purposes of this environmental justice analysis.

Because census data are released only in increments of $5,000, the analysis threshold will be $19,999. Therefore, any households that earn less than $19,999 per year will be evaluated for disproportionately high impacts and adverse effects. According to the *Census 2000* data at the block group level, approximately 28 percent of the households in Missoula County fall below the

$19,999 income threshold. Within the project area, none of the ten block groups exceed the county average of 28 percent based on a family of four.

Although not above the county average, the majority of block groups shown along the eastern portion of the project area contain higher percentages of low-income households. Since most of these block groups extend well outside the study area to the east, it is likely that the majority of low-income households in those block groups are in neighborhoods located east of the project area.

Two block groups cover the US 93 corridor in the western portion of the project area. These groups contain 14 percent to 15 percent low-income households based on the threshold described above. Because of the rural demography of the project area, these census block group boundaries extend far beyond the project area, with land coverages over 10,000 acres each. In addition, the area west of US 93 is primarily forested land. Therefore, more detailed research at the regional and local levels was conducted to determine whether low-income populations exist within the project area and potential impact area.

The Human Resources Council (HRC) is a private nonprofit community action agency that offers assistance to low-income households in three counties: Mineral, Missoula, and Ravalli. The HRC provides financial assistance to qualifying households in the purchase of new homes or repairs to homes. A representative of the HRC explained that no financial support has been provided to residents of the Miller Creek area. This is because a restriction to the program states that the purchase price of a home being bought by a qualifying household cannot exceed the Federal Housing Administration (FHA) mortgage limit for Missoula County. The FHA mortgage limit is $220,875, and homes selling in the project area exceed this limit.

Missoula Measures provides a description of income, poverty, and housing figures of residents within Missoula County. The report explains that as of May 2001, over 16 percent of Missoula residents lived in poverty, compared to approximately 11 percent in 1970. The percentage of children living in poverty has at least doubled since the 1970 census (from 10 percent to over 20 percent). More specifically, approximately 4,700 Missoula children under the age of 18 live in poverty. Statistics show that poverty rates are higher in rural areas. High poverty levels may also be attributed, in part, to the seven American Indian reservations located across the state. The Missoula Valley and Bitterroot Valley lie within lands ceded to the United States by the Salish and Kootenai Tribes. Detailed economic information for tribal lands is described in Section 3.6, Economic Conditions. Between the years 1997 and 2000, an average of 27 percent of Missoula County's elementary students received free school lunches. An additional 8 percent received lunch at reduced prices. In the three schools in or near the project area, 9 percent of the students are free lunch recipients at Cold Springs Elementary and 21 percent are free lunch recipients at Chief Carlo Elementary School.

According to the data, in 1990, rent consumed 21 percent of the average worker's monthly income. In 1998, rent consumed 28 percent of the average worker's monthly income ($550/$1,952, both in 1998 dollars), beginning to push the average household into a cost burden for housing. As a result, the average-income family is paying a higher percentage of their income for rental housing now than they did ten years ago. Low-income families are experiencing an increasingly severe cost burden for housing. This causes low-income families to move to towns and counties outside Missoula, such as Clinton, Lolo, and other nearby towns.

According to *Census 2000* data, none of the census blocks in and adjacent to the portion of US 93 within the project area exceed the low-income county average of 28 percent. Overall, low-income households are dispersed throughout the county. Contact with local sources did not indicate specific low-income households in the project area or within the potential area of impact.

3.4 Transportation

The information presented in this section is primarily from the *Transportation Analysis Technical Report*, August 2004, and as amended March 2006, prepared for this Environmental Impact Statement (EIS) and supplemented by information found in local and state plans. The various plans used provide more in-depth information and are as follows:

- *2004 Missoula Urban Transportation Plan Update*, May 2004
- *Maloney Ranch: Miller Creek Area Transportation Study*, July 1996
- *2001 Non-Motorized Transportation Plan*

The existing transportation conditions are used as a basis for forecasting approximate "design year" 2025 traffic conditions. Existing and future transportation conditions of the Miller Creek area serve as the primary basis for the purpose and need for the Miller Creek Road EIS. The transportation conditions are the result of many factors, including land use policies and resulting development patterns, population and employment growth, and public infrastructure funding availability.

The area evaluated for the transportation analysis is the general area within which potential transportation effects of the EIS alternatives, particularly changes in average daily traffic volumes and travel patterns, could be quantified or otherwise evaluated at a reasonable level of confidence. The transportation system that serves the project area provides limited travel routes to the Missoula urban core area that is situated north and east of the project area (see **Figure 1-2, page 1-3**). Miller Creek Road currently provides the only direct access between the existing and future development in the Miller Creek area and US 93, the primary route between this area and the Missoula urban core. It also is used by recreation and commercial vehicles for access to US Forest Service (USFS) land south and east of the project area. Gharrett Street serves as an indirect access with a longer, more circuitous route that provides limited effectiveness for moving traffic into and out of the Miller Creek area and directs traffic through a neighborhood. South Avenue and Blue Mountain Road are the primary routes that provide access to and from areas to the north of US 93. These northern areas were evaluated for indirect and cumulative transportation-related effects.

The transportation facilities serving the project area are oriented almost entirely towards accommodating motorized traffic, without a connective network of safe and convenient facilities for pedestrians and bicyclists. Furthermore, the transportation system does not support effective transit service, which relies on safe and convenient access by non-motorists. An incomplete and imbalanced transportation network serving predominantly low-density residential development in an area relatively far from concentrated community and commercial activities causes nearly all trips in and out of the project area to be made by single-occupant vehicles (SOVs).

Future Traffic Methodology

In coordination with, and with concurrence from, the SEE Team, revised 2025 forecasted ADT volumes and AM and PM peak hour traffic forecasts were developed for the No-Action Alternative and for each of the four alternative alignments (i.e., North Lower Miller Creek, Blue Mountain Road, South Lower Miller Creek, and Miller Creek Road). Similar to those developed for the *Miller Creek Road Transportation Analysis Technical Report,* completed in November 2004 and amended in 2006, these revised forecasts were made on the basis of ADT and peak period volumes that would not vary to a measurable degree under the different types of connections (intersections and interchange concepts) to US 93 proposed at each of the alignment locations.

2025 forecasted ADT volumes presented in the 2004 *Missoula Urban Transportation Plan Update* (MUTP) were used to analyze project alternatives and to prepare the *Miller Creek Road Transportation Analysis Technical Report,* November 2004 and amended 2006. The future transportation

system planning year for the *2004 Missoula Urban Transportation Plan Update* is consistent with the 2025 forecast horizon year for the Miller Creek Road EIS and represents the future "design" year for all of the Miller Creek Road EIS alternatives.

Several related factors warranted revision of the 2025 forecasted ADT volumes on US 93 south of Reserve Street to levels that are substantially greater than the 2025 ADT volumes presented in the MUTP and in the *Miller Creek Road Transportation Analysis Technical Report,* November 2004 and amended 2006. These factors include:

- Current (2003) US 93 ADT volumes from MDT that already approach forecasted 2025 ADT volumes conveyed in the MUTP.
- Foreseeable population growth trends and development proposals in Ravalli County and in the Lolo area that exceed the demographic baseline forecasts used to prepare the MUTP.
- Forecasted volumes displayed in the MUTP that were based on a desired regional constrained "smart growth" policy objective, which are not consistent with more current trends based on accelerated recent and foreseeable growth.

For detailed information on the revised 2025 ADT traffic volumes, please refer to Section 2.5.3, page 2-11.

Revised future traffic distribution throughout the Miller Creek analysis area was developed through a multiple step process that took into account several elements, including travel demand model distribution patterns, new ADT forecasts, and planned Wal-Mart expansion impacts that were not previously considered. The expansion to a Super Wal-Mart was assumed as a worst-case scenario; if this does not occur, the change in traffic volume would be fairly insignificant. First, the future traffic distribution in the Miller Creek analysis area was determined to be generally consistent with the traffic distribution developed for the *Miller Creek Road Transportation Analysis Technical Report,* November 2004 and amended 2006.

The transportation analysis addresses the roadway system serving the project area, including existing traffic flow and volumes, and analyzes existing traffic operating conditions and safety for the major roadway network, including segments and intersections. In addition to the vehicular traffic-oriented information, this section addresses non-motorized (pedestrian and bicycle) travel, public transportation, transportation system management (TSM), transportation demand management (TDM), emergency service provider access, and rail service in the project area.

3.4.1 Roadway Conditions

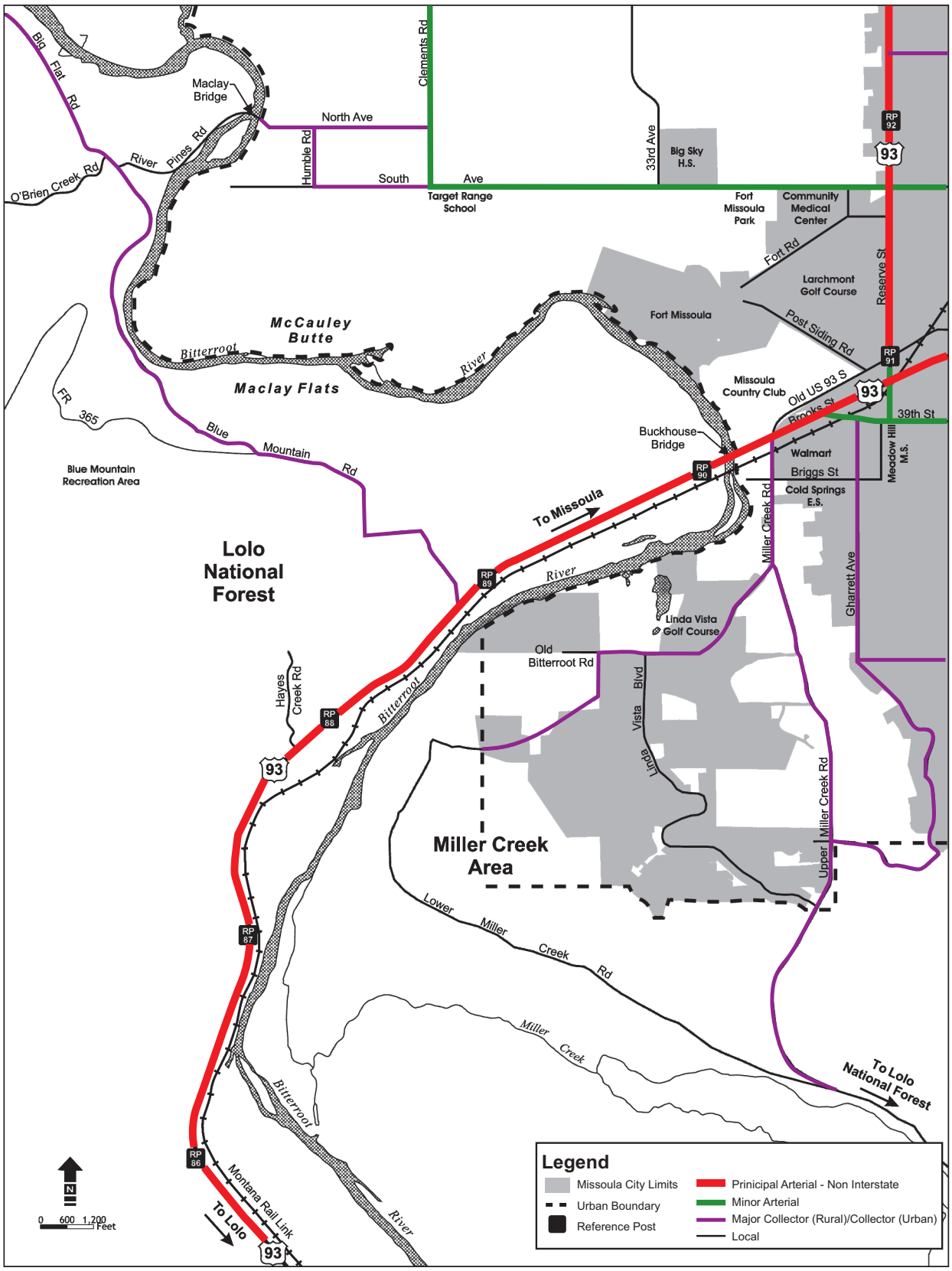
This section presents results of the existing traffic analysis of the project area. The existing traffic analysis includes an inventory of key roadway facilities; information on general vehicular traffic flow; and existing average daily traffic volumes, including AM and PM peak period traffic operating conditions.

Roadway System Inventory

Roads in the project area have several functional classifications and fall under three jurisdictions: MDT, City of Missoula, and Missoula County. The major roadway network generally consists of segments classified as collectors and arterials serving the project area is shown on **Figure 3-5.**

US Highway 93 (US 93)—a four-lane principal arterial under jurisdiction of MDT. US 93 is a part of the National Highway System (NHS) and is the primary north/south highway through the western portion of Montana. MDT is preparing access control plans for US 93, border-to-border. This highway provides the only arterial route for commuter traffic between Missoula, Lolo

Figure 3-5
Project Area Major Roadway Network



(approximately ten miles south of Missoula), and communities in the Bitterroot Valley and Ravalli County south of Lolo. US 93 is the primary route used for most travel between the project area and the Missoula urban core. Through the project area, the highway is generally aligned parallel with the Bitterroot River and Montana Rail Link (MRL) Line, and crosses the Bitterroot River via Buckhouse Bridge west of the highway's intersection with Miller Creek Road. South (west) of Reserve Street, US 93 shares NHS route designation with US Highway 12 (US 12). US 93 is situated in unincorporated Missoula County west of Miller Creek Road, and within the City of Missoula from Miller Creek Road to the east. In the city limits, US 93 is called Brooks Street to the signalized intersection with Reserve Street, and it follows Reserve Street north from this intersection. US 12 follows Brooks Street north (east) from this intersection. Through the project area, US 93 transitions from a rural principal arterial south (west) of Buckhouse Bridge to an urban principal arterial north (east) of Buckhouse Bridge.

- **Miller Creek Road**—a two- to three-lane urban collector road that provides the primary and most direct access route between US 93 and the Miller Creek area. South of the project area, Miller Creek Road provides direct access to recreation and timberland of the Lolo National Forest, privately owned commercial timber stands, and outlying rural residential development situated south/southeast of the Miller Creek area. Miller Creek Road intersects US 93 as the south leg of a four-way, signalized intersection and extends approximately 0.7 mile south to the north "Y" intersection. From US 93 to Briggs Street, Miller Creek Road is a two- to three-lane roadway with sidewalks on both sides of the roadway. South of Briggs Street to the north "Y" intersection, Miller Creek Road is a narrow, two-lane roadway with no shoulders or other facilities to accommodate passage by pedestrians and bicyclists without mixing with vehicular traffic.

  The north "Y" intersection has a substantial skew angle and cut slopes that severely impair sight distance for northbound drivers entering the intersection from Lower Miller Creek Road. The approach to this intersection from Lower Miller Creek Road is on an uphill grade with a relatively constrained level area for stopping a vehicle, which is particularly problematic during slippery conditions. The northbound Upper Miller Creek Road approach to the north "Y" intersection is on a downhill grade with limited stopping distance to the intersection and sight distances that are limited by cut slopes and a crest vertical curve located south of this intersection.

- **Old US 93**—a two-lane urban local road that serves multiple businesses on the north side of Brooks Street, and provides access to the Fort Missoula property north of the project area. Old US 93 is the north approach to the US 93/Miller Creek Road intersection. From the intersection with US 93, Old US 93 extends to the northeast on an alignment parallel to US 93 and intersects with Reserve Street approximately 600 feet north of the Brooks/Reserve intersection. Old US 93 extends east of Reserve Street as a local road serving commercial and residential areas.
- **Upper Miller Creek Road**—begins as a two-lane urban collector and transitions into a rural major collector with no shoulders that extends south from the north "Y" intersection to a second "Y"-configured intersection (south "Y" intersection) with Lower Miller Creek Road. Upper Miller Creek Road is aligned generally north/south along the east side of the Miller Creek area. This road serves a major portion of existing development in the Miller Creek area, plus rural residential development located south and east of the project area. Between the north and south "Y" intersections, Upper Miller Creek Road is a paved, two-lane road with no shoulders or other accommodations for non-motorized travel. It intersects Linda Vista Boulevard and Gharrett Street, as well as minor roads and residential driveways.
- **Lower Miller Creek Road**—begins as a two-lane urban collector and transitions into a local rural road with narrow shoulders that extends southwest from the north "Y" intersection and meanders along a generally circumferential route around the north, west, and south periphery of the Miller Creek area to the south "Y" intersection with Upper Miller

Creek Road. Lower Miller Creek Road serves a major portion of existing development in the Miller Creek area. It will be the primary road serving planned future development lying south and west of the existing residential areas. Lower Miller Creek Road is a paved roadway with narrow shoulders and no sidewalks from the north "Y" intersection to a point approximately 0.2 mile west of its intersection with Linda Vista Boulevard. From this location, to the south "Y" intersection, Lower Miller Creek Road is a narrow, unpaved rural road.

- **Linda Vista Boulevard**—a two-lane urban local road with wide, paved shoulders, and curb and gutter that bisects the existing Linda Vista residential neighborhood within the Miller Creek area on a generally north/south alignment. Linda Vista Boulevard intersects Lower Miller Creek Road approximately 0.75 mile west of the north "Y" intersection and it intersects Upper Miller Creek Road approximately 1.2 miles south of the north "Y" intersection.
- **Reserve Street (Brooks Street to 39th Street)**—a two-lane urban minor arterial with a continuous two-way left-turn lane, shoulders, sidewalks, and curb and gutter that provides a connection between US 93 and 39th Street and serves adjacent commercial properties.
- **Gharrett Street**—a two-lane urban collector that is aligned generally north/south and traverses residential neighborhoods east of the Miller Creek area. Gharrett Street intersects 39th Street near US 93, and it intersects Upper Miller Creek Road approximately 1.7 miles south of US 93, providing a second access to Miller Creek Road between US 93 and the Miller Creek area. Gharrett Street is an urban street with curbs/gutters and sidewalks north of 55th Avenue (located approximately one mile south of US 93). South of 55th Avenue, Gharrett Street is a rural road with no curb/gutter or sidewalk.
- **Briggs Street**—a two-lane collector with shoulders, sidewalks, and curb and gutter that intersects Miller Creek Road south of the Wal-Mart property. Briggs Street connects Miller Creek Road and Gharrett Street, and provides direct access to Cold Springs Elementary School and Meadow Hill Middle School, two schools serving the Miller Creek area.
- **39th Street**—a two-lane urban minor arterial with a continuous two-way, left-turn lane, striped bicycle lanes, sidewalks, and curb and gutter that provides a continuous east/west route that serves the south portion of Missoula. 39th Street intersects US 93 between the intersections of Miller Creek Road and Reserve Street, directly north of the Wal-Mart property, and connects to the Miller Creek area at Gharrett Street.
- **Blue Mountain Road**—a two-lane rural major collector with a generally substandard, predominantly curvilinear alignment with minimal shoulders that intersects US 93 on the north side of the highway approximately 1.5 miles west of Miller Creek Road. Blue Mountain Road provides access to the Montana Athletic Club and multiple commercial and industrial properties located adjacent to US 93, and extends north along an alignment that runs generally parallel to the Bitterroot River to the Lolo National Forest Blue Mountain Recreation Area and suburban and rural residential areas. Several miles north of the Miller Creek area, Blue Mountain Road turns into Big Flat Road, which serves residential areas and connects to Mullan Road, an east/west arterial that provides a second access route to the Missoula International Airport, Frenchtown, Smurfit-Stone Container and other destinations situated west of Missoula.
- **Maclay Bridge**—a one-lane local bridge that provides a connection across the Bitterroot River between Blue Mountain Road and North Avenue. The *2004 Missoula Urban Transportation Plan Update* includes a recommended project to construct a new two-lane bridge connecting River Pines Road to South Avenue to replace the one-lane bridge that has structural deficiencies and substandard geometry. Upon completion of this bridge, Maclay Bridge would not be open to vehicular traffic. The new bridge would accommodate two vehicular lanes and non-motorized facilities, and would reduce the distance between

Blue Mountain Road and the South Avenue/Humble Road intersection by approximately 0.4 mile compared to the current route.

- **South Avenue**—an urban minor arterial that serves as a key east/west route through the Missoula urban area. The segment of South Avenue in the project area is a two-lane rural arterial that functions as a key access route for local and through traffic from the unincorporated Target Range area located west of Reserve Street and north and east of the Bitterroot River. South Avenue also provides access to Reserve Street from rural residential areas located west of the river via the Maclay Bridge, North Avenue, and Humble Road or Clements Road. South Avenue serves multiple community facilities, including Target Range School, Big Sky High School, Missoula Vocational Technical Center, Community Medical Center, Fort Missoula, and the Missoula Fire District.
- **Hayes Creek Road**—a two-lane rural local roadway that intersects US 93 on the north side of US 93 approximately one mile south of the intersection with Blue Mountain Road. Hayes Creek Road provides access to multiple rural residential properties.

Table 3-7 summarizes the jurisdiction(s) and functional classifications for the key roadway segments that serve the Miller Creek area. The functional classification information provides useful data regarding design needs and access management strategies for roadways.

Table 3-7
Existing Miller Creek Area Roadways: Jurisdiction and Functional Classification

Roadway Segment	Jurisdiction	Functional Classification
US 93 (Brooks Street from Buckhouse Bridge to Reserve Street, and Reserve Street north of Brooks Street)	MDT	Principal Arterial (Urban)
US 93 (west of Buckhouse Bridge)	MDT	Principal Arterial (Rural)
Miller Creek Road (Brooks Street to Upper/Lower Miller Creek Road - north "Y" intersection)	City of Missoula	Principal Collector (Urban)
Old US 93	City of Missoula	Local (Urban)
Upper Miller Creek Road (north "Y" intersection to Linda Vista Boulevard)	City of Missoula	Collector (Urban)
Upper Miller Creek Road (south of Linda Vista Boulevard)	Missoula County	Major Collector (Rural)
Lower Miller Creek Road (east of Maloney Ranch Road)	City of Missoula	Collector (Urban)
Lower Miller Creek Road (west of Maloney Ranch Road)	Missoula County	Local (Rural)
Linda Vista Boulevard	City of Missoula	Local (Urban)
Reserve Street (Brooks Street to 39th Street)	City of Missoula	Principal Arterial (Urban)
Gharrett Street	City of Missoula/Missoula County	Collector (Urban)
Briggs Street	City of Missoula	Local (Urban)
39th Street	City of Missoula	Minor Arterial (Urban)
Blue Mountain Road	Missoula County	Major Collector (Rural)
South Avenue (Clements Road to Reserve Street)	Missoula County	Minor Arterial (Urban)
Hayes Creek Road	Missoula County	Local (Rural)

Source: Missoula Office of Planning and Grants (OPG).

3.4.1.1 2003 Traffic Flow and Roadway Segment Volumes

The majority of vehicular trips through the project area occur on US 93, with the heaviest concentration of traffic occurring during the weekday (Monday through Friday) AM peak period. During a typical weekday AM peak period, approximately 80 percent of the traffic on US 93 west of Reserve Street travels northbound (eastbound) on US 93 (west of Reserve Street). Saturated

levels of congestion regularly occur on US 93 in the northbound (eastbound) AM peak travel direction with slow-moving vehicle queues that typically extend west and south of Buckhouse Bridge.

While the predominant travel flow on US 93 through the project area is in the southbound (westbound) direction during the typical weekday PM peak traffic period, the directional flow is more evenly split with approximately 65 percent of travel in the southbound (westbound) direction and 35 percent of travel in the northbound (eastbound) direction. Travel on US 93 is relatively evenly split in both directions during most other times including weekends. Directly north and east of the Miller Creek area, US 93 traffic splits at the intersection of Brooks and Reserve Streets. In the AM peak period, approximately 45 percent of northbound (eastbound) traffic from Brooks Street turns north on Reserve Street; in the PM peak period, approximately 45 percent of southbound traffic from Reserve Street turns southbound (westbound) on Brooks Street.

Miller Creek Road, which collects predominantly commuter traffic generated within the Miller Creek area, experiences highest flows in the northbound direction during weekday AM peak periods and predominantly southbound flows during weekday PM periods. The signalized intersection of US 93 and Miller Creek Road accommodates most traffic movements between the Miller Creek area and US 93. At this intersection, the northbound to eastbound right turn is the critical movement during the weekday AM peak period, and the reverse movement—westbound to southbound left turn—is most critical during the weekday PM peak period. The combination of heavy volumes on US 93 eastbound and Miller Creek Road northbound during the typical AM peak period results in congestion on northbound Miller Creek Road with vehicle queues that extend south more than 0.5 mile through the north "Y" intersection.

Traffic flowing through the north "Y" intersection is highest in the northbound (Upper Miller Creek Road) and eastbound (Lower Miller Creek Road) directions during the weekday AM; the reverse flow is the highest of all movements during the weekday PM. Traffic flow is generally more balanced throughout the project area during other times of typical weekdays and on weekends.

Multiple residents, who live in the rural area west of Missoula near Blue Mountain Road and in the Target Range area, have raised concerns about drivers traveling between Missoula, Lolo, and other areas south of Missoula using Blue Mountain Road, Maclay Bridge, and North and South Avenues as alternate routes to avoid congested conditions on US 93. A small portion of through trips divert from US 93 to this secondary route, and the use of this alternate route will likely increase as traffic congestion on US 93 worsens. However, as revealed by a travel time comparison study conducted on Tuesday April 13, 2004, for northbound travel using two routes on a typical weekday AM peak period, the Blue Mountain Road/South Avenue alternate route is substantially longer and requires longer travel times compared to the primary route on US 93. For the travel time comparison, two drivers each started at the US 93/Blue Mountain Road intersection and finished at the Reserve Street/South Avenue intersection. One of the drivers made nine trips on the Brooks/Reserve (US 93) route and the other driver made six trips on the Blue Mountain Road/Maclay Bridge/South Avenue route. The results of the travel time comparison are summarized in **Table 3-8**.

Table 3-8
AM Peak Travel Time Comparison: US 93 vs. Blue Mountain Road/South Avenue

Route (Distance)	Low Time (minutes)	High Time (minutes)	Average Time (minutes)	Average Speed
US 93 (2.9 miles)	4:20	8:35	5:46	30 mph
Blue Mountain Road/South Avenue (6.7 miles)	11:43	12:51	12:10	34 mph

Once the proposed South Avenue bridge replaces the Maclay Bridge, the secondary route would reduce the distance between Blue Mountain Road and the South Avenue/Humble Road intersection by approximately 0.4 mile compared to the current route. Even with this improvement (resulting in a shorter distance and potential for a slight increase in average speed because of the increased capacity of a two-lane bridge), the US 93 route would be substantially shorter and take less time than the Blue Mountain/South Avenue Route. Despite the findings from this study, overall traffic growth in the Missoula region and desire of some drivers to divert away from the congested highway route (even if the travel time is slower on the alternate route) are expected to contribute to a continuous increase in traffic using Blue Mountain Road, South Avenue, Big Flat Road, and other roads that serve the rural area west of Missoula.

Traffic volume data includes average daily traffic on roadway segments and peak-period intersection turning movements. Average daily traffic (ADT) volumes are typically used in the planning and design of roadway improvements. The ADT represents the average 24-hour volume on a roadway segment measured over a one-year period. For a two-way roadway, ADT includes traffic traveling in both directions. Existing and 2025 ADT volumes for key roadway segments that serve the Miller Creek area are shown on **Figure 3-6** and **Figure 3-7**, respectively. The *Transportation Analysis Technical Report* (as amended in 2006) includes a description of the traffic forecasting methodology employed. The traffic forecasts for this FEIS utilized travel demand model results from the adopted *Missoula Urban Transportation Plan Update* as an initial starting point. Both the transportation plan and FEIS forecasts recognize planned future development in the Miller Creek area and other areas served by US 93 that will create additional demand on US 93, Miller Creek Road, and other major roadways serving the project area. However, the FEIS traffic forecasts were further refined from those presented in the updated transportation plan by considering additional factors that contribute to traffic demand and travel patterns within a more focused project area. As a result of the traffic forecasting refinement conducted for the FEIS, 2025 adjusted ADT forecasts for the No-Action Alternative addressed in the FEIS reflect volumes at some locations that are measurably different from those conveyed in the transportation plan. The key additional factors that were utilized for traffic forecasts in the FEIS include the following:

- Forecasted traffic activity, including trip distribution and travel route assignments, was developed for more individual roadway segments identified in the FEIS (e.g., US 93, Miller Creek Road, Gharrett Street, and Blue Mountain Road), compared to a broader and more general roadway network representing regional growth trends in the transportation plan.
- Traffic count data collected during 2003 or adjusted to reflect 2003 conditions was utilized to validate current year roadway conditions in the FEIS. This compares to traffic counts dated 2000 or earlier for the transportation plan base year.
- The FEIS projections considered and applied historic traffic growth trends for individual roadway segments within the project area to refine 2025 volume forecasts.

