The City of Gillette

2009Transportation Plan Update

Final Report

July 2009

DOWL HKM

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The City of Gillette

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Executive Summary

July 2, 2009

In 2004, the City of Gillette completed a **2004 Transportation Planning Study** to:

- Identify an effective regional transportation network to accommodate growth and the commensurate increase in traffic;
- Standardize transportation corridors and identify street classification criteria;
- Identify needs for new corridors/streets to accommodate future traffic; and
- Develop local street networks (off-system facilities) and preferred traffic patterns.

Since 2004, several new roadways have been built or improved, the City of Gillette has experienced significant growth, and additional transportation planning related studies have been performed. Because of this, the City of Gillette decided to update the **2004 Transportation Planning Study**.

This *2009 Transportation Plan Update* builds upon the background and evaluation discussed in the 2004 study and incorporates information from studies and projects that have been completed since 2004. Primary objectives of this transportation plan update are to:

- Review and update the transportation model;
- Evaluate the transportation network scenarios;
- Develop a priority list of transportation projects, including signal projects; and
- Review transportation standards.

Working with City, County and WYDOT staff to identify growth rates and locations; this study evaluated three future growth scenarios for impacts to the existing network. The main growth scenario identified for evaluation was for a population of 50,000; as well, intermediate growth scenarios of a population of 35,000 and 38,000 were evaluated. The current roadway network and proposed improvements were evaluated with respect to levels of service and prioritization of improvements.

Recommendations for future transportation improvements were identified as City projects, non-city or joint projects, and signal projects. With funding input provided by City staff, the following table summarizes the recommended improvement projects and approximate year of completion with respect to the transportation modeling results and traffic analysis.

PRIORITIZED TRANSPORTATION IMPROVEMENTS

CONSTRUCTION YEAR (APPROX.)	PROJECT
2009	Cocklebur Extension Extend Burma Road from 2nd Street to Lakeway Slate Street Extension 6th Street and 4J Intersection Traffic Signal
2010	Boxelder Road Extension from 4J to Burma 6th Street Grade Improvements Northern Drive from Garner Lake to Little Powder River Road. Also includes rebuild of Garner Lake from Warlow to Northern Drive.
2011	Extend Boxelder Road from Burma to Highway 50 Expand Enzi Drive to 5 lanes from 4J Road to Southern Drive Northern Drive from Highway 14/16 to Hannum Country Club Road Improvements Widen Highway 50 from Lakeway to Highway 14/16 Enzi Drive and Sinclair St. Intersection Traffic Signal
2012	Tanner Drive Extension Extend 6th Street to Stanley/7th Street Expand Boxelder to 5 lanes from Highway 59 to Emerson Extend Northern Drive from Hannum to Little Powder River Road 6th Street and Gurley Ave Intersection Traffic Signal Powder Basin Ave and Boxelder Road Intersection Traffic Signal
2013	Railroad Overpass - Location to be determined Expand Boxelder to 5 lanes from Emerson to 4J 6th Street and Hwy 59 Intersection Traffic Signal
2014	Extend Boxelder to Pioneer/Overdale Garner Lake South from Garner Lake Road to Union Chapel Road Boxelder Road and Garner Lake Road Intersection Traffic Signal
2015	Widen Burma to 5 lanes from Lakeway to Westover
2016	Widen Butler Spaeth to 5 lanes from Boxelder to Hwy 51
2017	Railroad Overpass – Location to be determined
2018	Expand Gurley Road to 5 lanes north of Warlow Oakcrest Drive Extension
2019	Widen Butler Spaeth from Lakeway to Boxelder
2020	Construct Gurley-South Road from Boxelder Construct Western Drive from Highway 50 to I-90 Extend Lakeway west to Western Drive
2021	Extend Lakeway east to Axels Ave Extension Construct Interchange at Western Drive and I-90
2022	Axels Avenue Extension Construct Western Drive from I-90 north to Northern Drive and Highway 14/16
2023	Extend Butler Spaeth Road Extend Sinclair Street to Butler Spaeth Road Develop Collector Grid

Note: Blue indicates city projects; Maroon indicates either non-City projects or joint projects; and Orange indicates signal projects

Other transportation recommendations addressed in this report include:

- The functional classification terminology of the City of Gillette is acceptable, however slightly different than WYDOT. Changing the "local-through" designation to "minor-collector" would keep the classification terminology consistent. Gillette subdivision regulations are not consistent with the design standard terminology. The subdivision regulations should be updated to reference the design standards.
- A few minor recommended modifications to update Gillette's existing ADA accessibility standards.
- The existing truck routes appear adequate. Oversized load routes are identified and recommended. As new roadways are built, the "intra-city" truck routes should be limited to arterials, and state highways will function as bypass routes. Opportunity for new bypass and oversize load routes exist with the Northern Drive, Western Drive, and Garner Lake South future roadways.
- Existing traffic impact analysis requirements appear adequate. However, there is not a good mechanism to assess and collect a fee for development's impact to the transportation system. A recommendation to consider a minimum traffic impact fee is included.

This update provides the City of Gillette with an updated transportation/traffic model, recommendations on standards and policies, and prioritized transportation improvement recommendations to accommodate traffic for a City of Gillette population of 50,000. Neither transit nor alternate modes of transportation were evaluated in detail; however consideration of these transportation modes; and other infrastructure corridors was noted during the network evaluations.

City of Gillette

2009 Transportation Plan Update

Final Report

1.0 Introduction and Background

1.1 Background

The **2004 Transportation Planning Study** provided The City of Gillette with:

- Identification of an effective regional transportation network to accommodate growth and the commensurate increase in traffic;
- Standardization of transportation corridors and street classification criteria;
- Possible new corridors/streets to accommodate future traffic; and
- Development of local street networks and preferred traffic patterns.

Since 2004, existing roadways have been improved, and new roadways have been built. The City of Gillette has experienced significant growth; and additional transportation planning related studies such as the Gillette Comprehensive Plan, the Park Master Plan, and the Rail Crossing Study have been completed.

This *2009 Transportation Plan Update* builds on the **2004 Transportation Planning Study**. Primary objectives of this transportation plan update include:

1. Update the transportation model;
2. Evaluate the future transportation network;
3. Develop a priority list of transportation projects, including signal projects; and
4. Review transportation standards and policies.

1.2 Process

The study was guided through interaction and collaboration with a Steering Committee composed of City of Gillette, Campbell County and WYDOT staff. Through workshops, the Steering Committee met with the consultant team. Minutes of these workshops are contained in Appendix A. Two public open houses were held and public comment on the update was solicited. Public comments from these open houses can also be found in Appendix A.

2.0 Existing Data since 2004

2.1 Recent Studies

Available existing data was analyzed in detail in the **2004 Transportation Planning Study**. Since 2004, the following studies have been performed, and were reviewed in the *2009 Transportation Plan Update*:

§ Rail Crossing Study;
§ Parks and Pathways Master Plan;
§ The "Gillette Plan" Comprehensive Plan; and
§ RTi Technical Memorandum on Population Growth Projections for the Gillette Regional Master Plan WWDC Level I Study.

2.2 Recent Projects

The City of Gillette has focused on construction of the priority projects as identified in the **2004 Transportation Planning Study**. Campbell County and the WYDOT have also assisted in funding and building projects that "fit" the vision of Gillette's transportation plan. Recently completed projects (since 2004), or projects that are "committed" to be built (currently in design or construction) are shown in Figure 2-1. This *2009 Transportation Plan Update* incorporates the recent projects, changes in growth projections and traffic patterns, and re-evaluates the future transportation network and transportation priorities based on recent and projected population growth.

2.3 Safety Analysis

In addition to the roadway network analysis, crash data was reviewed to identify roadways or locations that might require improvements to enhance travel safety within the comprehensive planning area. Intersections with high crash counts were evaluated with respect to signal prioritization.

2.3.1 Crash Data

The five year timeframe of the crash data is from January 1, 2004 through December 31, 2008. The data has been placed in GIS format. The data accounts for nearly 7,500 vehicle accidents. Although this *2009 Transportation Plan Update* did not perform an exhaustive study of the crash data; by grouping the data by location, areas of concern were identified. Figure 2-2 identifies locations with five or more crashes within the five-year time frame.

2.3.2 Summary of Crash Data Analysis

A high volume of past accidents can be seen on Highway 59. Expectantly, the crash density along this corridor should be reduced with the completion of the Highway 59 reconstruction project. Other areas of higher crash counts include:

§Boxelder Road between 4J and Butler Spaeth

§Lakeway Road between 4J and Highway 59

§Highway 50 between 2nd Street and Westover Road

§Gillette Avenue between 1st Street and 4th Street

§2nd Street between West Warlow Drive and Stetson Drive

§Intersection of 5th Street and Kendrick Avenue

§Several parking lots throughout the city

From a review of the crash data, the following observations were made:

1. Locations with high traffic volumes typically have higher crash volumes. It is expected, future crash location analysis will show declining crash rates on Highway 59. Prior to the recent Highway 59 reconstruction project, this high mobility arterial had many approaches and access points that limit mobility. The recent signalization and channelization improvements will restrict some of these access points and some accesses to right turn only, which should reduce the number of crashes, and the crash severity.

2. A significant number of locations, where crashes with parked vehicles occur, are along Powder Basin Avenue in the Powder Basin shopping center. Site traffic in the Powder Basin Shopping Center should be evaluated / modified to reduce parked vehicle and pedestrian conflicts. The Highway 59 reconstruction project will assist to reduce this problem, as the traffic previously using Powder Basin for mobility, as a way to avoid Highway 59 to get from Lakeway to Boxelder, stays on Highway 59.

3. Several residential areas have high crash rates. This could be due to unsignalized intersections, or pass-through traffic attempting to use a residential street to avoid congestion on the arterial network. Sight distance and proper signage should be continuously evaluated in residential areas. Also, traffic calming techniques may be necessary to reduce cut-through traffic problems.

Legend

Network

Functional Class

- Arterial
- Collector
- Interstate
- Proposed_Arterial
- Proposed_Collector
- Proposed_Interchange
- 2004 to 2009 Projects

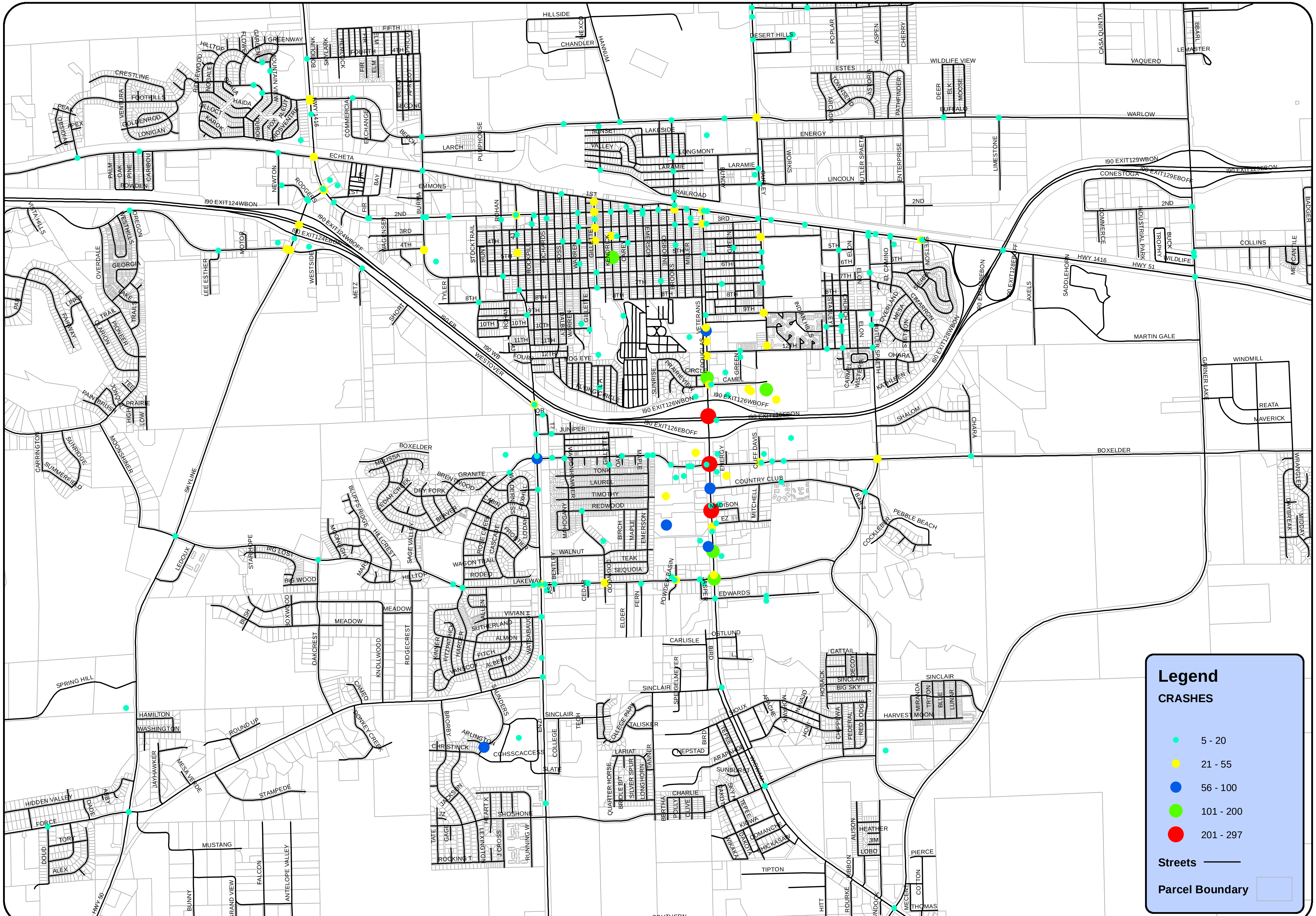
GILLETTE TRANSPORTATION PLAN UPDATE

2004 TO 2009 PROJECTS

DOWL HKM

Figure No.

2-1



GILLETTE TRANSPORTATION PLAN UPDATE

2004 - 2008 CRASH LOCATIONS

DOWL HKM

Figure No.

2 - 2

3.0 Functional Classification Network

Roadways, or streets, are defined or classified by the way they function. For example, local streets provide access through many driveways, alleys, curb cuts, etc. with slower speeds and less regional mobility, while major arterial roadways (interstates, freeways) have limited access, higher speeds and greater mobility. Prevailing practice uses the two functions of mobility and access to classify streets as local, collector, or arterial roadways.

The ability of a street to function as an arterial or collector is also influenced by connectivity in the street network. Without sufficient connections and parallel routes of similar function, traffic of all types (local and regional) will be focused on the streets that connect across the network. Assuring adequate connectivity in the network is as important as mobility or access in defining the function for individual streets in Gillette.

The 2000 Gillette Major Street and Highway System Report (WYDOT 1997) documents the development of a functional classification system for streets in the Gillette area. Figure 3-1 shows the current roadway functional classifications adopted by the City of Gillette and Campbell County Officials; and approved by WYDOT and the Federal Highway Administration. The adopted functional classification system categorizes existing and proposed roadways as Arterials, Collectors, or Local Streets based on the intended use for each roadway and distinguishes between existing and planned roadways. WYDOT has used this system as the basis for the travel forecasting model for the Gillette area; and to identify and prioritize transportation improvement projects.

3.1 Street Functional Classification Criteria

Street functional classification criteria was generally set forth in the **2004 Transportation Planning Study** and further refined in the Gillette Design standards. This *2009 Transportation Plan Update* provides a review of the various functional classes of roadways and compares them to the WYDOT functional classification system in an effort to align the City of Gillette roadway classes with the WYDOT classifications.

Figure 3-1 shows the current WYDOT roadway functional classification for the City of Gillette area. WYDOT and the Federal Highway Administration currently utilize the following classifications for urban roadways:

- Interstate
- Other Freeways and Expressways
- Other Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Local

Wyoming state highways have typically been classified as Principal Arterials by WYDOT. Other arterial roadways have been classified as minor arterial. However, for the City of Gillette, the arterial classification should include both principal and minor arterials, with no distinction needed. WYDOT also uses minor and major to distinguish between collector streets. To be consistent with WYDOT, the City of Gillette may want to consider changing their “local-through” designation to minor collector. However, this is not seen as a critical issue. Also, City of Gillette subdivision regulations are not consistent with the design standard terminology. The subdivision regulations should be updated to reference the design standards.

3.1.1 Design Criteria

The recommended street designations are described below as set forth in the **2004 Transportation Planning Study**. Specific design criteria in the Gillette Design Standards are acceptable, although traffic volumes are not necessarily an indicator of roadway function. The following descriptions and Table 3-1 generally describe the various roadway designations and corresponding functions.

- Arterial – Arterials move traffic at higher speeds and are intended to connect points of major destinations to provide for regional traffic movement. Limited access improves the arterial's mobility and safety. Target speeds on the arterial segments are in the range of 35 to 50 mph with slower speeds appropriate in the urbanized core of the city and higher speeds appropriate to outlying areas and areas where access control has been established. Within Gillette, arterials tend to be four-lane streets, but can be wider as volumes dictate. Parking is generally not allowed along arterials and access spacing is controlled appropriate with target speed.

- Collector – Collectors service neighborhoods and districts by connecting traffic movement between arterials and local streets. This function commonly provides for some direct access to abutting property. These are moderate speed streets, with target speeds in the range of 30 to 40 mph. Although generally two lanes wide, collectors can be four lanes in width. Lower target speeds are appropriate in residential and mixed-use areas, while higher target speeds can be used in commercial and industrial areas. The frequency of access and the type of access design will be affected by higher target speeds. Parking may be allowed along collectors, particularly those with lower target speeds.

- Local-through – these streets are local streets (see below) that provide limited connectivity between residential subdivisions. As such, they have a limited collector function, but are essentially residential in character. Target speeds on local-through streets are 25 to 30 mph and are dependent upon width and activity.

- Local – A local street provides circulation, parking, access to adjoining property and parking facilities. These streets provide the greatest degree of access, have lower speeds, and yield the right of way to all other street classes. Street architecture and traffic calming on local streets may be used to discourage through traffic and higher speeds. Target speeds on local streets are 20 -25 mph or less and are dependent upon width and activity.

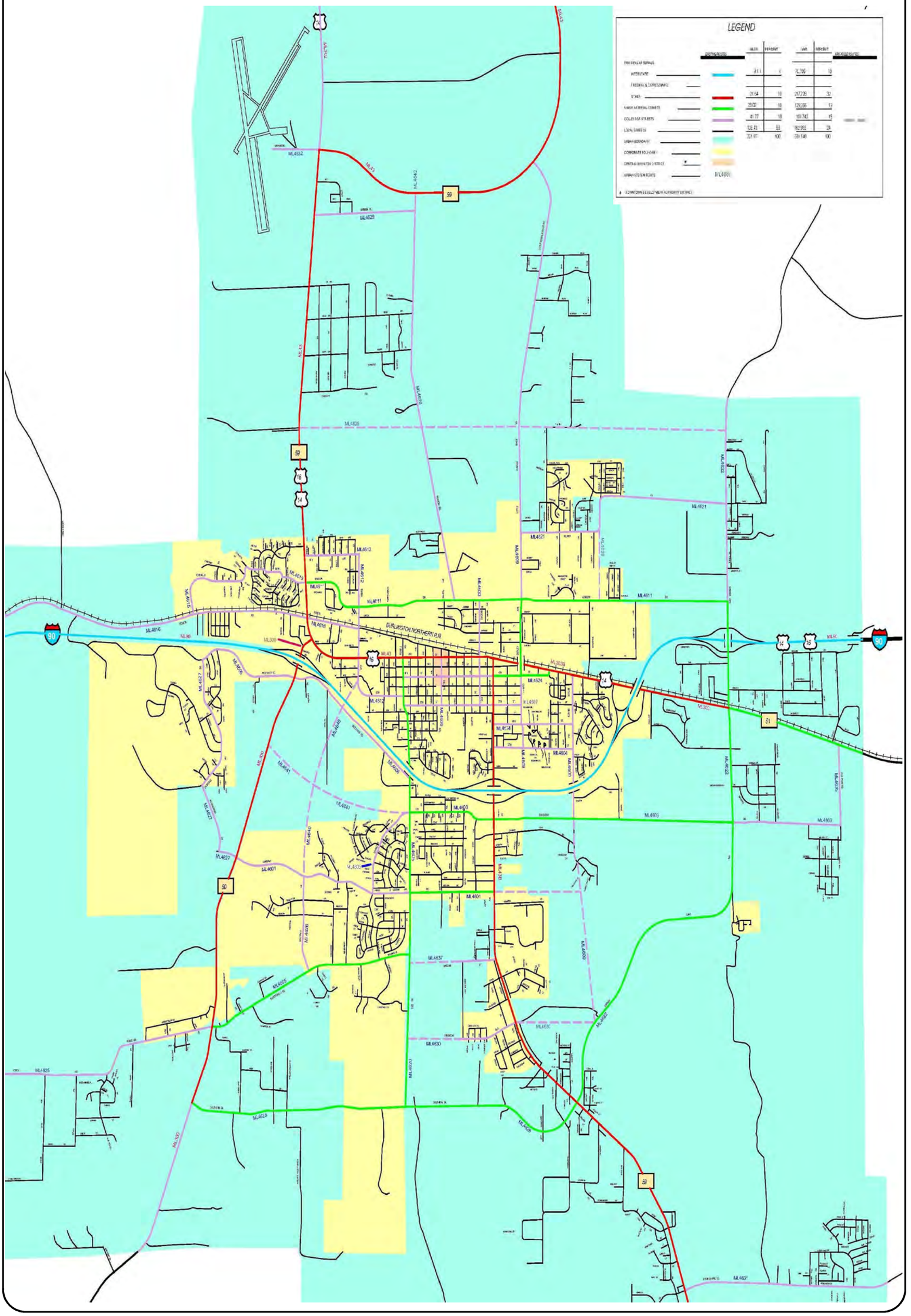


Figure No.
3 - 1

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EXISTING FUNCTIONAL CLASSIFICATION

Table 3-1 General Design Criteria by Classification

Street Classification	Target Speed (mph)	Access Spacing (ft)	Parking	Street Width (ft)	Right of Way Width (ft)
Arterial	35-50	250-600	None	50-98	100-120
Minor Arterial	30-45	100-400	None	38-72	90
Collector	30-40	100-350	Parallel	36-56	66-80
Local-through	25-30	50-100	Parallel	36-50	50-70
Local	20-25	50	Diagonal or parallel	36-50	50-70

Note: For more specificity, see The City of Gillette Design Criteria.

