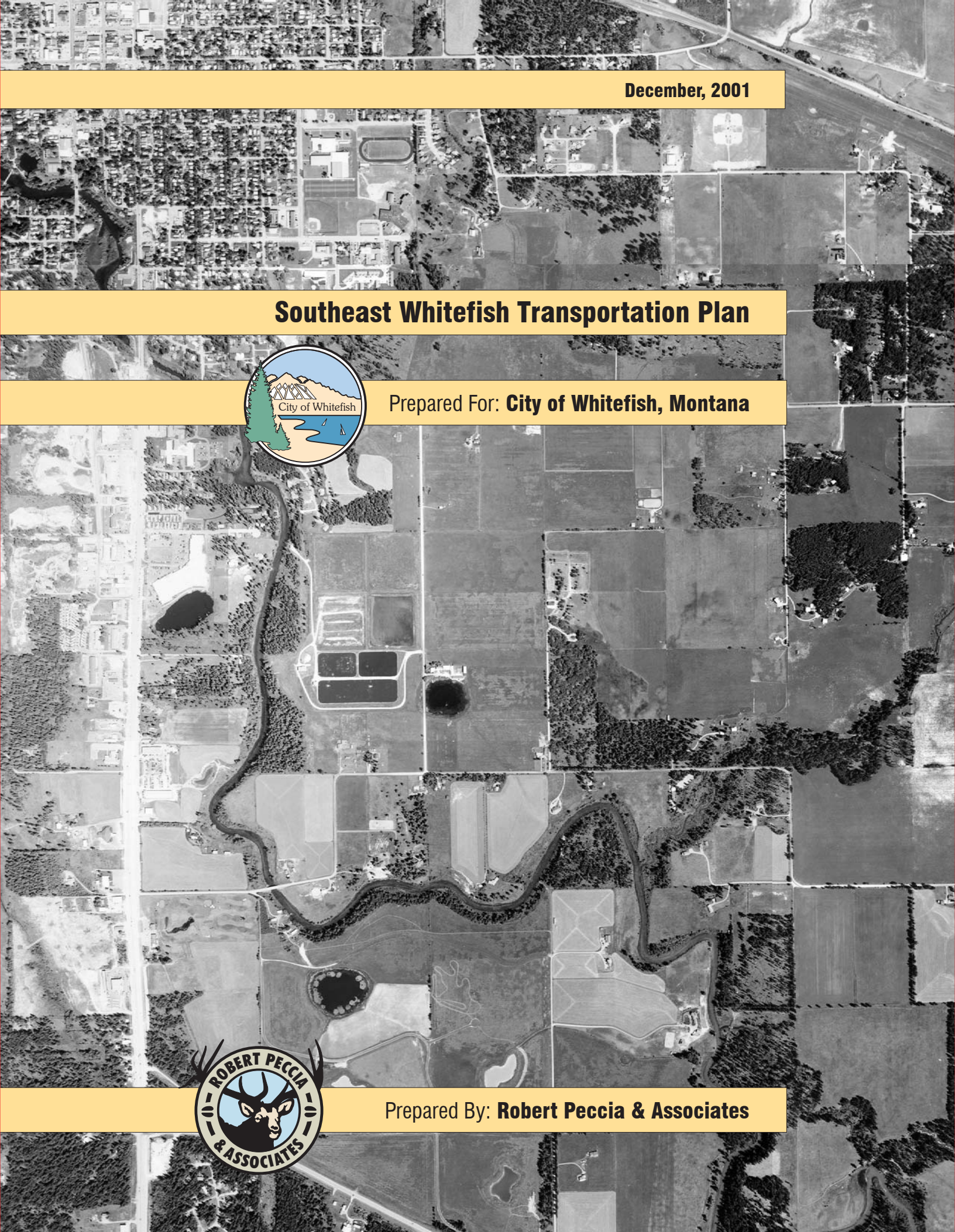

December, 2001

Southeast Whitefish Transportation Plan

Prepared For: **City of Whitefish, Montana**

Prepared By: **Robert Peccia & Associates**

Southeast Whitefish Transportation Plan

Whitefish, Montana

Prepared for:
The City of Whitefish, Montana
418 East Second Street
Whitefish, MT 59937

Prepared by:
Robert Peccia & Associates
825 Custer Avenue
P.O. Box 5653
Helena, Montana 59604

December, 2001

List of Preparers

The Traffic & Transportation Division of the consulting firm of Robert Peccia & Associates, Inc., Helena, Montana prepared this study. The following members of our firm were major contributors to this study or helped prepare the document:

Douglas E. Widmayer, P.E., Project Manager
Robert L. Abelin, E.I., Project Designer
Nicholas L. Ladas, Graphics Designer
Mary A. Bell, Production Manager

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CHAPTER 1:
Introduction and Background

Chapter 1: Introduction and Background

The Southeast Whitefish Transportation Plan is intended as a guide for the decision-makers in the Whitefish community. It contains an analysis of the current and projected transportation system in the southeastern portion of Whitefish. This Plan includes an examination of the traffic operations, road network, and growth potential of the area. This document identifies the potential problems of the existing road network and analyzes the impacts of possible road additions. The primary product of this Plan is a recommended road network for the southeastern area of Whitefish that will provide a sustainable road system that meets the current and future needs of the community.

1.1 Project Background

Up until now, there has not been a thorough examination of the road network in the southeast portion of the community because the land is mostly used for agriculture. Development pressure in this area has been relatively light; however, the Whitefish City Council requested this planning effort in the spring of 2001 because of several planned developments that would likely impact some of the area roads. Due to increased development pressure, it is clear there is a need for a transportation plan that provides the community and the developers with a blueprint of the future road system. In June of 2001, Robert Peccia and Associates was selected to assist the community with its transportation planning effort.

It is important that the future road system be determined before the land changes from agriculture use to residential use. A blueprint of the future road system is needed so the necessary right-of-way is acquired and the roads are constructed during the development process. As a result of this planning process, all parties involved will know and understand how the area should develop and where the critical roads will be located. This planning effort is essential in order to provide the community with a logical transportation framework that will serve their future needs and minimize impacts on the other areas of town.

1.2 Study Area

The study area for this project was established in consultation with the City staff and includes all of the area generally bounded by Second Street on the north, Montana Route 40 on the south, and U.S. Highway 93 on the west. The study area extends for about 2.5 miles east of U.S. Highway 93. **FIGURE 1-1** shows the general boundaries of the study area. The study area was established so that the road connections between the established areas of town and the undeveloped portions located to the southeast of the City and County could be examined. This planning document is not intended to address the existing City street grid system, except with regard to possible connections to the City's adjacent undeveloped areas.

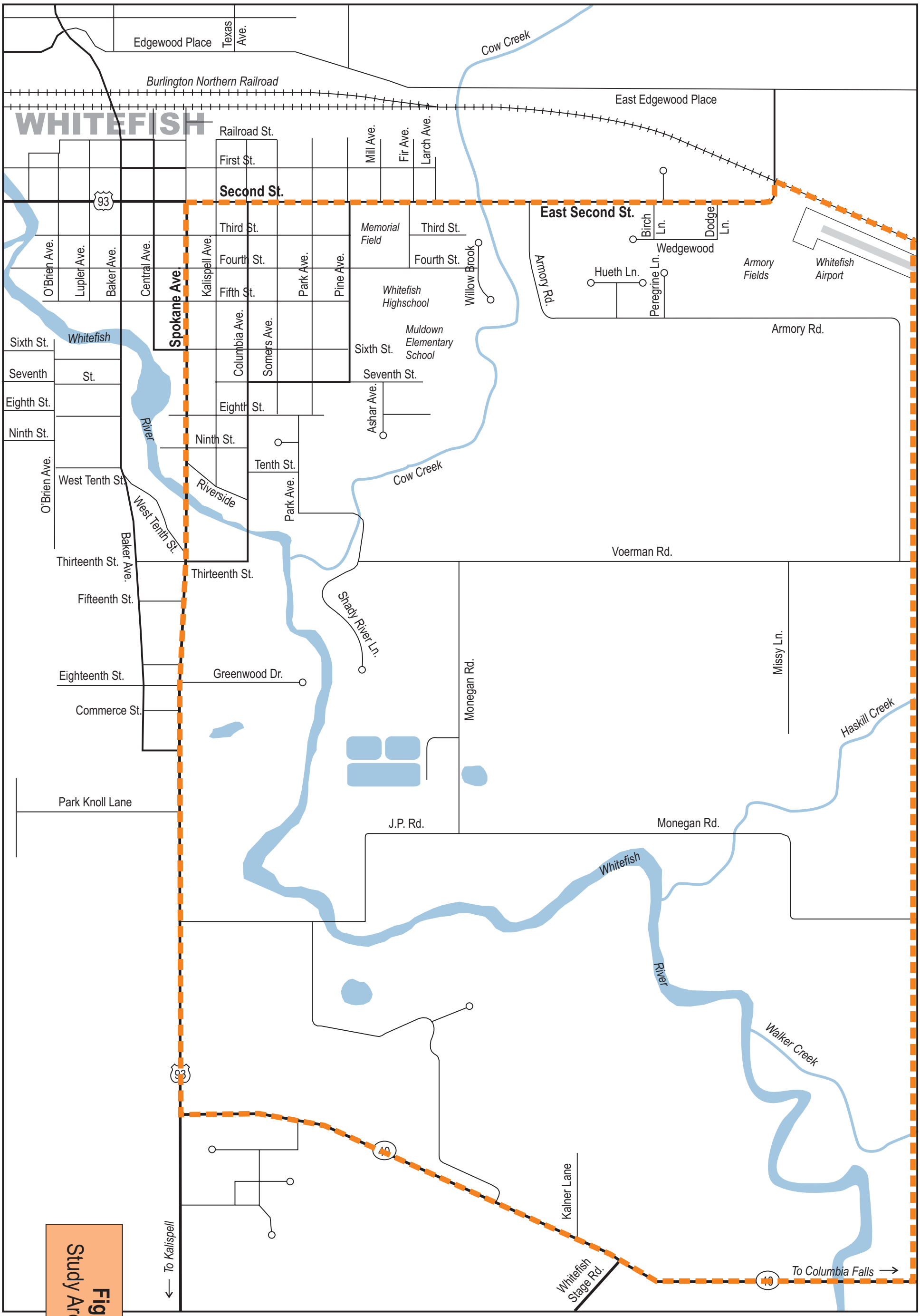


Figure 1.1
Study Area Boundary

1.3 Transportation Planning Goals

The primary goal of this Plan is to develop a strategy that will produce a logical road system providing for the existing and future needs of the community.

Although there is a recognized need of multi-modal amenities that provide for the movement of pedestrians and bicyclists, the emphasis of this Plan has been on the road system with vehicular traffic. The goal of this Plan is to provide a complete analysis of the existing and future transportation needs in the southeast portion of the community and to provide recommendations that will address any deficiencies in the roadway system. For information relating to pedestrian and bicycle planning efforts in the community, please refer to the Whitefish Bicycle and Pedestrian Master Plan.

Within the planning process there are two major concerns that need to be properly addressed. The first relates to how vehicles currently access town from the southeast, especially in the vicinity of Voerman Road and Park Avenue. It is likely that the current access configuration using Park Avenue is not a sustainable solution. As development occurs and traffic volumes increase, the impacts on the Park Avenue neighborhood may become intolerable. The dog-leg alignment of Park Avenue is also a safety concern that will be addressed in the Plan.

