CHAPTER 7. Meeting Future Transportation Needs

Introduction

Anchorage in 2025 will be a different city than Anchorage today. The picture of Anchorage 2025 emerges from the economic forecast in Chapter 6 and the addition of new households and employment sites. The 2025 picture reveals these broad characteristics:

- An urban region encompassing Anchorage and the Mat-Su Borough with a population approaching 500,000
- Increasing shares of the Anchorage population in suburban settings
- Addition of 92,000 new MOA residents since 2002, 65,000 of them within the Anchorage Bowl
- Continuation of Anchorage's role as the dominant population and employment center for the region and Alaska
- Tighter clustering and higher densities of development along transit corridors and in employment districts and town centers

In 2025, 400,000 more daily trips will vie for space on the Anchorage transportation system than did in 2002.

Daily travel continues to grow because of steady growth in Anchorage and the surrounding areas. Travel miles also escalate, not only because more trips are being made every day but also because a larger share of trips extend longer distance from suburban locations.

How well will our transportation system work in 2025? What improvements may be necessary and desirable? What happens under different hypothetical future scenarios such as doing nothing, greatly expanding transit service, adding road capacity, and connecting more trails and pedestrian facilities? What investments would be most effective? How will neighborhoods, safety, air quality, health, and the natural environment be affected?

This chapter seeks to determine answers to these kinds of questions. Its purpose is to report findings gleaned from analysis of a broad range of transportation plan alternatives so that choices can be understood and community decisions made.

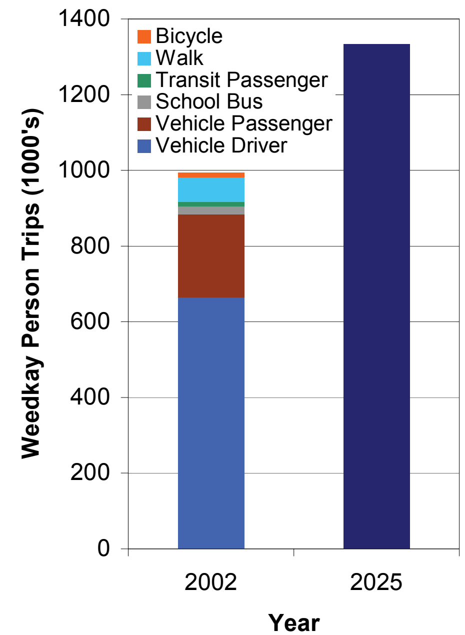
The Travel Demand Challenge

Figure 7-1 shows daily trips by mode in 2002 and the projected total trip demand expected in 2025. These daily trips, now and in 2025, show the mobility needed to sustain daily activity in Anchorage. The transportation system must be adequate to serve these needs.

Methods to Analyze and Evaluate Transportation Systems

During preparation of the LRTP, the Anchorage travel model was the chief analytical tool. The model integrates the information from many subset models that were used to forecast future travel,

Figure 7-1. Weekday Trips, 2002 and 2025



Source: CH2M HILL

delineate possible transportation systems, allocate travel to models and specific routes of the road and transit network, and evaluate how well transportation systems would work. Starting with the forecast of land use growth and where homes and jobs will be located, these models sum the trips made by all people, businesses, and freight movers and then determine how that travel will affect a candidate transportation system.

To verify that the computer models are realistic, they were first executed for current conditions and compared against independent information for accuracy. See *AMATS Travel Model Update and Validation Report* (CH2M HILL, 2004) for more information about the LRTP travel model.

Other analytical tools included mapping and various tabular presentations capable of displaying information about transportation system performance, and examining how travel and transportation systems may affect surrounding neighborhoods, communities, and the natural environment. Such methods permit comparison of results by location and impact topics.

Formulating Possible Future Transportation Alternatives

Transportation investments can be deployed in many ways to shape the Anchorage transportation system during the next 20 years. Funding public transportation could be emphasized to reduce road building and traffic. The highest priority could be roads and reducing vehicle congestion, or the top-ranking objective could be land use policy and strategy changes to minimize transportation impacts and needs.

The LRTP models and procedures focused on addressing all of these possibilities by providing balanced transportation planning. By delineating public transportation systems and separately creating road project combinations each with successively larger scope and investment, the results and ability to meet LRTP goals and objectives were assessed.

Analyzing Candidate Scenarios

Scenarios consisting of specific public transportation plans and specific road improvements were analyzed with the LRTP travel model. Several scenarios emphasizing transit with limited road improvements were processed and evaluated with the model to see how much travel could be attracted to larger public transportation systems and investments. Then scenarios with successively larger road cases and a transit case were processed to address capacity deficiencies and congestion. Each successive scenario and LRTP model run sought to improve the performance and cost effectiveness of the transportation system. In addition, three future scenarios for allocation of development and the associated population and employment growth were processed through the travel models to gauge their effects on transportation needs.

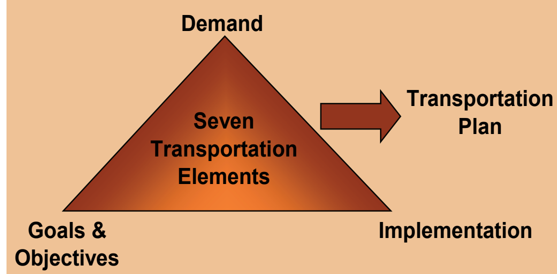
Evaluating and Comparing Alternatives

The outputs from the travel model and findings from the use of mapping and other supporting analytical tools provided information about the following:

- Transportation system performance
- Traveler mode selections
- Accessibility and connectivity
- Impacts, including air quality and noise
- Effects on communities and the environment

Consequently, extensive performance data for each candidate scenario were compiled. Information included travel demand, roadway

How Evaluation Integrated Goals, Needs, and Performance



The evaluation process aligned the technical data from the candidate scenario analysis with the goals and objectives articulated for the LRTP and Anchorage 2020. The citizens' Roundtable Committee assisted the LRTP team in developing the goal structure and formulating value weightings to reflect the relative importance of each goal and objective.

projects assumed for implementation, and performance of transportation modes other than the automobile. Figure 7-2 shows the structure of the LRTP goals and supporting objectives created by the LRTP Roundtable Committee. (See Chapter 3 for a discussion of LRTP goals and objectives.) Performance measures were identified for each goal and objective to assess how each transportation scenario would perform with respect to the community goals and objectives.

The performance data were extracted from the travel model output and summarized into an evaluation matrix (Figure 7-3) that compares the relative merits of each candidate scenario. These evaluation procedures were applied to many different possible transportation system cases. Specifically, the performance measures in Figure 7-3 guided and shaped development of recommendations. The findings and results are reviewed in the following sections. Solutions to meet transportation system needs are reviewed for each of the seven system elements—roads, public transportation, pedestrian facilities, bicycle system, freight distribution, regional connections, and congestion management.

Roads

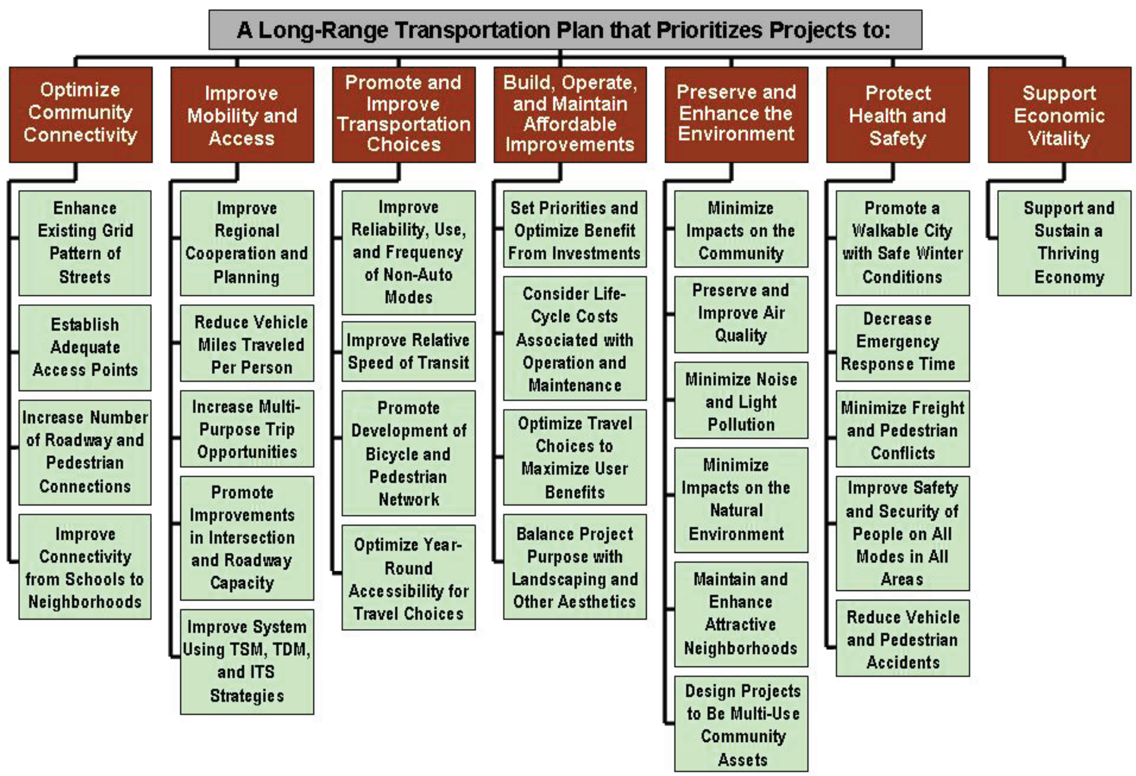
Evaluating Road System for Deficiencies

Our roads, by far the most visible and largest component of the transportation system, are the backbone of the entire transportation infrastructure. They are universally used by everyone. Roads get our children to school, commuters to work, transit riders to destinations, and freight to stores. The roadway grid enables movement for many modes of travel—walking, biking, automobile, truck, and transit.

Ongoing actions to maintain and improve our roads are undertaken through MOA general obligation bonds and AMATS programming of local, state, and federal funds. The planning process identifies necessary improvements and creates a priority schedule for implementing them.

The existing road system is the cumulative legacy of planning, operating, expanding, and building new segments during many decades. It is directly linked to land development because subdividing indelibly defines the spacing, type, and size of highway corridors and facilities. In a similar sense, the traffic volume "demand" on the existing road system results from the cumulative increase in travel that has accompanied a doubling of the

Figure 7-2. LRTP Goals and Objectives



Anchorage Bowl population from 124,400 in 1970 to 237,200 in 2002. Many planned improvements identified in prior LRTPs have not been implemented; consequently, the operating performance of today's road network reflects the lag in implementing planned projects.

Road Network Structure and Function

Road networks have a logical hierarchical structure, much like many other entities in nature—rivers, creeks, streams and brooks, or tree trunks, limbs, branches, and twigs. The road hierarchy is driven by two primary roles: serving travel mobility and providing abutting land access. Figure 7-5 maps the functional street classification structure for existing roads in Anchorage. Road classifications (Table 5-1) and factors affecting efficient flow of traffic are described in Chapter 5.

Design and Policies Associated with Road Classification

Functional street classifications reflect both the character of service provided and physical design features of a roadway. Street classification does not exist in a vacuum; it is the first link in a chain that connects important development principles and operational policies. Functional classification principles and policies guide standards for planning, physical design, operation, and adherence to context sensitivity with land use and other community features.

The MOA *Official Streets and Highways Plan,* updated in 1996, identifies the functional road classifications. This guidance document predates more current planning documents. It will be refreshed in conjunction with this LRTP. It needs to integrate contemporary best practices that have been identified for context-sensitive design. And it should consider the Anchorage 2020 characterizations of community land use and street configurations.

Figure 7-3. Sample of the Evaluation Measures Matrix

Goal	Description	Objective	Performance Evaluation Measures
(10.7%) Goal 3: Transportation Choices	Provide a balanced transportation system that provides viable transportation choices among various modes.	1. Improve the reliability, use and frequency of non-auto modes of travel.	Transit use - Total weekday transit trips.
			Shared Use - Total number of Daily Home-Based-Work trips using Shared Use vehicles only.
		2. Improve the relative speed of transit compared to automobile travel through the use of innovative technologies.	Transit/auto travel time ratio - Travel time to/from selected locations in the PM peak hour.
		3. Promote the development of a continuous, safe network of bicycle and pedestrian trails and sidewalks that provide access to work, schools, parks, services, shopping and the natural environment.	Additional bike network - Number of miles of additional bike facilities.
		4. Optimize the year-round accessibility to, and convenience of, travel choices.	Transit availability - Employment opportunities accessible by transit within 20 minutes.
(8.3%) Goal 4: Build, Operate and Maintain Quality, Attractive, and Affordable Improvements	Develop an attractive and efficient transportation network that takes into account the cost of building, operating, and maintaining a system that considers the equity of al...	1. Prioritize the projects within the LRTP to optimize the overall capital costs associated with each project.	LRTP Capital Costs.
		2. Improve the relative speed of transit compared to automobile travel through the use of innovative technologies.	LRTP Operation and Maintenance Costs.
		3. Optimize the travel choices ... transportation sys...	

Road Network Grid Spacing

A road system works best when the street grid does not have missing links and when the street system is spaced properly. Figure 7-4 illustrates missing grid links in the primary road network in Anchorage.

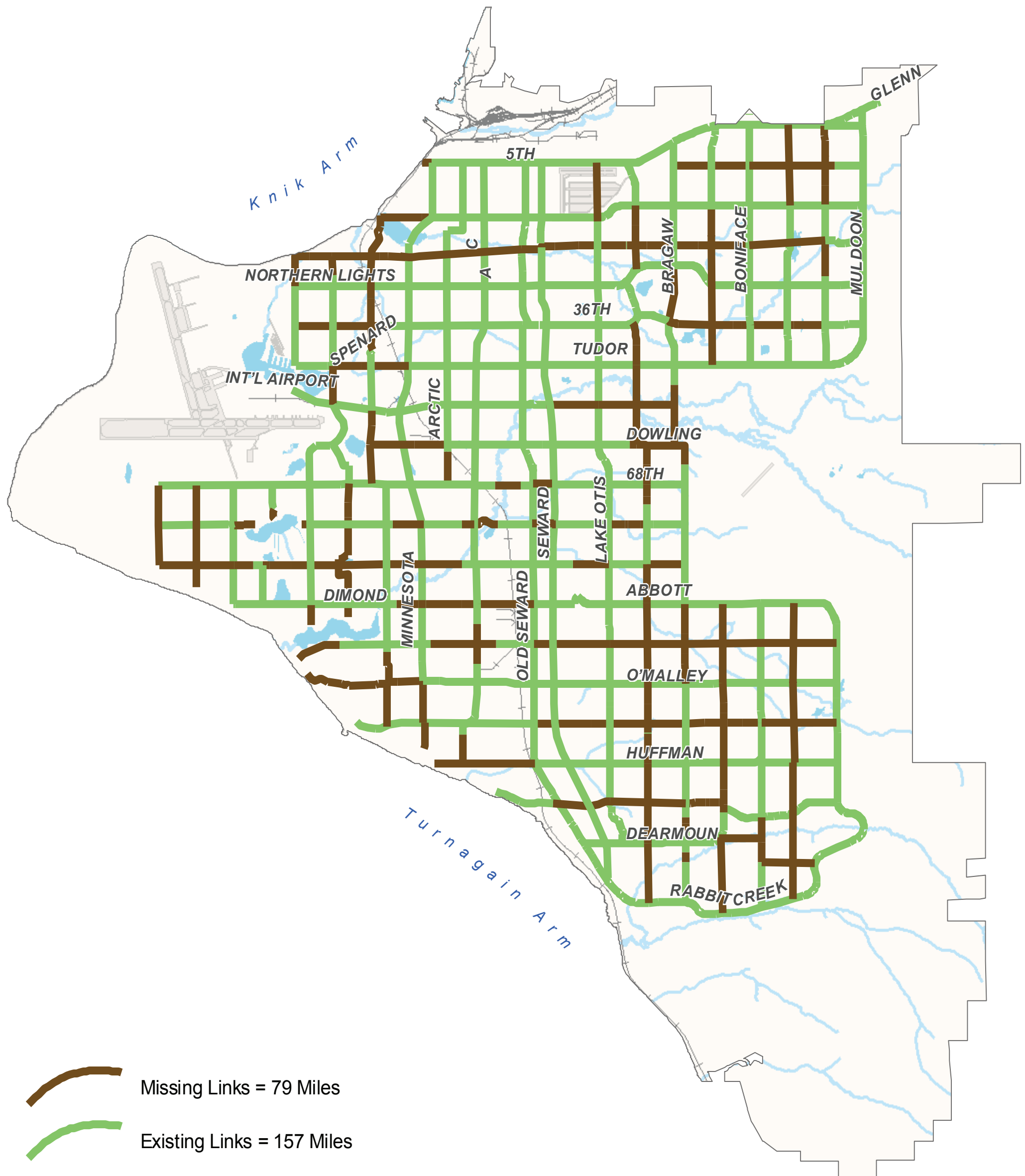
Benefits that would accrue from a more complete street grid network in Anchorage include minimizing out-of-direction (excess) travel; improving connectivity for walking, biking, and transit access; and providing more accessible routing for transit service. A grid network more evenly distributes the travel load and spreads over multiple roads the burden of carrying it. Spreading vehicle traffic over a greater number of roads would reduce the traffic growth experienced on some existing routes. Consequently, some roads may not need to be made wider, which also makes them more amenable to walking and transit use. Large-block land areas in Anchorage without roads (such as parks and airports) and wide spacing of major arterials place a tremendous strain on fewer widely spaced roads and intersections to carry the travel demand. Such concentrated travel demand often occurs in employment areas, as well as higher density residential areas.

Road Improvements

Potential road improvements considered in LRTP development are grouped into categories or tiers.

In Progress. Road repair, rehabilitation, and improvement is a continuous process. The MOA and the State of Alaska identify, program, and fund the process in an ongoing 6-year Transportation Improvement Program (TIP) that is updated every

Figure 7-4. Missing Links in the Anchorage Road Network



Source: MOA and CH2M HILL

2 years. The MOA performs a similar exercise for its road bond program (the Capital Improvement Program [CIP]). Projects in the TIP and CIP are the first tier of improvements programmed for the road system.

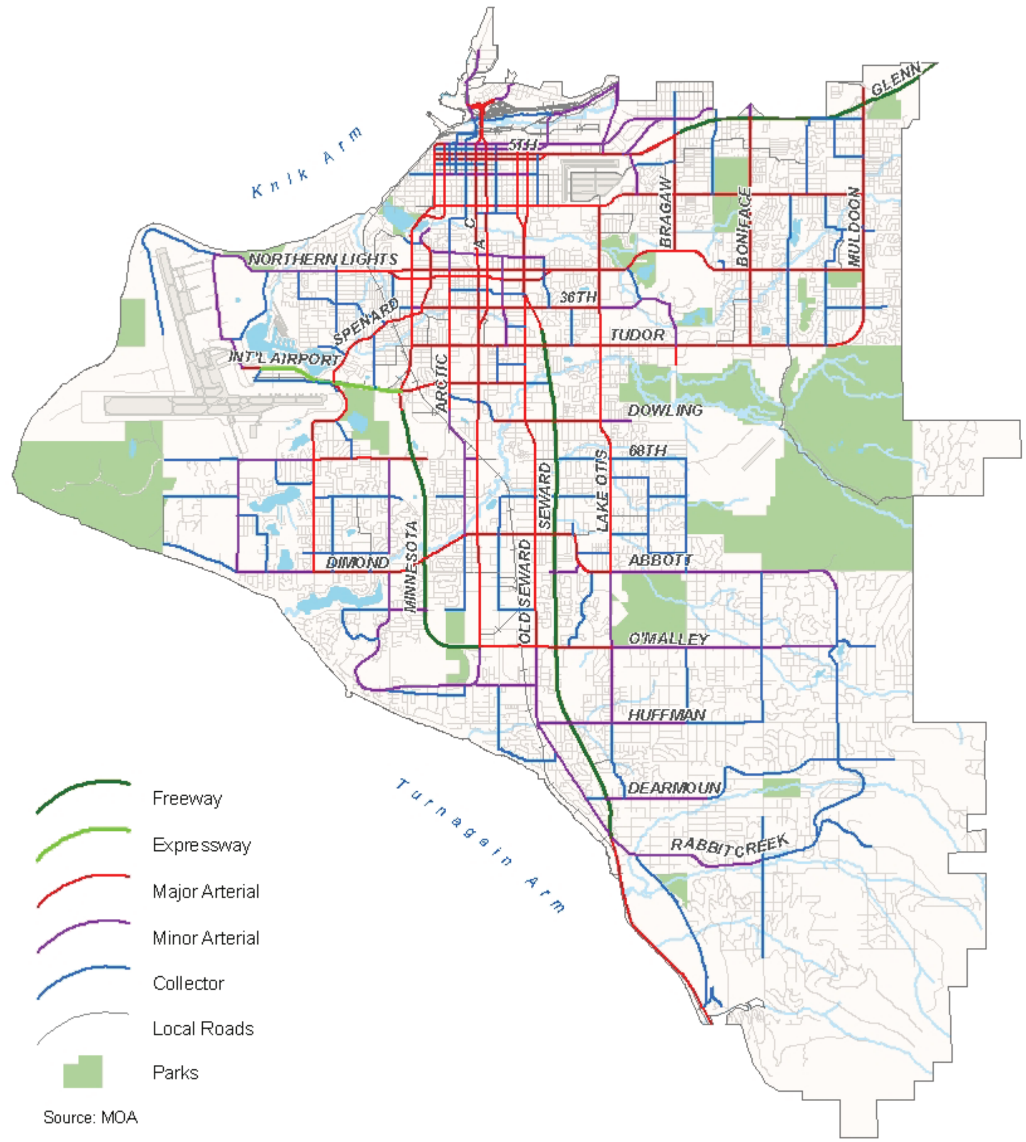
In addition to funded TIP and CIP projects, several large projects proposed for Anchorage have been advanced in significant environmental impact and preliminary engineering analyses. These projects include the Glenn Highway between McCarrey Street and the Ingra-Gambell streets couplet, the Seward Highway from Rabbit Creek Road to 36th Avenue, a Dowling Road extension from Old Seward Highway to Raspberry Road at Minnesota Drive, and the Bragaw Street–Abbott Loop Road connection.

Collectively, existing roads plus the TIP, CIP, and major investment study projects are termed "the existing and committed road network" shown in Figure 7-6.

Identified in Past LRTPs. LRTPs for Anchorage are updated every 3 years. Figure 7-7 shows the road improvement projects identified in the most recent (2003) LRTP. (Because the LRTP updated in 2003 addressed improvements through 2023, it is referred to in the following pages as the 2023 LRTP. This LRTP, prepared in 2005, focuses on a planning horizon of 2025.)

