



Background: Existing Conditions, Problems, and Needs

Prepared for:

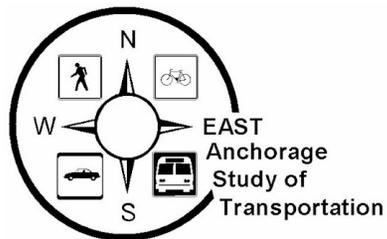
Alaska Department of Transportation & Public Facilities

and

Municipality of Anchorage

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May 2002

Table of Contents

1.0 INTRODUCTION..... 1
REPORT OVERVIEW 1
STUDY AREA 2

2.0 LAND USE-TRANSPORTATION CONNECTION: HISTORIC OVERVIEW..... 3
HOW WE GOT WHERE WE ARE TODAY: LAND USE AND TRANSPORTATION 3
Implications of our Historic Development..... 7

3.0 LAND USE-TRANSPORTATION CONNECTION: EXISTING CONDITIONS..... 9
INTRODUCTION 9
LAND USE..... 10
RESIDENTIAL DISTRIBUTION..... 11
Population Density..... 12
Housing Unit Density..... 13
TRIP PURPOSE 14
Anchorage..... 14
Employment..... 15
Shopping 16
School Trips 17
Social & Recreational Trips..... 18
Medical Facilities 19
Emergency Services 20
Freight Distribution 21

4.0 MODE..... 22
INTRODUCTION 22
ROAD NETWORK..... 23
Roadway Classification..... 23
Roadway Ownership and Management..... 24
Average Daily Traffic..... 25
Intersection Traffic Volumes 26
TRANSIT NETWORK 27
People Mover..... 27
Share-A-Ride Service 29
AnchorRIDES Paratransit Service..... 29
PEDESTRIAN NETWORK 30
Pedestrian System Characteristics..... 31

5.0 PROBLEMS AND NEEDS 32

ROADWAYS.....	32
<i>Congestion - Level of Service</i>	33
<i>Traffic Accidents</i>	35
<i>Mobility and Accessibility</i>	36
<i>Connectivity and Accessibility</i>	39
TRANSIT QUALITY OF SERVICE (OR TRANSIT LEVEL OF SERVICE).....	40
<i>Frequency of Service</i>	40
<i>Accessibility to and from the Service</i>	41
<i>Service Coverage</i>	42
<i>Hours of Service</i>	43
<i>Passenger Loads</i>	43
PEDESTRIANS & BICYCLES.....	44
<i>Pedestrian Conditions Analysis</i>	45
<i>Pedestrians Environmental Factors</i>	46
<i>Pedestrian & Bike Related Accidents</i>	47
EMERGENCY SERVICES.....	48
FREIGHT DISTRIBUTION.....	49
6.0 REFERENCES.....	50

List of Acronyms

ADT	Average daily traffic
AFD	Anchorage Fire Department
AMATS	Anchorage Metropolitan Area Transportation Solutions
APU	Alaska Pacific University
ASD	Anchorage School District
ATIS	Advanced Transit Information Systems
CBD	Central Business District
DOT&PF	Alaska Department of Transportation and Public Facilities
FHWA	Federal Highway Administration
ISER	Institute of Social and Economic Research
LOS	Level of service
ITE	Institute of Transportation Engineers
LRTP	Long Range Transportation Plan
MPH	Miles per hour
MOA	Municipality of Anchorage
UAA	University of Alaska Anchorage

TAZ	Transportation analysis zone
TCRP	Transit Cooperative Research Board
VHT	Vehicle hours traveled
VMT	Vehicle miles traveled

List of Definitions

Arterial	A road that is designed to move large volumes of traffic and goods, generally from one part of the community to another to connect major employment and activity centers to large residential areas.
Collector	A road designated to carry traffic between local streets and arterials, or from local street to local street.
Dwelling unit	A building, or portion of a building, that contains separate living facilities.
Freeway	A limited access, high-speed road with grade-separated interchanges whose function is to carry traffic.
Local street	A road designed to provide access to adjacent properties.

1.0 Introduction

Report Overview

A key objective of the background report is to collect meaningful data on existing and future conditions to help identify transportation needs and support study conclusions.

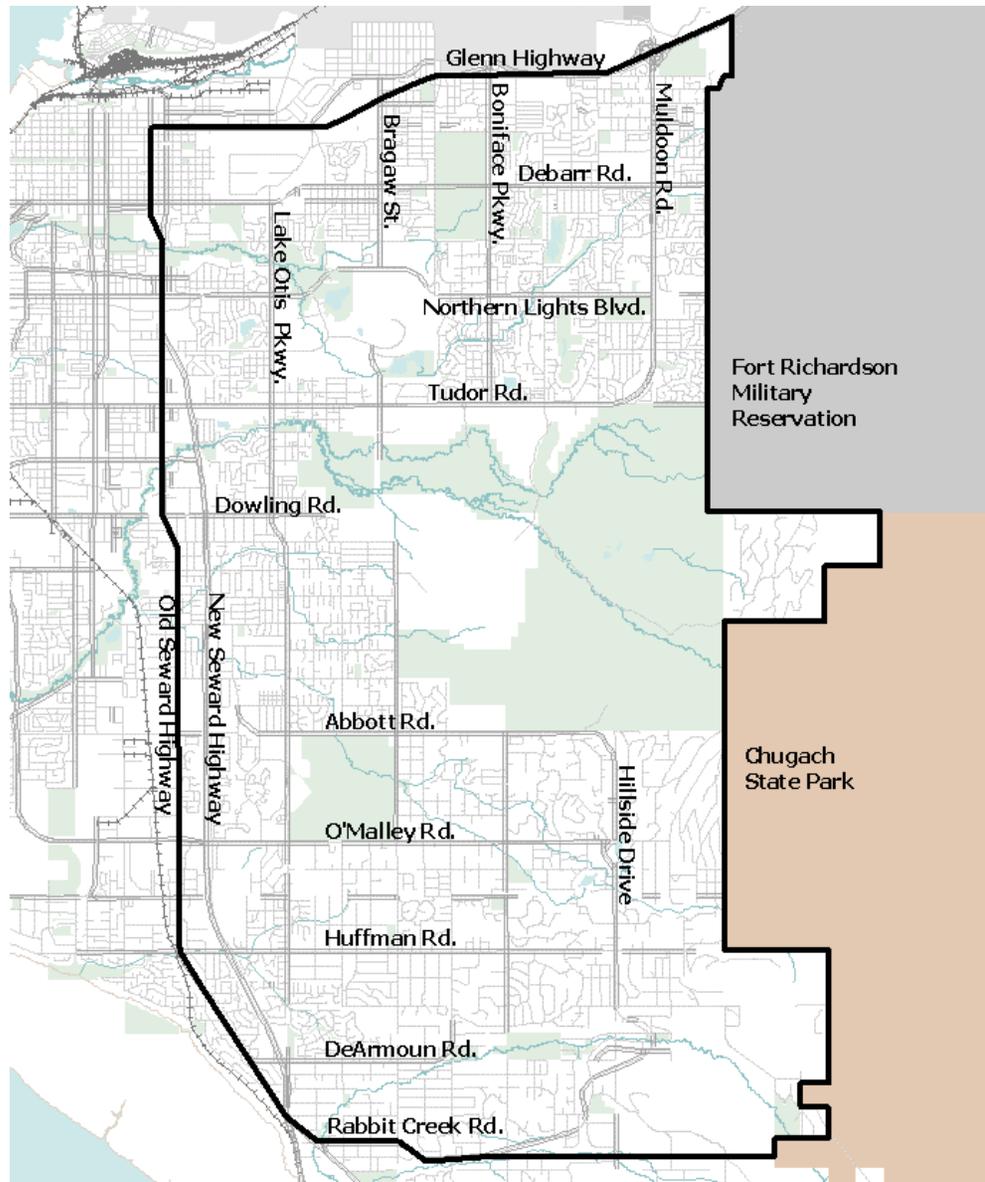
State and local officials commissioned the East Anchorage Study of Transportation (EAST) to examine transportation improvements for the East Anchorage study area.¹ The study's objective was to identify current problems; forecast future transportation demands and deficiencies (through the year 2023); and then analyze approaches to improve our ability to travel safely and efficiently within and through the study area. The study focused on accessibility, mobility, and public safety, as well as relieving congestion at major eastside intersections. The end product will provide data and analysis to help plan future public transportation, sidewalk, trail, and road improvements. Findings from EAST will be used, in part, to prepare Anchorage's long-range transportation plan (LRTP).

Having a solid base of information upon which to make decisions and using that data in objective and meaningful ways is critical to the study. The ability to successfully plan for transportation needs is largely related to our understanding of the current transportation picture in East Anchorage. The primary objectives of this phase of the study involved developing an understanding of existing conditions affecting and relating to the transportation system in East Anchorage and using that information to predict future conditions and to guide the study. The data gathering and analysis in this report focus on identifying existing conditions, deficiencies, and problem areas. The data and analysis contained herein provide the information necessary to identify problems and develop solutions to the traffic and growth-related challenges we will face over the next 20 years.

Key objectives of this phase of the study:

- Acquire necessary baseline information to serve the study throughout the process.
- Inventory information to better understand existing transportation needs.
- Develop the baseline information needed to support demand forecasting.
- Map and document existing condition information.
- Present background information to the public.

¹ Defined as the geographic area bounded by the Glenn Highway to the north, Rabbit Creek Road to the south, the Old Seward Highway to the west, and the Ft. Richardson Military Reservation and Chugach State Park to the east.

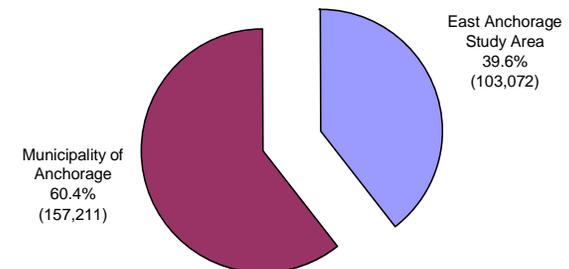


Study Area

The study boundaries are the Glenn Highway on the north, the Old Seward Highway on the west, Rabbit Creek Road on the south, and the Fort Richardson Military Reserve and Chugach State Park on the east.

Running along the north and west edges of the study area are the two primary highways into and out of Anchorage: the Glenn Highway and the Seward Highway.

As of the 2000 Census, the Municipality of Anchorage (MOA) had a population of 260,283 people—an increase of 15% from the 1990 Census population of 226,338. The study area’s population makes up about 40% of the total population of Anchorage.



The adjacent figure (left) shows the area within the study boundary along with the primary arterial and collector road network.

2.0 Land Use-Transportation Connection: Historic Overview

How We Got Where We Are Today: Land Use and Transportation

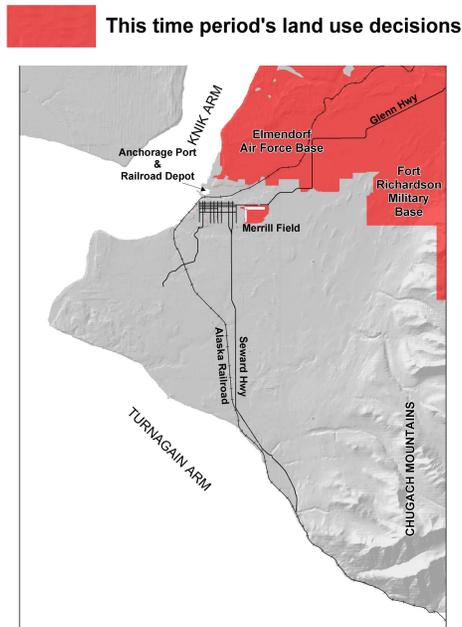


Figure 1: Anchorage 1914-1940

Land uses and transportation needs are inextricably linked. Unfortunately, nationwide, the planning for these two major shapers of our urban environment historically has been disjointed. Land uses often have been enacted with little forethought for the long-range implications of future transportation needs and problems. The converse is also true: transportation improvements have often been made without understanding the affect that more roadway capacity will have on our future land use patterns.

To a certain extent, what is possible for the future is governed by the past. Our previous decisions to locate land uses and investments where we did have largely influenced the transportation patterns we see today. These decisions also set up a framework that shapes future transportation options and establishes policy sideboards, or constraints. Much like joining a game of chess that has already begun, in Anchorage, many of the moves that effect transportation patterns have already been played. We cannot simply start over with a fresh board; instead, we must move forward within the context of our city's natural features and historic land-use and transportation decisions. This section presents information on Anchorage's historic development to identify past decisions that establish the current land use and transportation patterns that act as parameters to this study.

The natural setting of the Anchorage Bowl has strongly influenced its urban form. Natural features—coastlines and currents, mudflats, slopes, water bodies, stream corridors, and wetlands—have each framed major land use and transportation choices. Anchorage's present-day land use and traffic circulation patterns are the outcome of past decisions that were influenced, but not preordained, by natural features. Many decisions might have been made differently, with profoundly different results for development in the Anchorage Bowl. Moreover, many of the land use and transportation choices to be evaluated in EAST have potential to reshape existing patterns and shape future development.

An overview of formative natural features and key, past decisions is useful background for analysis of current circulation patterns and issues, and evaluation of future transportation options in the EAST area. It is always important to be mindful of the interplay between land use and transportation stemming from the separation of land uses—the places where people live, work, shop, visit, play, and carry on other daily activities—and the practical need to travel between locations.

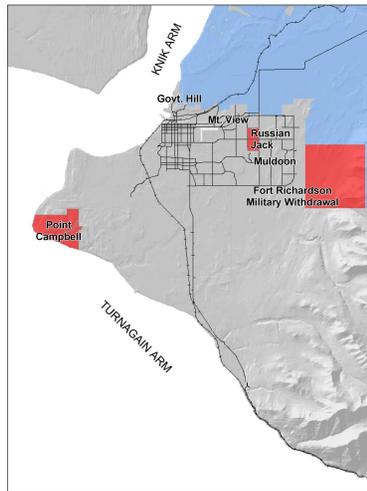


Figure 2: Anchorage 1941-1950

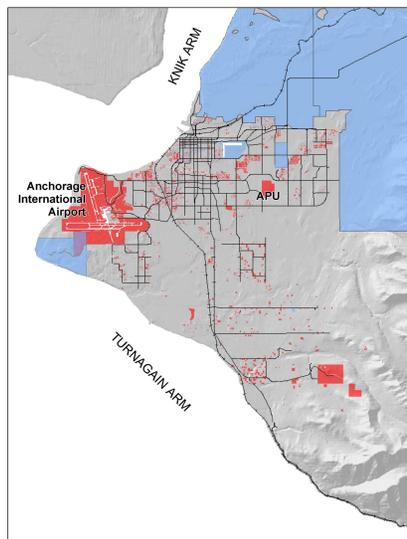
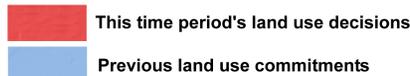


Figure 3: Anchorage 1951-1960

Some of the most significant natural features and historic land use and transportation decisions for Anchorage’s development are listed below. These decisions to commit certain areas to certain uses continue to affect transportation problems today and limit potential solutions and opportunities for future transportation improvements tomorrow.

1. At a broad scale, the Anchorage Bowl is bounded by several major natural features: the Chugach Mountains and the Knik and Turnagain Arms of Cook Inlet.
2. The Ship Creek landing offered the only practical port location in Upper Cook Inlet to supply Alaska Railroad construction. Anchorage’s port, its rail depot and yards, and related freight transfers, found their place in Ship Creek Valley.
3. Anchorage was established in 1914. The flat land atop the bluff south of Ship Creek was a natural location for Anchorage’s original town site. It became the nucleus of downtown Anchorage. The Anchorage town site auction of 600 lots occurred in 1915.
4. The Alaska Railroad was completed between Anchorage and Seward in 1918.
5. Anchorage incorporated as a city in 1920.
6. The Alaska Railroad line from Seward to Fairbanks was completed in 1923.
7. In 1930, Merrill Field replaced the original “Park Strip.” Merrill Field became one of the busiest centers of civilian aircraft activity.
8. Anchorage grew slowly at first, with less than 3,500 residents and one short paved street by the eve of World War II (1940). Even so, several significant land use and transportation decisions had already been made. Merrill Field (1930) was dedicated to civilian aircraft, and the routes for the future Glenn and Seward Highways were established.
9. In 1940, Elmendorf and Fort Richardson military bases were built on homesteads and other public lands withdrawn from civilian use. The bases effectively redefined Anchorage’s northern and eastern boundaries. The Anchorage Bowl was now fully encircled by natural or man-made barriers.
10. In 1942, 7,680 acres of land were withdrawn for use by the War Department for military purposes including the area now known as the Campbell Tract.
11. The military bases stimulated urbanization of the nearby Government Hill, Mountain View, and Muldoon neighborhoods, and fostered an early east-west development orientation.
12. World War II and the post-war years brought boom times to Anchorage. The first traffic light was installed on Fourth Avenue (1949). The Anchorage-Seward Highway (Old Seward Highway) was completed in 1951. By 1950, Anchorage’s population had grown to 31,500 people.

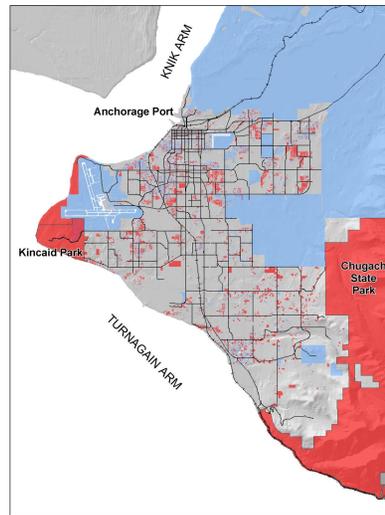


Figure 4: Anchorage 1960-1970

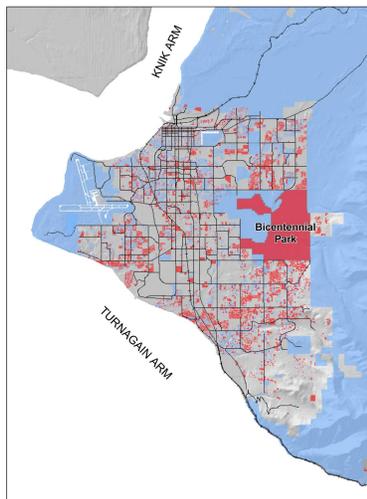
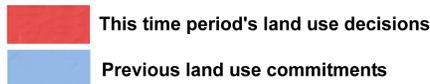


Figure 5: Anchorage 1970-1980

13. The early development patterns, topography, and transportation networks were already having a tremendous effect. The Glenn Highway provided access to plentiful, developable land in Eagle River and beyond, but the Seward Highway along Turnagain Arm opened up scant development potential due to limiting terrain. This difference is reflected in today's suburbanization and commuter patterns. By the year 2000, this pattern would result in 47,100 vehicles entering or leaving the Anchorage Bowl daily via the Glenn Highway, while only 8,300 vehicles enter or leave via the Seward Highway.
14. Several other large tracts (e.g., Point Campbell, Campbell Tract, Russian Jack) were reserved for military use in this period. Later transferred to municipal ownership, these tracts became several of Anchorage's largest municipal parks.
15. Anchorage International Airport (1951) committed a large tract in west Anchorage to transportation and related uses, and established Anchorage as Alaska's premier air transport center.
16. In 1959 Alaska became a state. In 1960, there were 44,237 people living in Anchorage. Alaska Methodist University (now Alaska Pacific University, or APU) began classes.
17. Federal survey practices provided section line rights-of-way for many arterials.
18. Anchorage's first comprehensive plan (1961) assumed local industry would be oriented toward rail and highway. It reserved large tracts for industry along the Seward Highway and Alaska Railroad corridor in central Anchorage. As it turned out, Anchorage's port and airport became the most important nodes for transportation-related industry. Today, Anchorage's port and airport are short of land for expansion, while much industrial land along the Seward Highway/Alaska Railroad corridor and in Ship Creek Valley is underused.
19. Several highway alternatives envisioned in the 1961 comprehensive plan (e.g., coastal, foothills, and Chester Creek freeways; a north-south parkway through the Campbell Tract) were subsequently forgone or compromised.
20. The 1964 Good Friday earthquake destroyed Seward's port, until then Southcentral Alaska's main port-of-entry. Anchorage quickly improved its port, which superseded the ports at Seward and Whittier, and consolidated Anchorage's position as Southcentral Alaska's marine, air, and highway transport hub.
21. During the 1960s, Midtown began to emerge as a secondary office center.
22. In 1968 oil was discovered at Prudhoe Bay. Kincaid Park was created from a former Nike missile site.
23. By 1970 there were 126,385 people living in Anchorage.
24. In August of 1970, Governor Keith Miller signed the bill that created Chugach State Park on a 490,000-acre parcel that borders Anchorage.

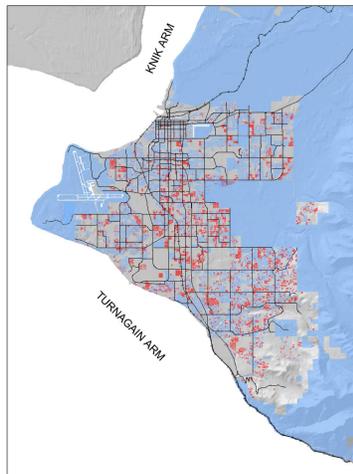


Figure 6: Anchorage 1980-1990

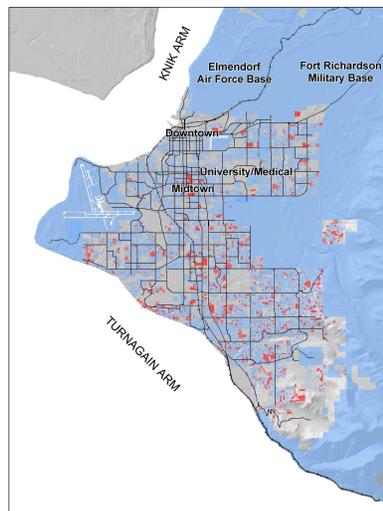
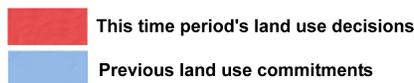


Figure 7: Anchorage 1990-2002

25. By and large, the arterial and collector road network we still rely on today was already laid out by 1970.
26. The Campbell Tract was transferred from the military to the U.S. Bureau of Land Management (BLM) in 1971.
27. The 4,000-acre Far North Bicentennial Park was created in 1975 out of the Campbell Tract.
28. The Trans-Alaska Pipeline was completed in 1977.
29. The pace of retail development accelerated after 1970 and peaked during the early 1980s, only to drop off dramatically during the recession.
30. In 1980 Anchorage population reached 174,431 people.
31. The series of decisions to locate Alaska Methodist University (now APU) and the University of Alaska Anchorage, relocate Providence Hospital and the Alaska Native Medical Center, and develop the Public Lands and Institutions zone on Campbell Tract, led to development of a major work and customer destination in east Anchorage.
32. Large public land dedications (e.g., Anchorage International Airport, Far North Bicentennial Park, the University-Medical District, Russian Jack Park, Merrill Field, south Anchorage's Ruth Arcand Park) shaped arterial road routes and reduced the viability of some route options.
33. Construction of limited access sections along the New Seward and Glenn Highways created man-made barriers that constricted cross-traffic flows.
34. In many Anchorage neighborhoods, piecemeal subdivision of small homesteads, local natural features (water bodies, wetlands, streams, steep slopes), or public open spaces and greenbelts reduced neighborhood road connections. Poor connectivity impeded neighborhood circulation and loaded traffic onto nearby arterials.
35. Commercial and industrial uses were largely excluded from the southeast quadrant south of Dimond Boulevard and east of the New Seward Highway.
36. Anchorage suffered from a major recession between 1986 and 1989.
37. In 1990 Anchorage population reached 226,338.
38. Auto-oriented, big-box retail development prevailed during the 1990s.
39. During the 1990s decisions were made to move federal government office workers downtown. The Municipality of Anchorage began moving government office workers to new facilities adjacent to Bragaw Street and Tudor Road.
40. Midtown continued to grow with additional auto-oriented retail establishments and big-box development such as Wal-Mart, Home Depot, Office Max, and Lowe's Hardware and Garden.
41. Anchorage's 2000 population topped 260,000 people.

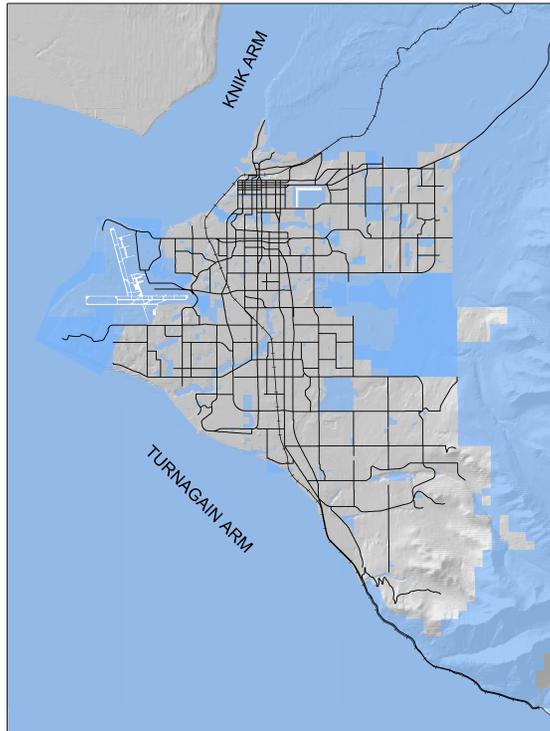


Figure 8: This figure shows how Anchorage would look if we were to think of some of our current land uses as if they were water. One can think of Anchorage as an island with a bridge to the north and one to the south. Historic development choices have created large blocks of land that break up the island and have tended to limit our surface transportation choices. The form of our city contributes to our transportation problems and affects our future options.

