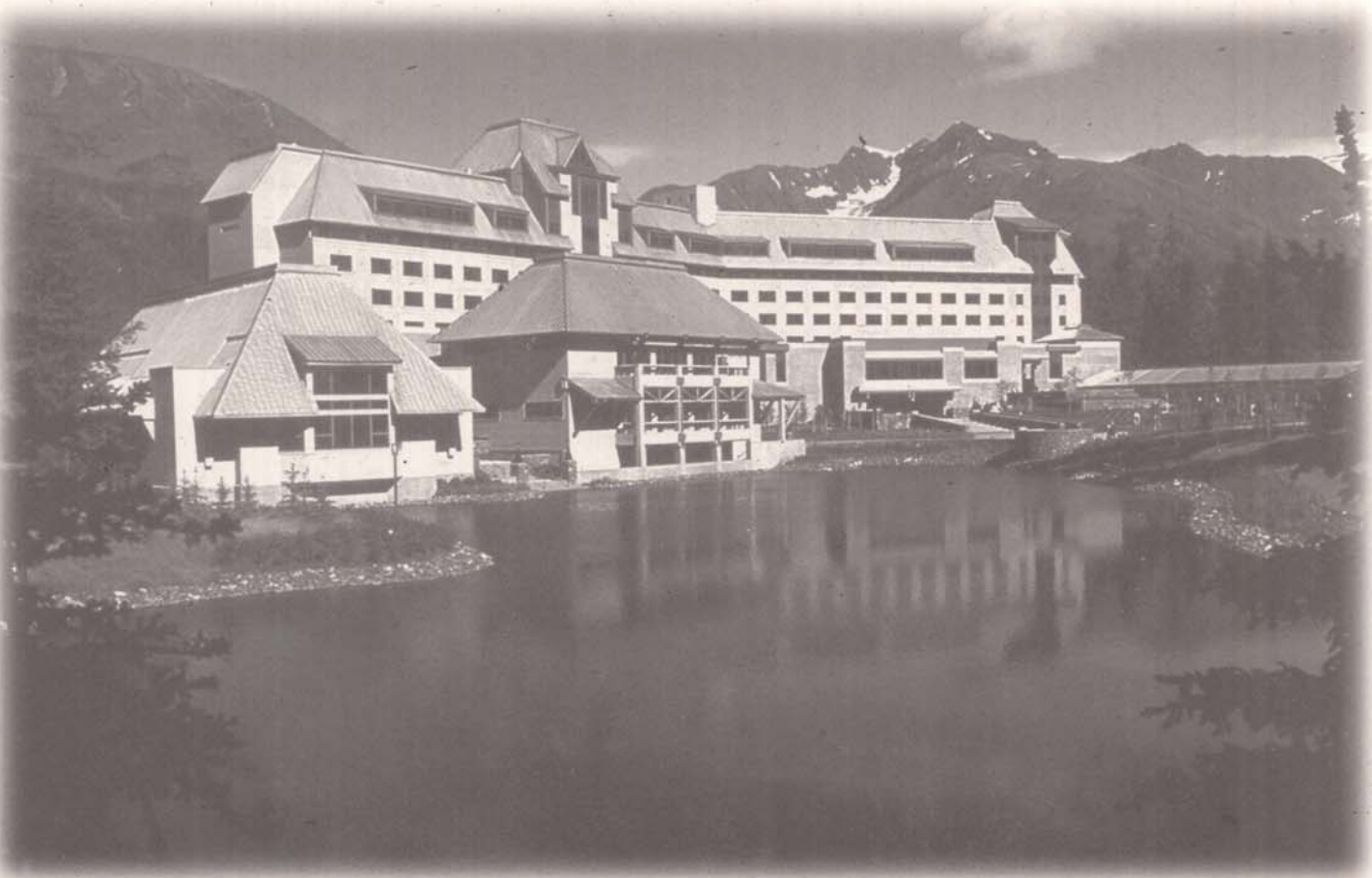
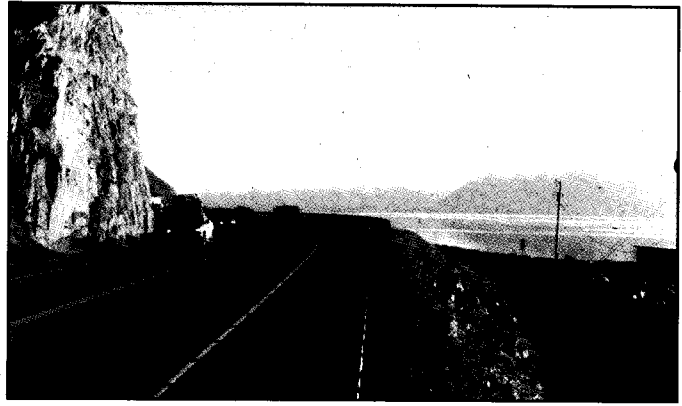


