AIRPORT HEIGHTS TRANSPORTATION STUDY

Prepared for:

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SUMMARY

This project was initiated by the Municipality of Anchorage (MOA) Assembly at the request of the Airport Heights Community Council. The project is managed by the Department of Public Works Traffic Engineering Division (Ron Thiel, Project Manager), who in turn retained USKH, Inc. (USKH) to perform the study. The purpose of the study is to identify community traffic and safety issues and generate a traffic calming plan to address those issues. Traffic calming uses a combination of devices, enhancements, and policies to reduce vehicle impacts and facilitate pedestrian use in residential neighborhoods.

The study includes the City View, Saxton, Anchor Park, Grandview Gardens, and Thunderbird Terrace Subdivisions, all within the boundaries of the Airport Heights Community Council. The study area lies between Debarr Road on the north, Lake Otis Parkway on the west, Bragaw Street on the east, and Chester Creek Greenbelt on the south.

This is a citizen-driven study. The study team formed a Citizens Advisory Committee (CAC) from applicants who live in different areas of the community with a broad range of issues. The study team mailed a questionnaire out to the residents within the study area which asked about issues and areas that needed traffic calming. A public workshop was held at the beginning of the project which also addressed issues and areas of concern.

The top issues that emerged from the CAC, the questionnaire, and the public workshop were:

- ✓ Speeding
- ✓ Cut-through traffic (traffic that uses the local street system to bypass arterial congestion)
- ✓ Safety for vehicles and pedestrians

The study team performed traffic studies and analyses to verify that these issues are real concerns. We found that average speeds on the streets inventoried were higher than posted speeds of 25 miles per hour (mph). We concluded that travel speeds were higher than posted speeds on most of the longer streets because of the wide streets and the long sight lines.

Street volumes were counted by Traffic Engineering prior to the study. The study team augmented the daily volume counts with peak hour studies and the cut-through studies. The volumes for the streets are within the ranges expected for local streets (< 2,000 cars per day). However, the 20th Avenue, Sunrise Drive, and Airport Heights Drive corridor had volumes at the 2,000 per day level, and had an extended peak duration of several hours. We performed a cut-through traffic study for the 20th Avenue, Sunrise Drive, and Airport Heights Drive corridor. We measured about 15 percent of the evening commute time traffic to be cut-through traffic which uses the local street system to avoid the congestion at the Debarr Road and Lake Otis Parkway signalized intersection.

Vehicle accidents did not appear to be excessive at any location. There were eight pedestrian or bicycle related accidents between 1989 and 1998, including a child pedestrian fatality in 1998 at 15th Avenue and Valarian Street. We counted over 100 school children walkers in the spring time from the Airport Heights Elementary School.

The CAC decided that speeding, cut-through traffic, and safety were valid issues, and that the main emphasis should be on speeding. Reducing speeds would make the streets less inviting to cut-through traffic and improve safety. The CAC selected areas and streets that were identified in the issues gathering stage as needing attention. The study team gave the CAC a "toolbox" of traffic calming devices and strategies to accomplish these goals and the CAC divided into two work teams that generated their own plans. The study team reviewed the CAC plans for engineering feasibility and "fatal flaws." We then combined the plans into a Preliminary Draft Plan which, for the most part, had the best elements of each team's plan. The CAC adopted this combined Preliminary Draft Plan as their work product. The CAC's plans and the Preliminary Draft Plan are included in this report.

The Preliminary Draft Plan was presented to service agencies for review and comment at a workshop held at USKH. Representatives from the CAC, the study team, Anchorage Fire Department, Street Maintenance, Transit, and School District attended the meeting. The service agencies were concerned about the proposed plan, especially traffic circles and speed humps. A follow-up demonstration project with a mock traffic circle was held in the neighborhood. The service agencies brought their equipment to the site and practiced maneuvers around the circle. At the conclusion of the exercise, the service agencies did not commit to the traffic circles.

In June 1999, we held the second public meeting to present the Preliminary Draft Plan to the residents of the Airport Heights neighborhood. At that meeting, following a presentation, the participants divided into three work groups. The work groups were asked to comment on the best part of the plan, the worst part of the plan, suggested changes, and how to priortize the plan and other considerations. For the most part, the groups supported the goals and the plan, except for the traffic circles. The groups also provided a community priority for the improvements. They listed 20th Avenue, Sunrise Drive, and Airport Heights Drive corridor improvements as the top priority, and Norene Street improvements as the second priority.

As a result of the feedback from the service agencies and the second public workshop, the study team and the CAC revised the plan to remove traffic circles and use speed humps. This Final Draft Plan was then presented to the Airport Heights Community Council in July. At the request of Traffic Engineering, the Council postponed action on the approval of the plan until temporary speed humps could be installed and used by the community.

Concurrent with the Airport Heights Transportation Study, Traffic Engineering purchased portable rubber speed humps to use as temporary traffic calming devices. Traffic Engineering decided to deploy two humps on 20th Avenue before adopting the Final Draft Plan in order to determine the effectiveness of the speed humps in reducing speed, and to ascertain if the public and service agencies would accept the humps.

A "before and after" study of the humps found that they are an effective means to reduce speeding. The residents of Airport Heights responded well to the speed humps. At the September Community Council meeting, the overall plan was again presented with emphasis on the performance of the speed humps. The Community Council passed a motion to approve the Final Draft Plan.

Section 7 has the results of the speed hump analyses and final recommendations. We recommend that the Final Draft Plan be implemented, except that no permanent speed humps be constructed until the Municipality has completed a Traffic Device Protocol Study. If the permanent humps are found to be acceptable to service agencies and continue to prove effective, then paved speed humps should be installed. However, in the interim period, the Municipality should continue to deploy the temporary speed humps at locations within the study area.

Section 7 also contains recommendations for pedestrian facilities that were not specifically addressed by the CAC planning efforts. These recommendations should be considered for implementation along with the Final Draft Plan.

ACKNOWLEDGEMENTS

The MOA and USKH would like to thank the members of the CAC for their dedication to this project. This is a community-driven process, and without the CAC's commitment to the evening workshops, public meetings, and community council meetings, it would not have gone forward. The members of the CAC deserve to be proud of their work and the vision they hold for Airport Heights.

The Airport Heights CAC includes:

Jack Bertino

Ed Brewer

Thomas Brunner

Sam Dickey

Kitty Evans

Michael Galginaitis

Elizabeth Hayes

Sylvia Hollway

Jim Malone

Deborah McIntyre

Faye McMartin

Helen O'Harra

Ken Rosenstein

Fred Schruman

Ron Thompson

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LIST OF ACRONYMS

AADT	Annual Average Daily Traffic
ADA	Americans with Disabilities Act
AFD	Anchorage Fire Department
APD	Anchorage Police Department
ASD	Anchorage School District
CAC	Citizens Advisory Committee
DOT&PF	Alaska Department of Transportation and Public Facilities
ITE	Institute of Transportation Engineers
MOA	Municipality of Anchorage
mph	miles per hour
SFD	Seattle Fire Department
USKH	Unwin Scheben Korynta Huettl, Inc.

1 INTRODUCTION

The Airport Heights Transportation Study is a project to initiate traffic calming, pedestrian improvements, and enhancements for the Airport Heights neighborhood. Traffic calming is a description of devices and policies that decrease vehicle speeds, and reduce non-neighborhood-based traffic volumes and traffic accidents, thereby achieving better livability for residents. Pedestrian facilities improve safety and mobility for walkers, and beautification enhancements accentuate traffic calming devices and emphasize the residential nature of the area.

This project is the third project in a program of neighborhood transportation studies focused on traffic calming by the MOA Traffic Engineering Division. Two previous studies, Fairview and Mountain View, have resulted in about $2 million of improvements for each of these neighborhoods, and have been successful in achieving traffic calming objectives. Additionally, in an article printed last Summer in the Anchorage Daily News, the program is credited with raising livability, increasing neighborhood interaction and cohesiveness, and raising property values.

Sections 1 through 6 in this report document the work that was necessary to develop traffic calming alternatives for citizen, community council, and service agency review. Section 7 presents recommendations after the plan was reviewed by the public, and after temporary portable speed humps were installed on 20th Avenue.

1.1 Project Objectives

The project objectives include:

- Implement a public process to identify transportation and pedestrian issues (issues included speeding, cut-through traffic volumes, pedestrian and vehicle safety, and snow removal).
- Identify issues through further public input, and verify these issues through traffic data collection and studies.
- Formulate feasible alternatives that address the issues for public consideration and buy-in.
- Prepare this report with recommendations and priorities.

1.2 Project Execution

The project team used a similar methodology to the one pioneered by the MOA Traffic Engineering Division and their consultant for the Fairview and Mountain View transportation studies. This process sought and included public input throughout every stage of the project. The public input was obtained on three levels:

- Questionnaires, which identified issues and locations.

- Public meetings and workshops, community council updates, and individual meetings with the public.

- A CAC, which was the working group for the project and participated in defining issues and alternatives.

By using this strategy, the study is community-driven and will engender public acceptance of the recommended alternatives. The project consultant team supported the public process by preparing engineering studies of issues, then formulating feasible alternatives for CAC and public review.

The next step of the project, after the acceptance of the Final Airport Heights Transportation Study Report, will be constructing the improvements using bond funds.

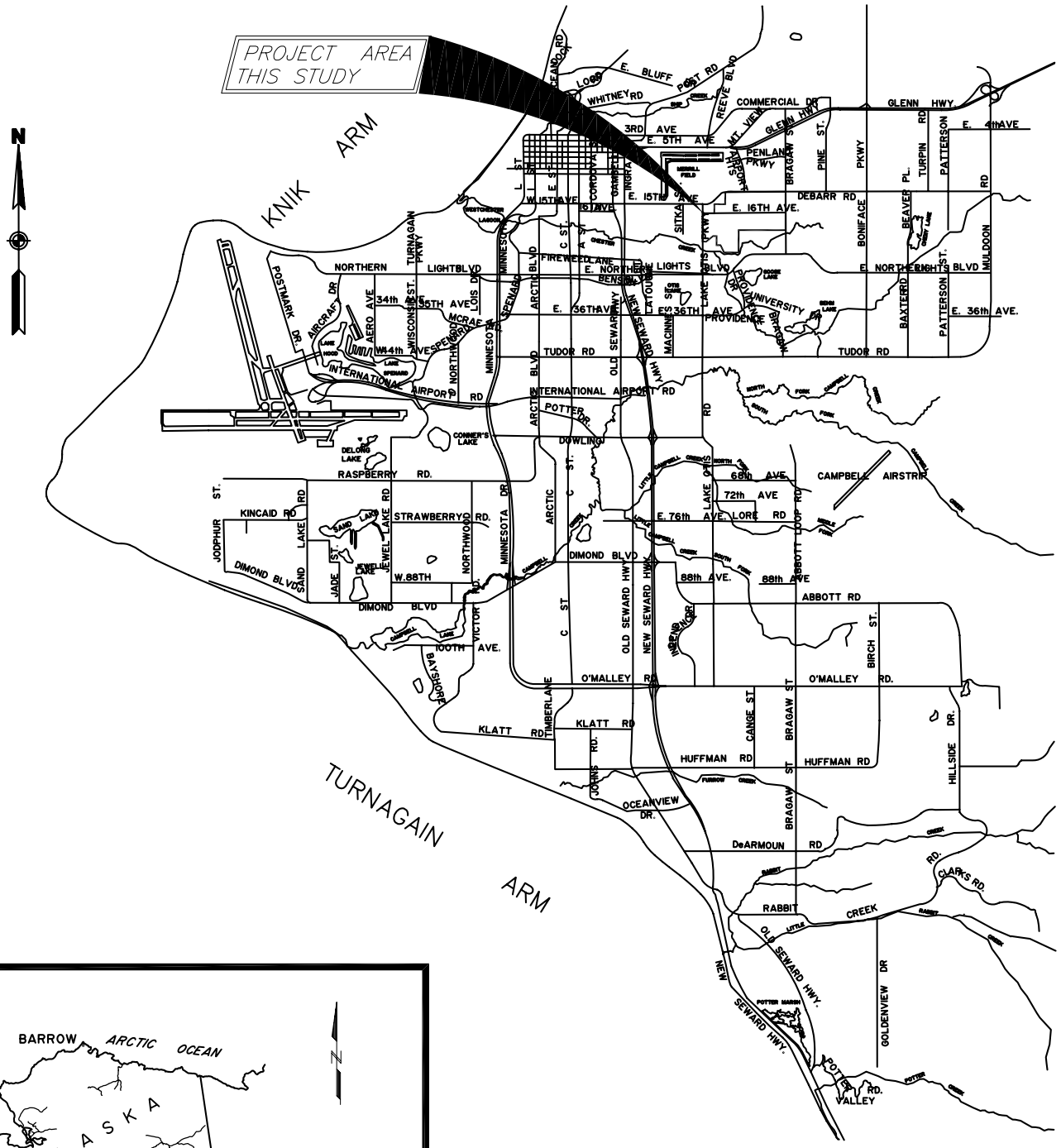
1.3 Study Area

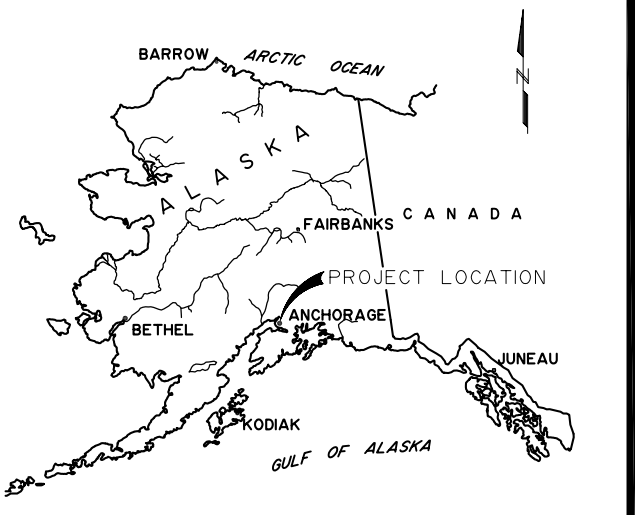
The project area is situated within the MOA, as shown in **Figure 1**, Location Map. **Figure 2**, Vicinity Map, shows the study area in detail.

The study area consists of the City View, Saxton, Grandview Gardens, Anchor Park, and Thunderbird Terrace Subdivisions. The study area is entirely within the Airport Heights Community Council boundaries.

1.4 Project Background

This project was initiated in 1998 by the MOA Assembly at the request of the Airport Heights Community Council. According to then council president Sharon Cissna, the community was concerned about a number of issues including traffic volumes (cut-through traffic), speeding, and Anchorage Montessori School traffic impacts. The project went out for a request for proposal in the summer of 1998, and was started in the winter of 1998/1999.