Implications of our Historic Development

Anchorage's present-day land use and circulation patterns are the outcome of these and other past decisions. Many decisions might have been made differently, with profoundly different results for development in the Anchorage Bowl. The decisions that were made, however, were based on the economic and value system of the time. This development history frames some of the major circulation and land use issues to be analyzed and addressed by EAST.

1. Work and activity patterns in the Anchorage Bowl are polycentric, with functionally distinct destinations:
 - Midtown has become Anchorage's primary retail and office business district, and a center for services and lodging, as well.
 - Downtown is a center for retail, office, visitor industry, and government employment, as well as cultural and civic activities.
 - The University-Medical District (roughly located near and includes Providence Medical Center, Alaska Psychiatric Institute, Alaska Native Medical Center, University of Alaska Anchorage, Alaska Pacific University) and the Public Lands and Institutional (PLI) zoning along Tudor Road support an estimated 10,500 jobs. It is the statewide center for health care and higher education, and a governmental service center.
 - Ted Stevens Anchorage International Airport directly supports over 6,000 jobs, and generates heavy passenger, aviation, and air-freight-related traffic.
 - The Dimond Boulevard and Old Seward Highway area is a regional retail center.
 - Elmendorf Air Force Base and Fort Richardson are significant employment destinations and retail and health care centers for many off-base military families.
2. Most Anchorage neighborhoods and commercial centers developed after 1950 are designed for vehicle-dependency.
3. Downtown Anchorage was well located for early Anchorage. However, situated at the northwest corner of the Bowl, with almost no access from three quadrants, and poor access across Chester Creek Valley to the south, Downtown was poorly positioned as the city center for a larger city. As Anchorage expanded south and east, new offices, stores, and service businesses gravitated toward the more central Midtown area, and Downtown became more marginalized. Today, the center of employment in Anchorage is in the vicinity of 36th Avenue and C Street; the center of population is near the New Seward Highway and Tudor Road.
4. Several of the busiest destinations (Downtown, Ted Stevens Anchorage International Airport, the University Medical District, Elmendorf Air Force Base, Fort Richardson) are on Anchorage's perimeter rather than centrally located. This contributes to diffuse travel patterns and makes these areas difficult to serve with transit.

5. Ted Stevens Anchorage International Airport and Far North Bicentennial Park constrict surface transportation to an hourglass like shape at the Anchorage Bowl's mid-point. This shape, together with the lateral location of major destinations, compounds the congestion potential, particularly at the Lake Otis Parkway/Tudor Road and Minnesota Drive/International Airport Road intersections.
6. Relatively high residential densities in Northeast Anchorage, plus Glenn Highway commuter traffic, put heavy traffic loads on east-west travel routes north of Tudor Road. Almost as many vehicles (191,000 daily) cross an imaginary line that extends from Lake Otis Parkway to Reeve Boulevard on six east-west arterials between Tudor Road and Commercial Drive as cross International Airport/Tudor Roads (201,000 daily) on seven north-south arterials between Spenard Road and Lake Otis Parkway.
7. Glenn Highway traffic to and from Anchorage is projected to double by 2020. Northeast Anchorage is expected to add another 13,000 to 18,000 residents by 2020. These increases will add to the traffic load on east-west arterials.
8. Residential and travel patterns in Northeast Anchorage may be more adaptable to congestion relief by providing additional transit service and creating "town center" development than other areas of Anchorage due to the existing housing densities.
9. Limited retail and service options in the large trade area south of Tudor Road and east of the New Seward Highway necessitate more trips through Lake Otis Parkway/Tudor Road and New Seward Highway over/under passes and add to congestion. Development of a "town center" in the Abbott Road vicinity may shorten travel trips and relieve local congestion, particularly in the Dimond Boulevard/Old Seward Highway area.
10. Existing land commitments to parks, airports, hospitals, universities, and other uses have precluded new arterial routes through Northeast Anchorage. Such commitments (policy sideboards) are evidenced by historical development, which has focused on expansion of the existing arterial network as opposed to connections through areas where land has been committed to other uses. This history has led to a network that relies heavily on the primary arterials to carry the bulk of the traffic and puts strain on that system to fulfill functions typically met and shared by other classes of roads. These historic land-use policy sideboards continue to be articulated for our future road network, as evidenced in our current Long Range Transportation Plan, which focuses on road capacity to be added primarily to existing arterials.
11. The establishment of additional connections on the transportation grid within the existing arterial networks could have major impacts on the arterial's ability to serve traffic demand into the future. These connections will allow people to complete local trips without requiring use of the arterial system, add capacity to the system as a whole.

3.0 Land Use-Transportation Connection: Existing Conditions

Introduction

Anchorage 2020 calls for “a transportation system, based on land use, that moves people and goods safely, conveniently, and economically, with minimal adverse impact on the community” (p. 37).

Anchorage 2020, the Anchorage Bowl Comprehensive Plan, calls for an integration of land uses and transportation needs, the two major elements of our urban environment.

According to Anchorage 2020, integrated land use and transportation planning requires answers to four basic questions:

- Where do people live? This defines the origin of the trip.
- Where are people going? This defines the destination of a trip taken for purposes such as work, shopping, visiting, or recreation.
- What choices are available? This identifies the possible modes of transportation (roads, transit, trails, freight routes) between points of origin and destination.
- What routes are available? This describes the transportation system or network of roads, transit, trails, and freight routes between points of origin and destination (Anchorage 2020 p. 64).

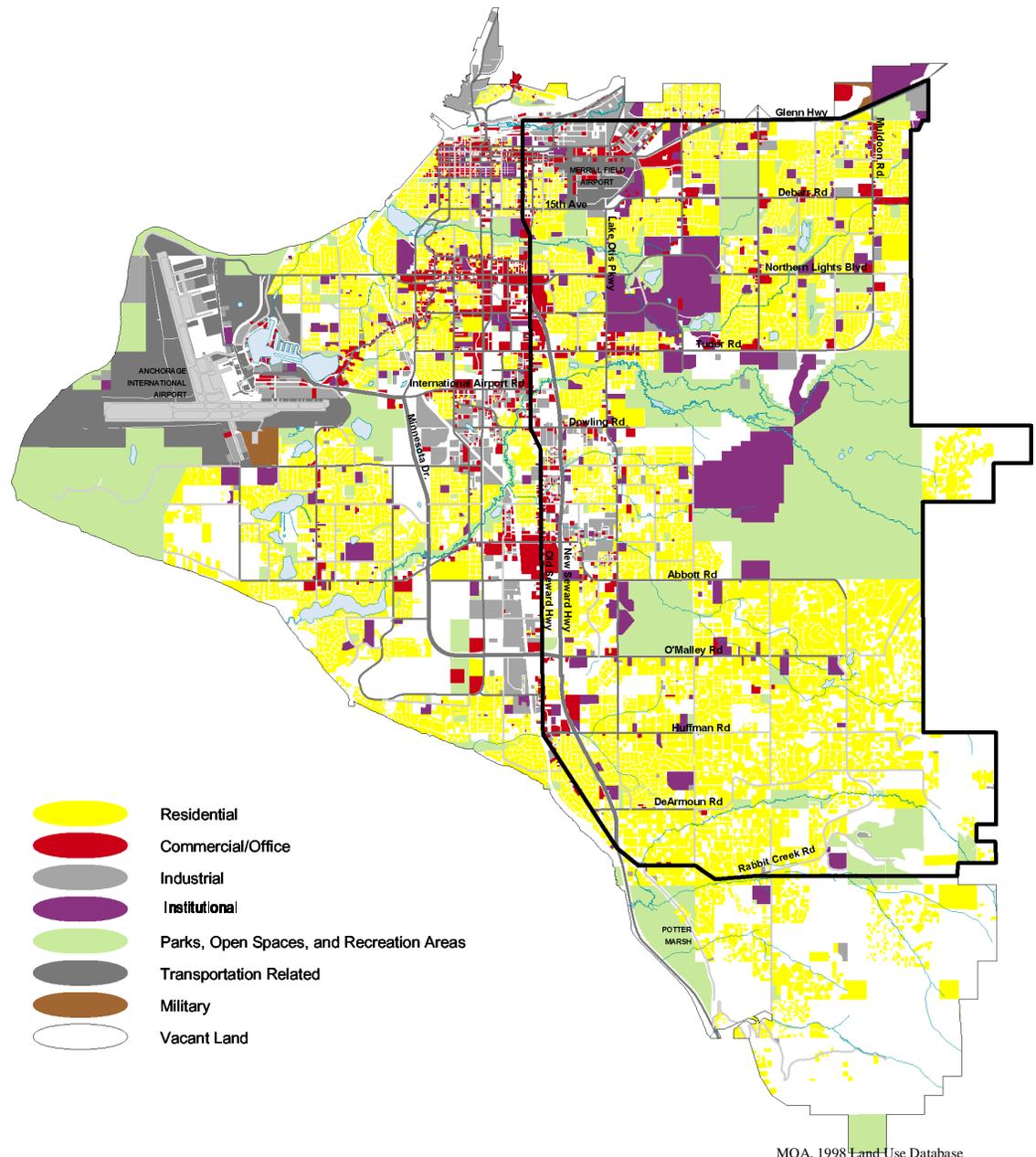
This remainder of this report begins laying out the data to help us answer these four questions and to bring about an integrated understanding of our transportation and land use related problems and solutions.

Land Use

The MOA has developed, for the most part, with highly segregated land uses. The primary use of land is residential (28%), followed by parks, open spaces, and recreational areas (21%). The majority of housing is along the edges of the community, while commercial and office uses have been clustered down the centerline along the north-south arterials. Industrial areas have clustered around transportation centers at the airport and Ship Creek, and along the Seward Highway and the Alaska Railroad mainline track through Anchorage. Major park lands and trail networks are located throughout the Anchorage Bowl. Far North Bicentennial Park, a 4,260-acre tract of land on the eastern edge of the study area, is a dominant land use within the study area.

Anchorage 2020 calls for “a balanced supply of commercial, industrial, institutional, and transportation land uses which is compatible with adjacent land uses and has good access to transportation networks” (p. 37).

Diversity of land use within an area is typically more conducive to pedestrian travel. The more land uses one can reach on foot or transit, the more likely that needs can be met without the use of a motorized vehicle. The relatively segregated uses found in Anchorage means activities have not historically been able to be accomplished on foot. This type of development pattern has necessitated people using their cars and reduces the effectiveness and efficiency of public transit services.



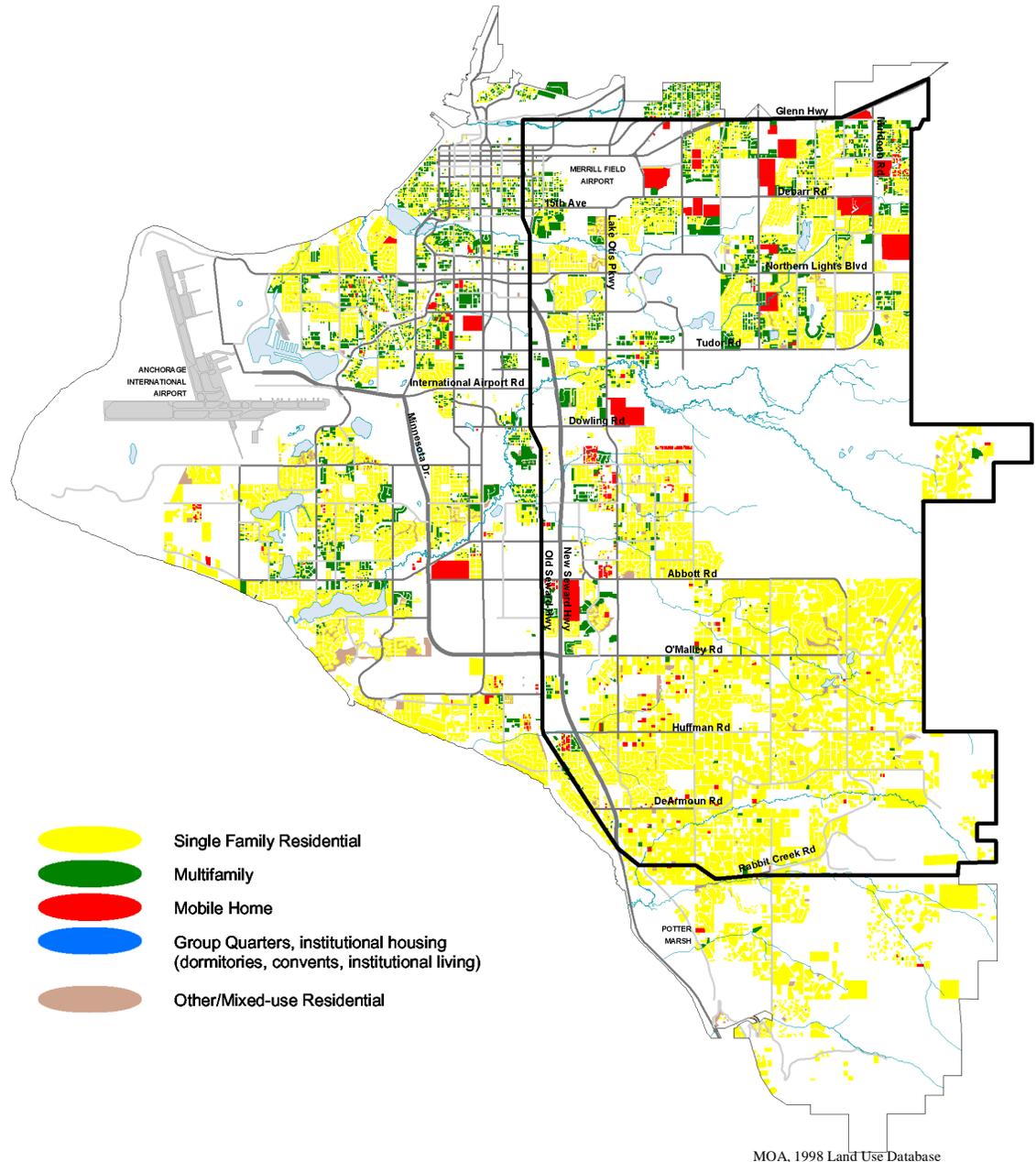
Residential Distribution

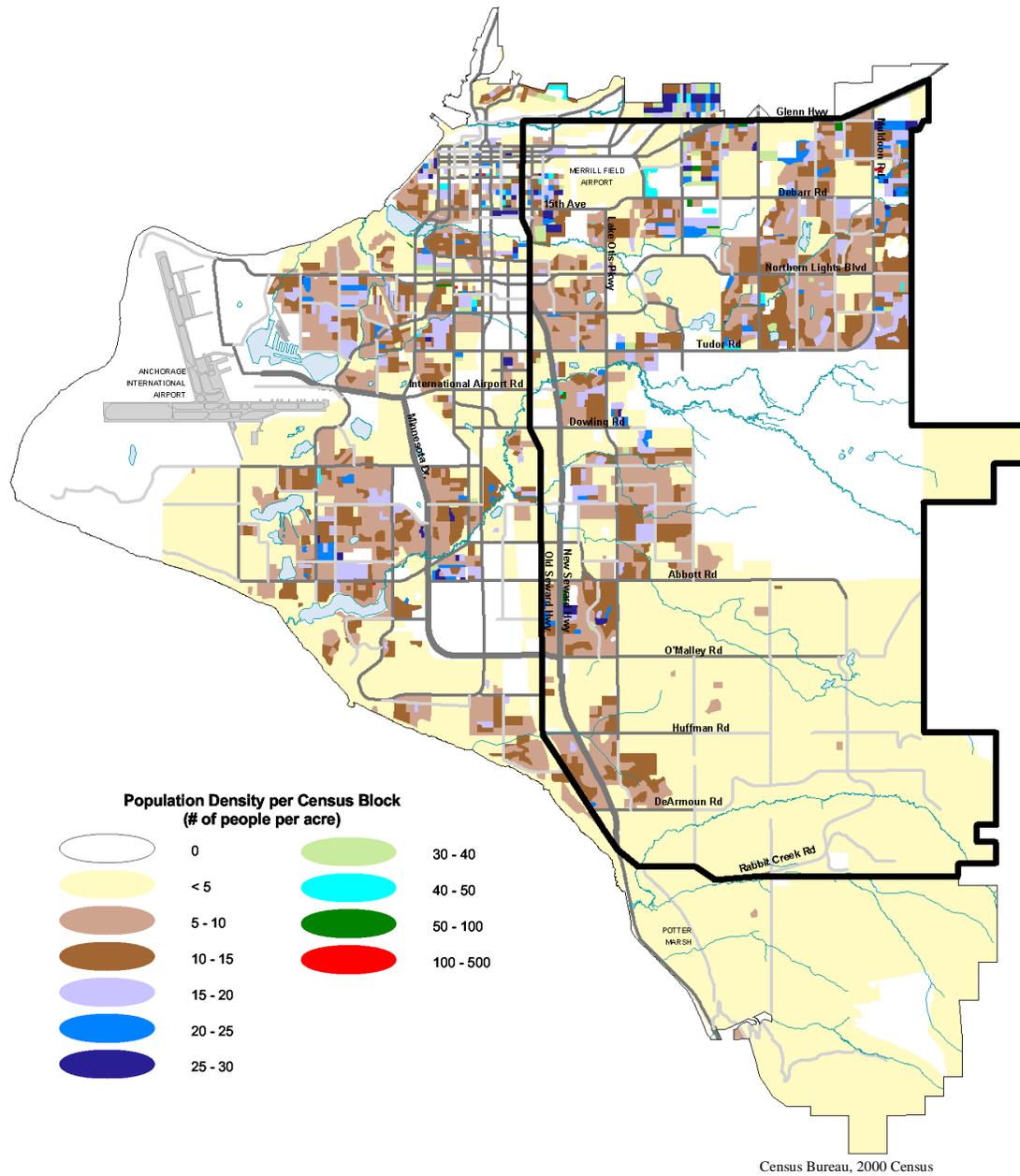
Where do people live?

As Anchorage 2020 points out, one of the first aspects to understanding the relationship between transportation and land use is knowing where people live. The first trip people make everyday typically starts from home, and the last trip they make at night typically ends at a residence. This often results in trip peaks occurring in the morning (between 7:00 and 9:00 am) and evening (between 4:30 and 6:30 pm). Anchorage experiences heavy trip activity during these periods and, to a large extent, most of the transportation congestion and delay occur during these periods.

Anchorage 2020 calls for “a variety of housing types and densities in safe, attractive neighborhoods that offer a choice of urban, suburban, and rural lifestyles that are appropriate for northern conditions and in harmony with our natural setting” (p. 37).

The figure at the right shows the distribution of residential land uses within the Anchorage Bowl. The Hillside area is primarily an area of single-family development (yellow) on larger lot sizes. The northeast quadrant of the study area has higher amounts of multi-family development (dark green). Multi-family development occurs down the centerline of the Municipality along the west side of the study area.





Population Density

Population and population density are important elements in estimating the numbers of person trips from a given area. In addition to determining the volumes of trips generated, population density has a large bearing on the potential solutions to traffic problems. Areas that are predominantly low density, such as single-family development, are more frequently difficult to efficiently serve with public transit. Higher density, multi-family development can generally support greater levels of transit service and the need for facilities such as sidewalks.

The figure to the left shows population density by census block in people per acre. Within the study area, we can see that the areas of highest density occur in the Muldoon area with population densities in the 15 to 25 residents per acre range and lower Hillside in the 5 to 15 residents per acre range. The mid- and upper-Hillside has much lower population densities, typically less than 5 people per acre. The areas that have higher population densities will generate a greater number of trips.

This population distribution helps us understand why continued People Mover service to the Hillside has been difficult to maintain. It presents challenges to increasing transit service or ridership to that portion of the study area without changes to land use densities. In contrast, the Muldoon area provides a stronger target area for transit.

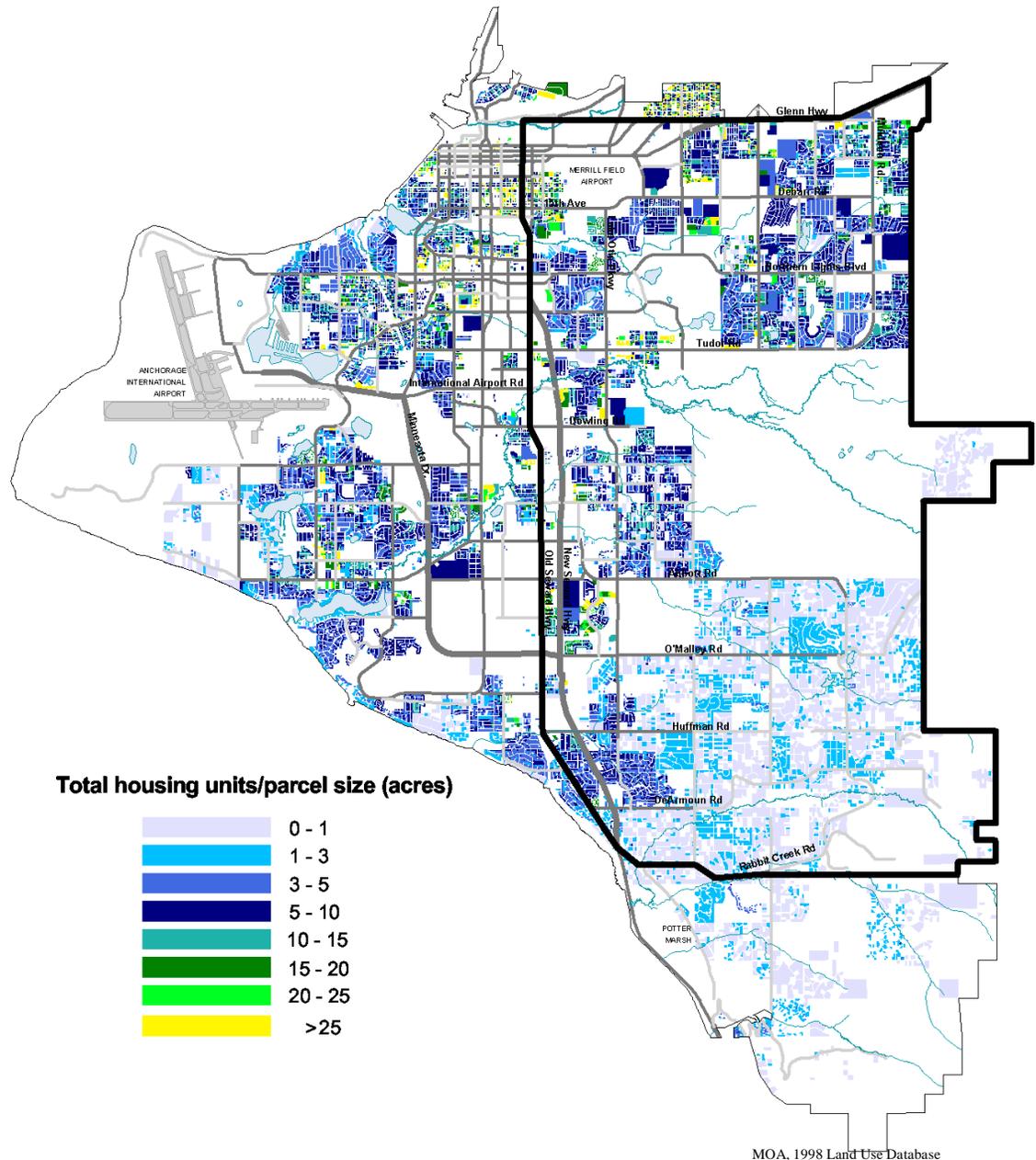
Housing Unit Density

Just as knowledge of population densities is important, so too is an understanding of housing unit densities. Areas with greater housing unit densities are easier to serve with transit efficiently and cost-effectively.

The distribution of housing unit density closely mirrors the distribution of multi-family land uses and population distribution. Within the study area, areas of Muldoon and lower Hillside have a greater number of housing units per acre than the mid- and upper-Hillside areas.

Land uses in Anchorage tend to be homogenous and segregated by density. For instance, low-density residential development prevails on the upper-Hillside, while high-density development is clustered in the Muldoon area.

Nationally, housing unit density has been found to correspond with transit ridership. According to the *Transit Capacity and Quality of Service Manual* (Transportation Research Board 1999), housing unit densities greater than 4.5 dwelling units per acre are generally needed before hourly transit service can be supported. Several studies have suggested that for each doubling of residential density, vehicle miles traveled decreases by 20 to 30 percent per household. Also, the opportunity for successful public transit operations increases (FHWA 1996).

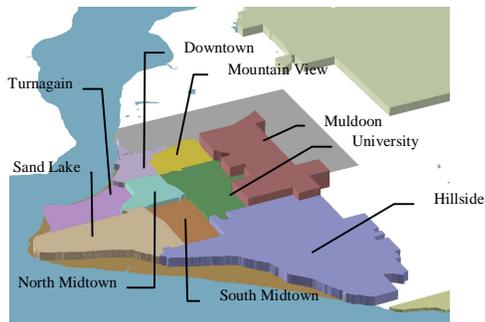


Trip Purpose

Where are people going?