# *T* Chapter 9 *Transportation*



COMPLETED IN 1994, THE NEW ALYESKA PRINCE HOTEL PROVIDES LUXURY ACCOMMODATIONS, RECREATIONAL AMENITIES AND FINE DINING. WITH ITS NEW HOTEL, AERIAL TRAMWAY AND IMPROVED SKI FACILITIES, ALYESKA RESORT ANCHORS GIRLWOOD AS A MAJOR VISITOR DESTINATION RECREATION AREA IN ALASKA.



*Seward Highway.*

T

ransportation is a very critical component to the **Girdwood Area Plan**. The type and pattern of circulation system that is established should provide easy access to the resort/recreational areas while preserving Girdwood's small-town character.

Three factors are key to establishing a successful circulation system. First, the circulation system should be efficient and free of congestion. Roadways should be adequately designed to handle anticipated traffic levels. In order to avoid high concentrations of traffic on any segment of the system, there needs to be routing that is connected. Having redundancy and connectedness will balance the traffic flow and reduce the need for wider and more extensive roadway arterials that are contrary to small-town character.

Second is the need to have a multi-modal circulation system. Movement throughout the area should not be dependent on a single mode of transport. A pedestrian circulation system is just as important as a vehicular-oriented system. Pedestrian pathways need to be included as part of the transportation plan in order to reduce roadway trips, as well as to recognize the needs of different segments of the population.

A successful multi-modal circulation system in a destination resort community should also include a transit system. The purpose is to reduce the number of auto-related trips on the roadway system by providing a convenient all-season and all-weather alternative mode of travel.

The third key factor to establishing a successful circulation system is to create the proper land use and site design for properties that adjoin the main roadways. Since land along the main roadway is the most visible area of the community, adjoining uses should be designed to add to, rather than detract from, the small-town resort character of the valley. It is also important to minimize congestion by restricting the types of uses that could generate a lot of turning movements.

# Roadways

To a large degree, transportation to, and within, Girdwood today is synonymous with the roadway system. Following is a description of the existing roadways, which is followed by transportation recommendations. Although the Seward Highway is not included in the scope of this Plan, it is still considered an element in understanding Girdwood's transportation needs.

## SEWARD HIGHWAY

The Seward Highway is classified as a principal arterial. Annual average daily traffic (AADT) measured at Potter Marsh during 1992 was nearly 7,000 trips per day. This level is compared to approximately 4,000 trips per day for 1982 and about 2,250 trips per day in 1972. Figure 6 displays AADT recorded over the past 25 years.

Compounding the significant increases in annual traffic are the pronounced seasonal fluctuations in the traffic flows. The highest monthly average daily traffic, which normally occurs in July, has consistently been two to four times greater than the lowest averages in November, December, and January. Figure 7 illustrates seasonal variations in Seward Highway traffic levels for the Bird Point to Girdwood segment by showing the average daily traffic by month for 1992.

Using normal traffic engineering computational methods, the current level of service provided by the Seward Highway in the Bird Point to Girdwood area is "D" to "F."\* This determination is strongly influenced by the very high summer weekend volumes typical of a road with seasonal recreational traffic.

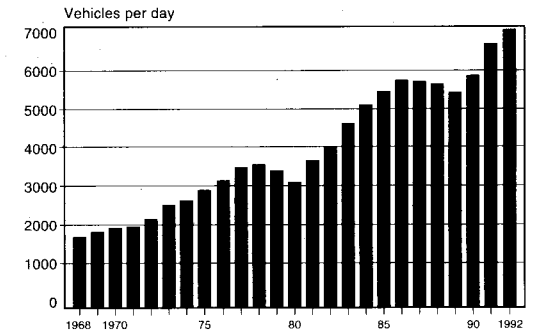
The Alaska Department of Transportation and Public Facilities (ADOT/PF) is improving the Bird-Point-to-Girdwood segment of the Seward Highway. Rather than widening the existing roadway into the mountainside, the roadway is being relocated at the edge of Turnagain Arm outside the existing Alaska Railroad Corporation (ARRC) line. The new location will reduce the frequency of avalanche closures and will allow room for a third passing northbound lane.