The other issue the Plan addresses is the broader view of how the road system should develop southeast of town. The roadway needs in this area have been minimal up until now, due to the agriculture use of the area. The Whitefish Master Plan has identified the southeast quadrant of the community as being the site of the majority of new residential development over the next 20 years. Over time this area will ultimately change from predominantly agricultural use to predominantly residential use. It is important that the long-range road needs are determined so future road corridors can be identified and set aside before the land is developed.

Typical urban street planning for the study area suggests that there needs to be a network of dedicated collector routes that will serve the future local neighborhood streets and carry the traffic to and from the business and commercial centers of the community. These collector routes need to be identified early in the development process because their alignment and connections to the rest of the street network affects their ability to function properly as traffic volumes increase over time. It would be desirable for these routes to have alignments that can provide relatively high traffic speeds. The planning of the major intersections is also important. They need to be properly spaced along the corridors and located in areas where the terrain will not limit the sight distance on the intersection approaches.

Ideally collector routes should be located throughout the area so that there is a collector route within a quarter mile of most properties. Therefore locating collector routes on a general half-mile grid would be a good starting point for road planning. Obviously considerations such as terrain, wetlands, and land ownership need to be taken into consideration. In areas where there are no physical limitations the section and half section lines have traditionally been used for road corridors.

The location and alignment of the future local network of neighborhood streets is not critical at this time and can develop as needed to meet the needs of the individual developers as the area grows.

Without proper advance planning of the road network the community grows at the discretion of the individual developers. As a general rule, land developers have control over the location and alignment of local street network within their individual development. They typically do not have the authority or jurisdiction to determine where the major collector routes should occur. Because the collector routes traverse a much greater area it is the responsibility and obligation of the community government to establish the major street network. This task is much easier and more beneficial if it is performed before extensive development occurs. Once the major street network is established the developers and local landowners have a clearer expectation of how the area should develop. Because of this advanced road planning, the land tends to develop in a more orderly fashion and producing a more desirable and functional result.

The final goal is to produce a Plan that is actively used to guide the transportation decision making process throughout the course of the next 20 years. The Plan must be sustainable and provide for the needs of the community. The Plan must be responsive to the quality-of-life issues that are important to the City of Whitefish, such as neighborhood integrity and safety.

1.4 Previous Transportation Planning Efforts

In the course of data collection, past plans and studies were obtained. From the review of these documents, applicable issues were incorporated into this Southeast Whitefish Transportation Plan. The contributing documents are as follows:

- Whitefish City-County Master Plan 2020;
- Whitefish Zoning Jurisdiction Regulations;
- Whitefish Zoning District Maps;
- South Whitefish Transportation Planning Project;
- South Whitefish Neighborhood Plan;
- Whitefish Transportation and Storm Drainage Master Plan;
- U.S. Highway 93 – Summers to Whitefish, Draft EIS
- Creekwood Park PUD proposed layout;
- Riverside at Whitefish proposed layout; and
- Land Ownership Maps.

1.5 Public Involvement Process

Public involvement process used in the development of the Southeast Whitefish Transportation Plan included an informal initial meeting with some of the principal landowners within the study area, a public informational meeting at a scheduled City Council meeting, and a formal public hearing administered by the City Council.

Display graphics that visually described the alternatives being considered were used during the

informational meeting and at the public hearing. These displays were available for viewing by the public at City Hall during the public review period between the publishing of the draft and final documents. Printed copies of the draft report were made available to the public through the City, and the entire draft report was available for viewing on a dedicated Website on the Internet.

Public comments were received at the informational meeting, during the public hearing, and during the public review period through both written letters and Email. All comments were considered prior to development of the recommendations included in the final report.

CHAPTER 2:
Existing Conditions

Chapter 2: Existing Conditions

2.1 Existing Road System

In an effort to clearly understand the existing traffic conditions, it was necessary to gather current information about different aspects of the Whitefish transportation system. The information gathered to help evaluate the system included a review of the existing Major Street Network, a field review of the entire area, and a review of all known proposed development projects within the study area.

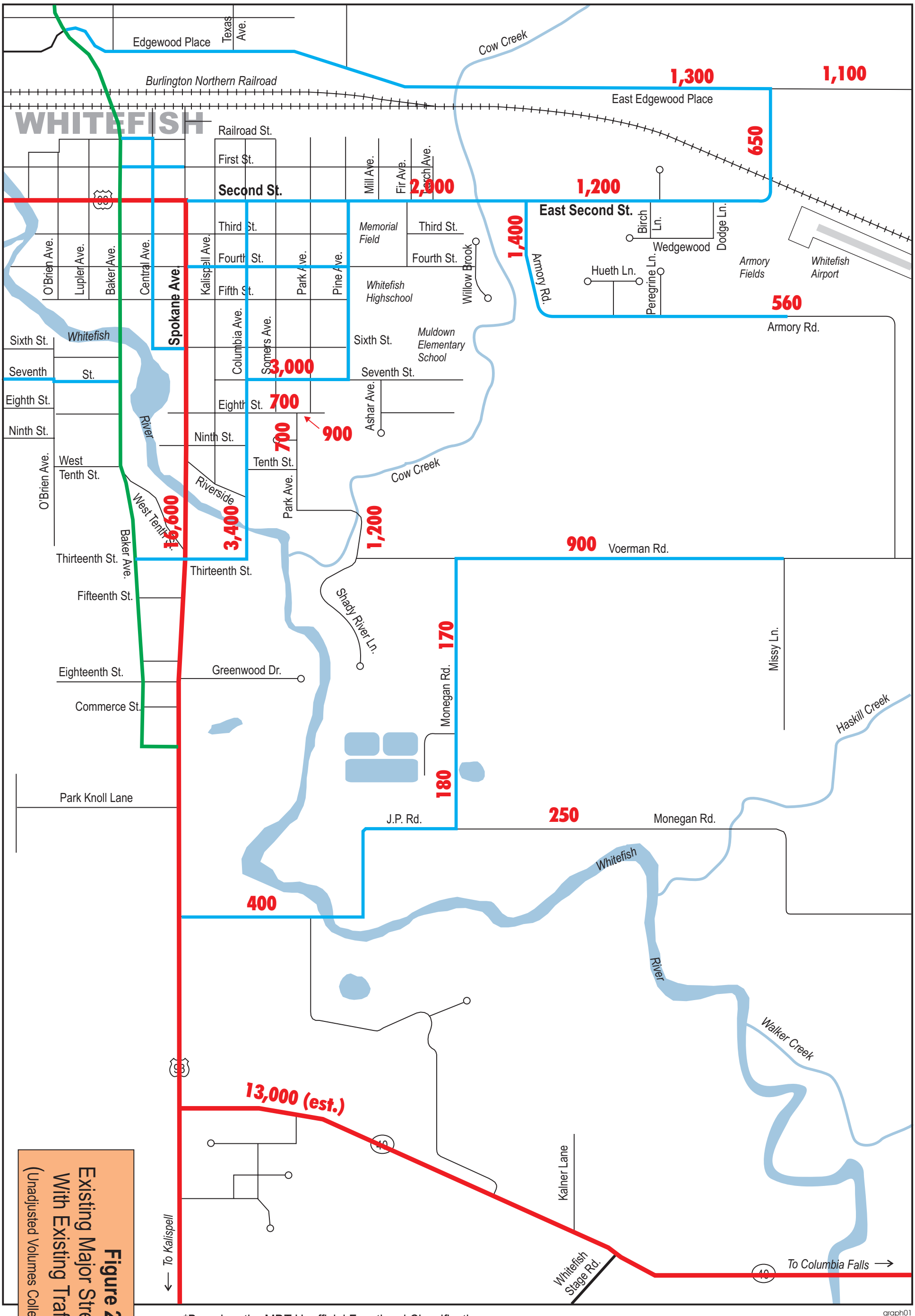
When examining the Major Street Network it is important to understand the function of each classification of roadway. The principal arterial system is designed to carry the most traffic and has a primary function to move traffic as efficiently as possible. To a much lesser extent, principal arterials have a secondary function of providing access to adjacent lands, but not to the detriment of their primary function of moving traffic. Minor arterials have a primary function of moving traffic but land access is given a slightly greater role. The collector routes provide a balanced function between moving traffic and providing access to the adjacent lands. These routes collect traffic from the local streets and neighborhoods and carry the traffic to the arterial system. Local street's primary function is to provide property access; moving traffic is considered secondary to the access function.

A review of the established Major Street Network indicates that all of the roads in the rural portion of the study area are currently considered either as local or collector streets. **FIGURE 2-1** shows the location of the streets included in the Major Street Network. The network shown in the figure is based on an unofficial functional classification map provided by the Montana Department of Transportation. U.S. Highway 93 and State Route 40 are considered principal arterials. Baker Avenue is the only route designated as a minor arterial. East Second, Edgewood, Columbia, Pine, Seventh, Aromry, Voerman, J.P., and a portion of Monegan are all identified as collector routes.

Almost all of the intersections within the study area are unsignalized. Typically, these intersections are controlled by stop signs on the minor street approaches. The only intersection controlled by a traffic signal and close to the routes being examined in this study is the intersection of 13th Street and U.S. Highway 93. An analysis of this intersection was not within the scope of this project, but field observations indicate that the signal is performing at an acceptable level of service (LOS) during all times of the day. There are other signalized intersections near the center of town but they were not a factor in this study.

The Whitefish River passes through the study area. There are highway bridges over the river at three locations within the study area including U.S. Highway 93, Columbia Avenue, and J.P. Road.

There are four major access routes connecting the southeastern portion of the community to the heart of town and the commercial businesses along U.S. Highway 93. These routes include Armory Road, Park Avenue, J.P. Road, and State Highway 40. Most of the land south of Whitefish River is only accessible via State Route 40. The area is also accessed to the east via



*Based on the MDT Unofficial Functional Classification

Principal Arterial
Minor Arterial
Collector

Figure 2.1
Existing Major Street Network*
With Existing Traffic Volumes
(Unadjusted Volumes Collected in May, 2001)

Dillon Road located about a mile east of the study area. Dillon Road connects to Voerman Road and State Route 40.

The major roads within the study area include Armory Road, which connects to Second Street and Voerman Road. Armory Road is paved and provides access to several dozen residential units along its route. Voerman Road is a paved east/west corridor that connects to Dillon Road to the east and Park Avenue at its western terminus. Monegan Road is a gravel north/south route that connects to Voerman Road at the north end and J.P. Road to the south. At the junction with J.P. Road, Monegen turns to the east and connects to Dillon Road east of the study area. J.P. Road connects Monegan Road to U.S. Highway 93 and crosses the Whitefish River. State Route 40 connects with U.S. Highway 93 and heads east toward Columbia Falls. The Whitefish Stage Road intersects Route 40 from the south about one mile east of U.S Highway 93.

2.2 Existing Traffic Volumes

One of the best ways to evaluate a street system is to compare the traffic volumes to the approximate capacity of each road. Robert Peccia & Associates collected traffic volumes for the major roads within the study area in the spring of 2001. These traffic volumes were used to determine current traffic conditions and to provide reliable data on traffic volumes and patterns. The data can also be used to identify any traffic problems that may exist or are likely to occur within the foreseeable future. The 2001 traffic volume data is presented in **FIGURE 2-1.** This figure shows that most of the highly traveled corridors are on the Major Street Network.