Table 3-9 provides a comparative summary of 2003 and 2025 forecasted ADT volumes on major project area roadway segments. A comparison of 2003 ADT volumes with forecasted 2025 ADT volumes reveals that traffic volumes are expected to increase on all major roadway segments that serve the project area, and that some roadway segments will experience substantially increased volumes over the next 20+ years. Daily volumes are reported as vehicles per day (vpd). The 2003 ADT volumes within the project area range from more than 30,000 vpd along segments of US 93 to less than 100 vpd along Lower Miller Creek Road west of the south "Y" intersection.

Large commercial vehicles (trucks) comprise approximately 6 percent of the daily traffic volume on US 93 and on the segment of Miller Creek Road between US 93 and Briggs Street. Commercial truck drivers use the segment of Miller Creek Road between US 93 and Briggs Street to serve

Figure 3-6
2003 Average Daily Traffic (ADT) Volumes

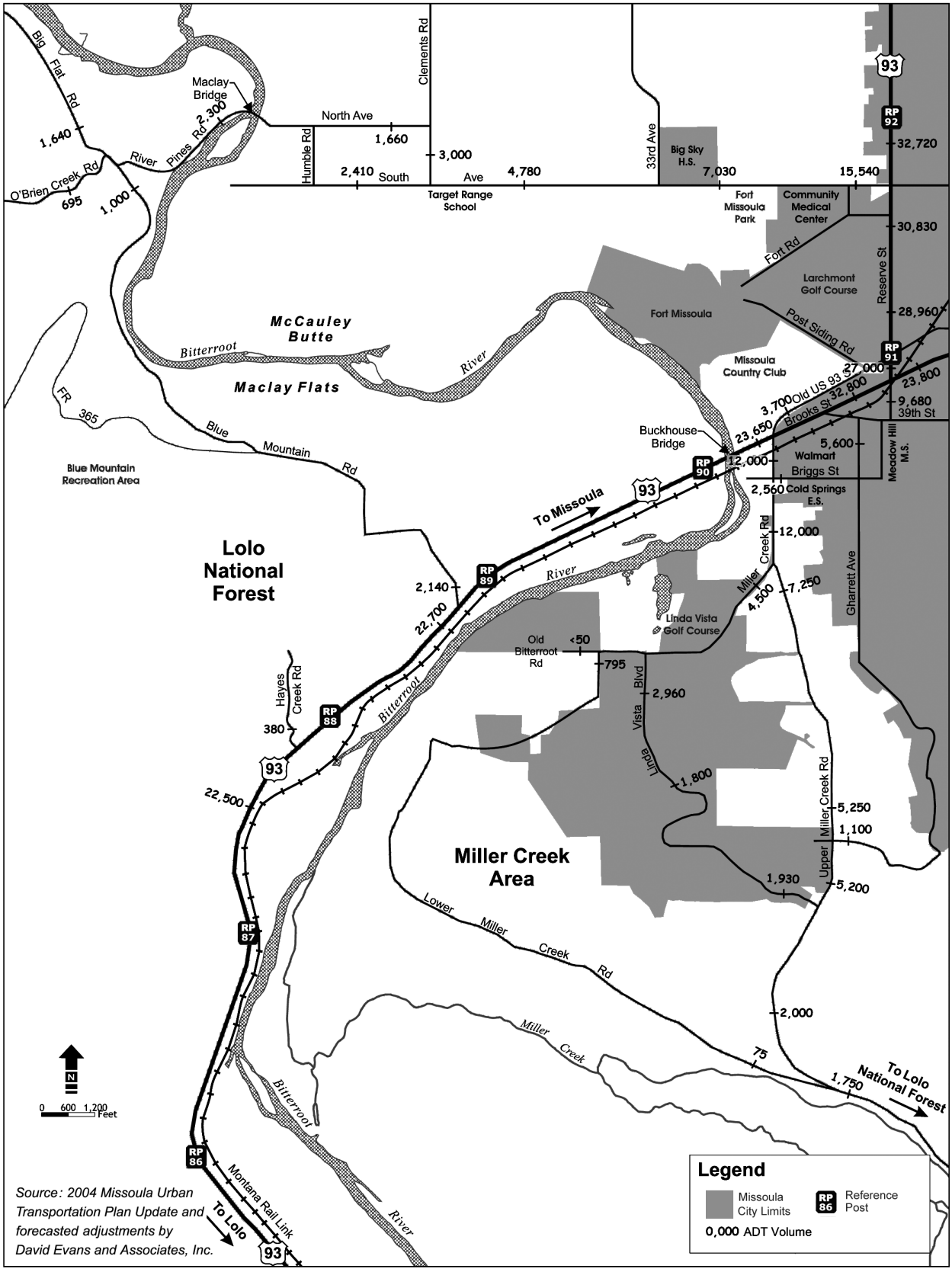


Figure 3-7
No-Action 2025 Average Daily Traffic (ADT) Volumes

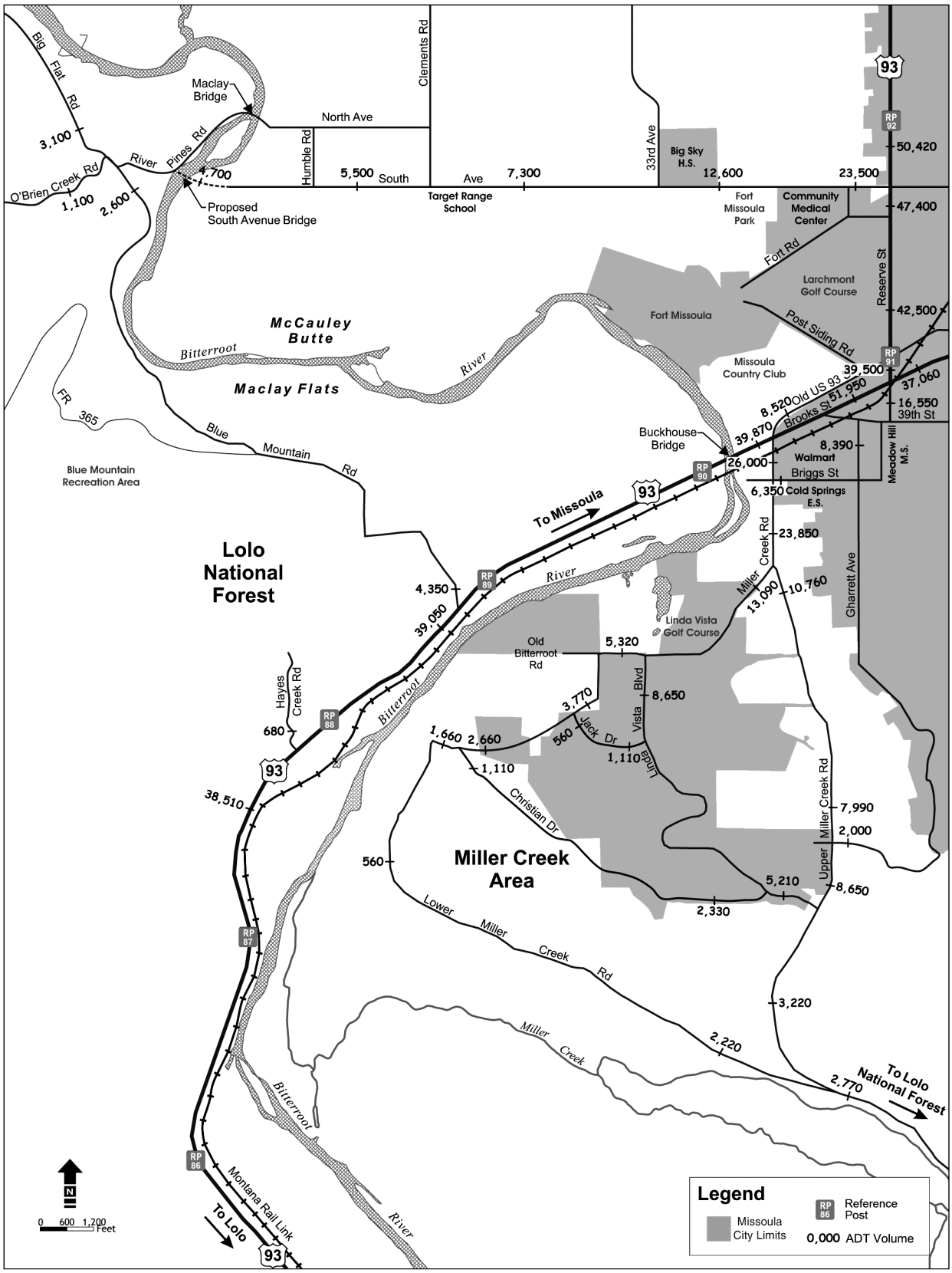


Table 3-9
Roadway Segment Traffic Volumes: 2003 and 2025 No-Action

Roadway Segment	Location	2003 ADT Volume Vehicles/Day	2025 Future ADT Volume Vehicles/Day	Change in ADT Vehicles/Day (Percent Change)
US 93	South of South Lower Miller Creek Alternative	22,500	38,510	16,010 (71%)
US 93	South of Blue Mountain Road	22,700	39,050	16,350 (72%)
US 93	South of Miller Creek Road	23,650	39,870	16,220 (69%)
US 93	South/west of Reserve Street	32,800	51,950	19,150 (58%)
US 93	North/east of Reserve Street	23,800	37,060	13,260 (56%)
Reserve Street	North of South Avenue	32,720	50,420	17,700 (54%)
Reserve Street	South of South Avenue	30,830	47,400	16,570 (54%)
Reserve Street	North of Old Highway 93	28,960	42,500	13,540 (47%)
Reserve Street	North of US 93	27,000	39,500	12,500 (46%)
Reserve Street	South of US 93	9,680	16,550	6,870 (71%)
Old Highway 93	North of US 93	3,700	8,520	4,830 (130%)
Old Highway 93	West of Reserve Street	3,200	8,000	4,800 (150%)
Hayes Creek Road	North of US 93	380	680	300 (79%)
Blue Mountain Road	West of US 93	2,140	4,350	2,210 (103%)
Blue Mountain Road	South of River Pines Road	1,000	2,600	1,600 (160%)
Big Flat Road	North of River Pines Road	1,640	3,100	1,460 (89%)
O'Brien Creek Road	West of Big Flat Road	695	1,100	450 (58%)
River Pines Road	East of Blue Mountain Road	2,300	4,700	2,400 (104%)
South Avenue	West of Clements Road	2,410	5.500	3,090 (128%)
South Avenue	East of Clements Road	4,780	7,300	2,520 (53%)
South Avenue	East of 33rd Street	7,030	12,600	5,570 (79%)
South Avenue	West of Reserve Street	15,540	23,500	7,960 (51%)
Briggs Street	East of Miller Creek Road	2,560	6,350	3,790 (148%)
Lower Miller Creek Road	West of Upper Miller Creek Road (north "Y")	4,500	13,090	8,590 (191%)
Lower Miller Creek Road	West of Linda Vista Boulevard	795	5,320	4,520 (569%)
Lower Miller Creek Road	West of Upper Miller Creek Road (south "Y")	75	2,220	2,145 (2860%)
Linda Vista Boulevard	South of Lower Miller Creek Road	2,960	8,650	5,690 (192%)
Linda Vista Boulevard	West of Christian Drive	1,800	2,330	530 (29%)
Linda Vista Boulevard	West of Upper Miller Creek Road	1,930	5,210	3,280 (170%)
Miller Creek Road	South of US 93	12,000	26,000	1,400 (117%)
Miller Creek Road	South of Briggs Street	12,000	23,850	11,850 (99%)
Upper Miller Creek Road	South of Lower Miller Creek Road (north "Y")	7,250	10,760	3,510 (48%)
Upper Miller Creek Road	North of Gharrett Street	5,250	7,990	2,740 (52%)
Upper Miller Creek Road	Between Gharrett Street and Linda Vista Boulevard	5,200	8,650	3,450 (66%)
Upper Miller Creek Road	South of LInda Vista Boulevard	2,000	3,220	1,220 (68%)
Miller Creek Road	South of Upper Miller Creek Road (south "Y")	1,750	2,770	1,020 (58%)
Gharrett Street	South of 39th Avenue	5,600	8,390	2,790 (50%)
Gharrett Street	East of Upper Miller Creek Road	1,100	2,000	900 (82%)

North "Y" = North intersection of Upper/Lower Miller Creek Road.
South "Y" = South intersection of Upper/Lower Miller Creek Road.
Sources: *2004 Missoula Urban Transportation Plan Update* and forecasted ADT adjustments by DEA, Inc.

Wal-Mart and other businesses adjacent to the highway. Large trucks comprise less than 5 percent of the total daily traffic volume on all other roadways serving the project area.

Representatives of the Lolo National Forest Ranger District and Plum Creek Timber Company provided general traffic information for recreation and log truck trips to national forest and private timberlands via Miller Creek Road. The Lolo Ranger District currently monitors recreation and logging traffic. The recreation traffic consists of all-terrain vehicle (ATV) riders, hunters,

campers, and hikers. Logging traffic is currently sparse, since there is minimal timber harvesting. The Ranger District estimates that an average of approximately 50 to 100 log trucks per year over the next ten years may access Lolo National Forest through the Miller Creek area. The Ranger noted that this estimate could change because of recent forest fires.

The Plum Creek timberlands are private and not available for recreation use. Log truck traffic serving Plum Creek lands is also sparse and is estimated to be approximately 500 trucks per year through the Miller Creek area for the next ten years. Plum Creek expects to average one to two sales per year, but acknowledges that this number could fluctuate (i.e., they expect to have a few years with no sales).

3.4.1.2 Roadway Operations

Traffic conditions are expressed in terms of level of service (LOS) using a letter grading system ranging from A for highly efficient operations to F for extremely poor conditions. LOS A represents the free-flow condition when there is no slowing or interference to the traffic flow. LOS F represents heavily congested and unstable flow with travel demand exceeding roadway capacity and, in some extreme cases, a complete breakdown or stop condition (traffic jam). **Figure 3-8** and **Figure 3-9** illustrate the different levels of service on roadways and at intersections, respectively.

A comparison of traffic volume demand to capacity is another method of evaluating how well a segment or intersection is operating. This comparison is presented as a volume-to-capacity (v/c) ratio. A v/c ratio between 0.0 and 1.0 indicates that volume is less than capacity. When the v/c ratio is low, nearer to 0.0, traffic conditions are generally free flowing with little congestion and short delays for most intersection movements. As the v/c ratio approaches 1.0, traffic becomes more congested and unstable with longer delays.

The *2004 Missoula Urban Transportation Plan Update* (adopted May 25, 2004) identifies "acceptable" capacity and LOS for roadway segments and intersections under both current and 2025 conditions. This plan defines "capacity deficiency" as "the condition when the current daily traffic volume in a corridor exceeds the acceptable capacity of the roadway."

For road segments within the urbanized area, LOS D is assumed to be the minimum acceptable LOS; LOS C is assumed to be the minimum acceptable operating condition in rural areas.

For key roadways serving the project area, the analysis reveals that the segment of Miller Creek Road between US 93 and the north "Y" intersection is *at capacity*. The analysis also reveals that sections of US 93 are *approaching capacity*: Reserve Street north of Brooks Street and south of Reserve Street to Lolo, Upper Miller Creek Road between the north and south "Y" intersections, and Gharrett Street between US 93 and 55th Street.

3.4.2 Intersection Conditions

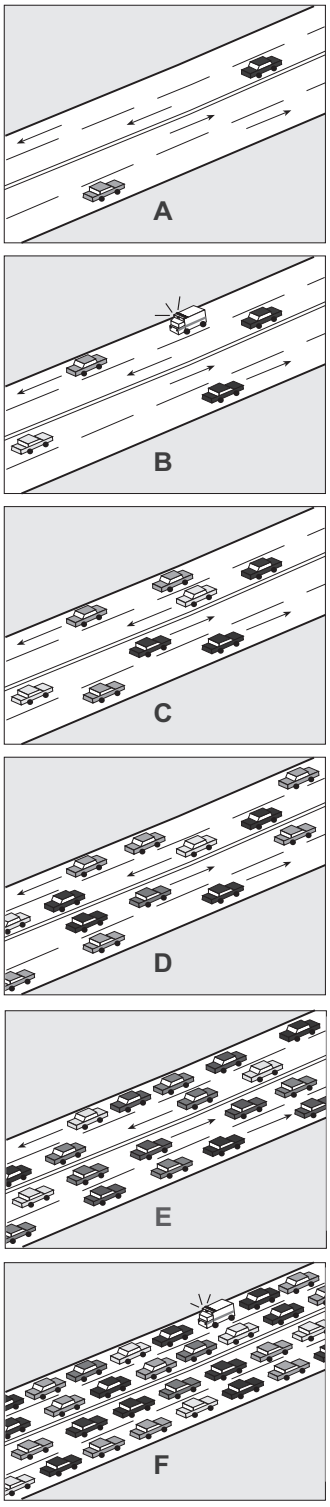
3.4.2.1 Intersection Volumes

Intersection turning movement and vehicle classification counts were collected at nine intersections on multiple weekdays in the spring of 2003 during the AM and PM peak traffic periods. Morning counts were conducted from 7:00 AM to 9:00 AM and evening counts were conducted from 4:00 PM to 6:00 PM. Typically, these are the time periods when traffic volumes on city streets reach their highest levels within a 24-hour period.

Existing AM and PM peak-hour turning movement volumes at the intersections are shown in **Figure 3-10**. **Figure 3-11** shows No-Action 2025 forecasted AM and PM peak hour traffic vol-

Figure 3-8
Level of Service (LOS) Definitions on Roadway Segments

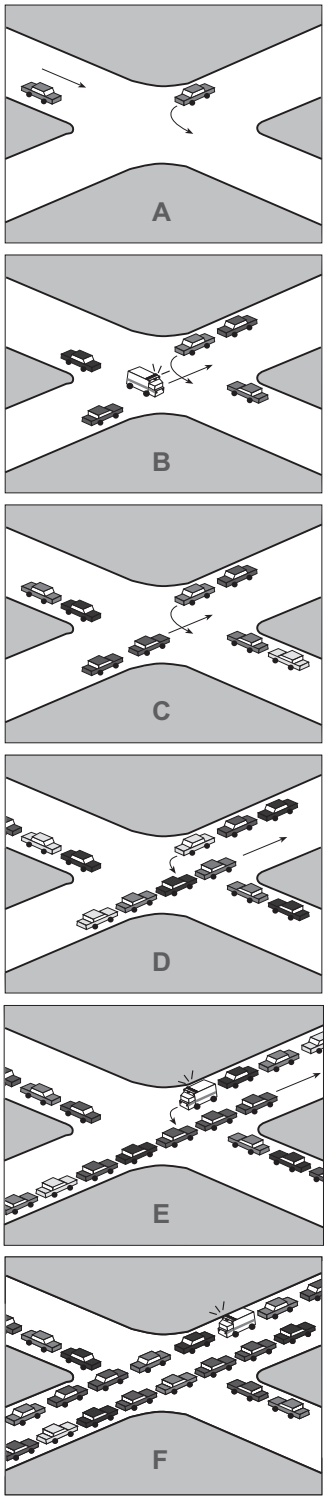
LOS	Roadway Segments
A	Free flow, low traffic density
B	Minimum delay, stable traffic flow
C	Stable condition, movements somewhat restricted due to higher volumes, but not objectionable for motorists
D	Movements more restricted, queues and delays may occur during short peaks, but lower demands occur often enough to permit clearing, preventing excessive backups
E	Actual capacity of the roadway involves delay to all motorists due to congestion
F	Forced flow with demand volumes greater than capacity resulting in complete congestion



Source: Highway Capacity Manual

Figure 3-9
Level of Service (LOS) Definitions at Intersections

LOS	Intersections
A	No vehicle waits longer than one signal indication.
B	On a rare occasion, vehicles wait through more than one signal indication.
C	Intermittently, vehicles wait through more than one signal indication, occasionally backups may develop, traffic flow still stable and acceptable.
D	Delays at intersections may become extensive, but enough cycles with lower demand occur to permit periodic clearance, preventing excessive backups.
E	Very long queues may create lengthy delays.
F	Backups from locations downstream restrict or prevent movement of vehicles out of approach creating a "gridlock" condition.



umes at key project area intersections. One of the most congested intersections is the Miller Creek Road/US 93 intersection.

3.4.2.2 Intersection Operations

A LOS analysis was conducted at ten existing key project area intersections in the Miller Creek area. This analysis was based on the methodologies specified in the *2000 Highway Capacity Manual* for signalized and stop-controlled intersections. Because of the rural/suburban nature of the project area, with no interconnection between signalized intersections, the intersections were analyzed individually. For intersections within the urbanized area, LOS D is assumed to be the minimum acceptable LOS; LOS C is assumed to be the minimum acceptable operating condition in rural areas.

The intersection operations analysis reveals that the signalized intersection of US 93 and Miller Creek Road/Old US 93 operates at an overall LOS E in the AM peak hour. During the AM peak hour, the critical northbound (eastbound) US 93 through/right movement operates at LOS E, and the critical northbound Miller Creek Road to northbound (eastbound) US 93 right-turn movement operates at LOS D. During the PM peak hour, this intersection operates at a more acceptable LOS C for the overall intersection and for the critical southbound (westbound) US 93 to southbound Miller Creek Road left-turn movement.

The north "Y" intersection operates at LOS F in the AM peak hour and LOS C in the PM peak hour, due primarily to the difficult eastbound Lower Miller Creek Road to northbound Miller Creek Road left-turn at this location. The westbound approach at the intersection of Miller Creek Road and Briggs Street operates at LOS D during the AM peak period and LOS F during the PM peak hour. This is a result of the relatively heavy westbound Briggs to southbound Miller Creek Road movement, which is partially attributed to drivers bypassing the US 93 and Miller Creek Road intersection and, instead, traveling along Briggs Street to enter the Miller Creek area.

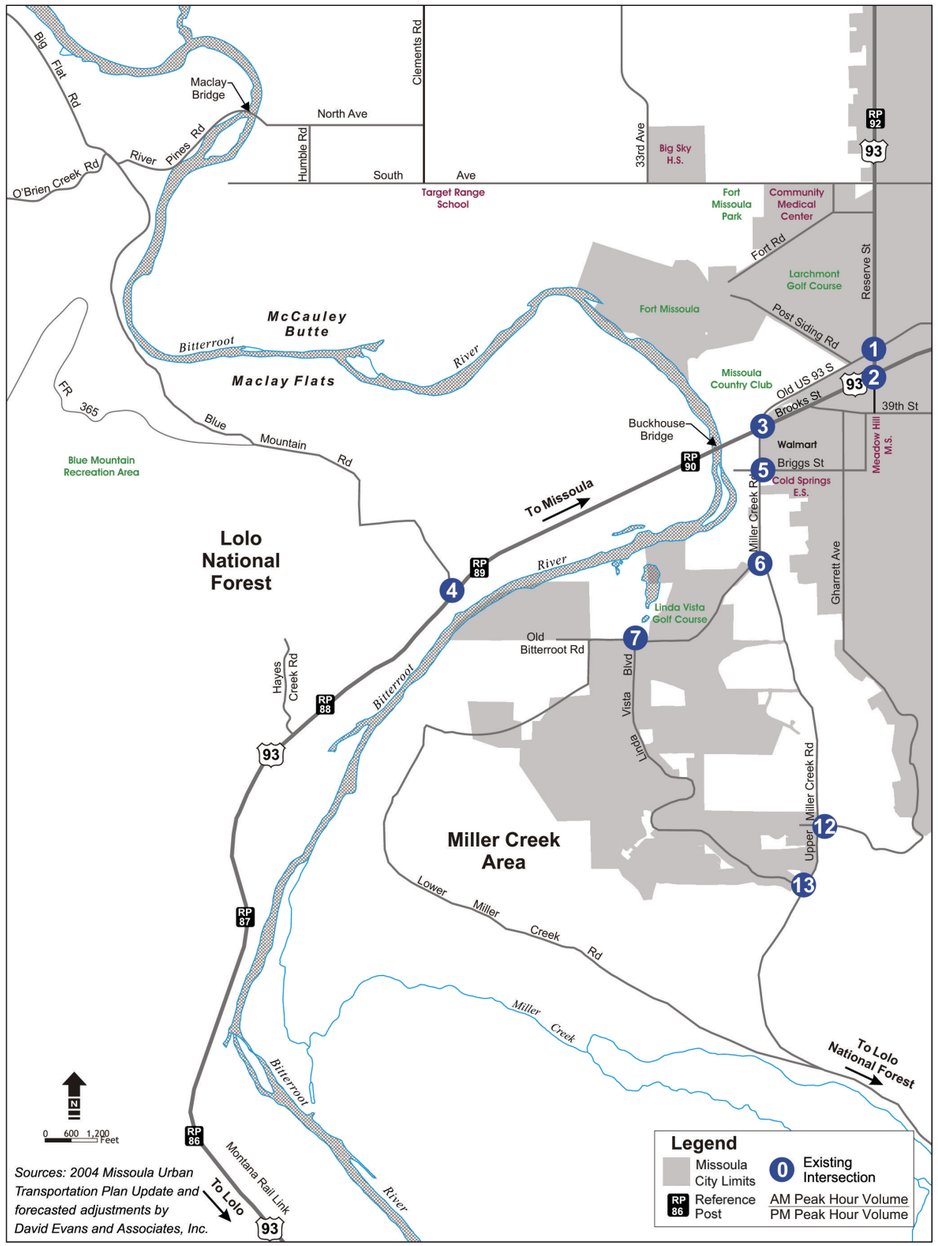
Table 3-10 lists key intersection roadway segments serving the project area that the analysis identified as exhibiting capacity deficiencies (either *at capacity* or *approaching capacity*).

Table 3-10
Existing Capacity Deficiencies

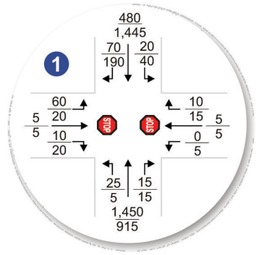
Roadway	Segment	Congestion
US 93/Reserve Street	South Avenue north to South 3rd West	At Capacity
US 93/Reserve Street	South Avenue south to Brooks Street	Approaching Capacity
US 93	Reserve Street south to Lolo	Approaching Capacity
Miller Creek Road	US 93/Brooks Street to north "Y"	At Capacity
Upper Miller Creek Road	North "Y" to south "Y"	Approaching Capacity
Brooks Street	East of Reserve Street	Approaching Capacity
Reserve Street	South of US 93/Brooks Street	Approaching Capacity
South Avenue	1/4-mile west of US 93/Reserve Street to US 93/ Reserve Street	At Capacity
South Avenue	33rd Avenue to 1/4-mile west of US 93/Reserve Street	Approaching Capacity
39th Street	East of US 93/Brooks Street	Approaching Capacity
Gharrett Street	39th Street to 55th Street	Approaching Capacity

Source: *2004 Missoula Urban Transportation Plan Update*.