3.1.2 Network Connectivity Criteria

Criteria for spacing of arterials and collectors should be used to establish potential future network needs. Arterial roadways should be established on an expansion of the City's grid system with an approximate spacing of one-eighth to one-quarter mile in business districts and the urban core and one-half to one mile in suburban areas. Collector streets to get traffic to the arterial roadways should be spaced uniformly between parallel arterials. Topography, present and future land use, sight distance, safety, connectivity, and existing street geometry are all considered when evaluating the street network.

3.1.3 Network Recommendations

Using the criteria above, recommendations have been made for the future roadway network. Future development within the Gillette area should be guided by the criteria stated above and the future network map provided in Chapter 5 of this report. Existing corridors may require modification (i.e. removing access, adding/removing parking, etc.) to improve the roadway network efficiency. The proposed future network and proposed improvements are discussed further in this report.

4.0 Modeling Future Growth Patterns

For the past two decades, WYDOT has maintained Gillette's transportation forecasting model using techniques developed by WYDOT that are specific to the unique characteristics of urban areas in Wyoming. Some understanding of the model characteristics is necessary to effectively use the model results. A brief discussion of those characteristics is presented in this Chapter.

The primary components of travel forecasting applications are a network, traffic analysis zones (TAZs), and a four-step modeling process that includes trip generation, trip distribution, mode split, and traffic assignment. Following are characteristics common to the forecasting process:

- The network is representative and includes only major links in the roadway system; not all roadways are modeled.TAZs divide the study area into discrete areas within the network.

Land use and socioeconomic data are associated with each TAZ and are used to calculate trips between zones. Figure 4-1 shows the system of TAZs in use for Gillette.

- The four-step model generates and distributes trips from zone to zone, based on the socioeconomic data and network provided, and assigns the trips to available modes (transit or auto) and specific links in the network.

Although this study focuses mainly on the City of Gillette and its immediate surrounding area, a portion of the traffic on the transportation network within the study area is generated by sources outside of the planning boundary. The model incorporates trips between the modeled area and external sources of demand differently from trips that are entirely internal to the modeled area. Two types of external trips are in the modeling process—external-external trips that pass through Gillette and external-internal trips that have one end (origin or destination) in Gillette. Growth in both types of external trips is based on historic rates of growth in adjacent highway traffic.

Significant sources of external demand in the Gillette area are traffic associated with coal mines, coal bed methane wells, and power plants, which surround the City of Gillette. Appendix B contains information on these and Figure 4-2 illustrates some of the sources of external trips. Also, county subdivisions and towns such as Rozet and Moorcroft contribute traffic to Gillette.

4.1 The Transportation Model

The forecasting model uses a sequential approach that starts with modeling existing (base year) activity on a network that represents the existing system. This base year model is calibrated and validated using observed conditions to ensure the model is functioning correctly. Once calibrated, the model is used to evaluate future conditions, which is accomplished by entering expected changes in development patterns, changes in the street network, or both. The future conditions are evaluated sequentially by first loading future traffic over the existing plus committed network, and then loading future traffic over the proposed future network. Results from iterations of the model (termed a model run) are then compared with each other.

The existing system 2008 model results were produced and compared to 2006 traffic counts, (some counting done in 2008) to verify the model accuracy. For the modeling of this transportation plan update, WYDOT provided the TAZ to TAZ trip generation numbers; and DOWL HKM performed the traffic assignment; the modeling that shows the amount of traffic on the roadways.

4.2 Future Growth Scenarios

For the forecasting model to determine the amount of future traffic demand, estimates of the amount of growth expected to occur in the urbanized area are needed on a zone (TAZ) by zone (TAZ) basis. DOWL HKM met with City of Gillette Engineering and Planning Staff and Campbell County Planning Staff to identify probable growth areas. This growth was then assigned to each TAZ in the model. Rather than use a specified growth rate, a target population for Gillette of 50,000 was used for this study update. To help evaluate roadway improvements and prioritize signals, the following growth scenarios were also evaluated:

- Existing 2008 (Population = 31,745)
- 5 year (Population = 35,000)
- 10 year (Population = 38,000)
- Main planning scenario (Population = 50,000)

For each of these growth scenarios, socioeconomic data was developed. Socioeconomic data consists of population, dwelling units, employment, and enrollment.

A summary of the total socioeconomic data for these growth scenarios is shown in Table 4-1. Appendix B contains discussion of socioeconomic data development for the growth scenarios.

Table 4-1. Socioeconomic Data

Growth Scenario	***Dwelling Units***	***Employment***	***Enrollment***		
			Elementary / Junior High	***High School***	***College***
Existing 2008	*16,381*	*26,841*	*5,211*	*1,609*	*914*
2013 (35,000)	*18,027*	*29,525*	*5,735*	*1,771*	*1,006*
2018 (38,000)	*20,083*	*32,907*	*6,389*	*1,973*	*1,121*
Population = 50,000	*26,247*	*43,095*	*8,350*	*2,578*	*1,465*

Note: Includes city limit boundaries as well as relevant county data.

Figures 4-3, 4-4, and 4-5 show the expected growth in dwelling units, employment, and enrollment, respectively for the four growth scenarios identified above.

Each of the growth scenarios shown in Table 4-1 were used to assign traffic to roadways in the transportation network. For travel forecast modeling, three networks are used. They are:

- Existing 2008 network
- Committed Network – the existing network plus "committed" projects (projects in the design phase, or are currently being constructed).
- Proposed Network - proposed roadway network to accommodate the traffic for a City of Gillette population of 50,000.

Insert 4-1

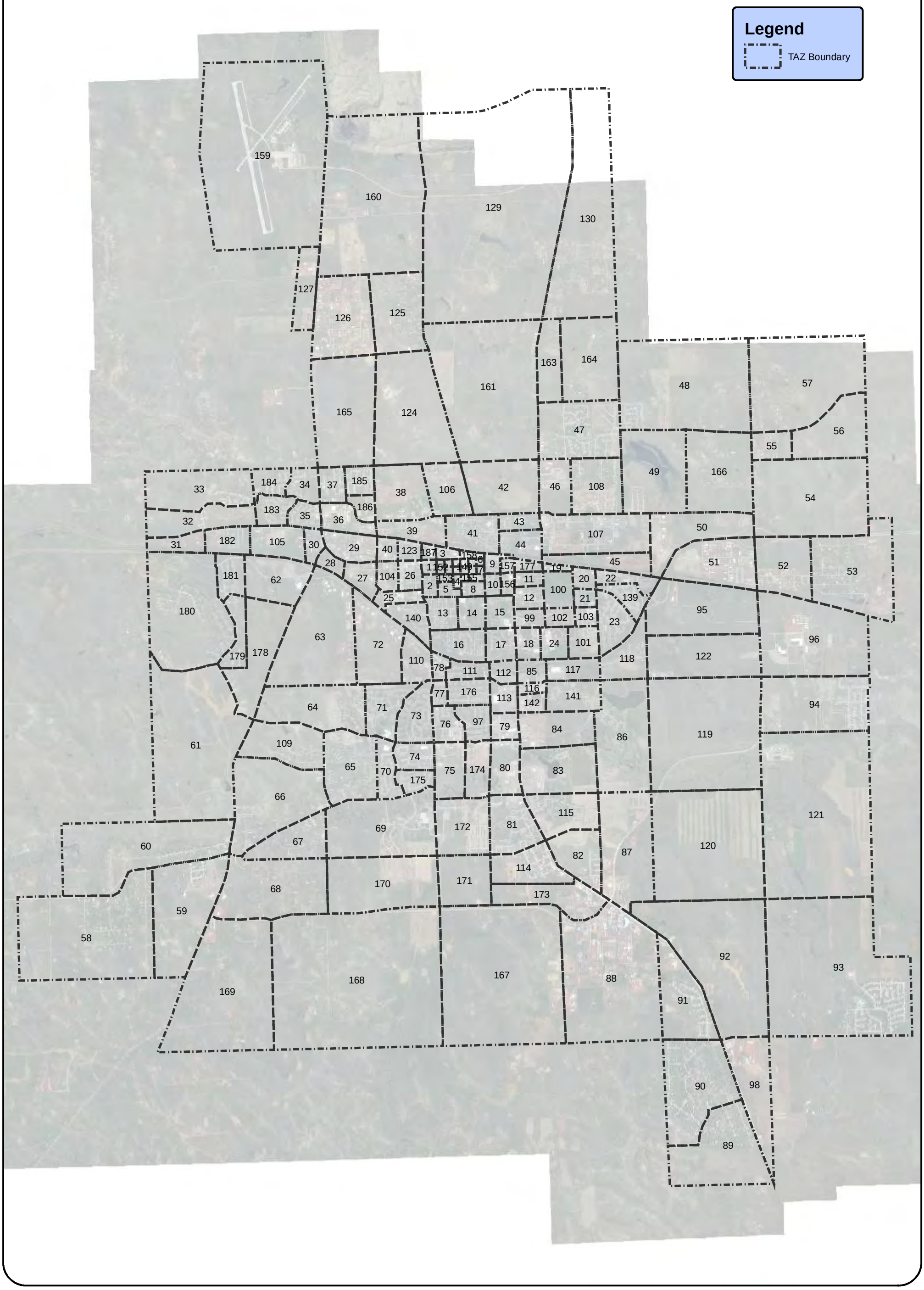

Figure No. 4 - 1

DOWL HKM

GILLETTE TRANSPORTATION PLAN UPDATE

Traffic Analysis Zones

BUCKSKIN

RAWHIDE

EAGLE BUTTE

DRY FORK

KFX

FORT UNION

WYODAK

CABALLO

BELLE AYR

CABALLO ROJO

CORDERO

Legend

Streets

Major Roads

Interstate 90

Highways

Secondary Roads

Other

Interstate Ramp

Mines

Coal Bed Methane Wells

N

W E

S

Figure No. 4-2

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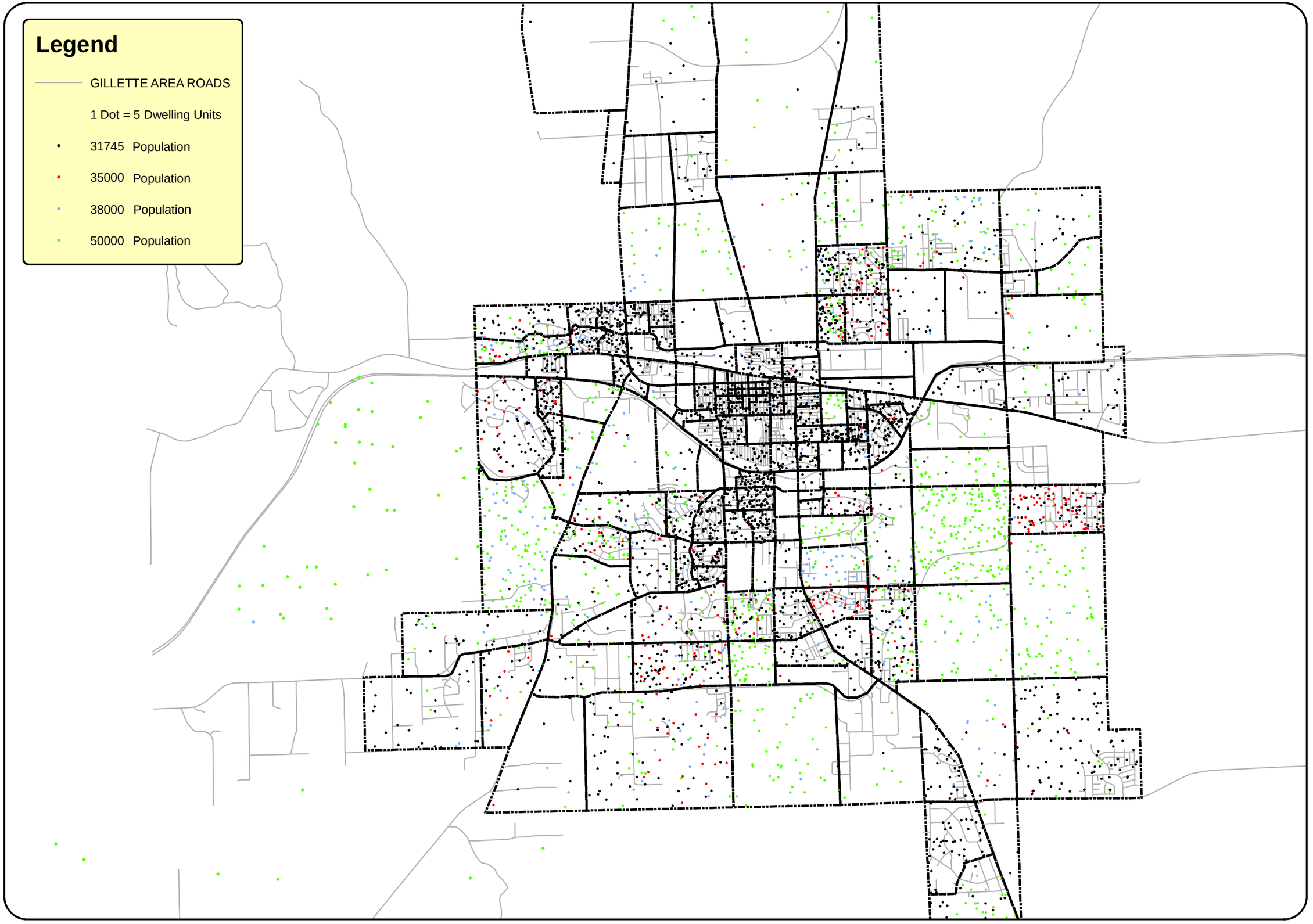
GILLETTE TRANSPORTATION PLAN UPDATE

EXTERNAL TRIP GENERATORS



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DWELLING UNIT GROWTH

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Figure No.

4-3

Jobs Per Growth Scenario

1 Dot = 5 Jobs

- 50,000 Population
- 38,000 Population
- 35,000 Population
- Current Population

N

W E

S

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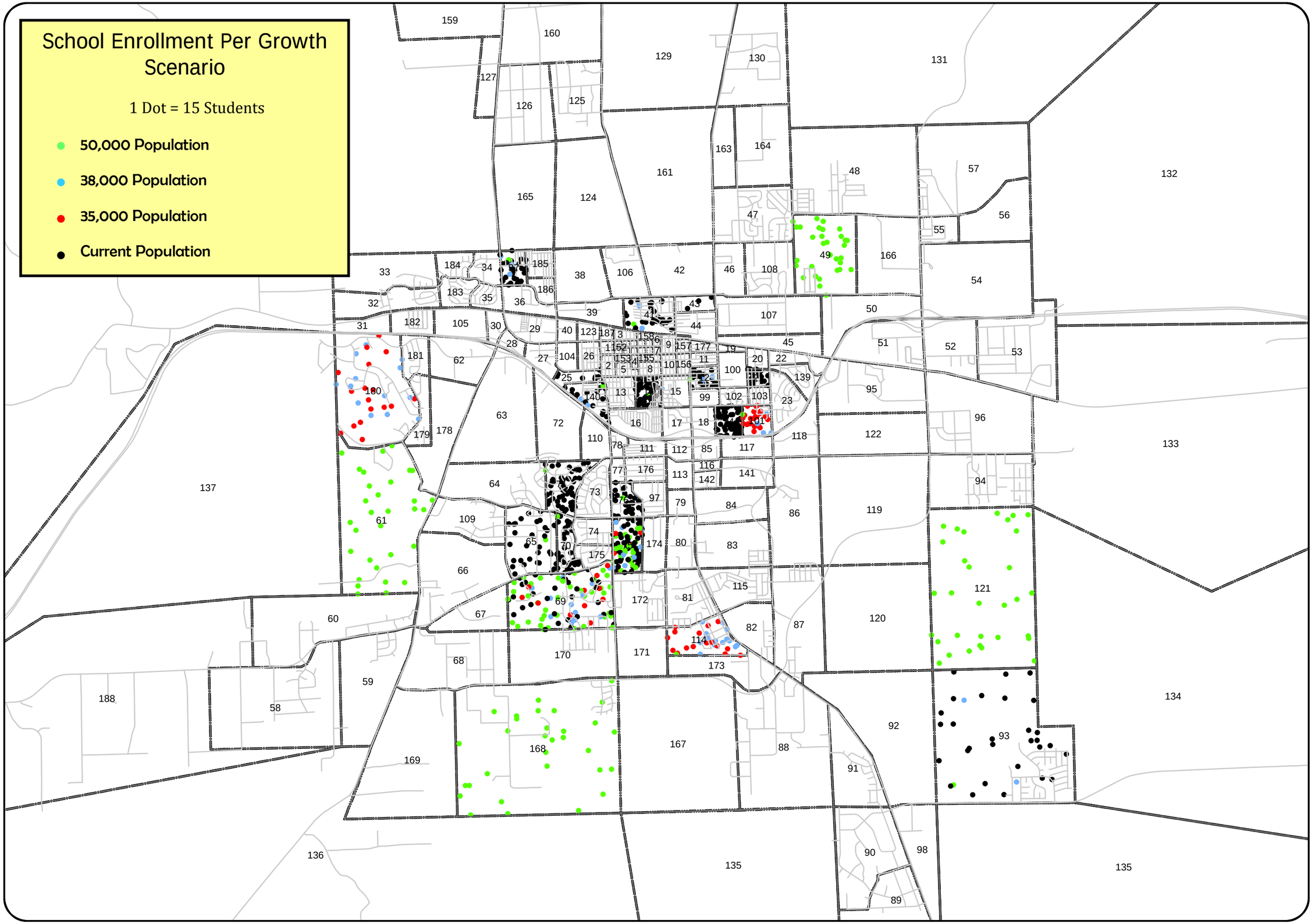
EMPLOYMENT IN EACH TAZ

DOWL HKM

Figure No.

4-4



GILLETTE TRANSPORTATION PLAN UPDATE

ENROLLMENT IN EACH TAZ

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Figure No.

4-5

5.0 Proposed Network

Proposed Network

To accommodate the growth patterns for Gillette described previously, a proposed future network is shown in Figure 5-1. Roadways are illustrated by functional classification and includes both modifications to existing roadways and new roadways to support new development. The proposed network is a framework for guiding development of the recommended roadway network, and a tool for preserving roadway corridors.

In addition to the planning criteria used to develop the proposed roadway network, the performance of the network in efficiently accommodating future traffic must be evaluated. Accordingly, the proposed roadway network was modeled in TransCAD. The results of a series of model runs were used to evaluate the effectiveness of the proposed network, as described in Chapter 6 of this Report. New roads are also shown on Figure 5-1 outside of the City of Gillette. The roadway arterial and collector network should be extended as this land is developed. In addition to new roads, several roadways may need expanded from 3 to 5 lanes. This is shown by comparing figures 5-2 and 5-3.

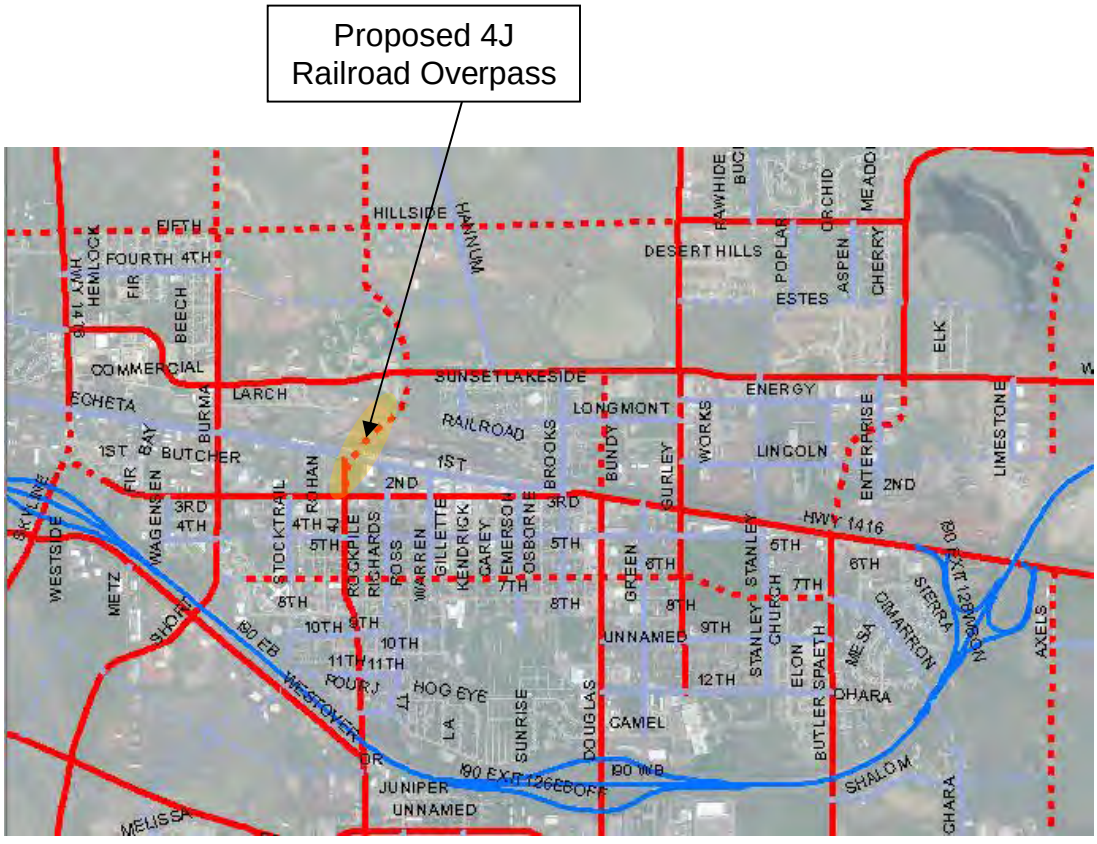
The following Chapters describe the various projects listed in the transportation improvement plan tables.