All of the roads within the study area currently have relatively low traffic volumes. The only route that appears to be approaching the operational capacity of the corridor is U.S. Highway 93. All of the other roads within the study area have volumes that are well below the capacity of a typical two-lane road. As a general rule, most two-lane roads can comfortably carry 10,000 to 12,000 vehicles per day (vpd). The actual roadway capacity is a function of the type of traffic, amount of turning movements, road grade, alignment, number and type of intersections, and the number of driveways.

The maximum desirable amount of traffic on local residential streets is usually less than 3,000 vpd. In smaller communities such as Whitefish, the collector routes would generally carry between 3,000 and 5,000 vpd. Due to the relatively low traffic volumes, both local and collector routes are typically two-lane roads.

Traffic congestion on the community road system occurs along Highway 93 during the summer months due to the influx of tourism. The other area that experiences traffic congestion is the area on Seventh Street east of Pine Avenue. This traffic congestion occurs during times when parents are picking up or dropping off students at the various schools in the area. This is the site of the high school, junior high school, and several private schools serving elementary students. The congestion is usually greater in the afternoon around the end of the school day. The traffic congestion is due to drivers stopping and standing while waiting for their children and the fact that there is no easy way to exit the eastern end of the Seventh Street corridor without turning around at the eastern end of the Seventh Street.

CHAPTER 3:
Travel Demand Forecasting

Chapter 3: Travel Demand Forecasting

3.1 Traffic Model Development

Travel patterns within the Whitefish area, along with the characteristics and geographic distribution of population settlement and businesses are interrelated. New housing development on the City's periphery, in unincorporated areas elsewhere in the transportation planning area, and in areas outside of the planning area have dispersed and distanced the home-related travel. Geographic distribution of recent housing development contributes substantially to traffic on roadways leading into Whitefish. New commercial development along the U.S. Highway 93 corridor has also attracted major traffic increases to these roadways.

To accurately assess current conditions and to project future traffic conditions, it was necessary to develop traffic projections. The Whitefish area transportation system was modeled using a simple manual gravity model based on existing and projected travel patterns. Traffic forecasts with the study area were developed using the methodology commonly applied in motorized vehicle demand forecasting.

The first step in developing the transportation model was to establish the modeling area. In this case, the model area boundary is the same as the study area. The next step involved subdividing the entire modeling area into sub-areas known as transportation analysis zones (TAZ). The development potential of each TAZ was estimated using aerial photographs and information obtained through field observations. The number of acres of developable land was estimated for each zone. In most cases, it was estimated that only a portion of the land within each TAZ could be successfully developed due to terrain limitations, wetlands, and land dedicated to road and utility corridors.

Once the number of acres of developable land was estimated, it was necessary to estimate the likely development density. The unknown factor at this time is the actual type of development that will occur in the southeast portion of the Whitefish community. This will depend on the landowners, the developers, and the residential housing market in future years. The known factor is that the Flathead Regional Development Office (FRDO) considers this portion of the Whitefish area to be the most likely site for future residential development.

In order to estimate future traffic volumes, additional information relating to the projected growth of population was needed.

3.2 Population Growth Trends

Population and economic growth are largely responsible for increases in motor vehicle and other travel in the Whitefish area. According to the U.S. Census Bureau, the population of Montana increased by 12.9% between 1990 and the year 2000. In recent decades, Flathead County has been one of Montana's fastest growing areas. **TABLE 3.1** provides a historic overview of

population growth in the county, within the City limits of Whitefish, and within the Whitefish planning jurisdiction (extends about 4.5 miles outside of the City limits).

TABLE 3.1
Population Trends

Year	Flathead County Population*	City of Whitefish Population**	Population within Planning Jurisdiction**
1990	59,218	4,368	9,142
2000	74,471	5,012	10,524
2010 (projection)	92,159	5,554	11,637
2020 (projection)	109,546	6,096	12,749

* Source: 1990 and 2000 data is from the US Census Bureau, Projections are from Montana Department of Commerce
** Source: Whitefish City-County Master Plan

According to the recent 2000 U.S. Census, Flathead County currently has a population of 74,471. The Census and Economic Information Center of the Montana Department of Commerce projects a countywide annual growth rate of 2.27% during the next 20 years.

According to the Whitefish Master Plan, the population of Whitefish increased by 11.8% between 1980 and 1990, and increased by 15.2% between 1990 and the year 2000. Based on recent development trends in Flathead County, it does not seem unreasonable to assume that the population of the Whitefish area will increase at a rate that is more than the countywide growth.

FRDO estimated that the population within the study area would increase by about 1,600 persons over the next 20 years. Of that amount, 1,200 would be within the current City limits and 400 would be within the County portion of the study area.

The census data indicates that there are 2.2 persons per household in Whitefish and 2.48 persons per household in Flathead County. Using a weighted average of 2.4 persons per household, the anticipated population growth within the study area translates into approximately 667 new housing units.

3.3 Allocation of Growth within the Study Area

The only committed development planned within the study area at this time is Riverside at Whitefish. This development will be located in the southwestern portion of the study area on the south side of the river. This development will consist of 310 residential units, 150 assisted-living units, and a sports complex consisting of approximately eight soccer fields and eight softball fields.

This is also a proposed planned unit development called Creekwood Park, which is currently in the approval process. This development would consist of 54 residential units and would be located in the northwest portion of the study area on the north side of Voerman Road and close to its eastern terminus at Park Avenue.

These two developments account for about 1,024 of the 1,600 new people that are projected to live within the study area within the next 20 years. Using these assumptions, there will be 240 additional new homes distributed throughout the study area during the next 20 years. These estimates are based on the FRDO estimate of 1,600 additional people in the study area.

Other than these two planned developments, it is unknown how the study area will develop. Landowner desires will dictate land development. Much of the land will probably remain in agricultural use while some portions will be converted into residential subdivisions. Landowners will determine the location of these future residential developments.

Most of the study area is currently zoned for either agriculture or residential development. It is believed the zoning of the land within the study area will change over time as development occurs. A portion of the land in the central portion of the study area will be restricted to relatively low density due to high ground water, which limits the density because of septic system restrictions. This condition could be overcome by the installation of sewer mains in the area. With municipal sewer service, the residential densities would not be limited by the high ground water conditions.

It is likely that most of the development during the next 20 years would occur on land that is not restricted by high ground water. Although the development would likely be somewhat localized in certain areas, it is assumed that it would occur relatively uniformly throughout the study area. For the purposes of this Plan, it was assumed that the area would develop in a fairly uniform pattern.

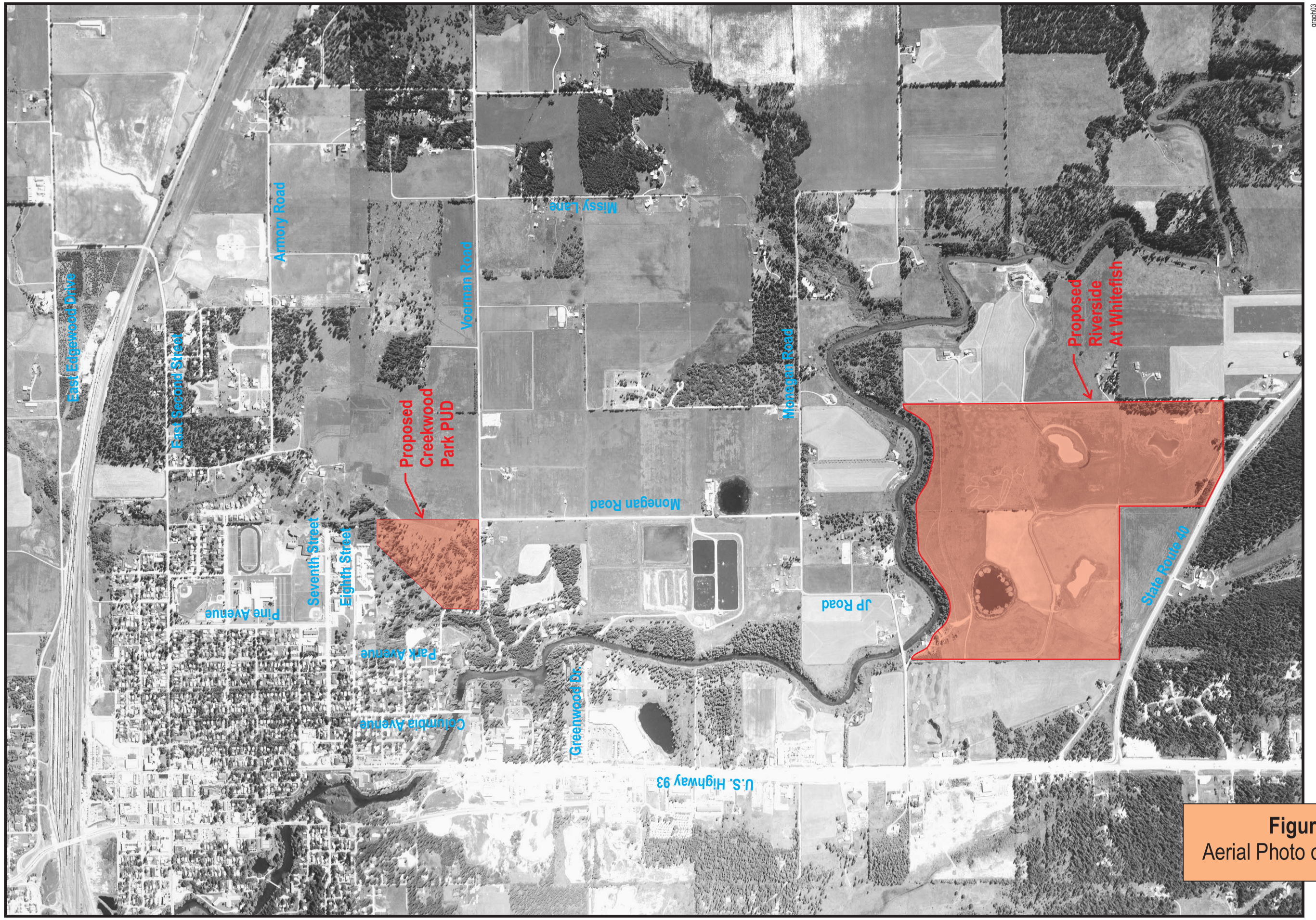
FIGURE 3.1 presents an aerial photo that was taken of the study within the last five years. This photo provides an overview of the current land use and housing densities within the study area.

3.4 Traffic Projections

In this planning process it is important to identify how the anticipated growth would impact the transportation system, assuming there are no changes to the road system. In order to project traffic it is necessary to assess the trip generation potential of the anticipated development.

The *Trip Generation Manual* (Sixth Edition, Institute of Transportation Engineers) was used to convert the estimated population growth into increased traffic volumes. The manual indicates that the average residential unit generates 9.57 vehicle trips per day. A vehicle trip is defined as any trip that either begins or ends at the residence.

Using this trip generation rate, it is estimated that the 310 new residential units (9.57 trips/unit) and 150 assisted living units (3.48 trips/unit) planned for Riverside at Whitefish would generate 3,489 vehicle trips per day. The sports complex portion of this development is more difficult to estimate because it largely depends on the level of activity and scheduling of organized practice sessions and games. Using data from similar types of sports facilities, it was estimated that the sports complex portion of the development would generate approximately 2,880 trips per day.



graph03

No Scale

Figure 3.1
Aerial Photo of Study Area

The total number of trips generated by Riverside at Whitefish is therefore estimated to be about 6,369 trips per day.

