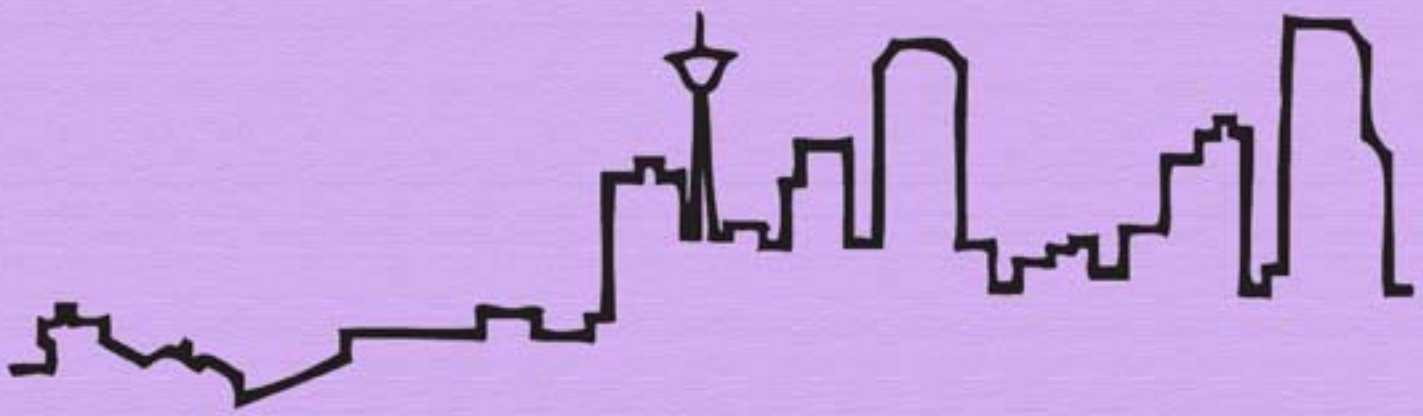
# CALGARY HELIPORTS SYSTEM PLAN

## Approval Procedures for Heliports and Special Aviation-Related Events



**Facilitated by the**
**CALGARY TRANSPORTATION AUTHORITY**

March 1994

**Barry Simpkins and Associates**
URBAN PLANNING AND AVIATION CONSULTANTS

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## ACKNOWLEDGEMENT

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## PURPOSE OF REPORT

* To develop a system plan for heliports in Calgary

* To prepare a framework of urban planning guidelines, community consultation parameters and approval procedures for future heliport development and special aviation events

## CURRENT SITUATION

### Existing Heliports

* Calgary currently has a total of 13 heliports, including the facility recently constructed by the Alberta Children's Hospital

* Of the existing 13 heliports, only 9 are certified by Transport Canada, these include 2 public-use facilities (Downtown and Calgary International Airport), 4 hospitals, 2 private commercial and one government facility

* The 4 uncertified heliports include 2 military facilities at CFB Calgary (Currie and Harvey) which are exempt from Transport Canada certification, the new Alberta Children's Hospital heliport, and a private commercial rooftop facility on the Southport building which has been uncertified and unused since 1986

* Current usage of the heliports is typically about one flight per week or less at each, and there is ample capacity for increased usage in most cases

* As a general rule, Calgary's heliports operate autonomously rather than as a system

### Established Helicopter Flight Corridors

* At present there are only two established helicopter flight corridors, the **Alpha** route, which follows Barlow Trail south from the southeast corner of the Airport to Memorial Drive and then heads west along the Bow River to the Downtown heliport, and the **Bravo** route, which proceeds south over Barlow Trail to 50 Avenue S E. and then heads east beyond the city limits

* In addition to these two established flight corridors, helicopters currently use a number of other routes to reach established destinations internal and external to Calgary, these include 64 Avenue N E /Beddington Trail, Crowchild Trail and Sarcee Trail

**CURRENT SITUATION** (cont'd)

**Helicopter Operations**

* The majority of Calgary's helicopter operators are based at Calgary International Airport These include the STARS air ambulance and several private commercial operators

* Operators not based at the Airport include the Military (who have no helicopters based in Calgary), the Alberta Forest Service (Bow Crow), CFCN-TV (Broadcast House) and Russell Gerrish (Westport)

* The majority of helicopters used in Calgary are in the "light" category (e g Bell 206 JetRanger), with some "medium-weight" aircraft (e g the Eurocopter BK117 used by STARS)

* Besides STARS, which serves Calgary's three designated trauma centres (Alberta Children's Hospital, Calgary General Hospital/Bow Valley Centre and Foothills Hospital), the existing heliports are currently used for such purposes as rooftop airlifts, VIP transportation (e g Airport to Downtown), forestry work, television news gathering and military activities Helicopters operating from bases at the Airport are involved in a wide range of activities, including seismic work, power and pipeline inspections, aerial applications (e g mosquito abatement), aerial photography, film production, tourism and recreation, and radio road traffic reports

**HELICOPTER OPERATING CHARACTERISTICS**

* The two major public concerns with respect to helicopter and heliports are **safety** and **noise**

* As a general rule, helicopters are safer than fixed-wing aircraft, and their safety record has been improving steadily and substantially since 1970

* In terms of noise, helicopters have a distinctive acoustical signature ("blade slap") which makes them easily identifiable, and a source of occasional public complaint This problem can be minimized by operators and their pilots adopting a **"fly neighbourly"** approach

**FACTORS INFLUENCING HELIPORT DEMAND**

**Emergency Services**

* With respect to **medevac operations** (e g STARS air ambulance), there is potential for additional trauma centres to be designated The most logical candidates at this time would appear to be the Rockyview Hospital, which already has a certified heliport, and the Calgary General Hospital/Peter Lougheed Centre

* The **Calgary Police Service** is currently examining the possible use of helicopters in law enforcement, and may eventually incorporate their use within its long-range strategy

* The **Calgary Fire Department** has explored the potential for deploying helicopters in fire-fighting and search-and-rescue However, the acquisition of helicopters for this purpose could not likely be justified until the population of Calgary and its environs reaches a level of about one million

**FACTORS INFLUENCING HELIPORT DEMAND** (cont'd)

**Corporate and Government Services**

* Under current economic conditions the demand for helicopters relative to corporate and government services (e.g. VIP transportation, oilfield activities, forestry services) is relatively low. An upturn in the economy, combined with continued urban growth, could initially lead to greater utilization of Calgary's existing heliports, and ultimately to a demand for new facilities.

**Tourism and Recreation**

* With the decline in other sectors of the helicopter service market due to the slow economy, private operators are looking increasingly towards opportunities in tourism and recreation. Two recent applications for heliports to serve as heli-tour bases (Canada Olympic Park and Stampede Park) were not approved because of concerns related to safety and noise.

**Military Operations**

* There appears to be little likelihood of any appreciable increase in helicopter traffic to/from either of Calgary's two military bases (CFB Calgary/Currie and Harvey) in the foreseeable future.

**Special Events**

* The **1988 Olympic Winter Games** created a very high demand for helicopter service between Calgary and the various games venues. The Downtown heliport, in particular, was heavily used at that time. Similarly, demands for helicopter service could be generated by the **International Fire and Police Games**, to be held in Calgary in 1994, or other major events of this nature.

* The annual **Calgary Exhibition and Stampede** utilizes helicopters for certain events, and helicopters service a number of trade shows annually at the Roundup Centre. Development of a **new convention centre** on the vacant lands west of the Stampede Park would create an opportunity to incorporate a heliport to serve the needs of conventions and trade shows.

* **Hot air balloons** share air space with helicopters at a designated cruising altitude of 500 feet above ground level. However, to date there have been no conflicts between the two types of aircraft.

## URBAN PLANNING FACTORS RELEVANT TO HELIPORTS

* The key concern in evaluating a proposed heliport is **safety**, both in the air and on the ground

* Next to safety, the major area of public concern regarding heliports and helicopter operations is **noise**, in particular the proximity of the facility to noise-sensitive land uses such as residential, schools and churches

* The **justification of need** is also an important consideration

* Once a site location has been determined for a heliport, the site needs to be analysed in terms of more specific **site design criteria** (e g helicopter approach paths)

* Transport Canada has only one set of standards for heliports, and does not relax these standards under any circumstances Exemptions under ***Air Regulation 534 (Aeronautics Act)*** are granted for some short term operations, but these exemptions are intended for "one-off" situations for police work or for the purpose of saving human life

## CURRENT HELIPORT APPROVAL AND CERTIFICATION PROCESS

* **The Minister of Transport** has sole jurisdiction over the certification of heliports However, it is the policy of Transport Canada to not certify a heliport unless and until the **local authorities** have given all necessary land use and development approvals, and unless certification is clearly in the public interest

* **The City of Calgary's Planning & Building Department** determines whether or not a development permit will be required for a heliport In the event that it is required, the application is taken to the **Calgary Planning Commission** for a decision

* In the past there appears to have been inadequate communication between Transport Canada and the City's planning authorities with respect to certain heliport applications, and a lack of clarity regarding the roles of the two levels of government Clearly, the heliport certification process in Calgary needs revamping

## EXPERIENCE ELSEWHERE

* In 1989 Transport Canada and the City of Edmonton jointly adopted and published ***"Approval Procedures for Special Aviation Events and Heliport Development in Edmonton"***. These procedures have apparently worked well, and offer a good model from which to develop similar procedures for Calgary.

* In 1991 the Government of Alberta approved an ***Airport Vicinity Protection Area Regulation*** for the ***Canmore Municipal Heliport***. This regulation might serve as a suitable model for Calgary relative to any of the existing or potential future heliports in the city.

* Experience in Vancouver, B.C., Portland, OR and Denver, CO demonstrates the importance of maintaining a viable downtown heliport. Both Portland and Denver are exploring the development of a system of public heliports, with their downtown facilities serving as the hubs for satellite heliports in suburban industrial/business parks.

* The ***Hawaii State Helicopter System Plan*** concluded that noise levels generated by helicopters are not high enough to have adverse effects on the public's health and welfare, and that noise abatement plans introduced voluntarily by the operators can effectively reduce the level of noise complaints.

* There are only two licensed heliports in all of **the United Kingdom**, although a category for "temporary" heliports exists whereby helicopters are permitted to take off or land at a site provided that it is not used for more than 28 days in any one calendar year. All landing sites located in urban and congested areas, whether they be permanent, temporary or private, require the prior written permission of the Civil Aviation Authority.

## KEY RECOMMENDATIONS

### Calgary Heliports System Plan

* The need for a system of public-use heliports beyond the two existing facilities (Downtown and Calgary International Airport) is not apparent at this time. Potential future needs in this regard should be addressed by the City of Calgary's Planning & Building Department in conjunction with long-range planning.

* The City of Calgary and the Calgary Transportation Authority should jointly endeavour, as soon as possible, to identify, secure and develop an acceptable alternative site for the Downtown Heliport.

* Inasmuch as the new helipad at the Alberta Children's Hospital does not meet Transport Canada's certification requirements, the Hospital should be encouraged to develop a certifiable heliport in conjunction with building expansion as soon as it is economically feasible to do so.

* The Calgary General Hospital/Peter Lougheed Centre should be encouraged to determine and protect a suitable site for a heliport which meets Transport Canada certification requirements, and to develop this facility as soon as it is economically feasible to do so.

**RECOMMENDATIONS** (cont'd)

**Calgary Heliports System Plan** (cont'd)

* At such time as preliminary design work begins on a new convention centre for Calgary, the opportunity for incorporating a heliport into the building or site should be explored

**Role of the Calgary Transportation Authority**

* The Calgary Transportation Authority should be requested to assume the role of liaison between Transport Canada, the City of Calgary, and heliport proponents, helicopter operators and the general public, on any matters pertaining to helicopter operations and heliport developments in Calgary

**Approval Procedures for Heliport Development and Special Aviation-Related Events**

* Transport Canada and the Calgary Planning Commission should be requested to endorse the Approval Procedures as recommended within this report

* The Calgary Planning Commission should designate the Director of Planning & Building as the City's contact for all applications or enquiries pertaining to the development of heliports or the approval of special aviation-related events

# 1.0 INTRODUCTION

## 1.1 BACKGROUND

On February 24, 1988, R G Bell (Director, Air Navigation, Western Region, Transport Canada) wrote to the Mayor of Calgary (Ralph Klein) regarding helicopter operations and the development of a system of certified heliports in the City of Calgary (see Appendix A) He observed that the existing heliports in Calgary were operating autonomously rather than as a cohesive system, and encouraged the City to develop a master plan for a system of heliports, which would be of great benefit to organizers of events which require the support of helicopter operations (e.g the 1988 Olympic Winter Games) He also suggested that officials in Calgary make reference to a booklet entitled ***"Approval Procedures for Special Aviation Events and Heliports in Edmonton"***, which had recently been published jointly by the City of Edmonton and Transport Canada.

Following completion of the 1988 Olympic Winter Games, in which helicopters and Calgary's heliports did in fact play a very significant role, no further action was taken to follow up on the recommendations of Mr. Bell's letter, despite the efforts of the Calgary Transportation Authority However, on September 11, 1992, the Minister of Transport (Hon Jean Corbeil) announced a $25,000 federal contribution to develop a heliport master plan for Calgary (see Appendix B) The announcement stated that *"the funds are being provided to the Calgary Transportation Authority under Transport Canada's financial assistance program for local and local/commercial airports "*

Shortly following this announcement and the transfer of funds from Transport Canada, the Calgary Transportation Authority established a Calgary Heliports System Plan Steering Committee under the chairmanship of Roy Staniland, with representation from the Authority, Transport Canada and the City of Calgary (see Appendix C) The Committee drafted terms of reference for the project, and on April 30, 1993, sent copies of these terms to a number of Calgary-based consulting firms with an invitation to submit proposals On July 06, 1993, the Committee selected the firm of **Barry Simpkins and Associates** to prepare the plan

## 1.2 PURPOSE AND OBJECTIVES

The purpose of the plan, as stated in the Minister of Transport's press release, is to identify the role and benefits of each heliport within the overall system, prescribe approach and departure paths to avoid flight over built-up areas, and enhance the City's disaster response plan

More specifically, the objectives are as follows

* to prepare an inventory and assessment of existing heliports within Calgary,
* to examine and assess established helicopter corridors in terms of safety and urban compatibility,
* to profile the various factors that will influence the demand for future heliport development throughout Calgary,
* to identify the urban planning factors that are important considerations in heliport development, including special events and the consequent need for temporary heliport facilities, and
* to prepare an appropriate framework of urban planning guidelines, community consultation parameters and municipal approval procedures for future heliport development, acceptable for consideration by the City of Calgary

# 2.0 CURRENT SITUATION

## 2.1 EXISTING HELIPORTS

The Canada Flight Supplement published by the Canada Centre for Mapping, Department of Energy Mines and Resources, currently lists 12 heliports in Calgary and its immediate vicinity (does not include the new helipad at the Alberta Children's Hospital). The locations of these facilities are shown in Map 1, site location maps for each heliport are presented in Appendix D

The existing heliports, listed below, have been established independently to serve five general categories of use

**Public Use Heliports**

Downtown/Bow River
Calgary International Airport

**Emergency Medical Heliports**

Alberta Children's Hospital/HMCS Tecumseh
Calgary General Hospital (Bow Valley Centre)
Foothills Hospital
Rockyview Hospital

**Government Heliports**

Bow Crow (Alberta Forestry, Lands and Wildlife)

**Private Industrial/Commercial Heliports**

Broadcast House (CFCN-TV)
Southport (Richfield Properties Inc )
Westport (R E T Gerrish)

**Military Heliports**

CFB Calgary/Currie
CFB Calgary/Harvey

It should be noted throughout this report that the term **"heliport"** is used in a very generic sense to denote an area, either at ground level or on an elevated structure, that is used for the landing and takeoff of helicopters, and is currently identified as such in the Canada Flight Supplement These existing heliports vary significantly from each other in terms of the facilities provided, and not all are certified by Transport Canada

Following is a brief description of each of the existing heliports.

### 2.1.1 Downtown/Bow River

The Downtown heliport, the first such facility in Calgary, was established in 1972. It was conceived by the Calgary Transportation Authority to serve the needs of downtown businesses, provincial and municipal government and emergency services. It has also been used extensively for airlifting bulky objects from ground level to downtown rooftops. The heliport is located at the west end of the downtown (1st Avenue at 7th Street S.W.), in parkland adjacent to the Bow River. The site was originally leased to the City by the Province for the express purpose of a heliport. Helicopter access/egress is along the Bow River to/from the southwest and northeast.

This heliport was used fairly regularly during the economic "boom" period of the late 1970's and early 80's. However, it achieved its peak usage during the month of February 1988, in conjunction with the Olympic Winter Games. In anticipation of this increased demand, and in response to complaints from nearby residents regarding noise from hovering helicopters, the facility had been expanded in 1987 to add four heli-parking stalls. It was recertified by Transport Canada at that time. Since 1988, usage of the Downtown heliport has tapered off significantly. Although reliable statistics are not kept, the operator (City of Calgary Transportation Department) estimates that, on average, there is only one flight per week.

The location of the Downtown heliport has been a contentious matter for some time. In 1979 the City of Calgary entered into an agreement with Eau Claire Estates Ltd. regarding the development of lands to the east of the heliport. Article 15.01 of that agreement commits the City to *"use its best efforts to cause the removal of the heliport from its present site to an alternative site suitable to the parties hereto prior to the occupancy of the first residential building in Area 'A' west of the 5th Street extension or as soon thereafter as feasible"*. A study was undertaken in 1988 to evaluate alternative locations. This study concluded that the best site for a Downtown heliport was the existing site, but in the event that the City decided that this site was unsuitable, the former Universal car lot to the west along the Bow River would be the best alternative site. No effort has yet been undertaken by the City towards relocation of this heliport.

### 2.1.2 Calgary International Airport

This facility was developed in 1979 for the purpose of accommodating helicopter transfers from the airport to downtown Calgary, as well as to other destinations (e.g. oil fields, mountain recreation areas). It is located to the east of the air terminal building, and requires passengers to walk or be taxied across a vehicular parking area. This heliport has apparently never experienced much usage (less than one flight per month, on average), but according to at least one private commercial operator, its potential could be greatly enhanced if it were relocated to a site with more convenient passenger access to/from the main terminal building. It is operated by the Calgary Airport Authority.

In addition to this public heliport, there are a number of privately operated helicopter facilities located within the McKnight and McCall South Aviation Parks near the south end of the airport. The locations of these facilities are shown in Map 2.

### 2.1.3 Alberta Children's Hospital

Since the early 1980s the Alberta Children's Hospital (ACH) has had an agreement with the Tecumseh Naval Base regarding use of the helipad on their drill square for the transportation of medical teams and equipment to other hospitals throughout southern Alberta, as well as for transporting stabilized trauma patients from rural locations to the ACH. This heliport has been certified by Transport Canada, but necessitates transfer of the trauma patient from the helipad to the hospital by means of a City ambulance.

The **Alberta Shock Trauma Air Rescue Society (STARS)** was established in 1985 to provide transportation for trauma patients and medical teams between rural locations and Calgary trauma centres, including the ACH. When STARS developed an enhanced transportation system in 1990, whereby severely ill or injured patients could be transported in an unstabilized condition, it found the Tecumseh helipad location to be unacceptable for the necessary immediate ground transfer of patients to the hospital's emergency wing. Consequently, STARS began to land its helicopters on the grassy area within the traffic loop ramp which links 17th Avenue S.W., Richmond Road and the Crowchild Trail. This operation is permissible by Transport Canada through an exemption under ***Air Regulation 534 (Aeronautics Act)***, although the intent of the exemption is for one-time rather than regular occurrences.

In late 1991, STARS formally requested that the ACH investigate alternatives for providing a proper helicopter landing facility closer to the hospital than Tecumseh, in order to enhance the safety of its operations and to eliminate the need of an ambulance for ground transportation. A total of six alternative sites were considered, and following its evaluation the ACH concluded that the best site would be the interior of the traffic loop ramp already being used by STARS. Although Transport Canada indicated that this site could not be certified, since it did not meet all of their requirements, the ACH proceeded to deal with the City Administration, the neighbouring communities and the Ward Alderman to win support for this proposal.

Since this facility was being developed on City-owned land by a public institution, the City did not require a development permit. The City did not object to the development on the understanding that it would be used by STARS only for emergency life-threatening situations, and that a permanent helipad would be incorporated into the next phase of hospital expansion. All non-emergency helicopter flights are to continue using the certified heliport at the Tecumseh Naval Base. Although certain residents of the adjacent communities have concerns regarding helicopter safety and noise, they are apparently willing to accept the development on the basis of these conditions.

Approximately 35 - 40 missions per year have been flown to and from the Childrens' Hospital since 1989, primarily during daytime hours (i.e. 7:00am - 10:00pm), and mostly for the transportation of emergency trauma patients. Notwithstanding that construction of the new "temporary" heliport is now complete, the Tecumseh facility will remain as the only heliport certified by Transport Canada relative to the ACH. The primary approach and departure paths for both facilities are along Crowchild Trail north and south.

### 2.1.4 Calgary General Hospital (Bow Valley Centre)

The helipad at the CGH (BVC) is a specially constructed elevated deck on the south side of the hospital, with direct ground access to the emergency wing via a short walkway The facility was built in 1987, and is used regularly by STARS for the delivery of trauma patients Helicopter access is along a grassed escarpment north of the Bow River corridor, east and west Although the hospital is surrounded by residential development on three sides (the Bridgeland and Riverside communities), and the Bow River pathway on the south, the hospital receives few complaints regarding helicopter noise or safety concerns

### 2.1.5 Foothills Hospital

The helipad at the Foothills is located on an abandoned surface vehicle parking area adjacent to the physical plant building near the western edge of the hospital site The location is not particularly convenient to the hospital's emergency wing, requiring that patients be wheeled across an extensive vehicular parking area However, modifications are now being planned to improve this access

This facility was first established in 1978, and was upgraded in 1987 Like the CGH, it is used regularly by STARS (1-2 flights per day, on average). Helicopter access is along an embankment from the west, with departures to the south over the Parkdale community Although residences in Parkdale are at a much lower elevation than the helipad, there are occasional complaints regarding helicopter noise, and it would appear that departures would be better routed along the embankment towards 16 Avenue N W

### 2.1.6 Rockyview Hospital

The helipad at the Rockyview is located on a paved surface area at the hospital's south end, with direct and convenient access to the emergency wing The facility was developed and certified in 1987, in conjunction with general upgrading of the hospital at that time, for availability during the 1988 Olympic Winter Games Helicopter access and egress is to/from the southwest over Heritage Park and adjacent to the Eagle Ridge community

Since the Rockyview Hospital has not been classified by the Province as a "trauma centre", it is not accessed by STARS, and receives only occasional visits from Transport Canada helicopters This heliport represents a significant underutilized resource for helicopter services in Calgary, and offers excellent potential for future use

### 2.1.7 Bow Crow

The Bow Crow heliport, located at the western edge of the Alberta Forestry, Lands & Wildlife complex to the north of Bearspaw Dam Road and west of 85 Street N W , was first licensed by Transport Canada in 1978 Although some use was made of this facility in conjunction with the 1988 Olympic Winter Games, it is now used exclusively by the Forest Service to transport personnel to and from field sites On average there is about one flight per day (weekdays only), except during the winter months when the helicopter is stored in a hangar at Calgary International Airport Helicopter access and egress is southwest to and from the Bow River The Forest Service advises that it receives no complaints about noise from nearby residents of the Bowness community or the Greenwood Village mobile home park

**2.1.8 Broadcast House**

The heliport at CFCN-TV's headquarters on Broadcast Hill (northwest of Sarcee Trail/Bow Trail S.W.) was first certified in 1983. Originally used for road traffic reports, when CFCN radio was on the air, it is now used relatively infrequently (perhaps one flight per month) for TV news gathering, or occasionally by STARS for picking up or dropping off medical personnel. The helipad is situated on the western side of the CFCN site, with helicopter access and egress being to/from the southwest over the Coach Hill community. A spokesperson for CFCN was unaware of any resident complaints regarding noise.

**2.1.9 Southport**

The Southport helipad was developed on the rooftop of the 5-storey Southport office building in 1979, concurrent with construction of the building. Access and egress was via the rail corridor to the west. According to the former President of Richfield Properties Ltd. (the developer), the facility was intended to serve only his company's corporate needs. Although there were apparently very few complaints about noise from residents of the Southwood community to the west, tenants of the Southport building itself were very concerned about noise distracting employees, as well as the potential safety hazard if a helicopter were to crash on landing. Consequently, use of the facility was restricted to weekends, and was relatively infrequent at that. The heliport has not been recertified since 1984, and has not been used since 1986. The facility remains in excellent condition, including a rooftop hangar and a waiting/reception lounge, but has restricted ground access via stairways.

