4.0 Transportation System Congestion

4.1 Identify Congested Locations

Roadways

Roadway segment volume-to-capacity ratios were developed for Performance Measure #1 – Roadway Segment Level of Service. Volume-to-capacity ratios were computed to identify both morning- and afternoon-peak-period congestion on the Anchorage Bowl transportation network. However, the volume-to-capacity ratio only provides a portion of the answer associated with roadway level of service. The average travel time and speed analysis conducted to compute Performance Measure #6 – Travel Time by Corridor was also used to identify peak-period roadway congestion in the Anchorage Bowl area.

Table 4.1 shows the roadway segments that currently have high volume-to-capacity ratios or poor levels of service for either the morning or afternoon-peak periods. Figure 4.1 shows the locations of these roadway segments in the Anchorage Bowl for the afternoon-peak hours. These corridors, typically operating at poorer volume-to-capacity ratios and levels of service in the afternoon-peak period include portions of the New Seward Highway, Old Seward Highway, Spenard Road, Tudor Road, C Street, and 5th Avenue. Only the Glenn Highway between Medfra Street and Airport Heights Road and Spenard Road north of International Airport Road contain segments that are worse than a LOS “C” in the morning peak period. There are, however, several other roadway segments that are very close to LOS “D” which starts at v/c = 0.76. These roads include Tudor Road East of Lake Otis, Dowling Road between New Seward and Lake Otis, and C Street South of Tudor.

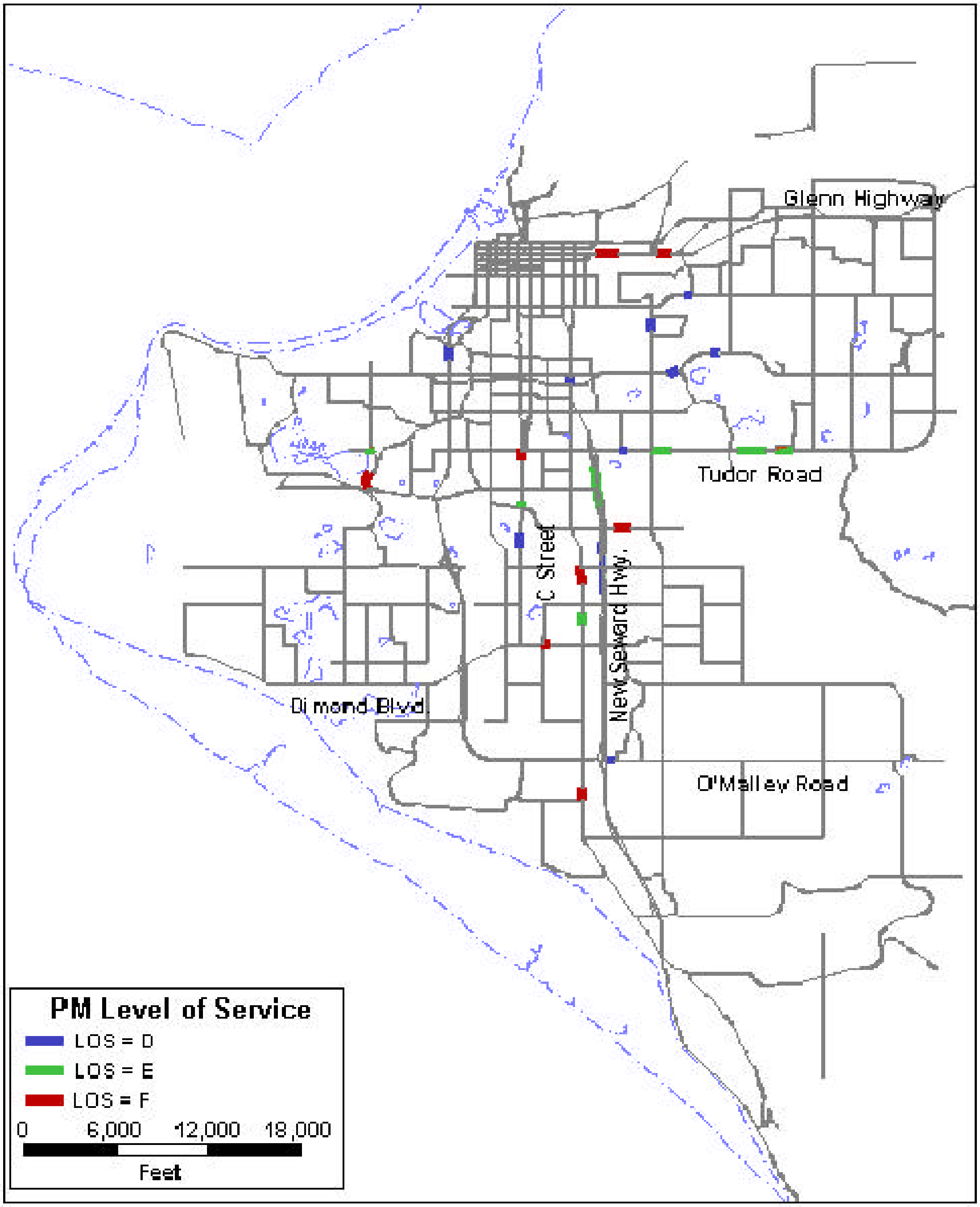
The travel time surveys collected for this analysis were used to compute average travel speeds for the nine selected corridors in the Anchorage Bowl. Average travel speed data can also be used to identify roadway levels of service as specified in procedures defined by the 1994 Highway Capacity Manual (HCM). Table 4.2 shows the criteria used to compute both expressway and principal arterial levels of service based on average travel speeds for the roadways. Tables 4.3 and 4.4 show the morning and afternoon-peak period average travel speeds and level of service grades for the roadway corridors evaluated as part of Performance Measure #6 – Travel Time by Corridor.

