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1. INTRODUCTION

A Transportation Master Plan facilitates orderly urban and rural development, guiding the location and type of roadway facilities that are needed to meet projected growth within an area. Cities and counties must identify and plan for their existing and future transportation improvement needs, and acquire adequate rights-of-way. A Transportation Master Plan is a means of assuring that basic infrastructure needs and right-of-way will be available when travel demand warrants new or improved facilities.

The City of Mountain Home Transportation Master Plan (hereafter, "Plan") was prepared to serve as a guiding document for the next 22 years of roadway improvements and capital facility improvements (through 2031). This Plan is consistent with City of Mountain Home's Comprehensive Plan. The Plan addresses the following:

- Evaluates the existing transportation system
- Addresses various modes of transportation
- Includes roadway cross-sections recommended for future capacity
- Identifies future transportation needs
- Recommends improvements that will enhance mobility

Background and Purpose

The City of Mountain Home is located between the Danskin and Owyhee Mountains, approximately 40 miles southeast of Boise, Idaho (see Figure 1.1). The City currently has a population over 14,500, up from 7,913 in 1990. This represents an annual growth rate of approximately 3.4 percent. Projections indicate that by 2031 the population will surpass 44,000 persons (Mountain Home Comprehensive Plan).

DANSKIN MOUNTAINS

The City of Mountain Home is in the fast-growing Boise/Sun Valley corridor, and this area is expected to continue experiencing population and employment growth, resulting in associated mobility and access improvement needs. The purpose of this Plan is to identify the roadway improvements needed to accommodate travel demands through the year 2031. Improvements include widening or extending some roadways, and construction of new facilities. Recommendations in this Plan were evaluated based on traffic density, mobility needs, engineering requirements, and land use zoning.

The Plan will help the City of Mountain Home and other agencies to prioritize construction projects over the next 20-25 years. The Plan is comprehensive--it assembles relevant data, assesses existing and future transportation development needs, and recommends prioritization of improvements. Projects identified in this plan can be submitted to the City Council for its consideration, programming, funding, and implementation.

Benefits of Transportation Planning

Transportation planning develops an efficient and appropriate transportation system that meets existing and future travel needs. Primarily, planning ensures the orderly and progressive development of a transportation network that serves the mobility and access needs of the public. Transportation planning should interrelate with land use planning and trail planning.

Good coordinated planning identifies long-term transportation needs like roadway requirements, intersection needs, transit facilities, bicyclist/pedestrian needs, access management, and other associated needs.

The benefits of effective transportation planning are realized by achieving the following objectives:

- Maximizing mobility by recognizing where future capacity may be needed
- Preserving adequate right-of-way for long-range transportation improvements
- Efficiently scheduling available resources by recognizing which streets will likely require improvements
- Appropriately sizing the amount of land required for streets and highways
- Identifying the functional role that each street should serve in order to promote and maintain stable traffic levels and land use patterns
- Informing citizens when streets will later be developed as arterial and collector streets, so that private land use decisions anticipate changes in traffic patterns
- Using information about transportation improvement needs to set priorities and schedules for capital facilities funding
- Prioritizing improvements and identify funding sources in implementation planning in the Capital Facilities Plan and serving as a guide in developing impact fee updates

Elements of the Transportation Master Plan

This Plan summarizes work done to identify changes to the Mountain Home transportation network. First, existing traffic and land use conditions were evaluated. The evaluation identified functional relationships between different types of roadways (e.g. freeways, arterial streets, collectors, and local streets). Next, future traffic and land use conditions were projected, and additional roadway alignments were put forth to support these conditions. The list of improvements is prioritized into three tiers: short term (2009-2014), intermediate term (2015-2020), and long term (2020-2031) or as development warrants.

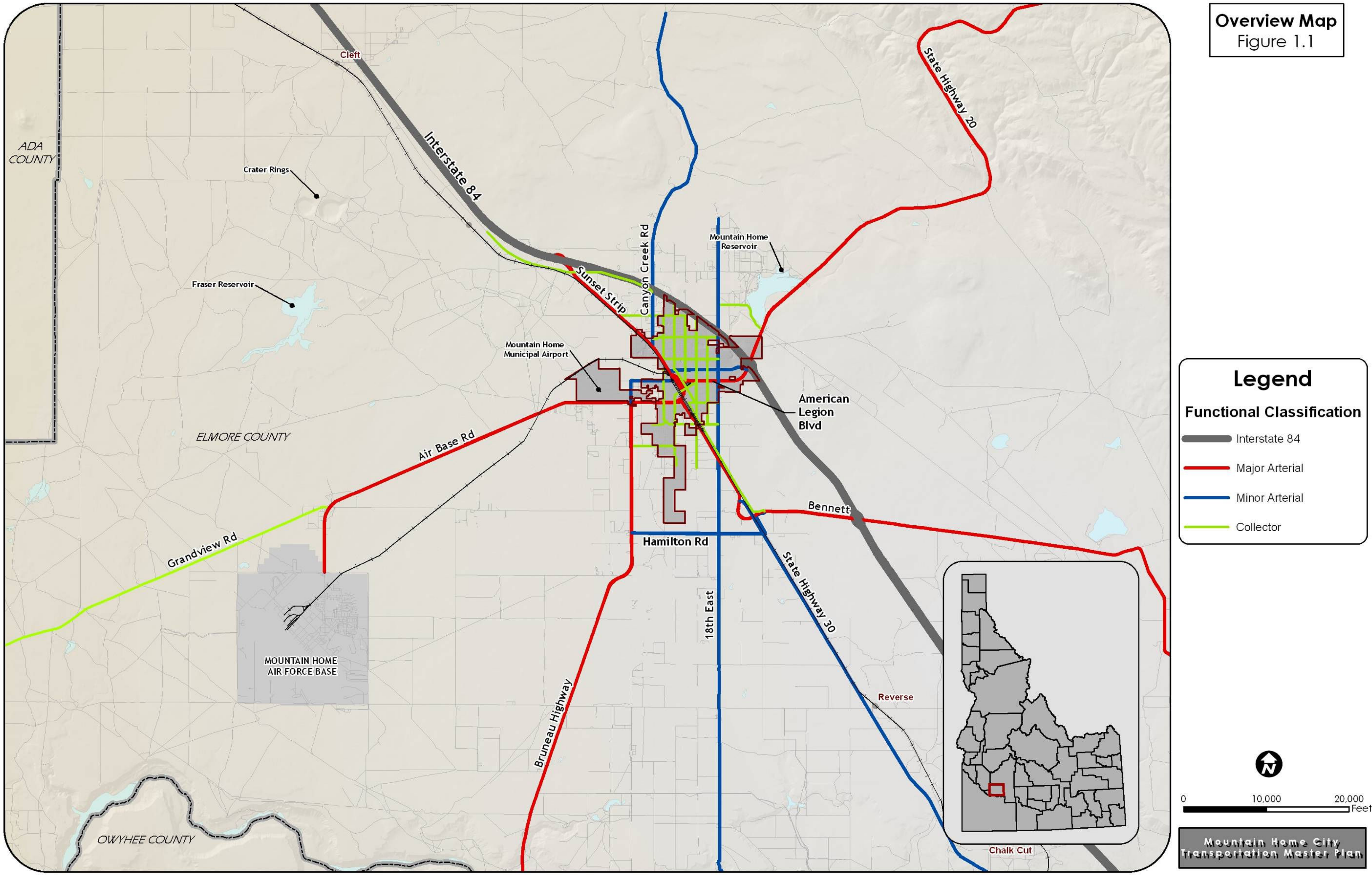


FIGURE 1.1 - OVERVIEW MAP

2. EXISTING TRANSPORTATION CONDITIONS

This section explores the existing transportation system in Mountain Home. Understanding the existing conditions is an important first step in developing a transportation plan specific to Mountain Home's future needs. The existing street network and traffic patterns provide data for projections about future conditions. The existing topographic and physical features of the community serve as criteria that any improvements must meet, and so those features are identified. The purpose is to identify problems that should be solved and the criteria that solutions must meet.

The following transportation information has been collected and analyzed:

- Functional classification of the transportation network
- Average Daily Traffic (ADT) volumes, with peak-hour volumes
- Counts of turning movement traffic at selected intersections
- Average delays and Level of Service at selected intersections
- Roadway geometrics (lane and shoulder widths, speeds, parking, etc.)
- Rail corridors
- Land use characteristics (present and future)

The next section describes how traffic patterns were analyzed.

Transportation Network Grid

The transportation network is the city's circulatory system--providing routes for the movement of goods, services, and people. The transportation network provides both access and mobility. Currently, the base network in Mountain Home is laid out in a grid pattern. A grid network allows for the greatest accessibility and spreads local traffic over a number of streets. This street pattern generally minimizes travel lengths to get from one point to another. New development in recent years on the periphery of the city has not necessarily deviated from the grid network. The foundation of maintaining a hierarchy of collector streets has been followed.

Existing Roadway Functional Classification

The functional classification system is a hierarchical organization of streets and highways that facilitates the safe and efficient operation of vehicles along different types of facilities. Freeway and arterial facilities are at one end of the spectrum, primarily providing the function of moving vehicles. Collector and local streets are at the opposite end of the spectrum, providing access to property.

To enable streets and highways to accomplish their intended function, the planning and design of the facilities should consider those elements that support the intended functions. Descriptions of the various roadway functional types and related planning and design considerations are provided in Table 2.1.

TABLE 2.1 ROADWAY FUNCTIONAL CLASSIFICATIONS

Roadway Functional Classifications	
Interstate	Interstates promote movement of traffic with limited access, high speeds, separated directional lanes, adequate geometries, and grade-separated intersections. The interstate freeway is essentially a specialized Principal Arterial. Interstate I-84 is the major east-west corridor through the region and is situated north-east of City of Mountain Home. There are no Interstates under the jurisdiction of the City of Mountain Home. The Idaho Department of Transportation maintains Interstate I-84.
Major Arterial	Major Arterials are generally the high traffic volume roads within a study area. These roadways contain the greatest proportion of through or long distance travel. Roadway access should be limited to promote efficient traffic movement. Speeds are generally in the 35 to 45 mph range in urban situations, and parking is usually prohibited. Arterials are typically about a mile apart, but may be in the half-mile range. Many of the major intersections will be signalized, and signal placement and coordination are critical to the operation of the arterial. Although the following roads are under state jurisdiction, they are currently classified as Major Arterials within the city limits: Sunset Strip, Downtown one-way couplet, State Highway 30, Air Base Road, American Legion Boulevard, State Highway 20, and Bruneau Highway
Minor Arterial	Roadways that connect principal arterials and collectors are classified as minor arterials. Minor arterials usually have capacity sufficient to carry 3 or 4 lanes of traffic and have curb, gutter, and sidewalk along both sides. The predominant function of a minor arterial is to provide movement of through traffic, but it also provides considerable access for local traffic that originates or is destined to points along the roadway. Often minor arterials become boundaries to neighborhoods, and serve less concentrated developments such as neighborhood shopping centers or schools. Urban speeds are generally in the 25 to 35 mph range. Access may be restricted and parking is often prohibited in an urban situation. North & South18th East, East 8th North, Canyon Creek Road, West5th North, Elm crest and Hamilton Road, are classified as minor arterials.
Collector	A collector is intended to assemble and concentrate residential and rural traffic and direct it to the arterial system. Collectors usually have capacity to carry 2 or 3 lanes of traffic, and have curb, gutter, and sidewalk along both sides. To preserve neighborhoods, collectors are generally spaced every half mile and do not cross arterials. Direct access to adjoining property is common and often essential. Operating speeds are generally 25 mph. Parking is acceptable, but may be limited. Collectors are sometimes sub-categorized into major and minor collectors. Major collectors tend to connect important regional facilities directly to the arterials, while minor collectors usually connect to the local roads. Collector streets make up the main network of Mountain Home's street grid. North & South Haskett Street, North & South 3rd East, North6th East, North & South10th East North & South14th East, East10th North, East15th North, McMurtrey Road, East 6th South, East&West12th South, East & West Jackson Street, and North & South 5th West, are collectors.

Roadway Functional Classifications	
Local Streets	Local streets typically consist of 2 lanes and shoulders, with curb, gutter, and sidewalks present in some locations. Local roads are the capillaries of a transportation network, providing direct access to public facilities, businesses, and private property. The typical speed limit on local streets is 20 to 25 mph. Local streets constitute all the City-owned roads that are not classified under the preceding categories.

Existing traffic operations were evaluated by conducting a capacity/Level of Service (LOS) analysis. Traffic operations for a given roadway are analyzed by first identifying several characteristics of the roadway, then assigning it a Level of Service (LOS) classification. Two key characteristics are the average daily traffic (ADT) load that uses the roadway, and the roadway's functional class. ADT is measured in a traffic survey. The functional class of a roadway is a formal designation given to the roadway to generally describe it. Appendix C provides the existing traffic operations analysis.

FHWA classifications for City streets are listed in Figure 2.1. Note that Federal funding programs only apply to roadways with functional classifications of collector and above. The functional classification and ADT loads for these roads will help determine each road's Level of Service (LOS).

For collector roads, Average Daily Traffic (ADT) counts were collected with automated counters throughout the study area. ADT counts were collected in November of 2007 for 48 hours. For state roads, ADT counts were obtained from the Idaho Transportation Department. It should be noted that traffic volumes collected represent a fixed time for that period. While these traffic volumes are used to represent average daily traffic for any given day, variables such as road construction, higher than normal business activities, or social/community events may not necessarily depict actual daily traffic volumes. Therefore, while some roads may appear to have heavy traffic volumes and some low volumes, the recorded traffic volumes are combined to obtain an "average" for that road. Traffic volumes for each road are contained in Appendix C.