5.1.1 Railroad Overpasses

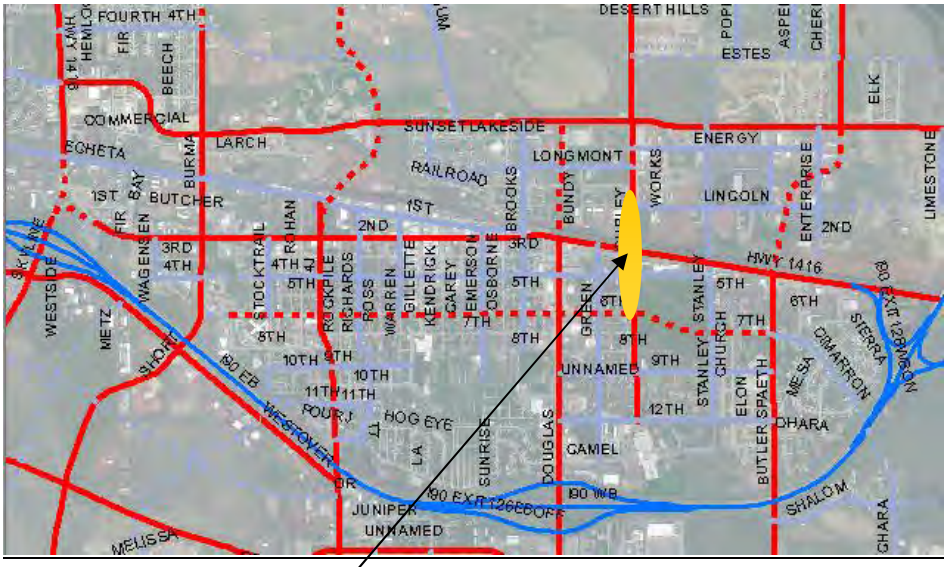
Currenlty Gillette has three grade separated crossings of the railroad, which are Highway 14/16, Gurley Avenue, and I-90. The railroad continues to be a physical barrier to traffic movement in Gillette. To develop the arterial network, new or expanded railroad crossings are needed as mentioned below. It should be noted at this time no priority has been assigned to the various railroad crossing improvements.

5.1.1.1 *Butler-Spaeth Railroad Overpass* - Construct a grade separated crossing over the railroad tracks that will extend Butler Spaeth from 2nd Street north to intersect Warlow Drive at Kluver Road.

5.1.1.2 *4J Railroad Overpass* - Construct a new grade separated overpass of the railroad tracks that will extend 4J from 2nd Street north to Warlow Drive.

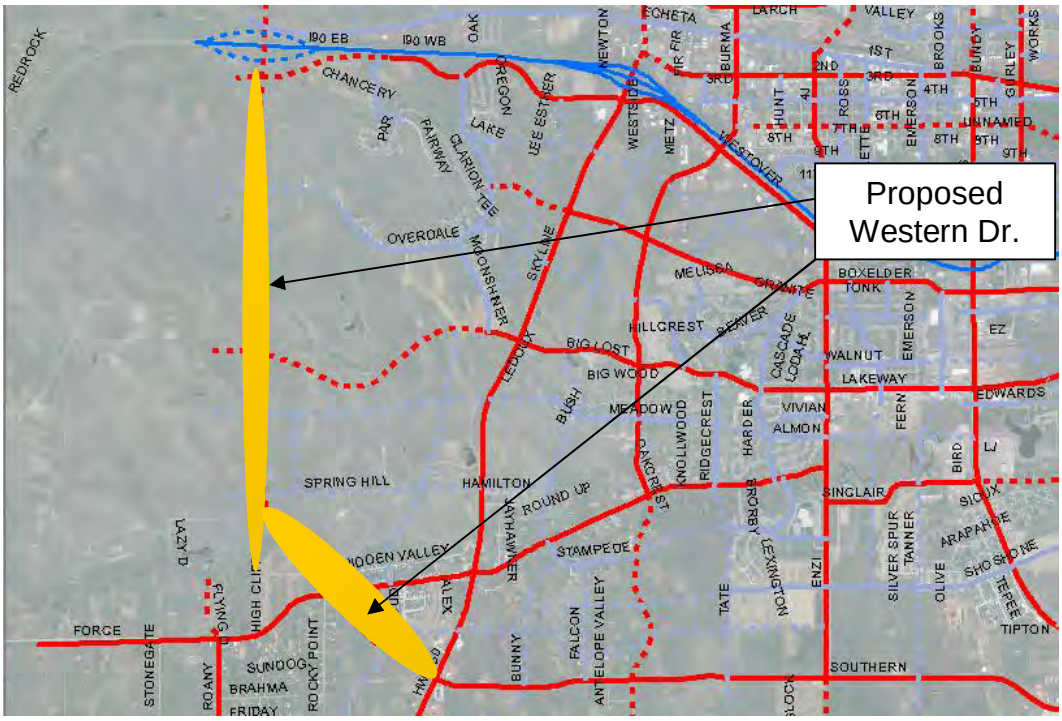


5.1.1.3 *Gurley Overpass* – Widen the existing Gurley overpass to 4 lanes. This option will increase capacity of the existing overpass.



5.1.2 Western Drive from Highway 50 to Interstate 90

Construct an Arterial road west of Gillette that starts at Southern Drive and Highway 50 and travels north to a new interchange with Interstate 90.

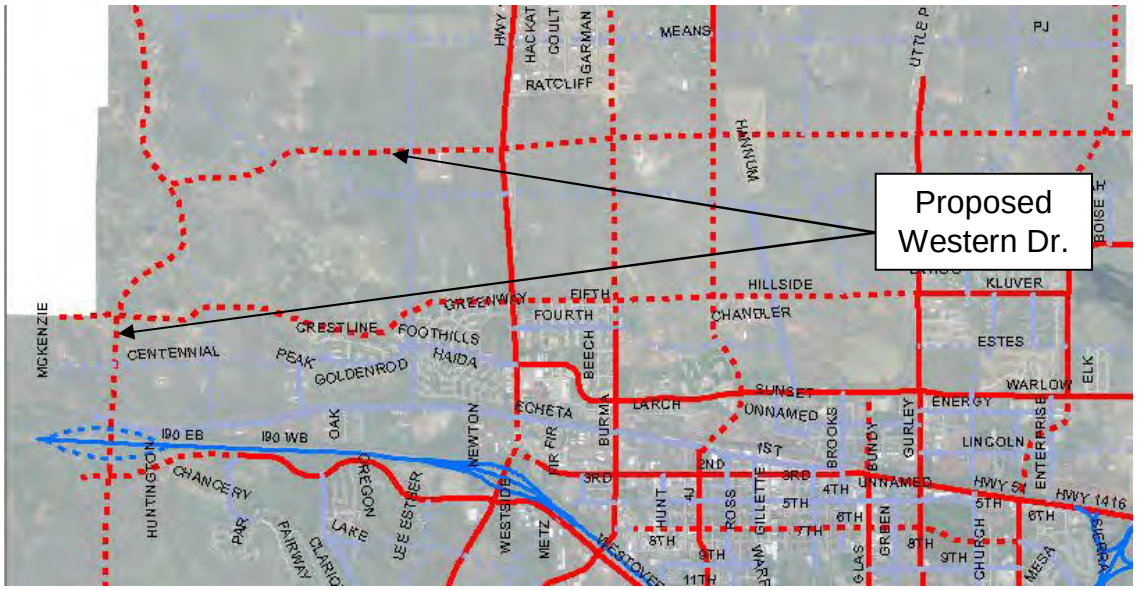


5.1.3 Interchange at Western Drive and Interstate 90

Construct a new interchange with Interstate 90 at the Western Drive location. The project should also accommodate a railroad overpass and a connection to Echeta Road.

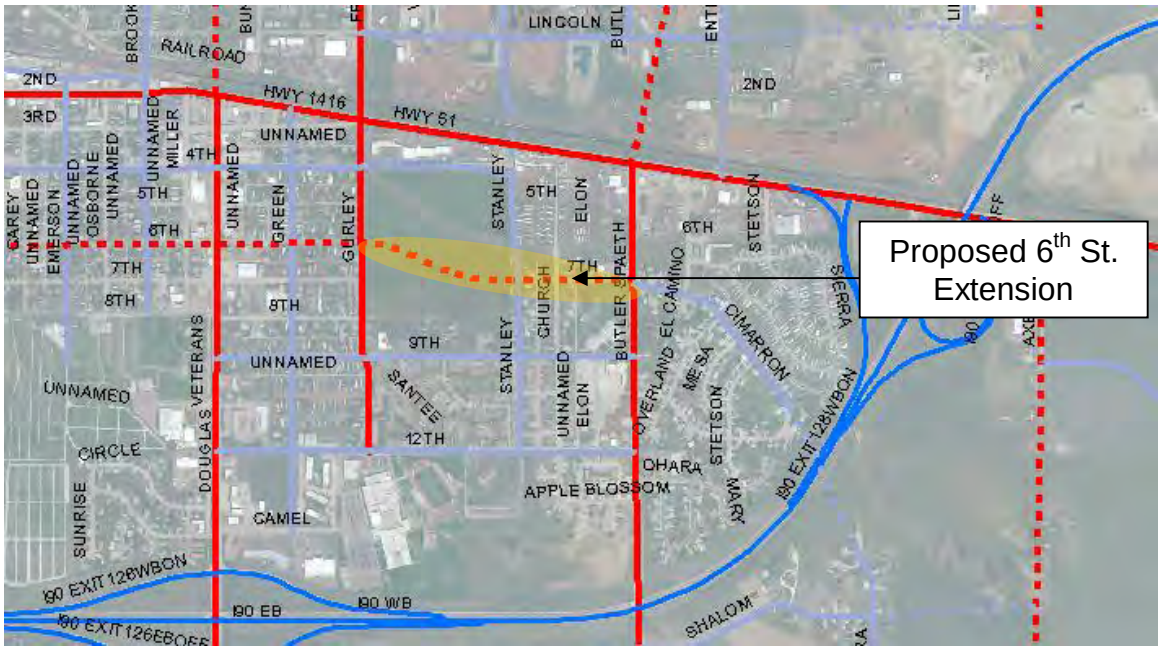
5.1.4 Western Drive from Interstate 90 to Northern Drive and Highway 14/16

Construct an Arterial road west of Gillette that starts at a new interchange with Interstate 90 and travels north to intersect Highway 14/16 at Northern Drive.



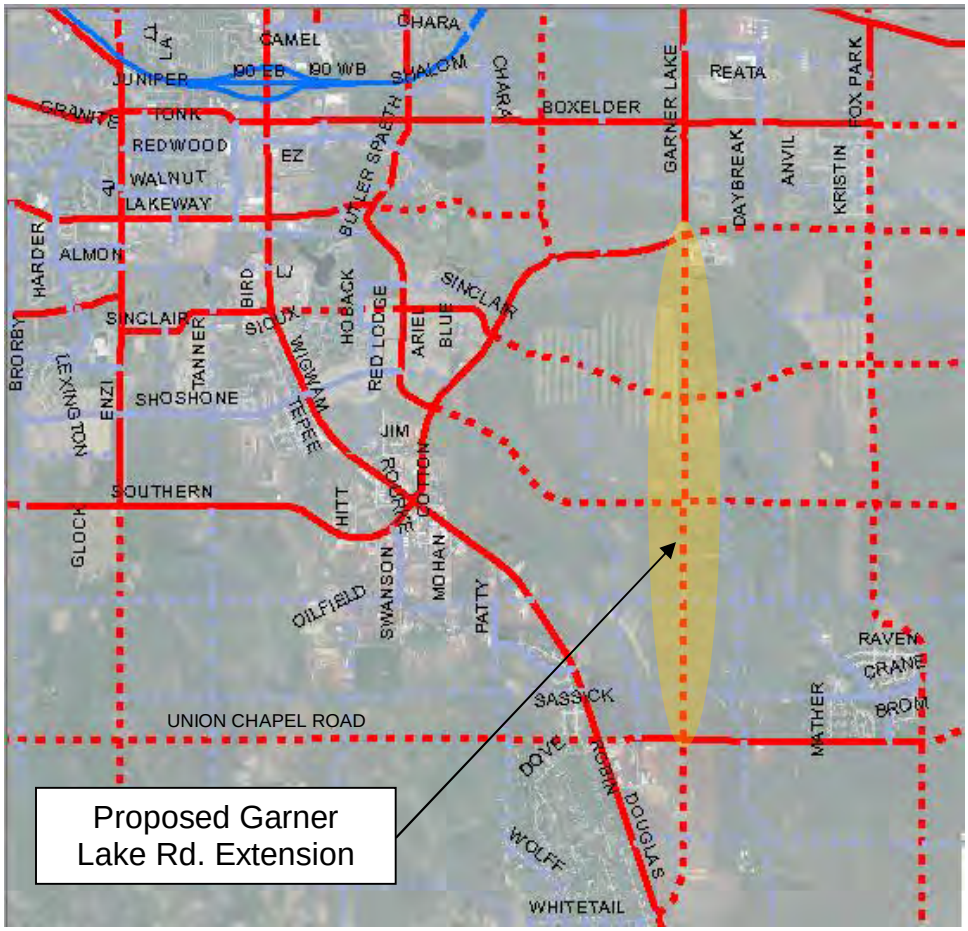
5.1.5 6th Street Extension

Extend 6th Street from Gurley Avenue to the Stanley/7th Street intersection. This connection enhances the network by providing an east-west minor arterial between Highway 59 and Butler Spaeth, and also connects Butler Spaeth to the Gurley railroad overpass.



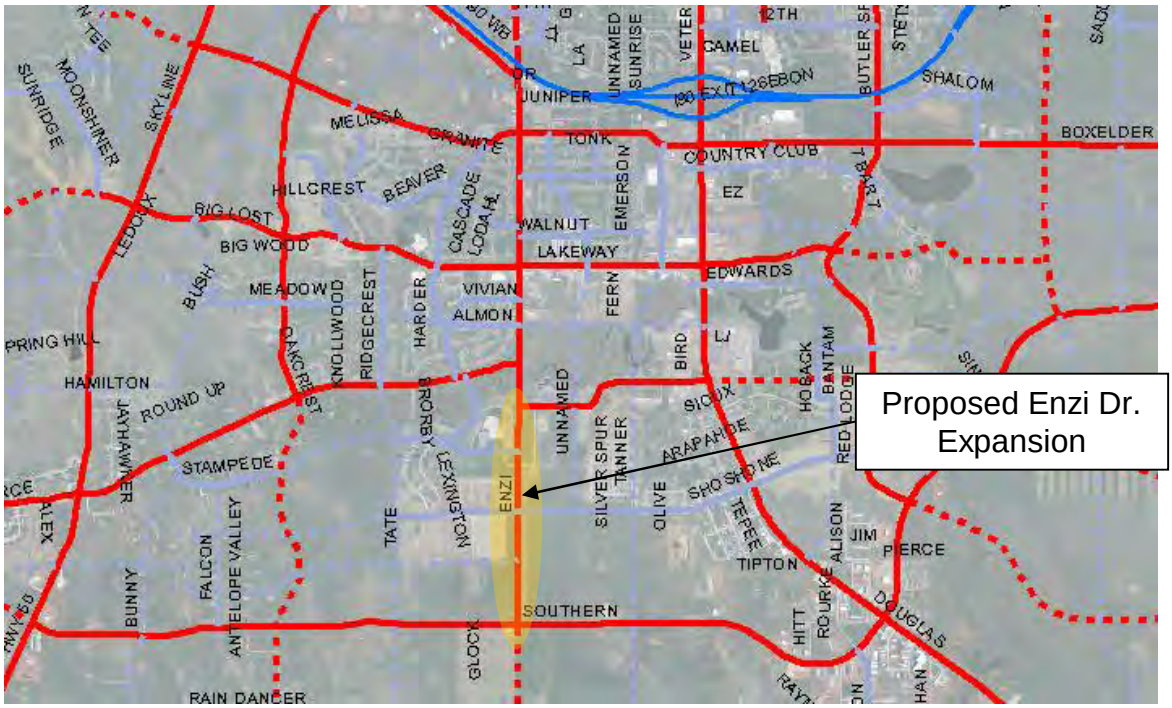
5.1.6 Garner Lake South

South of Boxelder, Garner Lake turns west and gradually makes its way to the south. The proposed extension of Garner Lake would head directly south forming a "T" intersection with the existing east/west section and intersect Union Chapel Road. This major arterial improves north/south connectivity from Highway 59 to I-90 and provides a major arterial through an area targeted for high growth. This connection also enhances the arterial network between Highway 59 and I-90.



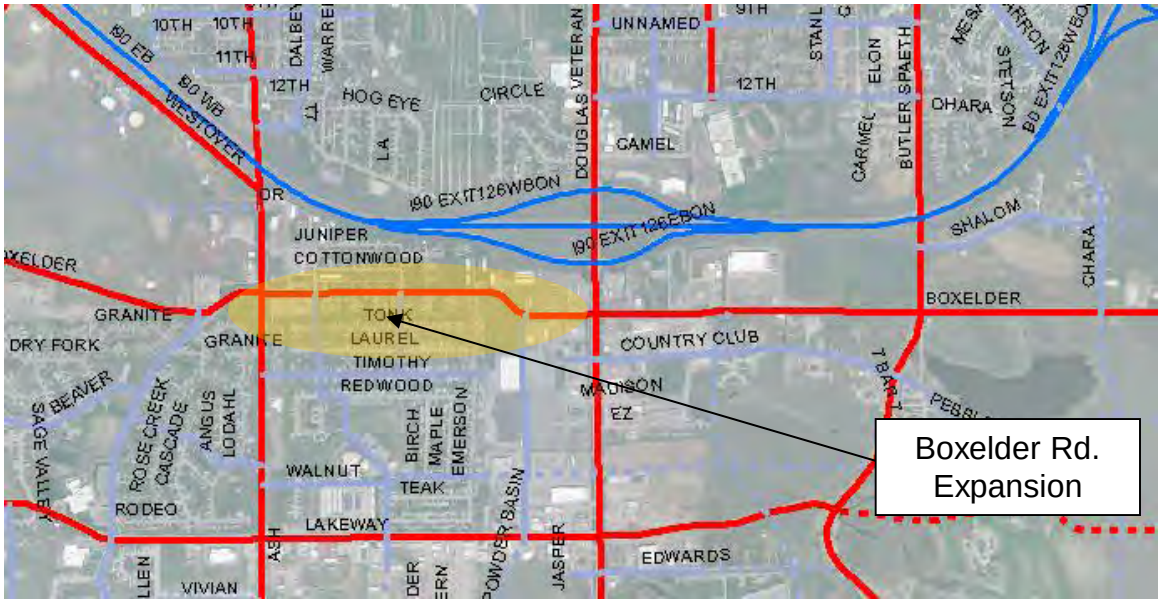
5.1.7 Enzi Drive Expansion

Reconstruct Enzi Drive and expand to five lanes from 4J Road to Southern Drive. The expansion will be necessary to accommodate 2018 traffic volumes, based on projected growth in the area.



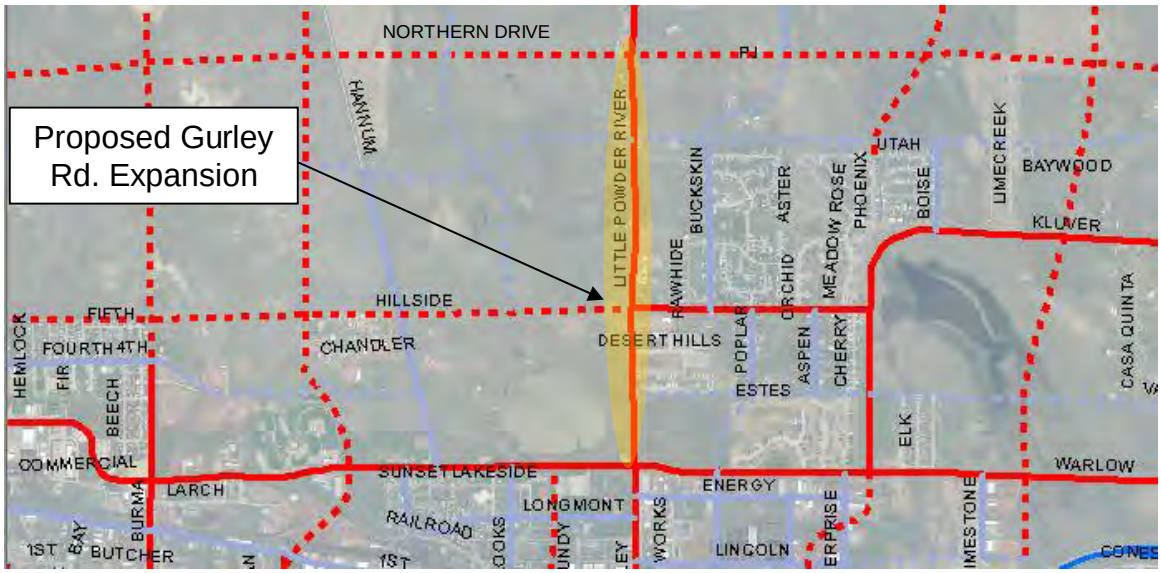
5.1.8 Boxelder Road Expansion

Reconstruct Boxelder Road and expand to five lanes from 4J to Highway 59 to accommodate 2018 traffic volumes.