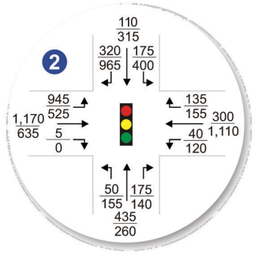
Figure 3-10
2003 AM and PM Peak-hour Key Intersection Traffic Volumes



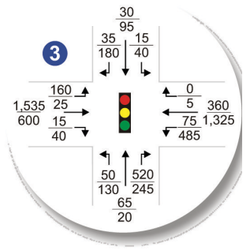
US 93 / Reserve St and Old US 93 South



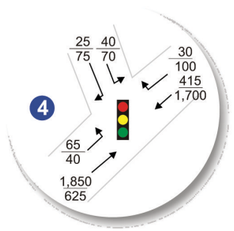
US 93 / Brooks and Reserve St



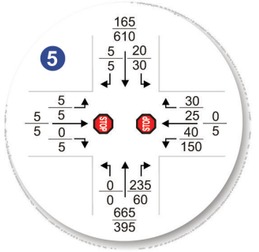
US 93 and Miller Creek Rd



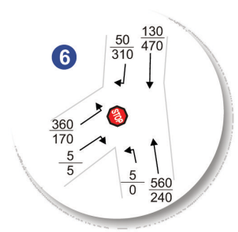
US 93 and Blue Mountain Rd



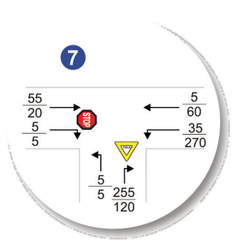
Miller Creek Rd and Briggs St



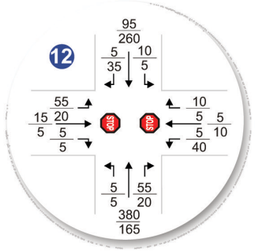
Upper Miller Creek Rd and Lower Miller Creek Rd (North Y)



Lower Miller Creek Rd and Linda Vista Blvd



Upper Miller Creek Rd and Gharrett Ave



Upper Miller Creek Rd and Linda Vista Blvd

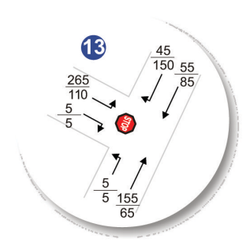
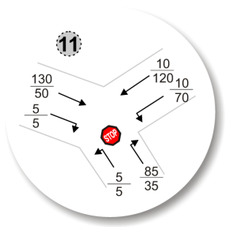
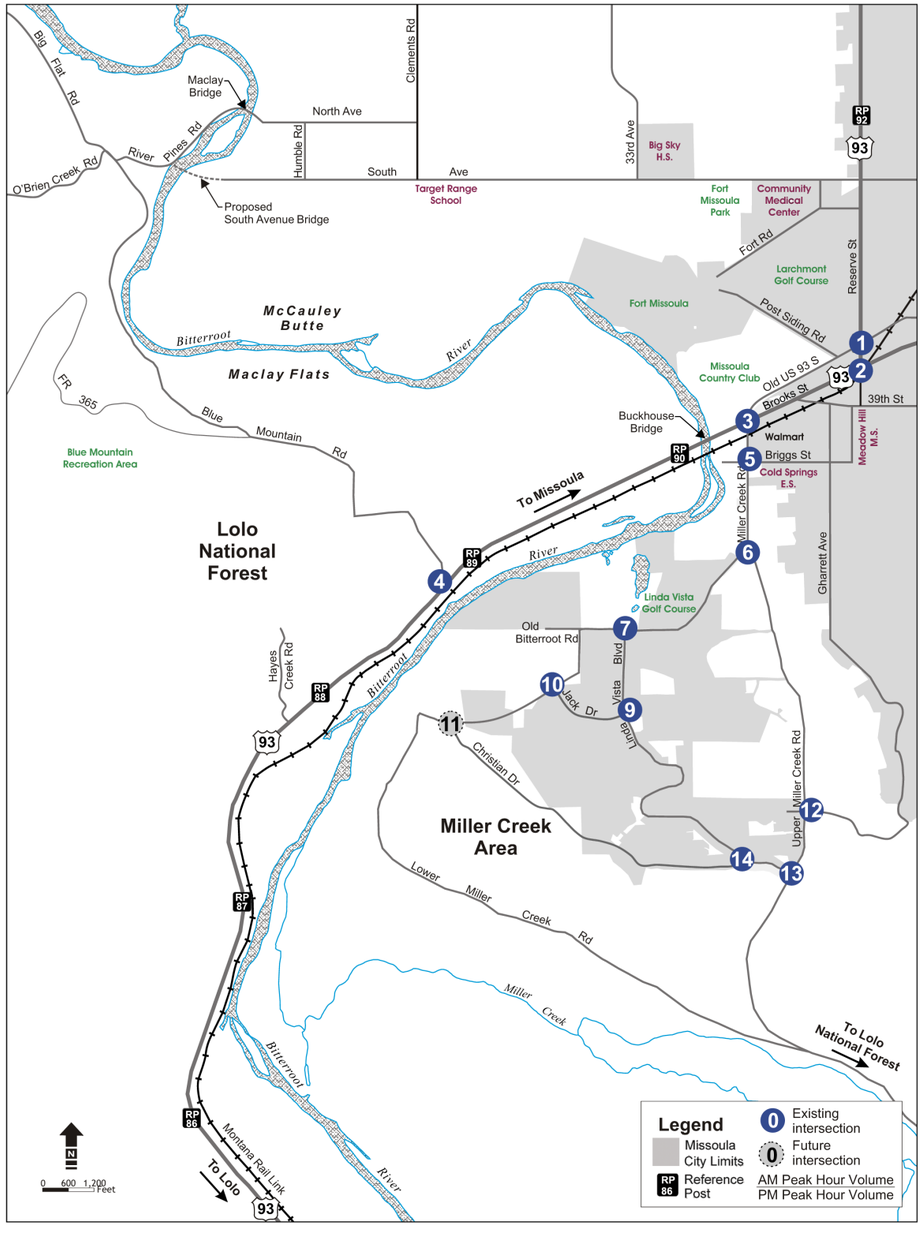


Figure 3-11
2025 No-Action AM and PM Peak-hour Key Intersection Traffic Volumes

Future intersection

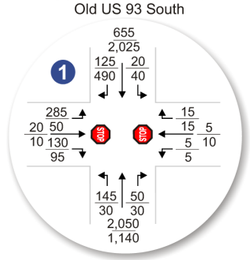
Lower Miller Creek Rd and Christian Dr



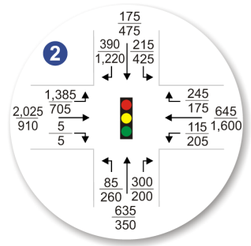


Existing intersections

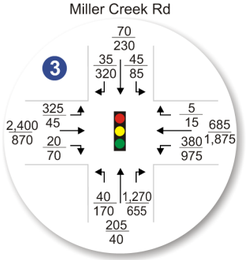
US 93 / Reserve St and Old US 93 South



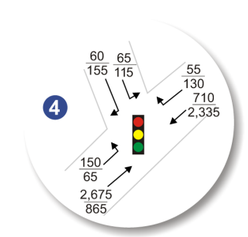
US 93 / Brooks St and Reserve St



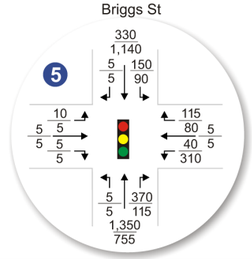
US 93 and Miller Creek Rd



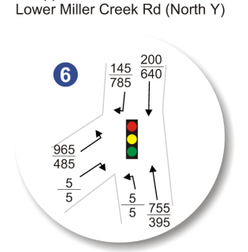
US 93 and Blue Mountain Rd



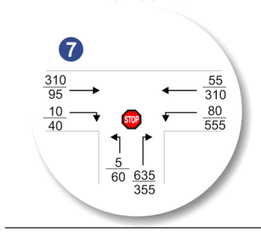
Miller Creek Rd and Briggs St



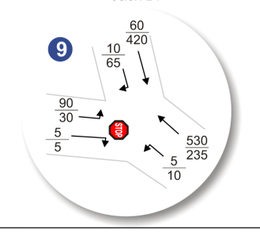
Upper Miller Creek Rd and Lower Miller Creek Rd (North Y)



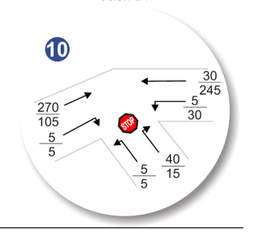
Lower Miller Creek Rd and Linda Vista Blvd



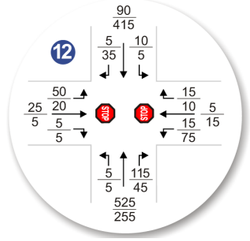
Linda Vista Blvd and Jack Dr



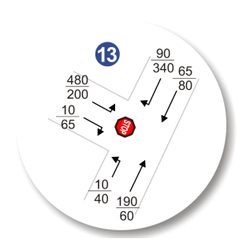
Lower Miller Creek Rd and Jack Dr



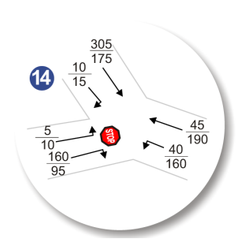
Upper Miller Creek Rd and Gharrett Ave



Upper Miller Creek Rd and Linda Vista Blvd



Linda Vista Blvd and Christian Dr



3.4.2.3 Transportation System Management (TSM)

Transportation System Management (TSM) strategies manage the flow of traffic on existing major roadways through operational-oriented strategies without adding substantial new infrastructure that is typically more costly.

Application of TSM measures to support continued acceptable operations of US 93 through the Miller Creek area will include traffic signal timing modifications at the intersections of US 93/Blue Mountain Road and US 93/Miller Creek Road.

The analysis of key intersections revealed that signal timing adjustments or "optimization" would improve traffic flow on US 93, such as overall operations of the signalized intersections with Miller Creek Road and Blue Mountain Road. Signal timing optimization at these two intersections would reduce stops and the length of traffic queues on US 93 by providing a longer green signal phase for US 93 through movements.

Because of forecasted growth in traffic volumes and requests for additional access locations to serve future development along US 93, MDT is in the process of implementing an access management program for US 93 through the state. This effort is focused on maintaining acceptable levels of service on US 93 by controlling the number of future access locations, while creating opportunities or locations where turning movements can be made safely.

MDT has a development review process that developers must abide by in order to gain new access or to modify existing access to a state-maintained roadway. This process, the System Impact Action Process (SIAP) is a coordinated MDT review of any access request that will substantially impact a state facility. In addition to reviewing access requests, MDT's SIAP requires that the applicant identify and mitigate any adverse impacts a proposed action will have on MDT's roadways. MDT must approve the mitigation measures, and approach permits are granted upon implementation of the approved mitigation.

3.4.3 Safety

This section is based on an analysis of five years of available crash data (1999 to 2003) provided by the MDT State and Local Traffic Safety Program Section for major roadways in the project area: US 93, Miller Creek Road, Upper Miller Creek Road, Lower Miller Creek Road, Old US 93, Gharrett Street, Blue Mountain Road, Big Flat Road, River Pines Road (including Maclay Bridge), South Avenue, Maclay Bridge, and approaches to this bridge. The safety analysis addresses crash locations and number of crashes, crash rates, and crash characteristics and factors that contributed to them at locations of concern including those with relatively high crash rates.

3.4.3.1 Roadway Crash Summary

The number of crashes and crash rates [crashes/million vehicle miles (mvm) traveled] for major roadway segments in the project area are shown in **Figure 3-12** and in **Table 3-11**.

MDT calculates statewide crash rates for rural (outside city limits) state highway facilities. The crash rate is defined as accidents per mvm traveled. According to MDT, US 93 west of Reserve Street is classified as a National Highway System noninterstate route-primary. The statewide five-year average crash rate (1999 to 2003) for this type of facility is 1.30 crashes/mvm traveled. Based on this value, none of the rural segments along US 93 meet or exceed the statewide average rate. One fatality was reported along US 93 between Miller Creek Road and Blue Mountain Road.

Statewide crash rate data is available for urban state highway facilities but is limited, and MDT recommends that this data be used with caution when making comparisons to rates for specific

Figure 3-12
Crash History

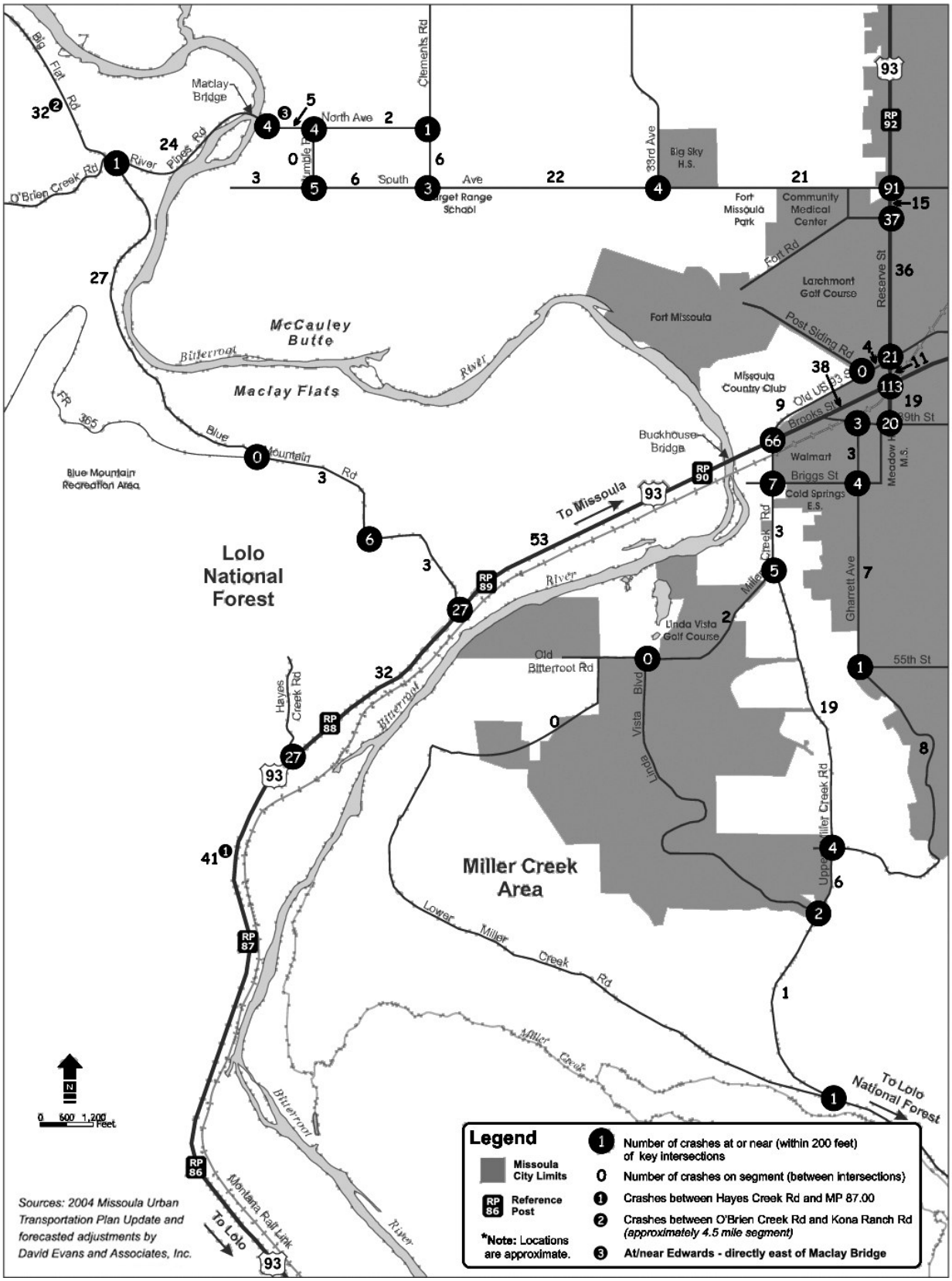


Table 3-11
Project Area Segment Crashes and Rates
(crashes/million vehicle miles traveled) for 1999 to2003

Roadway	Location	Number of Crashes (2000-2002)	Crash Rate (crashes/mvm)*	Exceed Statewide Average?
US 93	Between Reserve Street and Miller Creek Road	38	1.07	No
US 93(1)**	Between Miller Creek Road and Blue Mountain Road	53	0.88	No
US 93(2)**	Between Blue Mountain Road and Hayes Creek Road	32	0.77	No
Miller Creek Road	Between US 93 and north "Y"	3	0.29	No
Upper Miller Creek Road(3)**	Between north "Y" and Gharrett Street	19	1.26	No
Upper Miller Creek Road**	Between Gharrett Street and south "Y"	9	1.13	No
Lower Miller Creek Road	Between north "Y" and Maloney Ranch Road	2	0.19	No
Lower Miller Creek Road**	Between Maloney Ranch Road and south "Y"	0	0.00	No
Old US 93	Between US 93 and Reserve Street	13	2.83	No
Reserve Street	Between 39th Street and MacDonald Avenue	30	2.99	No
Gharrett Street	Between 39th Street and 55th Street	9	0.86	No
Gharrett Street**	Between 55th Street and Upper Miller Creek Road	8	3.04	Yes
Big Flat Road (4)**	Between Blue Mountain Road and Kona Ranch Road	32	1.94	Yes
River Pines Road**	Between Blue Mountain Road and Edwards Avenue	24	8.17	Yes
Blue Mountain Road**	North of US 93	33	3.93	Yes

*Crashes/million vehicle miles traveled.

**Denotes rural segments.

Notes:

(1) 16 of the 53 crashes in this segment involved an animal. 1 of the 53 crashes in this segment resulted in a fatality.

(2) 14 of the 32 crashes in this segment involved an animal.

(3) 14 of the 19 crashes in this segment involved an animal.

(4) 3 of the 32 crashes in this segment involved an animal.

Source: Crash data-MDT; crash rates compiled by DEA, Inc.

facilities and locations. This is because statewide urban crash rates for noninterstate highways and state primary routes do not differentiate between different roadway characteristics, such as number of lanes, presence of median. The urban crash rate of 6.17 crashes/mvm traveled is for the five-year period of 1997 to 2001. Using this as a guideline, the crash rates for the urban segments of US 93 (Brooks and Reserve Streets) through the project area are below the statewide guidelines.

The US 93 alignment is relatively straight and flat between Buckhouse Bridge and Blue Mountain Road. Just south of Blue Mountain Road, the alignment becomes curvilinear with steep grades as the terrain changes from level to rolling. Near the Hayes Creek Road junction, the alignment again becomes straight and flat. Travel speeds on US 93 west of Buckhouse Bridge through the project area typically exceed 60 mph. Motorists traveling southbound (westbound) on US 93 west of Buckhouse Bridge typically accelerate to rural highway speeds heading out of Missoula towards Lolo, and some of these drivers may not be prepared to come to a stop at Blue Mountain Road. At this signalized intersection, multiple tire skid marks on the US 93 pavement indicate that abrupt stopping movements are regular occurrences at this location. Multiple property owners located adjacent to US 93 in the project area noted that the traffic signal at Blue Mountain Road facilitates vehicular ingress/egress at their properties because of the gaps in traffic it creates.

A vehicle gap analysis study conducted on US 93 at Hayes Creek Road revealed that gaps acceptable to most drivers are limited, particularly in the northbound (eastbound) direction dur-

ing the AM peak period and in the southbound (westbound) direction during PM peak period. The study results indicate that the effectiveness of the signal at Blue Mountain Road for providing acceptable gaps is limited at Hayes Creek Road, approximately one mile south of Blue Mountain Road.

Missoula County maintains the remaining roadway segments in the project area. Although Missoula County does not have published average crash rates for these sections of roadway, MDT has limited data regarding County facilities. According to MDT the closest designation for the County facilities by the state is the state secondary classification. The average crash rate for a corresponding five-year period is approximately 1.73 crashes/mvm. Based on this value, the following sections in the project area meet or exceed the statewide average rates: Gharrett Street (55th Street to Upper Miller Creek Road), Big Flat Road (Blue Mountain Road to Kona Ranch Road), River Pines Road (Blue Mountain Road to Edwards Avenue), and Blue Mountain Road (US 93 to O'Brien Creek Road/Big Flat Road/River Pines Road). Roadway characteristics of each of these segments include two-lane roadways with minimal paved or graded shoulder area, and alignments with horizontal and vertical curvature that limit drivers' sight distance in some locations. The crash rates that meet or exceed the statewide average crash rate for the segments of Gharrett Street and River Pines Road are calculated with relatively short segment lengths (less than one mile), which results in a disproportionately high crash rate compared to longer roadway segments.

MDT also provides "severity index" and "severity rate" data for rural and urban segments of national noninterstate highway and state primary routes. The severity index accounts for the different degree of severity among accidents involving fatalities, injuries, and property damage. This information, as it compares to the severity index and severity rates calculated for key project area segments, is presented in **Table 3-12**. The severity index and rate were calculated for each of the segments along US 93. Comparing the rural statewide severity averages and using the urban statewide index averages as guidelines, the computed index and severity rates for project area roadway segments are below the applicable statewide averages, as shown in **Table 3-12**.

3.4.3.2 Intersection Crash Summary

Intersection crash rates are determined by the number of crashes divided by the number of entering vehicles. Based on the reported crash data from MDT (1999 to 2003), the major intersection crash rates are shown in **Table 3-13**. Statewide average crash rates for comparative intersections were not available.

As shown in **Table 3-13**, the intersection crash rate for the north "Y" intersection is 0.23 crashes per million entering vehicles. While the data compiled from reported incidents do not indicate an obvious hazard at this location, residents of the Miller Creek area who drive through it frequently perceive this intersection as hazardous. Multiple people have commented at the project scoping meetings that minor collisions and "near-misses" between vehicles, some of which result in vehicles veering off of the road, are frequent at this location and particularly when the intersection approaches are slippery.

Four fatal crashes occurred at the project area intersections between 1999 and 2003. US 93 at Miller Creek Road and US 93 at Hayes Creek Road each reported one fatal crash between 1999 and 2003. Two fatal crashes occurred at the intersection of US 93 at Blue Mountain Road during the same period.

3.4.3.3 Wildlife and Vehicle Conflicts

Roadkill data were compiled from 1999 to 2003 by Montana Fish, Wildlife & Parks (MFWP), US Fish and Wildlife Service (USFWS), and MDT on US 93 from reference posts 84 to 91 in and adja-

Table 3-12
Rural and Urban Segment Severity Index and Rates Along a National Noninterstate Highway and State Primary Routes

Roadway	Location	Severity Index[1]	Statewide Average Severity Index[1]		Severity Rate[2]	Statewide Average Severity Rate[2]	
			Rural	Urban[3]		Rural	Urban[3]
US 93	Between Reserve Street and Miller Creek Road	2.73	NA	1.75	2.54	NA	10.80
US 93[2]*	Between Miller Creek Road and Blue Mountain Road	2.61	2.32	NA	2.30	3.02	NA
US 93[3]*	Between Blue Mountain Road and Hayes Creek Road	1.97	2.32	NA	1.52	3.02	NA

[1]The severity index accounts for the different degree of severity among accidents involving fatalities, injuries, and property damage. Specifically, it is defined as the ratio of the number of fatal and incapacitating injury crashes times 8, plus the number of other injury crashes times 3, plus the number of property damage crashes to the total number of crashes.
[2]The severity rate is defined as the crash rate (crashes per million vehicle miles traveled) multiplied by the severity index (see Table 3-13, page 3-39 for crash rates).
[3] Average urban severity and index rates for inside city limits with population over 5,000 were taken from the 1997 to 2001 National Non-Interstate Highways and State Primary Routes, which does not correlate with the five-year analysis in this study (1999 to 2003) or differentiate between roadways with different characteristics and thus should be used as a guideline value only.
*Rural segments.

Table 3-13
Intersection Crashes and Rates
(crashes/million vehicle miles traveled) for 1999 to 2003

Intersection	Number of Crashes (1999-2003)	Crash Rate (crashes/mev)*
Upper/Lower Miller Creek Roads (north "Y")	5	0.23
Upper Miller Creek Road/Gharrett Street	4	0.38
Miller Creek Road/Briggs Street	7	0.30
Reserve Street/Old US 93	21	0.43
US 93/Miller Creek Road[1]	66	1.14
US 93/Reserve Street	113	1.30
US 93/Blue Mountain Road[2]	27	0.57
US 93/Hayes Creek Road[3]	27	0.48
	Total: 270	

*Crashes/million entering vehicles (mev).
[1] Four of 66 crashes at this intersection involved an animal.
[2]Three of 27 crashes at this intersection involved an animal. Two of 27 crashes resulted in a fatality.
[3]Ten of 27 crashes at this intersection involved an animal. One of 27 crashes resulted in a fatality.

cent to the project area. Statewide average rates for crashes involving wild animals were not available. The data show that 91 percent of the documented roadkill (limited to medium-sized and large mammals) consists of white-tailed deer, 1.3 percent consists of moose, 1.3 percent consists of mule deer, 1.3 percent consists of unknown domestic animals, 1.3 percent consists of skunk, 1.3 percent consists of beaver, 1.3 percent consists of unknown wildlife, and 0.6 percent consists of black bear. Deer frequently cross US 93, shifting from cover and forage along the Bit-

terroot River to cover in the Lolo National Forest to the north. Information from MNHP also indicates that five black bears have been killed by vehicles in the vicinity of reference post 87. Most instances of roadkill have occurred between reference posts 87 and 91.

Fifty-five (or 20 percent) of the 270 crashes reported on US 93 north of reference post 87.0 involved an animal. All but seven of these crashes occurred in the rural section of US 93 west of Buckhouse Bridge. Eighteen (or 33 percent) of the crashes involving an animal occurred between reference posts 88.0 to 88.9, which includes the Blue Mountain Road intersection; and 16 (or 30 percent) of the crashes involving an animal occurred between reference posts 87.0 to 87.9, which includes the Hayes Creek Road intersection.

3.4.4 Non-Motorized (Pedestrian and Bicycle) Travel

Non-motorized travel consists primarily of walking and bicycling, and serves three primary functions: internal circulation within a distinct area (e.g., neighborhood, commercial district, campus, etc.); recreation/leisure; and commuter travel between places of residence and work, school, shopping, or other locations.

The Missoula urban area has a "core" system of designated bicycle routes, bicycle lanes, bicycle and pedestrian trails, sidewalks, and pedestrian-only hiking trails that serve all three of the primary non-motorized travel functions listed above. This core system is bounded by 39th Street on the south and Reserve Street on the west. Both 39th and Reserve Streets have non-motorized facilities that connect to the core non-motorized network. These facilities extend to the northeast edge of the Miller Creek area, situated at the periphery of the Missoula urban area.