The distribution of these estimated trips is based on the anticipated access points to the development. The development will have two access points including one onto J.P. Road at the northwest corner of the property and one onto State Route 40 near the southeastern corner of the development. It is estimated that about 80% of the traffic entering and exiting this development would use the northern access that connects to J.P. Road. It is likely that the vast majority (90%) of the traffic using the northern access point will use U.S. Highway 93 to commute between the development and town. It is estimated that only about 10% of the traffic using the northern access point would use Monegan Road and Voerman Road to access town. The large majority of the development-generated traffic that would use the Route 40 access would use Highway 93 to commute between the development and City.

The proposed development of Creekwood Park is estimated to generate 517 trips per day. Without any new road connections to town almost all vehicle trips generated by the development would use Voerman Road and Park Avenue to access town.

Within the next 20 years, the rest of the anticipated residential development within the study area would likely occur from several new subdivisions at unknown locations. **FIGURE 3.2** shows the projected traffic volumes within the study area for the year 2020, assuming the road system does not change and there are an additional 1,600 people living in the area. Traffic volumes on other roads in the developed portion of the community were estimated to increase at a rate of 1% per year.

The data in **FIGURE 3.2** shows the traffic volumes on the Park Avenue connection to town will increase to 3300 vpd. The volumes will also increase to 4,800 vpd on J.P. Road and increase to 2,000 vpd on Armory Road. Traffic on Columbia Avenue will increase to 5,100 vpd while traffic on Seventh Street will increase to 4,600 vpd.

3.5 Projections for Full Build-out

In the process of planning for the long-range future of the community, it is important to assess the possible conditions and assume full build-out of the area. In the previous sections the Plan examined the traffic impacts resulting from the known proposed developments and the 20-year projection of population within the study area. In this section the Plan will examine a variety of full build-out scenarios.

Although it is highly unlikely that the entire study area would eventually be converted into residential developments, it is possible that a large portion of this land could be residential in nature. This transformation most certainly would not occur within the 20-year planning horizon of this Plan, but it could possibly occur within a 50- or 75-year period. To plan this far in advance is not typical, but in this instance it will provide the City with additional insight as to the possible long-term traffic impacts that could result from community growth.

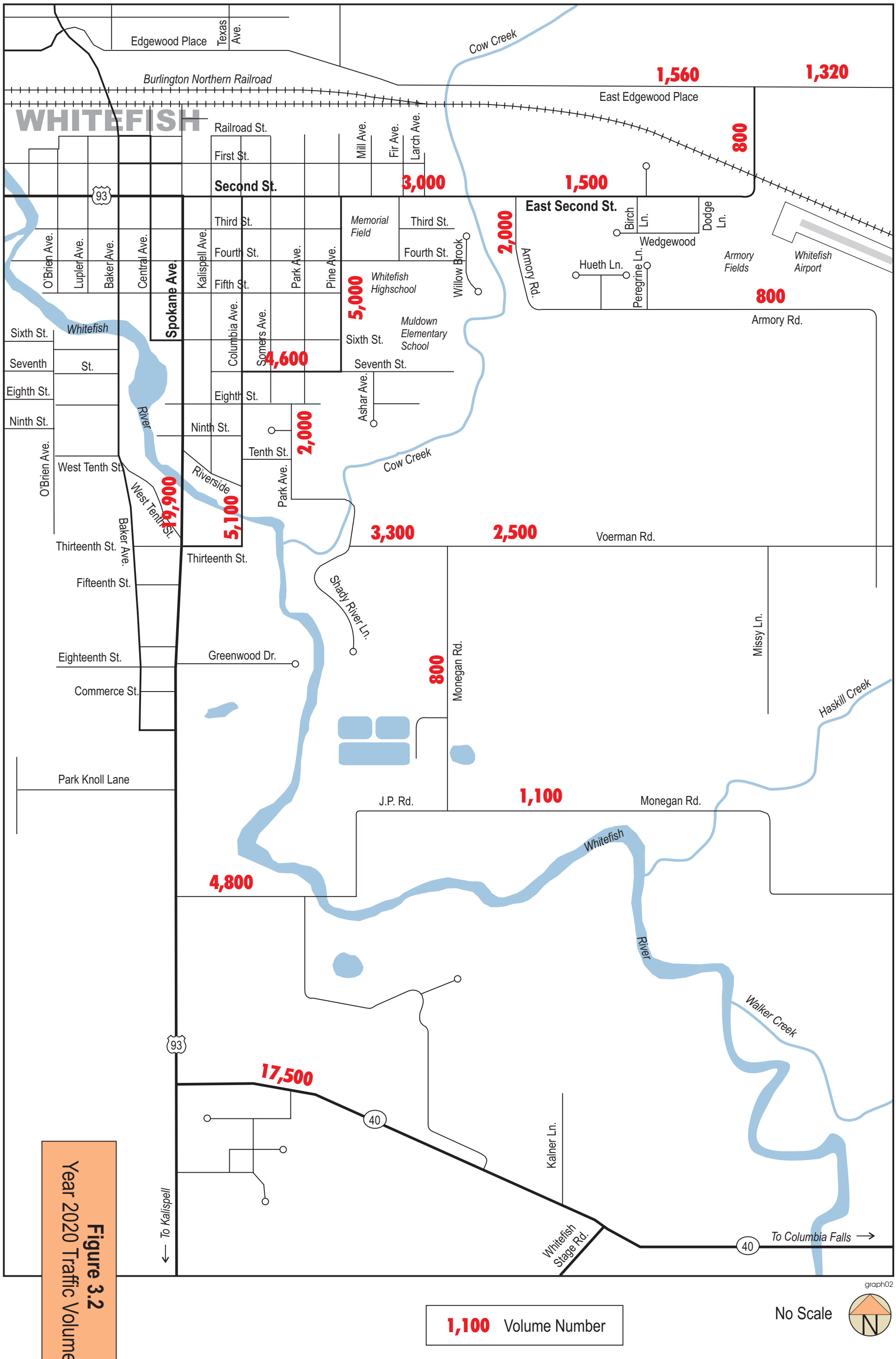


Figure 3.2
Year 2020 Traffic Volumes

1,100 Volume Number

The study area consists of approximately 3,300 acres. Of this amount, approximately 2,500 acres could be developed. The other 800 acres are either unsuitable for development or would be used for roads and utility corridors.

It is understood that no one can predict how this area will develop; however, the best method of estimating development density is to look at the range of possibilities. Larger estate homes could be built on 20-acre tracks. There could also be a demand for homes on ten- and five-acre parcels. At the same time, it is possible that many homes could be built in traditional subdivisions that would have densities of one or two homes per acre. Using the FRDO's estimate, there would about 700 total homes within the study area by the year 2010. This represents an average housing density of about one house per 3.6 acres. **TABLE 3.2** shows the possible range of development densities at full build-out within the study area and the number of vehicle trips that would be generated by this amount of development.

TABLE 3.2
Traffic Generation Resulting from Various Full Build-out Scenarios

Developable Land (acres)	Average Housing Density	Total Houses	Daily Vehicle Trips Generated Within the Study Area**
2500	1 per 3.6 acres*	700	6,700
2500	1 per 2 acres	1,225	11,700
2500	1 per acre	2,500	23,900

*Estimated average housing density in year 2020.
** Based on an average trip generation rate of 9.57 trips per household and rounded to nearest 100.

The data in **TABLE 3.2** indicates that in the year 2020 there will be approximately 700 homes within the study area. This amount of homes will generate 6,700 vehicle trips per day. An average housing density of one home per acre would generate almost four times as much traffic within the study area. To put this density into perspective, the Riverside at Whitefish development plans a density of about two homes per acre and the Creekwood Park subdivision plans a density that is slightly greater than one house per acre.

A realistic projection of average housing density at full build-out within the study area would probably be in the range of one home per every two acres. This would generate about 11,700 vehicle trips per day. With the existing road system and the current access opportunities leading into town, the traffic impacts on some existing neighborhoods would be significant. **FIGURE 3.3** shows the projected traffic, assuming an average housing density of one home per every two acres and the existing street network.

The data in **FIGURE 3.3** shows the traffic volumes on the Park Avenue connection to town will increase to 5,100 vpd. The volumes will also increase to 6,400 vpd on J.P. Road and increase to 2,500 vpd on Armory Road. Traffic on Columbia Avenue will increase to 6,000 vpd, traffic on Seventh Street will increase to 5,5,00 vpd, and traffic on East Second Street will increase to 3,400 vpd.

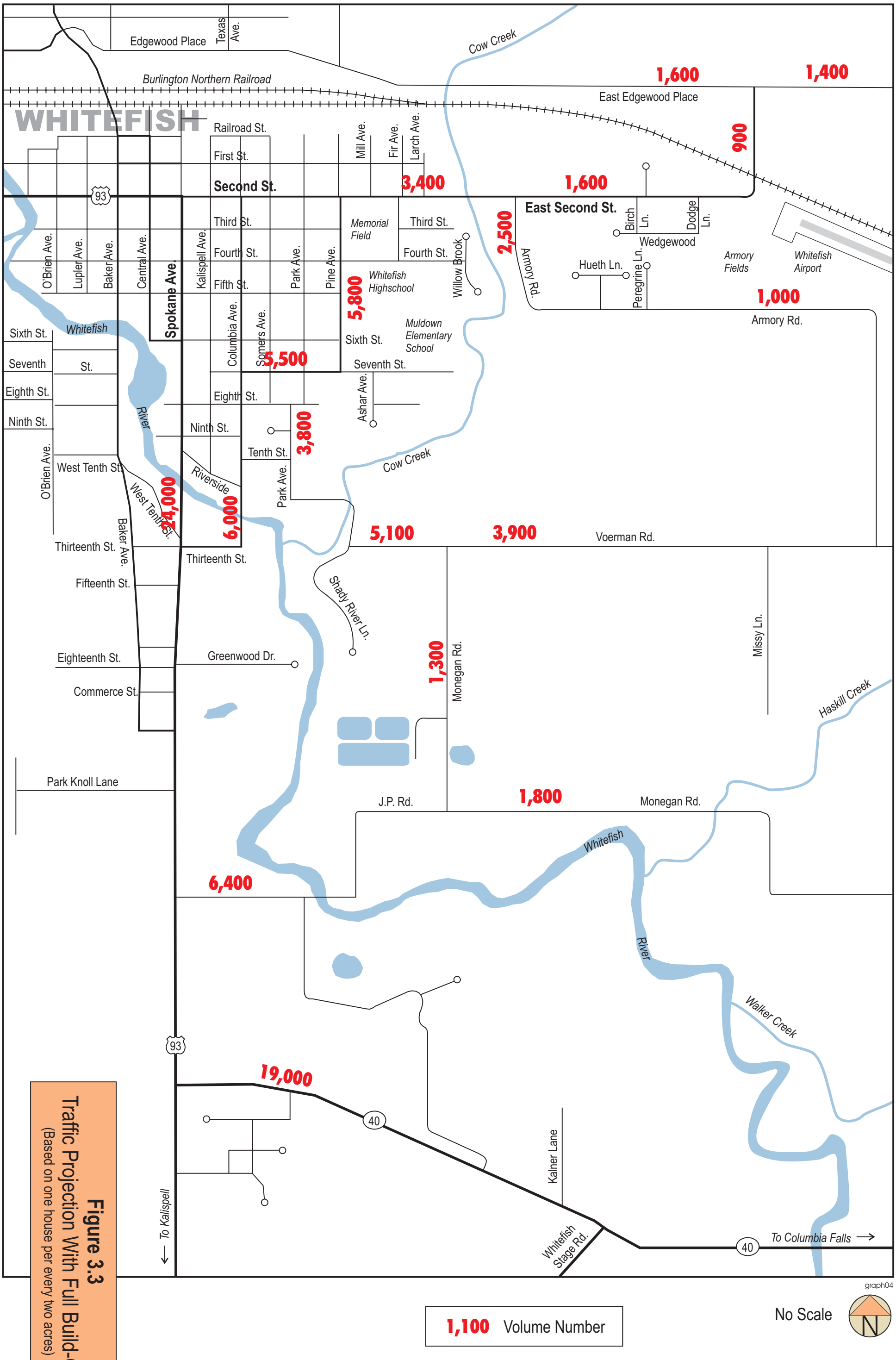


Figure 3.3
Traffic Projection With Full Build-Out
(Based on one house per every two acres)

CHAPTER 4:
Street Network Alternatives

CHAPTER 4: STREET NETWORK ALTERNATIVES

4.1 Purpose for Identifying Network Alternatives

It is important for the reader to understand what a street network alternative is and how the links described in that alternative become actual roads. The rural area in the southeast portion of Whitefish has only four possible access routes that lead into the City. Most of the traffic will use Armory Road, Park Avenue, or J.P Road. Most properties located south of the river will gain access to the City using State Route 40. With only these few routes, traffic impacts associated with future growth in this area will be significant in some of the neighborhoods located next to these routes.