**2.1.10 Westport**

The Westport heliport is located on a private residential acreage on the south side of 17 Avenue at about 74 Street S.W., just west of the city limits in the Municipal District of Rocky View. This facility was built in 1983 by Russell Gerrish, for his personal use and that of other private helicopter operators who visit him from time to time. It has also been used occasionally by STARS for picking up and dropping off medical teams. The facility was certified by Transport Canada in 1984, and has been recertified regularly since then. Access and egress is to/from the southwest over undeveloped rural lands. Over the 10 years it has been in operation, this heliport has been used only about 30 times in all.

**2.1.11 CFB Calgary/Currie and Harvey**

Both the Currie and Harvey bases at CFB Calgary utilize open grassed areas for the landing and takeoff of military helicopters. In each case, the facilities are located in close proximity to an officers' mess, and are equipped with a wind sock and a portable fire extinguisher. Neither has any permanent lighting, although portable lights are set up in the event of night-time landings. While helicopter activity at the Currie base does draw some complaints from nearby residents to the northwest (Sarcee Park), operations at the Harvey base do not appear to have any significant impact on residents of adjacent communities (Lakeview to the east, and Glamorgan to the north). These facilities do not require certification by Transport Canada, but both are located within the airspace zone which is subject to Air Traffic Control from the tower at Calgary International Airport.

## 2. 1.12 Summary Assessment of Existing Heliports

Of Calgary's 13 existing heliports, 9 are currently certified by Transport Canada. The facility on the roof of the Southport office building has been uncertified and unused since 1986, while the two military heliports (CFB Calgary/Currie and Harvey) are exempt from certification requirements. Furthermore, the new heliport recently constructed within the traffic ramp to the west of the Aberta Children's Hospital does not meet Transport Canada's certification requirements.

Only two of the existing heliports (Downtown/Bow River and Calgary International Airport) are certified for general public use. Three of the four emergency medical heliports are used regularly by the STARS air rescue service, the exception being the Rockyview Hospital, which is not a designated trauma centre. Usage of all of these facilities is generally quite light (i.e. one flight per day or less, on average), and operations are generating relatively few public complaints regarding helicopter safety or noise.

In conclusion, it can be stated that the City of Calgary is blessed with a good inventory of heliports, most of which are certified by Transport Canada and have reserve capacity to accommodate considerable growth in helicopter activity. With the possible exception of the emergency medical heliports, however, these facilities operate autonomously rather than as a cohesive system.

## 2.2 ESTABLISHED HELICOPTER FLIGHT CORRIDORS

As shown in Map 1, the Canada Flight Supplement currently designates two helicopter flight corridors within Calgary. These routes were established by Transport Canada in the early 1970's in order to move the majority of helicopter traffic to and from Calgary International Airport safely, and without conflict to fixed wing aircraft. The Flight Supplement also specifies arrival/departure routes or envelopes for each heliport.

The **Alpha** route begins at the intersection of Runways 16/34 and 07/25 at Calgary International Airport, proceeding southeasterly to the intersection of Barlow Trail and McKnight Boulevard N.E., south over Barlow Trail to 17 Avenue S.E., and then westerly along the Bow River to the Downtown heliport at 7 Avenue/ 1 Street S.W. The **Bravo** route extends south along Barlow Trail from 17 Avenue S.E. to 50 Avenue S.E., and then easterly along 50 Avenue. In addition to these two designated routes, Transport Canada (Air Traffic Control) advises that helicopters flying from Calgary International Airport in a westerly direction follow a route from the 64th Avenue/Deerfoot Trail overpass directly onto Nose Hill Park, thence via green spaces to the northwestern edge of the city. Military helicopters use Crowchild Trail and Sarcee Trail to access CFB Calgary's Currie and Harvey bases, respectively.

The use of major roadways as helicopter flight routes is standard practice, since land use adjacent to such corridors (e.g. industrial or commercial) is generally not noise-sensitive. Furthermore, the ambient noise of roadway traffic may "drown out" much of the helicopter noise. Railways offer similar advantages. Rivers and other waterways may also present desirable flight corridors if they are sufficiently wide, although often they will have noise-sensitive uses along or adjacent to their banks (e.g. parks, pathways, residential development).

At the present time both of Calgary's established flight corridors appear to be functioning satisfactorily, generating few public complaints. Barlow Trail (both the **Alpha** and **Bravo** routes) represents a particularly suitable corridor. The portion of the **Alpha** route which follows the Bow River rates less well, as it is bordered by residential and other noise-sensitive uses on both sides over much of its length. Although road traffic from Memorial Drive helps to mitigate noise impacts on the north side, there were some complaints from residents of the Hillhurst/Sunnyside community near the Downtown heliport during the 1980's, when helicopters were forced to hover while awaiting an opportunity to land.

The specified cruising altitude along both of these routes is 4,100' ASL (above sea level), equivalent to about 500 - 700' AGL (above ground level). While this requires helicopters to cruise closer to the ground than the 1,000' AGL preferred by Transport Canada and the U.S. Federal Aviation Administration (FAA), it was necessary in order to provide adequate vertical clearance from fixed wing aircraft landing and taking off from the airport. Although hot air balloons also are required to cruise at 500' AGL, and have the right-of-way over helicopters, this sharing of air space has not apparently created any problems for either type of aircraft.

While the two established helicopter flight corridors appear to be operating satisfactorily, they fall short of providing access to all of the city's existing heliports. It would be appropriate for Transport Canada to examine the merits of establishing additional flight corridors, in consultation with Air Traffic Control (C.I.A.), the users and the City, on a "demonstrated need" basis.

## 2.3 CALGARY-BASED HELICOPTER OPERATIONS

The terms of reference for this study did not specify inclusion of a full inventory of existing helicopter operators, equipment and manpower in Calgary. However, the following descriptions provide a general picture of the types of operations using the city's heliports.

### 2.3.1 Alberta Shock Trauma Air Rescue Society (STARS)

STARS has been operating an emergency air ambulance service in southern Alberta through its base in Calgary since 1985, with more than 1,700 missions having been flown over that period. In 1991/92, one out of every six patients transferred was a Calgary resident (e.g. highway accident victims).

STARS transports critical trauma patients from rural areas to one of three designated "trauma centres" in Calgary - the Alberta Childrens' Hospital, the Calgary General Hospital (Bow Valley Centre) and the Foothills Hospital. Patients may be brought in directly from the scene of an accident, or may be transferred from a local hospital which is not adequately equipped to deal with the situation.

STARS' operation is based out of the Shell Aerocentre in the McKnight Aviation Park (see Map 2). One Eurocopter BK 117 air ambulance helicopter and flight crew is provided under contract by ALC Airlift Canada Inc. The helicopter carries a paramedic and a nurse at all times and, in addition, emergency physicians are on call 24 hours a day. All medical and paramedical personnel are fully qualified and volunteer their time. The service is normally able to respond to emergencies within 5 - 10 minutes. STARS also transports specialty medical teams to emergency locations where appropriate, and transports organ transfers.

Under the federal ***Aeronautics Act, Air Regulation 534*** (see Appendix F), emergency medical helicopters can choose their own flight path and can land wherever they consider necessary for the purpose of saving a human life. As a result, this may require overflights of noise-sensitive areas (e.g. residential), even in the middle of the night. While this does generate some complaints, most people appreciate the importance of this service, and that it could be their life or that of a loved one that is at stake.

### 2.3.2 Private Commercial Operations

Several private commercial helicopter operators have bases in Calgary, most of them being located in the McCall South Aviation Park at the southeast corner of Calgary International Airport (see Map 2). These companies engage in a wide variety of operations, largely external to Calgary, including the following:

- seismic activity (e.g. moving drills and recording equipment);
- aerial applications (seeding, fertilizing and mosquito abatement);
- forestry (fire fighting support, surveillance, crew and equipment transport);
- film making; aerial photography; power & pipeline inspection and maintenance; transportation & supply to remote locations;
- corporate and government VIP transportation (e.g. airport to/from downtown);
- tourist flights; recreational transfers;
- road traffic reports;
- rooftop construction and maintenance of heating/air conditioning units.

**2.3.2 Private Commercial Operations** (cont'd)

Except for corporate and government VIP transportation and recreational transfers (e.g. skiers connecting at the airport), these operations are generally flown to and from the operators' bases at the airport, and place minimal demands on any of Calgary's heliports. The helicopters used are typically light to medium-sized aircraft (e.g. Bell 206 JetRanger and LongRanger; Eurocopter AS-350 Astar; Robinson R22). Flights external to Calgary can generally follow the Alpha corridor (Barlow Trail, 50 Avenue S.E.), with vitually no impacts on residential or other noise-sensitive areas. The greatest potential for adverse impacts is from tourist flights, and during the past two years this possibility has stirred up considerable controversy with applications for heliports at Canada Olympic Park (Canadian Helicopters Ltd.) and Stampede Park (Calgary Helicopters Ltd.).

**2.3.3 Alberta Forest Service**

The Alberta Forest Service owns and operates a Bell 206 JetRanger helicopter from its Bow Crow heliport. This is a "light" helicopter, and all of its missions are external to Calgary. In addition to this helicopter, other government and privately-owned helicopters land at the facility on occasion, some of these being "medium"-sized (e.g. Bell 212).

**2.3.4 Department of National Defence**

There are no helicopters based permanently at either CFB Calgary/Currie or Harvey. The helicopters that do land at these two bases (1 or 2 per month, on average) generally originate from either 408 Squadron at Namao/Edmonton (north), CFB Wainwright (northeast) or CFB Suffield (east). The highest level of activity occurs annually during January, when there is a concentration of 9 helicopters on the base for a two-week training operation. In order to reduce noise impacts on neighbouring residents, this operation is conducted mainly over the open Sarcee range on the Harvey base.

The aircraft currently used are the Bell 212 "twin" UH-1N, and the smaller Bell 206 Kiowa (a military version of the JetRanger).

**2.3.5 Other**

Besides the operations described above, there are a number of other small operations. These include CFAC Radio (road traffic reports), CFCN-TV (news gathering), and private operators such as Russell Gerrish at Westport.

# 3.0 HELICOPTER OPERATING CHARACTERISTICS

## 3.1 SAFETY FEATURES AND RECORD

One of the major concerns surrounding proposals for new heliports is the question of public safety. There is always the fear that a helicopter might crash on takeoff or landing, injuring or killing not only the pilot and/or his passengers, but possibly also one or more "third parties" on the ground.

As a general rule, helicopters are safer than fixed-wing aircraft, and certainly have a much better safety record than motor vehicles. Information published by the U.S.-based Helicopter Association International (HAI) indicates that they are becoming continually safer. In 1992 there were only 6.96 accidents per 100,000 flying hours throughout the United States, as compared to 30.46 in 1970. This trend reflects the increased emphasis being placed on safety by helicopter manufacturers and operators.

There are three primary considerations related to helicopter safety: aircraft design; pilot training; and heliport design and access. With regard to aircraft design, the progressive replacement of older piston-driven engines with the more reliable turbine engine, and the increasing use of twin-engined helicopters, have been major factors in the improved safety record since 1970. Also, manufacturers devote considerable effort to the development of other features, and to the preparation of pilot training manuals specific to the particular aircraft.

In most emergencies, or instances of engine failure, helicopters have the ability to land safely provided that a suitable landing area is available. This is because the helicopter can descend under a condition known as **"autorotation"**, whereby the pilot decreases the pitch of the main rotor blades to allow them to be rotated by the upward flow of air. The spinning rotor acts somewhat like a parachute, and a nearly constant rate of descent is maintained.

Transport Canada requires that all helicopters receive regular airworthiness inspections and certification, in addition to providing inspection and certification of all heliports, with particular emphasis on safety. All heliports are inspected annually to ensure compliance with safe arrival and departure routes. Flight corridors are also inspected to ensure continued compliance with safety requirements (e.g. possible obstructions, availability of emergency landing areas).

## 3.2 NOISE CHARACTERISTICS

Next to safety considerations, helicopter noise is the most important factor in evaluating proposed sites for heliports, and determining flight corridors and approach and departure paths. The helicopter is a low-flying aircraft (generally 500 - 1,000 feet above ground level), and as a result, its sound frequently comes within the audible range of community residents. Nevertheless, its noise footprint during approach, landing, takeoff and departure is considerably less than that of a fixed-wing aircraft.

The acoustical signature of a helicopter is partly due to the modulation of sound by the slowly turning main rotor. This modulation, referred to as **"blade slap"**, attracts attention much as a flashing light is more conspicuous than a steady one, and is a significant source of helicopter noise. The tail rotor (required only for single main rotor helicopters), piston engines and some gas turbines, and weather (specifically wind and temperature) also impact noise levels.

**3.2 NOISE CHARACTERISTICS** (cont'd)

The basic measurement system for acoustical power or intensity is the **decibel (dB)**, a logarithmic ratio. The term **dB(A)** refers to filtering or weighting which is applied to refine the measurement process to better represent what is actually heard by the human ear. There are several noise simulation systems related to aircraft, and these are addressed briefly in Appendix E. The dB(A) is the basic unit of measurement in the Calgary Noise By-law, and for purposes of this report, the **dB(A)** is recommended as the reference measurement, expressed in terms of **Ldn**, the day-night average sound exposure level.

The degree of annoyance of helicopter noise generally varies inversely with the level of ambient community noise. Noise levels for the types of helicopters most frequently used in and around Calgary typically range from 72 to 82 dB for "light" helicopters (e.g. Bell 206 JetRanger) and 79 to 87 dB for "medium-sized" helicopters (e.g. the Eurocopter BK 117 used by STARS air ambulance) at a distance of 400 feet. By comparison, the noise from an automobile at a distance of 50 feet can range from 60 to 90 dB, depending upon size and speed, while other common sources of urban noise (e.g. truck or bus, power lawnmower, diesel train) are even louder.

The City of Edmonton has recently instituted a requirement that aircraft noise levels in the vicinity of heliports be no greater than 5dB(A) Ldn over the community background (ambient) noise levels. By comparison, the 1989 Hawaii State Helicopter System Plan (see 7.6) recommended that the forecasted on-site operations at a heliport meet the ambient noise levels less 5dB(A) Ldn at all noise sensitive properties within a 6,000 foot radius of the facility.

Four of Calgary's existing heliports, and possibly one or more future ones, are located at hospitals. Although hospitals are classed as noise-sensitive land uses, it is impossible to control helicopter noise at or below ambient noise levels for designated trauma centres served by STARS air ambulance. Since the frequency of these operations is not high, and generally involves the saving of human life, no restrictions should be imposed upon these helicopter operations relative to noise.

In the case of either public-use or private commercial heliports, however, helicopter noise should be controlled in order to minimize nuisance to the affected community. In evaluating the suitability of a proposed heliport site, the City should aim, where it is feasible, to prevent situations where helicopter noise could exceed ambient community noise levels (dB(A) Ldn) in the vicinity of the heliport. It should be noted that noise is not a criterion considered by Transport Canada in the heliport certification process.

Careful planning of heliports and helicopter flight corridors, together with operational sensitivity, can help to mitigate the impacts of helicopter noise. Heliports should be located as far away as possible from noise sensitive land uses (e.g. residential, schools, churches), and flight corridors should utilize major roadways, rail corridors or rivers. Wherever possible, helicopters should maintain a minimum cruising altitude of 1,000 feet above ground level, particularly where overflights of noise-sensitive areas cannot be avoided. Furthermore, helicopter operators and their pilots should be encouraged to adopt a **"Fly Neighbourly"** program in order to further reduce noise levels and to preclude the need for formal noise abatement regulations.

A more detailed discussion of the characteristics of helicopter noise is presented in Appendix E.

## 4.0 FACTORS INFLUENCING HELIPORT DEMAND

The foregoing review of current helicopter operations in Calgary, together with investigation into operations in other communities and discussions with local helicopter operators and others, has identified the following range of potential future demands for helicopter services and heliports in Calgary

* emergency services (emergency medical, police, fire, disaster services)

* corporate and government services (shuttle of VIPs to/from airport, seismic services, forestry services, power and pipeline inspection and maintenance, etc )

* tourism and recreation (heli tours of the city and/or mountain regions, access to skiing and other recreation areas)

* military

* special events (1988 Olympic Winter Games, Grey Cup, Calgary Exhibition & Stampede, trade shows, etc )

* other services (rooftop lifting, film making, aerial photography, etc )

Each of these categories is discussed below

### 4.1 EMERGENCY SERVICES

#### 4.1.1 Emergency Medical Transportation

The important role played by the Alberta Shock Trauma Air Rescue Society (STARS) in emergency medical transportation has already been discussed at some length in previous sections of this report Future growth in the demand for STARS services will likely be proportional to population growth Whether or not future trauma centres will be designated in Calgary is purely conjectural at this time, particularly in the face of current budget cuts However, the Rockyview Hospital and the Calgary General Hospital (Peter Lougheed Centre) would appear to be logical candidates

The City of Calgary's Emergency Medical Services Department does not expect to require its own helicopter within the foreseeable future Paramedics currently call on STARS as required to transport trauma patients from the scene of a roadway accident or other critical situations A spokesman for the department suggested, however, that every hospital should have its own heliport

### 4.1.2 Police Services

Airborne law enforcement is common in U.S. cities. The Los Angeles Police Department, for example, has a fleet of 15 helicopters working in areas such as traffic surveillance, crime deterrent patrols, criminal search and apprehension. Although helicopters have not been used to date in any Canadian municipalities, the RCMP as well as provincial forces in Ontario and Quebec all have airborne units.

The Calgary Police Service has recently undertaken a pilot project to determine whether it would be worthwhile for them to pursue airborne law enforcement. The project, leasing the CFAC radio helicopter, was carried out over the last two weekends of August and the first weekend of September, 1993. Although the Police Service is not yet in a position to release its report, discussions with staff involved indicate that the results were generally positive, and might possibly lead to an extension of the pilot project.

### 4.1.3 Fire Services

The Calgary Fire Department does not currently use helicopters in its operation on a regular basis. However, over the past two years it has taken advantage on several occasions of access to the STARS and RCMP (Red Deer) helicopters for emergency rescue and rural brush fire-fighting operations. In addition, the Alberta Forest Service helicopter has come into Calgary twice to pick up Fire Department personnel for transportation to rescue missions, utilizing the Downtown and CGH/BVC heliports respectively.

A study undertaken for the department in 1991, based on the deployment of helicopters by the Los Angeles County Fire Department, explored the potential for the CFD to acquire one or more helicopters for its regular use. One recommendation of the study was that the Fire Department collaborate with Emergency Medical Services and the Calgary Police Service to develop a joint venture proposal for either the use or acquisition of a helicopter by the City. Due to current economic constraints, no action has yet been taken on this or any of the other recommendations put forward in the report, and it appears that the CFD will be unable to justify acquiring a helicopter for its exclusive use until the population of Calgary and its environs reaches a level of about one million

### 4.1.4 Disaster Services

In 1975 City Council adopted the Calgary Peacetime Disaster Plan. The Fire Chief is the Director of Disaster Services, and his support staff comprises a Disaster Services Coordinator and a Disaster Services Officer. Implementation of the Plan is activated through a Disaster Services Committee, made up of elected officials, and an Emergency Operations Committee, chaired by the Mayor and comprising key senior officials of the City Administration. Implementation is guided by three confidential reference documents - the Policy & Procedure Manual; the Action Book; and the Resource Manual.

**4.1.4 Disaster Services** (cont'd)

Helicopters and heliports can play an important role in dealing with disasters and other major emergencies in Calgary and surrounding communities with which the City has entered into "mutual aid agreements". At present, the Resource Manual referred to above includes a listing, with telephone numbers, of the various helicopter operators in Calgary and vicinity. There is no information on the relative capabilities of these operators in terms of manpower and equipment, nor is there any information on the available heliports. An up-to-date record of all of this information is essential if helicopters and heliports are to play a meaningful role in responding to disasters and emergencies.

## 4.2 CORPORATE AND GOVERNMENT SERVICES

During Calgary's economic "boom" of the late 1970's and early 80's, the Downtown heliport was often used by oil companies and other businesses for the purpose of quickly shuttling executives and other VIPs between the Airport and Downtown. This facility has also been used to some extent by the provincial government when the Premier and/or cabinet ministers are attending meetings at the McDougall Centre. Under current economic restraint measures, both the business and government sectors seem more inclined to sacrifice time savings and travel by taxi. However, this demand could materialize again as the economy begins to improve.

Another "casualty" of economic decline, from the helicopter operators' perspective, is the demand for transporting geologists, engineers, crews and equipment from the airport and certain other heliports (e.g. Downtown) to the oilfields of central and northern Alberta. According to information provided by the operators, the only component of this market still active is seismic exploration. Nevertheless, this activity could grow again as the economy recovers. In addition, many operators continue to work on power and pipeline inspections throughout southern Alberta.

The Alberta Forest Service operations out of the Bow Crow heliport have been fairly stable for several years. However, a spokesman for Alberta Forestry, Lands and Wildlife speculated on the possibility that the Provincial Government could decide to sell off their helicopter as an austerity measure, and contract the service to a private operator. In this case the service might operate in and out of the airport.

## 4.3 TOURISM AND RECREATION

With the decline in other components of the helicopter service market, operators are looking increasingly towards opportunities in the tourism and recreation sectors. Over the past year or so two Calgary-based helicopter operators have applied for certification of heliports which would have provided bases for heli-tours of the city and, in one case, of mountain areas as well. The first application was for a permanent facility at Canada Olympic Park; this application raised a number of concerns at the Calgary Planning Commission, primarily related to safety and noise, and was eventually withdrawn by the applicant prior to a decision. The second proposal was for a temporary heliport in the northwest corner of Stampede Park, from which heli-tours of the Park and the adjacent city core area would have been offered during Stampede Week. This proposal did not come to fruition either, since it neither qualified for exemption from Transport Canada requirements under Air Regulation 534, nor did the proponent submit a formal application for certification of a heliport..

**4.3 TOURISM AND RECREATION** (cont'd)

In addition to heli-tours, some operators claim that there is market potential for transporting people by helicopter from Calgary International Airport to ski areas and other recreational opportunities in the mountains. Heliports in Canmore and at Kananaskis Village offer connecting points. There appears to be some justification for the Calgary Airport Authority to consider a more convenient location for the heliport at CIA.

**4.4 MILITARY OPERATIONS**

There appears to be little likelihood of any appreciable increase in helicopter traffic to/from either of Calgary's two military bases (CFB Calgary/Currie and Harvey) in the foreseeable future. However, beginning in 1995 the existing fleet of Bell 212's (twin UH-1N) and 206's (Kiowas) will be replaced by Bell 412's. These aircraft are much larger and noisier than the Kiowas, but are similar in size and noise generation to the 212s.

**4.5 SPECIAL EVENTS**

**The 1988 Olympic Winter Games** created a very high demand for helicopter service between Calgary and the various Games venues, particularly Canmore and Nakiska. As noted earlier, the Downtown heliport was upgraded in 1987 to accommodate the anticipated demands. From January 30 to March 01, 1988, there were 215 flights out of this facility, reaching a peak of 24 flights during one day. The helipads at the Calgary General (Bow Valley Centre), Foothills and Rockyview hospitals were also put to good use, and the facilities at Bow Crow, Broadcast House, and CFB Calgary/Currie and Harvey were available as required. In addition, a temporary helipad was established at Lindsay Park for the exclusive use of broadcast teams. All in all, Calgary's extensive system of heliports proved to be a great asset during these events.

Calgary has won the distinction of hosting **the World Fire and Police Games in 1994**. Other future possibilities include the Commonwealth Games and, of course, a repeat of the Winter Olympics, as well as numerous other possibilities. The City needs to be prepared with every available mode of transportation to meet the demands of such large-scale events. One of the key advantages offered by helicopters in this regard is security, especially for the transportation of VIPs and media coverage.

In addition to the annual Calgary Exhibition & Stampede, during which helicopters are frequently used for various purposes, the City also hosts a number of conventions and trade shows every year. The existing Calgary Convention Centre is not equipped with a helipad, and the Downtown heliport is not close enough to be of any real advantage. Although in the past helicopters have been allowed to land in open areas of Stampede Park to serve trade shows held at the Roundup Centre, this permission by Transport Canada has gone beyond the intent of exemptions under Air Regulation 534. A consultant study undertaken for the City in 1991 recommended that **a new convention centre** be developed on the vacant land on the west side of Macleod Trail, across from the Roundup Centre, thus creating a combined convention/trade facility. The consultants' report did not address the potential for a heliport being incorporated into these new facilities. However, this opportunity should be explored in the course of planning and design of the building.

**4.5 SPECIAL EVENTS** (cont'd)

Among the more familiar "special aviation events" which occur in Calgary are **hot air balloon** flights. Launching sites are subject to the approval of Calgary Parks & Recreation and City Council, and Transport Canada has established the cruising altitude at 500 feet above ground level. Although this is similar to the airspace used by helicopters, it has not resulted in any conflicts to date.