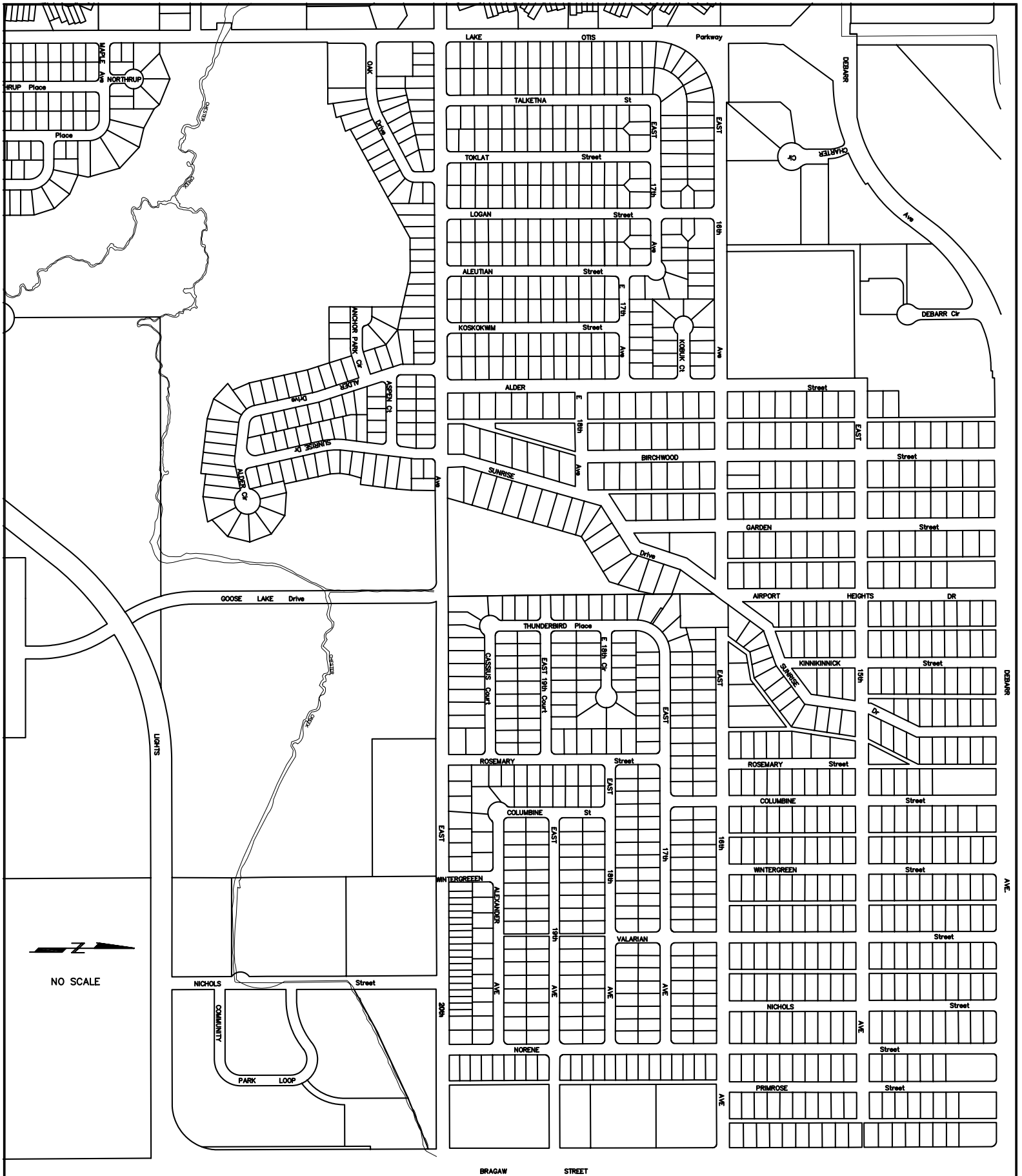


AIRPORT HEIGHTS TRANSPORTATION STUDY

LOCATION MAP

1999

FIGURE 1



AIRPORT HEIGHTS TRAFFIC ANALYSIS

VICINITY MAP

1999

2 EXISTING CONDITIONS

Existing conditions of the neighborhood define constraints and opportunities for this study.

2.1 Streets

The streets in the City View, Saxton, and Grandview Gardens subdivisions are laid out in a rectangular grid system. Predominantly, the long sides of the rectangular grid are oriented north-south. Many of the blocks in the City View, Saxton, and Grandview Gardens subdivisions are bisected by north-south alleys. Thunderbird Terrace and Anchor Park streets are not grid patterned and do not have alleys.

All streets are paved, and most have curb and gutters to convey drainage. Street widths vary from 32 feet to 40 feet, including curbs and gutters. Storm drain systems are used to convey and discharge runoff. However, the drainage system is not continuous, and some curb flow lengths are several hundred feet.

Streets have two lanes. Parking is generally allowed on both sides of the street.

Streets are centered within 50-foot or 60-foot right-of-way widths. Alleys have 20-foot right-of-way widths. Street and alley right-of-ways are used for overhead utilities and discontinuous street lights mounted on wood poles in the City View, Saxton, Anchor Park, and Grandview Gardens subdivisions. Utilities for the Thunderbird Terrace Subdivision are underground, and the subdivision has a street illumination system in place.

With regards to traffic calming, the street widths, long straight segments, and good sight lines are conducive to speeding.

2.2 Pedestrian and Trails Facilities

Most of the streets within City View, Anchor Park, Grand View Gardens, and Saxton subdivisions have 4- to 5-foot-wide sidewalks on both sides of the street. Sidewalks are attached to the curb in City View, Anchor Park, and Grand View Gardens subdivisions. Saxton Subdivision has separated sidewalks. The Thunderbird Terrace Subdivision has no sidewalks.

Most of the pedestrian facilities do not meet the Americans with Disabilities Act (ADA) Accessibility Guidelines. Throughout the neighborhood, there are intersection corners with no accessible ramps, constrictions in width, and surface spalling that do not meet accessibility standards. However, all of the intersections along 16th Avenue between Lake Otis Parkway and Sunrise Drive, and 15th Avenue between Alder Street and Sunrise Drive have recently had curb ramps installed. These streets are along the walking routes for Airport Heights Elementary School.

The Chester Creek Trail Greenbelt traverses the south edge of the study area and connects to the neighborhood. A bicycle trail traverses Tikishla Park within the prolongation of the 20th Avenue right-of-way. There is a bicycle trail on the north side of 16th Avenue between Lake Otis Parkway and Airport Heights Elementary School.

2.3 Transit

People Mover Route 11 serves Airport Heights. Anchorage Indicators state that 4 percent of the neighborhood residents use public transit to get to work.

Inbound buses (towards the central business district) enter the neighborhood at Lake Otis Parkway and Oak Drive, travel east and north to 20th Avenue, travel east on 20th Avenue to Sunrise Drive, then north to Garden Drive for a short segment, then west on 16th Avenue to Lake Otis Parkway where the route continues. Outbound buses retrace the inbound route, except the buses bypass Oak Drive and instead exit the neighborhood at Lake Otis Parkway and 20th Avenue.

Table 1 summarizes ridership information for March 1999, which was provided by the People Mover staff.

Table 1 - Transit Boarding and Alighting Information for Airport Heights

	Daily Average	
	Boardings	**Alightings**
Inbound	21	8
Outbound	9	20

2.4 Land Use

The study area is mostly residential with single-family and multi-family dwellings. Some commercial land use is located on the borders of the study area.

Institutional use includes the Airport Heights Elementary School, the Anchorage Montessori School, the Grandview Gardens Community Center (at the corner of DeBarr Road and Primrose Street), and several churches.

Park lands include Anchor Park and the Chester Creek Greenbelt to the south of the study area, Tikishla Park in the south center, and a ballfield near 16th Avenue and Rosemary Street.

Outside of the study area, to the south and east, is an institutional development that includes Catholic Social Services, ARCA, and the Whaley Center school (serving special needs students). This area generates private vehicle and school bus traffic that use the study area streets.

2.5 Schools

Children in the study area that reside on or west of Sunrise Drive attend Airport Heights Elementary School. All Airport Heights Elementary School students are walkers or are transported by private vehicles except those from the Eastridge Subdivision on the west side of Lake Otis Parkway.

Students who live east of Sunrise Drive attend Russian Jack Elementary School. These students are bused to school.

The Whaley Center is a school for children with special needs. The students are bused from all areas of Anchorage, or are brought to school by private vehicles.

The Anchorage Montessori School is a private school and most of the students are not from the neighborhood and are brought to school by private vehicles. However, some students from the neighborhood do walk to the Anchorage Montessori School.

2.6 Airport Heights Demographics

The Airport Heights neighborhood has a population of 3,495, a 2 percent loss since the 1990 census data (1996 Anchorage Indicators). Based on 1990 census data indicating a total population of 3,554, 58 percent of the population in Airport Heights is between the ages of 20 and 59, 32 percent is under 20, and 10 percent is over 59. Again using the 1990 census, there are 1,396 housing units in Airport Heights with 1,067 single-family units. The neighborhood is 533 acres in size for a density of 2.65 units per acre. Approximately 96.9 percent of the housing units have vehicles, which is an average of 1.8 vehicles per housing unit.

3 PUBLIC INVOLVEMENT

The public involvement process is very important to the success of neighborhood traffic calming. Without neighborhood ownership of the plan, and the resulting changes to their street system, the plan will not succeed. To ensure ownership of the plan, a combination of a neighborhood-wide questionnaire, CAC, public workshops, and regular updates to the Community Council were used.

A CAC of 15 members was established as a working group to represent the larger neighborhood on transportation issues. Members of the CAC were selected based on recommendations from the Community Council president and by their street address to ensure diverse representation of the neighborhood. Approximately 25 residents expressed an interest in participating in the CAC through a Community Council meeting and the project questionnaires. Addresses were mapped and an attempt was made to select members from all areas of the neighborhood.

The purpose of this small working group was to facilitate the identification of issues and solutions on behalf of the larger neighborhood and to educate community members about the project. The public workshops and Community Council updates provided a checks and balances system to verify the CAC was representing the larger neighborhood interests.

Table 2 is a summary of the process used to identify issues, develop project goals, focus data gathering efforts, and generate alternative solutions to address the concerns. This process led to the development of the draft plan presented in Section 6.

Table 2 - Airport Heights Transportation Study Public Involvement Summary

Date	Activity	Purpose
Jan/Feb 1999	Questionnaire	Mailed to all property owners to introduce the project, identify key neighborhood concerns, and generate interest for CAC membership.
1/21/99	Community Council Meeting	Introduce the project to the Community Council.
2/10/99	CAC Meeting	Define the role of the CAC as representing neighborhood interests and begin issue identification.
2/24/99	CAC Meeting	Prioritize the range of issues identified by the questionnaires, Community Council, and CAC.
3/4/99	Public Workshop	Present project purpose and progress to date including the role of the CAC. Conduct small group exercises to identify neighborhood concerns.
3/10/99	CAC Meeting	Guest presentation by the Anchorage Police Department and a report on data collection efforts including traffic counts, cut-through studies, and speed studies.
3/18/99	Community Council Meeting	Project Update.
4/14/99	CAC Meeting	Update on data collection efforts and an overview of the different traffic calming measures that can be applied to Airport Heights.
4/28/99	CAC Meeting	Data collection update. Application of alternative traffic calming schemes to Airport Heights
5/12/99	CAC Meeting	Consultant team presents Preliminary Draft Traffic

Table 2 - Airport Heights Transportation Study Public Involvement Summary		
Date	**Activity**	**Purpose**
		Calming Scheme based on CAC alternatives.
5/19/99	Service Agencies Meeting	Preliminary Draft Plan is presented to agencies for comment and to identify potential impacts to operations.
6/2/99	CAC Meeting	Agency comments on Preliminary Draft were presented to CAC prior to taking plan to the public.
6/9/99	Public Workshop	Present Preliminary Plan for neighborhood comment.
6/15/99	Demonstration Project	Build a demonstration traffic circle of flexible cones to determine maneuverability concerns for the service vehicles.
6/23/99	CAC Meeting	Present revised plan in response to public comment.
7/15/99	Community Council Meeting	Present Draft Plan.

At the July 15, 1999, meeting, the Airport Heights Community Council postponed final acceptance of the plan until the community had time to use the temporary, portable rubber speed humps that were installed on 20th Avenue during August and September. The consultant and Municipal team appeared before the Community Council on September 30, 1999, to report on the effectiveness of the speed humps, and at that meeting, the Community Council approved the draft plan. After that time, final recommendations were formed and are presented in Section 7 of this report. On November 1, 1999, the recommendations of this study were presented to the Planning and Zoning Commission.

4 ISSUE IDENTIFICATION

Several strategies were used to identify the issues of concern to the Airport Heights' residents. First, a questionnaire was mailed to over 1,100 property owners. Second, the CAC identified issues, and third, a Public Workshop was held on March 4, 1999.

Over 130 responses to the questionnaire were received. A copy of the questionnaire and the results are summarized in Appendix A. Respondents were asked to list their top three concerns associated with the neighborhood transportation system. The most common concerns raised were:

- Snow removal
- Speeding
- Cut-through traffic
- On-street parking
- Vehicle and pedestrian safety
- Public transit

At the second CAC meeting on February 24, 1999, members were given a comprehensive list of issues taken from the questionnaire results. Each CAC member was asked to rank each issue on a scale of one to three with three being a high priority and zero being of no concern. The rankings from all of the members were tallied and the results in order of priority were:

- Speeding
- Pedestrian safety
- Cut-through traffic
- School traffic
- Snow removal

Approximately 30 people attended the public workshop where they were asked to identify their transportation concerns within the neighborhood (meeting minutes from the workshop can be found in Appendix B). The most common issues identified were:

- Cut-through traffic
- Speeding
- Vehicle and pedestrian safety
- Snow removal
- On-street parking

As shown, each forum identified the same top issues. In order to verify and quantify these concerns, traffic studies were undertaken.

5 TRAFFIC STUDIES

USKH, performed the following traffic engineering studies for this project to verify issues and problems raised by the initial public process. Data are included under Appendix G.

5.1 Accidents

Accident studies were performed to verify the public's concern about safety (5th on the questionnaire list, 2nd on the CAC list, and 3rd on the public workshop list). Municipal records between 1989 and 1998 were examined for the street system within the Airport Heights area. Street intersections with the major arterials were excluded from the analysis because accidents at those locations are usually caused by problems associated with high speed arterials and less by residential streets.

There were 156 accidents in the 10-year period. Of those, 132 accidents were property damage only accidents, 32 involved injuries as well as property damage, and one included a fatality. As expected, most accidents were at intersection locations. The range of accidents at intersections is between 1 and 21. All but one intersection (the one with 21) had 10 or less accidents in the 10-year study period.

All intersections had very low accident rates, except for the intersection of Columbine Street and East 15th Avenue (15th/Columbine). This location had 21 accidents in the10-year period, and an estimated accident rate of 1.96 accidents per million entering vehicles. Similar intersections in Anchorage between 1993 and 1996 had an average of about 2 accidents per million entering vehicles. Although the observed rate at Columbine/15th is less than the normal Anchorage rates, it is still considerably higher than other Airport Heights' intersection accident rates. The Municipality installed an all-way stop in 1994 to reduce accidents at this location.

Table 3 summarizes each pedestrian and bicycle accident.

Table 3 - Airport Heights Pedestrian and Bicycle Accidents

Year	Location	Accident	Injury/fatality
1989	20th Ave and Nichols	Pedestrian	—
1992	15th Ave and Columbine	Pedestrian	—
1992	Norene and Alexander	Pedestrian	1 Injury
1994	17th Ave and Valarian	Bicycle	2 Injuries
1994	16th Ave and Alder	Bicycle	—
1995	18th Ave and Norene	Pedestrian	1 Injury
1998	15th Ave and Valarian	Pedestrian	1 Fatality
1998	20th Ave and Kuskokwim	Bicycle	—

Key points of the accident analysis include:

- Intersections had 10 accidents or less during the 10-year study period except for the Columbine/15th Avenue intersection that had 21 accidents. Although these numbers may seem high, the *accident rates* (number of accidents per million entering vehicles) for the neighborhood are below the average value of other similar streets.

- Although the observed accident rate at Columbine/15th is less than the normal Anchorage rates, it is still considerably higher than other intersection accident rates in the area.

- There is no intersection or location that appears to have an a unusual pedestrian accident problem. No location had more than one accident. However, accidents did appear to happen on the longer segments of the street system which may be related to speeding.

