

CHAPTER 6: CONGESTION MANAGEMENT

I. CONGESTION MANAGEMENT SYSTEM - MUNICIPALITY OF ANCHORAGE

The Transportation Equity Act for the 21st Century (TEA-21) requires that each Transportation Management Area (TMA) with a population over 200,000 develop and implement a Congestion Management System (CMS). The Municipality of Anchorage, as the designated TMA, has the responsibility for developing the CMS in cooperation with the Alaska Department of Transportation and Public Facilities.

For air quality considerations, TEA-21 planning regulations require transportation planners to look at ways to change the number of vehicles using the transportation system, instead of simply adding more capacity (travel demand reduction measures). Specifically, 23 CFR 450.320 (b) states that “In Transportation Management Areas (TMA) designated as Nonattainment for ozone or carbon monoxide (includes the Municipality of Anchorage), federal funds may not be programmed for any project that will result in a significant increase in carrying capacity for single occupant vehicles (a new general purpose highway on a new location or adding general purpose lanes, with the exception of safety improvements or the elimination of bottlenecks) unless the project results from a congestion management system (CSM) meeting the requirements of 23 CFR part 500, subpart E.”

TEA-21 regulations state, “Within a transportation management area, the transportation planning process shall include a congestion management system that provides for effective management of new and existing transportation facilities through the use of travel demand reduction and operational management strategies.” The regulations further state that a CMS should have five main components:

1. Identification and Evaluation of Potential Strategies
2. Performance Measures
3. Data Collection of System Monitoring
4. Evaluation of the Effectiveness of Implemented Strategies
5. Implementation of Strategies

AMATS has a fully implemented Congestion Management System, which meets all of the above-mentioned requirements. AMATS initiated its Congestion Management Program with the publication and adoption of the “**Congestion Management Program**” report in October 1994. The report identified and recommended a set of over 50 potentially effective congestion management strategies for Anchorage to employ in meeting travel demands and minimizing congestion.

On March 27, 1998, AMATS adopted 16 performance measures as part of its Congestion Management System. When used in conjunction with the data collection and monitoring efforts, performance measures provide the basis for identifying the extent, severity and specific locations of congestion on a system-wide basis as well as evaluate the effectiveness of implemented actions.

A. Status of the System Report

The latest effort in the implementation of the Congestion Management System involved the publication of the Anchorage Congestion Management System “Status of the System Report” in September 2000. This report utilized the previously adopted 16 performance standards to conduct a comprehensive multi-modal data collection effort.

The information contained in the report has four primary uses:

- Identify the locations, magnitude, and nature of congestion in the Anchorage region
- Develop the “Status of the System Report” of 1998 conditions of the Anchorage transportation system to be used as a baseline database to analyze changes over time
- Evaluation of existing congestion management strategies as well as aid in the identification and implementation of the new strategies
- Identify potential ongoing transportation system monitoring programs for future data collection needs, data storage and maintenance needs, and level of service standards.

The Status of the System Report looked at the Municipality of Anchorage’s road, transit, and pedestrian and bicycle system.

In assessing the road system, a total of 259 roadway segments, 30 intersections, and 9 travel corridors were evaluated. The Level of Service (LOS) for each roadway segment was calculated using a volume-to-capacity (V/C) ratio, a conventional level of service measure, which equates roadway demand to supply. Of the road segments evaluated for the morning peak period, most (94%) operated at LOS A or B. Only 16 roadway segments operated at LOS C, and none of these was located in the Chugiak-Eagle River area. During the evening peak period, again most segments operated at LOS A or B. One roadway segment operating at LOS C was located in the Chugiak-Eagle River area; the rest of the roadway segments analyzed in Chugiak-Eagle River operated at a level of service A or B.

A total of 30 intersections were identified and selected for analysis. The MOA Traffic Engineering Department provided volume turning movement, signal timing, and geometric data for these intersections. Two intersections in Eagle River were analyzed: Eagle River Loop and Eagle River Road, and Old Glenn Highway and Eagle River Loop. Both intersections performed at LOS C for all periods, with one exception. The intersection of Eagle River Loop and Eagle River Road performed at LOS D for average PM peak.

Travel time data was collected for nine corridors as part of this project. Travel time, considered by many as the best measure of system congestion, is measured as the amount of time required to transverse a segment or a complete route. Travel Corridor #2, Glenn Highway (Artillery Road Interchange to C Street) was the only corridor analyzed having segments in the Chugiak-Eagle River area. For the Glenn Highway, the most congested segments (below LOS C) were not in Chugiak-Eagle River, but the non-freeway segments eastbound in the Anchorage Bowl.