**4.6 OTHER FACTORS**

In addition to all the activities mentioned above, helicopters are frequently used to **airlift materials and equipment to the rooftops of buildings** In fact, City and Transport Canada records indicate that roughly 85% of all applications for approval of "special aviation-related events" fall into this category. This type of activity was even more significant during the construction "boom" of the late 70's and early 80's, when the Downtown heliport was used extensively for this purpose.

A number of Calgary helicopter opertators also get involved in **film production work**, as well as **aerial photography**. These flights are generally made from the companies' bases at the airport, and therefore do not place demands on any of the city's heliports. However, these operations are a potential public concern with respect to safety and noise from overflights of residential areas.

**Road traffic reports** by one or more local radio stations offer another community service application of helicopters. At present only CFAC 960 Radio offers such a service, operating from the airport every weekday during morning and afternoon "rush" hours. However, other radio stations may decide to offer similar service as Calgary grows towards one million population, and traffic congestion increases.

Another use of helicopters which has been taken advantage of in Calgary for many years now is the annual **mosquito abatement spraying** program carried out by Calgary Parks & Recreation. This operation is contracted biennially to a private operator, and is normally carried out during the first week of July. Since the spraying area extends from the peripheral areas of the city out 7 kilometres into the municipal districts of Foothills and Rocky View, it is unlikely that the scope of the operation will change significantly in the foreseeable future. Some of Calgary's helicopter operators are also involved in **rural seeding and fertilizing** applications. These flights, as well as those for the mosquito abatement program, take off from and land at the operator's base at the Airport, and thus place no demands on any of the city's heliports.

In the larger American cities (e.g. New York, Los Angeles) helicopters are used to some extent for commuter purposes. However, even in these highly congested cities this is a very minor role, and it seems highly unlikely that Calgary will experience a similar phenomenon within the foreseeable future.

# 5.0 URBAN PLANNING FACTORS RELEVANT TO HELIPORTS

## 5.1 SAFETY CONSIDERATIONS

The key concern in evaluating a proposed heliport is whether or not it meets the criteria for safety This is a matter which is addressed by Transport Canada during the certification process and includes the safety of persons and property on the ground as well as in the air Among the factors considered are the following

* the takeoff/landing area and the availability of obstacle-free approach and departure flight paths (e g buildings, trees, towers electric wires)

* the availability of emergency landing areas both in the vicinity of the proposed heliport and along the approach and departure flight paths (e g parking or vacant lots parks school yards)

* the direction of prevailing winds and the presence of crosswinds, gusts and turbulence

* compatibility with other aerodromes and with other traffic within controlled airspace

* the potential for distraction of motorists on nearby major roadways

* the impact on roadway traffic safety of passengers and/or cargo accessing the heliport

* access for emergency vehicles (e g fire ambulance) in the event of an emergency on site

## 5.2 ENVIRONMENTAL CONSIDERATIONS

Next to safety, the major area of public concern regarding heliports and helicopters is noise. Although noise abatement procedures can only be approved by the Minister of Transport this is an issue which is appropriately addressed by the municipal planning authorities The major factors to be considered are

* proximity of proposed site to existing and proposed noise-sensitive land uses (e g residential schools churches) ideally the separation should be sufficient that adoption of a *heliport vicinity protection area regulation* under the Planning Act of Alberta could protect the facility from future encroachment by such uses

* availability of approach/departure flight paths which can avoid overflights of noise-sensitive areas at least at elevations of less than 1 000 feet above ground level

* ambient community noise levels (e g traffic from nearby roadways railways, LRT lines)

Another "environmental" consideration is the **compatibility with adjacent land uses**, existing or proposed, whether or not these uses are noise sensitive In the case of the Downtown heliport, for example, there is concern regarding the compatibility of the existing site with adjacent parklands and pathways, and its potential impact on further residential development in the downtown core Part of this impact pertains to the **aesthetics** of the facility but of greater significance is the **noise impact** of the helicopter operations

### 5.3 JUSTIFICATION OF NEED

The justification of need is an important consideration in the heliport site selection process Among the questions needing to be addressed in this regard are the following

* the availability of suitable alternate sites (**note:** with Calgary already having a number of under-utilized heliports, the need for additional facilities at this time should be carefully evaluated),

* relative convenience of proposed and alternate sites to origins/destinations of users (e g Downtown, Alberta Children's Hospital Calgary International Airport)

* the type and volume of traffic anticipated (e g essential community service vs commercial use, frequent regular use vs occasional irregular use)

* hours of operation and duration of event

### 5.4 SITE DESIGN CONSIDERATIONS

Once a generalized site location has been established relative to the criteria as set out under 5 1 - 5 3 above, the site needs to be analysed in terms of more specific design criteria These include the following

* **adequate area and suitable topography** for a heliport, based on Transport Canada's ***"Heliport and Helideck Standards and Recommended Practices"***

* the **best use** of this site (i e have other uses been proposed which might be preferable),

* availability of **convenient connections to roadway network** and, if possible public transit

* **roadway design standards** adequate to accommodate large trucks and semi-trailers,

* ample space for required **parking** on site or nearby

* ample space for **medevac operations**

* **convenient truck access** and room on site for a truck to load/unload and turn around if facility to be used for cargo handling

* **structural adequacy** and the availability of elevator and/or stairway access to the lower floors of the building are key considerations if it is to be a **rooftop facility**,

* **site availability and costs** (site acquisition development and maintenance) are important considerations particularly for a publicly owned and operated heliport

## 5.5 AIR REGULATION 534 AND SPECIAL AVIATION-RELATED EVENTS

Transport Canada has only one set of standards for all heliports designed to ensure safety of operations under any and all circumstances Although some heliports are certified for "seasonal" or "temporary" use, these facilities must still meet the specified standards

***Air Regulation 534*** under the federal ***Aeronautics Act*** (see Appendix F) provides for exemptions of certain aviation facilities and events from Transport Canada's operating requirements These exemptions are intended to apply to police authorities, firefighting or ambulance operations, or any flight necessary for the purpose of saving human life **in single-event (i.e. non-repetitive) situations** However, they have in the past been applied in other situations and this has created an inappropriate expectation among certain applicants (e g manufacturer demonstrations trade shows heli-tour operations) Such applications are more appropriately considered under the heliport approval procedures

# 6.0 CURRENT HELIPORT APPROVAL AND CERTIFICATION PROCESS

## 6.1 THE ROLE OF TRANSPORT CANADA

The Minister of Transport has sole jurisdiction over the certification of all airports, including heliports, throughout Canada. The administration of this jurisdiction falls under the Director General, Air Navigation Systems. Except for military facilities, any aerodrome located within the built up area of a city or a town is required to be certified as an airport in order to comply with Air Regulations.

Transport Canada's primary objective in certifying heliports is to ensure public safety, both in the air and on the ground. The steps involved in the certification process are outlined in an "internal" procedural document. Although this document is not currently available to the public, Transport Canada provides all necessary information through requests to the regional office. This document will be included as a chapter in Transport Canada's ***Heliport and Helideck Standards and Recommended Practices*** in 1994.

A proponent must file notice of intent to establish a heliport using the ***Aerodrome Certificate Application Form***. Transport Canada then carries out an **initial certification inspection** to confirm application details, assess conformity with standards, identify areas requiring redevelopment, and specify constraints to development. Following completion of the initial certification inspection, the proponent is advised as to whether or not Transport Canada considers the proposed heliport to be eligible for certification. If it is considered to be eligible, the proponent is then advised to consult with the local land use approving authority before undertaking any substantial commitments towards development of the facility. It is the policy of Transport Canada to not certify a heliport unless and until the local authorities have given all necessary land use and development approvals, and it is clear that certification of the heliport is in the public interest. In the event that the local authorities oppose the establishment of a certified heliport, the matter is then referred to the Minister of Transport for resolution. (**Note:** Such a case currently exists in the City of Niagara Falls, Ontario.)

Another prerequisite to heliport certification is the submission of an ***Airport Operations Manual (AOM)*** by the proponent. The AOM serves as the legal reference between Transport Canada and the heliport operator with respect to standards, conditions and levels of service to be maintained for certification, as well as a reference document for inspections and for users and tenants.

Once certification has been approved, an ***Aerodrome Certificate*** is then released. It is the policy of Transport Canada to inspect each heliport at least once every two years to ensure that it is being operated and maintained in accordance with the conditions specified in the airport certificate. To the extent possible, however, Transport Canada's Western Region endeavours to do annual inspections.

## 6.2 THE ROLE OF THE CITY OF CALGARY

The land use approving authority in Calgary is **City Council**. However, development permits for heliports are dealt with by the **Calgary Planning Commission** (CPC), whose decision is subject to appeal through the **Development Appeal Board** (DAB). City Council has no jurisdiction over this latter decision, except indirectly through its appointments to both the CPC and the DAB. Furthermore, the City's land use planning approval authorities have no jurisdiction over Crown lands, either federal or provincial.

While the process and requirements for obtaining a development are set out in ***"A Guide to the Development Permit Process in Calgary"***, produced in 1991 by the City's Planning & Building Department, the municipal approvals required with respect to heliports have never been documented. This has been a source of some confusion to heliport proponents. The City does not have a designated contact person for this purpose, although the Transportation Department has generally taken on this role. As stated under section 6.1, Transport Canada's main concern in this regard is whether or not development of the heliport is in the public interest.

With respect to land use, airports are identified as a discretionary use under the ***PS (Public Service District)*** within the ***City of Calgary Land Use By-law***. Among the existing heliports, seven are located within a PS land use. The remainder are on sites designated as follows:

* *Downtown* - PE (Public Park, School and Recreation District)
* *Bow Crow* - UR (Urban Reserve District)
* *Broadcast House* - DC (Direct Control District)
* *Southport* - DC (Direct Control District)
* *Westport* - outside the City of Calgary's jurisdiction (located within the M.D. of Rocky View)

In the Bow Crow, Broadcast House and Southport situations, it was the position of the City's Planning & Building Department that the heliport was ancillary to the primary use of the land, and could therefore be approved on this basis. In the case of the Downtown heliport, the land was leased to the City by the Province in 1970 expressly for use as a heliport.

The term **"development"** is defined within the ***Alberta Planning Act***, and includes the following:

> *" a change of use of land or a building or an act done in relation to land or a building that results in or is likely to result in a change in the use of the land or building;"*

The paving of a helipad, the construction of perimeter fencing and/or the installation of lighting are all "developments" according to this definition, and require the issuance of a development permit. In the case of the new heliport currently under construction to the west of the Alberta Children's Hospital, however, the City did not require a development permit because the proponent was a provincial government agency and the land was City-owned

In considering whether or not to approve the issuance of a development permit, the CPC and DAB have regard mainly to land use compatibility, environmental and site design issues, as discussed under sections 5.2 and 5.4 above. However, the municipal approving authorities also have regard to safety concerns, and in this respect are guided by the recommendations of Transport Canada.

## 6.3 ASSESSMENT OF CURRENT PROCESS

The current heliport approval and certification process appears to suffer somewhat from inadequate communication among the various parties involved, as well as from a lack of clarification regarding the respective roles and approval prerequisites of the approving authorities Furthermore, there is no evidence of an established public consultation process to be followed by all heliport proponents

In the case of the **Canada Olympic Park application** referred to above (Calgary Olympic Development Association/Canadian Helicopters Ltd ), there appears to have been a breakdown in communications between Transport Canada and the Calgary Planning Commission Although Transport Canada had advised the City's development planner in writing that the site was deemed capable of being developed to certification standards providing certain concerns were addressed these assurances apparently did not satisfy the Planning Commission This application was eventually withdrawn by the proponent, and certification was not pursued any further with Transport Canada notwithstanding the fact that all of their concerns had been addressed

A second case involves a proposal by Calgary Helicopters to run heli-tours from the **Calgary Exhibition & Stampede Park** The proponents initially applied for an exemption under ***Air Regulation 534*** When this was rejected by Transport Canada, they pursued approval as a **heliport** Although both the City and the Stampede Board were apparently prepared to support this proposal a formal application with all the necessary supporting information was never submitted to Transport Canada, and the proposed operation was therefore unable to proceed This situation reflected a lack of understanding by the proponent about the approvals process and its requirements and perhaps also a lack of adequate communication between the City and Transport Canada

The new heliport recently constructed to the west of the **Alberta Children's Hospital** offers a third and the most critical, case for assessing the current approvals process In a letter to the City's development planner in August, 1992 Transport Canada stated that *"even though the traffic circle site cannot be certified our Air Regulations would not preclude the STARS helicopter from landing in this area providing the flight is necessary for the purpose of saving human life"* On this basis the City proceeded to liaise with the proponent to arrange for the necessary modifications to the site (e g removal of trees, relocation of light standards, installation of traffic control signals) and to give its endorsement to the development as a **"temporary heliport"** subject to certain operating conditions The proponent undertook a comprehensive public consultation process with adjacent communities, involving City representatives, and proceeded with construction of the heliport even though it would not be certified by Transport Canada

Clearly, the heliport certification process in Calgary needs revamping The respective roles and jurisdictions of Transport Canada and the municipal planning approval authorities should be clarified and communications between these parties and with the heliport proponents should be improved and formalized Furthermore, the designation of a formal coordinating agency, such as the **Calgary Transportation Authority** could assist heliport proponents in pre-screening their proposals and ensuring that they fully understand the various steps in the approval/certification process and the information and application requirements of the respective approval authorities

# 7.0 EXPERIENCE ELSEWHERE

## 7.1 EDMONTON, ALBERTA

Unlike Calgary, Edmonton has very few heliports, with the majority of operations being focused on the Municipal Airport and the CFB 408 Squadron at Namao. However, in 1989 Transport Canada and The City of Edmonton jointly adopted and published ***"Approval Procedures for Special Aviation Events and Heliport Development in Edmonton"***. These procedures were subsequently followed in the processing and approval of applications for heliports at the Royal Alexandra and University of Alberta Hospitals.

These Approval Procedures achieve the following:

1) Establish the title and address of contact persons at both Transport Canada and The City of Edmonton, to whom enquiries should be addressed and applications and supporting information submitted;

2) Clarify the respective roles of the federal and municipal authorities in the approvals process, with flow charts to outline the sequence of steps in the process and the sequence of approvals;

3) Specify the information required by each approving authority as a prerequisite to approval, and include samples of application and other forms to be completed by the proponent in conjunction with his submission; and

4) Establish a clear process for communication at various stages between Transport Canada, The City of Edmonton and the proponent.

Edmonton's Approval Procedures may not be ideal in every respect as a model for Calgary. For example, the municipal contact there is through the Edmonton Municipal Airport (City Transportation Department), whereas in Calgary it would seem to be more appropriate to establish the Director of Planning & Building as the contact. Furthermore, Edmonton's procedures are silent on the need to apply for a development permit, and what this entails. This is a matter which should be addressed in some detail in establishing procedures for Calgary. In general, though, the Edmonton model serves as a good basis for Calgary to work from.

## 7.2 CANMORE, ALBERTA

The Canmore Municipal Heliport was constructed in late 1987, by the combined forces of the Province of Alberta and OCO'88, as a facility for use in conjunction with the 1988 Olympic Winter Games. Following completion of the Games the heliport was turned over to the Town of Canmore, to be operated as a municipal heliport to service the local helicopter/heli-tour industry. The **Canmore Heliport Commission**, a body appointed by the Town Council, has operational jurisdiction over the heliport.

This facility, located adjacent to the Trans Canada Highway, serves as a base for three private helicopter companies, each of whom sub-lease their space from the Town. The three companies all operate mountain tour packages during the summer months, and provide a wide range of other services throughout the year. The heliport also provides for transient users.

**7.2 CANMORE, ALBERTA** (cont'd)

In 1991, the Government of Alberta approved an ***Airport Vicinity Protection Area Regulation for the Canmore Heliport***, similar in format to the Calgary International A.V.P.A. Regulation, and the only one in Canada applicable to a heliport. This regulation might serve as a suitable model for Calgary, in the event that it should be considered appropriate to adopt such a regulation or an equivalent municipal by-law relative to any of the existing or potential future heliports in the city.

**7.3 VANCOUVER, BC**

Neither the City of Vancouver nor the Greater Vancouver Regional District have, as yet, developed a heliports system plan or approval procedures for heliports. Since 1986, however, the Vancouver Port Corporation has operated a very successful **Harbour Heliport** which, in 1993, will handle a total of about 22,000 helicopter movements and 120,000 passengers. With its proximity to the downtown business district, the Canada Place convention centre, the Sky Train, the Sea Bus and the main railway terminal, this facility is proving to be a tremendous asset to the city.

The **heliport at Vancouver International Airport** will shortly be relocated from ground level to the rooftop of the expanded terminal building. This should provide greater convenience for connecting passengers, and may be worth considering for the future at Calgary International Airport.

**7.4 PORTLAND, OREGON**

For more than three decades following World War II the City of Portland had a number of sites available in its downtown area for helicopter landings and takeoffs. When the last of these was closed off in 1984 due to safety concerns, a concerted effort was launched by operators, business representatives and concerned citizens to find a safe site downtown for a public heliport. A site selection study was undertaken, and in 1986 the City Council endorsed a recommendation to construct a combined public parking garage and rooftop heliport adjacent to the Willamette River in the city's "Old Town" area. The facility was built, and has been in operation since 1988.

Portland's **downtown heliport** operates on a 24-hour basis, although roughly 90% of its usage is between the hours of 7:00am and 7:00pm, mainly for business-related purposes. A **Heliport Noise Abatement Committee**, comprising representation from the helicopter operators, downtown businesses and inner city neighbourhoods, has established and monitors helicopter operating procedures. This committee also serves as a channel of communication between the neighbourhoods and the operators on noise complaints. The State of Oregon has established a noise limit of 55 Ldn for heliports in their initial year of operation, although noise levels of up to 65 Ldn are considered to be compatible with residential neighbourhoods.

Portland's downtown heliport is not capable of expansion. Consequently, the City recognizes the need to begin planning for a system of public heliports, with the downtown facility as a hub, and satellite heliports located in industrial/business parks and other suitable suburban sites.

## 7.5 DENVER, COLORADO

In the mid-1980's the **Denver Regional Council of Governments (DRCOG)** undertook a comprehensive study of helicopter activities and heliport demands for the six-county Denver metropolitan area. The major impetus for this study had been the recent closure of Denver's **downtown heliport**, together with growing public concern over helicopter noise, particularly with regard to overflights of residential and other noise-sensitive areas. The Denver Region currently has a total of 70 helicopter landing areas, of which 53 are certified by the Federal Aviation Administration (FAA). Only two of these heliports, both located at airports, are public-use facilities The majority are located at hospitals, and are used for emergency medical services

The study recommended that the downtown heliport be reopened as the hub of regional helicopter activities, and that four satellite public heliports be developed in suburban business/industrial parks. Together, these five facilities would constitute the primary infrastructure for a regional helicopter system. The study also developed a set of guidelines to be used by both proponents and municipal planning officials in determining the feasibility of a proposed heliport and its environmental impacts.

The DRCOG has recently published a report entitled ***"The Denver Regional Heliport System Implementation"***. Total helicopter activity throughout the region is expected to double over the next 20 years, according to FAA forecasts. The report identifies as the top priority the establishment of a **heliport at the new Denver International Airport**, together with the fullest possible use of existing public-use airports and private heliports. Development of a downtown heliport is ranked as a Phase II priority, with public-use satellite heliports left to Phase III, depending upon demonstrated demand and congestion relief requirements at other facilities.

This report also recognizes the challenge faced by the helicopter industry in winning public acceptance for their operations and facilities due to safety and noise concerns. It recommends that operators establish a regional or state-wide **"helicopter users association"**, the purpose of which would be to promote helicopter and heliport operations and safety, protect helicopter airspace and flight corridors, and educate communities and the general public as to the benefits of helicopters and heliport systems.

## 7.6 THE STATE OF HAWAII

The State of Hawaii's Department of Transportation, in conjunction with the FAA, undertook the preparation of a ***"Hawaii State Helicopter System Plan"*** in the late 1980's. At that time there were approximately 40 companies with 90 helicopters providing sightseeing tours of the various islands. These operations were based mainly at airports and near tourist resorts, and their rapid growth was a matter of concern to some residents as well as to users of the state's remote wildland areas. In addition, the military (Air Force, Navy and Marine Corps) operate 200 or so helicopters from their three separate bases on the island of Oahu.

The primary objectives of the plan were to: identify problems and assess the impacts of helicopter operations; plan for the future accommodation of helicopters within the state's airport system; and seek to improve the compatibility of helicopter operations within the community. **Technical Advisory Committees** were established in each of the state's counties (i.e. major island groups) to help resolve concerns between the operators and the communities, and to provide input in developing the recommendations of the plan.

**7.6 THE STATE OF HAWAII** (cont'd)

The plan recognized that helicopters, in addition to serving the demands of the tourist industry and the military, provide valuable public services - search and rescue, fire-fighting, emergency medical transportation, drug and law enforcement. Overflights of residential areas and low-flying by helicopters, generally during poor visibility conditions, were the two primary causes of public complaints. It was also concluded that noise levels generated by helicopters (usually below 55 Ldn) are not high enough to have adverse effects on the public's health and welfare. Furthermore, noise abatement plans developed and enforced voluntarily by the operators had effectively reduced the level of noise complaints, except in certain problem areas.

The plan's recommendations were focused mainly on noise abatement measures, including continuation of the voluntary program followed by the operators, and on criteria for the siting of new heliports. Regarding the latter, the primary intent was to minimize conflicts between heliports and incompatible uses. To minimize noise impacts, two basic criteria were recommended: the avoidance of noise-sensitive areas along the ingress/egress routes to the heliports; and the limitation of forecasted helicopter noise levels to 5 Ldn units below the background ambient noise levels in noise-sensitive areas within a 2-mile radius of the facility. The plan recommends that noise contours (at 5 Ldn intervals from 55 Ldn to 5 Ldn below the minimum background ambient noise level at the noise-sensitive receptors) be developed for the future year at which the facility permit is scheduled to expire.

**7.7 THE UNITED KINGDOM**

The **British Helicopter Advisory Board (BHAB)**, in a recent publication entitled ***"The Civil Helicopter in the Community"***, outlines specific requirements for helicopters operating in urban areas. Low flying over urban areas is rigidly controlled, with helicopters forbidden to cruise any lower than 1,500 feet above the highest fixed object within a 2,000 foot radius except when flying within controlled air space. Most established helicopter flight corridors are routed over as much open area as possible.

An ***Air Navigation Order (ANO)*** establishes noise standards for the certification of helicopters. The ***Civil Aviation Act*** (1982) precludes persons from claiming damages under common law for nuisance in respect of noise and vibration at licensed heliports, provided that ANO requirements are met. There are only two licensed heliports throughout the UK - one at Battersea, London, and the other at Penzance in Cornwall. In the case of unlicensed heliports and landing sites, noise nuisance claims can be pursued under common law The Civil Aviation Act empowers municipalities to control aircraft noise during landing and takeoff relative to ambient noise levels in the vicinity of the aerodrome.

A category for **"temporary" heliports** exists in the UK for usage to a maximum of 28 days in any one calendar year. Local planning authorities are authorized to withdraw these rights, and to require that an application be made for continued use of the site. Planning approval is not required for helicopter operations from commercial or industrial premises, provided that these operations are ancillary to the principal use of the land. However, all landing sites located in urban and congested areas, whether they be permanent, temporary or private, require the prior written permission of the Civil Aviation Authority before they can operate.

# 8.0 SUMMARY AND CONCLUSIONS

## 8.1 SUMMARY OF FINDINGS

The findings of this study may be summarized as follows:

1. Of the **existing 13 heliports** identified, 12 are located within the present city limits, the other one (Westport, a privately owned facility) being situated just west of the city in the Municipal District of Rocky View. Of the remainder, only two are public-use facilities (Downtown and Calgary International Airport); five are associated with hospitals; two are on military bases; two are private commercial facilities; and one is owned by the Province. All but the two military heliports (CFB Calgary/Currie and Harvey) and one private commercial facility (Southport) are currently certified by Transport Canada, the latter having been uncertified and unused since 1986.

2. **A new "temporary" heliport** has recently been constructed by the **Alberta Children's Hospital.** This facility, which does not meet Transport Canada's certification requirements, will be used only for the transportation of emergency patients in life-threatening situations. The existing certified helipad at the Tecumseh Naval Base will continue to be used for all other flights to and from the hospital.

3. Except for the **three hospital heliports** which are served by the STARS air ambulance (Alberta Children's, Calgary General/Bow Valley Centre and Foothills), usage of the existing facilities is generally quite light (one flight per week or less, on average).

4. As a general rule, the existing heliports operate autonomously, rather than as a cohesive system. One exception to this rule is that STARS deals with the CGH/BVC and Foothills Hospitals in a coordinated way to the extent that pilots and paramedics can decide, depending on the circumstances of their mission, which hospital to deliver a patient to.