5.2 Volumes

Traffic volume studies were performed to verify concerns about cut-through traffic (3rd on the questionnaire and CAC list, and 1st on the public workshop list).

The residential streets within the Airport Heights neighborhood are classified as local streets. Local streets emphasize access over mobility and volumes usually range from a couple hundred vehicles daily to 2,000 vehicles daily. Local streets typically branch from collector streets, which provide both access and a higher degree of mobility. Arterial streets connect with collectors, and the arterials' main function is mobility. The MOA *Official Streets and Highways Plan* indicates that local streets should have an Annual Average Daily Traffic (AADT) volume of 2,000 or less. The 2,000 AADT volume is also mentioned as a upper limit in the State of Alaska Department of Transportation and Public Facilities' (DOT&PF's) *Highway Preconstruction Manual*.

The Institute of Transportation's (ITE's) *Trip Generation Manual* indicates that local street peak hours are usually about 10 to 12 percent of the total AADT volume.

The MOA performed volume counts at locations in the neighborhood in August 1998. **Table 4** shows the estimated AADT for these streets, based on the counts.

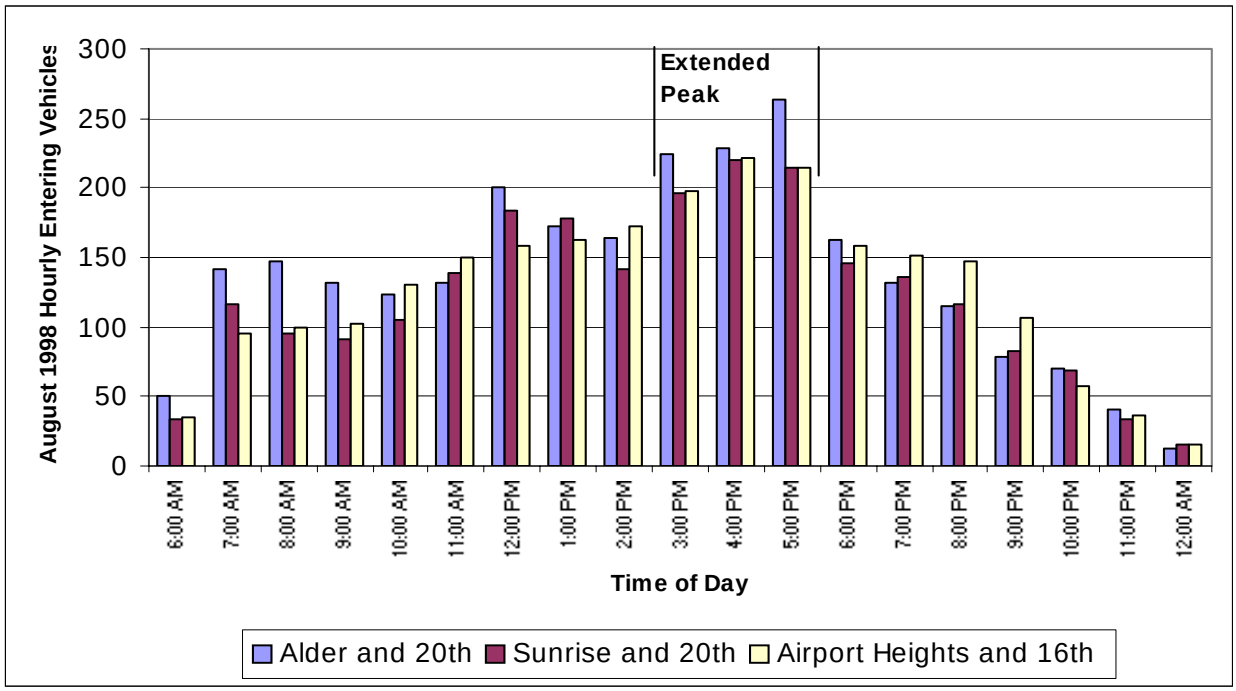
Table 4 - Estimated AADT for Airport Heights Streets

Street	AADT (vehicles per day)
20th Avenue	2,000
Sunrise Avenue	2,000
15th Avenue (East of Sunrise)	1,250
16th Avenue (Columbine to Nichols)	900
16th Avenue (West of Sunrise)	1,200
Columbine Street	1,800

Table 4 - Estimated AADT for Airport Heights Streets	
Street	**AADT (vehicles per day)**
20th Avenue	2,000
Norene Street	750

USKH prepared graphs of hourly volumes for these streets. The graphs identified peak hours which appeared to be within the expected range of about 10 percent of the AADT. Unusual trends were evaluated by comparing the graphs to other Anchorage street hourly volume graphs. The 20th Avenue, Sunrise Drive, and Airport Heights Drive corridor has an extended peak period between 3 p.m. and 6 p.m. where hourly volumes are about the same (see **Figure 3**). This corridor was identified in the public process as having substantial cut-through traffic, that is traffic seeking to avoid arterial congestion and delay by using the residential street network. The extended peak period was analyzed to determine if the volume levels are prolonged by cut-through traffic, making up a substantial portion of the total traffic volumes.

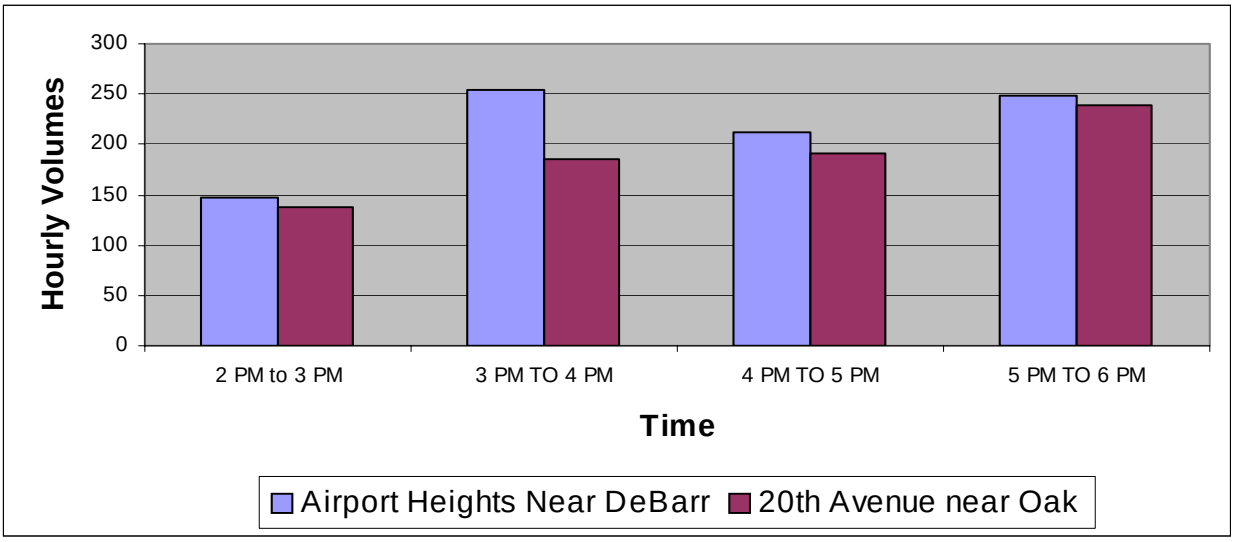
Figure 3 - August 1998 Hourly Volumes for 20th Avenue, Sunrise Drive, and Airport Heights Drive



USKH inspected and graphed count data for other streets in the MOA and found those streets to have similar volume profiles. As such, we concluded the extended peak period in and by itself is not unusual for residential streets in the MOA.

In April 1999, USKH performed 4-hour manual counts for the 20th Avenue/Sunrise Drive/Airport Heights Drive corridor in conjunction with the cut-through study. Graphing the information, shown in **Figure 4**, both the hourly volumes and the extended peak duration are found to be similar to the August 1998 data. The second count verified that the school traffic did not substantially change the traffic volumes.

Figure 4 - April 1999 Hourly Volumes for 20th Avenue, Sunrise Drive, and Airport Heights Drive



Key points of this analysis include:

- Daily volumes (AADT) appear to be within the range expected for residential streets.
- Peak hour traffic is within expected ranges of 10 to 12 percent of the AADT.
- The extended peak period along the 20th Avenue/Sunrise/Airport Hts. corridor is not unusual and is observed at other local streets within the Municipality.

5.3 Speeds

Speeding was the top concern stated by the CAC and the second priority on the questionnaire and public workshop lists. USKH performed speed studies during the month of April 1999. **Table 5** summarizes these studies.

Table 5 - Speeds

Location	Speeds in mph Average	85th Percentile	Maximum
16th Avenue near Columbine	29	33	38
15th Avenue near Columbine	26	29	34
20th Avenue near Logan	27	33	43
Airport Hts. Near 15th	27	30	36
Valarian between 15th and 16th	26	30	35
16th Avenue near Logan	28	34	39

mph - miles per hour

Key points of the speed study include:

- In all cases, the average speed exceeds the posted speed of 25 mph. The Municipality has a policy of posting 25 mph as the speed limit for neighborhoods. Since neighborhood streets have many unexpected conflicts (e.g., children playing, driveways), a 25 mph speed allows the driver time to perceive and react to conflicts.

- The 85th percentile speed indicates the speed at which 85 percent of the traffic travels at that speed or below. Normally, on open highways or arterial streets, the 85th percentile speed is used to determine the speed that drivers consider safe and influences the establishment of the posted speed. For the Airport Heights streets that were studied, the observed 85th percentile speed is considerably higher than the posted speed limit. As mentioned above, 25 mph speed limits are set in neighborhoods for pedestrian and residential safety reasons and should not be raised because of actual 85th percentile speeds.

- The sampling was performed on longer streets. Similar speed profiles can be expected on other longer streets in the area, and in fact, many of the residents along similar, long segments have complained about speeders.

5.4 Cut-Through Traffic Volumes

In response to the cut-through traffic concerns (1st in the public workshop, 3rd in the questionnaire and CAC), USKH performed a cut-through traffic study of the street system. Observers were positioned near the neighborhood entry ways at 20th Avenue and Lake Otis Parkway, 16th Avenue and Lake Otis Parkway, and Airport Heights Drive and DeBarr Road. From those locations, we observed vehicle direction, time it passed, and the license plate number. The vehicle was deemed to be a cut-through vehicle if it entered one location and left another location and dwelled within the neighborhood only for a few minutes.

The public had indicated that the 20th Avenue/Sunrise Drive/Airport Heights Drive corridor was heavily used by drivers trying to avoid the Lake Otis/DeBarr signals and the DeBarr/Airport Heights signals. We also observed 16th Avenue because it could be used as a cut-through route. However, there were few cut-through vehicles (less than 3 percent of the total traffic) observed on 16th Avenue.

Table 6 summarizes the observations for the 20th Avenue/Sunrise Drive/Airport Heights cut-through traffic. These numbers should be considered as the minimum amount of cut-through traffic. Our position near the Airport Heights Drive and DeBarr Road intersection could not observe cut-through traffic that uses streets east of Airport Heights Drive and connecting to 15th Avenue. After our study, we heard from the CAC that many drivers used these north-south streets between DeBarr and 15th Avenue in combination with 15th Avenue to connect with 20th Avenue/Sunrise Drive/Airport Heights.

Table 6 - Cut-Through Traffic on 20th Avenue/Sunrise Drive/Airport Heights				
Time	**Northbound**	**Southbound**	**Total**	**Percent of Total Traffic**
2 p.m. to 3 p.m.	7	8	15	11%
3 p.m. to 4 p.m.	19	10	29	16%
4 p.m. to 5 p.m.	13	12	25	13%
5 p.m. to 6 p.m.	30	13	43	18%
TOTALS	69	43	112	15%

Key points of the cut-through traffic study are as follows.

- Our conclusions are that a substantial portion of the 20th Avenue/Sunrise Drive/Airport Heights traffic includes cut-through vehicles that are seeking to avoid arterial intersections. The cut-through traffic was observed to be about 18 percent of total traffic during the evening peak hour, but is probably higher because of the unaccounted traffic that uses streets east of Airport Heights.

- The cut-through traffic occurs during the extended peak duration (3 p.m. to 6 p.m.) found in the volume studies, obviously in response to the increasing afternoon congestion. Drivers use local streets to bypass traffic signals.

- Although the 20th Avenue/Sunrise Drive/Airport Heights traffic hourly volumes are within expected ranges over this extended 3-hour peak period, measures to discourage cut-through traffic would reduce hourly volumes and may also shorten the observed peak duration from its present 3-hour length.

5.5 Airport Heights Elementary School Studies

We contacted the principal of the Airport Heights Elementary School, Ms. Florie Hamilton. There are 339 students and 50 staff at the school. There are 20 spaces on site for staff parking, and the remainder use Alder Street or 16th Avenue. She said that three buses serve about 70 students, and the remainder either walk or are dropped off and picked up by private vehicles.

At most schools, traffic conditions are more congested during the afternoon dismissal than in the morning. Morning traffic drops off children and then leaves. Moreover, the morning traffic will drop off children over a period of approximately 30 minutes. The afternoon pickup traffic typically arrives a few minutes early, waits for dismissal, and upon loading the children, all will leave at about the same time. Although the traffic volumes in the morning and evening are about equivalent, the afternoon is more congested because the cars queue until student dismissal. come.

After the school was let out on an April 1999 afternoon, we observed approximately 90 students crossing the intersection at 16th Avenue and Alder Street (under teacher supervision), and counted up to 90 cars parked along Alder Street, 16th Avenue, and in the school parking lot (cars included both staff and parents picking up their children). From these observations, we estimate that there are about 100 to 120 walkers using 15th Avenue (not observed), 16th Avenue, and Alder Street. We also estimate that there are about 100 to 120 cars picking up and dropping off children.

Key points of the school analysis include the following:

- Airport Heights Elementary School has 3 buses serving about 70 students.

- There are about 100 to 120 students who walk to and from school. The primary walking routes are 15th Avenue, 16th Avenue, and Alder Street.

- There are about 100 to 120 cars that come to the Airport Heights Elementary School to pick up and drop off children. Currently, the cars park along 16th Avenue and Alder Street, as well as in the school parking lot while they are waiting for the dismissal bell.

6 DRAFT PLAN DEVELOPMENT

After the issues were identified and the traffic analyses performed, the draft plan was developed. To develop that plan, the following steps were taken:

- Define priorities
- Identify traffic calming devices
- Formulate a Preliminary Draft Plan
- Review preliminary plan with service agencies
- Present preliminary plan at public workshop
- Revise plan and recommend implementation priorities

This Draft Plan was presented before the Airport Heights Community Council at their July and September meetings. Plan recommendations, presented in Section 7, considered their comments and agency comments.

6.1 Define Priorities

Based on the issue identification process and the results of the traffic studies, the CAC determined that **the top priority that this study should address is reducing speeds in the Airport Heights neighborhood**. This was strongly supported by the results of the questionnaire and the first public workshop.

Although cut-through traffic was also identified as a major concern, the CAC felt that some cut-through traffic is acceptable if the speed limit is observed. In addition, the volume studies indicated that the traffic volumes observed in Airport Heights are not exceptionally high and appear to be as expected in a residential area. Therefore, even though the neighborhood is being used as a cut-through route, the volumes created are not excessive. It was also noted that if measures were taken to reduce speeds, the neighborhood may not be so desirable as a cut-through route.

Improving pedestrian safety was also mentioned repeatedly and the pedestrians counts done at Airport Heights Elementary School confirm the need to consider pedestrians. However, it was felt that decreasing speeds would have a major influence on improving pedestrian safety.

