

## **CHAPTER 4: IDENTIFICATION OF ROAD SYSTEM DEFICIENCIES: TRANSPORTATION PLANNING MODEL**

### **I. INTRODUCTION**

Transportation planning models are the primary tools used to predict future travel conditions. With the information derived from the model, it is possible to identify which roadways are expected to experience unacceptable levels of congestion. Solutions to these congestion problems can then be developed.

The Municipality of Anchorage Transportation Planning Model was utilized to forecast future (Year 2023) travel volumes in the Chugiak-Eagle River area. This model was developed using TransCAD 3.61 software. Complete documentation of the model is contained in the “Anchorage Transportation Planning Model Documentation Report” dated June 2000 and is available at the Municipality of Anchorage Transportation Planning Division.

### **II. MODEL ASSUMPTIONS**

The number and distribution of households and employment are the primary factors underpinning transportation demand. There are well-defined relationships between land use development and travel demand generation. The following section presents the major land use assumptions used in the model.

#### **A. Population**

One of the most important assumptions of any traffic projection model is population. TEA-21 planning regulations require that all transportation plans utilize a 20-year planning horizon. Thus, for the purposes of this planning study, the population of the study area was estimated for the year 2023. TEA-21 planning regulations also require that long-range transportation plans utilize the most recent data available. The most current population projections available at the time this study was being developed are contained in the report entitled “Economic Projections: Alaska and the Southern Rail belt 2000-2025”, prepared by Scott Goldsmith of the Institute of Social and Economic Research (ISER) and published in October 2001. The population projections in the ISER report were based on an economic model utilizing a consistent set of assumptions about levels of future basic industry activity within the state, national variables, and state fiscal policy variables. Three separate projections were developed: the Low Case, the Base Case, and the High Case. The Base Case projection (see Table 1), which is considered to be the most likely scenario, was selected for use in the Chugiak-Eagle River Long-Range Transportation Plan. According to the Base Case estimates, the future rate of wage and salary employment growth in Anchorage will be 0.74 percent for the remainder of this decade, 1.33 percent for the next decade, and 1.09 percent thereafter.

**Table 1**  
**Year 2023 Projections**

	<b>Municipality of Anchorage</b>	<b>Chugiak-Eagle River</b>
<b>Population</b>	350,700	54,500
<b>Households</b>	130,500	17,650
<b>Number of Persons Employed</b>	167,800	7,070

Once the Municipality of Anchorage projections had been established, the population projections for the Chugiak-Eagle River sub-region could then be determined. In order to accomplish this, staff utilized the same assumptions as the 1993 Chugiak-Eagle River Comprehensive Plan. Based on an historical population analysis, the Comprehensive Plan estimated that Chugiak-Eagle River would capture approximately 22 percent of the Municipality of Anchorage’s population growth within the next 20 years. The resulting estimate of 54,500 represents an 82% increase between 2000 and 2023 or an annual average growth rate of 3.5% a year.