Origins and Destination of Trips

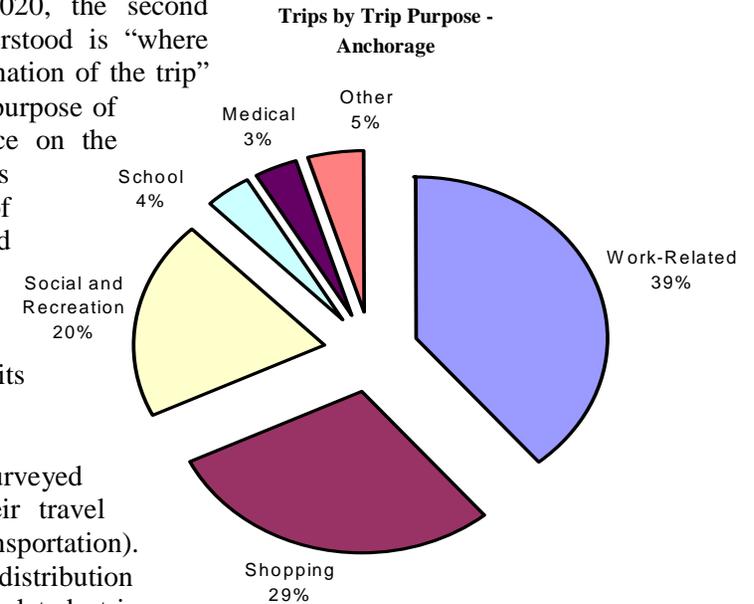
Understanding where people are coming from and where they are going by trip purpose is important to understanding the problems facing our transportation system and the effectiveness of the potential solutions. In the sidebars in this section, we present origin and destination data derived from a 1996 Municipality of Anchorage, Public Transportation Department Survey (MOA Public Transportation). Due to the structure of the data and original survey questions posed, the analysis is limited to subareas as they were defined in that study. Those subareas are as follows:



The entire dataset is large and is not presented in its entirety. The graphics that are presented show the origins of trips only for the primary destination areas for each trip purpose.

As indicated in Anchorage 2020, the second element that needs to be understood is “where people are going,” or the “destination of the trip” (Anchorage 2020, p. 64). The purpose of each trip has a direct influence on the mode of travel, the time the trip is made, and trip length. Because of Anchorage’s segregated and homogeneous land use distribution, the purpose of the trip, to a large extent, can be associated with its geographic location.

In 1996, People Mover surveyed Anchorage residents about their travel behaviors (MOA Public Transportation). The adjacent graphic shows the distribution of trips by purpose. Work-related trips account for 39% of the trips made, shopping accounts for 29%, social and recreational trips account for 20%, school for 4%, and medical for 3%. This information compares with national trends that indicate only 27% of trips are for work.



Trips by Trip Purpose - Nationwide		Anchorage
Work	27%	39%
Other Family & Personal Business	27%	--
Shopping	22%	29%
Social and Recreational	18%	20%
School and Church	4%	4%
Doctor/Dentist	1%	3%

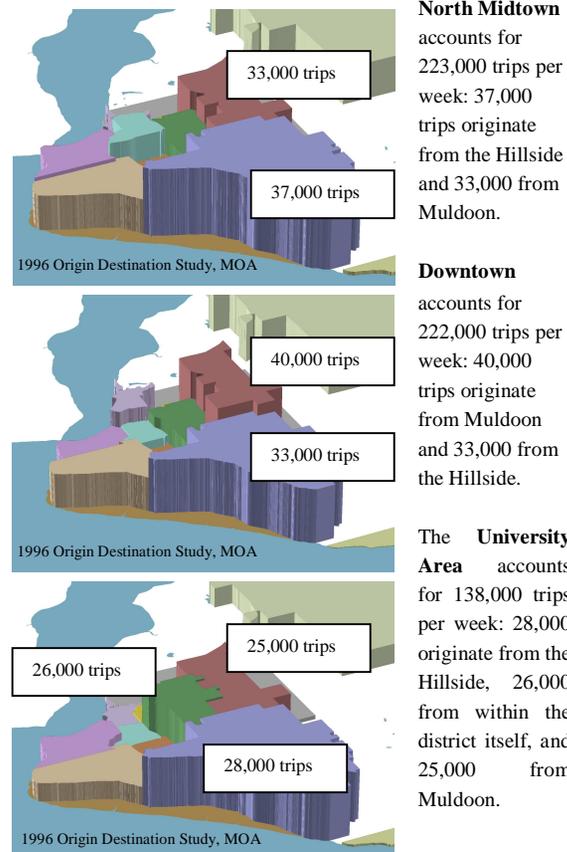
Nationwide Personal Transportation Survey, FHWA, 1996
MOA Public Transportation, 1996

The remainder of this section discusses the distribution of land uses corresponding with each of the major trip purposes identified with Anchorage travel behavior.

Employment

Where do people work?

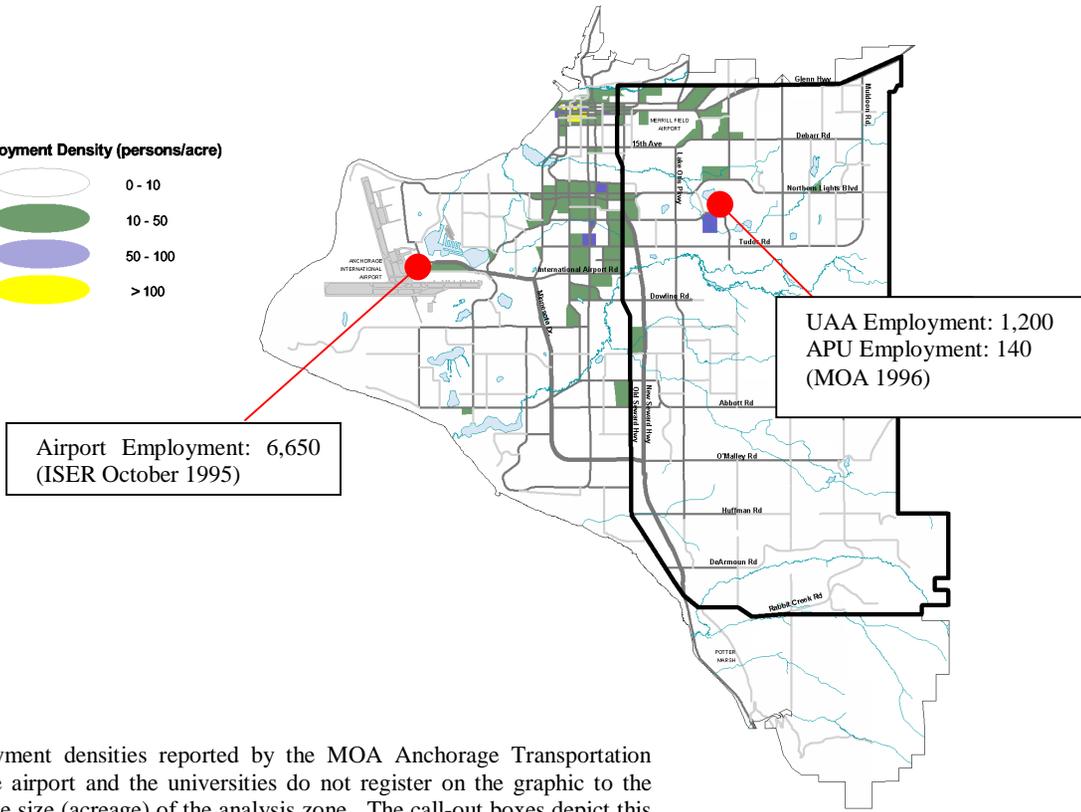
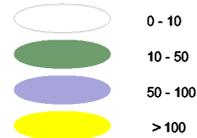
Origins of Work Trips to the Following Locations



As identified in the 1996 origin-destination survey (MOA 1996), trips from home to work account for the largest number (39%) of trips in Anchorage. As can be seen on the graphic below, which shows employment density as reported by the MOA computer traffic model, Anchorage has concentrated employment in several districts. Downtown and Midtown account for the majority of the jobs and work-related trips, followed by the University-Medical District.

In the same survey, the MOA conducted examined the origins and destinations of travel within the city. They estimated that more than 220,000 work trips per week are destined for North Midtown and Downtown. The primary origins for these trips were the Muldoon area and the Hillside. The graphics (left) show the origins of the work related trips to the North Midtown, Downtown, and the University area.

Employment Density (persons/acre)



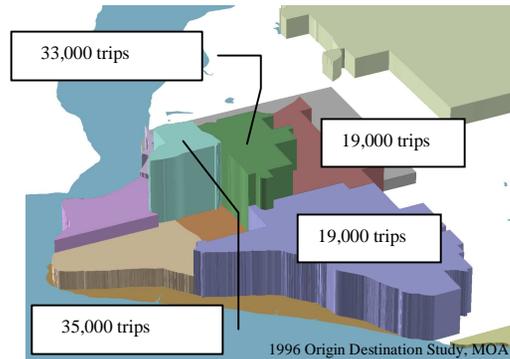
* Areas noted with call-outs above and throughout these pages represent the areas with the greatest number of trip origins. Only origins and destinations with the greatest numbers of trips are called out. As such, numbers do not add to the total.

Note: Employment densities reported by the MOA Anchorage Transportation Model for the airport and the universities do not register on the graphic to the right due to the size (acreage) of the analysis zone. The call-out boxes depict this employment information for these areas.

Shopping

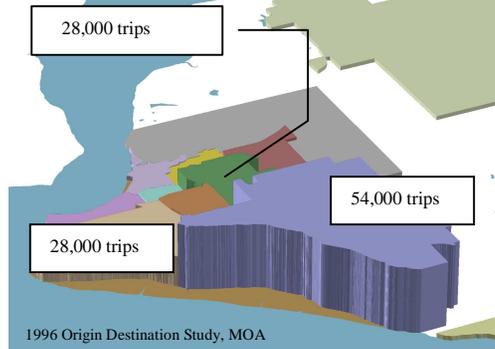
Where do people shop?

Origins of Shopping Trips to North Midtown



North Midtown accounts for 177,000 shopping trips per week: 35,000 trips originate from within the district, 33,000 are to and from the University area, and 19,000 trips are to and from the Hillside and Muldoon, respectively.

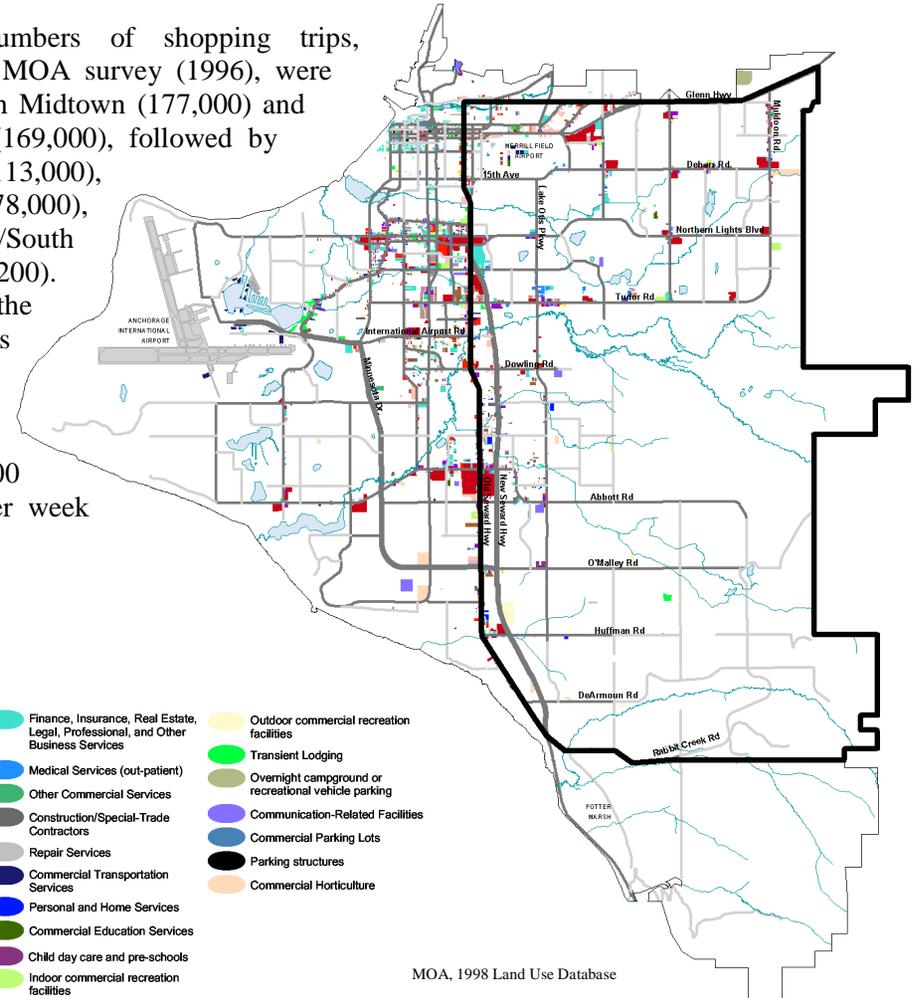
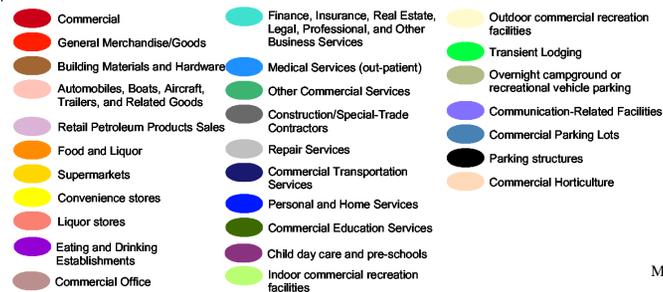
Origins of Shopping Trips to South Midtown



South Midtown accounts for 169,000 shopping trips per week: 54,000 trips are to and from the Hillside, 28,000 originate from within the district, 26,000 trips originate from Sand Lake, and 22,000 trips originate from the University area.

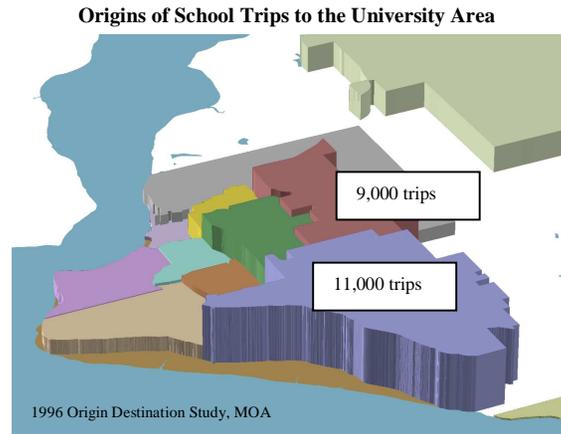
According to the 1996 MOA survey, shopping trips account for approximately 29% of the trips in Anchorage. The figure below shows the distribution of commercial land uses within the Anchorage area. These land uses are primarily located down the centerline of the Anchorage Bowl. Clusters of commercial land uses occur along Northern Lights and Benson Boulevard and the A-C couplet in North Midtown, and on Dimond Boulevard and the Old Seward Highway in South Midtown.

The greatest numbers of shopping trips, according to the MOA survey (1996), were destined for North Midtown (177,000) and South Midtown (169,000), followed by Muldoon (113,000), Mountain View (78,000), and Hillside/South Anchorage (63,200). Surprisingly, the Downtown area is not one of the larger shopping destinations, with only 63,000 shopping trips per week destined there.



School Trips

Where do people go to school?



The **University Area**, which contains both the University of Alaska Anchorage and Alaska Pacific University, is the destination area for the greatest number of school trips: 55,000 trips are made to and from this area each week. Approximately 11,000 trips are made to and from the Hillside/South Anchorage, followed by Muldoon with 9,000 trips. The University of Alaska Anchorage has approximately 12,800 students and 1,200 faculty and staff. Alaska Pacific University has approximately 700 students and 140 faculty and staff.

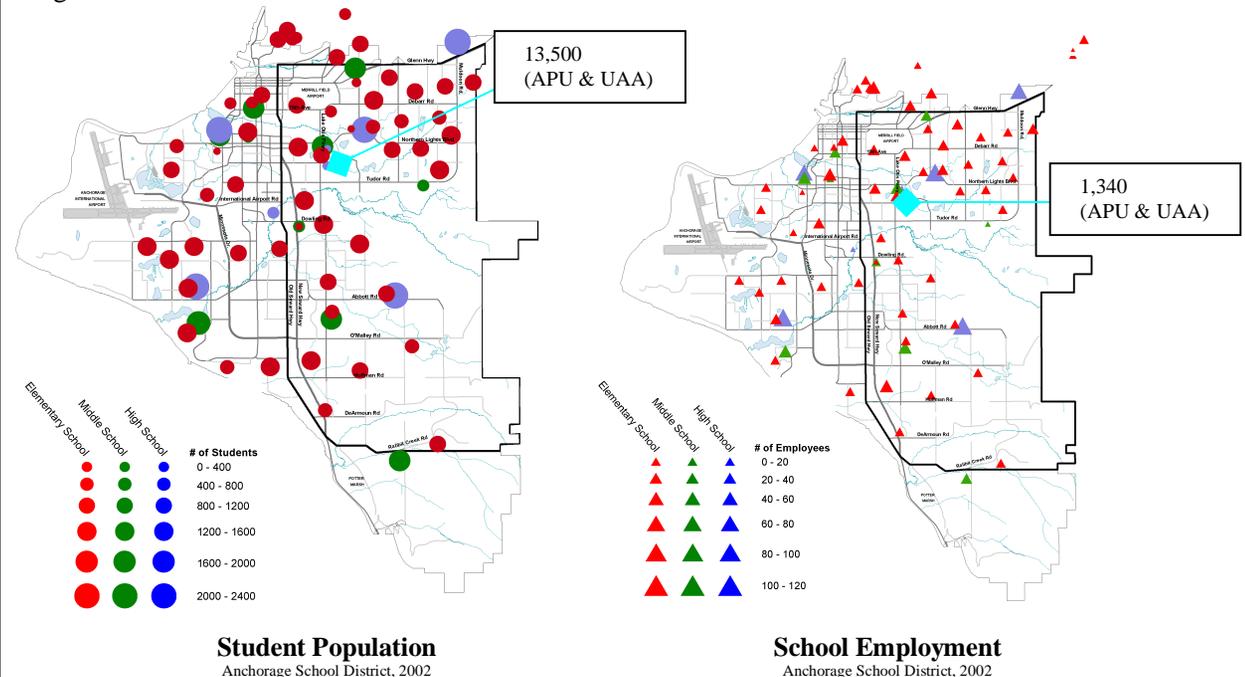
The next largest destination area is the Hillside/South Anchorage area with 14,000 trips, 12,000 of which originate within the area itself.

*Areas noted with call-outs above and throughout these pages represent the areas with the greatest number of trip origins. Only origins and destinations with the greatest numbers of trips are called out. As such, numbers do not add to the total.

Schools can be major traffic generators. In Anchorage, more than 46,000 students travel to and from home to Anchorage's 84 public and private schools each day. These students travel to school by a variety of means. The Anchorage School District (ASD) transports roughly 20,000 students to and from school on approximately 252 buses covering over 1,500 routes daily. The ASD buses are estimated to travel 3,000,000 miles annually. The remaining 26,000 students either walk or take a private vehicle to school (ASD 2001).

Anchorage has an open attendance policy, meaning that students are able to attend schools outside of their district. Approximately 4,100 elementary students and 770 middle and high school students attend schools outside their districts. Because bus transportation is only provided by the ASD for students to their "assigned school," this means that out-of-district students must be transported to school another way. These trips contribute to traffic during peak times of the day.

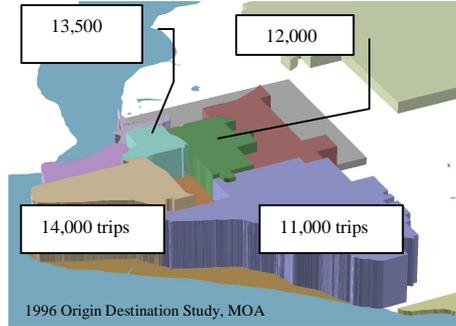
Trips by ASD employees (3,800) also contribute to the trips destined for each school. High schools (noted in blue, below) have the greatest number of employees (between 135 and 155 full-time employees). Elementary schools are noted below in red, and middle schools are noted in green.



Social & Recreational Trips

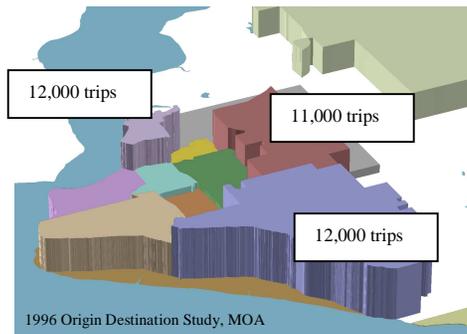
Where do we recreate?

Origins of Social/Recreation Trips to North Midtown



The greatest number of social/recreational trips is made to the **North Midtown** area (94,000 trips per week). These trips are made relatively uniformly from the other areas, with 14,000 to and from Sand Lake, 13,500 within North Midtown, and 12,000 to and from the University area each week.

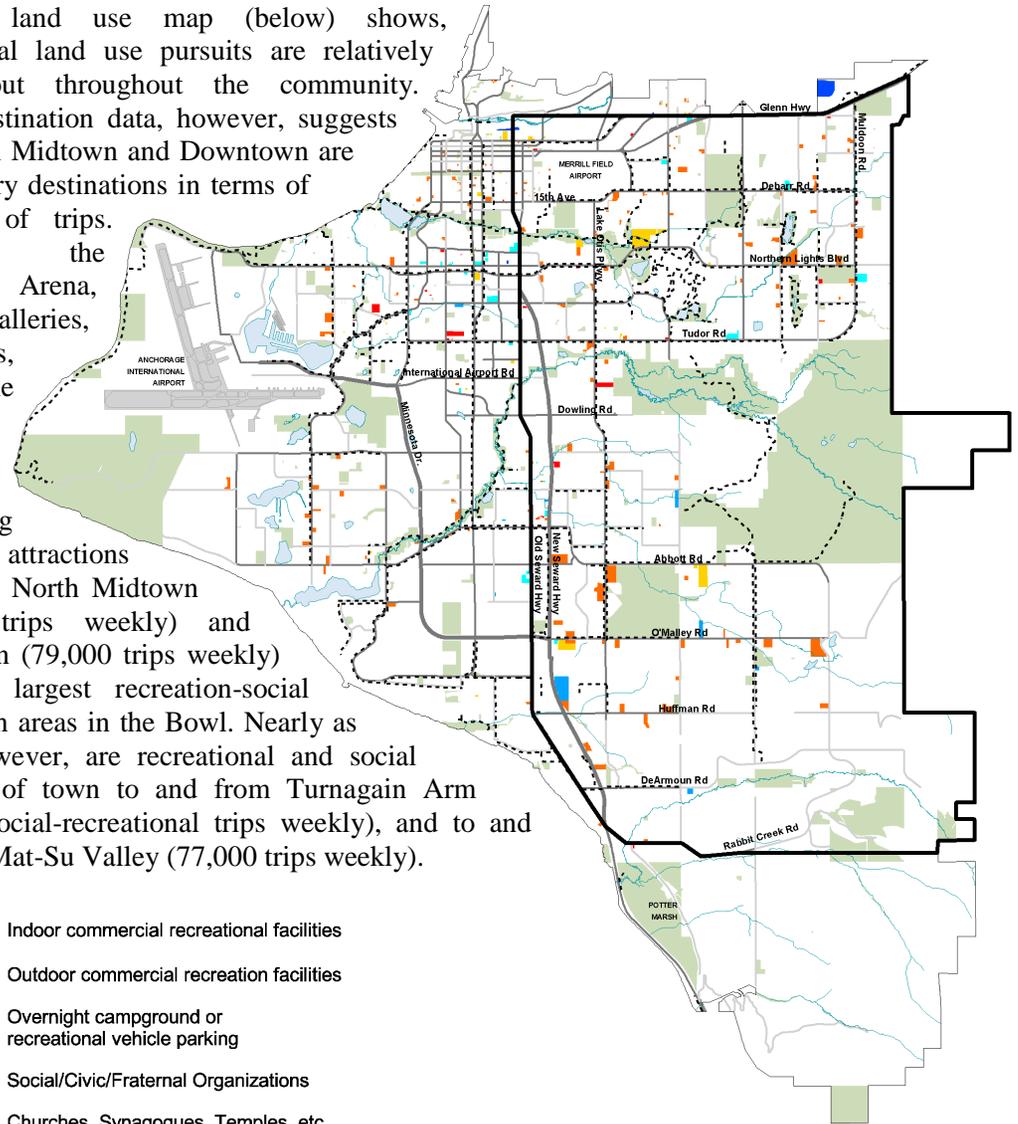
Origins of Social/Recreation Trips to Downtown



Downtown is the next largest social-recreational destination with 78,000 trips per week. Approximately 11,000 to 12,000 of these trips come to and from each of the Hillside, Downtown, and Muldoon areas each week.

As the land use map (below) shows, recreational land use pursuits are relatively spread out throughout the community. Origin-destination data, however, suggests that North Midtown and Downtown are the primary destinations in terms of numbers of trips. Theaters, the Sullivan Arena, art galleries, restaurants, and the Alaska Center for the Performing Arts are attractions that make North Midtown (94,000 trips weekly) and Downtown (79,000 trips weekly) the next largest recreation-social destination areas in the Bowl. Nearly as large, however, are recreational and social trips out of town to and from Turnagain Arm (73,000 social-recreational trips weekly), and to and from the Mat-Su Valley (77,000 trips weekly).

- Indoor commercial recreational facilities
- Outdoor commercial recreation facilities
- Overnight campground or recreational vehicle parking
- Social/Civic/Fraternal Organizations
- Churches, Synagogues, Temples, etc.
- Social Service Facilities
- Parks, open space, and recreation areas

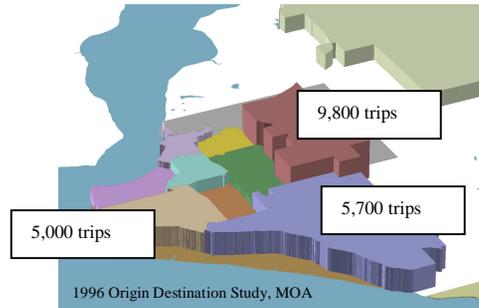


MOA, 1998 Land Use Database

Medical Facilities

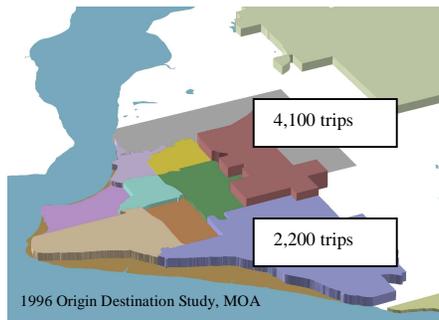
Where do we go for medical care?