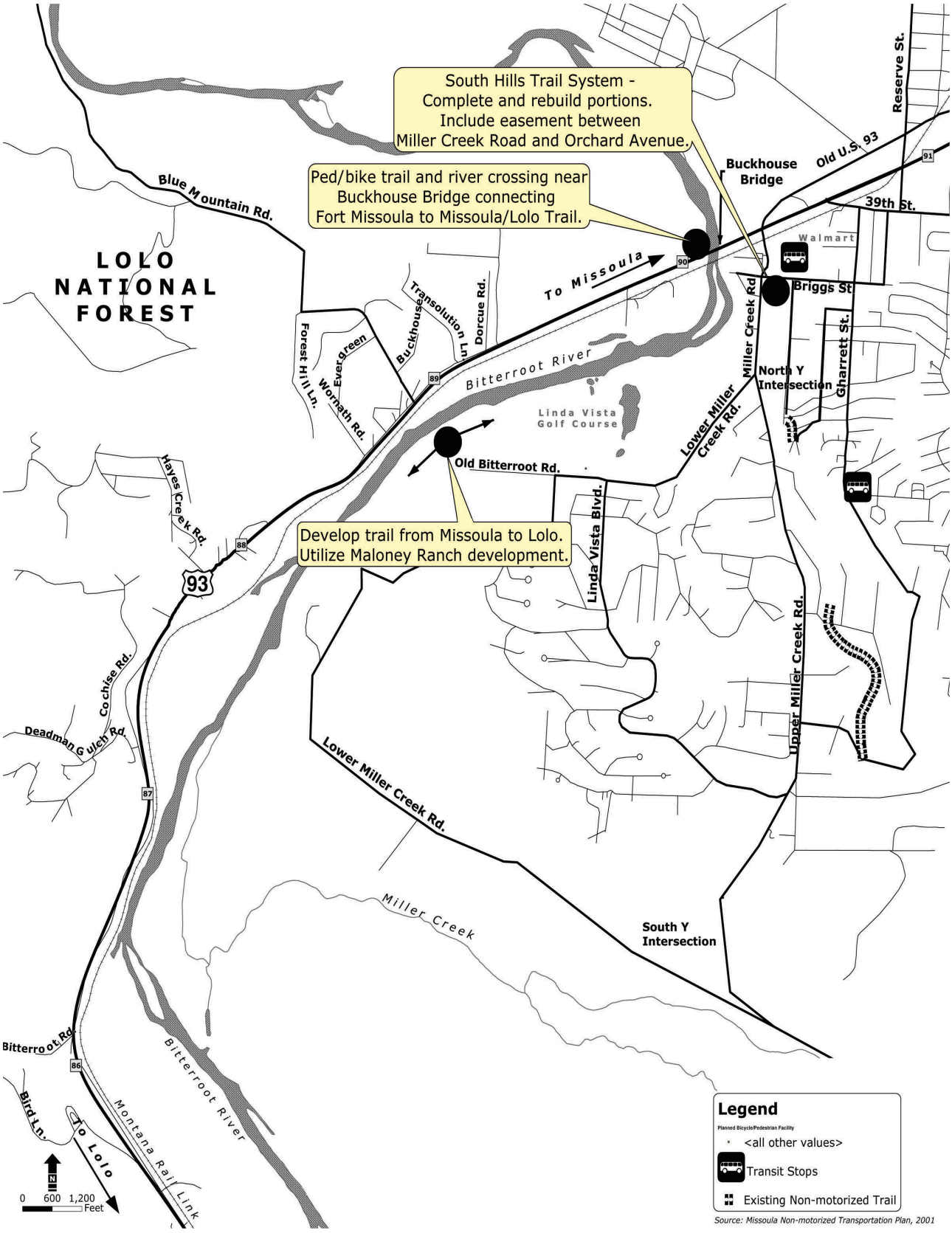
The section of US 93 adjacent to the Miller Creek area has wide shoulders that accommodate pedestrians and bicyclists. Despite the presence of shoulders, however, US 93 exhibits heavy traffic volumes, including large vehicles that operate at high speeds (typically exceeding 60 mph), frequent driveway approaches, and gravel and debris that are present on the highway shoulder areas at certain times. These conditions limit the use of the highway shoulder by non-motorists.

The Miller Creek area is predominantly characterized by low-density development largely served by rural roads that have limited or nonexistent facilities to safely accommodate non-motorized travel. The majority of residents within the existing and planned Miller Creek area development do not live within a convenient distance to walk or even ride a bicycle for most commuter trips. Furthermore, the Miller Creek area is disconnected from the core non-motorized system, because Miller Creek Road lacks adequate on-street and off-street facilities for pedestrians and bicyclists, and US 93 (Brooks and Reserve Streets) forms a barrier between the Miller Creek area and the Missoula urban area that is nearly impassable for non-motorists. This isolation from the urban core non-motorized transportation system generally limits non-motorized travel within the Miller Creek area to internal circulation, and results in nearly all trips in and out of the Miller Creek area being made by motorized vehicle. The existing and planned pedestrian and bicycle facilities are shown on **Figure 3-13**.

Miller Creek Road/Upper Miller Creek Road, the primary access route in and out of the Miller Creek area, lacks shoulders or other provisions for non-motorized travel. This lack of safe facilities prevents Miller Creek area residents from walking or bicycling to nearby schools located on Briggs Street, the nearest bus stop located north of Briggs Street, recreation sites such as the Blue Mountain Recreation area and Montana Athletic Club, and other destinations that would be otherwise accessible by bicycling or walking.

Walking and bicycling occurs through shared use of most roads within the established residential neighborhoods that comprise the Miller Creek area. The paved section of Lower Miller Creek Road east of Maloney Ranch Road, and Linda Vista Boulevard have shoulders that are used by

Figure 3-13
Existing and Planned Off-Street Bicycle and Pedestrian Facilities



Source: Missoula Non-motorized Transportation Plan, 2001

pedestrians and bicyclists. Separated, non-motorized trails that would provide connections within the Miller Creek area, or between this area and other non-motorized facilities, do not exist.

Planned improvements to the non-motorized system serving the Miller Creek area are identified as components of the Maloney Ranch development, the *2001 Non-Motorized Transportation Plan* and in the *2004 Missoula Urban Transportation Plan Update*. Proposed facilities under the Maloney Ranch development plans include roadway shoulders, sidewalks, and separate shared-use trails. Both the transportation plan update and the Maloney Ranch development plan identify a long-term future project to develop a shared-use trail parallel to the Bitterroot River between Missoula and Lolo that utilizes the Maloney Ranch development. The transportation plan also identifies a future trail easement extending east from Miller Creek Road to connect to non-motorized facilities east of the Miller Creek area. However, these two trails are not included in the final fiscally constrained conforming transportation plan.

3.4.5 Public Transportation and Transportation Demand Management (TDM) Strategies

The Missoula Urban Transportation District (MUTD; a.k.a., "Mountain Line") provides public transportation in the Missoula urban area. Mountain Line buses are routed on a "hub and spoke" network, with all routes originating and returning to the Mountain Line Transfer Center located in downtown Missoula. Mountain Line buses operate on weekdays (Monday through Friday) on 30-minute headways (time between each bus).

The nearest Mountain Line bus routes to the Miller Creek area are Route 7 that has a stop at the Wal-Mart located south of Brooks Street and 39th Street, Route 12 that runs along Gharrett Street and south to 55th Street, and Route 6 that has a stop at the K-Mart located southeast of the Brooks/Reserve Streets intersection. Each of these routes generally operates between 6:15 AM and 8:15 PM each weekday. See **Figure 3-14** for transit routes.

The Miller Creek area is situated outside of the MUTD, and Montana state law requires a 51 percent vote of registered landowners in an area to be added to the district. The trend for MUTD is for areas to remain within the district once they are included.

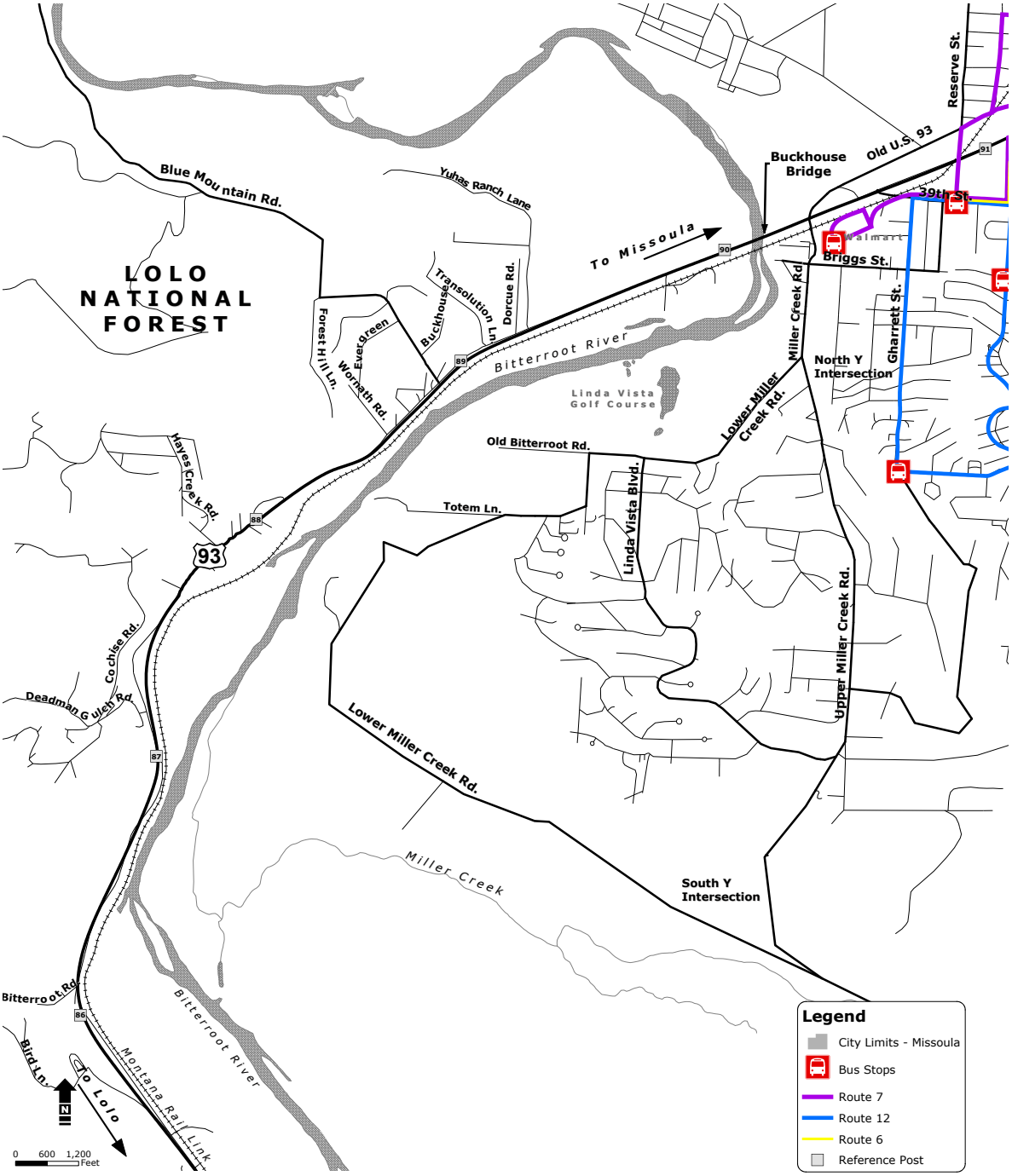
The current development density in the Miller Creek area (approximately two dwelling units per acre) is substantially below the desired density needed to support transit service. Additionally, the existing design deficiencies of Miller Creek Road, Upper Miller Creek Road, and the north "Y" intersection of Upper and Lower Miller Creek Roads make the facilities unacceptable for bus service operation and deter pedestrians and bicyclists from traveling between the Miller Creek area and the nearest bus stops.

The proposed Maloney Ranch development density and mix of single-family and multifamily residential, and neighborhood commercial land use nodes could more effectively support transit service in the Miller Creek area. Approximately 90 percent of the proposed future development will occupy about 18 percent of the total future developed land area.

Possible recommendations from this plan could affect future transit service to the Miller Creek area. Potential future changes to MUTD service include:

- Expanding the MUTD to include the future development, and extending bus service to the Miller Creek area via Lower Miller Creek Road and Linda Vista Boulevard.
- Increasing transit service frequency by decreasing headways to 15 minutes (virtually schedule free).
- Extending service hours to approximately 18 hours per day.

Figure 3-14
Existing Transit Routes



3.4.5.1 Transportation Demand Management (TDM) Strategies

Transportation Demand Management (TDM) strategies are designed to improve the efficiency of the existing transportation system by reducing or redirecting the demand for use of roadways and other facilities rather than increasing roadway capacity. TDM strategies are typically designed to influence travel choices by providing alternatives to driving alone, and to emphasize reduction of peak-period, home-based work (commuter) trips. This may be achieved by eliminating the need for certain trips, providing attractive alternatives to driving alone, or enabling people to time trips outside of peak travel periods. Within the Miller Creek area there is no known participation in existing TDM programs by businesses or residences.

The US Census Bureau lists commuting to work statistics for the population of employed persons age 16 and over in Missoula County. Statistics show that as of 2000, 73 percent of the population drove alone and approximately 11 percent of the population carpooled. A small percentage, 1.3 percent of the population, utilized public transportation, and 5.5 percent walked. The mean travel time to work is 17.5 minutes, which is similar to the entire state of Montana travel time figures.

TDM coordinators within the Missoula area include Missoula in Motion (MIM), the Missoula Ravalli Transportation Management Association (MR TMA), and the Associated Students of the University of Montana (ASUM). The *2004 Missoula Urban Transportation Plan Update* describes current TDM programs administered by MIM, MR TMA, and ASUM.

MIM was established in 1997 through the Missoula Transportation Technical Advisory Committee (TTAC) to increase public awareness of transportation options and to reduce single-occupancy vehicle travel in the Missoula region. MIM represents a consortium of local agencies and is funded with federal Congestion Mitigation Air Quality (CMAQ) funds combined with local monies and in-kind services that exceed the necessary match requirements. MIM coordinates efforts of all Missoula agencies involved in TDM and works with employers of all sizes to establish and maintain customized TDM programs, such as the Momentum, EZ Pass, and Guaranteed Ride Home programs. MIM supports marketing, recognition, and evaluation of TDM programs. Communitywide, MIM provides incentives to individuals including those at work locations that may not have a TDM program through the Way to Go! Club. More information about MIM can be found on their Web site at http://www.missoulainmotion.com/.

MR TMA is a nonprofit agency that administers carpool and vanpool ridesharing programs, and a ride-matching program to reduce single-occupancy vehicle travel for local and regional commuters. More than 90 people participate in seven MR TMA vanpools, including six vanpools that travel on US 93 between Missoula and the Bitterroot Valley. Five of these serve people who travel to Missoula for work, and one reverse commute van originates in Missoula. The vanpools use park-and-ride lots along US 93 from Hamilton to Lolo and other areas designated as pick-up/drop-off sites. MR TMA does not currently operate a vanpool that serves the project area, but has expressed interest in serving this area. MR TMA is funded through a grant from MDT with matching funds from a consortium of Ravalli, Missoula, and Lake County organizations. More information on MR TMA can be found at their Web site: http://www.mrtma.org.

The ASUM Office of Transportation partners with MIM, Mountain Line, MR TMA and other organizations to enhance and promote transportation options associated with the University of Montana campus. Programs supported by ASUM include ridesharing assistance, park-and-ride and frequent Mountain Line bus and shuttle services, guaranteed ride home, and a "cruiser" bicycle co-op. More information on ASUM can be found at their Web site: http://www2.umt.edu/asum/ot.

3.4.6 Rail Service

An MRL track crosses Miller Creek Road directly south of US 93 and crosses diagonally through the Brooks Street/Reserve Street intersection. This line operates bi-directionally once weekly for the majority of the year, although on occasion it will make the southerly run twice. The average length of trains on this track is approximately 735 feet, which is typically seven to nine cars (two engines and five to seven cars). Train traveling speeds south of Missoula to Miller Creek Road are approximately ten mph; south of Buckhouse Bridge speeds increase to 25 mph.

The track crosses Miller Creek Road directly south of US 93. Traffic safety devices at the spur track crossing consist of railroad crossing signage, pavement striping, and crossing gates with flashing lights. Despite the presence of the track and associated safety mechanisms, vehicles stopped at the Miller Creek Road approach to US 93 frequently encroach onto the tracks. Crash data provided by MDT (2000 to 2002) does not reveal any train-related crashes at this site. The traffic signal at the US 93/Miller Creek Road intersection directs drivers approaching Miller Creek Road from US 93 and from Old US 93 to stop at the intersection while the railroad crossing gates are activated.

3.4.7 Emergency Service Provider Access

The City of Missoula Fire Department provides fire suppression and emergency medical response, technical and rope rescue, hazardous materials response, inspections of businesses and residences on request, fire investigations, and public fire safety education to residents within the city limits. The City of Missoula Fire Department Operations Division staffs four stations. Each station has an engine company staffed by a minimum of three firefighters. A new fire station (Station #5) was recently completed in March 2007 (see letter dated May 22, 2006, **Appendix A**). It is located in the project area on Lower Miller Creek Road and will be staffed by three firefighters. This station serves the Linda Vista/Miller Creek area and will be a part of the network of stations designed to provide fire and emergency services to the community.

The Missoula Rural Fire District provides fire protection, emergency medical services, a hazardous materials response team, and other services to approximately 35,000 people in a 75-square-mile area of Missoula County. The District has over 60 resident and volunteer firefighters that serve five stations. Three of the stations are located in Missoula and West Missoula and two are in the outlying towns of Bonner and Lolo.

Other than Station #5, which was completed in March 2007, there are no existing fire stations (city or rural district) in the immediate project area. The City of Missoula Fire Department Station #3 is located approximately one mile east on 39th Street. The Missoula Rural Fire District Station #1 is located one mile north of US 93 on South Avenue.

The Missoula Police Department, located at City Hall on Ryman Street, provides general law enforcement for the city. The Montana Highway Patrol is in charge of traffic enforcement and accident investigation outside the city limits. The Highway Patrol office is located approximately four miles northeast of US 93 at Ryman Street and Broadway. The Missoula County Sheriff is the chief law enforcement officer and is responsible for the enforcement of state and county laws. The Missoula County Sheriff also serves as coroner and administers the detention center.

Emergency access in and out of the project area by emergency service providers and residents is hampered by a frequent bottleneck condition at the US 93/Miller Creek Road intersection. A Missoula Fire Department representative indicated that when responding to calls in the project area, emergency vehicle drivers generally try to avoid the US 93/Miller Creek Road intersection. Although traffic signal preemption (ability to trigger a green signal phase) for emergency vehicles is provided at the intersection of US 93 and Miller Creek Road, congestion at the intersection

can create some delays and increased response times. These delays and increased response times are especially realized during peak traffic periods.

3.5 Right-of-Way and Utilities

The existing right-of-way owned by MDT along US 93 varies in width from approximately 200 feet to 400 feet. A summary of the right-of-way assessment is provided in the *Conceptual Right of Way Acquisition Memo*, and update 2006, prepared for the Miller Creek Road EIS. Existing right-of-way and property ownership data were derived from the Missoula County Assessor's Office.

An overhead power line is located along the south side of the railroad (MRL). Buried telephone lines, including fiber-optic cable, are located along both sides of US 93. A direct-bury cable television line is located along the north side of US 93. A four-inch gas pipeline is located approximately 130 feet north of the north bank of the Bitterroot River. A leased utility site and associated overhead power line is located south of the river near the Lower Miller Creek alignment. Utilities also are located along Miller Creek Road, Reserve Street, Lower Miller Creek Road, Old Bitterroot Road, and Blue Mountain Road, such as underground cable television line, a sanitary sewer line, water lines, and overhead power and telephone lines. A four-inch gas line is located within the Old Bitterroot Road right-of-way. A storm drain line exists along the centerline of US 93 with two catch basins in the existing intersection. At various points along Old US 93, utilities include overhead power, overhead and underground communications, gas lines, a water line, as well as sanitary force and gravity systems. Utilities along Reserve Street include a 30-inch storm drain, a catch basin, and others previously mentioned.

3.6 Economic Conditions

Missoula County is the second largest trade and service center in Montana. The county ranks 52nd out of 56 counties in Montana for total agricultural receipts, though most of the land in the county is classified as agricultural or forest land for tax purposes. Less than one percent of Missoula County’s net income is derived from raising livestock and crops contributing little to the income and employment base.

The per capita income and median household income of both Montana and Missoula County have steadily increased over the past ten years. Personal income in the county is derived from services, government, and retail trade sectors. According to the Montana Department of Labor and Industry, the 2004 average annual wage for all employment sectors in Missoula County was $28,583, compared to the state average of $27,833. The unemployment rate decreased between 1990 and 2000. Between 2000 and 2004, the unemployment rate of Missoula County decreased from 4.1 percent to 4.0 percent. This decrease is inconsistent with trends across the United States, which experienced an increase of unemployment from 4.0 percent to 5.5 percent during the same time period. The *Missoula County Growth Policy*, 2002, states that the economic outlook is optimistic for the future, and economic growth in Missoula County is expected to increase between 3 and 4 percent annually in the next several years. The economic profiles of Montana and Missoula County are shown in **Table 3-14**.

Missoula County experienced rapid economic growth between 1998 and 2000. This growth was generated by major construction projects, the increased strength of the business and professional services sector, and growth in health services.

The civilian labor force increased by 34 percent between 1989 and 1999 while the total private employment increased by 48 percent. Recent statistics show that the top five private employers in the county (listed alphabetically) are Albertson's, Blackfoot Telephone Cooperative, Community Medical Center, Costco, and Home Depot. All private employment sectors, with the excep-

Table 3-14
State and Missoula County Economic Profiles, Years 1990 and 2000

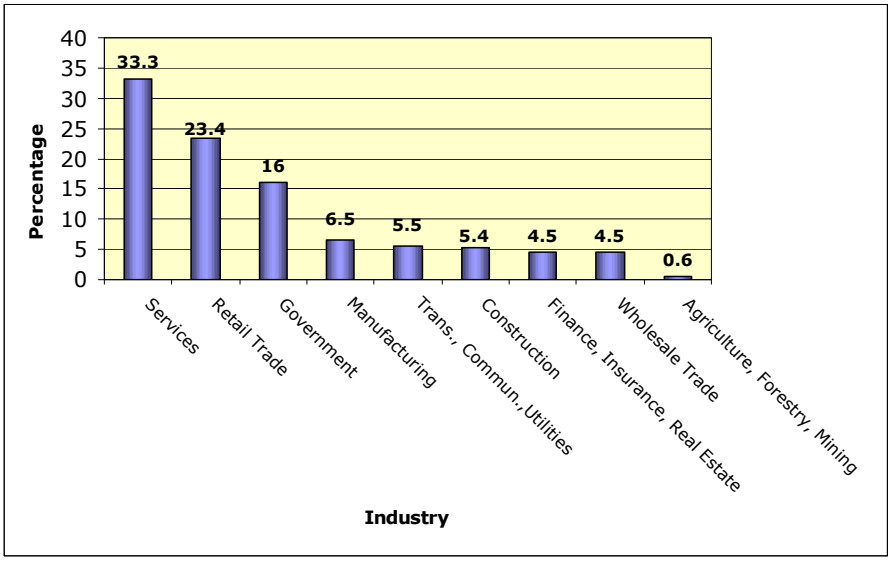
Economic Measure	Montana		Missoula County	
	1990	2000	1990	2000
Population	799,065	902,195	78,687	95,802
Per Capita Income	$15,516	$22,518	$15,906	$24,111
Median Household Income	$22,988	$33,024	$23,388	$34,454
Employment	377,000	455,608	40,181	53,393
Unemployment	24,000	23,524	2,523	1,856
Unemployment Rate	6.0%	4.9%	5.9%	3.4%
Average Annual Wage	$18,636	$24,275	$18,790	$24,128*
Percent of Population in Poverty	16.1%	14.6%	16.9%	8.8%

*Based on 1999 statistics.
Source: Montana Research and Analysis Bureau, Department of Labor and Industry.

tion of manufacturing, demonstrated growth between 1989 and 1999. The service and construction sectors experienced the highest growth during this time period with 64 percent and 84 percent growth, respectively.

The primary industrial sectors in Missoula County by percentage employed are services, retail, trade, government, and manufacturing, as shown in **Figure 3-15.** Missoula County is currently a net importer of labor, according to a recent study conducted for Missoula County, and this trend is expected to continue.

Figure 3-15
Missoula County Primary Industrial Sectors by Percentage Employed



Source: *Census 2000*, US Census Bureau

Wal-Mart is the largest commercial center within the project area. There are numerous commercial and retail services and family-owned businesses along US 93 within the project area, such as auto sales business, wood flooring business, Honda dealership, radio station, and antique/furniture sales. The Wal-Mart and K-Mart retail stores attract high traffic volumes along Miller Creek

Road and US 93 within the project area. Two other large retail corridors are within 0.5 mile of the north boundary of the project area. The Reserve Street retail corridor is the area's newest shopping district with discount stores, casinos, restaurants and a Super Wal-Mart. The Brooks Street/ US 93 retail corridor is located along Brooks Street east of US 93 and includes department stores, smaller retail stores, and restaurants.

New residential and commercial development is proposed in the Miller Creek area over the next several years. The *Revised Development Plan, Maloney Ranch*, 2003, and the *1997 Miller Creek Area Comprehensive Plan Amendment* include plans for a neighborhood commercial center with surrounding high-density urban residential to be located south of Lower Miller Creek Road with various density levels for residential development throughout the Miller Creek area.

3.6.1 Future Economic Goals

Future economic goals and objectives of Missoula County are described in the *Missoula County Growth Policy*. The goals focus on protecting and further developing the county's economic base and ensuring that development conserves and enhances both natural and human resources. Objectives include the following:

- Allow for diverse business and employment opportunities and a competitive business climate.
- Support a stable economy by encouraging "clean" industries that utilize raw materials and diversify demand dependence; concentrating economic expansion on stable industries with long-term prospects; encouraging a broad economic base; and encouraging economic expansion that meets residents' needs first.

3.7 Air Quality

3.7.1 Regulatory Background

Under the Clean Air Act of 1970, the Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants to protect the public from the health hazards associated with air pollution. These six criteria pollutants are: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter less than 10 microns in diameter (PM_{10}). Since July 18, 1997, standards for particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) have been added. The state of Montana is required to meet these federal standards and has also developed its own set of ambient air quality standards [the Montana Ambient Air Quality Standards (MAAQS)]. The state standards are at least as stringent as the NAAQS, and in some cases are more stringent.

Concentrations of these pollutants in ambient air are monitored by the Montana Department of Environmental Quality (MDEQ). In addition to the NAAQS, Montana has adopted state air quality standards for settleable particulates and non-transportation-related pollutants, such as fluoride in forage and hydrogen sulfide.

Geographic areas that exceed a particular NAAQS pollutant standard are considered "non-attainment" areas for that pollutant. Non-attainment areas that return to compliance are called "maintenance" areas.

The regulations in 23 CFR part 450, subpart C, require that metropolitan planning organizations (MPOs) be designated for each urbanized area. MPOs must prepare transportation plans that identify regionally significant transportation projects that are likely to be funded and built. Emissions from all of the included projects cannot exceed emissions budgets contained in the State

Implementation Plan (SIP). A conformity analysis is performed each time the transportation plan is updated. To demonstrate conformity, a project must be included in a conforming Transportation Plan and Transportation Improvement Program (TIP). See Section ES.7, page ES-9, for a definition of these planning terms.

The primary pollutants emitted by motor vehicles are CO, nitrogen oxides (NO_x), and volatile organic compounds (VOCs). NO_x and VOCs combine in the atmosphere to form ozone. Particulate matter on roadways can be resuspended into the air when motor vehicles pass over it.

Motor vehicles are also sources of air toxics. The Clean Air Act Amendments of 1990 identified 188 air toxics, also known as hazardous air pollutants. The EPA defines air toxics as pollutants that cause or may cause cancer or other serious health effects. The EPA has assessed this expansive list of toxics and identified a group of 21 as mobile source air toxics (MSATs), which are set forth in an EPA final rule, *Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17235)*. The EPA also extracted a subset of this list of 21 that it now identifies as the six priority MSATs. These are benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene. While these MSATs are considered the priority transportation toxics, the EPA stresses that the lists are subject to change and may be adjusted in future rules.

The EPA is responsible for the establishment of NAAQS, national guidance, and guidelines for the uniform and scientifically reliable study of air pollutants. To date, there are no NAAQS for MSATs and no established criteria for determining when MSAT emissions should be considered a significant issue.

In its February 2006 interim guidance for MSATs in NEPA documents, the Federal Highway Administration (FHWA) developed a tiered approach. Depending on the specific project circumstances, FHWA has identified three levels of analysis:

- No analysis for projects with no potential for meaningful MSAT effects.
- Qualitative analysis for projects with low potential MSAT effects.
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

There is typically greater potential for MSAT effects to occur for roadways that have an ADT volume of 140,000 to 150,000 vpd or greater in the design year. The ADT in 2025 for roadways under Alternatives 2B, 3B, 4C, and 5A ranges from 100 to 51,950 vpd (DEA, 2006), resulting in low potential for MSAT impacts. Therefore, a qualitative analysis for the Miller Creek Road FEIS is recommended by FHWA.