The results of the performance measure analysis reveals that the bus transit, carpooling, and vanpooling programs contribute to a substantial reduction in the number of vehicle miles traveled on the roadway system with a combined reduction of over 23 million vehicle miles

traveled per year. Of the three programs, vanpool is the newest and growing the fastest. The vanpool service to the Mat-Su Valley is experiencing particularly strong growth.

The transit performance measures point out several areas where improvements to the bus transit system might improve the transit mode share. Both the time between buses and the ratio of bus to automobile travel time performance measures indicate that bus service in Anchorage is well below the national average.

The Pedestrian Environmental Factors performance measure was designed to assess the quality of the pedestrian environment of Anchorage neighborhoods using criteria such as sidewalk availability, street connectivity, and topological barriers. The resulting composite scores show that much of Anchorage (with the exception of downtown and its surrounding neighborhoods) has a relatively poor pedestrian environment. This affects the performance of other transportation modes such as bus transit and carpooling that relies on walking to either access the mode or provide mobility once the destination is reached.

A total of 20 miles of paved bike trails currently exist in the Chugiak-Eagle River area. There are also a number of unpaved trails that are available for use by bicyclists. It should be noted that the number of miles of bicycle paths does not address the issue of connectivity. There may be important gaps in the pathway system.

Implementation of Strategies, as well as Evaluation of the Effectiveness of Implemented Strategies, is an on-going process. The analysis and findings contained in the “Status of the System Report” provide valuable insight into which strategies will do the most to solve Anchorage’s congestion problem.

Based on the analysis conducted for each of the above performance measures, intersection level of service appears to be the key determinant of congestion in Anchorage, and is worse during the afternoon peak period, when workers are attempting to return home. As a result, some of the most effective non-operational congestion management strategies will involve demand management strategies that are aimed at reducing the number of single-occupancy vehicle commuter trips. These include carpool, vanpool and transit strategies, alternative work hours, telecommuting, and the voluntary trip reduction ordinance.

B. CMS Data Collection and Monitoring Recommendations

Transportation model results for this 2003 LRTP Update show higher levels of congestion for Chugiak-Eagle River than the 1998 baseline information gathered for the Status of the System Report. One roadway segment is currently operating at level of service D, and several are projected to be operating at D or worse in the PM peak by 2023 in the Chugiak-Eagle River area. (See Table 3). Transportation Model results also identify five intersections as overcapacity by 2023 in the Chugiak-Eagle River area (**see Map 3**), which includes the two studied for the Congestion Management System. In addition, model results indicate that the Glenn Highway, Hiland Road to Artillery Road, is currently operating at LOS D. Four segments of the Glenn Highway, from the Scale houses to South Birchwood Loop Road, are projected to operate at LOS D by 2023. (See Table 3).

A recommendation of this LRTP update is to continue to monitor the roadway segments and intersections in the Chugiak-Eagle River area which have been identified by the analysis in Chapter 4 as currently overcapacity, or projected to be overcapacity in the future (Table 3), as part of the ongoing Congestion Management System data collection and monitoring effort.

II. CONGESTION MANAGEMENT STRATEGIES AND ROADWAY IMPROVEMENT NEEDS - CHUGIAK-EAGLE RIVER

According to Table 3, roadway segments within the Chugiak-Eagle River area projected to operate at congested levels by 2023 include:

- Glenn Highway – Scaleshouses to Hiland Road (LOS D)
- Glenn Highway – Hiland Road to Artillery Road (northbound) (LOS D)
- Glenn Highway – Artillery Road to N. Eagle River Access Road (LOS D)
- Glenn Highway – N. Eagle River Access Road to S. Birchwood Loop Road (LOS D)
- Eagle River Road – Crestview Lane to Greenhouse (LOS E)
- Eagle River Road – Old Glenn Highway to Chain of Rock (LOS D)
- Eagle River Loop Road – Coronado Street W. to Baranoff Avenue (LOS D).

These road segments very nearly match the list of roads identified in the 1996 Chugiak-Eagle River LRTP as being congested in the future. Eagle River Road is new to the list for this 2003 LRTP Update. The Old Glenn Highway does not re-appear on the list of future congested roadways in the Update. However, four of the five intersections identified as overcapacity in the future are located on the Old Glenn Highway from Artillery Road to the North Eagle River Access Road, within the Central Business District; the fifth is at the Eagle River Road intersection with Eagle River Loop Road.