## ALYESKA HIGHWAY

In contrast to traffic patterns on the Seward Highway, traffic on the Alyeska Highway in Girdwood is characterized by two peak seasons during the year. The timing of the tourist-related summer peak mirrors that of the Seward Highway. In addition, Alyeska Highway experiences ski season-related weekend peaks, especially during February, March, and April. Virtually all of the recent counts taken by ADOT/PF and others indicate that the winter traffic peaks on Alyeska Highway exceed summer peaks.

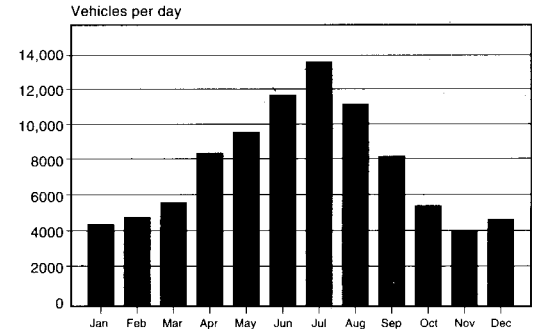
\* Level of service measures range from "A," which is free-flow traffic in which vehicles are not hindered by traffic, to "F," in which cars must move at the pace of the surrounding traffic and delay is frequent.

**Figure 6**  
**Seward Highway Traffic**  
**Annual Average Daily Traffic at Potter**



Source: ADOT/PF.

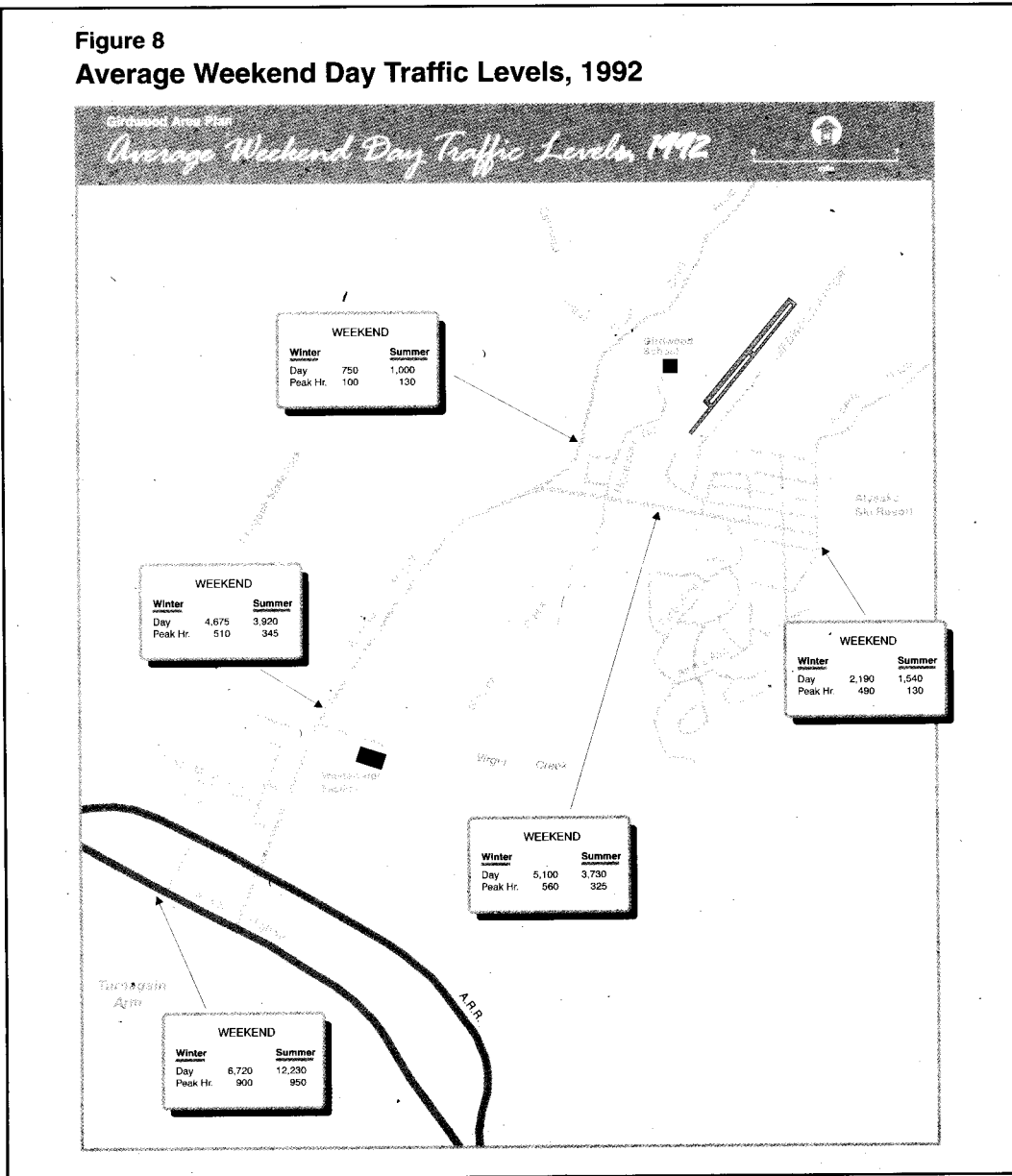
**Figure 7**  
**Seward Highway Traffic at Girdwood**  
**Weekend Vehicles Per Day, 1992**



