DILLON CONSULTING

COWICHAN VALLEY REGIONAL DISTRICT

Air Transport Feasibility Study

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Cowichan Air Transport Feasibility Study

Dillon Consulting Limited (Dillon) is pleased to submit this Feasibility Study report to the Cowichan Valley Regional District.

The preparation of this study has incorporated stakeholder engagement, input from the Cowichan Valley Regional District and Municipality of North Cowichan, statistics gathered from various agencies, and research on comparative airports.

Through the development of this feasibility study, a number of assumptions have been made. Should the assumptions change, the outcomes will also change.

It is recognized that there may be a demand for an airport in the Cowichan Valley. However, financial viability is contingent upon sensitivities and assumptions in terms of the capital to develop the airport, as well as the operating funds. Ultimately, the decision on the feasibility of the development of a new airport for the Cowichan Valley will depend on the success of the "owner" to obtain capital up front for development and the strength of the marketing of the airport to attract tenants and create revenue.

Sincerely,

DILLON CONSULTING LIMITED

Patricia A Maloney, FCIP, RPP
Project Manager

Table of Contents

Figures

Tables

Appendices

Executive Summary

Dillon Consulting Limited (Dillon) has completed this Cowichan Valley Air Transport Feasibility Study with the overall goal to determine if the development of an airport is a feasible endeavour.

Regional/community airports provide a significant value in a community which is often difficult to measure. These services include:

- Supporting personal travel and tourism;
- Providing essential air services, including air ambulance, search and rescue, emergency evacuation, and forest fire response;
- Scheduled and charter air services that link communities to regional, national, and international markets for goods and services;
- Commercial air services (for example, aerial photography and flying schools); and
- Corporate aircraft and general aviation.

This study looks at and estimates the future demand for an airport, the potential revenues, the potential users and tenants, and the overall benefit to the community.

The process involved key stakeholders and airport operators, the Airport Advisory Panel, CVRD staff, research, and economic analysis. The viability or feasibility of a Cowichan Valley Airport is dependent upon accessing capital, gaining tenants quickly, and a strong business plan.

The general consensus of the stakeholders is improved aerodrome facilities would be a great benefit to the community. With the increase in emergency evacuations, the construction of the new hospital, the overall growth of the area and the risk of isolation during a major earthquake event, an improved aerodrome would be essential.

While a specific location for a future airport was not defined in this study, costs for the development of a new airport were developed. The costs were based on the purchase of a site that would be close to a highway, close to the hospital and yet a sufficient distance from a built up residential area. The optimum airport would have a 3,500 foot paved runway with sufficient land to allow for a minimum of 60 acres of groundside industrial land and airside land to allow for hangar development. Assumptions were made about who the airport would attract as users and tenants. The concept is to keep the airport as a registered aerodrome but to ensure sufficient land to apply for Aerodrome Authorization should a commercial carrier want to fly into the Cowichan Valley airport.

Several other BC airports were considered for their services and fees and the economic assessment developed a fee structure for future tenants. A long term lease would support development and encourage investment. The total ultimate cost of developing this airport is approximately $20 million. Fund sources would include BC Air Access grant program, partnerships with industry, health and emergency services and various forms of fundraising.

The next steps would be for an airport location study to be completed that would look at locational options in the Cowichan Valley, determine the most suited site and complete the studies required to confirm the site for a regional airport.

1.0 Background

The Cowichan Valley Regional District (CVRD), in collaboration with Economic Development Cowichan, issued a Request for Proposals (RFP) for a qualified consultant to prepare an Air Transport Feasibility Study. Dillon Consulting Limited was hired to complete this study.

Duncan Airstrip, Transition Zone

It has been determined that air transport is a vital economic consideration for the Cowichan Valley. Public safety issues, continued growth of the community, and support for business/industry, are key factors in the consideration of developing a stronger air transport system. There appears to be support for expanded Air Transport for links to tourism, industry, technology, post-secondary institutions and manufacturing. On-time delivery, courier, employee transportation, charter flights, commercial passenger flights, and firefighting are all areas which depend heavily on air transport.

It is noted that the Regional District board is comprised of 15 members representing nine electoral areas and the incorporated municipalities of The Town of Lake Cowichan, the Town of Ladysmith, The City of Duncan and the Municipality of North Cowichan. The Regional District provides a broad range of services, both mandated by the Province (such as solid we, emergency planning and land use planning) and those services mandated by the ratepayers (such as economic development and regional parks).The Regional District cannot take on any other major services unless mandated by either the Province or the electorate. Air service has not been mandated at this time.

Funds to operate the various Regional District services are provided through property taxes, fees, charges and grants. The Regional District web site states "Unlike municipalities, regional districts are required to match the costs and benefits of its services to the residents that benefit from them; this means residents pay for the services they receive".

The purpose of the Air Transport Feasibility Study is to determine the advantages of expanded air transport balanced with the cost of providing this service. The Feasibility Study looks at the various levels of government regulations and financial supports, develops goals for air transport, and then considers options as to how to achieve or meet those goals.

The RFP identified five purposes of this study:

- Examine the business case;
- Quantify the demand for new services;
- Outline the potential scope of the air transport infrastructure;
- Identify a sustainable business model; and
- Define the legislative, zoning, permitting, and community consultation processes.

The study has considered the existing infrastructure, relationships with existing airports, and the overall growth of the region. Through stakeholder engagement, this study identifies the optimum air transport service for the valley as a registered aerodrome with a 3,500 foot paved runway and a minimum of 60 acres for groundside light industrial/commercial development located within five minutes of a highway.

It was clear from the beginning that the current Duncan Butler Brothers airstrip is not a feasible long term solution for a regional/community airport for the Cowichan Valley. The lack of long-term stability, lack of land for revenue generation, the ownership model, and inability to expand the runway to the optimum length make this site inappropriate for a long term aviation solution for the Cowichan Valley.

Butler Brothers Gravel Pit

The rationale for completing this feasibility study was guided by the current deficiencies in the Valley as previously identified to the Board, including:

- The Cowichan Valley has been identified as the gap in the south Island air transport system, specifically for emergency services in the event that the highway is closed and connectivity to Nanaimo and Victoria is lost;
- Other communities leverage their airports for economic development and public safety while securing significant funding through a variety of sources;
- The Cowichan Valley does not have an air facility to support the new hospital. Fixed wing is a common form of transportation for medical emergency trips;
- The Cowichan Valley does not have an air facility to support the Province's earthquake response program;
- Air transportation fosters expansion of existing and development of new businesses, while generating well-paying jobs, supporting expanded population and allowing for innovation; and

- Changes in general aviation on South Vancouver Island will create opportunities in the Cowichan Valley.

The scope of this study was not to find the specific site for a future airport, but to outline the feasibility of continuing the search and studies to identify the specific site. The site identification and selection will require additional study to determine the suitability of:

- Runway length potential and orientation;
- Weather, including prevailing wind and suitability for year-round use;
- Compatibility with Transport Canada airspace and airport configuration requirements;
- Ease of ground transportation access;
- Proximity to potential users;
- Size and general suitability for a financially viable, mixed-use facility;
- Potential for expansion;
- Land owners, implications for governance and operation;
- Land and other costs including airside infrastructure (i.e., runway, taxiway, apron, weather station, GPS approach, and terminal building) and groundside infrastructure (such as potable water, sanitary, storm water, internal roads, access road upgrades, power, and broadband);
- Funding sources that could apply;
- Impact on the local community;
- Community engagement;
- Constraints to overcome and strategies; and
- Political support.

Duncan Airstrip, Runway

The cost of completing this additional study has been factored into the costs of the business model.

1.1 History

The small Duncan airstrip has been operating in the Cowichan Valley for over 50 years. The Duncan Flying Club was established in the 1950's and operated out of Cassidy Airport. In 1967 the Chamber of Commerce formed the Cowichan Airport Society and the current airport on the Butler Brothers land was constructed. In 1969 the Duncan Flying Club was incorporated. There have been several

investigations into siting and building a new airport in the Valley. The first in 1971-72, followed by 1977 and 1979-80, and finally in 1986. Not one of these studies attempted to demonstrate the viability for a new airport. In 1986 the Cowichan Community Airport Society was incorporated with the purpose of promoting the establishment and maintenance of a community airport in the Cowichan Valley. The results of this study did not include finding a viable airport site and the group disbanded several years later. The need to find a viable site close to the services and population and yet separate from residential development, and the ability to find the finances to construct and operate the airport have been the challenge from the beginning.

1.2 Current Operations

The current Duncan airstrip is located on land owned by the Butler Brothers gravel operation and leased to the Duncan Flying Club. The current airport has a 1,500-foot paved airstrip, a small area for T-hangars and a club house structure with a trailer for the use of the custodian. There is parking for four vehicles. The airstrip is situated in a portion of the gravel pit that is currently not required for gravel extraction, however, Butler Brothers may require this gravel at any time.

Duncan Flying Club Fuel

The lease to the Flying Club is a five year lease.
The sublease to the hangar owners is 1 to 2 years. This is not sufficient to encourage significant investment. The runway length is extremely limiting to the type of aircraft that can use it. The Butler Brothers do not support any government investment that may hinder the profitable operation of the gravel pit. They produce many speciality products there and need to ensure that they have the unencumbered space to continue the operation.

The Flying Club posts notices to airmen for the airport for wildlife, winds and extreme drop offs on the take-off and approach and transition ends of the runway. The airport provides fuel sales which is a revenue source for the Flying Club. The Flying Club also makes a variety of contributions to the community including programs for youth and providing weather briefings for incoming medevac flights.

1.3 Regional Trends

During the preparation of this study there were several regional trends identified:

Duncan Fly Club, Clubhouse and Terminal

- Growth – The region is growing at a slow but steady rate and as it grows, more services will be provided that would benefit from the provision of a regional/commercial airport. The Cowichan Valley registered a population of 83,739 in the 2016 Federal Census. This is a 4.2% increase from the 2011 population of 80,332.
- The Cowichan Valley is located on the south end of Vancouver Island. The Cowichan Valley covers 3,474 km^2 of forested land, with significant agriculture, extensive tourism, and outdoor recreation opportunities. There are four municipalities within the Cowichan Valley boundary: City of Duncan, Town of Ladysmith, Town of Lake Cowichan and the Municipality of North Cowichan plus nine electoral areas.
- The Cowichan Valley is sandwiched between the City of Nanaimo and the Nanaimo Airport and the City of Victoria and the Victoria International Airport. Downtown Duncan is a 29 minute drive from the Nanaimo Airport and a 79 minute drive from the Victoria Airport. This provides a very high level of air service. However, there are several bridges between Duncan and the two municipalities and as such, should a major emergency event occur such as an earthquake which results in any of those bridges being damaged, access may be cut off, leaving the Cowichan Valley isolated. In this event the existence of an airport would be critical for the evacuation of residents and non-residents and the delivery of essential supplies and services.
- One of the key economic initiatives for the Cowichan Valley is the promotion of tech companies. While the current tech companies have not indicated that they would anticipate much use of a regional/community airport, it has been demonstrated in other communities that if there is a viable airport, industry will use the airport. This can include flying in executives, clients, and specialists. A key goal of the CVRD is to increase the number of tech companies in the next few years, bringing in higher paying jobs and creating innovative products.
- As with many communities on Vancouver Island, the average age of residents is increasing. This trend of aging baby boomers is universal. An aging population requires more services, they have the money to make things happen and are consumers.