Table 4.1 Locations of Morning- and Afternoon-Peak-Period Volume-to-Capacity Ratios of Congested Locations in the Anchorage Bowl

Location	Volume-to-Capacity Ratios (LOS)	
	Morning	Afternoon
1. New Seward Highway South of Dowling	0.55 (C)	0.76 (D)
2. C Street South of Dowling Road	0.62 (C)	0.76 (D)
3. O'Malley Road East of New Seward Highway	0.52 (C)	0.76 (D)
4. Northern Lights Blvd. Between UAA Dr. and Bragaw	0.48 (B)	0.77 (D)
5. Northern Lights Blvd. Between Lake Otis and UAA Drive	0.48 (B)	0.77 (D)
6. DeBarr Road West of Airport Heights	0.51 (C)	0.78 (D)
7. Minnesota Drive North of Northern Lights Blvd.	0.58 (C)	0.80 (D)
8. Tudor Road West of Lake Otis	0.60 (C)	0.80 (D)
9. New Seward Highway Bet. Northern Lights and Benson	0.56 (C)	0.82 (D)
10. Lake Otis Boulevard Between DeBarr and 20th Ave.	0.58 (C)	0.84 (D)
11. Tudor Road Between Bragaw and Wesleyan	0.64 (C)	0.86 (E)
12. Tudor Road Between Wesleyan and Boniface	0.65 (C)	0.87 (E)
13. New Seward Highway Between Dowling and Tudor	0.63 (C)	0.88 (E)
14. Wisconsin Street Between Lakeshore and Spenard	0.60 (C)	0.93 (E)
15. C Street North of Potter	0.64 (C)	0.93(E)
16. Tudor Road East of Lake Otis	0.72 (C)	0.95 (E)
17. Old Seward Highway Between Dimond and 76th Avenue	0.50 (B)	0.96 (E)
18. Old Seward Highway South of 68th	0.51 (C)	1.02 (F)
19. Dowling Road Between New Seward and Lake Otis	0.74 (C)	1.04 (F)
20. C Street South of Tudor	0.75 (C)	1.05 (F)
21. Dimond Boulevard Between Old Seward and King	0.48 (B)	1.06 (F)
22. 5th Avenue East of Reeve (Between Reeve and Mountain View)	0.83 (D)	1.06 (F)
23. 5th Avenue East of Medfra (when 6th merges with 5th)	0.84 (D)	1.08 (F)
24. Spenard Road North of International Airport	0.95 (E)	1.11 (F)
25. Old Seward Highway North of Klatt	0.75 (C)	1.15 (F)

Source: MOA and Cambridge Systematics, Inc.

Figure 4.1 Roadway Segments where PM Peak V/C Ratio is Higher than 0.75 (Worse than LOS C)



Note: C Street between Tudor and Int'l Airport Road has been recently upgraded from 2 to 6 lanes. As a result, it is assumed that its level of service has been substantially improved.

Based on the travel time data presented below, Anchorage Bowl corridors appear to operate at very good levels of service during the morning-peak period ranging from grades of "A" to "C". The only exception is the Lake Otis Parkway corridor in the northbound direction which has a moderate grade of “C”. The same corridors do not operate as well during the afternoon peak period. Corridors which exhibit the worse operating levels in the afternoon peak periods include the Glenn Highway arterial segments eastbound, the New Seward Highway arterial segments northbound, DeBarr Rd. eastbound, Lake Otis Pkwy. northbound, and Northern Lights Blvd. eastbound all of which operate at a grade of C. The arterial segment of the New Seward Highway southbound is the only corridor which operates at a grade of “D” which is considered to be a poor service level.

Table 4.2 Levels of Service Criteria for Expressways and Principal Arterials

	Expressways	**Principal Arterials**
Range of Free Flow Speeds (mph)	45 to 35	35 to 30
Typical Free Flow Speeds (mph)	40	33
Level Of Service	***Average Travel Speed (MPH)***	
A	≥35	≥30
B	≥28	≥24
C	≥22	≥18
D	≥17	≥14
E	≥13	≥10
F	<13	<10

Note: Average travel speed is calculated using free flow speed and intersection delay.
Source: 1994 Highway Capacity Manual.