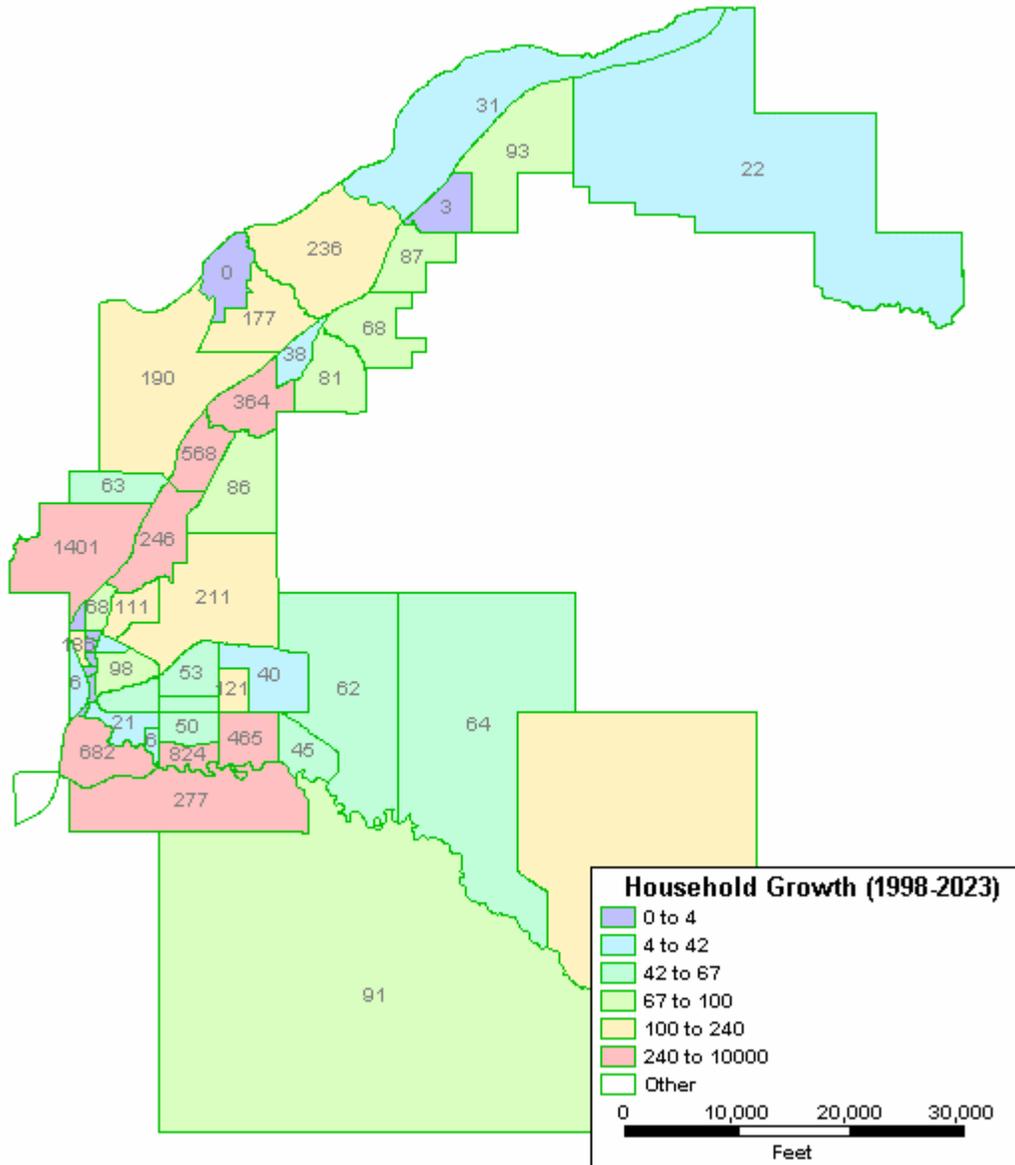
**B. Number and Location of Dwelling Units**

In order to be useful in the transportation-planning model, the future population and household estimates for Chugiak-Eagle River must be distributed by traffic analysis zones (the building block of the transportation planning model). The allocation of households to a TAZ is accomplished through the use of the Municipality of Anchorage land use allocation model. The following five factors are used to allocate growth:

- The availability of the parcel for development (Is it vacant?)
- The suitability of the land for development (Is it located in a wetland or steep hillside?)
- The type and amount of development allowed under zoning ordinances
- The accessibility of the location of the parcel (How close is the parcel to existing development?)
- Growth in the pipeline (Are there set plans to develop the property in the near future?)

Figure 2 shows where the land use allocation model allocates future growth. The “hot spots” of residential growth are found primarily in four areas: (1) the Powder Reserve west of the Glenn Highway, (2) Eagle Crossing, (3) the area south of Eagle River and bordered on the south and east by Eagle River Loop Road, and (4) Eklutna 770 located between the Glenn Highway and Old Glenn Highway and North and South Birchwood Loop Roads. All except for the Eklutna 770 contain active subdivisions, which are on sewer and water and consequently can be developed at higher densities. Although there are no plans to develop Eklutna 770 at this time it is assumed that sewer and water will be extended within the next 20 years and development will take place during the timeframe of this plan.