- New Hospital – the new hospital is under design and is scheduled to open in 2024. This will bring more medical personnel and related businesses into the Valley. Having a nearby, reliably accessible alternate in the event that the hospital helipad is not available is highly desirable.
- Promotion of tourism, recreation, and entertainment – tourism and outdoor recreational activities are growing in the Valley. In addition to the increased volume of people enjoying the valley, the recreationalists are becoming more involved in high risk activities such as mountain biking. These activities are responsible for accidents and injuries and will create a stronger dependency on the hospital.
- Support for small unique commercial ventures – The Cowichan Valley community supports small unique commercial ventures. There have been many new businesses such as micro distilleries that have opened in the region. There is a shortage of serviced light industrial land in the area. The land at the new airport would provide options for large and small lots with good access and transportation options.
- Just in time delivery – Many of the small businesses that are opening in the Duncan area may not be linked to a large supply chain and as such may have high value, low volume products that need to be delivered in a short time frame and may be coming from great distances. An airport could provide the courier, Just-in-time, Amazon, and Wayfair-type delivery of product and materials and provide a location for shipping out online purchases.

1.4 Stakeholder Engagement

During the course of the preparation of this feasibility study, a number of people were consulted and engaged to collect information about the potential demand for an airport, the potential uses that could locate at the airport, and the potential revenue that the airport could generate. Over the course of three months, a number of people were interviewed, meetings held and some of these stakeholders included:

- Project Advisory Panel;
- Operations Manager from the Victoria International Airport;
- Airport Manager for the Nanaimo Airport;
- Local business people;
- Local pilots and aircraft owners;
- Butler Brothers (owner of the current Duncan Airport;
- Duncan Flying Club;
- Both the Nanaimo and Victoria Flying Club representatives; and
- Municipal Planning and Economic Development Staff.

Cowichan Tribes were contacted several times, offered meetings and invited to the Airport Advisory Committee meetings but did not take up the invitations.

Generally there was concern regarding the future of the existing Duncan airstrip and support for the development of a new airport. However, there was no clear indication that partnerships or financial support was forthcoming. This is a reasonable outcome given the fact that the reality of a new airport is not a tangible project yet. There was also concern that the user costs of a new airport would be high.

The idea of a new airport certainly generated some conversation about new economic development opportunities. One of the primary goals for a new airport seemed to be the provision of groundside industrial land. Serviced industrial land close to a major highway or road is in short supply and as such the lands on the airport property would be highly desirable for light industrial uses.

All of these concerns are valid and should be addressed should the airport project move forward.

2.0 Into the Future

The Cowichan Valley Air Transport Feasibility Study has determined that there is a certain demand for an airport. Sourcing the location and the funding will be a challenge. However, the vision presented here provides direction for continuing the studies and the work to develop a regional airport.

2.1 Alignment with Regional District Policies

The Cowichan Valley has several Official Community Plans and Zoning Bylaws regulating the land uses in the individual municipalities or electoral areas – those for the nine electoral areas are currently being harmonized. Without having a potential specific site for a future airport, these documents will be reviewed once a site has been selected (if selected). However, there are documents that provide direction to the entire Cowichan Valley including the following. The Air Transport Feasibility Study must align with these documents.

2.1.1 Cowichan 2050 Regional Collaboration Framework

The Regional Collaboration Framework is a call to action for regional collaboration rather than the traditional concept of individual jurisdictions. This approach to regionalism focuses on governance, process, cross sectional coalitions, collaboration, voluntary agreements and building trust. The development of a regional airport would be the quintessential collaboration and governance challenge. In addition, the development of a regional airport would meet the desire for expanded and broadened transportation options.

REGIONAL ECONOMY SNAPSHOT

- **Local businesses are optimistic.** A 2016 regional Business Leaders Survey found that the business community is optimistic about growth.
- **There is a lack of skilled labour.** The same survey identified a regional skills shortage as the top obstacle for local business.
- **Services, construction and tourism are growing.** According to the last census, the service industry (health care, social services, transportation, warehousing, finance & insurance), construction and tourism are the fastest growing employment sectors in the region.
- **Our economy is regionally interconnected.** Many Cowichan region residents, particularly in Area D, Duncan, and Ladysmith, work outside of the region in the Victoria or Nanaimo area.

The Liveability section addresses the regional economy and addresses employment. The Airport would provide opportunities for more diverse employment opportunities. In addition, resiliency is addressed. An airport would also provide the emergency and evacuation potential in the event of an earthquake or other major catastrophic event. The power outage of December 2018 demonstrated that the Cowichan Valley community is vulnerable to being isolated and that air services would increase the opportunities for provision of supplies, evacuation of the injured and connectivity with other communities.

2.1.2 Industrial Land Use Strategy

In March 2019, the Industrial Land Use Strategy was released. The findings of this study were quite extraordinary, including:

- Less than one half of one percent of the total land base is zoned for industrial land; and
- The picture of industrial jobs in Cowichan is changing from resource based jobs to technology, manufacturing and distribution.

The Reports states "as competition and demand for industrial land becomes more acute in Cowichan, the relationships that open the door to new, innovative and sustainable industrial land use development will ultimately define the success of the strategy".

The report identifies a lack of industrial/commercial land and indicates that the value of industrial land at the time of preparing the report ranged between $450,000 and $600,000 per acre of land. The demand is for smaller lots (one half to two acres in size) and leaseholders are looking for smaller spaces (1,000 to 2,000 sq.ft). The report goes on to address air transportation:

> *6.4.1 Air Transportation*
>
> The CVRD is exploring the development of an Air Transportation Study that will look at for supporting the emergency management, fire protection, and sector development aspirations of the region. The proposed study should also explore the feasibility of establishing a dedicated industrial park that will directly benefit from being located with an airstrip.

Non-residential tax base is critical for the resiliency and sustainability of municipalities and keeps the residential taxes down to improve affordability. The development of industrial land at an airport provides a synergy that a stand-alone industrial park does not provide.

2.2 Vision

The vision for the airport has assumed that the residents, businesses, and the governments in the valley agree with the recommendations that an airport would be beneficial to the community and looks twenty years out to the successful accomplishment of the vision.

The Cowichan Valley has a fully functioning registered multi-use air transport facility that serves the residents and businesses of the valley providing a runway and airport services to accommodate emergency services, tourism, industry and residents' needs.

2.3 Goals

The goals identified are the goals to achieve the vision:

- To complete studies to identify the specific location for the aerodrome;
- To source funding to construct the aerodrome; and
- To establish a governance model to manage and operate the aerodrome.

2.4 Objectives

To achieve the goals, there are a number of steps and objectives to be achieved.

- To consider potentially available sites;
- To prioritize the potential airport sites for suitability and availability;
- To source funding to complete the location assessments of the identified sites;
- To acquire the site identified as suitable for a 3,500 foot runway with 60 acres of developable, groundside land;
- To source funds for design and detailed background studies to construct the airport;
- To develop partnerships for the construction and operation of the airport;
- To formalize a governance model to manage and operate the airport; and
- To source funds for construction of the airport.

3.0 Options and Costs

Table 1 identifies options for the development of a variety of airstrips in the Cowichan Valley. A series of assumptions have been made in the assessment of the options. This assessment of operations and costs does not identify or reflect any specific site or option. While some sites were suggested during the preparation of this study, a separate study would have to be completed to select viable sites, complete the full assessment of the sites for suitability and to facilitate community engagement.

The following assumptions were also made:

- Costs include the construction of the runway, including base work, site clearing and grading, paved strip, painted lines and numbers, taxiway, apron (200 ft. x 200 ft.), lighting, wind socks, and fencing of the perimeter of the site;
- Costs are gross estimates and may increase once geotechnical and environmental reports are completed;
- Costs do not include the purchase of the site, access road, provision of piped water and sewer, or power. These will fluctuate depending on the distance of the site from existing services; and
- Critical aircraft determine the pavement load rating and increases the cost of runway construction.

In September 2016, the Aeronautics Act was amended to insert regulations mandating consultation before any funding or approvals are given by Transport Canada. It states that the “applicant shall include in the application, proof that the applicant has consulted with the interested parties”. The consultation must be completed when building a new aerodrome or increasing the length of an existing runway by 100 metres or 10% of the length (whichever is greater).The applicant must then provide a summary of the consultation. ‘Interested parties’ is defined as anyone within 4,000 metres of the proposed project. Because the Cowichan Valley Regional District is the client initiating this study, it has been assumed that the CVRD will be the “applicant”. Separate costs for the engagement have not been factored into the costs.

Table 1: Runway Options and Costs

Option	Comments	Critical Aircraft	Pros	Cons	Order of Magnitude Costs	Other Comments
Current Butler Airstrip	The current airstrip is located at the Butler Brothers gravel pit and provides a 1,500 foot asphalt strip with a small taxi way, T hangars and a very small tie down area with a parking area for approximately four cars. There is no opportunity for extension and the owner is not interested in using government grant money to invest in the airport since they cannot guarantee the continued operation of the airport. The airport is operated by the Duncan Flying Club. The airstrip is limited to small, single-engine aircraft and small-to-mid size helicopters. Because the site is privately owned and there is no area for leasing industrial lots. There is no revenue for the municipality.	**Four-seat light aircraft**: Single-engine Cessnas and Pipers and small helicopters	• The airport exists • CVRD gets property taxes • The Duncan Flying Club is a not-for-profit society	• Airstrip in current form is severely restricted for transition, take off and approach areas • Aircraft types very limited • No land for industrial development • No long term security that the airport will continue to exist • Long term operation of the airport is not secure • Operated by the Flying Club (not transparent or publicly responsible) • Butler Brothers keeps all revenue • CVRD has no authority or control over the uses • No source of funding for capital improvements • Operations limited by the availability of volunteers	None	This site is not recommended for long term public use.
2,500 foot paved runway	This length of runway will require a minimum of 3,000 foot length to provide for take-off and approach areas.	**Incrementally larger general aviation types**: Twin Cessna and Pipers Cessna Caravan DHC6 Twin Otter	• Increases the variety of aircraft that can use the airport	• Need to find a location • Length is still restrictive and cannot accommodate the fixed wing types used for medevac	$6.5 million	This length would not provide sufficient length to accommodate corporate or emergency aircraft.
3,500 foot paved runway	Required site length would be approximately 4,000 feet to accommodate runway and a displaced threshold.	**Broad range of general aviation and public safety types**: All of the above aircraft including: Beechcraft King Air 350 Citation M2 Fire Boss forest fire airtanker Cormorant SAR helicopter	• This length allows medevac and multiple other aircraft types • Increases corporate and tourism options	• Need to find a location • Critical aircraft require larger aprons and wider taxiways	$9.5 million	This appears to be the optimal registered aerodrome air transport solution for the Cowichan Valley
3,500 foot gravel runway	Required site length would be approximately 4,000 feet to accommodate runway and a displaced threshold.	**Broad range of general aviation and public safety types**: All of the above aircraft including: Beechcraft King Air 350 Citation M2 Fire Boss forest fire airtanker Cormorant SAR helicopter	• This length will accommodate medevac and multiple types of other aircraft, and is less expensive to construct, but many corporations will not land on gravel strips	• Need to find a location • Corporations and other users may not support a gravel strip • Critical aircraft requires larger aprons and wider taxiways	$7.5 million	Less expensive, interim solution – could be paved at a later date
5,200 foot paved runway	Required site length would be approximately 6,000 feet to accommodate runway and a displaced threshold.	**Smaller airliners:** All of the above aircraft including: 737-200/B 737-700/B,C	• Allows a very broad range of aircraft	• Need to find a location • Critical aircraft requires larger aprons and wider taxiways	$14 million	Potentially competes with Victoria and Nanaimo in the short term but provides long-term flexibility

Option	Comments	Critical Aircraft	Pros	Cons	Order of Magnitude Costs	Other Comments
		Dash 8 – Q400/B,C, D CRJ 200/ B, C, D				

In addition to the runway option analysis described above, the airport would require additional infrastructure to support operations for a regional/community airport. This infrastructure is not expected to vary substantially based on the runway options considered.