5. **Two helicopter flight corridors** are currently established by Transport Canada, and are identified in the Canada Flight Supplement. The **Alpha** route links the Calgary International Airport with the Downtown heliport via Barlow Trail N.E., Memorial Drive and the Bow River, while the **Beta** route extends further south on Barlow Trail from the Alpha route to 50 Avenue S.E., and easterly from there to the city limits. Cruising altitude for both corridors is established at 4,100 feet above sea level (approximately 500 - 700 feet above ground level). While these two corridors appear to be operating satisfactorily, it would be appropriate for Transport Canada to consider establishing additional corridors, in consultation with the users and the City of Calgary.

6. There are **several helicopter operators** currently based in Calgary. These include: the Alberta Shock Trauma Air Rescue Society (STARS), based in the Shell Aerocentre in the McKnight Aviation Park; several private commercial companies, mostly based at Calgary International Airport; the Alberta Forest Service, based at the Bow Crow heliport in the city's northwest sector; and miscellaneous other private operators (e.g. CFAC Radio, CFCN-TV, and Russell Gerrish - owner of the Westport heliport). There are no helicopters based at either CFB Calgary/Currie or Harvey.

**8.1 SUMMARY OF FINDINGS** (cont'd)

7. **Current helicopter operations** are for such purposes as: emergency medical transportation (STARS); forestry services; mosquito abatemant and other aerial applications; occasional military missions; roadway traffic reports; and a wide variety of commercial, business and industrial activities (e.g. seismic activity, power and pipeline inspections, film making, aerial photography, corporate and government VIP transportation, tourism and recreation, trade shows, cargo transfers).

8. Most of the **helicopters used in Calgary** are in the "light" weight category (i.e. Bell 206 JetRanger and Kiowa, Aerospatiale AS-350 Astar, Robinson R22). The helicopter used by STARS is a "medium" weight Eurocopter BK 117, and some of the private operators as well as the military also use "medium" sized aircraft, such as the Bell 212. The majority of these aircraft have twin-turbine engines, which enhances safety relative to single-engine piston aircraft.

9. As a general rule, **helicopters are much safer than fixed-wing aircraft**. A twin-engine helicopter can continue to fly in the event that one engine fails. Even with engine failure on a single-engine aircraft, the pilot can generally utilize **autorotation** to bring his helicopter down safely in an emergency landing area (e.g. open field, parking lot, lightly used roadway).

10. **Helicopter noise**, while often not as loud as ambient noise levels from roadway traffic and other urban sources, is easily identifiable. For this reason it can be regarded as a nuisance by residents, and is often a source of complaints, particularly when it occurs during quieter nighttime hours. By following established helicopter flight corridors and adopting voluntary noise abatement procedures (i.e. **"flying neighbourly"**), helicopter operators and pilots can reduce noise impacts significantly.

11. **Innovations in helicopter design** (e.g. the McDonnell-Douglas "notar", which eliminates the tail rotor) have the potential of reducing helicopter noise significantly.

12. **The demand for additional heliports** in Calgary will depend largely on the economy and on the rate of urban growth. Two recent applications (Canada Olympic Park and Stampede Park) have both related to proposed heli-tour operations. A new heliport has recently been constructed at the Alberta Childrens' Hospital, and the City is obligated through a legal agreement with Eau Claire Estates Ltd. to "use its best efforts" to relocate the Downtown heliport. Other potential sites for future heliports include a new convention centre near the Stampede Park, and the Calgary General Hospital/Peter Lougheed Centre.

13. The use of helicopters by the **Calgary Fire Department** and the **Calgary Police Service** is a strong possibility for the future. The Police Service has recently competed a pilot test project, but has not yet released a report on the findings. The Fire Department's strategic plan indicates that demand will not be sufficient to warrant acquisition of a helicopter in the short term. However, this position could be altered on the basis of technological improvements in helicopters, and/or a growing demand for their use within the Department's "specialty operations" (e.g. hazardous materials, rescue).

14. **The Calgary Peacetime Disaster Plan** includes in its ***Resource Manual*** a list of the various helicopter operators in Calgary, but does not include an inventory of the capabilities of each operator (manpower and equipment) or of the existing heliports.

**8.1 SUMMARY OF FINDINGS** (cont'd)

15. From time to time Calgary experiences **special aviation-related events**, the most significant of which to date has been the **1988 Olympic Winter Games**. This two-week event made extensive use of helicopter services between Calgary and various Games venues, and led to the development of a number of heliports within Calgary and elsewhere (e.g. Rocky View Hospital, Canmore). Other special events include **the Calgary Exhibition and Stampede, hot air balloon launchings**, and **aerial photography**.

16 In evaluating potential locations for heliports, a number of **"urban planning" factors** must be taken into account. These include: safety considerations, both in the air and on the ground; environmental considerations, particularly noise impacts on residential communities and other noise-sensitive land uses; the justification of need, and the availability of suitable alternate facilities or sites; and site design considerations.

17. Transport Canada has only one set of design standards and operating requirements for heliports, and does not relax these standards for temporary or seasonal operations. Transport Canada is becoming less receptive to attempts by proponents to avoid these requirements by applying for exemption under ***Air Regulation 534.***

18. **The current process for the approval and certification of heliports in Calgary**, as well as special aviation-related events, is not clearly documented. The requirements are a source of confusion and frustration to heliport proponents, and there appears to be inadequate communication between Transport Canada and the City of Calgary during the application review and approval process

19. Transport Canada and the City of Edmonton jointly adopted in 1989 ***"Approval Procedures for Special Aviation Events and Heliport Development in Edmonton".*** These procedures apparently worked well with respect to heliports at the Royal Alexandra and University of Alberta Hospitals. An extensive network of helicopter flight corridors radiate from the Edmonton Municipal Airport, with cruising altitude established at 800 feet above ground level, and noise abatement procedures are in effect.

20. The Government of Alberta has enacted an ***Airport Vicinity Protection Area Regulation for the Canmore Municipal Heliport***, constructed in 1987 for use during the 1988 Olympic Winter Games. This regulation ensures that no incompatible land use or development encroaches upon the heliport.

21. The **Vancouver Port Corporation** has, since 1986, operated a highly successful **Harbour Heliport**. The success can be attributed largely to its convenient location relative to the downtown business district, the Canada Place Convention Centre, and various key transportation facilities.

22. A review of experience in selected cities and states in the **United States**, as well as in the **United Kingdom**, indicates similar problems and challenges to those being faced in Calgary. For example, both **Portland, Oregon** and **Denver, Colorado** have placed strong emphasis on the development of a downtown heliport as the hub for a system of regional public-use heliports.

## 8.2 CONCLUSIONS

On the basis of the findings summarized above, the following conclusions can be reached:

1. Calgary has more heliport capacity than is needed to serve current levels of demand. However, only two of these facilities are available for public use, the remainder being dedicated to specific users. Notwithstanding the present surplus of capacity, future growth in helicopter activity will undoubtedly justify the development of additional heliports, as well as the upgrading and/or relocation of some existing facilities.

2. The importance of maintaining a conveniently located public-use heliport to serve the downtown area is confirmed by experience in other Canadian and U.S. cities. However, the City of Calgary is obligated by a legal agreement with Eau Claire Estates Ltd. to *"use its best efforts to cause the removal of the heliport from its present site to an alternative site suitable to the parties hereto prior to the occupancy of the first residential building in Area 'A' west of the 5th Street extension or as soon thereafter as feasible"*. The best alternative site identified by a consultant study undertaken for the City's Transportation Department in 1989 does not appear to be suitable in all respects, and therefore it is necessary to pursue other alternatives.

3. Helicopter operations are not presently a source of major public concern in Calgary, in terms of either safety or noise. However, proposals to develop new heliports invariably generate public controversy. There is need for a concerted effort by the helicopter operators, with the assistance of Transport Canada, the City and the Calgary Transportation Authority, to educate the public on the benefits to the community of helicopter services, the facts about helicopter safety and noise, and the efforts of the operators to "fly neighbourly".

4. Except to the extent that STARS deals with the three designated "trauma centres" in a systematic way, Calgary's existing heliports do not function as a system. For the foreseeable future the only apparent demand for a systems approach is for purposes of disaster and emergency services, and for these purposes an inventory of existing heliport facilities, users and their resources (equipment and staff) should be compiled and disseminated to the appropriate disaster and emergency service agencies. With respect to the need for a systems plan for public heliports, as is currently being contemplated in Denver and Portland, this should be considered in conjunction with the City's long range planning for suburban employment centres.

5. There appears to be justification for Transport Canada to consider expanding on the established helicopter flight corridors (**Alpha** and **Bravo**) so as to provide access to all of Calgary's existing heliports. This expanded network will need to be reviewed and, if necessary, further expanded as additional heliports are developed in Calgary. Once clear of any conflicts with fixed-wing aircraft approaching and departing Calgary International Airport, a cruising altitude of 1,000 feet above ground level should be established.

6. Proposals for new heliports need to be evaluated in terms of the potential for making use of existing facilities, as well as the suitability of the proposed site from a safety and urban planning perspective. The capability of protecting the facility from future encroachment by incompatible land uses through adoption of an ***Airport Vicinity Protection Area Regulation*** or municipal land use restrictions should also be considered. For this purpose, the AVPA Regulation enacted for the Canmore Municipal Heliport should serve as a useful model.

**8.2 CONCLUSIONS** (cont'd)

7. The current process for the approval and certification of heliports, and the approval of special aviation-related events in Calgary, needs to be clarified and documented. For this purpose, the ***"Approval Procedures for Special Aviation Events and Heliport Development in Edmonton"*** serve as a suitable model.

8. There is an apparent need for a readily identifiable agency in Calgary to serve as a source of information on helicopter services and operators, existing heliport facilities, and the process and requirements for applying for approval of new heliports or special aviation events. The **Calgary Transportation Authority** would seem to be the ideal agency to undertake this role. In addition, however, it would be beneficial to the operators if they could form a voluntary **"helicopter operators' association"**, perhaps covering all of southern Alberta, for purposes of liaising with government approval authorities and with the public.

9 Several helicopter operations are currently located at Calgary International Airport because of the support facilities available there (e.g. aircraft storage, fuelling and servicing). Since the Airport is certified by Transport Canada for helicopter operations, there is no need for individual operations to be certified separately. A similar situation prevails at Springbank Airport to the west of the city.

# 9.0 RECOMMENDATIONS

## 9.1 CALGARY HELIPORTS SYSTEM PLAN

9.1.1 Copies of this report should be provided to the **Calgary Fire Department**, the **Disaster Services Office**, the **Calgary Police Service**, the City of **Calgary Emergency Services Department** and the **Alberta Shock Trauma Air Rescue Society (STARS)**, for purposes of providing each of these agencies with an inventory of existing heliport facilities in Calgary.

9.1.2 The **City of Calgary Planning & Building Department** should advise the agencies identified in Recommendation 9.1.1 above that, as this inventory is updated by Transport Canada, current information can be obtained through subscription to the Canada Flight Supplement.

9.1.3 The **Calgary Fire Department**, through the **Disaster Services Office**, should liaise with the various helicopter operators in Calgary, both public and private, to compile an inventory of their equipment and manpower capabilities for inclusion within the ***Resource Manual*** of the ***Calgary Peacetime Disaster Plan***.

9.1.4 The need for **a system of public-use heliports** in Calgary beyond the two existing facilities (Downtown and Calgary International Airport) is not apparent at this time. Potential future needs in this regard should be addressed by the City of Calgary Planning & Building Department in conjunction with long-range planning.

9.1.5 The City of Calgary should adopt a policy whereby no heliport will be allowed to develop within the city which does not meet Transport Canada's requirements for certification.

9.1.6 The City of Calgary and the Calgary Transportation Authority should jointly endeavour, as soon as possible, to identify, secure and develop a suitable alternative site for the Downtown Heliport.

9.1.7 The importance of maintaining a conveniently located public-use heliport at the airport is confirmed by experience in other Canadian and U.S. cities. The **Calgary Airport Authority** should be encouraged to explore alternate sites for a **heliport at Calgary International Airport** such that the convenient transfer of passengers between the heliport and the main terminal building would be facilitated.

9.1.8 Inasmuch as the **new helipad** at the **Alberta Childrens' Hospital** does not meet Transport Canada's certification requirements, the hospital should be encouraged to develop a certifiable heliport in conjunction with building expansion as soon as it is economically feasible to do so.

9.1.9 The **Calgary General Hospital/Peter Lougheed Centre** should be encouraged to determine and protect a site for a heliport which meets all of Transport Canada's requirements for certification, and to develop this facility as soon as it is economically feasible to do so. Furthermore, any new hospitals constructed in Calgary should incorporate heliports into their plans and designs.

## 9.0 RECOMMENDATIONS (cont'd)

### 9.1 CALGARY HELIPORTS SYSTEM PLAN (cont'd)

9.1.10 **Calgary International Airport and Springbank Airport** should remain as the primary locations for the storage and servicing of commercially-owned helicopters, and for all operations which are not "special events" requiring positioning elsewhere.

9.1.11 Notwithstanding that they are all currently very low-usage or unused/uncertified facilities, **Bow Crow, Broadcast House, Southport** and **Westport** should be retained within Calgary's inventory of heliports. Each of these heliports is capable of providing useful service in the event of a disaster or emergency, or for potential future "special events".

9.1.12 The two military facilities (**CFB Calgary/Currie and Harvey**) should also be retained within Calgary's inventory of heliports, particularly in conjunction with the ***Calgary Peacetime Disaster Plan***.

9.1.13 Unless it can be clearly established that they offer potential benefits to the community at large (e.g. for use in disaster or emergency situations), future private commercial heliport proposals should be considered as "special event" facilities and should be reviewed as such in accordance with the procedures set out under section 9.3 of this report.

9.1.14 Public complaints regarding helicopter operations (e.g. noise, low level flying) should be directed to the Calgary Airport Authority's Environment Office, who in turn should provide regular reports to the Calgary Transportation Authority and the City of Calgary Planning & Building Department for monitoring and followup action.

9.1.15 Transport Canada should consider routing helicopter departures from the Foothills Hospital along the embankment towards 16 Avenue N.W. rather than over the Parkdale community.

### 9.2 ROLE OF THE CALGARY TRANSPORTATION AUTHORITY

9.2.1 Recommend to the Calgary Transportation Authority that it assume the role of liaison between Transport Canada, the City of Calgary, and heliport proponents, helicopter operators and the general public on any matters pertaining to helicopter operations and heliport developments in Calgary. In this role, the C.T.A. would also be expected to provide timely information to Calgary's various emergency services (e.g. fire, police, ambulance) as to the types and frequencies of helicopters using the city's various heliports. This would not preclude direct contact between Transport Canada and individual heliport proponents or helicopter operators.

9.2.2 In conjunction with Recommendation # 9.2.1, recommend to the Calgary Transportation Authority that it encourage private commercial helicopter operators in Calgary, and perhaps throughout southern Alberta, to establish a **Helicopter Operators' Association** for the purpose of collective liaison with government agencies, development and implementation of a "fly neighbourly" program, and education of the public regarding the benefits to the community of helicopter services, the "fly neighbourly" program, and any other matters of relevance to helicopter operations and heliports in Calgary and vicinity. At such time as this association is established it could assume part of the role assigned to the C.T.A. in 9.2.1 above.

## 9.3 APPROVAL PROCEDURES FOR HELIPORT DEVELOPMENT AND SPECIAL AVIATION-RELATED EVENTS

9 3 1 Recommend that **Transport Canada** and the **Calgary Planning Commission** endorse the ***Approval Procedures for Heliport Development and Special Aviation-Related Events in Calgary***, as set out in of this report

9 3 2 Recommend to the **Calgary Planning Commission** that the **Director of Planning & Building** be designated as the City's contact for all applications or enquiries pertaining to the approval of heliports or special aviation-related events and that he/she be responsible for liaising with all other relevant City departments and agencies regarding their comments and concerns

9 3 3 Request that **Transport Canada** and the **City of Calgary** advise the **Calgary Transportation Authority** of the receipt of any applications for approval of heliport developments or special aviation-related events, of any concerns regarding these applications and of any approvals or refusals thereof

# APPROVAL PROCEDURES FOR HELIPORT DEVELOPMENT AND SPECIAL AVIATION-RELATED EVENTS IN CALGARY

# PREAMBLE

This document is intended to assist anyone who is interested in seeking approval for either the development of a heliport or the undertaking of a special aviation-related event within the city of Calgary. The Federal Government, through the Minister of Transport, has sole jurisdiction over the certification of heliports. However, proponents of heliports or special aviation-related events should be aware that certification will not normally be granted without municipal support.

Transport Canada and the City of Calgary have different but related roles in reviewing and approving such applications. Each has an obligation to ensure that the public's interests are protected, yet each is also responsible to assist the public in developing a safe, efficient and effective air transportation system to serve the needs of the broader community.

While Transport Canada is primarily concerned with the safety of heliports and helicopter operations, both in the air and on the ground, the City of Calgary's planning authorities focus mainly on land use and environmental issues, to ensure that the heliport will be compatible with surrounding developments. Similarly, each level of government has concerns with respect to special aviation-related events. Information required by each agency, as well as a flow chart describing the various steps in the heliport certification procedure, are presented in this document. We wish to acknowledge the valuable assistance provided by the ***"Approval Procedures for Special Aviation Events and Heliport Development in Edmonton"***, which served as the primary model for developing Calgary's Approval Procedures.

The Calgary Transportation Authority will act as a source of information regarding application requirements and procedures, and will serve as a liaison between proponents and the respective approval authorities. Enquiries should be directed to:

**Calgary Transportation Authority**
**Suite 1960, 540 - 5th Avenue S.W.**
**Calgary, AB T2P 0M2**
**TEL: (403) 266-6716**
**FAX: (403) 262-2587**
**Attention: Donald M. Brownie**
**Special Adviser**

# ROLE OF TRANSPORT CANADA

## 1. HELIPORT INFORMATION REQUIREMENTS

Transport Canada has established standards for heliport development and rules for helicopter operations which prescribe various requirements that must be observed by the heliport owner and helicopter operator. The regulations are comprehensive, and concern such matters as proper approach and departure paths, appropriate take-off and landing area, safety area, obstacle limitation surfaces, lighting and markings, and related standards to assure the safety of persons and property both in the air and on the ground. The purpose for such broad regulations is to achieve safety through the uniform and standardized control of aviation operations.

### 1.1 Notification

Notification of intent to establish a heliport should be submitted to Transport Canada using the ***Aerodrome Certificate Application Form*** provided herewith. This form is to be submitted to the Transport Canada office located at the following address:

**Regional Director**
**Air Navigation Requirements**
**Transport Canada**
**11th Floor, Canada Place**
**9700 Jasper Avenue**
**Edmonton, AB T5J 4E6**
**TEL: (403) 495-5180**
**FAX: (403) 495-5190**

### 1.2 Standards

Applicable standards for heliports may be found in the document entitled ***"Heliport and Helideck Standards and Recommended Practices" (TP2586E)***. Information on this publication may be acquired at the above address.

### 1.3 Initial Certification Inspection

After receipt of a heliport application, an initial inspection may be conducted by Transport Canada to:

a) Confirm the application details.
b) Assess conformity with standards.
c) Identify areas requiring redevelopment.
d) Identify constraints to development.

Upon completion of the inspection and review, Transport Canada will issue a notice to the applicant as to its favourable or unfavourable findings, and will advise the City of Calgary and the Calgary Transportation Authority regarding these findings.

**2. SPECIAL AVIATION-RELATED EVENTS**

Authorization is required of any special aviation-related activities occurring below 1,000 feet AGL (above ground level) and requiring authority under ***Air Regulations Sections 515, 534 and ANO V No. 30***. Such activities include formation fly pasts, aerial photography, temporary balloon launching sites, temporary heliports, and any other temporary aviation-related activities within the Calgary city limits.

A ***Notice of Special Aviation Activity***, using the form provided herewith, should be submitted at least five (5) working days prior to the event. However, activities such as air shows, low level air races and fly-ins require at least 60 days notice. Notice of special aviation-related events should be submitted to the Transport Canada office located at the following address:

**Regional Director**
**Air Carrier Operations**
**1100 Canada Place, Zone 3**
**9700 Jasper Avenue**
**Edmonton, AB T5J 4E6**
**TEL: (403) 495-5247**
**FAX: (403) 495-3380**

Upon receipt of an application, Transport Canada will forward a copy to the City of Calgary's Director of Planning & Building. Once the City has reviewed it, its recommendation will be transmitted to the applicant, and to Transport Canada for approval or refusal.

Upon approval of the application, Transport Canada will advise both the applicant and the City. Upon refusal, the applicant will be notified of the reasons. The applicant may submit a revised proposal, with modifications addressing previously cited problems or deficiencies, and may initiate the review process again. There is no appeal process for an application that has not incorporated the appropriate modifications.

# ROLE OF THE CITY OF CALGARY

Municipal planning authorities, in reviewing heliport proposals forwarded to them by Transport Canada, are concerned primarily with land use compatibility, environmental impacts (e.g. noise), and other "quality of life" considerations that have a direct effect on the welfare of local residents.

Upon receipt from Transport Canada of notification of favourable finding following the Initial Certification Inspection, the proponent should contact the City of Calgary through the following office:

**Director of Planning & Building (#8108)**
**The City of Calgary**
**4th Floor, 800 Macleod Trail S.E.**
**P.O.Box 2100, Stn."M"**
**Calgary, AB T2P 2M5**
**TEL: (403) 268-5302**
**FAX: (403) 268-1528**

## ROLE OF THE CITY OF CALGARY (cont'd)

Following the initial contact with the Director of Planning & Building, a **Development Planner** will be assigned to handle the project and to liaise with and advise the proponent. The Development Planner will arrange a pre-application meeting with the proponent to identify potential planning issues and to ensure, as far as possible, that the proposed heliport will be compatible with surrounding land uses. The proponent will be encouraged, where appropriate, to also arrange pre-application meetings with adjacent Community Association(s). At this stage, the need for a **development permit** will also be determined.

***Note:*** *These Procedures presume either that the proposed heliport is an ancillary use to an existing use (e.g., hospital, office building, etc.) or that the heliport is to be located on lands designated as PS Public Service District under the Calgary Land Use By-law. If these conditions do not exist, then an amendment to the Land Use By-law will be required prior to the consideration of a development permit.*

### 1. HELIPORT INFORMATION REQUIREMENTS

Upon determination that a development permit is required, the proponent must submit an application together with the following supporting information:

a) A copy of the **Certificate of Title** of all of the property to be developed;
b) Copies of all registered **Restrictive Covenants** and **City Caveats** that apply to the property;
c) **Written authorization** from the owner, if the applicant is not the owner;
d) **Photographs** of the site and the adjacent area; and
e) **Site Plan** showing how the site would be developed, landscaped and accessed.

A total of 8 sets of the information specified above are required for circulation purposes. The **site plan** will be accompanied by a map showing the relationship of the proposed site to other land uses and development, both existing and proposed, within one (1) kilometre, with particular emphasis on noise-sensitive uses (e.g. residential, schools, churches, hospitals). In addition, proposed flight paths to and from the heliport and the intensity of use proposed (i.e. type of aircraft, frequency and timing of flights) should be indicated.

In addition to the foregoing information relative to the development permit application, the proponent will be required to undertake **noise monitoring tests** of typical ambient community noise levels, daytime and nighttime, and to provide estimates of the noise levels that will be generated during landings and take-offs by representative helicopters expected to use the heliport. The noise monitoring tests and analysis shall be undertaken by a qualified acoustical engineer at the applicant's expense, subject to the approval of the City's Director of Transportation. As a guideline to proponents, helicopter noise should not exceed ambient noise levels in adjacent noise-sensitive areas, and except in the case of hospitals served by STARS air ambulance, it should not exceed the limits as specified in the Calgary Noise By-law.

The applicant will also be expected to organize **public meetings** with local residents to inform them of the proposal, provide information on the noise analysis, and respond to any concerns which they may have regarding potential impacts of the heliport on their safety and enjoyment of their property.

**1. HELIPORT INFORMATION REQUIREMENTS** (cont'd)

A review of potential problems with respect to **ground access** to the heliport shall be undertaken, to the satisfaction of the Director of Transportation. A traffic flow plan must be submitted, indicating points of ingress/egress between the heliport and the adjacent roadway network. Vehicular parking needs and pedestrian safety measures shall also be addressed.