Consistent with the volume-to-capacity analysis performed for roadway segment level of service, the afternoon-peak period is more congested than the morning-peak period based on average travel times. Moreover, the average travel speeds for the afternoon-peak period decrease significantly from the free flow speeds as represented by midday travel times (see Table 4.5 based on Performance Measure #6). Corridors showing a significant reduction in freeflow travel speeds during the afternoon-peak period include:

- DeBarr Road / 15^{th} Avenue eastbound shows a decrease of travel speed by 44 percent
- Glenn Highway eastbound shows a decrease of travel speed by 16 percent (Note: This represents the decrease in travel speed for the entire corridor from Ingra Street to Eagle River. The decrease in travel speed along the arterial portion of the corridor would be much greater.)
- Muldoon Road / Tudor Road northbound / eastbound shows a decrease in travel speed by 29 percent
- New Seward Highway northbound and southbound show a decrease of travel speed by 19 and 15 percent respectively
- Northern Lights Boulevard eastbound shows a decrease of travel speed by 43 percent

These corridors tend to contain the Anchorage intersections that operate at poorer levels of service as indicated in the next section.

Table 4.3 Average Speed and Level of Service by Anchorage Corridor for the Morning-Peak Period

Corridor	Direction	Average Speed (mph)	Level of Service (grade)
C Street	NB	27.12	B
C Street	SB	26.20	B
DeBarr Road / 15th Avenue	EB	28.56	B
DeBarr Road / 15th Avenue	WB	24.80	B
Dimond Boulevard / Abbott Road	EB	37.50	A
Dimond Boulevard / Abbott Road	WB	36.36	A
Glenn Highway			
Freeway	EB	62.71	A
Arterial		31.46	A
Freeway	WB	57.62	A
Arterial		26.94	B
Lake Otis Parkway	NB	21.90	C
Lake Otis Parkway	SB	27.48	B
Minnesota Drive	NB	32.65	A
Minnesota Drive	SB	37.80	A
Muldoon Road / Tudor Road	NB, EB	33.55	A
Muldoon Road / Tudor Road	SB, WB	30.20	A
New Seward Highway			
Freeway	NB	49.38	A
Arterial		30.98	A
Freeway	SB	56.69	A
Arterial		26.63	B
Northern Lights Boulevard	EB	28.52	B
Northern Lights Boulevard	WB	26.22	B

Source: Cambridge Systematics, Inc.

Table 4.4 Average Speed and Level of Service by Anchorage Corridor for the Afternoon-Peak Period

Corridor	Direction	Average Speed (mph)	Level of Service (grade)
C Street	NB	26.36	B
C Street	SB	24.15	B
DeBarr Road / 15th Avenue	EB	20.87	C
DeBarr Road / 15th Avenue	WB	24.34	B
Dimond Boulevard / Abbott Road	EB	28.96	B
Dimond Boulevard / Abbott Road	WB	22.89	B
Glenn Highway			
Freeway	EB	61.52	A
Arterial		21.53	C
Freeway	WB	62.45	A
Arterial		27.06	B
Lake Otis Parkway	NB	22.46	C
Lake Otis Parkway	SB	24.96	B
Minnesota Drive	NB	34.84	A
Minnesota Drive	SB	32.48	A
Muldoon Road / Tudor Road	NB, EB	26.16	B
Muldoon Road / Tudor Road	SB, WB	28.65	B
New Seward Highway			
Freeway	NB	54.10	A
Arterial		18.96	C
Freeway	SB	53.31	A
Arterial		17.43	D
Northern Lights Boulevard	EB	18.63	C
Northern Lights Boulevard	WB	24.00	B

Source: Cambridge Systematics, Inc.

Table 4.5 Percent Congested Travel Time Increase by Corridor

Corridor	Direction	Midday Travel Time (minutes)	Afternoon Travel Time (minutes)	Percent Increase Travel Time
C Street	NB	12.18	14.57	20%
C Street	SB	12.97	15.90	23%
DeBarr Road / 15th Avenue	EB	11.18	16.10	44%
DeBarr Road / 15th Avenue	WB	12.76	13.80	8%
Dimond Boulevard / Abbott Road	EB	8.74	9.32	7%
Dimond Boulevard / Abbott Road	WB	10.69	11.79	10%
Glenn Highway	EB	16.00	18.54	16%
Glenn Highway	WB	16.26	16.75	3%
Lake Otis Parkway	NB	12.06	15.76	31%
Lake Otis Parkway	SB	12.86	14.18	10%
Minnesota Drive	NB	14.08	14.12	0%
Minnesota Drive	SB	13.84	15.15	9%
Muldoon Road / Tudor Road	NB, EB	16.04	20.65	29%
Muldoon Road / Tudor Road	SB, WB	15.67	18.85	20%
New Seward Highway	NB	12.20	14.52	19%
New Seward Highway	SB	12.86	15.22	15%
Northern Lights Boulevard	EB	13.99	19.97	43%
Northern Lights Boulevard	WB	13.78	15.50	12%

Source: Cambridge Systematics, Inc.

Intersections

The Boniface Parkway and Tudor Road intersection is the only intersection in the region operating at a failing level of service of “F”. This occurs during the morning-peak hour. Other intersections operating at poor levels of service (“D” and “E”) for each of the three time periods, morning-peak, midday off-peak, and afternoon-peak hours include:

- #4 – Boniface Parkway and Northern Lights Boulevard
- #6 – Bragaw Street and DeBarr Road
- #8 – C Street and Tudor Road
- #11 – Lake Otis Parkway and 36th Avenue
- #12 – Lake Otis Parkway and Northern Lights Boulevard
- #14 – Lake Otis Parkway and Tudor Road
- #20 – New Seward Highway and 36th Avenue
- #27 – Old Seward Highway and Dimond Boulevard

The eight intersections identified above are considered the primary congested intersection locations that occur in Anchorage regardless of the time-of-day.