Therefore, the assumptions made on the additional costs for the airport include:

- **A site assessment** – To determine the potential site for the potential Cowichan Valley airport, a site assessment would be required to be undertaken by the Cowichan Valley Regional District. The value of the site assessment is estimated to be $200,000.
- **A site** – The site is required to be at least 150 acres with approximately 90 acres used for the airport and airside and airport operational uses, and 60 acres of industrial land (two-thirds are anticipated to be developable) . The anticipated value of a site is $2,000,000.
- **A terminal building** - The terminal building would provide a waiting room, washrooms, pilots lounge, and potential offices to support the operation of the airport. It is assumed that the terminal would be minimal to start including economically efficient pre-fabricated buildings or other minimal infrastructure to reduce the capital burden. The terminal is expected to be valued at $250,000. The terminal building could also include office space for users (charter or commercial airline companies), car rental kiosk, food and beverage concessions, and other services.
- **A helipad** – Considering the desire to service the new hospital being constructed north of Duncan and the anticipated operational date in 2024, a primary or backup helipad is required for specialized landings required for public safety purposes. The value of the helipad is expected to be $500,000.
- **Additional infrastructure** – Additional infrastructure servicing the airport and associated industrial properties including electrical transmission, roads, water, and wastewater is required to facilitate revenue and provide suitable amenities to clients. The value of the anticipated infrastructure is anticipated to be $1,000,000 in the first year. It is estimated the owner will spend an additional $250,000 annually in years 2-10 to facilitate additional airport land availability for industrial development.

The costs above do not include additional capital investments including, but not limited to:

- Industrial land improvements, including internal roads, survey, provision of piped water, and sewer; and
- Parking lots, including the grading and gravelling or paving;
- Construction of hangars, which will be completed by the hangar owner or a developer who constructs hangars, including T-hangars, for lease; and
- Fuelling infrastructure, including tanks, pads, spill containment etc.

Investments in these items may be monetized for additional sources of revenue. Various regional airports including the existing Duncan Airport have used fuel infrastructure, in particular, for revenue generation.

In the cost modelling, a 50% contingency for construction of capital infrastructure is included as part of the estimated cost. Therefore, the total expected capital cost to complete the full airport development and servicing for the groundside industrial uses could be approximately $20,000,000. The development would be phased, with the acquisition in the first year along with design. Runway construction, fencing, airside and operational construction in year 2. This would be followed by the development of the industrial park component, terminal building and other amenities. The total cost could be spread out over a 5 to 10 year time frame. A high degree of variance is anticipated in this cost as the specific site is the key determinant of cost for all of the previously listed features. The cost of debt and amortization is not included in the capital costs explicitly. Additionally, it does not include a capital reserve for restoring infrastructure or a general cash reserve. The volume of debt and the rate at which it can be financed may impact the overall capital cost of the project.

It is assumed for the remainder of the study the preferred 3,500 foot paved runway is chosen as the design standard. This has assumed that the 3,500 foot paved runway best suits the environmental and socio-economic profile of the Cowichan Valley as minimal suitable sites are available within the region and the presence of two established larger airports relatively close to urban centres is likely to reduce the Cowichan Valley's ability to compete for large aircraft. That said, a 3,500 foot paved runway allows operation of a broad range of general aviation and public safety aircraft types which aligns with the CVRD's vision, goals and objectives as identified in the Industrial Land Use Policy (section 2.1.2 of this document). Depending on where the airport would be located, it will be required to conform to the vision and mission of the local OCP. Generally, all OCP's support sustainable growth, regional transportation, economic development, job opportunities and safety of the residents.

Generally, increasing the size or quality of the runway would result in access to more aircraft, which could facilitate more demand. Additional industrial land would also be expected as a larger site is required. However, capital costs also increase due to the higher quantity or quality of infrastructure. No 'straight line' assumptions should be made about how changes in infrastructure influence the airport's feasibility.

4.0 Legislative Framework

4.1 Transport Canada

The development of a registered aerodrome that will function as a public airport in the Cowichan Region will be required to meet all Transport Canada regulations. Aerodromes Standards and Recommended Practices (TP312) 5th Edition (Revised 07/2015) is the regulation that all aerodromes must meet. The Cowichan Valley Regional District, the Municipality of North Cowichan and the Town of Duncan have never owned and operated an airport. As such, the municipal governance structure has no experience in managing an airport. A summary of airport restrictions and requirements is provided in **Appendix A** (Airports "101") and more information is available in the Transport Canada publication Land Use in the Vicinity of Airports (TP1247).

There are three different categories of aerodromes, each presenting progressively different safety requirements. In order of ascending safety level, the categories are listed below:

- Aerodromes (small airstrips located on private property that are neither registered nor certified) which can accommodate private aircraft, general aviation, and itinerant pilots;
- Registered aerodromes which can accept private aircraft, general aviation and itinerant pilots and may accommodate regularly scheduled passenger commercial flights with special approval from Transport Canada; and
- Certified aerodromes, referred to as airports, which can accommodate all forms of flights.

Emergency flights and landings can occur at any form of aerodrome if the runway is sufficient for the aircraft used by the agency.

The current Duncan Butler Brothers airstrip is an aerodrome. Should a new airport be designed and constructed in the Cowichan Valley, it is strongly recommended that a new airport would be, at a minimum, a registered aerodrome.

There have not been many new aerodromes constructed in Canada over the past 50 years. It is difficult to find a site that meets the needs of the airport, is located far from development (particularly residential) and fits the topographic and physical requirements for an airport. In addition, Transport Canada requires community engagement in the design and development, or expansion, of an aerodrome.

It is important to note that under federal jurisdiction, the owner and operator of the airport controls and regulates the uses at the airport. Uses at an airport can include both airside (hangars) and groundside (industrial). A municipal bylaw does not technically control land on an airport. However, many airports and municipalities develop arrangements and agreements for the airport to follow

the local government bylaws and land uses and processes. If local government owns the airport, there is no question of following the local zoning bylaws.

Regardless of whether the airport is owned by the local government, the municipal bylaws, including the Official Community Plan and the Zoning Bylaw, should reflect the operation of an airport, the outer surface height restrictions, and the uses on the airport land. It is important to have clear definitions of airport and the appropriate uses on the airport lands.

4.2 Cowichan Valley

The Cowichan Valley Regional District is made up of several municipalities (City of Duncan, Town of Ladysmith, Town of Lake Cowichan and the Municipality of North Cowichan) and nine electoral areas. The region covers 3,474 square kilometers of land. The population of the Regional District was listed as 83,739 (2016 Federal Census). This is a 4.2% increase in population over the five years between the 2011 and 2016.

The region is located between Victoria and Nanaimo and is surrounded by forest, agricultural lands, and is highly used for a variety of outdoor recreation activities.

The current Butler Brothers Strip is located in Electoral Area 'E' and is located on the gravel pit lands partially zoned industrial. There is no special recognition of the airport or the airstrip.

4.3 Ownership and Governance Models

In 1994 Transport Canada established the National Airport System and identified 26 airports that are owned by Transport Canada and leased to local authorities. In British Columbia, this includes Kelowna, Prince George, Vancouver and Victoria. The Airport Authorities pay an annual rent to the Federal Government and sublease the land to tenants, impose Airport Improvement Fees and establish landing and fuel fees. These airports are beyond the scope of this study for comparison.

For the Cowichan Valley Air Transport Feasibility Study, the report has considered small regional and community airports.

There are three primary models for governance and ownership of airports (with variations) that are being considered in this study. The three models are described below with the pros and cons listed for each.

Note that the option for the CVRD owning and operating the airport has not been included as a specific governance model at this time. The current services provided by the CVRD do not include an airport. Should the CVRD wish to pursue a regional airport as a service line for the Regional District, support and direction from the ratepayers and electorate would have to be provided. This would

have to be captured by plebiscite or referendum. There are examples of airports owned and operated by Regional Districts.

The following are two examples of airports owned and operated by Regional Districts:

a) **Tofino Long Beach Airport** – owned and operated by Alberni Clayquot Regional District. The airport was transferred to the Regional District in the 1990's.The airport was constructed in the 1940's as a military airport and has the iconic triangle runway formation. The airport has three commercial carriers and supports over 20,000 passengers a year. The infrastructure existed when the Regional District took the airport over. As a certified aerodrome, the Airport is eligible for federal grant money. The airport has received of $5 million in funding this year to complete upgrades to the airport. The revenue generated at the airport is put back into the airport operating budget.

b) **Texada Gilles Bay Airport** – this community registered aerodrome is within the services provided by the qathet Regional District. The airport receives a requisition of over $108,000 per year from general tax revenue. There is virtually no revenue generated at the airport. The airport had certified status to allow a single commercial airline to provide service, but when the airline lost their certification, the airport lost theirs. The land owned by the Regional District is surrounded by private forestry lands and ALR with few options for development and revenue generation.

4.3.1 Privately Owned and Privately Operated

This option is similar to the current situation in Duncan. There are other privately owned airports including Nanaimo and Boundary Bay. This is not a recommended option due to the lack of control on behalf of the local municipalities or the Regional District. The Nanaimo Regional Airport is privately owned and operated, and while the Airport Manager and the Airport Board strive to work closely with the Regional District staff and Board, the reality is that the Airport could approve any uses on the airport without any application to the Regional District. All revenue generated on the airport, stays on the airport as a not for profit organization and no funding is received from the local municipalities or the two Regional Districts. The Airport has had to seek funding from other sources, including their own revenue generation, to complete the expansion work, install the Instrument Landing System and operate the airport.

Pros	Cons
• No financial responsibility for the municipality • Operator needs to follow Transport Canada regulations • Operator pays property taxes to the municipality	• Operator does not have to follow municipal land use regulations • Municipality does not get any lease revenue • Municipality cannot control the operator or operational decisions

4.3.2 Publicly Owned and Privately Operated

Several airports are owned by the local municipality but managed by a contractor or resident Flying Club. Some examples of this are Castelgar and Lacombe (Alberta).There are several options for the airport operator. There are companies that manage airports for municipalities. While this may bring expertise to the airport that may not be available locally, it is often provided at a cost. The operator may require all lease revenue, may support a company structure outside of the local community and may not re-invest in the airport. Other management options include the local Flying Club working with the local government. This provides some expertise and resources while keeping the money in the community.