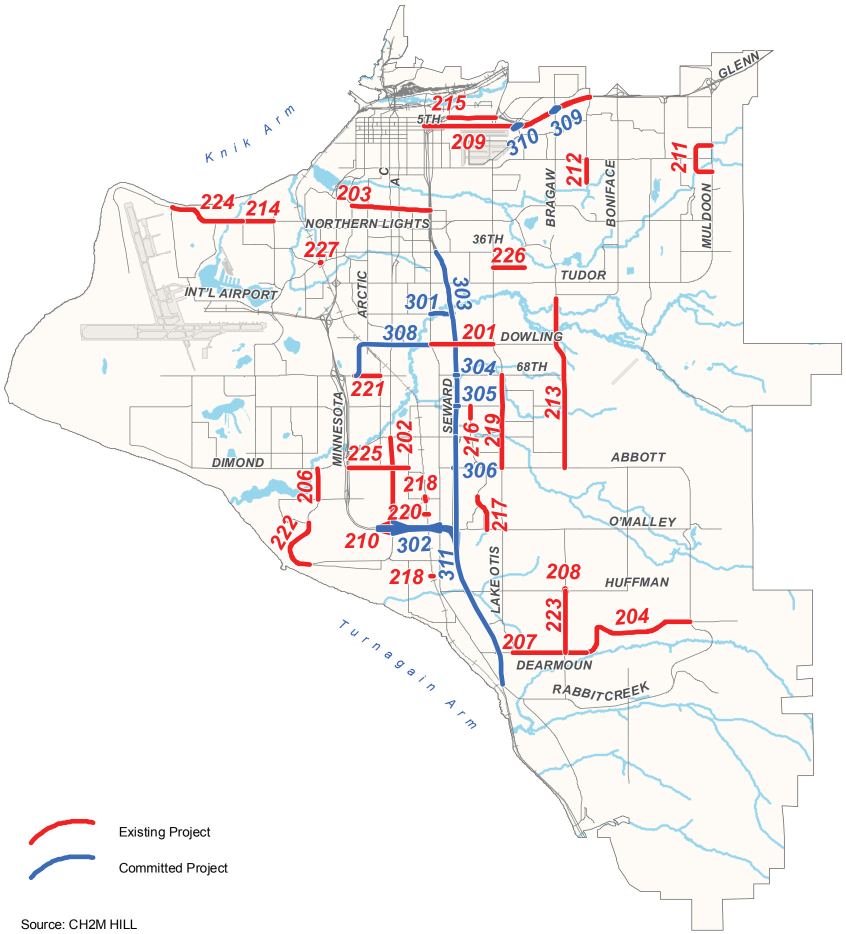
In the 2023 LRTP, two sets of projects are identified: "near-term" projects anticipated to be implemented between 2004 and 2013 and "long term" projects programmed for 2013 to 2023. The

Figure 7-5. MOA OS&HP Functional Street Classifications of Anchorage Roads



Note: The functional classifications shown are from the 1996 Official Streets and Highway Plan of the MOA. Separate classifications apply for all state roads, which are identified as DOT&PF roads in Figure 5-2, "Road Ownership."

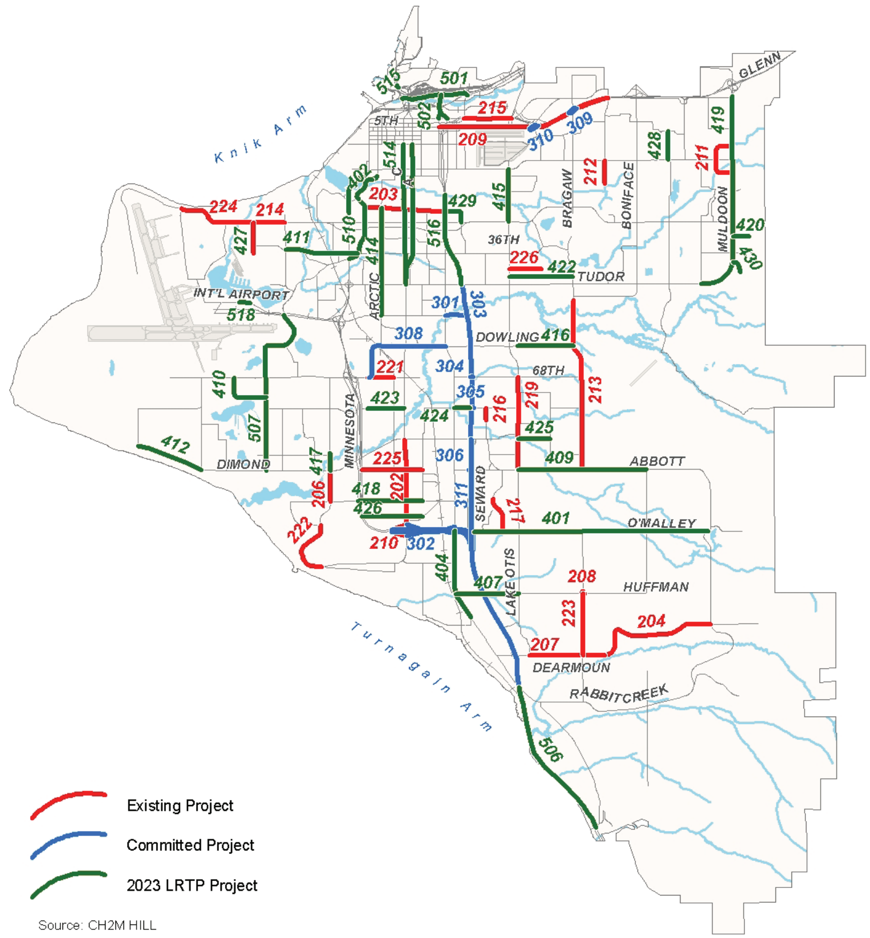
Figure 7-6. Existing and Committed Road Network Projects



Source: CH2M HILL

The numbers on the map identify specific projects considered.

Figure 7-7. 2023 LRTP Projects



Source: CH2M HILL

The numbers on the map identify specific projects considered.

TIP projects and environmental study projects described above are included among the "near-term" LRTP projects.

Projects identified in previous LRTPs are the initial building blocks for the 2025 Anchorage LRTP. But are all of them needed? Will they be sufficient to assure satisfactory mobility to meet future needs? These questions are answered in the series of "what if" analyses of candidate scenarios described in the following paragraphs.

Zeroing In on Future Road Deficiencies

As Anchorage evolves toward 2025 (and the regional population approaches 500,000), travel growth will put more traffic and stress on the transportation system. Gauging where that stress will occur and its intensity is the challenge, and the goal, in framing LRTP improvements.

Possible scenarios of future road networks with specific road improvement projects were created as "what if" cases. Each scenario was evaluated by using the Anchorage travel model to forecast future 2025 travel by mode and then route vehicle trips over the scenario road network to determine traffic volumes on each road segment. Traffic conditions were determined for three time-of-day periods, 7 to 9 AM, 3 to 6 PM, and all other hours. Mapping and statistical evaluations for each scenario outcome yield a comprehensive assessment of how well it would meet future travel demand and possible community, environmental, physical, and other impacts.

No-Build Scenario

A worst-case scenario was defined: It assumes only the existing 2002 road network is available to serve future travel, that no road or transit improvements are implemented. This extreme worst case was examined to help identify where potential road deficiencies would occur and how bad they might be. The orange and red road segments in the illustration of this scenario (Figure 7-8) indicate where severe traffic overload and congestion would occur.

Performance statistics for this 2025 no-build scenario define more specific implications. Driver hours spent in severely congested traffic would increase to more than six times the hours for existing (2002) equivalent conditions. Approximately 28 percent of all freeway network miles and 19 percent of major arterial miles would be operating at unsatisfactory levels of service during peak periods.

Fortunately, the no-build scenario is hypothetical because funded TIP and MOA bond improvements are being implemented. It would result in clearly unacceptable mobility conditions by 2025. Nonetheless, the findings help identify where future problems may be expected. (See Figure 7-8.)

Existing and Committed Road Projects Scenario

The collective TIP, MOA CIP, and major study capital improvements projects will cost nearly $800 million (in 2004 dollars) when implemented. The existing road network and these projects were delineated into an "existing plus committed" scenario. The illustration of how this scenario might perform (Figure 7-9) shows severely overloaded and congested conditions (orange and red segments) in 2025. Statistical results are summarized in Table 7-1.

Severe congestion problems for the committed projects scenario are mostly in the Central and East Anchorage planning areas. The Glenn Highway east of Airport Heights, the axis of the Ingra-Gambell streets couplet from 5th Avenue through 6th Avenue, Tudor Road from Boniface Parkway to Minnesota Drive, and the Boniface Parkway are especially affected. Other north-south and east-west arterial streets in East Anchorage are overloaded as well, although less severely.

Other roads that perform unsatisfactorily are International Airport Road access to Ted Stevens Anchorage International Airport (TSAIA), segments of Dowling Road, and segments of the Bragaw Street–Abbott Loop Road connection. Rabbit Creek Road shows modest overloading.

All Project Improvements Proposed in 2023 LRTP Scenario

A second 2025 scenario included all improvement projects proposed in the 2023 Anchorage LRTP. (See Figure 7-7 for road projects map). The illustration of road segment performance for this scenario in terms of available capacity to traffic ratio (Figure 7-10) again show overloaded and congested conditions (orange and red segments) in 2025.

Figure 7-8. Total Daily Performance of "No-Build" 2002 Road Network in 2025

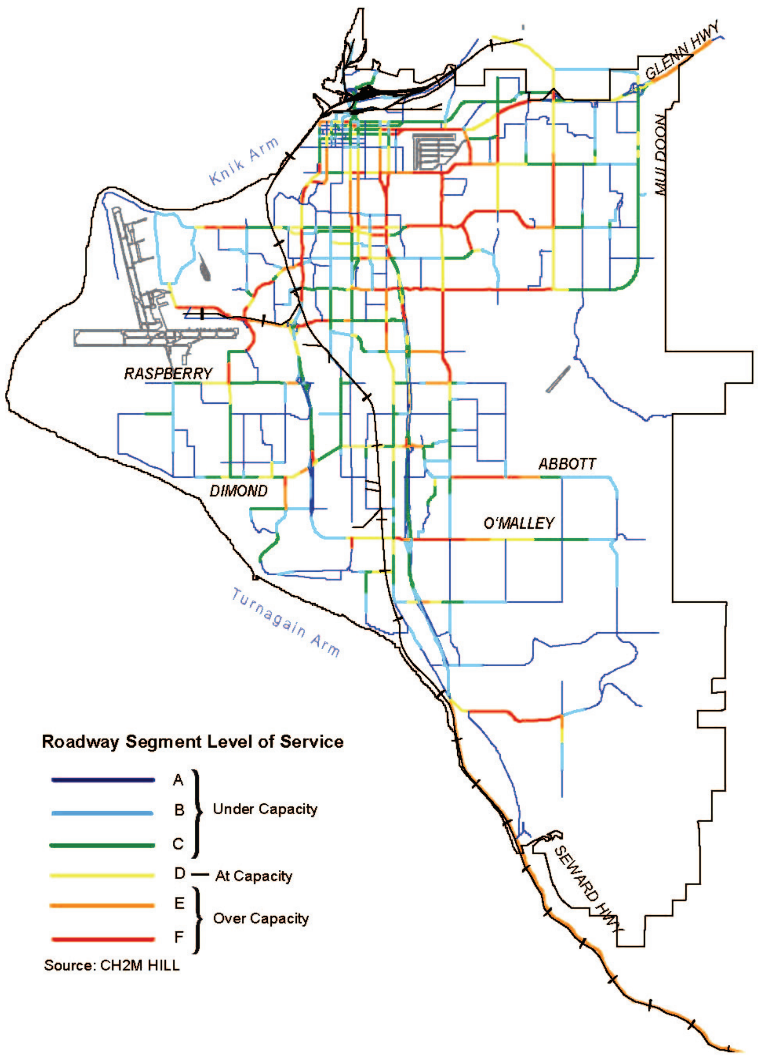


Figure 7-9. Total Daily Performance of Existing Plus Committed Projects in 2025

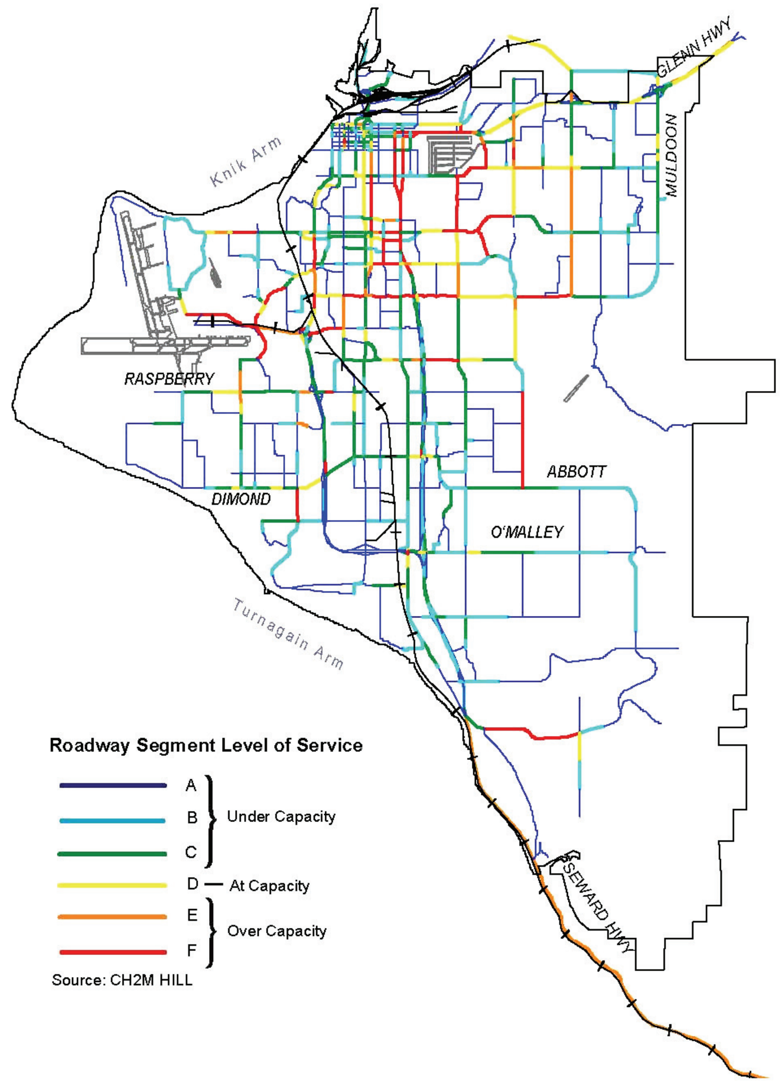


Table 7-1. Performance of Existing, No-Build, and Planned Project Scenarios

Feature	Scenario: 2002 Road Network, 2002	No-Build 2002 Road Network, 2025	Existing and Committed Road Projects, 2025	2023 LRTP Improvements, 2025
Vehicle miles of travel in severe congestion	143,680	677,950	487,170	455,150
Traveler hours spent in severe congestion	4,420	27,255[a]	23,330	18,330
Congested freeway miles				
Morning peak period	2%	31%	25%	25%
Afternoon peak period	4%	29%	27%	27%
Congested arterial miles				
Morning peak period	8%	28%	22%	21%
Afternoon peak period	23%	31%	24%	21%

The patterns and locations of congested, overloaded road links for the 2023 LRTP scenario is much the same as was observed for the existing plus committed scenario. Serious problems are most concentrated in Central and East Anchorage, and results for South Anchorage are similar to those described for the existing plus committed scenario.

Table 7-1 provides summary performance statistics and comparison to other scenarios. The performance findings for the 2023 LRTP scenario show relatively modest improvement over the previous scenario.

Analysis of Deficiencies

Neither the committed projects scenario nor the 2023 LRTP projects scenario is adequate to meet 2025 needs. Many projects in both scenarios are in South Anchorage. As a result, road network performance there is generally good. Elsewhere however, some overloaded road segments are severely overloaded. The principal congestion and mobility deficiencies unresolved by the existing and committed scenario and the 2023 LRTP scenario are discussed below.

Glenn Highway Corridor

Rapid growth in Chugiak-Eagle River and the Mat-Su Valley results in near doubling of daily traffic entering the Anchorage Bowl along the Glenn Highway corridor. At the west end of the freeway corridor, near Merrill Field, arterial street capacity is grossly inadequate to handle the heavy freeway traffic volume. Severe congestion and backed up traffic cause many drivers to shift off the Glenn corridor to avoid slow-moving traffic and delay. The spillover to other city streets compounds the traffic burden on most East Anchorage arterials—DeBarr Road, Northern Lights Boulevard, Boniface Parkway, and Lake Otis Parkway. Requests for neighborhood traffic calming demonstrate congestion impacts.

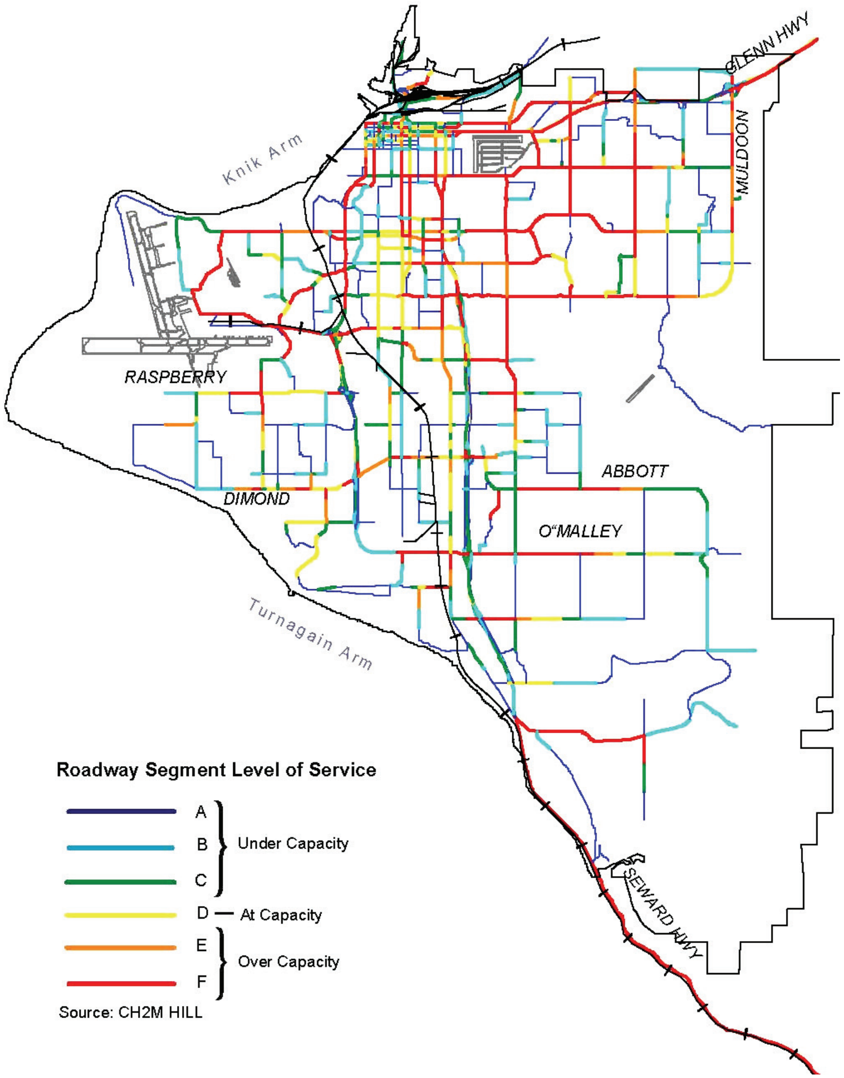
Ingra-Gambell Streets Couplet and Seward Highway Corridor

Seward Highway is the dominant north-south traffic corridor in the Anchorage Bowl. North of 36th Avenue, the highway transitions into an arterial street, eventually evolving into the Ingra-Gambell streets arterial couplet. Very heavy traffic volume at 36th Avenue, overwhelms the arterial portion of Seward Highway and the Ingra-Gambell streets couplet farther north. A virtual traffic blockage occurs in an "L-shaped" area from the Glenn Highway at Airport Heights to Ingra-Gambell Street and then down the couplet and Seward Highway to 36th Avenue. Congestion brings north-south traffic to a standstill and creates a barricade for east-west traffic. Drivers move to alternative routes to avoid getting caught in the gridlock (Figure 7-11).

East Anchorage Arterials

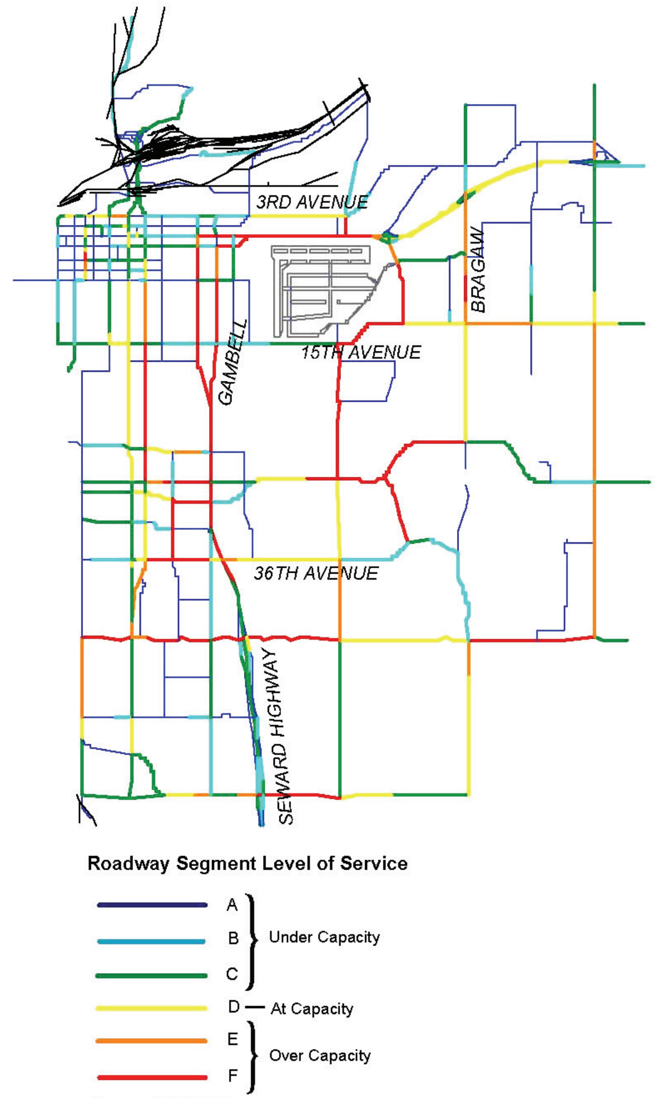
DeBarr Road, Northern Lights Boulevard, and Tudor Road, the major east-west arterials routes in East Anchorage, are spaced at 1-mile intervals. North-south arterial spacing is also 1 mile between Lake Otis Parkway, Bragaw Street, and Boniface Parkway, but 1.5 miles between Boniface Parkway and Muldoon Road. Because Bragaw Street is discontinuous through the University area, south of

Figure 7-10. Total Daily Performance of 2023 LRTP Projects in 2025



Source: CH2M HILL

Figure 7-11. Total Daily Performance of Ingra-Gambell Streets Couplet and Seward Highway Corridor in 2025



Source: CH2M HILL

Northern Lights the spacing is 1.5 to 2 miles between the few continuous north-south arterial routes. This major arterial spacing is marginal to handle locally generated traffic and travel attracted to major facilities such as the universities, hospitals, and major commercial areas. When traffic shifts from the Glenn Highway corridor, it overloads these East Anchorage arterials.

Neither the universities nor Providence Hospital can be reached easily from the north or the east. Inadequate access and traffic circulation to these major travel generators compounds traffic conditions throughout East Anchorage.

Tudor Road Corridor

Tudor Road from Minnesota Drive to Muldoon Road is one of the busiest arterials in the Anchorage Bowl. A component of the National Highway System, this road is one of only a few east-west arterials that traverse the entire city. Daily traffic volumes in 2002 ranged from 25,000 at each end to 50,000 vehicles per day in busier sections.

Travel projections for 2025 show that congestion across the Tudor Road corridor becomes increasingly severe. The intersection deficiencies along Tudor Road and the systemic congestion and capacity deficiency across the full length of the Tudor Road corridor need to be addressed to adequately cope with 2025 traffic demand.