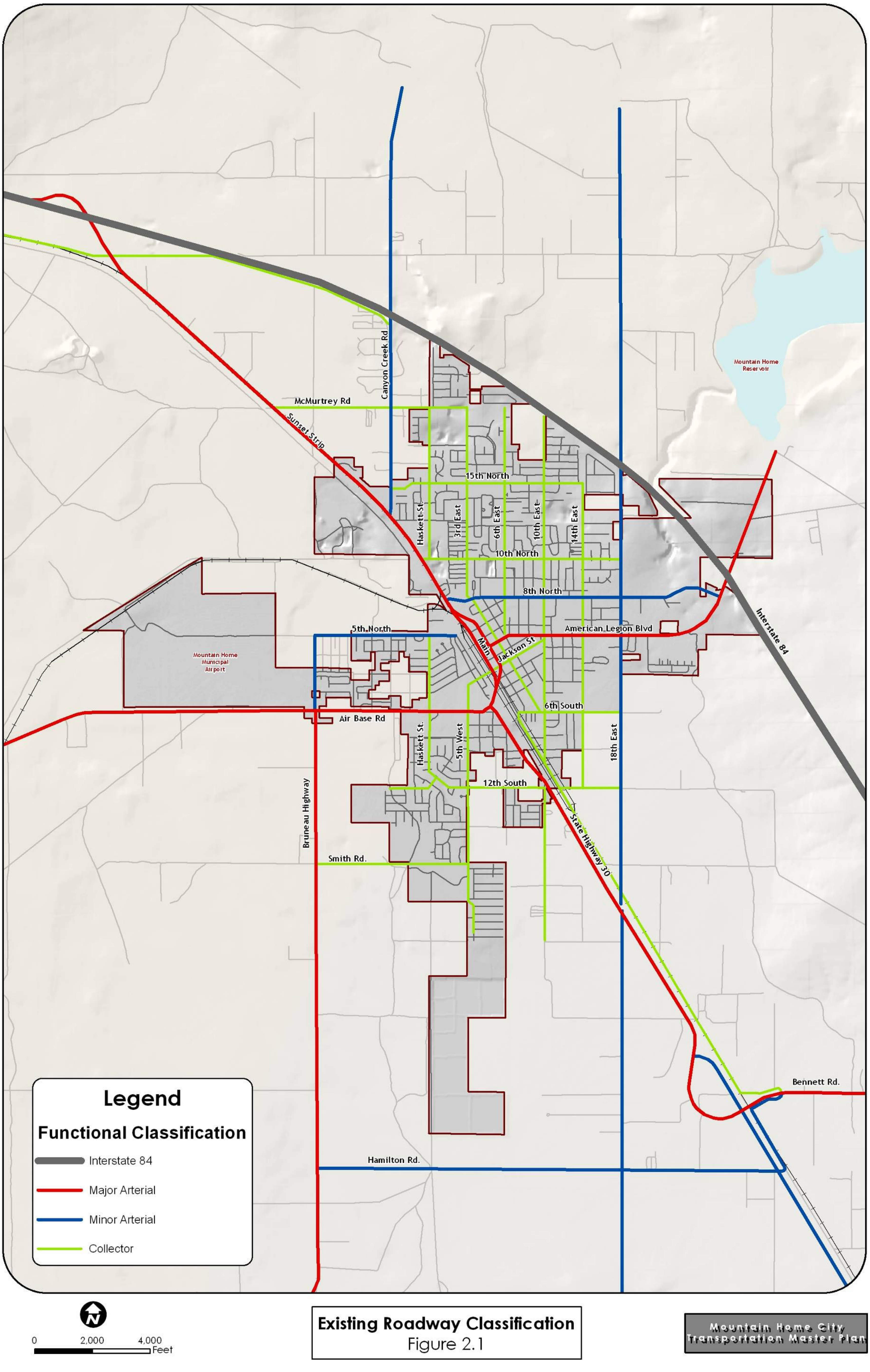
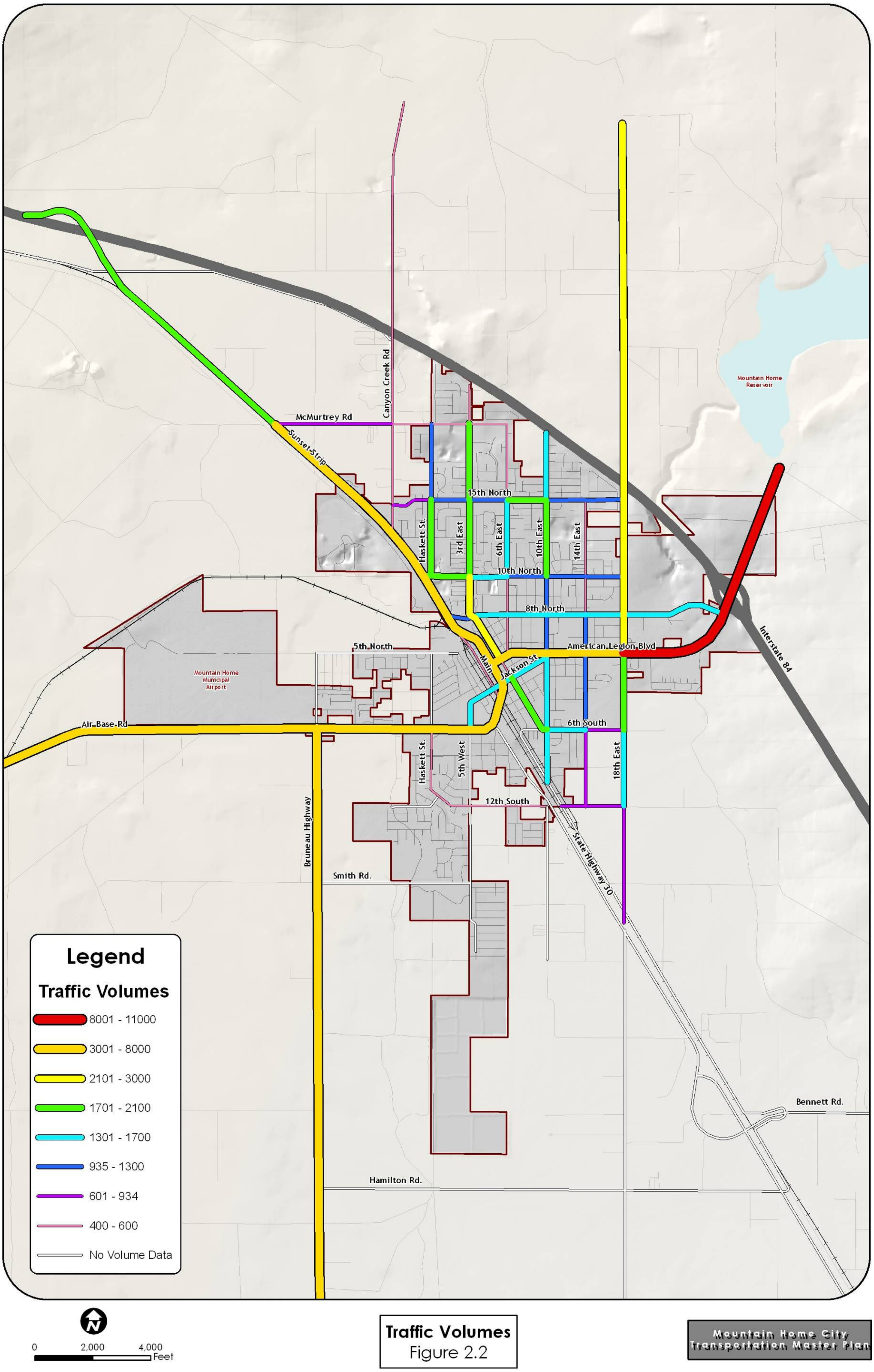


FIGURE 2.1 - EXISTING ROADWAY CLASSIFICATION



Traffic Volumes
Figure 2.2

FIGURE 2.2 - TRAFFIC VOLUMES

Existing Traffic Controls

Traffic control devices are an essential element to the operation of each intersection. Within City of Mountain Home, seven intersections are controlled by traffic signals, while others are controlled by stop or yield signing. The existing signalized intersections were selected for evaluation: turning movement counts were collected; traffic control devices present were counted; and posted speeds, pedestrian presence, adjacent parking, and so on were noted.

The intersections are located at:

- Air Base Road/Bruneau Highway
- Air Base Road/South 5th West
- Air Base Road/State Highway 30/
- East Jackson Street/North 2nd East
- American Legion Boulevard/North 2nd East
- American Legion Boulevard/North 3rd East
- North 10th East/American Legion Boulevard

Existing Railroad Crossing

The Union Pacific Railroad mainline runs through the City of Mountain Home, generally paralleling US 30. One grade separated crossing is provided at Air Base Road. Three at-grade railroad crossing are located on 12th South, West Jackson Street, and West 5th North (Figure 2.3). Volume along the corridor is approximately 34 trains per day (Federal Railroad Administration Office of Safety Analysis).

Alternative Travel Modes

Transit

Currently, the only form of mass transit available to Mountain Home is provided by the Treasure Valley Transit (TVT). TVT provides transit service in the form of a daily shuttle bus currently offering two routes. The first route is provided as circulating system along the main travel corridors of the city (Figure 2.4). The second route provides service within the Mountain Home Air Force Base.

Bicycle and Pedestrian Facilities

Bicycling and walking are often the only modes available to the young and elderly. As Mountain Home continues to grow, many of its once-quiet streets will carry large volumes of high-speed traffic without the benefit of an environment that is conducive to walking or biking.

A pedestrian and bicycle network allows shorter distance trips, such as children's trips to school, to be taken off of the street network and moved to the pedestrian network. In addition, bicycle and pedestrian facilities offer a wide range of recreational opportunities and often add to the quality of life. Figure 2.5 shows the existing and proposed trails and Figure 2.6 shows the bicycle pathways in the City of Mountain Home. See Appendix E for further information on bicycle and pedestrian facilities.