The CAC focused on the cut-through corridors, as well as long, straight segments that are typical in the grid street systems. These grid streets have long sight distances and are wide, particularly in the middle of the day when on-street parking is absent. This combination of factors is conducive to speeding.

6.2 Define Traffic Calming Devices

There are many tools that can be used to calm traffic in residential areas. A summary of all the potential measures, including their advantages and disadvantages, was presented to the CAC before they developed their draft plans, and the summary can be found in Appendix C. The preliminary plans incorporated the following devices:

- Gateway treatments
- Chicanes
- Raised intersections
- Chokers
- Traffic circles
- Speed humps
- Textured crosswalks

Following is a brief description of each of the above devices.

Gateways

Gateways are special landscaping treatments placed at the entrance to neighborhoods. Their purpose is to signify to the motorist a change in roadway character and alert the motorist to the fact that they are entering a residential neighborhood. **Figure 5** shows a typical gateway treatment for Airport Heights. Gateways have been shown to reduce speeds and discourage cut-through traffic, at the same time they enhance the appearance of the neighborhood. However, gateway landscaping requires some maintenance.

Chicanes

Chicanes are typically a series of curb extensions on alternating sides of the streets, which narrow the roadway and require the driver to shift from one side of the right-of-way to the other. A chicane was recently constructed in Fairview as part of a traffic calming project. A typical chicane for the Airport Heights neighborhood is shown in **Figure 6** Chicanes reduce speeds and decrease cut-through traffic, and they offer an area for landscaping. However, because the street needs to be reconstructed and drainage patterns may be affected, chicanes are expensive. The variation in the curb line creates some restrictions for snow removal. Therefore, it is important that bollards be placed behind the curb to alert the operators of the change in alignment. On-street parking is eliminated in those areas where the street narrows.

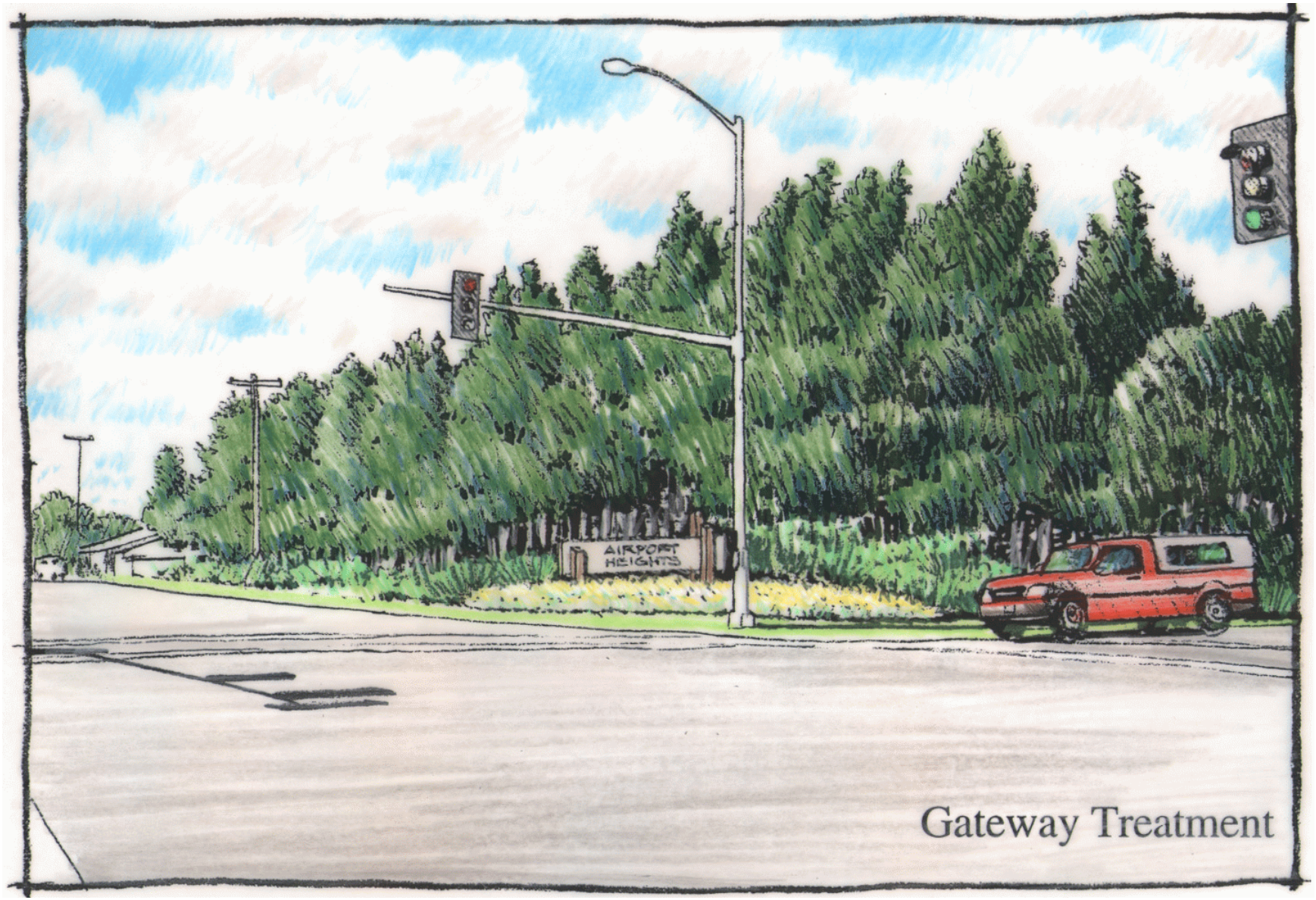


Figure 5 - Gateway Treatment

Figure 6 - Chicanes

Raised Intersections

Raised intersections are raised sections of the roadway where the pavement is elevated to be flush with the top of the curb, and the approaches to the raised intersection are ramped like speed humps. They are also called speed tables. **Figures 7** and **8** depict a typical raised intersection for this neighborhood. Raised intersections slow vehicles and discourage cut-through traffic. They also are a benefit to pedestrians because they serve to emphasize the pedestrian priority, give the pedestrian better visibility, and traffic is slowed at the crossing point. The raised intersection also eliminates the need for a curb ramp. Because the speed table impacts drainage patterns, they can become expensive if extensive reconstruction of the storm drain system is required. Snow removal operations also need to be considered. To alert the operators of the ramped portion of the roadway, bollards should be placed at the beginning of the ramps. There may also be a slight decrease in emergency response time, but the Anchorage Fire Department (AFD) felt the inconvenience would be minimal.

Chokers

Chokers are extensions of the curb into the roadway to narrow the road. They are typically used at intersections, though they can be used mid-block. **Figure 9** illustrates a typical choker and textured crosswalk at 16th Avenue and Columbine Street. Chokers improve pedestrian safety because they make the pedestrians more visible to motorists, they improve the pedestrians' view of oncoming traffic, and they decrease the amount of time a pedestrian spends in the street. Chokers break up the sight line of long narrow streets which tends to decrease excessive speeds. Like the other devices that impact drainage patterns, chokers can be expensive if major modifications to the storm drain system are needed. Similar to chicanes, the change in the curb line requires snow plow maneuvering and bollards need to be installed to alert the operators. Although chokers reduce the number of on-street parking spaces, the intersections tend to provide greater sight distance visibility.

Textured Crosswalks

Textured crosswalks are brick patterned concrete crosswalks that have integral colors to contrast with the roadway (**Figure 10**). The pattern selected should provide a rumble effect as motorists drive across them (bricks in various patterns or orientation), yet they must meet accessibility guidelines for the disabled. Because of the visual contrast and the rumble effect, motorists should be more aware of the possibility of pedestrians and should exercise more caution at these locations as well as throughout the street segment.

Textured crosswalks have been used more and more over the past several years. They are holding up reasonably well under snow plows. Even if the concrete is chipped or spalls, the integral color remains, and the rumble effect continues.

Figure 7 - Raised Intersection Perspective

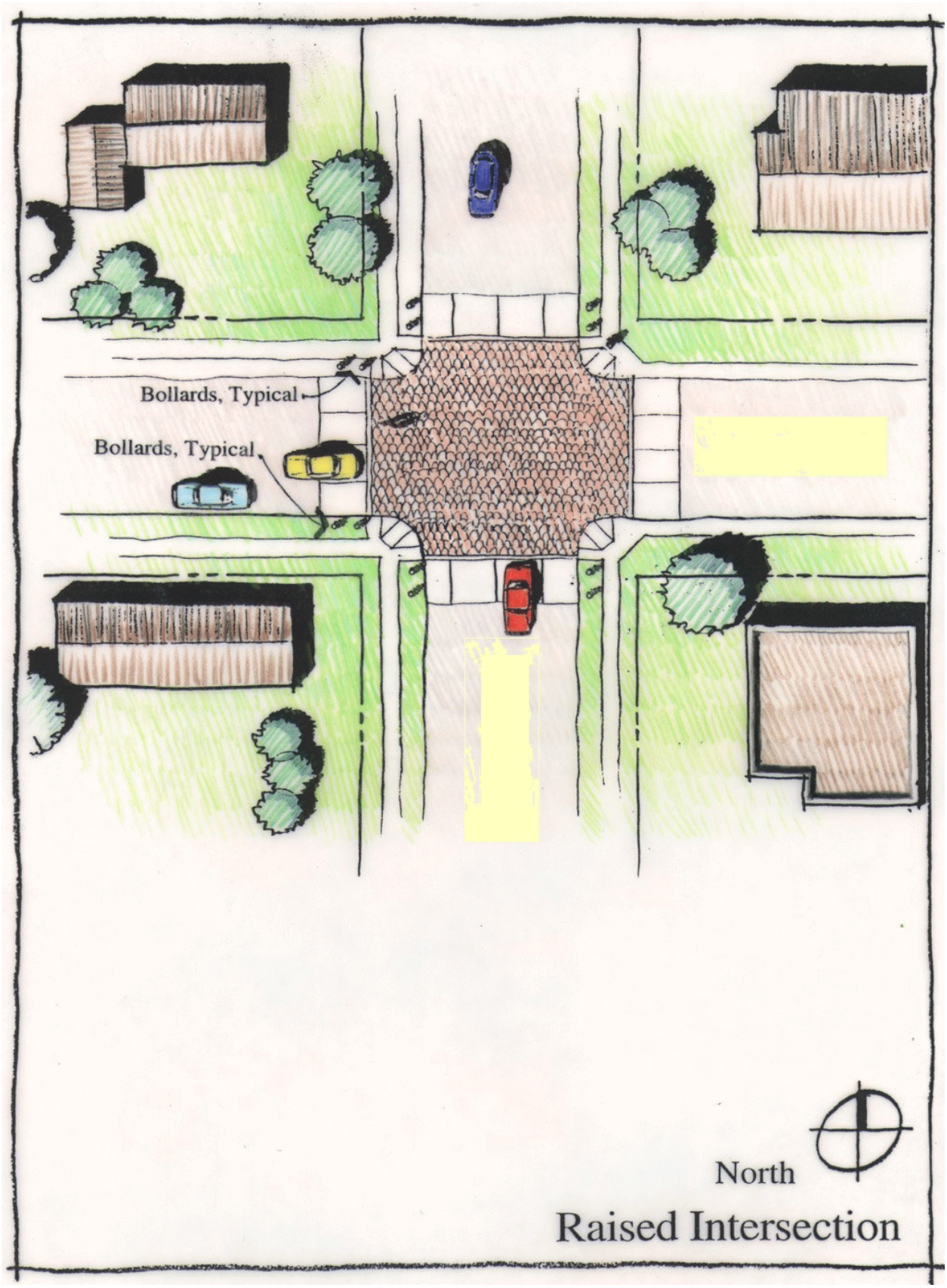


Figure 8 - Raised Intersection Plan

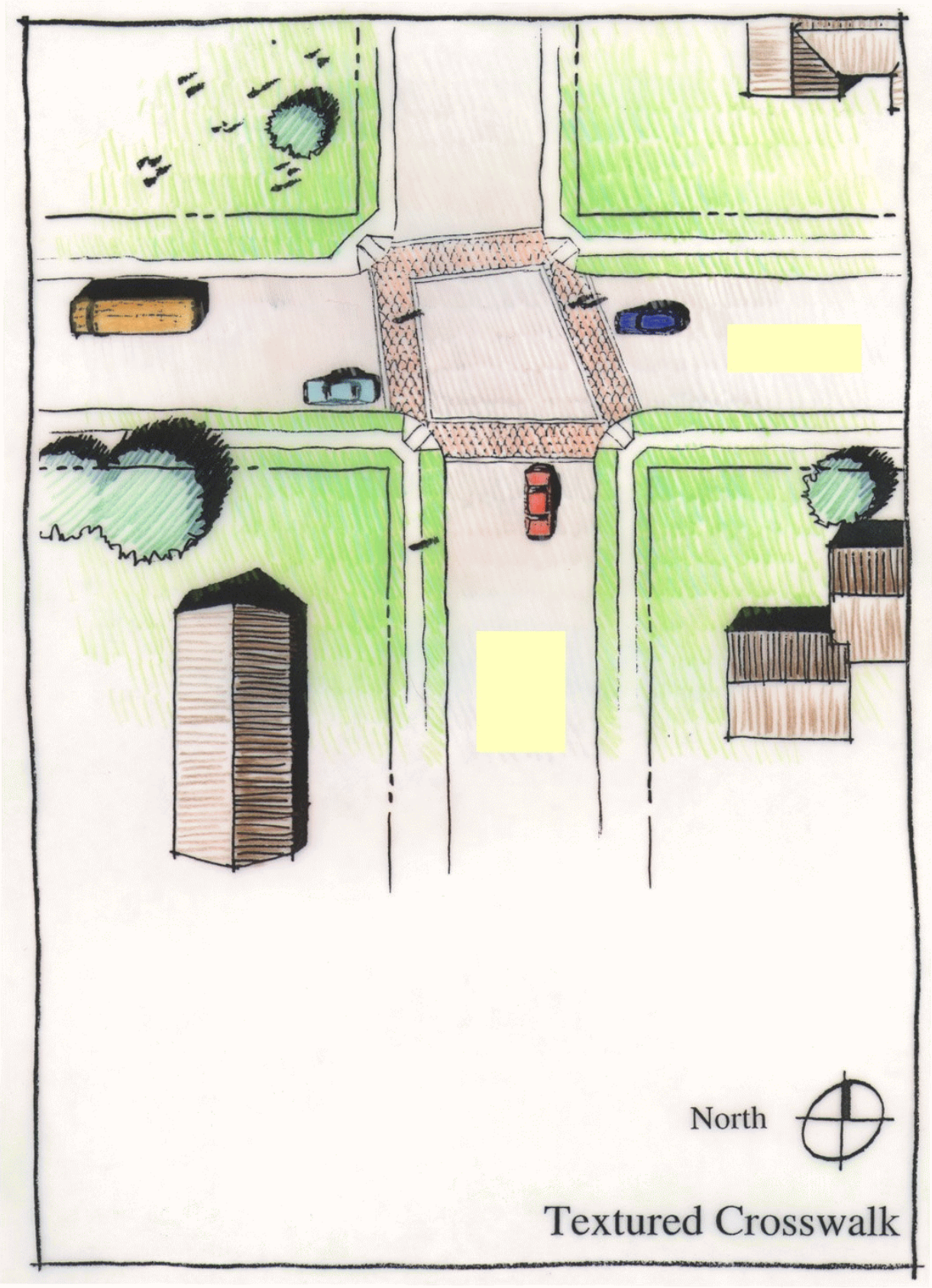
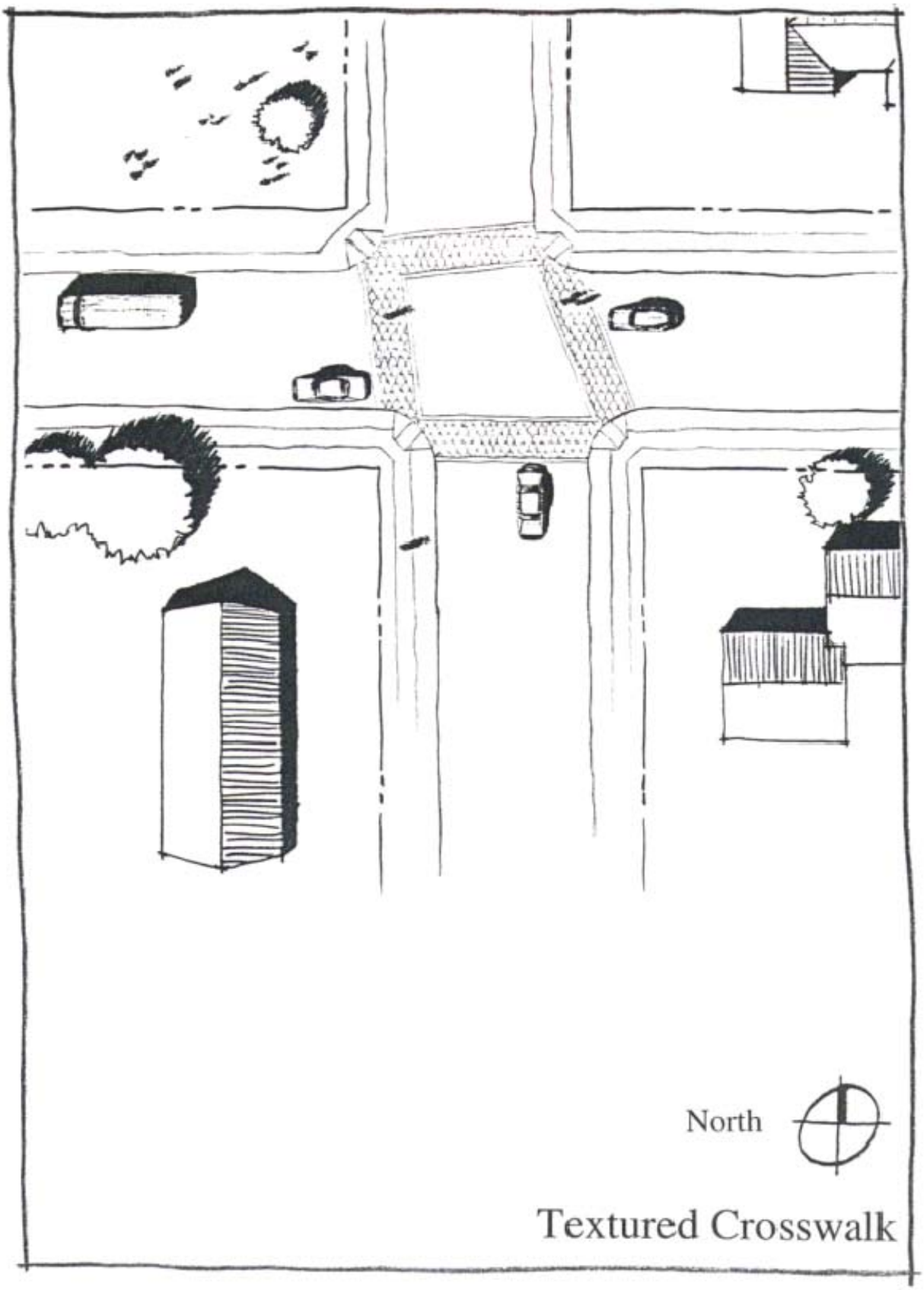