Pros	Cons
• Municipality controls the uses • Municipality receives property taxes paid on the lease lands • Municipality engages the operator and has an operating agreement • Consider a regional airport commission to "share" the risk and benefits	• Municipality may be responsible for all capital costs • Municipality may be responsible for grant application • Operator agreement may give the operator all lease revenue (no additional revenue for the municipality) • Operator may not invest in the airport and money leaves the community

4.3.3 Publicly Owned and Publicly Operated

The large majority of airports are both owned and operated by municipalities. Examples of this model include Campbell River, Quesnel, McBride, Cranbrook, Qualicum Beach, and Chilliwack.

Pros	Cons
• Municipality controls the land uses • Municipality gets all revenue from property taxes and leases	• Municipality may need to hire expertise • Municipality may have to prioritize the airport for maintenance and services

This feasibility study recommends that any future airport follow the publicly owned and publicly operated governance model. In recognition of the cost to operate an airport and the maintenance required, this report recommends that the CVRD investigate the option of developing a Regional Airport Commission. This would then involve all of the municipalities and electoral areas in the operation of the airport. This could include agreements and assistance with maintenance (member municipalities could assist with road and runway maintenance, snow removal (should it be an issue) and the agreement could extend to funding, recognizing that an airport must be located in an undeveloped area, but it greatly benefits the developed areas. The Airport Commission would be comprised of elected officials from each of the municipalities and electoral areas, other appointed

members who are familiar with airport operations, marketing, running a business, and/or community engagement. The airport may have an operating shortfall in the first years until land is leased and air traffic increases. The shortfall of operating revenue could then be shared between these municipalities and electoral areas. The revenue support could be calculated based on a percentage breakdown based on population.

An example of an airport that operates like this is the Peace River Airport (Alberta).The airport is owned by the Town of Peace River, is located in the Municipal District of Peace, and benefits the Town of Grimshaw and the County of Northern Lights. The residents and elected officials of these municipalities recognize the importance of the airport, connecting the northern communities to the medical, government, social, cultural and business services in Edmonton and Calgary. The municipalities have formed an airport commission and each provides monies each year based on the budget shortfall for both operating costs and capital reserve fund.

4.4 Funding Options

Funding Options for community and regional airports are limited. There are virtually no funding sources for airport operation. There are some funds for capital projects. There are also funds through provincial departments for studies and economic development initiatives. The following is a summary of funding sources for airports. Should the Cowichan Valley Airport be considered a feasible option, it is suggested that the owner/operator look at all of the following options to compile all of the funding that will be necessary to construct and operate a new airport.

- **BC Air Access Program** – The British Columbia Air Access Program (BCAAP) provides capital funding to assist BC aviation facilities, including airports and water aerodromes, with improvements to their infrastructure. Through this cost-sharing program, facility operators can invest in safety and infrastructure enhancements that help strengthen local, regional, and provincial economies. BCAAP encourages funding partnerships with local, regional and federal governments as well as agencies and private sector organizations. The program is administered through the Ministry of Transportation and Infrastructure. A recipient cannot qualify in consecutive years. The types of projects that were accepted for funding in 2019 were: an airside storage building in Creston for $105,706; an automated weather system in McBride for $75,000; the main apron rehabilitation in Pitt Meadows for $1 million; and an apron expansion in Vanderhoof for $80,000.
- **Airport Capital Assistance Program** - The Airports Capital Assistance Program (ACAP) is a federal program that has been funding improvement projects for regional airports since 1995. To date, the Government has invested more than $785.9 million for 904 projects at 182 airports. Although regional airports play an essential role in Canada's air transportation sector, they can struggle to raise enough revenue for operations. However, this program is only available to those airports that provide regularly scheduled passenger flights. This generally includes certified aerodromes, but some registered aerodromes are granted

special permission to have regularly scheduled flights and in those cases, those airports would qualify for this program. Texada Gilles Bay Airport is an example of such an airport. The Authorization is attached to an approved commercial server. Unfortunately Texada lost their Authorization because the airline (KD Air) lost their certification. ACAP funds projects that:

  - Improve regional airport safety;
  - Protect airport assets (such as equipment and runways); and
  - Reduce operating costs.

- **Infrastructure Planning Grant Program** – This program offers grants to support local government in projects related to the development of sustainable community infrastructure. Grants up to $10,000 are available to help develop or improve long-term comprehensive plans including but not limited to: asset management plans, integrated stormwater management plans, water master plans and liquid waste management plans. This could be used to help design the future airport site.
- **Economic Development** – There are a variety of grants available to fund studies such as tourism and economic development studies that can assist the airport in the promotion and justification of the airport. These grants change annually and must be applied for by the local government.
- **Local Government Infrastructure Grants**–there are several grant streams including: rural and northern communities (under 25,000 population), infrastructure planning grant, small communities fund (application intake is closed but there could be a reopening)
- **BC Community Gaming Grants –** funding is provided to not for profit organizations that improve public safety which have in the past included local volunteer fire departments and search and rescue operations. This could be used to establish a search and rescue location at the airport.
- **Real Estate Foundation Grant Program** – The Real Estate Foundation of BC provide this grant program to address current land use challenges and help communities plan for the future. There are five areas for grant applicability: land use, built environments, fresh water, food lands, and real estate. There are two intakes a year open to non-profit organizations. If there was an airport society, they could apply for this grant to assist with the site selection study and potentially with rezoning the property.
- **Partnerships** – Because airports support local businesses, there are opportunities for the airport operator/owner to work with local business and industry to develop the airport. This can provide capital to the airport, while potentially reducing operating revenue (as the trade-off for the capital investment). Some examples of this include:
  - Sundre Alberta airport is owned and operated by Mountain View County and sits in an area of active forestry. The forestry company used the airport fly in executives, technicians, specialists, and investors. The airport did not have runway lighting, which made the hours of operation in the winter very short. The company wanted the runway lighted. They agreed to purchase the lighting system if the County would

install and maintain it. This arrangement significantly increased the operational hours of the airport to the benefit of both the County and the company.

  - Strathcona Airport Alberta is owned and operated by Strathcona County. In the late 1990's, Shell was transporting crews to the Fort McMurray area. Edmonton International Airport had increased its fees and the Municipal Airport was closing. Shell approached the County with the offer to lengthen and pave the airport runway for no landing fees for five years. This saved the company fees at the Edmonton Airport, provided free parking for the crew personnel, reduced the airport time, (no security, no delays) and the total activity at the airport increased significantly, providing benefit to Strathcona County economic development)

- **Taxes** – Tenants at airports pay property taxes as any property owner does. This relates to the value of the development. This also strengthens the need for the airport to offer long leases to attract investment and get more development on the airport.
- **Leases and Concessions** – The highest source of revenue for most airports are the leases for the airside and groundside lands. This revenue source provides a reliable annual revenue source for the airport. Other sources of lease or on airport revenue is parking. Many community and regional airports consider it their "advantage" if they do not charge for parking. However, this is a steady revenue stream and can provide needed income for the airport. The same is true for fuel sales.
- **General Revenue**- A local government may supplement the operational expenses of an airport through general revenue. This is sometimes bundled with road maintenance and snow removal through the engineering or public works departments. Staff can be cross trained to work at the airport and other departments, often burying the salaries in other departments or general revenue.

5.0 Forecasts and Projections

5.1 Population

For the purpose of this study, Dillon has used the population and employment projections of the Cowichan Valley Regional District presented in the Population, Housing and Employment Projections for the Cowichan Valley Regional District's Modernized Official Community Plan, prepared in March 2019. These projections used the 2016 Federal Census and projected 35 years into the future to 2051.

This projection reflects a 28.32% population increase over the 35 year period or less than one percent per year. This is a slow but steady increase that is very manageable for municipal planning and operations (see **Table 2**).

The total population in and of itself does not trigger a requirement for an airport particularly with two airports and a major highway within such close proximity.

Table 2: Population Projections for the Cowichan Valley

Total Population Cowichan Valley Regional District					
Age Group	**2017**	**2021**	**2031**	**2041**	**2051**
0 – 14	12,434	12,885	14,298	15,309	15,701
15 - 24	9,622	8,943	9,198	9,984	10,956
25 - 34	7,541	8,686	8,883	9,274	10,069
35 - 44	8,471	8,521	10,059	10,383	10,787
45 - 54	11,778	10,784	10,525	12,111	12,448
55 - 64	14,590	14,950	13,076	12,967	14,557
65 - 74	12,007	13,699	15,552	14,016	14,047
75 - 84	6,248	7,443	11,664	13,492	12,490
85+	2,593	2,957	4,418	6,909	8,326
TOTAL	**85,234**	**88,837**	**97,673**	**104,444**	**109,380**

5.2 Employment

The Population, Housing and Employment Projections for the Cowichan Valley Regional District's Modernized Official Community Plan, prepared in March 2019, also completed employment projections. In our experience, the employment projections can be significantly varied should the community attract a major anchor employer, or if they lose one. This is particularly evident in the resource sector and communities that rely on natural resources. Dillon is aware that the Economic

Development arm of the Cowichan Valley and the other municipalities within the Cowichan Valley are trying to expand the number of tech companies as well as start-up companies. The success of this drive could see a significant change in the number of jobs which in turn would impact the population growth. In addition, the new hospital is slated to open in 2024. This would see a large spike in medical/administrative personnel positions that may not be reflected in this employment projection.

Table 3 is the summary table from the Cowichan Valley projections for total employment by industry sector.

Table 3: Employment Projections for the Cowichan Valley

Total Employment Cowichan Valley Regional District					
Industry Sector	**2017**	**2021**	**2031**	**2041**	**2051**
Primary	1,841	1,710	1,654	1,539	1,441
Transport, Warehouse, Utilities	996	941	998	1,062	1,120
Construction	2,999	2,237	3,215	3,550	3,882
Manufacturing	2,933	3,007	3,248	3,256	3,183
Wholesale & Retail Trade	5,192	5,273	5,892	6,386	6,758
Finance, Real Estate, Other Business	4,203	4,277	4,960	5,603	6,094
Education, Health, Information	8,018	8,510	9,810	10,941	11,869
Accommodation & Food Services	2,417	2,589	2,823	3,101	3,221
Other Services	1,612	1,532	1,591	1,655	1,726
Public Administration	918	940	1,007	1,036	1,057
TOTAL	**31,1129**	**31,715**	**35,200**	**38,039**	**40,351**

5.3 Supply-Side Factors

The supply of airport services is defined by the availability of airport services and cost of providing those services. These factors represent constraints on the feasibility of the proposed regional airport.

5.3.1 Physical Constraints

Physical constraints limit the potential use of the site and thus the revenue that can be obtained from the site. Physical constraints are broken into two factors: land and aircraft traffic landings. The physical constraints are used to inform demand projections in **Section 5.4** by determining the maximum airport services that can be provided.

Land considers the potential industrial land available and space for hangars. It is assumed a 150 acre area would be required for the airport. Airport infrastructure is expected to cover 90 acres. The airport infrastructure does not include hangar spaces. Therefore, 60 acres of industrial land are available for lease, though it is anticipated only 40 acres would be developable as industrial land or hangar space. As described in Section 3.0, land set aside for hangars and industrial use would be unimproved and leasees would be required to conduct their own improvements.