**Figure 2  
Household Growth (1998-2023)**



**C. Amount and Location of Future Employment**

The amount and location of future employment also has a strong influence on the traffic volumes on area roads. Employment, especially retail employment, acts as a traffic attractor. Large concentrations of retail land uses create high traffic volumes on the adjacent roads.

Estimates of future employment utilized in the traffic projection model also follow the assumptions of the 1993 Comprehensive Plan. Historic trends show employment increasing from 10 percent of the Chugiak-Eagle River area’s 1980 population to 11 percent of its 1990

population. With economic growth, more of the area's population will be employed locally. Because Chugiak-Eagle River is expected to remain a bedroom community of Anchorage during the next twenty years, most of this increased employment will probably continue to be local serving rather than region serving.

Based on the above assumptions, the Comprehensive Plan calculated that year 2010 employment would be 13 percent of the projected population. Utilizing this assumption gives an estimated 2023 employment base for Chugiak-Eagle River of about 7,070 jobs.

The 1993 Chugiak-Eagle River Comprehensive Plan also contains direction regarding the location of future commercial development. The plan states that it is the policy of the Plan that downtown Eagle River is retained as the major commercial center for the Chugiak-Eagle River area. It also recognized however that commercial development would occur at strategic locations such as in Ekultna, Peters Creek, North Birchwood, at the Old Glenn Highway in Chugiak, South Birchwood, at the intersection of Eagle River Road and Eagle River Loop Road, and at the intersection of the Old Glenn Highway and North Eagle River Access Road. Major designated industrial areas are located around the Birchwood Airport, along the Old Glenn Highway in Chugiak, at Springbrook Drive in Eagle River, and at West Artillery Road in Eagle River.

This Long-Range Transportation Plan has adopted the employment distribution guidelines contained in the 1993 Comprehensive Plan. While this plan was being revised, Fred Meyer announced that the company was planning to build a new store on the northeast corner of the Old Glenn Highway and North Eagle River Access Road. The model assumed that these plans would be implemented.

### **III. MODEL RESULTS**

#### **A. Roadway Segments**

The transportation model traffic projections for 2023 are presented in Table 2 below and on Map 2. Due primarily to the population growth in the next 20 years, traffic in Chugiak-Eagle River is expected to grow substantially. Traffic growth will not be evenly distributed, however. Some of the largest increases will be along the Glenn Highway between North Eagle River Access Road and the Anchorage Bowl. Commuters who live in Chugiak-Eagle River and work in the Anchorage Bowl generate most of this traffic. There will also be a fairly large increase in traffic along Eagle River Loop Road between Eagle River Road and the Hiland Interchange of the Glenn Highway. This growth is also driven by commuter traffic from newly developing subdivisions in Eagle Crossing and the area south of Eagle River on the inside curve of Eagle River Loop Road.

Traffic on Eagle River Road is also expected to grow substantially over the next 20 years as a result of expected residential growth in Eagle River Valley. It should be noted, however, that the traffic projections for Eagle River Road could vary substantially depending on the pace of development of the relatively large tracts of vacant land located south of Eagle River Road and east of Eagle River Lane. The Old Glenn Highway north of the North Eagle River Access Road is also subject to significant increases in traffic depending on future land use development in the

Eklutna 770 area (located between the Old Glenn Highway and Glenn Highway and South and North Birchwood Loop Roads).