3.7.2 Existing Conditions

The project area is located at the southern end of Missoula, the largest city in Missoula County. It is situated at the confluence of the Bitterroot and Clark Fork Rivers. Its climate is mild, with mean temperatures ranging from the mid-to-high 20s (°F) in the winter to the mid-60s in the summer, and has an annual mean rainfall of about 17 inches. The Missoula Valley is home to approximately 95,000 people. The valley is fairly narrow, approximately six miles across, and is susceptible to temperature inversions during the fall and winter months that can cause pollution episodes. Wind speeds are generally low throughout the year, which can result in poor flushing of pollutants from the valley.

The MDEQ currently has three ambient air quality monitoring stations in Missoula near the project area. Two of the sites monitor airborne particulates PM_{10} and $PM_{2.5}$, and a third one monitors CO. From 1994 to 2005, the ambient CO concentration did not exceed the 8-hour standard of 9 parts per million (ppm) or the 1-hour standard of 35 ppm. During the same period, the

ambient PM_{10} concentration exceeded the 24-hour standard of 150 cubic micrograms one time in the year 2000. No violations of the $PM_{2.5}$ standard have been reported since $PM_{2.5}$ monitoring began in 1999. **Table 3-15**, **Table 3-16**, and **Table 3-17** show recent CO, PM_{10}, and $PM_{2.5}$ concentrations from ambient air quality monitoring stations in Missoula, respectively.

Table 3-15
Missoula(1) Ambient Carbon Monoxide Concentrations (ppm)

Year	Highest 1-Hour Concentration (ppm*)	Highest 8-Hour Concentration (ppm)	Number of Exceedances of the 1-Hour Standard	Number of Exceedances of the 8-Hour Standard(2)
1994	8.5	75	0.0	0.0
1995	8.9	7.8	0.0	0.0
1996	6.7	5.8	0.0	0.0
1997	8.1	6.3	0.0	0.0
1998	5.7	4.7	0.0	0.0
1999	6.0	4.9	0.0	0.0
2000	5.4	3.9	0.0	0.0
2001	7.0	5.5	0.0	0.0
2002	5.7	4.6	0.0	0.0
2003	4.5	4.0	0.0	0.0
2004	3.8	3.2	0.0	0.0
2005	4.3	4.1	0.0	0.0

(1)Data from Malfunction Junction site in Missoula, Montana.
(2)The NAAQS is only defined to one significant figure; therefore, values below 9.5 are considered below the standard, and 9.5 and greater are considered exceedances.
*ppm = parts per million.
Source: Montana Department of Environmental Quality.

The City of Missoula is a designated non-attainment area for the transportation-related criteria pollutants CO and PM_{10}. The majority of the project area is outside of the boundaries for the non-attainment areas, in areas designated as attainment/unclassified. A small section of the project, including three intersections that would be signalized under the build alternatives (the intersections of Miller Creek Road and US 93, US 93 and Reserve Street, and Reserve Street and Old Highway 93), is located within the Missoula PM10 and CO non-attainment boundaries. The area where the project is located outside the city limits is designated as attainment/unclassified. A conformity analysis is performed each time the transportation plan is updated. To demonstrate conformity, a project must be included in a conforming transportation plan and TIP. Missoula County approved an update to the *Missoula Urban Transportation Plan* (MUTP) in May 2004, and the FHWA and FTA issued a finding of conformity on June 4, 2004. However, the MUTP does not include the preferred project alternative. Therefore, the local MPO will need to amend (update) their MUTP to include the Miller Creek Road project preferred alternative. The current TIP *(Missoula Transportation Improvement Program, Federal Fiscal Years* 2007-2011) does not include the Miller Creek Road Project. The project will need to be included in a conforming MUTP and TIP before a project-level determination of conformity can be made by FHWA. See Section ES.7, page ES-9, for a definition of these planning terms.

A hot spot analysis to determine localized CO impacts at signalized intersections is only required for affected intersections that are within the non-attainment area boundary. A hot spot analysis was performed for the three intersections listed above for the Preferred Alternative (Alternative 5A).

In accordance with the federal Clean Air Act and the Transportation Conformity Rule (40 CFR 93.104), proposed projects must be found to conform to the State Implementation Plan (SIP)

Table 3-16
Missoula Ambient PM_{10} Concentrations (ug/m^3)

Year	Boyd Park Site (1)		Health Department Site (1)	
	Highest 24-Hour Average	No. of Days > 150 ug/m^3* 24-Hour Standard	Highest 24-Hour Average	No. of Days > 150 ug/m^3* 24-Hour Standard
1994	105	0	70	0
1995	83	0	67	0
1996	114	0	71	0
1997	88	0	78	0
1998	127	0	72	0
1999	61	0	46	0
2000	164	1	193	1
2001	91	0	63	0
2002	46	0	43	0
2003	109	0	134	0
2004	86	0	49	0
2005	85	0	57	0

(1)The highest data value was selected when the site had more than one monitoring method.
* ug/m^3 = micrograms per cubic meter.
Source: Montana Department of Environmental Quality.

Table 3-17
Missoula Ambient $PM_{2.5}$ Concentrations (ug/m^3)*

Year	Boyd Park Site (1)		Health Department Site (1)	
	98th Percentile of the 24-Hour Average Concentration(2)	Annual Arithmetic Mean	98th Percentile of the 24-Hour Average Concentration(2)	Annual Arithmetic Mean
1999	24	9	29	10
2000	49	13	53	15
2001	41	11	44	10
2002	26	8	27	10
2003	-	-	89	15
2004	-	-	53	11
2005	-	-	49	11

(1)The highest data value was selected when the site had more than one monitoring method.
(2)A federal violation of the 24-hour standard occurs when the 3-year average of the 98th percentile of the 24-hour concentrations exceeds the standard.
* ug/m3 = micrograms per cubic meter.
Source: Montana Department of Environmental Quality.

before they are adopted, accepted, approved, or funded by FHWA or the Federal Transit Administration (FTA). This requirement necessitates that the project be in a fiscally constrained conforming Transportation Plan and Transportation Improvement Program (TIP). Before FHWA can sign the ROD, which permits a project sponsor to proceed to further actions, such as final design or construction, the funding for completion of the project through construction need to be identified in the fiscally constrained conforming Transportation Plan and TIP.

3.8 Noise

3.8.1 Noise Principles

Decibels (dB) are the unit by which noise levels are measured. Given that the human ear responds differently to various frequencies, measured sound levels (in decibels) are generally "weighted" to equate to the frequency response of humans and human perception of loudness. Weighted sound levels are expressed in units called A-weighted decibels (dBA). Generally, three decibels is the minimum change in outdoor sound levels that can be perceived by a person with normal hearing, and a change of five decibels is readily detected. A difference in ten decibels is generally perceived as being twice or half as loud. For orientation purposes, **Table 3-18** lists examples of common outdoor noise levels. These representative noise levels are shown as dBA values.

Table 3-18
Common Outdoor Noise Levels

Common Outdoor Noise Levels	Noise Level dBA
Diesel truck at 15 feet	90
Noisy urban daytime	80
Commercial area	65
Quiet urban daytime	50
Quiet urban nighttime	40
Quiet suburban nighttime	35

Source: *Guide on Evaluation and Abatement of Traffic Noise*, American Association of State Highway and Transportation Officials, 1993.

Transportation-related noise generally fluctuates over time because of varying traffic operating conditions, traffic volume, speed, and types of vehicles. Averaging noise levels produced by different activities over a period of time allows the use of a single number to describe the condition. This resulting single number captures the equivalent continuous noise level, or Leq. Leq(h) is the descriptor for the equivalent continuous noise level when the time period is one hour.

3.8.2 Noise Abatement Criteria

Two primary guidance documents were used in analyzing noise impacts and determining when it is appropriate to consider mitigation for impacted receivers:

- Federal Highway Administration, *Procedures for Abatement of Highway Traffic Noise and Construction Noise* [23 Code of Federal Regulations (CFR) Part 772].
- Montana Department of Transportation, *Traffic Noise Analysis and Abatement: Policy and Procedure Manual* (2001).

These documents collectively establish noise thresholds based on land use. Land uses in the project area were categorized, and hourly noise level maximums were established. A complete list of FHWA Noise Abatement Criteria (NAC) and each land use threshold is listed in **Table 3-19**. The location and magnitude of noise impacts were assessed based on the FHWA NACs. This project is not funded by MDT; however, the MDT standards are the standard of practice in Montana for traffic noise and were used to evaluate impacts for this project. A noise impact occurs with noise levels 1-dBA below the FHWA NACs. Impacts are also considered to occur if predicted

noise levels substantially exceed existing noise levels. A 13-dBA increase in noise levels is considered substantial.

Table 3-19
FHWA Noise Abatement Criteria (NAC)
Hourly A-Weighted Sound Level in Decibels (dBA)

Activity Category	Leq (h) (hourly)	Description of Activity Category
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	Developed lands, commercial areas, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 CFR Part 772), FHWA

Table 3-20
Existing Noise Levels at Measurement Points

Receptor Location	Activity Category	Monitored Noise Level (dBA)	Applicable FHWA NAC (dBA-Leq)
Measurement Point 1 (Hayes Creek Road)	B	57	66
Measurement Point 2 (Totem Lane)	B	50	66
Measurement Point 3 (Old Bitterroot Road)	B	48	66
Measurement Point 4 (Blue Mountain Trailer Park)	B	46	66
Measurement Point 5 (Buckhouse Lane)	B	45	66
Measurement Point 6 (US 93/Blue Mountain Road)	B	54	66
Measurement Point 7 (US 93 east of Blue Mountain Road)	B	61	66
Measurement Point 8 (Lower Miller Creek Road)	B	51	66
Measurement Point 9 (Old US 93)	C	58	66
Measurement Point 10 (Miller Creek Road)	B	58	66
Measurement Point 11 (Miller Creek Road)	B	58	66
Measurement Point 12 (north "Y")	B	58	66
Measurement Point 13 (Miller Creek Road)	B	67	66

Source: Noise measurements made on August 28 and 29, 2003, and August 4, 2004.

The above criteria are typically applied to outdoor areas of use. If a proposed action would result in noise levels above these thresholds, noise mitigation would need to be considered as a part of the proposed action.

3.8.3 Existing Conditions

The information for the noise analysis is taken from the *Technical Noise and Air Quality Analysis Report* (TWE, 2004, amended 2006). Land uses in the project area vary from undeveloped rural

and suburban residential uses to commercial/light industrial uses. The majority of the project area includes residential development and vacant land platted for future development. Along the US 93 corridor, land uses include commercial, light industrial, and residential. "Noise-sensitive" land uses include numerous single-family residential developments, a mobile home park, two motels, and two churches.

Existing traffic noise levels for this proposed action were calculated using FHWA's Traffic Noise Model (TNM, Version 2.5). Noise levels were measured at 13 locations to document existing noise levels, and to support calibration of the model. Field results are shown in **Table 3-20**, and locations are shown in **Figure 3-16**.

Following model calibration, TNM was used to model existing conditions during the peak noise hour (the PM peak traffic hour). Eighteen residential properties, one church, and one commercial property within the project alignment corridors currently have traffic noise levels that exceed the noise impact criteria. **Table 4-21, page 4-77** and **Figure 4-8, page 4-84** identify the receiver locations and existing noise level impacts.

3.9 Water Resources and Water Quality

3.9.1 General Description

The Bitterroot River and the confluence of Miller Creek with the Bitterroot River are the primary water resources in the project area (**Figure 3-17**).

The project area lies within the Bitterroot River Basin, the Upper Clark Fork sub-major basin, and the Bitterroot Watershed [Hydrologic Unit Code (HUC) 17010205]. The Bitterroot Watershed is located to the west of the Continental Divide and drains approximately 2,900 square miles, the majority of which falls within Missoula and Ravalli Counties.

Principal land uses of the Bitterroot Watershed within the project area include grazing, hay production, commercial and residential development, and recreation. Agricultural uses create a major demand on the surface water supplies during most of the year. At times there are more demands than there is water in the river. As the demand exceeds the supply, the water rights of farmers and other residents in the valley and the Bitterroot's trout populations have been compromised. Lying just south of one of Montana's fastest-growing cities, the Bitterroot Valley is experiencing population growth and development, creating even more demands for water.

3.9.2 Impaired Waters and TMDL Regulation

The Montana Department of Environmental Quality (MDEQ) is the state agency with responsibility for preserving and maintaining the quality of Montana's water supply. MDEQ has responsibility under the federal Clean Water Act and the Montana Water Quality Act to monitor and assess the quality of Montana surface waters. The Clean Water Act requires states to adopt standards for the protection of surface water quality. Montana's standards are designed to maintain water quality that will support the beneficial uses identified by the Montana Water-Use Classification System. Classifications assigned by this system require waters to support some or all of the following uses: drinking and food processing; bathing; swimming and contact recreation; growth and propagation of fish and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply.

When water quality standards cannot be met, and when permits and Best Management Practices (BMPs) prove inadequate to fully protect water quality, the provisions of Section 303(d) of the Clean Water Act come into effect. The language of this section and related EPA regulations

Figure 3-16
Noise Measurement Locations

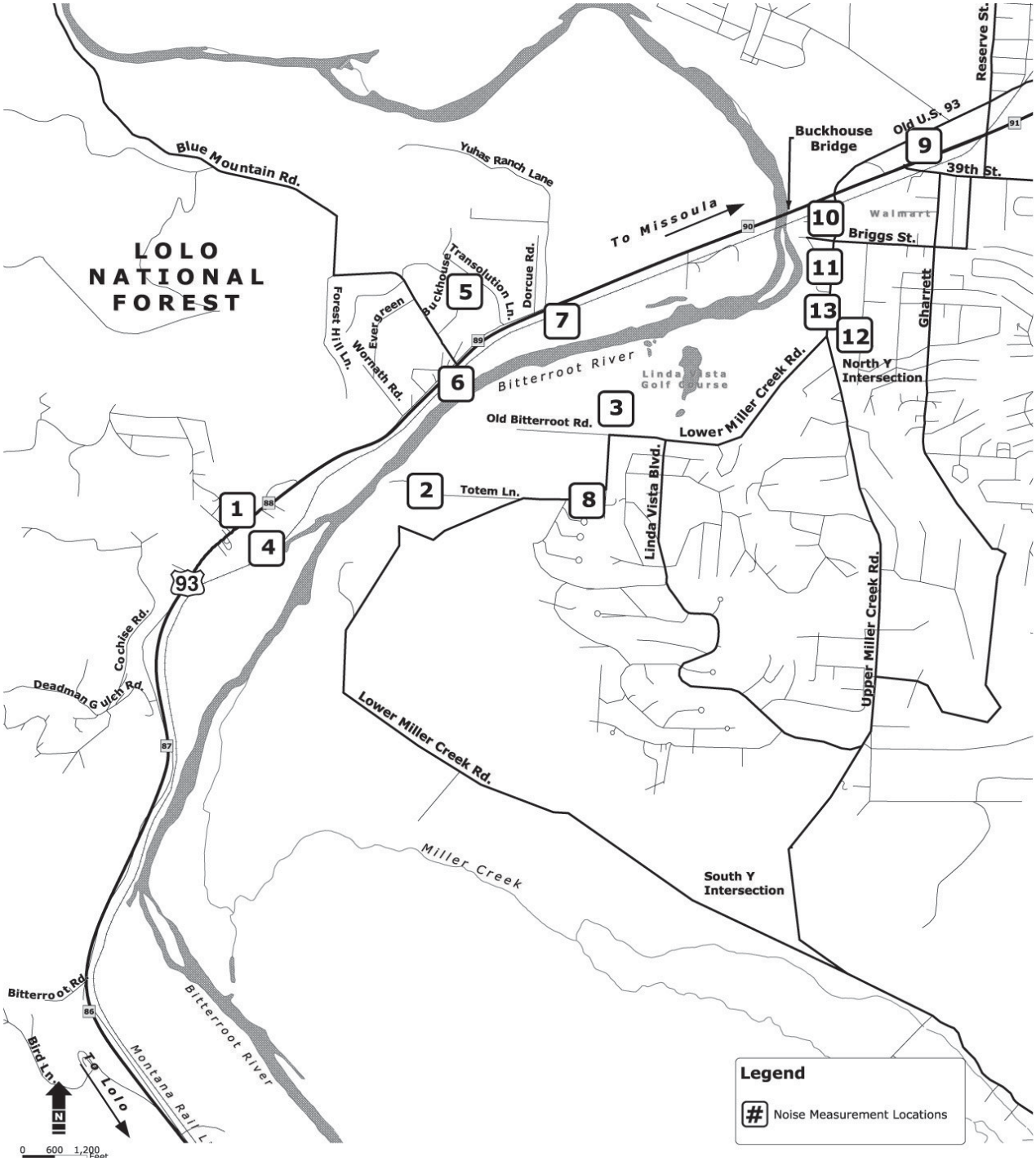
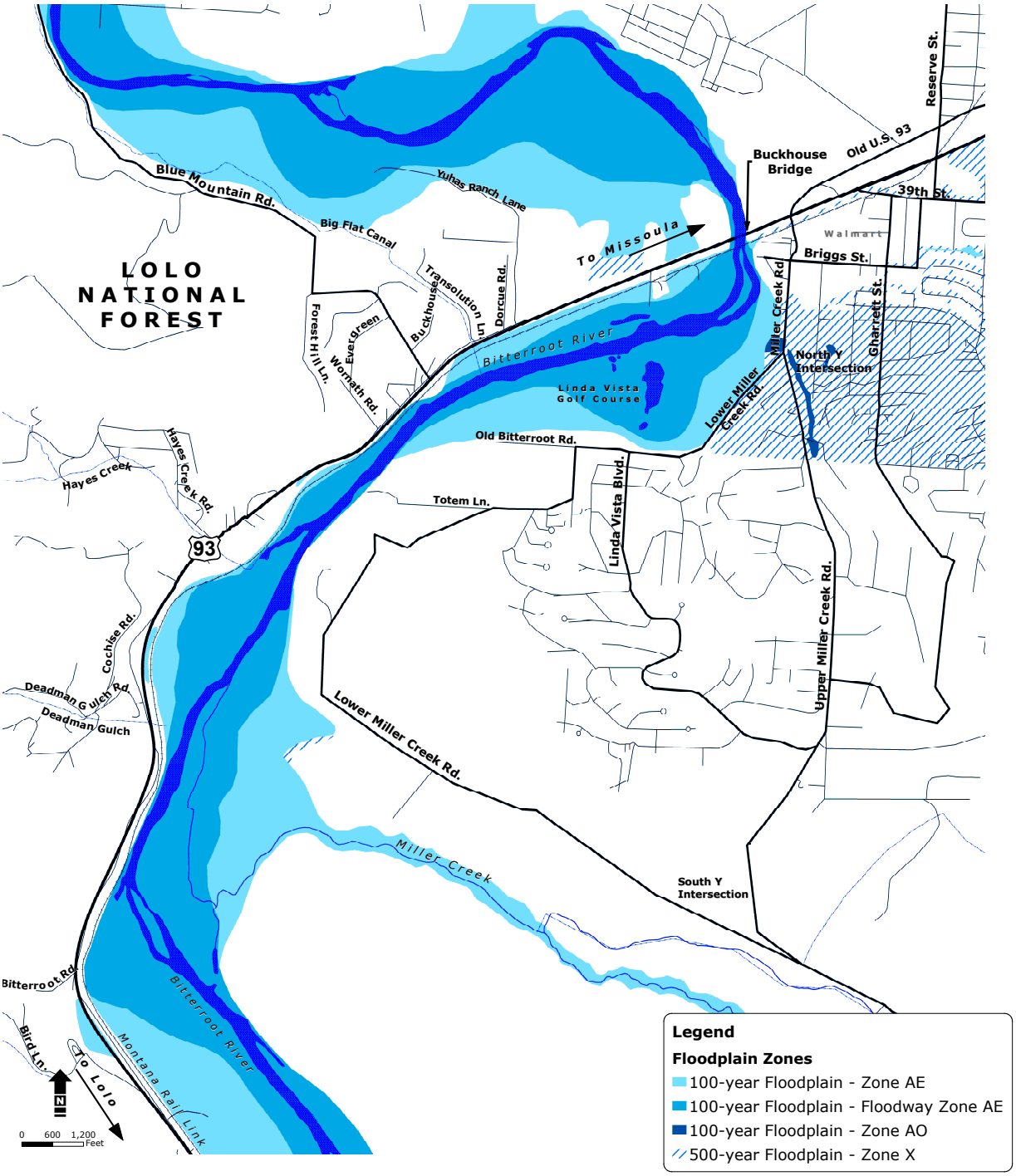


Figure 3-17
Water Resources and Floodplains in the Project Area



require states to identify waters where quality is impaired, and submit a list of the threatened or impaired waters. An impaired water body is defined as one that does not fully support one or more beneficial uses. The Montana 303(d) list identifies water bodies that are impaired and are in need of a plan to identify the necessary measures to bring water quality into compliance. This can be accomplished by estimating the Total Maximum Daily Load (TMDL) of pollutants that a water body can assimilate and still meet water quality standards. Once the 303(d) list is submitted, EPA and MDEQ can establish a "high," "moderate," or "low" priority for TMDL development, based upon factors such as individual water body characteristics, grouping waters having similar or interrelated problems, availability of data, and the degree of public interest and support.

The Bitterroot River and Miller Creek within the project area are considered impaired water bodies. Miller Creek was listed on the MDEQ's 1996 303(d) list (was not assessed in 2004), and the Bitterroot River is listed on MDEQ's 2004 303(d) list. Beneficial uses that are fully supported within the Bitterroot River are agriculture, drinking water supply, industrial and primary contact (recreation). Partially supported beneficial uses are aquatic life and cold-water fishery (trout). No beneficial uses are fully supported by Miller Creek. Aquatic life is the only partially supported beneficial use within Miller Creek. However, because of irrigation diversions upstream, Miller Creek is often a non-flowing stream within the project area. **Table 3-21** lists the probable causes and sources for listing of the Bitterroot River and Miller Creek.

Table 3-21
List of Probable Causes and Sources for Listing on the 2004 Montana State 303(d) List

Water Body	Probable Causes	Probable Sources
Bitterroot River (2004)	• Nitrate • Nutrients • Metals • Other habitat alterations • Siltation	• Agriculture • Range grazing (riparian areas) • Urban runoff/storm sewers • Land disposal • On-site wastewater systems (septic tanks) • Habitat modification • Bank or shoreline modification/destabilization • sediment resuspension
Miller Creek (1996) *was not assessed in 2004	• Flow alterations • Other habitat alterations • Siltation • Thermal modifications	• Agriculture • Irrigated crop production • Natural sources • Range grazing (riparian areas) • Silviculture

Source: Montana Department of Environmental Quality 1996 and 2004 303(d) Lists.

The activities that may impact all water bodies in the project area are: land development; agricultural practices and sources; municipal point source pollution; highway, road, and bridge construction; stream and streambank modifications such as channelization and flow regulation; and habitat modification. EPA and MDEQ are working together to develop and adopt a schedule that will result in developing all necessary TMDLs for waters on Montana's 303(d) list on a watershed basis. It is expected that the Bitterroot River and Miller Creek will be reassessed and TMDLs will be developed by the end of 2006.

3.9.3 Surface Water

The Bitterroot River is the principal water body within the project area. The Bitterroot River (within the Clark Fork Columbia River drainage) is classified by the state of Montana as B-1. The B-1 classification stipulates that these waters are to be maintained suitable for drinking, culinary and food processing purposes, after conventional treatment; bathing, swimming and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers;

and agricultural and industrial water supply. The Bitterroot River provides groundwater recharge, water for irrigation, habitat for fish and other aquatic life, wildlife habitat, and recreation opportunities.

Other water bodies of note within the project area include ephemeral tributaries to the Bitterroot River, Hayes Creek, and Deadman Gulch. The ephemeral tributaries usually contain discharge from spring to summer or early fall in response to spring runoff. US 93 crosses both Hayes Creek and Deadman Gulch west of the Bitterroot River. These waterways are shown on **Figure 3-17** and described below.

- **Bitterroot River**—The Bitterroot River flows from south to north through the project area before its confluence with the Clark Fork River at the west side of Missoula, which is downstream and outside the project area. The Bitterroot River runs on the east side and parallel to US 93 through the entire project area. Natural flows in the Bitterroot River and its tributaries typically peak in the spring, decline in the summer, and remain relatively stable through the winter. The daily mean stream flows recorded by the US Geological Survey (USGS) since the early 1900s have ranged from 300 to 38,300 cubic feet per second.

  The quality of surface water in the Bitterroot River is influenced by the geology of the headwater areas approximately 100 miles upstream from the project area. The Bitterroot River and its tributaries typically have low concentrations of dissolved solids as a result of flowing through terrains of igneous and metamorphic rocks in the Bitterroot Mountains. However, dissolved solids concentrations increase in the lower segments of the Bitterroot River because of increased return flow from irrigation canals in the Bitterroot River Valley and inflow from tributary streams that flow over sedimentary and igneous formations of the Sapphire Mountains southeast of the project area. Water temperatures in the Bitterroot River near Missoula have reached 74 degrees Fahrenheit. See **Photo A** of the Bitterroot River.

Photo A. Bitterroot River.

- **Miller Creek**—Miller Creek flows from east to west and joins the Bitterroot River approximately three miles upstream from the Buckhouse Bridge near the intersection of Miller Creek Road and US 93. Miller Creek is considered ephemeral with upstream irrigation diversions frequently resulting in dewatering the stream's lower reaches. **Photo B** shows Miller Creek in the middleground as it flows toward the Bitterroot River.

Photo B. Miller Creek.

- **Hayes Creek**—Hayes Creek flows from west to east entering the Bitterroot River immediately downstream from Miller Creek. This drainage is outside the direct area of influence.
- **Deadman Gulch**—Deadman Gulch flows from west to east entering the Bitterroot River opposite Miller Creek. This drainage is outside the direct area of influence.
- **Big Flat Canal**—The Big Flat Canal diverts water from the north bank of the Bitterroot River (see **Photo C** of Big Flat Canal).

Photo C. Big Flat Canal.

3.9.4 Groundwater

About 445,000 Montanans depend on groundwater for their primary water supply. This represents more than one-half of the state's total population. Approximately 217 million gallons each day (mgd) is withdrawn from aquifers underlying Montana. In 1990, groundwater withdrawals were used for irrigation (90 mgd or 41.5 percent); public water supply and rural domestic use (66 mgd or 30.4 percent); industry (30 mgd or 13.8 percent); livestock (16 mgd or 7.4 percent); and mining (15 mgd or 6.9 percent). More than 50 percent of Montana's citizens rely on groundwater for drinking and household use.

Although groundwater is readily available and widely used in nearly every part of Montana, it currently represents only about 2 percent of the state's total water withdrawals. The demand for high quality water will no doubt increase in the future as the state's population and industries continue to grow. In practical terms, this means the use of groundwater must increase since most of the state's surface water supply is already legally allocated, or in the process of being allocated. Much of Montana's population growth is in rural areas near urban centers. Many of these new bedroom communities are not supported by existing municipal water supplies and will have to rely on groundwater. Another factor that causes increased use of groundwater is recurring drought. It has been estimated that Montana experienced drought in 9 of the last 17 years. During drought years, the availability of surface water is substantially reduced and consumers are forced to increase their use of groundwater. With the availability of surface water being limited, or uncertain, it is clear that Montana's groundwater resources will play a major role in the state's economic development in the future.

Large intermontane basins in western Montana and major stream valleys in central and eastern Montana are known to contain highly productive aquifers. Surface and groundwater specialists

agree that the overall statewide volume of groundwater stored in Montana's aquifers is much greater than the total volume of the state's surface water resources.

It seems reasonable to assume that the groundwater resource could generally support increased use in many parts of the state. However, groundwater systems are complex and often delicately balanced. Many aquifers are prone to localized contamination from human activities and can be seriously damaged if they are overdeveloped. It is important to understand that shallow groundwater and surface water systems are connected in most areas. Expanding the use of localized shallow groundwater in an area where surface water is already in short supply may further impact the quality and quantity of the resource.