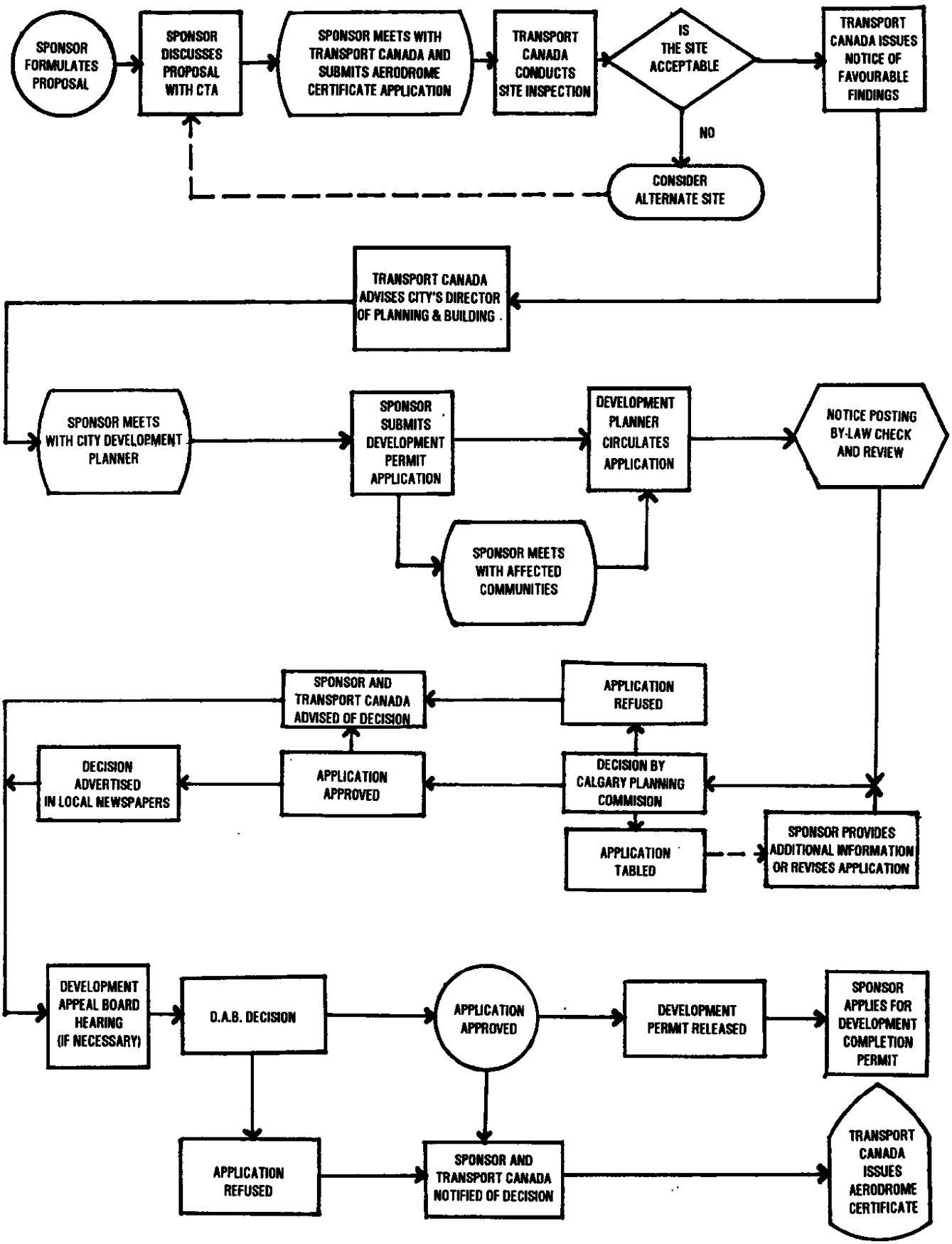
The various steps in the City's **development permit approval process** are shown generally in the **flow chart** on the following page. Upon completion of circulation and review, the Development Planner will submit the application to the **Calgary Planning Commission (CPC)** for a decision. The Planning Act requires that a decision be made within 40 days of receipt of the application, unless the applicant agrees on an extension. The CPC may decide either to **approve** the development permit, with or without conditions, **refuse** it, or **table** it to be brought back at a later date with revisions and/or additional supporting information. Following the decision of the CPC, either the applicant or any interested party may **appeal the decision** to the City's **Development Appeal Board (DAB)**. Any appeal must be heard by the DAB within 30 days of receipt of the notice, and a decision must be rendered within 15 days of the hearing. The decision of the DAB cannot be contested, except in the Courts on questions of law and jurisdiction.

Once the DAB has rendered its decision, the Director of Planning & Building will notify Transport Canada as well as the Calgary Transportation Authority. If the development permit has been issued, Transport Canada may then proceed to issue an ***Aerodrome Certificate***, provided that all of its certification requirements have been met. If a development permit has been refused, Transport Canada may either refuse to issue an Aerodrome Certificate, or may refer the application to the Minister of Transport for resolution.

**2. SPECIAL AVIATION-RELATED EVENTS INFORMATION REQUIREMENTS**

As already noted, Transport Canada will provide notice to the City's Director of Planning & Building of any proposed special aviation-related events or activities. The Director of Planning & Building will immediately circulate such notice for review and comment to the Manager of Traffic Operations (Transportation Department) as well as to the Fire Chief, the Chief of Police, the Secretary to the Board of Commissioners and the aldermen of any wards affected by the activity. Upon receipt of all comments, the Director of Planning & Building will provide a coordinated response to Transport Canada, with a copy to the applicant.

# REVIEW AND APPROVAL PROCEDURES FOR HELIPORT DEVELOPMENT



# AERODROME CERTIFICATE APPLICATION

**CITY OF CALGARY**

Transport Canada / Transports Canada

| Full Name of Applicant | Telephone |
|---|---|
| Address | Postal Code |
| Location of Aerodrome<br>*Attach Sketch or Photograph* | Direction and Distance From Nearest Community<br>Latitude / Longitude |

## PROPOSALS FOR AERODROME

| Use (Design Aircraft) | | |
|---|---|---|
| Elevation | Hours of Operation | Certificate Fee is Enclosed<br>☐ Yes ☐ No |

## CLASSIFICATION OF AERODROME

☐ Private Use ☐ Day ☐ IFR ☐ Land ☐ Heliport ☐ Ice

☐ Public Use ☐ Night ☐ VFR ☐ Stolport ☐ Water

## AERODROME PROPERTY TITLE

| Details of Rights You Hold on Aerodrome Site: |
|---|
| Period for Which You Hold Those Rights: |
| Name and Address of Owner Who Has Permitted this Site to be Used as an Aerodrome: |

## LOCAL NOTICE

| Have Local Land Use Authorities Been Notified of Proposal To Use This Site as an Aerodrome:<br>☐ Yes ☐ No | |
|---|---|
| Have Objections been Raised to the Proposed Use of the Site as an Aerodrome:<br>☐ Yes ☐ No | |
| Name and Address of Authorities Advised | Date and Reference of Advisement |

**RETURN TO: TRANSPORT CANADA, Regional Manager, Air Navigation Requirements**
**11th Floor, Canada Place, 9700 Jasper Ave., Edmonton, Alberta T5J 4E6**

# NOTICE OF SPECIAL AVIATION ACTIVITY

**CITY OF CALGARY**

Transport Canada / Transports Canada

NAME AND ADDRESS OF PROPONENT, INDIVIDUAL OR ORGANIZATION

- [ ] Flypass
- [ ] Balloon Launching
- [ ] Temp. Landing Area
- [ ] Aerial Lift
- [ ] Other (specify) _____

**A. Location of Landing Area, Departure or Overflight Area**

| 1. NEAREST STREET | 2. NAME OF LANDING/ DEPARTURE AREA | 3. ELEVATION/ALTITUDE |
|---|---|---|
| | | |

**B. Purpose**

| Describe Use | | | **C. Activity Dates** | |
|---|---|---|---|---|
| ☐ Public | ☐ Private | ☐ Military | To Begin | To End |
| | | | | |

**D. Other Landing Areas in Vicinity**

| | Direction from Landing Area | Distance from Landing Area |
|---|---|---|
| | | |

**E. Landing/Departure Area Data**

| | Existing (if any) | Proposed |
|---|---|---|
| Dimensions of Landing and Takeoff Area in Feet | | |
| Dimensions of Touchdown Area in Feet | | |
| Direction of Ingress/Egress Routes | | |
| Type of Surface | | |

| Description of Lighting (if any) | Direction of Prevailing Wind |
|---|---|
| | |

**G. Operational Data**

| 1. Estimated or Actual Number Aircraft | 2. Estimated Number of Departures/Landings |
|---|---|
| | |

**F. Obstructions**

| Type | Height Above Landing Area | Direction from Landing Area | Distance from Landing Area |
|---|---|---|---|
| | | | |

**I. Estimated Vehicular Traffic Generation and Proposed Pedestrian Safety Measures**

**H. Noise Considerations:** Identify Noise Sensitive Land Uses and their Direction and Distances from Landing Area

CERTIFICATION: *I hereby certify that all of the above statements made by me are true and complete to the best of my knowledge.*

| Name, title, *( and address if different than above )* of person filing this notice — type or print. | Signature (in ink) | |
|---|---|---|
| | Date of Signature | Telephone No.(*Precede with area code )* |

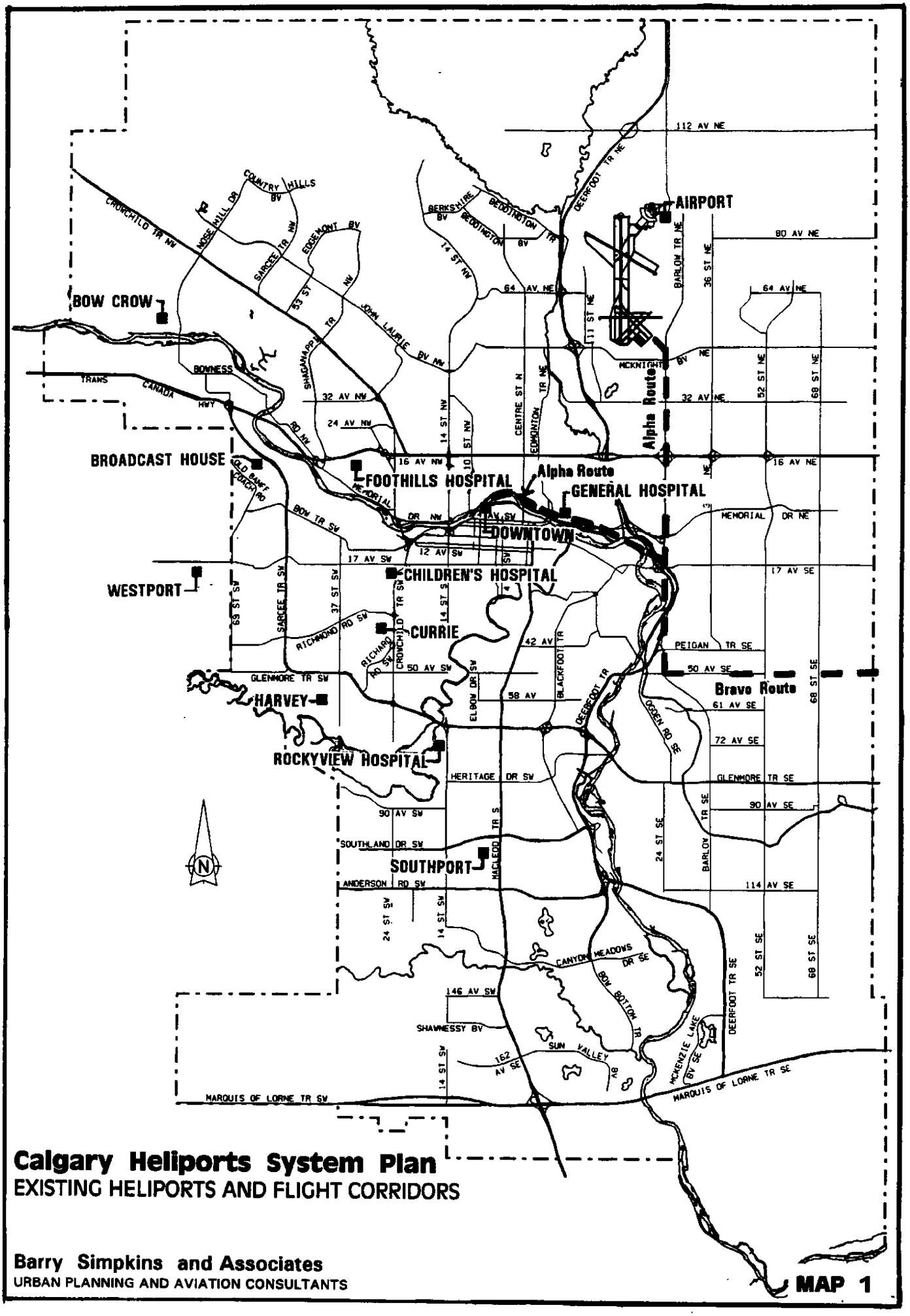
**FOR TRANSPORT CANADA USE ONLY** Transport Canada will either return this form or issue a separate acknowledgement.

| **Approval:** Issued On | Signature | Date |
|---|---|---|
| | | |

Remarks:

RETURN TO: TRANSPORT CANADA, Regional Manager, Aviation Licensing
11th Floor, Canada Place, 9700 Jasper Ave., Edmonton, Alberta T5J 4E6

# MAPS

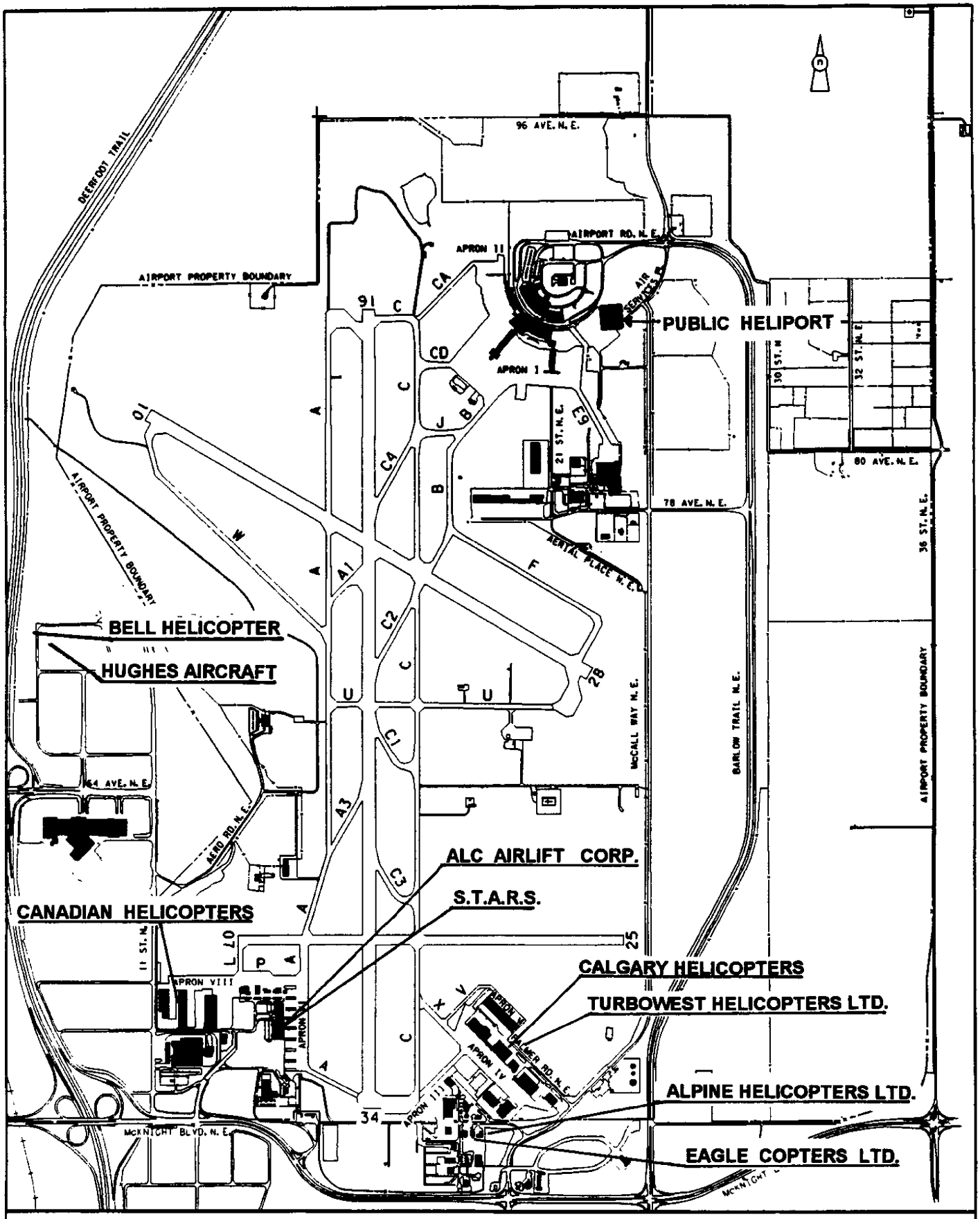



# Calgary Heliports System Plan

## EXISTING HELIPORTS AND FLIGHT CORRIDORS

**Barry Simpkins and Associates**
URBAN PLANNING AND AVIATION CONSULTANTS

**MAP 1**




# Calgary Heliports System Plan

Calgary International Airport

**HELICOPTER OPERATORS**

0 1000 2000 M

**MAP 2**

# APPENDIX A

## LETTER FROM TRANSPORT CANADA TO CITY OF CALGARY
## February 24, 1988

Transport Canada / Transports Canada

Western Region

Federal Building
6th Floor
9820 - 107 Street
Edmonton, Alberta
T5K 1G3

Your file / Votre référence

Our File / Notre référence
5151-3

February 24, 1988

Mayor of Calgary
303 - 7th Avenue S.W.
Calgary, Alberta
T2P 2M5

His Worship Ralph Klein:

Transport Canada and the City of Calgary share a common responsibility to assist the public in developing a safe and efficient air transportation system. This letter will address helicopter operations and the development of a system of certified heliports within the City of Calgary.

The City of Calgary is one of the most progressive cities in the development of certified heliports. Currently there are over 10 heliports within the city limits, the majority of which are certified. These certified heliports operate autonomously since there is no master system in place to link all these heliports into a cohesive plan. A master heliport system would be of great benefit to organizers of events which require the support of helicopter operations. The 1988 Winter Olympic Organizing Committee would be an excellent example of an organization that would profit from such a system.

Consequently we encourage the City of Calgary to proceed one step further in the management of their air transportation system by developing a master plan for a system of certified heliports within the City of Calgary. Helicopter operations have served the citizens of Calgary well in the past particularly with regards to emergency medical services. We do not forsee that helicopter activity will diminish in the near future and that by instituting a master heliport plan the City could tailor existing heliports to meet the needs of its citizens.

A plan for a system of certified heliports could provide numerous benefits to the city as well as an avenue to avoid problem areas that have arisen in the past. A system of certified heliports would:

.../2

1. Ensure all heliports meet Transport Canada's Standards thereby enhancing aviation safety and reassuring surrounding residents.

2. Prescribe approach and departure paths designed to avoid (as much as possible) flight over built up areas. This would also enhance safety as well as address certain noise issues to minimize citizen annoyance.

3. Enhance the City Disaster Plan and preclude the necessity of utilizing parking lots and city parks as landing sites during emergencies. This did occur at the Calgary General Hospital prior to the completion of the new helideck.

4. Allow the city to address environmental issues to maintain the quality of life for city residents while providing them with superior service. This could avoid situations in the future where there might be a competition for recreational facilities versus heliport facilities. For example, the Calgary Downtown Heliport has served the City very well, but we are aware of concerns which may have a negative impact on this facility.

5. Allow the development of heliports to proceed in a controlled manner in keeping with the needs of the community.

The City of Calgary has an impressive number of heliports within its boundaries. Your present policy enhanced with a master plan to develop a cohesive system of heliports could assure the public of a comprehensive air transportation system plan. We are also encouraging the City of Edmonton to address this same issue. The City of Edmonton in concert with Transport Canada have published the "Special Aviation Events and Heliport Development in Edmonton" booklet. This booklet defines both the City's and Transport Canada's roles and facilitates the procedure to follow when developing new heliports. I have enclosed a copy of this booklet as you may wish to consider the benefit of this document when reviewing your own air transportation system.

.../3

Transport Canada has enjoyed the co-operation of City of Calgary in the past. We hope that you will seriously consider this recommendation and we are prepared to pursue this in cooperation with the City of Calgary should you decide to develop such a system.

Yours truly,

R.G. Bell
Director,
Air Navigation

# APPENDIX B

## PRESS RELEASE FROM MINISTER OF TRANSPORT
## SEPTEMBER 11, 1992

No. 168/92 For release
Sept. 11, 1992

## FEDERAL CONTRIBUTION FOR A HELIPORT MASTER PLAN

Barbara Sparrow, MP (Calgary Southwest), today announced on behalf of Transport Minister Jean Corbeil a $25,000 federal contribution to develop a heliport master plan for Calgary.

The plan will identify the role and benefits of each heliport within the overall system, prescribe approach and departure paths to avoid flight over built-up areas and enhance the city's disaster-response plan.

Calgary has more than 10 heliports within the city limits. The facilities operate autonomously and there is no master system in place to link them into a single plan.

Municipal heliport systems are used for emergency/disaster response, such as air ambulance services, and for business aviation.

The funds are being provided to the Calgary Transportation Authority under Transport Canada's financial assistance program for local and local/commercial airports.

---

Contacts: Joyce Bourgeois
Public Affairs, Edmonton
(403) 495-3810

Don Brownie
Executive Director
Calgary Transportation Authority
(403) 266-6716

Canada

# APPENDIX C

## STEERING COMMITTEE MEMBERSHIP
## AND
## TERMS OF REFERENCE

## STEERING COMMITTEE MEMBERSHIP

Roy Staniland (Aviation Consultant - Chairman)

Don Brownie (Calgary Transportation Authority - Secretary)

Ted Brown (City of Calgary Planning & Building Department)

Catherine Fletcher (Transport Canada Aerodrome Standards & Certification)

Jim Lambert (City of Calgary, Transportation Department)

Wayne Morris (Deputy Chief/Operations Calgary Fire Department)

Bill Watts (Calgary Transportation Authority General Aviation Committee)

CALGARY TRANSPORTATION AUTHORITY
SUITE 440, 1201 - 5th STREET S.W., CALGARY, ALBERTA T2R 0Y6
TEL: (403) 266-6716 FAX: (403) 262-2587

April 30, 1993

Mr. Barry D. Simpkins
Planning Consultant
10624 Mapleglen Cres. S.E.
Calgary, AB
T2J 1X2

Re: Calgary Heliport Master Plan

Dear Mr. Simpkins:

The Calgary Transportation Athority (CTA), the client, is inviting qualified consultants to propose on a study which will examine the urban planning aspects of heliport development throughout Calgary.

The CTA is a joint-agency of the City of Calgary and the Calgary Chamber of Commerce and represents the local public interest on transportation matters.

1. General Background:

Over the years Calgary has witnessed the development of a number of heliports within its corporate boundaries. There are currently about a dozen such facilities situated throughout the city, serving a variety of needs and representing various levels of technical sophistication. For example, the heliport at the Bow Valley Centre (Calgary General Hospital) is a special purpose facility for accommodating the transport of seriously-ill medical patients, while the Downtown Heliport on the Bow River serves a range of uses requiring close proximity to the central core.

While all licensed heliports have been developed in accordance with Federal Government safety standards, there is no uniform guideline for ensuring that these facilities are fully compatible with the urban environment. Although this has not proven to be a major issue up to now, the CTA believes that it would be prudent to develop a planning guideline governing urban heliport construction and location and, thereby, help to forestall any potential conflicts in the future. This would respond to growing urban sensitivities about environmental disturbance and provide municipal government and developers with a planning standard for preparing and assessing proposals for future heliport development.

2. Description of Work:

In conducting the study the successful consultant will be expected to complete the following tasks:

A. Inventory and assess existing heliports within Calgary's city limits in terms of:

- Basic characteristics: ownership, dimensions, location, special features, etc.
- Conformance with Transport Canada standards.
- Purpose and benefit to the community.
- Compatibility with adjacent land-uses.

B. Examine and assess established helicopter corridors in terms of safety and urban compatibility.

C. Profile the various factors that will influence the demand for future heliport development throughout Calgary (e.g. private and commercial needs, emergency measures, protective services).

D. Identify the urban planning factors that are important considerations in heliport development. In completing this part of the study the consultant will be expected to:

- Identify exceptional circumstances where a departure from the normal criteria for heliport development may be warranted.
- Consider varying performance criteria for heliports experiencing different volumes of traffic and under different conditions. For example, an emergency or special event heliport may operate at a lower frequency of traffic and, therefore, require a less restrictive standard than a high-frequency commercial facility.

E. Prepare an appropriate framework of urban planning guidelines, community consultation parameters and municipal approval procedures for future heliport development. In completing this task the consultant will be expected to examine the experience at other major cities and address the potential for interaction between the various facilities.

F. Prepare a Draft Report for review by the client which will include all the findings of the consultant's investigations and a proposed policy for urban heliport development that will be acceptable for consideration by the City of Calgary.

G. Prepare a Final Report incorporating any required changes.

3. Consultant Qualifications:

The successful consultant will be expected to demonstrate training and experience with respect to a unique combination of skills related to land-use planning, helicopter and heliport operations and the interrelationship between aviation and the urban environment.