Changing traffic patterns will also have an effect on future traffic volumes in the Chugiak-Eagle River area. Changes in the distribution of retail activity within Chugiak-Eagle River are the primary cause of these shifts in traffic patterns. Wal-Mart, located on the southeast corner of Eagle River Loop Road, and Fred Meyer, to be built on the northeast corner of the Old Glenn Highway and North Eagle River Access Road, will have the largest impact. Given their size, these two establishments are expected to generate a substantial amount of traffic. As a result, traffic in downtown Eagle River will grow slower than traffic on roads leading to the new stores. This is particularly true with respect to Eagle River Loop Road between the Old Glenn Highway and Eagle River Road. People from Eagle River Valley will utilize this route to access the Fred Meyer store and people from the north part of Eagle River will utilize this route to access the Wal-Mart store. Reconstruction of this section of Eagle River Loop Road (currently scheduled for 2006) will also cause more people to use this route. Another major traffic generator, the new high school planned to be built on Yosemite Drive in Eagle River, will also affect traffic patterns on Hiland Road and at the Glenn Highway – Hiland Road Interchange.

The total volume of traffic on area roads is not very informative in and of itself. In order to be meaningful, traffic volumes must be converted to Level of Service. Level of Service is a useful way of defining how well a particular street or road is operating and whether or not its capacity is being exceeded and improvements might be needed. It is based on the ratio of traffic volume to roadway carrying capacity. Levels of Service range from A to F, with LOS A describing primarily free flow operations and LOS F describing forced or breakdown flow. (See Figure 3, Level of Service Illustrations.)

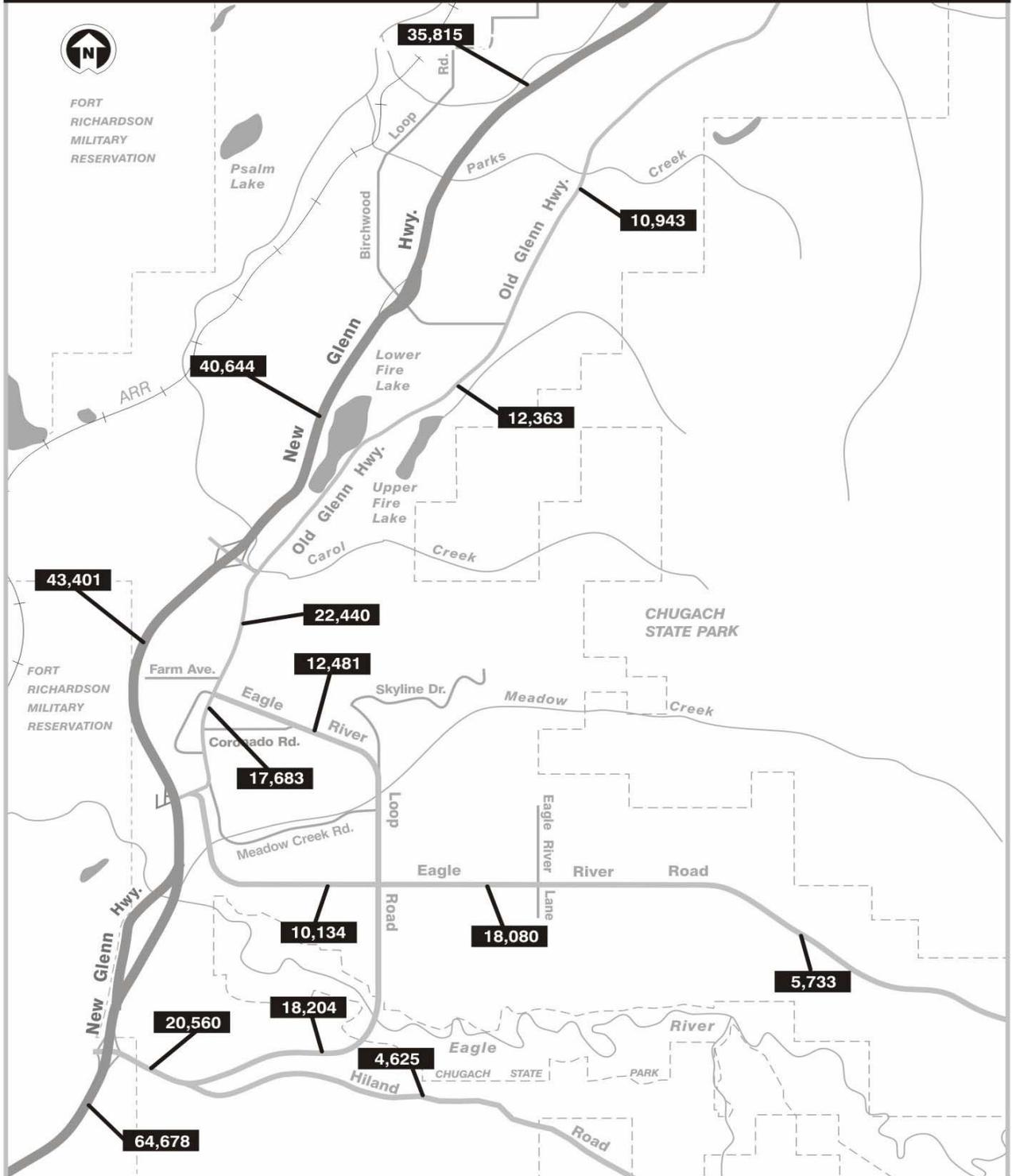
The Chugiak-Eagle River Long-Range Transportation Plan contains a policy, which states that any road segment with a Level of Service of D or worse is considered to be overcapacity. According to Table 3, only two roadway segments are currently operating at LOS D or below: (1) the northbound lanes of the Glenn Highway between Hiland Road and Artillery Road and (2) the Eagle River Road between Crestview and the Greenhouse. Several more roadway segments are expected to exceed the standard by the Year 2023. The majority of roadways in the Chugiak-Eagle River area are expected to continue to operate at a satisfactory level, however. The roadway segments projected to operate at congested levels include:

- Glenn Highway - Scalehouses to Hiland Road
- Glenn Highway - Hiland Road to Artillery Road (northbound).
- Glenn Highway - Artillery Road to N. Eagle River Access Road
- Glenn Highway - N. Eagle River Access Road to S Birchwood Loop Road
- Eagle River Road – Crestview Lane to Greenhouse Street
- Eagle River Road – Old Glenn Highway to Chain of Rock Drive
- Eagle River Loop Road – Coronado Street W. to Baronoff Avenue

**Table 2**  
**Year 2023 Traffic Projections**  
**(AADT = Annual Average Daily Traffic)**

Roadway Segments	Actual 2000 AADT	Projected 2023 AADT	Percent Change
Eagle River Road (east of Eagle River Loop Rd.)	9,700	18,080	86.4%
Eagle River Road (west of Eagle River Loop Rd.)	7,623	10,100	32.5%
Eagle River Loop Rd. (between Old Glenn Hwy. & Eagle River Rd.)	7,230	12,500	72.9%
Eagle River Loop Rd. (between Eagle River Rd. & Hiland Rd.)	10,968	18,200	65.9%
Eagle River Loop Rd. (between Hiland Rd. & the New Glenn Hwy. Interchange)	13,090	20,600	57.4%
Old Glenn Hwy. (between Eagle River Rd. & Eagle River Loop Rd.)	13,516	17,700	30.9%
Old Glenn Hwy. (between Eagle River Loop Rd. & North Eagle River Access Rd.)	16,990	22,400	31.8%
Old Glenn Hwy. (between South & North Birchwood Loop Rd.)	3,820	10,900	185.5%
Glenn Hwy. (between Scale- houses and Hiland Rd.)	47,111	64,700	37.3%
Glenn Hwy. (between Hiland Rd. and Artillery Rd.)	39,090	50,100	28.2%
Glenn Hwy. (between Artillery Rd. & N. Eagle River Access Rd.)	25,570	43,400	69.7%
Glenn Hwy. (between N. Eagle River Access Rd. & S. Birchwood Loop Rd.)	28,500	40,600	42.5%
Glenn Hwy. (north of N. Birchwood Loop Rd.)	25,860	34,400	33.0%