Figure 10 - Textured Crosswalks



Textured Crosswalk

Speed Humps

Speed humps are areas of pavement raised 3 to 4 inches in height over a minimum of 12 feet. Advance warning signs and traffic markings are typically used to warn motorists. **Figure 11** shows the details of a typical 14-foot speed hump. These are different from speed bumps, which you would typically find in parking lots and are only 1 to 3 feet long.

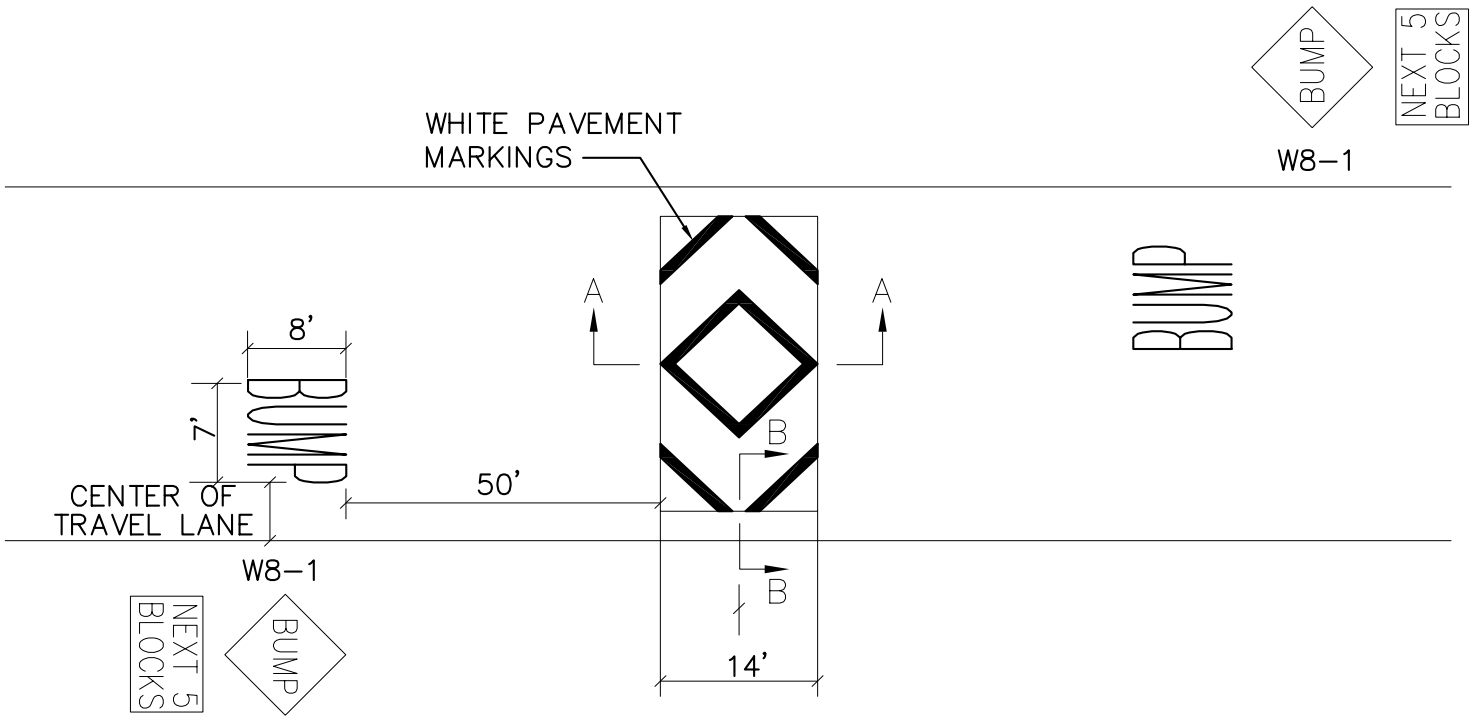
Speed humps have been shown to decrease speeds when they are used in series or in conjunction with other traffic calming measures. The vertical acceleration and deceleration experienced by a car crossing a hump is comfortable at normal speeds, but becomes uncomfortable at higher speeds. Bicycles can easily cross over speed humps.

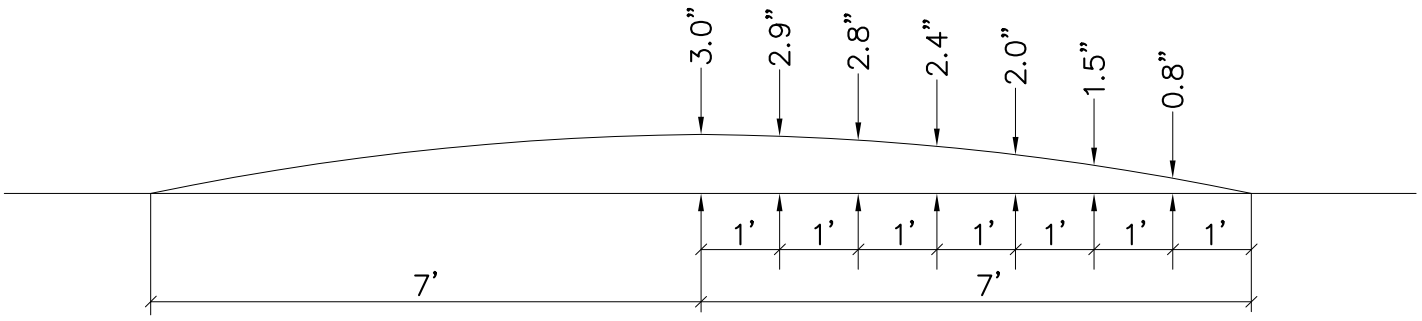
They can be constructed between the gutters, leaving the drainage unchanged which makes speed humps relatively inexpensive. The disadvantages of speed humps are that buses and fire trucks must negotiate at slower speeds and some traffic may be diverted to other streets as motorists attempt to avoid them. All speed humps will be installed for summer use only unless approved in the new Traffic Calming Protocol Manual to be completed in 2000.

Traffic Circles

Traffic circles are raised circular medians placed in the center of intersections so that vehicles must change their travel path to maneuver around the circle. The circle is usually landscaped with low growing shrubs, flowers, and occasionally a tree or two. **Figure 12** shows a typical traffic circle with mature trees. Traffic circles have been shown to slow traffic through neighborhoods when they are used in series or in conjunction with other devices. The circles are designed to cause approach vehicles to deflect horizontally around the circle, which is comfortable at normal speeds. Traffic circles also break up sight lines on straight streets, which also tends to decrease the speeds. However, any landscaping in the circle must be carefully maintained to allow vehicular and pedestrian sight distance.

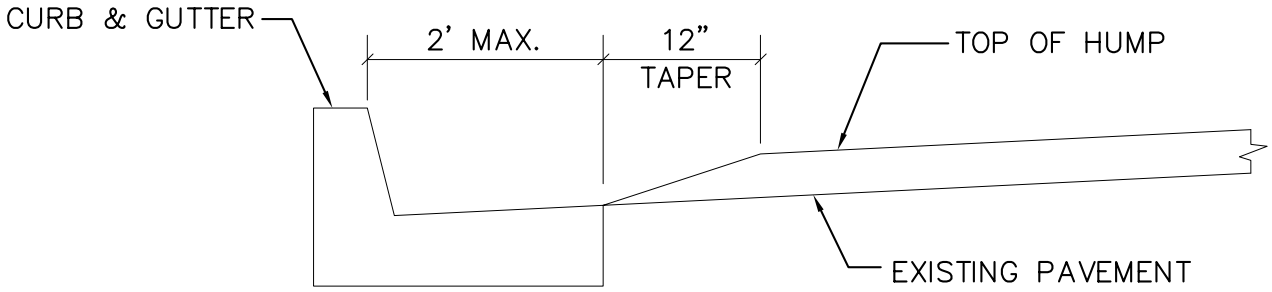
Most communities where circles have been installed have seen a decrease in multi-vehicle accidents at the intersections. Buses, emergency vehicles, and garbage trucks are required to negotiate the circles at low speeds and the circle may impede left turns by large vehicles. Snow removal operations will take longer at these intersections and the curb radius will need to be distinguishable for the operators. Traffic circles were part of the Preliminary Draft Plan, but are not part of the Final Draft Plan.





PARABOLIC CROWN

SECTION A–A



SECTION B–B

AIRPORT HEIGHTS TRAFFIC ANALYSIS

SPEED HUMP (TYPICAL)

1999

FIGURE 11

Figure 12 - Traffic Circle

Other Measures Discussed

Increased enforcement and the addition of stop signs are often requested by the public to calm traffic. Increased enforcement is not truly a traffic calming measure; however, many people think it is the solution to decreasing speeds in their neighborhood. While enforcement operations do result in appreciable speed reductions, the speeds are generally reduced only as long as the enforcement is maintained. Use of personnel for speed enforcement is typically not a high priority for police departments. This sentiment was echoed by the Anchorage Police Department (APD) when asked about enforcement in Airport Heights. National studies have shown, and APD agrees, that people cited for speeding in neighborhoods are typically local residents.

Through the public process, many Airport Heights residents requested additional stop signs. The purpose of stop signs is to assign the right of way at the intersection, not to reduce speeds. Studies have shown that mid-block speeds actually increase between stop signs, probably because motorists are trying to make up for lost time. Compliance of unwarranted stop signs is also a concern, and studies have shown a significant violation rate for unwarranted, multi-way stop signs. Therefore, a careful analysis and an examination of alternatives should be undertaken before adding stop signs.

6.3 Formulation of the Preliminary Draft Plan

Because community buy-in is critical to the success of a neighborhood traffic calming project, the study team worked with the CAC in developing a plan. At the April 28, 1999, CAC meeting, the committee was broken into two groups and each group developed a plan to address the concerns. The consultant team then consolidated the two plans into one plan and this became the Preliminary Draft Plan. The Preliminary Draft Plan and the two plans developed by the CAC can be found in Appendix D

The Preliminary Draft Plan included traffic circles, chicanes, gateways, permanent speed humps, and raised intersections combined with chokers. The CAC was very sensitive to snow removal operations and did not want to recommend a device that would have too great of an impact on snow removal. In addition, the CAC was very aware of the neighborhood's need for on-street parking and worked to minimize the loss of on-street parking.

6.4 Review of Preliminary Draft Plan with Service Agencies

A meeting was held on May 19,1999, to present the preliminary draft plan to the AFD, APD, Anchorage School District (ASD) Transportation, MOA Street Maintenance, and MOA Transit. The intent of the meeting was to explain the plan, identify the agencies' concerns, and discuss alternative solutions. Minutes of this meeting can be found in Appendix E.

To prepare for the meeting, USKH simulated the turning movements of a 40-foot vehicle around a traffic circle. The traffic circle was depicted at a four-way intersection with 38-foot-wide streets (typical of the streets in Airport Heights). The conceptual circle design included a raised circular center surrounded by a textured concrete ring that would be flush with the pavement. The intent of the concrete ring is to allow more turning room for large vehicles while

encouraging smaller vehicles to travel around the larger diameter. The larger diameter creates more of a deflection and therefore reduces speeds more significantly.

The 40-foot-long vehicle could make the right turn without difficulty. The left turn required the vehicle to turn in front of the circle. This is typical in other communities that have traffic circles. There can also be a conflict if a vehicle is parked or stopped on the street onto which the large vehicle wants to turn.

AFD was concerned about routing their trucks in front of the circle and potentially into on-coming traffic. AFD was also concerned about their 48-foot ladder truck being able to maneuver around the circle. Although the local fire station may not be equipped with such a large truck, all trucks in AFD's fleet need to be able to respond.

APD and MOA Traffic Engineering did not see any objections to large vehicles turning left in front of the traffic circle.

MOA Street Maintenance was uncertain about their graders maneuvering around the traffic circles and clearing the snow from the intersection. Typically, during a plow out, a snow berm remains in the middle of the street and this would impact left turning movements. Because traffic circles were not planned at every intersection, the inconvenience may have been avoidable.