Across Montana, activities such as spills, improper waste disposal, and land use practices have caused groundwater contamination. The Montana Water Quality Act [75-5-101 through 641, Montana Code Annotated (MCA)] is designed to protect, maintain, and improve the quality of Montana's water resources. Contained within the Water Quality Act are provisions to prevent degradation of water quality and to protect beneficial uses of state water. Pursuant to the Water Quality Act, the Board of Environmental Review must establish classifications for all state waters and establish water quality standards to protect human health and the environment. A permit system is also administered under the Water Quality Act to control discharges of contaminants to surface water and groundwater. In addition to the Water Quality Act, other statutes have been passed that include water quality protection provisions. These laws control mineral extraction and processing, hazardous and solid waste management, underground storage tank installation and monitoring, pesticide and fertilizer management, and municipal and domestic sewage disposal. Any of these activities may threaten the quality of groundwater.

3.9.4.1 Missoula Valley Aquifer

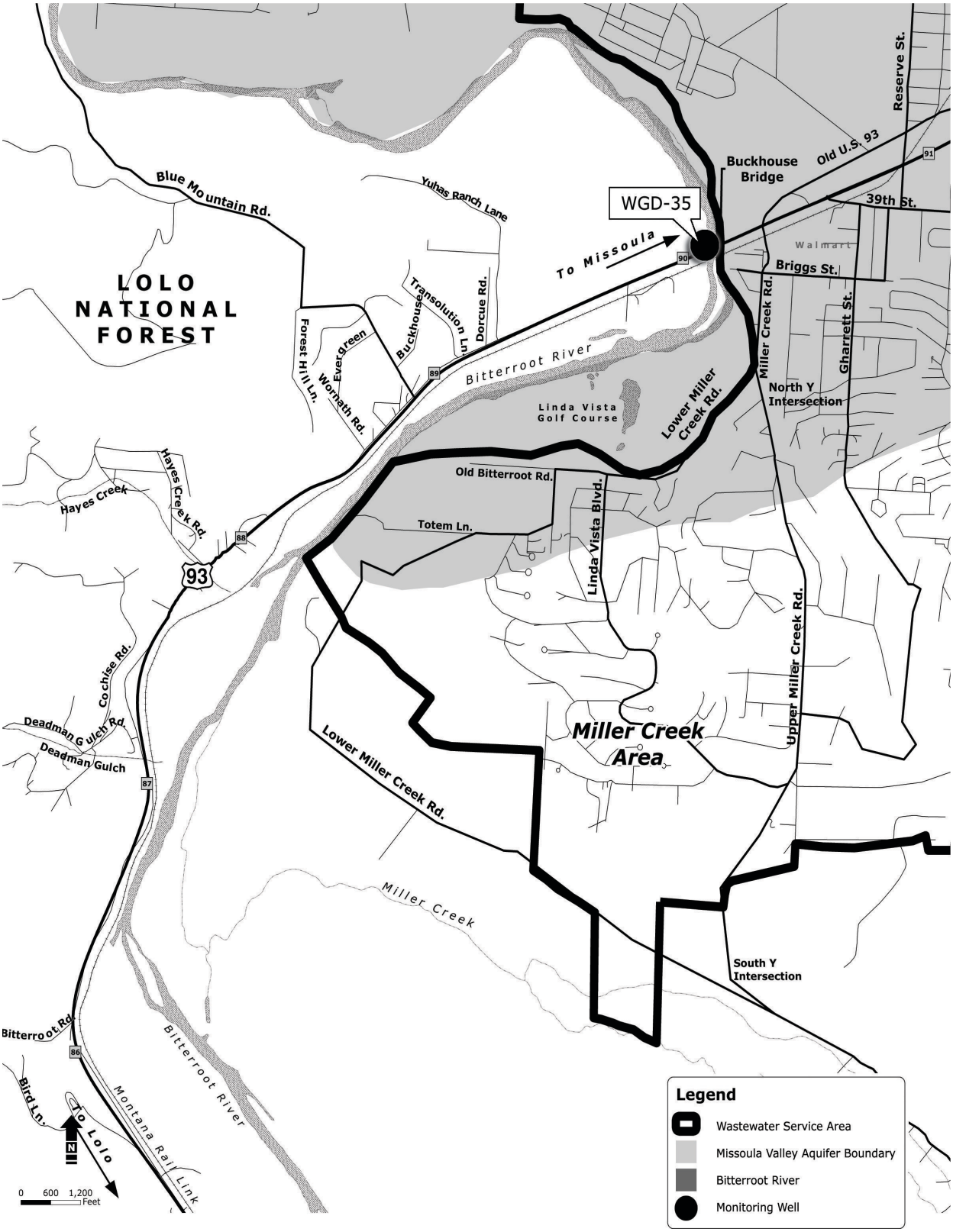
The Missoula Valley Aquifer is the primary groundwater resource of the Missoula Valley and project area. Drinking water for 80 percent of Missoula County residents is supplied from groundwater from the Missoula Valley Aquifer. The Missoula Valley Aquifer is designated as a "sole source aquifer" under Section 1424(e) of the Safe Drinking Water Act. This designation, made at the request of the Missoula City-County Health Department in 1988, provides for EPA review of federal financially assisted projects to assure that such federally assisted projects do not contaminate an aquifer that is the sole or principal source of drinking water for an area. **Figure 3-18** depicts the geographic coverage of the Missoula Valley Aquifer.

The Missoula Valley Aquifer is the primary drinking water source for the City of Missoula. Mountain Water Company owns and operates the drinking water system serving the City of Missoula. Mountain Water Company is a private, investor-owned utility with regulatory oversight by the Montana Public Service Commission and the MDEQ. The system relies on 37 wells, drawing from the Missoula Valley Aquifer. The only treatment the water receives is chlorination before distribution. Mountain Water Company also operates the Rattlesnake Creek surface supply as an emergency backup supply and future resource if needed.

The Montana legislature passed a law in 1991 giving local governments the authority to form local Water Quality Districts (WQD). By creating a WQD, local governments assume more direct control for the protection of drinking water and streams. With this authority, the Missoula Valley Water Quality District was created by resolution of the Missoula Board of County Commissioners in January 1993 and began operations in July 1993. The Missoula Valley Water Quality District, in coordination with MDEQ, enforces the Montana Water Quality Act to protect, preserve, and improve the quality of surface water and groundwater.

Within the Missoula Valley Water Quality District, the City of Missoula adopted the *Missoula Valley Water Quality Ordinance* in June 2001. This ordinance is intended to protect the public health, safety and general welfare of those utilizing the Missoula Valley Aquifer and surface

Figure 3-18
Wastewater Service Area and Missoula Valley Aquifer



water in the Missoula Valley for drinking water, recreation and other beneficial uses. As such, it establishes prohibitions and restrictions to prevent surface water and groundwater contamination.

Geology and Aquifer Properties

The Missoula Valley Aquifer is unconfined and composed primarily of a 100- to 150-foot-thick sequence of flood-deposited sand, gravel, and boulders, with some silt and clay. The depth from the surface to the aquifer varies from 10 to 100 feet. Stream water seeps through these very porous deposits and recharges the aquifer. Leakage from the Clark Fork River and tributaries (Rattlesnake Creek and Grant Creek alluviums) is the major contributor to the Missoula Valley Aquifer recharge. Recharge of the aquifer is also provided from precipitation that falls on the ground surface and eventually percolates through the sands, gravels, and silts that exist within the alluvial deposits of the Clark Fork River valley. These alluvial materials filter contaminants from the percolating water. Other recharge sources include:

- Direct precipitation on the aquifer.
- Discharge from the adjacent hydrostratigraphic units.
- Stormwater runoff.
- Septic systems.
- Leakage from irrigation ditches.

Much of the precipitation within the Missoula area is intercepted by impervious surfaces, such as rooftops and road and parking lot pavement. To minimize direct discharge to surface waters, such as the Bitterroot River, the runoff from the impervious surfaces is conveyed to "dry wells" or sumps that have been established by the City of Missoula within the city limits. The dry wells or sumps collect and direct the surface runoff into the alluvial materials and, after percolating through the alluvial materials, the runoff eventually reaches the Missoula Valley Aquifer. Missoula County has not established "dry wells" in the vicinity of the proposed action and does not propose to establish any in the area.

Groundwater flow within the Missoula Valley Aquifer north of the Clark Fork River is away from the channel and away from the northern aquifer boundary. South of the Clark Fork River, groundwater flows southwest toward the Bitterroot River and towards the confluence of the Clark Fork and Bitterroot Rivers.

Water Availability and Supply

The Missoula Valley Aquifer yields up to 7,000 gallons per minute and over 9.7 billion gallons of water to wells that supply the City of Missoula. The water table within the Missoula Valley Aquifer follows several general trends:

- Water levels rise between March and June and then decline until the following February and March.
- The seasonal water table fluctuations decrease with increasing distance from the Clark Fork River or other influent streams.
- Water levels near the mouths of Grant Creek and possibly Rattlesnake Creek have the largest fluctuation.

Based on observations during the early to mid-1980s, the long-term water level trends indicate a general lowering of the valley water table in response to climatic influences and pumping stress on the aquifer.

Water Quality

The Missoula Valley Water Quality District has a groundwater monitoring network established for the Missoula Valley Aquifer consisting of 36 monitoring wells, including one well reportedly located in the Miller Creek area (location not disclosed by the District). Although a published monitoring plan was not available, the District reportedly samples the monitoring wells twice a year (wet/dry seasons) for dissolved oxygen, metals, calcium, potassium, nitrate, pH, and other constituents.

The Missoula Water Quality District has one monitoring well within the Missoula Valley Aquifer Boundary: Well Number WQD-35, near Buckhouse Bridge (MV-39) (see well location on **Figure 3-18**). It is located on the east bank of the Bitterroot River near US 93. The record consists of 43 samples from 1995 through 2006. The average depth to groundwater, as reported in the monitoring well, is 26.7 feet, with a mean elevation of 3,122.4 North American Vertical Datum of 1988 (NAVD'88). **Table 3-22** provides the median constituent values for this monitoring well.

Table 3-22
Median Constituent Values for Monitoring Well Near Buckhouse Bridge

Well Number WQD-35 Buckhouse Bridge (MV-39)	Median Constituent (mg/L)
Potassium	2.5
Sodium	13.0
Calcium	61.8
Magnesium	18.5
Sulfate	19.2
Chloride	19.0
Bicarbonate	209.2
Nitrate-N	1.9
Hardness	232.0
Alkalinity	209.0
EC	526.0 mhos/cm
pH	7.4
Dissolved Oxygen	7.1
Arsenic	0.001
Barium	0.27
Cadmium	<0.001
Chromium	0.001
Lead	<0.001
Iron	0.014
Manganese	0.002
Nickel	0.001
Zinc	0.002

Water quality in the Missoula Valley Aquifer meets or exceeds all acceptable drinking water standards. However, according to the Missoula Valley Water Quality District, perchlorethylene concentrations have been detected in water samples collected along US 93 in the past. The presence of perchlorethylene is presumed to be remnants of past dry cleaning operations along the highway. Recent samples indicate nondetectable concentrations of perchlorethylene.

Additionally, the Missoula Valley Aquifer is hydrologically connected to the Milltown to Hellgate Aquifer, an aquifer that receives metals contamination from the sediment of Milltown Dam and Reservoir, which is a federal Superfund site. The Milltown to Hellgate Aquifer is located generally to the east of Missoula and upgradient of the project area. The Missoula Aquifer in the Missoula urban area receives approximately 22 percent of its flow from the Milltown to Hellgate Aquifer.

Nearly 40 percent of the Missoula Valley homes outside the urban area use a septic system for disposal of domestic waste. Approximately 200 gallons per day per household enter each septic system. City of Missoula and Missoula County regulations require approximately one acre of land per conventional residential septic system. As the number of the Missoula Valley households relying on septic systems for domestic waste disposal increases, the potential for degradation of the Missoula Valley Aquifer groundwater supply also increases. Contaminants typically associated with septic systems include phosphorous, nitrogen (nitrates), chloride, and fecal coliform.

The City of Missoula provides sewer service within the urban area. The 1999 Wastewater Facilities Plan Update established a sewer service area boundary, which includes the project area, where sewer service is anticipated to be expanded within the next 20 years. The existing wastewater treatment plant is being upgraded to increase capacity to 12 mgd from 9 mgd to accommodate this expansion.

3.9.5 Municipal Water Supply Systems

Missoula County owns and operates several water systems that serve about 3,500 residents, including the Lolo, El Mar, Sunset West, and Lewis and Clark systems. The Confederated Salish and Kootenai Tribes maintain two community water systems in Missoula County. There are additional private water supply wells within and outside the urban area that provide drinking water. The number of new private wells in Missoula County over the past ten years is 4,061.

Missoula relies primarily on the Missoula Valley Aquifer to supply the daily water demands of the community. The primary suppliers of domestic water in the Missoula urban area are Mountain Water Company and Valley West Water Company. Nine public water supply wells operated by these water supply companies are located within the project area.

3.10 Wetlands

This section describes the wetland resources that may be affected by the alternatives under consideration. The project area surveyed for the wetlands is limited to areas in the general vicinity of the build alternatives.

Wetlands are areas in transition between aquatic and terrestrial ecosystems, characterized by a water supply sufficient to support vegetation adapted for growing in wet soils. Wetlands frequently support a wide variety of plant and wildlife species and provide a number of important functions, including streambank stabilization, water quality protection, and water storage. Wetlands and "Waters of the United States" are regulated by the US Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA). The act states that any discharge of dredged or fill material into such waters requires a permit by the USACE. Executive Order 11990, Protection of Wetlands, signed in 1977, also provides protection for wetlands.

A wetland survey, delineation, and function/value assessment of project area wetlands was conducted during late July 2003 and June 2004 in accordance with the 1987 USACE *Wetland Delineation Manual* and Executive Order 11990. The *MDT Montana Wetland Assessment Method* was used as the locally accepted method to document the function/value assessment. Detailed information on the wetlands in the project area is presented in the *Biological Resources Report* prepared for the EIS.

There are 17 potential wetlands covering approximately 5.6 acres identified in the project area. Of the 17 sites, 4 sites (wetlands 4, 8, 16, and 17) did not meet wetland qualifications. The remaining sites were classified under nine hydrogeomorphic types and were of MDT Function/ Value Assessment Categories I, III, or IV. The MDT Montana Wetland Assessment Method rates the functions and values of wetlands from Category I (highest) through Category IV (lowest). No Category II wetlands were found in the project area. Only two of the wetlands were rated Category I. See **Figure 3-19** for the general location of delineated wetlands. **Figure 2-6, page 2-20**; **Figure 2-12, page 2-28** through **Figure 2-16, page 2-33**; and **Figure 2-18, page 2-35** show the wetland locations in relation to the conceptual designs.

3.10.1 Clean Water Act Section 404 Jurisdiction

Table 3-23 indicates which wetlands fall under USACE jurisdiction with respect to Section 404 of the federal CWA. This determination is based upon guidance received by USACE staff in the Helena Regulatory Office letter dated May 16, 2006, see **Appendix A**.

Under the authority of Section 404 of the Clean Water Act, Department of the Army permits are required for the discharge of fill material into Waters of the United States. Waters of the United States include the area below the ordinary high water mark (OHWM) of stream channels and lakes or ponds connected to the tributary system, and wetlands adjacent to these waters. In addition to these waters, isolated waters and wetlands, as well as man-made channels and ditches, may be Waters of the United States, which must be determined on a case-by-case basis. If a ditch or canal returns flow to a Waters of the United States, it is tributary to a Waters of the United States, and activities undertaken in that water will require a Department of the Army permit.

Based on the guidance cited above, and on location adjacent to the Bitterroot River, a jurisdictional water of the US, these wetlands were determined to be considered jurisdictional: 1, 5, 6, 7 East, 7 West, 9, 10, 11, and 14. Wetlands 2, 3, 12, 13, and 15 are considered isolated or excavated on dry land and, therefore, non-jurisdictional. Wetlands 4 and 8 did not meet wetland qualifications.

3.10.2 Wetland Site Descriptions

Three major wetland plant community types from *Classification of Wetlands and Deepwater Habitats of the United States* were identified in the project area: willow (scrub-shrub) wetlands, wet meadows (palustrine emergent), and submergent aquatic bed. Willow and wet meadow wetlands frequently occur in a mosaic pattern. Refer to **Table 3-23** for additional information on each wetland.

Wetlands 1, 6, 7, 9, 10, and 11 are palustrine emergent and scrub-shrub wetland bands adjacent to the Bitterroot River. Within the project area, the approximate total area of these wetlands is 3.4 acres. Dominant vegetation includes sandbar willow, reed canarygrass, redtop, quackgrass, water sedge, beaked sedge, and spikerush. Occasionally, balsam poplar and peachleaf willow are present at the upper margins. Hydrology sources include river flows and groundwater seepage. Wetlands 6 and 11 could provide habitat for bull trout and general wildlife and, as such, are rated Category I, while Wetlands 1, 7 west, 9 and 10 are rated Category III.

Wetland 2 is an emergent wetland in a shallow depression in a stock enclosure. The area of this wetland is approximately 0.01 acre. Dominant vegetation is plantain. The hydrology source is primarily overflows from a watering trough. Wetland 2 is rated Category IV.

Wetland 3 is a palustrine emergent wetland in a ditch south of the US 93 right-of-way. The approximate area of this wetland is 0.10 acre. Dominant vegetation is spikerush, smartweed,

Figure 3-19
General Locations of Delineated Wetlands

Table 3-23
General Characteristics of Wetlands

Wetland[1]	Legal Description	Vegetated Cowardin Classes[2]	MDT Wetland Rating Cat.[3]	Wetland Size in Project Area (acres)	Source of Wetland Hydrology	Narrative Description
1	T2N, R20W, S2	Palustrine, Emergent, Scrub-shrub	III	0.3	Bitterroot River	Narrow wetland bands and on slopes and a low cobble bar adjacent to Bitterroot River. USACE jurisdictional.
2	T2N, R20W, S2	Palustrine, Emergent	IV	0.01	Watering trough	Wetland in stock enclosure. Isolated, non-jurisdictional.
3	T2N, R20W, S2	Palustrine, Emergent	IV	0.1	Runoff, groundwater	Vegetated ditch at toe of highway embankment. Isolated, non-jurisdictional.
5	T2N, R20W, S2	Palustrine, Emergent, Aquatic bed	III	0.31	Irrigation flows	Narrow emergent wetland bands adjacent to Big Flat Canal and submerged vegetation in the channel. High species diversity. USACE jurisdictional.
6	T2N, R20W, S11	Palustrine, Emergent, Scrub-shrub	I	1.0	Bitterroot River	Narrow to wide wetland bands adjacent to the Bitterroot River. High species diversity. USACE jurisdictional.
7 East	T2N, R20W, S2	Palustrine, Scrub-shrub	III	0.1	Bitterroot River	Mainly narrow, patchy wetland bands on a fill slope adjacent to Bitterroot River. USACE jurisdictional.
7 West	T2N, R20W, S2	Palustrine, Emergent, Scrub-shrub	III	0.8	Bitterroot River	Narrow to wide wetland bands on slopes and gravel bars adjacent to Bitterroot River. USACE jurisdictional.
9	T2N, R20W, S2	Palustrine, Emergent	III	0.1	Bitterroot River	Narrow wetland bands on slopes and gravel bars adjacent to Bitterroot River. USACE jurisdictional.
10	T2N, R20W, S2	Palustrine, Emergent, Forested	III	0.1	Bitterroot River	Narrow wetland bands on slopes and gravel bars adjacent to Bitterroot River. USACE jurisdictional.
11	T2N, R20W, S11	Palustrine, Emergent, Scrub-shrub	I	1.0	Bitterroot River	Wetland bands on slopes and a large cobble bar adjacent to Bitterroot River and wetland bands adjacent to an overflow channel. USACE jurisdictional.
12	T2N, R20W, S2	Palustrine, Emergent	IV	0.07	Runoff	Wetlands adjacent to a small seasonally ponded area in a shallow swale. Isolated, non-jurisdictional.
13	T2N, R20W, S1	Palustrine, Emergent, Scrub-shrub	IV	0.7	Groundwater, runoff	Wetland on heavily grazed, private farming property. Hydrology from a channelized ditch that flows into the wetland through PVC pipes located at the northwestern portion of the property to maintain a ponded area for watering horses. Isolated, non-jurisdictional.
14	T2N, R20W, S1	Palustrine, Emergent	IV	0.4	Bitterroot River, groundwater	Wetland in a topographically low area at the toe of slope of the RR. Groundwater from river to the west provides hydrology for this wetland. USACE jurisdictional.
15	T2N, R20W, S1	Palustrine, Emergent, Scrub-shrub	III	0.6	Groundwater	Wetland within golf course fenced property in topographically low area at toe of slope. Area around wetland is maintained golf course green. Isolated, non-jurisdictional.

[1]Wetlands 4, 8, 16, and 17 did not meet wetland qualifications.
[2]From Cowardin, L.M., et al. 1979, *Classification of Wetlands and Deepwater Habitats of the United States,* USFWS.FWS/OBS-79/31.
[3]From Berglund, J., 1999, *MDT Montana Wetland Assessment Method*, prepared for MDT by Western Eco Tech.

sedges, and quackgrass. Hydrology sources include runoff and probably groundwater. Wetland 3 is rated Category IV.

Wetland 5 is a palustrine emergent wetland on the banks of Big Flat Canal and an aquatic bed wetland within the ditch. The Big Flat Canal provides irrigation water and extends from north of the project area to its confluence with the Bitterroot River. Approximately 0.3 acre of this wetland is within the project area. Dominant vegetation is spikerush, sedges, forbs, rushes, reed canarygrass, and redtop. Hydrology sources include irrigation flows and probably groundwater. Wetland 5 is rated Category III.

Wetland 12 is a palustrine emergent wetland in a shallow channel within a grassed pasture within the project area. Approximate area is less than 0.1 acre. Dominant vegetation is sedges with reedgrass. A small, seasonally ponded area with duck weed is present at the northeast end of the wetland. Balsam poplar and Douglas hawthorn are up gradient of the wetland area. Hydrology sources include runoff and possibly groundwater. Wetland 12 is rated Category IV.

Wetland 13 is an emergent and scrub-shrub wetland on heavily grazed, private farming property. Horses were observed grazing during field investigation. A channelized ditch flows south (overflowing into Wetland 13) and west under Miller Creek Road. The landowner has diverted water from this ditch into the wetland through PVC pipes located at the northwestern portion of the property in order to maintain a ponded area for watering horses. Approximately 0.7 acre of this wetland is within the project area. Most of the dominant vegetation was hydrophytic and consisted of common dandelion, tall buttercup, black cottonwood, black medic, orchardgrass, white clover, peachleaf willow, redtop, and reed canarygrass. Wetland 13 is rated Category IV.

Wetland 14 is an emergent wetland bordered by the railroad to the north, Bitterroot River to the west, and residences to the southeast. This wetland is found in a topographically low area at the toe of slope of the railroad. Groundwater from the Bitterroot River provides hydrology for this wetland. Approximately 0.4 acre of this wetland is within the project area. Dominant vegetation is hydrophytic and consists of reed canarygrass, field horsetail, and common cattail. Wetland 14 is rated Category IV.

Wetland 15 is an emergent and scrub-shrub wetland bordered by a residence to the south and golf course to the north. The wetland is found in a topographically low area at toe of slope of the residential lawn. The wetland is located within the boundaries of the golf course and enclosed by a chain link fence. Approximately 0.6 acre of this wetland is within the project area. Dominant vegetation was hydrophytic and consisted of creeping spikerush, sandbar willow, common cattail, panicled bulrush, bay forget-me-not, reed canarygrass, field horsetail, and common cattail. Wetland 15 is rated Category III.

3.11 Vegetation, Wildlife, and Aquatic

3.11.1 General Vegetation

The project area is within the intermontane Bitterroot/Frenchtown Valleys ecological unit of the Bitterroot Valley Section. Principal vegetation types of the project area are grassland meadows, riparian forests, wetlands, coniferous forest, and residential/commercial landscaping.

Grassland meadows are present adjacent to US 93 in the Blue Mountain Road and North Lower Miller Creek corridors, south of the Bitterroot River, and west of Linda Vista Boulevard. Common species include bluebunch wheatgrass, Idaho fescue, rough fescue, prairie Junegrass, timothy, cheatgrass, and bluegrass. The meadows are used for hay production and rangeland. Typical grasses within the US 93 right-of-way include smooth brome, Canada bluegrass, and quack-

grass. Infestations of spotted knapweed and other noxious weeds are common in the highway right-of-way and pastures.

Bands of riparian trees and shrubs are present on the upper banks of the Bitterroot River. Dominant tree and shrub species include balsam poplar, Douglas hawthorn, common chokecherry, red-stem dogwood, Woods' rose, and common snowberry.

Wetlands dominated by willows, grasses, spikerush and sedges are present on the lower banks of the Bitterroot River. Balsam poplar and peachleaf willow are occasionally present at the upper margins. Additionally, wetlands dominated by a variety of grasses, forbs, and sedges are present adjacent to the Big Flat Canal and in several isolated ditches and depressions. Wetlands are discussed in more detail in Section 3.10.

Ponderosa pine forests with a grass and forb understory occur on upper slopes at the west side of US 93 in the Lolo National Forest.

Residential and commercial landscaping occurs throughout the project area in developed locations and includes irrigated bluegrass lawns, ornamental flowers, and native and introduced trees and shrubs.

The existing Miller Creek Road corridor consists of existing right-of-way, small businesses, golf course, residential landscaping, and grazed rangeland. The residential landscaping includes irrigated bluegrass lawns, ornamental flowers, and native and introduced trees and shrubs. The grazed meadows include herbaceous species such as white clover, timothy, and bluebunch wheatgrass. The portion of Miller Creek Road between US 93 and Reserve Street consists of small businesses with little to no vegetation and a manicured golf course green with plant species, such as planted ryegrass and ornamental shrubs.

3.11.2 Noxious Weeds

Executive Order (EO) 13112, signed on February 3, 1999, addresses federal agency responsibilities with respect to invasive species (noxious weeds). As a federally funded action, the proposed action is subject to provisions of EO 13112. The proposed action is also subject to provisions of the Montana County Noxious Weed Control Law (MCA 7-2101 through 2153) of 1948 that established weed management districts directed by county weed boards. The Missoula County Weed Board divided the State Designated Noxious Weeds into four groups based upon the distribution, abundance, and potential long-term control within Missoula County:

- **Group 1**—noxious weeds that are currently established and generally widespread (over 5,000 acres in the county).
- **Group 2**—noxious weeds that have been recently introduced or are rapidly spreading (over 1,000 acres in the county).
- **Group 3(a)**—noxious weeds that are currently small infestations at limited sites (less than 1,000 acres in the county).
- **Group 3(b)**—noxious weeds that have not been detected in Missoula County, but may possibly appear. Groups 3(a) and 3(b) are the highest control priority since containment or eradication of these weed species is most possible.

Of the 26 Designated Noxious Weed species, 7 from Groups 1, 2 and 3(b) are known to be or potentially occur in the project area:

- **Group 1**—Spotted knapweed is common and widespread throughout fields, rights-of-way, and disturbed sites. Canada thistle, common tansy, and leafy spurge are frequently present in pastures or at upper margins of wetland areas. Oxeye daisy was observed in a pasture south of US 93 in the eastern portion of the project area.

- **Group 2**—Field bindweed was frequently present in disturbed grasslands.
- **Group 3(b)**—Rush skeletonweed was observed in right-of-way north of US 93 in the eastern portion of the project area and in rangeland on the south side of the Bitterroot River in the central portion of the project area.

3.11.3 Wildlife

In general, Missoula County possesses diverse and high-quality terrestrial wildlife habitat. Within the project area, the habitat has been affected by residential and commercial development associated with growth in southwest Missoula County. In addition to the habitat lost from the construction of commercial, residential structures and roadways, human activity in the area indirectly affects wildlife. Undisturbed areas within the project area provide habitat for small rodents, ground nesting birds, and birds of prey. Wetland habitats adjacent to the Bitterroot River and the Big Flat Canal support a variety of wildlife, including mule deer and white-tailed deer, various small mammals, songbirds, amphibians and reptiles, and birds of prey. According to the USFWS, bald eagles, grizzly bears, gray wolves, Canada lynx, and yellow-billed cuckoos may also occur in the vicinity of the project area. Most of these species depend on undeveloped land for some critical phase of their life cycle. Each of these species is discussed under Section 3.14, Threatened, Endangered, and Sensitive Species.