In preparing the 1996 Plan, prior to making any recommendations regarding congested roadways, a thorough study of congestion management strategies was undertaken to determine how it might be possible to reduce the anticipated congestion to acceptable levels without adding lanes. Each of the six roadway segments projected as having congestion was analyzed in turn to determine if congestion management strategies could effectively reduce traffic volumes. The overall effectiveness of the strategies as well as the effectiveness of the most important individual strategies was assessed and a recommendation regarding needed improvements was made.

Several of the roadways identified as congested in the 1996 Plan and this 2003 LRTP Update have already been programmed for funding through the AMATS Transportation Improvement Program. This 2003 LRTP Update focuses on congested roadways not yet programmed for funding.

A. The Glenn Highway

The roadway segments along the Glenn Highway identified as being congested in the future in the 2003 LRTP Update are the same as those identified in the 1996 Plan. New projections show all four segments will perform at LOS D by 2023. The segment between Hiland Road to Artillery Road is currently operating at LOS D. One of the reasons why this segment of the

Glenn Highway is so congested is due to the steepness of the terrain in the area. Road segments traversing hilly terrain generally have less capacity than those traversing level terrain due to the fact that cars and trucks are forced to slow down.

The heaviest volume of traffic is on the six-lane segment of the Glenn Highway between the scalehouses and Hiland Road. A lesser amount of traffic is found on the segments between Artillery Road and South Birchwood Loop Road, but its capacity is not as great since it is only four lanes.

Traffic will have to be substantially reduced in order to avoid having to construct additional lanes on the Glenn Highway. Table 5 shows the greatest improvement needed is on the roadway segment between the Hiland Road and Artillery Road interchanges, which will require a reduction of 21,130 vehicles per day in order to achieve an LOS C, which is considered to be satisfactory. Percentages of AADT reduction needed for all four segments shown to provide a LOS C in 2023 are significantly higher than those reported in the 1996 Plan.

Table 5
Traffic Volume Reduction Needed to Achieve LOS C

Glenn Highway Road Segment	2023 AADT	AADT at LOS C	Reduction in AADT Needed to Achieve LOS C	% AADT Reduction Needed
Scalehouses to Hiland Rd.	64,700	48,576	16,124	24.9%
Hiland Rd.. to Artillery Rd.	50,100	28,970	21,130	42.2%
Artillery Rd. to N. Eagle River Access Rd.	43,400	32,384	11,016	25.4%
N. Eagle River Access Rd. to S. Birchwood Loop Rd.	40,600	32,384	8,216	20.2%

The Glenn Highway received the most intensive analysis of congestion management strategies of any roadway in Chugiak-Eagle River for the 1996 Plan. The study included the following specific strategies to reduce traffic demand:

- Commuter Rail Service from Anchorage to the Matanuska-Susitna Borough
- Increasing Bus Transit
- Increasing Carpooling
- Increasing the Vanpool Program
- Land Use Policies
- Bicycle and Pedestrian Improvements
- High Occupancy Vehicle (HOV) Lanes
- Reversible Lanes

Based on the results of the 1996 analysis, there did not appear to be any practical means of reducing the traffic volumes enough to avoid the need to add additional lane capacity on the four segments of the Glenn Highway projected to be congested in 20 years. Vanpooling and

carpooling appeared to have the most potential, but both would have had to be increased exponentially in order to make a dent in the congestion levels projected for the Glenn Highway.

This is still true today, with an even greater reduction in daily vehicle traffic (by 13,290 vehicles per day from Hiland Road to Artillery Road) required to achieve a LOS of C on the New Glenn during the PM peak. While the potential exists for some expansion of transit services (see Chapter 5), increasing transit usage to the levels required to avoid adding capacity to the Glenn Highway is not a realistic alternative given the low residential densities of this suburban / rural area. With a forecast ridership of 2,900 daily trips for Chugiak-Eagle River residents, which is more than six times the current level of ridership, and with more than 1/3 of these being intra-zonal (starting and ending in the area), expanded transit service will not address the need.

As stated in Chapter 5, carpooling and vanpooling have the most potential for reducing congestion between Chugiak-Eagle River and Anchorage. According to Anthony Downs (Stuck in Traffic, 1992), the number of solo drivers shifting to two persons per car would have to increase by 40% to achieve a reduction of 13.6% in peak hour trips. While the majority (approximately 80%) of Chugiak-Eagle River residents commuting to Anchorage drive alone, the average number of passengers per vehicle in Chugiak-Eagle River is higher than for the entire Municipality, and carpooling to work is also more popular. Thus, the potential may exist to expand the program within Chugiak-Eagle River. However, there are currently no vanpools that originate in the Chugiak/Eagle River area, and no vehicles are currently available for expansion of the vanpool program.