The other reason for the City to be exploring future road locations is to provide logical and functional collector routes to eventually serve this area. The existing road network in this rural area is acceptable for serving the ranches and few homes currently within the study area. However, there are not enough roads in this area if the land changes from agriculture use to residential use.

History has taught community planners a hard lesson about planning roads. It is always a difficult process, but it is incredibly more difficult and much more expensive if roads are not planned before the land develops.

The purpose of this planning effort is to identify where it would be desirable for the roads to be located if and when the land-use changes. As this land changes from agriculture use to residential use, additional roads will be necessary to serve the access needs of the new residents.

At this time, the road alignments considered in this plan are only lines on a map. These lines will only become roads if the land-use changes. However, unless it is in cooperation with the landowners and developers, the community of Whitefish does not have the financial strength or the political temperament to acquire the right-of-way necessary for these future corridors and to build these roads.

The lines on the map will become roads through the development process when the land changes from agriculture use to residential use. The community's planners will request the right-or-way for these roads to be dedicated and the roads to be constructed by the developer.

This Plan is a tool to help the community planners foresee the future - it is not meant to propose building roads across farm and ranch land in an effort to encourage development. The alternatives examined and recommended in this Plan assume the roads would be built as the land develops. The landowners have control over the timing of this change. If the landowners wish to continue to farm the land, then the roads will not be necessary. However, when the landowners decide to develop their land, they will be expected to assist in the road development serving the homes to be constructed on their land.

The best reason for conducting this transportation planning process before the land develops is that it defines and clarifies the desired end result for all of the current and future landowners and developers. The primary intent of this document is to identify where the collector routes in this area should be located. The plan will provide the necessary structure developers will need to produce a community with the qualities the current and future residents deserve.

It is important to note the proposed corridor alignments shown in the figures presented in this chapter are only conceptual in nature. This is especially true for all proposed river crossings. The exact location of these corridors will be refined during future planning efforts based on property boundaries, topographic conditions, wetland areas, and other local factors.

4.2 Alternatives Considered and Rejected

In the development of the street network alternatives, two options were initially explored and then dropped from further consideration. The first was a relatively direct north/south connection between the intersection of Voerman and Monegan Roads, connecting to the bend in Armory Road. This road connection is appealing because it provides a reasonable north/south route along the eastside of the City. However, this alternative was not considered practical because it would require taking several homes located on or near the corridor alignment.

Another road connection initially considered but later rejected was an east/west road connection that would extend Seventh Avenue to the east, then swing to the north to connect to the bend in Armory Road. This road connection would require the taking of the several homes located near or on the road alignment.

Modifying the traffic patterns to create a one-way couplet on Seventh and Eighth Streets was also considered. This concept was suggested as a possible way to minimize traffic congestion in the vicinity of the schools at the eastern end of Seventh Street.

Although creating a one-way circulation pattern might relieve some of the traffic congestion problems it would also create some other problems. Seventh Street was identified in the Highway 93 EIS as a desirable east-west connector and designated as the future alignment over the Whitefish River connecting to the western side of town. If the eastern extension of Seventh Street is ever connected to a collector route serving the southeastern portion of the community it would be desirable for Seventh to remain a two-way facility. With the one-way couplet the couplet would have to be rerouted at both ends to use the future bridge at the west end and the single road extension over Cow Creek on the east end. Changing the traffic patterns would have a significant impact on the residential neighborhood along Eighth Street. It would also create problems at the eastern end of the corridors, because there is no convenient route connection between Seventh and Eighth east of Ashar Avenue.

It was felt that it would be more desirable to work with the school district to help minimize the traffic congestion created by their establishments. As a result, the Seventh and Eighth Street one-way couple was eliminated from further consideration in this Plan.

No alternative was considered if it was known to require the taking of an existing home. No alternatives were considered if it required creating a new at-grade crossing of the railroad tracks.

4.3 Street Network Alternatives

Several road options were identified and analyzed in an attempt to connect the southeastern quadrant of the community to the central part of the City. The greatest problem associated with the current connections is the Park Avenue route. Currently, Voerman Road connects to Park Avenue. The Park Avenue route alignment has several 90-degree turns and is a safety concern, especially during the winter months. Several route alternatives are included for consideration. These route connections include the following:

Alternative A: Extend Ashar Avenue south from Eighth Street connecting to Voerman Road;

Alternative B: Extend Seventh Street to the east and south connecting to Voerman Road at the intersection of Monegan Road;

.

Alternative C: Extend Voerman Road to the west, crossing the river and connecting to Columbia Avenue; and

Alternative D: Extend Greenwood Drive to the east, crossing the river and connecting with Monegan Road.

These four route Alternatives were modeled separately to help identify their impact on the road system. The results of these analyses are presented in **FIGURES 4.1 through 4.4.** Each of these Alternatives is analyzed in the following sections.

Alternative A

The addition of the Ashar Avenue connection will significantly reduce the amount of traffic using the Park Avenue Route, which is considered a desirable result. Traffic reductions will also occur on Armory Road and J.P. Road. The addition of this road segment would also increase the amount of traffic on the north/south portion of Monegan Road. A greater portion of the traffic from Riverside at Whitefish would likely use this route to avoid traffic congestion on U.S. Highway 93, especially during the summer months.

The Ashar connection would also bring more traffic to the Seventh Street Corridor. This new traffic would have a moderate impact on the schools and residents along the corridor. This road connection would have to be carefully designed to minimize the

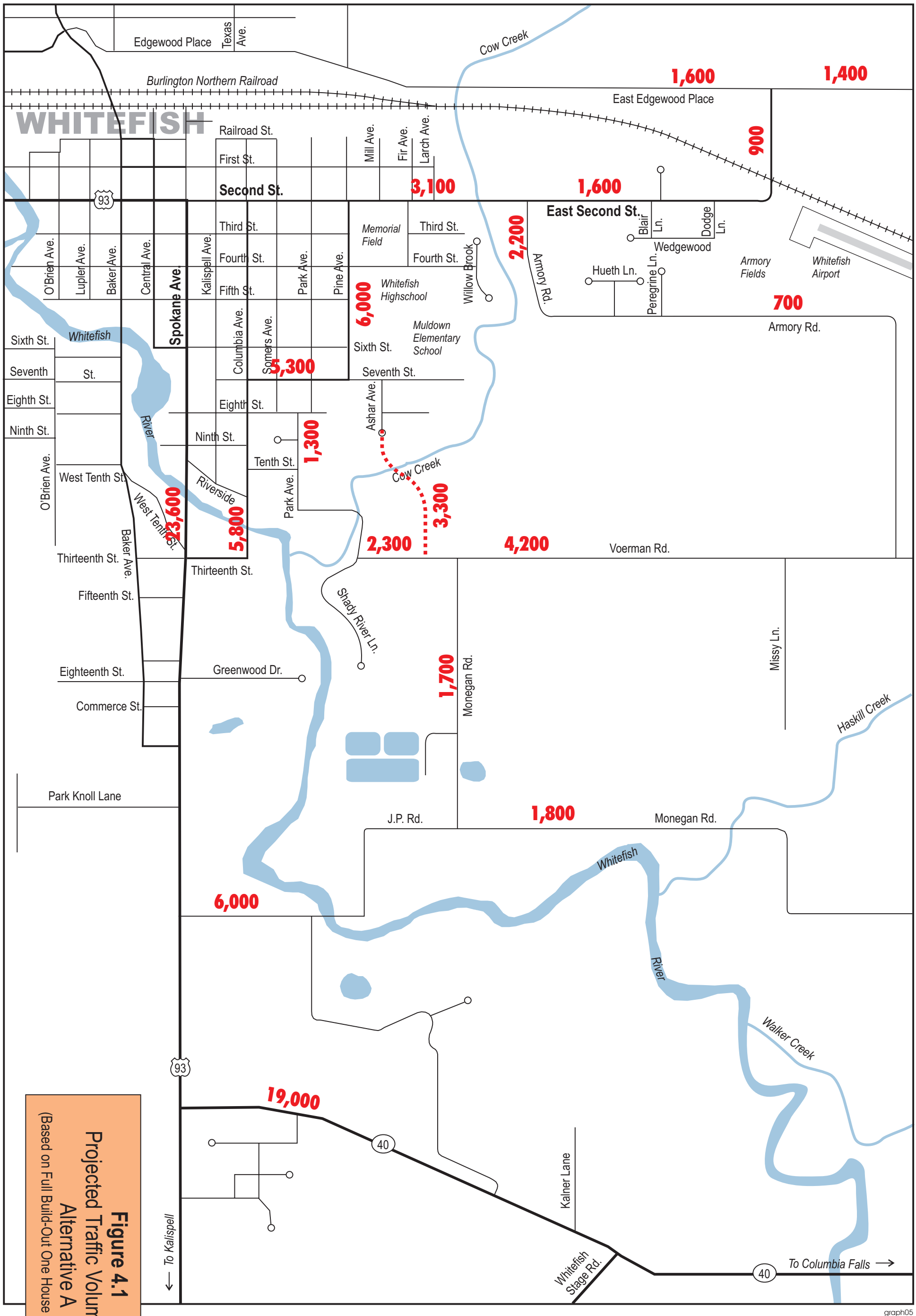


Figure 4.1
Projected Traffic Volumes with Alternative A
(Based on Full Build-Out One House per Two Acres)