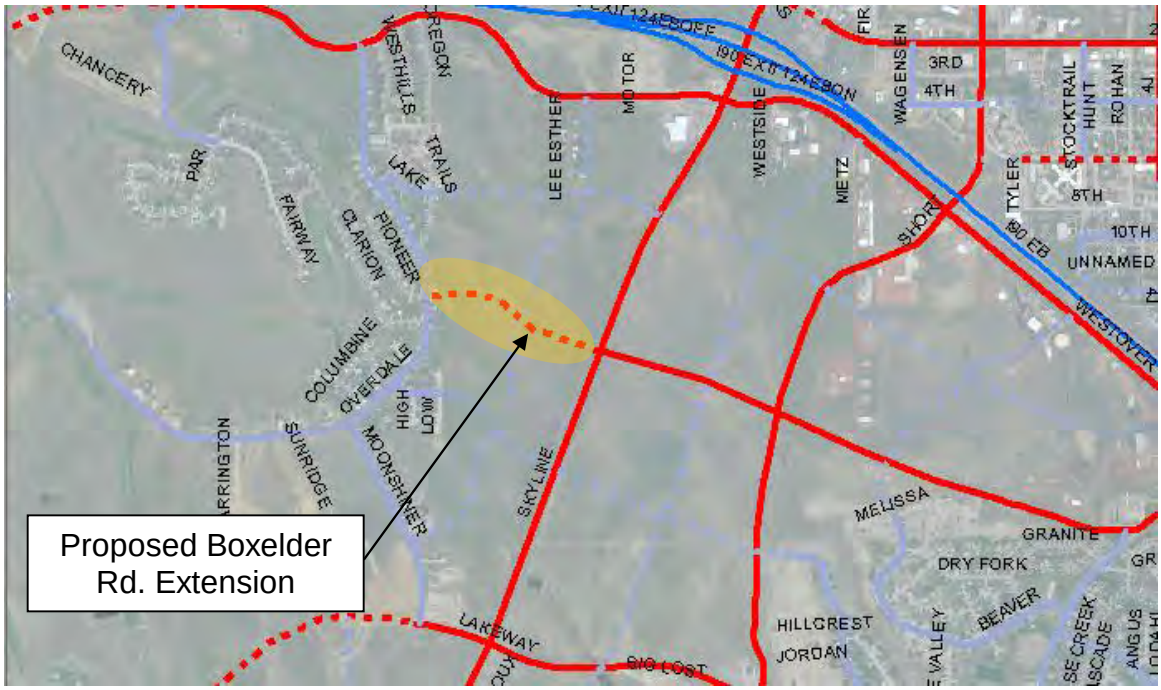
5.1.9 Gurley Road Expansion

Reconstruct Gurley Road and expand to five lanes from Warlow Drive to Northern Drive to accommodate 2018 and 50,000 population traffic volumes.



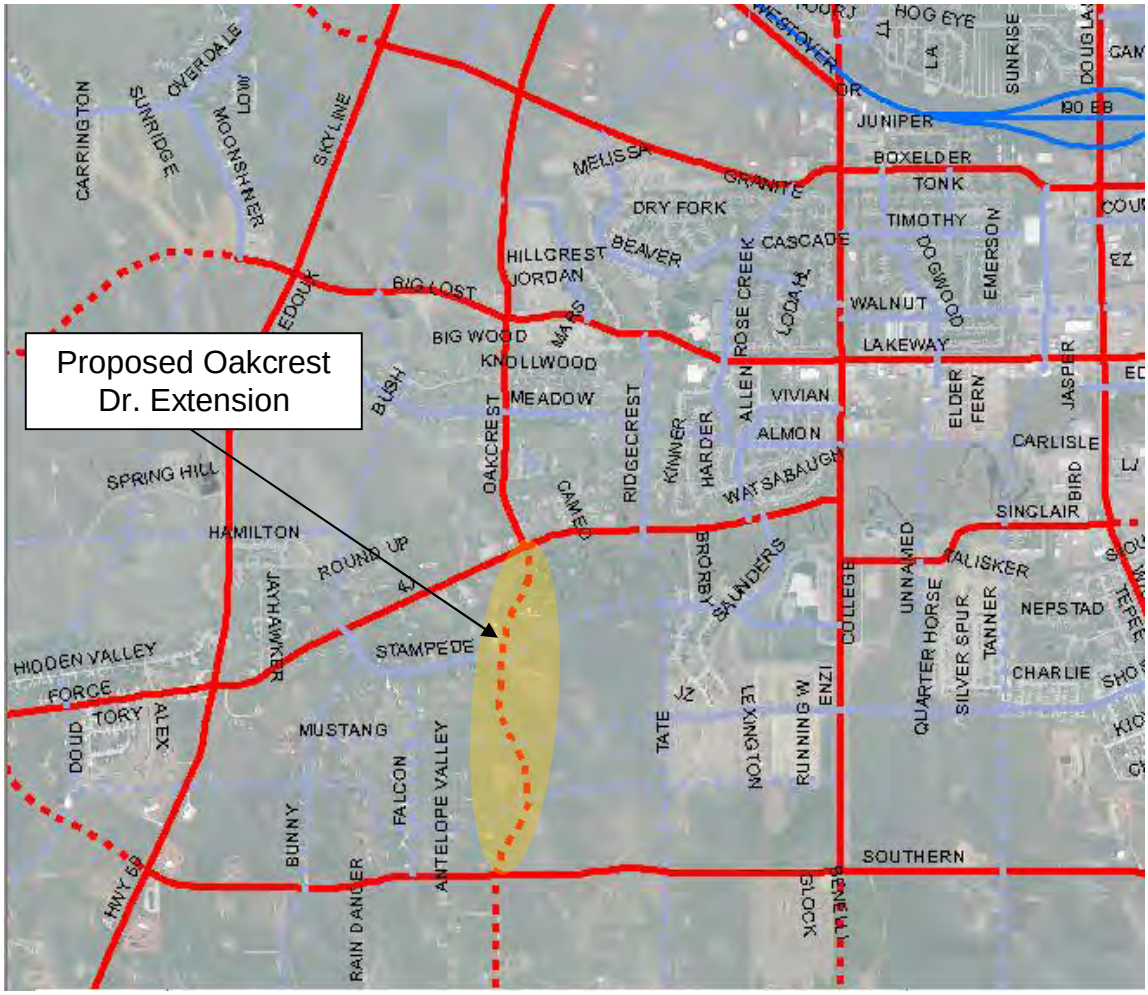
5.1.10 Boxelder Road Extension

Extend Boxelder Road East from Highway 50 to connect to collector street network at Pioneer/Overdale. This extension would be a minor arterial or major collector extension and would provide another connection to the development east of Highway 50.



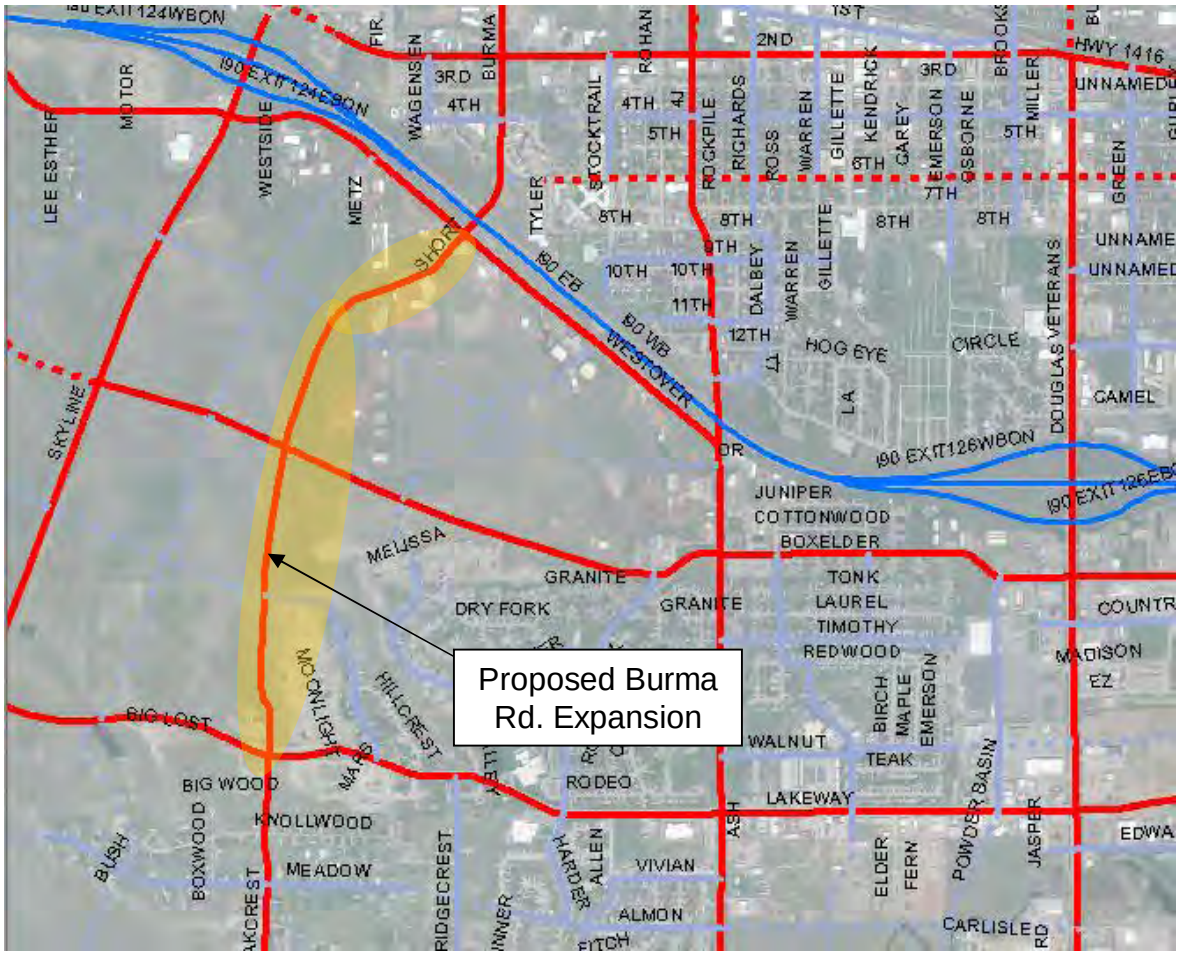
5.1.11 Oakcrest Drive Extension

The southern end of Oakcrest Drive terminates at the intersection of West 4J. An arterial extension from the Oakcrest/West 4J intersection south to Southern Drive provides a connection to Burma Road, to reduce congestion along Highway 50 and Enzi.



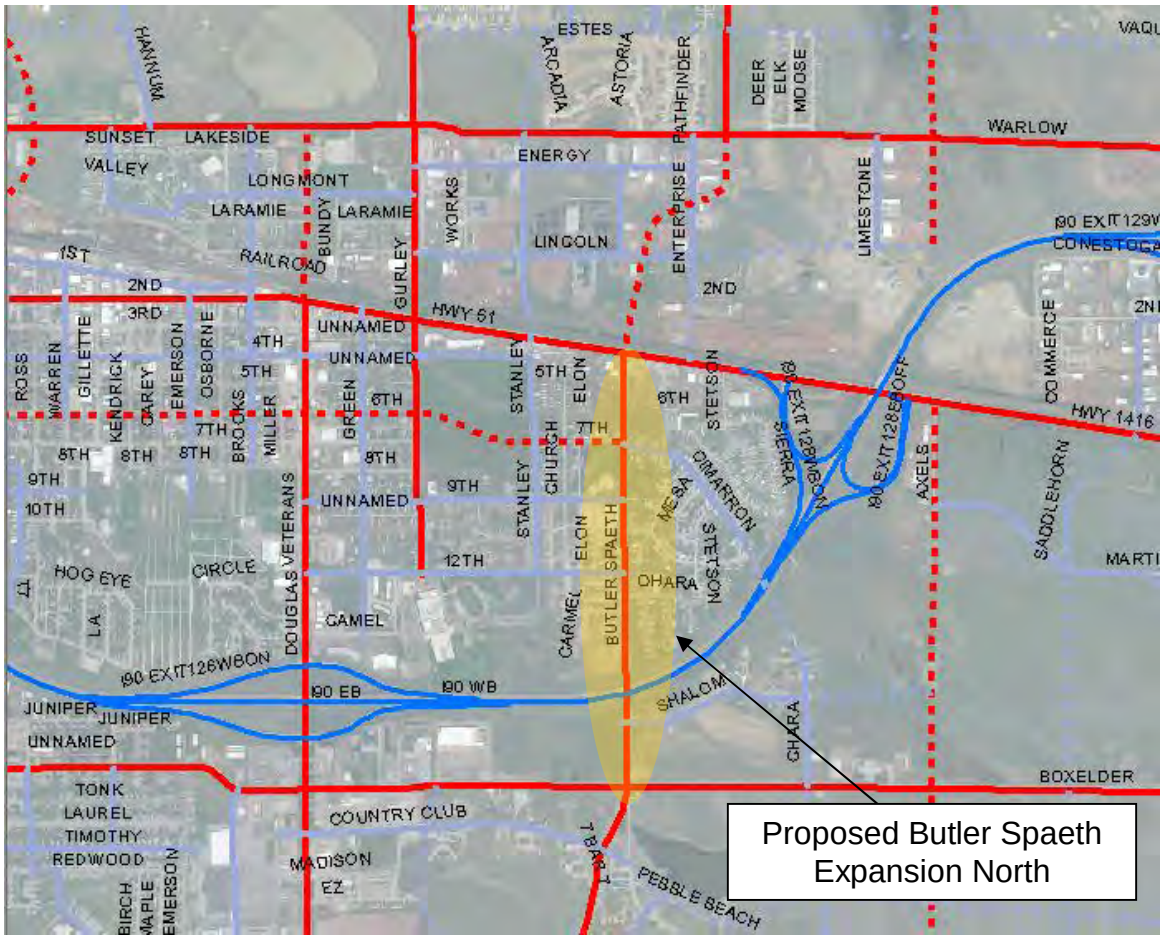
5.1.12 Burma Road Expansion

Expand Burma Road from three lanes to five lanes from Lakeway Road to Westover Road. This expansion will be necessary to accommodate the 50,000 population traffic.



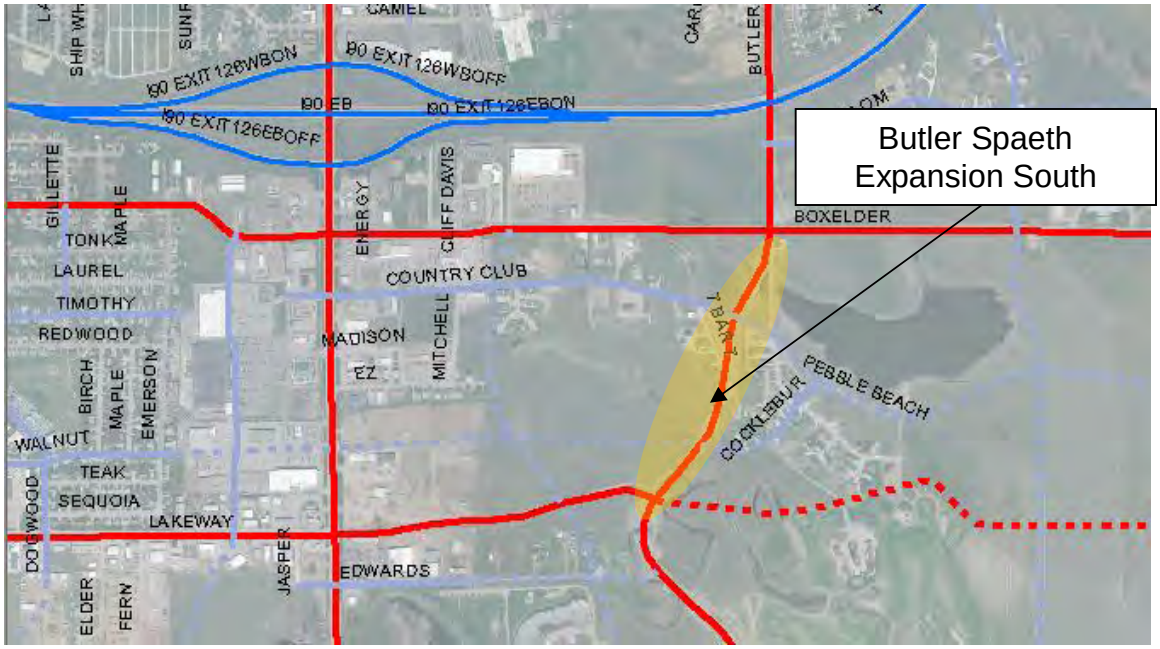
5.1.13 Butler Spaeth Expansion North

Expand Butler Spaeth to five lanes from Boxelder Road to Highway 51.



5.1.14 Butler Spaeth Expansion South

Widen Butler Spaeth to five lanes from Lakeway Road to Boxelder Road.

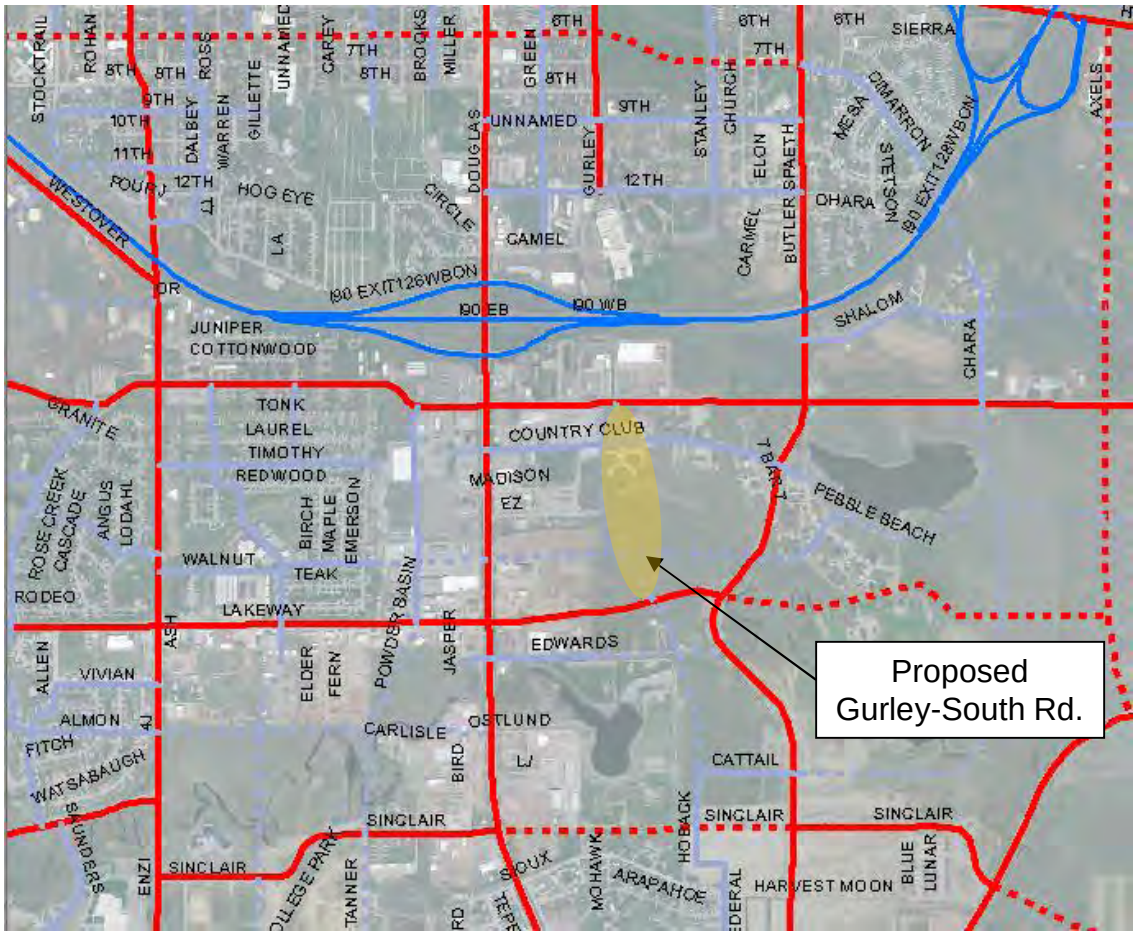


5.1.15 Lakeway Road Extension West

Extend Lakeway Road East from Highway 50 to connect to Western Drive.

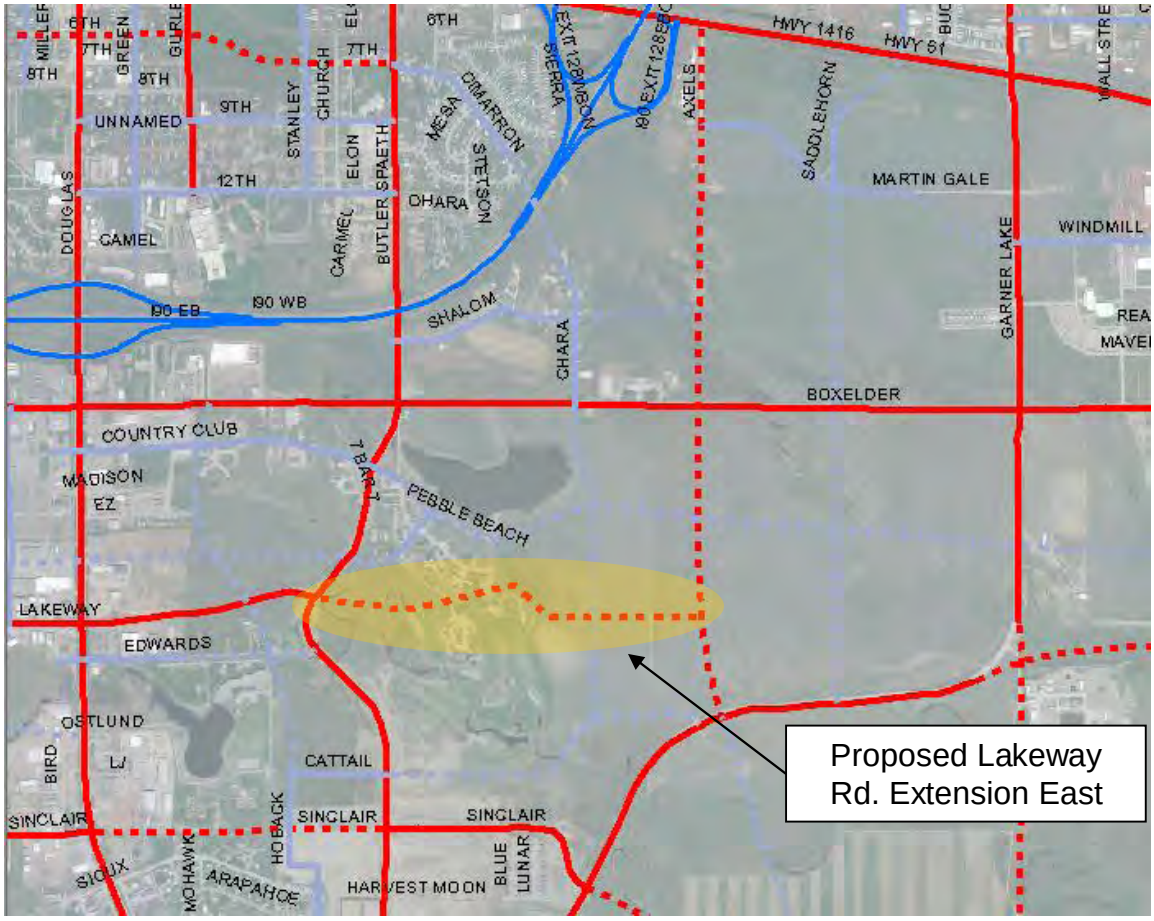
5.1.16 Construct Gurley-South Road

Provide a new Collector Street (aligned with Gurley Avenue) from Boxelder Road to Lakeway Road to provide supplemental access to commercial/retail business fronting Highway 59.