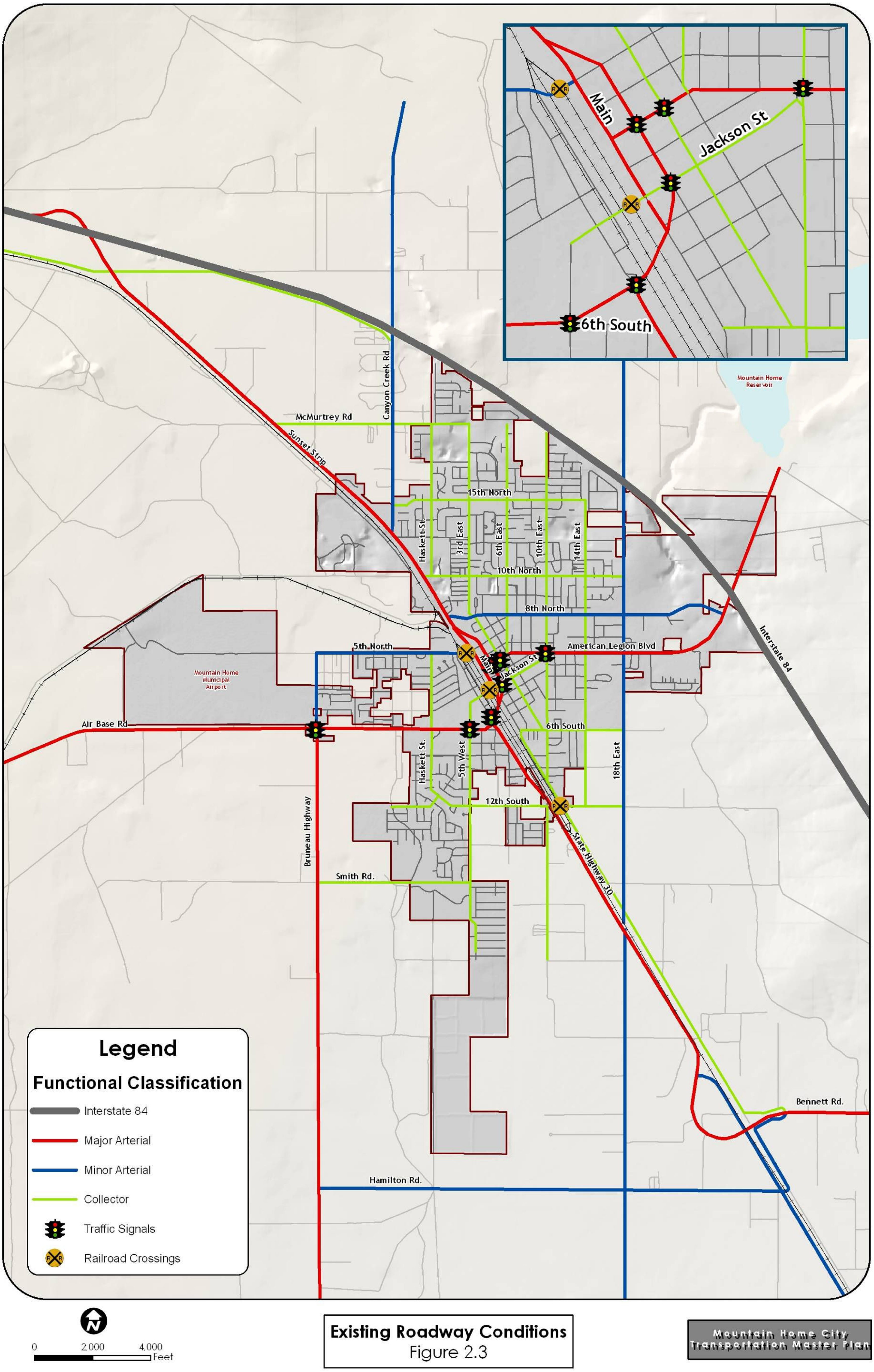


FIGURE 2.3 - EXISTING ROADWAY CONDITIONS

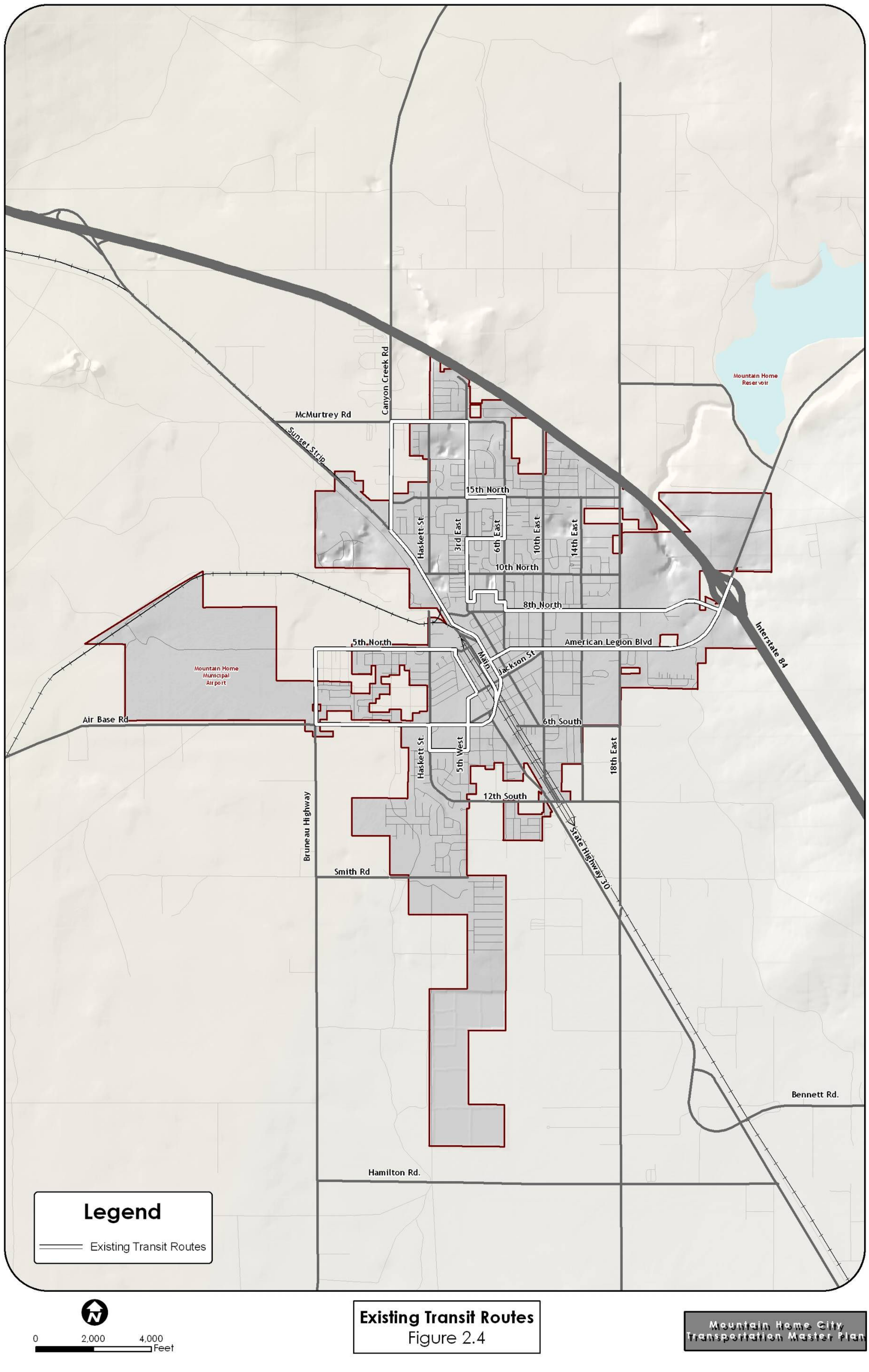


FIGURE 2.4 - EXISTING TRANSIT ROUTES

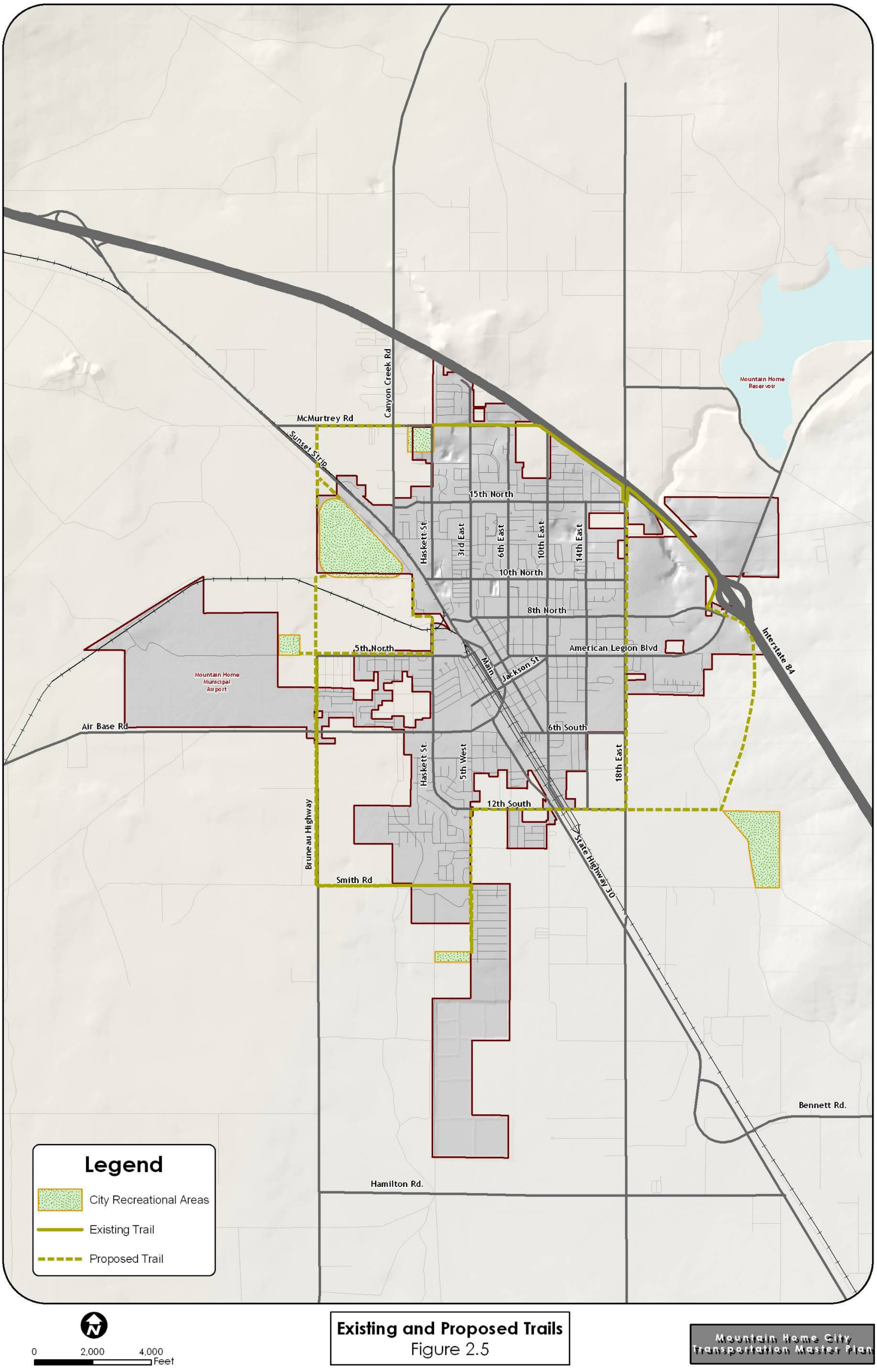


FIGURE 2.5 - EXISTING AND PROPOSED TRAILS

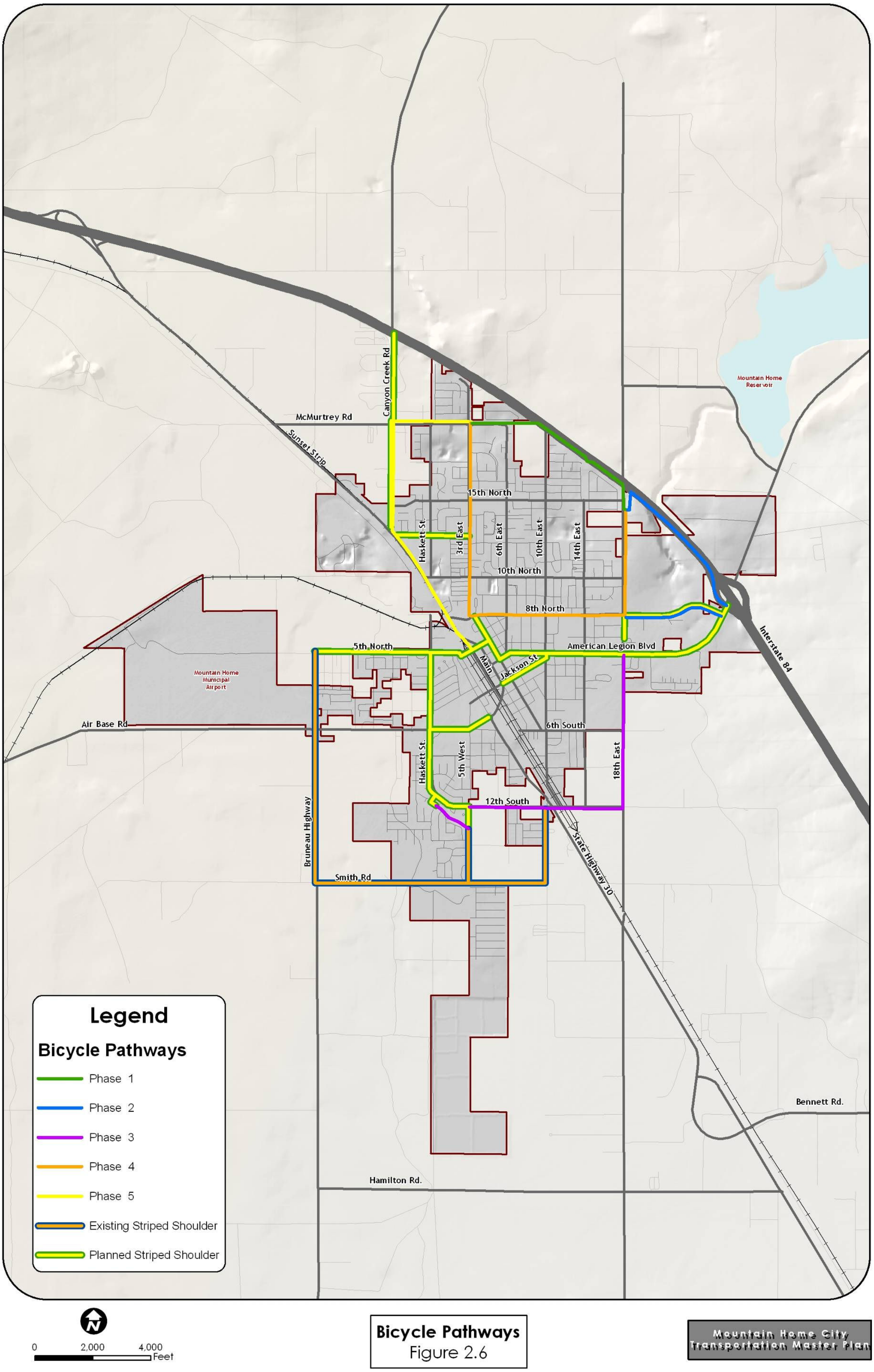


FIGURE 2.6 - BICYCLE PATHWAYS

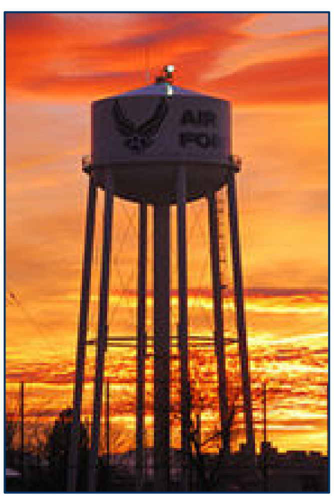
Existing Major Traffic Generators

Major traffic generators influencing traffic volumes and flow patterns within the study area include: the Central Business District, including City Hall and related offices; Elmore County offices; Elmore Medical Center; Mountain Home Air force Base; Mountain Home School District; Pilot Travel Center; Simplot Livestock; and the Marathon Cheese Plant. The major traffic generators in the City of Mountain Home are shown in Table 2.2.

TABLE 2.2 - MAJOR TRAFFIC GENERATORS

Business	Employees
Mountain Home Air Force Base	5,231*
Mountain Home School District #193	500
Marathon Cheese Facility	500
Elmore Medical Center	210
Simplot Livestock	150
Elmore County	137
City of Mountain Home	120
Pilot Travel Center	60

** Source: Mountain Home Air Force Base Public Relations*



MOUNTAIN HOME U.S. AIR FORCE BASE

ELMORE COUNTY COURTHOUSE

3. FUTURE CONDITIONS ANALYSIS

The link between land use and transportation is critical. Land use types and their locations influence the travel patterns of an area. The City will be experiencing a tremendous amount of residential growth and improvements to the transportation network have to keep up with this demand. Residential growth has occurred in areas that were once agricultural land. The transportation network that was originally designed cannot support current or future traffic volumes.

The City's General Land Use Plan provides existing and future land use information. This chapter analyzes land uses for the purpose of forecasting the future demand on the transportation network. This data will be the basis for the future "build-out" transportation model. Specific inputs include: population projections, employment centers, and anticipated land uses in undeveloped areas. Through the analysis of these variables, future transportation needs are identified and evaluated.

Population Growth

The study area is expected to experience significant growth over the next twenty-five years. Future population is projected based on the City's Area of Impact Map and assume that the residential zone will be developed between 3.5 - 4.5 residential units per acre. That population is expected to increase by 300 percent to almost 44,000. Table 3.1 shows the population projection.

TABLE 3.1 - POPULATION PROJECTIONS BASED ON FUTURE LAND USES

Category	2004	2008	2031
Housing Units	4,900	5,912	18,906
Population	11,427	14,500	44,000

Source: Idaho Commerce & Labor, Mountain Home Comprehensive Plan

This information provides the basis of future land use projections and is used to estimate future travel demand scenarios.

Future Land Use

The City's Comprehensive Land Use Plan and Area of Impact Map are official documents that guide the City's decisions about how and where the City would like to accommodate growth and the intensity of growth. The AOI Map also identifies areas where the City anticipates expanding its boundaries. The Comprehensive Land Use plan lists the land use categories and the allowable densities for each. Future land use is used to forecast traffic volumes based on density permitted for each land use classification. The future land use identified in the AOI is translated into traffic analysis zones which are used to forecast the 2031 traffic volumes. This is described further in the traffic analysis zone discussion.

Transportation Analysis Zones

In order to construct a travel demand model for a given area, the overall area must be parsed into smaller units or sub-areas called Traffic Analysis Zones (TAZs). TAZ boundaries typically follow major roadways and are drawn to encompass land areas that are generally homogenous with regard to land use (Figure 3.1 - Traffic Analysis Zones). Ideally, boundaries of TAZs do not overlap with boundaries of sub-areas identified by planning agencies, highway district boundaries or census data boundaries.

Each zone has an identifiable or prominent land use or activity characteristic which generally follows the AOI. This characteristic differentiates the area within the zone from the area outside. Prominent internal characteristics might include:

- A residential neighborhood
- A retail business area
- A recreational destination
- A transportation terminal or hub
- An industrial or agricultural area
- With the TAZ boundaries and respective land uses identified, it is possible to model the density of households and employment centers and their corresponding impact on the existing and future transportation networks.

TABLE 3.2 - MOUNTAIN HOME TRANSPORTATION ANALYSIS ZONE LAND USE DENSITIES

Land Use Type	Land Use Densities
Residential Land Use	**Residential** - High density housing, 4.5 units per acre or less. **Urban Development Residential** - Medium density housing, 3.0 units per acre or less. **Rural & Mixed** - Low density housing, 1.0 units per acre.
Commercial Land Use	**General Commercial** - shopping centers, which can satisfy the specialty shopping needs of the community and surrounding areas. This also includes the downtown core which is intended to create a mixed-use shopping and financial center for the City and surrounding region, characterized as “the center of town.” Densities for commercial uses rely on the Institute of Transportation Engineers (ITE) Trip Generation Manual’s density per square foot.
Industrial Land Use	**Light Industry** - Land uses in this category mix commercial and light industrial uses like clean types of manufacturing, processing, warehousing, repair and general industrial uses. Industrial areas should have easy access to railroad and highway systems. **Heavy Industry** -This designation is specifically established for heavy manufacturing and processing industries. Densities for Industrial uses rely on the ITE Trip Generation Manual’s density per square foot.

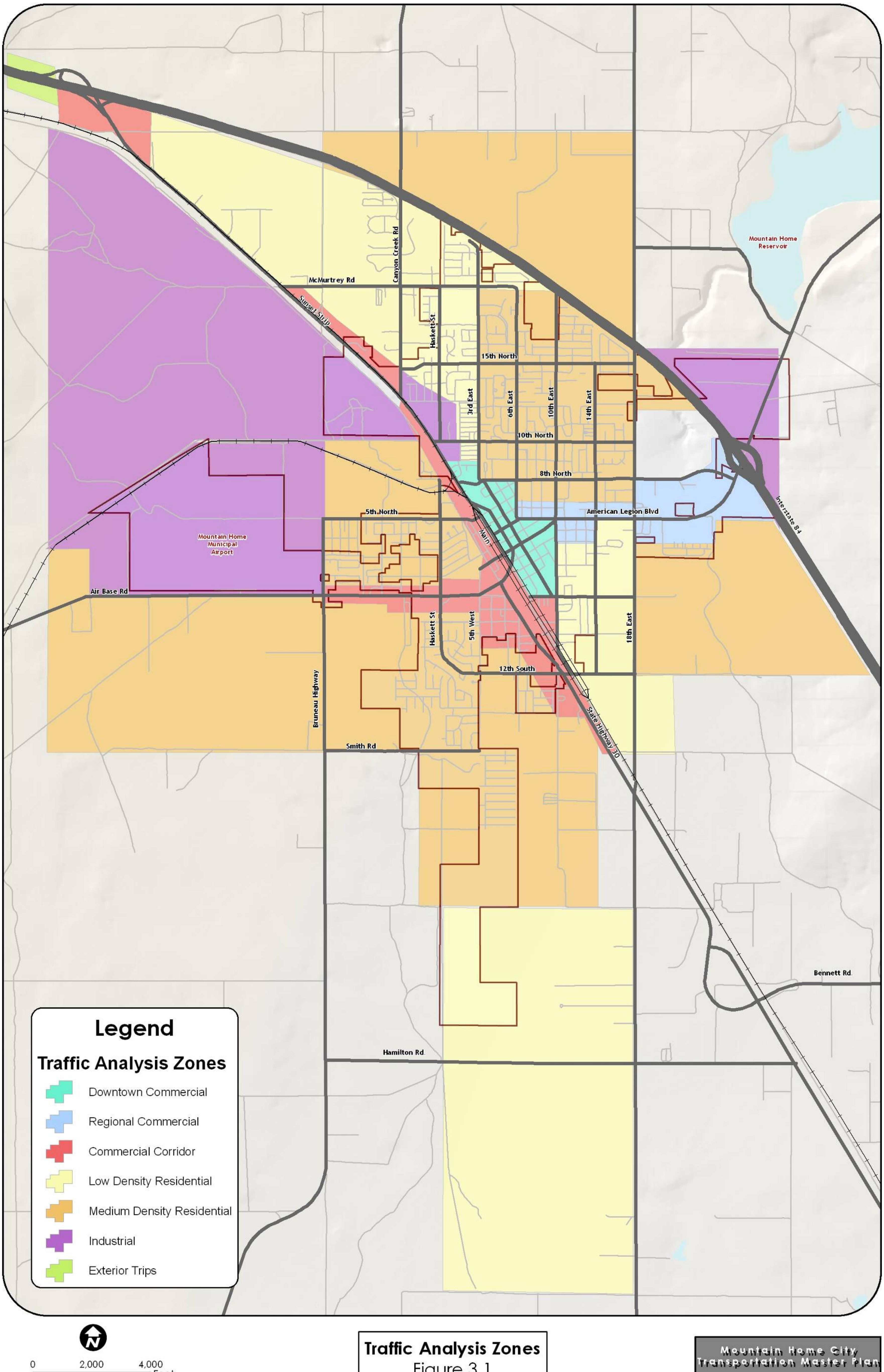


FIGURE 3.1 - TRAFFIC ANALYSIS ZONES

Trip Generation Analysis

This section includes projections of traffic conditions for a design year of 2031. With the AOI divided into TAZs, it is possible to project trip generation volumes. Trip generation is the number of vehicle trip ends generated by an area during the AM peak hour, PM peak hour, and normal weekday drive time. To determine the volumes, we refer to the manual, “Trip Generation, 7th Edition” published by the Institute of Transportation Engineers (ITE), the industry standard ITE publishes data that has been collected throughout the United States on the number of vehicle trips that a particular land use attracts.

Daily traffic within the transportation network includes three trip categories:

- Traffic generated by residents in the study areas,
- Pass-by traffic generated by the neighboring cities,
- Visiting traffic from the surrounding region for either employment or commercial purposes (commuters and shoppers).

In order to estimate the highest traffic volumes possible for the City’s roads, 9.57 daily trips per housing unit is applied for each housing unit, in each residential TAZ. Because of the lack of future employment information that could be used to determine commutes, these trips were stratified into three trip-purpose categories:

- Intercity trips leaving Mountain Home for Boise and other cities
- Trips between Mountain Home and the Air Force Base
- All other trips (the assumed destination is the commercial developments and industry developments)

Trip volumes for each category were calculated separately. Intercity trips were projected by applying the anticipated 300 percent population growth rate in 2031 to the 2006 intercity traffic volume data on the freeway exchanges. Because employment growth at the Air Force Base may not necessarily require personnel to live outside the base, it is assumed that Air Force Base Trips will be the same as current trips, 15,542 trips per weekday. Intra-city trips were calculated based on an analysis of the types of roads near residential areas, and on the percent of trips ITE identifies as commercial and industrial trips, and on the presence of employment centers.