The consultant will also be expected to work effectively with the City of Calgary, Transport Canada, helicopter operators and users and any other parties that will be directly affected by future heliport development.

4. Budget:

The total budget available for this project is $25,000, including professional fees and out-of-pocket expenses.

5. Timing:

The study will be completed and a Draft Report submitted to the client 10 weeks from initial authorization. Subject to review by the client, a Final Report will be submitted 4 weeks later.

Consultants interested in proposing on this study are requested to submit a formal proposal that will include a general approach to the project, a workplan, relevant qualifications, personnel assigned to the project, per diem rates and a statement of their ability to effectively complete the project within the prescribed timeframe and budget.

Proposals must be in the hands of the client by no later than May 21, 1993.

The CTA reserves the right to terminate or alter the terms of the project at any time.

For any further information please contact Don Brownie at 266-6716.

Yours truly,

Roy Staniland
Chairman, Calgary
Heliport Master Plan
Steering Committee

# CALGARY TRANSPORTATION AUTHORITY

SUITE 440, 1201 - 5th STREET S.W., CALGARY, ALBERTA T2R 0Y6
TEL: (403) 266-6716 FAX: (403) 262-2587


July 12, 1993

Mr. Barry D. Simpkins
Barry Simpkins & Associates
10624 Mapleglen Cres. S.E.
Calgary, Alberta
T2J 1X2

Re: Calgary Heliport Master Plan

Dear Mr. Simpkins:

The Calgary Transportation Authority (CTA) has determined the need for a study which will identify planning criteria for future heliport development throughout Calgary. Accordingly, a call for proposals was issued to a number of consultants on April 30, 1993, and, after due consideration by a CTA Steering Committee, it was decided to award the project to your firm, Barry Simpkins & Associates, hereinafter referred to as 'the Consultant'.

The Steering Committee met with the Consultant on July 6, 1993, and it was generally agreed to conduct the study according to the terms of reference contained in the Request for Proposal (See attached), except for the following changes and additions:

1. A draft report will be submitted to the CTA by the Consultant by no later than October 8, 1993.

2. The draft report will be reviewed by the Steering Committee and, in turn, the City of Calgary Administration and the Consultant will then complete any changes in order that a final report can be submitted to the City's formal approval process by the first week of December 1993.

3. The total budget for the study, including G.S.T., will be $25,000. Upon submission of appropriate invoices, professional fees and any accumulated out-of-pocket expenses will be reimbursed to the Consultant in approximately three equal installments on or about August 31, October 15 and December 1, 1993.

If you agree with the above terms and conditions, please sign in the space allotted below and return one copy to this address.

Yours truly,

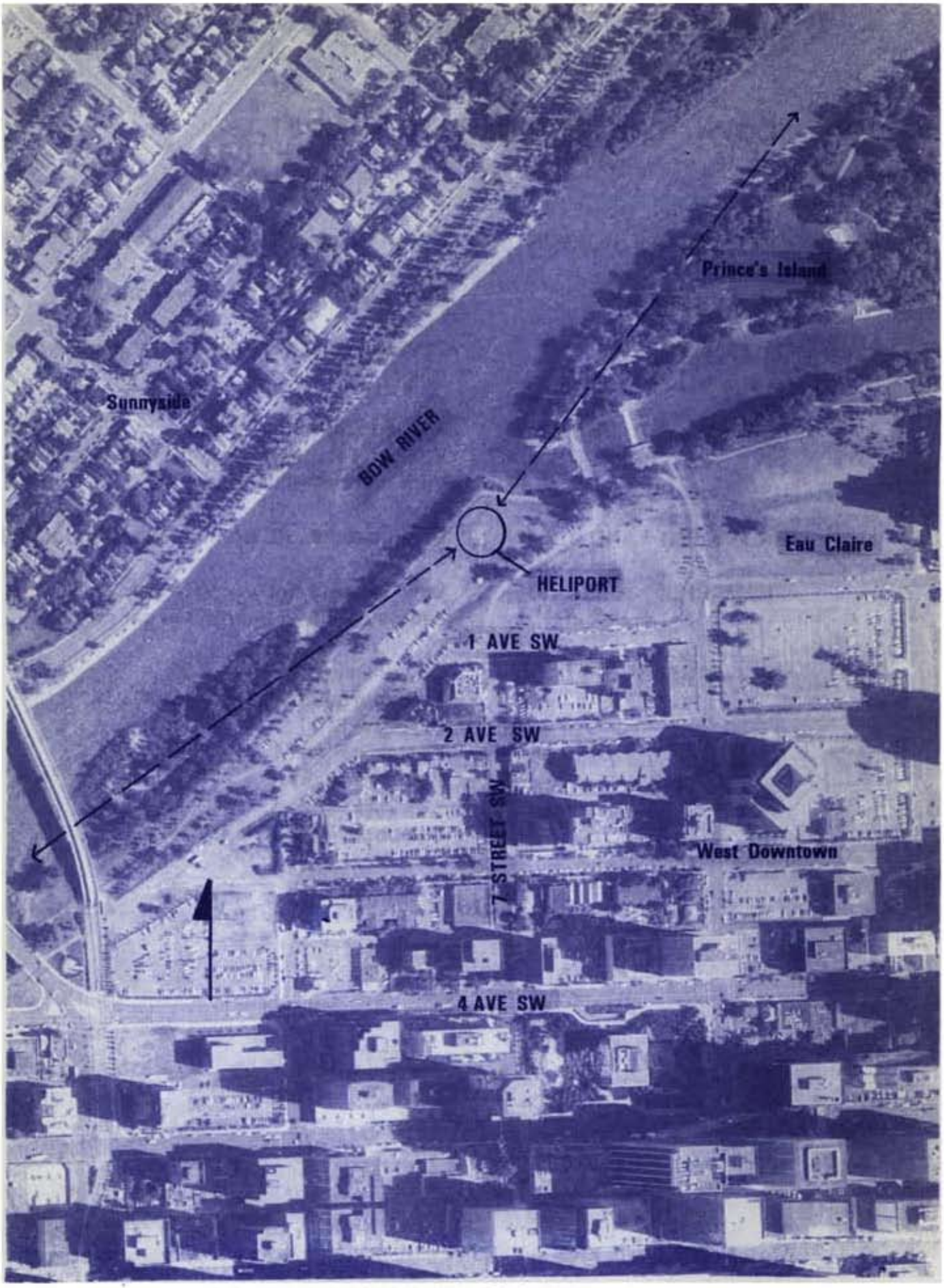
Donald M. Brownie
Executive-Director

Barry D. Simpkins

# APPENDIX D

## LOCATION MAPS FOR EXISTING HELIPORTS

# INDEX




# CALGARY DOWNTOWN HELIPORT

Scale: 1:4000

Reference: Latitude N 51° 03' 11 Longitude W114° 04 43 Magnetic Dec. 19° E

Operator: The City of Calgary (403) 268-2251

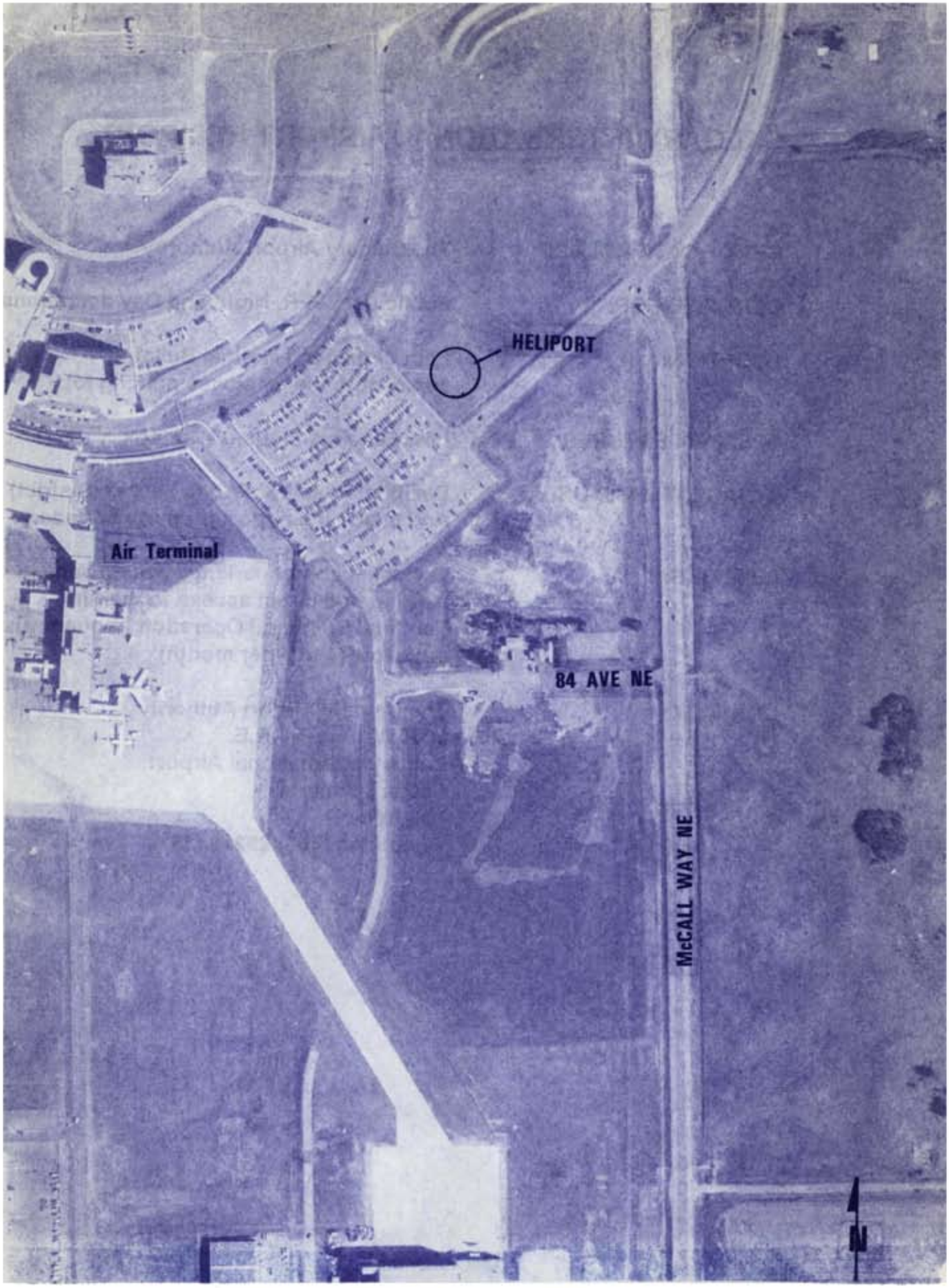
Elevation: 3405' ASL

Arrival and Departure via Bow River (Alpha Route) Note: Noise sensitive area

1

# DOWNTOWN / BOW RIVER HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | City of Calgary, Transportation Department |
| CERTIFIED FOR: | Public Use, VFR, Day operations |
| LOCATION: | 7th Street and 1st Ave. S.W. at the Bow River |
| SPECIAL FEATURES: | Fenced, Lighted Windsox, Flood Lighting, Shelter, Telephone, Touchdown Pad and Parking for 4 Helicopters. |
| ADJACENT LAND USE: | Designated as PE (Public Park, School,etc) |
| REMARKS: | Low usage at present with only an estimated 4 to 5 operations per month. |
| CONTACT: | City of Calgary<br>Transportation Department #8124<br>P.O. Box 2100<br>Postal Station M<br>Calgary, Alberta<br>T2P 2M5<br>Telephone (403) 268-2251 |




## CALGARY AIRPORT HELIPORT

Reference: Latitude 51° 08' Longitude W114° 00' Magnetic Dec. 19° E

Operator: The Calgary Airport Authority (403) 292-8436

Elevation: 3556' ASL

# CALGARY INTERNATIONAL AIRPORT HELIPORT

| | |
|---|---|
| **CERTIFICATE HOLDER:** | **The Calgary Airport Authority** |
| **CERTIFIED FOR:** | **Public Use, VFR, Night and Day operations** |
| **LOCATION:** | **East of the Air Terminal Building adjacent to the employee parking lot.** |
| **SPECIAL FEATURES:** | **Low Fencing, Lighted Windsox,** |
| **ADJACENT LAND USE:** | **Designated as PS (Public Service District) And Inside the airport property boundary.** |
| **REMARKS:** | **Lacks helicopter parking, ground vehicle parking and direct access to the Air Terminal Building. Operation frequency is quite low (4 to 5 per month)** |
| **CONTACT:** | **The Calgary Airport Authority<br>2000 Airport Rd. N.E.<br>Calgary International Airport<br>Calgary, Alberta<br>T2E 6W5<br>Telephone (403) 292- 8436** |


# ALBERTA CHILDREN'S HOSPITAL & TECUMSEH HELIPORTS

Reference: Latitude N51°02'15" Longitude W114°06'51" Magnetic dec. 19°E

Operator: Calgary Children's Hospital (403) 229-7211

Elevation: 3635' ASL

Tecumseh arrival and departure between 031 and 211

Scale: 1:4000

3

## TECUMSEH HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | Alberta Children's Hospital |
| CERTIFIED FOR: | Private Use, VFR, Night and Day operations |
| LOCATION: | 17th Ave. S.W. west of Crowchild Trail |
| SPECIAL FEATURES: | Inside security fenced area, Large paved landing pad area |
| ADJACENT LAND USE: | Designated as PS (Public Service District) |
| REMARKS: | Used primarily for emergency operations by S.T.A.R.S. Access to Hospital is poor . |
| CONTACT: | Alberta Children's Hospital<br>1820 Richmond Rd. S.W.<br>Calgary, Alberta<br>T2T 5C7<br>Telephone (403)229-7211 |

## ALBERTA CHILDREN'S HOSPITAL HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | No certificate has been issued as of Nov.15,1993 |
| CERTIFIED FOR: | Not certified. |
| LOCATION: | 17th Ave S.W. East of Crowchild Trail |
| SPECIAL FEATURES: | Fenced, lighted windsox, Paved landing pad with lighting, sidewalk access, controlled vehicle access across roadway to hospital. |
| ADJACENT LAND USE: | Designated as Residential |
| CONTACT: | Alberta Children's Hospital<br>1820 Richmond rd. S.W.<br>Calgary, Alberta<br>T2T 5C7<br>Telephone (403) 229-7211 |


# GENERAL HOSPITAL / BOW VALLEY CENTRE HELIPORT

Scale: 1:4000

Reference: Latitude N51 03 04 Longitude W114 02 33 Magnetic Dec. 19 E

Operator: Calgary General Hospital (403) 268-9111

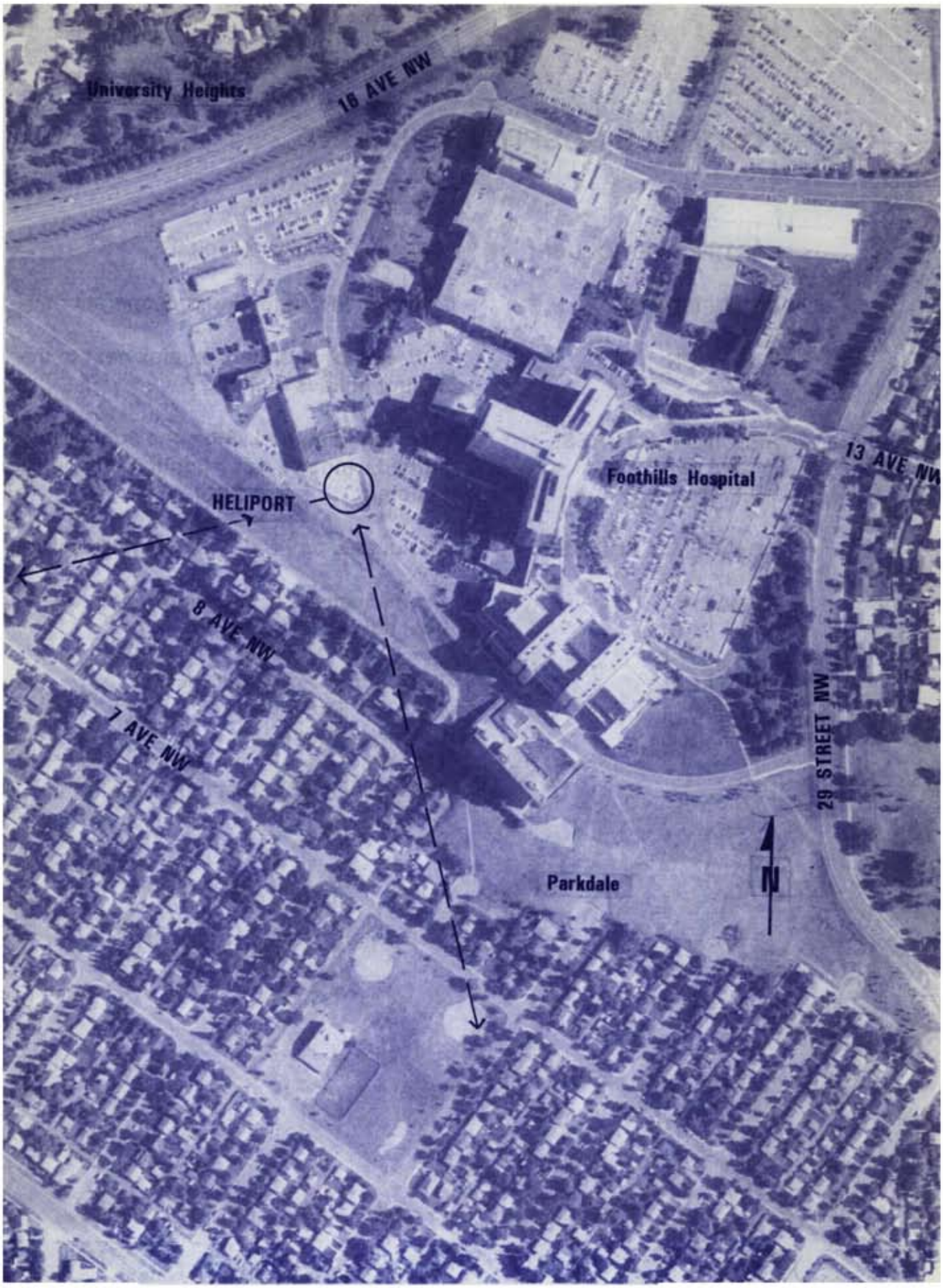
Elevation: 3442' ASL

Two Arrival/and Departure Flight Paths 071 and 246

4

# GENERAL HOSPITAL(BOW VALLEY CENTRE) HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | Calgary General Hospital |
| CERTIFIED FOR: | Private, VFR, Night and Day operation |
| LOCATION: | 8th Street S.E. North of McDougall Rd. at emergency entrance to Bow Valley Centre Hospital. |
| SPECIAL FEATURES: | Elevated landing deck, 21 metres in dia., 1m safety net surrounds, max. allowable weight is 11,200 lbs., lighted windsox |
| ADJACENT LAND USE: | Designated as PS (Public Service District) |
| REMARKS: | Used by S.T.A.R.S. for emergency response |
| CONTACT: | Calgary General Hospital<br>841 Centre Ave. E.<br>Calgary, Alberta<br>T2E 0A1<br>Telephone (403) 268-9111 |




# CALGARY FOOTHILLS HOSPITAL HELIPORT

Scale: 1:4000

Reference: Latitude N51° 03' 52" Longitude W114° 08' 12" Magnetic Dec. 19 E

Operator: Foothills Hospital (403) 270-1110

Elevation: 3635' ASL

Arrivals and Departure between 146° and 236°

# FOOTHILLS HOSPITAL HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | Calgary Foothills Hospital |
| CERTIFIED FOR: | Private, VFR, Night and Day operations |
| LOCATION: | S.W. side of hospital complex next to the central utilities building. |
| SPECIAL FEATURES: | Paved landing pad with edge lighting, lighted windsox, flood lighting on adjacent building. |
| ADJACENT LAND USE: | Designated as PS (Public Service District) |
| REMARKS: | Ground access to emergency area of hospital is poor. |
| CONTACT: | The Calgary Foothills Hospital<br>1403 - 29 Street N.W.<br>Calgary, Alberta<br>T2N 2T9<br>Telephone (403) 270-1110 |


# CALGARY ROCKYVIEW HOSPITAL HELIPORT

Scale: 1:4000

Reference: Latitude N50° 59' 20" Longitude W114° 05' 52" Magnetic Dec. 19° E

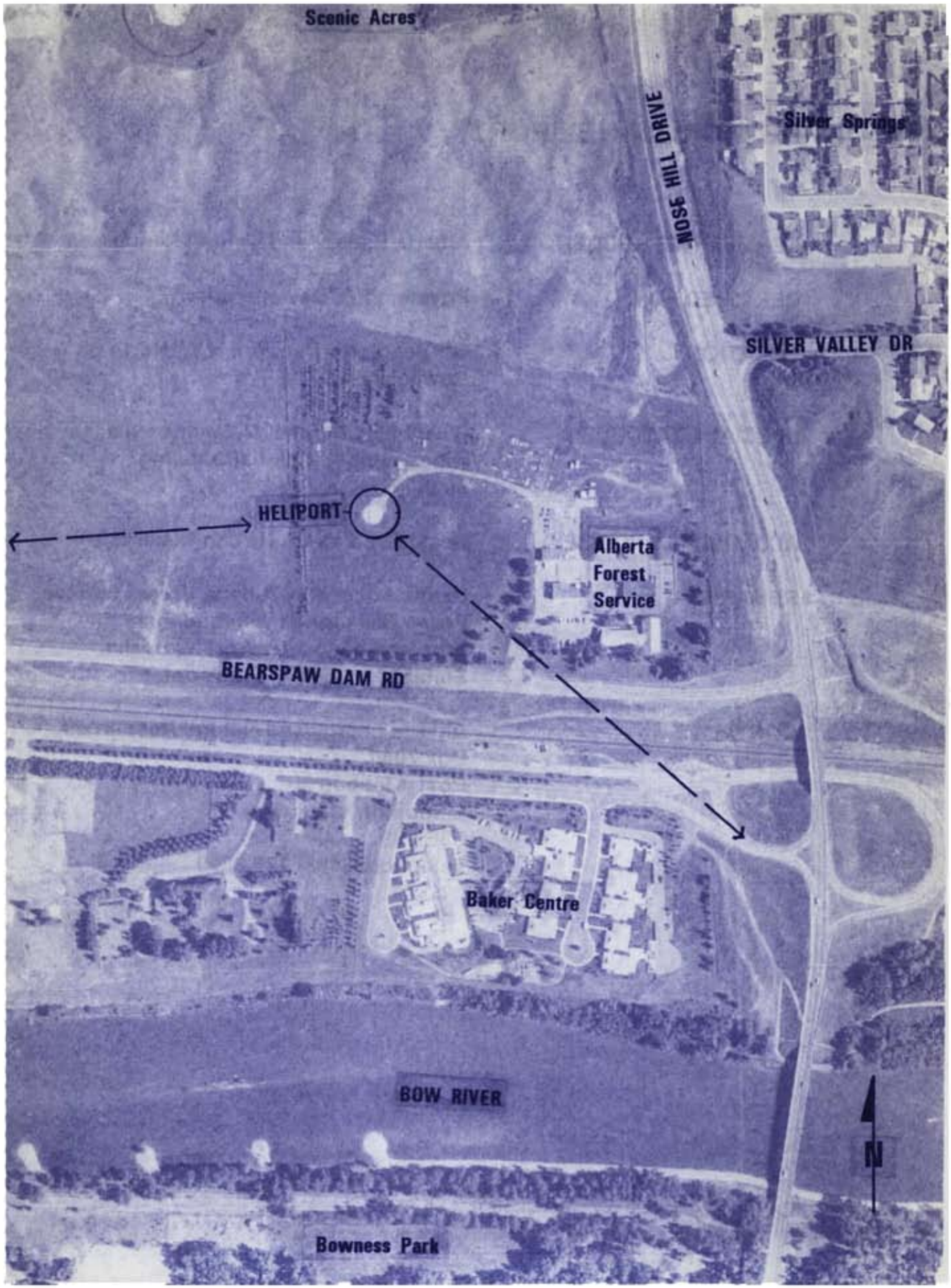
Operator: Rockyview Hospital (403) 541-3000

Elevation: 3590' ASL

Single Arrival and Departure Flight Path - 193

# ROCKYVIEW HOSPITAL HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | Rockyview Hospital |
| CERTIFIED FOR: | Private, VFR, Night and Day operation |
| LOCATION: | South end of hospital at entrance to emergency ward. |
| SPECIAL FEATURES: | Fenced, Paved landing pad with edge lighting, lighted approach arrow. lighted windsox. |
| ADJACENT LAND USE: | Designated as PS (Public Service District) |
| REMARKS: | Not currently used by S.T.A.R.S. but has excellent emergency service potential. |
| ONTACT: | The Rockyview General Hospital<br>7007 - 14th Street S.W.<br>Calgary, Alberta.<br>Telephone (403) 541-3000 |




# CALGARY BOW CROW HELIPORT

Scale: 1:4000

Reference: Latitude N51° 06' 10" Longitude W114° 12' 52" Magnetic Dec. 19° E

Operator: Department of Forestry Lands and Wildlife (403) 297-8800

Elevation: 3540' ASL

Arrival and Departure between 111 and 246 Note: Power lines to the N.