Origins of Medical Trips to the University-Medical District



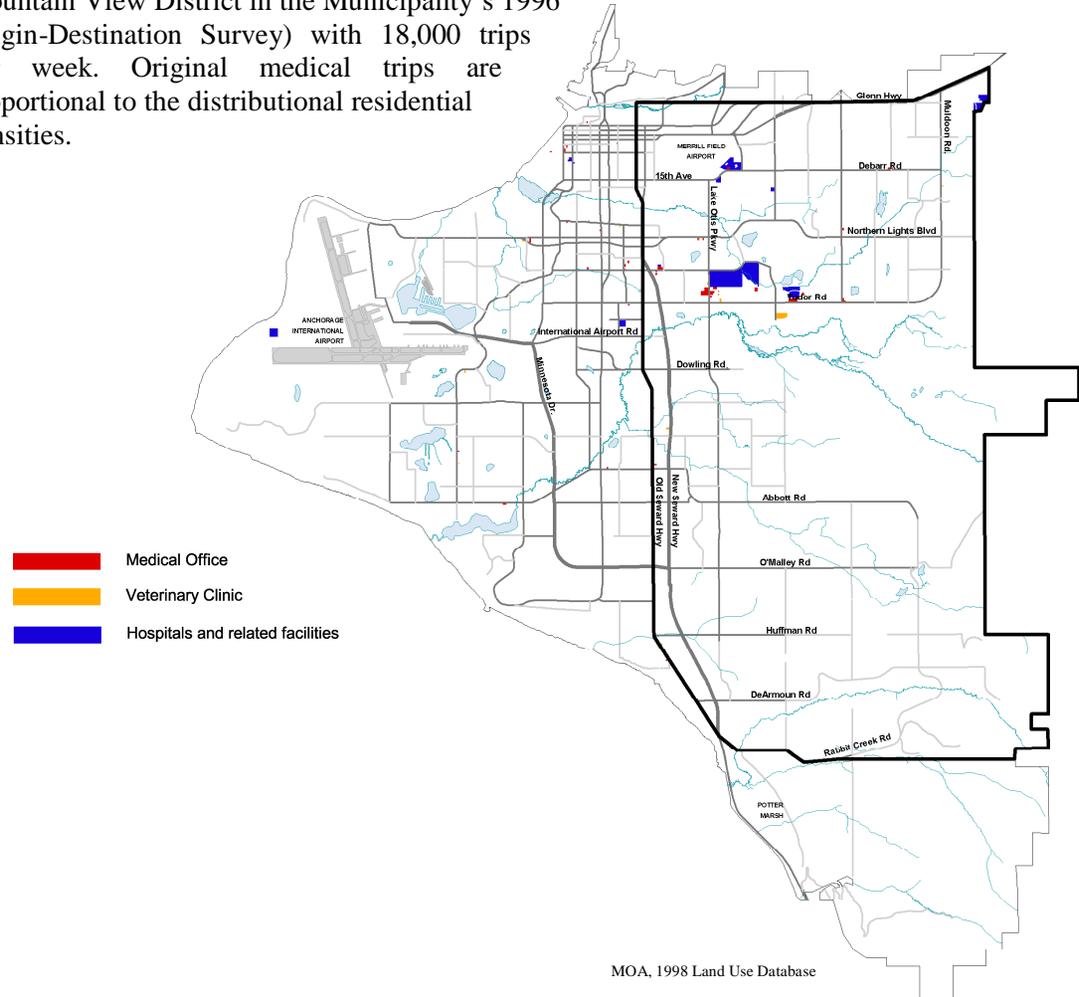
Medical trips destined for the **University-Medical District** originate from areas of heavy population, with 9,800 trips to and from Muldoon each week, 5,700 trips to and from the Hillside, and 5,000 trips to and from the Sand Lake area.

Origins of Medical Trips to the Mountain View (Alaska Regional) Area



The **Mountain View** area (Alaska Regional Hospital) is the second largest destination for medical trips, with the greatest numbers of trips coming to and from Muldoon (4,100 trips per week) and Hillside (2,200 trips per week).

While medical trips account for only about 3% of the trips made each week, these trips often represent some of the most important and time-critical trips. The majority of these trips are destined for the following areas of the community: (1) the University-Medical area (46,000 trips per week), which includes Providence Hospital, the Alaska Native Medical Center, and the ancillary medical support offices; and (2) the Alaska Regional Hospital area (classified in the Mountain View District in the Municipality's 1996 Origin-Destination Survey) with 18,000 trips per week. Original medical trips are proportional to the distributional residential densities.



Emergency Services

The mission of the Anchorage Fire Department (AFD) is “to safeguard our community by providing prevention, education, medical, fire, and rescue services that protect life, property, and the environment.” Each year the AFD responds to approximately:

- 305 house fires
- 15,000 emergency medical services calls
- 145 wild land fire incidents
- 515 hazardous materials incidents.

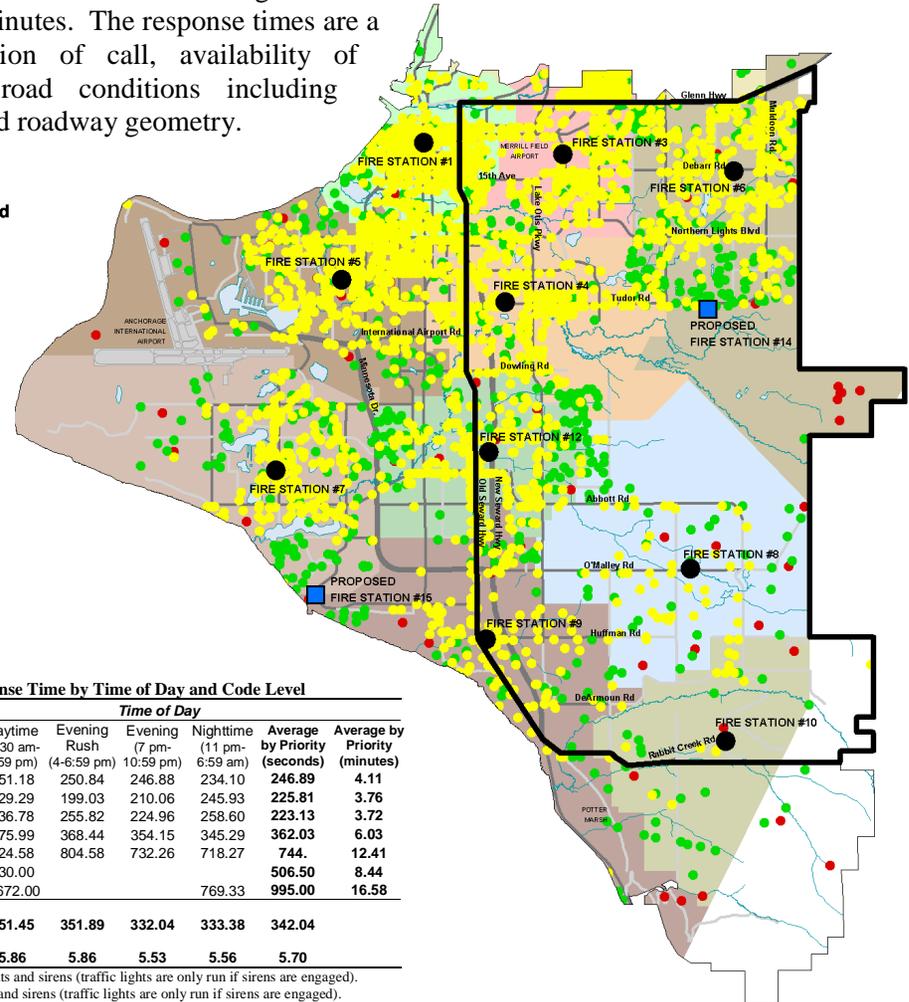
The goal of the AFD is to respond to all calls for emergency assistance within 360 seconds (6 minutes). The average response time during the last half of 2001 exceeded the goal—approximately 343 seconds (5.7 minutes). The table (right) shows the average response times by time of day and code level. The evening (7-10:59 pm) responses on average had the fastest response time (332 seconds) and the evening rush hour (4-6:59 pm) had the slowest response time (352 seconds).

Having a road network that supports the AFD is critical to its ability to get to each incident in a timely manner.

Another important aspect to our transportation system is the ability of emergency services personnel to get where they need to go—quickly. Based on the equipment currently in use, this means that good road accessibility is essential. The map below shows the actual response times of code-red calls within the Anchorage Bowl for the second half of 2001. The red dots indicate a response time for a call that took longer than the AFD’s goal of 6 minutes. The response times are a function of location of call, availability of equipment, and road conditions including traffic, weather, and roadway geometry.

Actual response times for Code Red and Baseline Red calls from June 2001 to Jan. 2002 data

- Less than 4 Minutes
- 4 to 8 Minutes
- Greater than 8 Minutes
- Existing Fire Stations
- Proposed Fire Stations



Average Response Time by Time of Day and Code Level

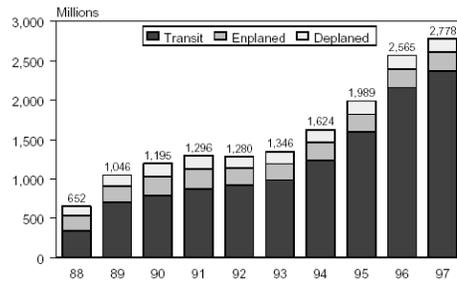
	Time of Day					Average by Priority (seconds)	Average by Priority (minutes)
	Morning Rush (7-9:29 am)	Daytime (9:30 am-3:59 pm)	Evening Rush (4-6:59 pm)	Evening (7 pm-10:59 pm)	Nighttime (11 pm-6:59 am)		
Code Red	254.74	251.18	250.84	246.88	234.10	246.89	4.11
Baseline Red	252.05	229.29	199.03	210.06	245.93	225.81	3.76
Code Red/Yellow	82.25	236.78	255.82	224.96	258.60	223.13	3.72
Code Yellow	361.50	375.99	368.44	354.15	345.29	362.03	6.03
Baseline Yellow	818.68	724.58	804.58	732.26	718.27	744.	12.41
Call on Hold	583.00	430.00				506.50	8.44
Advised Incident		1,672.00			769.33	995.00	16.58
Average by Time of Day (seconds)	333.54	351.45	351.89	332.04	333.38	342.04	
Average by Time of Day (minutes)	5.56	5.86	5.86	5.53	5.56	5.70	

Note: Code Red: Responders use lights and sirens (traffic lights are only run if sirens are engaged).
 Baseline Red: Responders use lights and sirens (traffic lights are only run if sirens are engaged).
 Code Red/Yellow: Used only for fire incidents—the first responder is code red; all others are code yellow.
 Code Yellow: Responders follow all road and traffic rules.
 Baseline Yellow: Responders follow all road and traffic rules.
 Source: Municipality of Anchorage, 2002

Anchorage Fire Department, 2002

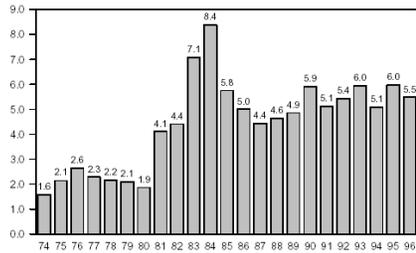
Freight Distribution

Airline Cargo (Millions of Pounds)
Anchorage International Airport - FY 1988-1997



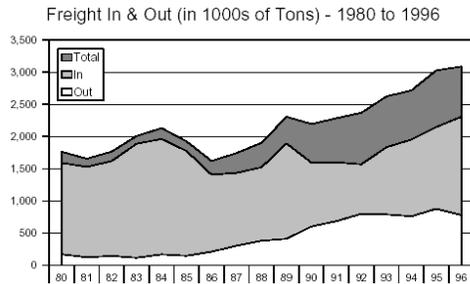
Source: Anchorage International Airport. (Revised 9/11/07)

Alaska Railroad Freight
Annual Tons (in Millions) Hauled - 1974-96



Source: Alaska Railroad Corporation. (Revised 5/14/97)

Port of Anchorage
Freight In & Out (in 1000s of Tons) - 1980 to 1996

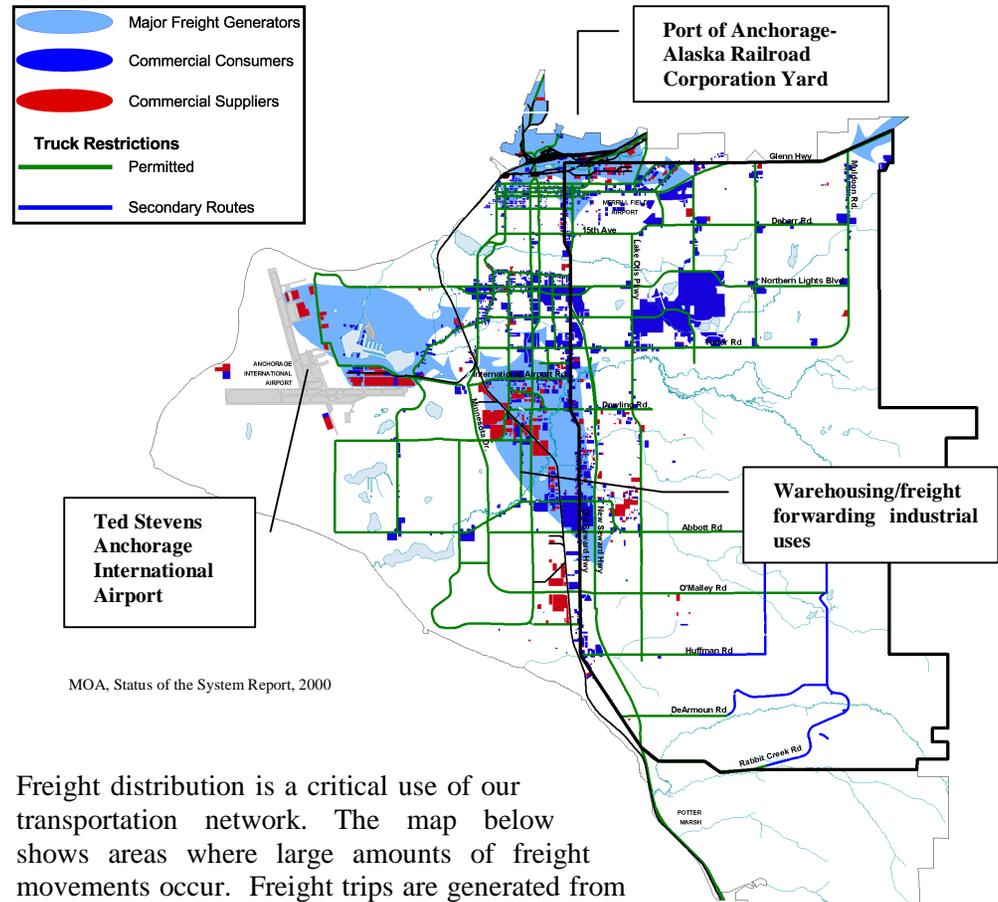


Source: Anchorage Indicators, MOA, 1997

Ted Steven Anchorage International Airport is the #1 airport in the country in terms of landed weight (www.dot.state.ak.us/anc).

In 1998, the Alaska Railroad moved 614,000 passengers and 5,445,000 tons of freight over 525 miles of track. (www.arrc.com).

The Port of Anchorage serves 80% of Alaska's populated area and handles over 90% of all consumer goods sold in the railbelt. (www.ci.anchorage.ak.us)



MOA, Status of the System Report, 2000

Freight distribution is a critical use of our transportation network. The map below shows areas where large amounts of freight movements occur. Freight trips are generated from three primary areas of the Anchorage Bowl, corresponding with major transportation/intermodal facilities; (1) Port of Anchorage-Alaska Railroad Corporation Yard in the Ship Creek Valley (2) Ted Stevens Anchorage International Airport, and (3) warehousing/freight forwarding and industrial uses in South Midtown. Freight arrives from outside Anchorage via ship, rail, or air, and is redistributed by truck from warehousing and transportation industrial sites (red parcels) to commercial locations throughout the city (blue parcels) and southcentral Alaska on the permitted truck routes (blue and green roads).

4.0 Mode

Introduction

How do we get where we are going?

As indicated by Anchorage 2020 (p. 64), the last two elements in understanding transportation-land use problems and solutions are: “What choices are available?” and “What routes are available?” In other words, what are the “possible modes of transportation (roads, transit, trails, freight routes) between points of origin and destination” and what “transportation system or network of roads, transit, trails, and freight routes between points of origin and destination” exist? This section of the report defines the means (choices) we have to get to the places we need to go to and the routes that are available. As indicated in the adjacent graphics, Anchorage primarily uses automobiles for travel, but we also rely on transit, biking, walking, and skiing.

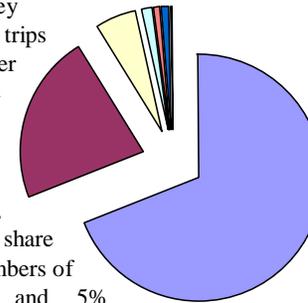
Anchorage 2020 calls for “an efficient transportation system that offers affordable, viable choices among various modes of travel that serve all parts of the community” (p. 38).

Principal Means of Travel to Work - Nationally	
Automobile	87.7
Drives self	78.2
Carpool	9.4
Public transportation ^a	4.9
Taxicab	0.1
Bicycle or motorcycle	0.6
Walks only	3.1
Other means ^b	0.8
Works at home	2.8

[http://www.bts.gov/btsprod/nts/\(1999\)](http://www.bts.gov/btsprod/nts/(1999))

In March 2001 Anchorage residents were asked what mode of travel they use to make the trips they make. Over two-thirds of the respondents (69%) indicated they drive by themselves to work, home, school, or shopping. 22% share rides with other members of their households, and 5% typically share a ride with another person. In other words, 96% of the winter trips are made by driving.

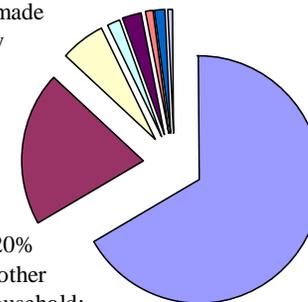
Principal Means of Travel - Anchorage (Winter)



- Drive Alone (69%)
- Share Ride with a Household Member (22%)
- Share Ride with Other Person (5%)
- Ride the Bus (1%)
- Bike/Ski (0%)
- Walk (1%)
- Other (1%)
- Don't Know (0%)

In summer, residents are slightly more likely to get out of their cars, with only 92% of the trips made by car. Approximately 66% of the respondents indicated they drive by themselves to work, home, school, or shopping; 20% share rides with other members of their household; while 6% typically share a ride with another person.

Principal Means of Travel - Anchorage (Summer)



- Drive Alone (66%)
- Share Ride with a Household Member (20%)
- Share Ride with Other Person (6%)
- Ride the Bus (2%)
- Bike/Ski (2%)
- Walk (1%)
- Other (1%)
- Don't Know (0%)

The remainder of this section explores each of the modes and routes available in order of their usage by Anchorage residents.

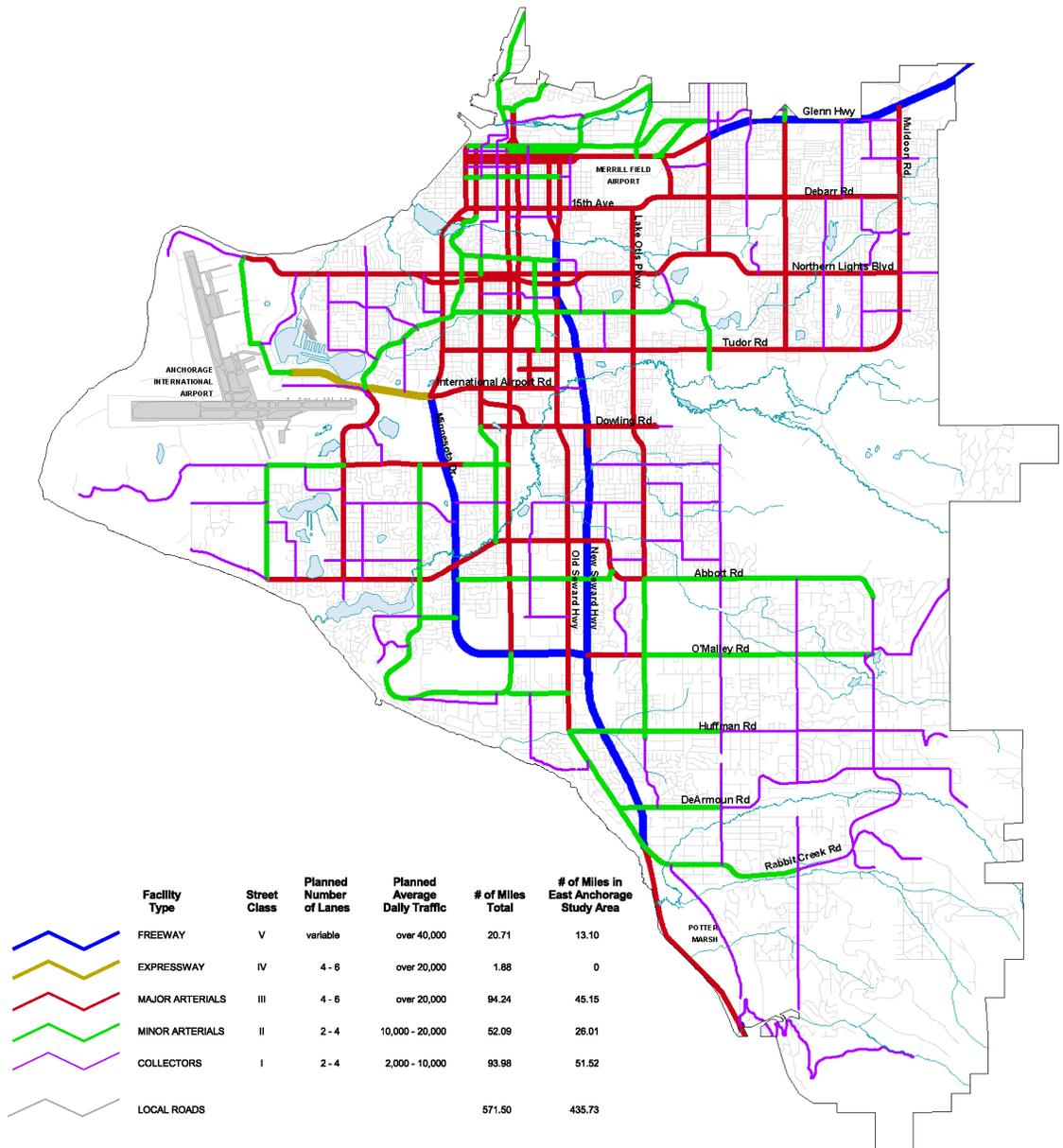
Road Network

Roadway Classification

The majority of our trips are made by automobile. This section explores our road network to show what routes we use to make those trips.

Roadways are classified into functional classes based on a system designed to accommodate distinct travel movements. According to the American Association of State Highway and Transportation Officials (AASHTO), the distinct movements include main movement, transition, distribution, collection, access, and termination. Main movements generally occur on freeways or expressways. When approaching destinations from the freeway, vehicles reduce speeds on the freeway ramps (transitional movement) and enter an arterial (distribution) that brings the vehicle closer to the vicinity of their destination. The trip continues onto the collector roadway system that enters the neighborhood, where it connects with local access roads and provides access via driveways to individual parcels (AASHTO 1990).

Each phase of the trip should be on a roadway that is specifically designed for its function. Problems can occur where roadways are not designed for the functions they are being called upon to accommodate or when the same roadway is trying to accommodate two distinct functions (e.g., a high volume major arterial with direct access to businesses). The adjacent map shows the classification system on the Anchorage road network.