ASD stated that they can re-route buses to avoid left turns at intersections with traffic circles and supported the idea of reducing speeds in the neighborhood.

MOA Transit's current inbound bus travels northbound on Lake Otis Parkway, turns right on Oak Street, right on 20th Avenue, left on Sunrise Drive, left on Garden Street, left on 16th Avenue, and right on Lake Otis Parkway. The outbound bus follows the same route from 16th Avenue, but stays on 20th Avenue to Lake Otis Parkway. The inbound bus must turn at Oak Street instead of 20th Avenue because there is a power pole on the southeast corner of 20th Avenue and Lake Otis Parkway that prohibits the bus from making the right hand turn. The Preliminary Draft Plan did not pose any concerns to the transit route.

The Preliminary Draft Plan included speed humps along Norene Street. AFD was concerned about the impact to the passengers and the vehicle as the truck travels over a speed hump and whether or not damage may result. Many of the studies that have been done to determine the impacts on emergency response vehicles were done on streets with posted speed limits higher than 25 miles per hour. The speed humps proposed in Airport Heights are designed to limit speeds to 25 miles per hour.

Many of the ASD buses traveling to the Whaley Center transport medically fragile children who would not be able to tolerate traveling over a speed hump. ASD said they would re-route their buses to avoid any speed humps.

Another issue that AFD mentioned is the existing small radii at the intersections within the neighborhood. As part of this project and possibly another ADA curb ramp project, the radii could be improved.

The agencies' main concern with the Preliminary Draft Plan was maneuverability around the traffic circles. The agencies were interested in how other communities dealt with traffic circles and the agencies wanted to participate in a field demonstration of a mock traffic circle.

Survey of Other Communities

Seattle, Washington has had traffic circles in their neighborhoods for over 20 years. USKH contacted the Seattle Fire Department (SFD) to gather comments on left-turn maneuverability and their experiences with cars potentially blocking turning movements. We spoke with two SFD Operations Assistant Chiefs. Assistant Chief Roger Ramsey said that the SFD requests the circles be designed with rolled curb and low plantings or shrubs so that the fire trucks can drive over the circle, if needed. They also request that circles not be placed along certain critical routes. Assistant Chief Jim Fosse stated that in many instances, the landscaping has matured such that the fire trucks cannot possibly drive across the traffic circles. He pointed out that their biggest problem occurs when motorists park illegally. Traffic circles require prohibiting parking near each corner of the intersection, however, many of the traffic circles were installed in Seattle neighborhoods where on-street parking is necessary for the residents and therefore, the parking restrictions are often violated. In general, however, SFD does not have a problem maneuvering around and making turns at traffic circles.

USKH also contacted the City of St. Paul, Minnesota, to gather insight from another winter city. We spoke with Al Shetka, their City Traffic Engineer, who was the City Maintenance Engineer for 20 years. St. Paul typically receives 50 inches of snow annually with most snowfalls in the 6- to 8-inch range. They have had snowfalls in excess of 20 inches and have never had problems plowing around traffic circles. They try to use the same operator each snowfall so the operators get experienced maneuvering around the circles. The traffic circles in St. Paul are up to 15 years old and they are designed without any landscaping–just a concrete island in the middle of the intersection. They tested the design of the circles with the fire department prior to construction. He also pointed out that they do not have a lot of traffic circles in the city, and they have not done any studies associated with them to determine their effectiveness.

Demonstration Project of Traffic Circles

Because Anchorage does not have any traffic circles in intersections, the study team set up a demonstration project so that the agencies could test maneuverability around the circle. The demonstration was set up at the intersection of 16th Avenue and Alder Street on June 15,1999. Traffic cones were set up in a 12-foot-diameter circle to simulate a 16-foot-diameter circle that includes a 2-foot-wide textured concrete ring between the gutter pan and the asphalt pavement. The demonstration was videotaped and photographs were taken. The following vehicles were involved:

- ASD school bus

- People Mover bus
- MOA Street Maintenance road grader
- AFD fire truck
- AFD fire engine (38-foot)

Each vehicle executed a right turn, a left-turn, and a through movement at the simulated traffic circle. Various parking scenarios were also simulated. All of the vehicles were able to make all of the movements under all of the scenarios and the grader was able to drive completely around the circle (**Figure 13**). There was concern expressed about how far into the other lane of traffic the larger vehicles had to encroach, and the grader operator was very concerned about the curb being properly delineated.

Figure 13 - Grader Negotiating Traffic Circle

6.5 Public Workshop

The Preliminary Draft Plan was presented at a public workshop on June 9, 1999, at Grandview Gardens. Over 65 people from throughout the neighborhood attended the workshop and several people who could not attend the workshop reviewed the plan at USKH's office. The process of the overall project was explained, the traffic data were reviewed, traffic calming devices were explained, and then the Preliminary Draft Plan was presented. The attendees split into three smaller groups to discuss the likes and dislikes of the plan and priorities for implementation. In general, most people supported the intent of the project and felt that there was a need to slow traffic in their neighborhood.

Although some people liked the traffic circles, most of the attendees were not in favor of them. They felt they would be too difficult to maneuver around and would impede snow removal too greatly.

There was more support for raised intersections and speed humps. Gateways and chokers were also well received. There was a lot of concern and discussion about the cost of the improvements. Minutes from the workshop can be found in Appendix B.

6.6 Final Draft Plan

Based on the input received at the public workshop, the Preliminary Draft Plan was revised. The Final Draft Plan incorporates the improvements listed below. **Figure 14** depicts the schematic locations of the proposed improvements.

The Final Draft Plan dropped traffic circles as a speed reduction device. The circles were not well received by the residents at the public meeting and the service agencies continued to have reservations about traffic circles impacting their operations. Instead, series of speed humps were used in the Final Draft Plan for speed reduction.

The Municipality purchased portable speed humps for use around the Anchorage. These speed humps are made of a rubber material and can be removed for the winter. Because of the concerns that permanent, paved speed humps would present problems for snow plows, and because of the uncertainty that residents would accept speed humps, Traffic Engineering decided to install two temporary speed humps on 20th Avenue between Lake Otis during August and September 1999. This allowed the study team to evaluate the speed humps with regards to:

- Effectiveness in slowing down traffic (see Section 7.1).
- Community acceptance of speed humps (Section 7.2).
- Impact on service agencies operations, except snow plows (Section 7.3).

20th Avenue/Sunrise Drive/Airport Heights Drive

To slow traffic, and maximize on-street parking, a series of speed humps are proposed between Lake Otis Parkway and Kuskokwim Street. Studies have shown that to achieve an 85th percentile speed of 25 mph and 30 mph, the spacing between humps should be approximately 275 feet and 550 feet, respectively. Therefore, four speed humps are recommended as illustrated on Figure 14.

Chokers and a textured crosswalk are recommended for the intersection of Alder Drive, Alder Street, and 20th Avenue. Many school children cross 20th Avenue at this intersection, so improvements were desired to improve pedestrian safety. Because this is an offset intersection, the choker on the south side of 20th Avenue will be elongated and will need to be designed to accommodate the existing bus stop.

A textured crosswalk is proposed for the intersection of 20th Avenue and Sunrise Drive. Chokers were considered at this intersection, however, storm drain facilities are currently lacking, so installing chokers would be very costly since it would require storm drain construction.

The existing curb line on the west side of Sunrise Drive widens excessively within the roadway curve just north of 18th Avenue, and creates a segment of widened roadway. We recommend that this curb be reconstructed so that the roadway width is constant. The alley entrance will have to be realigned as well.

Textured crosswalks are recommended at the intersection of 16th Avenue and Sunrise Drive. This area also lacks storm drain facilities, so chokers were not recommended.

A raised intersection is proposed at Airport Heights Drive and 15th Avenue. This intersection does have storm drain facilities which will need to be modified. Chokers in conjunction with the raised intersection were considered. The chokers were eliminated, however, because the sidewalk would be flush with the roadway which could create an unsafe condition for pedestrians.

East 16th Avenue: West of Sunrise Drive

The intersection of 16th Avenue and Lake Otis Drive is an optimum location for a gateway treatment. There is sufficient right of way at this location and the wide roadway (40 feet) combined with the vacant land on the north side does not convey the message of a residential street. Gateway treatments were well supported at the public workshop, however, this is one of only two intersections on the perimeter of the neighborhood with adequate right of way for the improvement. The other proposed gateway treatment is at 20th Avenue and Bragaw Street. The CAC had a brief discussion as to what they would like to have for an Airport Heights gateway and they preferred a very natural looking landscaped area. We recommend that the actual design of the gateway be closely coordinated with community representatives.

The Final Draft Plan recommends a chicane be constructed on 16th Avenue from near Lake Otis Parkway to just east of Logan Street. **Figure 15** depicts a modified chicane that was designed to minimize the elimination of on-street parking in front of the houses. This particular design narrows the roadway to 31 feet by moving the south curb line to the north which also creates more of a buffer strip on the residential side of the street. Parking on the north side would be prohibited. **Figure 16** depicts the intersection of Logan Street and 16th Avenue which incorporates both chokers and a textured crosswalk.

East 15th Avenue: East of Kinnikinnick Street

East 15th Avenue is one of the long stretches of wide roadway in Airport Heights that typically sees higher speeds. To reduce speeds and break up the long sight lines, raised intersections at Sunrise Drive and Valarian Street and chokers with textured crosswalks at Columbine Street are recommended. The Preliminary Draft Plan recommended traffic circles at these intersections, but they were deleted because of the lack of public support.

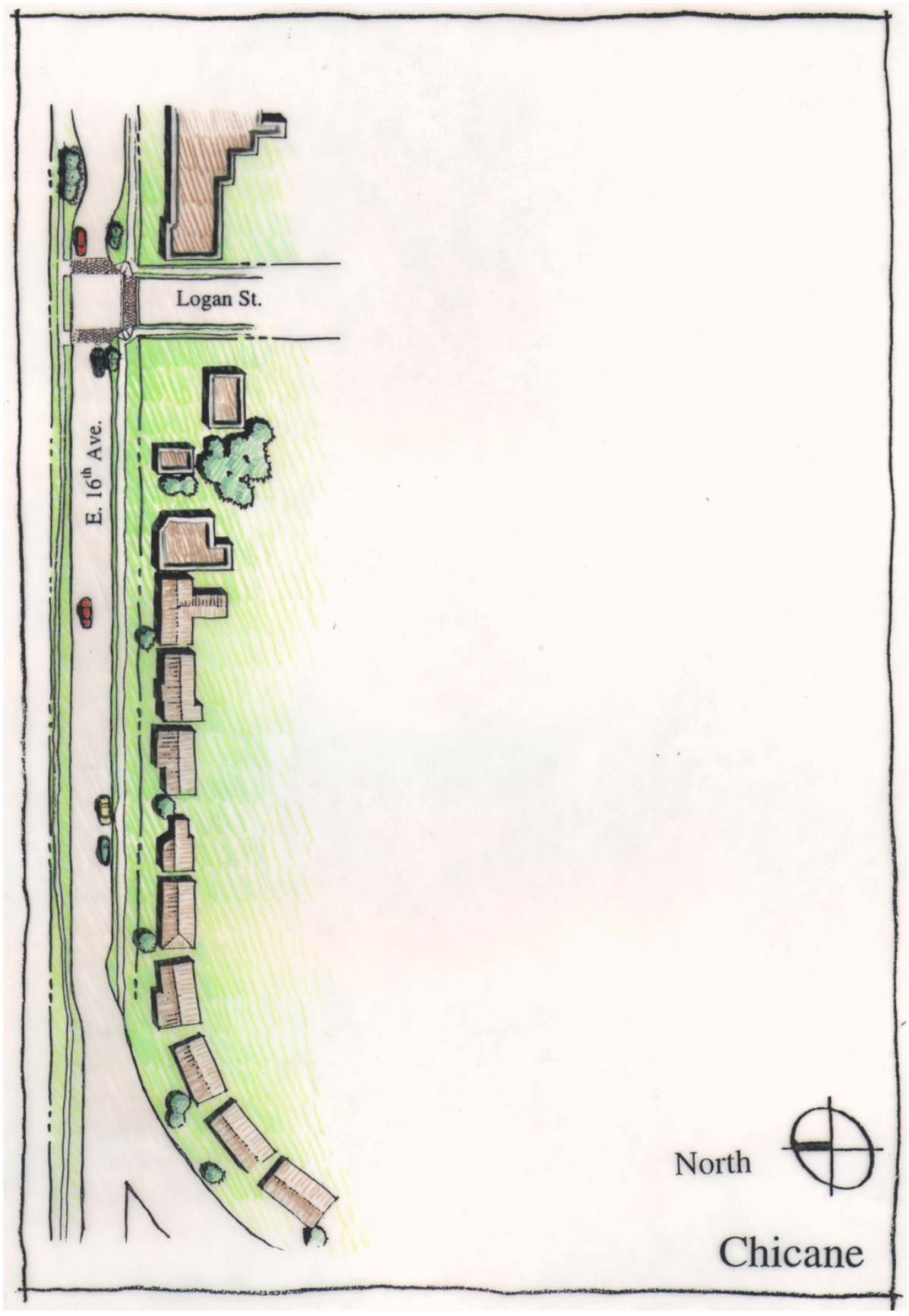


Figure 15 - Modified Chicane at 16th Avenue

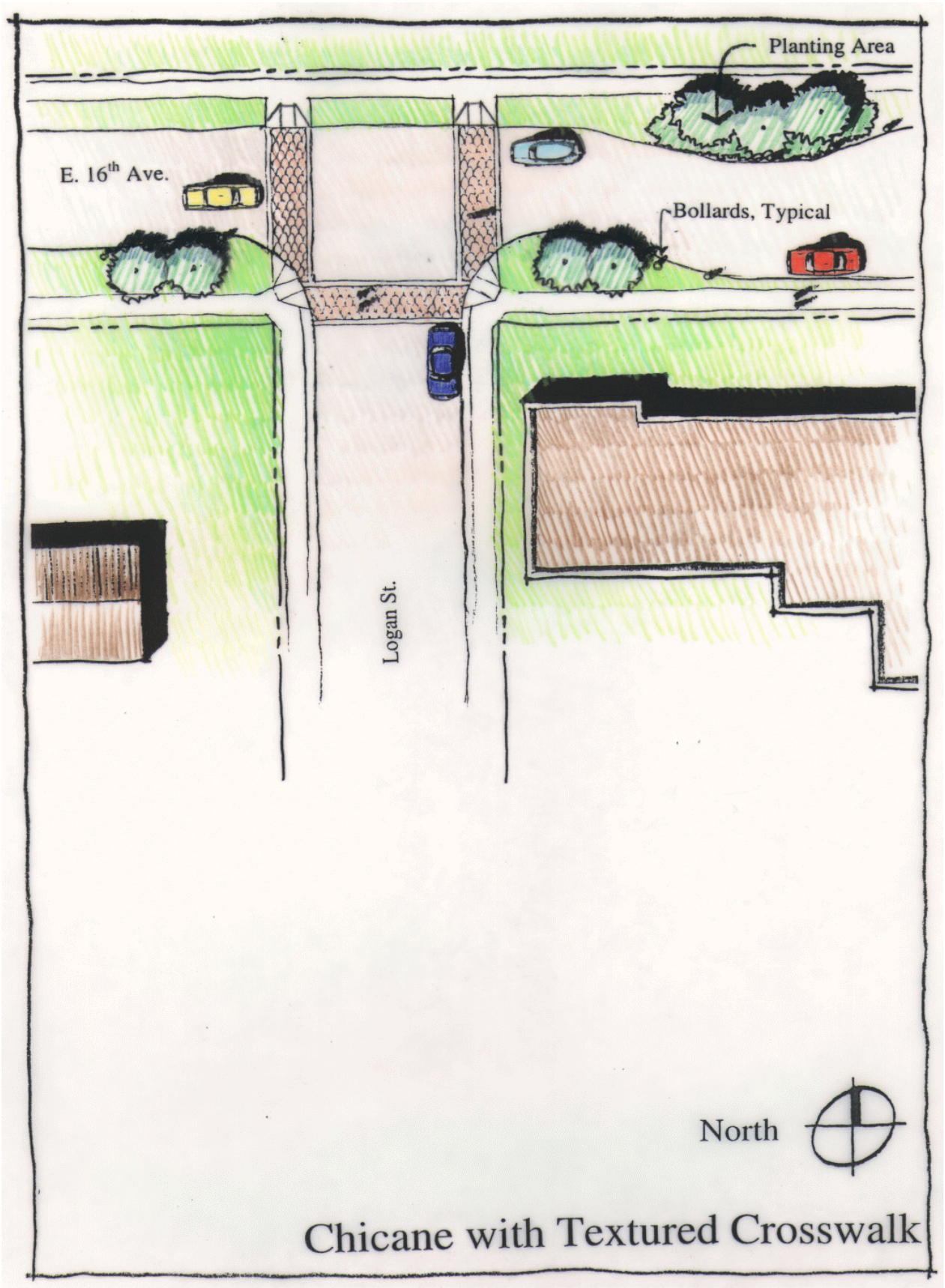


Figure 16 - Modified Chicane with Textured Crosswalk

East 16th Avenue: East of Rosemary Street

This stretch of roadway is similar to East 15th Avenue as are the recommended improvements. Chokers with textured sidewalks are recommended at the intersection of Columbine Street, and also recommended to raise the intersection at both Valarian Street and Norene Street. These improvements are proposed in lieu of the traffic circles which were initially recommended.