Landings considers the maximum realistic use of the runway for landings. With the 3,500 ft. runway identified as the preferred option[1], it is assumed a maximum of 102 flights can land daily. The projected maximum landings is determined by the hours of operation and the time per flight on the runway. It is assumed the airport would be operational for 17 hours daily (with lighting). It is also assumed each flight would require use of ground facilities for 10 minutes. This yields the potential for 102 flights per day to utilize the airport. It should be assumed that there would be peak periods and lower demand periods, which means the functional availability for landings should be lower than the maximum projected here.

Additional constraints include the size of the runway, which is a limiting factor in the types of aircraft that can land at the potential airport. The 3,500 foot paved runway allows a broad range of general aviation and public safety aircraft types but does not allow for larger planes such as small airliners or larger cargo planes.

Based on these factors, the following assumptions are made regarding the physical constraints of the airport informing the potential demand for air services:

- The site would have 40 acres of available land for use as industrial land or as hangars. These land uses are considered competing and substitutable. It is anticipated a blend of uses would be undertaken;
- Up to 81 or approximately 80% of the maximum daily landings (102) may take place on any given day; and
- The airport would be used by charters, general aviation craft, niche cargo aircraft, and public safety aircraft. No large aircraft would be considered potential users.

5.3.2 Operating Expenses

Operating expenses are difficult to project given the lack of current operations, variety of users, and uncertain blend of usage. A 2005 study of regional airports found that 48% of small and regional airports in Canada generate insufficient revenue to cover costs (InterVISTAS 2005). As result,

[1] Subject to identifying a feasible site and sufficient capital to develop the airport.

operating expenses were estimated using revenue to expense ratios from other regional airports. Expenses as a percentage of total revenues for other airports in BC include:

- Nanaimo – 55% (Nanaimo Airport Commission 2016);
- Victoria – 48% (Victoria International Airport 2018);
- Campbell River – 121% (Tetra Tech 2016);
- Prince George – 64% (Prince George Airport Authority 2019); and
- Comox – 54% (Chan Nowosad Boates 2019).

Therefore, it is assumed expenses would be 85% of revenue. While this is inexact as some expenses would be fixed while others would vary with use, this can be used as a rough estimate given the scope and limitations of the study. This rate of expense is assumed as it is a regional airport which tend to lose money through operation or operate at a slight profit (INTERVistas 2005). However, the large area of industrial land and demand for it in the Cowichan Valley should allow the potential airport to be profitable. It is also anticipated it would not have the passenger volume or economies of scale to match the financial performance of larger airports such as Prince George, Nanaimo and Victoria as these airports are too large to be directly compared.

Recognizing this is a new development, it is assumed the expenses would be higher within the first year than in subsequent years prior to reaching a profit margin of 15% in Year 6. Over the first five years, expenses as a percentage of revenue are estimated to decline 10% annually from the Year 1 high of 135%. The decline in expenses is likely to result from improved operational efficiency and further development of industrial land increasing its percentage of annual revenue.

5.4 Airport Demand

The demand for air services refers to the expected use of the airport and airport lands for revenue generation. There are two primary sources of revenue for a potential airport in Cowichan Valley: land leasing and landing fees. Other sources of revenue may emerge based on the development of the airport. However, since the owner/operator of the proposed airport is likely to be capitally constrained, the assumption of minimizing capital costs for the airport by proposing minimal infrastructure in the short run is valid.

Leasing land for hangars and groundside development is anticipated to be the primary revenue source for the airport. As described in **Section 5.3.1**, there are 40 acres of industrial land expected to be available on a proposed airport site. This land is anticipated to be vacant and can be leased to businesses to build structures and companies to provide revenue to the airport. It is assumed industrial land would also be leased for hangars, which support the use of the airport for aircraft. It is assumed hangars would be constructed on leased land by the leasee.

Another source of revenue are landings and landing fees. Landings are anticipated to be undertaken by a variety of airport users including emergency services provides, tourist organizations, flying clubs, charters, and commercial use. Landing costs are expected to be priced using third degree price discrimination[2,3] allowing for a variable pricing model depending on the landing characteristics of each group. This would help the regional airport maximize revenue, which is anticipated to be a challenge in the zero to 5 year term.

Targeting these services is consistent with existing strategies for small airport success. A 2005 study on the viability of regional airports in BC found viewing airports as part of a regional system with individual airports complimenting each other is important for increasing the likelihood of viability (InterVISTAS 2005). In this case, the potential Cowichan Valley airport would tend to capture demand for services being pushed out of larger airports in the region such as Nanaimo and Victoria. This is identified as including general aviation and other small craft-centred airport uses. A similar approach was undertaken with the Campbell River and Comox airports where each airport undertook activities that reflected their specific strengths instead of competing uses (InterVISTAS 2005).

The subsequent sections define the parameters of the potential demand from these users for the airport's services based on best available information. These projections are used to forecast revenue for the airport.

5.4.1 Forecasting Demand

Each identified airport user is expected to have varying use of the airport based their current usage of airport facilities in the Cowichan Valley and other regions. Demand forecasts also consider interviews with key potential airport users to determine their desire for the airport and information on their potential usage. **Table 4** provides a summary of potential airport users and their identified desire for use of the airport.

[2] Third degree price discrimination is defined as charging different consumers a different price for the same good. For example the Tofino airport has four charge rates based on the size of the aircraft and a flat rate for commercial carriers.

[3] To an extent, second degree price discrimination based on demand would also be undertaken. Second degree price discrimination is defined as charging a different price for different quantities of the same good consumed.

Table 4: Summary of Potential Airport Users

User	Justification
Airport Users	
Duncan Flying Club Users	Current airport user.
General Aviation Users	There are other flying clubs on South Vancouver Island that may opt to use a new airport in the Cowichan Valley. The airport could also be used for training.
Emergency Services	Emergency services were identified as a potential use for the airport during the interviews.
Laketown Ranch	Laketown Ranch is identified as requiring airport services for both performers and corporate operations.
Charter Services	Other regional airports noted increased demand for charter flights and corporate use which is becoming more of a challenge at these sites. Therefore, it is anticipated there would be additional demand for charter flights into Cowichan Valley due to its proximity to both Nanaimo and Victoria.
Maple Bay Cargo	Maple Bay currently receives cargo shipments which were identified as a better service to be provided by an airport in the Cowichan Valley during interviews.
Courier Services	Courier services were identified as potential use for the airport as quick shipping to the mid-island area is identified as a concern.
Anchor Industries	The opportunity exists to attract a large anchor business to the airport that would then have spin off impacts on the Valley and the airport. An example is the location of KalTire at the Vernon airport at a time when the Airport was considering closing.
Tech Sector	Information from discussions with those in the tech sector indicate that an airport may not be a major benefit – improved broadband would be seen as a better advantage to attracting Tech Sector to the Valley.
Land Users	
Duncan Flying Club Hangars	Current airport user and it is considered that some of the current users would use the new airport.
Expanded Hangar Development	With improved hangar line, longer runway and longer lease, it is anticipated that there would be more demand for hangar lots and there would be more valuable structures constructed. This would increase use of the airport, lease payments to the airport owner and increased tax base to the jurisdiction.
General Aviation	There is the potential for general aviation to relocate from the larger airports (Victoria and Nanaimo) to a new airport in the

User	Justification
	Cowichan Valley. In addition the potential for flight training can expand.
Industrial Land Use	Industrial land is identified as a shortage within the community. It is assumed a portion of the land would be rented out as industrial land from the 150 acre site. Potential industrial land users at an airport site may include members of the tech sector. This could include light industrial and commercial uses. This would depend on the location of the site and proximity to ground transportation and other amenities.

As much of the demand for airport services is based on qualitative information and interviews, sensitivity analysis will be utilized to consider how changes in demand influence key demand factors. The sensitivity analysis is particularly important as these estimates are not based on refined demand projections due to the scope of the feasibility study.

5.4.1.1 Forecasted Annual Demand

Based on the user profiles and information provided by potential users, annual demand was forecasted based on the anticipated unit rates and the potential usage rates for different potential users. The user rates are provided in **Table 5**. The unit rate reflect current economic conditions but would be likely to change based on economic circumstances at the time of development and throughout the lifecycle of the operation. These rates were designed to reflect likely prices the market would bare at the time of completion of the feasibility study.

Table 5: Unit Rates for Airport Land Usage and Landing Fees

Item	Rate	Justification
Landing		
General Aviation Landing Fees	$10.00	Due to the volume of the landings and the general small size of the aircraft, the rate is kept low to be competitive with other airports.
Emergency Landing	$50.00	Emergency landings would be charged at a preferred rate.
Charter Landing	$300.00	Charter landings would be provided at a higher rate due to the projected clientele and infrequency of their use of facilities. This proposes only a landing fee and not a passenger charge or an airport improvement charge.
Commercial Landing	$200.00	If the airport receives a certified status to allow for commercial scheduled flights, these landings would be charged at a flat rate and as with the Charter flights, would

Item	Rate	Justification
		not be charge a passenger fee or an airport improvement charge.
Other Landings	$300.00	All other landings would occur at the base rate.
Land Use		
Hangar	$12.00 per ft^2	Assumed to be the same cost as industrial leaseholds as they are treated as exact substitutions.
Industrial land	$12.00 per ft^2	Interviews have identified a shortage of industrial land. Industrial land currently is leased for $15 annually for unimproved vacant industrial lands. It is assumed based on the shortage and the consideration of the airport as a premium amenity, the industrial land would rent at 80% of that rate. The increased volume of industrial land may reduce prices.

Table 6 provides the estimated demand for land and airport services based on estimations of usage and the preferred unit rates identified in **Table 5**, and projected revenues in present dollars. This demand is based on best available information at the time of drafting the feasibility study and the physical constraints of the potential airport. Minimal information on the usage of the potential Cowichan Valley airport was provided by stakeholders. This lack of information may be due to the lack of detail available on the proposed Cowichan Valley airport. It is likely more accurate information could be identified prior to development consistent with more information about the parameters of the airport becoming available.

Table 6: Anticipated Airport Usage (Year 1)

User	Usage Rate	Justification	Rate	Total Projected Revenue
Airport Users				
General Aviation	10,950	It is assumed the general aviation that would utilize the airport would come from Duncan, Victoria, Nanaimo and the total usage is estimated at 30 flights per day.	$10.00	$109,500
Emergency services	26	Last year, the Cowichan Valley had 36 search and rescue incidents. It is assumed approximately 26 of these uses could utilize the airport.	$50.00	$1,300
Laketown Ranch	25	It is assumed Laketown Ranch would be responsible for approximately 25 charter	$300.00	$7,500

User	Usage Rate	Justification	Rate	Total Projected Revenue
		flights annually landing at the potential Cowichan Valley airport.		
Other Charter Services	52	Based on the increased demand for charter services in general and the reduced ability of Nanaimo and Victoria airports to provide these services, one charter flight per week is expected at the potential Cowichan Valley airport.	$300.00	$15,600
Maple Bay Cargo	26	It is assumed 26 cargo flights currently landing in Maple Bay would be redirected to the potential Cowichan Valley airport as it is better suited to receive these shipments	$200.00	$5,200
Courier Services	52	A weekly courier service to the Cowichan Valley is anticipated as part of shipping services.	$300.00	$15,600
Anchor Businesses	52	It is anticipated that the Region can attract a significant anchor business. It is assumed that this business would generate some demand for air services. As result, one flight per week has been assumed.	$200.00	$10,400
Land Users				
General Aviation	43,560	It is assumed one full acre of land would be leased by the small general aviation users to construct T hangars or larger hangars for approximately 50-100 planes.	$12.00	$522,720
Industrial Land Use	174,240	It is assumed four acres (174,240 ft^2 net land) would be leased for industrial land. This represents 10% of anticipated industrial land available given the assumed 150 acre site and 40 acres of developable industrial land.	$12.00	$2,090,880
Total				**$2,778,700**

The total annual demand for Year 1 of the feasibility study is anticipated to be $2,778,700 based on the best available information. Considering the supply constraints for landings and leased land, this scenario assumes 56.8%of maximum landings occur and 12.5% of the available industrial and hangar land is leased (80% of which is for industrial use).