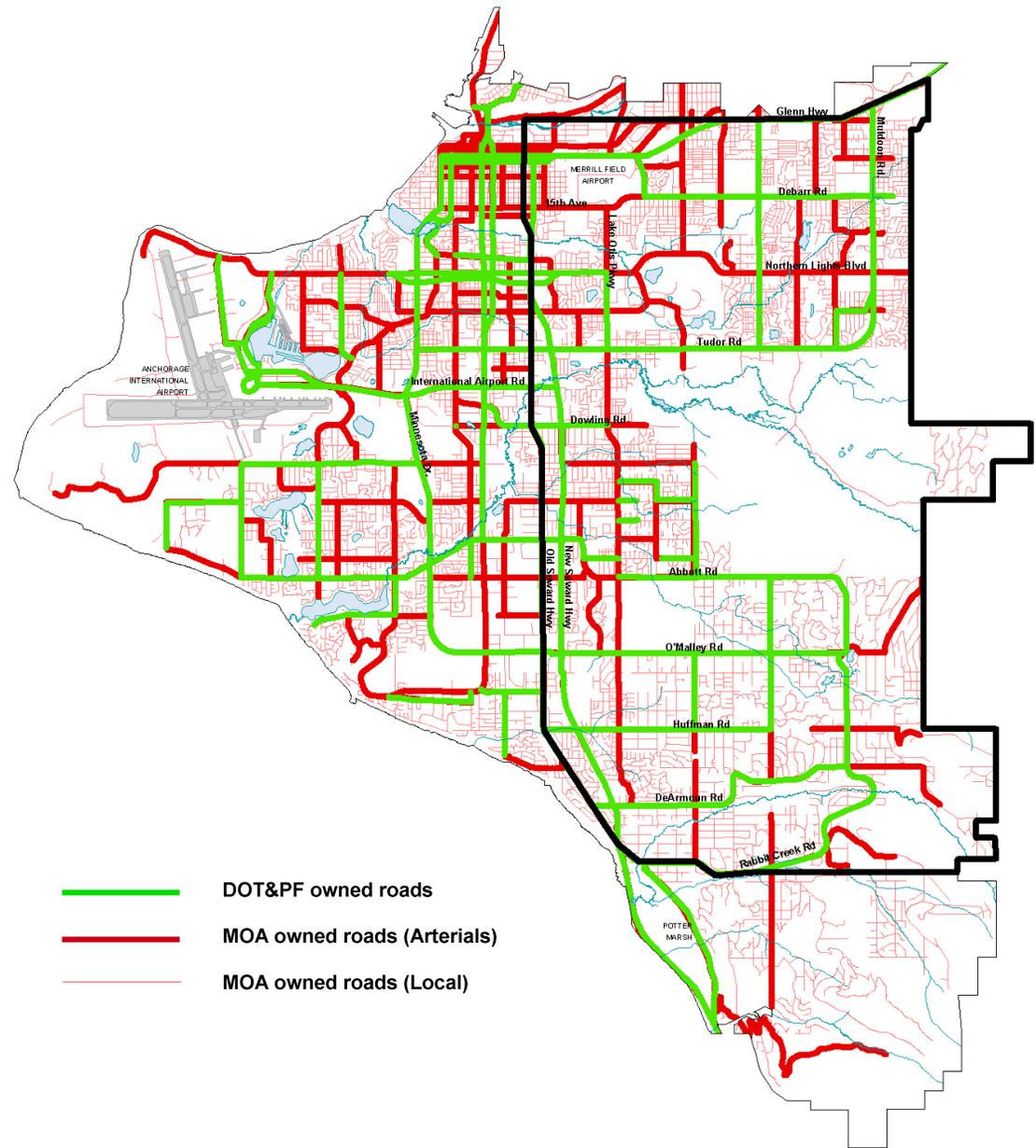
Facility Type	Street Class	Planned Number of Lanes	Planned Average Daily Traffic	# of Miles Total	# of Miles in East Anchorage Study Area
 FREEWAY	V	variable	over 40,000	20.71	13.10
 EXPRESSWAY	IV	4 - 6	over 20,000	1.88	0
 MAJOR ARTERIALS	III	4 - 6	over 20,000	94.24	45.15
 MINOR ARTERIALS	II	2 - 4	10,000 - 20,000	52.09	26.01
 COLLECTORS	I	2 - 4	2,000 - 10,000	93.98	51.52
 LOCAL ROADS				571.50	435.73

MOA, Official Streets & Highways Plan, 2000

Roadway Ownership and Management

In Anchorage, the Alaska Department of Transportation and Public Facilities (DOT&PF) owns more miles of highway than a typical state Department of Transportation in a city the same size in the Lower 48. Many arterials that would normally be owned by the local government in other states are owned by the DOT&PF in Anchorage.

Historically, all of these local arterials were developed by the Alaska Road Commission, which had the resources to build and maintain them at the time. When Alaska became a state in 1959, the Alaska Omnibus Act transferred all the roads within the jurisdiction of the Alaska Road Commission to the Alaska Department of Highways. Since that time, the Municipality has not assumed ownership of many of the roads that would normally be under local jurisdiction. As a result, the DOT&PF continues to operate and maintain the vast majority of Anchorage's arterial and collector road network.

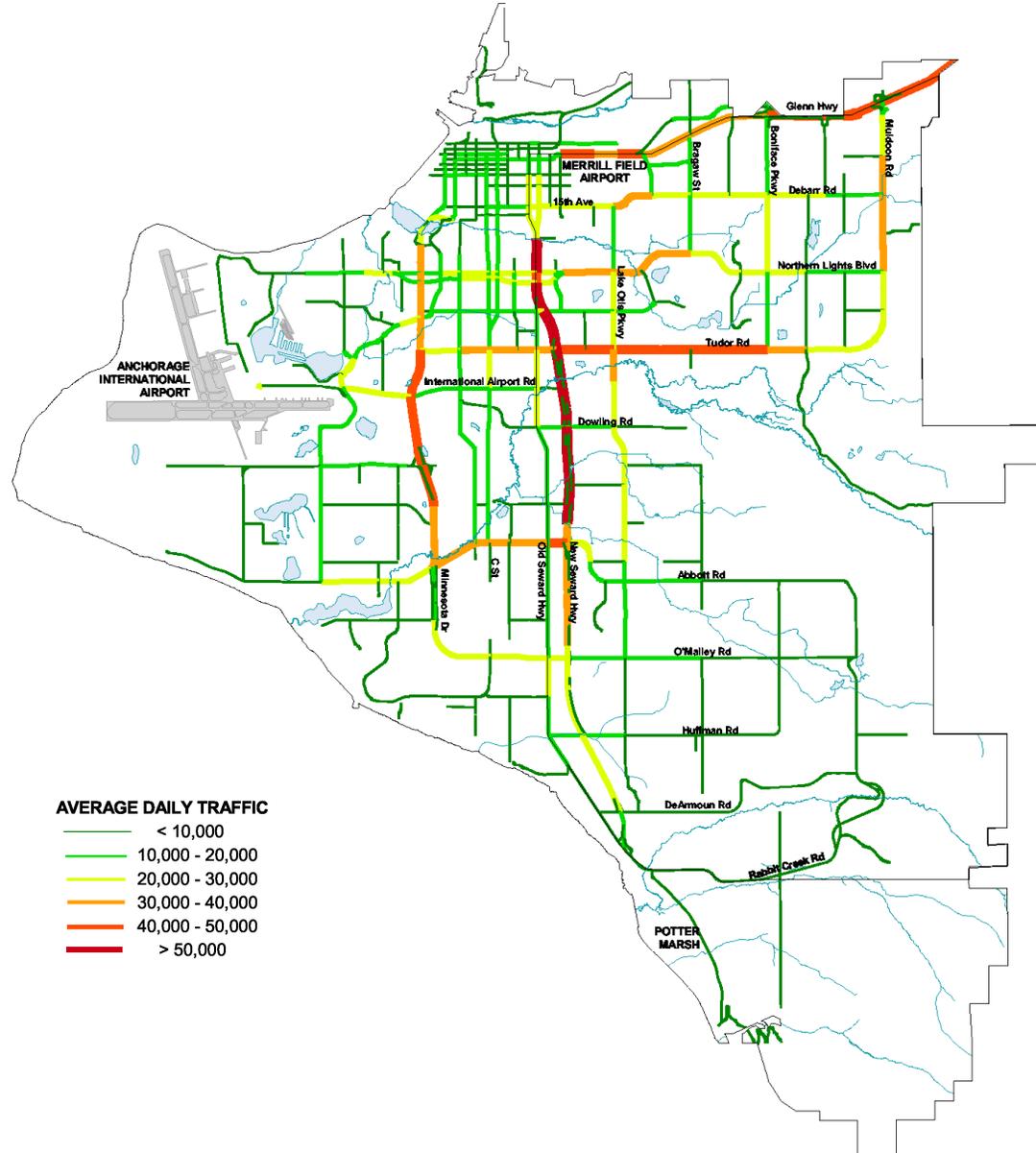


Average Daily Traffic

Within the project study area, average daily traffic counts are highest on the Glenn and Seward Highways, Tudor Road, Northern Lights Boulevard and Muldoon Road. These roadways are designated arterials that are intended to serve “main movements” in transporting people from where they live (Matanuska-Susitna Borough, Muldoon area, and Hillside), to the places they work (Downtown, North Midtown, and the University area) and shop (North and South Midtown). However, these roads also perform the function of collectors, as well as to allow direct access to parcels.

To a lesser extent, DeBarr Road, Lake Otis Parkway, Muldoon Road, O’Malley Road, and Abbott Road also carry significant amounts of traffic. These roads function more as distribution type arterials and collectors, but also allow direct access to parcels.

Note: Average daily traffic represents the average number of cars traveling on a given roadway segment each day. It is calculated by taking the total traffic volume during a given period (greater than 1 day and less than 1 year) divided by the number of days in that period.



DOT&PF Annual Traffic Reports 1998, 1999, 2000

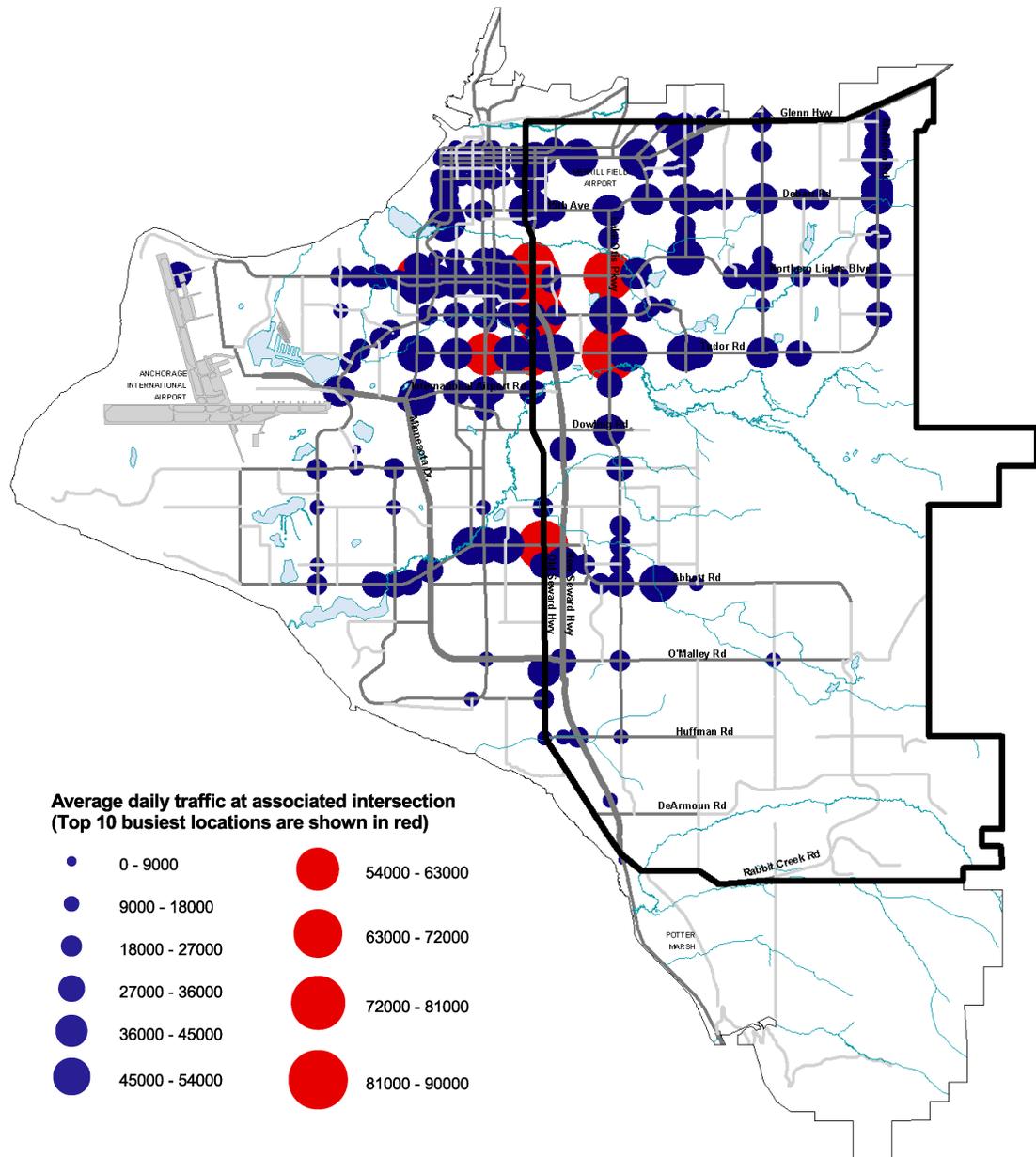
Intersection Traffic Volumes

The land use development pattern in the Anchorage Bowl has a profound and direct effect on the geographic distribution of traffic. Because the major employment centers are located in Downtown, Midtown and the University area, and the major residential areas are in Muldoon and on the Hillside, we experience high volumes of Hillside traffic flowing north-south and high volume in the Muldoon area traffic flowing east-west.

To a lesser, but important extent, areas outside the study area contribute to the traffic patterns. Sand Lake and Southwest Anchorage traffic contribute to the north-south flows, and Eagle River/Matanuska-Susitna Borough traffic contributes to the east-west flows.

In Anchorage, the highest-count intersections are where arterials serving major north-south and east-west traffic flows cross (red dots). The majority of these intersections are in Midtown, on the west edge of the study area, primarily on four roadways: Lake Otis, Seward Highway, Tudor Road, and Northern Lights-Benson Boulevards. There are some localized high-count intersections along Dimond Boulevard, but these counts are not as high as on the midtown streets.

Note: Intersection volumes take into consideration traffic from both directions and have been averaged for the years 1998, 1999, and 2000.



MOA Annual Traffic Reports, 1998, 1999, and 2000

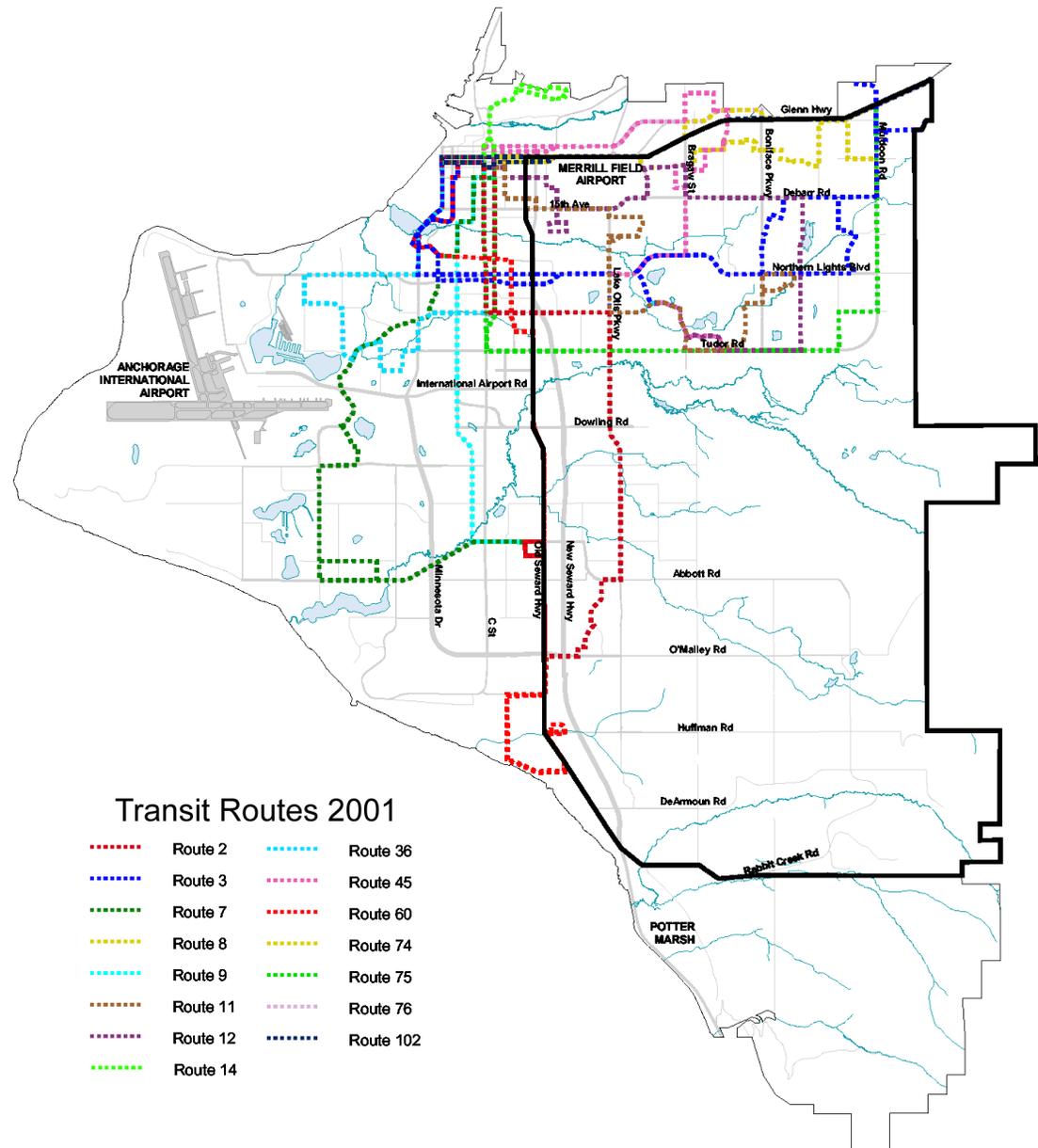
Transit Network

Over the years, public investment in public transportation has accomplished many community goals: improved air quality and energy efficiency, transportation options for citizens without access to an automobile, and mobility for passengers with special needs. As we look at the expected population and economic growth in the Bowl over the next 20 years, the public transportation system gives us an opportunity to provide mobility for many residents in the East Anchorage project area.

Public transportation in the MOA consists of three services: People Mover bus fixed route, Share-A-Ride carpool and vanpool service, and AnchorRIDES paratransit service. Each of these is discussed briefly below.

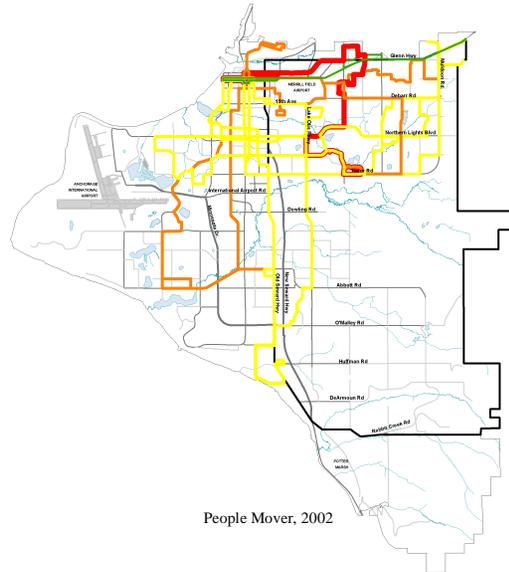
People Mover

Anchorage Public Transit operates a standard bus service on fixed routes called “People Mover.” With a total fleet of 50 standard sized buses and 18 scheduled service hours per day, a foundation for growth in service delivery and patronage is available. The current service offered by three express bus routes and 15 urban fixed routes support the mobility needs of 11,480 peak period riders. If these transit riders used cars instead of People Mover, about 10,043 more automobile trips a day would be on the streets in the Bowl.



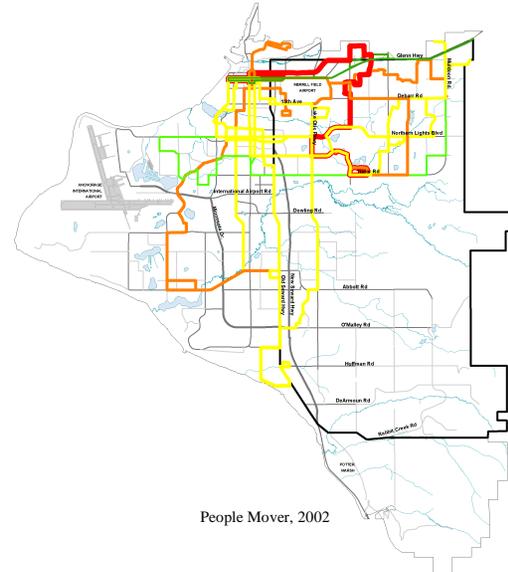
Transit Ridership – People Mover Transit System (January 2000 Data)

Average Weekday Ridership



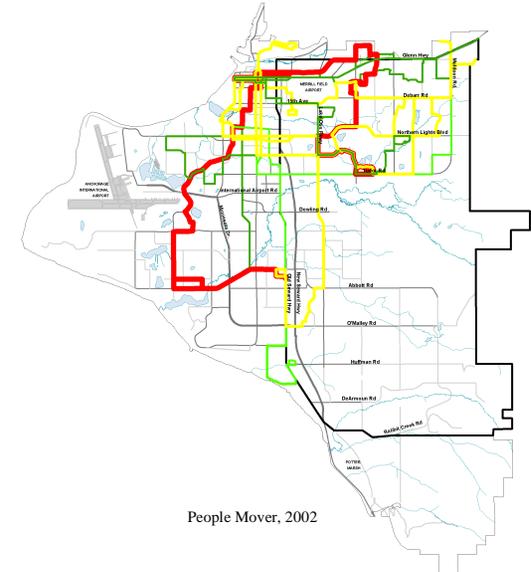
People Mover, 2002

Average Saturday Ridership



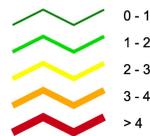
People Mover, 2002

Average Sunday Ridership



People Mover, 2002

Average # of Passengers per mile



Bus transit, carpooling, and vanpooling programs contribute to a substantial reduction in the number of vehicle miles traveled on the roadway system, with a combined reduction of over 23 million vehicle miles traveled per year.
– Status of the System Report, MOA 2001

People Mover has been designed to support the travel needs of the Municipality’s service area. The trips from concentrated areas are tied to employment and shopping centers, as well as government, hospital, education, and other important institutional facilities, which guarantee responsiveness to user needs. Those routes with the largest People Mover ridership connect the areas with the highest residential densities and the highest employment densities. While People Mover is intended to provide other services throughout the day, its most captive market for riders is the peak hour home-to-work trip. This is also the trip where People Mover can make the most substantial contribution to transportation conditions in the Bowl.

People Mover received public comment on a Bus Route Restructuring Plan concept, which would re-schedule and re-route multiple routes in the system around five transit centers and would increase both peak and off-peak hour frequencies. For example, the schedules of several bus routes terminating at the Downtown Transit Center would be modified to provide a more reliable transfer experience.

Share-A-Ride Service

Another component of Anchorage’s public transit system is the Share-A-Ride Program. This program is a carpool and vanpool program backed by federal funding and matching local dollars (federal funds are used for capital improvements, while local funds are used for operation). The goal of the program is to encourage people to reduce the number of commuters who drive alone. The Share-A-Ride Program runs throughout Anchorage, and includes Girdwood, Palmer, and Wasilla. The program matches commuters (who are in the Share-A-Ride database) with others who have similar destinations and schedules. The incentives for participating in this program include helping to reduce traffic congestion and improve air quality, as well as to reduce commuting costs (gas and vehicle wear-and-tear).

Share-A-Ride Program Participation				
	Participants in Share-A-Ride Database	Mat-Su Valley Participants	Eagle River, Chugiak, Peters Creek Participants	Anchorage and/or Girdwood Participants
Total applicants	5,006	1,161	662	3,183
Total carpoolers	862	98	165	599
Total carpools	424	45	83	296
Total vanpoolers	246	198	1	47
Total vanpools	18	15	0	3

Source: Share-A-Ride Program May 2001

AnchorRIDES Paratransit Service

This service is a demand-response, curb-to curb transportation system for senior citizens and for people with disabilities. Riders must pre-qualify to participate in this program. The majority of funding for this program comes from local taxes and from the Alaska Commission on Aging, but rider fares, donations, and Medicaid also pay for the service.

Pedestrian Network

Our sidewalks, crosswalks, and trails systems play a vital role in serving travel needs and meeting land use goals in East Anchorage. Many citizens view walking as an important recreational and health-related activity. In neighborhoods, sidewalks connect residents to schools, parks, and each other's homes and help to define the neighborhood's identity. Transit patrons need sidewalks to connect them to bus stops and their destinations.

A well-designed sidewalk environment contributes to the economic development and enhancement of commercial areas. For example, the success of downtown Anchorage's merchants and property values is largely dependent on storefront window shopping and strolling by pedestrians, and the Downtown area is clearly best appreciated on foot.