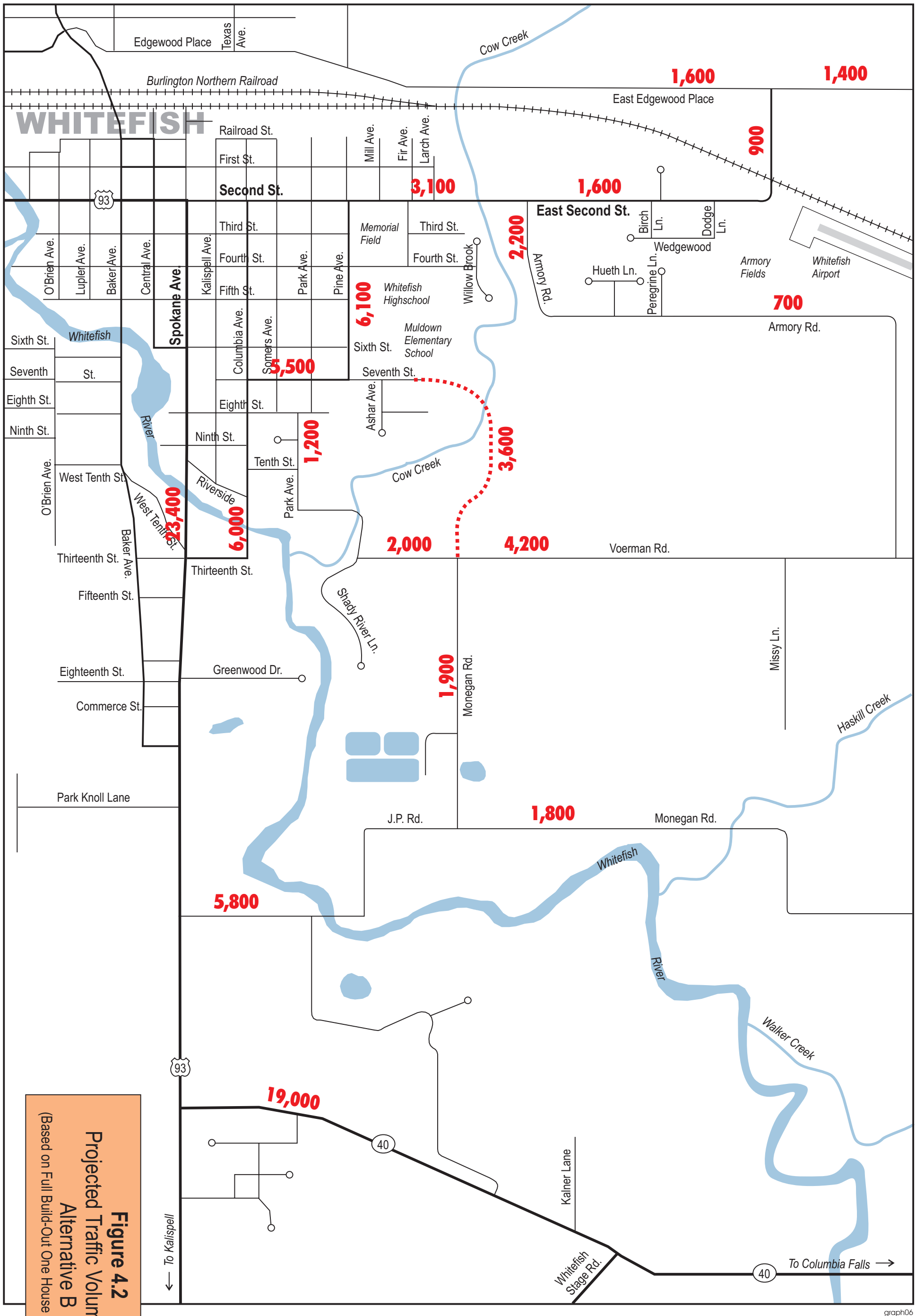


Figure 4.2
Projected Traffic Volumes with Alternative B
(Based on Full Build-Out One House per Two Acres)

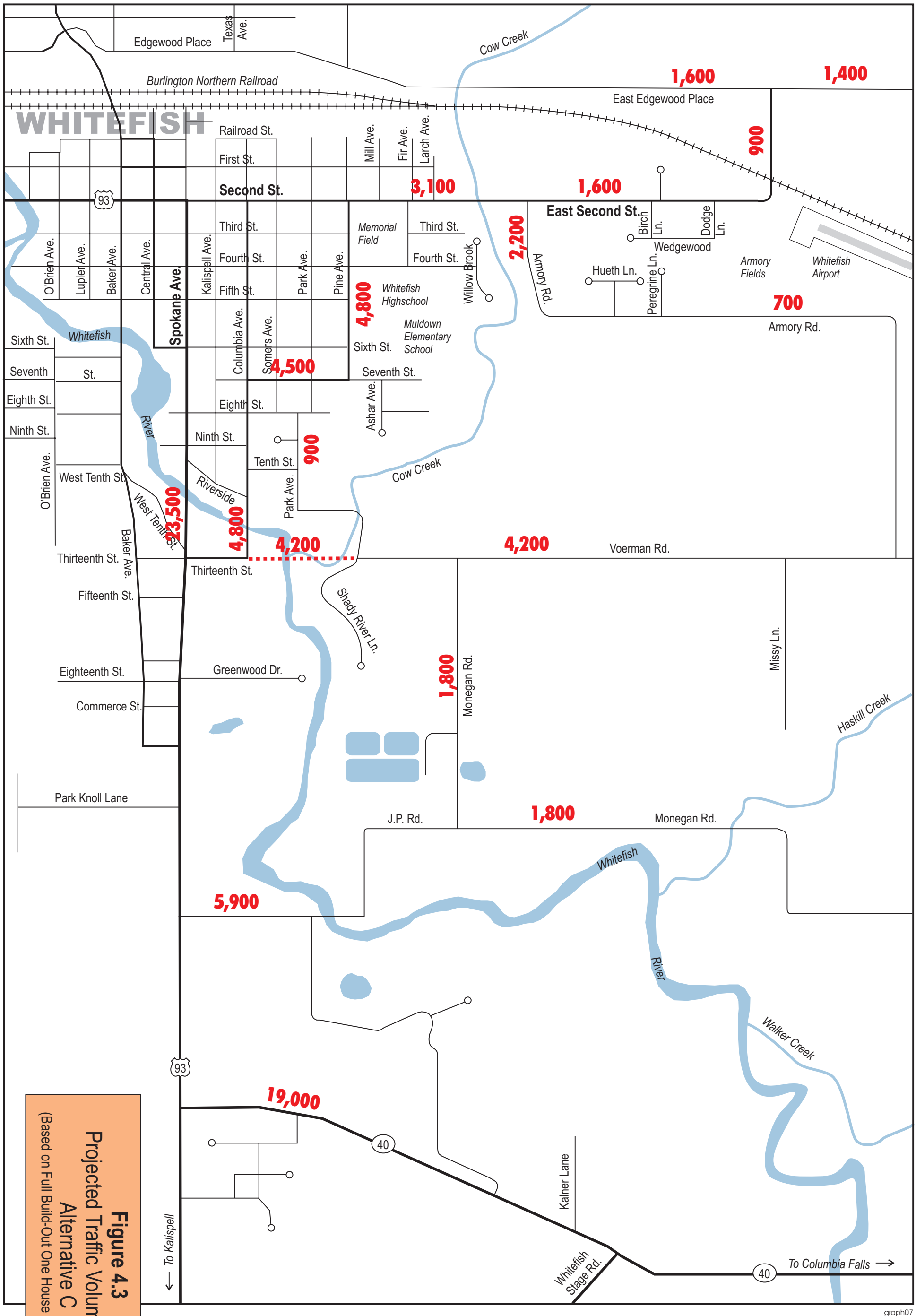


Figure 4.3
Projected Traffic Volumes with Alternative C
(Based on Full Build-Out One House per Two Acres)

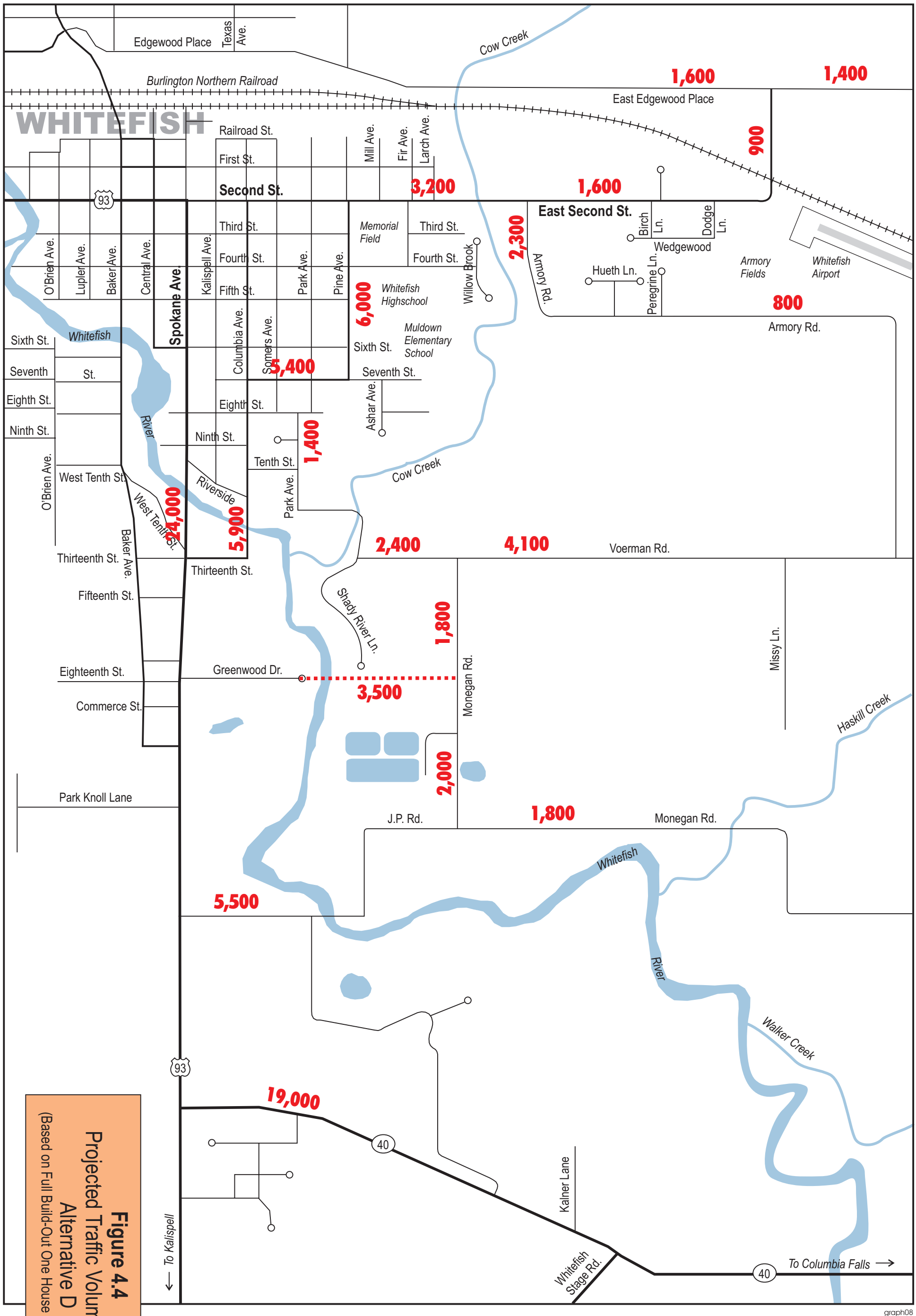


Figure 4.4
Projected Traffic Volumes with Alternative D
(Based on Full Build-Out One House per Two Acres)

impacts on the Creekwood Park subdivision. Traffic on Monegan would have to jog over onto Voerman to connect to Ashar to keep traffic speeds within acceptable limits.

This addition would require a drainage culvert at the crossing of Cow Creek.