Pass-by traffic on I-84 will use exit 95, the I-84 and SR-51 Interchange, generating local stops as drivers exit and then re-enter the freeway after using local services.

The TAZ analysis table which identifies the analysis results by Traffic Analysis Zone as described above is located in Appendix C.

4. TRANSPORTATION NETWORK IMPACT SCENARIOS

The City had identified a future transportation network which was used in developing the trip generation analysis (Figure 4.1 - 2031 No Build Network). Once the trip generation analysis was complete, the next step was to evaluate three scenarios to determine the overall effect on the future transportation network, with or without significant improvements. The analysis included evaluation of the following three scenarios:

1. 2031 No-Build Network
2. 2031 Roadway Network with Expanded Transportation Network (Scenario 1)
3. 2031 Roadway Network with Expanded Transportation Network and Proposed One-way Couplets in Downtown Area (Scenario 2)

2031 No-Build Network

The No-Build scenario assumes that the existing road network and traffic control devices would remain as they are, with only maintenance or minor modifications occurring; and analyzing this condition using projections from the build-out year land use projections. Under this scenario, all representative intersections and roads are projected to operate below acceptable LOS. 2031 traffic volumes were highest along American Legion Boulevard (approximately 42,000 ADT) and along Air Base Road (approximately 32,000~51,000 ADT), as shown in Figure 4.1. Other heavily traveled roadways include Highway 30 (32,000 ADT), Jackson Street (12,600 ADT), and 18th East Street (ADT 17,000). Table 4-1 identifies the LOS of major intersections of the roads. Under the No-Build scenario, all of the major intersections and roadways within the City operate at LOS “F”.

TABLE 4.1 - 2031 NO BUILD ANTICIPATED CAPACITY AND LOS

Intersections	Anticipated LOS
American Legion Boulevard/18th East	“F”
American Legion Boulevard/14th East	“F”
American Legion Boulevard/10th East	“F”
American Legion Boulevard/Highway 30	“F”
Air Base Road/Highway 30	“F”
Air Base Road/Haskett Street	“F”
Air Base Road/Bruneau Highway	“F”
Highway 30/McMurtrey Road	“F”
Highway 30/Canyon Creek Road	“F”
North 18th East/East 10th North	“F”

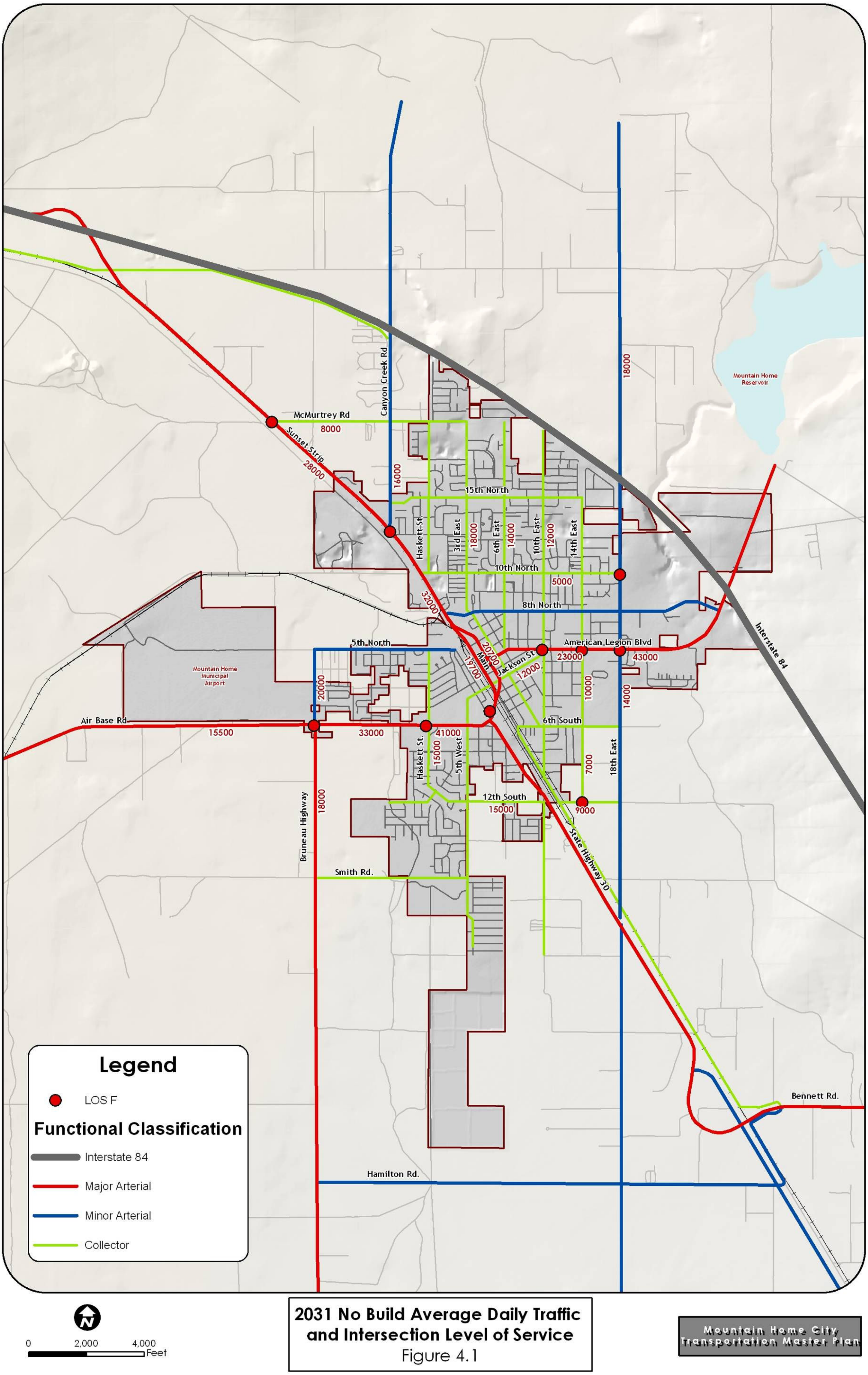


FIGURE 4.1 - 2031 NO BUILD NETWORK

2031 Transportation Network with Proposed Improvements

The two proposed transportation network scenarios were evaluated to address the 2031 travel demand. Both improvement scenarios upgrade traffic control devices at necessary intersections, and adjusts functional classifications as necessary for certain roads. For example, principal arterials were modeled with seven lanes, minor arterials were modeled with five lanes, and collector roads were modeled with three lanes of travel. These proposed upgrades were based on the traffic volume data from Section 3, where the data identified deficiencies in the no-build scenario.

The expanded transportation network scenarios propose certain upgrades to alleviate traffic congestion and improve safety and mobility at intersections throughout the transportation network. These improvements include signalizing the intersections listed in Table 4.2.

TABLE 4.2 - PROPOSED INTERSECTION SIGNALIZATION

Proposed Intersection Signalization for the 2031 Roadway Network	
Smith Road and Bruneau Highway	East 10th North and Sunset Strip
12th South and South Main/State Highway 30	East 10th North and 3rd East
12th South and 14th East	East 10th North and 10th East
12th South and 18th East	East 10th North and North18th East
American Legion Boulevard and 6th East	McMurtrey Road and Sunset Strip
Air Base Road and Haskett Street	McMurtrey Road. and Canyon Creek Road
East 6th South and 18th East	Canyon Creek Road and Sunset Strip
American Legion Boulevard and 14th East	Jackson Street and Main Street
American Legion Boulevard and 18th East	Interchange Ramp Signals Exit #95
West 10th North and Elmcrest Extension	American Legion Boulevard and Main Street

Most of intersections under Scenario 1 operate at an acceptable LOS except for in the downtown area. The proposed signalized intersections at American Legion Boulevard/Main Street, and American Legion Boulevard/6th East, and the existing signalized intersections at American Legion/3rd East, and American Legion/2nd East operate at an unacceptable LOS “F” with the proposed 7-lane arterial on American Legion Boulevard Proposed signals at American Legion Boulevard/18th East and American Legion Boulevard/Interchange operated at an LOS “D-E” (Figure 4.2 Scenario 1). When this same scenario was modeled with a 5-lane arterial (similar to existing conditions), only one intersection changed; the intersection at 14th East/American Legion Boulevard operated at operated at LOS “E”. The rationale for modeling the transportation network with the 5-lane arterial was due to the potential right of way costs that would be required to accommodate a 7-lane arterial. Approximately 24 feet would be required to accommodate a 7-lane arterial along American Legion Boulevard between 18th East and Main Street. The change from a 5-lane to 7-lane did not result in a significant change for the downtown area. All intersections operated at an LOS “F”.

It was then determined that other modifications to the transportation network were needed beyond a change in roadway classification and/or widening. It was assumed that if the LOS in the downtown area improved, it would likely have a rippling affect to other intersections along American Legion Boulevard

Scenario 1 was with the 5-lane arterial was modified to include a one-way couplet system in the downtown area. One-way couplets were determined as an option for widening to a 7-lane facility.

The intersections in the downtown area under scenario 2 all operated at an acceptable LOS. The proposed signal at the intersection of American Legion Boulevard/Main Street and the existing signals at American Legion Boulevard/3rd East, and American Legion Boulevard/4th East operated at a LOS “B”. The intersection at 14th East/American Legion Boulevard changed from an LOS “E” to an acceptable “D”.

For both scenarios, the average daily traffic volumes and intersection LOS for the year 2031 are depicted in Figures 4.2 and 4.3. The recommended roadway improvements are discussed further and identified in Section 5.

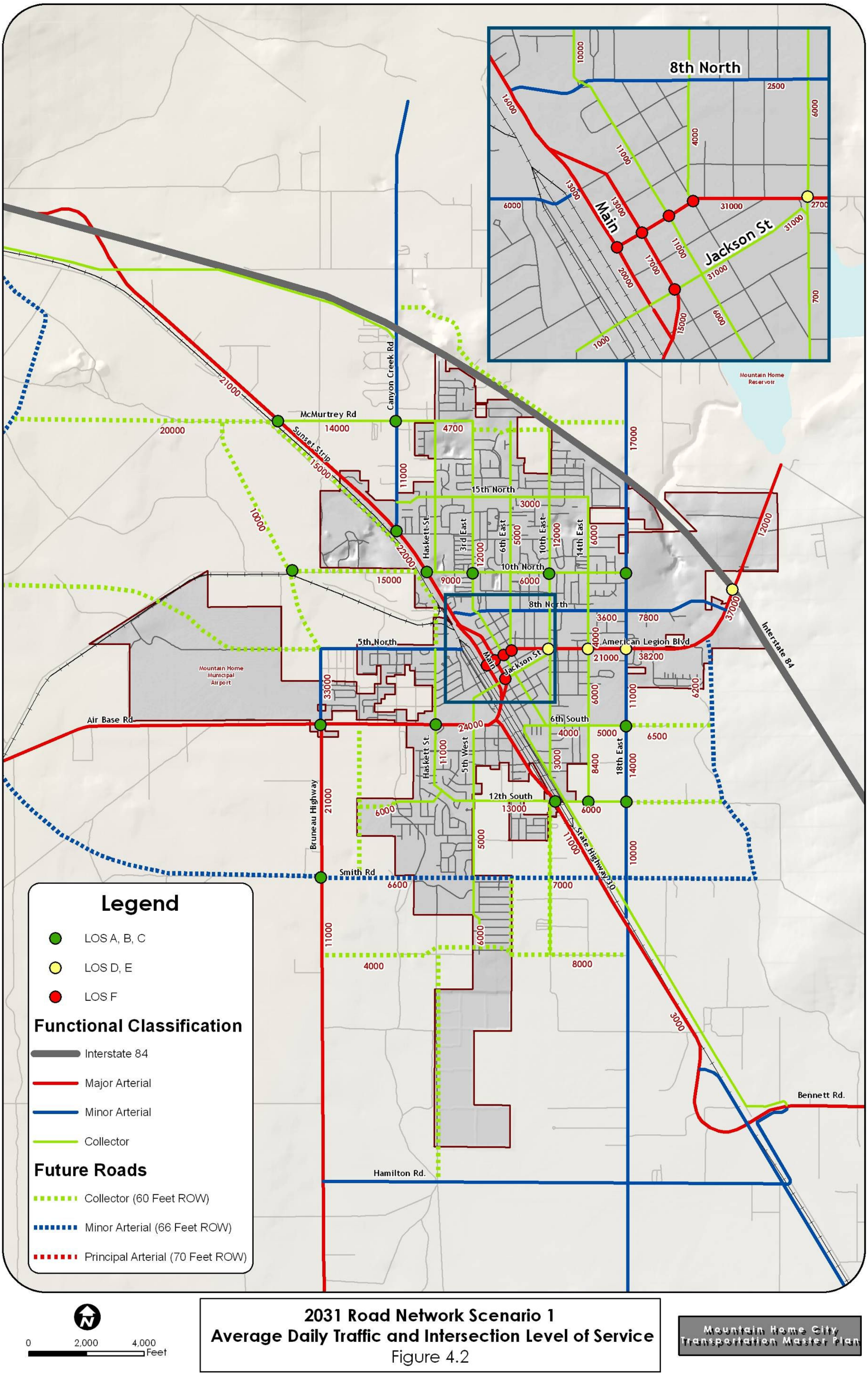


FIGURE 4.2 - 2031 ROADWAY NETWORK WITH EXPANDED TRANSPORTATION NETWORK (SCENARIO 1)

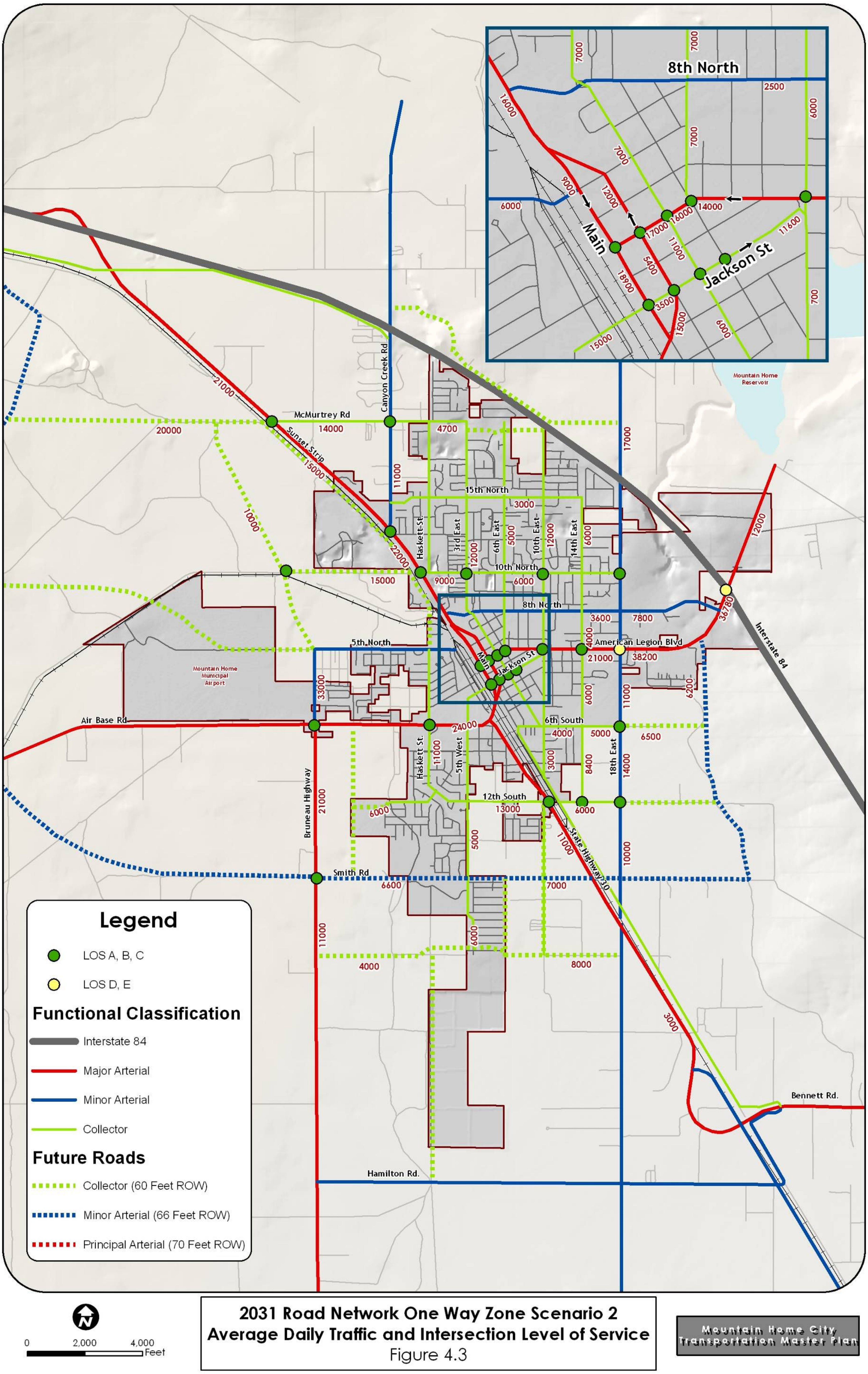


FIGURE 4.3 - 2031 ROADWAY NETWORK WITH EXPANDED TRANSPORTATION NETWORK AND PROPOSED ONE-WAY COUPLETS IN DOWNTOWN AREA (SCENARIO 2)

5. SUMMARY & RECOMMENDATIONS

The population for the City of Mountain Home is projected to reach approximately 44,000 by 2031, planning year. It is assumed that automobiles will remain the main mode of travel within the study area and region. Traffic volumes will increase correspondingly. To forecast where future traffic will originate, what roads will be most affected, and to what extent the transportation network will be affected, two scenarios were considered for build-out conditions: No-Build and Transportation Network Improvements.