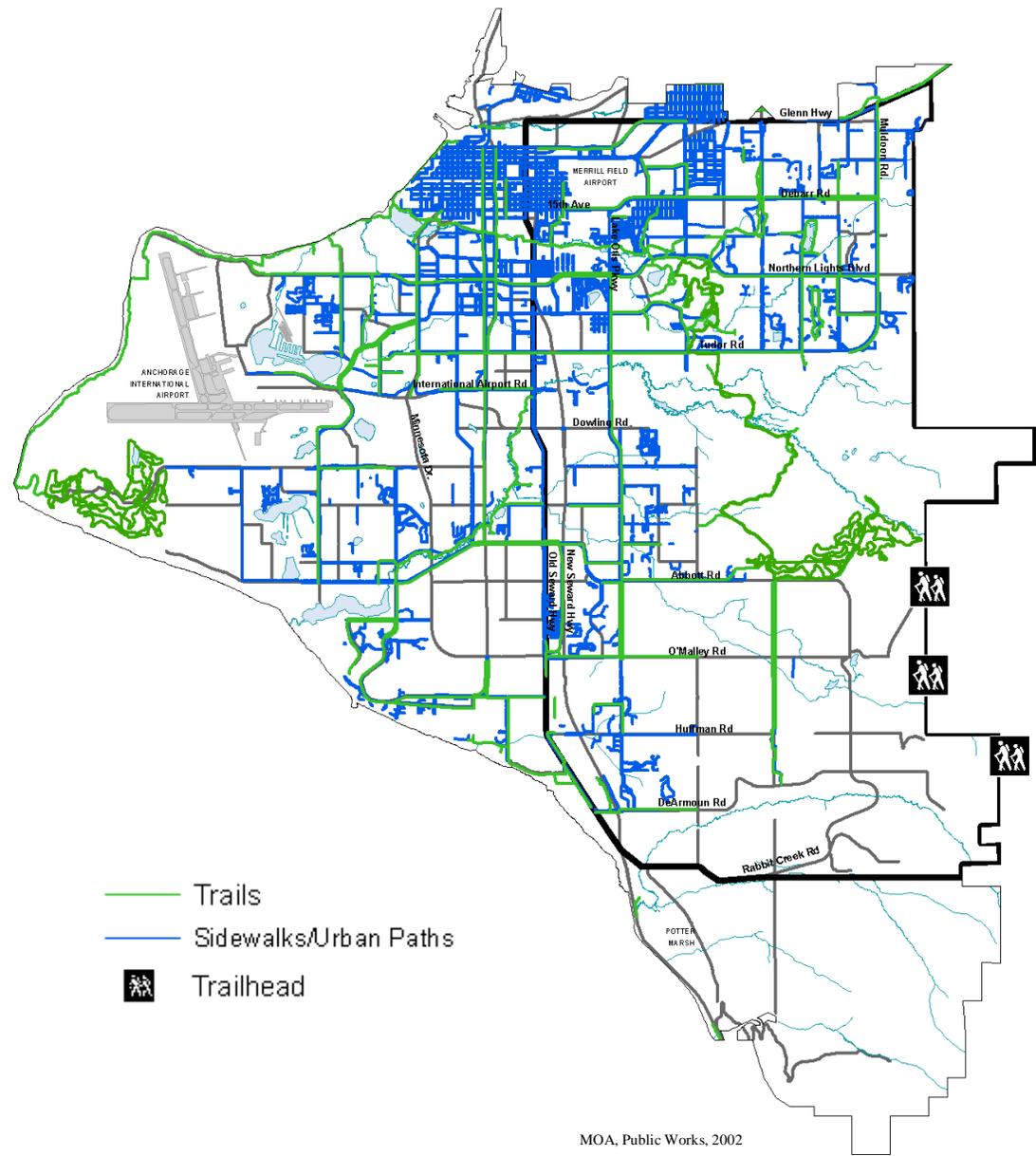
Because travel by foot does not contribute to peak hour transportation conditions at congested locations, the pedestrian system is often overlooked when evaluating how to resolve problems at those locations. Building an interconnected pedestrian system, however, can be a strategic component of future transportation plans because it actively supports transit passenger needs and provides an additional travel option. In addition to building these pedestrian connections, it is important that our zoning codes and subdivision regulations encourage land uses conducive for developing a more walkable environment. Creating walkable land uses through land use regulation should be integrated into the overall transportation strategy.

Pedestrian System Characteristics

East Anchorage’s pedestrian system includes 219 miles of sidewalks and 74 miles of recreational trails. In combination with sidewalks that provide access from parking areas to office and government buildings, hospitals, schools, stores, restaurants, and cultural institutions, pedestrian systems are a part of every traveler’s journey.

If we compare the residential land use map with the location of sidewalk and trail systems, it is clear that our residential neighborhoods are lacking sidewalks. Older neighborhoods (Downtown, Fairview, Mountain View, Airport Heights, and South Addition) have relatively complete sidewalk systems. Other areas have only sporadic sidewalk development. Areas on the Hillside are completely lacking any sidewalk development.

The constraint to pedestrian travel is generally associated with a lack of connectivity between sidewalks. Many trips that could begin or end on a sidewalk do not have the connections necessary to complete the person’s entire trip. In some cases where sidewalks do not continue, pedestrians walk in the street, on dirt paths, or on private property – often an unsafe practice – to complete their trips.



5.0 Problems and Needs

A key objective of this phase of the study was to identify transportation problems and needs that should be resolved to improve accessibility, mobility, safety, and livability, and deal with congestion in East Anchorage.

Roadways

“Provide a comprehensive roadway network that moves people and goods in an economical and safe manner.” – Anchorage Long Range Transportation Plan, 2001

In any planning study, framing the issues through problem identification is critical. How problems are framed shapes the nature of the solutions and the criteria upon which those solutions will be judged. The information contained in this section of the report represents only one source of information on potential problems—those identified from a review and analysis of data on existing conditions. Other potential problems are identified during other phases of the study, namely, through a forecast and analysis of future conditions, and from residents, elected officials, and other users of the current transportation system.

As mentioned earlier, Anchorage’s road network is the system carries the vast majority of our trips. Given that 92% to 96% of all trips occur in private automobiles on the road network, and all transit trips take place on the road network, it is not surprising that areas of our road network is congested. In Anchorage, congestion primarily occurs during the peak hours of commute traffic on weekday mornings and evenings. A simplistic definition of the problem might be “too many cars in one place at the same time.” But upon further examination, the causes of the congestion are more complex. Population growth and an increased number of vehicles, while contributing factors, are not by themselves the cause. Understanding how and where growth has occurred helps us to understand why we experience congested conditions in the Anchorage Bowl.

Anchorage can be thought of as an island approximately 10 miles wide from east to west with a bridge at the northeast (the Glenn Highway to the Mat-Su Borough) and southeast (the Seward Highway to Turnagain Arm). In the middle, the island is effectively 2 miles wide, pinched between the airport on the west and Far North Bicentennial Park on the east, forming an hourglass shape. For north-south travel, this shape compresses 10 miles of land uses and trip generators down to 2 miles. Our major destination land uses are on the north side of the hourglass in Midtown and Downtown, largely along the west side of the centerline. The location of residential areas northeast and southeast requires crossing east-west across the centerline. In addition to the conflicts set up by these crossing traffic patterns, our major commercial destinations lie along the same arterial road network used to make these trips. Such a pattern requires our roads to function both for through traffic and local access to commercial property.

Congestion is a result of this form.

Congestion - Level of Service

Level of service refers to a standard measurement used by transportation officials which reflects the relative ease of traffic flow on a scale of A to F, with free-flow being rated LOS-A and congested conditions rated as LOS-F (FHWA.).

“Improve non-project arterial intersection capacity by 15 percent for at least 5 intersections per year.” - Anchorage Long Range Transportation Plan, 2001.

“Provide a roadway network that operates at a Level of Service (LOS) ‘D’ or better for 95 percent of the projected 2023 travel demands.” - Anchorage Long Range Transportation Plan, 2001.

In order to describe the operational efficiency of a given intersection or roadway segment, transportation planners have defined a range of six qualitative service levels, tied to six quantitative measurements, to characterize traffic conditions called “level of service.” This section looks at two ways of measuring the congestion on our roadways: (1) intersection level of service and (2) roadway segment level of service.

One measure for intersection level of service (LOS) is the average stopped delay for the vehicles using the intersection. The adjacent table (right) shows standard level of service criteria established by the Highway Capacity Manual.

LOS Criteria for Signalized Intersections		
LOS	Average Stopped Delay (Sec./Vehicle)	Description
A	<5.0	Intersections operate with very low delay.
B	5.1-15.0	More vehicles stopped than with LOS A.
C	15.1-25.0	Number of vehicles stopped is significant, though many pass through the intersection without stopping.
D	25.1-40.0	Many vehicles stop, and proportion of vehicles not stopping declines.
E	40.1-60.0	Considered by many agencies to be the limit of acceptable delay.
F	>60	Considered to be unacceptable to most drivers.

Source: 1998 Highway Capacity Manual & MOA, Status of the System Report, 2001

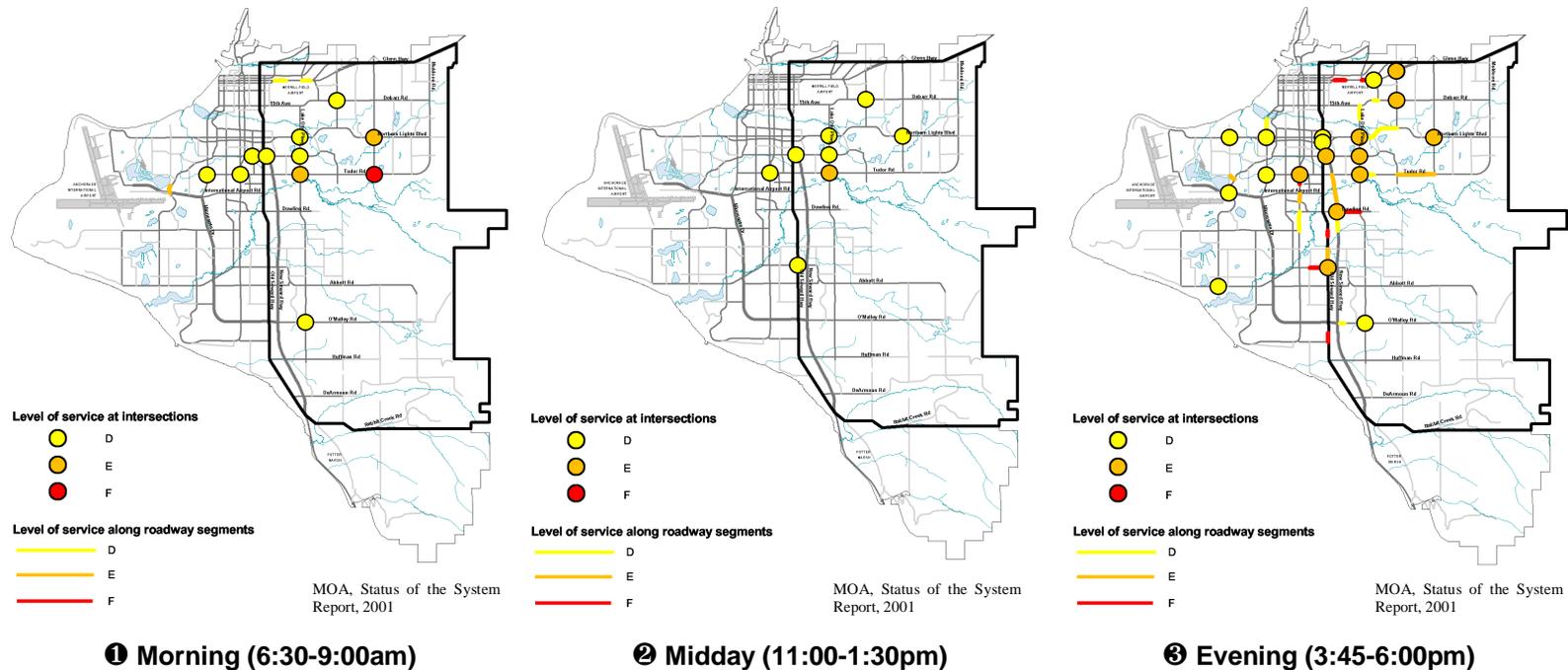
Roadway level of service can be measured in terms of the volume of traffic it is carrying relative to its capacity to handle that volume. The table below describes the levels of service classification for road segments.

LOS C has generally been established as the standard for design of transportation facilities for peak hour traffic conditions. However, LOS D is often accepted in urbanized areas (such as Anchorage) where the costs

Roadway Segment Level of Service		
LOS	Volume/Capacity Ratio	Description
A & B	< 0.50	Primarily operates at free-flow or reasonably free-flow speeds.
C	0.51-0.75	Provides for flow with speeds still at or near the free-flow speeds. Ability to maneuver is more restricted than LOS B. Motorist will experience tension while driving.
D	0.76-0.85	Borders on a range in which small increases in flow may cause substantial increases in delay.
E	0.86-1.00	Operates at capacity and is characterized by significant delays.
F	>1.00	Vehicular flows break down and result in extremely low speeds.

Source: 1998 Highway Capacity Manual & MOA, Status of the System Report, 2001

or impacts of providing LOS C are prohibitive. Levels E or F indicate problem areas and are depicted on the adjacent map. Areas currently experiencing Level D are areas of concern. If growth continues in the patterns we have seen, problems will likely occur in the future.



Poor LOS (traffic congestion) occurs at intersections and roadway segments where demand exceeds the capacity of the network. In the study area, locations where east-west and north-south traffic flows are attempting to use the same intersections at the same time experience the worst conditions. The traffic flows primarily create congestion on the east-west arterials. This occurrence is most pronounced during the evening rush hour when the north-south traffic impedes the efficiency of the east-west movement, and the peaking characteristics of the travel overload the capacity of the road network. According to the Status of the System Report (MOA 2001), the Glenn Highway and Tudor Road experience “poor to severe” LOS over a “significant portion of their roadway segments.

① During the peak hour, the Boniface-Tudor intersection is failing and the Lake Otis-Tudor and Boniface-Northern Lights intersections are at LOS E.

② During the midday, Only the Lake Otis-Tudor intersection is below the goal of the Long Range Transportation Plan. It is functioning at LOS E.

③ During the evening peak hour, a number of intersections and roadway segments are functioning below LOS C. The table (right) identifies these locations.

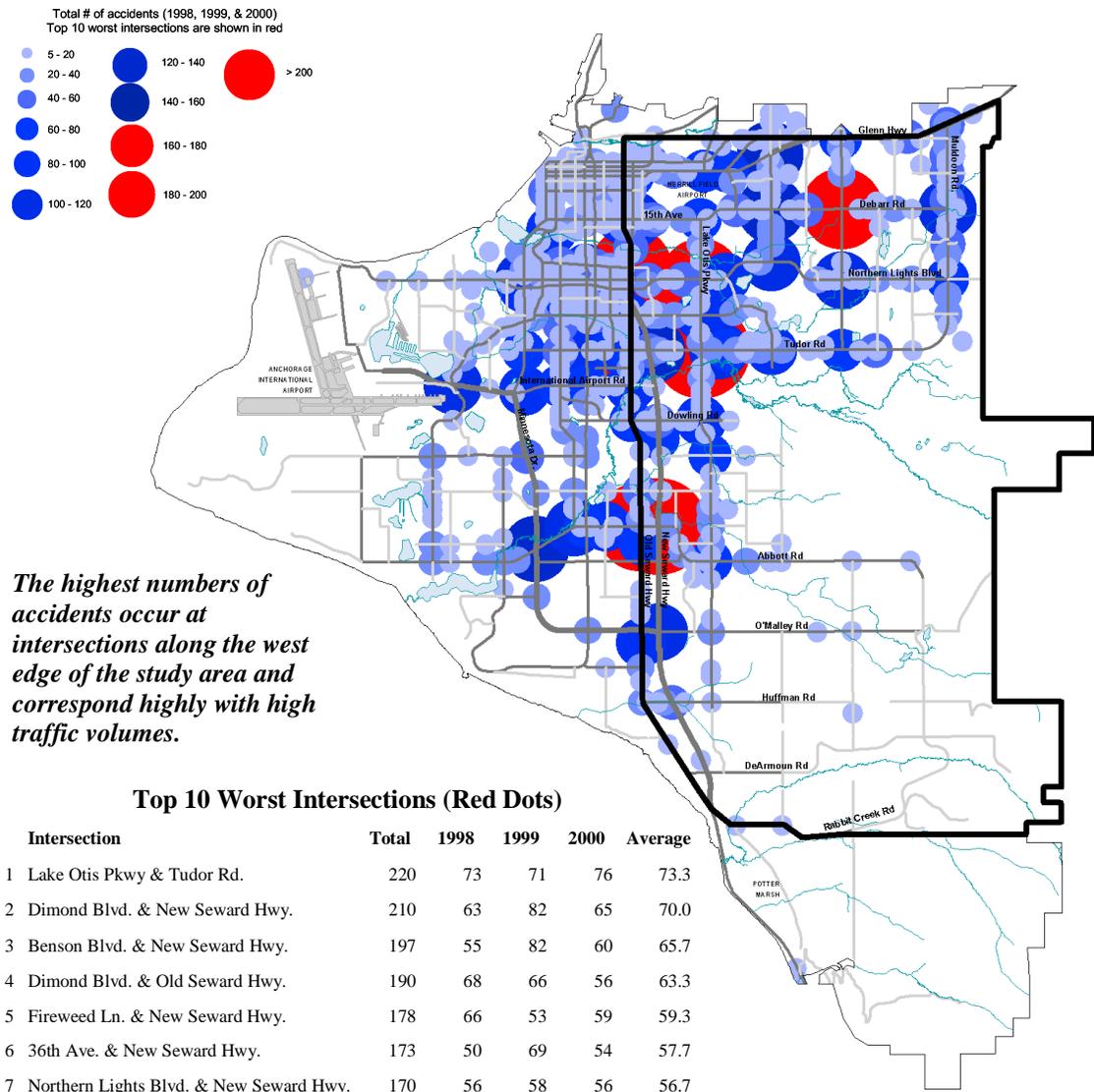
Roadways & Intersections operating at less than acceptable LOS (p.m. peak)	
Intersections	Road Segments
• Glenn Highway & Bragaw	• Glenn Hwy between Medfra & Concrete, and between Reeve & Airport Heights
• DeBarr & Bragaw	• Tudor Road between Bragaw & Boniface
• Northern Lights & Boniface	• New Seward Hwy between Tudor & Dowling
• Northern Lights & Lake Otis	• Dowling between New Seward & Lake Otis
• 36th & New Seward	• Old Seward between 64th and 69th
• 36th & Lake Otis	• Old Seward between 76th & Dimond Blvd.
• Lake Otis & Tudor	• Old Seward between 112th and Klatt
• New Seward & Dowling	
• Old Seward & Dimond	

Source, MOA, Status of the System Report, 2000

Traffic Accidents

Although most traffic accidents are caused by operator error, they can also be a symptom that something requires attention in the roadway network. This section presents accident data. In terms of *accident frequency*, 33 out of the top 50 intersections where accidents occur are in the East Anchorage study area. That is contrasted by the *accident rate*, which takes into account the amount of traffic entering an intersection. In our study area, only 26 of the 50 *highest rate* intersections are in the study area. This data suggests that while there is a high frequency of traffic accidents in the study area, when compared to the amount of traffic in the study area, the rate of accidents are not disproportional to the rest of the city.

The highest accident rate for any intersection within our study area is at the intersection of the New Seward Highway and Huffman Road. These accidents are primarily taking place at the west ramps to and from the highway. A total of 15 accidents occurred at these locations in the year 2000. While the number of accidents is low enough that this intersection did not make the list of the top 50 intersections for accident frequency, because the traffic volumes are relatively low, there is a higher rate of accidents at this location. It should be noted that although this intersection has the highest *accident rate* in the study area, by national standards the rate is still quite low for an urban intersection. All intersections within the study area have low *accident rates*, with only two intersections having observed rates over two accidents per million vehicles.



The highest numbers of accidents occur at intersections along the west edge of the study area and correspond highly with high traffic volumes.

Top 10 Worst Intersections (Red Dots)

Intersection	Total	1998	1999	2000	Average
1 Lake Otis Pkwy & Tudor Rd.	220	73	71	76	73.3
2 Dimond Blvd. & New Seward Hwy.	210	63	82	65	70.0
3 Benson Blvd. & New Seward Hwy.	197	55	82	60	65.7
4 Dimond Blvd. & Old Seward Hwy.	190	68	66	56	63.3
5 Fireweed Ln. & New Seward Hwy.	178	66	53	59	59.3
6 36th Ave. & New Seward Hwy.	173	50	69	54	57.7
7 Northern Lights Blvd. & New Seward Hwy.	170	56	58	56	56.7
8 Lake Otis Pkwy & Northern Lights Blvd.	158	57	53	48	52.7
9 Boniface Pkwy & DeBarr Rd.	157	51	55	51	52.3
10 Tudor Rd. & Old Seward Hwy.	153	51	63	39	51.0

Mobility and Accessibility

The most basic definition of mobility, also used by the Federal Highway Administration, is “the ability to move or be moved from place to place.”

Anchorage 2020 defines mobility as “the ability of people and goods to move quickly, easily, and affordably to their destinations” (p. 32).

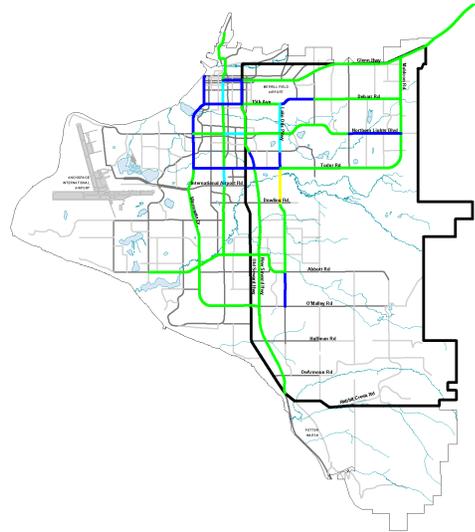
We measure the quality of our mobility, in part, on our ability to get where we need to go in a timely manner. Introducing the element of time to the mobility equation introduces the notion of “accessibility” which is defined as follows:

The opportunity to reach a given end within a certain time frame, or without being impeded by physical, social, or economic barriers. Enhancing mobility is one way of providing improved access. (ISTEA Planner's Workbook, www.transact.org/Reports/Planner.htm)

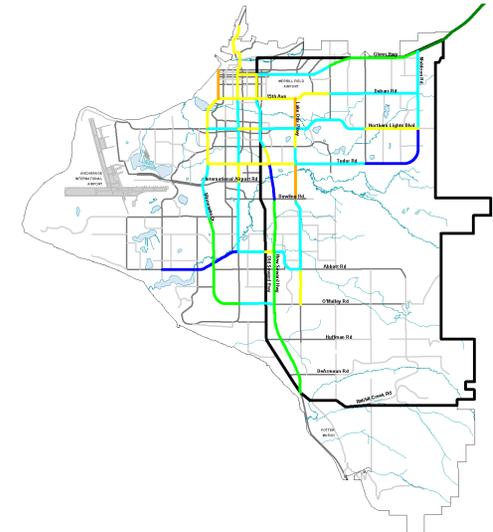
Travel time and travel speed are two measures often applied to a road network to gauge mobility and accessibility. Both the travel time and average travel speed data for this report were developed by the “Status of the System Report for 2000.”

Average Travel Time

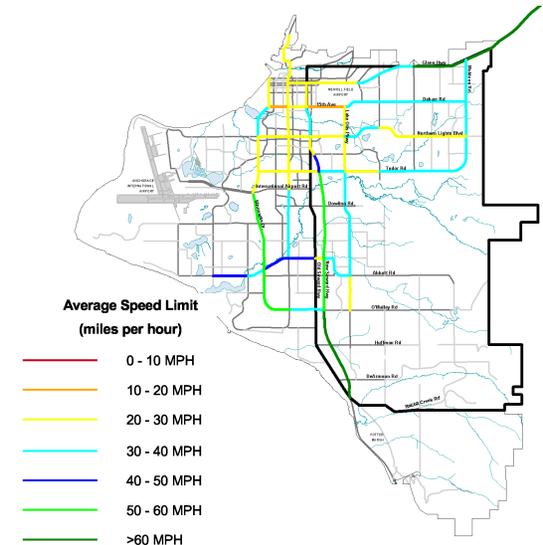
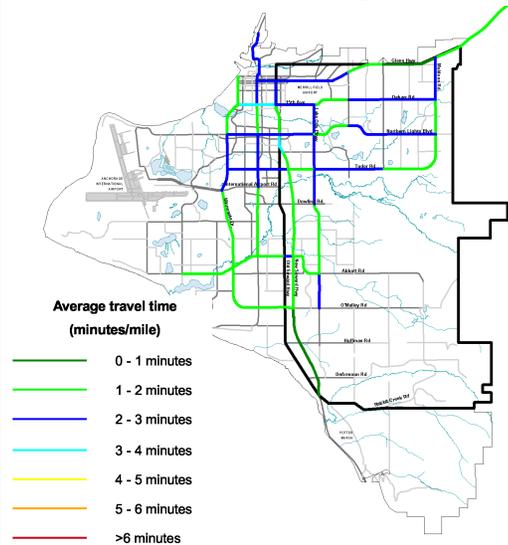
Morning Peak Hour – Southbound and Westbound



Average Speed



Morning Peak Hour – Southbound and Westbound



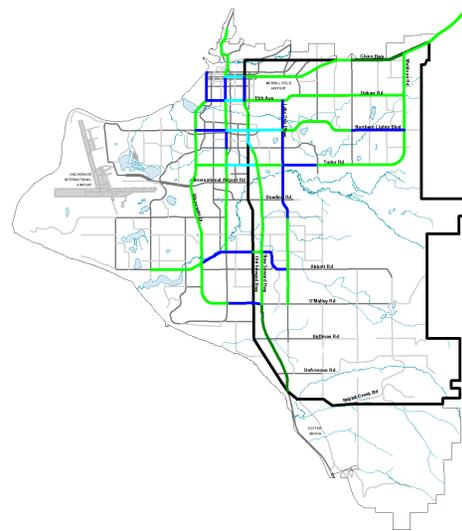
As with the LOS analysis, the evening peak hour analysis shows the most pronounced problems, with the slowest travel speeds and the longest travel times. Assuming that the evening peak can be improved, the morning and midday peak hours would also improve. The Highway Capacity Manual has established LOS criteria for urban arterial road networks. According to the Highway Capacity Manual (TRB 1998), a principal arterial between major traffic generators, without parking, few signals and little pedestrian or roadside activity, and with a “suburban design” pattern, is considered a Class I arterial. A minor arterial that typically serves shorter trips, has some significant parking and limited interferences from pedestrian and roadside activity, or is a principal arterial with an urban design and many signals and interferences is considered a Class II arterial. Intermediate combinations of these characteristics are considered Class III arterials (ITE 1992). The LOS criteria established by ITE are as follows:

LOS Criteria for Arterial Streets			
Class	I	II	III
Free-flow speeds (mph)	45-35	35-30	35-25
Typical free-flow speed	40	33	27
LOS	Average Travel Speed (mph)		
A	≥ 35	≥ 30	≥ 25
B	≥ 28	≥ 24	≥ 19
C	≥ 22	≥ 18	≥ 13
D	≥ 17	≥ 14	≥ 9
E	≥ 13	≥ 10	≥ 7
F	<13	<10	<7