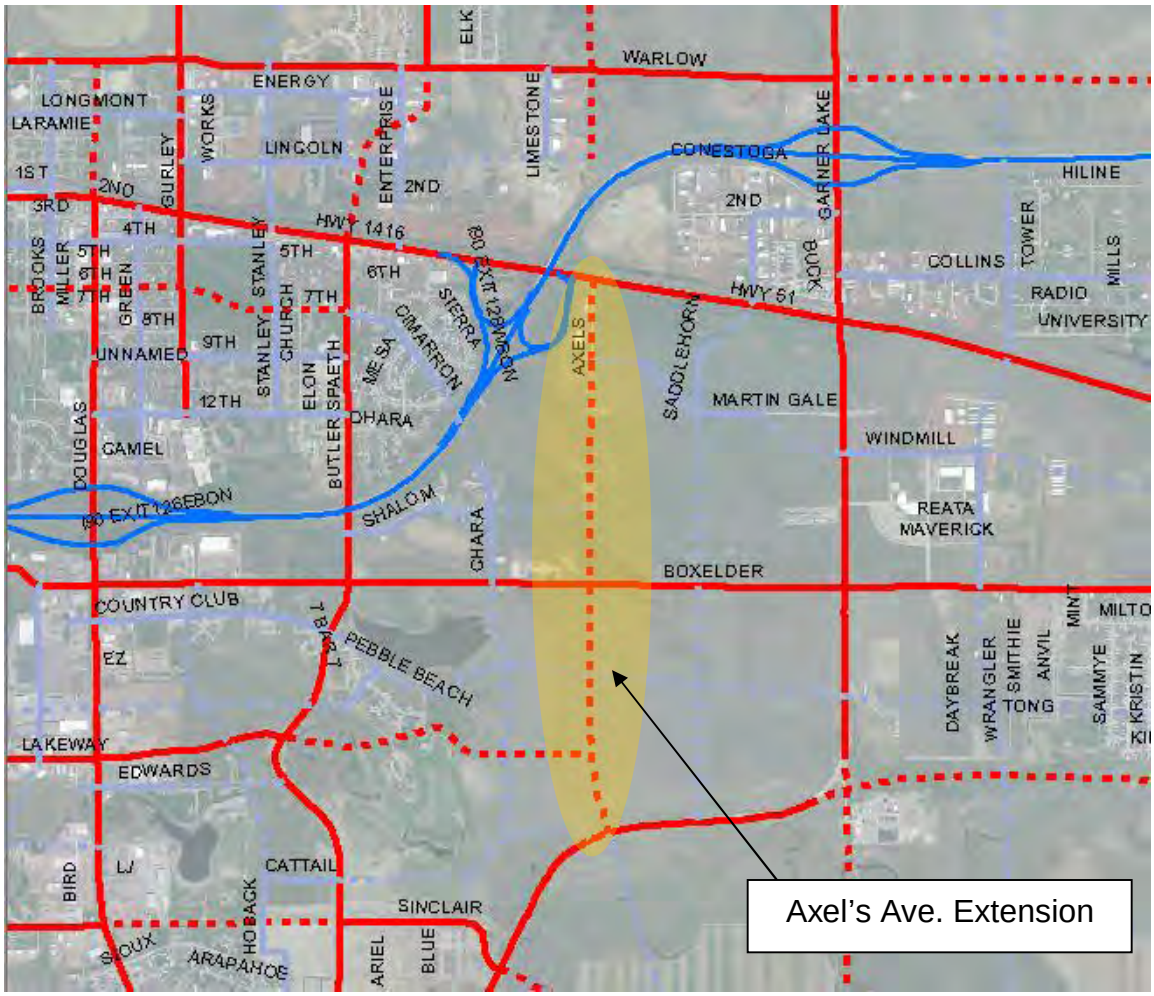
5.1.17 Lakeway Road Extension East

Modeling the projected growth in southeast Gillette shows congestion along Boxelder Road is inevitable. Extending a minor arterial east from the intersection of Lakeway and Butler Spaeth will provide another option for east/west travel. The proposed extension would terminate at the intersection of Axel's Avenue.



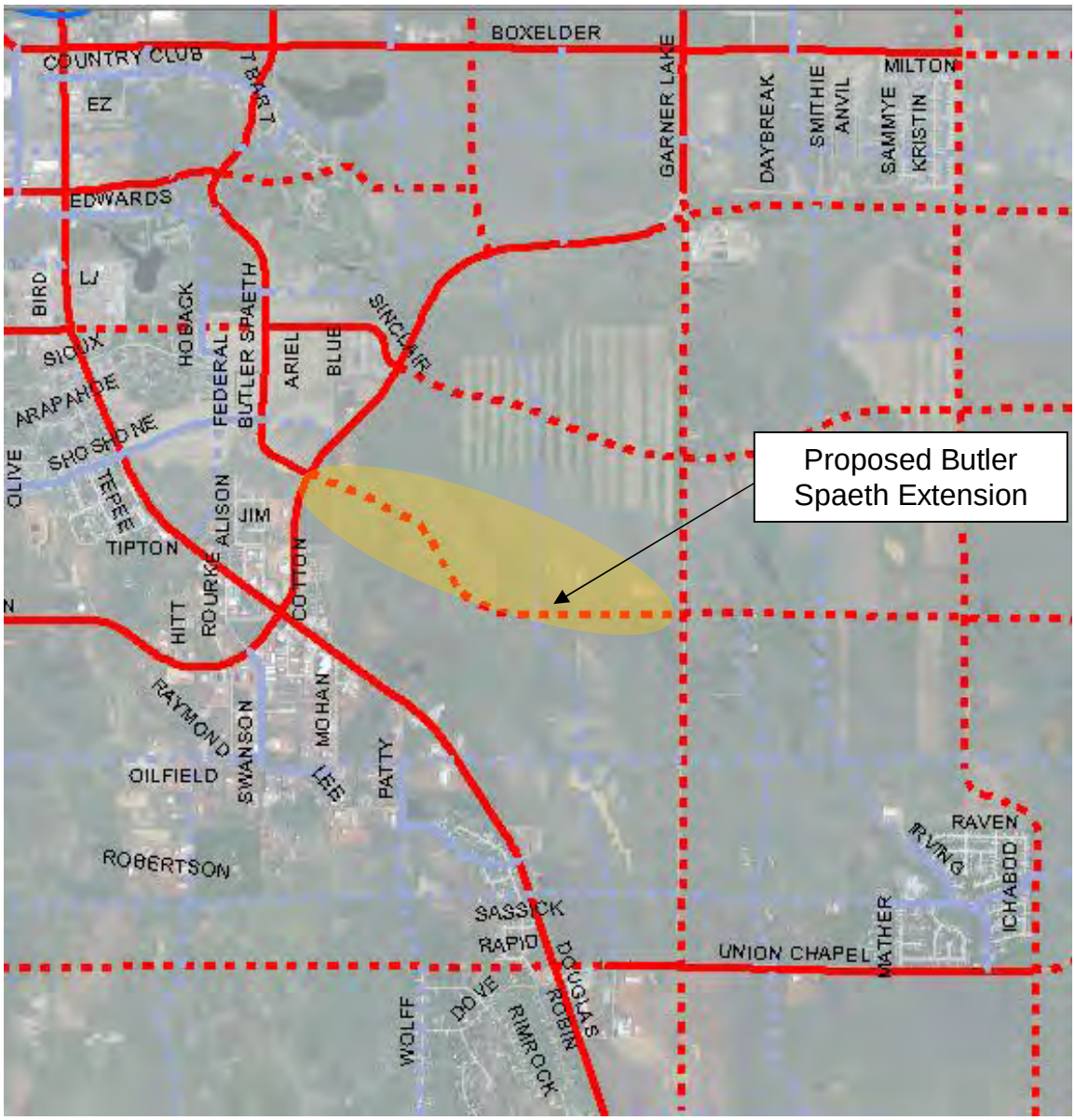
5.1.18 Axel's Avenue Extension

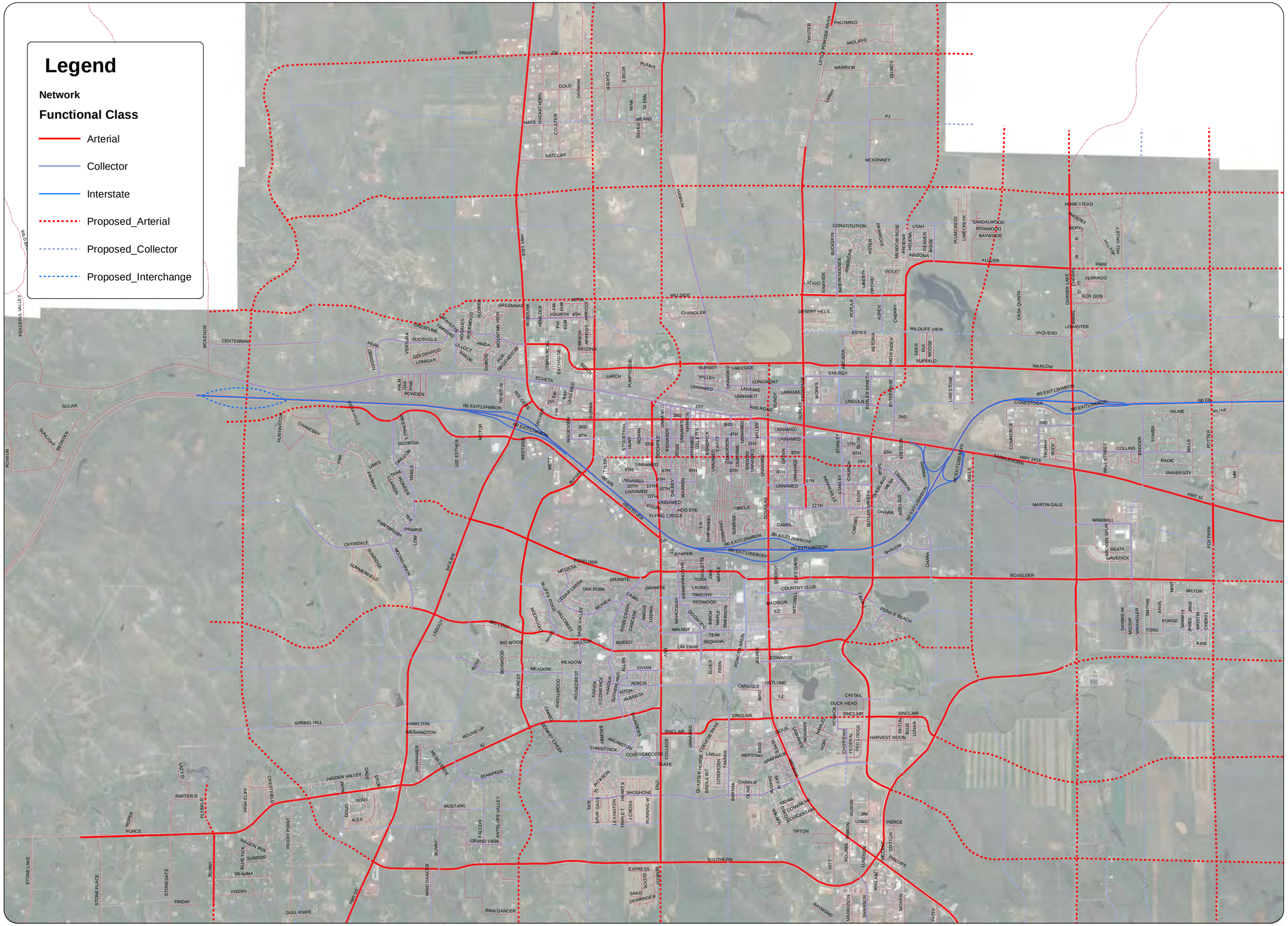
Axel's Avenue is currently a dead-end road branching south from Highway 51. The proposed arterial connects Highway 51 and Garner Lake Road.



5.1.19 Butler Spaeth Extension

Butler Spaeth currently terminates at a "T" intersection with Garner Lake between Sinclair Street and Highway 59. An arterial extension from this intersection east into the proposed Garner Lake South provides east/west connectivity for the future network.





GILLETTE TRANSPORTATION PLAN UPDATE
PROPOSED FUTURE NETWORK

DOWL HKM

Figure No.
5 - 1

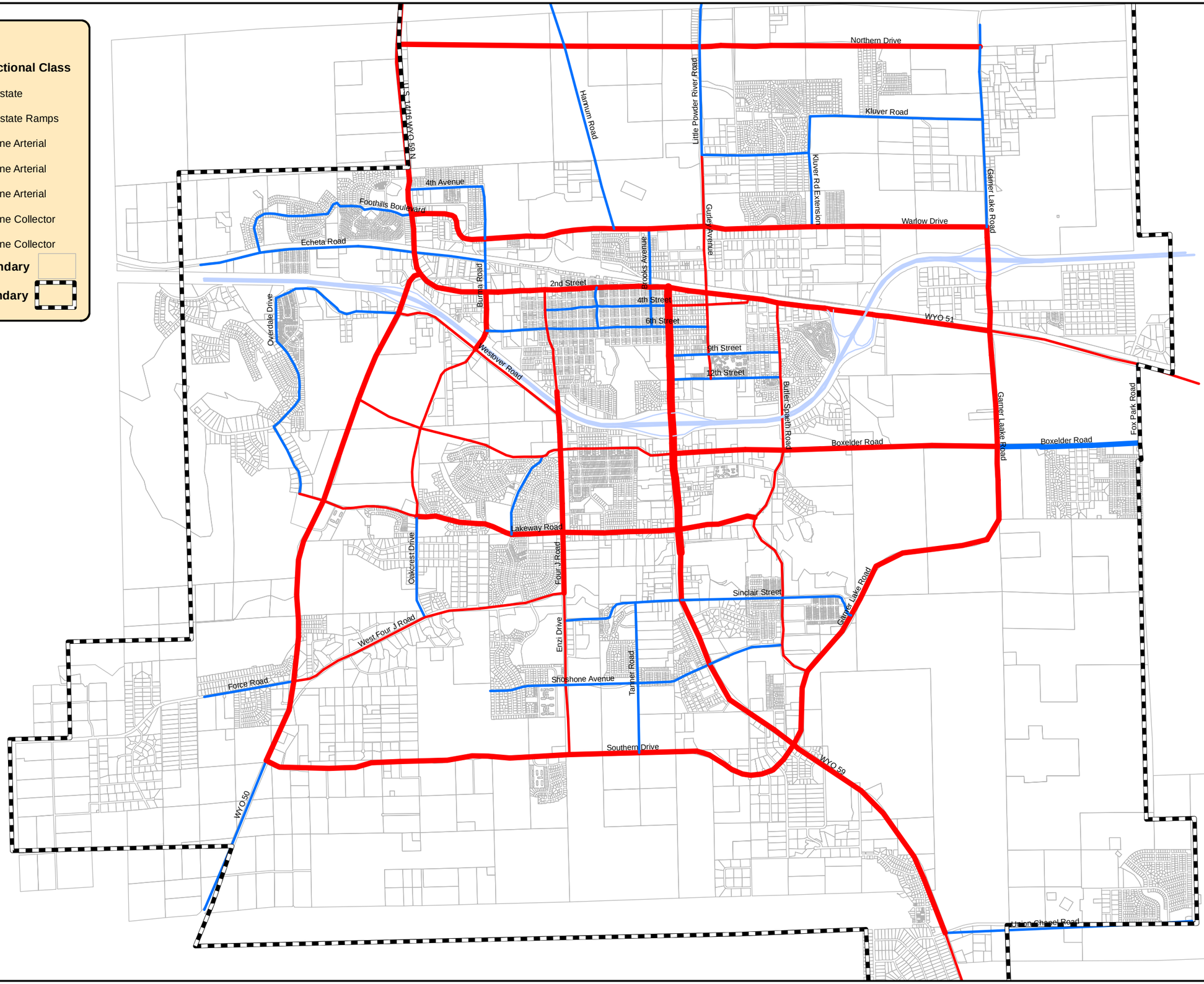
Legend

Lanes, Functional Class

- Interstate
- Interstate Ramps
- 6 Lane Arterial
- 4 Lane Arterial
- 2 Lane Arterial
- 4 Lane Collector
- 2 Lane Collector

Parcel Boundary

Model Boundary



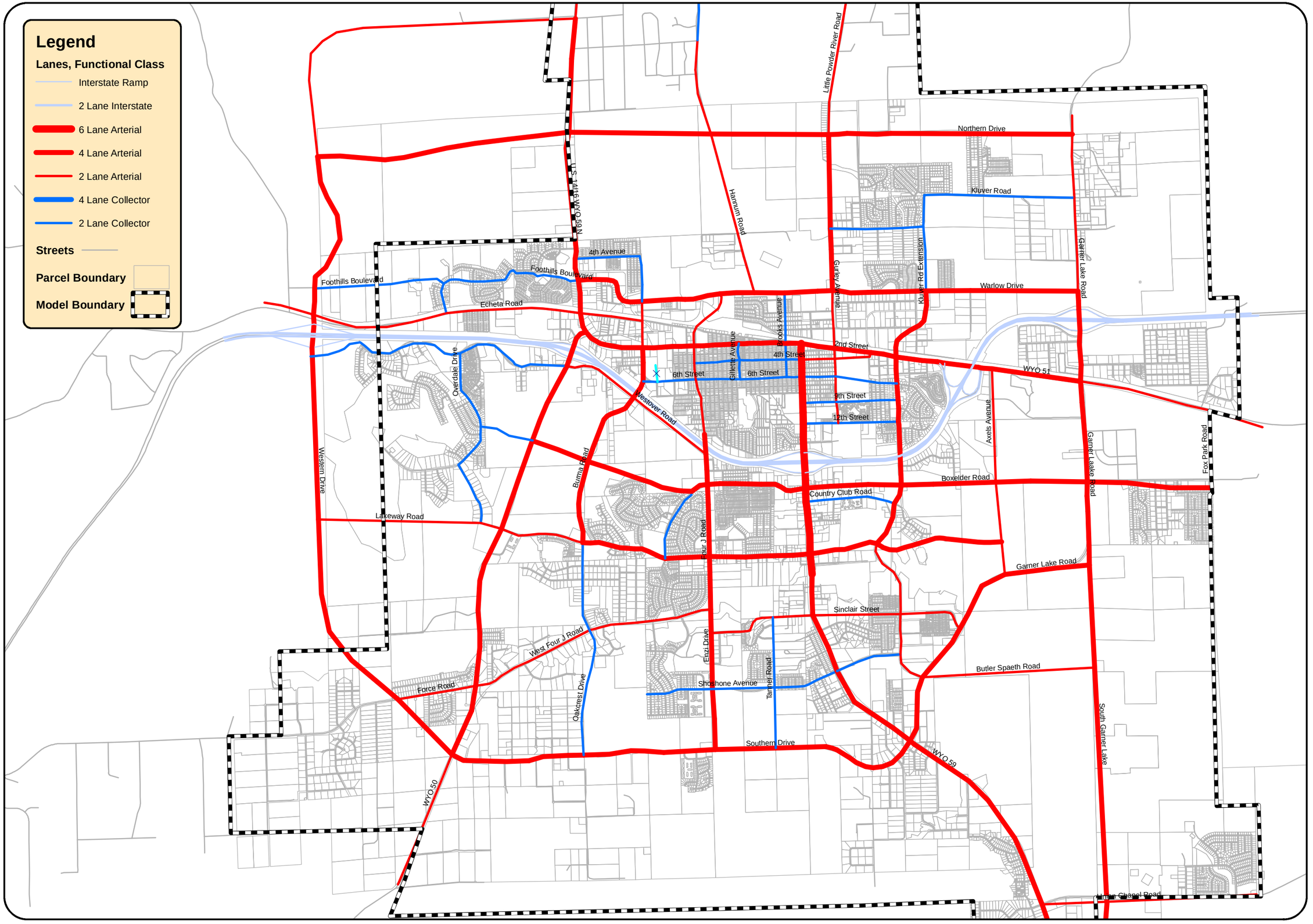
GILLETTE TRANSPORTATION PLAN UPDATE

COMMITTED NETWORK - Lanes and Functional Class

DOWL HKM

Figure No.

5-2



GILLETTE TRANSPORTATION PLAN UPDATE

PROPOSED NETWORK - Lanes and Functional Classification

DOWL HKM

Figure No.

5-3

6.0 Level of Service Analysis

Level of service (LOS) is a quality measure describing operational conditions within a traffic stream. Operational conditions affecting the LOS include speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. LOS is determined by the ratio of a roadway's volume to its capacity. A level of service analysis was performed for the purpose of relating each roadway's volume and capacity. Table 6-1 shows each LOS, its corresponding volume-to-capacity ratio (v/c), and a general description of the traffic conditions to be expected within the LOS.

Table 6-1. Level of Service Relationships.

Level of Service	V/C Ratio	Description
A	0.00 to 0.65	Below capacity. Free-flow conditions with unimpeded maneuverability. Delay at signalized intersections is minimal.
B	0.66 to 0.75	Below capacity. Reasonably unimpeded traffic flow with slightly restricted maneuverability. Intersection delays are still minimal.
C	0.76 to 0.85	Below capacity. Speeds and maneuverability controlled due to increased traffic volumes.
D	0.86 to 0.95	Approaching capacity. Restriction of maneuverability and controlled-intersection delays become substantial.
E	0.96 to 1.00	At capacity. Conditions maintain low speeds and increased intersection congestion.
F	above 1.00	Over capacity. Very low speeds, long delays, and low degree of maneuverability.