# BOW CROW HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | Alberta Energy and Natural Resources |
| CERTIFIED FOR: | Private, VFR, Day operation |
| LOCATION: | Off Bearspaw Dam Rd. N.W. North of Bowness Park |
| SPECIAL FEATURES: | Paved landing pad 17.2 metres dia., windsox(not lighted), Refueling facilities. |
| ADJACENT LAND USE: | Designated as UR (Urban Reserve ) |
| REMARKS: | Restricted use by Alberta Forest Services. Power line along north boundary of property marked with orange balls. Suitable for Bell 212 helicopter. |
| CONTACT: | Alberta Energy and Natural Resources<br>Box 7040<br>Postal Station M<br>Edmonton, Alberta<br>T5E 5S9<br>Telephone (403) 297-8800 |


## CALGARY BROADCAST HOUSE HELIPORT

Scale: 1:4000

Reference: Latitude N51 03 32 Longitude W114 10 17 Magnetic Dec. 19 E

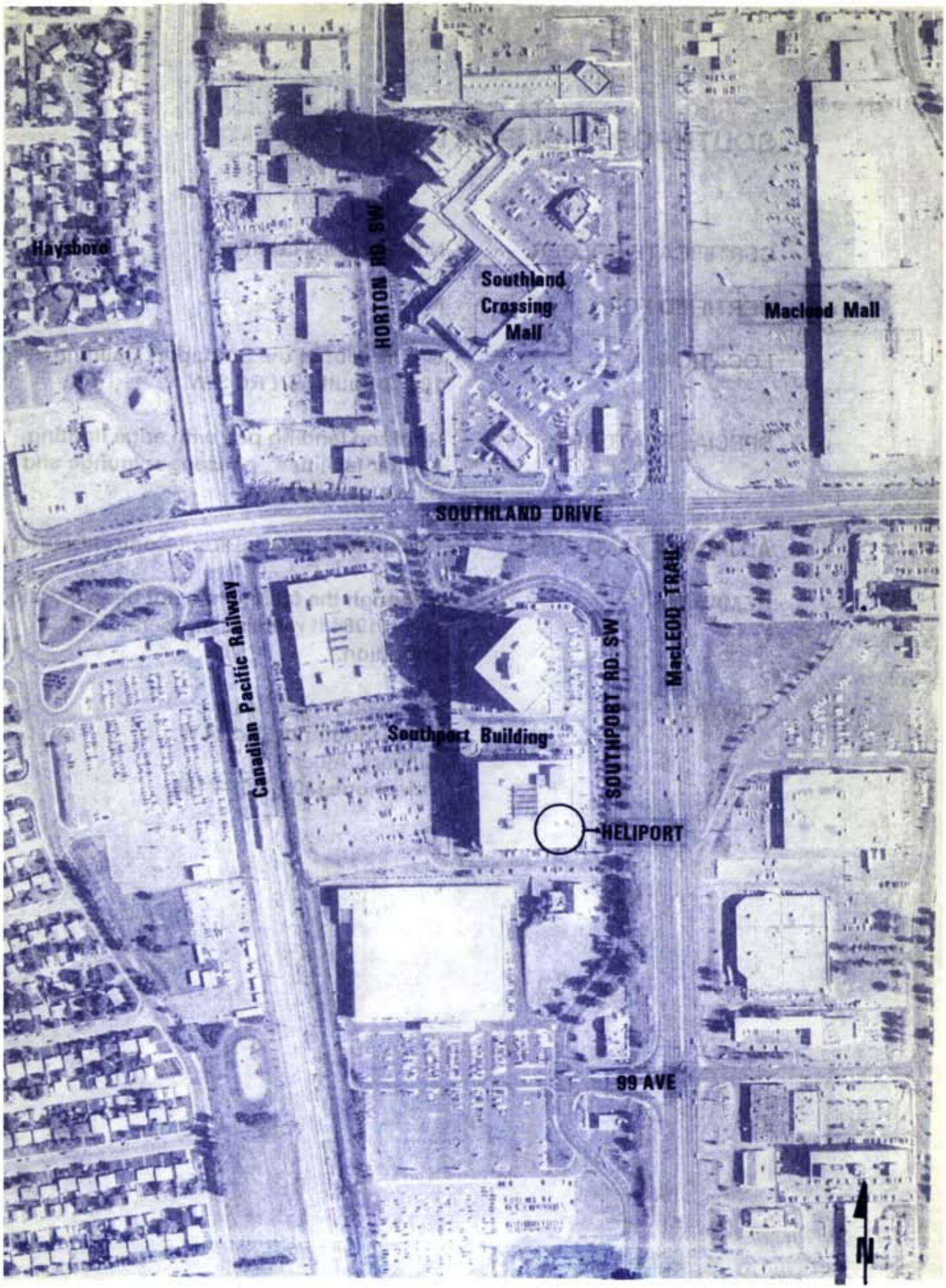
Operator: CFCN Communications (403) 240-5600

Elevation: 3925' ASL

Single Arr/Dep Flight Path 181 only Note: Towers with wires in NW to E

# BROADCAST HOUSE HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | CFCN Communications Ltd. |
| CERTIFIED FOR: | Private, VFR, Day operations |
| SPECIAL FEATURES: | Fenced, 10 metre paved landing pad with basic edge lighting, lighted windsox. |
| ADJACENT LAND USE: | designated as DC (Direct Control District) |
| REMARKS: | High towers and guy wires on north, east. and west sides, approach and takeoff to S.W. Suitable for up to Chinook helicopter. |
| CONTACT: | CFCN Communications Ltd.<br>Broadcast House<br>P.O. Box 7060, Postal Station E<br>Calgary, Alberta<br>T3C 3L9<br>Telephone (403) 240-5600 |




## CALGARY SOUTHPORT HELIPORT

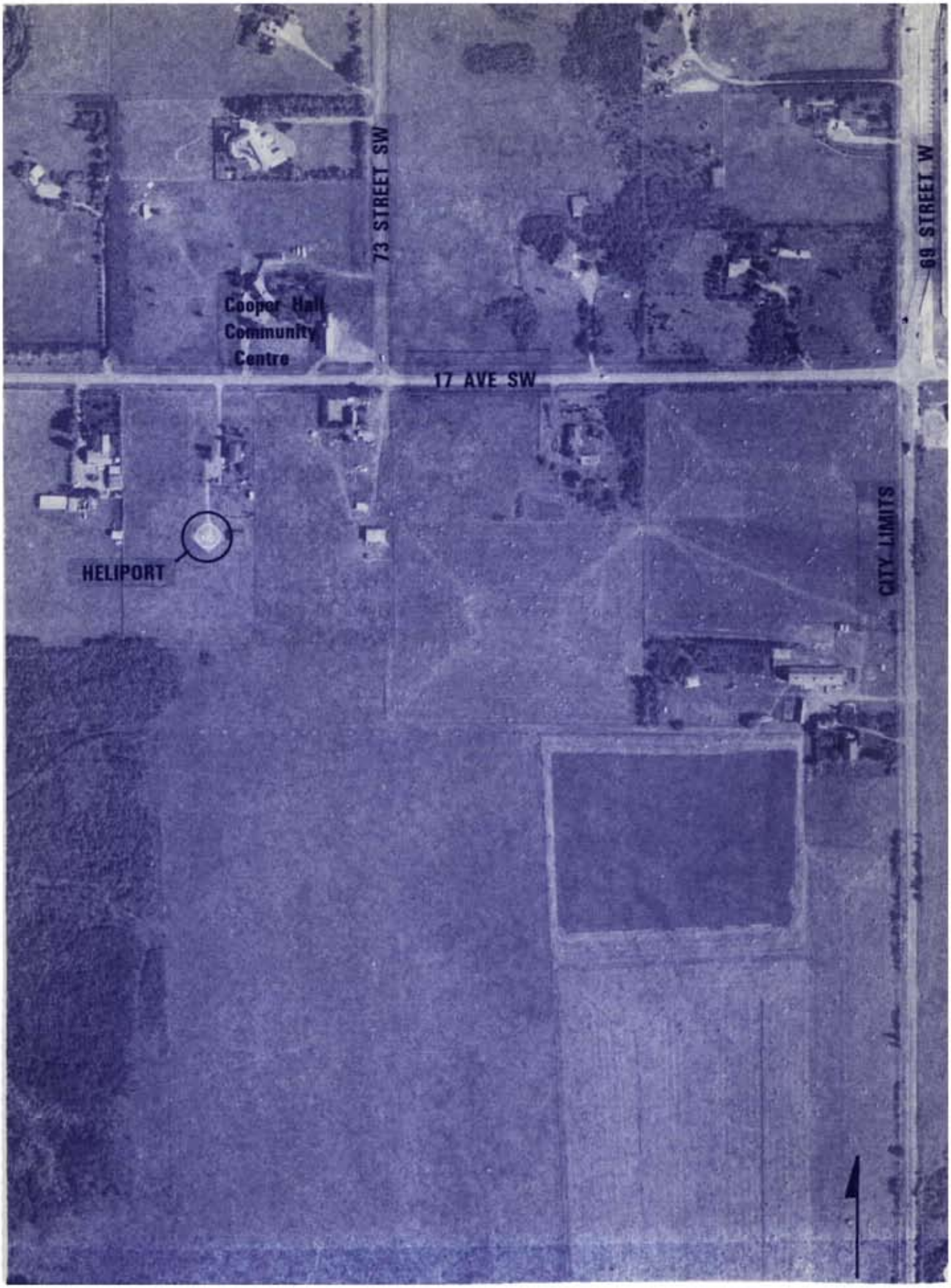
Reference: Latitude N50°58' Longitude W114°05' Magnetic Dec. 19

Operator: Not currently Certified

Elevation: 3575' ASL

# SOUTHPORT HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | Not presently certified. |
| CERTIFIED FOR: | N/A |
| LOCATION: | On the roof of the Southport Building at 10333 Southport Rd S.W. |
| SPECIAL FEATURES: | Roof top landing pad with edge lighting, hangar facilities , passenger lounge and pilot's quarters. |
| ADJACENT LAND USE: | Designated as DC (Direct Control District) |
| REMARKS: | Although the facility has not been certified since 1984 it remains in operational condition. |
| CONTACT: | Richfield Properties Inc.<br>10201 Southport Rd. S.W.<br>Calgary, Alberta<br>Telephone (403) 253-7155 |




# CALGARY WESTPORT HELIPORT

Scale: 1:4000

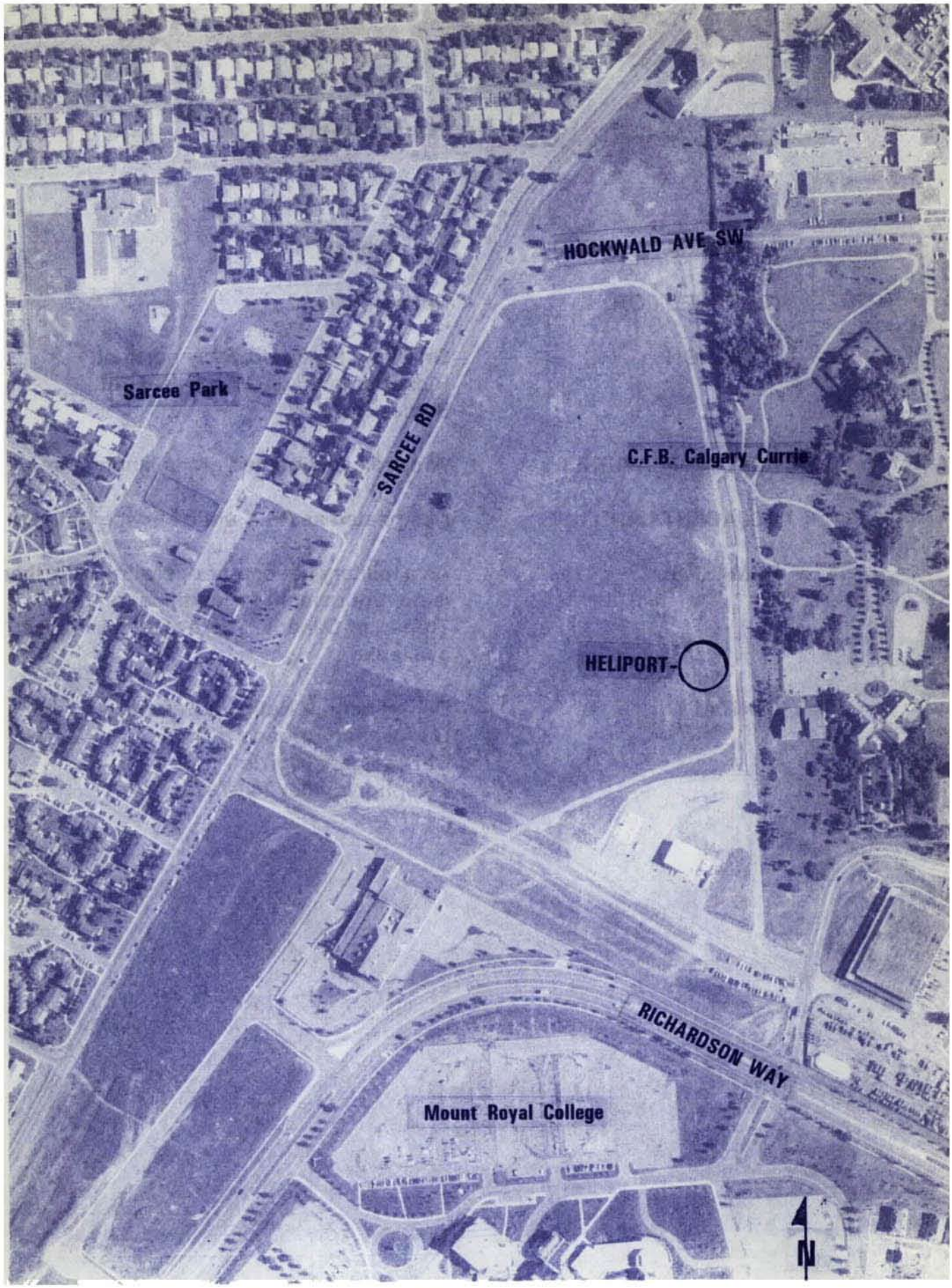
Reference: Latitude N51° 02' Longitude W114 12 Magnetic Dec. 19 E

Operator: R.E.T. Gerrish (403) 242-0509

Elevation: 3983' ASL

# WESTPORT HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | R.E.T. Gerrish |
| CERTIFIED FOR: | Private, VFR. Day operation |
| LOCATION: | 17th Ave. S.W. west of 73rd Street S.W. |
| SPECIAL FEATURES: | Paved landing pad, windsox, hangar |
| ADJACENT LAND USE: | Located within the MD of Rockyview. |
| REMARKS: | Very low frequency of use.( less than 6 per year). |
| CONTACT: | Mr. R.E.T. Gerrish<br>Telephone (403) 242-0509 |




# CALGARY CURRIE HELIPORT

Scale: 1:4000

**Reference: Latitude N51°01' Longitude W114°08' Magnetic Dec. 19 E**

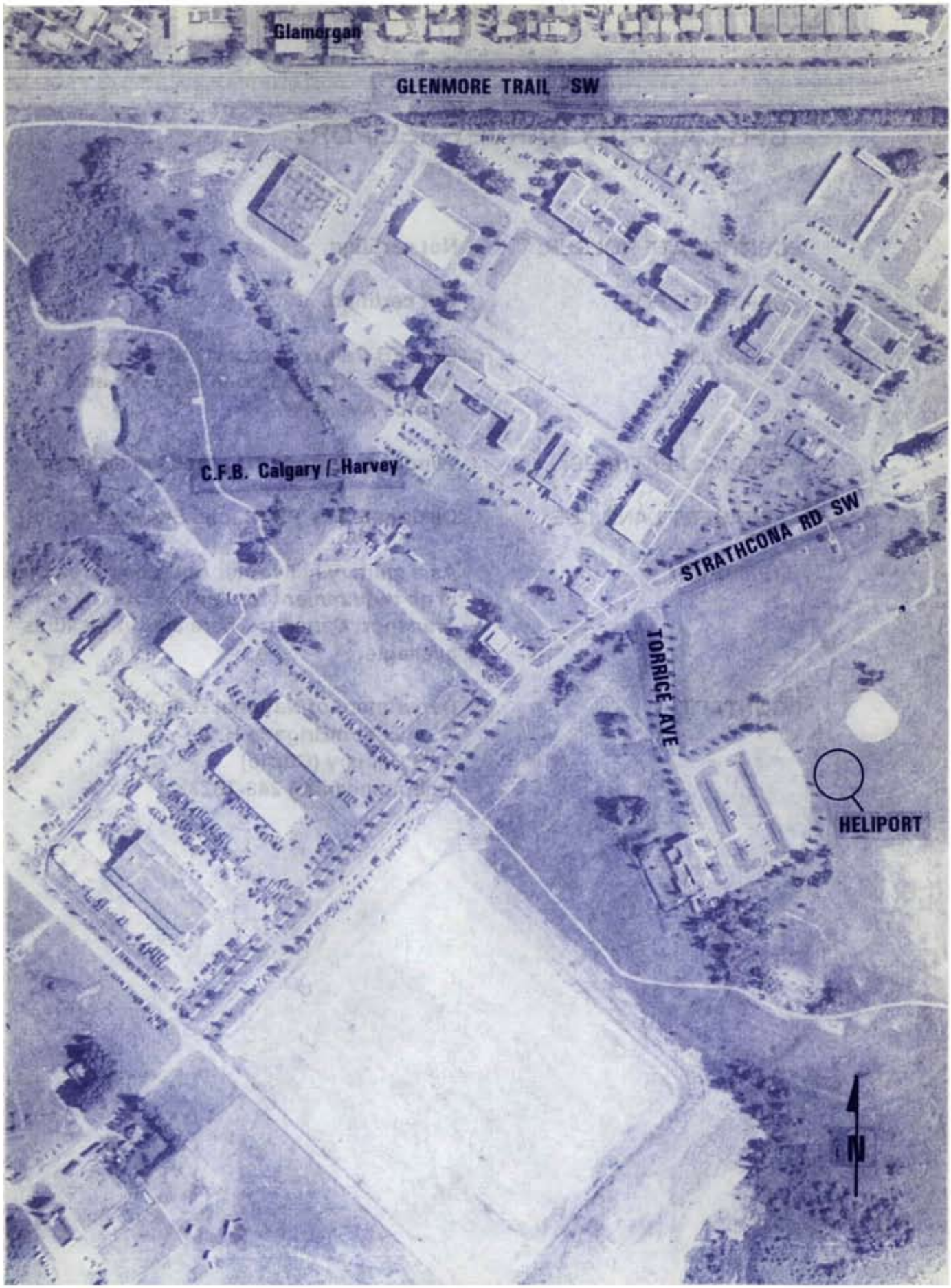
**Operator: Department of National Defence (403) 240-7343**

**Elevation: 3700' ASL**

Arr/Dep to be made over CFB Calgary. Note: Tower 100' at 150' NE

# CFB CALGARY CURRIE HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | Not certified |
| CERTIFIED FOR: | Not certified |
| LOCATION: | On CFB Calgary property north of Richardson Way S.W. and east of Sarcee Rd. S.W. |
| SPECIAL FEATURES: | Windsox, designated grass landing area. |
| ADJACENT LAND USE: | Designated as PS (Public Service Dstrict) |
| REMARKS: | As a military helicopter operating area there is no requirement for certification by Transport Canada. There are no facilities available. |
| CONTACT: | Department of National Defence<br>G3 Aviation Brigade H.Q.<br>CFB Calgary (Currie)<br>Telephone (403) 240-7323 |




## CALGARY / HARVEY HELIPORT

Scale 1:4000

Reference: Latitude N51°00' Longitude W114°09' Magnetic Dec. 19 E

Operator: Department of National Defence (403) 240-7323

Elevation: 3675' ASL

# CFB CALGARY HARVEY HELIPORT

| | |
|---|---|
| CERTIFICATE HOLDER: | Not certified. |
| CERTIFIED FOR: | Not certified. |
| LOCATION: | On CFB Calgary property at Harvey barracks off Strathcona Rd. S.W. and Torrice Ave. S.W. |
| SPECIAL FEATURES: | Windsox, designated grass landing area. |
| ADJACENT LAND USE: | Designated as PS (Public Service District) |
| REMARKS: | As a military helicopter operating area there is no requirement for certification by Transport Canada. There are no facilities available. |
| CONTACT: | Department of National Defence<br>G3 Aviation Brigade H.Q.<br>CFB Calgary (Currie)<br>Telephone (403) 240-7323 |

# APPENDIX E

## CHARACTERISTICS OF HELICOPTER NOISE

# HELICOPTER NOISE

## The Definition of Noise

Sound is defined as: *"Mechanical vibrations transmitted through an elastic medium, travelling in air at a speed of approximately 1100 feet per second at sea level"*. **NOISE** is described as **"SOUND WHICH IS HARSH AND UNPLEASANT IN NATURE".** For the purposes of helicopter noise the following narrative is intended to consider the current methods used to measure noise impact and to provide a reasonable method for assessing helicopter noise in the urban community.

An individual's sensitivity to loudness, frequency content of the sound, attitude toward the source of the sound, and activity being pursued by the individual at the time of the sound, determine whether a sound is judged to be noisy. In this instance the main concern is the intrusiveness of noise which is related to its duration and the disruption of community activity, particularly speech communication and sleep.

## Systems of Noise Measurement

There has been much discussion on the many approaches to noise measurement which relates to frequency, duration, intensity, tone, time of day, etc. and it is not intended to discuss the technicalities of each of these. There is however a need to provide a basic understanding of the systems of sound measurement and to provide the rationale for the method which is used for helicopter noise measurement in the community.

The basic measurement system for acoustical power or intensity is the **decibel (dB),** which is a logarithmic ratio of the measured value to a reference value. The decibel scale reduces a dynamic range of sound pressures to a more manageable range of sound pressure levels of only 0 to 120; zero indicating the reference minimum threshold and 120 the approximate threshold of pain. Zero decibel level does not mean an absence of sound, it merely implies that the level in question is equal to the reference level.

Because of the logarithmic units, normal addition and subtraction cannot be used directly on decibel quantities. Two sound sources, each producing a sound pressure level of 60 dB when measured in absence of each other, will produce 63 dB and not 120 dB when both are emitting at the same time. A 3 dB decibel change is barely perceptible to the human ear. These numbers are filtered to maintain a closer correlation with what the human ear actually hears. Thus, the term **dB(A),** where **"A"** represents this filtering or weighting which occurs in the measurement process.

There are several noise simulation systems related to aircraft movement and it is useful to have a basic understanding of their differences. Simply stated they are as follows:

**SEL** — **Sound Exposure Level**
A single event measure combining both the event's maximum intensity and its duration.

**Ldn** — **Day - Night Average Sound Exposure Level**
A 24 hour average of sound with a 10 dB weight factor added for night time sound. (ie. Between 10PM and 7AM)

| | |
|---|---|
| **Leq** | **Equivalent Sound Level**<br>The energy sound level, expressed in decibels, integrated over some specified time which provides a single-number measure of noise level averaged over some period of time. (eg. Leq(8) = 8 hours) |
| **EPNdB** | **Effective Perceived Noise Level**<br>A tone and duration corrected decibel equivalent of Leq. EPNL is used as the certification metric for helicopters by the US Federal Aviation Administration (FAA) |
| **NEF** | **Noise Exposure Forecast**<br>A logarithmic sum of EPNL index values of all expected aircraft operations during a forecast day with a 16.67 times weighting to all nightime operations. (10PM to 7AM) |

**A COMPARISON OF INDICES USED FOR NOISE IMPACT MEASUREMENT***

| **Quantity Described** | **Index Name** | |
|---|---|---|
| | **No Tone Adjustment** | **With Tone Adjustment** |
| Sound Level | A- weighted Decibel<br>**dB(A)** | Perceived Noise (Tone Corr.)<br>**PNTdB** |
| Single Event Exposure Level (Level & Duration) | Single Event Equivalent Level<br>**Leq(dB)** | Effective Perceived Noise Decibel<br>**EPNdB** |
| Long Term Noise Exposure (Incl # of operations) | 24 Hour Equivalent Level<br>**Leq or Ldn** | Noise Exposure Forecast<br>**NEF** |

(* Source: Transport Canada Noise Management Guidelines for Airport Managers - 1990)

Airports in Canada use Noise Exposure Forecasts (NEF) as a measure of future noise levels around an airport. These NEF values equate to the anticipated levels of public acceptance of noise, where at a value of 0 to 20 there would be no community reaction. Concern increases however as NEF values reach 30 to 40.