Because of restricted right-of-way and development fronting the Tudor Road corridor, widening is not desirable or realistic. A corridor traffic management program that uses all available and appropriate techniques for managing the transportation system can improve traffic flow on the corridor.

Boniface Parkway Corridor

Boniface Parkway in East Anchorage provides access to Elmendorf Air Base and has continuity from the Glenn Highway to Tudor Road—one of only two such links in East Anchorage. Boniface Parkway has relatively few driveway accesses and cross-street intersections. The limited access reduces traffic friction along the corridor. Future travel demand (2025) in this corridor exceeds 30,000 vehicles daily. An access management program should be implemented to preserve its traffic-carrying ability as traffic demand increases to projected 2025 levels.

Lake Otis Parkway Corridor

Lake Otis Parkway in East Anchorage is another important north-south arterial corridor. It provides access to Alaska Regional Hospital and offers continuity from Huffman Road in South Anchorage to DeBarr Road in East Anchorage. But it does not provide direct arterial continuity with Airport Heights Drive or the Glenn Highway. An interchange connection with the Glenn Highway at Airport Heights Drive would improve north-south circulation and decrease neighborhood cut-throughs in East Anchorage.

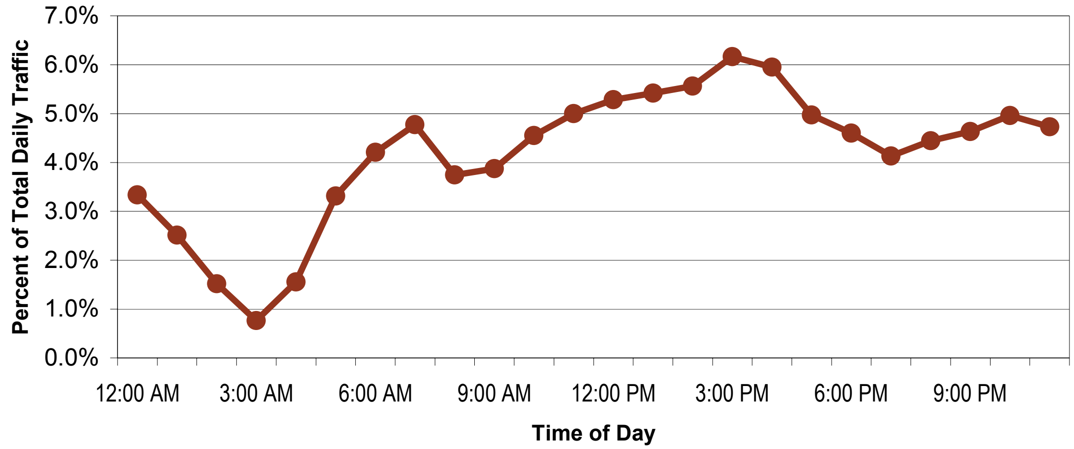
Minnesota Drive North of International Airport Road

Minnesota Drive carries heavy traffic volume as it transitions from freeway to arterial street at Tudor Road. Travelers from Southwest Anchorage and the airport area use Minnesota Drive to reach destinations in Midtown, Downtown, and East Anchorage. Traffic volumes in 2025 are projected to be heaviest between International Airport Road and Tudor Road, declining somewhat between Tudor Road and Spenard Road, and dropping north of Northern Lights. Development of a Minnesota Drive interchange at Tudor Road and arterial improvements north of Tudor Road to Northern Lights are needed to accommodate 2025 traffic demand. The Minnesota Drive segment between Spenard Road and Northern Lights Boulevard will require special attention to address complex traffic flow patterns between Spenard Road, 36th Avenue, and Benson/Northern Lights boulevards.

Ted Stevens Anchorage International Airport Access

International Airport Road from Minnesota Drive to the TSAIA terminals consistently shows a heavy travel demand and overload of available capacity. Closer examination of details suggests the

Figure 7-12. Hourly Traffic Flow for International Airport Road



Source: MOA Department of Public Transportation

deficiency may be overstated, however. Travel to and from the airport is unique because a large share of use occurs during night and mid-day hours and, conversely, a relatively lesser share occurs in traditional morning and afternoon commute hours. Because of this different time-of-day travel pattern, the capacity deficiency is likely overstated. Figure 7-12 illustrates the hourly traffic flow for International Airport Road. Other arterial roads typically have 8 to 9 percent of daily traffic in the maximum peak hour while the peak for International Airport Road is about 6.6 percent.

Except for the signalized intersections of International Airport Road at Jewel Lake Road and Postmark Drive, the airport access route is effectively an expressway from Minnesota Drive to the airport terminals. Either flaring these intersections to achieve higher throughput capacity or construction of interchanges at Jewel Lake Road and Postmark Drive is needed to eliminate the signalized intersection constraints.

Dowling Road

Segments of Dowling Road east and west of Seward Highway show excess capacity deficiency. The traffic demand overload is partially due to the discontinuities in the east-west street grid south of Tudor Road and north of Dimond Boulevard. A pragmatic improvement would connect Raspberry Road from its interchange at Minnesota Drive to 68th Avenue for full east-west continuity from Sand Lake Road to Abbott Loop Road. However, creeks and wetlands, developed housing, and neighborhood impact issues are impediments for this connection. A connection of Dowling Road to Raspberry Road would provide another east-west connection in Central Anchorage to achieve better traffic circulation.

Abbott Loop Road

Deficiencies are apparent in 2025 along Abbott Loop Road between Abbott Road and 68th Avenue. Connecting the grid on the east side of town, by extending Abbott Loop Road to connect with Bragaw Street to the north, alleviates traffic on Lake Otis Parkway and creates a direct route to the University-Medical District for Hillside residents. Adding left turn lanes and traffic signals at locations along Abbott Loop Road would manage traffic demand sufficiently. Right-of-way should be preserved for future connections and extensions of Abbott Loop Road from Abbott Road to Elmore Road at O'Malley Road.

Rabbit Creek Road

Rabbit Creek Road is the primary access to many lower Hillside residential areas, especially those served by Goldenview Drive. By 2025, Rabbit Creek Road shows a capacity deficiency. A third lane for left turns likely will be needed to accommodate the projected traffic demand.

Resolving Outstanding Deficiencies with New Projects

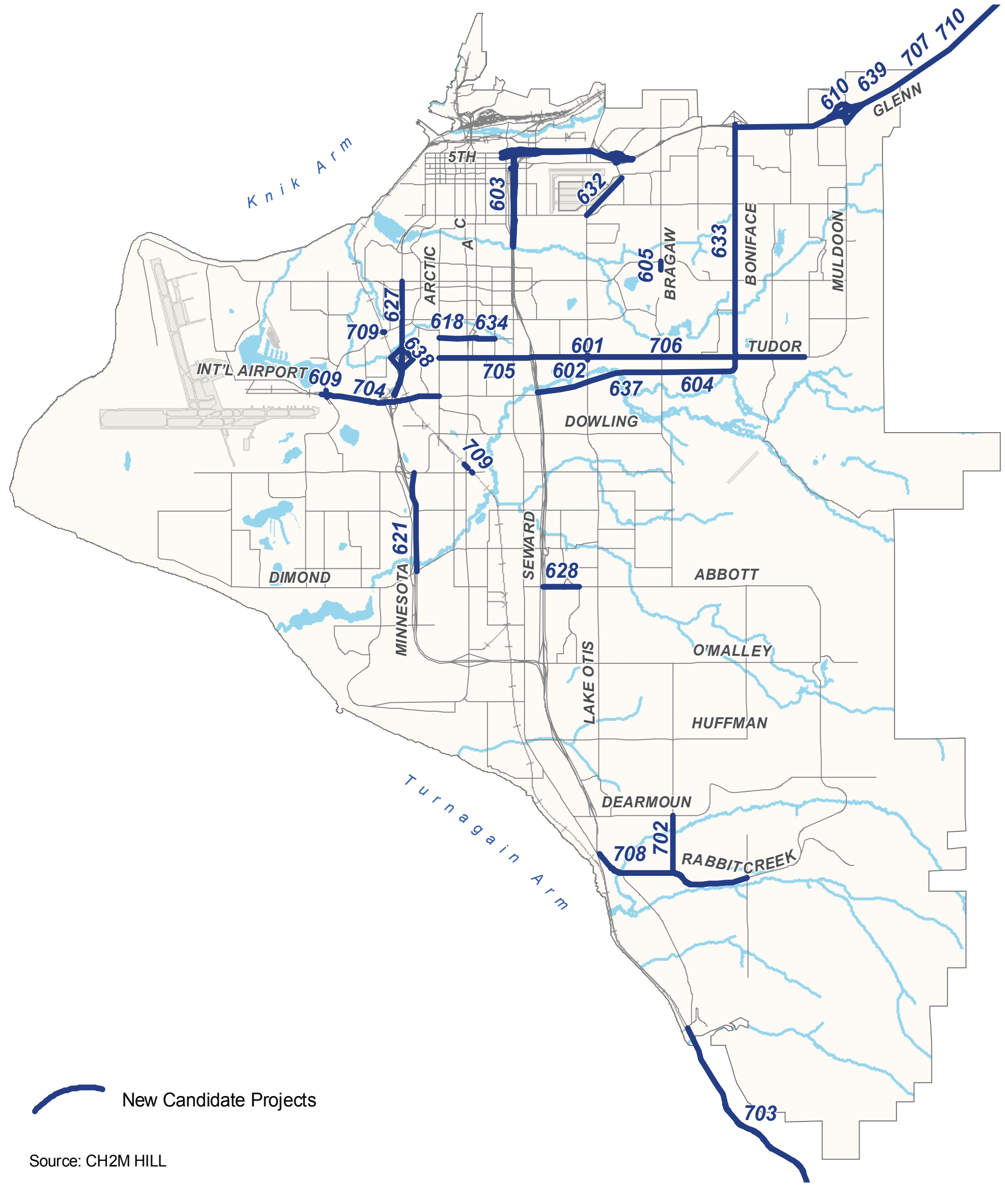
New Projects Scenario

The deficiencies analyses guided specification of new projects to improve the 2025 road network performance. The identified new project candidates depicted in Figure 7-13 range from widening existing road segments to building new segments. The most significant new project connects the Glenn Highway with the Seward Highway, providing a continuous, high-capacity, controlled-access facility along the Ingra-Gambell streets couplet and the Glenn Highway corridor. Other new projects add interchanges (International Airport Road at Jewel Lake Road and at Postmark Drive, Minnesota Drive at Tudor Road, and Lake Otis Parkway at Tudor Road).

Several combinations of these projects were evaluated to determine how they contribute to resolving deficiencies observed in earlier scenarios. Some candidate projects subsequently were rejected. A composite new projects scenario evolved, adding selected new projects to those already in the 2023 LRTP scenario. Traffic performance results for the new projects in 2025 are displayed in Figure 7-14 and shown in Table 7-2.

The road network performance is substantially improved overall in the new projects scenario. The number and scale of deficiencies are markedly reduced from the conditions reported for the scenarios discussed above. The effect of the Glenn Highway to Seward Highway connection is especially noteworthy. It literally removes nearly

Figure 7-13. Additional Candidate Projects



Source: CH2M HILL

The numbers on the map identify specific projects considered.

Table 7-2. Performance Comparison for 2002 and 2025 Project Scenarios

Feature	Scenario			
	2002 Road Network, 2002	Existing and Committed Road Projects, 2025	2023 LRTP Improvements, 2025	New Projects, 2025
Vehicle miles of travel in severe congestion	143,680	487,170	455,150	84,850
Traveler hours spent in severe congestion	4,420	23,330	18,327	3,565
Congested freeway miles				
Morning peak period	2%	25%	25%	16%
Afternoon peak period	4%	27%	27%	18%
Congested arterial miles				
Morning peak period	8%	22%	21%	16%
Afternoon peak period	23%	24%	21%	14%

Source: CH2M HILL

100,000 vehicles daily from other city streets, channeling them instead in a high-capacity facility able to maintain satisfactory traffic flow. The impact in the immediate corridor is to dramatically reduce surface street traffic volume and neighborhood disruption. The effect extends throughout East Anchorage, generally shifting travel patterns, lowering traffic on arterial roads, and reducing intrusion into and through neighborhoods.

Elsewhere, positive effects can be observed for Minnesota Drive north of the TSAIA, Tudor Road, and in generally better balance of volume demand and capacity throughout the network. However, Tudor Road corridor deficiencies remain unresolved, even with this connection.

Boniface Parkway Connection to TSAIA Scenario

An additional scenario was created to address traffic overloading on Tudor Road and provide a more southerly cross-town route with direct access to TSAIA. Boniface Parkway is extended south of Tudor Road to the vicinity of 48th Avenue, then continues westward on a curving alignment to meet International Airport Road at a new interchange on the Seward Highway, and provides direct connection to TSAIA.

Although the connector is significantly effective in relieving Tudor Road congestion (Figure 7-15) and generally improving overall network operation, cost as well as environmental and community impacts are high for this scenario.

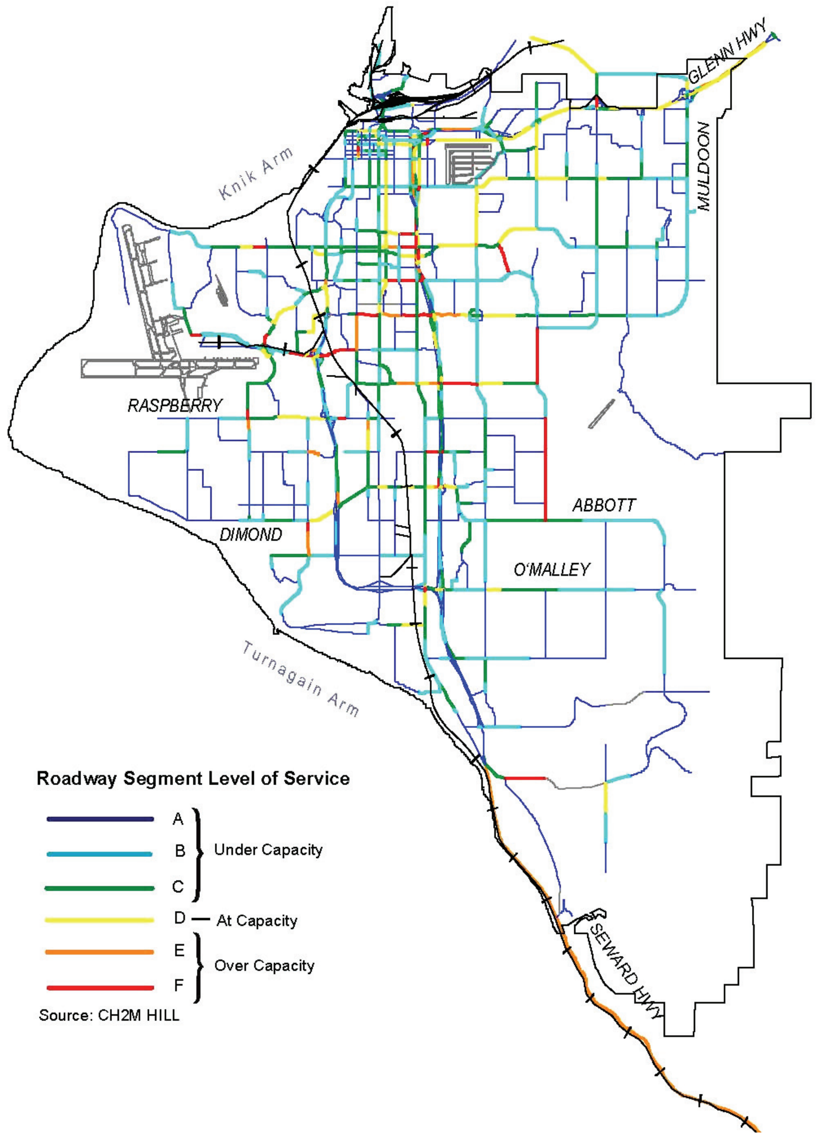
Because the adverse impacts were judged to be too costly and significant to achieve acceptance, the Boniface Parkway connection to the airport scenario was rejected.

East Bypass Scenario

Proposals have been advanced in the past to consider a new road corridor, the East City Bypass road corridor to direct traffic around the east periphery of Anchorage. Conceptually, the bypass route would be a limited access corridor east of Muldoon Road and south of Tudor Road. Its northern terminus would be an interchange with Glenn Highway, and its western terminus would be an interchange on Seward Highway. The route would connect to TSAIA through International Airport Road. Intermediate interchanges would be included at DeBarr Road, Northern Lights Boulevard, and southern extensions of Muldoon Road, Boniface Parkway, and Bragaw Street.

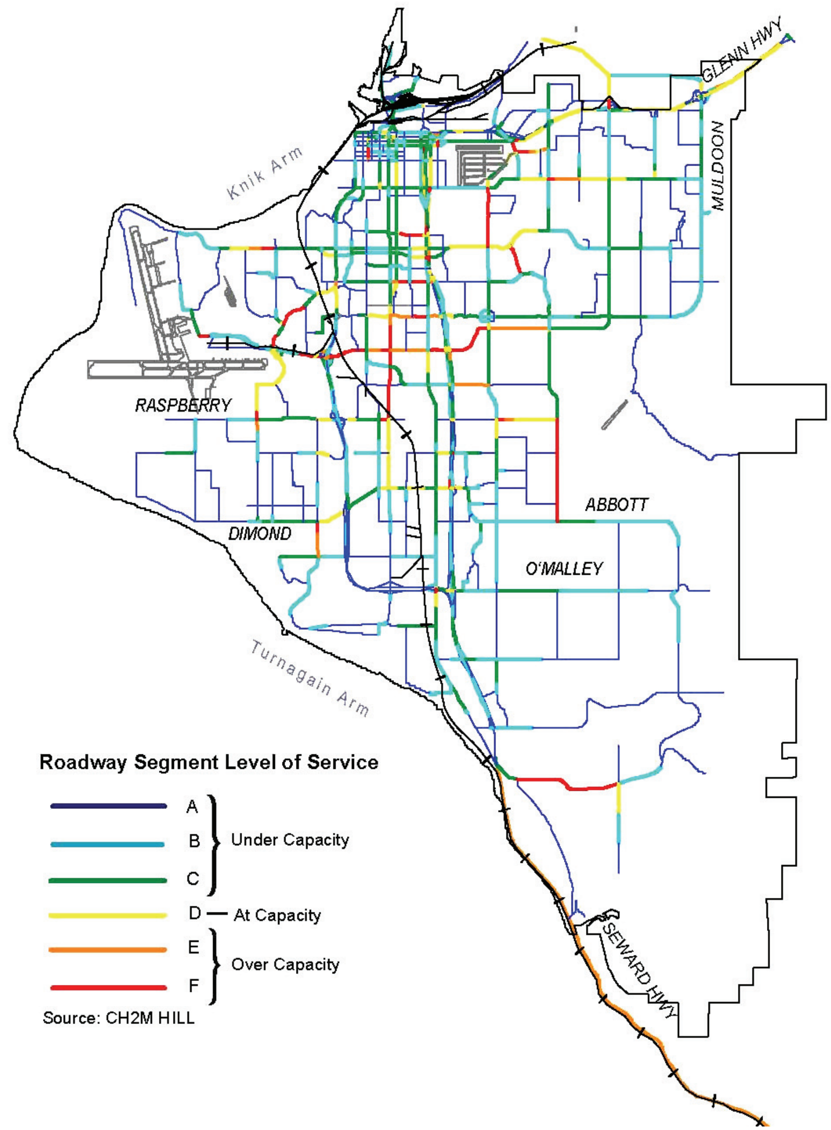
This scenario was examined in the *East Anchorage Study of Transportation, Forecast Report, Draft* (HDR Alaska, Inc., 2003). The bypass was found to split traffic coming into Anchorage from the north, but to provide small benefits in serving travel within the Anchorage Bowl. Bypass use would be light along its periphery segment east of Muldoon Road, with traffic picking up considerably west of the Boniface Parkway connection. Because this scenario did not significantly affect the severely congested areas within the Anchorage Bowl and travel to employment centers, it is not a viable candidate scenario for the LRTP.

Figure 7-14. Total Daily Performance of Additional Projects in 2025



The numbers on the map identify specific projects considered.

Figure 7-15. Total Daily Performance of Additional Projects with Boniface International Airport Road Expressway in 2025



The numbers on the map identify specific projects considered.

Effect on Road Performance of Intensifying Anchorage 2020 Land Use Policies

Would significantly concentrating new housing growth near employment and at more compact density reduce Anchorage road needs? A land-use scenario characterizing new housing intensification was evaluated to determine its potential to reduce travel, shift trips to non-automobile modes, and reduce road investment requirements.

A growth pattern that concentrates nearly 80 percent of new Anchorage Bowl household growth into the transit corridors, town centers, and employment centers of Anchorage 2020 was created. Evaluation of this "intensification policy" scenario with the travel model compared its travel, mode shares, and transportation system performance to the corresponding results for the adopted Anchorage 2020 comprehensive plan.

The projects needed to accomplish LRTP objectives were not discernibly different for implementation of the intensification scenario or the Anchorage 2020 scenario. The intensification scenario does encourage more pedestrian and bicycle trips, increases transit riders, and yields some reduction in daily vehicle miles of travel (VMT); however, roadway traffic volume differences are virtually imperceptible—congestion levels are still high in many areas of the Anchorage Bowl. More detailed information about this scenario is presented in the LRTP Working Paper, "Policy Area Intensification Land Use Alternative Scenario Evaluation" (available at www.muni.org/transplan).

Assessing Individual Road Projects

The road scenarios evaluated above considered groups of road projects in each scenario. In some cases, some project overlap or redundancy is apparent. Accordingly, each project was reviewed individually to determine if it merited inclusion and retention as an LRTP improvement. Two considerations were included in evaluating merit: (1) Is the project warranted for physical preservation and rehabilitation reasons? (2) Is the project justified to accommodate forecast traffic for mobility and congestion relief? Projects that met either criterion were carried forward for further consideration in LRTP planning for road improvements.

Road Improvement Impact Measures and Cost Estimates

In addition to traffic performance, other impact measures were developed concurrently to assist in assessing projects and alternative scenarios. The projects in each scenario were examined to identify land areas to be acquired from property owners; effects on wetlands, open space, parklands, noise, and air quality; and other community and environmental impacts. These data were incorporated into the alternatives evaluation.