A service volume table, shown in Table 6-2, can be calculated from the LOS v\c relationships. The service volume table relates the number of lanes for a given urban roadway to the average daily traffic (ADT) threshold within each LOS. For example, the maximum ADT a major arterial, such as Highway 14/16, can handle and still maintain a LOS C is 33,660 vehicles. The corridor will operate at an unacceptable LOS (D, E, or F) with an ADT greater than 33,660 vehicles.

The assumptions made in the Table 6.2 are general and may not apply to all roadways in the Gillette network. Roadway intersections play a significant role in the determination of LOS. Effective green ratio is a relation between the effective green time of a traffic signal to the entire time period of the signal cycle. For example, an effective green ratio for major arterials of 0.55 assumes the signal is green at all intersections for the traffic on the arterial roadway 55 percent of the time. This is a reasonable assumption for intersections with minor arterials, collectors, and locals. However, in the event of an intersection with another major arterial, such as the intersection of HWY 59 and Boxelder, the green time for each roadway may be reduced.

Despite the affect intersections have on traffic flow and congestion, the LOS analysis based on roadway capacity provides a good indication of how well the proposed network will handle future traffic.

The following results show how the existing, committed, and proposed networks accommodate the various levels of traffic.

Table 6-2. Service Volume Table.

Level of Service Threshold Volumes						
Total Daily Vehicles (ADT)						
	LOS A	**LOS B**	**LOS C**	**LOS D**	**LOS E**	**LOS F**
Interstate						
4 Lanes	49920	57600	65280	72960	76800	> 76800
Major Arterial						
4 Lanes	25740	29700	33660	37620	39600	> 39600
2 Lanes	12870	14850	16830	18810	19800	> 19800
Minor Arterial						
4 Lanes	20475	23625	26775	29925	31500	> 31500
2 Lanes	10238	11813	13388	14963	15750	> 15750
Collector/Local						
4 Lanes	15470	17850	20230	22610	23800	> 23800
2 Lanes	7735	8925	10115	11305	11900	> 11900

Note: The table above is based on the Highway Capacity Manual and the following assumptions.

	Interstate	Major Art.	Minor Art.	Collector/Local
Effective Green Ratio	0.8	0.55	0.45	0.35
Adj. Sat. Flow	2400	1800	1750	1700
Signal Density (sig/mi)		0.8	3	5

Table 6-2 was used to analyze the existing traffic conditions based on daily traffic counts from 2006 for the Gillette area, as well as the predicted future conditions for the following scenarios.

- Figure 6-1 Existing Network (Population: 31,745)
- Figure 6-2 Committed Network (Population: 31,745)
- Figure 6-3 Committed Network (Population: 35,000)
- Figure 6-4 Committed Network (Population: 38,000)
- Figure 6-5 Committed Network (Population: 50,000)
- Figure 6-6 Proposed Network (Population: 38,000)
- Figure 6-7 Proposed Network (Population: 50,000)

A review of the model results compared to the 2006 traffic counts show the model is calibrated well, and the main traffic tendencies exhibited by the model reflect the tendencies of traffic in Gillette.

Figure 6-1: Existing Network (Population: 31,745)

The existing Gillette network shows several areas of congestion using the analysis criteria described above. Some of the noticeable areas are:

- Highway 50 near 2nd Street has a LOS F.
- Brooks Street and Gurley Avenue crossings of the railroad tracks are congested.
- 4J Road shows stretches of congestion between 4th Street and I-90.

Figure 6-2: Committed Network (Population: 31,745)

Figure 6-2 shows a model run with the committed network and the existing population. The committed network consists of roadways in the existing network, plus roadways currently in construction or design, and includes the additions of Burma Road, Boxelder Road, Northern Drive, reconstruction of Highway 50 to four lanes, and an extension of Tanner Drive south to Southern Drive. With these roads, and a population of 31,745, the following points were noted:

- The addition of two lanes to Highway 50 helps relieve the congestion on Highway 50. However, the intersection of Highway 50 and Highway 14/16 will likely continue to be a bottleneck due to the volume of traffic at this intersection.
- Burma Road provides north/south connectivity to offload traffic on Highway 50 and 4J.
- The extension of Tanner Drive to the south provides school access and added north/south connectivity.
- The Brooks Street crossing of the railroad tracks is congested, as in the existing model run. In other words, none of the "committed" projects helps ease congestion on the railroad crossings.

Figure 6-3: Committed Network (Population: 35,000)

Figure 6-3 shows a model run with the committed network and a 35,000 population. With the committed network and a population of 35,000, the following points were noted:

- Volumes throughout Boxelder increase, possibly due to the additional mobility gained by the extension of Boxelder to the west.
- Volumes continue to increase along Enzi.
- The Gurley Avenue crossing of the railroad tracks becomes more congested.

Figure 6-4: Committed Network (Population: 38,000)

Figure 6-4 shows a model run with the committed network and a 38,000 population. With these roads, and a population of 38,000, the following points were noted:

- Growth in the area around the community college such as the new elementary school and rec. center create a high amount of traffic on Enzi Drive north of Sinclair Street.
- Growth in southeast Gillette causes the traffic in the Garner Lake/Butler-Spaeth area to increase.
- The Gurley Avenue and Burma crossings of the railroad tracks become more congested.

Figure 6-5: Committed Network (Population: 50,000)

Figure 6-3 shows the results of the 50,000 population growth scenario modeled on the committed network. This model scenario illustrates the need for network improvements beyond what is currently committed. There is a significant increase in roadway miles demonstrating undesirable congestion. Some noticeable areas are:

- All areas of elevated volumes discussed in the previous scenarios are magnified.
- All north-south railroad crossings show congestion.
- East-west streets between Highway 59 and 4J; particularly Sinclair and Boxelder have congestion.
- Butler Spaeth shows congestion from Lakeway north to 12th Street.
- Highway 59 south of Southern Drive shows congestion.
- Union Chapel road shows congestion.

Figure 6-6: Proposed Network (Population: 38,000)

Figure 6-6 shows the results of the 38,000 population growth scenario modeled on the proposed network. The proposed network provides additional mobility and connectivity through the addition of the corridors described

in the "Proposed Network" section of this report. Some noticeable points about this model run are:

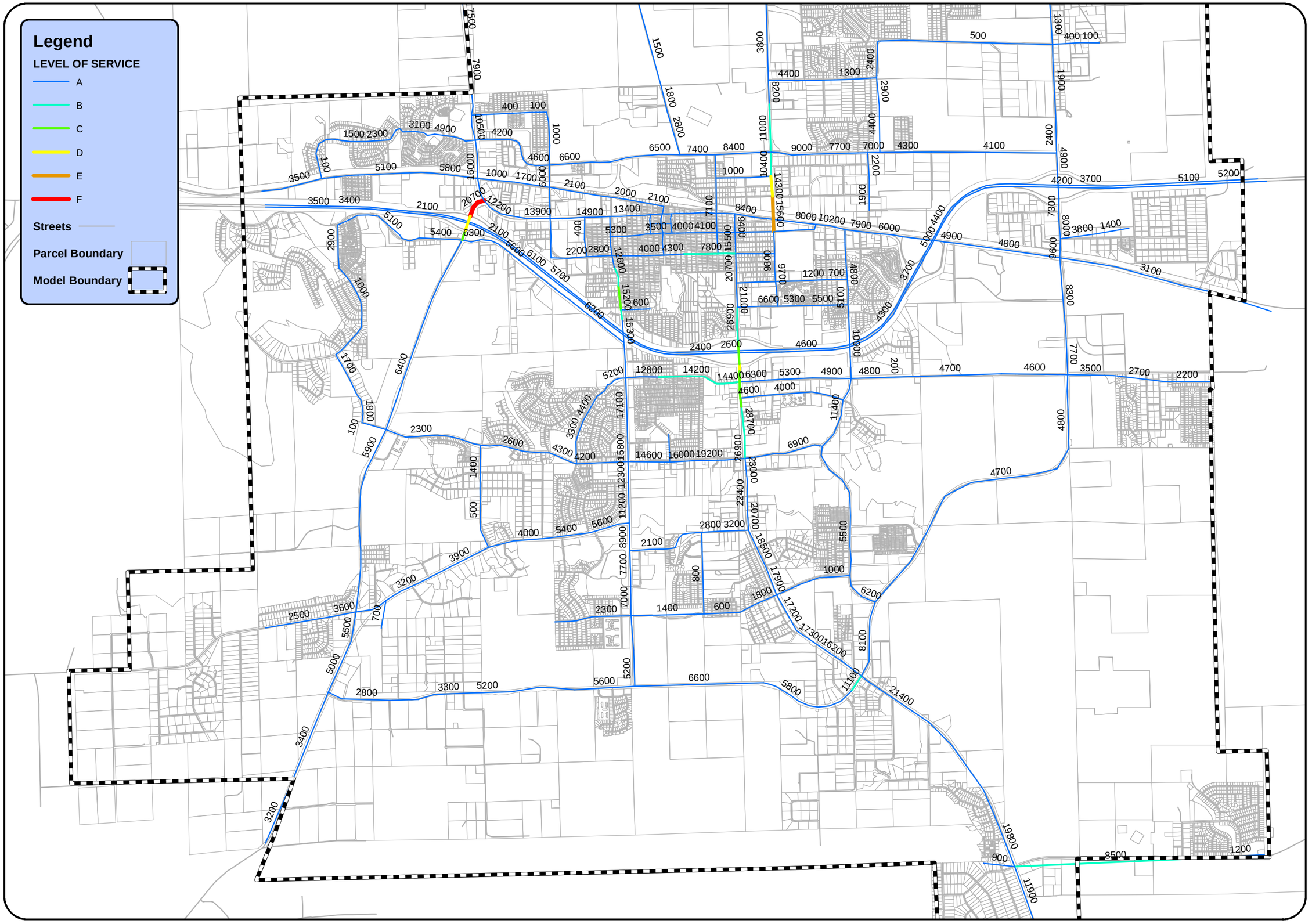
- A large amount of traffic is shifted to the new crossings of the railroad at Butler Spaeth and 4J, improving the LOS on Gurley, Brooks, and Burma.
- Highway 59 also shows relief due to Garner Lake South and the Lakeway extension.
- Additional lanes on Boxelder are utilized by the increased traffic volume.

Overall, the proposed network handles the 38,000 population traffic well.

Figure 6-7: Proposed Network (Population: 50,000)

Figure 6-7 shows the results of the 50,000 population growth scenario modeled on the proposed network. Comparing Figure 6-7 to Figure 6-5 shows the ability of the proposed network to handle future traffic and alleviate congestion resulting from future development. Noticeable areas are:

- The proposed arterial network in the southeast portion of Gillette appears to be well utilized, and includes Garner Lake South, Axel's, Boxelder, and East Lakeway.
- The 4J and Butler Spaeth overpasses of the railroad appear to successfully offload the north-south traffic from the other railroad crossings.
- Volumes on Garner Lake South are double those seen with a city population of 38,000 which allows Highway 59 to maintain an acceptable LOS.
- Western Drive and the western interchange handle a fair amount of traffic, which helps congestion in the Highway 50 / I-90 and Hwy 14/16 area.
- Westover west of Hwy 50 shows congestion. An extension of Boxelder to Pioneer would help offload traffic from the residential developments west of Highway 50.



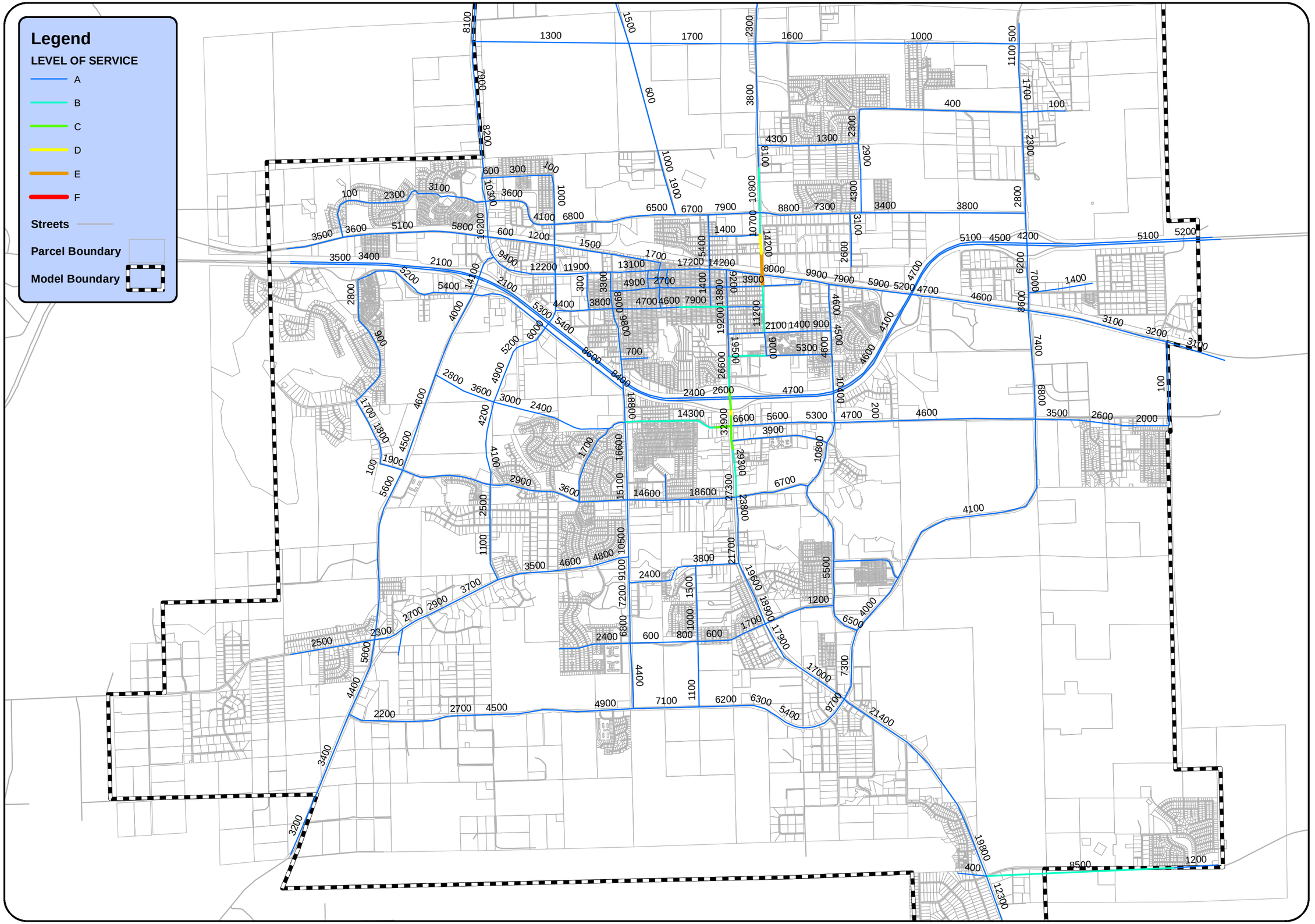
GILLETTE TRANSPORTATION PLAN UPDATE

EXISTING NETWORK (POPULATION: 31,745)

DOWL HKM

Figure No.

6 - 1



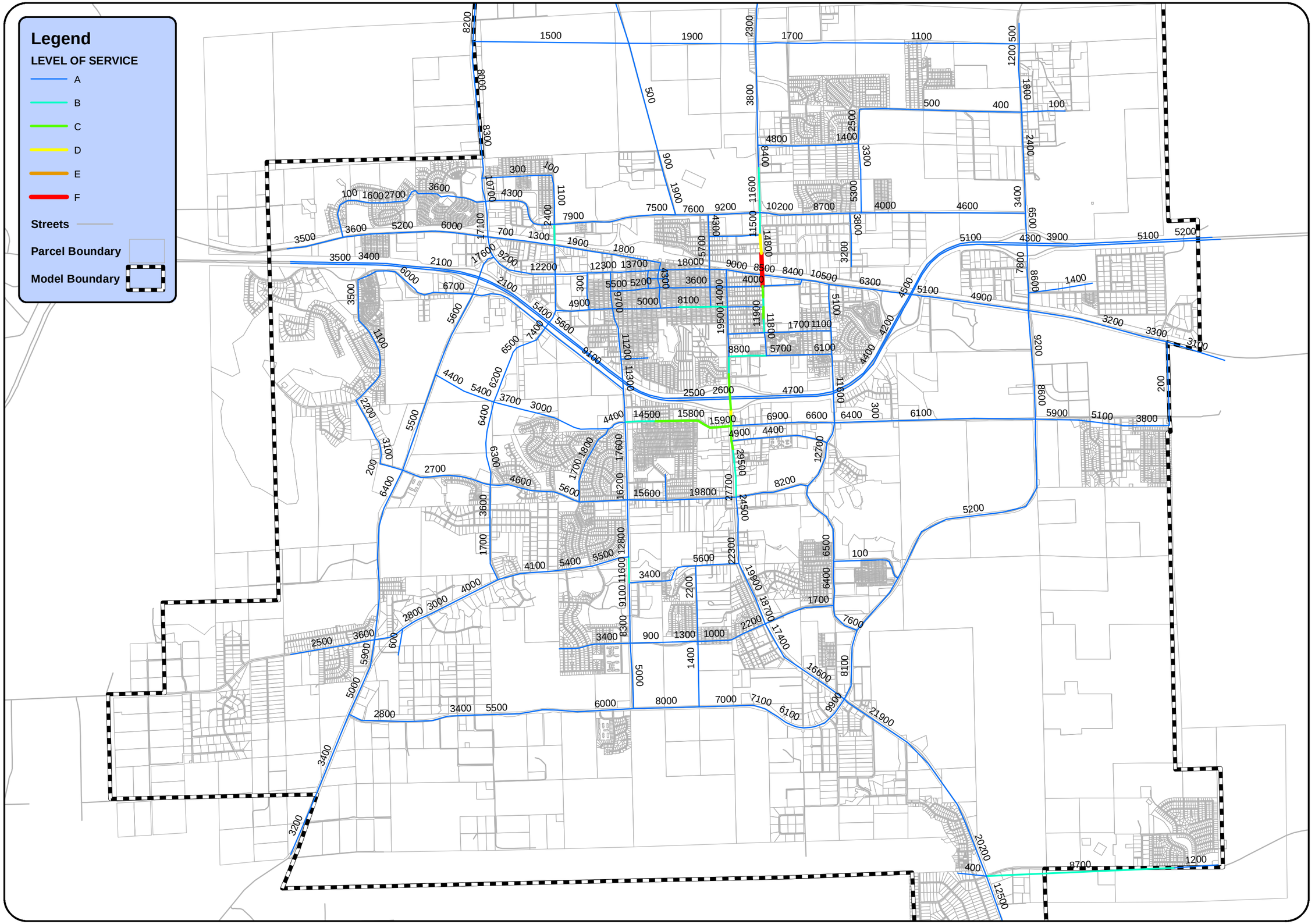
GILLETTE TRANSPORTATION PLAN UPDATE

COMMITTED NETWORK (POPULATION: 31,745)

DOWL HKM

Figure No.

6 - 2



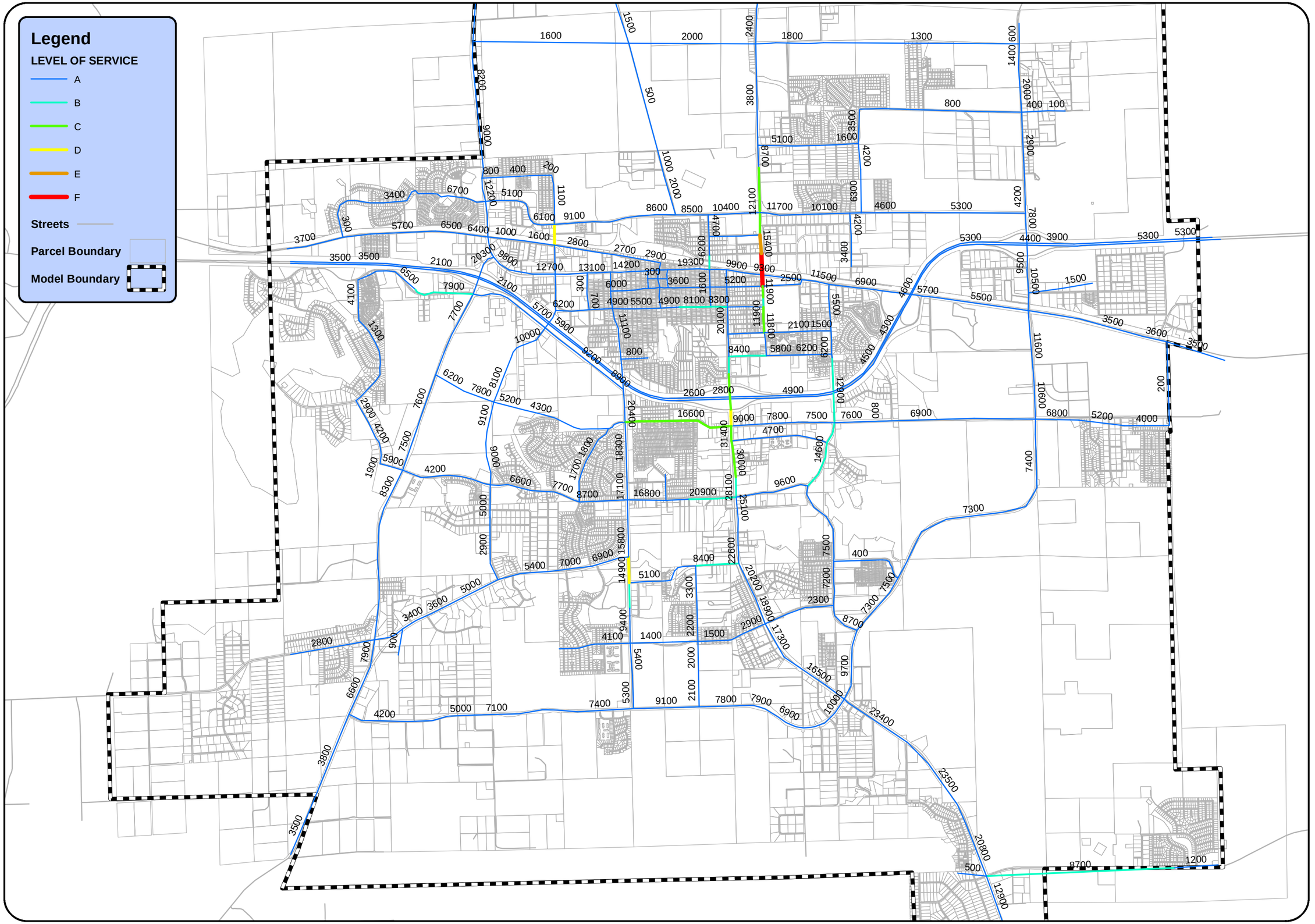
GILLETTE TRANSPORTATION PLAN UPDATE

COMMITTED NETWORK (POPULATION: 35,000)

DOWL HKM

Figure No.