Alternative B

Extension of Seventh Street to the south and east, then connecting to Voerman at Monegan would result in a beneficial shift in traffic away from the Park Avenue route and would bring the traffic in on Seventh Street. It would have a similar effect on the north/south portion of Monegan as Alternative A. Traffic from the south would find this new route a relatively direct one into the City that avoids possible traffic congestion on U.S. Highway 93. The new connection would draw some traffic away from Armory Road and J.P. Road.

This new route connection would have a major impact on the schools located on Seventh Street. Unlike Alternative A, this one would make Seventh Street a through street that carries a significant amount of traffic directly past the schools. The direct alignment of the resulting corridor would tend to encourage higher traffic speeds that would have to be managed through traffic calming and enforcement.

This alternative would require a drainage culvert at the crossing of Cow Creek.

Alternative C

Extension of Voerman Road to the west would involve crossing a portion of City Park land and the Whitefish River. The cost of a bridge at this location makes this Alternative much more expensive than Alternatives A and B. It is estimated that the bridge would cost approximately $7 million.

The benefits of this Alternative are that it creates a desirable east/west route that makes a direct connection to U.S. Highway 93, Baker Street, and the north/south portion of Columbia Avenue. This alignment also provides direct access to the hospital. This new route connection would pull a significant amount of traffic off of the Park Avenue route. This route addition will not have any measurable impact traffic on Armory Road. It will tend to increase the use of the north/south portion of Monegan Road and people would likely use this route to avoid traffic congestion on U.S. Highway 93 when traveling to and from areas in the south such as Riverside at Whitefish.

Alternative D

Extension of Greenwood Drive to the east across the Whitefish River would create an entirely new way to access the southeast portion of the community. Greenwood Drive would have to be routed around the southern portion of the Shady River Estates. The new route would connect to Monegan Road. This new route would provide access to U.S. Highway 93 at a point just north of the Mall.

The addition of a new bridge as part of this Alternative makes this option significantly more expensive than Alternatives A and B. The bridge would cost about $5.4 million.

The Greenwood connection would divert a reasonable amount of traffic away from the Park Avenue route. It would also tend to reduce the traffic volumes on J.P. Road. It would not impact the traffic on Armory Road.

In addition to the four Alternatives described and analyzed above, two north/south route alignments within the area were also considered. These two options involve developing new north/south roads between Armory Road and State Route 40. Both of these routes would be desirable when the areas develops. They would provide access to many parts of the study area that currently do not have direct road access.

Alternative E

This route would begin on Armory Road at the intersection with Peregrine Lane. This location was chosen because it has adequate sight distance in both directions along Armory Road. Sites farther to the west had limited sight distance due to the crest in the road. From Armory Road, the alignment swings to the west and then heads south along the half section line. The route would cross Voerman Road and the east/west portion of Monegan Road. The route would extend across the river and continue along the eastern boundary of the Riverside at Whitefish development to intersect with Route 40. The alignment of this Alternative is shown in **FIGURES 4.5 and 4.6.**

This route alignment is estimated to carry about 1,500 vpd. It would provide a north/south option to the street network and provide access to several portions of the study area that currently do not have direct access. The possible southern extension across the river and connection to Route 40 would be a desirable addition to the network, although the bridge over the river would add to the overall cost of this Alternative. All of the other segments of this route would be desirable as the area develops.

The addition of this route Alternative would tend to reduce the traffic volumes on Route 40 and Highway 93 while increasing the volumes on Armory Road and East Second Street.

The location of the river crossing shown in the figure is conceptual only. The exact location of the bridge will be determined in future planning efforts. The cost of the bridge over the river is estimated to be about $4.6 million.

Alternative F

This route would begin at East Second Street between the Armory Fields and the airport. The route would skirt around the east side of the Armory Fields and extend south along the section line. This route would intersect Armory Road and follow it's alignment to the east and south to the intersection with Voerman Road.

The route would continue south across Haskill Creek, Monegan Road, and Walker Creek connecting with State Route 40. The alignment of this Alternative is shown in **FIGURES 4.5 and 4.6.**

It is estimated that this route alignment would carry between 2,800 and 3,000 vpd. It would provide several desirable additions to the road network. It provides direct access to East Second Street and Edgewood Road. The route alignment makes use of two existing road segments and provides access to areas that currently do not have direct road access. Although the crossings of Haskill and Walker Creeks would add to the cost of this Alternative, the route alignment is far enough east to avoid the cost of another bridge crossing of the Whitefish River. This route would function as an eastern bypass route when completed

This route would impact the traffic patterns in the area. It would reduce traffic volumes on Route 40 and U.S. Highway 93 due to traffic using this route to avoid congestion on U.S. Highway 93 and in the City. However, this Alternative would increase traffic volumes on East Second Street and on Edgewood Road.

The location of the crossing of Haskill Creek and Walker Creek in Alternative F shown in the figures are conceptual only. A more in depth review of the topography in these areas would be necessary prior to sighting the proposed location of the route through the southeastern portion of the study area. It is believed that bridges would not be necessary to cross these creeks and that the crossings could be accomplished using large culverts.

FIGURE 4.5 shows the alignment of Alternatives E and F in unison with Alternatives A and D. This figure demonstrates how these four Alternatives would function in combination. The figure shows the resulting traffic volumes with this combination of routes at full build-out, assuming an average density of one house per every two acres.

The analysis of this combination of routes indicates that the Ashar Lane connection would redirect much of the traffic that would otherwise use the Park Avenue route. The Greenwood Drive extension would have significantly less traffic when used in combination with the Ashar Lane connection. The new connections in the north tend to reduce the traffic loads on J.P. Road. The Alternative E and F route alignments do not significantly affect the other two road connections. Alternative F tends to carry over twice the volume of Alternative E.

FIGURE 4.6 shows how a combination of Alternatives B, C, E, and F would function together. The western extension of Voerman and the southeastern extension of Seventh Street both divide the traffic somewhat evenly and divert the flow away from the Park Avenue route. These new routes result in a reduction in traffic using J.P. Road. An examination of the proposed north/south routes indicates that Alternative E carries about half the volume of Alternative F.

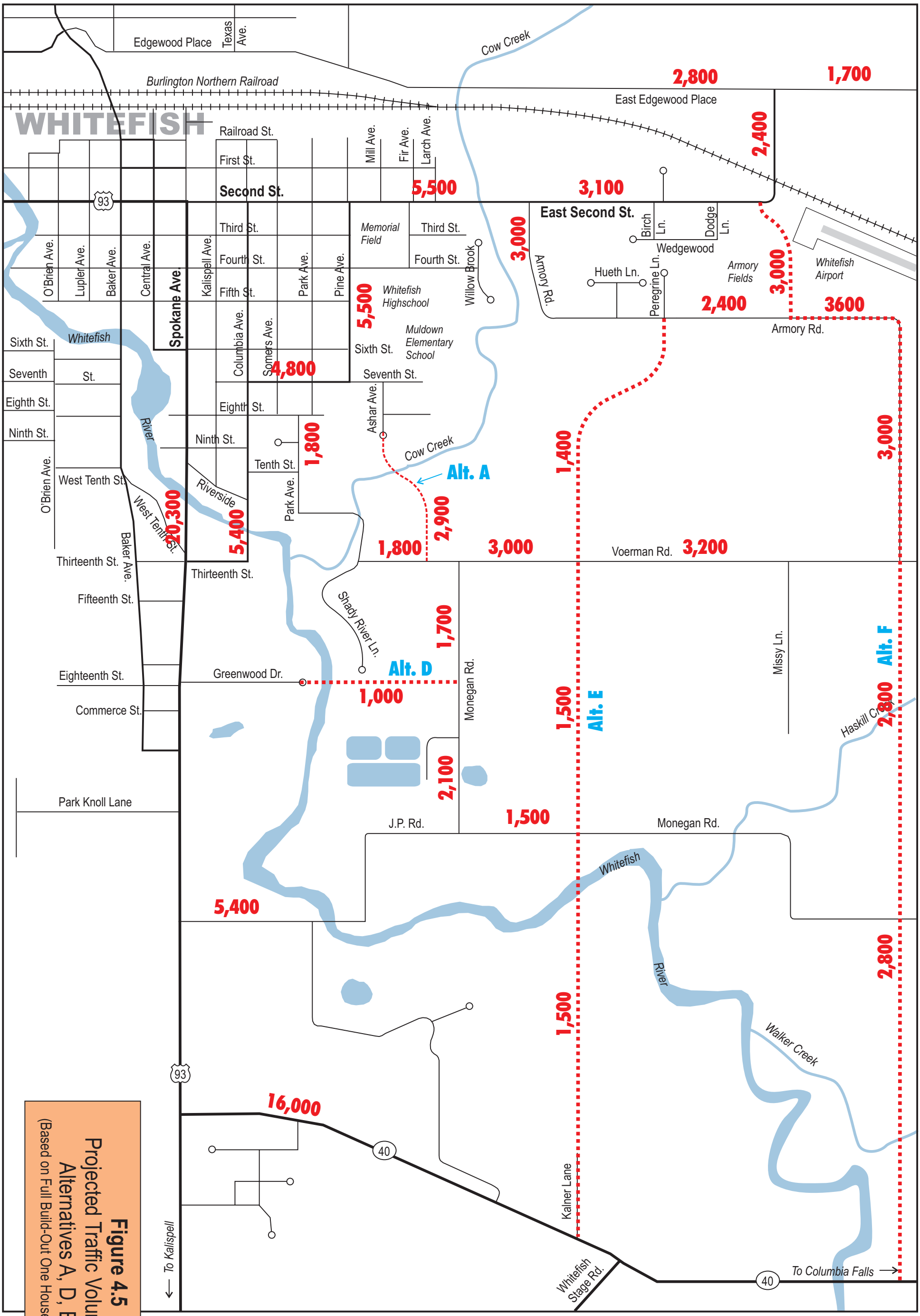


Figure 4.5
Projected Traffic Volumes with Alternatives A, D, E, & F
(Based on Full Build-Out One House per Two Acres)