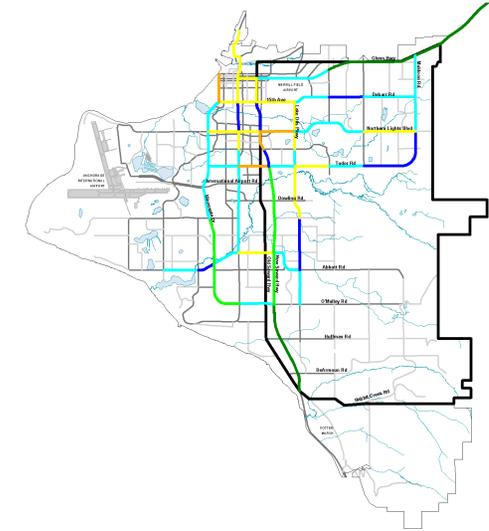
Source: ITE 1992

Average Travel Time

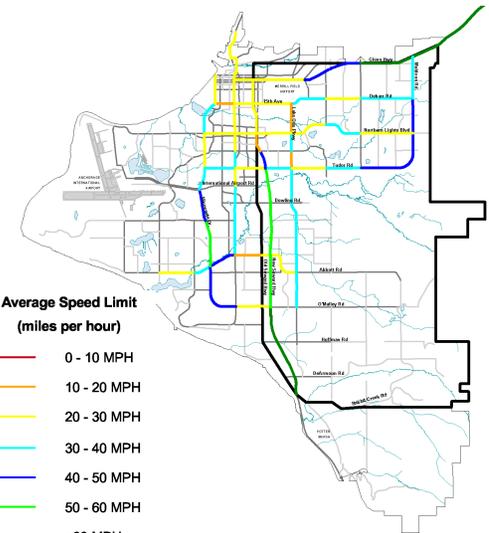
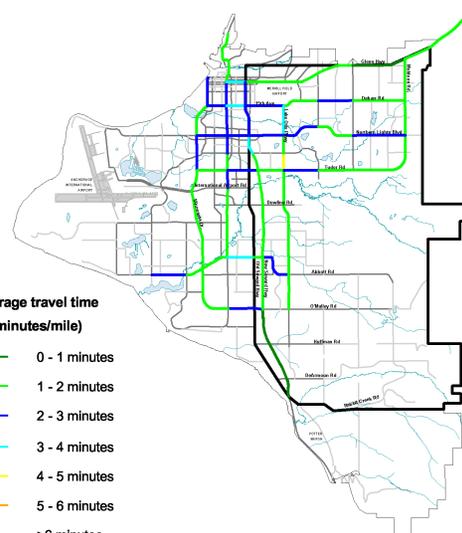
Midday – Northbound & Eastbound



Average Speed



Midday – Southbound and Westbound

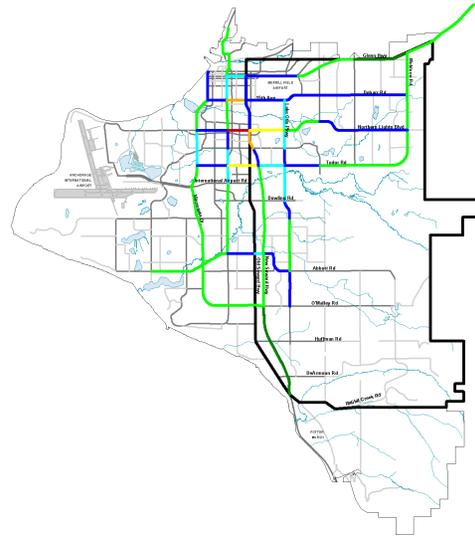


One potential source of driver frustration with travel speeds and travel times might be our perception of what function our arterials are intended to serve. Segments of Northern Lights Boulevard and Tudor Road are designed and function as Class I arterials, while other segments function as Class II arterials. Where these arterials are trying to serve multiple functions, we also have congestion and slower travel speeds. If drivers perceive (based on roadway design characteristics) that the roadway should function as a Class I arterial, but its travel speeds are functioning closer to the Class II or III arterials, driver expectations are not met, resulting in driver frustration.

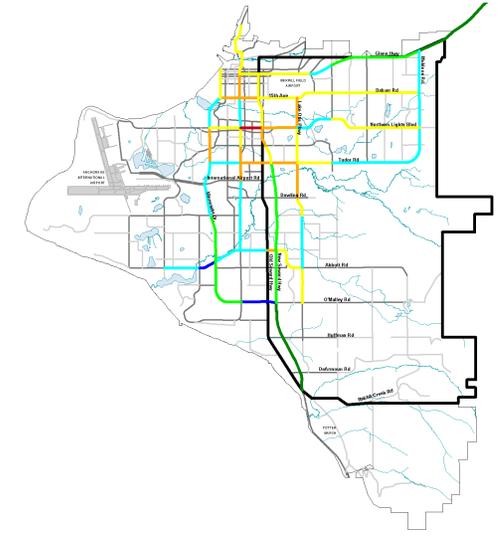
Segments of red and orange on the “average speed” maps to the right indicate areas where the average travel speeds on these arterial are between 0 and 20 miles per hour. Depending on the class of arterial (or the perceived class), these roads could be considered, or perceived by travelers, as functioning at LOS D, E, or F.

Average Travel Time

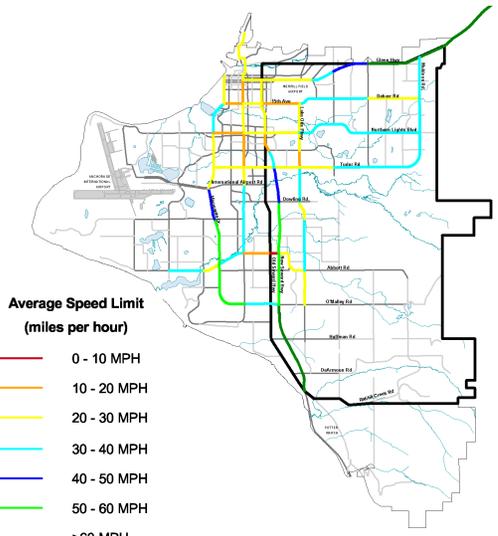
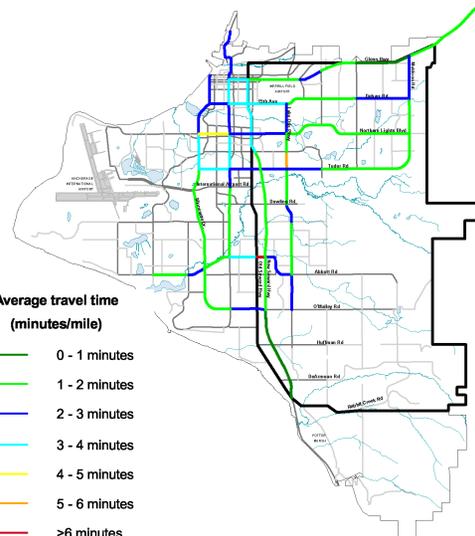
Evening Peak Hour– Northbound & Eastbound



Average Speed



Evening Peak Hour– Southbound and Westbound



Average travel time (minutes/mile)

- 0 - 1 minutes
- 1 - 2 minutes
- 2 - 3 minutes
- 3 - 4 minutes
- 4 - 5 minutes
- 5 - 6 minutes
- >6 minutes

Average Speed Limit (miles per hour)

- 0 - 10 MPH
- 10 - 20 MPH
- 20 - 30 MPH
- 30 - 40 MPH
- 40 - 50 MPH
- 50 - 60 MPH
- >60 MPH

Connectivity and Accessibility

In addition to the element of time, accessibility necessitates the physical ability to get where we need to go. This means having sufficiently sized and spaced roads that connect to each other. The Institute of Transportation Engineers (Transportation Planning Handbook, ITE, 1992) recommends the following spacing for gridded networks:

- **Residential Streets.** Spacing of residential streets is generally a land use decision related to lot size and layout of the development.
- **Collectors.** Collectors should be provided at approximately ½-mile intervals.
- **Arterials.** Arterials should be located approximately 1 mile apart to ensure that a resident does not have to travel more than ½ mile to reach an arterial.
- **Freeways.** Freeways should be located 4 to 6 miles apart. Freeway interchanges are typically spaced no closer than 1 mile apart and preferably farther.

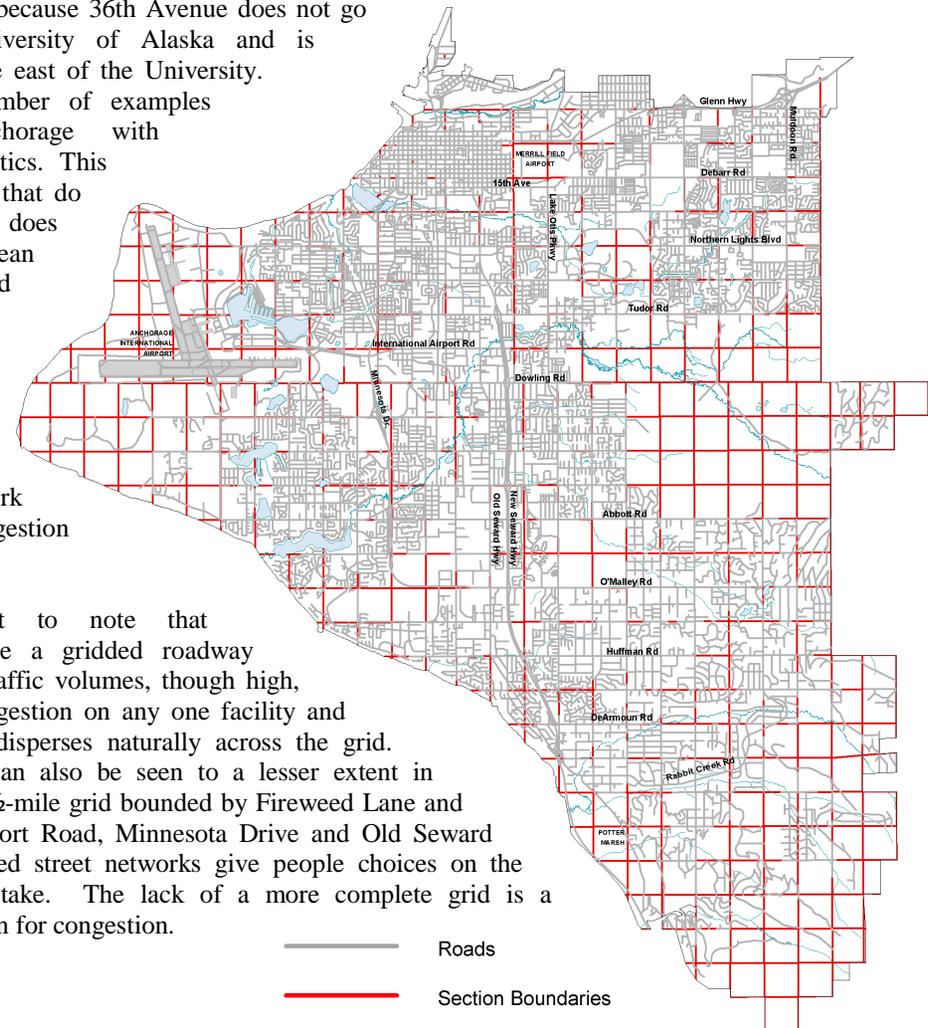
“Maximize use of the existing system by completing the grid pattern on the collector and arterial roadway system.” – Anchorage Long Range Transportation Plan, 2001

Depicted on the adjacent map are missing pieces and indirect pieces of the ½- and 1-mile gridlines. In each case where there is a missing gridline, some component of the existing arterial network is spaced farther apart than recommended by ITE. It means a certain number of travelers must detour around the missing or indirect link to complete their trip. Such travel adds to the total vehicle miles traveled and contributes to congestion and air quality problems as our population and corresponding traffic movements grow.

Generally, Anchorage’s system follows the spacing guidelines identified by ITE. In areas where the connections are not complete, however, the spacing is, in effect, farther than the recommendation. This results in more traffic on the remaining roadways (the ones that do connect through). This may not have been a problem before Anchorage, but as we have grown, the traffic load being placed on the network that does connect has grown beyond the capacity, resulting in LOS problems, delay, and congestion. For example, we see roads like Northern Lights Boulevard and Tudor Road carrying collector traffic as well as arterial traffic because 36th Avenue does not go through the University of Alaska and is nonexistent to the east of the University.

There are a number of examples throughout Anchorage with similar characteristics. This map shows links that do not exist, but it does not necessarily mean that we should build each of these links. It does, however, help us understand the contribution of our missing network to traffic congestion problems.

It is important to note that Downtown, where a gridded roadway network exists, traffic volumes, though high, do not cause congestion on any one facility and traffic generally disperses naturally across the grid. This dispersion can also be seen to a lesser extent in Midtown on the ½-mile grid bounded by Fireweed Lane and International Airport Road, Minnesota Drive and Old Seward Highway. Gridded street networks give people choices on the routes that they take. The lack of a more complete grid is a contributing reason for congestion.



Transit Quality of Service (or Transit Level of Service)

“Transportation improvements will be balanced among transit, pedestrian, and road improvements” (Anchorage 2020 p. 48).

Frequency of Service

“Transit service frequency is increased and routes are expanded” (Anchorage 2020 p. 48).

Objective: *Provide 15-minute peak and 30-minute off peak headway to 80 percent of the population in the transit focus area. – Anchorage Long Range Transportation Plan, 2001*

This section evaluates the transit network as a means of travel in Anchorage. As previously mentioned, the AMATS survey (2001) estimates that approximately 1% to 2% of the trips are made on the transit system. This equates reasonably well with the MOA’s estimate of People Mover’s mode share (percent of the travel that occurs on transit), which is approximately 1.8% of commuter trips and 1.2% of total trips.

One means of evaluating service quality is provided in the *Transit Capacity and Quality of Service Manual*, which is published under the auspices of the Transit Cooperative Research Program (TCRP), a branch of the National Academy of Sciences. The TCRP Manual provides methods for evaluating a variety of different transit service operating characteristics, such as accessibility, frequency, schedule, and hours of service, and measures them with a LOS A through F grading system similar to highway analysis. These results are not reflective of every passenger’s experience, but provide a relatively objective understanding of how the total system performs in meeting passenger and community needs. Analyses using the TCRP Manual were conducted for a select number of critical service areas and are reported below.

The frequency of service measure refers to the amount of transit service provided at any one point for boarding and discharging of passengers, and is calculated based on the headway, or time between service stops (e.g., a bus that makes two complete trips through its route in an hour has a headway of 30 minutes). As shown (right), nearly all of People Mover’s routes during peak periods rank between LOS D and E in terms of frequency of service. According to the Status of the System Report (MOA 2001), the average time between bus departures is 72 minutes in the morning peak period, 88 minutes during the midday peak period, and 61 minutes in the evening peak period.

Frequency of Service Peak Period Headways		
LOS	Headway (minutes)	People Mover Peak Hour Service - Number of Routes
A	< 10	0
B	10-14	0
C	16-20	0
D	21-30	6
E	31-60	8
F	>60	4

Source: People Mover Route Restructuring Study, 12/01 and TCRP Transit Capacity and Quality of Service Manual Criteria

At present, we are not providing the frequency of service envisioned in the *Long Range Transportation Plan* (left). The amount of service we are providing makes it challenging to meet the needs of the “choice” rider, otherwise defined as the passenger who has access to another means of travel.

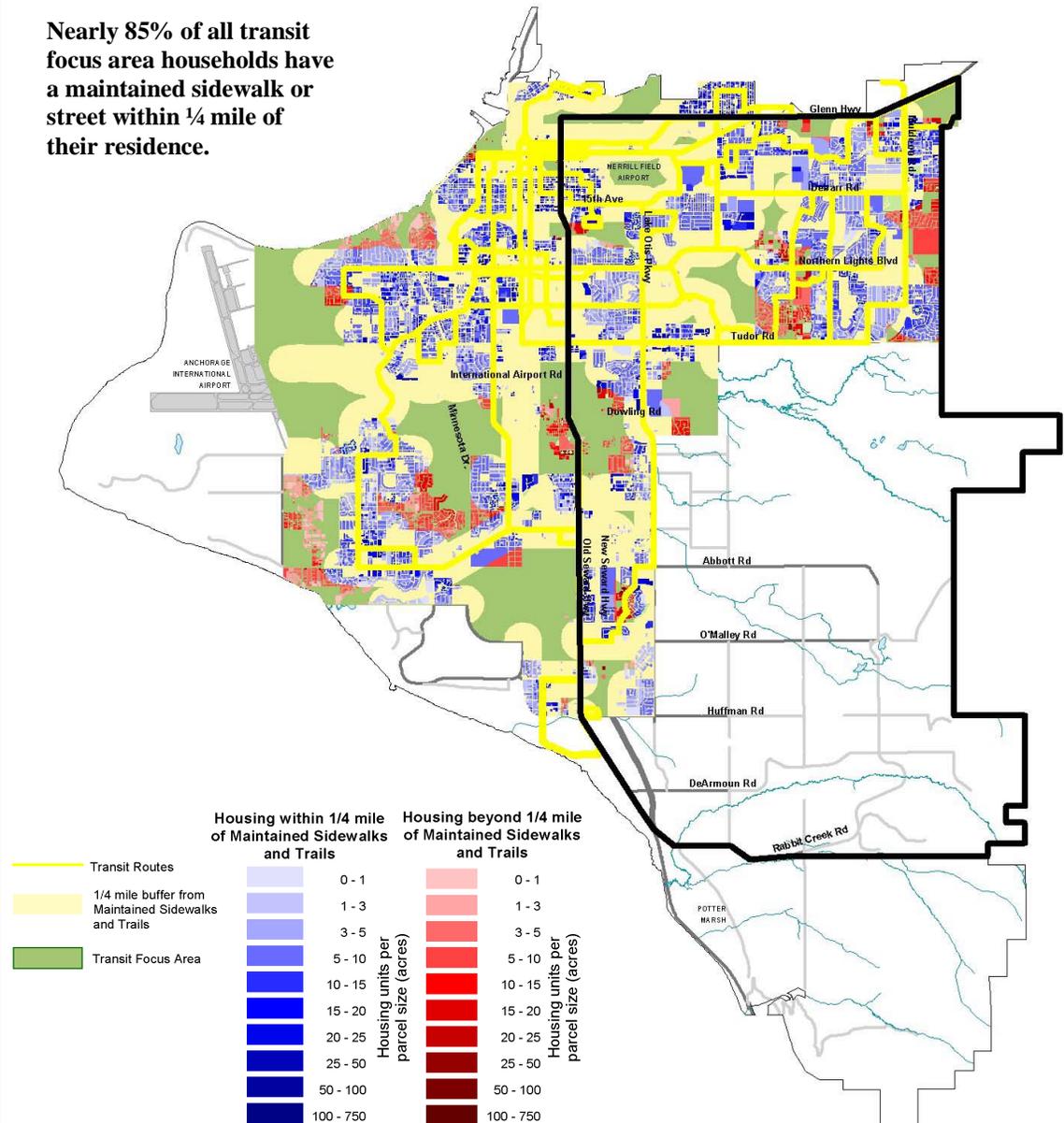
Accessibility to and from the Service

This measure refers to the ability to arrive and depart a transit stop/station by other modes. In the East Anchorage study area, the relevant connecting modes are walking and bicycling, which can be determined by the presence and proximity of connecting streets and sidewalks. As shown in the map at the right, nearly 85% of all transit focus area households have a maintained sidewalk or street within 1/4-mile of their residence.

Provide maintained sidewalks or trails to within 1/4-mile of 80 percent of the transit focus area population – Anchorage 2001 Long Range Transportation Plan.

“A safe, energy-efficient transportation system that is designed and maintained for year-round use and that respects the integrity of Anchorage’s natural and built northern environment” (Anchorage 2020 p. 38).

Nearly 85% of all transit focus area households have a maintained sidewalk or street within 1/4 mile of their residence.



Service Coverage

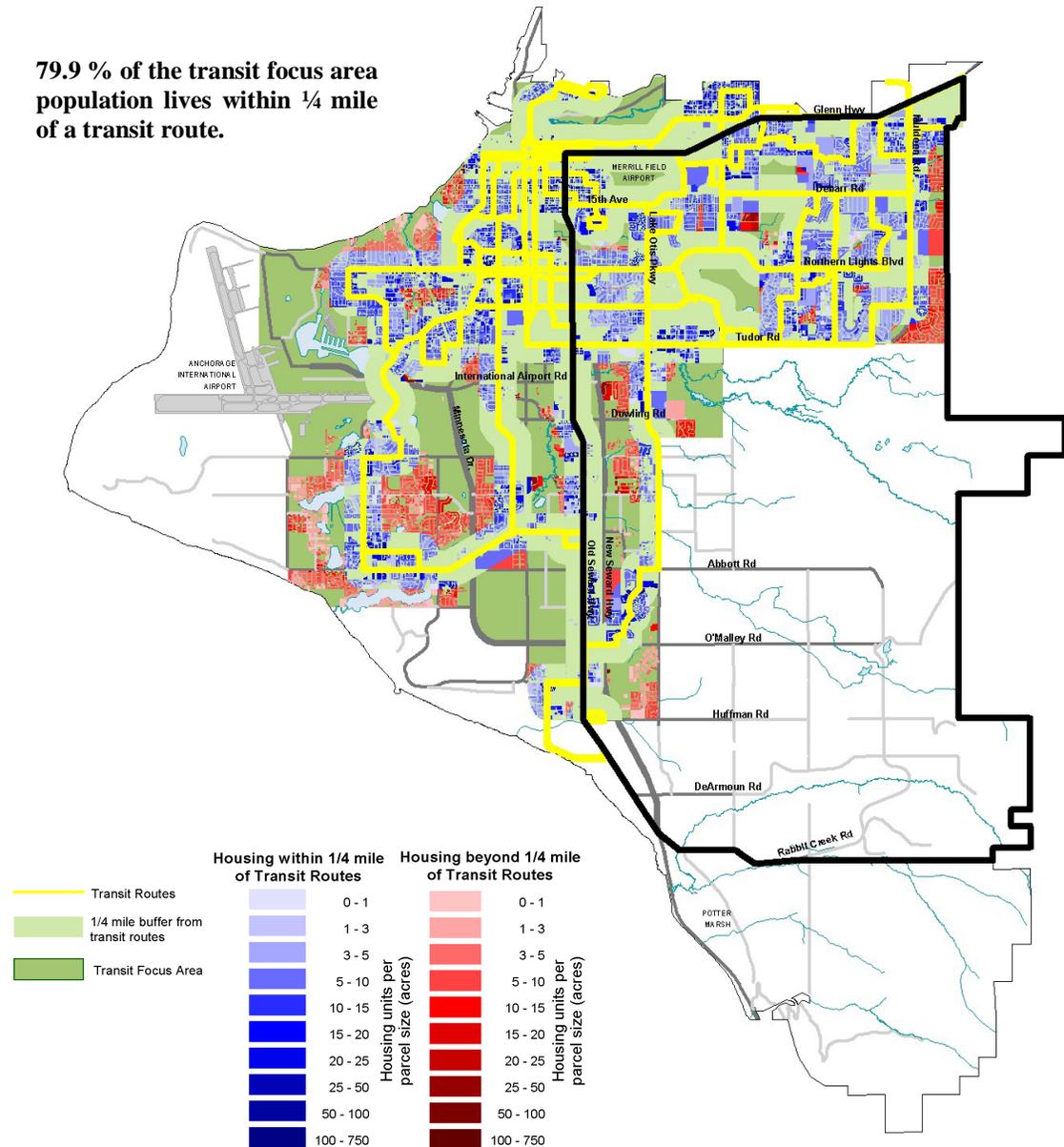
This measure focuses on the proximity of the transit system to a community's households. The criteria used for the measurement is a walking distance of less than ¼ mile. As shown in the adjacent map, nearly 80% of all households in the Bowl are located within ¼ mile of a transit route, which according to the TCRP Manual, results in a LOS B score for this measure. Anchorage has an objective in the 2001 *Long Range Transportation Plan* (LRTP) directly relevant to the service area coverage LOS criterion. It reads:

Objective: Provide 15-minute peak and 30 minute off-peak headway to 80 percent of the population in the transit focus area - Anchorage 2001 Long Range Transportation Plan.

Criteria: Percent of transit focus area population within ¼ mile of transit routes - Anchorage 2001 Long Range Transportation Plan.

As we observed in the frequency of service analysis, Anchorage is not meeting its frequency of service objective. The route structure, however, does provide service coverage meeting the criterion for this objective. The map (right) shows the transit routes (yellow) with the housing within ¼ mile (blue) of the transit routes. Housing areas in the transit service area but farther than ¼ mile are shown in red. Areas within the transit service area, but without housing, are green. Light green areas show the ¼-mile buffer. It is important to note that areas that are not colored are not within the transit focus area and the objective does not apply.

79.9 % of the transit focus area population lives within ¼ mile of a transit route.



Hours of Service

This measure refers to the number of hours per day that transit service is available. Transit systems that operate very frequent headways during peak hour periods and no service during off-peak periods would result in a lower LOS than a system with half the peak hour service but off-peak service throughout the day. This is the case with People Mover's services, which has over 80% of its routes measuring LOS B or C, and the remainder as LOS E (see the table, right). In other words, People Mover provides a relatively good schedule over the course of the day for users who do not always need to travel during peak hour periods.