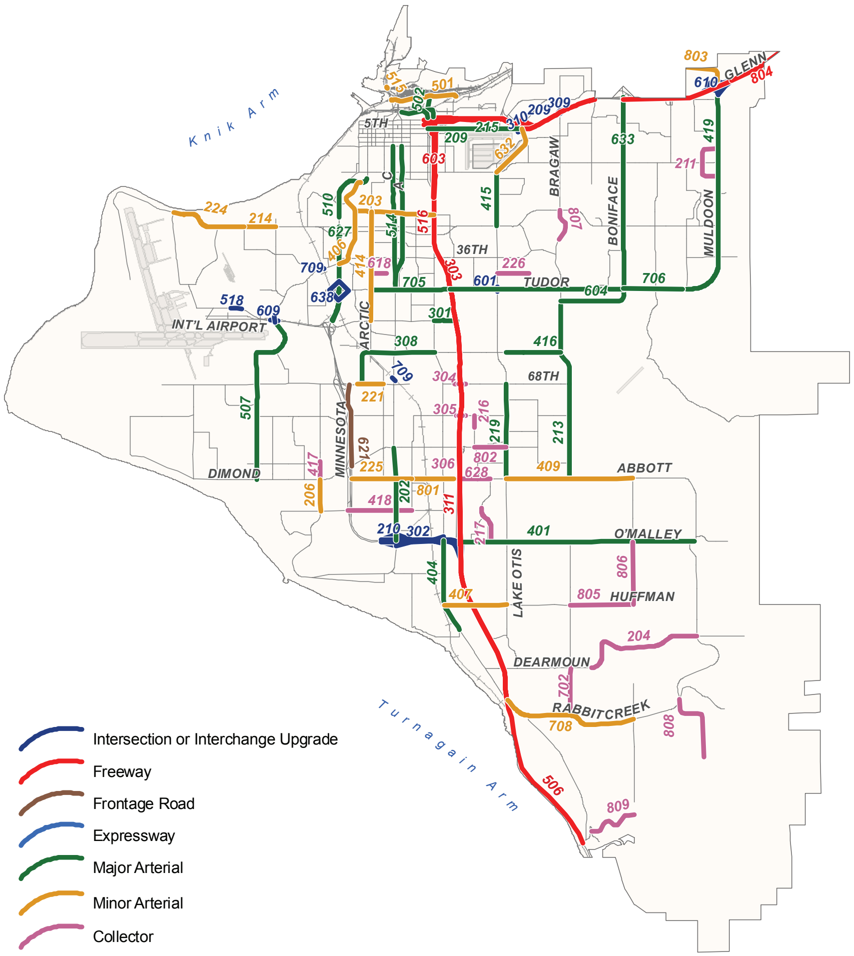
Planning-level cost estimates were prepared for each project. Cost estimates were assembled from previous AMATS, MOA, and DOT&PF work and adjusted to 2004 dollars when necessary. Newer cost estimate information from major environmental and preliminary engineering studies was obtained for applicable projects. If estimates were not available, planning-level estimates were developed by the LRTP team. All costs are at a planning level, generally without benefit of more engineering detail. All cost estimates are expressed in 2004 constant dollars without future escalation. Costs and funding are discussed more fully in Chapter 9.

Recommended Projects Scenario

The composite results of individual project assessments, community impact effects, and project costs culled certain projects from consideration. The road projects emerging from this multi-tier screening process compose the recommended road projects scenario in Figure 7-16.

Illustration of how the recommended projects scenario performs (Figure 7-17) reveals that nearly all earlier road network deficiencies are cleared up. Some road segments do show modest overloads (orange and red segments) in 2025. However, in many cases, overloading is on isolated road segments and the scale of overloading is markedly reduced and manageable. Statistical results for the recommended plan scenario are summarized and compared to conditions in 2002 in Table 7-3.

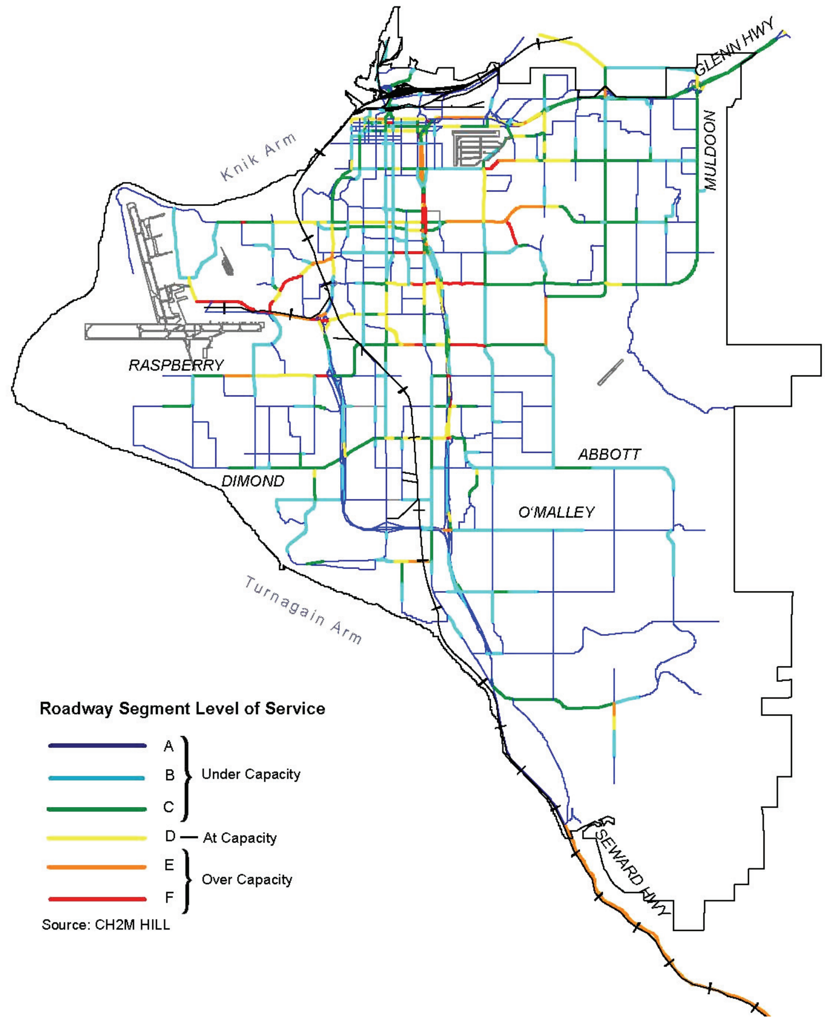
Figure 7-16. Recommended Road Projects



Source: CH2M HILL

The numbers on the map identify specific projects considered.

Figure 7-17. Total Daily Performance of Recommended Road Projects



Source: CH2M HILL

Table 7-3. Performance Comparison for 2002 and 2025 Project Scenarios and the Preferred Network

	Scenario				
Feature	2002 Road Network, 2002	Existing and Committed Road Projects, 2025	2023 LRTP Improvements, 2025	New Projects, 2025	Preferred Scenario
Vehicle miles of travel in severe congestion	143,680	487,170	455,150	84,850	69,150
Traveler hours spent in severe congestion	4,420	23,330	18,327	3,565	3,261
Congested freeway miles					
Morning peak period	2%	25%	25%	16%	13%
Afternoon peak period	4%	27%	27%	18%	13%
Congested arterial miles					
Morning peak period	8%	22%	21%	16%	13%
Afternoon peak period	23%	24%	21%	14%	12%

Source: CH2M HILL

Conclusions and Approaches for the Road System

The recommended road improvements were assessed for performance in 2025. Comprehensive evaluations of road network performance, community impacts, and costs were considered.

The recommended road plan cuts 100 million annual VMT in comparison to the congested travel conditions that would be experienced in 2025 with implementation of the existing LRTP. It also eliminates 3.9 million annual driver hours spent in severe congestion in 2025. The recommended plan sustains and improves on the mobility of 2002 for the next 20 years.

Managing and dealing with Anchorage traffic growth during the next 20 years will pose challenges. Road improvements will need to focus on completing major missing links, preserving and rehabilitating the already-built network, establishing continuity, and balancing capacity to travel demand. Although projects included in the prior 2023 LRTP plan are a significant step forward, more improvements will be needed to meet future demand. Continuing community support will be essential.

When fully implemented, the recommended road plan will cut 100 million annual vehicle miles of travel, compared to the results of the 2023 LRTP.

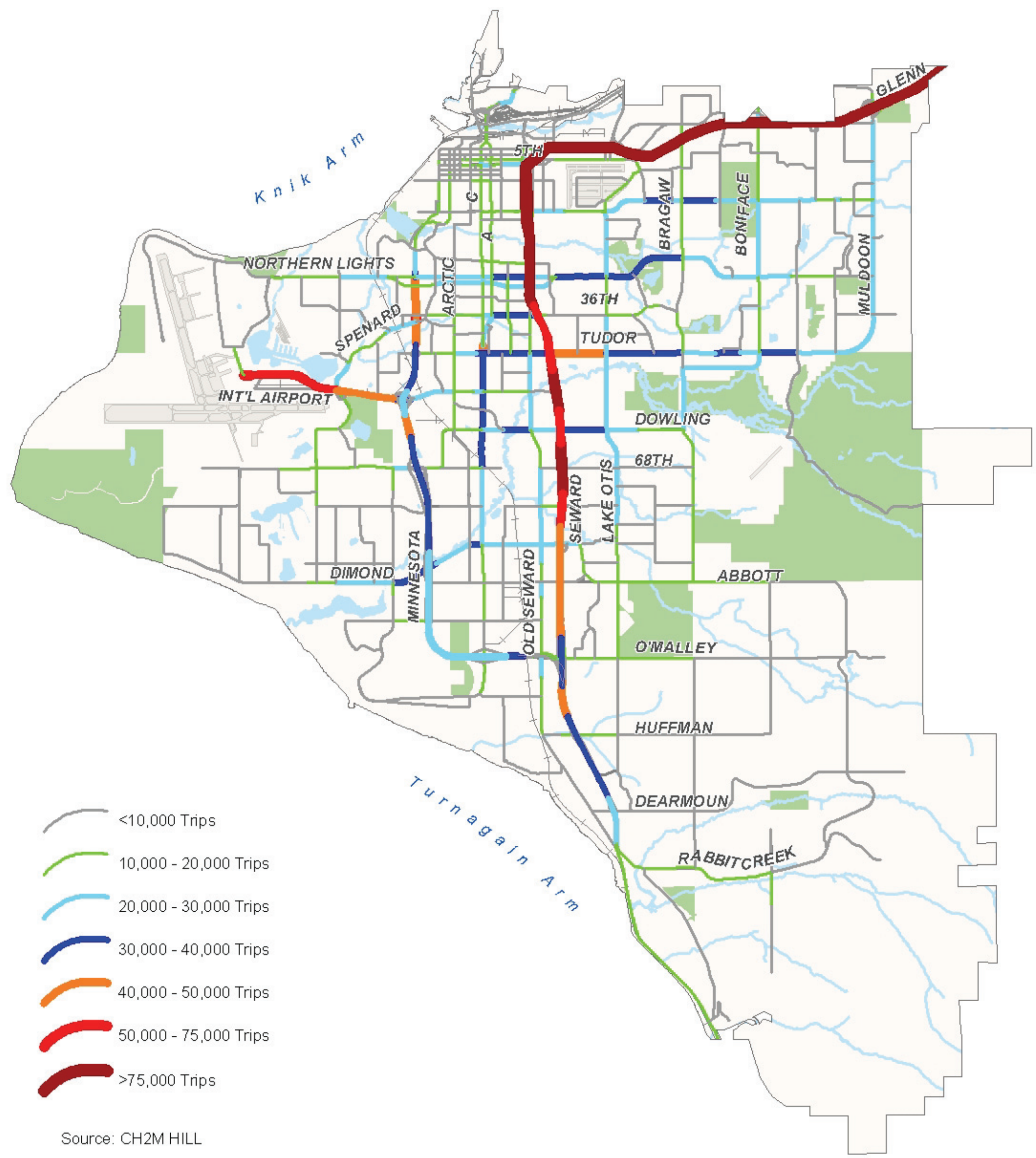
Remaining Deficiencies in the Road System

Modeling for the 2025 traffic predicts that the 40 percent increase in vehicle trips from the 2002 traffic level will present several locations where, in spite of the recommended LRTP road improvements, the volume of vehicles will exceed the capacity of the roadways. (See Figure 7-18.) Peak-hour congestion and related intersection delays will result. Some of these locations are in and around Midtown, an area that presents significant challenges in promoting solutions to its congestion.

Where such locations exceeding roadway capacity still exist, more analysis of the roadways, alternative parallel routes, and other operational improvements is needed. In addition, efforts should be made to preserve the right-of-way for road improvements that would help alleviate congestion in these locations, including the following road system components:

- East-west functional road structure from Tudor Road to south of Dimond Boulevard
- Tudor Road corridor
- Dowling Road corridor
- C Street, from International Airport Road to 68th Avenue
- UAA Drive and University-Medical District access
- International Airport Road, from Minnesota Drive to TSAIA

Figure 7-18. 2025 Average Daily Traffic for Highways, Arterials, and Collectors



Source: CH2M HILL

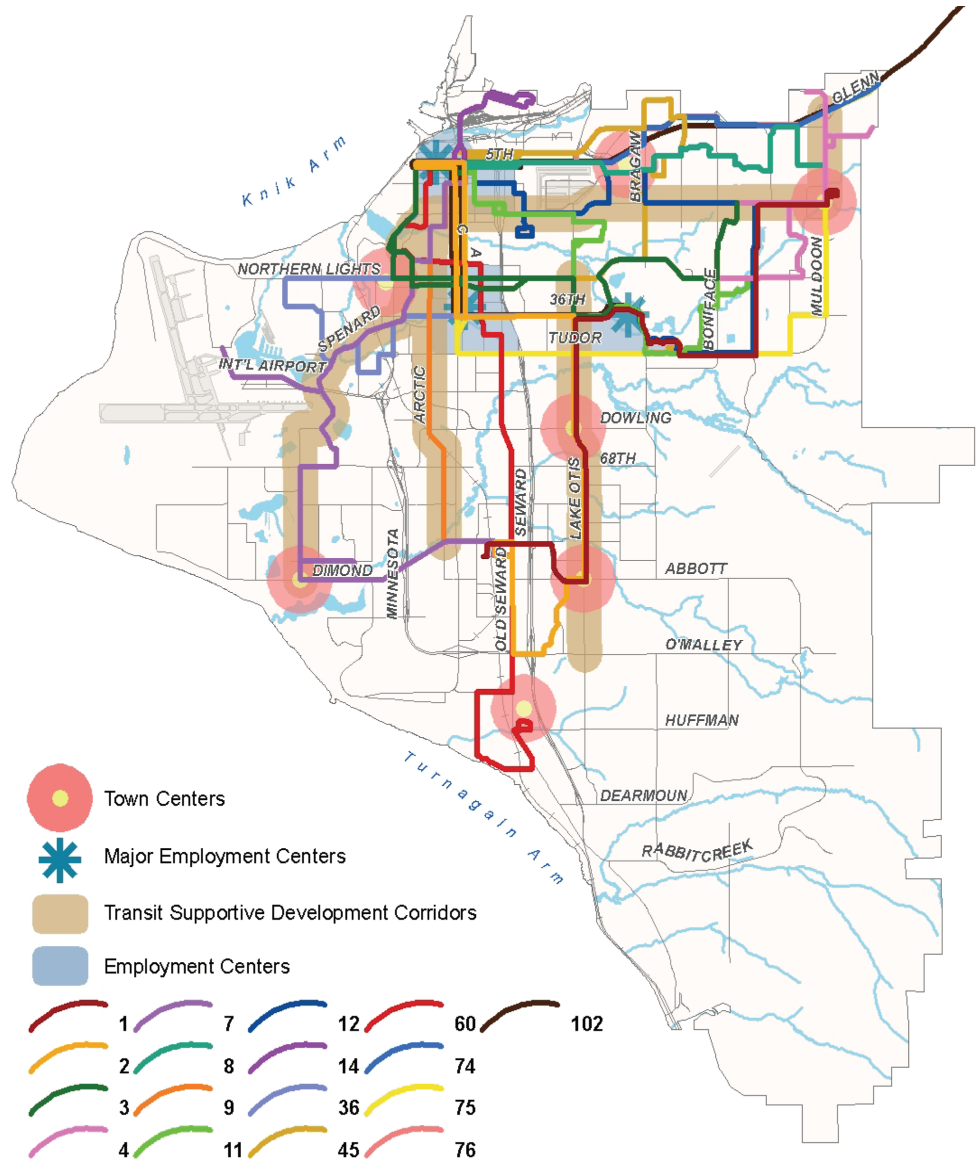
- Spenard Road, from Northwood Drive to Wisconsin Street
- North-south coastal route as an alternative to the Glenn Highway for emergency access from Port of Anchorage to Knik River (study)

Public Transportation

Important questions for the LRTP revolve around what scale of transit system is most appropriate. What frequency and scope of service? How many riders might transit attract? How can transit help relieve congestion? In 2002, the People Mover system operated 14 routes in the Anchorage Bowl and three routes serving Chugiak-Eagle River. See Figure 7-19. During weekday peak hours, 11 routes had 30-minute frequency; during mid-day, service was generally at 60-minute frequency. Average weekday riders numbered 10,691. Characteristics of the bus service and ridership (Figure 5-7) are discussed in Chapter 5. Table 7-4 summarizes transit service operational data trends from 1992 to 2004.

People Mover was beginning to transition to a new service configuration described in *The People Mover Blueprint: A Plan to Restructure the Anchorage Transit System* (RLS and Associates, 2002). Extensive work was under way to revamp routes and transit operation to deliver more attractive and more effective service. The route restructuring plan called for improving service in several phases between 2003 and 2007.

Figure 7-19. People Mover Bus System, 2002



Source: Anchorage 2020 Comprehensive Plan and CH2M HILL

Table 7-4. People Mover Service and Ridership, 1992–2004

Year	Peak Hour Buses	Timetable Hours	Operating Cost ($)	Passengers	Operating Revenue[a] ($)
1992	44	105,371	9,943,764	3,050,659	1,768,437
1993	42	104,252	9,655,793	3,058,469	1,861,292
1994	40	104,527	9,459,389	3,029,483	1,830,907
1995	38	104,829	9,419,151	3,019,765	1,827,339
1996	38	105,569	9,408,753	3,052,690	1,923,758
1997	42	107,315	9,465,703	3,161,658	1,913,393
1998	42	108,666	9,781,769	3,220,524	1,947,758
1999	39	107,414	10,333,089	3,316,060	2,019,359
2000	40	104,506	10,532,615	3,356,982	1,955,982
2001	40	109,255	11,727,420	3,339,940	1,836,844
2002	41	110,449	13,023,362	3,120,567	2,397,031
2003	43	114,614	13,526,892	3,339,451	2,452,354
2004	46	124,734	17,234,475	3,536,059	3,162,262

[a]Operating revenue consists of passenger fare revenues, advertising revenues, and other program revenues. Federal capital and other program grants are excluded.

Source: MOA Department of Public Transportation

Table 7-5. Population and Employment with 1/4-Mile Access to Transit Routes, 2002, 2013, and 2025

Indicator	Population			Employment		
	2002	2013	2025	2002	2013	2025
Total Anchorage Bowl	225,305	242,389	300,741	135,444	145,829	171,354
Transit System	**Population within ¼ Mile**			**Employment within ¼ Mile**		
2002 bus system	143,910	153,820	184,090	110,565	116,470	137,160
Restructured routes	NA	189,010	226,100	NA	129,880	152,570

NA = Not applicable

Source: CH2M HILL

Bus System in 2013 and 2025—Base Scenario

The initial analyses of possible future transit service scenarios examined what might evolve based on the 2002 bus system, as well as on the new route restructuring system.

For many years, fiscal constraints have controlled bus service and operation in Anchorage. What transit use can be anticipated if the same funding limitations prevail through 2013 or 2025? Guided by Anchorage 2020 policies, population and employment growth will create opportunity for increasing transit riders. About 10,000 more people and 9,500 new jobs are expected to be within one-quarter mile of the existing (2002) bus routes by 2013, and about 40,000 more people and more than 30,000 additional jobs by 2025. (See Table 7-5).

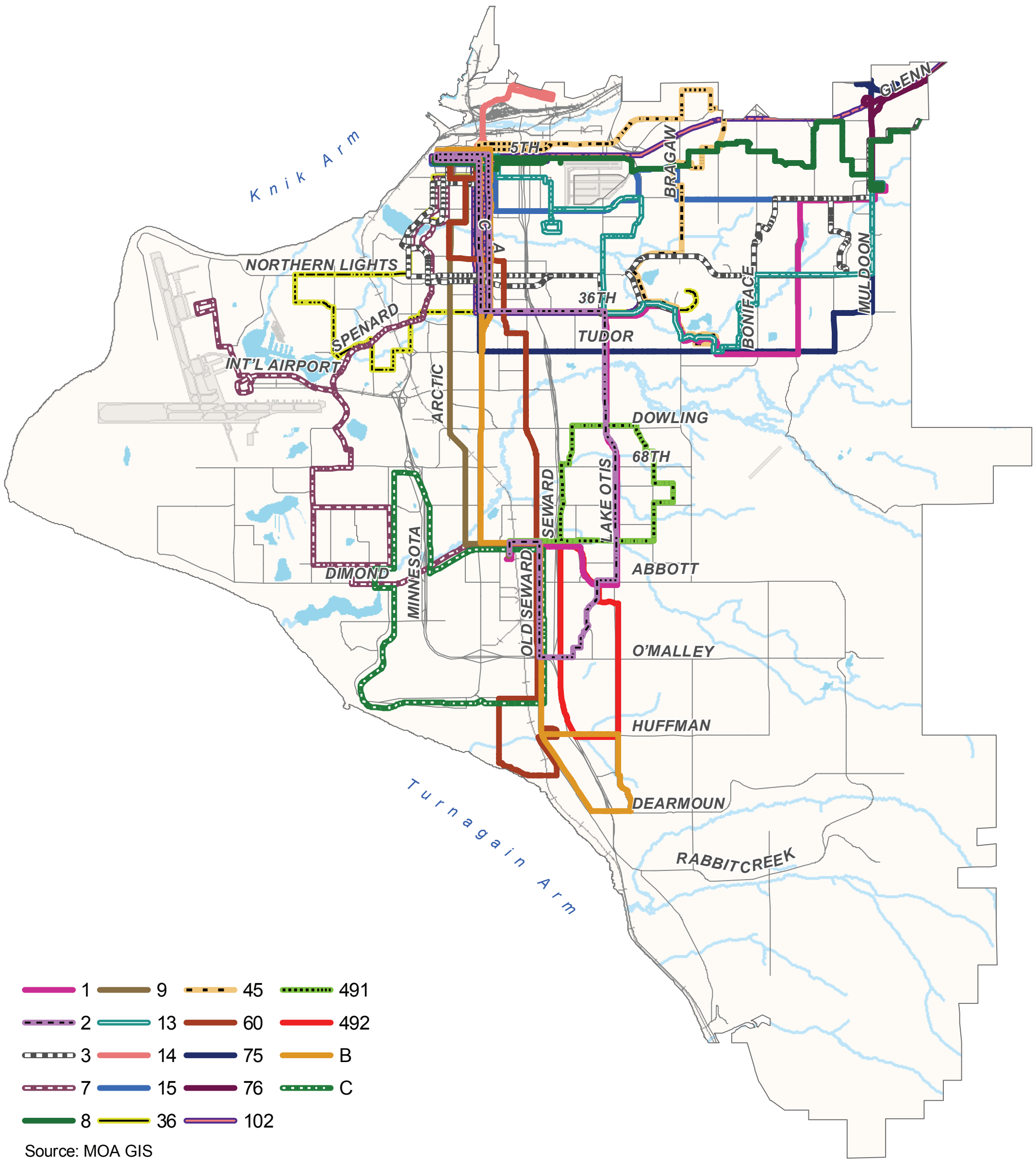
If the transit routes, service frequencies, and fares remained at 2002 levels, weekday transit riders in 2013 and 2025 would increase to 11,700 and 15,600, respectively (Table 7-6). These ridership increases correspond to gains of 10 percent by 2013 and 47 percent by 2025.

Table 7-6. Existing and Estimated Riders for 2002 Bus Routes and Service

Year	Ridership
2002	10,600
2013	11,700
2025	15,600

Source: CH2M HILL

Figure 7-20. People Mover Route Restructuring Bus System



Source: MOA GIS

The transit rider increase can be attributed at least partially to greater density of housing units and jobs in transit development corridors resulting from Anchorage 2020 policies. Because transit service level remains constant, the gain in riders is drawn primarily from population and job growth in areas accessible to transit routes.

Route and Service Restructuring Scenarios

Implementation of Ongoing Improvements

In 2002, efforts were under way to transition the People Mover bus system into a different route structure with more frequent service, modified schedules, and better coordination among bus routes. Route restructuring was based on results of surveys, public input, analysis of ridership patterns on each route, and proposed improvements to the route structure and schedules for the system. The overall objective of more "customer focus" prompted reorienting the system to provide reduced passenger travel times, increased access to employment sites, and generally easier use of transit.