In the No-Build scenario, the majority of arterial and collector intersections are anticipated to operate at unacceptable levels of service, as will many of the roadways. Development alone will drive a future capacity need such that the transportation network will fail without significant roadway improvements.

The Transportation Network Improvements scenario recommends additional roadways and improvements at select intersections (for geometric improvements and for additional signals). The modifications and additions accommodate the 2031 projections and minimize the impacts on the existing areas of the city. This modifications and additions included an arterial road that essentially bypasses the City center and eliminates the need for property relocations and community and business disruptions.

The recommended transportation network for the 2031 traffic projections is identified in Figure 5.1. Table 5.1 lists the intersections improvements. Intersection improvements would consist of signalization and/or adding turn or through lanes. For intersections already containing a signal, improvements are assumed to include either a dedicated left turn lane or an additional through travel lane. Table 5.2 lists the recommended new roadways and upgrade in roadway classifications.

TABLE 5.1 - 2031 INTERSECTION IMPROVEMENTS

Intersection	Improvement
Short term (2009-2013)	
American Legion Boulevard and 18th East	Proposed Signal
East 12th South and South 18th East	Proposed Signal
Air Base Road and Haskett Street	Proposed Signal
East 8th North and North 18th East	Proposed Signal
Intermediate (2013-2018)	
10th North and 18th East	Proposed Signal
10th North and 6th East	Proposed Signal
10th North and Sunset Strip	Proposed Signal
American Legion Boulevard and I-84 Interchange ramps	Proposed Signal
McMurtrey Road and Sunset Strip	Proposed Signal
12th South and 10th East	Proposed Signal
18th East and Old Highway 30	Proposed Signal

Intersection	Improvement
American Legion Boulevard, Jackson Street, and 10th East	Intersection redesign (proposed roundabout)
Jackson Street and 3rd East	Proposed Signal to coincide w/one-way couplet
Jackson Street and Main Street	Proposed Signal to coincide w/one-way couplet
Main Street and 5th North	Proposed Signal to coincide w/one-way couplet
2nd East and 5th North	Proposed Signal to coincide w/one-way couplet
Long Term (As Development Warrants)	
Bruneau Highway and Smith Road	Proposed Signal
Canyon Creek Road and McMurtrey Road	Proposed Signal
Canyon Creek Road and Sunset Strip	Proposed Signal
18th East and 6th South	Proposed Signal to coincide with new roadway
American Legion Boulevard and 22nd East (approximate)	Proposed Signal to coincide with new roadway
10th North and Elmcrest	Proposed Signal to coincide with new roadway
McMurtrey Road and Western Belt Road	Proposed Signal to coincide with new roadway

TABLE 5.2 - 2031 ROADWAY IMPROVEMENTS

Map Designation	Roadway
Short-term (2009-2013)	
S1	South 18th East from American Legion to East 6th South
S2	North 6th East from American Legion Boulevard to East 10th North
S3	West 5th North from Sunset Strip to North Haskett

Map Designation	Roadway
S4	North Haskett from Foster Road to Air Base Road
S5	Elmcrest Road to Air Base Road
S6	West 12th South from South 5th West to Highway 30
S7	Roundabout at Cinder Loop Road and North 18th East
Intermediate (2013-2018)	
3	Construct East 23rd North from North 6th East to North 10th East as a collector (by developer)
18	Construct South 6th East from West 24th South to Smith Road as a collector (by developer)
15	Construct West 10th North from Sawmill Road to Elmcrest Street Extension as a collector (by developer)
1	Construct Elmcrest Street from West 5th North to West10th North (by developer)
5	Construct West 24th South between Bruneau Highway and South18th East (by developer)
9	Construct West 12th South from Garrett Street to Autumn Drive (by developer)
10	Construct new collector (Autumn Drive) between Air Base Road and Smith Road (by developer)
Figure 5.1 Insert	Designate Jackson Street a one-way zone between Main Street and 10th East (This improvement should be coordinated with the intersection redesign at American Legion Boulevard, Jackson Street, and 10th East)
Figure 5.1 Insert	Designate American Legion Boulevard a one-way zone between Main Street and 10th East (This improvement should be coordinated with the intersection redesign at American Legion Boulevard, Jackson Street, and 10th East)
Long-term (As Development Warrants)	
19	Construct Smith Road as a collector between Bruneau Highway and South 24th East
2	Construct Elmcrest Street from West 10th North to West McMurtrey Road
4	Construct a Frontage Road between Canyon Creek Road and North18th East
6	Construct South 24th East between American Legion Boulevard and Smith Road along the Canal Corridor

Map Designation	Roadway
7	Construct East 6th South from South 18th East to South 24th East
8	Construct East 12th South from South 18th East to South 24th East
11	Construct Smith Road from Bruneau Highway to Air Base Road
12	Reconstruct Western Loop Road from Air Base Road to north Frontage Road
13	Construct West 5th North from Elmcrest Street to Western Loop Road
14	Construct West McMurtrey Road to Western Loop Road
20	Construct collector between Hamilton Road and 24th South (Alignment not specific to avoid sewage lagoons)
16	Construct collector southerly of and adjacent to the railroad tracks from West 5th North to West McMurtrey Road
17	Construct South 10th East from West 12th South to West 24th South

Long-term Land Use Considerations

Land use types and locations have a substantial effect on the transportation network. As we evaluated the existing and future traffic conditions, the industrial land use designation stood out more than other land uses because of the location. Industrial land use facilities that require daily truck traffic on an existing transportation network not necessarily designed to accommodate the demand can have negative impact on a community. Requiring heavy truck traffic to pass through the central core of the city could potentially have a negative effect on other land uses especially residential. For this reason, the City should consider relocating the light industrial land use in the northwest area of the City to the southern area near the southern I-84 Interchange. This will limit vehicle and heavy truck traffic through the downtown and residential areas. While most of the industrial land use is currently vacant, now would be an opportune time to evaluate the possibility of this.

Another long term consideration for the City is to evaluate the potential for one-way couplets for most arterial roadways within downtown area. The results were favorable in meeting future traffic capacity. The advantage of one-way couplets is that it rarely involves the acquisition of right-of-way and usually can be accommodated within the existing roadway cross section. Secondly, the costs to implement are generally much lower than widening. Of course disadvantages include driver confusion and frustration, business owner opposition, and intersection control redesign. These are typically short term and usually mitigated over time.

The City of Mountain Home should consider evaluating one-way couplets within the next 10 years. One way couplets would not be necessary until the 20 year horizon or sooner depending on development and the affect it could have on the transportation network.

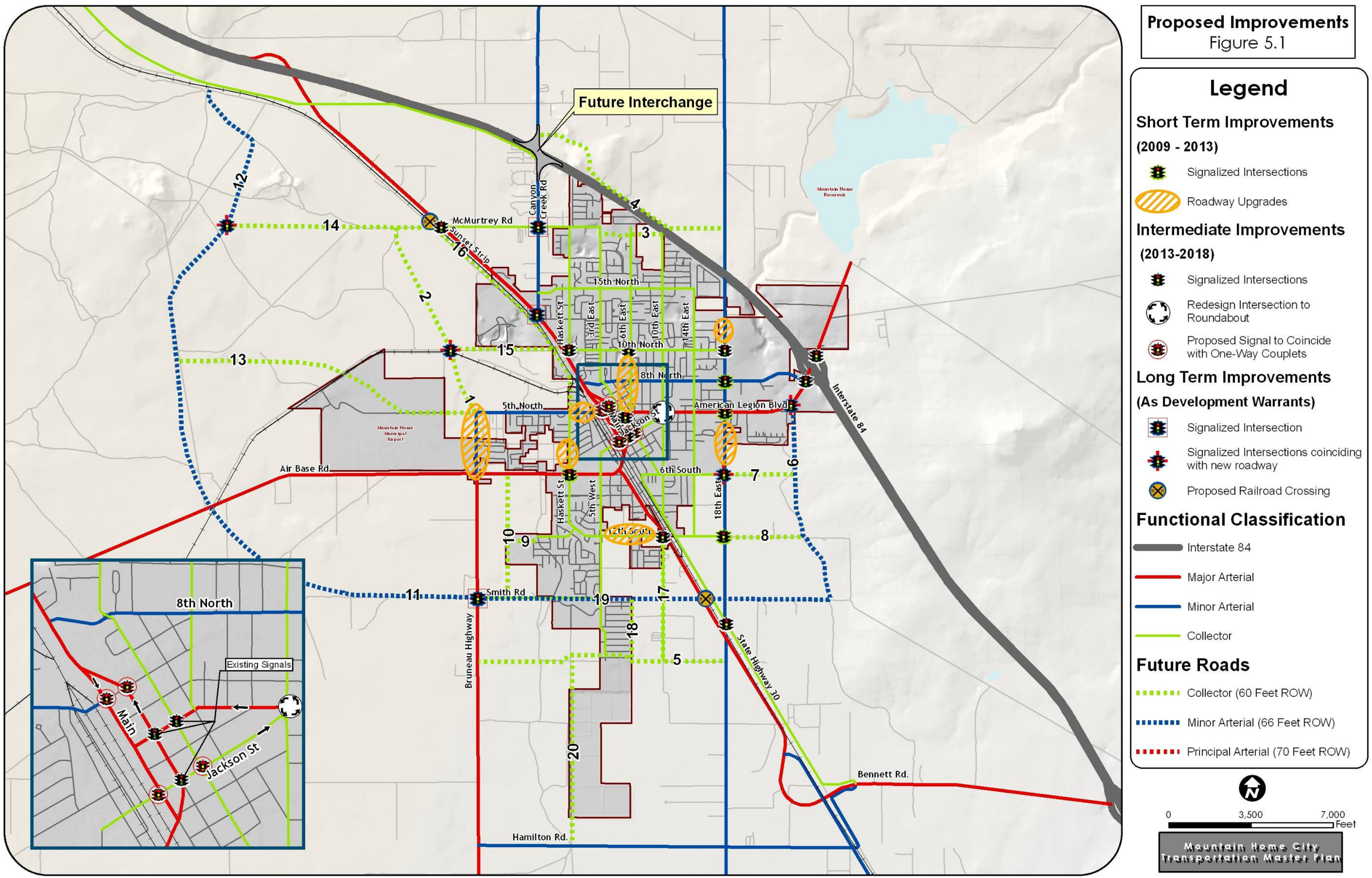


FIGURE 5.1 - PROPOSED IMPROVEMENTS

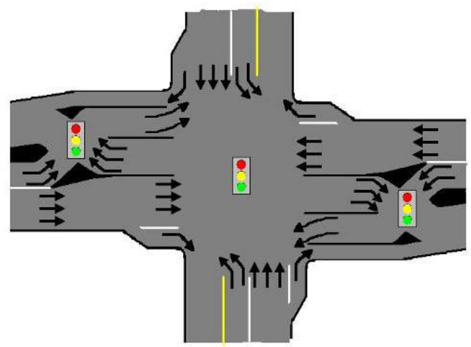
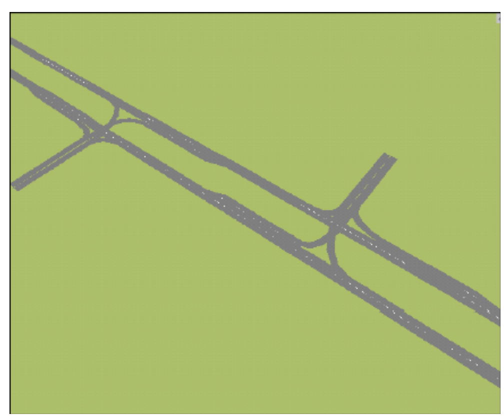
Transportation System Considerations

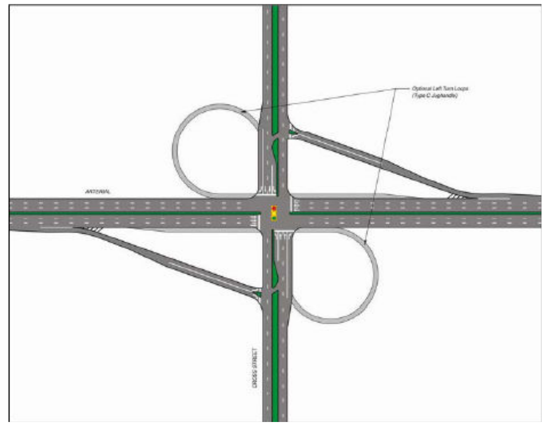
Traffic Signal Options

While traffic signals are the most common method for traffic flow and safety improvements, once traffic volumes exceed a certain threshold, mobility begins to decline, and LOS degrades. Many State Transportation Departments as well as County and City transportation departments are looking for creative solutions to increase mobility, improve LOS, and maintain vehicular and pedestrian safety.

The following are descriptions of some potential innovative intersection designs that could improve mobility and LOS, while not necessarily requiring a traffic signal. In some cases even if traffic signals are required, the left turn movement is displaced from occurring directly at the intersection to eliminate and/or minimize this conflict. Table 5.3 identifies a few intersection design options.

TABLE 5.3 - TRAFFIC SIGNAL OPTIONS

Traffic Control Alternative	Description	Figure
Continuous Flow Intersection	An innovative intersection design in which left-turning vehicles cross over the travel lanes of the opposing through movement in advance of the intersection, so left-turns and through movements at the main intersection can proceed simultaneously. Also referred to as a "crossover displaced left-turn."	
Continuous Green "T"	A design option at T intersections where oncoming traffic from the right need not be stopped to allow left-turns from the T-approach to enter. Instead, left turns have an extended merge lane.	

Traffic Control Alternative	Description	Figure
Jug handles or mini cloverleaf	To make a left turn, all vehicles would instead make three rights on a “loop ramp” as with a cloverleaf freeway interchange. Unlike a loop ramp on a freeway, this would be very low speed (15-20 mph).	

Access Management

Access management is a term that refers to providing and managing access to land development while maintaining traffic flow and being attentive to safety issues. It includes elements such as driveway spacing, signal spacing, and corner clearance. Access management is a key element in transportation planning helping to make transportation corridors operate more efficiently and carry more traffic without costly road widening projects. Access management offers local governments a systematic approach to decision-making applying principles uniformly, equitably and consistently throughout the jurisdiction.

An access management program must address the balance between access and mobility. While the functional classification of roads implies the priority of access versus mobility access management does much the same thing. Freeways move vehicles over long distances at high speeds with very controlled access and great mobility. Conversely, residential streets offer high levels of access but at low speeds and with little mobility. Access management standards must account for these different functions of various facilities. Figure 5.2 shows this relationship between access and mobility.