Demand forecasting at this stage is a volatile process as minimal estimates of use or committed usages are available. At this stage, demand forecasting relies on market trends and information from interviews with key potential users. Regarding market trends, industrial land prices are increasing in the Cowichan Valley reflecting the low supply of land. As result, it is assumed the Cowichan Valley would, over the first 10 years, be able to develop and lease the available industrial land on the site. Regarding interviews with key potential users, the two major airports in the area (Nanaimo and Victoria) and the local Duncan airport are unsustainable for general aviation and health services flights. As result, we anticipate demand for these services could be easily captured, at least in part, by the proposed Cowichan Valley airport. However, these estimates should not be interpreted as accurate forecasts of revenue or demand as they are developed independent of a site, negotiations with interested partners, and do not consider changing economic conditions.

While not included as part of demand, airports also enable economic activity within a region. This is further defined in **Section 7.1**

5.4.1.2 Forecasting Lifecycle Demand

The feasibility study covers a period of 25 years as it is assumed the primary airport structures including the runway would be amortized over a 25 year period. At the 25 year point, it is anticipated significant capital investment would be required, which should be expected to be funded by the airport's operations. Over 25 years, there is a general expected increase in demand of 0.81% annually based on growth in employment between 2017 and 2041. Employment is used as a proxy as the primary driver of revenue for the airport is industrial land, which is tied to economic activity. Additional uses include niche commercial and hobbyist activities which require economic activity or disposable income. Therefore, employment is the best available proxy for the growth in airport revenue.

In addition, the following potential demand shocks are anticipated due to information obtained during the interview program:

- An additional four acres of industrial land being leased annually between Years 2 and 9 with an additional two acres of industrial land leased in Year 10. At this point, the maximum 40 acres of industrial land on the site would be under lease, in the assumptive case.
- The current Flying Clubs at the Nanaimo and Victoria Airports may see increases in rents and decreases in air time. There is the potential for members of these flying clubs to consider a relocation. If this occurred, it has been assumed that the members would lease at least one acre of hangar space and undertake 5,475 flights annually (15 daily) at the flying club rate of $10.00 per landing.

Overall, lifecycle revenue is estimated to be approximately $478 million based on the previous assumptions and a 25-year life cycle of the infrastructure. Much of the projected revenue (93.6%) is

due to industrial land leasing. This does not consider other potential lifecycle changes in demand for the airport which have the potential to occur. These may include:

- The construction of other regional airports influencing demand;
- Changes in the desire for or use of airports or industrial land; and
- Any indirect or induced community economic benefit related to relocation of businesses or training programs into the community.

In addition, it does not capture the value of low-probability, high-cost events such as natural disasters impacting community access. In these cases, a regional airport with access may become invaluable for a variety of services including the transport of individuals and goods for the purposes of protecting lives. Information on the value of the airport for public safety during natural disasters is included in **Section 7.2**.

6.0 Feasibility

Feasibility for the airport is determined by considering the revenue generated from the anticipated demand in **Section 5.4** relative to the expenses (**Section 5.3.2**) and capital costs (**Section 3.0**) associated with construction. For the purposes of this assessment, we assume feasibility is tied to the Return on Investment (ROI). Should the ROI be greater than one, it is expected the airport is likely to generate a net earnings over the life cycle of the infrastructure. As the runway is the core infrastructure, an amortization period of 25 years is used which is consistent with best practices.

Table 7 provides key feasibility metrics based on the assumptions regarding, supply of services, and demand for services, expenses and capital costs. The cost of debt is assumed to be 5%, 1.05% above prime. The cost of equity is assumed to be 2%. This rate is assumed as grants would be the primary equity funding allowing for below market costs of equity derived from the costs of applications.[4] As result, the weighted average cost of capital (WACC) is expected to be 3.96% based on the proposed debt and equity blend. The rate of return on risk-free reinvestment is assumed to be 2.75%, the long-term bond return as identified by the Bank of Canada (Bank of Canada 2019).

Table 7: Summary of Key Metrics

Metric	Value
Capital	
Capital Cost	$20,175,000
Available Funding[5]	$7,000,000
Net Capital Cost (Debt)	$13,175,000
Revenue	
Annual Revenue (Yr1)	$2,778,700
Annual Revenue Multiplier	1.0081
Lifecycle Revenue	$478,054,145
Expenses	
Rate of Expense	0.85

[4] If equity is obtained at a market rate of 5.75%, the return on the airport is negative and not feasible as measured by net present value and capital internal rate of return. 5.75% would be considered a low rate of return on equity based on the current risk free return and the risk of the potential Cowichan Valley airport.
[5] It has been assumed that the Cowichan Valley can capture $7 million dollars up front from grants, municipal revenue, partnerships and potential flying club fundraising.

Metric	Value
Expenses (Yr1)[6]	$3,751,245
Lifecycle Expenses	$414,766,610
Return Metrics	
Lifecycle Earnings	$63,287,536
Return on Investment (ROI)	3.1
Capital Internal Rate of Return (IRR)	6.8%
Modified Internal Rate of Return (MIRR)	5.1%
Net Present Value (NPV)	$11,046,480

Based on the overall assumptions included within this report, the potential Cowichan Valley airport would be considered feasible. The return on capital investment as measured by the ROI is expected to be 3.1:1 as shown in **Table 7.**The ROI considers the net profit over the life cycle relative to the total capital cost absent of funding. The net present value (NPV) of these earnings is estimated to be approximately $11 million. NPV is the difference between the present value of cash inflows and the present value of cash outflows over a period of time. Therefore, in this case, the potential Cowichan Valley airport is anticipated to earn approximately $11 million measured in present dollars. The earnings are lower than the nominal earnings as it factors in inflation and potential earnings from alternative investments. The biggest assumption is that the Cowichan Valley can find a suitable site, the site is acquired and the $7 million in start-up capital is obtained.

The capital internal rate of return (IRR) is anticipated to be 10.3% and the modified internal rate of return (MIRR) is 5.1%. These suggest that the investment in the potential Cowichan Valley airport would generate value for the investors based on the assumptions contained within the Feasibility Study. These returns are sensitive to the WACC. If the WACC increases through increased costs of debt or equity, the potential Cowichan Valley airport may not be feasible.

The primary constraints are likely to be cash flow and capital. It is unlikely a positive cash flow would occur annually until after Year 4 or 5 of operation, at which point, earnings are expected to exceed expenses. As a rudimentary expense methodology is used, the specific costs of debt and amortization are not considered. This is due to the high-level scope of this assessment.

[6]Over the first 5 years, expenses as a percentage of revenue are estimated to decline 10% annually from the year 1 high of 135%.

When considering the potential feasibility of the airport, it should be noted that the revenue potential associated with the potential airport site is minimally dependent on having an airport, but is in fact, driven by the lease of industrial land.

6.1 Demand Sensitivities

Demand sensitivities can be conducted on the demand for all airport services provided. However, the sensitivity analysis focused on key revenue generators such as industrial land leasing. No other revenue item is expected to contribute above 10% of annual revenue over the life cycle of the potential Cowichan Valley airport so fluctuations in individual items are unlikely to alter overall feasibility.

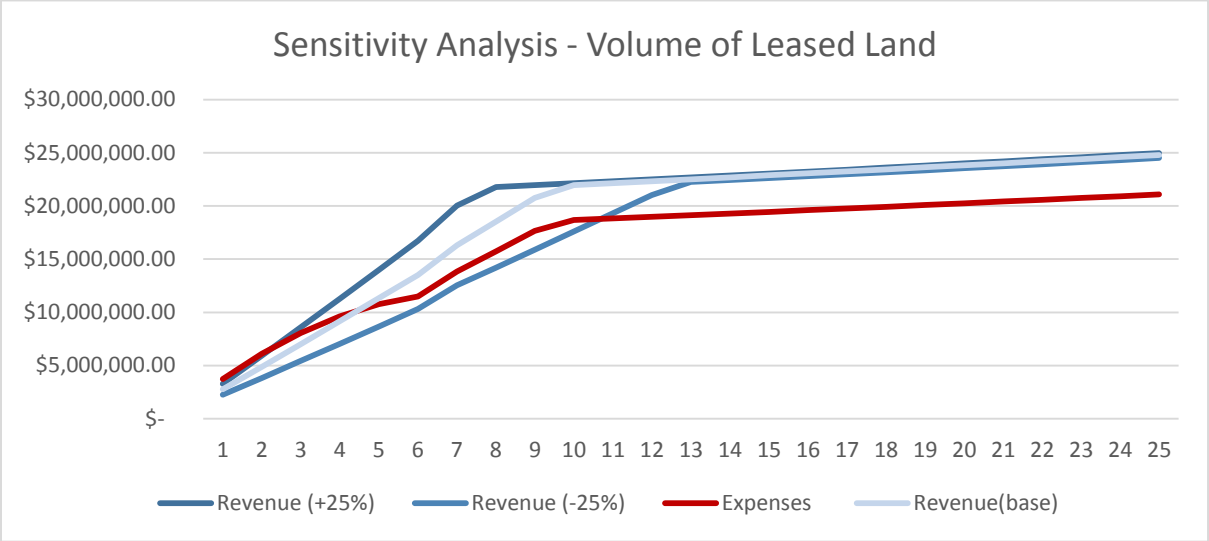
Industrial land leasing is the primary source of projected revenue for the regional airport accounting for 75.2% of the annual revenue in Year 1 of the forecast[7].Industrial land leasing is sensitive to two primary factors, demand for the use of land and the price of the industrial land. As noted in **Section 5.4.1.1**, industrial land is in high demand which formed the basis of the projections including price and quantity leased. However, the airport would provide a large volume of industrial land relative to the area which may alter the industrial land market. As result, the sensitivity analysis considered if changes in demand altered both the price of land and quantity of land used.

Figure 1 shows the change in projected revenue based on the percentage of industrial land leased relative to the projected four acres annually. It is assumed there are 38 acres[8] of industrial land available on the site. The rate of industrial land leasing is altered to reflect each acre. For example, in the '+25%' case, an additional acre of industrial land (five acres instead of four acres) is expected to become available and can be leased in each year until the maximum leasehold is reached. The price is held constant at $12.00 per ft^2.

[7] Over the life of the airport in the base case, industrial land leasing revenue accounts for 93.6% of lifecycle revenue.

[8] Two acres are expected to be used for hanger space.