Source: ADOT/PF, TPA.

The Alyeska Highway, designated a minor arterial, receives winter weekend traffic volumes that are 20 to 35 percent higher than summer. Winter midweek traffic, however, is comparable to summer midweek volumes. This is because winter traffic is much higher on the weekends due to Anchorage area skiers going to Alyeska, while summer traffic levels are more constant throughout the week as a result of summer tourism.

Most Alyeska Resort summer visitors come as clients of packaged tours and tend to arrive by bus rather than car, significantly reducing traffic-related impacts. Figure 8 shows summer and winter weekend traffic volumes by day and peak hour at key points on selected roads in the Girdwood area. Data from ADOT/PF and Alyeska Resort-sponsored field surveys were used to estimate the weekend traffic volumes. ADOT/PF estimated AADT on the Alyeska Highway for 1992 at 2210 vehicles per day. As can be seen, the winter weekend daily volumes presented in Figure 8 are more than double the AADT.



With few exceptions, the Alyeska Highway and other principal roads in the valley operate with little delay. This is evidenced by the generally free-flow conditions that characterize the road at nearly all times except ski season weekends that coincide with good weather.

During the summer the intersection of the Alyeska and Seward Highways is believed to function reasonably well, particularly after the recent improvements that added a left-turn lane for eastbound Seward Highway traffic turning onto the Alyeska Highway. However, local residents experience delays in making turns when summertime traffic on the Seward Highway is heaviest.

#### **OTHER LOCAL ROADS**

There are a few other roads in the Girdwood area that receive more than local traffic. The two most significant are Crow Creek Road and Arlberg Avenue. Crow Creek Road is a gravel roadway which has no state maintenance much beyond California Creek. Beyond the state-maintained lower portion of the roadway, maintenance, clearing and widening has been performed by local residents. The roadway has been receiving increasing vehicular traffic in the summer as more people use the road to access the Crow Creek Pass Trailhead and Crow Creek Mine attraction. The road has also seen an increase in pedestrian usage by bikers and walkers.

Arlberg Avenue is a collector that extends from the end of Alyeska Highway to the new resort hotel. In 1993, the road was upgraded as part of the resort expansion project. The upgrade included paving of the roadway, and development of a separated and paved bicycle/foot path.

Other roads in the valley are basically local residential streets. Timberline Drive functions more as a collector than a local street, since it is the only outlet to Alyeska Highway from the southern portion of Alyeska Basin Subdivision. The other exception worth noting is Hightower Avenue, which extends from Alyeska Highway through the new townsite commercial area to the elementary school. Like Arlberg Avenue, it is also paved with a bicycle/foot path.

#### **RECOMMENDED ROADWAYS**

A number of new roadways are proposed in this Plan, along with selected intersection improvements that will be necessary to facilitate safe and efficient movement through the valley community. The recommendations reflect the importance a circulation system has on the successful functioning of a resort community. In addition, they are intended to be sensitive to the desire to retain a small-town character to the valley.

Continued use of the existing roadway system, with proper improvements, will accommodate most of the new community development being projected in this Plan for the greater portion of the 20-year planning period. Some of the roadways are proposed to provide better connections to current or planned activity areas, while others will be needed in response to new resort development.