Other morning-peak-hour intersections with poor (“D” or “E”) levels of service, also considered operating at congested levels, include:

- #9 – Jewel Lake Road and International Airport Road
- #13 – Lake Otis Parkway and O’Malley Road
- #17 – Minnesota Drive and Tudor Road

Other afternoon-peak-hour intersections with poor (“D” or “E”) levels of service include:

- #2 – Airport Heights Road and Glenn Highway
- #7 – Bragaw Street and Glenn Highway
- #9 – Jewel Lake Road and International Airport Road
- #10 – Jewel Lake Road and Dimond Boulevard
- #13 – Lake Otis Parkway and O’Malley Road
- #16 – Minnesota Drive and Northern Lights Boulevard
- #17 – Minnesota Drive and Tudor Road
- #23 – New Seward Highway and Benson Boulevard
- #24 – New Seward Highway and Northern Lights Boulevard
- #28 – Wisconsin Street and Northern Lights Boulevard
- #30 – Eagle River Loop and Old Glenn Highway

The congested intersection locations for each time period are shown in Figures 4.2, 4.3, and 4.4. It should be noted that only 30 intersections were analyzed for this study. As a result, there may be other intersections not identified in the following figures that operate at LOS “D”, “E”, or "F”.

Figure 4.2 Intersections with LOS “D”, “E”, or “F” During the Morning Peak-Period