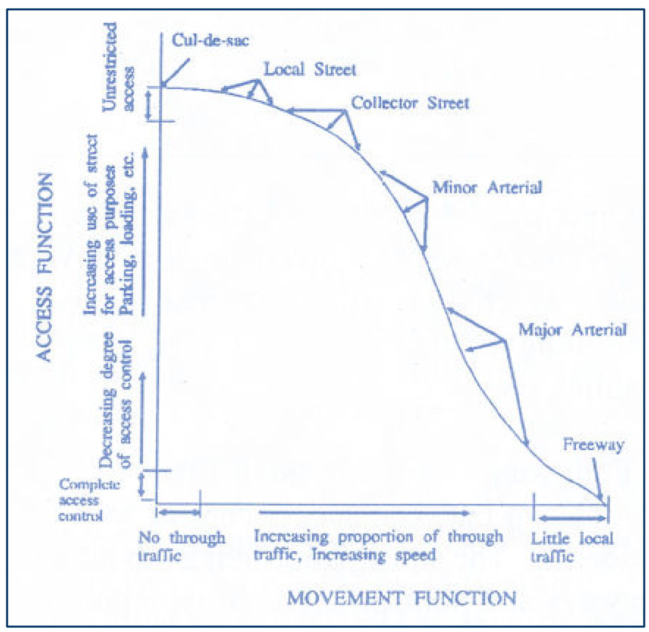


FIGURE 5.2 - ACCESS VERSUS MOBILITY

ITD Coordination

Mountain Home must be an integral player in developing and conforming to access management standards on state highways. The reason for this is that ITD controls the design and related standards on the state highway system while Mountain Home controls the land uses that abut the state highway system.

It is inappropriate for Mountain Home to approve a site plan for a given land use on a state highway within Mountain Home only to have ITD deny the curb cuts identified as access points in the site plan. In this example, as in actual developments, there is an overlap of approvals between ITD's curb cut permit and Mountain Home site plan approval. Access Management Guidelines for New Development Table 5.4 shows recommended spacing standards for Mountain Home streets.

TABLE 5.4 - RECOMMENDED SPACING STANDARDS BY FUNCTIONAL CLASS

Functional Classification	Minimum Signal Spacing (ft)	Minimum Street Spacing (ft)	Minimum Access Spacing (1) (ft)	Minimum Interchange Crossroad Access Spacing(2) (ft)		
				A(3)	B(4)	C(5)
Freeway/State Highway	Standards for freeways and state highways are determined by FHWA and ITD. See appropriate guidance for state highways					
Arterial	2,640	660	300	660	1320	500
Major Collector	1,320	330	150	N/A	N/A	N/A
Minor Collector	1,320	250	85	N/A	N/A	N/A

(1) Also refers to minimum corner clearance.

(2) If consistent with weaving analysis. If not, greater distance should be used.

(3) Distance from off-ramp to first right in/right out.

(4) Distance from off-ramp to first major intersection.

(5) Distance from last right in/right out to on-ramp.

The minimum street spacing refers to the minimum distance that full directional access points will be allowed. Spacing is measured from edge to edge and not from the centerline. A full directional access point is typically a public street but may include a private driveway that allows for right and left turn access. The minimum access spacing refers to the spacing of private driveways and also applies to spacing from corners. This spacing may be limited to right-in-right-out driveways only as Mountain Home may install raised medians on public streets at any time in the future in order to protect the safety of the public.

These spacing requirements are shown as a standard in which developers may plan for in site design. Deviations from these standards may be required based on neighboring development plans and the specifics of each roadway or development on a case-by-case basis at the discretion of the Mountain Home Engineer.

Traffic Signal Spacing

Proper intersection and traffic signal spacing is an important aspect in providing for progression along arterial and collector streets. The more uniformly spaced the traffic signals are along a corridor the better the progression will be. It is difficult to maintain good progression if signals are spaced any more than one mile apart. Signals located less than one-half mile apart also lead to poor progression and increased driver frustration due to the delays at each intersection. Of course there will be instances when this recommended spacing is not possible, but it should be maintained as much as possible.

As developments occur along these arterials and collectors it is important that driveway and intersection spacing be considered in the design of the site itself, particularly for large commercial developments. In such cases developers and Mountain Home should seek to locate the site driveway(s) at locations that will provide the best spacing between adjacent traffic signals on either side of the driveway, particularly along arterials. For example if a parcel is being developed along an arterial with traffic signals spaced one half mile apart the most desirable location for a main site driveway would be halfway between the signalized intersections. There will be cases when a driveway to a large development will warrant a traffic signal due to the large volume of traffic generated by the development in which case proper intersection spacing is especially important.

Driveways

Many of the access management problems facing cities have to do with driveway problems regarding both spacing and design. The figure to the right shows a driveway with both poor and adequate vehicle storage. By creating a throat at driveways it is possible to increase its efficiency.

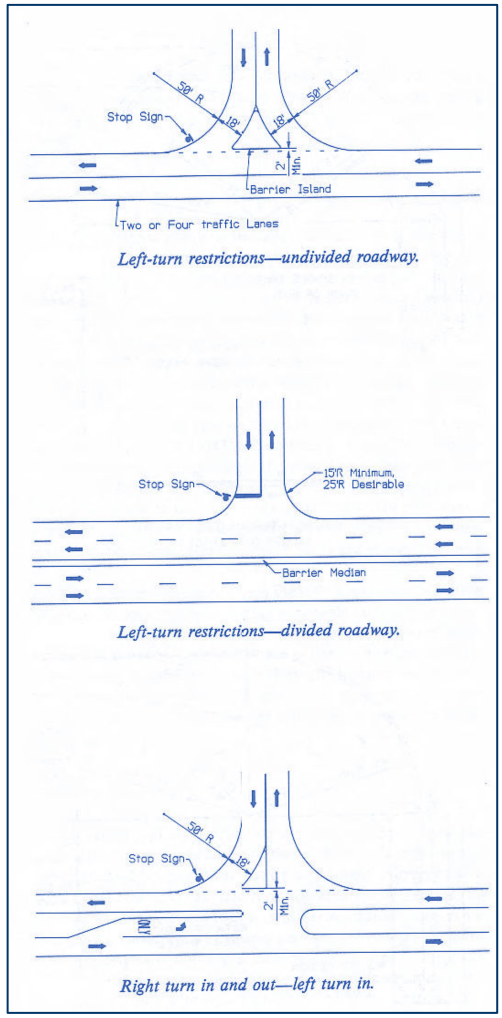


FIGURE 5.3 - DRIVEWAY VEHICLE STORAGE

Sharing or combining driveways of adjacent parcels as well as limiting the number of accesses of developments are also principles of good access management. For example, if there is a parcel being developed adjacent to another undeveloped parcel, Mountain Home may wish to work with the owners of both parcels to plan for one shared driveway along the property line which would provide access to both parcels. This would allow Mountain Home to minimize the occurrence of several closely spaced driveways along an arterial or collector which would promote better traffic flow along the corridor as well as reduce the number of accidents along that corridor. A key to being able to control the number and location of site driveways is good site design and circulation within one development as well as between adjacent developments. Internal “collectors” should encourage traffic to access the adjacent street network from the parking lots at signalized intersections or driveways and vice versa.

Limiting the number of driveways that any one development has on an arterial or collector would also be a good practice to improve traffic flow and safety. There are many cases in which one small commercial development or a corner gas station will have three or four driveways, which are typically more than are necessary. It is particularly important to limit the number and location of driveways at corner developments adjacent to busy intersections. In these cases driveways should be spaced as far away from the intersection as is practical so as to reduce the effects of the site traffic on the adjacent intersection.

It is very difficult from a practical and legal standpoint to remove or combine driveways of existing developments. There is not a lot that can be done to remedy these problems without considerable effort and expense. However, by exercising and promoting the access management guidelines discussed in this chapter in all new development and re-development areas, the transportation system in Mountain Home can operate more efficiently and safely in the future.

It is also recommended that driveways on opposite sides of the street be lined up opposite one another rather than offset slightly. These are good practices for residential as well as commercial developments.

Access Management Guidelines for Developed Areas

Introducing a “retrofit” program of access control to an existing roadway or built-out area is very difficult. Pressure from adjacent property and business owners is perhaps the most challenging obstacle of all. It can be difficult to compare the cost of economic hardship on an individual to the overall benefits to the general public. Most retrofit actions involve the application of accepted traffic engineering techniques that limit the number of conflict points, separate basic conflict areas, limit speed adjustment problems and remove turning vehicles from the through travel lanes. Most of the information in this section was taken from the *NCHRP Report 348: Access Management Guidelines for Activity Centers* produced by the Transportation Research Board

Medians

Physical medians fully separate opposing traffic flows, clearly define where cross movements are permitted, provide space for single and multiple-turning lanes at signalized intersections, and may limit certain access points to right-turn movements only. They also provide better pedestrian protection than painted islands. They may be continuous, allow only left-turn entry (or exit), or provide full openings at specified locations. Thus, medians are generally desirable at major activity centers where a few high volume channelized driveways provide property access. They are also desirable where volume or safety considerations require restricting property access to right turns. The table below compares raised medians to two-way left turn lanes.

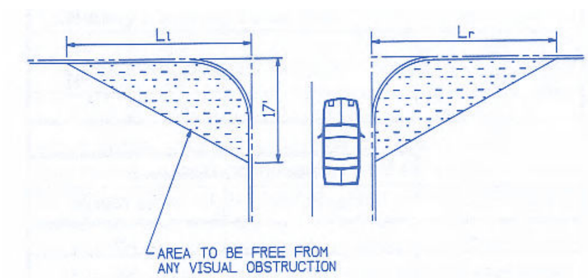
TABLE 5.5 - RAISED MEDIAN COMPARISON

Advantages	Disadvantages
Discourages strip development	Reduces operational flexibility for emergency vehicles
Allows better control of land uses by local government	Increases left turn volumes at median openings
Reduces number of conflicting maneuvers at driveways	Increases travel time and circuitous travel for some motorists
Provides pedestrian refuge	May increase accidents at openings
If continuous, restricts access to right turns only	Limits direct access to property
Reduces accidents in mid-block areas	Operating speeds usually limited to 45 miles per hour
Provides positive separation of opposing traffic	
Two-Way Left Turn Lane	**Two-Way Left Turn Lanes**
Makes use of "odd-lanes"	Encourages random access
Reduces left turns from through lanes	Illegally used as a passing lane
Provides operational flexibility for emergencies	No refuge for pedestrians
Safer than roads with no left turn lanes or medians	Poor visibility of markings

Advantages	Disadvantages
Facilitates detours	High maintenance cost
Provides positive separation of opposing traffic	Operate poorly under high volume of through traffic
	Allows head-on collisions

Driveway access restrictions may be required for certain access levels or road types. A review of the number and location of access drives may also be required. Safety considerations associated with intersecting traffic volumes or poor visibility are the primary reasons. Whether or not driveway restrictions such as these should be used should be evaluated on an individual basis during the planning stages of any particular development.

It is essential to provide sufficient sight distance for vehicles using a driveway. The sight triangle refers to the area on the corners of the intersection that should be free from obstacles such as landscaping, signs, or street furniture. Minimum sight triangle dimensions are shown to the left.

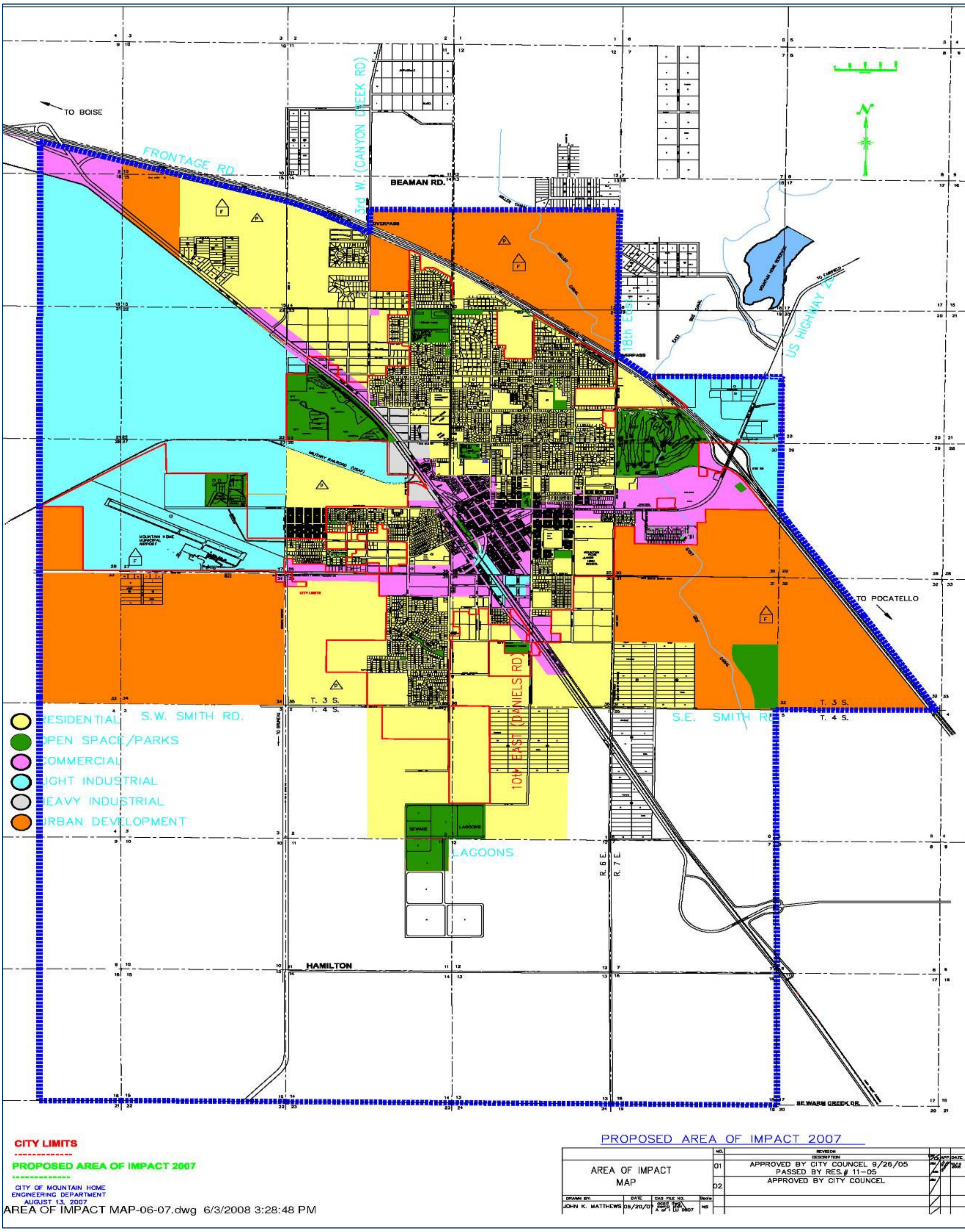


POSTED SPEED (mph)	Ll (ft.)	Lr2 (ft.)	Lr4 (ft.)
30	270	190	140
35	340	230	165
40	430	280	210
45	540	340	250
50	650	400	300
55	760	460	350

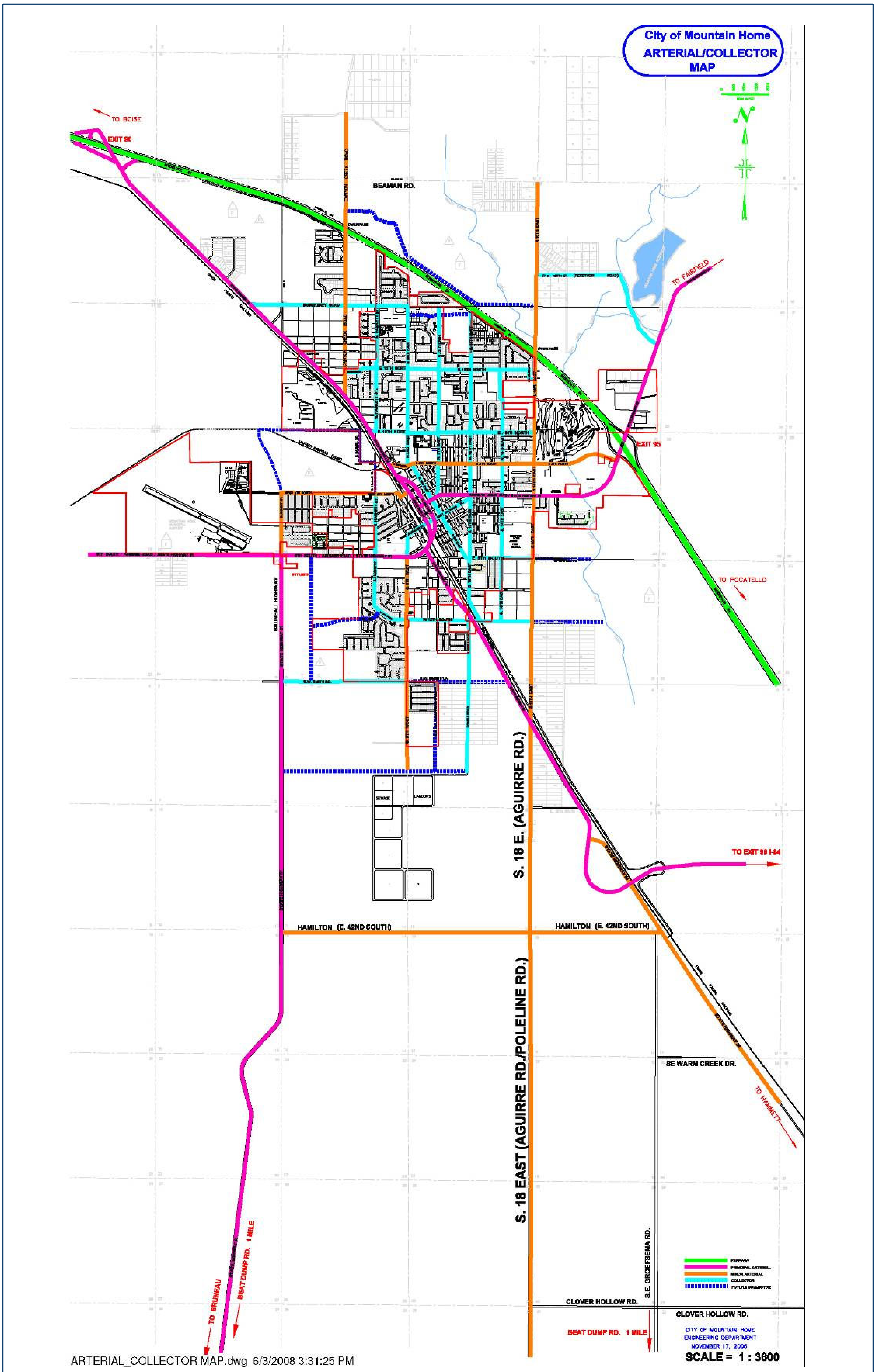
NOTE: Assumes 12 foot wide traffic lanes.
Ll = Clear distance to the left.
Lr2 = Clear distance to the right - 2-lane roadway.
Lr4 = Clear distance to the right - 4-lane roadway.