Additional information on terrestrial wildlife occurring within the project area and Missoula County are presented in the *Biological Resources Report* prepared for this EIS.

3.11.3.1 Mammals

Big game winter range for elk, mule deer, and white-tailed deer occurs in the project area on the western side of US 93. Winter range for white-tailed deer occurs along the riparian edges of the Bitterroot River in the project area and wintering range for white-tailed deer and moose occurs in the Miller Creek drainage. There is also winter range for these species located outside of the project area to the southwest. Small mammals present in the project area include squirrels, skunks, voles, gophers, shrews, mice, raccoons, muskrats, porcupines, and weasels. Predators consist of bobcat, coyote, red fox, and badger. Other less common predators in the project area include mountain lion, lynx, and wolf. Bat species possibly inhabiting the project area include Yuma myotis, fringed myotis, California myotis, Townsend's big-eared bat, and the big brown bat.

3.11.3.2 Birds

The project area provides habitat for numerous bird species, particularly adjacent to the Bitterroot River. Several bird species were observed within the project area during the field visits conducted for this FEIS. These species include American robin, eastern starling, common crow, northern flicker, song sparrow, savannah sparrow, western meadowlark, red-winged blackbird, western bluebird, rock dove, mountain chickadee, mourning dove, cliff swallow, black-billed magpie, Canada goose, mallard, common merganser, northern pintail, turkey vulture, killdeer, osprey, and great blue heron. Raptors that may be found in the project area include osprey, bald eagle, northern harrier, red-tailed hawk, golden eagle, merlin, American kestrel, and prairie falcon. Two osprey nests are located in the project area, but outside the area of impact.

The analysis of migratory birds has been included in this FEIS at the request of the FHWA to ensure compliance with the Migratory Bird Treaty Act (MBTA). Additional information is as it relates to migratory birds and their habitats is outlined in the *Biological Resources Report*.

The MBTA is a federal statute (16 U.S.C. Section 703 et. seq.) managed by the USFWS to conserve migratory bird populations and their habitats. The MBTA was originally passed in 1918 to stop the "indiscriminate slaughter" of migratory birds by market hunters targeting birds that migrate between the United States and Canada. Once passed, the MBTA implemented a 1916 Convention between the United States and Canada. It was later ratified to include Mexico, Russia, and Japan. The MBTA specifies that no one may take, possess, import, export, transport, sell, purchase, or barter, any migratory bird, or parts including nests and eggs unless authorized by a valid permit.

The MBTA includes 861 protected species based on the revised list. The list of all species protected under the MBTA is available in the Department of Interior - Fish and Wildlife Service - 50 CFR Part 10.

The USFWS has prepared regional lists of species that warrant the highest level of protection in order to prevent or remove the need for additional ESA bird listings and ensuring the future of healthy avian populations and communities. The *Birds of Conservation Concern 2002* (USFWS, 2002) depicts the study area as being within Bird Conservation Region (BCR) 10 (Northern Rockies-U.S. portion only). Species identified for BCR 10 include Swainson's hawk, ferruginous hawk, golden eagle, peregrine falcon, prairie falcon, yellow rail, American golden-plover, snowy plover, mountain plover, solitary sandpiper, upland sandpiper, whimbrel, long-billed curlew, marbled godwit, sanderling, Wilson's phalarope, yellow-billed cuckoo, flammulated owl, black swift, Williamson's sapsucker, Lewis's sapsucker, red-naped sapsucker, white-headed woodpecker, Lewis' woodpecker, loggerhead shrike, pygmy nuthatch, Virginia's warbler, Brewer's sparrow, and McCown's longspur. Some of these species may utilize the study area since migratory birds often travel extended distances between nesting and wintering habitats, and briefly occupy diverse habitat types along their migration route. Others nest, winter, or forage in specific habitat types.

3.11.3.3 Reptiles and Amphibians

Reptiles and amphibians likely to be present near riverine and wetland habitats within the project area include long-toed salamander, Coeur d'Alene salamander, Rocky Mountain tailed frog, Columbia spotted frog, western toad, rubber boa, eastern racer, gopher snake, western terrestrial garter snake, and western skink.

3.11.3.4 Wildlife Mortality

Vehicles on highways pose the greatest threat to wildlife, and roadkill usually increases as traffic volumes and speeds increase. While some species avoid roads, others are attracted to them for a variety of reasons, often to their demise. Dark pavement absorbs radiant heat and releases it at night, creating a "heat island" around roads. This can attract heat-seeking species, such as birds and snakes, to roads, increasing their chance of being killed by vehicles. Snakes and other ectotherms go there to bask, some birds use roadside gravel to aid their digestion of seeds, mammals go to consume de-icing salts, deer and other browsing herbivores are attracted to the dense vegetation of roadside edge, rodents proliferate in the artificial grasslands of road verges, and many large mammals find roads to be efficient travelways. Songbirds come to dust bathe on dirt roads and along road shoulders, where they are vulnerable to vehicles as well as predators. Vultures, crows, coyotes, raccoons, and other scavengers seek out roadkills, often to become roadkill themselves.

Roadkill data for 1999 to 2003 was provided by the Montana Fish, Wildlife & Parks (MFWP), USFWS, and MDT for US 93 between reference posts (RP) 84 and 91 in and adjacent to the project area. The data show that 91 percent of the documented roadkill (limited to medium-sized and large mammals) consists of white-tailed deer, 1.3 percent consists of moose, 1.3 percent consists of mule deer, 1.3 percent consists of unknown domestic animals, 1.3 percent consists of skunk, 1.3 percent consists of beaver, 1.3 percent consists of unknown wildlife, and 0.6

percent consists of black bear. Deer frequently cross US 93, shifting from cover and forage along the Bitterroot River to cover in the Lolo National Forest to the north. Information from the Montana Natural Heritage Program (MNHP) also indicates that five black bears have been killed by vehicles in the vicinity of reference post 87. The majority of the roadkill has occurred between reference posts 87 and 91.

Elk and other animals are often on steep forested lands on the western side of the highway near Miller Creek during winter and spring. This segment of the highway has high traffic volume, steep cut banks, and jersey barriers throughout, which limits wildlife movement across the highway.

3.11.4 Aquatic Resources

The primary waters supporting aquatic resources within the project area are the Bitterroot River and Miller Creek. Upstream irrigation diversions on Miller Creek frequently result in dewatering of the stream's lower reaches, a condition that is not conducive to the establishment of aquatic resource communities. Therefore, a majority of the aquatic biota inhabiting the area resides in the Bitterroot River. Additional information on the aquatic resources within the vicinity of the project area can be found in the *Biological Resources Report* prepared for the EIS. At least 18 species of fish inhabit the Bitterroot River watershed. This includes 12 native species and 6 introduced species.

There are two species of fish known to utilize the Bitterroot River and that are listed by either a federal or state jurisdiction: bull trout *(Salvelinus confluentus)* and westslope cutthroat trout *(Onchorhynchus clarki lewisi)*. Bull trout are listed as a threatened species under the Endangered Species Act (ESA) and are under jurisdiction of the USFWS. Both bull trout and westslope cutthroat trout are recognized by the state of Montana as species of special concern. These fish are discussed in more detail in Section 3.14, Threatened, Endangered, and Sensitive Species.

In addition to the bull trout and westslope cutthroat trout, other salmonids documented in the Bitterroot River include rainbow trout, brown trout, brook trout, and mountain whitefish. The Bitterroot River in the project area is known as a rainbow and brown trout fishery. It is managed by MFWP to emphasize large game fish and protect native species. Recreation fishing for rainbow and brown trout in the Bitterroot River is an important pastime for both local and out-of-state fishermen. However, the limited availability of public access limits overall use of the project area for recreation fishing.

Other fish species inhabiting the Bitterroot River include largescale and longnose suckers, pumpkinseed, smallmouth bass, largemouth bass, yellow perch, slimy sculpin, longnose dace, northern pikeminnow, peamouth, and redside shiners.

3.12 Floodplains

3.12.1 Existing Conditions

Executive Order 11988, *Floodplain Management*, requires federal agencies to avoid direct or indirect support of development in floodplains whenever a practical alternative exists. The base flood (100-year flood or a flood that has a one percent chance of being equaled or exceeded in any given year) is the regulatory standard used by federal agencies, and most states, to administer floodplain management programs. As described in the Code of Federal Regulation, 23 CFR 650 Subpart A, floodplains provide natural and beneficial values, serving as areas for fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural flood moderation, water quality maintenance, and groundwater recharge.

Updated flood insurance rate maps (FIRMs) from the Federal Emergency Management Agency (FEMA) dated September 2004 were used to identify streams with FEMA-regulated 100-year floodplains within the project area. Two regulated floodplains exist within the project area: the Bitterroot River and Miller Creek (see **Figure 3-17, page 3-56**). However, the alternatives under consideration are within or adjacent to the Bitterroot River floodplain only. The regulatory 100-year flood discharge for the Bitterroot River is established by FEMA in the 1998 Flood Insurance Study (FIS) to be 31,000 cubic feet per second (cfs). The Bitterroot River 100-year floodplain width within the project area varies from approximately 500 feet to 3,000 feet. Historically, major flood events of the Bitterroot River near Missoula occur in May and June during spring snowmelt. Three flood hazard zones (AE, AO, and X), as identified by FEMA, exist in association with the Bitterroot River within the project area:

- **Zone AE**—corresponds to the 100-year floodplain. Within this zone exists a floodway where the water is likely to be the deepest and fastest. This area should be kept free of obstructions to allow floodwaters to move downstream. Placing structures in a floodway may block the flow of water and increase flood heights. The remaining portion of the 100-year floodplain is referred to as the floodway fringe.
- **Zone AO**—corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one foot and three feet. Zone AO areas lie west of Lower Miller Creek Road and adjacent to the Linda Vista Golf Course.
- **Zone-X**—corresponds to areas outside of the regulatory 100-year floodplain. Average flood depths are less than one foot. These areas exist sporadically throughout the project area.

All Zone AE areas are designated "Parks and Open Space" in the 1998 update of the *Missoula Urban Comprehensive Plan*. These lands are considered to have value for wildlife habitat, for filtering pollutants from runoff, and for preventing erosion. The City of Missoula and Missoula County have adopted Floodplain Regulations that restrict land use within these areas. The City of Missoula Long Range Planning Division (established through interlocal governmental agreement) provides floodplain management of the project area.

3.12.2 Local Floodplain Regulations

The City of Missoula ordinance *(City of Missoula Floodplain Regulations)* and the Missoula County resolution *(Missoula County Floodplain Regulations)* were developed to comply with the Montana Floodplain and Floodway Management Act (Title 76, Chapter 5 MCA) and to ensure compliance with the requirements for the continued participation by the City of Missoula in the National Flood Insurance Program. The *City of Missoula Floodplain Regulations* were developed to promote the public health, safety, and general welfare; to minimize flood losses in areas subject to flood hazards; and to promote wise use of the floodplain. These regulations apply to the floodway and floodway fringe portions of the 100-year floodplain as delineated on the official floodplain maps, and correspond to the numbered A or AE zones depicted on the Missoula Flood Insurance Maps.

3.13 Wild and Scenic Rivers

The Wild and Scenic Rivers Act of 1968, (Pub.L. 90-542 as amended; 16 USC. 1271-1287) established a method for providing federal protection for certain free-flowing rivers in the United States, and preserving these rivers and the immediate environment for the use and enjoyment by present and future generations. Rivers are included in the system for the protective management and control of development for which the act provides.

The Bitterroot River and Miller Creek within the project area are not designated as Wild and Scenic Rivers, nor are other streams in the project area.

3.14 Threatened, Endangered, and Sensitive Species

3.14.1 Threatened or Endangered Species

The MNHP, Montana Rivers Information System (MRIS), USFWS, and MFWP provided information on endangered, threatened, and sensitive plant and animal species in the project area. The MNHP is the state's clearinghouse for information on Montana's native species and habitats, emphasizing those species of conservation concern.

The MNHP performed a database search for sensitive plant species in the project area. No records of federally listed threatened or endangered plant species were reported for this area

Five listed animal species or candidates for listing under the ESA that are known or expected to occur in the project area were assessed to ensure ESA compliance. These five species are: grizzly bear *(Ursus arctos)*, gray wolf *(Canis lupus)*, Canada lynx *(Lynx canadensis)*, bull trout *(Salvelinus confluentus)*, and yellow-billed cuckoo *(Coccyzus americanus)*. Based on the lack of suitable habitat in the project area and the potential for only intermittent or rare occurrence in the action area, the proposed action would have *no effect* on grizzly bear, gray wolf, Canada lynx, and yellow-billed cuckoo. Critical habitat has been designated for bull trout, which includes the Bitterroot River where it flows through the project area. Critical habitat has been proposed for Canada lynx, but none exists within the project area. Therefore, the proposed action would not destroy or adversely modify proposed critical habitat. Should critical habitat for Canada lynx be designated prior to completion of the project, the proposed project would have no effect on designated critical habitat. The bald eagle was delisted in August 2007, but it is still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Based on the information summarized above, the existing conditions for only the bull trout, designated critical habitat for bull trout and bald eagles are discussed in this document.

3.14.1.1 Bull Trout

Bull trout are listed as a threatened species under the ESA. The project area is located within the Clark Fork Recovery Unit, which is the largest recovery unit in the range of bull trout. The bull trout inhabits cool lakes and streams in western North America. The Bitterroot River provides foraging, migratory, and overwintering habitat for bull trout (USFWS letter, **Appendix A**). Within the Bitterroot River drainage, most bull trout tend to be associated with resident populations located in higher elevation streams within the Bitterroot National Forest. Migratory riverine bull trout are now rare in the mainstem Bitterroot River. Bull trout abundance in the project area typically averages one to two fish per mile where they overwinter from September through June depending upon stream temperature. The peak spawning period for bull trout in the Bitterroot and Clark Fork rivers typically occurs during the second and third weeks of September. It is unlikely bull trout are present in the project area during the months of July and August because of elevated stream temperatures. No bull trout spawning habitat exists in the mainstem of the Bitterroot River.

Designated critical habitat for bull trout became effective as of October 26, 2005 (Federal Register, Vol. 70, No. 185, pages 56212-56311, September 26, 2005). The Bitterroot River is within the boundary of Unit 2: Clark Fork River Basin. Within areas designated as critical habitat, which includes the project area, the Primary Constituent Elements (PCEs) essential for the conservation are those sites and habitat components that support one or more life stages. PCEs of critical

habitat are the known physical and biological features that are essential to the conservation of the species. The PCEs for bull trout include:

- Permanent water having low levels of contaminants, such that normal reproduction, growth, and survival are not inhibited.
- Water temperatures ranging from 36 to 59 degrees Fahrenheit with adequate refugia available for temperatures at the upper end of the range.
- Complex stream habitat (LWD, side channels, pools, undercut banks).
- Substrate of sufficient size, amount, and composition, to ensure egg, fry, young of the year, and juvenile survival.
- Natural hydrograph with peak, high, low, and base flows within historic range.
- Springs, seeps, groundwater sources, and subsurface water connectivity.
- Migration corridors with minimum barriers between necessary habitats.
- Abundant food base.
- Few or no predatory, interbreeding, or competitive non-native species.

3.14.1.2 Bald Eagle

The bald eagle was delisted in August 2007, but it is still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagles are considered yearlong residents and spring/fall migrants, and nest along major waterways in Missoula County. The Bitterroot River in the project area serves as foraging and wintering habitat for bald eagles. Although there are no documented bald eagle nests in the project area, suitable nesting habitat is present. The closest documented nest site is approximately five miles south of the project area along the Bitterroot River, near Lolo Creek. Wintering and foraging eagles have been documented along the Bitterroot River in the project area and nesting eagles could frequent the area while foraging.

3.14.2 Rare and Sensitive Plants

Sensitive plant species as identified by the MNHP and that have documented occurrences in the general project area are obscure evening-primrose, narrowleaf penstemon, small yellow lady's-slipper, and toothcup. A survey of potential habitat for these species and a search for toothcup was conducted from July 21 to 23, 2003. **Table 3-24** summarizes state sensitive species, MNHP ranking, potential habitat and known distribution in the project area. No sensitive plants were observed in the project area during the July 2003 surveys. Additional information pertaining to the occurrence and description of these species can be found in the *Biological Resources Report*.

3.14.2.1 Obscure Evening-Primrose

Obscure evening-primrose is a small annual herb with tiny yellow flowers that is present in the sandy soil of sagebrush areas and juniper woodlands. Its flowering season is May to June. The MNHP ranking is S2 (imperiled because of rarity). No habitat for this species was observed in the project area.

3.14.2.2 Narrowleaf Penstemon

Narrowleaf penstemon is a perennial herb with pink to lavender or bright blue flowers that is present in sandy grasslands on the plains. The MNHP ranking is S2, and it is a Bureau of Land

Table 3-24
State Sensitive Plant Species that May Be Present in Project Area

Species	2003 MNHP Ranking*	Potential Habitat and Expected Occurrence in Project Area	Known Distribution in Project Area
Obscure evening-primrose *(Camissonia andina)*	G4, S2	Sandy soil of sagebrush steppe and juniper woodlands in the valley and foothills zones. No suitable habitat in project area.	Hillside south of Missoula, north of project area.
Narrowleaf penstemon *(Penstemon Angustifolius)*	G5, S2	Sandy grasslands on the plains. No suitable habitat in project area.	Near Bitterroot River, north of project area.
Small yellow lady's-slipper *(Cypripedium parviflorum)*	G5, S3	Fens, damp mossy woods, seepage areas, and most forest-meadow ecotones in the valley to lower montane zones. Possible habitat in riparian areas of Bitterroot River at south end of project area.	Near Bitterroot River, south of project area.
Toothcup *(Rotala ramosior)*	G5, S1	Open, wet, gravelly soil around ponds and sloughs in the valley zone. Potential habitat adjacent to Bitterroot River at south end of project area.	South of Bitterroot River, north of project area.

Source: Montana Natural Heritage Program.
*Definitions are provided in Appendix B of the *Biological Resources Report*.

Management (BLM) Watch Species. Its flowering season is May to June. No habitat for this species was observed in the project area.

3.14.2.3 Small Yellow Lady's-Slipper

Small yellow lady's-slipper is a perennial orchid with yellow blossoms that is present in damp mossy woods, seepage areas, and moist forest-meadow ecotones. The MNHP ranking is S3 (vulnerable because of rarity), and it is a Sensitive Species and BLM Watch Species. Its flowering season is May to June. Possible habitat for this species was observed in the riparian areas adjacent to the Bitterroot River in the southern portion of the project area; no members of this species were observed during late July 2003 surveys.

3.14.2.4 Toothcup

Toothcup is a small annual with white blossoms that is present in open, wet, gravelly soil around ponds and sloughs in the valley zone. The MNHP ranking is S1 (critically imperiled because of extreme rarity). Its flowering season is late July to August. Although potential habitat for toothcup was observed on the gravel bar adjacent to a backwater area of the Bitterroot River in the southern portion of the project area, no members of this species were observed during late July 2003 surveys.

3.14.3 Rare Birds

The Missoula chapter of the National Audubon Society lists several "rare" species that may be found in the project area, although bird surveys have not been conducted in the area. These species are Lewis' woodpecker, willow flycatcher, red-eyed vireo, pileated woodpecker, veery, and Barrow's goldeneye. Habitat for these species would most likely be found in the project area near the riparian area of the Bitterroot River. Additional information regarding impacts to "rare" species can be found in the *Biological Resources Report* prepared for this EIS.

3.15 Cultural Resources

Previous documentation of cultural resources within the project area included NRCS reports and a historic preservation inventory conducted in anticipation of the Bonneville Power Administration's high-voltage transmission line alignment just south of the current project area. The Cultural Resource Information System (CRIS) search revealed a prehistoric lithic scatter site (24MO189); Miller-Kelley and Cave-Gannon Ditch, a previously recorded irrigation ditch (24MO520-recommended eligible); and Maloney Ranch, a historic farmstead (24MO192-not eligible). Archaeological testing at site 24MO189 revealed a diagnostic Middle Prehistoric projectile point and various ground-stone tools. The site recorders listed the National Register eligibility of this property as "not eligible" after testing activities.

Prior to initiation of field work, a search of the historic preservation site files maintained by the Montana SHPO was requested. Areas of small-scale commercial, industrial and residential development were not inventoried, principally because the level of previous disturbance in these areas would have destroyed or masked evidence of earlier occupations. A pedestrian survey was conducted for these areas in April 2003, as well as an additional inventory in August 2003 and August 2004, after identification of the alternatives to be carried forward in the FEIS. Research was conducted using materials that identified several potential sites within the project area, including stage trails and related sites, and a historic farmstead from General Land Office maps. The Confederated Salish and Kootenai Tribal Preservation Department was contacted to discuss the potential cultural significance of all or a portion of the project area. Copies of this correspondence are included **Appendix A**.

An assessment of cultural resource sites in the study area was conducted as part of the Section 106 historical properties analysis. The Missoula Country Club is not eligible for listing on the NRHP due to loss of integrity as a result of modifications made over the years. The State Historic Preservation Office (SHPO) concurred with that finding. Refer to the *Cultural Resources Report*, HRA, 2003 and *Addendum to Cultural Resources Report*, 2004, for a complete description of the Missoula Country Club historical status and findings.

There are three previously recorded prehistoric and historic sites within the project area, of which one is eligible and the other two are not considered eligible. In addition to these sites, the 2003 and 2004 surveys identified an additional 18 sites (16 historic and 2 prehistoric), of which 3 historic and 2 prehistoric sites were determined to be eligible or potentially eligible for the National Register of Historic Places (NRHP). **Table 3-25** identifies and **Figure 3-20** shows the NRHP-eligible and potentially eligible properties within the Area of Potential Effects (APE). The APE is defined as: The geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking [36 CFR 800.16(d)]. To ensure confidentiality, prehistoric resources are not shown on **Figure 3-20**. SHPO concurrence on NRHP eligibility status was received in letters dated February 12, 2004 and December 14, 2004 (**Appendix A**).

Site 24MO520—Miller-Kelley and Cave-Gannon Ditch (Missoula Irrigation District). W.J. McCormick originally constructed the ditch system in 1880. Field ditches divert from this main canal, providing irrigation water to the pastures associated with the agricultural fields. The main canal is an open, unlined structure measuring approximately 5 feet across and 1.5 feet deep. It crosses under Miller Creek Road in a culvert just north of the north "Y" intersection. In addition to the ditch, structural components include a series of corrugated metal culverts that carry water below the surface across a horse pasture and along the east shoulder of Miller Creek Road.

Figure 3-20
Cultural Resources Sites

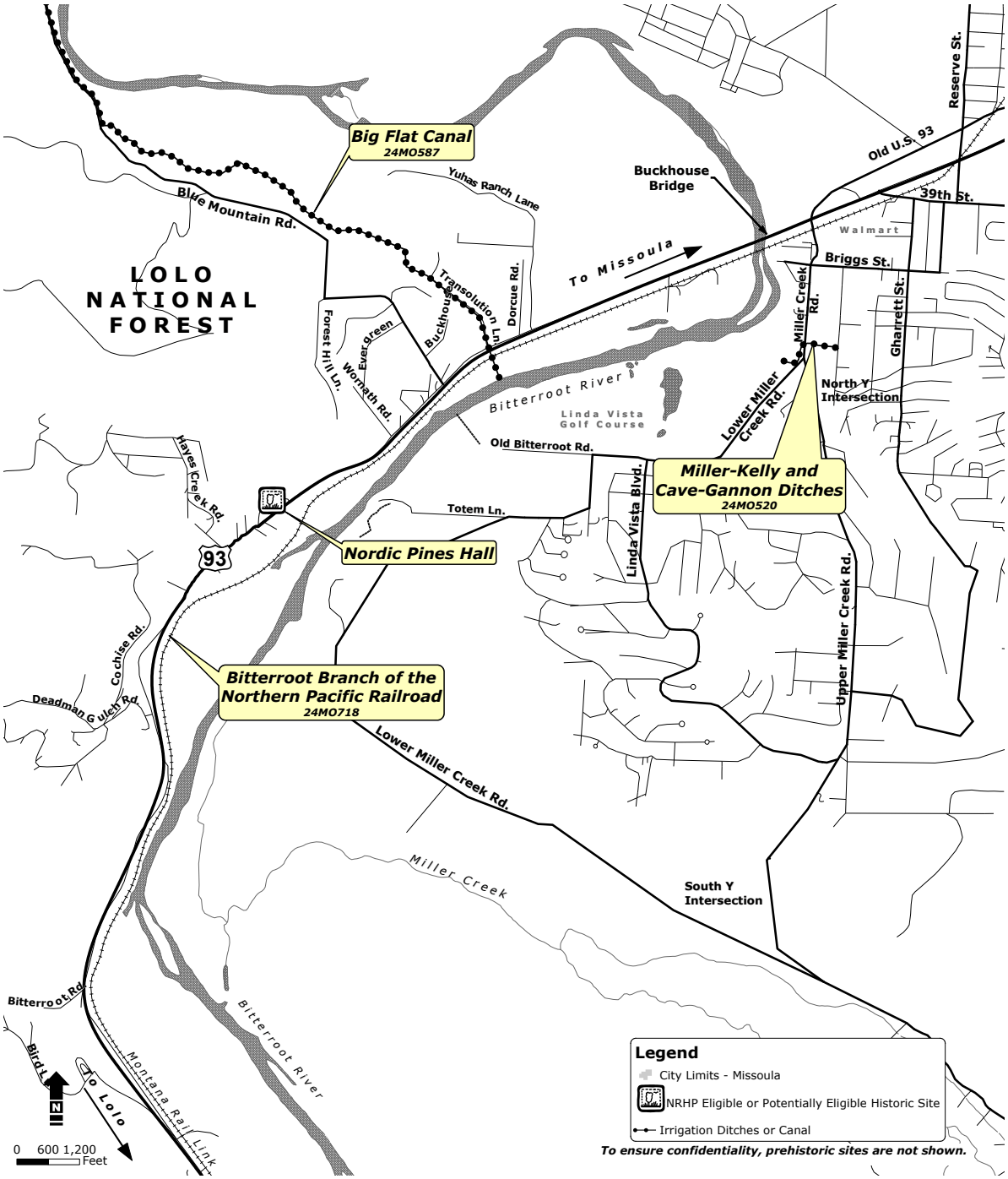


Table 3-25
Cultural Resources Sites Within Project Area

Site Number	Site Name	Type	Inside APE	NRHP Status	Reference
24MO520	Miller-Kelley and Cave-Gannon Ditch (Missoula Irrigation District)	Historic irrigation system	Yes	Eligible	Previously recorded 1993 and 1998
24MO718	Bitterroot Branch of the Northern Pacific Railroad (MRL)	Historic	Yes	Eligible under Criterion A	Previously recorded 1997
24MO587	Big Flat Canal	Historic irrigation system	Yes	Eligible under Criterion A	2003 Survey(1)
24MO583	South Miller Creek Site	Prehistoric encampment	Yes	Eligible under Criterion A and D	2003 Survey(1)
NA	Isolated artifacts	Prehistoric isolated artifact	Yes	Additional testing required	2003 Survey(1)
NA	Sons of Norway: Nordic Pines Hall	Fraternal lodge/ historic	Yes	Potentially eligible in 2009	2003 Survey(1)

(1)*Cultural Resources Report*, HRA, 2003 (Addendum 2004).
NA = Not applicable.

Site 24MO718—Bitterroot Branch of the Northern Pacific Railroad. The Bitterroot Branch of the Northern Pacific Railroad is a standard gauge railroad, with standard gauge trackage affixed to wooden ties laid on an approximately 25-foot-wide grade. The short line was purchased by MRL in June 1987. Today the railroad still carries agricultural produce and lumber from the valley to the MRL main line. This site is eligible for the NRHP under Criterion A (Axline, 1997).