# Year 2023 Projected Average Daily Traffic

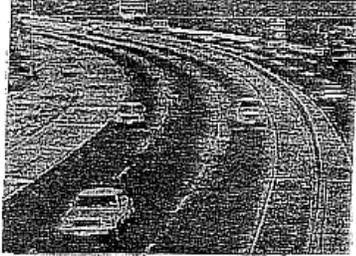


Source: Municipality of Anchorage, Traffic Department

February 7, 2003

MAP 2

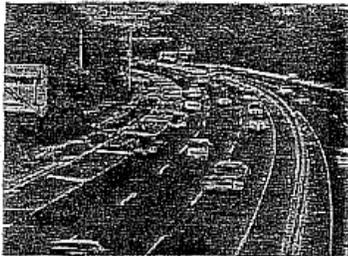
Figure 3  
Level of Service Illustrations



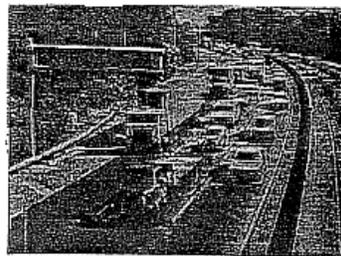
Level of Service A



Level of Service D



Level of Service B



Level of Service E



Level of Service C



Level of Service F

**Table 3**  
**Level of Service Summary**  
**Chugiak-Eagle River Freeways and Arterials**  
**(LOS = Level of Service, A to F)\***

Roadway Segments	2000 LOS	2023 LOS
<b>Glenn Highway</b>		
Scalehouses to Hiland Rd.	C	D
Hiland Rd. to Artillery Rd. (Northbound)	D	D
Hiland Rd. to Artillery Rd. (Southbound)	B	C
Artillery Rd. to N. Eagle River Access Rd.	B	D
N. Eagle River Access Rd. to S. Birchwood Loop Rd.	C	D
S. Birchwood Loop Road to N. Birchwood Loop Rd.	C	C
<b>Old Glenn Highway</b>		
Eagle River Rd. to Business Blvd.	B	B
Business Blvd. to Eagle River Loop Rd.	C	C
Eagle River Loop to N. Eagle River Access Rd.	C	C
North Eagle River Access Rd. to S. Birchwood Lp. Rd.	A	C
<b>Eagle River Road</b>		
Old Glenn Hwy. to Chain of Rock Drive	C	D
Chain of Rock Drive to Eagle River Loop Rd.	B	B
Eagle River Loop Rd. to Crestview Lane	C	C
Crestview Lane to Greenhouse Street	D	E
<b>Eagle River Loop Road</b>		
Old Glenn Highway to Coronado St. W.	B	B
Coronado St. W. to Baronoff Ave.	C	D
Baronoff Ave. to Eagle River Road	B	B
Eagle River Road to Driftwood Bay Drive	C	C
Driftwood Bay Drive to Hiland Road	A	B