Implementation of the 5-year program of improvements for years 2003 to 2007 is ongoing. See Figure 7-20 and Table 7-7. The restructuring plan implementation is assisted by a Federal Highway Administration congestion mitigation and air quality (CMAQ) grant that expires in July 2006.

Table 7-7. Expected Results for People Mover Route Restructuring, 2003–2007

Feature	2003 Bus System	Route and Service Restructuring Scenario
Number of annual passengers	3.3 million	4.2 million
Number of buses	45	59
Total transit operating cost covered by rider fares	21%	24%
Additional annual operating support from the MOA general fund needed to sustain the 2007 service level	$0.75 million	$4.1 million

Source: RLS and Associates, *The People Mover Blueprint: A Plan to Restructure the Anchorage Transit System*, 2002

Objectives and elements of the restructured system enhancements include the following:

- Improve service frequency (the length of time between buses on a route) to 30-minute frequencies all day on weekdays on all routes (a doubling of service frequency on most routes) and to 60 minutes during evenings and weekends
- Implement community circulator service operating with smaller vehicles in the lower-density areas in South Anchorage and Chugiak-Eagle River where demand for transit service is lower. This service, referred to as DART, deviates from the normal routes to come closer to more homes and destinations.
- Operate later service on weekdays and weekend service that starts earlier in the morning and ends later at night
- Establish timed transfers Downtown and elsewhere so that riders transferring between routes can get off one bus and directly onto another
- Rewrite bus schedules that use memory or "clock" headways, so that riders need not always carry a timetable. One would only need to know that the bus at any particular stop, for example, arrives 10 minutes before the hour and 20 minutes past.
- Provide more direct routing that permits express service to reduce travel times
- Create a transit center near the intersection of Muldoon and DeBarr roads (Creekside Town Center)
- Improve paths and sidewalks from residential and commercial areas to bus stops, including snow removal on paths and around bus stops.

By the end of 2004, many restructuring changes were in place. All routes had been realigned and 30-minute weekday service had been introduced on three routes with highest patronage. The average 2004 weekday riders on People Mover increased to 11,921 (versus 10,691 in 2002). For the entire year, People Mover carried 3,536,060 passengers, the fifth highest ridership per year on record.

Factors That Influence Traveler Mode Decisions

Decisions by individuals about what transportation mode to use represent a key component of travel behavior. Statistical analyses of these decisions in dozens of metropolitan areas have revealed common relationships among factors that affect traveler behavior. (A list of several factors that influence transit use appears in the Chapter 5 section on "Public Transportation.")

Extensive research on traveler behavior includes studies of traveler responses to transportation system changes and mathematical modeling of mode-decision behavior. For example, *Traveler Response to Transportation System Changes* (Transit Cooperative Research Program Report 95), published by the Transportation Research Board of the National Academy of Sciences, documents more than four decades of exhaustive tracking of how travelers respond when transit service, parking, road, and other transportation system changes are introduced.

The Anchorage travel model, which embodies traveler decision behavior, is able to closely predict the number of People Mover riders for different conditions. In a test of model accuracy, the number of weekday riders estimated with the model for 2002 was 10,714 bus riders. This figure was very close to the recorded 2002 transit count of 10,691 riders.

To fully implement route restructuring, future efforts require upgrading to 30-minute mid-day frequency on 11 routes, extending late evening service and earlier morning service, improving DART frequency, and adding new routes.

If all route restructuring improvements are funded as planned during each of the 5 implementation years through 2007, as outlined in the People Mover route restructuring plan, the service improvements are expected to attract about 14,300 weekday and reposition transit.

Route Restructuring Riders with 30-Minute Frequency in 2013 and 2025

Weekday riders for the bus system with route restructuring and 30-minute frequencies on all routes in 2013 and 2025 were assessed by using the Anchorage travel model. Figure 7-21 presents the results and 2002 numbers for comparison. Impressive gains in transit riders are realized in 2013 and 2025 compared to 2002—15,300 riders in 2013 (43 percent more than in 2002) and 20,700 in 2025 (93 percent more than in 2002).

The route restructuring service improves accessibility to bus routes. More homes and jobs are within one-quarter mile of transit service than before route restructure was implemented. Table 7-5 shows that about 23 percent more people and 11 percent more jobs are projected to be within walking access of the restructured route system than would be the case for the 2002 bus system.

Route Restructuring with Increased Service Frequency

In another transit scenario, the effect of providing more frequent transit service was examined. The same restructured routes were assumed, but service during weekday morning and afternoon commuting periods was increased to 15 minutes on all routes. Service remains at 30-minute frequency for other hours.

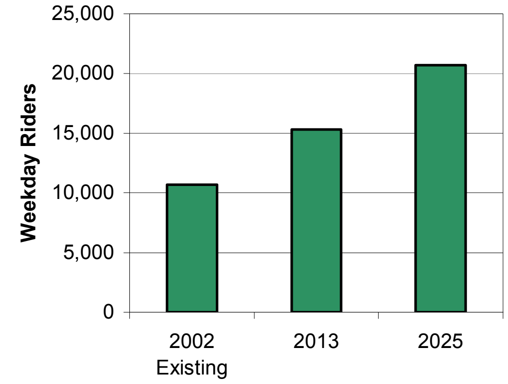
The effect of more frequent service during commuting hours is a 23 percent gain in riders for 2025 (Figure 7-22). Total ridership for the 2025 scenario with 15-minute peak and 30-minute off-peak frequencies is about 137 percent of weekday ridership in 2002.

Advanced Technology Transit Scenario

An important policy question for Anchorage is whether a significantly higher performance transit system could attract many more riders and reduce vehicle traffic and road investments. That thesis was examined by hypothesizing a substantially more sophisticated scenario featuring an advanced technology express transit system operating primarily on separate rights-of-way. A high-end system was used in this scenario because the purpose was to see what the upper limits of transit potential might be.

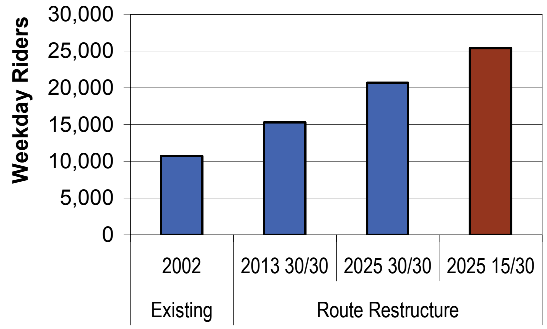
The key feature of this scenario is that the express bus service is not hindered by road traffic and not affected by traffic congestion. Transit stops are spaced at intervals of one-half to three-quarters of a mile. Weekday service frequency in all express bus corridors is set at 15 minutes during peak

Figure 7-21. Estimated 2013 and 2025 Weekday Riders for Route Restructuring with Weekday Service at 30-Minute Frequencies



Source: CH2M HILL

Figure 7-22. Estimated 2013 and 2025 Weekday Riders for Route Restructuring with Weekday Service at 15-Minute Frequencies



Source: CH2M HILL

commute periods and 30 minutes for all other time periods. Fifteen minute service frequency for peak hours and 30-minute frequency for other hours is provided for all bus routes that do not overlap the express bus corridors. Local bus service within the express bus corridors is at 30-minute frequency all day.

Transit vehicles would have traffic signal preemption transmitters, electronic fare collection, low floors for quick passenger entry and exit, and other amenities.

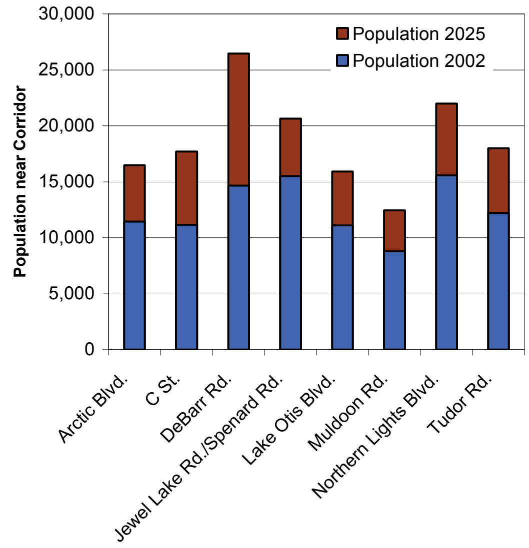
Glenn Highway express bus service operates from Chugiak-Eagle River to major employment center destinations in the Anchorage Bowl; similar service would run from the Mat-Su Valley to the same Anchorage Bowl destinations. Express services runs at 10- to 15-minute frequency in the morning and evening commute periods only.

Commuter rail in the Alaska Railroad corridor during commute hours only was also included in the advanced transit scenario. Commuter rail service would run between Wasilla in the Mat-Su Borough and the Ship Creek Intermodal Terminal, possibly to the TSAIA terminal. Commuter stations would also serve Chugiak-Eagle River.

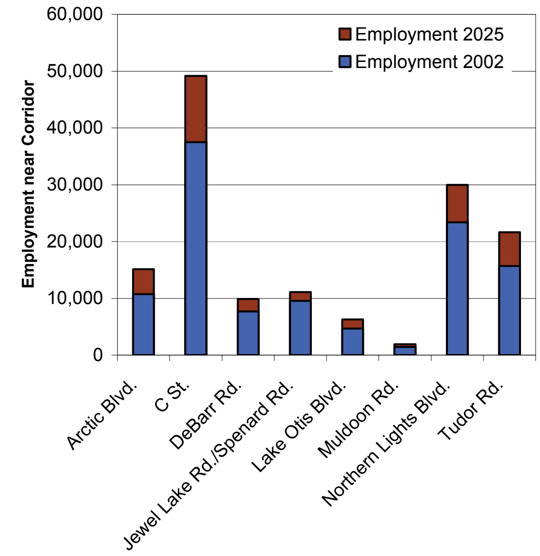
Designation of Express Bus Priority Corridors

The land-use policies of Anchorage 2020 delineate transit-supportive development corridors to encourage more frequent transit service. Generally, the corridors with the largest populations and the most employment would be

Figure 7-23. Accessibility Findings for North-South and East-West Primary Corridors



Source: CH2M HILL and MOA



Source: CH2M HILL and MOA

expected to offer the best opportunities for attracting transit riders.

Corridors were examined to determine the number of persons and accessible jobs within one-quarter mile in 2002 and to project those results for 2013 and 2025. Figure 7-23 depicts the accessibility findings for eight north-south and east-west primary corridors within the Anchorage Bowl. From these analyses, four priority corridors were selected along with the Glenn Highway corridor for designation as express bus corridors in the advanced technology transit scenario:

- Creekside Town Center (Muldoon Road) to Downtown via DeBarr Road, a loop to serve the Northway Town Center, 15th Avenue, and the A-C couplet
- Muldoon Road from the Glenn Highway to TSAIA via Muldoon Road, Northern Lights Boulevard, Boniface Parkway, Tudor Road, the University-Medical District via Bragaw Street and 36th Avenue, Lake Otis Parkway, Northern Lights-Benson boulevards couplet, Minnesota Drive, Spenard Road, and International Airport Road
- Downtown to Dimond Mall, Abbott Town Center, and Huffman Town Center via the A-C couplet, Tudor Road, Arctic Boulevard, Dimond Boulevard-Abbott Road, Lake Otis Parkway, and Huffman Road

- Downtown to Dimond Mall, Abbott Town Center, and Huffman Town Center via 5th Avenue, Bragaw Street, Northern Lights Boulevard, the University-Medical District, Tudor Road, Lake Otis Parkway to the Dowling and Abbott town centers, 92nd Avenue to Dimond Mall, and Old Seward Highway to Huffman Town Center

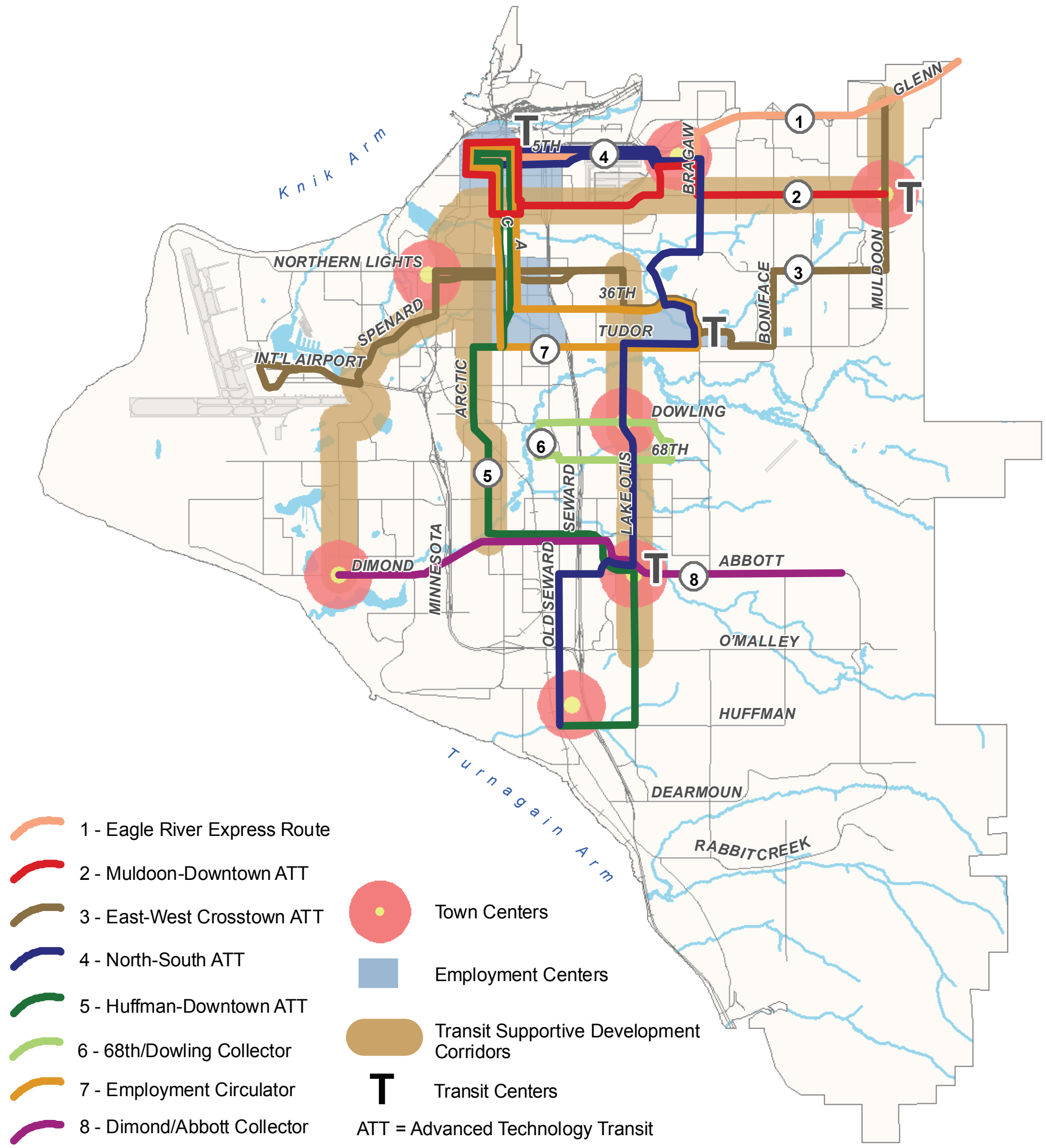
Figure 7-24 shows the composite layout for the advanced technology transit system. The number of weekday transit riders in 2025, shown in Figure 7-25, was estimated with the Anchorage travel model. The advanced technology system attracts 30,000 daily riders on its express bus network, People Mover bus, and commuter rail components. The rider volume is an increase of nearly three times the 2002 rider level and reflects 18 percent more riders than for the 2025 route restructuring scenario with 15- and 30-minute service frequencies.

Interpreting the Alternatives and Outcomes

Since the 1970s, LRTP documents have consistently envisioned improved transit services and a larger transit system. Transit service improvements have been few, however. In 2002, the People Mover bus system operated significantly less service and consequently carried fewer riders than in the early 1980s. Therefore, a critical challenge for the LRTP transit proposals is to confront this basic dichotomy between the vision and historical reality.

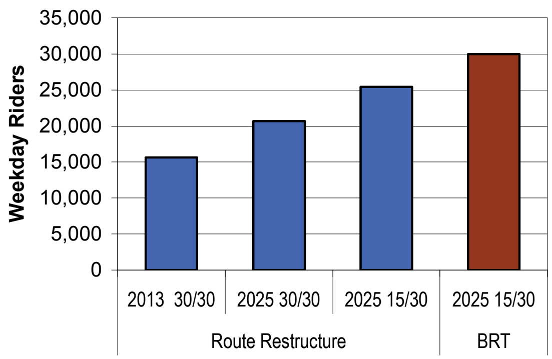
High per capita reliance on automobiles often results in congestion, larger streets, constant traffic,

Figure 7-24. Advanced Technology Transit System Scenario



Source: Anchorage 2020 Comprehensive Plan and CH2M HILL

Figure 7-25. Comparison of Advanced Technology Transit and Other Route Restructuring and Service Enhancement Scenarios



Source: CH2M HILL

drivers cutting through neighborhoods, adverse safety and health effects, larger street scale, and more parking and land consumption. These factors tend to thwart compact and walkable neighborhoods conducive to the use of transit and other modes of transportation. Success in reducing peak-hour congestion and the need for road expansion hinges on providing effective and viable transportation options.

In this context of conflicting development goals, economics, and transit performance metrics, it becomes necessary to scrutinize choices carefully.

Reliability of Rider Estimates

Candidate scenario estimates of transit riders presented above are based on a relatively sophisticated computer travel model that reflects the following:

- Traveler socioeconomic demographics
- Trip patterns and purposes
- Observed travel behavior and mode decision relationships for Anchorage households
- Detailed door-to-door travel time and cost for both automobile and transit
- Access time from points of origins and egress to destinations
- Time spent waiting and transferring during the trip

In the process of determining these statistics, every trip that is able to use the transit system from its origin to its destination was considered.

Nonetheless, the future rider projections are estimates, not guaranteed results. The predicted rider numbers could vary by 10 to 20 percent. Other factors such as the condition of vehicles, schedule convenience, service reliability, fares, and automobile and fuel costs could influence the rider estimates. Additionally, projections for MOA growth are subject to uncertainties, specifically how much growth and how growth will occur during a 10- and 20-year forecast period.

Transit Share of All Trips

Table 7-8 compares the number of existing and 2025 estimated daily transit trips by trip purpose and time of day for the several service scenarios.

Transit scenarios with more frequent peak-period service clearly attract more riders, especially for home-based trips to and from work. The 15-minute peak-period scenarios show three times as many riders for work trips than used the 2002 bus service. These findings demonstrate that increasing transit service frequency can gain more riders and shift travelers out of automobiles. For selected corridors and destinations, the transit share of trips is higher.

Transit Impact on Relieving Congestion

The transit contribution to meeting travel demand varies by specific corridor. Frequent and fast transit service in the Glenn Highway corridor during commuting periods can potentially be a decisive element in averting the congestion anticipated from twice as much traffic in 2025. Elsewhere the effects will be positive but not as dramatic. It will be absolutely essential to increase peak-period service to at least 15-minute frequency or better to achieve any noticeable shift of automobile drivers to transit riders.

Transit Service Economics

The number of transit riders predicted for each transit scenario is one dimension of the economics picture. The cost to provide the service and the revenue earned by that service are additional dimensions. Vehicle fleet size and operating costs are determined by the bus hours of service needed during peak hours and other hours of the day.

A reliable, continuing funding mechanism for public transit must be found, and more public funding for transit will be needed to improve service and adequately meet future needs.

Table 7-8. Mode Share and Purposes of Weekday Trips by Transit, 2002 and 2025

Trip Purpose	2002	2025 Route Restructure		2025 Advanced Technology Transit System
	Existing Frequency	30-Minute Peak & 30-Minute Off Peak Frequency	15-Minute Peak & 30-Minute Off Peak Frequency	15-Minute Peak & 30-Minute Off Peak Frequency
7 to 9 AM Transit Mode Share:	**1.2%**	**1.5%**	**2.3%**	**3.3%**
Home-based work trips	1,309	2,264	3,543	5,503
All other home-based travel	1,233	866	1,438	1,612
Total trips	1,964	3,386	5,393	7,533
3 to 6 PM Transit Mode Share:	**1.3%**	**1.5%**	**2.2%**	**2.9%**
Home-based work trips	1,378	2,235	3,549	5,028
All other home-based travel	1,570	2,475	3,779	4,166
Total trips	3,462	5,389	8,422	10,305
Total Weekday Transit Mode Share:	**1.0%**	**1.6%**	**1.9%**	**2.2%**
Home-based work trips	4,205	8,728	10,894	14,622
All other home-based travel	4,373	9,631	11,393	12,134
Total trips	10,094	21,127	25,407	29,961

Note: Mode share is the number of trips by transit as a percent of all trips by all means.
Source: CH2M HILL

Expected operating revenues are derived from the number of passengers carried.

Table 7-9 presents a statistical abstract of the operating economics expected for the transit scenarios in 2025. All costs are expressed in terms of constant 2004 dollars without inflationary effects. The cumulative costs to implement each scenario during the 20-year period to 2025 would vary as service and fleet are ramped up from existing 2005 conditions and full implementation of the People Mover route restructure improvements planned for completion in 2007.

Increasing transit service will require more budget and more public funding. Public funding to improve transit service from the 2002 level to 15-minute peak and 30-minute off peak would require an additional $11.6 million in annual public funds for transit operating support in 2025 (in constant 2004 dollars).

Capital costs are not tallied in Table 7-9. They are predominantly covered by federal transit capital grants, although a local capital matching share is required. Capital costs for the different alternatives for bus route restructuring would vary from about $55 million on the low end to $130 million on the high end.

The advanced technology scenario with express bus and commuter rail components would have much higher capital costs for separate right-of-way for the corridors, transit vehicles, rail car equipment and stations, and development of the express bus corridors. The cost range for the advanced technology scenario is on the order of $170 million, if none of the express transit corridors is on separate right-of-way, to $700 million if all corridors are separate.

The findings show that the cost per rider remains close to the 2002 amount, except for the advanced technology transit scenario. Even with the very significant expansion in transit service,

The extensive advanced technology system with express bus on separate rights-of-way attracts the most 2025 riders, but costs far more than the route restructuring alternatives.

Table 7-9. Economic Considerations for Transit Scenarios, 2002 and 2025

	2002	2025 Route Restructuring		Advanced Technology Transit System
Indicator	Existing Frequency	30-Minute Peak & 30-Minute Off-Peak Frequency	15-Minute Peak & 30-Minute Off-Peak Frequency	15-Minute Peak & 30-Minute Off-Peak Frequency
Weekday riders	10,691	20,700	25400	30,000
Annual riders	3,120,567	6,106,500	7,239,000	8,604,000
Revenue hours of service	110,449	181,165	220,780	261,100
Annual operating cost	$13,023,362	$21,739,800	$26,493,600	$36,332,000
Annual fare box revenue	$2,173,942	$4,885,200	$5,791,200	$8,265,000
Estimated other revenue	$223,089	$300,000	$300,000	$300,000
Federal/state operating assistance	$1,970,492	$925,000	$925,000	$925,000
Net public cost	$8,655,839	$15,629,600	19,477,400	$26,434,000
Net public cost per rider	$2.77	$2.56	$2.69	$3.09
Peak hour bus fleet	41	67	83	99

Note: Cost and revenue in 2004 dollars.

Source: MOA Department of Public Transportation

operating productivity is sustained. Fifteen-minute service is a threshold to attract peak-period commuters who have automobile options.