Site 24MO587—Big Flat Canal. The Big Flat Canal diverts water from the north bank of the Bitterroot River in Section 2 of T12N/R20W. The canal extends northward, passing beneath the Bitterroot Branch of the Northern Pacific Railroad and US 93 through concrete box culverts. Between the river and the railroad grade, the intake channel is at least 15 feet deep and 50 feet wide, with banks lined with riprap. A concrete box headgate just south of the railroad contains valves and a metal guard railing. On the north side of US 93 the ditch narrows and is slightly more shallow. The ditch itself appears unlined; however, it was carrying water during the inventory and the bottom was not visible.

Site 24MO583—South Lower Miller Creek Site. This property was identified during examination of the cutbank at the edge of a stable terrace above the Bitterroot River. Cultural materials observed in the cutbank at the edge of the terrace include an edge-battered cobble tool, a few pieces of fire-cracked rock, and a small lens of fire-cracked rock and shell.

Isolated Artifacts. In addition to Site 24MO583, the field crew located two isolated artifacts during the archaeological survey. Additional archaeological investigations, including subsurface testing, may reveal more extensive cultural deposits. Both isolates are within the "area of interest" identified by the Confederated Salish and Kootenai Tribal Preservation Department.

Sons of Norway Nordic Pines Hall. This property is located adjacent to US 93 on the north side near the proposed South Lower Miller Creek (Alternative 4C) alignment. The property consists of a single gabled-roof building, set back from the highway within a stand of ponderosa pine and fir trees, separated from the highway by a deciduous shrub hedge. The Nordic Pines Hall is owned by the Normanden 4-424 Lodge of the Sons of Norway, a nationwide fraternal organization that promotes Norwegian cultural activities. The building appears to possess all seven aspects of historical integrity; however, since it was built in 1959 it is not 50 years of age.

3.16 Hazardous Waste

3.16.1 Environmental Site Assessment

Hazardous waste sites are regulated by the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The potential for encountering hazardous waste and/or hazardous materials during construction was evaluated for the Miller Creek EIS. A Phase I Environmental Site Assessment was conducted in August 2003. The objective of the study was to identify *recognized environmental conditions* in the project area. The assessment was performed in general conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Standard Practice E 1527-00.

Recognized environmental conditions are the presence or likely presence of any hazardous substances, hazardous waste, or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any such substances into structures on the property or into the ground, groundwater, or surface water of the property.

The project area consists of undeveloped land and commercial developments along the US 93 corridor. A Phase I Environmental Site Assessment was prepared of the approximately 5,075-acre property located in Montana Principal Meridian (MPM) in Sections 6, 7, 18 and 19 of Township 12 North, Range 19 West and Sections 1, 2, 10, 11, 12, 13, 14, 15, 22, 23 and 24 of Township 12 North, Range 20 West, in Missoula County.

Based on available data, 18 sites were identified that are within or adjacent to the project area. These sites are shown on **Figure 3-21** and are listed below:

1. 6207 Linda Vista Boulevard—Former heating oil underground storage tank (UST) located at this site. Records indicate the UST was removed and there was no contamination. This site is located south of Old Bitterroot Road.

2. 6204 Helena Drive—Former heating oil UST located at this site. Records indicate the UST was removed and there was no contamination. This site is located south of Old Bitterroot Road.

3. 3425 Lloyd Court—Records indicate that radioactive material is used in this facility. There are no records of violations. This site is located south of Old Bitterroot Road.

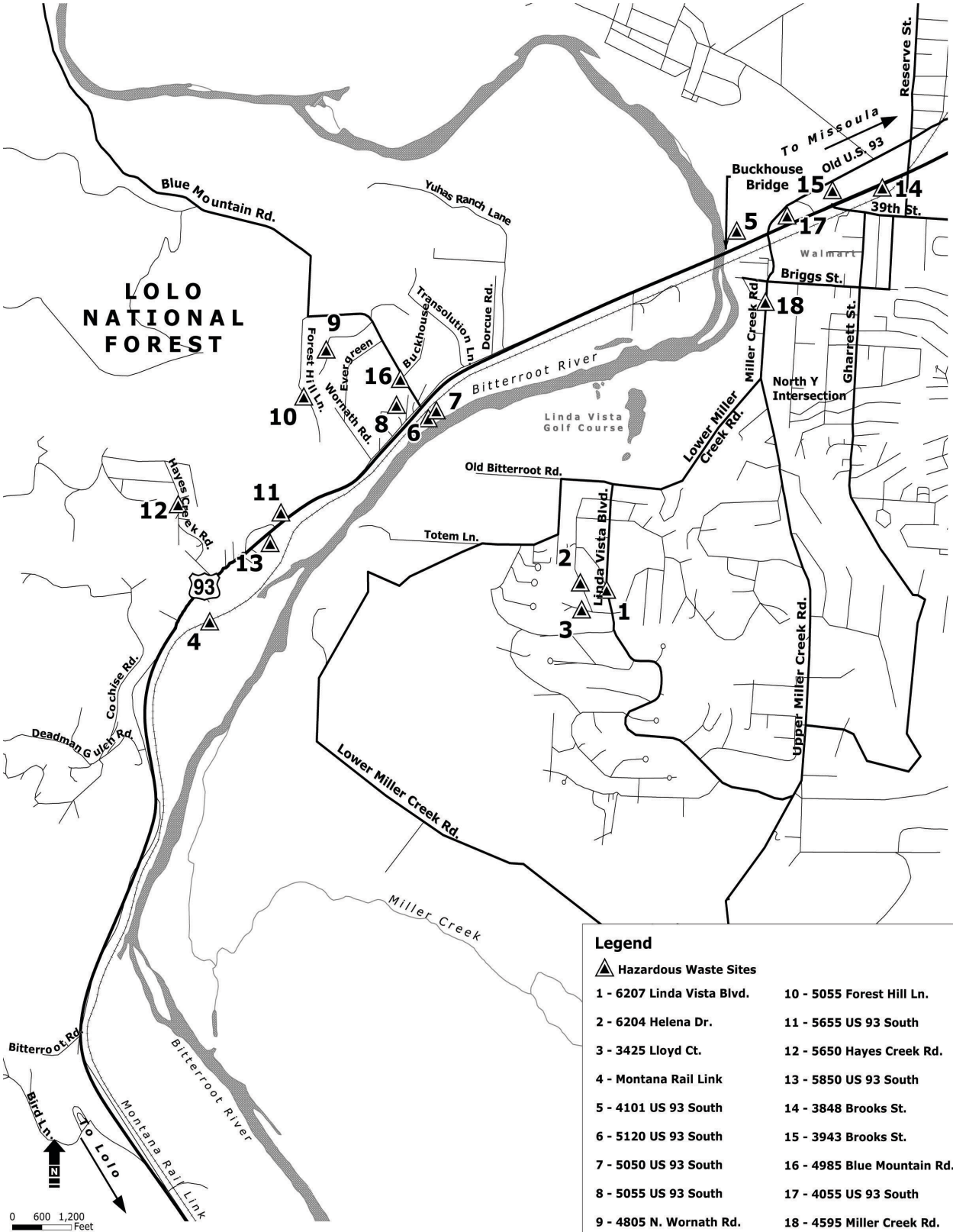
4. The Montana Rail Link (MRL) right-of-way—This is a linear site where elevated levels of metals and/or petroleum hydrocarbons may be encountered in surface soils. The MRL is located south of US 93.

5. Seven storage trailer type structures, 4101 US 93 South—This site is located northeast of the Buckhouse Bridge.

6. Superior Hardwoods & Millwork, 5120 US 93—The site may require further investigation with respect to any chemicals stored at the facility and materials that make up the building itself (i.e., asbestos-containing materials). This site is located south of US 93 at Blue Mountain Road.

7. 5050 US 93 South—Auto salvage yard located southeast of US 93/Blue Mountain Road intersection.

Figure 3-21
Hazardous Waste Sites Within or Adjacent to Project Area



8. 5055 US 93 South—Trailer salvage yard located northwest of the US 93/Blue Mountain Road intersection.

9. 4805 North Wornath Road—Former heating oil UST located at this site. Records indicate the UST was removed and there was no contamination. This site is located outside the project area.

10. 5055 Forest Hill Lane—Former heating oil UST located at this site. Records indicate the UST was removed and there was no contamination. This site is located outside the project area.

11. 5655 US 93 South—Former heating oil UST located at this site. Records indicate the UST was removed and there was no contamination. This site is located northwest of US 93.

12. 5650 Hayes Creek Road—Former heating oil UST located at this site. Records indicate the UST was removed; there was some soil contamination but it was addressed and the site was closed. This site is located outside the project area.

13. 5850 US 93 South—Former heating oil UST located at this site. Records indicate the UST was removed and there was no contamination. This site is located southeast of US 93.

14. 3848 Brooks Street—This site is located south of US 93. Big O Tire is the current business. This leaking underground storage tank (LUST) site is upgradient or adjacent to the project area.

15. 3943 Brooks Street—This LUST site is located adjacent to and upgradient of the project area. Bitterroot Motors is the current business.

16. 4985 Blue Mountain Road—Drums containing unknown contents.

17. 4055 US 93 South—Gas station and convenience store with UST.

18. 4595 Miller Creek Road—Residence with UST.

3.17 Visual Resources

3.17.1 Project Area Description

US 93 along the northern and western edge of the project area is bounded by the Lolo National Forest and the Bitterroot River. As described in Section 3.1, much of the project area contains undeveloped floodplain or residential and commercial development. The project area overlooks the southern end of Missoula. US 93 is located immediately west of the Bitterroot River and is a primary regional and interstate route through western Montana. The Montana Rail Link line follows US 93 for much of the north and western boundary. Miller Creek is a primary drainage located at the southern end of the project area.

3.17.2 Landscape Character

Landscape character can be broken down into landscape units containing similar physical elements that are different from other distinct areas. The physical elements of a landscape are what form the visual patterns that strongly influence people's response to the landscape, such as landform and vegetation, water and wildlife features and other man-made modifications, such as

residential and commercial development. **Figure 3-22** shows the location of the landscape character photographs. Foreground landscape units are those immediately visible from the highway that define the local character of the area. The foreground is defined as the area within 0 to 0.5 mile. The middleground is defined as 0.5 mile to 4 miles. The background views are 4 miles or greater and include the Lolo National Forest and mountains encircling Missoula. Wide viewsheds are typical.

The visual landscape units within the project area are defined as follows:

- **Residential**—The residential areas are typical of suburban and rural development and densities. The rural areas include homesites scattered in between fields and grazing pastures, as shown in **Photos D** and **E**. The suburban housing includes primarily single-family residences, with much higher density than the rural areas. As described in Section 3.1, much of the undeveloped land is planned to be developed into residential subdivisions, with the exception of floodplain lands closer to the Bitterroot River. **Photos F** and **G** depict local arterial roads and suburban residential character.

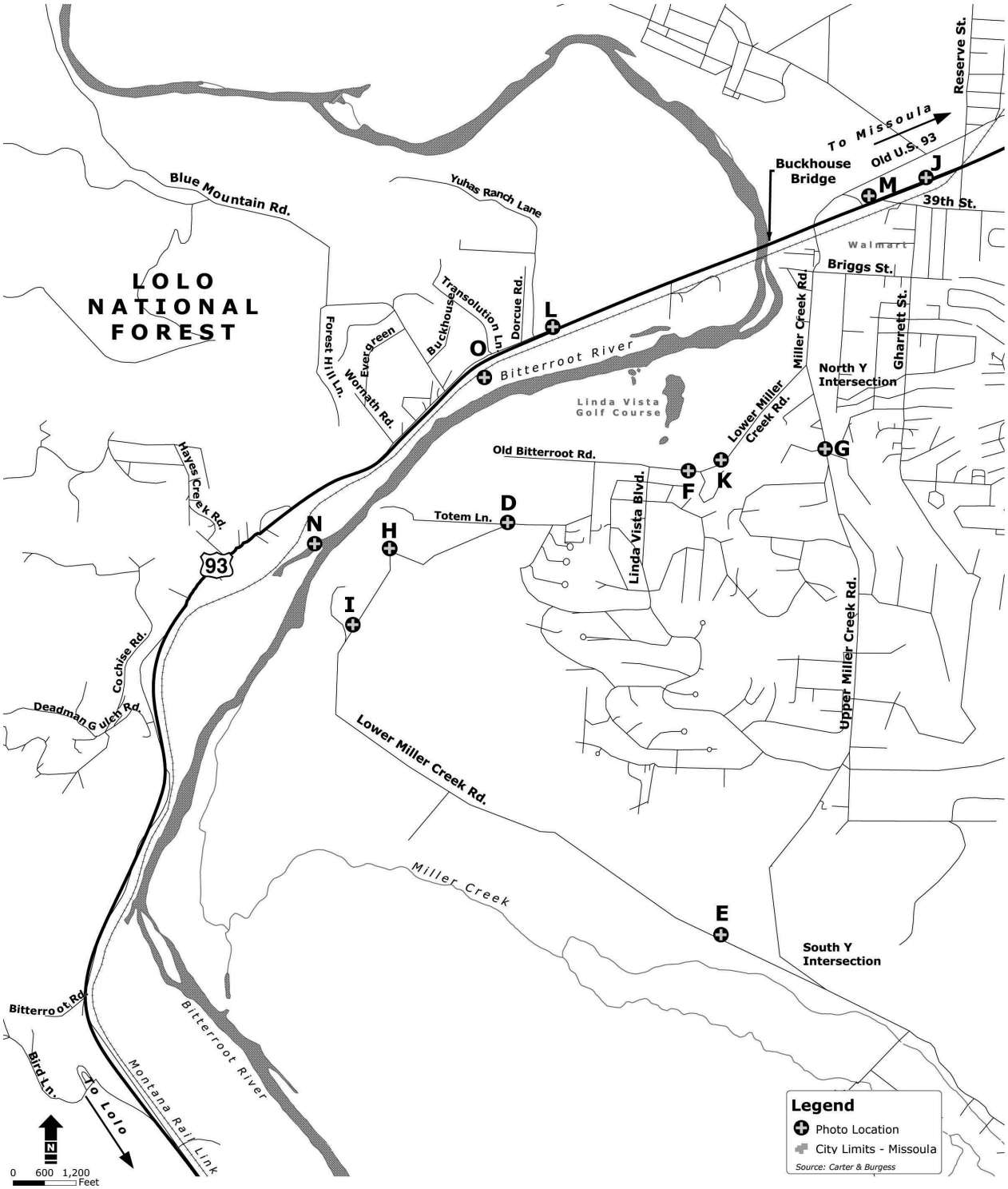
Photo D: Residential development south of Lower Miller Creek Road.

Photo E: Miller Creek floodplain and current agricultural/grazing land in the foreground. Residential development located south of Miller Creek and Lower Miller Creek Road.

Photo F: View looking east on Lower Miller Creek Road, typical landscaping, grade variation and suburban residential.

Photo G: View looking north on Upper Miller Creek Road in area of proposed improvements. Mature evergreen trees adjacent to road.

Figure 3-22
Location of Landscape Character Photographs in the Project Area



- **Open Space/Recreation/Undeveloped Land**—Much of the northern and western portion of the project area that is south and east of the Bitterroot River is undeveloped and includes agricultural lands, open space, and the designated open lands protected through conservation easements (see **Photos H** and **I**). This landscape unit is typically in the foreground and middleground. Many open areas are used for ranching or are associated with a natural drainage or open space. Native vegetation along drainages creates areas of scenic interest. Grazing activities are present within the project area. These lands contain vegetative communities and landscaping styles typical of urban/suburban natural open space or golf courses. Because of the limited amount of development as rural homesites, many of these areas provide a wide viewshed that enhances the scenic quality of the area. **Photo J** depicts the southern boundary of the Larchmont Golf Course and Missoula County Club and Golf Course. Old US 93 is in the foreground. Linda Vista Golf Course is the primary developed open space/recreation property in the project area (see **Photo K**).

Photo H: Undeveloped agricultural/grazing land south of the Bitterroot River in the northern portion of the project area.

Photo I: Riparian and floodplain land east of the Bitterroot River looking south and west and to Miller Creek floodplain area. Lolo National Forest is in the background.

Photo J: Old US 93 looking east with Larchmont Golf Course (also known as Missoula County Municipal Golf Course) in the background.

Photo K: Linda Vista Golf Course.

- **Commercial/Industrial/Other Non-Residential Development**—Commercial development is clustered along both sides of US 93 in areas with local access, from Miller Creek Road to Hayes Creek Road and contains elements common to a commercial landscape character (see **Photos L** and **M**). A substantial amount of commercial/light industrial development is located on both sides of US 93 at Blue Mountain Road. The built environment includes such elements as signs, varying architectural styles and materials, utility lines, driveways, lighting, parking areas, a railroad corridor (see **Photo N**), and a larger percentage of vehicles. Emmanuel Baptist Church is located at 4907 Blue Mountain Road, just north of the Montana Athletic Club and Buckhouse Lane. A new development is under construction immediately east of the Montana Athletic Club and is proposed to be accessed off of Buckhouse Lane. Future similar development would be expected along US 93 as access is allowed. The US 93 portion of the project area has typical road elements, such as signing, guardrail, overhead utilities, and signals.

Photo L: US 93 southbound at Yuhas Ranch Lane.

Photo M: Commercial development along US 93 east of Miller Creek Road.

Photo N: Montana Rail Link at-grade crossing just east of Blue Mountain Road/US 93.

- **Natural Areas: River/Riparian Corridor, Floodplain and Mountains**— Views to water resources within the project area are to the Bitterroot River and Miller Creek. The Bitterroot River is used for boating, kayaking, rafting trips and fishing. The Bitterroot River is aesthetic and serves as an aquatic and wildlife habitat (see **Photo O**). Wildlife and waterfowl are commonly found along the river, which enhances the scenic quality of the corridor. Riparian and wetland communities are present along the Bitterroot River and floodplain.

Photo O: Bitterroot River looking south, upstream.

3.17.3 Viewsheds

Views to US 93 are possible from adjacent residential and commercial development along the highway. Hikers and recreationists can see portions of the highway from the adjacent Lolo National Forest. Much of the foreground and middleground along US 93 reflects landscape character that is typical of a rural mountain corridor transitioning into an urban corridor. Motorists traveling north along US 93 experience views of the Lolo National Forest to the west and University Mountain and the other mountains that encircle Missoula to the east and the Bitterroot River riparian corridor. The drive into Missoula from the south along US 93 has been described as having a "gateway" quality or experience. Being the primary route of travel, US 93 is regularly used by commuters, truckers, and travelers. However, current high travel speeds do not present the opportunity for a sight-seeing experience.

3.18 Parks and Recreation Resources

3.18.1 Existing Parks

Both the City of Missoula and Missoula County manage parks throughout Missoula County. The USFS manages Lolo National Forest, which provides recreation opportunities and is located adjacent to the project area north and southeast. USFS Blue Mountain Recreation Area near the project area includes Blue Mountain and Maclay Flats, both north of US 93 on Blue Mountain Road. There are several small neighborhood and pocket parks within the project area; these are shown on **Figure 3-23** and listed in **Table 3-26**.

Table 3-26
Existing Project Area Public Parks and Recreation Areas

Map Reference	Park	Size	Amenities
C	Marilyn Park	9.3 acres	Tennis court, ice rink, basketball court, small softball field, play equipment, picnic area
D	Raelene Park	4.3 acres	Undeveloped park
E	Whitetail Park	2.2 acres	Play area
F	Rainbow Park	5.4 acres	Sledding, play equipment, soccer field
G	Nicole Park	4.2 acres	Play area
H	Mockingbird Park	0.8acre	Natural area
I	Shelby Common Area	1.9 acres	Visual open space
J	Floral Park	2.5 acres	Undeveloped park
L	Lolo National Forest/Blue Mountain Recreation Area	5,500.0 acres	All-terrain vehicle (ATV) trails, horse trails, pedestrian trails and mountain biking. Lolo National Forest offers biking, camping, fishing, boating, hiking, horseback riding, hunting and off-roading.
N	Scotty Park	2.4 acres	No amenities
O	Kelsey Park	1.1 acres	Swing, slide, volleyball court
P	Larchmont Golf Course (also known as Missoula County Municipal Golf Course)	154.6 acres	Golf course
R	River Pines	0.7 acres	Picnic table and playground
S	Meriwether Addition	3.1 acres	Undeveloped park

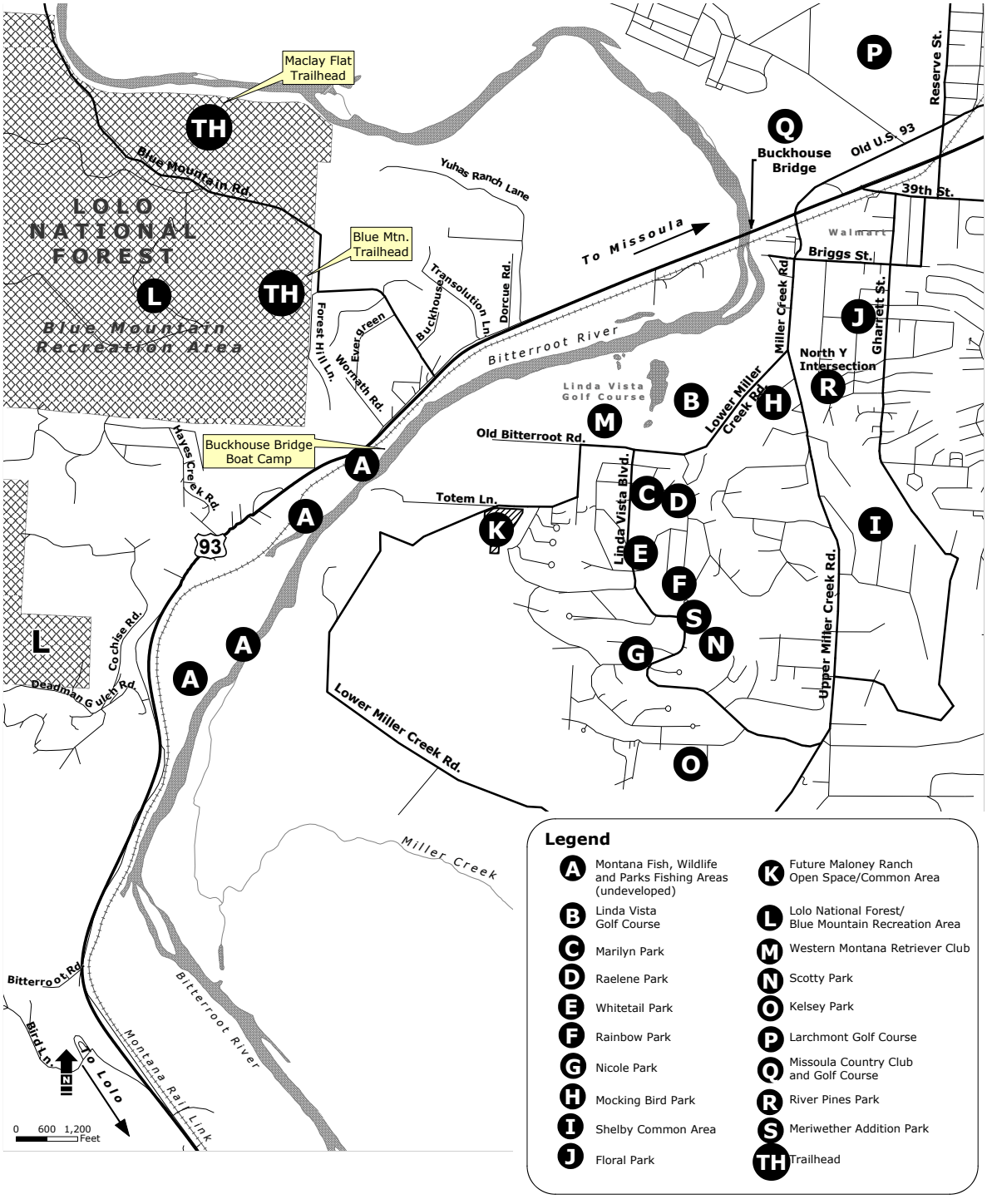
Source: City of Missoula, Missoula County; MFWP; Lolo National Forest Plan, Blue Mountain Recreation Area Plan.

There are several parcels owned by MFWP within the project area (Sites A on **Figure 3-23**)**.** The parcels were deeded to MFWP from the Five-Valleys Land Trust *(Maloney Ranch Conservation Easement Report)*. The purpose for the land transfer was to provide access opportunities for public recreation. Many people use these sites to access the Bitterroot River for fishing opportunities. There are 98 acres total, with parcels on both sides of the river. There is currently no funding or formal plan to develop these sites. These parcels are managed in a "primitive state" and will continue to be managed in this manner.

The nearby Bitterroot River offers recreation activities such as fly fishing and boating. Maclay Flats has a boat launch, fishing access, trail, and wildlife viewing area.

An undeveloped portion of the Lolo National Forest with no formal improvements is located southeast of the project area. Recreation use in this area is relatively low with no formal trails or

Figure 3-23
Parks and Recreation Resources in Project Area



camping destinations. A primary use for the last ten years has been logging; however, it is currently used primarily for hunting.

Section 4(f)/Public Park and Public Recreation Resources

Three privately owned recreation facilities are located in the project area. The Linda Vista Golf Course is a private club, yet open to the public, located on the north side of Lower Miller Creek Road (Site B on **Figure 3-23**). The Western Montana Retriever Club provides open grounds for training hunting dogs in a controlled environment (Site M on **Figure 3-23**). It also is located north of Lower Miller Creek Road. The Missoula Country Club is a private golf course on 104 acres and is located on the north side Old US 93 and west of the Larchmont Golf Course (Site Q on **Figure 3-23**).

The Missoula Country Club's non-Section 4(f) status is supported by the fact that it is not eligible for, or listed on the NRHP and that it is privately-owned and, therefore is not a public recreation area. Based on 23 CFR 771.135(a), the definition of applicability of Section 4(f) to golf courses has to do with ownership. The Missoula Country Club is a privately owned course and club for use of members only. It is not open for public use. Since the Missoula Country Club is owned, operated, and managed by the private membership, it is considered private, even if it is occasionally open to public use for a charity or social event.

3.18.2 Recreation Trails

Multiuse paths, also known as trails, are used both for recreation and commuter travel. They are generally used for nonmotorized travel to connect to on-street systems; neighborhood trails; walkways and trails outside the urban area; and schools, employment, and commerce centers. The City of Missoula and Missoula County have constructed approximately 22 miles of trails in the urban area. However, these trails are not interconnected and have gaps between segments. Two trailheads are located within the Blue Mountain Recreation Area and are accessed off Blue Mountain Road: the Blue Mountain Trailhead and Maclay Flat trailheads.

There is a limited, noncontinuous trail network within the project area with limited sidewalks, as shown in **Figure 3-13**. Located east of the Miller Creek area is the South Hills trails system, which consists of ten interconnected bicycle and/or pedestrian routes designed to link with other neighborhoods and parks. Bicycling and walking to and from the Miller Creek area is very difficult given the lack of sidewalks and bicycle paths. Both Miller Creek Road and Upper Miller Creek Road lack shoulders and do not provide safe facilities for pedestrians and bicyclists.

Area planning documents identify several proposed system improvements within the project area. These include:

- Complete some portions of the South Hills Trail system; this includes an easement for a trail between Miller Creek Road and Orchard Avenue.
- Develop bicycle facilities and a sidewalk on Gharrett Street.
- Develop a pedestrian/bicycle trail with a river crossing near Buckhouse Bridge connecting Fort Missoula to a Missoula/Lolo trail.
- Develop a trail from Lolo to Missoula.
- Add pedestrian/bicycle facilities on Miller Creek Road.
- Provide pedestrian/bicycle facilities as part of all new development.

3.18.3 Planned Parks and Trails

According to the *Revised Development Plan for Maloney Ranch*, February 2003, there is a 7.9-acre open space/common area planned near the intersection of Lower Miller Creek Road and Maloney Ranch Road to serve the Maloney Ranch subdivision. This is shown as Site K on **Figure 3-23**. Future parks and "open space/common areas" will be dedicated as part of new subdivision developments. Missoula County would then designate uses and have responsibility for maintaining the area.