The Airport Vicinity Protection Area(AVPA) regulation, which directs community planning activity near airports, restricts residential development in areas above an NEF value of 30. AVPA regulations control development activities adjacent to the Calgary International Airport and the Canmore Municipal Heliport.

The generation of these NEF values is a lengthy process and is not considered essential for low usage heliports such as hospitals and private helipads.

The City of Calgary Planning and Building Department uses dB(A) measurements to monitor and enforce its noise by-law. The intent of this by-law is **"that all noise shall be reduced as far as possible compatible with normal activities of urban life and that unnecessary noise be eliminated."**

## Helicopter Noise Sources

The acoustical signature of a helicopter is partly due to the modulation of sound by the relatively slow-turning main rotor. This modulation attracts attention, much as a flashing light is more conspicuous than a steady one. This modulated sound is referred to as **blade slap.**

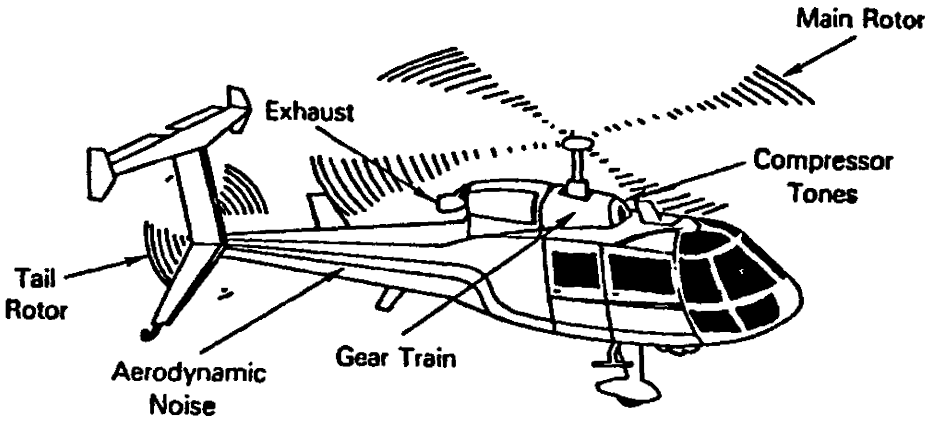
This blade slap is a significant source of helicopter noise and is caused by variable loads, both periodic and random, on the rotor lifting surfaces. Blade interaction also provides a substantial noise contribution as a blade moves through the atmospheric disturbance caused by the preceding blade.

The tail rotor, required only for single main rotor helicopters, is a substantial noise generator. Its spectrum includes narrow band tones, and also fluctuating noises caused by the interaction of the tail rotor and main rotor flow fields.

Piston engines, and gas turbines that produce strong compressor tones or exhaust noises, can be additional noise sources.

In addition to the aircraft itself, weather can impact helicopter noise; specifically wind and temperature. Wind carries sound in the direction it is moving, and can, in high wind conditions, create a background noise in itself, which tends to reduce the annoyance of helicopter sound. Conversely, wind driven sound in the direction of populated areas can increase helicopter noise to an annoying level.

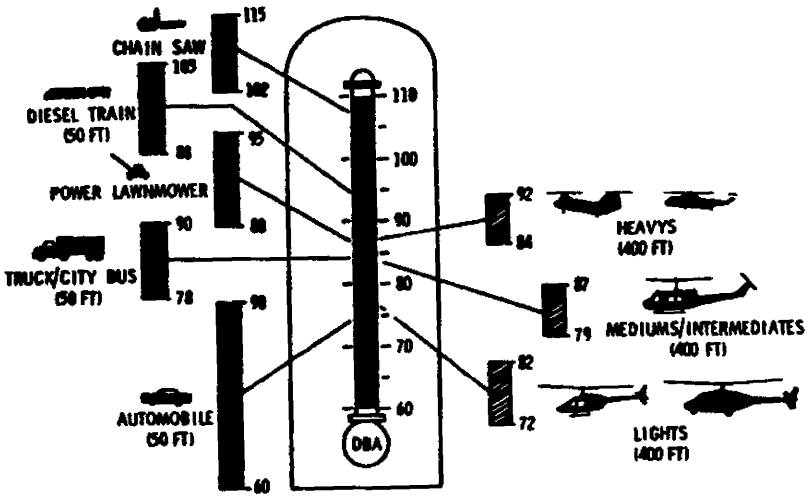
Because sound travels faster in warmer air, the normal temperature gradient, which is negative (the temperature decreases with altitude), results in the sound propagation effectively curving upward and away from the populace. However, under temperature inversion conditions, when the normal gradient is reversed, an abnormally high portion of the sound energy is directed back toward the ground.



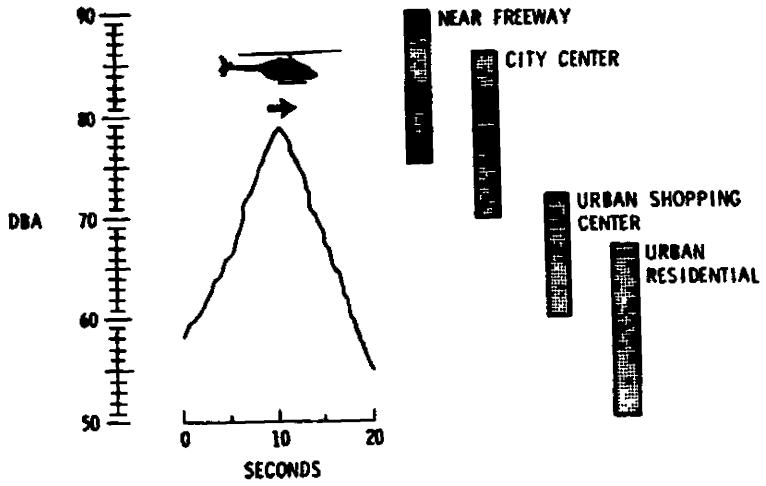

**Helicopter Noise Sources**
(Source:"Community Rotorcraft Transportation Benefits And Opportunities - HAI")

Helicopter noise is considered to be one of the most important characteristics influencing where and how helicopters can be used in urban areas (Safety being foremost). The helicopter is a low flying aircraft and, as a result, it frequently comes within the audible range of the community. Operation of the helicopter creates a noise footprint during approach, landing, takeoff and departure that is considerably less intense than that of a fixed wing aircraft.

The helicopter noise, within the footprint region, is comparable to other sounds that are acceptable to the community, if only because of familiarity. Light trucks and city buses are examples of the helicopter noise equivalent, and these noise events normally occur with greater frequency compared to helicopter noise events.




**Comparison of Sounds**

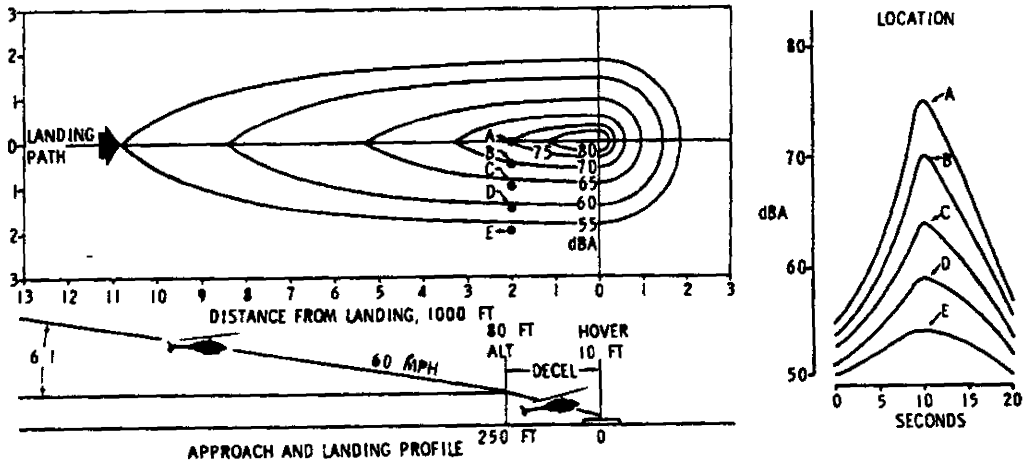



**Comparison to Ambient Noise**
(Source: HAI "Community Rotorcraft Transportation Benefits and Opportunities)

## Helicopter Noise Measurement

Two measurement standards have emerged from the maze of candidates as the standards for helicopter noise measurement. These are **EPNdB** (Effective Perceived Noise) for vehicle noise emission, and **Ldn** (Day-Night Sound exposure Level) for environmental response. The EPNdB provides a measure of certain characteristics of noise, namely the presence of tones and duration of the sound that is considerably more descriptive than dB(A). Unfortunately, an EPNdB measurement instrument is expensive compared to dB(A) measurements. Communities, however, have measured noise from various transportation and other sources for many years using the dB(A) unit. Helicopter noise, therefore, measured in this unit can be more easily compared to noise associated with other transportation vehicles.

Using the **dB(A)** unit of measurement, and the BELL 206B helicopter as the noise "role model" the chart shown below provides some insight into the helicopter noise footprint at a heliport.




**Bell 206B Flyover Noise/ Time History**
(Source: Bell Helicopter TEXTRON)

For initial assessment of new heliports (or reassesment of existing heliports) related to noise issues it is suggested that the basic dB(A) be used as the measurement system. **The addition of helicopter activity using the heliport should not increase the ambient noise levels of the area in which it is (to be) located.**

## Helicopter Noise Reduction

Helicopter manufacturers are continuously seeking ways to improve the operating sound qualities for their aircraft. Planned changes in the design of the main rotor to minimize blade slap and sound attenuation changes to the tail rotor which incude installation of a shroud (or elimination of the rotor) will greatly reduce this annoying tonal quality.

Pilot operation which emphasizes noise reduction are practiced routinely in urban areas. Helicopter owners, manufacturers, operators, and support agencies energetically promote a **Fly Neighborly** program which has a significant impact on reducing helicopter noise.

Selection of heliport sites and flight corridors which are away from noise sensitive residential areas can have a positive effect of community acceptance. Locating flight routes along high traffic roadways and heliports in commercial or industrial areas will minimize noise complaint.

## Planning Considerations

Planing considerations related to heliport and flight corridor selection related to reducing the noise impact should include the following:

### Land Use Compatibility

Select locations which are away from noise sensitive areas which will generate unwanted complaint and possibly restrictions on operations which will negatively affect the heliport (reduced hours of operation, reduced operating frequency,etc.). Utilize major road systems, railway right-of-ways, and river locations for access corridors to heliports.

### Public Consultation

Prior to any development there should be a well planned consultation process to inform the public of the specific heliport proposal. This consultation should provide details of the proposed operation including helicopter type to be used, and frequency of operations with particular emphasis on minimizing the noise impact. A public acceptance program should be established which will engender media support, promote positive public relations, and enact a program to prevent or resolve complaints.

### Noise Abatement

Adoption of a **Fly Neighborly** program will reduce the need for a formal noise restriction policy. Selection of a suitable site (noise compatible) will also reduce the requirement for serious operational controls. There are several guidelines which can be used if flight over noise sensitive areas is unavoidable. These are:

- Maintain an altitude of at least 1000 feet where possible,
- Reduce speed if helicopter is flying above normal crusing speed,
- Observe low-noise speed and descent settings,
- Avoid sharp maneuvers, and
- Use high takeoff and descent profiles.

## Acknowledgements

The subject of helicopter noise is complex and this outline is intended to provide a basic level of insight into the noise issues and its impact on the community, and to provide a means of direction for developing future helicopter facilities. The following references were used in research:

Bruel & Kjaer, **"Acoustic Noise Measurements"** 5th Edition, June 1988

Federal Aviation Administration, **"Noise Assessment Guidelines For New Heliports"** FAA AC150/5020-2 , December 1983

Federal Aviation Administration, **"Flight Operations Noise Tests of Eight Helicopters"** FAA EE-85-7, August 1985

C.R. Cox, **"Flying Neighborly - How To Operate Medium Helicopters More Quietly"** Bell Helicopter Company

Federal Aviation Administration, **"Helicopter Noise Survey For Selected Cities In The USA"** FAA 1985

Urban Dynamics, **"Aircraft Noise Management Guidelines For Managers Of Canadian Airports"** August 1989

Helicopter Association International, **"Community Rotorcraft Transportation Benefits and Opportunities"** NASA CR - 166266 , December 1981

Helicopter Association International, **"Fly Neighborly Guide"** February 1992

# APPENDIX F

## AIR REGULATION 534
## (AERONAUTICS ACT)

# AIR REGULATION 534 (AERONAUTICS ACT)

(1) In this section,

**"police authority"** means the Royal Canadian Mounted Police, Ontario Provincial Police, Surete du Quebec, Canadian Coast Guard or any municipal or regional police force established pursuant to provincial or territorial legislation; and

**"special purpose operation"** means an operation in which an aircraft is flown for the purpose of spraying, dusting, seeding, crop fertilizing, inspection of crops or livestock, pipeline or powerline patrolling, aerial photography and survey or other operation of a similar nature, and also includes helicopter external cargo operations and pilot training.

(2) Except as provided in subsections (4), (5) and (6) or except in accordance with an authorization issued by the Minister, unless he is taking off, landing or attempting to land, no person shall fly an aircraft

(a) over the built-up area of any city, town or other settlement or over any open air assembly of persons except at an altitude that will permit, in the event of an emergency, the landing of the aircraft without creating a hazard to persons or property on the surface of the earth, and such altitude shall not in any case be less than 1,000 feet above the highest obstacle within a radius of 2,000 feet from the aircraft; or

(b) elsewhere than over the built-up area of any city, town or other settlement or over any open air assembly of persons at an altitude less than 500 feet above the highest obstacle within a radius of 500 feet from the aircraft.

(3) For the purposes of subsection (2), an aircraft shall be deemed to be over the built-up area of any city, town or other settlement or over any open air assembly of persons where that built-up area or open air assembly of persons is within a radius of 2,000 feet from the aircraft.

(4) A person may fly an aircraft at an altitude lower than those specified in subsection (2) where the flight is conducted without creating a hazard to persons or property on the surface of the earth and

(a) the aircraft is operated in the service of a police authority within the geographic jurisdiction of the government that established that police authority;

(b) the flight is necessary for the purpose of saving human life; or

(c) the aircraft is flown for firefighting or air ambulance operations.

(5) A person may fly an aircraft at a lower altitude than that specified in paragraph (2)(b) where

(a) The flight is conducted without creating a hazard to persons or property; and

(b) the aircraft is flown in a special purpose operation of a nature that necessitates the flight of the aircraft at such lower altitude.

(6) A person may, over non populous areas or over open water, fly an aircraft at a lower altitude than that specified in paragraph (2)(b) where

(a) the flight is conducted without creating a hazard to persons or property; and

(b) except for an aircraft operated in accordance with subsection (4) or (5), the aircraft is not flown at a distance less than 500 feet from any person, vessel, vehicle or structure.

(7) Except in accordance with an authorization issued by the Minister, no person shall cause any aircraft to take off or attempt to take off from, land on or attempt to land on, any surface within the built-up area of any city or town unless

(a) that surface is an airport or a military aerodrome;

(b) the aircraft is operated in the service of a police authority within the geographic jurisdiction of the government that established that police authority; or

(c) the take off or landing is necessary for the purpose of saving human life.

# APPENDIX G

## PERSONS INTERVIEWED

**CALGARY HELIPORTS MASTER PLAN STEERING COMMITTEE**
All Members

**CITY OF CALGARY**
**Planning & Building Department**
Richard Parker *(Director)*
Deb Day *(Manager, Downtown Planning)*
Mary Axworthy *(Senior Planner, Downtown Planning)*
Ian Fawcett *(Senior Development Officer)*
Jack Saunders *(Head, Land Use Planning)*
George Sykora *(Head, Building Inspections)*
**Emergency Medical Services Department**
Tom Sampson *(Manager, Operations & Support Services)*
**Fire Department**
Morris Simonin *(Division Chief)*
Gordon Jeffrey *(Firefighter)*
Reg Varga *(Disaster Services Officer)*
**Police Service**
Superintendent Rick Hanson *(Centralized Support Division)*
Sergeant Kevin Brookwell *(Centralized Support Division)*
**Parks & Recreation**
Todd Reichardt *(Insect Abatement)*

**TRANSPORT CANADA**
Gordon Lowe *(Chief Air Traffic Controller, Calgary)*
Mike Paslawsky *(Civil Aviation Inspector, Edmonton)*
Bill Yearwood *(Regional Rotary Wing Section, Vancouver)*
Guy Heneault *(Civil Aviation Aerodrome Policy & Standards, Ottawa)*

**CALGARY AIRPORT AUTHORITY**
Clark Norton *(Superintendent, Environment)*
Terry Thompson *(Environmental Technician)*

**CALGARY CONVENTION CENTRE**
Paul Nannelli *(Acting General Manager)*

**CALGARY CONVENTION & VISITORS BUREAU**
Richard Hudson *(Director of Marketing)*

**CALGARY EXHIBITION & STAMPEDE BOARD**
Gordon Fache (Assistant General Manager)

**HELIPORT OPERATORS**
**Alberta Children's Hospital**
Linda Traquair *(Director of Planning)*
**Bow Crow**
George Benoit *(Alberta Forest Service)*
**Broadcast House**
Anonymous Spokesperson for Max Farmer *(Chief Engineer, CFCN)*
**Calgary General Hospital**
Gary Duke *(Planning Department)*
**Calgary International Airport**
Fred Purich *(Vice President, Economic Development, Calgary Airport Authority)*
**Downtown**
Jim Lambert *(Transportation Department, City of Calgary)*
**Foothills Hospital**
Bud Webster
**Rockyview Hospital**
Gary Taylor
**Southport**
Fred Purich *(former President, Richfield Development Ltd.)*
**Westport**
Russell Gerrish *(private owner/operator)*
**CFB Calgary/Currie and Harvey**
Capt. Claire De Repentigny *(Department of National Defence)*

**HELICOPTER OPERATORS/MANUFACTURERS**
**Alberta Shock Trauma Air Rescue Society (STARS)**
Capt. Greg Curtis *(Aviation Manager)*
**ALC Airlift Canada Inc.**
Ron Ellard *(Director of Business Development)*
**Alpine Helicopters Ltd.**
Dave Gubbels *(Alberta Manager)*
**Bell Helicopter, Textron**
Ken McDonald *(Marketing Manager, Western Canada)*
**Calgary Helicopters**
Wayne Johnson *(Operations Manager)*
**Canadian Helicopters Ltd.**
Steve Matthews *(Marketing Manager, Western Division)*
Doug McLelland *(Base Engineer, Canmore)*
**Canmore Helicopters**
Rocky Cooper *(President)*

**MISCELLANEOUS**

Michael Adams *(Aviation Planner, Denver Regional Council of Governments, Denver, CO)*
Paul Bates *(Director of Planning, Town of Canmore, AB)*
Lynn Beconis *(Department of Transportation, State of Hawaii, Honolulu)*
Major Dean Black *(Department of National Defence, 408 Squadron, CFB Edmonton)*
Martin Buckley *(Director of Legislative & Personnel Services, Town of Canmore, AB)*
J. P. W. Friedberger *(Chief Executive Officer, British Helicopter Advisory Board, Surrey, UK)*
Ken Glaze *(Helijet Corp., Vancouver, BC)*
Jim Meyer *(Director, Airport and Commercial Development, Edmonton Municipal Airport, Edmonton, AB)*
John Sanders *(Aries Consultants Ltd., Morgan Hill, CA)*
Danny Sitnam *(Helijet Corp., Vancouver, BC)*
Craig Smith *(Senior Aviation Planner, Portland International Airport, Portland, OR)*
Harold Warner *(Aero Dynamics Aerostats and Promotions Inc. & Alberta Free Balloon Society, Calgary, AB)*
Debby Zavadil *(Helicopter Association International, Alexandria, VA)*

# APPENDIX H

## DOCUMENTATION RESEARCHED

1. **"Calgary Heliports Master Plan"** (letter from R.G.Bell, Transport Canada to Mayor Ralph Klein, City of Calgary; February 24, 1988)
2. **"Federal Contribution for a Heliport Master Plan for Calgary"** (Press Release, Transport Canada; September 11, 1992)
3. **"Eau Claire Estates: Memorandum of Project Agreement"** (between Eau Claire Estates Ltd. and The City of Calgary; October 1, 1979)
4. **"Downtown Heliport Location Study"** (UMA Engineering Ltd. for the City of Calgary Transportation Department; June, 1988)
5. **"Heliport, Canada Olympic Park"** (Report to Calgary Planning Commission on Development Permit Application by the Calgary Olympic Development Association; August 5, 1992)
6. **"Heliport, Canada Olympic Park"** (Supplementary Report to the Calgary Planning Commission from the Planning & Building Department; September 30, 1992)
7. **"A Guide to the Development Permit Process"** (The City of Calgary Planning & Building Department; 1991)
8. **"Public Participation in the Planning Process: Planning Education Program"** (The City of Calgary Planning & Building Department; May, 1993)
9. **"Calgary Peacetime Disaster Plan: Executive Summary and Authority"** (Calgary Fire Department, Disaster Services; 1985)
10. **"Shock Trauma Air Rescue Society (STARS): 1991/92 Annual Report"**
11. **"STARS: Hospital Heliport Information Package"** (Alberta Shock Trauma Air Rescue Society; undated)
12. **"Canada Flight Supplement: Canada and North Atlantic Terminal and Enroute Data"** (Canada Centre for Mapping; Department of Energy, Mines and Resources; updated every 56 days)
13. **"Heliport and Helideck Standards and Recommended Practices"** (Transport Canada; April, 1985)
14. **"Report on Helicopter Accidents in Calgary and Vicinity: 1976 - 1990"** (Transport Canada; 1993)
15. **"Calgary International Airport: Draft Master Plan"** (Calgary Airport Authority; 1992)
16. **"OCO'88 Transportation Special Services: Final Report"** (1988 Olympic Winter Games, Calgary)
17. **"Kananaskis Village Helistop"** (memorandum from E.S.Marshall, Manager, I.D.No.5; March 1, 1990)
18. **"Canmore Airport Vicinity Protection Area Regulation"** (The Alberta Gazette; 1991)
19. **"Terms of Reference for Studies of the Canmore Municipal Heliport to the Year 2002"** (Town of Canmore Heliport Commission; 1993)
20. **"Edmonton Municipal Airport Noise Policy Study: Executive Summary"** (1983)

21. **"Edmonton Municipal Airport: Aircraft Noise Management System"** (1989)
22. **"Airport Noise Rules"** (Edmonton Municipal Airport; 1989)
23. **"Noise Abatement Rules III"** (Edmonton Municipal Airport; July, 1989; expiry date July 31, 1993)
24. **"Special Aviation Events and Heliport Development in Edmonton: Approval Procedures"** (Transport Canada and The City of Edmonton; 1989)
25. **"Denver Regional Heliport Study: Executive Summary"** (Denver Regional Council of Governments; 1986)
26. **"Denver Regional Heliport System Implementation"** (Denver Regional Council of Governments; 1993)
27. **"Heliports: A Helicopter Study Finds an Active Market in Denver, and the Probable Reopening of its Downtown Heliport"** (Kathleen Kocks; Rotor & Wing International; September, 1986)
28. **"Portland Downtown Public Heliport: Master Plan"** (Bureau of General Services, City of Portland, Oregon; 1986)
29. **"Hawaii State Helicopter System Plan: Final Technical Report"** (Department of Transportation, Airports Division, State of Hawaii; 1989)
30. **"New Orleans Downtown Heliport"** (Information Brochure; 1986)
31. **"Helicopters in the Fire Service: A Study of the Los Angeles County Fire Department's Air Operations Division"** (Gordon A. Jeffrey, Firefighter, Calgary Fire Department; 1991)
32. **"The Helicopter in Law Enforcement"** (Bell Helicopter Textron; January, 1992)
33. **"Airborne Law Enforcement: Operations Survey and Guide"** (Rotor & Wing International, Special Supplement; sponsored by Bell Helicopter Textron; 1992)
34. **"Air Medical Transportation"** (Bell Helicopter Textron; 1991)
35. **"Measuring Safety in Single and Twin-Engine Helicopters"** (reprint from Flight Safety Digest; August, 1991)
36. **"The Sound of Helicopter Operations"** (C.R.Cox, Research Project Engineer, Bell Helicopter Textron; October, 1968)
37. **"Flying Neighborly: How to Operate the Medium Helicopter More Quietly"** (C.R.Cox, Research Project Engineer, Bell Helicopter Textron; undated)
38. **"Fly Neighborly Guide"** (produced by the Fly Neighborly Committee, Helicopter Association International; revised February, 1992)
39. **"Visibility Unlimited: A Public Communications Manual for Helicopter Operators"** (Helicopter Association International; February, 1993)