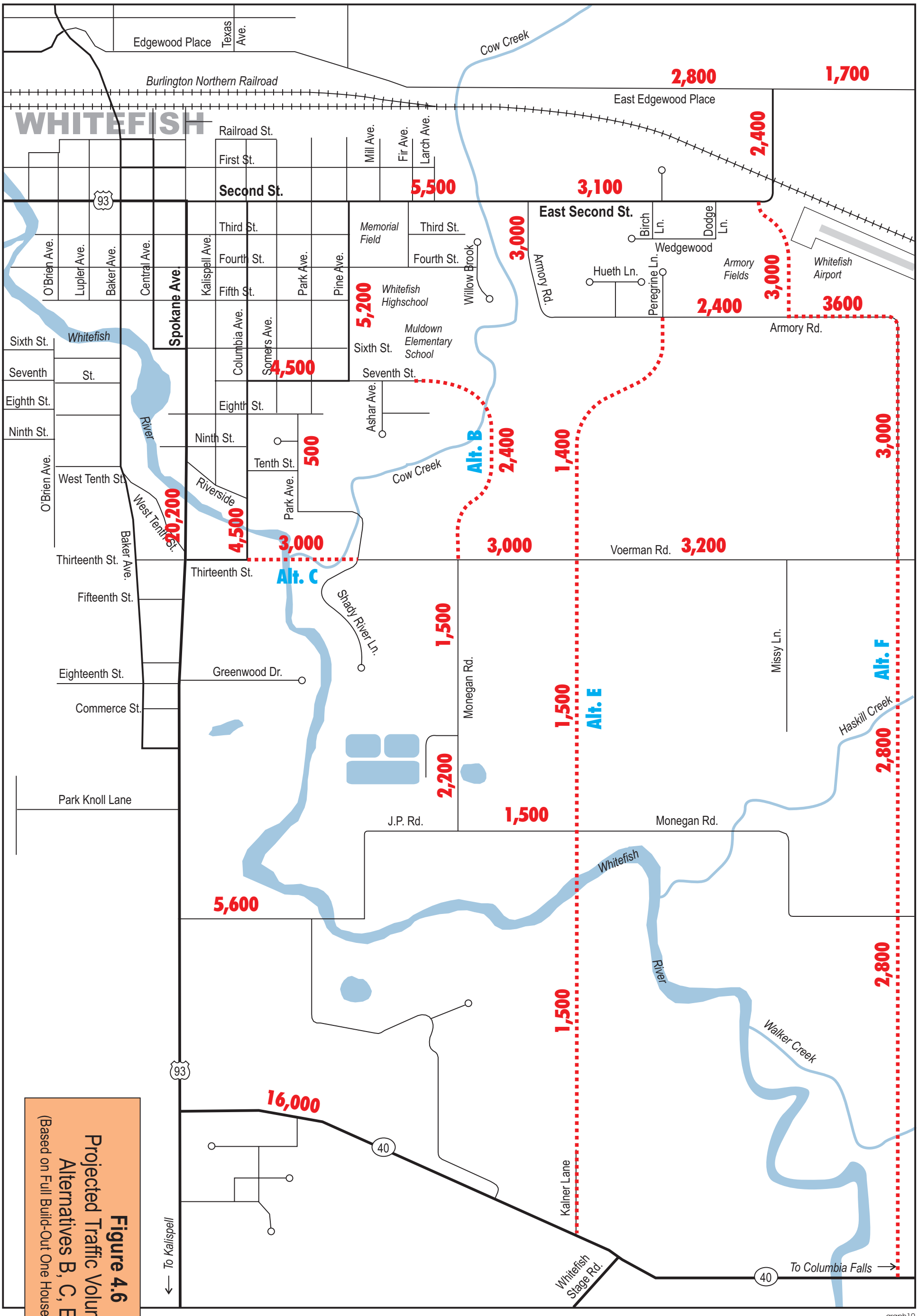


Figure 4.6
Projected Traffic Volumes with Alternatives B, C, E, & F
(Based on Full Build-Out One House per Two Acres)

CHAPTER 5:
Recommended Major Street Network

CHAPTER 5: RECOMMENDED MAJOR STREET NETWORK

5.1 Conclusions

After reviewing all of the route Alternatives and the resulting effects on the distribution of traffic, it becomes clear that each Alternative has some beneficial effect on the area's traffic patterns. When making a recommendation, it is important to consider the reality of the limited financing available to the community for bridge construction. It is unlikely that the community will get much in the way of financial assistance from the County or the State for new bridge construction.

The following conclusions emerge after reviewing the Alternatives:

- The Ashar connection in Alternative A would be relatively easy to implement and would relieve the traffic pressure on the Park Avenue route. The routing of traffic through the Creekwood Park subdivision would have to be done carefully so as to not adversely affect this proposed neighborhood.

- The southeastern extension of Seventh Street would also be relatively easy to implement and would create an effective link with the existing network. This connection will become more desirable if Seventh Street is ever extended across the river as recommended in the U.S. Highway 93 Environmental Impact Statement. The one drawback of this Alternative is that the route would draw traffic past several schools located at the east end of Seventh Street.

- In order to effectively use Seventh Street as an effective access route connection with the area southeast of town, it will be necessary to eliminate the traffic congestion problems on Seventh Street east of Pine Avenue. There are four schools in this area including the High School, the Muldown Elementary School, the Montessori School, and the Cross Currents Christian School. The traffic congestion is primarily due to drivers stopping or parking while picking-up or dropping-off children and the concentration of vehicles in the area during the times the schools begin and end for the day. It is recommended that the City work with the School District to improve an existing one-way northbound route on the Fir Avenue alignment located between the high school and the elementary school. If improved this connection could be used to encourage drivers to exit the area via this route. It will also be necessary to increase enforcement of the current no parking restrictions on Seventh Street. It would be desirable for the schools to work cooperatively with the City to encourage student pick up and drop off at some location within the school property, on Pine Avenue or Fourth Street.

- The river bridges included in Alternatives C and E are very desirable link connections but would be prohibitively expensive at this time. Although these route connections are unlikely to be funded in the foreseeable future it is recommended that they be

presented as long-range future road connections, in the hope that funding would be available at some point in the future.

- The Greenwood Drive extension in Alternative D does not carry enough traffic to justify the expense of the river crossing.

- Alternative F tends to carry more traffic than Alternative E and makes a more desirable connection at the northern terminus. Although the southern portion of this route has to cross Haskill and Walker Creeks it is a desirable link connection.

5.2 Recommendations

The combination of Alternatives A and B provide a favorable redistribution of traffic in the northeastern portion of the study area. Each alternative tends to minimize the traffic using the Park Avenue route and provide reasonable access routes into town. It is important to note that there are many reasons why one or more of these recommended Alternatives would not be implemented. In the case of Seventh Street extension in Alternative B, the route extension involves a single landowner that may not develop the land for quite some time. The City must weigh this fact when pursuing a solution to the traffic problems on the Park Avenue Route.

In light of the current Creekwood Park development proposal it is recommended that Alternative A be implemented as part of the development providing a local street connection between Voerman Road and Ashar Avenue. This road addition will provide some immediate relief for the traffic currently using the Park Avenue route into town.

It is recommended that Alternative B be included as part of the future Major Street Network. The eastern extension of Seventh Street with a connection to Voerman at Monegan Road is a desirable connection. It would be desirable to obtain enough right-of-way at the Voerman-Monegan intersection so that a modern round-about intersection configuration can be considered.

The bridge connection at the western end of Voerman Road as presented in Alternative C is a desirable and logical link connection, even when considering the cost and potential problems associated with the extension. Unfortunately the cost of the bridge makes this alternative unlikely for the foreseeable future. It is recommended that this alternative be included as a long-range future improvement to the Major Street Network. By doing so, this route connection can be reconsidered in future transportation planning efforts when the funding situation is perhaps more favorable or the demand for the bridge is significantly greater.

Alternatives E and F are both favorable alignments providing access to most of the land in the undeveloped portions of the study area. Because the ultimate development pattern is unknown, it is desirable to include both of these routes in the recommended street network. In this way if the land develops in one area versus the other, or in both areas, the community is prepared and routes can be implemented along with the land development.

The bridge over the Whitefish River in Alternative E should be considered a long-range future improvement due to the funding limitations associated with this structure. A more favorable funding situation and greater traffic demand would be necessary to justify such a project.

It is recommended that these future collector routes include pedestrian and bicycle facilities. The community should acquire 60 feet of right-of-way for the streets within the City Limits and 90 feet of right-of-way in the rural areas. This amount of right-of-way is necessary to ensure that there is adequate room for the road, pedestrian and bicycle facilities, utilities, and future growth.

The recommended Major Street Network is presented in **FIGURE 5.1.** Although the Bridge over the Whitefish River at 7th Street and the extension of the 7th Street Bridge between Spokane and Kalispell Avenue are not included in this analysis, their future construction factors into the overall function of East 7th Street and are included in **FIGURE 5.1** to illustrate previously established planning goals.

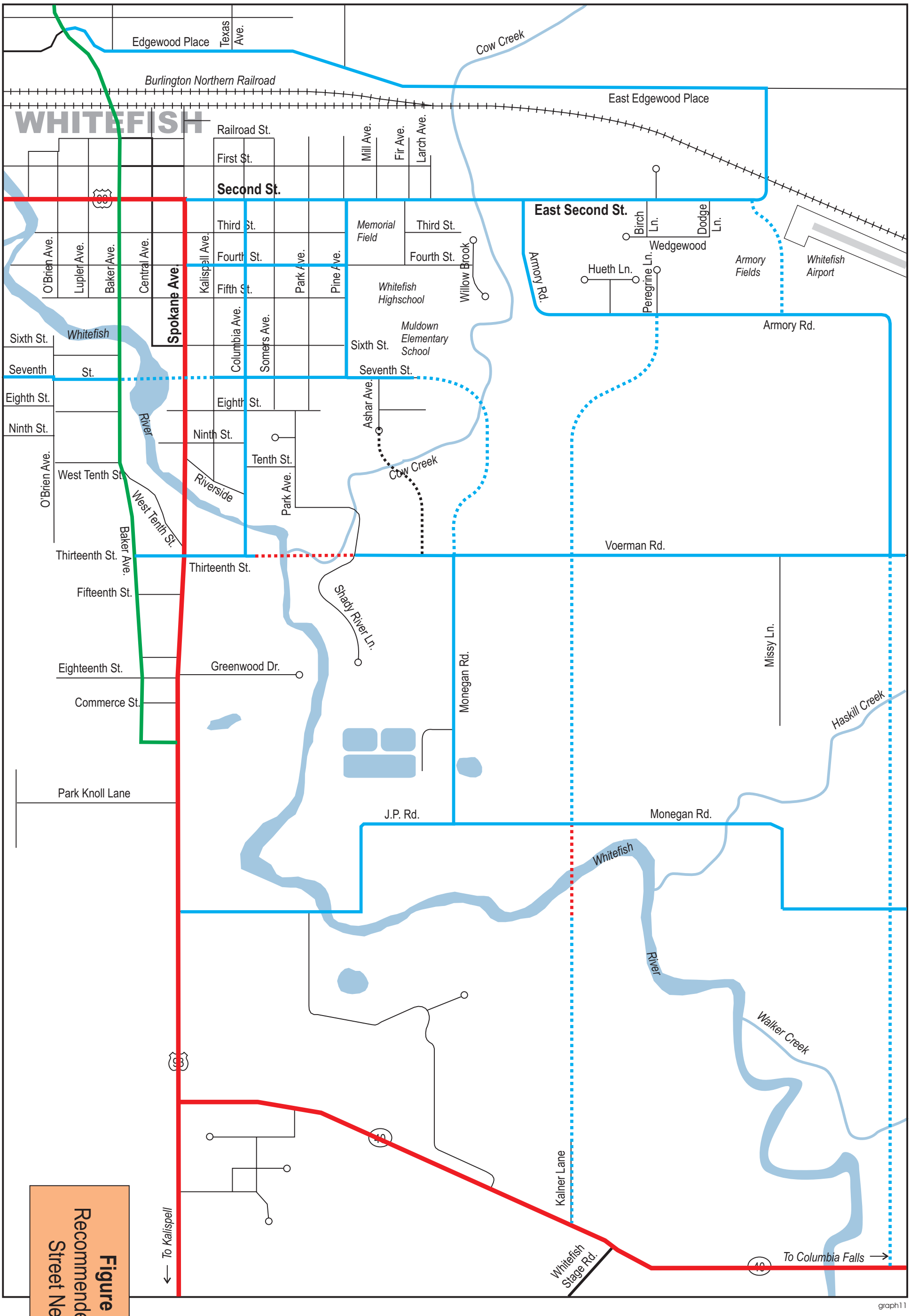


Figure 5.1
Recommended Major Street Network