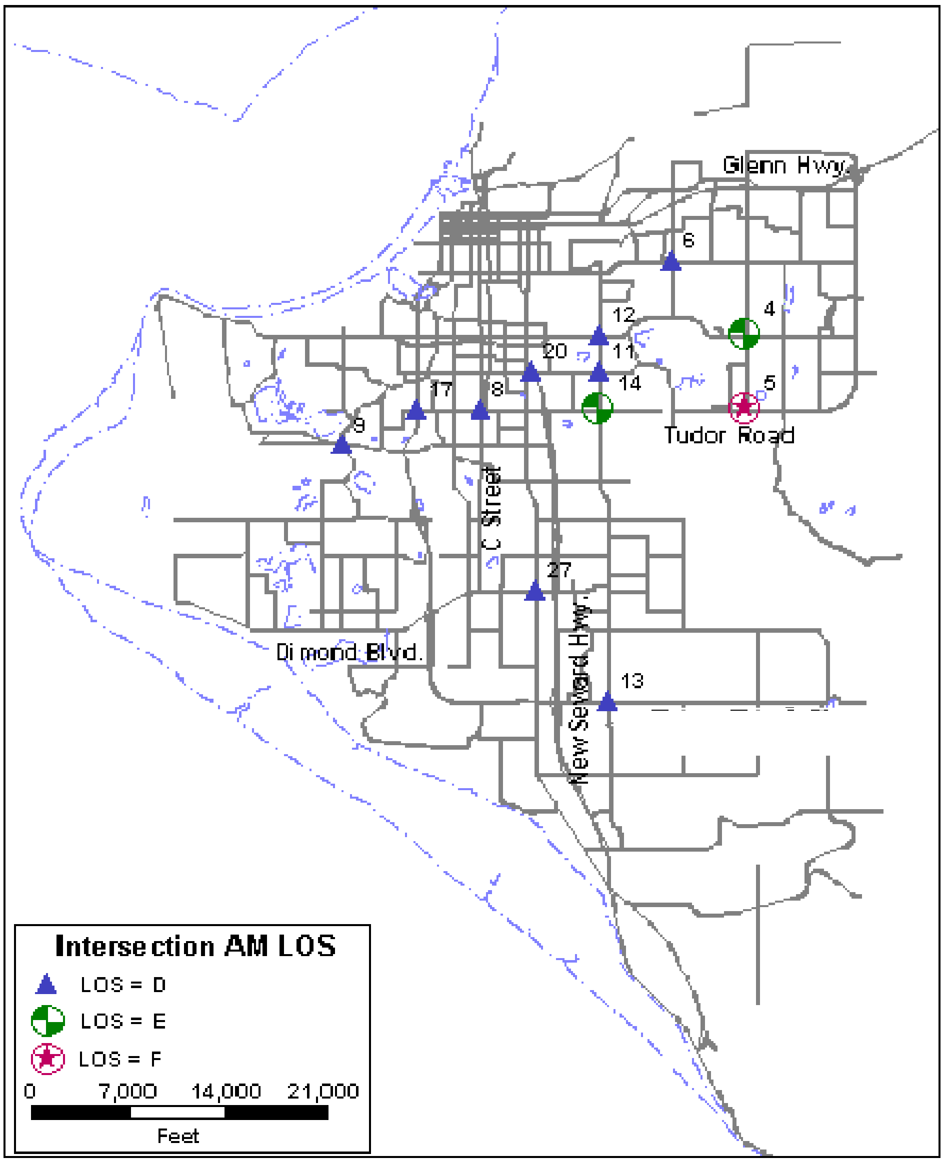


Figure 4.3 Intersections with LOS "D", "E", or "F" During Midday Peak Period

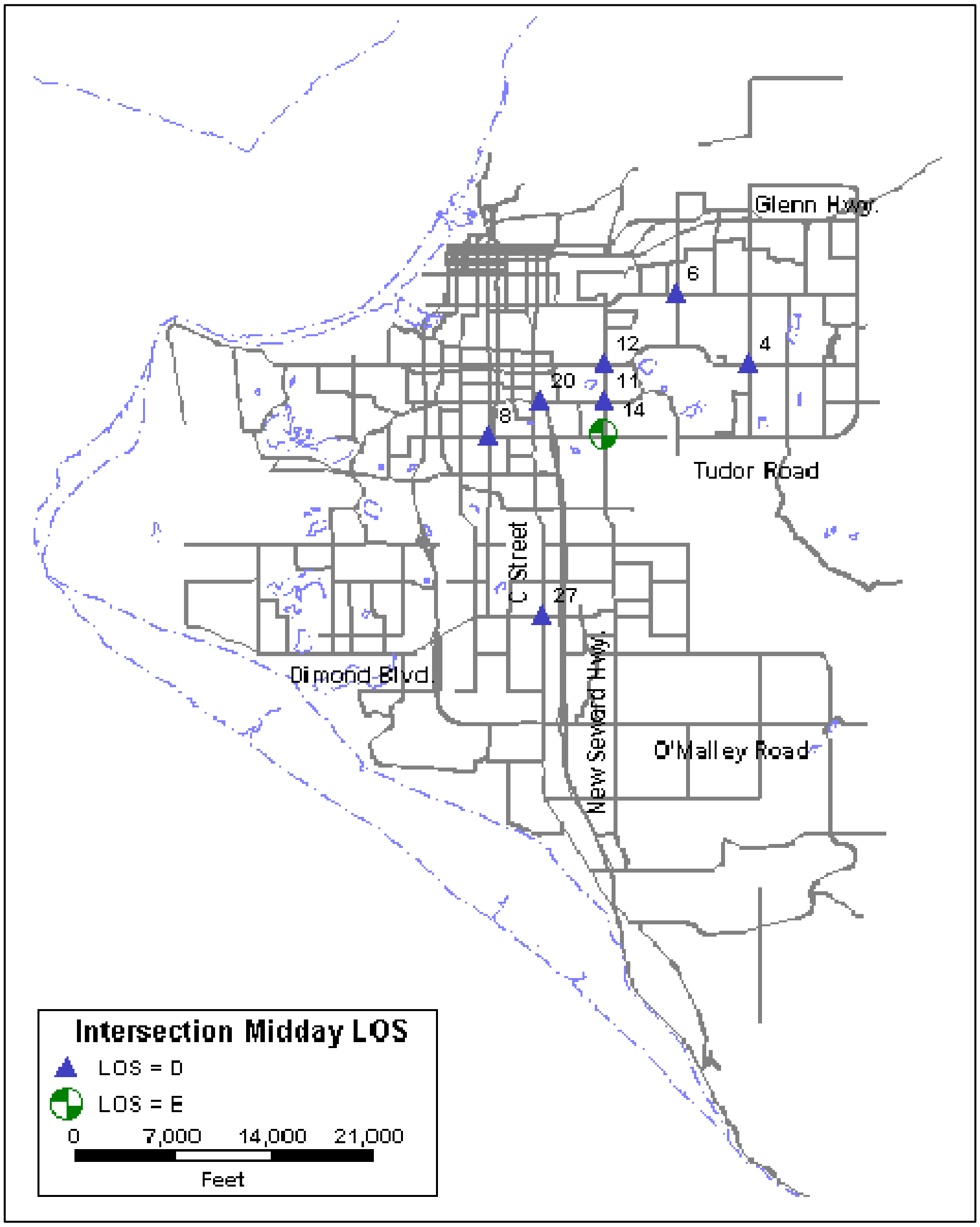
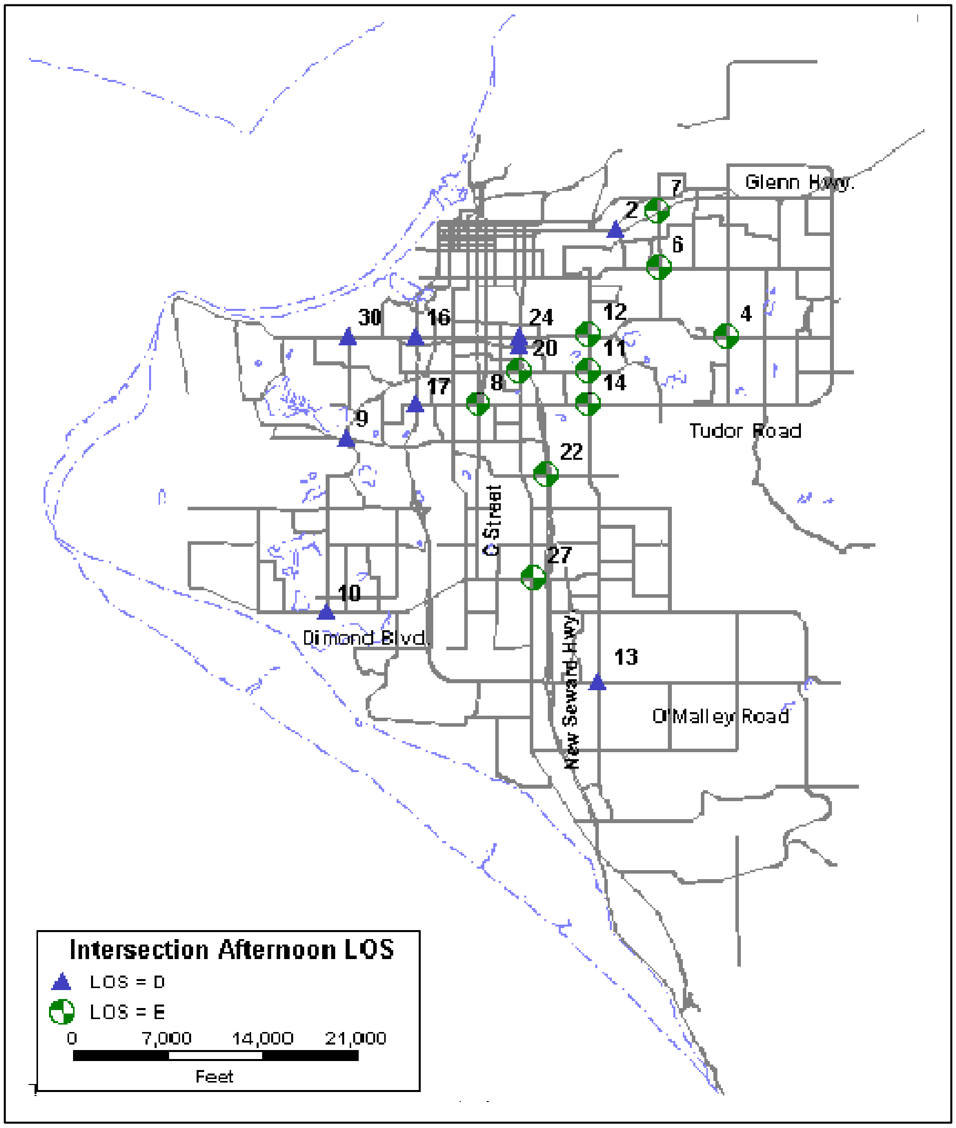