The sequence of actions to be considered for addressing increased transportation needs should begin with improvements to the existing roadway system and commencement of transit service before certain major new roads are introduced. Before such roads as the New Girdwood Access and Crow Creek - Arlberg Connector are constructed, corridor studies identifying transportation alternatives, costs, and community and environmental impacts should be undertaken. Final actions should be based upon the results of these studies.

# Transportation Plan, Proposed Roadways



**Existing Roadways**  
**Proposed Roadways**  
**Proposed Up-grade Roadways**

Municipality of Anchorage, Department of Community Planning and Development, December 1995



*New Girdwood Access Road*

This road is proposed to connect the Seward Highway with Alyeska Highway on the east side of Glacier Creek. It would be a two-lane roadway with vegetative buffers on each side. It would also include a separated but parallel bicycle/foot path.

The road would be needed to provide relief to Alyeska Highway at such time as new resort development doubles in size or activity over the current level with the new hotel.

The alternative to building the new Girdwood access road would be to upgrade Alyeska Highway to a four-lane roadway with a fifth lane for turning movements onto side streets and driveways. This alternative, however, may significantly alter the small town character of the community. The large number of closely spaced driveways on the western portion of the roadway below its intersection with Crow Creek Road, coupled with future development on the western side of the valley, may also create additional safety hazards and congestion during periods of peak visitor traffic.

This Plan recommends that a corridor study be done to evaluate each alternative prior to any decision being made. The study should evaluate each alternative for its community and environmental impacts, as well as cost.

*Crow Creek - Arlberg Connector*

This new roadway would connect Arlberg Road from its current terminus at the new Alyeska Resort hotel site, to Crow Creek Road. The roadway would be routed north of the Girdwood Airport, providing access for additional resort base facilities, as well as the upper valley recreational area.

The connector roadway would serve to relieve traffic loading and congestion at the Arlberg/Alyeska Highway intersection and on the eastern portion of Alyeska Highway. Recreational/resort traffic would be balanced between Crow Creek and Arlberg Roads.

The lower portion of Crow Creek Road would also be upgraded from its intersection with Alyeska Highway to the link with the new connector. Crow Creek Road would remain two lanes, but may be widened to allow for some channelization at key locations. It would also have a separated bicycle/foot path, and a vegetative buffer beyond California Creek.

Rather than using Crow Creek Road, an alternative route for providing additional access to the resort area(s) may be to extend a new road north of Alyeska Highway along the west bank of Glacier Creek past the new townsite area and school. The new roadway's intersection with Alyeska Highway would be grade-separated, thus allowing for continuous movement of traffic.

This routing alternative could act as a levee to protect the commercial townsite area from future flooding by Glacier Creek, as well as minimize the impact of resort-bound traffic on Crow Creek Road. Problems associated with this alternative, however, would be high cost, and the land area needed for the right-of-way.

Similar to the New Girdwood Access Road, this Plan recommends that a corridor study be done to evaluate each alternative prior to any route decision being made. The study should evaluate each alternative for its community and environmental impacts, as well as cost.

***Arlberg Extension to Winner Creek Resort Base***

This roadway would be a continuation of Arlberg Road from the current terminus at the Alyeska Prince Hotel to the Glacier-Winner Creek resort base area. The purpose for the road would be to provide access to alpine skiing recreational facilities, and possibly other resort base area facilities.

The roadway would be built very similar to the most recent extension of Arlberg Road around the Moose Meadows. It would be a curvilinear roadway that would basically keep to the base of Mount Alyeska along its north face, skirting the eastern edge of the Recreation Reserve. Actual design standards would be based upon type and degree of use.

Limitations on vehicular access to Glacier-Winner Creek are encouraged. There is insufficient space for parking of private vehicles in the Glacier-Winner Creek area. Skiers and other recreationists may be shuttled to the upper valley from the lower valley resort base areas by road or other off-road system, such as gondola. The roadway may possibly function as only a service road.

This Plan recognizes that a roadway to the Glacier-Winner Creek area will be necessary. The actual design and construction can be decided during the course of resort master plan development and review, based upon the proposed type and intensity of use.

The Alaska Department of Natural Resources owns a large portion of the Glacier - Winner Creek area and needs access to its land holdings across municipal lands. The construction of new access to these state lands should generally coincide with the extension of Arlberg Road to the Winner Creek Resort Base. The location of any access beyond the resort base area to state lands should be based upon the type of access needed.

***Girdwood Airport Access Road***

This road would provide direct access to the airport from the new connector roadway described previously. The new access road is intended to re-direct general traffic away from the current access through an existing residential subdivision. The new access road would also provide a more direct connection between the resort areas and the airport.