6 - 3



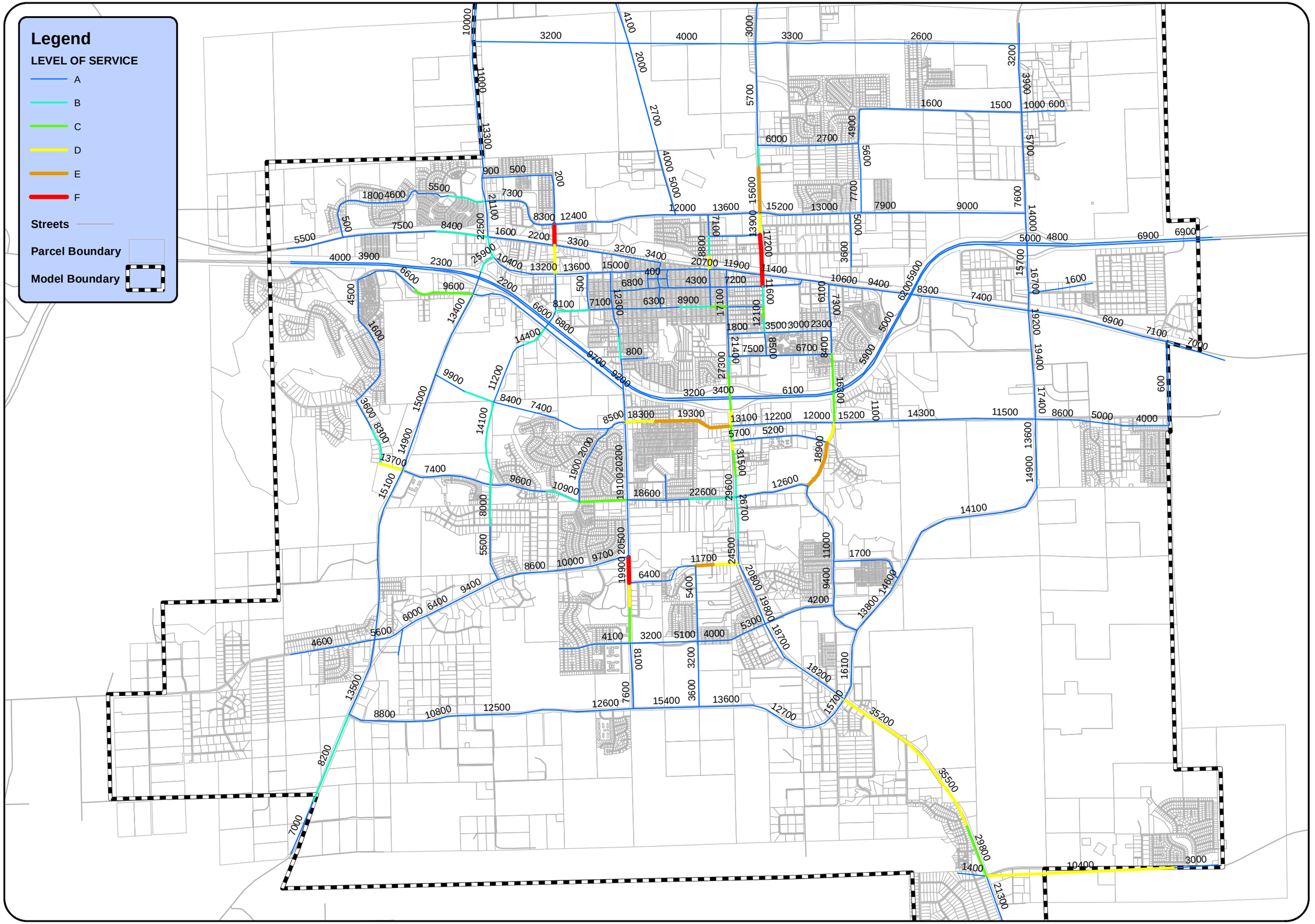
GILLETTE TRANSPORTATION PLAN UPDATE

COMMITTED NETWORK (POPULATION: 38,000)

DOWL HKM

Figure No.

6 - 4



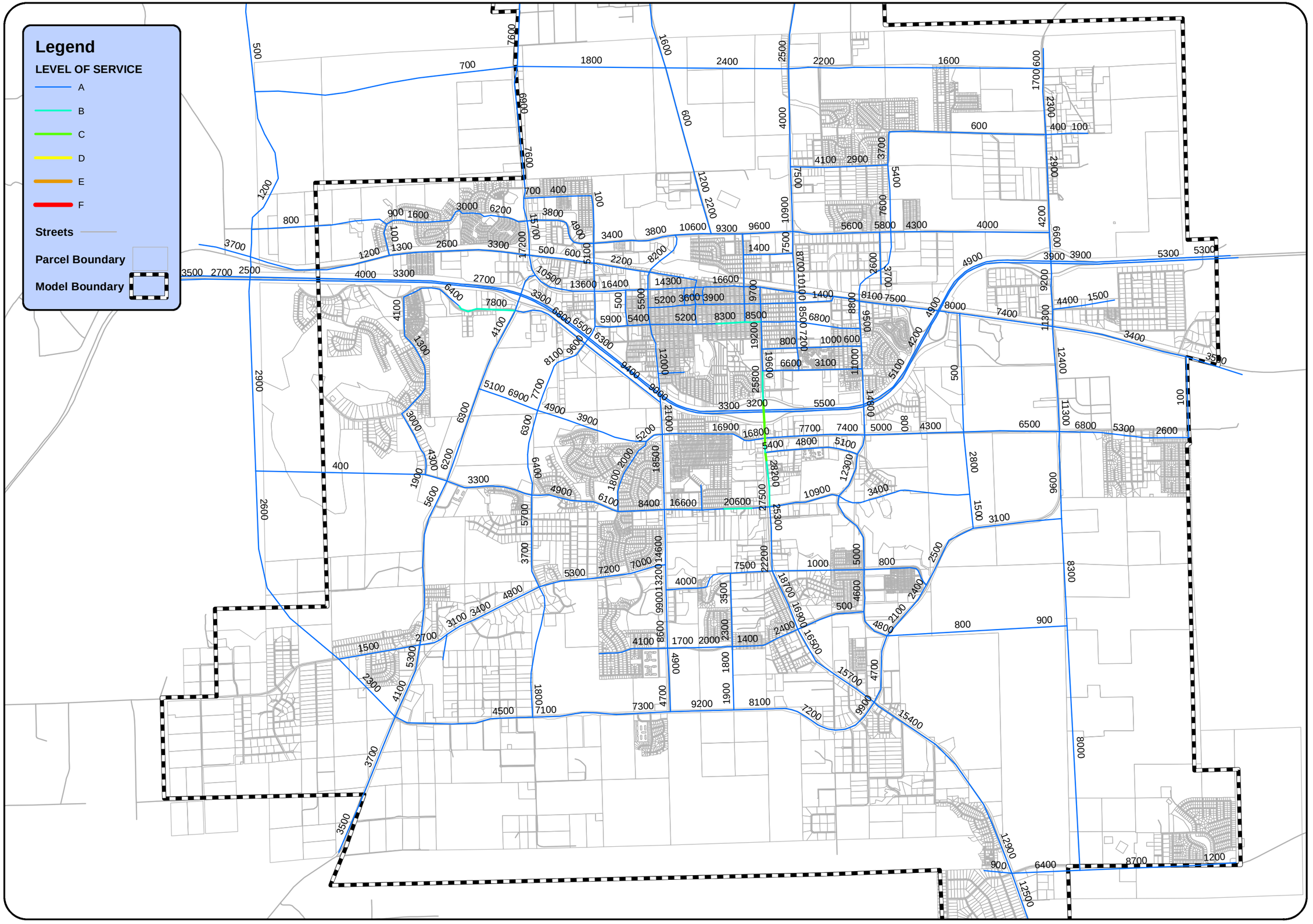
GILLETTE TRANSPORTATION PLAN UPDATE

COMMITTED NETWORK (POPULATION: 50,000)

DOWL HKM

Figure No.

6 - 5



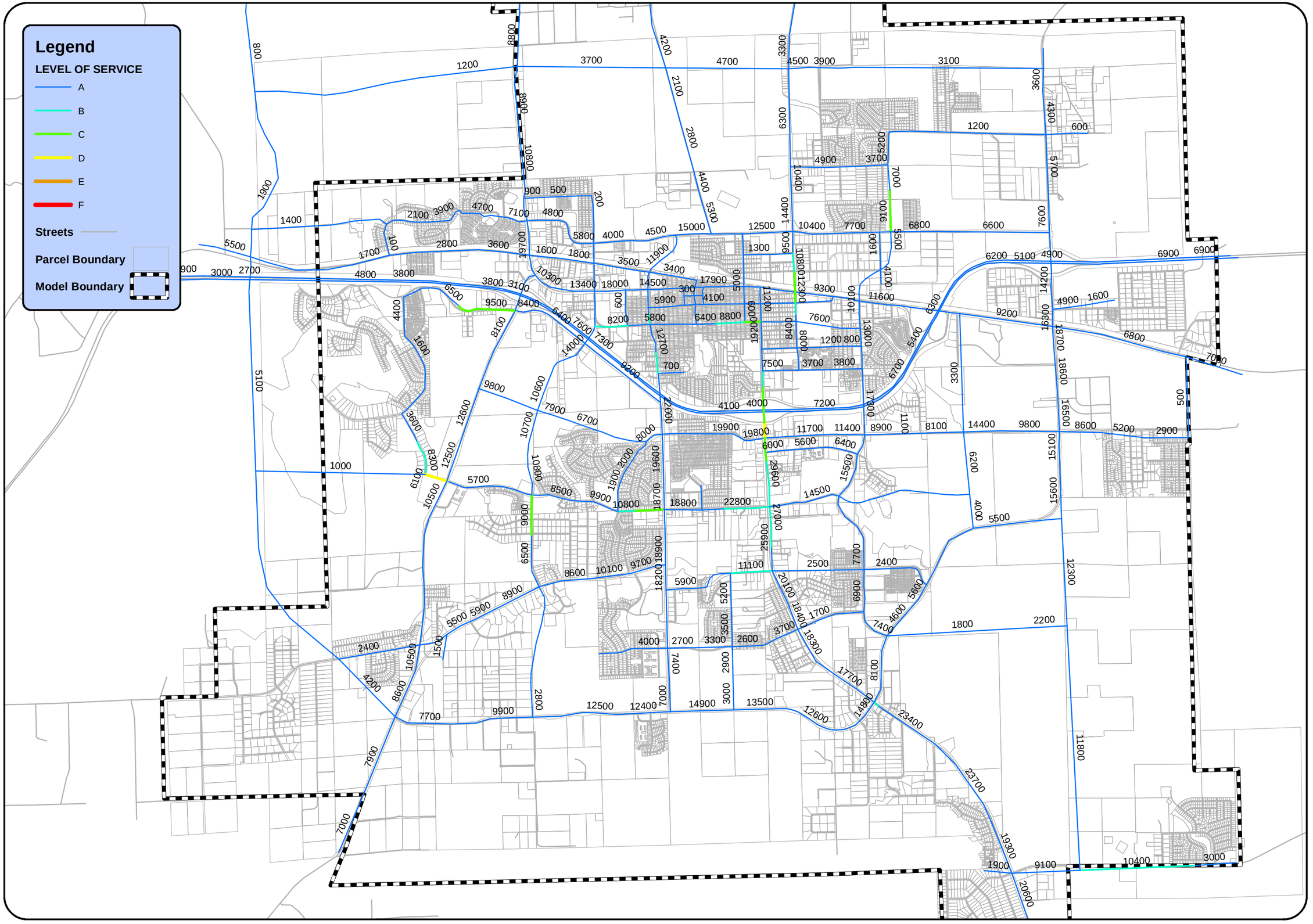
GILLETTE TRANSPORTATION PLAN UPDATE

PROPOSED NETWORK (POP: 38,000)

DOWL HKM

Figure No.

6 - 6



GILLETTE TRANSPORTATION PLAN UPDATE

PROPOSED NETWORK (POP: 50,000)

DOWL HKM

Figure No.

6 - 7

7.0 Transportation Improvement Plan

7.1 Roadway Project Prioritization

The transportation improvement projects discussed in Section 4 and 6 of this report were prioritized primarily based on impact to the transportation network. Transportation improvements were identified in three (3) categories, for prioritization. These categories were City projects, Non-city or joint projects, and signal projects. Tables 7-1, 7-2 and 7-3 show the priority lists and cost estimates for these groups of projects.

Although projects were mainly prioritized based on need for improving traffic, some project priorities were adjusted based on funding or projects scheduled in other capital improvement plans. It should be noted the priorities shown are approximate, and may be adjusted due to funding or growth patterns. Figure 7-1 shows the proposed 15-year improvement plan.

7.2 Signal Prioritization

As traffic increases on the roadway network, installing signals or other traffic control at intersections becomes necessary to improve traffic flow. Table 7-3 shows the priority signal projects for the next 5 years. The prioritization evaluated current and forecasted traffic volumes to prioritize the signals. Priority for the signal projects was also evaluated based on coordination with funding and construction of other priority projects. For example, the signal at Boxelder / Powder Basin was coordinated to be constrtucted at the same time as the realignment of Boxelder. The prioritized intersections are as follows:

1. Powder Basin / Lakeway (currently has temporary signal) – This signal is currently being designed and should be constructed in the fall of 2009.
2. 6th Street / 4J (currently has temporary signal) – Will be designed and constructed fall of 2009 or spring of 2010. This signal project will account for grade issues on 6th Street.
3. Powder Basin / Boxelder
4. 4th Street / Gurley
5. Garner Lake / Boxelder
6. Shoshone / Enzi

Appendix C contains the analysis and background information for the signal prioritization.

7.3 Roundabouts

As the signal prioritization proceeds, the City of Gillette should consider implementation of roundabouts as an alternative to signals at some locations. For some situations, roundabouts have the potential to provide the following benefits:

- Improve safety - A study by the Insurance Institute for Highway Safety indicates roundabouts reduce crashes by 75 percent at intersections where stop signs or signals were previously used for traffic control. Reasons for this improved safety include:
    - Less potential for serious crashes – since vehicles all travel around the center island in the same direction, head-on and left-hand turn (T-bone) collisions are eliminated.
    - Low travel speeds – because drivers must yield to traffic before entering a roundabout, they naturally slow down. The few collisions that occur in roundabouts are typically minor with few injuries, since they occur at low speeds of 15 – 20 miles per hour.
    - No red lights to run – roundabouts are designed to keep traffic flowing without requiring vehicles to stop, so the incentive for drivers to speed up to make it through a yellow or red light is eliminated.

- Reduce delay and improve traffic flow - Contrary to the perception of many, roundabouts actually move traffic through an intersection faster and with less congestion on approaching roads. Roundabouts promote a continuous flow of traffic. Unlike intersections with traffic signals, traffic doesn't have to wait for a green light at a roundabout to get through the intersection. Traffic is not required to stop – only yield – so the intersection can handle more traffic in the same amount of time. However, a two lane roundabout is typically effective up to about 50,000 average daily traffic (ADT) volumes. Most intersections in Gillette have less traffic than 50,000 ADT.

  Studies by Kansas State University http://www.ksu.edu/roundabouts/ have measured traffic flow at intersections before and after conversion to roundabouts. In each case, installing a roundabout led to a 20 percent reduction in delays. The proportion of vehicles that had to stop – just long enough for a gap in traffic – was also reduced.

- Cost - The cost to build a roundabout and a traffic signal is comparable. A roundabout may need more property within the actual intersection, but takes up less space on the streets approaching the roundabout. Roundabouts usually require less overall property to build than a signal with turn lanes because traffic doesn't have to line up and wait for a green light. In addition to reducing congestion and increasing safety, roundabouts eliminate hardware, maintenance and electrical costs associated with traffic signals, which can amount to approximately $5,000 per year. In addition, many communities are favorable to the aesthetics of a well-designed and landscaped roundabout.

Roundabouts are safe and efficient, but they are not the ideal solution for every intersection. Several factors must be considered when deciding to build a roundabout at a specific intersection.

- Accident history – data about the number of accidents, type of crash, speeds, and other contributing factors are analyzed.
- Intersection operation – the level of current and projected travel delay being experienced, and backups on each leg of the intersection.
- Types of vehicles using the intersection – we look at the different kinds of vehicles that use the intersection. This is especially important for intersections frequently used by large trucks.
- Cost – this includes the societal cost of accidents, right-of-way (land purchase) requirements, and long-term maintenance needs.

Roundabout information taken in part from http://www.wsdot.wa.gov/Projects/roundabouts/benefits.htm , Washington State DOT.

Some of the potential roundabout locations in Gillette are:

- Burma and Boxelder
- Garner Lake Road and Boxelder
- Warlow and Kluver
- Westover and Overdale
- Brooks and Warlow
- Gurley and Kluver
- Additional locations where traffic on both intersecting streets is approximately equal and where topography and R.O.W. allow.

7.4 Transportation Improvement Plan Implementation

The City of Gillette, Campbell County and the WYDOT have been very proactive in implementation of the recommendations of the **2004 Transportation Planning Study**. Similar to the previous plan, funding sources will play a big role in implementing this plan.

Aside from funding, additional study may be warranted prior to design and construction of some of the projects identified in the transportation improvement plan. A few examples of these additional studies are:

- 6th Street improvement reconnaissance study – since 6th street is currently a local-through street with parking and direct access, a reconnaissance study should be performed to identify a cross section to mitigate concerns with increasing traffic volumes on 6th and the adjacent residences. This study should also identify improvements to the grade and slopes as well as the potential to manage accesses along this street.
- Boxelder widening and access management reconnaissance study – this study would look at options to widening Boxelder from Highway 59 to 4J, and access management of the many accesses along this arterial.
- Western Drive corridor study – this study would evaluate options for installing Western Drive from Highway 50 to Highway 14/16. This study would identify the R.O.W. requirements, potential interchange and roadway locations, and costs for the various options.
- Western Drive interchange feasibility/justification study. These studies are required by the Federal Highway administration (FHWA) for any new interchange on the interstate system.
- Railroad crossing alternative analysis – This study identifies the need for new railroad crossings. The previously completed *Railroad Crossing Alternatives Evaluation* prioritized the railroad crossings based on a cost / benefit analysis. Some additional study and consideration may be needed to identify and prioritize the potential railroad crossing improvements.

Also, updating this transportation plan is important as Gillette grows and new roadways are built. A review of proposed legislation for the federal transportation bill indicates an emphasis will be placed on having a transportation plan with specific performance standards. Also, this bill will require new road projects to be comprehensive and multi-modal, so all new road projects should incorporate comprehensive street design principles, which take into account the needs of all users. This is typically done already in Gillette, but may need to be emphasized or publicized more in future designs.