Figure 4.4 Intersections with LOS "D", "E", or "F" During the Afternoon Peak Period



4.2 Magnitude and Nature of Congestion

Based on the analysis conducted for each performance measure presented in Section 3.0 of this report, intersection level of service appears to be the key determinant of congestion in the Anchorage region. Intersections at various critical locations on the Anchorage transportation network are often the cause of bottlenecks or delay. These intersection bottlenecks generally cause delay on the transportation system roadway segments.

Intersections with a level of service of "D" or worse ("E" to "F") should be considered congested. This occurs during base-year conditions at the following intersections during each period of the day – morning, midday, afternoon – evaluated for the Congestion Management System (CMS).

- #4 – Boniface Parkway and Northern Lights Boulevard
- #6 – Bragaw Street and DeBarr Road
- #8 – C Street and Tudor Road
- #11 – Lake Otis Parkway and 36th Avenue
- #12 – Lake Otis Parkway and Northern Lights Boulevard
- #14 – Lake Otis Parkway and Tudor Road
- #20 – New Seward Highway and 36th Avenue
- #27 – Old Seward Highway and Dimond Boulevard

The afternoon-peak period should also be considered the most congested period during the course of the average weekday in Anchorage. Including the intersections identified above, a total of 19 intersections out of the 30 evaluated for the CMS operate at poor levels of service ("D" to "E") in the afternoon-peak period. For comparison purposes, 12 intersections operate at levels of service worse than "D" in the morning-peak period and eight intersections operate at poor conditions during the midday period.

4.3 Congestion Management Standards

While collecting data on performance measures can be valuable in and of itself, it does not tell anything about whether or not congestion is exceeding a level considered to be unacceptable to the community. In order to determine when something needs to be done about congestion, performance standards need to be established. Performance standards are used to establish the level of desired operation for the transportation system. This function is distinctly different from performance measures that are used to identify current or anticipated operating conditions on the transportation system.

Metropolitan regions throughout the U.S. have implemented various forms of performance standards. In order to decide which type of performance standard is best suited for Anchorage, the following issues need to be addressed.

1. Which type of standards should AMATS adopt?

   A traditional performance standard has been minimum level of service (e.g., achieve at least a LOS C or D). Other performance standards could be established depending on which performance measures are adopted, including:

   - Minimum average speed

- Maximum VMT/lane miles
- Maximum delay per VMT
- Ratio of travel time over free flow speed
- Minimum average vehicle ridership
- Maximum delay/vehicle at intersections

2. Should AMATS establish a uniform performance standard for the entire study area?

   Should the roadway standards be the same throughout the region or should they recognize that a specific level of performance might be appropriate or acceptable in one area while not in another area? For example, the downtown, university, or airport areas may have different expectations from the traveling public than other areas of the region.