Any improvements in carpooling / vanpooling will need to include expanded participation by residents in the Mat-Su Valley, as nearly half of the traffic on the Glenn Highway in the study area is composed of Mat-Su Valley traffic. With the need to reduce traffic by 20.2% to 42.2% on the New Glenn, relying on expanded transit, carpool and vanpool for Chugiak-Eagle River alone to address the need is simply not feasible. Currently there are 15 vanpools serving the Mat-Su Valley. With each van carrying 12 persons, there are 252 fewer passenger trips per day on the Glenn Highway as a result of the program. With the need to reduce traffic by 13,290 trips per day on the Glenn Highway, an additional 1,107 vans would be required. Vanpooling can help, but it will not be the only answer.

The Share-a-Ride program will continue to be a critical alternative transportation mode. However, it is difficult to estimate ridership in the future based on past trends. The numbers of carpoolers/vanpoolers rose from 797 in 1988 to 2,176 in 1994, but dropped back to 973 by 2001.

Another alternative to the construction of additional lanes on the Glenn Highway, which was not included in the Congestion Management Program, involves the development of commuter rail service from the Mat-Su valley to downtown Anchorage. The 1996 Plan looked at three feasibility studies conducted on the subject since 1979, and based on their findings, concluded that a commuter rail system was not feasible at that time without a high level of subsidy.

The most recent study by Wilbur Smith Associates for ARRC, **South Central Rail Network and Commuter Rail Operational Plan, 2001**, considers four different scenarios, looks at projected ridership, capital and operating costs, and makes recommendations. The Study recommends a minimal level of service between Anchorage and the Mat-Su Valley beginning in 2005, which would include a stop near Eagle River located on Fort Richardson. The projected

ridership is 152,000, or average daily trips of 416, focused on peak commute period service. (The high level of service ridership for 2005 is estimated at 256,000, or average daily trips of 520, expanding to a projected level of 290,000 by 2015.)

The ARRC study estimates the Year 2005 fare box recovery rate for the minimum level of service between the Mat-Su Valley and Anchorage at 18.4%. By comparison, the fare box recovery rate for People Mover is about 22% to 24%. A few years ago it was 18%. The required Year 2005 subsidy would be about \$2.7 million. However, ARRC is not planning to pursue commuter rail service independently. The study creates a blueprint for potential further actions by local and state officials to establish a viable and operational commuter rail system if they choose to do so, with participation by ARRC.

Adding a third lane in both directions on the Glenn Highway from Hiland Road to South Birchwood Loop Road appears to have the best potential for improving the operation of the roadway to LOS C. Level of service analyses need to be conducted for interchanges at Hiland Road and Artillery Road to determine if they are functioning efficiently. There is also a need for a fourth lane in both directions on the Glenn Highway between the scalehouses and Hiland Road. However, it does not make any sense to add a fourth lane to this segment unless it is extended all the way into Anchorage. Otherwise, a bottleneck will occur at the point where the number of lanes suddenly decreases.

Any recommendation to expand the section of the Glenn Highway between the scalehouses and Hiland Road should be coordinated with the next major revision of the 2001 Anchorage Bowl Long Range Transportation Plan (LRTP). The two long-range plans (Anchorage Bowl and Chugiak-Eagle River) should be considered at the same time, which would ensure that the recommendations regarding the Glenn Highway are consistent along its entire length.

B. The Old Glenn Highway and the Central Business District

Traffic along the Old Glenn Highway between Eagle River Road and North Birchwood Loop Road is expected to increase substantially in the next 20 years. As shown in Table 3, the roadway segments between Business Boulevard and North Eagle River Access Road are currently operating at LOS C. By 2023, the segments are expected to maintain LOS C, while the segment from North Eagle River Access Road to S. Birchwood Loop Road is expected to degrade from LOS A to C. While no segments along the Old Glenn are projected to operate below LOS C by 2023, four intersections are projected to be overcapacity by 2023. These include:

- Eagle River Road and the Old Glenn Highway
- Business Boulevard and the Old Glenn Highway
- Eagle River Loop Road and the Old Glenn Highway
- North Eagle River Access Road and the Old Glenn Highway.