Factors that Affect Transit Effectiveness in Anchorage

Is a transit system that attracts 10 to 20 percent of all trips, or even just commute-to-work trips, achievable in Anchorage? Systematic analysis of land-use development, travel patterns, and the performance of several transit schemes suggest that transit use could triple, although transit's percentage share of all trips remains single digit. It is difficult to envision a transit system in Anchorage attracting more than 40,000 to 50,000 daily riders.

Some other metropolitan areas do indeed attain significant commuter shares on transit. These cities have at least two distinguishing characteristics. First, they are much larger than Anchorage, usually with well above a million metropolitan residents. Second, they invariably have a dominant central business district, and often have a radial road network focusing on downtown. And generally, traffic congestion is more significant and parking a bigger issue than in Anchorage.

In Anchorage, transit use has increased substantially with the addition of new and enhanced service initiated in 2003 and 2004. People Mover increased service, in terms of bus trips per week, by 18.5 percent from 2002 to 2005. It is expected that ridership for 2005 will exceed 4 million passenger trips, which equates to a 28.5 percent increase accomplished in 3 years. Industry experience is that the realization of ridership gains from service changes generally takes 3 years. Additionally, People Mover productivity (riders per hour of service) increased by nearly 7 percent from 2002 to 2004. This progress clearly suggests that people will choose transit if it offers more easily accessible and faster, more-responsive service. The 14,000 passenger trips per weekday carried by People Mover reduce roadway congestion. People Mover is well on its ways to achieving its route restructuring plan goals.

The Anchorage Bowl is projected to reach a population of about 302,000 by 2025. The regional population within the MOA and Mat-Su Borough combined will be less than 500,000. Low densities will characterize most of the urbanized areas.

The downtown Central Business District is thriving, but it does not dominate the urban landscape for employment or retail activity. The Central Business District will have about 12 percent of the total projected employment in 2025. Other strong activity centers within the Anchorage Bowl

Policy commitment to significantly improved transit services is important. The first priority is creation of viable travel choices to address the adverse impacts of automobile dependency. Steady, continual focus on improving service and executing superior service delivery is needed to maintain rider gains.

include the military bases, University-Medical District, Midtown, the airport area, and the Dimond Mall.

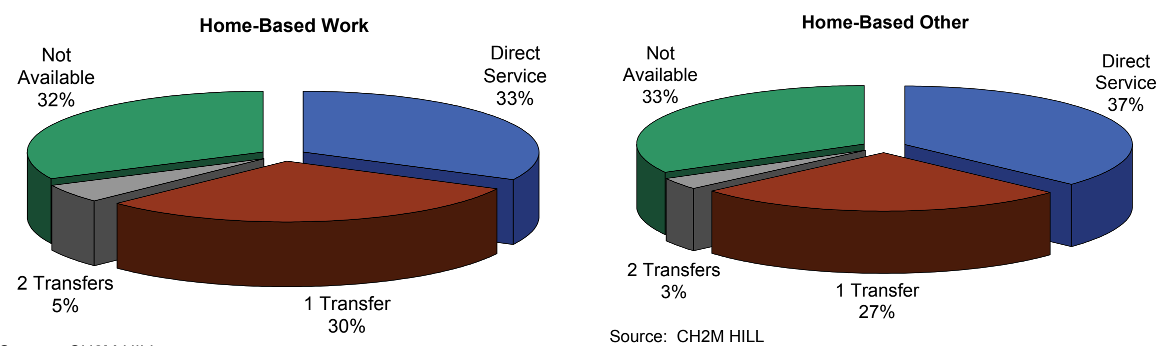
One result of the multi-center development is a broad dispersal of trips to multiple centers. Transit systems work well when large numbers of travelers from a common origin area are going to a common destination area. In that circumstance, effective corridor transit service can be provided directly between origins and destinations. Similarly, the lack of a complete road grid system directly relates to the amount of time that each transit trip takes and the transfers required to make some transit trips.

It is difficult for transit to serve travel demand to dispersed destinations, especially when the travel also originates from lower-density residential areas. A transit route generally serves a single corridor directly. Travelers in that corridor with destinations outside of it generally must transfer to a second or third route or perhaps are not able to use transit at all. When transfers are required for an itinerary, virtually all travelers with other options elect not to use transit. The transfer impediment may be mitigated to some extent by transit hubs and timed schedule coordination among routes, but it remains an obstacle to attracting riders who have other travel choices.

Two illustrations serve as examples of the complexity and difficulty that Anchorage development patterns create for direct transit service without the need to transfer to one or more different routes. In 2025, nearly 77 percent of the total Anchorage Bowl population and 72 percent of jobs are anticipated to be within walkable access of transit routes. These statistics suggest that the probability of a traveler being within walking access of both home origin *and* an employment-based destination is no more than the product of the home access and destination access probability percentages, or 56 percent. And that maximum probability can be obtained only if each transit route directly serves all accessible homes and all accessible jobs.

Figure 7-26 shows the percentage of forecasted 2025 trips for home-based work and for home-based other trip purposes by transit service availability. For one-third of work or other trips, no transit connection is available. Of all home-based work trips, 35 percent would require one or more bus transfers if transit were used; about 30 percent of home-based other trips would have to transfer. Travelers who have access to an automobile are unlikely to use such a transit alternative. The trips that can be made without bus transfers are candidates to attract riders who have a choice. For those individuals, the time and cost of transit travel compared to automobile travel will generally dictate their transit decisions. More frequent transit service—15 minutes or more frequent—and direct, non-transfer routing are the thresholds needed to attract these commuters.

Figure 7-26. 2025 Transit Availability for Trips in 2025



Source: CH2M HILL

Source: CH2M HILL

Is Rail Line or Express Bus Corridor a Fit in the Anchorage Bowl?

It is a natural and common human trait to look for a "technology fix" or "silver bullet" solution to problems. Proposals have been advanced for a light rail line or express bus corridors within the Anchorage Bowl. But analysis of Anchorage Bowl trip patterns and densities along specific single-line corridors demonstrates no single corridor has sufficient demand—tightly aligned origins and destinations—to make a rail line or an express bus corridor a viable solution for Anchorage. High cost, as well as modest patronage and nominal impact on corridor traffic, pose an economic hurdle. Rather than one or two high-technology corridors, the compelling need is for a network of transit routes on most primary corridors to minimize transfers and operation of transit service with closely coordinated schedules to reduce time when transfers are necessary.

Anchorage 2020 stresses that travel choice is an important goal so that residents are not, by necessity, required to drive everywhere. The foundation for travel choice is frequent transit service to all mid-density and higher-density areas.

Elderly and Disabled Transportation Needs

The 2000 U.S. Census reported more than 34,000 persons with disabilities in Anchorage, or more than 13 percent of the total MOA population. In addition, about 5.5 percent of the MOA population was 65 years of age or older. State of Alaska statistics indicate that 46 percent of this senior group has a disability.

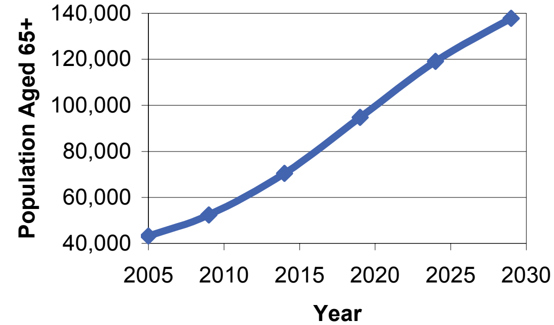
Not all persons with disabilities or elderly persons are transportation-limited. But the scale of the numbers demonstrates there is a community-wide need for special transportation services to enable older persons and disabled persons to get around and stay connected and involved in the community. Mobility support services need to be coordinated through the collaboration of many participants and providers from medical, social, faith-based, human services, and transportation service entities.

Special mobility service needs can be expected to increase with an aging population. Alaska Department of Labor projections indicate the number of seniors will increase by more than 200 percent between 2000 and 2029 (Figure 7-27).

The MOA AnchorRIDES program provides demand-responsive transportation service for seniors and disabled persons. The number of annual rides provided has grown steadily over the years, reaching 196,000 in 2003 (Figure 7-28). Operating costs of $2.67 million in 2003 far exceeded service revenues. Funding is provided primarily by the MOA general fund and the Alaska Commission on Aging; rider fares, donations, and Medicaid also contribute to revenues.

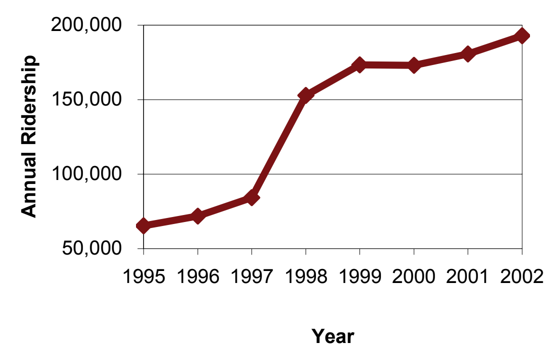
More senior and disabled persons will require specialized transportation services in the future. It will be difficult for AnchorRIDES alone to meet the expanded needs. More private-sector involvement is needed; public-private partnerships and multi-provider collaboration should be embraced. AnchorRIDES will need to exploit advanced

Figure 7-27. Alaska Population Projection, Age 65 and Older, 2000–2029



Source: Alaska Department of Labor, "Population Projections, 2000-2029," Alaska Economic Trends, February 2005

Figure 7-28. AnchorRIDES Trends, 1995–2002



Source: MOA Department of Public Transportation dispatching, vehicle location, scheduling, and routing logistics technologies to contain costs. The operation of AnchorRIDES likely will need to increase by about 50 percent over the LRTP period.

Conclusions and Approaches for Enhancing Transit Service

The Anchorage 2020 comprehensive plan positions transportation as a significant policy and strategy component to help achieve desired goals and serve future development. In short, the comprehensive plan articulates a future with greater emphasis on transportation choice, more frequent transit service, organization of land development patterns to strengthen opportunities to gain more transit riders, and generally, a reduction in automobile dependency.

A core mission of public transit is to ensure that all segments of our community have transportation mobility and access to community opportunities.

Another mission is to help reduce congestion by offering a viable choice to as many travelers as possible. Better transit service is a requisite to attract riders who could use automobiles.

In identifying the scope of the LRTP public transportation element, two important challenges are recognized:

- Funding determines what level of transit service is possible.
- Public policy and perceptions of transit service value define public willingness to support for funding.

Attracting more riders and sustaining or improving service productivity are the key benchmarks for transit performance. More frequent transit service and improved service delivery quality will increase riders, as has been clearly demonstrated by recent People Mover productivity gains.

For the public transit element, this LRTP recommends increasing the frequency of peak-period transit service to 15 minutes on seven better-performing routes and initiate express bus services in the Glenn Highway corridor. Rigorous attention to fine-tuning operations, scheduling, on-time reliability, operating efficiency, and superior service delivery is advocated. Similar attention to detail is recommended for specialized AnchorRIDES transportation services. Chapter 8 elaborates on these guiding principles for the LRTP public transportation element.

Pedestrian and Bicycle System

Introduction

Walking and cycling paths that are accessible, convenient, and well connected contribute to the quality of life in the MOA. They provide relaxation, recreation, exercise, and the opportunity to enjoy nature, as well serving to transport individuals to schools and work.

Anchorage citizens take pride in their trail system. Trails consistently get high marks in polls, public discussions, and planning inputs. Everyone seems to agree they are important and an integral component of the transportation system; they support travel mobility for our children going to and from school, for walking and cycling trips on recreational outings, and for travel to work. Illustrations in Chapter 5 show the purposes of pedestrian and bicycle trips in Anchorage.

Anchorage 2020 policies support a walkable city with a concentration of services and facilities in town centers, transit corridors, and employment centers. The plan also advocates increased mobility choices, including safe walking routes and trails. Through Anchorage 2020, the community has stated that easy and enjoyable walk and bike opportunities enhance quality of life, promote healthy lifestyles, support neighborhood safety, and add community value.

Current Planning, Funding, and Maintenance

Ongoing actions to maintain and improve Anchorage pedestrian and bicycle facilities are undertaken through MOA capital improvement bonds and AMATS programming of local, state, and federal funds.

The MOA CIP and the AMATS TIP planning process identifies pedestrian and bicycle facility improvements and prioritizes projects with local and community council input.

Maintenance of trails and sidewalks is conducted by the State of Alaska for state-owned roads and the MOA for city roads and park trails. Non-profit user groups assist in maintenance. The MOA *Areawide Trails Plan* (1997) is the guiding document for existing improvements and building new segments.

Evaluation of Future Needs

Anchorage 2020 articulates policies and provides advocacy for inclusion of non-motorized travel choice as a strongly valued community asset. Public inputs and comments to the LRTP process express a similar, strongly held position.

The trails and sidewalks that would be provided under planned roadway projects were charted and represent more than 185 miles of additional or improved pedestrian and bicycle network.

Connections to promote trail use and better serve neighborhoods were assessed. The following missing links for sidewalks and trails were identified:

- Along arterials and collectors, 95 miles
- In all town centers (within one-quarter mile), 13 miles
- Along all transit corridors (within one-quarter mile), 23 miles
- In all employment and redevelopment centers, 11 miles
- Within one-quarter mile of schools, 328 miles
- Finally, improvements in the MOA *Areawide Trails Plan* (1997) were identified. The specific improvements were considered in two groupings:
- Top 50 trails from the plan
- All trails in the plan

Identification of Solutions

Facility Plans

Scenarios combining various features were developed. All scenarios present additional improvements and assume that the trails and sidewalks that are part of the road projects are implemented:

- All missing links on arterial and collector roads, all transit corridors missing links, and elementary school missing links
- Scenario 1 above, plus the top 50 trails from the trails plan
- Scenarios 1 and 2 above, plus missing links in employment and redevelopment areas
- Scenarios 1, 2, and 3 above, plus all trails in the trails plan

Each scenario was evaluated for merit of physical preservation and rehabilitation, ability to accommodate mobility and connectivity, and impact on safety. Figure 7-29 shows pedestrian and bicycle crash data from 2003 and 2004.

The most beneficial scenario of pedestrian and bicycle facility improvements is discussed in Chapter 8. Figure 7-30 shows the recommended pedestrian and bicycle facilities.

Planning Policies and Priorities

The Anchorage Bowl sidewalk system is not covered in the *Areawide Trails Plan* (MOA, 1997), and recognition of the need for sidewalk planning prompted a policy “call for implementation” of a pedestrian plan in Anchorage 2020. Many of the first neighborhoods built in Anchorage have extensive and complete sidewalk networks; many of the newer subdivisions have no sidewalks. Often pathway easements are required in subdivision plats during the zoning process to enable connectivity between neighborhoods and public facilities such as schools. These pathway easements frequently have been allowed to be vacated or appear to be nonexistent because of established vegetation or landscaping and structures introduced by adjacent owners.

The LRTP citizen Roundtable Committee identified safe walking routes to schools and transit stops and connecting existing trails among its highest priorities. Input from a bike and pedestrian workshop and other public meetings yielded the following specific policies as priorities:

- Initiate a pedestrian plan as called for in the Anchorage 2020
- Fund a community council inventory and mapping database of missing neighborhood links (sidewalks and bike trails) for CIP funding
- Develop policy for inclusion of trails and sidewalks on collector and arterial roads
- Develop a policy in the MOA Title 21 land use regulations for sidewalk requirements in town centers, transit corridors, and employment centers
- Develop MOA Title 21 and MOA *Design Criteria Manual* (2005) design standards for sidewalks, trails, and amenities
- Develop funding mechanisms for sidewalk and trail maintenance, including snow clearing

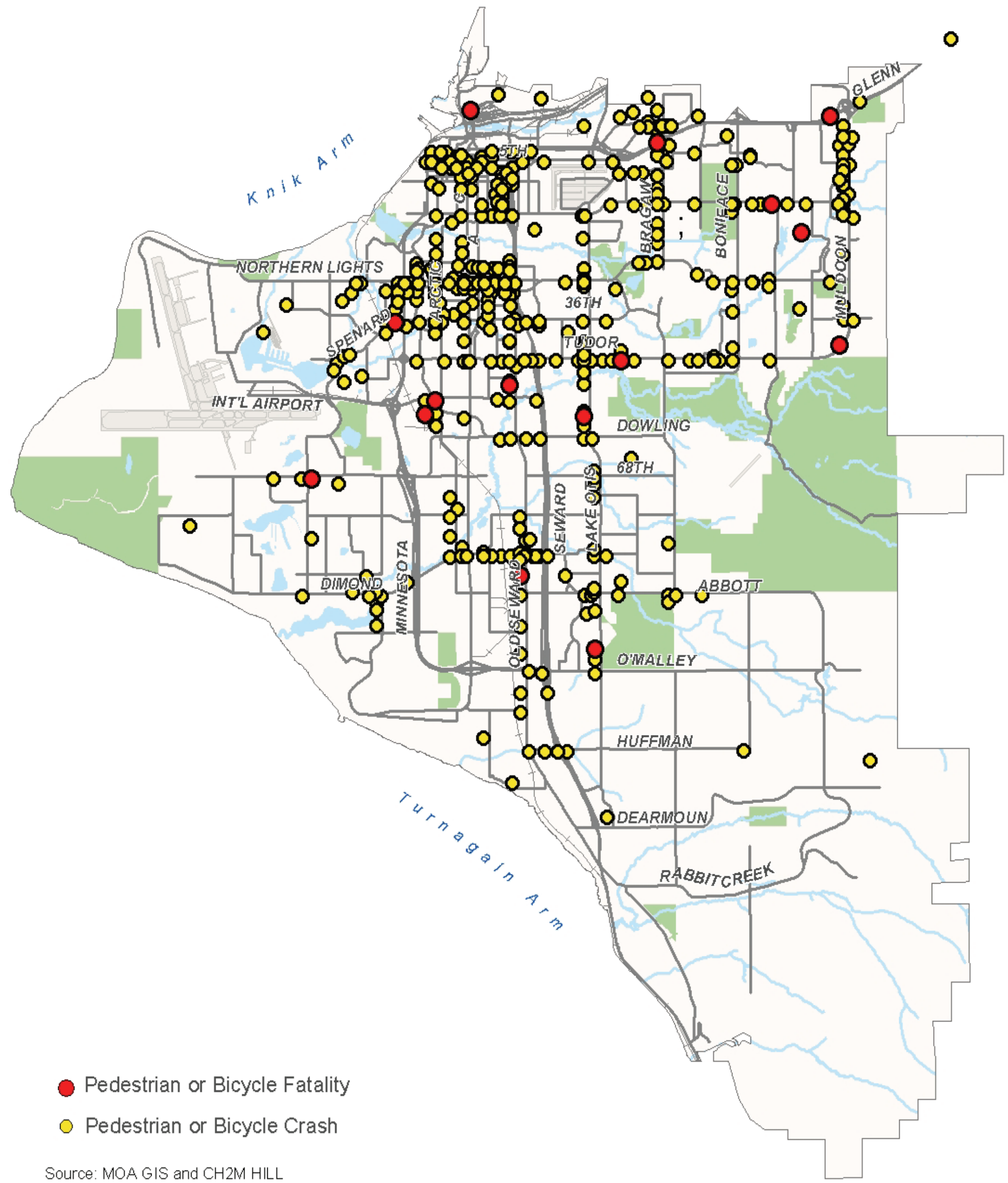
Pedestrian and Trail System Cost Estimates

Previous AMATS, MOA, and DOT&PF cost estimates were assembled to provide planning-level cost estimates for projects. Costs and funding are discussed in Chapter 9.

Conclusions and Approaches for the Pedestrian and Bicycle System

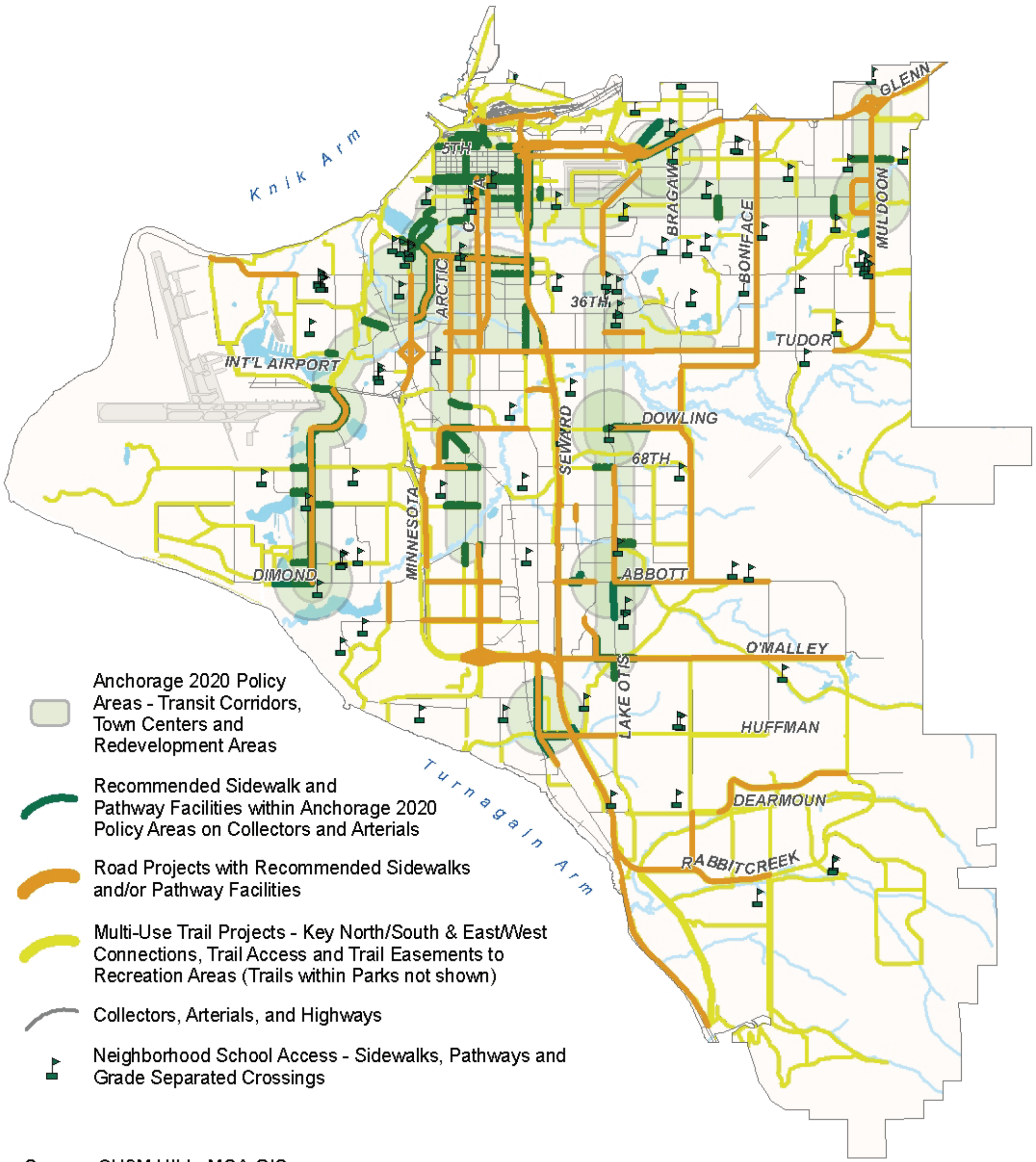
Pedestrian and bicycle improvements included in the road projects and other facility enhancements are needed. The LRTP recommendations for the pedestrian and bicycle elements focus on expanding the sidewalk network, crosswalks, street furniture, bus shelters, and landscaping. The primary thrust of improvements is to complete major missing links, preserve and rehabilitate the already built infrastructure, and establish several new major trail corridors. More is desired than can be funded with foreseeable resources. Therefore, priorities and phasing of within future funding is required. Chapter 8 presents more information for recommended pedestrian and bicycle improvements.