3. How high should the standards be set?

   Should the performance standards be set high (e.g., LOS C or D) even though they may not be achievable, with the possibility of roadways being shown as deficient even after improvement or should the performance standards be set low (e.g., LOS E) with the acceptance of some congestion, but with a practical ability to achieve the goal?

4. Should duration of congestion be included in the standard (e.g., LOS E for two hours of the day)?

With respect to issue #1, the Municipality should continue to rely on level of service as its primary traffic standard for both roadway segments and intersections. Level of service (LOS) is a universally accepted measure of roadway and intersection performance. Level of service is often used as a trigger for initiating a more detailed examination of transportation problems, and in particular, a method to identify the magnitude of congestion. In some metropolitan areas, although relatively effective as an indicator of congestion, LOS is not particularly useful in providing insight or analysis of congestion effects or solutions. However, for Anchorage, LOS measurement provides a good starting point for evaluating the impacts of intersections on transportation system congestion. Level of Service has several advantages; it is relatively easy for the general public to understand and data is readily available to monitor the standard.

A travel time standard based on the ratio of peak travel time over free flow travel time should be reconsidered for use in the future as a replacement or supplement to the level of service standard. The main problem with the use of this type of standard at the present time involves the selection of a ratio that is meaningful and truly reflects what residents consider to be an unacceptable level of congestion. Without an historical database, it would be difficult to determine if the standard represents a high or low level of congestion in Anchorage.

With respect to issue #2, many cities that experience severe congestion problems have adopted multiple standards. These standards are generally set lower for the urban core areas where existing development densities preclude significant transportation system expansion at an acceptable cost due to high right-of-way acquisition costs. In suburban areas located outside of commercial centers standards are generally set higher in response to higher expectations regarding what is an acceptable level of congestion.

According to the information contained in Chapter 3.0, the Municipality of Anchorage appears to experience a lower degree of congestion than many other cities in the Lower 48. Moreover, there is no evidence to suggest that the expectations of the traveling public regarding congestion differs from one part of the city to another. As a result, the Municipality should adopt a uniform performance standard at least for the time being.

With respect to issue #3, staff recommends that the preferred level of service be set at LOS “C” and that the acceptable level of service be set at LOS “D”. This standard is consistent with the 1991 Anchorage Bowl Long-Range Transportation Plan which states as one of its objectives: ”Provide a roadway network that operates at Level of Service (LOS) “D” or better for 95 percent of the projected 2010 travel demands”. Adjustments to the level of service standards should be considered as a part of the next Long-Range Transportation Plan update if the standards prove to be unrealistic given the financial constraints.

With respect to issue #4, staff recommends that the Municipality adopt a one-hour standard. Most of the MPOs surveyed for this report only used peak hour to measure congestion levels. This is also in line with the relatively short duration of congestion experienced in Anchorage.

Table 4.6 Recommended Intersection and Roadway Performance Standards

	Preferred Operating Standard	Acceptable Operating Standard	Exceeds Deficiency Threshold
Intersections	C	D	E
Roadway	C	D	E

4.4 Congestion Management Strategy Implementation

Intersection delay is the primary cause of congestion on the Anchorage transportation network. Moreover, intersection delay predominately occurs during the p.m.-peak period when workers are attempting to return home. As a result, some of the most effective non-operational congestion management strategies will involve demand management strategies that are aimed at reducing the number of single-occupancy vehicle commuter trips. The Congestion Management Program identified a long list of existing and potential demand management strategies for the Municipality of Anchorage to implement (see Tables 4.7 and 4.8). Of these strategies, many directly target the work trip. These include various carpool and transit strategies, alternative work hours, telecommuting, and the voluntary trip reduction ordinance.

With respect to transit strategies, the performance measures reviewed in Section 3.0 point out several areas where improvements to the bus transit system might improve the transit mode share. Both the performance measure # 13 (time between buses) and performance measure #14 (ratio of bus to automobile travel time) indicate that bus service in Anchorage is well below the national standard. According to the Municipal Public Transportation Department, infrequent bus service is sited as the number 1 reason why people don't ride the bus.

Performance measure # 16 (Pedestrian Environment Factors) illustrates other areas where improvements might be made. The PEF measure shows that much of the Anchorage Bowl (with the exception of downtown) has a relatively poor pedestrian environment. This affects a number of strategies including carpooling, vanpooling, and transit which rely on walking to either access the mode or provide mobility once the destination is reached.

Table 4.7 Existing Congestion Management Strategies

Access Management	Ridesharing Program
Priority Parking for Carpools / Vanpools	Employer Subsidized Transit Use
On-Site Transportation Coordinator	Rideshare / Transit / Bike Marketing Programs
Alternative Work Hours	Telecommuting
Improvements to Bus Routes and Schedules	More Frequent Service
Transit Passenger Amenities	Transit Marketing and Information Programs
Monthly Transit Passes	Improved Feeder Bus Service
Improved Express Bus Service	Park and Ride Facilities
Road Operational Changes	Paratransit Service
Intersection Improvements	Signal System Improvements
Roadway Improvements	Enforcement
Turn Prohibitions	Public Sector Parking Pricing
On-Street Parking Controls	Bicycle Plans and Maps
Bicycle Lockers, Racks, and Other Storage	Pedestrian Connections with Transit
Integration of Facilities for Bicyclists w / Transit[1]	Safety Consideration for Sidewalks

Note: [1]The program to integrate facilities for bicyclist with transit was a new strategy recommended in the 1994 Congestion Management Program which was subsequently implemented since the plan was adopted.