East 17th Avenue: East of Thunderbird Place

This roadway segment is slightly shorter in length than 15th and 16th Avenues and improvements to this street were not included in the Preliminary Draft Plan. Comments from the public indicated that there may be a speeding problem here so a raised intersection at Rosemary Street was added to the Final Draft Plan. This intersection is currently uncontrolled, so we also recommend adding a stop sign on Rosemary Street.

Norene Street

There was a strong desire by the neighborhood to reduce speeds on Norene Street, so a series of speed humps are proposed. Three humps are recommended north of 16th Avenue and two south of 16th Avenue. The intersection of 16th Avenue and Norene Street would be raised. There is a concern that the speed humps may cause some traffic to be diverted to the alley on the east side of Norene Street. This should be carefully monitored and additional measures may need to be taken to discourage use of the alley.

East 20th Avenue: East of Wintergreen

During the Preliminary Draft Plan stage, a chicane was considered on 20th Avenue between Rosemary Street and Wintergreen Street, however, there was not enough concern about speeds on this segment to justify the cost of a chicane. An improvement at the intersection of Nichols Street was supported by the community. The intersection lacks curb and gutter so a raised intersection or chokers was not an option. Therefore, we recommend a textured intersection that would create a rumble effect but would not have a vertical deflection. The rumble effect and the color contrast should help to reduce the excessive speeds.

A gateway treatment is recommended at the Bragaw Street intersection. There is a trail beginning at the southwest corner of the intersection and there is mature vegetation there already. Therefore, it is recommended that a gateway be constructed on the north side. The property on the north side, however, is vacant and is zoned R-O. A neighborhood gateway treatment may not be compatible with an office building. In the event an office building is constructed on that site, the gateway may need to be relocated or it may be possible to request the business to donate and maintain a gateway treatment.

6.7 Implementation Priorities

Recognizing that construction funding for all of the improvements may not be available, or that funding may not be available all at one time, attendees at the second public workshop were asked to prioritize the proposed improvements. Overwhelmingly, the community felt the 20th

Avenue/Sunrise Drive/Airport Heights corridor should be the top priority. Norene Street was identified as the second highest priority. After that, 15th Avenue and 16th Avenue (both east and west of Sunrise Drive) received about equal amounts of support. Though the improvements are supported by the community, 17th Avenue and 20th Avenue (east of the park) are the lowest priority.

6.8 Cost Estimate

Construction estimates for the traffic calming devices have been estimated for planning purposes. During the design phase, a better estimate can be done that will take into account site-specific circumstances that are unknown during this study phase. **Table 7** summarizes the construction costs by network and more detailed information can be found in Appendix F. The costs shown in Table 7 include a 25 percent contingency but they do not include design and construction management costs.

Table 7 - Construction Cost Estimates for Priority Traffic Calming Projects

Priority	Network	Estimated Cost
1	20th Avenue–Sunrise Drive–Airport Heights	$ 278,000
2	Norene Street	$ 126,000
3	East 16th Avenue: West of Sunrise Drive (Includes Gateway at Lake Otis/20th)	$ 189,000
3	East 15th Avenue: East of Kinnikinnick Street	$ 303,000
3	East 16th Avenue: East of Rosemary Street	$ 192,000
4	East 17th Avenue: East of Thunderbird Place	$ 100,000
4	East 20th Avenue: East of Wintergreen (Includes Gateway Treatment at Bragaw/20th)	$ 42,000
	Total construction cost of all improvements	$ 1,230,000

6.9 Other Issues

In the course of this transportation study, several issues were raised beyond vehicle traffic calming. These include traffic generated by the Anchorage Montessori School, snow removal, on-street parking, the need for sidewalks, and the need for calming in the Eastridge Subdivision.

Anchorage Montessori School

One of the main issues that initiated this study was the issue of the Anchorage Montessori School's traffic impacts on the neighborhood. The school is located on 18th Avenue between Alder Street and Sunrise Drive. The school has about 150 students. Most students are not from the neighborhood and are transported to and from school in private vehicles. Some students from the neighborhood walk to and from school.

Throughout the study, the team emphasized that this project could not change land use and displace the school. However, the study would address traffic impacts.

The questionnaire results included 9 responses that negatively described the school as an area of concern. In addition, the team had several conversations with individual residents who strongly oppose the school's presence. Traffic impacts, speeds, volumes, and pollution were cited in the questionnaire as issues related to the school. Individuals objected to the volume of traffic that use the alley off of 20th Avenue, and the volumes on the surrounding streets.

We performed traffic counts at the Anchorage Montessori School. Ms. Sylvia Hollway, the school director and also a CAC member, stated that the busiest time for the school is the time period between 11 a.m. and 12:30 p.m., because of the overlap in the dismissal of the morning session and start of the afternoon session.

Figure 17 shows time slice arrivals and cumulative arrivals at the school.

From information provided by Ms. Hollway, we calculate 270 to 300 trip ends are generated by the Montessori school daily. The mid-day period generates about 150 trip ends (75 cumulative entering, then 75 leaving). The remainder of trips are split between the morning dropoff, afternoon pickup, and other trips.

We evaluated on-site and external street parking generated by the school. The school has 44 spaces on-site, 14 of which are used by staff. Most of the parents use the on-site parking for dropoff and pickup. Some use 18th Avenue. **Figure 18** summarizes the parking during the mid-day peak. As this graph shows, if all pickup and dropoff traffic parked on the site, there would still be about 5 spaces of reserve parking capacity. As such, parents who choose to use 18th Avenue for parking do so because of reasons other than insufficient capacity

Figure 17 - Anchorage Montessori School Arriving Traffic 11:00 A.M. to 12:30 P.M

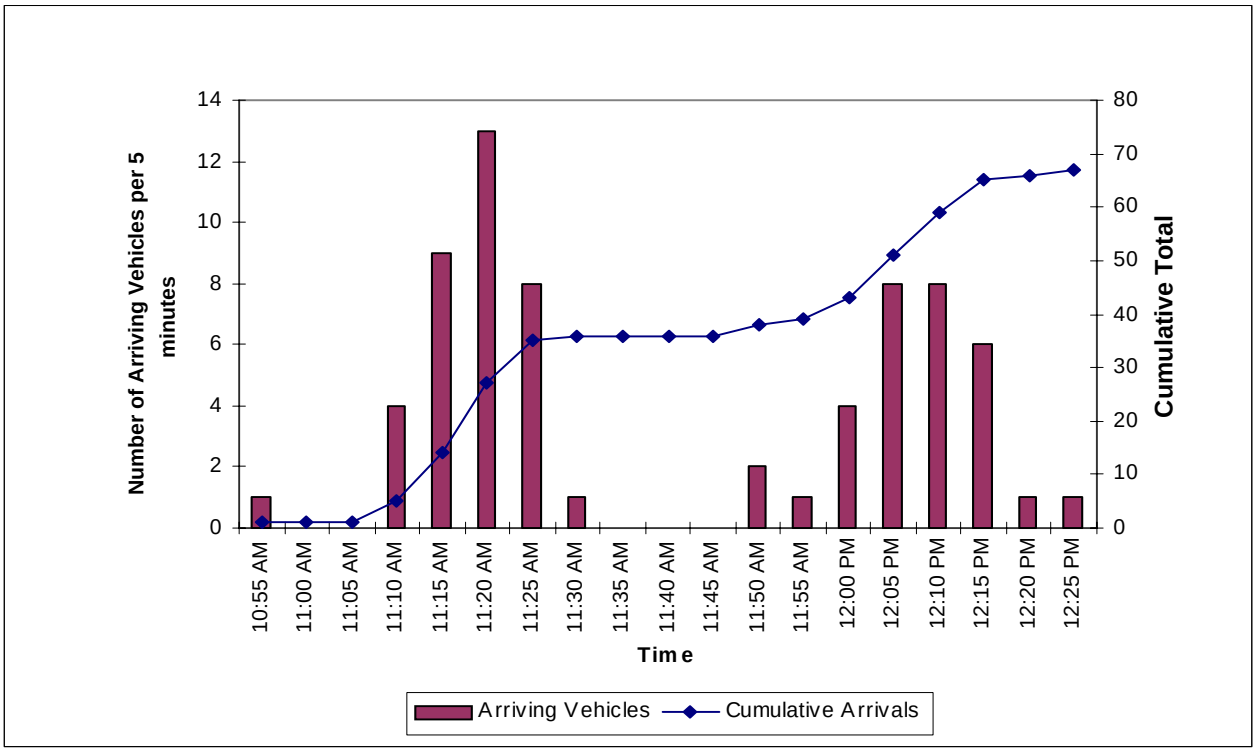
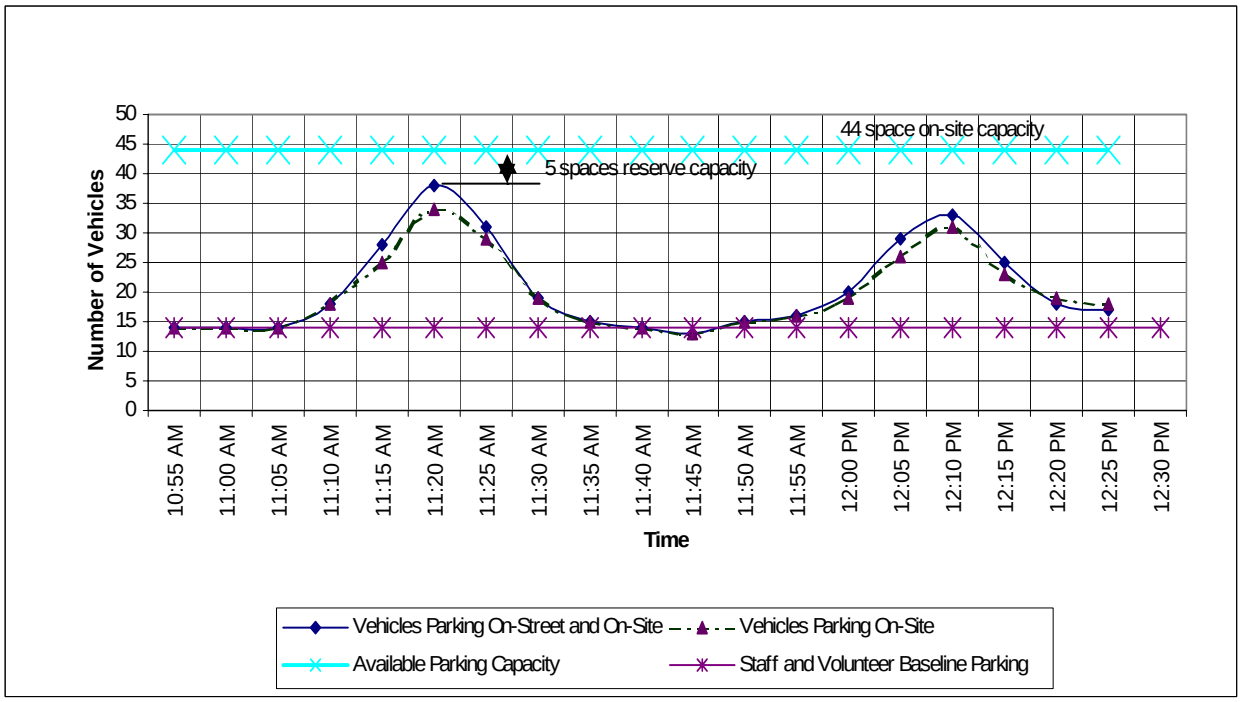


Figure 18 - Mid-Day Parking Requirements for Anchorage Montessori School



A final study examined the amount of traffic entering and exiting the alley off of 20th Avenue. During the mid-day peak hour count on May 10, 8 vehicles entered the alley and 7 vehicles exited the alley. A follow-up morning count that was performed on September 24, 1999, from 8:00 am to 9:00 pm recorded 8 vehicles entering the alley and 10 vehicles exiting the alley. Of these, 16 vehicles used the alley between 8:35 am and 8:55 am.

The data from these studies is summarized as follows.

- Most of the students are brought to and from school by parents' vehicles. During the mid-day peak period at the Montessori School, 75 vehicles drop off or pick up students. This is about 150 additional trips on the street system over 1 ½ hours. We estimate the school generates an additional 60 to 80 trips during the morning drop off, and 60 to 80 trips in the afternoon pickup.

- There is ample on-site parking for dropoff and pickup parent traffic. Use of the alley or 18th Avenue for parking is at the discretion of the parents and not a forced choice.

- The alley off of 20th Avenue had a total of 15 entering and exiting vehicles during the 1 ½ hour mid-day peak hour. It has 18 entering and exiting vehicles during the morning drop off time in September.

The location of the school suggests that parents traveling to and from school will mostly use the 20th Avenue/Sunrise/Airport Heights Drive Corridor, and some might use 16th Avenue. Since 20th Avenue, Sunrise Drive and Airport Heights Drive, and 16th Avenue have segmental AADTs of 2,000, 2,000, and 1,200 vehicles daily, the 300 daily trips generated by Anchorage Montessori School comprises between 6 percent and 8 percent, cumulatively, of the traffic on these streets. This is a relatively small percentage of the total traffic, and may not be noticeable by residents that live along the major corridors.

Since most of the inbound and outbound trips use Alder Street and 18th Avenue, the percent of Anchorage Montessori School traffic on these lower volume streets is much higher, on the order of 25 percent to 50 percent. We expect, and public input confirms, that the residents in the immediate vicinity do notice the Anchorage Montessori School traffic.

We understand that the school staff has requested parents not to use the alley at 20th Avenue, except to exit the site. Although the volume of school traffic using the alley is low, there were vehicles observed entering the alley.

Unfortunately, we have found no need for engineering solutions for the Anchorage Montessori School issues. Upon discussing the traffic studies at the school, the CAC and the project team find that this is not necessarily an issue to be addressed by this study because the parents and students have the right to attend the school, and the right to use public facilities to access the school. Nevertheless, we recognize that a few residents perceive the traffic generated by the school as an impact, and therefore it deserves analysis and attention.