FIGURE 5.4 - DRIVEWAY SIGHT TRIANGLE

APPENDIX A - MOUNTAIN HOME AREA OF IMPACT (AOI)



APPENDIX B - MOUNTAIN HOME ROADWAY CLASSIFICATION



APPENDIX C - EXISTING TRAFFIC OPERATIONS ANALYSIS

Functional classification places the roadway on a continuum between mobility and access. For example, an interstate freeway occupies one end of the continuum, providing traffic with greater mobility, but little access to adjacent lands. A cul-de-sac, at the opposite end of this continuum, provides access to land, but offers inefficient movement of traffic. Functional class also generally describes the size (right of way) of a roadway, the style of its intersections (if any), and its typical traffic use inside a larger transportation grid (a road in a suburban neighborhood is very different from a similarly sized frontage road near a freeway).

The ADT and functional classification help determine the capacity of a roadway. Roadway capacity is the maximum number of vehicles a roadway facility can accommodate during a particular time period and under prevailing roadway, traffic, and control conditions. Capacity, ADT, and functional classification are all then formally described with an LOS designation. LOS is a description of different operating conditions that occur on a roadway, or at an intersection, when accommodating various traffic volumes. It is a qualitative measure of the effect of traffic flow factors such as speed and travel time, interruptions and delays, freedom to maneuver, and driver comfort and convenience.

Level of Service (LOS) is a measure of the performance of an element of transportation infrastructure. An intersection, a rural roadway, or an urban road segment can all be graded, A through F, on the adequacy of their performance under given traffic conditions.

LOS is a description of different operating conditions that occur when accommodating various traffic volumes. It is a qualitative measure of the effect of traffic flow factors, such as: speed, travel time, interruptions and delays, freedom to maneuver, and driver comfort and convenience. The LOS for roadways and unsignalized intersections ranges from “free flow” to “highly congested flow.”

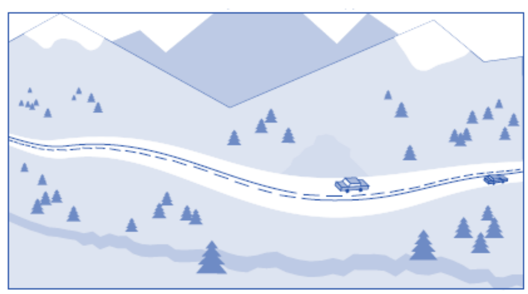
In rural areas, traffic flow is expected to be uninterrupted; but, in an urban situation the roadways are interrupted by traffic controls at intersections, lower speed limits, numerous approaches, and, in some cases, parking. Most of the roadways within the city qualify as rural for their LOS evaluation. The LOS for most of the urban roadways will be restricted by the performance of the intersections on the roadway.

Levels of Service

Flows are divided into six levels of service, which are defined as follows:

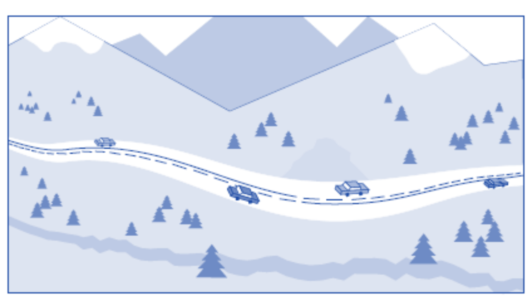
Level A

Free flow, low volumes, and densities, high speeds. Drivers can maintain their desired speeds with little or no delay.



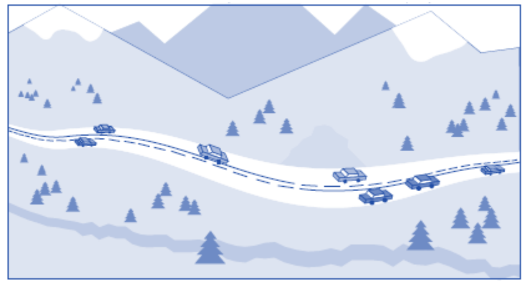
Level B

Stable flow, operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed. Suitable for rural design standards.



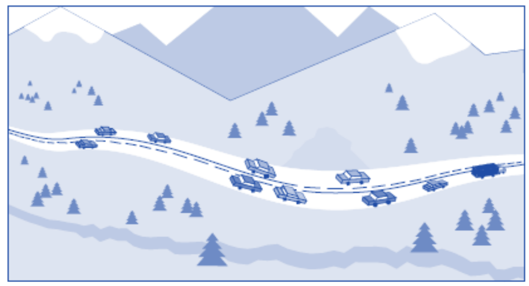
Level C

Stable flow, but speeds and higher volumes more closely control maneuverability. Suitable for urban design standards.



Level D

Approaches unstable flow, tolerable operating speeds that are, however, considerably affected by operating conditions. Drivers have little freedom to maneuver.



Level E

Unstable flow, with yet lower operating speeds and, perhaps, stoppages of momentary duration. Volumes at or near capacity.

Level F

Forced flow, both speed and volumes can drop to zero. Stoppages may occur for short or long periods. These conditions usually result from queues of vehicles backing up from a restriction downstream.

While there are several methodologies for estimating the LOS of intersections, the most commonly used is that presented in the Highway Capacity Manual (HCM) and is the methodology used in this study (HCM 2000). This analysis was conducted using the Synchro Traffic Model for signalized intersections. Highway Capacity Manual LOS criteria for signalized and unsignalized intersections are summarized in Table C.1.

TABLE C.1 - LEVEL-OF-SERVICE (LOS) CRITERIA FOR INTERSECTIONS

Level of Service (LOS)	Average Control Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	< =10	< =10
B	>10 - < 20	>10 - < 15
C	>20 - < 35	>15 - < 25
D	>35 - < 55	>25 - < 35
E	>55 - < 80	>35 - < 50
F	>80	>50

Source: Highway Capacity Manual 2000, Transportation Research Board, National Research Council, Washington, D.C., 2000.

When the traffic volume exceeds the capacity of the travel lane, delays will occur and queues will form, causing congestion and affecting other traffic movements in the intersection. These conditions typically warrant the improvement of the intersection.

Transportation Network Grid

The transportation network is the city's circulatory system--providing routes for the movement of goods, services, and people. The transportation network provides both access and mobility. Currently, the base network in Mountain Home is laid out in a grid pattern. A grid network allows for the greatest accessibility and spreads local traffic over a number of streets. This street pattern generally minimizes travel lengths to get from one point to another. New development in recent years on the periphery of the city has deviated from the grid network.

Capacity Analysis

Most local roadways in the City have relatively low traffic volumes and are within acceptable LOS.

LOS Analysis

The results of the existing conditions analysis identify that most local roadways in the City have relatively low traffic volumes and are within acceptable LOS.

Certain segments of American Legion Boulevard (State Highway 20) and Air Base Road (State Highway 51) experience LOS D and E (near capacity). American Legion Boulevard, between the I-84 Interchange and 6th East Street, has traffic volumes above 10,000 ADT. Air Base Road, between the Mountain Home Air Force Base and Jackson Street, has traffic volumes above 14,000 ADT. These are not necessarily high traffic volumes for principal arterial roadways, current LOS for these roadways are acceptably within B and C LOS.

TABLE C.2 - AVERAGE DAILY TRAFFIC: ROAD SEGMENT

Road Description	Average Daily Traffic
McMurtrey Road between Sunset Strip and Canyon Creek Road	850
Haskett Street between 15th North and McMurtrey Road	1,244
15th North between Haskett Street and Canyon Road	934
Haskett Street between 10th North and 15th North	3,216
Sunset Strip between 10th North and 15th North	5,302
Sunset Strip between 8th North and 10th North	11,417
8th North between 3rd East and Sunset Strip	959
3rd East between 8th North and 10th North	3,067
10th North between Haskett and 3rd East	1,793
3rd East between 10th North and 12th North	3,780
3rd East between 12th North and 15th North	2,200
15th North between Haskett Street and 3rd East	1,158
3rd East between 15th North and McMurtrey Road	1,958
3rd East between McMurtrey Road and the North City Limits	969
6th East between McMurtrey Road and 15th North	664
15th North between 3rd East and 6th East	1,607
6th East between 10th North and 15th North	1,758
10th North between 3rd East and 6th East	1,509
6th East between 8th North and 10th North	406
10th North between 6th East and 10th East	1,340
15th North between 6th East and 10th East	1,848
10th East between 15th North and McMurtrey Road	1,527
15th North between 10th East and 14th East	1,279

Road Description	Average Daily Traffic
10th East between 10th North and 15th North	2,040
10th North between 10th East and 14th East	740
10th East between 8th North and 10th North	800
14th East between 8th North and 10th North	452
14th East between 10th North and 15th North	460
15th North between 14th East and 18th East	1,122
10th North between 14th East and 18th East	1,077
18th East between 8th North and 10th North	2,940
8th North between 18th East and American Legion Boulevard	1,589
8th North between 18th East and 14the East	1,671
14th East between American Legion Boulevard and 8th North	1,231
10th East between American Legion Boulevard and 8th North	1,134
6th East between American Legion Boulevard and 8th North	406
3rd East between American Legion Boulevard and 8th North	3,067
American Legion Boulevard between 3rd East and 6th East	6,633
American Legion Boulevard between 10th East and 14th East	6,224
American Legion Boulevard between 14th East and 18th East	6,245
American Legion Boulevard between 18th East and Interchange	11,518
18th East between American Legion Boulevard and 6th South	1,833
14th East between American Legion Boulevard and 6th South	1,101
10th East between American Legion Boulevard and 6th South	1,657
3rd East between Jackson Street and 6th South	1,816
6th South between 10th East and 14th East	1,698

Road Description	Average Daily Traffic
6th South between 14th East and 18th East	826
18th East between 6th South and 12th South	1,538
18th South between 12th South and Old Highway 30	853
12th South between 18th East and 14th East	792
14th East between 12th South and 6th South	890
10th East between 12th South and 6th South	1,662
12th South between Old Highway 30 and 5th West	450
Air Base Road between 5th West and Haskett Street	6,188
Bruneau Highway between Air Base Road and Hamilton Road	7,333
Sunset Strip between McMurtrey Road and I-84 Interchange	2,100
American Legion Boulevard from I-84 Interchange to eastbound	10,000

APPENDIX D - TRAFFIC ANALYSIS ZONES & AVERAGE DAILY TRAFFIC

Section 3 describes the methodology used in defining the Traffic Analysis Zones. Figure 3.1 identifies the TAZs which were developed from the following table. For simplicity, Figure 3.1 shows the combined zones for each land use. For example, all the zones in High Density Residential (HDR) are shown on Figure 3.1 as a combined zone for HDR and not by the zone number.

TABLE D.1 - TRAFFIC ANALYSIS ZONES

TAZ	Land Use	Housing Units	ITE Daily Trips
3	High Density Residential	1,213	11,606
9	High Density Residential	1,454	13,919
10	High Density Residential	1,180	11,293
22	High Density Residential	1,462	13,988
23	High Density Residential	1,422	13,605
32	High Density Residential	1,911	18,290
44	High Density Residential	1,180	11,293
45	High Density Residential	1,180	11,293
46	High Density Residential	1,180	11,293
47	High Density Residential	1,180	11,293
35	High Density Residential	3,139	30,042
1	Low Density Residential	20	191
2	Low Density Residential	96	919
20	Low Density Residential	80	766
33	Medium Density Residential	485	4,640
36	Medium Density Residential	884	8,460
37	Medium Density Residential	841	8,046
8	Commercial	N/A	10,907
12	Commercial	N/A	2,516

TAZ	Land Use	Housing Units	ITE Daily Trips
26	Commercial	N/A	13,018
28	Commercial	N/A	5,111
29	Commercial	N/A	3,750
30	Commercial	N/A	3,138
38	Commercial	N/A	6,723
39	Commercial	N/A	4,254
27	Industry	N/A	400
31	Industry	N/A	320
40	Industry	N/A	8,526
41	Industry	N/A	38,400
42	Industry	N/A	560
16	To Boise	N/A	40,586
18	To East	N/A	800
19	To South	N/A	14,700
15	Air Force Base	N/A	12,434

APPENDIX E - BICYCLE AND PEDESTRIAN FACILITIES

A fully developed Transportation Master Plan includes not only motor vehicles, but also all modes of transportation. Cities that provide well-designed bikeways and pedestrian network facilities encourage greater use and commonly experience higher utilization.

Many factors can influence how and when these alternative modes of transportation are used. Often alternative modes of transportation are not supported or implemented by development. With new development, pedestrian and bicycle facilities should be created as an integral part of the design. Existing streets that currently serve the community's needs should be retrofitted to include safe bikeways and sidewalks.

The Importance of Good Planning and Design

Successful bikeway and trails plans are integrated into the overall transportation plan of a city, region, or state where they reflect the mobility and access needs of a community. Bikeways, sidewalks, and trails are placed in a wider context than simple movement of people and goods. Issues such as land use, energy, the environment, and livability are important factors. Bikeway, sidewalk, and trail planning undertaken apart from planning for other modes can lead to a viewpoint that these facilities are not integral to the transportation system. If bikeways and trails are regarded as amenities, bicycling and walking may not receive sufficient consideration in the competition for financial resources and available right-of-way.

People who walk or ride bicycles are the most vulnerable road users, being less protected from the weather and more likely to be injured in a collision with a motor vehicle. They must often use facilities that were designed primarily for automobiles. Effective and usable bikeway and trail networks depend on:

1. Accommodating bicyclists and pedestrians on all streets.
2. Providing appropriate facilities such as trail heads, designated paths, and signage.
3. Creating and maintaining a system of closely spaced, interconnected local streets.
4. Overcoming barriers such as freeway crossings, intersections, rivers, and canyons.

Well-designed bicycle and pedestrian facilities are safe, attractive, convenient, and easy to use. It is wasteful to plan, design, and build a facility that is seldom used because of poor design. Bikeways and trails may be under-designed if they are considered add-on features to roadway networks. Good design cannot solve all safety problems: enforcement and education are needed to make all road users aware of the presence of others.