Figure 7-29. Pedestrian and Bicycle Crash Data, 2003–2004



Source: MOA GIS and CH2M HILL

Figure 7-30. Recommended Pedestrian and Bicycle System



Source: CH2M HILL, MOA GIS

Freight Distribution

Ensuring Efficient Freight Movement

Efficient freight handling and movement is universally important. These activities supply consumer goods to households and move the commerce that sustains local, state, and national economies and security. The residents of Anchorage and all of Alaska rely heavily on ocean and air transport far more heavily than other urban regions and states. That reliance increases the importance of efficient freight transport. With only nominal manufacturing in Alaska, most goods need to be imported. The Port of Anchorage and TSAIA are the dominant freight termini for imports to Anchorage and the rest of the state. Distribution from these intermodal terminals is primarily by motor carriers over the road network into, out of, and within the Anchorage Bowl. The Alaska Railroad also plays an important role in distribution of consumer goods, natural resources, petroleum products, and heavy goods.

Port of Anchorage

Two Pacific Northwest carriers bring four to five ships weekly to the Port of Anchorage. Ships from Japan and Korea also use the Port of Anchorage, transporting construction materials or loading refined petroleum. Tankers supply jet fuel for airport operations, and barges load petroleum products for Western Alaska. (See Chapter 5 for freight volumes.)

The dramatic expansion in global economic trade is pressing ever-larger vessels, capable of carrying more than 3,000 container units, into service. To sustain its market and future services, the port infrastructure must accommodate larger ships and provide larger and faster cranes for container handling. Improved transportation links to and from the Port of Anchorage are needed to distribute goods to local, regional, and statewide establishments, as well as to support military and homeland security requirements.

A planned expansion project at the Port of Anchorage includes a new 8,880-foot dock to accommodate larger vessels, crane and cargo handling infrastructure, improved road and rail links, and terminal facilities to better serve the barge trade. Expenditures of roughly $400 million are anticipated for this phased expansion.

Road access to the Port of Anchorage is difficult because of topography and the presence of the railroad yard and mainline tracks between the marine facilities and the major road network. This configuration results in heavy vehicle and tractor trailer combinations being routed through the downtown area.

This LRTP recommends improving Port of Anchorage access with a new connection near the Ingra-Gambell couplet and ramps to a new freeway tying the Glenn and Seward highways together. The new connection enables both north and south freight distribution from the port.

Alaska Railroad

The Alaska Railroad Corporation operates freight and passenger services between Southcentral and Interior Alaska. Headquarters facilities are located in the Ship Creek area and include corporate offices, the main intermodal terminal, and yard facilities. The railroad moves bulk resource products (primarily gravel and coal), petroleum, and military shipments, as well as containers with general cargo. (See Chapter 5 for freight volumes.)

Federal Railroad Administration funds and Federal Transit Administration, Sections 5307 and 5309, funding have been used by the railroad for passenger-related projects.

Table 7-10 lists Alaska Railroad Corporation capital projects slated for completion between 2004 and 2010 and identifies their costs. These projects were identified in a planning process focusing on long-term (30 years) improvements. Planned improvements include the following:

- Continued development of passenger facilities
- Pedestrian improvements and enhancements
- Construction of additional track
- Continued realignment of tracks within the existing rail corridor
- Rolling stock rehabilitation
- Signalization

Roadway At-Grade Rail Crossings

There are currently 19 at-grade roadway crossings of railroad tracks within the AMATS study area. As the urban area grows and traffic increases, rail-roadway conflicts will become a bigger concern. Traffic counts for 2004 show that four rail crossing locations have daily traffic in excess of 15,000 vehicles:

- C Street
- Arctic Boulevard/Dowling Road
- Spenard Road
- International Airport Road

These four locations are on a list of roadway at-grade rail crossings with 2025 traffic volumes expected to exceed 15,000 vehicles per day. This LRTP recommends (Chapter 8) locations for priority roadway-rail grade separations. Two priority roadway-rail grade separations—Artic Boulevard/Dowling Road and International

Photo courtesy of CH2M HILL

In several locations, roadways and trails cross railroad tracks.

Table 7-10. Priority List of Alaska Railroad Capital Projects for 2004 to 2010

Project Name	Funding	Cost (millions of $)						
		2005	2006	2007	2008	2009	>2010	Total
Centralized Traffic Control	FRA	5.7	7	0	0	0	0	12.7
Anchorage Operations Center	FRA	9.5	0.5	0	0	0	0	10.0
Ship Creek Intermodal Facility, pedestrian amenities, covered walkways, parking garages, etc.	FTA	22	32	5.5	5.5	0	0	65.0
Passenger Equipment & Storage Shop – Anchorage Yard	FRA, FTA	3	5	30	15	15	93	161.0
Anchorage Car Shop	FTA	0	0	7	64	0	0	71.0
Ship Creek Trail	FTA	0.5	0	0	0	0	0	0.5
Rail Capacity Improvements, Mileposts 110–114	FRA, FTA	1	20	2.4	21.6	0	0	45.0
Capacity Improvements – Eagle River to Knik River	FTA	4	0	0	0	0	0	4.0
Technology upgrades/implementation	FRA	5.4	7	0	0	0	0	12.4
Locomotive Fueling & Service Facility	ARRC, FTA	2	14	0	0	0	0	16.0
Yard Improvements for Passenger Operations – Anchorage	FTA	0	0	0	2	2	3	7.0
Passenger Facilities, equipment and safety improvements	FTA	8.2	16.1	0	0	5.1	50	79.4
Total		**61.3**	**101.6**	**44.9**	**108.1**	**22.1**	**146.0**	**484.0**

ARRC = Alaska Railroad Corporation
FRA = Federal Railroad Administration
FTA = Federal Transit Administration

Source: Alaska Railroad Corporation

Airport Road—are accomplished with recommended road projects. The remaining two—C Street and Spenard Road—need to be planned.

These grade-separation projects improve the efficiency of the road system and the rail system. Although grade separations of the Alaska Railroad tracks provide safety benefits, the safety records for Anchorage rail crossings have been excellent and well above national averages.

In addition to the safety hazards at roadway-rail crossings, traffic delays caused by train movements will become more pronounced. Interim safety reinforcement should be considered to enhance safety. Implementation of electronic motorist warning systems at rail crossings can provide greater safety assurance until roadway- rail grade separations can be completed.

Trucks and Freight Distribution

By far the largest share of freight shipments are carried by trucks. Roads on the National Highway System (Glenn Highway, Seward Highway, Minnesota Drive, International Airport Road, and Tudor Road) have the highest truck traffic. Truck volumes on other major arterials such as C Street and Northern Lights Boulevard are significant, too.

Truck traffic is projected to increase from 49,400 daily in 2002 to nearly 65,000 in 2025, a gain of about 31 percent. Figure 7-31 shows expected origins of truck trips (productions) by traffic analysis zones (TAZs). About three-quarters of all truck trips are single-unit vehicles; the remainder are combination tractor-trailer units. Trips made by the latter type are primarily linked to the Port of Anchorage, TSAIA, or the railroad. Other truck-activity centers are the major big-box retail outlets, manufacturing and wholesale facilities, quarries, and industrial lands.

Road Projects That Assist Freight Distribution

Many road projects discussed in the road section of this chapter are important for freight distribution and truck movements. Figure 7-32 maps road projects that benefit freight movements. Overall reduction of traffic congestion on the road network helps freight movement. The following are particularly favorable enhancements for freight distribution:

- C Street viaduct improvements
- New port access from Glenn Highway through extension of the Ingra-Gambell streets couplet
- Connection of Glenn Highway and Seward Highway
- Completion of C Street through to the Minnesota Drive interchange
- Extension of Peninsula Circle to Lang Street
- Minnesota Drive freeway interchange with Seward Highway

Commercial Vehicle Systems Network

The Commercial Vehicle Intelligent System Network (CVISN) is an integrated intelligent transportation system that supports commercial vehicle operation. CVISN assists in motor carrier operations, enhancing communication, safety, and permit acquisition, as well as roadside safety enforcement and weigh station operations. The following are some of the components used in Alaska:

- Electronic weigh-in motion systems
- Automated vehicle classification count stations
- Motor carrier safety inspection data exchange
- Electronic oversize or overweight permit processing
- Wayside safety detection and warning systems such as vertical clearance or rollover indicators at critical sites

Significant progress has been made in deploying CVISN elements, and these efforts should continue and be completed throughout the MOA. This LRTP recommends (Chapter 8) continuing funding to pursue ongoing implementation.

Design Standards for Commercial Vehicles

Although motor carrier equipment size has increased, design standards have remained the same. Trailer units that are 53 feet long were rare when design standards were introduced, but now are common. State of Alaska motor carrier regulations allow long-combination vehicles (combinations of tractor-trailer units up to 120 feet in length) and 53-foot trailers on the National Highway System and as far as 5 miles off the National Highway System for access. Triple cargo-carrying combination units that extend even longer are now allowed on the Glenn Highway and the Parks Highway with seasonal permits.

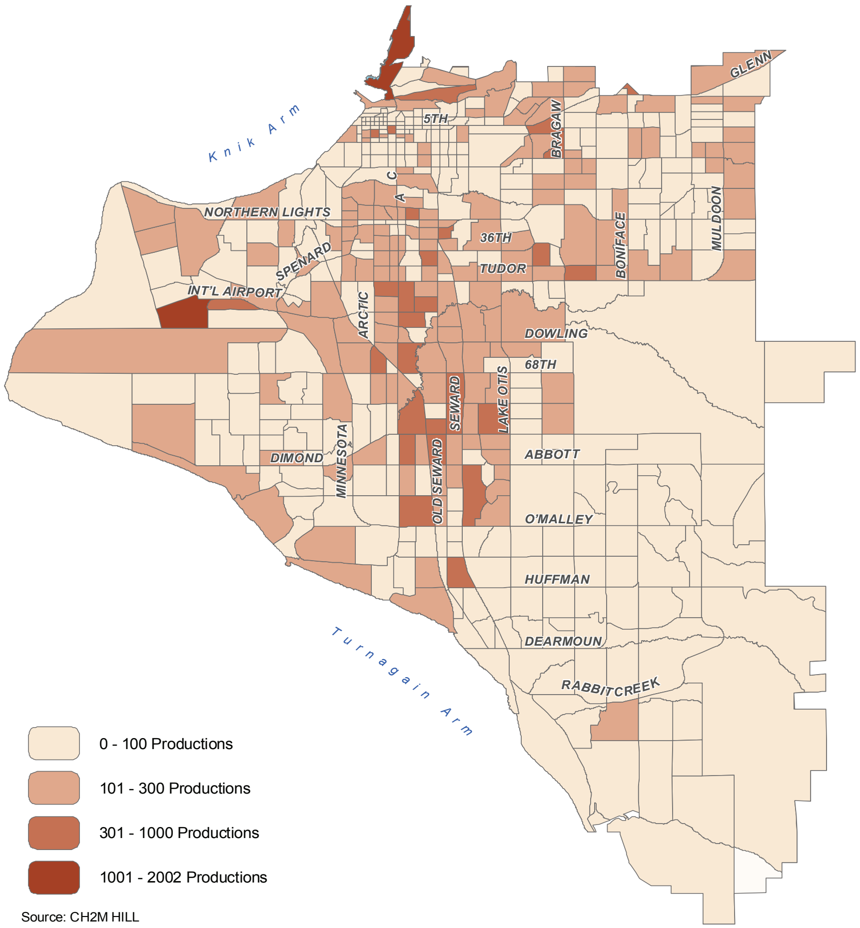
Different regulatory provisions are applied by the MOA and the State of Alaska. This disparity creates a problem for road designers and for the trucking industry.

Intersection and roadway design standards need to account for commercial vehicles, accommodating large vehicle sizes, turning radii, and other operational characteristics of trucks. A review of design standards and agreement on consistent MOA and state practices and regulations for commercial vehicles is needed.

Freight Community Liaison

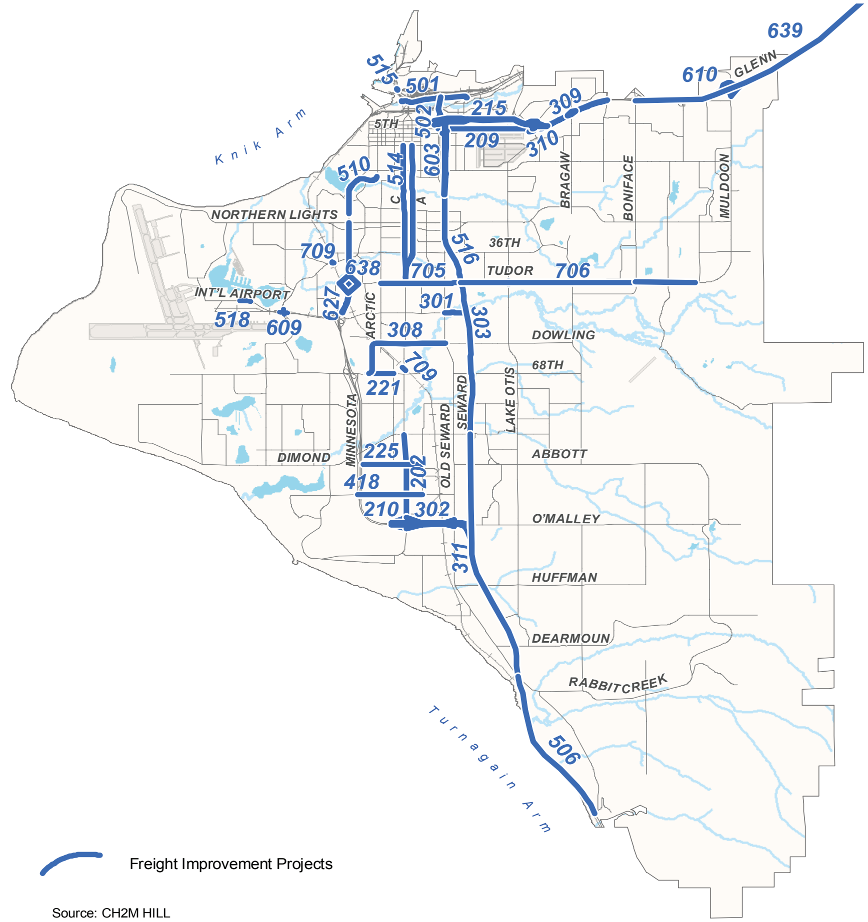
Many transportation policy, design, and operation issues affect the trucking community and their constituency. Industry input on road and intersection design treatments, operational issues, routing, and transportation concerns that affect truck operations can be beneficial. A forum is needed to enable freight industry interaction and communications, airing of concerns, and discussion of policies and issues. The LRTP recommendations in Chapter 8 incorporate freight industry collaboration with AMATS.

Figure 7-31. 2025 Truck Origin (Productions) by Traffic Analysis Zones



Source: CH2M HILL

Figure 7-32. Road Projects That Enhance Freight Distribution



Source: CH2M HILL

The numbers on the map identify specific projects considered.

Regional Connections

Railroad tracks and only two road connections link Anchorage by land to the north and south, serving freight distribution and travelers. Components of the National Highway System, the Glenn Highway and Seward Highway serve northbound and southbound travel, respectively. Major improvements on these two highways are incorporated in LRTP recommendations (Chapter 8). Other key access roads connect these regional highways to both TSAIA and the Port of Anchorage.

The community is considering two other regional connection concepts: a Knik Arm crossing and commuter rail service.

Knik Arm Crossing Studies and Implications

Only two roadways currently link Anchorage to elsewhere, but planning studies are in process for a bridge across the Knik Arm to the Mat-Su Borough. Currently the Knik Arm crossing project is in an environmental analysis phase; information about its alignment, configuration, components, costs, and other features are not yet known.

Critical questions and policy decisions will be addressed after more information has been gathered. How would a Knik Arm crossing affect the land use and growth patterns envisioned by Anchorage 2020? How would it affect the Anchorage housing market? Will broader urban sprawl be encouraged and enabled by transportation access to a large expanse of undeveloped land?

The magnitude of traffic or impacts of Knik crossing traffic on the LRTP program cannot be identified at this time. The potential cost burden and community impacts of supplemental projects needed to tie the crossing project into the Anchorage road network also cannot be anticipated at this time.

All of these topics need to be covered and documented in the federally mandated environmental analysis under way. The LRTP endorses completion of environmental and engineering studies and documentation for the Knik Arm crossing concept. Information about the alignment, configuration, components, costs, funding, and other features of the project can then be used by the MOA and AMATS to support future decisions.

Regional Public Transportation Services

The Glenn Highway corridor links Anchorage with Chugiak-Eagle River and the Mat-Su Borough. The only regional public transportation service operating regularly between the Mat-Su Borough and Anchorage is the MASCOT bus service. It offers two trips a day from the Mat-Su Borough.

The Glenn Highway corridor is unusual in that there is no alternative or back-up route in case of crashes or overcrowding. During commute hours, projected 2025 travel demand will exceed the existing corridor capacity, unless remedies are implemented. Figure 7-33 shows the existing road capacity and projected traffic demand along the Glenn Highway corridor from Eklutna Road to Boniface Road. Traffic demand on the Glenn Highway corridor will exceed capacity in 2025 from Mirror Lake to Boniface Road.

Commuter Rail Services

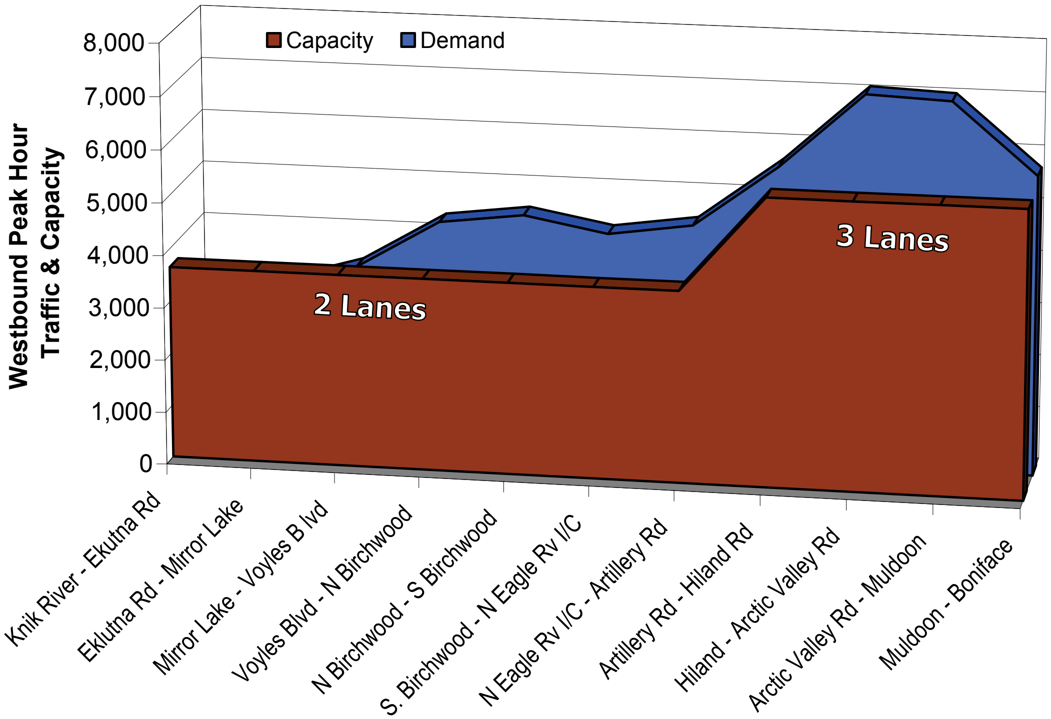
The Alaska Railroad mainline runs parallel to the Glenn Highway from Wasilla and other communities, providing the prospect of a commuter rail option for travel into and out of Anchorage. Feasibility of commuter rail service between the Anchorage Bowl and the Mat-Su Borough has been studied. (One analysis is *South Central Rail Network Commuter Study and Operation Plan*, by Wilbur Smith and Associates et al., January 2002.) Although there are advocates for implementation of a commuter rail service, the recent feasibility studies do not present a compelling case.

Two studies conducted in 2000 produced rider commuter rail rider estimates for 2005 of 152,000 to 190,000 annual riders for weekday service, or 600 to 750 riders per average weekday. For 2015, rail patronage was forecast at 230,000 annual riders, equivalent to about 900 riders per weekday.

Commuter rail passenger estimates were predicated on two morning trains from Wasilla to Anchorage and two trains from Anchorage to Wasilla in the afternoon, plus limited off-peak service. Travel by rail from Wasilla to the Ship Creek Intermodal Terminal in Anchorage would require about 1 hour. Stations in Chugiak-Eagle

The highlighting identifies text revised in the 2027 LRTP. See the Revisions chapter at the end of the book.

Figure 7-33. Managing Demand and Available Capacity on the Glenn Highway, 2025 Morning Peak Hour



Source: CH2M HILL

River provide opportunity for commuters there to use rail service also. Service is assumed to expand 30 percent by 2015 and 75 percent by 2025. Coordinating bus service in the Anchorage Bowl enabling train commuters to get to destination sites beyond walking distance from the rail terminal is assumed to be available.

Table 7-11 summarizes estimated outcomes for commuter rail services between Wasilla and Anchorage between 2005 and 2025. Rail service may take from 600 to 1,750 vehicle trips off the Glenn Highway, mostly commuters in peak hours. Net public costs (subsidy) to support the estimated rail service range from $2.66 million to $4.87 million per year (in 2004 dollars). The subsidy works out to be almost $10 per passenger on the optimistic end and more than $18 per passenger on the pessimistic end.

For commuter rail service to be implemented, a number of steps would be required. Foremost is determination of funding responsibilities, mechanisms, and sources. In parallel with the funding steps, creation of an institutional structure and negotiation of management, operations, and sponsorship agreements among the several affected parties is required. Other prerequisite activities include project development planning; engineering, and environmental analyses; operations detailing; equipment procurement and customization; station and facilities development; service specifications; patronage, pricing, marketing, and revenue projection refinements; connector transit service integration arrangements; and related multi-government coordination.

Conclusions and Approaches for Enhancing Regional Connections

Clearly, major issues are related to regional connection facilities. The rapid growth in the Mat-Su Borough and Chugiak-Eagle River will put significant strain on the Glenn Highway in the absence of other actions. A Knik Arm crossing would relieve some traffic pressure on the Glenn Highway, but many unknowns still characterize the Knik Arm crossing proposal.

Commuter rail implementation could assist in the Glenn Highway corridor. See Table 7-11. And new regional bus service could contribute. Its initiation would require development of funding resources and mechanisms, as well as many of the same development steps noted above for commuter rail service.

The solution to improving regional connections lies in greatly improved transit service, spot improvements to relieve traffic bottlenecks,

The highlighting identifies text revised in the 2027 LRTP. See the Revisions chapter at the end of the book.

Table 7-11. Estimated Operating Outcomes for Commuter Rail

Component	2005	2015	2025
Daily riders	600–750	900	1,050–1,750
Annual riders	152,000–190,000	231,000	266,000–439,000
Annual passenger revenue ($1,000s) [a]	$532–$686	$809	$930–$1,537
Capital cost ($1,000s)[a]	$32,000		
Annual operating cost ($1,000s)[a, b]	$3,350	$4,310	$5,800
Annual public funding ($1,000s)[a]	$2,664–$2,818	$3,501	$4,263–$4,870
Public funding per rider	$14.02–$18.54	$15.16	$9.72–$18.34

[a] Expressed in 2004 dollars.