Source: MOA.

Table 4.8 New Congestion Management Strategies

Voluntary Trip Reduction Ordinance	Land Use Policies to Reduce Single Occupancy Vehicles
Site Design Criteria to Increase Transit Use	Parking Requirements in Zoning Codes
Ordinance to require Bicycle Facilities	Education Programs
Guaranteed Ride Home	Employee Transportation Allowance
Eliminate Existing Employee Parking Subsidies	Joint Development Activities
Bus Traffic Signal Preemption	HOV Applicability
Arterial Concurrent-Flow HOV Lanes	Arterials with Limited Access
Reversible-Lane Systems	Parking Supply Control
Preferential Parking for HOV Vehicles	Trails Coordinator
Education Programs for Bicyclists and Potential Cyclists	Showers and Clothing Lockers for Bicyclists / Pedestrians
Bicycle Media and Promotion Campaign	

Source: MOA.

It appears from the analysis contained in Chapter 3.0 that at least eight of Anchorage's intersections are congested for most of the day. In addition, other intersections experience high levels of congestion during either the afternoon- or morning-peak periods or both. Congestion at these intersections will probably not be significantly relieved by demand management strategies which only focus on reducing work-related trips. In these cases, transportation supply strategies such as road operational changes, intersection improvements (including interchanges), and roadway improvements (including construction of missing roadway links) should be actively considered.

Identify Potential Deficiency Plan Process

Intersection delay will likely continue to occur in the near-term if transportation system improvement or mitigation strategies for intersections are not evaluated and deployed. Increases in intersection delay and congestion will also cause roadway congestion to worsen significantly from the good (or acceptable) levels reported in Section 3.0 of this report.

The identification of congestion mitigation strategies for the Anchorage transportation network described above could be integrated with the development of intersection level of service standards and a deficiency plan process. Level of service standards recommended in Section 4.3 could be used by the Municipality to flag those intersections considered to be operating at poor levels of service and to be major contributors to network congestion. The deficiency plan process could be developed by the Municipality to mitigate conges-tion at those intersections with levels of service falling below the established standard and ensure that a mechanism is in place to help improve congestion for ongoing transportation monitoring.

The Municipality could also incorporate into this process the option of "grandfathering" intersections currently operating below standard without the implementation of a deficiency plan. The deficiency plan process would then be focused on those intersections that fail to meet the standard for the first time. As congestion increases over time, this "grandfathering" process could be re-visited and potentially discontinued in order for the Municipality to begin to mitigate consistently poorly operating intersections.

The deficiency planning process outlined in this section has been developed to solicit local agency comment and review. If this general process meets the needs of regional congestion management, then the Municipality will need to further refine and fully develop an appropriate process for Anchorage.

Deficiency planning will provide the Municipality with a method to focus on areas where congestion problems have diminished transportation system performance below the adopted standards. These plans also provide an opportunity to analyze the cause of the deficiency and determine whether the implementation of improvements or measures could improve overall system efficiency, air quality, and general mobility for the region.

This general deficiency planning process considers three basic steps. Each are outlined below:

Identify deficient intersections. Use the data collection, monitoring, and analysis methods to determine if a deficiency exists at the 30 intersections evaluated in the CMS. Data collection (turning intersection counts by period) should be conducted at the 30 intersections every two years for monitoring purposes. Subsequent intersection capacity analysis should be conducted using 1998 Highway Capacity Manual-based software and techniques approved by the Municipality. This process will be used to determine or flag those intersections, by time period, that fall below the established LOS standard.

Identify causes of congestion and prepare the deficiency plan. Identify the land use development projects or general growth patterns that contributed to the exceedance of the level-of-service standard. Once identified, a deficiency plan program should be developed and evaluated to identify the impacts of potential implementation strategies and to identify the most appropriate mitigation strategies that most effectively improve intersection performance. Initially, transportation system management strategies, such as intersection-lane re-striping, signal timing, and phasing adjustments, and signal progression strategies, should be considered along with potential transportation demand management strategies. Locations where TSM/TDM strategies (see Tables 4.7 and 4.8) do not work to improve levels of service could consider the evaluation of geometric and other infrastructure improvements.

Review, adopt, and implement the plan. This step would include the adoption and approval of the plan by the Municipality and other member jurisdiction responsible for the given intersection. This process may also require the appropriate environmental review in the case of infrastructure improvements.

This process, while general, can be implemented by the Municipality as the foundation for enforcement of an Anchorage-based LOS standard to ensure that congested locations (intersections) will be mitigated as they worsen over time. This process would also be used by the Municipality to maintain the efficiency of the transportation system. Both the deficiency planning process and the intersection LOS standards could also be expanded to incorporate roadway segments. This may become necessary in Anchorage in the future as population and traffic levels increases. Improving roadway connections could improve the connectivity of the transportation system and thus relieve intersection pressure.