With the new access road, the current airport access entry could be gated, with access limited to plane owners and airport leaseholders. This would eliminate most airport-related traffic from the residential neighborhood.

***Hightower - Crow Creek Connector***

This two-lane collector road, with separated pathway, would provide a direct link between the Crow Creek Road and new townsite commercial areas. This would help re-enforce the two adjoining commercial/residential areas, and make California Creek a more central asset to them. The road would also provide better access to such public facilities as the post office and school.

***Ruane to Glacier Creek Drive Connector***

This road is intended to be a two-lane collector that provides access to the commercial/institutional, recreational area located between Glacier Creek and Alyeska Highway. This road is critical in providing convenient access to the most centrally located area in the Girdwood community. This area is intended to be a focal point for many community activities. In addition, the road will provide direct access to the proposed golf course and RV park/campground for visitors coming from outside the valley.



**OTHER RECOMMENDATIONS**

The following measures are recommended in order to improve traffic flow and reduce the number of auto trips. As with the proposed roadways, the timing of implementation of these recommendations would depend upon the anticipated need and feasibility. However, traffic conditions should be monitored, and the measures be considered well in advance of actual need.

- As traffic increases at the intersection of Seward and Alyeska Highways, consideration should be given to channelization in order to allow for smoother traffic flow and safer turning movement.
- As traffic increases at the intersection of Alyeska Highway and Crow Creek Road, consideration should be given to channelization and re-alignment of Crow Creek Road in order to allow for smoother traffic flow and safer turning movement.
- The Arlberg Road and Alyeska Highway intersection should be channelized to provide a continuous right-turn lane from Arlberg Road onto the Alyeska Highway, and a separate right-turn lane for traffic heading from Alyeska Highway to the Alyeska Resort Day Lodge parking lot.
- As traffic increases on Arlberg Road and drivers start taking short-cuts through Alyeska Subdivision, consideration should be given to closing to all but emergency vehicles the intersections of Arlberg Road with Cortina, Davos, Brighten, and Aspen, or alternatively the eastern end of all four local streets should be made one-way east-bound.
- Shuttle bus service should be instituted between the two existing resort base areas, any future resort base areas, the Girdwood commercial areas, and a prospective rail service station (when service is offered), to help alleviate some of the summer and winter peak period traffic congestion. It would also give residents and visitors alike an opportunity to make short trips within the community without the use of a car, particularly during inclement weather.

It is recognized that additional collector roads will be needed to access areas that are proposed for new residential development. Their location and design can best be accomplished at the time specific areas are being master planned prior to land disposal and development. The following design guidelines should be considered for future local streets and collectors.

- All new collector roads should include separated, fully improved bicycle/foot paths.
- Direct access should not be allowed from individual lots onto collector roads. Direct access should be limited to side streets and for corner lots with frontage on more heavily used roadways.
- Local streets and collectors should be designed and constructed to allow adequate space for underground utilities, drainageways and snow storage.
- Local streets and collectors should be configured to maximize views of unique and/or scenic vistas.

Interest has been expressed in investigating the possibility of establishing a small-scale automated people mover (APM) system in Girdwood. Ideally, the system would connect train sta-

tion/parking lot/transfer area near the Seward Highway with residences and business along the Alyeska Highway and north and south new townsite areas, as well as the resort base facilities from Mount Alyeska to Glacier-Winner Creek.

The APM system would essentially be a fixed-guideway transit system that is designed around a small footprint structure supporting vehicles that would carry a small number of people. Operation would be similar to a horizontal elevator, wherein passengers select their destinations and are taken there directly.

Although there would likely be much public appeal for such a transit system, the reality of the high installation cost, as well as on-going operating costs, preclude it from being a viable option for moving people through the community in the foreseeable future. A more likely possibility, however, may be a cable-based system such as trams or gondolas for transporting people from mid-valley resort base areas to the Glacier-Winner Creek area. The unknown costs associated with such a system for cross-valley transportation make its feasibility an uncertainty.

This plan does not preclude future consideration of an APM system of transportation in the Girdwood area. However, it will unlikely be able to substitute for the roadways being proposed.

A significant portion of traffic on the Seward Highway is Girdwood-related (approximately 1/3 on peak summer weekends). With continued population growth in Anchorage and Girdwood areas coupled with increased numbers of visitors traveling to Turnagain Arm, Prince William Sound and the Kenai Peninsula, traffic on the Seward Highway will continue to grow.