Well-planned facilities are appropriate to demand and integrated into the transportation network. Inadequate facilities discourage users and could be dangerous, and unnecessary facilities waste money and resources. Bicycle and pedestrian facilities must be considered at the inception of transportation projects and incorporated into the total design, so that potential conflicts with the safety and level of service for various modes are resolved early on.

Design Requirements for Bicyclists and Pedestrians: Similarities & Differences

Many early bikeway designs assumed that bicyclists resemble pedestrians in their behavior. This led to undesirable situations: bicyclists are under-served by inadequate facilities, pedestrians resent bicyclists in their space, and motorists are confused by bicyclists entering and leaving the traffic stream in unpredictable ways. Only under special circumstances should designs allow bicyclists and pedestrians to share the same space, e.g. on multi-use paths or wide rural shoulders.

Design requirements are similar in three ways:

- **Location** - Bicycle and pedestrian facilities, though separate from each other, are found at the roadway edge and often allocated insufficient space for their needs. This puts them close to the right-of-way line and in conflict with other demands such as parking, utility poles, and signs. This creates competition for use of this valuable space.
- **Exposure** - Pedestrians and bicyclists are exposed to the elements and are more vulnerable than motorists.
- **Variable Ability** - Pedestrians and bicyclists can be of any age and ability. Their actions and reactions change with age and are sometimes unpredictable.

Types of Bicyclists

Bicyclists vary in their skill levels and willingness to ride in traffic. Bicyclists range from children to experienced adult cyclists. These different levels of skill should be considered when planning and designing bikeways.

The following are the types of bicyclists that should be considered when designing a bikeway system within Mountain Home, because it is not practical to plan facilities largely or solely for the needs of one skill level of bicyclists.

TABLE E.1 - BICYCLIST TYPES AND MOTIVATIONS

Cyclist Type	Motivation	Skill Level
Community/Utility	Travel to and from a specific destination; usually along routes that are efficient and fast such as arterial and collector streets.	Experienced and some novice riders, including children.
Recreation	Pleasure, exercise, and to enjoy scenic beauty. They may or may not have a destination in mind but usually do not tolerate nearby, continuous automobile traffic.	Experienced and novice riders, including children.
Touring	Touring, exploring, or sightseeing by bicycle (similar to backpacking for pedestrians).	Experienced riders.
Off-road/Mountain	Riding on natural trails or off-road.	Novice to experienced riders.

Types of Bikeways and Design Considerations

Bicycles are legally classified as vehicles, and most public roads in Idaho are open to bicycle traffic, with a few exceptions (mostly the freeways). Roadways must be designed to allow bicyclists to ride in a manner consistent with the AASHTO standards. Bicycle facilities should follow the guidelines set forth in the AASHTO Guide for the Development of Bicycle Facilities.

A bikeway is a road that has the appropriate design treatment to accommodate bicyclists, which is determined by motor vehicle traffic volumes and speeds. Bicycle travel may be accommodated on the road (shared roadway or bike lanes) or separated from the roadway (multi-use path).

Shared Roadway *(Also referred to as a Class III Bike Route)*

On a shared roadway, bicyclists and motorists share the road. On narrow roads motorists will usually have to cross over into the adjacent travel lane to pass a bicyclist. Shared roadways are applicable on low speed, low volume roads. Shared roadways are common on neighborhood streets. A street may be recommended as part of the bikeway network although no widening or other specific improvements other than signing have been or can be easily implemented to accommodate bicycles. Such Class III routes have an important function in providing continuity to the bicycle route system that serves the entire City and connects with other routes.

A Class III signed bike route may be a local or residential street, an arterial, or collector with wide outside lanes, a rural roadway with paved shoulders, or a bicycle boulevard.

FIGURE E.1 - CLASS III BIKE LANE

Wide Outside Lanes

Where shoulder bikeways or bike lanes are warranted but cannot be provided due to severe physical constraints, a wide outside lane may be provided to accommodate bicycle travel. Wide outside lanes should be designed to be 14- to 16-feet wide. A wide lane usually allows an average size motor vehicle to pass a bicyclist without crossing over into the adjacent lane. Wide outside travel lanes on arterial roadways are generally acceptable for experienced cyclists, but less-experienced bicyclists may not feel comfortable on this type of facility.

Paved Shoulders

Paved roadway shoulders on rural roadways provide space for pedestrian and bicycle use. A minimum width of four feet is desirable for paved shoulders. Paved shoulders also improve safety for motor vehicles, prevent pavement damage at the edge of the travel lanes, and increase the effective turning radius at intersections. Rumble strips are not desirable for paved shoulders used by bicyclists.

Bicycle Boulevards

Bicycle boulevards are low volume, low speed streets that are designed to allow bicyclists to travel at a consistent, comfortable speed along low-traffic roadways and to cross arterials conveniently and safely. Priority is given to "through" bicycle movement by turning stop signs away from the bicycle boulevard Traffic calming devices and traffic management treatments such as traffic circles, chicanes, and diverters control traffic speeds and discourage through-trips by automobiles. Quick-response traffic signals, median islands, or other crossing treatments are typically provided to facilitate bicycle crossings of arterial roadways.

Bike Lanes *(Also referred to as a Class II Bike Route)*

A bicycle lane is a portion of the roadway that has been designated by striping, signing, and/or pavement markings for the preferential use of bicyclists.

A properly designed bike lane can provide the following benefits:

- Increase the comfort of bicyclists on roadways
- Increase the amount of lateral separation between motor vehicles and bicycles
- Indicate the appropriate location to ride on the roadway with respect to moving traffic and parked cars, both at mid-block locations and approaching intersections
- Increase the capacity of roadways that carry mixed bicycle and motor vehicle traffic
- Increase predictability of bicyclist and motorist movements
- Increase drivers' awareness of bicyclists while driving and when opening doors from an on-street parking space

The minimum desirable bike lane width is four feet; five feet is recommended next to a curb or on-street parking. Bike lanes should be designed as one-way facilities carrying bike traffic in the same direction as adjacent motor vehicle traffic.

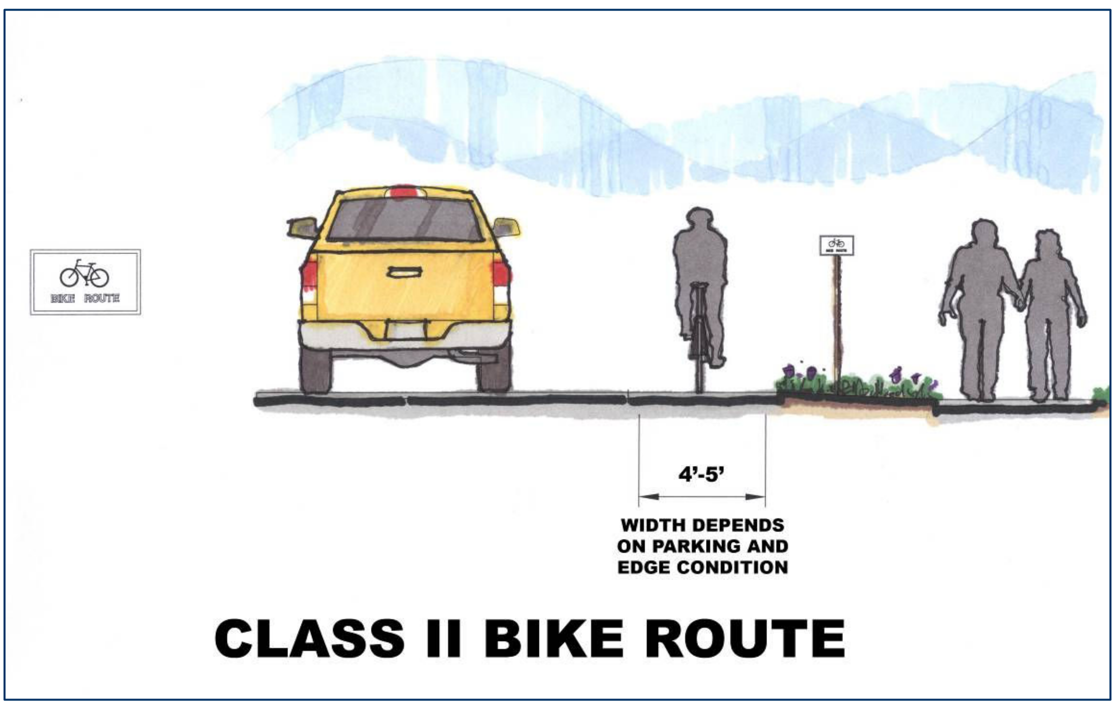


FIGURE E.2 - CLASS II BIKE ROUTE

Multi-Use Path *(Also referred to as a Class I Bike Route)*

A multi-use path, or shared-use path, is a facility separated from motor vehicle traffic by an open space or barrier, either within the roadway right-of-way or within an independent right-of-way. These are typically used by pedestrians, joggers, skaters, and bicyclists as two-way facilities. Multi-use paths are appropriate in corridors not well served by the street system (if there are few intersecting roadways), to create short cuts that link origin and destination points, and as elements of a community trail plan. Shared-use paths should be thought of as a complimentary system of off-road transportation and not used to preclude on-road facilities, but rather to supplement them. Typically, bike paths are a minimum of 8 to 12 feet wide, with an additional graded area maintained on each side of the path.

FIGURE E.3 - CLASS I BIKE PATH

Trail users vary in their skill levels and willingness to utilize trails. Types of users range from joggers and walkers to cyclists. While most users normally adjust to certain types of trails, not all casual walkers or bicycle commuters utilize trails with gravel, woodchip, or other materials affecting the trail surface. These types of users should be considered when planning and designing trails that can be used by all those interested.

It is also important to note that there are differences between walking and bicycling in the design of facilities. These design considerations are listed here in the following table so that the differences between walking and bicycling can be taken into account.

TABLE E.2 - DESIGN CONSIDERATIONS FOR TRAIL USERS

Issue	Pedestrian Design Concerns	Bicycling Design Concerns
Surface Treatment	Surface can vary considerably from concrete or asphalt to cobblestone to crushed granite; ADA rules will apply.	Asphalt or concrete; Decorative pavers if installed appropriately (and not cost-prohibitive)
Design Speed	Typically 2 to 4 mph. Pedestrian phasing timed at between 2.5 feet per second (fps) (1.7 mph) and 4 fps (2.7 mph)	20 mph level; 30 mph on a graded surface.
Location	Sidewalks in urban/suburban areas. Shoulder or edge of roadway in rural areas.	Shoulder or bike lane preferred, regular traffic travel lane acceptable. Sidewalk permitted if riders are age 12 or under
Parking	N/A	Needed
Grades	Stairs permitted, ADA also requires ramps.	Stairs not permitted ADA usually governs an 8.25% maximum grade for ramps

Mixed-use trails need special consideration because by definition they accommodate more than one mode of transportation, all with varying speeds and behaviors: pedestrians, joggers, bicyclists, inline skaters, children on tricycles, etc. In general, the more varied the users, the wider the trail should be. Optimum designs will separate trails for slower users and faster users.

Special attention is needed in the design of multi-use paths at intersections and path termini where users must negotiate motor vehicle traffic and may be left traveling on the wrong side of the roadway.

Bicycle Parking

For a bikeway network to be used to its full potential, secure bicycle parking should be provided at likely destination points. Bicycle thefts are common, and lack of secure parking is often cited as a reason people hesitate to ride a bicycle to certain destinations. The same consideration should be given to bicyclists as to motorists, who expect convenient and secure parking at all destinations.

To provide real security for the bicycle (with its easily removed components) and accessories (lights, pump, tools and bags), either bicycle enclosures/lockers or a check-in service is required. Bicycle parking facilities are generally grouped into 2 classes:

- **Long-term** - Provides complete security and protection from weather; it is intended for situations where the bicycle is left unattended for long periods of time: apartments and condominium complexes, schools, places of employment, transit stops, etc. These are usually lockers, cages, or rooms in buildings.
- **Short-term** - Provides a means of locking a bicycle frame and both wheels, but does not provide accessory and component security or weather protection unless covered; it is for decentralized parking where the bicycle is left for a short period of time and is visible and convenient to the building entrance; retail stores, restaurants, libraries, post office, etc.

Bicycle racks must be designed so that they:

- Do not bend wheels or damage other bicycle parts
- Accommodate the high security U-shaped bike locks
- Accommodate locks securing the frame and both wheels
- Do not conflict with pedestrians (include in site plan during review process)
- Are covered where users will leave their bikes for a long time (e.g. at employment centers)
- Are easily accessed from the bikeway or street and protected from motor vehicles

Pedestrian Design Considerations

In designing for pedestrian circulation and access the Americans with Disability Act (ADA) and AASHTO standards should be followed.

A buffer strip between the sidewalk and the roadway can greatly increase pedestrian comfort levels and provide a zone for signs, trees, and utilities that will not hinder pedestrian travel.

The minimum desirable width for a sidewalk is five feet. ADA compliant pedestrian ramps should be used at all intersections and alleys. A four-foot landing ramp is required at the top of ramps to allow adequate room for wheelchair users to line up with the ramp.

Automobile traffic calming provides many benefits to pedestrians and to the creation of livable neighborhoods. Reduced motor vehicle speeds enhance pedestrian safety by: decreasing the chances of a car-pedestrian collision, reducing the severity of injuries should a collision occur, and making it easier and less intimidating for pedestrians to cross streets.

Traffic calming and slower traffic encourage more walking and bicycling by improving the ambiance of the neighborhood and more livable streets by reducing traffic noise. On street parking creates valuable buffers between traffic and pedestrians. Larger parking lots should be located away from the street and placed behind buildings when appropriate or possible to create a more inviting pedestrian environment thereby encouraging walking.

Improvement Prioritization

Priority for bicycle and pedestrian improvements and projects should be determined by working within the priority guidelines of the Bicycle Plan. Improvements can be made to segments of a network as a whole or to specific spots. Improvements can be made to the network by adding a new route or path or installing directional and safety signage or systematic installation of bike parking.

“Spot improvements” is a large category that includes many different types of safety and access improvements that significantly improve the safety, convenience, travel time, ambiance, and/or overall utility of a bicycle and/or pedestrian route. A spot improvement is generally limited to a specific location or intersection, as opposed to those that are applied to an entire segment. Examples of spot improvements include:

- Improving site-specific hazards such as railroad tracks or unsafe drainage grates
- Providing a signal or other device to help bicyclists and pedestrians cross an arterial
- Providing a grade separated bicycle/pedestrian crossings over a freeway or other barrier
- Five main categories can be used in prioritizing bikeway projects. Each category is scored on a three-part scale of High, Medium, and Low. The highest scoring projects can then be considered the High Priority projects.

The five criteria used to prioritize the projects are:

- **Accident history** - Safety for all users of the system is paramount. Projects that directly or indirectly improve safety are rated higher than others.
- **Broad bicyclist demand** - Projects that serve the highest numbers of bicyclists (existing or future) are rated higher than others.
- **Serves a school** - Projects which serve schools are rated higher than others.
- **Closure of a gap in the bicycle network** - Connectivity is important and projects that enable direct travel are given higher priority.
- **Ease of implementation** - Projects which can be implemented quickly and with little controversy should be given higher priority.

It is recommended that as roadway projects are implemented and in response to changing conditions, Mountain Home will re-assess these priorities annually and revise them as needed. The projects within the "High" priority category should be rated relative to each other in order to advance the development of these high priority bikeways.

Plans to Improve Bicycling in Mountain Home

The goal is to provide safe, accessible, and convenient pedestrian and bicycle facilities, and to support and encourage increased levels of bicycling and walking in Mountain Home.

Action 1

Provide bikeway and trail systems that are integrated with other transportation systems.

- **Strategy 1A** - Integrate bicycle and pedestrian facility needs into all planning, design, construction, and maintenance activities in Mountain Home.
- **Strategy 1B** - Retrofit existing roadways with paved shoulders or bike lanes to accommodate bicyclists, and with sidewalks and safe crossings to accommodate pedestrians.
- **Strategy 1C** - Seek financial assistance for bikeway and trail projects on local streets through grants.

Action 2

Create a safe, convenient and attractive bicycling and walking environment.

- **Strategy 2A** - Adopt design standards that create safe and convenient facilities to encourage bicycling and walking.
- **Strategy 2B** - Provide uniform signing and marking of all bikeways and trails.
- **Strategy 2C** - Adopt maintenance practices to preserve bikeways and trails in a smooth, clean, and safe condition.
- **Strategy 3C** - Develop bicycling and walking safety education programs to improve skills and observance of traffic laws, and promote overall safety for bicyclists and pedestrians.
- **Strategy 3D** - Develop a promotional program and materials to encourage increased bicycling and walking.