Figure 1: Sensitivity Analysis – Volume of Leased Land



This analysis demonstrates the long-run feasibility and lifecycle revenue of the airport is minimally affected by the rate at which industrial land is leased. Instead, the differential primarily influences the point at which the operation becomes cash flow positive. In the base case, revenue begins to exceed costs in Year 5. In the '+25%' case, revenue exceeds cost in Year 3. However, in the '-25%' case, the potential Cowichan Valley airport begins profitable in Year 11. This means the airport owner would be required to support the deficit in operational revenue for an additional six years relative to the base case. This may mean changing other operational expense, taking on additional debt or raising additional revenue to support the airport for a longer period of time.

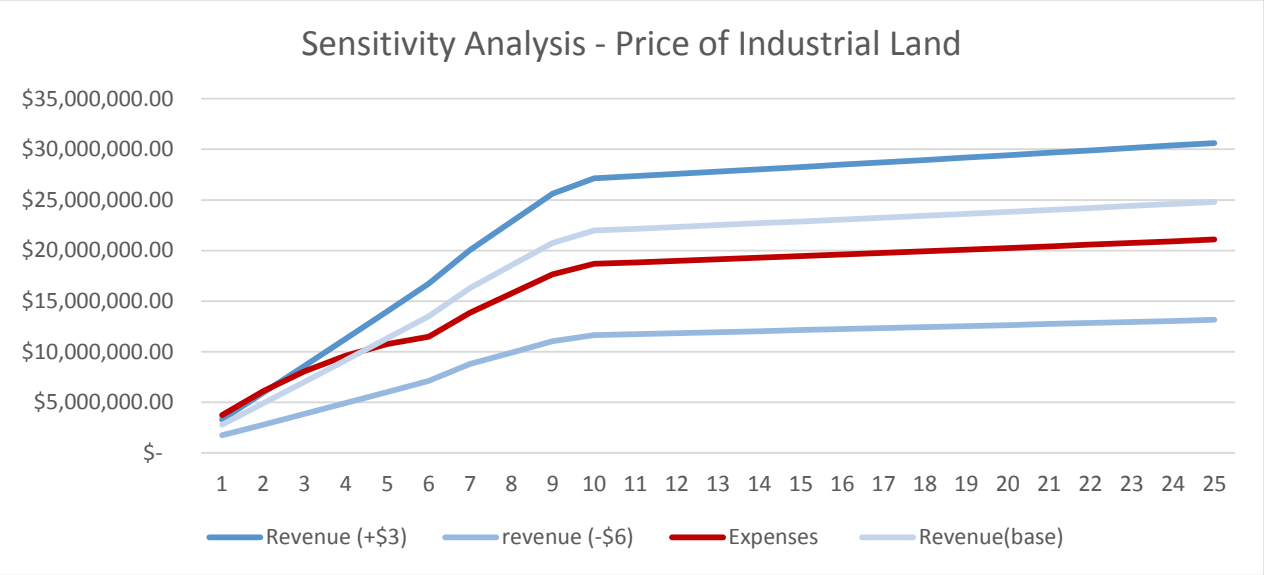
While the graph shows three cases, this is for illustrative purposes. Considering the reality of the potential operation, it can be implied the pace at which industrial land is leased would be a determinant in when the proposed airport is profitable.

The sensitivity analysis is also illustrative of the importance of leasing the industrial land to the feasibility of the overall airport. As shown in the **Figure 2**, high volumes of industrial land being leased are required for the overall profitability of the airport.

It should be noted expense are held constant at a rate of expense relative to the base case revenue. Fluctuations in the demand for industrial land may influence the expenses associated with the project relative to the usage of the industrial land. This would influence the feasibility of the potential Cowichan Valley airport in all cases.

Figure 2 shows the change in projected revenue based on the price of industrial land leased relative to the projected cost of $12.00 per ft^2. The quantity of land leased is held constant at four acres in Year 1 with an increase of four acres annually until the maximum 38 acres is reached.

Figure 2: Sensitivity Analysis – Price of industrial Land



As shown in **Figure 2**, the price of industrial land is a key determinant in the feasibility of the potential Cowichan Valley airport. The base case at $12.00 per ft2 shows feasibility with profitability in Year 5. In the '+$3' case, industrial land is leased at $15 per ft2 and the breakeven occurs in Year 3. In the '-$6 'case, the potential Cowichan Valley airport is not profitable at any point due to the reliance on industrial land for revenue. Considering fluctuations in price, it was determined industrial land is required to be leased at a minimum of $9 per ft^2 for the potential Cowichan Valley airport to be profitable.

The decrease in industrial land price is a concern as 40 acres of additional industrial land becoming available over a ten year period would represent a large shift in the regional supply of industrial land. It is likely this supply increase would depress the market for industrial land. However, staggering the availability of industrial land may also alleviate this concern as no drastic supply shock would occur, rather an incremental increase in availability. This would also allow industrial land growth to correspond with the anticipated increased economic activity as described in **Section 7.1.**

7.0 Additional Airport Benefits

Regional airports cannot be considered simply as businesses as they are often operated by governments for additional purposes. Regional airports may be used for attracting and supporting local business or industrial activity. Additionally, they may be used for public safety purposes during search and rescues or other emergencies.

7.1 Economic Impact

Regional airports provide additional direct, indirect or induced economic benefits to a community as defined below:

- **Direct Economic Activity** - Refers to economic activity directly related to the site services including employees.
- **Indirect Economic Activity** - Refers to economic activity generated by spending as result of the airport. This includes businesses who are dependent on the airport or some portion of the airport.
- **Induced Economic Activity** - Refers to economic activity from the spending from those directly and indirectly employed by the site (InterVISTAS 2016).

For example, in 2013, Canada's airports had 194,000 jobs generating direct economic effects of $13 billon in wages, $19 billion in GDP and $48 billion in economic output. However, considering the total impact, Canada's airports provided for 355,000 jobs enabling $22 billion in wages, $35 billion in GDP and $79 billion in economic output.

Within British Columbia, Statistics Canada uses Input-Output Multipliers[9] to estimate the value of direct economic activity on the overall economy. For British Columbia, every dollar spent on air transportation is expected to generate 1.936 dollars of output. Additionally, each million dollars spent in the air transportation industry is expected to create approximately eight jobs (Statistics Canada 2019).

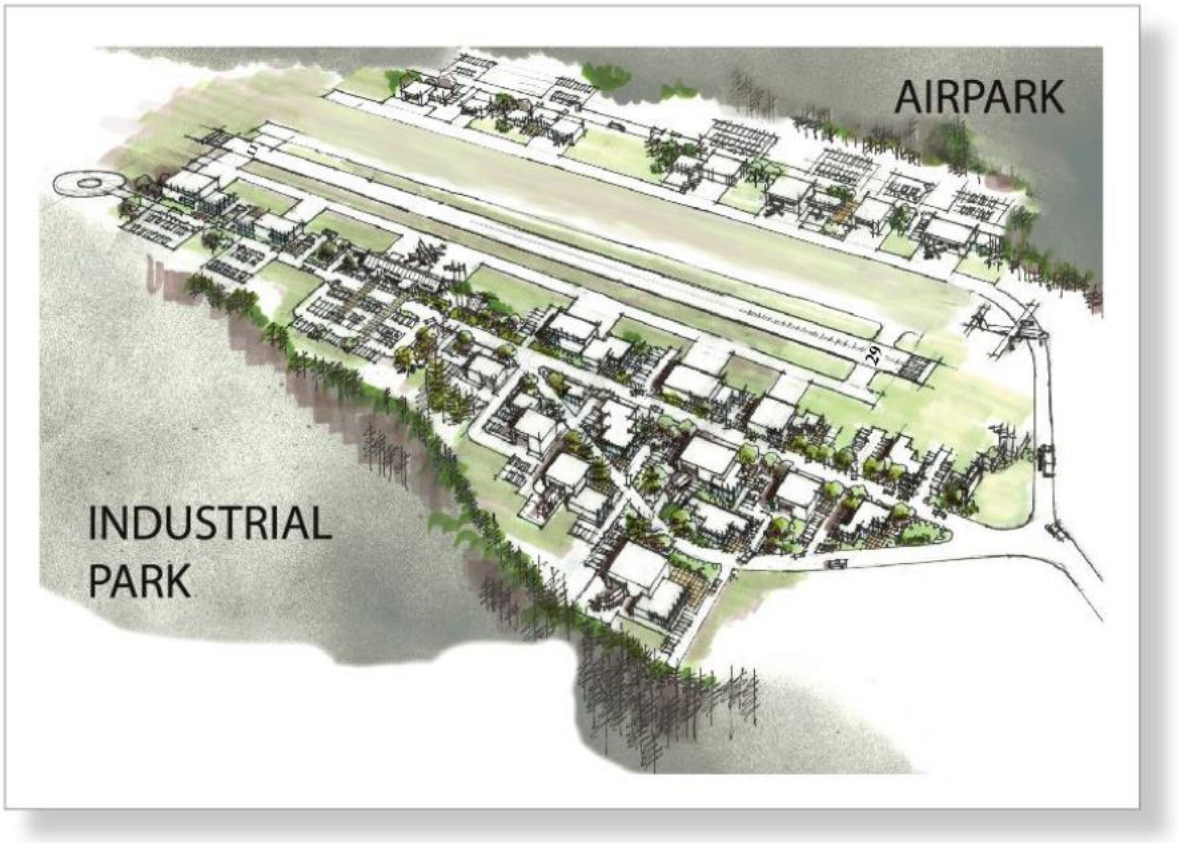
Therefore, the spending and employment opportunities generated by an airport are likely to result in increased economic activity. Additional economic activity also results in additional tax revenue, which often benefits the local government.

The Sechelt Airport proposed a major expansion, updated in 2014, and the Airport was renamed the Sunshine Coast Regional Airport. The community recognized the opportunity for business

[9] 2015 multipliers were used.

development on the Sunshine Coast and the fact that the airport would make an excellent location for such development. The proposal was for a 4,000-foot runway, extended from the existing 2,600 feet) and upgrade, 150 acres of industrial land, a fenced operation area, terminal building, runway lighting and a fuel facility. It was noted in their 2013 summary that "support exists through the area's local government authorities for an improved airport to provide scheduled air service and all weather landing capacity for emergency transportation such as air ambulance or disaster assistance aircraft. The total cost estimate was $10.0 million. The goals are lofty, but this demonstrates the understanding that airports contribute to the overall economy of a region, can accommodate a variety of industrial and commercial uses, create a synergy with the airport and air transportation and enhance all public safety, medical and emergency services.