This Plan encourages the Municipality, the Alaska Railroad, Seibu Alaska, Inc., and any other future major resort operators to consider actions that will reduce the number of vehicle trips between Anchorage and Girdwood. For example, an immediate step being taken by the Municipality is the introduction of a van pool program. For long commutes, such as between Girdwood and Anchorage, van pools can be convenient and cost effective.

Rail ridership studies should be done periodically in the future to monitor increases in potential ridership associated with various employment, recreational and visitor-related markets. (Rail transportation passenger service is discussed more fully on pages 90-92.) In the meantime, the operation of various public and private bus transport systems with sufficient flexibility to respond to fluctuating demand should also be considered.

## *Girdwood Airport*

Girdwood Airport is located on 174 acres in the middle of Girdwood valley. Only a small portion of the site is in active aviation use. The airstrip, adjoining lease lots and access road are wedged between Glacier Creek and the Moose Meadows wetland.

The airport is owned and operated by the ADOT/PF. Aircraft using the facility are small single-engine planes, typically Cessna 185's and 206's and Piper Cherokees. The department operates the airport as a public facility under state regulations. As such, the State determines which airport development activities ensure compliance with state and federal laws and regulations that govern airport operations.

**EXISTING CONDITIONS**

A 2,080-foot-by-73-foot gravel runway and a 35,000-square-foot apron have been constructed next to Glacier Creek. The creek and its braided floodplain are at each end of the runway as well as flowing along side its entire length on the northwest side.

To the southeast of the runway are 12 hangers located on 16 lease lots. Several businesses are based on the lease lots. These include a sky-diving and flight-seeing service and a certified A/P mechanic. There are no terminal or commercial fueling facilities serving the airfield. However, telephone, electric, and sewer services are available to each lease lot.

The airport has no control tower or flight service station. The runway also has no lights, and navigational aids are limited to wind cone and a segmented circle.

Being centrally located in the valley, the surrounding area is generally flat. The airport grade is slightly sloped. The southern approach to the runway follows a 20:1 slope and begins over Turnagain Arm, running towards the mountains. The northern approach is off the mountains, and although the approach is still 20:1, the area outside the approach slope is obstructed by the mountains.

Little data is available on wind speed and direction or ceiling and cloud cover. However, poor weather is frequent in the area, and often limits operations at the airport to visual flight rules (VFR).

In 1992, there were 28 general aviation single-engine aircraft based at the airport. According to FAA data, there were about 3,300 operations that year, the majority of which occurred in the summer. Almost half of the operations are air taxi, about 1,000 are general aviation local, and 800 general aviation itinerant. Operations levels have not increased since 1980.

The only existing access to the airport is a circuitous route combining three residential streets in an adjoining subdivision to the southeast. Other existing and proposed land uses nearby include the school immediately across the creek to the west, and the commercial/residential area in the new townsite area a short distance to the southwest. AWWU also has two water wells at the north end of the airport property.

**AVIATION FORECASTS**

Girdwood Airport is lightly used by general aviation single-engine aircraft, and periodically by helicopter traffic. Future air traffic will most likely depend upon population growth, and to some extent, on resort/recreational development and increasing visitorship. Along with the number of operations increasing, the number of private planes based at the airport may also rise.

If new resort development activity significantly increases the number of destination visitors to the valley, there may be enough potential demand to introduce commuter shuttle service using twin-engine aircraft. However, such activity would be constrained by the existing facility deficiencies and environmental conditions.

A more likely demand for aviation services will be summertime flight-seeing and year round heli-skiing activities by use of helicopter. Flight-seeing has become a very popular activity for many tourists who want to see many of the spectacular natural features and wildlife found nearby, but lack the time or ability to do it on their own.

Major constraints to basing helicopter services in Girdwood will be inclement weather and lack of necessary helicopter facilities, especially fueling and terminal facilities. It is conceivable, however, there will be interest in establishing helicopter services at Girdwood Airport. There is currently space for such an operation. However, the shape of the valley coupled with the potential number of operations will likely pose a noise problem for the surrounding area.

This Plan recommends that any proposed helicopter operations at the Girdwood Airport for the purpose of providing flight-seeing or heli-skiing services be preceded by a noise impact study. Based on the results of the study, conditions may be placed on the proposed operations which could include restrictions on hours of operation, approach and departure paths, total daily helicopter operations, or even relocating the operations away from the Girdwood Airport.