The following recommendations for the school, generated solely by the project consultant team, are more behavioral in nature and may help reduce the tension between the school and residents.

- The proportion of school traffic on main streets is moderately low. The traffic calming devices installed to discourage speeding will also influence the Anchorage Montessori School traffic. The Anchorage Montessori School staff should continue to encourage parents to obey traffic laws especially in the vicinity of Alder Street and 18th Avenue.

- In order to minimize impacts on the residents, parents should be required to follow the current circulation plan patterns and drop off or pick up students on school grounds. As shown above, there is adequate on-site parking. No parking should be allowed on 18th Avenue (except for special events).

- The alley at E. 20th Avenue should only be used for exit traffic.

Snow Removal

Many of the comments received on the questionnaire and those heard during the public process were related to snow removal. Snow removal in the Airport Heights neighborhood is particularly challenging because of the high volume of on-street parking. The residents recognize the challenge but they would like to see better service. Some of the suggestions that were mentioned to improve the service include:

- Street maintenance giving advance notice so cars could be moved off the street.

- Parking on alternate sides of the streets.

- Utilizing a neighborhood contact person or phone tree to alert residents of expected time of snow removal.

- Enforcing the "junk car" ordinance.

The study team recommends that a representative from MOA Street Maintenance attend an Airport Heights Community Council meeting in the fall and begin a dialogue with the residents that hopefully will result in improved snow removal.

On-Street Parking

There are many residents in the Airport Heights neighborhood that have no choice but to park their car on the street–either because they do not have a garage or they have inadequate garage space. In reality, parked cars calm traffic because the narrowing of the street slows traffic. Unfortunately, parked cars can also block sight distances at driveways and intersections particularly when they are illegally parked. The traffic calming improvements for Airport Heights need to be designed to minimize loss of on-street parking yet still function as intended. The treatments may actually help improve the situation by better delineating on-street parking areas.

Sidewalks

The streets in the Thunderbird Terrace Subdivision have no sidewalks. Although all streets should have sidewalks, the following streets listed below should have sidewalks because of unique factors.

- Norene Street north of 16th Avenue has sidewalks on both sides of the street, south of 16th Avenues it has no sidewalks. Sidewalks should continue to 20th Avenue to provide continuity and accessible routes. Norene Street has been cited as having excessive speeding, which also supports the plan for separate pedestrian walkways. The total length of sidewalk to complete the connection would be about 2,600 feet (both sides) and would cost about $130,000.

- Seventeenth Avenue from Thunderbird Place to Norene Street should have a sidewalk on at least one side of the street (to be determined in the design phase). The street has a long, straight section similar to other streets that have higher speeds. Moreover, the street is a logical walking route. Total length of sidewalk on one side of the street would be about 1,800 feet and would cost about $90,000.

- The south side of 16th Avenue between Sunrise Drive and Bragaw Street has a sidewalk, but the north side has none. The north side should be considered for a sidewalk because 16th Avenue is a long, straight street that has high speeds. Although the traffic calming improvements should reduce speeding, the north side sidewalk would create a continuous connection, reduce pedestrian crossings, and would be more accessible. The north sidewalk would be about 2,400 feet long, and would cost about $120,000.

- Twentieth Avenue should have a sidewalk on the north side between Rosemary Street and Bragaw Street. The north side sidewalk would directly front the residential homes along the street. This would complete a walking route connection between the Tikishla Trail, the Thunderbird Terrace Subdivision, and the sidewalks on Bragaw Street. Total length of this sidewalk would be about 1,800 feet and would cost about $90,000.

- A community member who attended the July 15, 1999, Community Council meeting recommended a sidewalk be included to access Tikishla Park from the 20th Avenue and Sunrise Drive intersection. The sidewalk would be about 200 feet long and would cost about $10,000.

Eastridge Traffic Calming

The scope of the project did not consider the Eastridge Subdivision. Both the CAC and the Community Council, felt that Eastridge, as part of the Airport Heights Community Council should be included. However, Lake Otis Parkway is a traffic shed line in which east and west sides need to be considered independently as separate systems.

We have heard from Eastridge members attending the Community Council meeting that the Sitka Street/Eastridge Dr./20th Avenue corridor is a cut-through route for external traffic seeking to avoid the DeBarr/Lake Otis signal. As such, the same strategies and devices used in this study may be applied to the Eastridge Subdivision.

The CAC did not wish to address Eastridge issues without Eastridge resident representation. They believed the public process that was followed in this project works well, and therefore mandates that residents participate in the decision-making processes.

Although we did not prepare concepts or costs, it is expected that the traffic calming features for the Eastridge area would be similar to the 20th Avenue, Sunrise, Airport Heights corridor and would cost about $300,000.

Nichols Street and Community Park Loop

The unimproved section of Community Park Loop should be closed to discourage illegal dumping and other illegal activities. We estimate that this closure would cost less than $5,000.

7 RECOMMENDATIONS

7.1 Speed Hump Analyses

Prior to accepting the Final Draft Plan, the public and the Municipality wanted to evaluate speed humps on three levels:

- ✓ Effectiveness in slowing down traffic
- ✓ Community acceptance of speed humps
- ✓ Impact to services agencies

In order to ascertain performance and acceptance, Traffic Engineering decided to install two temporary rubber speed humps on 20th Avenue near Logan Street and Aleutian Street. The spacing between the two temporary humps was about 350 feet, which is more than the recommended spacing of 275 feet to reduce the 85th percentile speed to 25 mph.

The humps were in service throughout August and September. Just before the humps were installed, Traffic Engineering gathered speed and volume directional data near both of the speed humps. About a month after installation and while the humps were in place, Traffic Engineering gathered additional speed and volume data.

Right before entering the speed hump segment the westbound and eastbound speeds did not change much in the before and after study. However, once within the segment, speeds dropped significantly. **Table 8** summarizes before and after speeds and volumes at the end of the speed hump segments for eastbound and westbound traffic.

Table 8 - Before and After Speeds/Volumes on 20th Avenue

Average Speeds	**Before**	**After**	**% Change**
Eastbound 20th Avenue (near Aleutian)	28	24	-16%
Westbound 20th Avenue (near Toklat)	29	25	-14%
85th Percentile Speeds	**Before**	**After**	**% Change**
Eastbound 20th Avenue (near Aleutian)	34	29	-15%
Westbound 20th Avenue (near Toklat)	36	30	-17%
Daily Volumes	**Before**	**After**	**% Change**
Eastbound 20th Avenue (near Aleutian)	1250	1050	-16%
Westbound 20th Avenue (near Toklat)	1500	1500	0%

In comparing these results to results published in the *Canadian Guide to Neighbourhood Traffic Calming* (ICBC, ITE, CITE December 1998), we find that the before and after changes are on the low side of other studies. This may be because the Municipality only has a limited number of these devices and installed two temporary speed humps instead of the recommended four speed hump series.

Figure 19 shows the changes in the high, low, and average speeds in the before and after cases.

Figure 19 - High-Low-Average Before and After Speeds

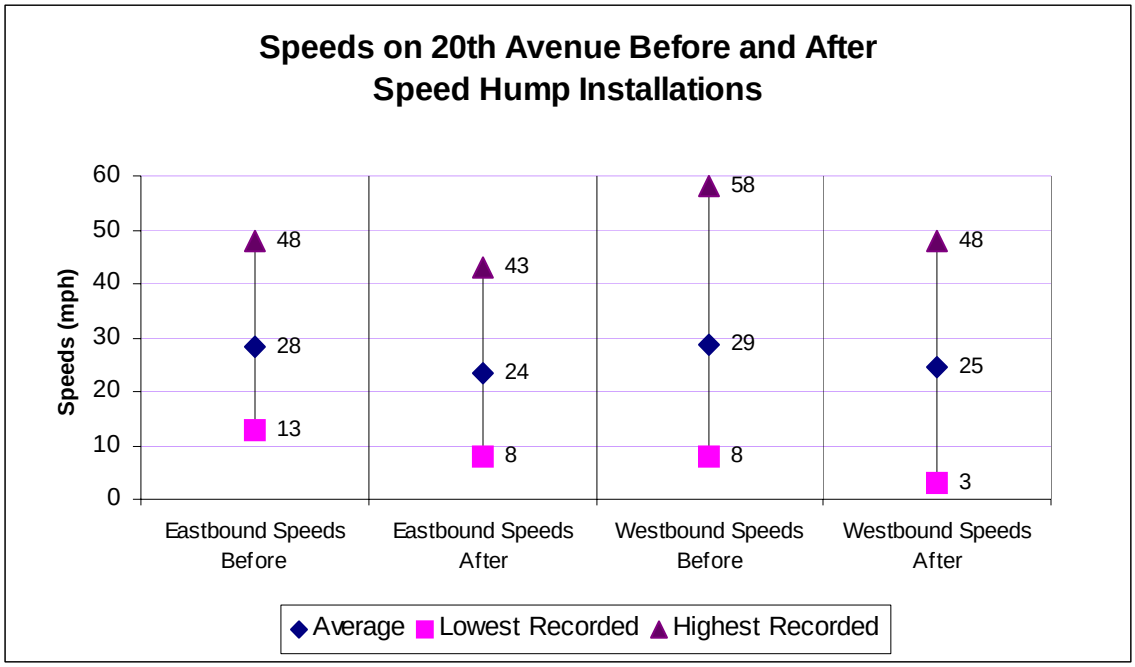


Figure 19 shows that the speed humps were successful in lowering extreme high speeds. Although the frequency of extreme high speeds is low, this is of concern because of the accident potential associated with high speeds. Speeding vehicles are less likely to be able to perceive, respond, and stop in time to avoid children darting into the road, cars backing out of driveways, or intersection conflicts.

Based on the before and after speed study, we conclude that temporary speed humps are a useful speed reduction tool. We believe that permanent paved speed humps would achieve the same reduction. We also believe that a four-hump series would bring the after 85th percentile speeds even closer to the desirable 25 mph posted speeds.

7.2 Community Acceptance of the Temporary Speed Humps and the Final Draft Plan

Traffic Engineering kept track of comments from the public while the speed humps were in service. There were no adverse comments about the speed humps except that one resident called to tell Traffic Engineering about marking paint peeling up and being carried by wind into his yard.

On September 30, 1999, we attended the Airport Heights Community Council meeting to present the results of the before and after study, to hear comments about the speed hump and the plan, and to seek Council endorsement of the Final Draft Plan. During the meeting, residents commented favorably about the effectiveness of the speed humps and requested the Municipality to expand the speed humps throughout the community.

The Council passed a motion to approve the plan. However, there was one resident that was not happy with the proposed chicane on 16th Avenue between Lake Otis Parkway and Logan Street. Her main objection was that the chicane would prohibit parking on the north side of the street, and that the church patrons at the corner of 16th and Logan would park further down the street and impact parking availability for residents.

On Wednesday evening October 13, 1999, we met with the resident, and another interested neighbor on site. The church holds services on Wednesday evenings and we were able to review the parking. We saw that the parking on that night did not extend much beyond the church frontage. The resident said that the attendance that night was unusually light, and that the main service is on Saturdays.

We showed the residents where the new curb and channelization would be located and showed that parking in front of the residents homes was not going to impacted except at the end of the chicanes where chokers are developed to deflect traffic paths. We showed the resident that the south side curb would be moved north, and that the sidewalk could be relocated or widened. The resident brought up the point that wider sidewalks meant more effort on her part to keep the sidewalks clear in winter or there may be more lawn to maintain between the curb and the property line.

The resident's concerns were not allayed and she said that parking should be maintained on the north side so that the church would not park in front of the homes on the south side. She also correctly pointed out that a bus stop would have to be relocated because of the chokers near Lake Otis Parkway. We pointed out that the parking in front of the homes was public, and church patrons had the right to park there and on other streets.

We told the residents that we could find no engineering, safety, or operational reasons that require the chicane to be deleted from the Draft Final Plan. We restated the need (excessive speeds), the opportunities for the chicane without substantial impact to on-street residential parking, and the methodology (planned by the CAC that represents the community). We also stated that the Final Draft Plan was endorsed by the Community Council and that without significant engineering cause we could not alter it at this point.

These residents supported speed humps instead of the chicane. We told the two residents that before the plan goes into design, a new public involvement process would be opened. During that process, the Municipality invites comments about the design, and at that time the chicane and alternatives such as speed humps could be revisited. This would also be the time to resolve issues with maintenance, sidewalks, landscaping, driveways, parking, and bus stops.

7.3 Service Agencies Acceptance of Speed Humps

No service agencies have commented on the temporary speed humps. Transit buses were observed crossing the speed humps without significant speed reduction and appeared to be able to maintain a comfortable ride for transit patrons.

7.4 Summary

Traffic Engineering and the Airport Heights Community Council have approved the Final Draft Plan shown in Figure 14 of this report. Instead of the permanent speed humps that are shown, we recommend that temporary speed humps should be used until the upcoming Municipality Traffic Calming Protocol Study is completed. This future study will determine if permanent speed humps can be used in Anchorage and will develop guidelines for such use. If speed

humps are feasible, they should be installed at the recommended locations.

Table 9 summarizes the estimated construction costs and priorities for the recommendations including traffic calming improvements shown in Figure 14 (labeled "Street"), Sidewalks and Pathways (labeled "Ped"), and Eastridge. Design and construction management costs are not included. Street improvements were developed and prioritized by the CAC/public methodology. Pedestrian improvements were not addressed in detail by the CAC, and the recommendations and priorities were developed by USKH. The Eastridge Subdivision improvements were also not addressed and the cost estimate is based on typical improvements. A final recommendation for this study is that the residents of Eastridge Subdivision be engaged to form their own CAC and develop a traffic calming plan for their neighborhood.

Table 9 - List of Recommendations, Priorities, Construction Costs for the Airport Heights Transportation Study

Priority	Network	Estimated Construction Cost
Street 1	20th Avenue–Sunrise Drive–Airport Heights	$278,000
Street 2	Norene Street	$126,000
Street 3	East 16th Avenue: West of Sunrise Drive (Includes Gateway at Lake Otis/20th)	$189,000
Street 3	East 15th Avenue: East of Kinnikinnick Street	$303,000
Street 3	East 16th Avenue: East of Rosemary Street	$192,000
Street 4	East 17th Avenue: East of Thunderbird Place	$100,000
Street 4	East 20th Avenue: East of Wintergreen (Includes Gateway Treatment at Bragaw/20th)	$42,000
Other	Closure of Community Park Loop at Nichols	$5,000 or less
	Total Construction Cost of Street Improvements	**$1,235,000**
Ped 1	Norene St. between 16th Ave. and 20th Ave., on both sides	$130,000
Ped 1	East 17th Ave. between Thunderbird Place and Norene St., on one side of the street	$90,000
Ped 1	East 20th Ave. between Rosemary St. and Bragaw St. on the north side of the street	$90,000
Ped 2	16th Avenue between Sunrise Drive and Bragaw Street on the north side of the street	$120,000
Ped 2	Tikishla Park access from 20th/Sunrise to the Park	$10,000
	Total Cost of Pedestrian Improvements	**$440,000**
Eastridge	Traffic Calming measures in Eastridge Subdivision	$300,000

APPENDIX A

Questionnaire and Summary of Results

APPENDIX B

CAC and Public Workshop Meeting Minutes

APPENDIX C

Traffic Calming Devices

APPENDIX D

Preliminary Draft Plans

APPENDIX E

Service Agencies Meeting Minutes

APPENDIX F

Cost Estimate Support Data

APPENDIX G

Traffic Study Data