Daily Hours of Service

LOS	Hours/Day	People Mover Daily Hours of Service Number of Routes
A	19-24	0
B	17-18	4
C	14-16	11
D	12-13	0
E	4-11	3
F	0-3	0

Source: People Mover Route Restructuring Study, 12/01 and TCRP Transit Capacity and Quality of Service Manual Criteria

Passenger Loads

Passengers per Seat During Peak Hours

LOS	Pass/Seat	People Mover Pass/Seat Ratio Number of Routes
A	0.00-0.50	0
B	0.51-0.75	3
C	0.76-1.00	0
D	1.01-1.25	10
E	1.26-1.50	1
F	>1.51	2

Source: People Mover Route Restructuring Study, 12/01 and TCRP Transit Capacity and Quality of Service Manual Criteria

Passenger loads is a measure of the room available on a transit vehicle for passengers. There are several ways to measure passenger loads, the most direct being the number of passengers per seat (i.e., divide the total number of passengers per route by the total number of seats available on that route). Over the course of the day, some People Mover routes have ridership that slightly exceeds the number of available seats: on three routes (routes 14, 74, and 102) ample seating is available, and on another three routes (routes 7, 12, and 45) many people are without a seat due to maximum and crush loadings.

Pedestrians & Bicycles

This section explores the condition of our pedestrian and trail system. Pedestrian systems not only need to be interconnected and located at and connected to major traffic generator sites, they also need to provide amenities that encourage pedestrians to use them, such as crosswalks, shorter walk distances across intersections, grade-separated walkways, benches, landscaping, and other “human scale” features. In addition, encouraging pedestrians to use sidewalks – particularly at night – requires adequate lighting and other pedestrians to help them achieve a sense of personal security. Pedestrian systems ought to be located directly adjacent to building entrances, rather than bisected by parking areas, which lengthen and disturb the walking experience. In some densely populated areas of other cities, particularly those with large transit systems, these kinds of amenities have led to increased pedestrian travel – sometimes as high as 2% to 5% of all peak hour trips.

A number of factors have been shown to be important in making an efficient, useable pedestrian network. These factors measure the ease with which we can make our pedestrian trips. The following factors (often called “Pedestrian Environmental Factors”) have been analyzed to gauge the condition of our pedestrian system. The analysis is based on transportation analysis zones (TAZs), which are simply small, relatively uniform areas used by transportation planners to analyze a transportation system.

- **Sidewalk Availability:** The existence of sidewalks is an important factor in determining whether a walking trip will be made and be made safely.
- **Building Setbacks:** The type of design called for in the zoning code has an influence on the walkability of an area. Large setbacks often indicate large parking lots fronting the street, making it difficult for pedestrians to get from one destination to another.
- **Connectivity.** Accessibility, or the physical ability to make the trip, is a key factor in deciding to walk. Good connections within and between neighborhoods are conducive to walking. “I can’t get there from here” often results in using your car to make the trip. Internal and external connectivity factors examine how well connected the road networks are. The areas with high concentrations of street crossings (i.e., streets that bisect zones) and node links (or number of roads that connect to an intersection) provide the kinds of street networks needed to be conducive to walking.
- **Natural Barriers.** Natural obstacles to pedestrian travel including stream crossings, wetlands, hillsides and other steep slopes, are evaluated. Many of these natural features are incorporated into parks and recreational trails and actually generate and facilitate pedestrian travel; however, without good maintenance and connections through them, these natural areas can be impediments that discourage travel on foot, particularly where they require navigating through rough terrain or increase travel distance and time.
- **Maintenance:** Alaska is a winter city. To be conducive and safe for walking and biking, the pedestrian network needs to be well maintained. This factor provides information on the maintenance of our pedestrian network.

Pedestrian Conditions Analysis

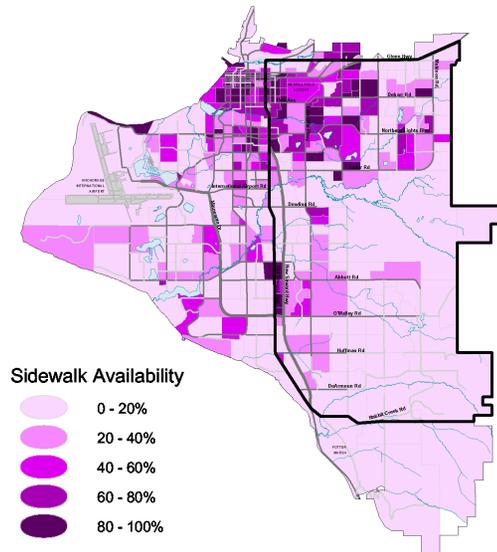
① The sidewalk availability map illustrates those areas where there are relatively high, medium and low concentrations of sidewalks as determined by the number of lane miles of sidewalk within each analysis zone area. Some zones within Downtown, Midtown, and in older neighborhoods such as Fairview and Mountain View, enjoy sidewalk coverage on over 80% of their streets. Other areas, such as newer subdivisions east of Bragaw Street and north of Tudor Road, are characterized by minimal sidewalk concentrations. Sidewalks are nearly non-existent on the Hillside.

② Building setbacks show how close buildings are to the roadway edge based on the Anchorage zoning code. Areas where buildings are closer to the street (darker red) tend to indicate areas that are more conducive to walking.

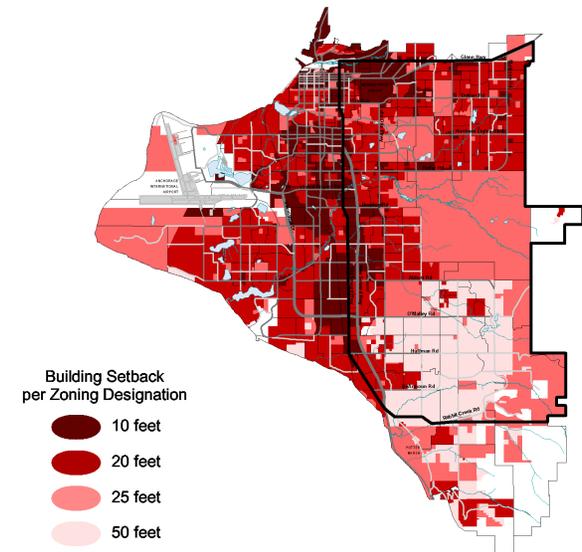
③ This map shows how well connected parcels within the each TAZ are connected. Long blocks and few connections tend to discourage walking. Internal connectivity is higher in the densely populated areas and the commercial centers. The highest areas are in Downtown and Spenard.

④ This map shows how well each TAZ is connected (by road) to neighboring TAZs, measuring how conducive it is to walk from one to another. Downtown and South Addition areas have the highest external connectivity (meaning they are well connected to surrounding areas by road links), Parts of Spenard and Muldoon Roads also have good external connectivity.

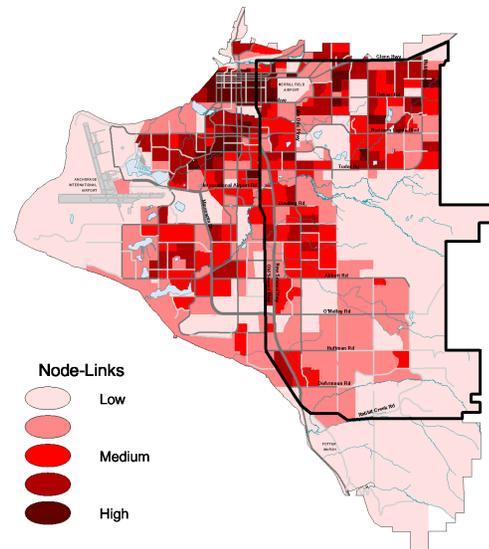
① Sidewalk Availability



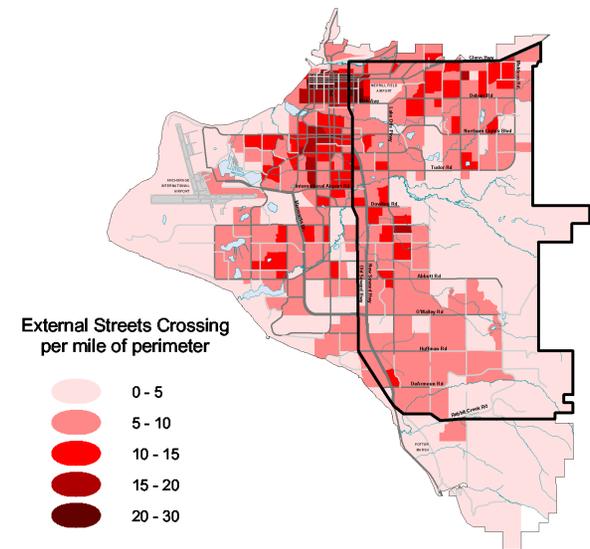
② Building Setback



③ Internal Connectivity



④ External Connectivity



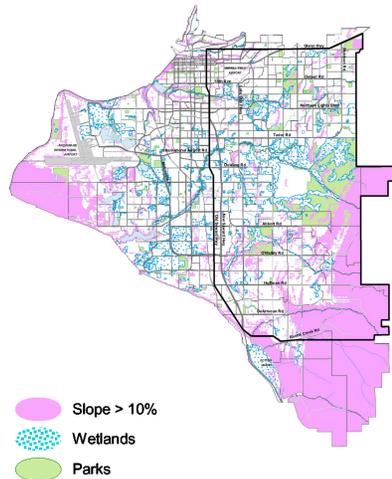
Pedestrians Environmental Factors

① & ② These maps show areas of the community that have a large concentration of physical barriers, which, without trail or pedestrian improvements and good maintenance, can impede walking. Map 1 shows the actual constraints, Map 2 translates those constraints into each transportation analysis zone rated by the percent of the zone covered by a physical or natural barrier. To increase the walkability of the poorest scoring areas, pedestrian improvements could be considered.

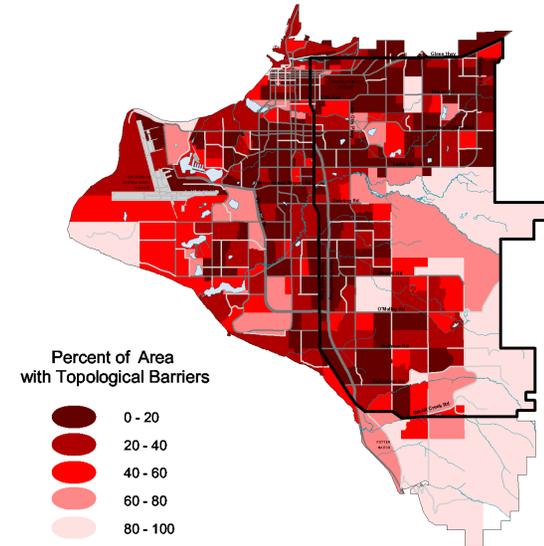
③ Because Anchorage is a winter city, maintaining our pedestrian system is critical. This map is the sidewalk system and the amount of maintenance provided according to the Municipality’s Public Works Department.

④ This map shows overall suitability, taking into account each of the factors for each traffic analysis zone. As might be expected from a casual look at each of the factors individually, older areas of the city, with well-developed grid road networks and complete sidewalk coverage, are most conducive to walking. Areas on the Hillside have relatively poor connectivity, little sidewalk availability, and topological barriers. These areas scored low in the composite analysis.

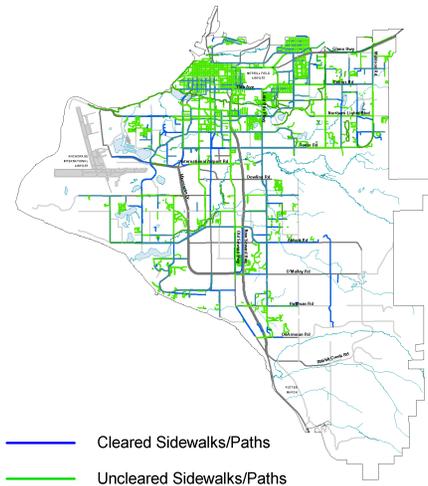
① Barriers & Topography



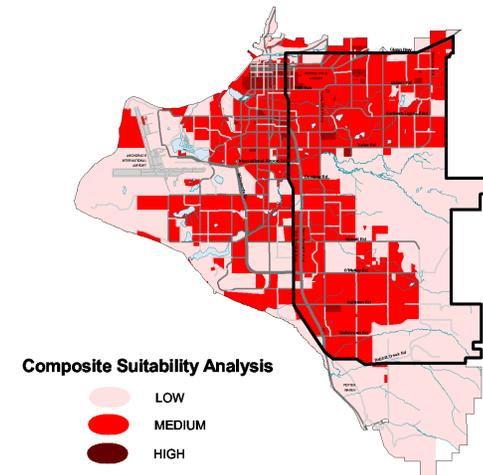
② Barriers & Topography Rating by TAZ



③ Sidewalk Maintenance



④ Composite Suitability Analysis



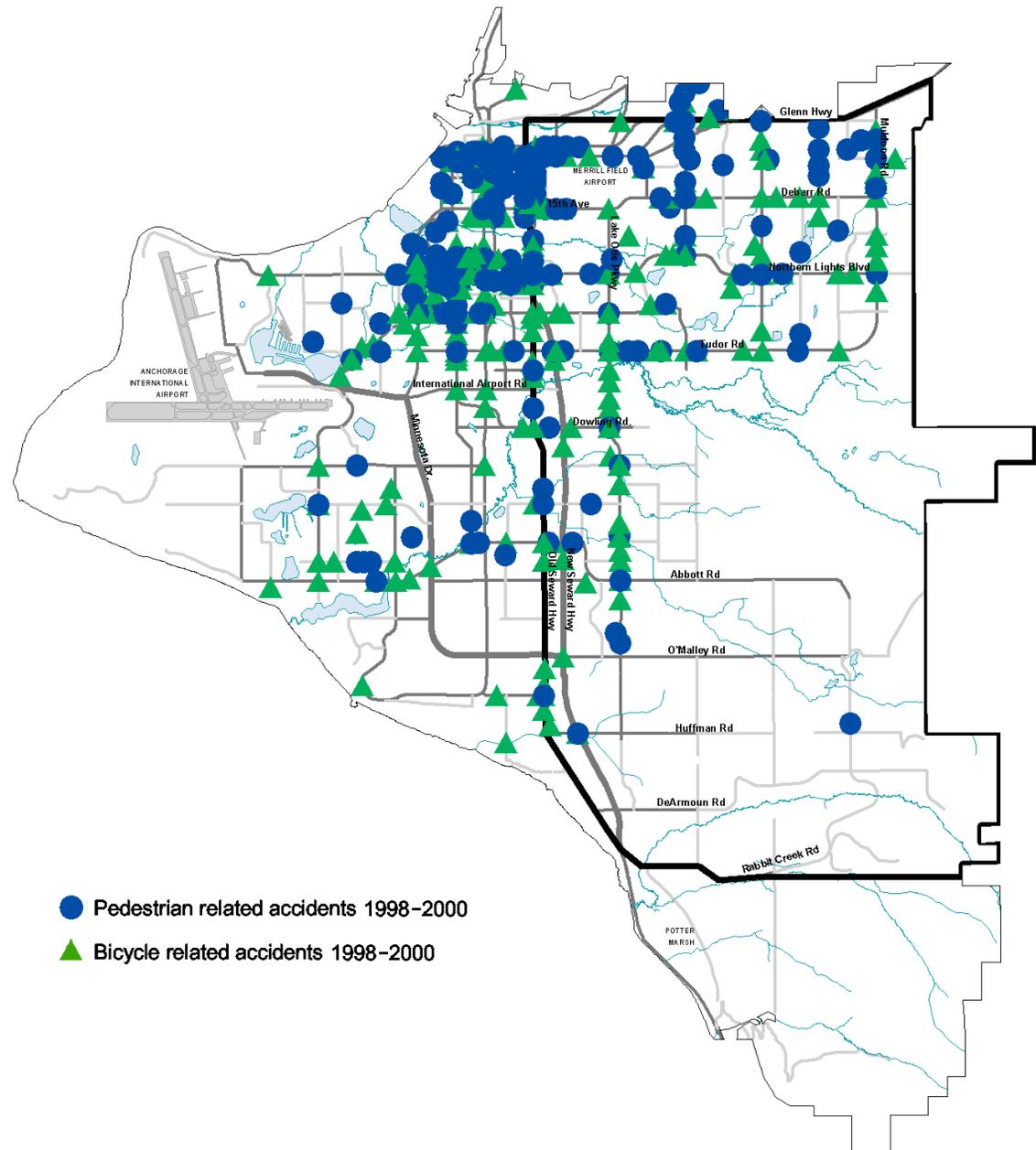
Pedestrian & Bike Related Accidents

As was mentioned in the roadway analysis section, accidents are an indication of a problem. The adjacent map shows the locations of bicycle and pedestrian accidents over the years 1998, 1999, and 2000. Areas of concentration likely indicate areas of high pedestrian usage, coupled with heavy traffic volumes. As can be seen from the map, the vast majority of pedestrian and bicycle accidents occur on the collector and arterial roadway network.

Snowy sidewalks and icy roads put pedestrians in peril.

“Though 2002 has just begun, the year has been perilous for Anchorage pedestrians... Navigating hazardous conditions is a seasonal ritual around town, but the problem may be stressed by sidewalk maintenance and human behavior.”

Some people say more crosswalks are needed, and others say walkers are impatient and often don't use those already in place.” – Anchorage Daily News, March 4, 2002.



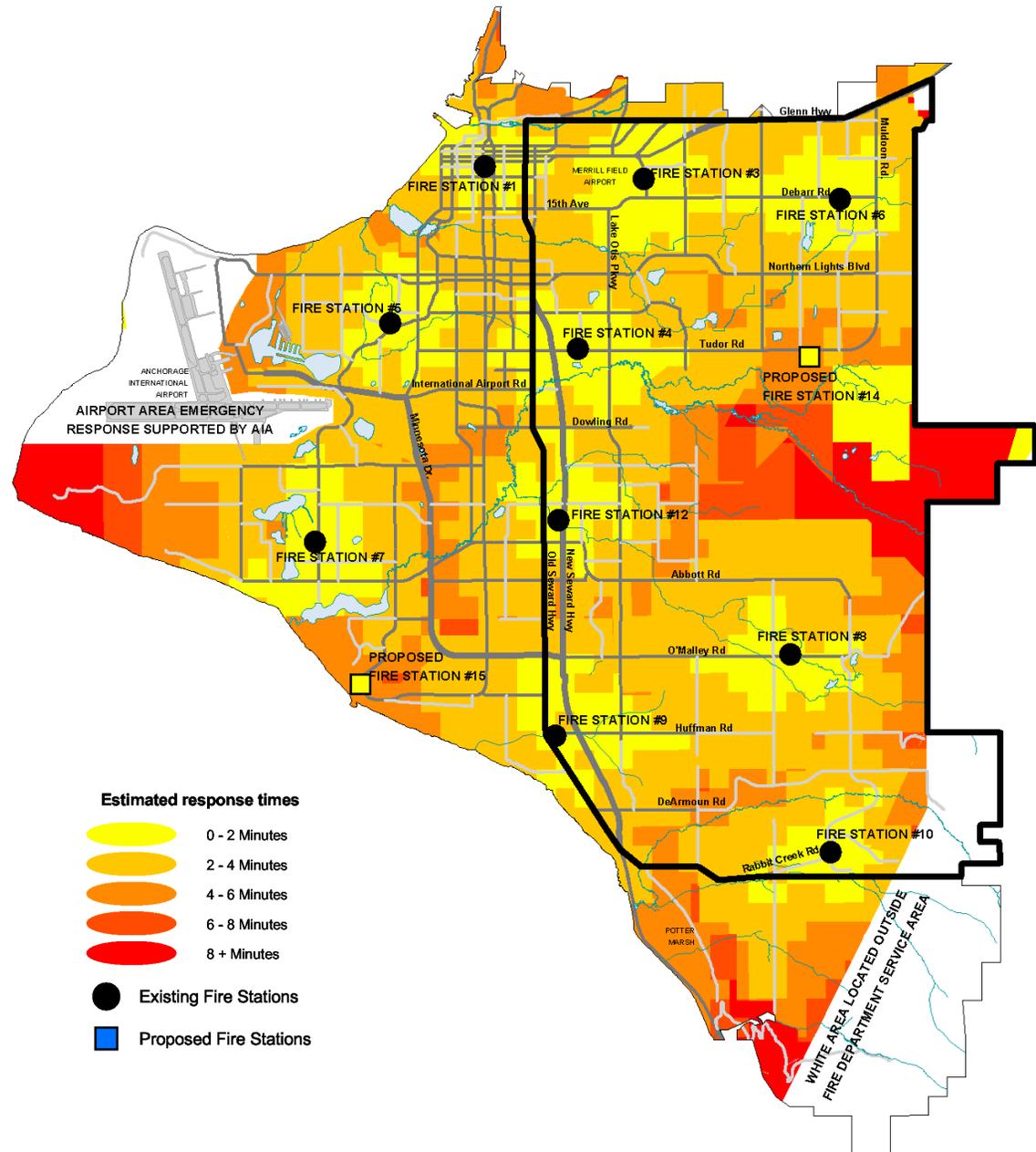
Emergency Services

The adjacent figure illustrates the locations of the fire stations and the *estimated* response times based on a model developed by the Municipality that takes into account factors such as road conditions, traffic congestion, and speed limits. The darker the color on the graphic, the longer the estimated emergency response times. As can be seen from the map, the two areas proposed for new fire stations have the worst response times. The new stations will likely alleviate the slow response times to those locations.

Within the study area the following are the worst served areas in terms of response times:

- The upper Hillside east of Hillside Drive
- Mid-Hillside along DeArmour Road
- Basher Road area

Anchorage 2020 establishes a goal for all government departments to create “a community where people and property are safe” (Anchorage 2020, p. 41).



Freight Distribution

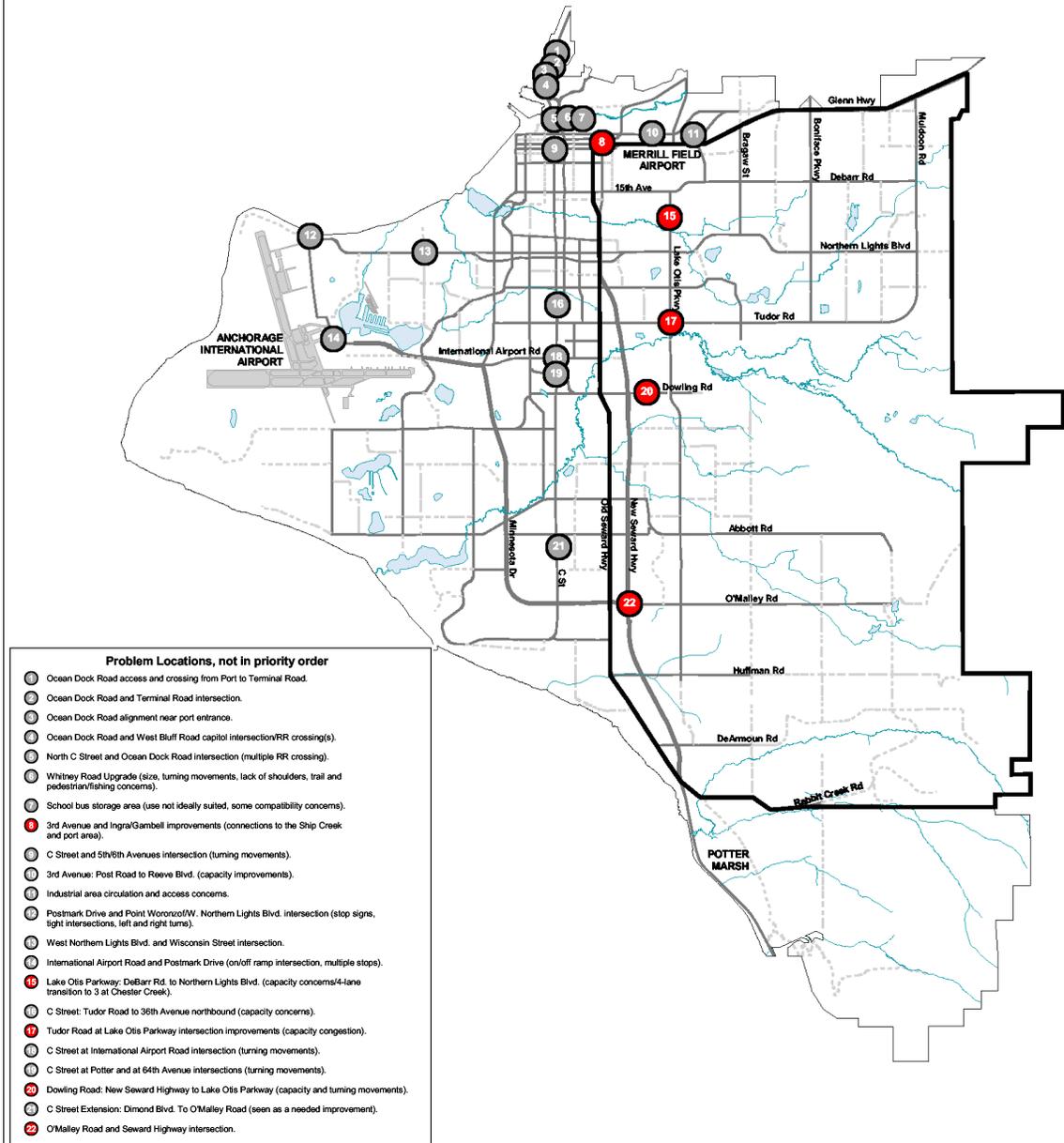
The adjacent figure shows the locations of freight movement problem areas according to the MOA's Freight Mobility Study (MOA 2001). Areas in red indicate freight mobility related problems within the study area as described below.

Tudor Road has a high density of commercial development along most of its length and also serves as a major through route with four lanes east-west. Congestion is a problem during peak times and intermittently at other times; driveways, and side streets add to the congestion.

Lake Otis Parkway has developed into a secondary freight route and is experiencing increasing commercial development. Congestion occurs at several locations and design standards are problems at several locations. In particular, the area between 15th and 20th Avenues, where Lake Otis Parkway drops to three lanes, has been identified.

Improved access to the Ship Creek area has been an issue for some time. One location identified for improvements is the Gambell-Ingra intersection.

Dowling Road has been identified as a capacity concern.



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