Glenn Highway

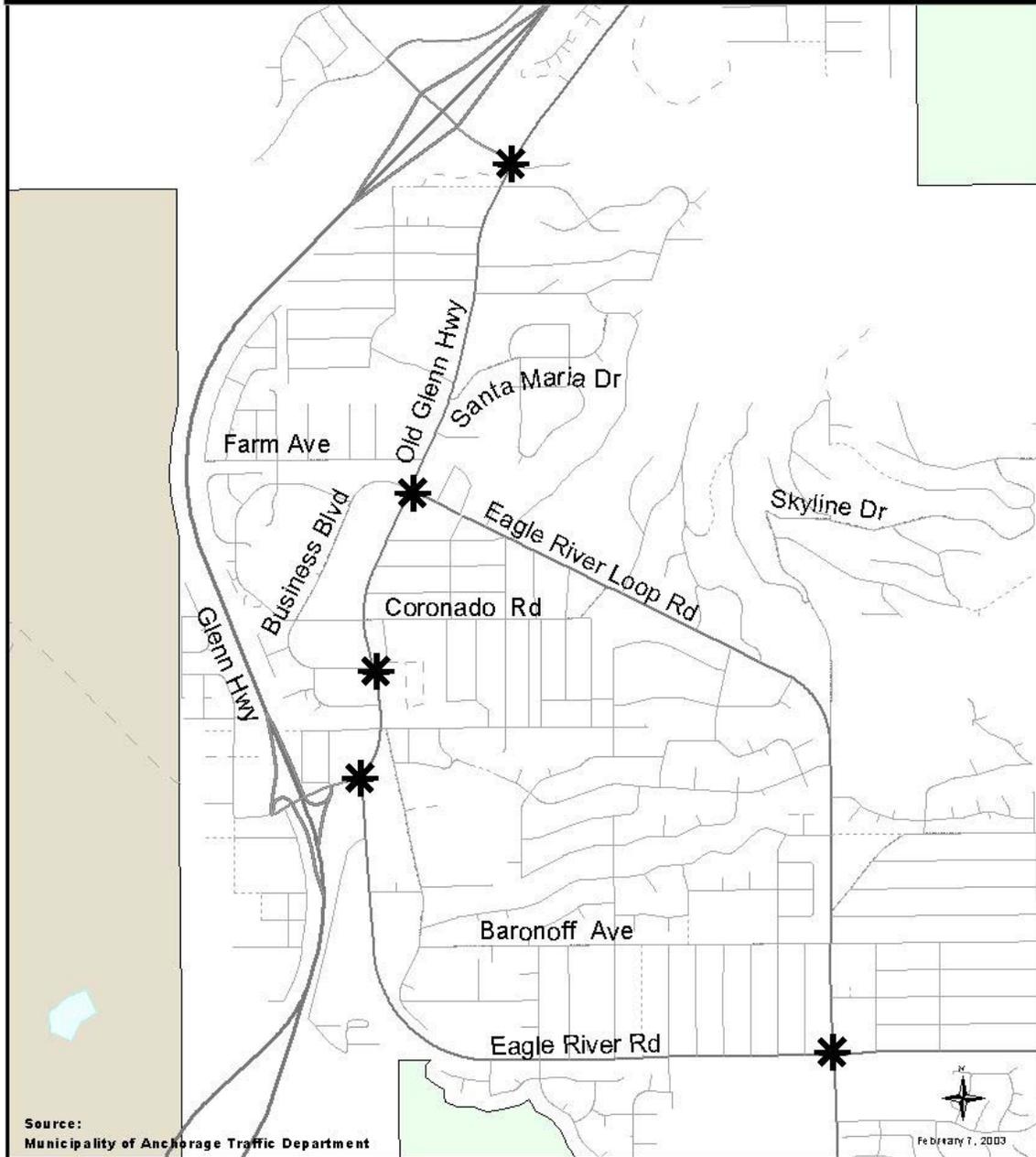
## **B. Intersections**

Measuring the Level of Service of roadway segments does not always tell the whole story. According to the Anchorage Congestion Management System “Status of the System Report,” published in September 2000, intersection delay is the primary cause of congestion on the Anchorage roadway network.

At the present time, none of the intersections in Chugiak-Eagle River is overcapacity, although the Old Glenn Highway/Eagle River Loop Road intersection is quickly approaching its ability to handle its traffic load. An analysis of intersections using projected traffic volumes, however, reveals that at least five intersections will be overcapacity within the next 20 years.

As Map 3 reveals most of these problem intersections are located along the Old Glenn Highway where it traverses the downtown core of Eagle River. As Chugiak-Eagle River grows, the number of trips from the residential growth areas (Powder Reserve, Eagle Crossing, etc.) to the downtown core will increase substantially. Unfortunately there are only two main access routes into and out of the core, one from the north (the Old Glenn Highway) and one from the south (Eagle River Road). This forces most of the traffic to go through a limited number of intersections. As a result, these intersections will soon become overburdened and increase delays.

# Future Overcapacity Intersections



Map 3