Access management techniques are a group of TSM congestion management strategies, which have been demonstrated to be effective regardless of the type of trip, and particularly effective in improving traffic flow and reducing congestion on urban arterial streets such as the Old Glenn Highway. These include intersection lane re-striping and the provision of deceleration lanes for

turning traffic; the use of non-traversable medians; the spacing of median openings; signal timing, signal phasing adjustments, and signal progression strategies; the location and design of driveway (public and private) and intersection spacing; and interparcel circulation. A deficiency plan program should consider these types of improvements. However, given the increase in development and traffic in the CBD, access management techniques alone may not be sufficient to improve traffic flow.

Widening the Old Glenn Highway from four to six lanes would have little effect on the congestion problems along the Old Glenn Highway. The Old Glenn Highway between Eagle River Road and North Eagle River Access Road is classified as an urban arterial according to the definitions contained in the Highway Capacity Manual. As such, the capacity of this arterial is generally dominated by the capacity of its signalized intersections which in turn are dominated by the delay time at the intersections. Moreover, adding additional lanes would probably require the acquisition of additional right-of-way along the most important business district of the Chugiak-Eagle River area. The current right-of-way width is 100 feet. Two additional lanes may require 30 more feet of right-of-way, and would reduce space available for pedestrian facilities. However, there may be other roadway improvements, including new / alternate routes, which could relieve traffic volumes on the Old Glenn Highway. Specific intersections, such as the intersections of Eagle River Road and Monte Road with the Old Glenn Highway, that were identified as a concern to the community in the Draft CBD Revitalization Study, and which have not been addressed by programmed roadway projects, should be addressed.

More improvements to the local street network, including providing new roadway connections, are likely to be needed in the future to solve downtown core congestion at intersections. These may include a Coronado Drive connection to Business Boulevard, a west side frontage road to the Glenn Highway, a connection from this frontage road to Business Boulevard, or an extension of the Artillery Road exit ramp to Business Boulevard. Some of the solutions developed in the future could require additional right of way.

It is a recommendation of this 2003 LRTP Update to conduct a comprehensive circulation study for the entire road network within the downtown core of Eagle River. The study will include an assessment of pedestrian improvement needs, access management alternatives, the need for improved connectivity between the Old Glenn Highway and Business Boulevard, and traffic flow along the Old Glenn Highway, including the movement of freight vehicles. A rigorous alternatives analysis will also address improved connections between the Powder Reserve and the Central Business District (CBD). The proposed study should reference and utilize the suggestions of the Draft Eagle River CBD Revitalization Study.

The proposed study should reference and utilize the findings of the Draft Eagle River CBD Revitalization Study.

C. Eagle River Road

Traffic varies along the length of Eagle River Road. The western portion between VFW Road and Eagle River Loop Road handled an average of 7,623 vehicles in 2000, and 9,700 vehicles per day east of Eagle River Road; more easterly segments closer to the Eagle River Nature Center handled only 580 vehicles per day (1999). The transportation model projects that traffic

will increase in 2023 by 86.4% to 18,080 east of Eagle River Loop Road, (to LOS E from Crestview to Greenhouse), and by 32.5% to 10,100 west of Eagle River Road, (to LOS D from Old Glenn Highway to Chain of Rock.) In addition, the intersection of Eagle River Road and Eagle River Loop Road is identified as overcapacity by 2023.

The difference in traffic to the east and west of Eagle River Loop Road indicates that a significant amount of trips are occurring, and are projected to increase, on Eagle River Loop Road between downtown and the subdivisions to the east of Eagle River Loop Road. These trips are most likely shopping trips, and not home – work trip interchanges. Thus, as discussed earlier, transportation demand measures targeted towards work trips will probably not be very effective in addressing congestion for those trips. As with Eagle River Loop Road, transportation system improvements, which should be considered, include adding right turn and left turn pockets, and widening shoulders to expanding the existing roadway to 3 lanes, should also be considered to improve access and reduce congestion.

Congestion is also expected to worsen closer to the Glenn Highway. Traffic on the Glenn Highway between Artillery Road and the North Eagle River Access Road is projected at 43,400 for 2003; traffic between Hiland Road and Artillery Road in 2023 is projected to be 50,100. It might be assumed that much of the increase in peak hour traffic picked up at the Artillery Road Interchange is related to work trips by residents between Eagle River Road and Anchorage, although some of the traffic is probably also going downtown. Morning congestion on Eagle River Road as traffic approaches the Glenn Highway is exacerbated by limited storage capacity on the overpass bridge during left-turning movements. Transportation demand measures targeted at work trips should be considered.



Recent improvements: Artillery Road at Glenn Highway and Eagle River Road