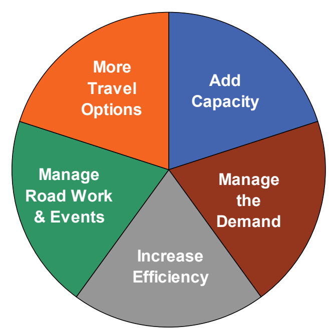
[b] Assumed initial rail service in 2005 is two train schedules inbound in the morning and outbound in the afternoon. Service by 2015 is increased 30 percent and at 2025 by 75 percent.

Sources: CH2M HILL and Wilbur Smith Associates (*South Central Rail Network Commuter Study and Operation Plan*, 2002)

deployment of advanced technologies for transportation system management, and aggressive travel behavior incentives. Collectively, tightly coordinated strategies and programs can be packaged together to meet future travel demand. High investment stakes and substantial impacts or consequences are among the long-lasting effects; carefully, well-reasoned policy and strategy execution will be important.

Congestion Management

Congestion management is a compendium of policies, strategies, and actions designed to address the root causes of congestion and to reduce or relieve its magnitude. Congestion management encompasses land use and city form that reduces travel necessity; reduction in dependency on automobiles, especially solo-driver automobile travel; promotion of travel options and availability of non-automobile modes (transit, carpooling, and vanpooling) and non-motorized transportation; more efficient management and operation of existing systems; and calming traffic in neighborhoods.



Coping with Congestion

Traditional ways of coping with congestion are to add road capacity or increase transit service, largely because the automobile remains the overwhelmingly dominant mode of travel in most urban areas across the United States, including the MOA. The cumulative consequences of vehicle dominance are increasingly receiving serious attention and policy debate.

Civic officials and citizens across the nation are confronting congestion by crafting transportation and urban growth management policies, strategies, and actions to guide development, reduce vehicle dependency, and control congestion.

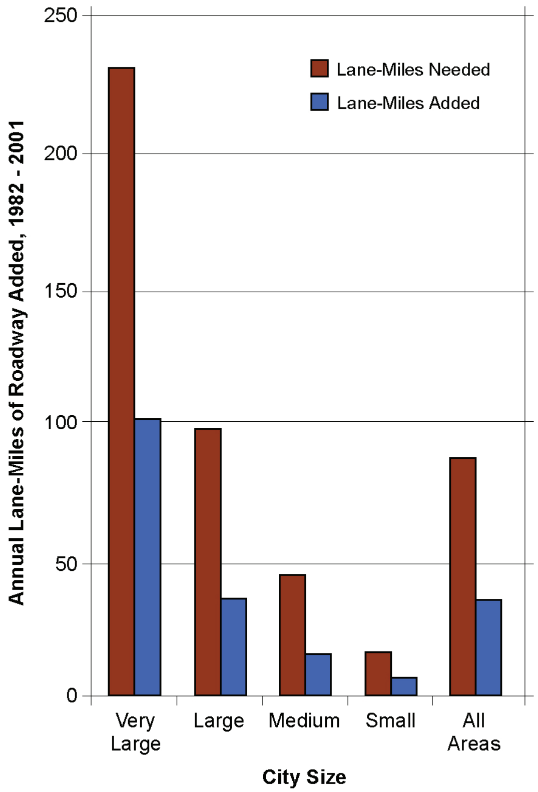
It is unrealistic to presume that personal automobiles will not continue to be widely used. But other modes need to have larger roles. The MOA can leverage opportunities and nurture a future cityscape with attractive urban design and broader travel choices. Careful and judicious policies, strategies, and investment initiatives are needed.

Public interest in nurturing alternatives—walking, cycling, public transit, and telework opportunities—is broadening. Aging population, rising fuel costs, the health and well-being of cities, and other demographics suggest the need for more balanced options and bolstering availability of alternative modes.

Limitations of Infrastructure Additions

Congestion and traveler delay has increased dramatically in most U.S. metropolitan areas over the past two decades. The response to worsening congestion has first been to build (primarily roads and transit systems). But deficiencies have worsened. Figure 7-34 illustrates the historical gap between needs and actual capacity increases by

Figure 7-34. Historical Gap Between Capacity Needs and Actual Projects for U.S. Cities, 1982–2001



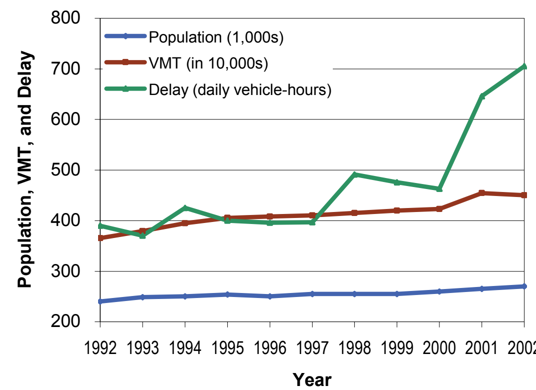
Source: Texas Transportation Institute

measuring annual hours of delay. (More delay means less capacity available to meet demand.) The lesson from evidence across the nation is emphatic—capacity cannot be added fast enough to build our way out of congestion. Other strategies are needed.

Consequences of additional capacity include the financial burden of continuing road construction and expansion. But much broader effects on neighborhoods, communities, city structure, health, and other urban amenities are also concerns. Wider streets, more traffic, expansive parking lots, noise, air pollution, congestion, unpleasant walking environments, isolation of non-driver population segments, traffic-related injuries and fatalities, hazards around school environments, pedestrian and bicycle safety conflicts, intrusion in neighborhoods, health impacts … the list of consequences is unending. Street scale and aesthetic character, neighborhood walkability, noise levels, and even urban character eventually succumb to vehicles and traffic.

Congestion growth in Anchorage has been moderate, generally mirroring patterns observed in other smaller North American cities. In recent years, however, the system has begun nearing capacity. Delay (measured in daily vehicle hours of travel) has been growing markedly faster (Figure 7-35). This pattern has been repeated elsewhere; the *2003 Annual Urban Mobility Report*, by David Shrank and Tim Lomax of the Texas Transportation Institute, Texas A&M University (2003), notes that "the average annual delay for every person in 75 urban areas studied climbed from 7 hours in 1982 to 26 hours in 2001." Anchorage is now on the first part of that accelerating curve for hours of vehicle delay.

Figure 7-35. 1992-2002 Annual Peak Hours of Traveler Delay



Source: 2005 Urban Mobility Study (Texas Transportation Institute)

Strategies to Reduce Travel Demand and Congestion

Three broad strategies characterize efforts to reduce travel demand and congestion: land use, transportation system management (TSM) and travel demand management (TDM).

Land Use. Community land use and urban form within the Anchorage Bowl reflects a distinct pattern of development that is the legacy of decisions spanning 50 years. By 2002, the MOA population was 270,000 and about 80 percent of the available, usable land space was occupied. Within the Anchorage Bowl, five major retail centers (Downtown, Midtown, Northway, Muldoon, and Dimond Center) attract commercial activity. Jobs are concentrated at the military bases, airport area, Midtown, University-Medical District, Downtown, and Dimond Center.

Foreseeable growth by 2025 will add approximately 30 percent more housing units and employment in the MOA. Nearly one-third of that growth is already defined by building permits and known planned projects. Clearly, the pattern already established will be the dominant anchor for the future.

Identification of Anchorage 2020 policies and implementation of Title 21 Land Use Codes are efforts to change land use to encourage fewer single-occupant vehicle trips.

Anchorage is also a city with highly valued natural open spaces and large special-use sites that significantly define its land uses: TSAIA, Elmendorf and Fort Richardson military bases, Mulcahy Park, Delaney Park, Bicentennial Park, adjacent University of Alaska Anchorage and Alaska Pacific University campuses, and notable water bodies and creeks (Lake Hood, Lake Spenard, Campbell Creek, and Chester Creek). These assets are assets prized by MOA citizens, and need to be considered in future land use policies.

Transportation System Management. TSM strategies are designed to achieve the best possible operation and performance from the existing transportation system. Generally, they are roadway improvements that increase effective capacity, optimize traffic operation, and apply traffic calming in residential areas. TSM strategies tend to be low cost, require minimal right-of-way, and can be implemented quickly. Responsibility for TSM activities generally lies in government domains.

Travel Demand Management. TDM strategies are intended to influence travel behavior and demand, reducing the need for travel, increasing vehicle occupancy, creating more travel options, encouraging use of non-driver modes, and shifting the timing of trips to flatten peaks. These strategies seek to improve system performance by reducing and redistributing the demand for single-occupancy vehicle trips. Travel demand behavior response is highly dependent on employer support and employee commuting actions.

Implementation Progress. Table 7-12 itemizes new congestion management strategies that have been recommended for implementation. Because most of the proposed new management strategies are not active in 2005, no measurable impact on congestion has been observed. To successfully integrate planned strategies and components as part of the Anchorage Congestion Management Program, additional work is required.

Measuring Change in Congestion

Transportation system performance measurements for Anchorage were developed and applied in two studies, the first in 1998 and the second in 2003. The results of these studies and comparisons during the 5-year period help assess congestion severity and trends:

- In 2003, 32 percent of 72 arterial intersections were operating at an unsatisfactory level of service (LOS E or worse) during the afternoon peak period.
- Fifty-two percent of intersections studied in both 1998 and 2003 had worse level-of-service

Table 7-12. New Congestion Management Strategies Recommended, 1994

Voluntary trip reduction ordinance
Site design criteria to increase transit use
Ordinance to require bicycle facilities
Guaranteed ride home
Eliminate existing employee parking subsidies
Bus traffic signal preemption
Arterial concurrent-flow high-occupancy vehicle lanes
Reversible-lane systems
Preferential parking for high-occupancy vehicles
Education programs for bicyclists and potential cyclists
Bicycle media and promotion campaign
Land use policies to reduce single-occupancy vehicles
Parking requirements in zoning codes
Education programs
Employee transportation allowance
Joint development activities
High-occupancy vehicle applicability
Arterials with limited access
Parking supply control
Trails coordinator
Showers and clothing lockers for pedestrians and bicyclists

Source: MOA, *Congestion Management Program*, October 1994 conditions in 2003; 20 percent were the same; and 28 percent had improved between 1998 and 2003.

- Congestion on arterial and collector streets accounts for nearly all of the congestion in Anchorage. About 50 percent of all hours of travel in Anchorage are on these streets. Therefore, improving efficient operation of the arterial street system will be the largest factor in congestion relief.
- Transportation system delay is evident in longer travel time during peak commute hours compared to mid-day travel time. Major corridors studied in 2003 showed a peak-hour delay of between 5 and 40 percent.
- Comparison of 1998 and 2003 travel times revealed that travel on 45 percent of the routes took longer in 2003. The average increase in 2003 travel time was about 10 percent.
- The Texas Transportation Institute continuing studies of urban mobility show sharp increase in delay since 2000 in Anchorage (Figure 7-35).
- Transit riders in 2004 were up 23 percent compared to 2002. That figure translates to non-automobile mobility for nearly 2,500 additional daily riders.
- Vanpool formation has grown, and additional potential users (on the waiting list) could double the vanpool users if vans were available. Almost all vanpools operate in the Glenn Highway corridor, where reducing solo-driver vehicle miles is especially important.

Actions to Reduce Congestion

Other cities have achieved significant success in reducing congestion through TSM tools and initiatives focused on travel behavior change. The *2005 Urban Mobility Report* (2005) developed by the Texas Transportation Institute cites various strategies that reduce congestion. The examples listed below show programs and the percentage to which they reduce congestion or delay:

- Arterial signal coordination, 1.5 percent
- Incident management, 5 percent
- Public transportation service, 4 percent
- Ramp metering for freeways, 4 to 26 percent

Specific opportunities for improving congestion management strategies are best achieved by enabling and promoting traveler behavior change. Travel, like other behaviors, can be influenced and conserved. The essential ingredient to make change possible is access to viable options. The fundamental strategy in promoting traveler behavior change is creation of practical, pragmatic choices that are sufficiently attractive to induce a shift from personal vehicle use.

For most people, use of a personal vehicle is by far the easiest way to travel. The high cost of ownership, operation, insurance, and maintenance for the multiple vehicles common in many households is widely recognized, however. Drivers also are conscious of environmental and other effects created by vehicle operation.

Changing automobile reliance is a very large task because of the degree to which private vehicles are ingrained into American lifestyles. Encouraging peak-hour travelers to shift modes, time of travel, or to not make trips at all are three behavior changes that can help reduce congestion.

The enablers to facilitate traveler behavior change include the following:

- Providing traveler choices
  - **Accessible transit service.** Public transportation is a widely available alternative to automobile use. For transit to be a viable option, service must be available within reasonable walking distance of origins and destinations
  - **More frequent transit service.** Transit helps reduce peak-period traffic if it attracts riders. More frequent service (15-minute frequency) during peak periods on priority corridors is needed
  - **Ride-share programs.** Facilitating ride sharing results in fewer vehicles on the road. Most carpools are created informally by members, often from the same household.[1]

[1] Anchorage commuters who share rides (carpool) typically do so without any encouragement. Approximately $620,000 is expended annually for ride-share programs that result in about 800 carpool participants. The persons participating in rideshare carpools and vanpools represent about 0.8 percent of the 140,000 employed workers in the MOA. The 2000 U.S. census reported 23,000 persons travel to work in carpools and vanpools; obviously many workers create their own ride-sharing arrangements independent of the publicly funded ride-sharing program.

– **More vanpool.** Vanpools are especially effective for two reasons: (1) one vehicle carries more travelers than carpools, and (2) they reduce more vehicle miles because of typically longer trip distance. Nearly all existing vanpools operate along the Glenn Highway, helping to reduce congestion in that busy corridor.

– **Guaranteed Ride Home Program**. This program offers backup to ensure that in emergency situations ride-share participants can get home, increasing ride sharing viability. Employer partnering is needed to implement this strategy.

– **Employer participation.** Active support of employers is critical to realize measurable success in shifting employee commute habits. Employer implementation of telecommuting, flexible work schedules, priority carpool and vanpool parking, bus passes, and other initiatives helps relieve congestion. Government efforts at ride-share and related programs are significantly ineffective in the absence of broad, continuing employer participation.

– **Telecommuting and other work schedule options.** Communications technology makes it possible for many people to work from home, at least some of the time. Currently in Anchorage, about 15,000 daily work trips are eliminated by telecommuting. This number is about the same number of weekday trips carried by the People Mover bus system. The scale attests to the powerful benefit of promoting telecommuting programs with employers.

- Financial incentives

– **Tax (monetary) benefits.** Under the federal commuter tax benefit, bus passes are tax-free. Employers could support this program with companion programs.

– **Cash incentives.** Consumers respond to price stimuli and incentives. Most consumer behavior decisions have a cost-value dimension. Price-related and cash incentive programs can encourage desired behavior. For example, the State of Washington is implementing innovative value-pricing experiments and programs to expand traveler behavior responses. Analysis of potential cash incentives applied to reduce solo commutes on the Glenn Highway suggests that as little as $8 million may achieve traffic reduction sufficient to avoid the necessity of a large road expansion investment. Funding to implement carefully crafted pilot programs could be highly effective.

– **Parking management.** Most employers in Anchorage provide free parking for their employees, but very few provide free bus passes, resulting in a built-in bias toward automobile commuting. Parking pricing affects employee commute choice.

- School transportation

– **School access and safety.** Schools attract an inordinate amount of vehicle traffic. Some students are driven to and from school, generating a round trip in the morning and another in the afternoon, totaling four trips. The automobile trips to schools occur even at schools whose students live within walking distance. At high schools, restrictions on student parking (to encourage alternative modes and carpooling) could relieve traffic.

– **Walking School Bus Program.** A program of chaperoned walks to schools (known as a “Walking School Bus”) can substitute for student chauffeuring. It would also promote health benefits by fostering exercise for students. As many as 15,000 daily automobile trips could be eliminated from around schools by aggressive implementation of walking to school initiatives.

- Market research and performance assessments

– **Market research and analysis.** Affecting behavior change is a marketing activity. There clearly is risk in undertaking such programs. Research helps assess the risk and merits of potential programs and targets efforts for maximum effectiveness. Research is critical to gauge market segments: those pre-disposed to the concepts, those open to considering the proposition, and those decidedly uninterested. That knowledge should guide design of programs and investments.

– **Performance evaluation.** When a travel behavior change initiative is launched, it should be viewed as an experiment. Evaluation of the performance, costs, and effectiveness of each program should be part of the process. Evaluation feedback should inform decision makers and focus energies.

Transportation System Operations (TSM Strategies)

Signalized intersections are clearly the key determinants of congestion in the MOA. Numerous intersections cause bottlenecks and significant delays. Many of these problem intersections are concentrated in the central part of the Anchorage Bowl. There are relatively few congested intersections in the southwest and southeast areas of the Anchorage Bowl or in Chugiak-Eagle River.

Some intersections are congested not only during the morning and afternoon peak periods but are also during mid-day (shown in Figure 5-6). The most congested intersections are as follows:

- Boniface Parkway and Northern Lights Boulevard
- Bragaw Street and DeBarr Road
- C Street and Tudor Road
- Lake Otis Parkway and 36th Avenue
- Lake Otis Parkway and Northern Lights Boulevard
- Lake Otis Parkway and Tudor Road
- Seward Highway and 36th Avenue
- Old Seward Highway and Dimond Boulevard

Generally, the afternoon peak period is more congested than the morning peak period. Although intersection bottlenecks cause most delays on the road system, congestion is also evident because of inadequate capacity along some major roadway corridors. Corridor travel time studies and analyses of roadway segment service levels reveal the locations and extent of roadway delay.

Transportation operations management strategies should focus on improving these congested intersections (through signal timing or physical improvements). Other strategies may focus on systemwide issues or address local issues through individual projects. Potential strategies are discussed below.

Traffic Signal Timing

Traffic signal timing and coordination along corridors is arguably the single most important factor in management of arterial streets. Optimizing timing to traffic conditions is a continuous task and requires adequate staffing to monitor, analyze, and re-time signals. Strategies for improving signal system operations include the following:

- Periodic review and re-optimizing
- Intersection signal timing to reduce delay and coordinate timing plans for subareas or along corridors
- Time-of-day optimization, including vehicle-actuated signals
- Automated and real-time data collection
- Operation of a traffic management center to facilitate monitoring and rapid response
- Emergency vehicle and transit signal preemption
- Intersection geometry changes to eliminate split-phase signal operation (for example, by installing dedicated left-turn lanes)
- Field observation and maintenance

Most signals in Anchorage operate on long cycle lengths, with significant delays waiting for the green signal occurring even when traffic is light. A more than 30 percent reduction in delay is possible during periods of low demand (traffic at 50 percent of the afternoon peak-period volumes). With 3.6 million vehicle movements per day through the 74 busiest intersections in the Anchorage Bowl, a delay savings of 4.1 seconds per vehicle per intersection would result in a daily savings of 4,800 vehicle-hours—about 1 million driver hours per year. This time difference is emphatic evidence of the importance of good signal timing.

Signal System Upgrade

Good signal timing and system management produce significant benefits. Critical elements of the signal system include intersection signal controller technology, communications infrastructure, operations management and analysis software, and centralized control.

Modern advanced signal controllers have advanced state-of-the-art computer components—logic and control, sensors and detectors, automated data acquisition and communications, wireless and hard-wired communications, and modular software components. These advances provide greater flexibility in traffic management. They enable greater efficiency through administration by a centralized traffic management center, increase staff productivity, and permit faster response in adapting to traffic conditions and changes. These technology and system advances can be leveraged by the MOA to improve the street system management.

An additional benefit of central traffic management is the opportunity to provide real-time traveler information about the status of the street system. Information automatically gathered from intersection signal controllers and detectors at other locations can be fed to broadcast media to inform travelers about incidents and traffic conditions.

Spot Geometric Improvements

Focused geometric improvement (at intersections or on freeways) can remedy bottleneck situations. An added auxiliary lane between ramps on a freeway in many cases can eliminate or delay the need for expensive widening. An additional turn bay at one approach to an intersection may reduce delay for all movements, in all directions, at that intersection. Although there is no specific strategy that can be implemented throughout Anchorage, focused studies at key bottlenecks can reveal cost-efficient strategies.

Traffic Calming

Cut-through traffic on neighborhood streets is a safety and quality-of-life concern for neighborhoods. Cut-through traffic is often a symptom of a congested system; drivers are avoiding congested major thoroughfares. Implementation of neighborhood traffic calming can eliminate the negative impacts of the congestion problem.

The *Traffic Calming Protocol Manual* (MOA Traffic Department, 2002) provides a toolbox of strategies available for traffic-calming applications. These strategies require engineering judgment, but there is ample experience on the effectiveness and cost of various solutions. Traffic calming is intended for neighborhoods, in contrast to the location-specific spot improvements on higher volume arterial streets.

Photo courtesy of CH2M HILL

Highway Railroad Crossings

Roads cross railroad tracks at grade in 17 Anchorage locations. Electronic warning and preemption systems for highway-rail intersections can be deployed to enhance safety and help prevent vehicle-train crashes or incidents at locations where grade separation projects are not feasible. These warning systems are identified in plans for deploying Intelligent Transportation System elements in the MOA.

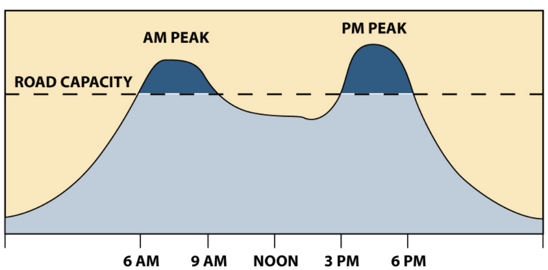
The Alaska Railroad crossings in Anchorage have an excellent safety record and collectively rank well above national averages for rail crossings. The at-grade road crossings of the Alaska Railroad affect the transportation system with differing levels of delay.

Conclusions and Approaches for Congestion Management

Managing the transportation system efficiently and pursuing programs to reduce or shift travel demand complement traditional expansion of transportation capacity through road projects and increases in transit service. These management efforts will become increasingly important to address congestion in coming years.

The primary issue is coping with weekday surges that occur during only a few commute hours. Figure 7-36 shows the fluctuation of trips throughout the day. By fixing capacity "pinch points" and reducing some demand or shifting it to other hours, the most severe problems can be relieved. Management initiatives focused on specific congestion problems will be most effective. These include traffic signal timing, spot improvements at pinch points of congestion in the transportation network, more bus service and vanpool availability, and employer partnering emphasis to change commuter habits. In addition, pricing mechanisms are an important tool to bring change.

Figure 7-36. Peak-Period Traffic Strains Road Capacities



Travel during peak hours is the biggest problem. If traffic during the peak-hour commute periods is managed more efficiently, congestion can be reduced.

Source: CH2M HILL

A much greater challenge lies in creating viable choices and options and addressing pervasive single-occupant vehicle travel. These issues are far larger, broader, and more difficult than congestion management. The character of Anchorage in the future city will hinge on confronting this challenge.

Overview and Assessment of Recommended LRTP Road System

Implementation and construction of the transportation programs and projects in the recommended LRTP will achieve significant success in meeting future transportation needs. (See Figure 7-18.) The following are examples of successes anticipated in 2025 from the LRTP recommended road plan when compared with outcomes of the 2003 LRTP:

- Doubling of the number of transit riders if the transit budget is increased to enable provision of 210,300 annual bus revenue service hours
- Overall savings of about 4.5 million vehicle hours of travel
- Elimination of nearly 85 percent of the congested vehicle hours of daily travel per year
- Reduction of freight travel time and corresponding costs by 15 to 20 percent
- Addition of 160 miles of pedestrian and bicycle facilities in conjunction with road projects, significantly enhancing trail connectivity and continuity
- Inclusion of transportation strategies and programs for system management and operation, safety improvements, and travel options that complement recommended transit and road improvements
- Improvement in air quality, economic vitality, and traveler options, as well as reduction in neighborhood traffic intrusion