As resort/recreational activity increases in the Girdwood area, aviation operations associated with such activity should be closely monitored. Monitoring will better allow the community to establish relationships between the level of aviation activity to any resultant off-site impacts.

## *Railroad*

Rail passenger transportation service came to Girdwood in the early 1920's with the completion of the Alaska Railroad. For a few decades, it was the only ground transportation available to the community. However, the completion of the Seward Highway during the early 1950's spelled the beginning of the end for rail passenger service between Anchorage and Girdwood.

Recent interest has been expressed for re-establishing regularly scheduled rail passenger service between Anchorage and Girdwood as an alternative to the automobile. Much of this interest has been caused by the growing level of summer traffic, congestion and accidents along the Seward Highway.

Girdwood residents, many of whom commute daily to Anchorage, have expressed interest in the availability of rail service as a reasonably safe and convenient way to travel to Anchorage. Seibu Alaska, Inc., owners of the new Alyeska Prince Hotel, has hired many Anchorage residents, and has also expressed interest in employee use of rail service. Additionally, rail service along scenic Turnagain Arm is being viewed as a growing recreational attraction and pleasant means of transportation for day-use and destination resort visitors to Girdwood.

As part of the comprehensive planning effort for the Girdwood area, a rail service feasibility assessment was performed as part of the Girdwood Community Impact Study (Transport/Pacific Associates and Kevin Waring Associates). The feasibility assessment included the development of an operational plan and schedule which took into consideration coordination with other rail activity, costs of operation, and potential users and ridership.

Potential users were segmented into specific markets, and included Girdwood residents who commute to Anchorage, Alyeska Resort employees, Girdwood students who attend Dimond High School, skiers and out-of-state and Alaska resident visitors. Two fare levels were analyzed using \$10 and \$5 one-way base fares, as well as monthly passes.

The operational schedules, fares, markets, season and day of week were then assessed to produce a range of ridership estimates for each rider group by season. This resulted in estimates of revenues, which in turn, were compared to estimated operational costs.

The proposed rail service that was assessed would operate from the Alaska Railroad depot on First Avenue in Anchorage to a station location in Girdwood near Alyeska Highway. The service would include intermediate stops at the Dimond Center and in the vicinity of Huffman Road and Old Seward Highway. One or two Rail Diesel Cars (RDCs), depending on season, would be the rail vehicle used for this service.

The rail service assessment study concluded that sizable government support would be required in the near term to cover the difference between revenues and costs. If the service was operated during all seasons, either fare scenario would require \$350,000 to \$500,000 in annual operating support during the next one to three years.

When the prospects for rail service were viewed over the 20-year planning period, a number of factors were anticipated that would tend to increase the attractiveness of the rail service. Increased attractiveness would translate into higher ridership and improved financial feasibility.

Even without additional resort development, the number of Girdwood residents, commuters to Anchorage, and non-residents employed in Girdwood would all be expected to increase. Resort/hotel employee and skier trips would be influenced primarily by the realization of any additional resort expansion, while other, mostly summer, visitors would increase at a rate determined by the growth of tourism in Alaska and the population of Anchorage. If Girdwood continues to be increasingly attractive to the visitor, the community will likely see a larger portion of those who come to Alaska and travel along Turnagain Arm regardless of the specific feature that brought them to the State. The combined effect of growth in each of these markets should be a steady improvement in the cost/revenue "balance sheet" of the proposed Girdwood rail service.

Summer traffic volumes on the Seward Highway are likely to continue to increase as a result of increased tourism, whether or not additional resort development occurs in Girdwood. Given the difficulty and cost of expanding the entire Anchorage-Girdwood segment of the Seward Highway to four lanes, the present two-lane configuration with three lanes between Bird and Girdwood will be in place for most of the next 20 years. Consequently, the likelihood of summertime, and especially weekend congestion-related delay is substantial. As such delay begins to add noticeable time to the trip, a rail option will appear steadily more competitive and attractive.

Given the difficulty in anticipating both the growth of the market for rail service and the growth in population and tourism, it is not possible to gauge future improvement in feasibility of the rail service with precision. However, it is clear that the specific, and in some cases unique, factors that will influence the potential rail service ridership and revenue will, during the next 20 years, move it in the direction of improving feasibility.

This Plan anticipates the eventuality of rail service to Girdwood as a beneficial transportation and recreational service. Any use of the commercially designated area next to the rail line west of Alyeska Highway must be complementary to the establishment of a rail station and related parking area. Adequate land area, up to three acres, should be reserved in the northern portion of the site for transportation facilities.