TABLE 7-1
2009 GILLETTE TRANSPORTATION PLAN UPDATE
2009 to 2023 (*PROPOSED FIFTEEN YEAR PLAN*)
CITY OF GILLETTE PROJECTS

PRIORITY	CONSTRUCTION YEAR (APPROX.)	PROJECT	PROPOSED FUNCTIONAL CLASSIFICATION	LENGTH (MILES)	EST.CONSTRUCTION COSTS		ANTICIPATED R/W AND EASEMENT ACQUISITION COSTS (2009 DOLLARS)	ESTIMATED PROFESSIONAL SERVICES (2003 DOLLARS)				ESTIMATED TOTAL COSTS 2009 DOLLARS (MILLIONS)
					UNIT COST 2009 DOLLARS (MILLIONS/MILE)	EXTENDED COST 2009 DOLLARS (MILLIONS)		LEGAL FEES	APPRAISAL AND R/W NEGOTIATION	DESIGN ENGINEERING	CONSTRUCTION ENGINEERING	
1	**2009**	Cocklebur Extension	Collector				-					0.4
2	**2010**	Boxelder Road Extension from Four J to Burma	Arterial	1.0	3.0	3.0	200,000.00	$ 150,000.00	$ 90,000.00	$ 300,000.00	$ 300,000.00	4.0
3	**2010**	6th Street Grade Improvements	Minor Arterial / Major Collector	0.5	2.26	0.40	$ 200,000.00	$ 90,000.00	$ 40,000.00	$ 40,000.00	$ 40,000.00	0.6
4	**2011**	Boxelder Road Extension from Burma to Highway 50	Arterial	0.5	3.0	1.4	10,000.00	$ 60,000.00	$ 30,000.00	$ 140,000.00	$ 140,000.00	1.8
5	**2011**	Expand Enzi Drive to 5 lanes from 4J Road to Southern Drive	Arterial	1.1	1.45	1.61	-NA- City Owned	-	$ 160,000.00	$ 160,000.00	$ 160,000.00	1.9
6	**2012**	Tanner Drive Extension	Collector				-					1.8
7	**2012**	Extend 6th Street to Stanley/7th Street	Minor Arterial	0.3	2.26	0.74	$ 850,000.00	$ 42,500.00	$ 70,000.00	$ 70,000.00	$ 70,000.00	1.8
8	**2012**	Expand Boxelder to 5 lanes from Hwy 59 to Emerson	Arterial	0.3	4.01	1.20	$ 100,000.00	$ 5,000.00	$ 120,000.00	$ 120,000.00	$ 120,000.00	1.7
9	**2013**	Railroad Overpass - Location to be determined	Arterial RR Overpass	-	-	7.69	$ 3,310,000.00	$ 165,500.00	$ 770,000.00	$ 770,000.00	$ 770,000.00	13.5
10	**2013**	Expand Boxelder to 5 lanes from Emerson to 4J Road	Arterial	0.5	4.01	2.01		$ -	$ 201,000.00	$ 201,000.00	$ 200,000.00	2.6
11	**2014**	Extend Boxelder to Pioneer/Overdale	Minor Arterial/Major Collector	0.4	1.87	0.78	$ 520,000.00	$ 26,000.00	$ 80,000.00	$ 80,000.00	$ 80,000.00	1.5
12	**2015**	Widen Burma to 5 lanes from Lakeway to Westover	Arterial	1.3	1.45	1.93	-NA- City Owned	-	$ 190,000.00	$ 190,000.00	$ 190,000.00	2.3
13	**2016**	Widen Butler Spaeth to 5 lanes from Boxelder to Hwy 51	Arterial	1.0	2.81	2.87	$ 1,100,000.00	$ 55,000.00	$ 290,000.00	$ 290,000.00	$ 290,000.00	4.6
14	**2017**	Railroad Overpass - Location to be determined	Arterial RR Overpass	-	-	5.81	$ 1,620,000.00	$ 81,000.00	$ 580,000.00	$ 580,000.00	$ 580,000.00	9.2
15	**2018**	Expand Gurley Road to 5 lanes north of Warlow	Arterial	1.3	2.81	3.62	$ 336,000.00	$ 16,800.00	$ 360,000.00	$ 360,000.00	$ 360,000.00	4.7
16	**2019**	Widen Butler Spaeth from Lakeway to Boxelder	Arterial	0.5	1.45	0.73	-NA- City Owned	-	$ 70,000.00	$ 70,000.00	$ 70,000.00	0.8
17	**2020**	Construct Gurley-South Road from Boxelder	Collector	0.9	3.00	2.60	-NA- Acquired through development	-	$ 260,000.00	$ 260,000.00	$ 260,000.00	3.1
18	**2021**	Extend Lakeway east to Axels Ave Extension.	Arterial	1.0	2.26	2.15	$ 1,000,000.00	$ 50,000.00	$ 210,000.00	$ 210,000.00	$ 210,000.00	3.6
19	**2022**	Axels Avenue Extension	Arterial	1.6	2.26	3.62	$ 2,020,000.00	$ 101,000.00	$ 360,000.00	$ 360,000.00	$ 360,000.00	6.4
20	**2023**	Extend Sinclair Street to Butler Spaeth Road	Arterial	0.7	2.26	1.58	$ 880,000.00	$ 44,000.00	$ 160,000.00	$ 160,000.00	$ 160,000.00	2.8

TABLE 7-2
2009 GILLETTE TRANSPORTATION PLAN UPDATE
2009 to 2023
RECOMMENDED IMPROVEMENTS - JOINT PARTNERSHIP / NON-CITY PROJECTS

PRIORITY	CONSTRUCTION YEAR (APPROX.)	PROJECT	PROPOSED FUNCTIONAL CLASSIFICATION	LENGTH (MILES)	EST.CONSTRUCTION COSTS		ANTICIPATED R/W AND EASEMENT ACQUISITION COSTS (2009 DOLLARS)	ESTIMATED PROFESSIONAL SERVICES (2003 DOLLARS)				ESTIMATED TOTAL COSTS 2009 DOLLARS (MILLIONS)	PROJECT DESCRIPTION
					UNIT COST 2009 DOLLARS (MILLIONS/MILE)	EXTENDED COST 2009 DOLLARS (MILLIONS)		LEGAL FEES	APPRAISAL AND R/W NEGOTIATION	DESIGN ENGINEERING	CONSTRUCTION ENGINEERING		
1	2009	Burma Road 2nd Street to Lakeway	Arterial	2.1	6.8	14.4	-					14.4	Burma Road 2nd Street to Lakeway - Cost shown includes new utilities
2	2009	Slate Street Extension	Local				-					0.5	Slate Street Extension
3	2010	Nothern Drive from Garner Lake to Little Powder River Rd. Also includes rebuilding Garner Lake from Warlow to Northern Drive	Arterial	3.2	3.8	12.2	-	$ 480,000.00	$ 240,000.00	$ 1,220,000.00	$ 1,220,000.00	15.4	Rebuild Garner Lake Road between Warlow and Northern Drive. Build Northern Drive from Garner Lake to Little Powder River Road.
4	2011	Northern Drive from Hwy 14/16 to Hannum	Arterial	1.3	5.0	6.3	-	$ 180,000.00	$ 90,000.00	$ 630,000.00	$ 630,000.00	7.8	Build Northern Road between US 14/16 and Hannum Road.
5	2011	Country Club Road Improvements	Collector	0.5	3.0	1.5	250,000.00	$ 90,000.00	$ 30,000.00	$ 150,000.00	$ 150,000.00	2.2	Widen Country Club Road from Hwy 59 to Mitchell
6	2011	Widen Hwy 50 from Lakeway to Hwy 14/16	Arterial				-	$ -	$ -	$ -	$ -	15.0	Widen Hwy 50 from Lakeway to Hwy 14/16
7	2012	Northern Drive from Hannum to Little Powder River Road	Arterial	0.9	6.7	6.2	-	$ 150,000.00	$ 60,000.00	$ 620,000.00	$ 620,000.00	7.7	Build Northern Road between Little Powder River Road and Hannum Road.
8	2014	Garner Lake South from Garner Lake Road to Union Chapel Road	Arterial	3.8	2.77	10.49	$ 1,200,000.00	$ 60,000.00	$ 1,050,000.00	$ 1,050,000.00	$ 1,050,000.00	14.9	Construct a new roadway, Garner Lake South Road, to connect Garner Lake Road to Union Chapel Road and I-90.
9	2018	Oakcrest Drive Extension	Arterial	1.0	1.03	1.06	$ 650,000.00	$ 32,500.00	$ 110,000.00	$ 110,000.00	$ 110,000.00	2.0	Extend Oakcrest Drive South from West 4J to Southern Drive
10	2020	Construct Western Drive from Hwy 50 to I-90	Arterial	3.8	1.77	6.70	$ 1,200,000.00	$ 60,000.00	$ 670,000.00	$ 670,000.00	$ 670,000.00	10.0	Construct an Arterial road west of Gillette that starts at Southern Drive and Hwy 50 then heads north to a new interchange with I-90
11	2020	Extend Lakeway west to Western Drive	Arterial	1.5	1.03	1.59	$ 490,000.00	$ 24,500.00	$ 160,000.00	$ 160,000.00	$ 160,000.00	2.4	Extend Lakeway west from Highway 50 to connect to Western Drive.
12	2021	Construct Interchange at Western Drive and I-90	Interchange	-	12.00	12.00	-NA- Provided by WYDOT	-	$ 1,200,000.00	$ 1,200,000.00	$ 1,200,000.00	15.6	Construct a new interchange with I-90 at the Western Drive location. Structure should also accommodate railroad overpass and connection to Echeta.
13	2022	Construct Western Drive from I-90 north to Northern Drive and Highway 14/16	Arterial	3.0	2.00	6.06	$ 960,000.00	$ 48,000.00	$ 610,000.00	$ 610,000.00	$ 610,000.00	8.9	Construct an Arterial road west of Gillette that starts at a new interchange with I-90 and goes north to intersect Highway 14/16 at Northern Drive.
14	2023	Extend Butler Spaeth Road	Collector	1.5	2.90	4.44	$ 1,940,000.00	$ 97,000.00	$ 440,000.00	$ 440,000.00	$ 440,000.00	7.3	Extend an East-West section of Butler Spaeth from Garner Lake Road to South Garner Lake Road.
		Develop Collector Grid	Collector										Construct collectors to subdivide the arterial grid, as growth occurs.

2009 GILLETTE TABLE 7-3
TRANSPORTATION PLAN UPDATE
2009 to 2014 (*PROPOSED FIVE YEAR PLAN*)
RECOMMENDED SIGNAL IMPROVEMENTS

PRIORITY	CONSTRUCTION YEAR (APPROX.)	PROJECT	PROPOSED FUNCTIONAL CLASSIFICATION	LENGTH (MILES)	EST.CONSTRUCTION COSTS		ANTICIPATED R/W AND EASEMENT ACQUISITION COSTS (2009 DOLLARS)	ESTIMATED PROFESSIONAL SERVICES (2003 DOLLARS)				ESTIMATED TOTAL COSTS 2009 DOLLARS (MILLIONS)	PROJECT DESCRIPTION
					UNIT COST 2009 DOLLARS (MILLIONS/MILE)	EXTENDED COST 2009 DOLLARS (MILLIONS)		LEGAL FEES	APPRAISAL AND R/W NEGOTIATION	DESIGN ENGINEERING	CONSTRUCTION ENGINEERING		
1	2009	6th Street and 4J Intersection Traffic Signal	Traffic Signal	-	-	0.40	-NA- City Owned	-	$ 40,000.00	$ 40,000.00	$ 40,000.00	0.5	Install a Traffic Signal at the intersection of 6th Street and 4J Road. Rebuild intersection to alleviate grade issues on 6th Street.
2	2011	Enzi Drive and Sinclair St. Intersection Traffic Signal	Traffic Signal	-	-	0.35	-NA- City Owned	-	$ 40,000.00	$ 40,000.00	$ 40,000.00	0.5	Signalize the intersection of Sinclair Street and Enzi Drive. Revamp High School entrance to intersect Enzi Drive at Sinclair Street, to form a 4 legged intersection. May be able to remove Slate Street signal at this time. Install Signal as part of Enzi Drive Expansion.
3	2012	6th Street and Gurley Ave. Intersection Traffic Signal	Traffic Signal	-	-	0.30	-NA- City Owned	-	$ 30,000.00	$ 30,000.00	$ 30,000.00	0.4	Install a Traffic Signal at the intersection of 6th Street and Gurley Ave. Plan for 4 legged intersection.
4	2012	Powder Basin Ave. and Boxelder Road Intersection Traffic Signal	Traffic Signal	-	0.35	0.35	-NA- Provided by Boxelder Widening	-	$ 35,000.00	$ 35,000.00	$ 40,000.00	0.5	Install a Traffic Signal at the intersection of Powder Basin Ave and Boxelder Road as part of Boxelder Road Expansion.
5	2013	6th Street and Hwy 59 Intersection Traffic Signal	Traffic Signal	-	-	0.40	-NA- Provided by WYDOT	-	$ 40,000.00	$ 40,000.00	$ 40,000.00	0.5	Install a Traffic Signal at the intersection of 6th Street and Hwy 59. Move signal from 7th Street and Highway 59.
6	2014	Boxelder Road and Garner Lake Road Intersection Traffic Signal	Traffic Signal	-	0.35	0.35	$ -	-	$ 35,000.00	$ 35,000.00	$ 40,000.00	0.5	Install a Traffic Signal at the Intersection of Boxelder Road and Garner Lake Road.

Legend

Sig_priority

Priority

Non-City / Joint

2009

2010 - 2013

2014 - 2017

City

2009

2010 - 2013

2014 - 2017

Priority

Priority

Non-City / Joint

2009 - 2013

2014 - 2018

2019 - 2023

City

2009 - 2013

2014 - 2018

2019 - 2023

GILLETTE TRANSPORTATION PLAN UPDATE
PROPOSED 15 YR IMPROVEMENT PLAN

DOWL HKM

Figure No.

7 - 1

8.0 ADA Standard Review

A review of the Gillette handicap ramp standard ADA drawings was conducted, and recommendations for changes to update the standards to bring them into compliance with current ADA requirements are identified.

The City of Gillette Design Standards (2005) Section 611.07 Street Geometrics were reviewed alongside 28CFR Title 35, Americans with Disabilities Act (ADA). The following standard drawings were included in this review:

2530-04	Standard Residential Driveway Detail (June 2004)
2530-05	Handicap Ramp – Detached Sidewalk (June 2004)
2530-06	Handicap Ramp – Attached Sidewalk (June 2004)

ADA Recommendations:
ADA Regulations have undergone substantial change since their inception; and are likely to continue to change. It would be impractical to include standard drawings in Section 611.07 to cover all design cases. Although paragraph 611.07c makes reference to ADA and is adequate, details showing commonly occurring design cases would be beneficial.

Some agencies dedicate up to 50 pages to ADA. WYDOT uses 6 Standard Drawing Sheets. Montana Department of Transportation uses 7 Standard Drawing Sheets. At a minimum, it is recommended the drawings should cover the following design cases:

<u>New Construction</u>
Corner – Detached Sidewalk
Corner – Attached Sidewalk
Parallel - Attached Sidewalk
Parallel – Detached Sidewalk
Driveway and approach detail (includes ADA Bypass)

All ADA ramps should have colored detectable warning device call-outs. The proposed revisions and proposed new details can be found in Appendix E.

9.0 Truck Routes

Designated Truck Routes

Another facet of the transportation network to consider is truck travel. To better manage truck travel, improve mobility, and enhance the level of safety within the city limits, the existing preferred truck routes were reviewed. A few issues to consider when designing and planning for truck routes include maintenance, location, design and safety, and enforcement. This section summarizes the recommendations for future truck routes. The existing truck routes map can be found in Appendix E.

The City of Gillette currently has bypass routes and intercity routes defined in their City Code. For now, these existing routes appear adequate. However, future growth may require modification of these designated routes. Figure E-1 identifies the existing truck routes. Future intercity truck routes are typically arterial roadways. Future roadways to be considered for bypass routes would include:

- Garner Lake South – This roadway provides a direct link between I-90 and Highway 59, and would be a good location for a bypass route to offload Highway 59.
- Western Drive roadway and interchange – this roadway provides a good link between Highway 50 and I-90, as well as a connection to Highway 14/16 via a Northern Drive extension. This route would also serve as an over height load route.
- Northern Drive – Provides a good east-west truck route north of Gillette, and connects I-90 to Hwy 14/16, Gurley, and Southern Drive.

Oversized Load Routes

Construction of the Burma Road interstate overpass will require incorporation of over-height freight routes for I-90. Trucks with loads exceeding 16 feet in height must comply with the routes designated in this section. Trucks passing through Gillette via I-90 must exit the interstate using either the Highway 50 interchange or the Highway 51 interchange depending on their direction of travel. Garner Lake Road, Southern Drive, and Highway 50 will be used to access the opposite interchange. As mentioned above, construction of Western Drive and Northern Drive will simplify the over height load routes around Gillette.

WYDOT has prepared a preliminary map identifying the designated oversized load routes around and through Gillette. This map is located in Appendix E.

10.0 Traffic Impact Fees

10.1 Minimum Traffic Impact Fee

The City of Gillette currently requires development to prepare a traffic impact assessment (TIA). However, no consistent mechanism exists to require development to pay for its share of impact to the transportation network.

The criteria for the TIA was reviewed and appears adequate. However the main goal of this task was to identify a mechanism to require development to mitigate their impact to the transportation network.

Currently, the TIAs are required in the development process, and developers are required to mitigate their impact to the transportation system. For large developments, this may work well, because the TIA will require signals, turn lanes, or other improvements. However, many times a development's traffic impact analysis may show very little impact to the network, their access points, or adjacent intersections. Therefore, it can be difficult or unclear how to quantify the impact and correctly assess the developer for it. One way to overcome this is with a minimum traffic impact fee.

Traffic impact fees can be assessed similar to plant investment fees for water and sewer service. The simplest way to assess a minimum traffic impact fee is to base the fee on the trips generated by the development. More information on traffic impact fees will be provided in the final report, if the steering committee and City council wish to explore them further.

10.2 Tax Increment Financing

During the course of this update, Tax increment financing was mentioned as an alternative to Traffic Impact Fees. It was requested that the difference between Traffic Impact Fees and Tax Increment Financing be explained, because they have the same acronym (TIF). Tax increment financing is a tool to use future gains in taxes to finance the current improvements that will create those gains. When a public project such as a road, school, or hazardous waste cleanup is carried out, there is often an increase in the value of surrounding real estate, and perhaps new investment (new or rehabilitated buildings, for example). This increased site value and investment generates increased tax revenues. The increased tax revenues are the "tax increment."

Increment Financing dedicates tax increments within a certain defined district to finance debt issued to pay for the project. Tax increment financing is designed to channel funding toward improvements in distressed or underdeveloped areas where development would not otherwise occur, and creates funding for public projects that may otherwise be unaffordable to localities.

11.0 Other Transportation Recommendations

In addition to capital improvements to increase capacity, the City of Gillette should consider various traffic management techniques and technology applications to ease congestion while improving safety. Many of the following recommendations were noted in the 2004 Transportation Planning Study, and should continue to be considered as the City of Gillette grows.

- Alternate transportation modes. The current park master plan addresses parks and a pathway network. New road designs should consider a "complete street" design and allow for extension of this pathway network, as well as opportunities to incorporate bike lanes on the road network.
- Transit. At some point, a transit system may begin to be feasible and attractive. Employing a transit system has the ability to relieve vehicle pressure on the network. Federal funding is available for studying as well as implementing transit projects.
- Land use concepts. Some land use concepts are able to reduce vehicular travel by mixed use residential and commercial zoning. Some of this is already being done in Gillette.
- Intelligent Transportation Systems applies technologies (electronics, communications, traffic monitoring, advanced control strategies / software, and traveler information) to assist in the proactive management of traffic. These applications have proven very effective across the country to reduce congestion, improve safety, manage incidents, and better inform the traveling public. We recommend that these approaches be studied further to determine the most appropriate application of these techniques throughout the region and an Intelligent Transportation Systems Plan be developed in the near future. Such a plan should determine which of these techniques could be applied, their approximate cost, estimated benefits of implementation, and a preliminary schedule of deployment. The following is offered to begin to think about such approaches. Some elements that require further investigation include:
    - ***Traffic monitoring.*** A better understanding of near real-time traffic demand and incident detection can be used by traffic managers to respond more quickly to traffic congestion and emergency response. Collection of this type of information, usually speed and volume at a minimum, is essential to the successful implementation of other ITS elements. The use of loops or video detection is the common approach to collect this important data. Such devices would be placed at key locations in the region, both on the interstate and state highways, as well as major arterials and other key locations. Typically this information is collected and reviewed at a central location.

    - ***Traffic Signal Improvements.*** Various levels of signal improvements ranging from improved timing, to coordinating several signals together, to central management of the signal system (state and city together), to signal adapting to weather/pavement conditions can help to relieve congestion and provide for more proactive traffic management during incidents or special events.

    - ***Freeway Management.*** Another aspect of traffic management that, although is not within the City's jurisdiction, can affect the traffic within the City boundaries, is freeway management. Through the use of traffic monitoring, video detection, and traveler information, the freeway traffic, and its

impact on the City arterials, can be better managed.

- ***Traveler Information.*** One critical element of ITS is providing information to motorists and commercial vehicles so that they can make more informed decisions regarding their travel. This can be achieved through such dissemination techniques as websites, radio and television broadcasts, advisory radio, and Dynamic Message Signs (DMS). DMS are the large and small illuminated message boards that provide limited information to travelers during their route and can provide warnings, detours, or general traffic information. These are also being used in other states to provide mechanisms for the national Amber Alert Program (abducted child information).

- ***Communications Infrastructure.*** One of the primary enabling technologies that allows much of these applications possible is a communications network to allow for data to be transmitted from device to a central location and then disseminated to the public. A review of the communications infrastructure should be included in the ITS planning process and recommendations made to identify approaches that are appropriate for the region surrounding the City of Gillette.

- ***Management Center.*** A central location (or multiple locations) to collect, view, and analyze information to support traffic management decisions and disseminate traveler information can be in many forms and usually begins small with a single computer work station. Such a center provides the place where integrated traffic management can occur and has proven very successful in other cities across the country. The size and extent of this kind of center depends on the specific needs of the region. The planning process being recommended will determine what is appropriate for the City of Gillette and the surrounding region.

12.0 References

A Parks and Pathways Master Plan for the City of Gillette DRAFT (Chapter 4 – Trail and Pathway Standards and Plan). By RDG Planning and Design. September 2008.

A Policy on Geometric Design of Highways and Streets, 2004. Published by American Association of State Highway and Transportation Officials. Washington, D.C.. 2005.

City of Gillette Development Summary Fourth Quarter 2009. Prepared by the City of Gillette Planning Department, January 2, 2009

City of Gillette Transportation Planning Study (Vols. 1-2). Prepared by HKM Engineering Inc., Sheridan, Wyoming. 2004.

The Gillette Plan – A Comprehensive Plan for the City of Gillette, Wyoming. By RDG Planning & Design and Worthington, Lenhart and Carpenter. June 2006.

Highway Capacity Manual: Special Report 209, Third Edition. Prepared by Transportation Research Board. Washington, D.C.. 1994.

Major Street and Highway System Report: Travel Forecasting Process. Prepared by the Wyoming Department of Transportation, Planning Program, Systems Planning. Wyoming. 1997.

Manual on Uniform Traffic Control Devices: Part 4, Highway Traffic Signals. Prepared by U.S. Department of Transportation. 2000.

Railroad Crossing Alternatives Evaluation for the BNSF Railroad Powder River Division Black Hills Subdivision, Gillette, WY. Final Report. Prepared by HWS Consulting Group, Omaha, Nebraska and HDR, Inc., Rapid City, South Dakota. October 2008.

RTi Technical Memorandum Re: Gillette Regional Master Plan, Level I Study – Population Growth Projections. Prepared by Riverside Technology, Inc., December 12, 2008.

The Surface Trasnportation Authorization Act of 2009 – A Blueprint for Investment and Reform Executive Summary. By the Committee on Transportation and Infrastructure U.S. House of Representatives. Presented by Chairman James L. Oberstar, Ranking Member John L. Mica, Chairman Peter A. DeFazio, and Ranking Member John J. Duncan Jr. June 18, 2009

Trip Generation, 6th Edition. Prepared by Institute of Transportation Engineers. Washington, D.C.. 1997.