Rendering: Sechelt Airport Conceptual Plan, 2013 (*https://www.sechelt.ca/Live/Transportation/Airport*)



7.2 Public Safety

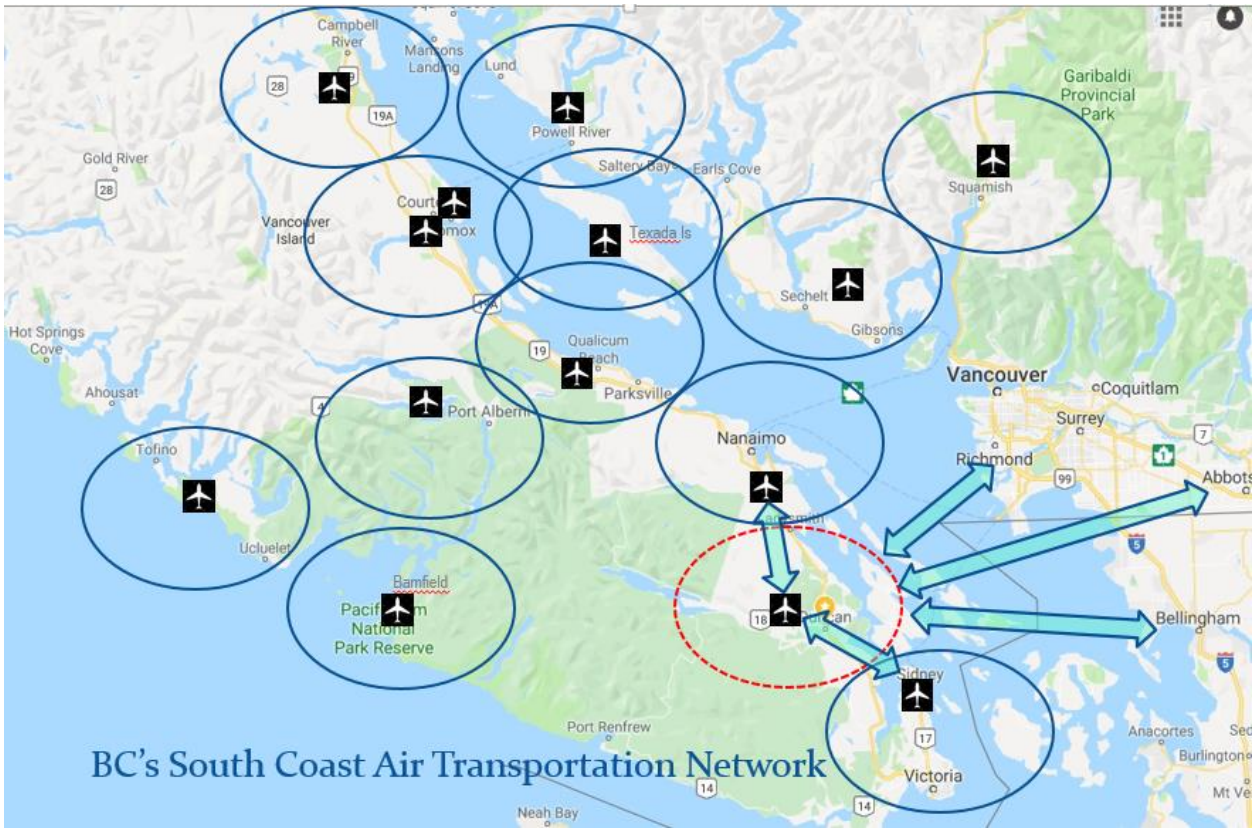
The presence of a regional airport may have public safety implications for the Cowichan Valley. In general, regional airports can support forest fire suppression efforts, search and rescues including earthquake response, and medical evacuations. In these cases, non-quantifiable value may be generated by the presence of the airport due to its ability to facilitate life-saving responses to these emergencies.

Additionally, in exceptional circumstances such as natural disasters, the airport may provide transportation value for goods, services, and people, facilitating a more effective response to the disaster. Similar to the emergency responses above, the positioning of the airport may contribute to live-saving measures for affected residents within the Cowichan Valley.

7.3 Airport Network

In January 2019, the Duncan Flying Club made a presentation to the Regional Services Committee. The presentation identified all of the airports in the South Coast Air Transportation Network. This map illustrates all of the public aerodromes in the region and the potential connectivity to the Cowichan Valley. The Club provided information on each airport and their access to grants and funding and growth plans. The critical factor here is that each of these airports exists, has land, has a governance model in place and with the exception of Nanaimo, all are publicly owned and operated. Geographically it does appear that the Cowichan Valley is a logical location for a community or regional aerodrome. There is a void in the Cowichan Valley. Also, from the activities of the other airport, an airport in the Cowichan Valley would support the local economy, including development around the new hospital, provide an alternative location for medical and emergency evacuation and services and support tourism and residents.

BC South Coast Air Transportation Network



8.0 Summary

This study has assessed the feasibility of developing a new airport in the Cowichan Valley. While the analysis demonstrates that an airport would be feasible, it is only feasible if an appropriate site can be found adjacent to a major road, close to the new hospital, that $7 million is accessed for the start–up capital, and that the community supports the construction of the new airport. Additionally, sufficient demand for industrial land is required as a primary revenue source to support the airport's ongoing operation. While most residents will agree that an airport will provide benefit to the community as a whole, the people who live near the future airport may object to the noise, traffic, and perceived safety issues of developing a new airport close to them.

In addition, the airport can only be a success if the economic value of the groundside land is significant to generate revenue and activity at the airport. The key is that the development of infrastructure should pay for itself through a variety of revenue sources and it should increase the level of high-value employment. A multi-purpose airport with a groundside industrial park has the opportunity to do that.

The design aircraft has been identified as the King Air 350, with a 3,500 foot paved runway. This establishes the area and standards for the airport. The original plan was to develop a registered aerodrome. However, if the airport is developed to meet all Transport Canada regulations, the operator can apply for certified status for specific airlines, aircraft, and flights. This would be a significant advantage for the Valley.

Should any of the assumptions change, the sensitivity of the analysis will shift and the assessment of the viability or feasibility could change.

It is recommended that current and future regional planning initiatives undertaken within the Cowichan Valley Regional District consider the potential benefits of a multi-use regional air transport facility.

If the CVRD Board believes that this study has demonstrated the merit of the construction of a Cowichan Valley airport, the next step is to investigate potential locations, complete community engagement and complete the studies to determine the actual developability and costs of the selected site.

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Appendix A

Airports “101”

Airports '101'

The truth of airports is that they are challenging to make profitable and while they may generate sufficient revenue to operate in the black, the capital costs generally far outweigh the ability of small airports to pay for themselves. A strong business plan with supporting land use regulations can assist the airport to encourage revenue generating development to assist with the sustainability of the airport. As a registered aerodrome, the existing Duncan Airstrip and the proposed Cowichan Valley Airport, would not be eligible for federal grants through the federal ACAP[10] funding. However, they would be eligible for provincial grants through the BCAAP[11].

The scope of the Feasibility Study was to review the demand for air transport now and into the future, and determine if the construction of a new airport is feasible. This has looked at how much associated industrial/commercial land would be required to support the airport. This has also looked at how an airport with 3,500 foot runway would improve the emergency/medical services in the area. A new airport would require amendments to the applicable Official Community Plan and the Zoning Bylaw. However, the critical regulations that apply to the operation of airports are the federal regulations such as TP1247 Land Use in the Vicinity of Airports and TP312 Aerodromes Standards and Recommended Practices 5th Edition. There are other restrictions such as municipal utilities and landowner input that all combine to determine the true feasibility of developing a new airport in the Cowichan Valley. The key is to ensure that there is sufficient revenue to operate the airport and to contribute to an airport reserve fund.

With a population of almost 80,000 people, the Cowichan Valley demonstrates a large community to be served by a regional airport. Located on the TransCanada Highway between Nanaimo and Victoria, the valley has the potential of being isolated by a severe event such as an earthquake and as such an airport would serve the community well. In addition, the area is growing and demand for industrial and commercial land will increase. Most small municipal airports function as general aviation aerodromes used by flying clubs, industry, and itinerant pilots. Increased use by corporate employees, just in time delivery, and tourism, would benefit the revenue generation for the airport and take off some of the financial burden from the local government.

Airports are generally divided into three categories: airside, groundside and operational. These areas are further regulated by the takeoff and approach surfaces, transitional surfaces and the obstruction zone.

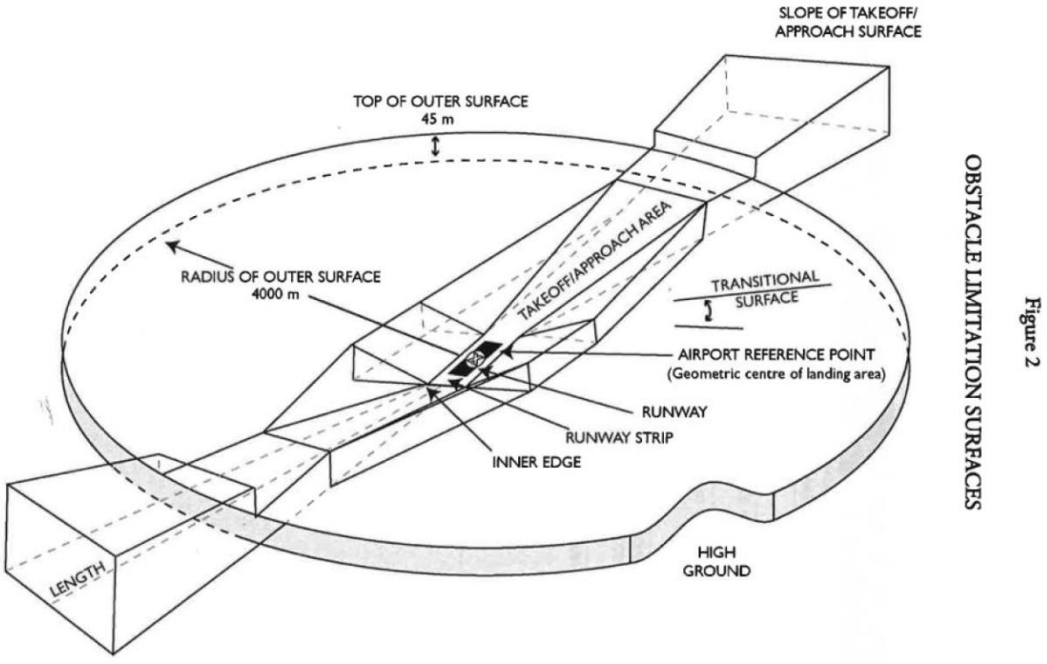
Airside uses are generally those that are aviation related and require direct access to runways, taxiways, and aprons to operate their business (for example airlines, couriers, agricultural operators such as crop

[10] Airport Capital Assistance Program
[11] British Columbia Air Access Program

dusters, and charter air operations). Groundside uses can be aviation related, but do not have to be aviation related and do not require direct access to the runways, taxiways, or aprons. Examples of aviation uses that do not require direct airside access could include avionics, upholstery, and catering. Groundside uses often seen at airports include light industrial, warehousing, storage, and specialty recreation (such as indoor climbing walls and gymnastics). Operational uses are those uses that the airport requires to maintain a functional airport including the runways, taxiways, aprons, terminal building, control tower, weather stations, lighting, maintenance sheds etc.

Figure A-1 shows the obstruction limitations for airport as identified by Transport Canada[12]. The obstruction limitation surface establishes the limit to which objects may project into the airspace associated with an aerodrome. This is primarily a height restriction parallel to the runway, at the ends of the runway and a 4 circle above the runway, 45 metres high, into which structures should not penetrate. This Outer Surface generally extends beyond the airport property and out of the jurisdiction or control of the Airport owner/operator. This area generally requires interjurisdictional cooperation and collaboration to ensure that the local government regulating development does not approve something that may jeopardize the safe and continued operation of the airport.

Figure A-1: Obstruction Limitations



[12] Transport Canada, Land Use in the Vicinity of Airports, TP1247.