Saunders Field

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MERRITT AIRPORT MASTERPLAN

MARCH 2006

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Executive Summary

The Merritt Flying Club has initiated the preparation of an Airport Master Plan for the Merritt Airport. The purpose of the Airport Master Plan is to incorporate the recent direction of City Council into a strategic plan and future vision for the Merritt Airport.

In recent years, significant changes have occurred both in the aviation industry and the community. Examples of changing standards and trends in the aviation industry include major modifications of Transport Canada Aviation airport design criteria, a national increase in the number of personal use general aviation aircraft owners, with an increasing number of maintenance facilities, corporate, charter, and air cargo operations. Passenger air carriers have also undergone a shift in dynamics. The structure of the commercial industry has changed, with the transition of major airline hub-and-spoke operations and code sharing regional carriers, and the growth of no-frills operators such as WestJet Airlines and its imitators. Merritt is particularly affected by the continued growth and development in International airports in Kelowna, Abbotsford and regional airports in Kamloops and Chilliwack.

On the local level, there has been significant economic growth in the Merritt / Thompson Nicola and Okanagan Valley region. The City of Merritt initiated the Land Use planning process in 2003 and has been invited to work cooperatively with the Merritt Flying Club, to ensure the long-term viability of the airport and to enhance service to the aviation user. To ensure long-range capabilities, an assessment of airport requirements, along with consideration of economic and industrial development opportunities and strategies, are major issues that need to be addressed as part of the Master Planning program.

The Merritt Flying Club strongly believes that all of these changes, opportunities, and constraints contribute to the need for a comprehensive review of the airport and its role in the community. We have initiated the process in this first draft, and if successful in our bid to remain as the airport operator, will strive to complete and formalize the plan with all stakeholders.

The Master Plan for the Merritt Airport represents a unique and important opportunity to construct a clear vision of where the airport is in the present and where it should be going in the future. The Airport Master Plan is intended to serve as a medium for assembling community opinion, spirit, and concurrence.

The Plan consists of three integral parts:

A. Inventory of Existing Conditions
B. Forecasts of Aviation Activity
C. Capacity Analysis and Airport Facility Requirements

Chapter One

Inventory

The inventory is the initial step in the development of the Master Plan. Pertinent data and information was assembled which relate to aviation activity in the region and airport development requirements. The inventory is a systematic and comprehensive data collection process, which provides an understanding of past and present aviation factors. The information compiled is then used as a basis to forecast aviation demand and determine future airport facility requirements.

1.1 Airport Setting and Role

Merritt Airport is located on approximately 30 hectares at an elevation of 2080' above sea level. The airport is approximately three miles North of downtown Merritt and has access from highway 5A, Airport Road..

Based on the types of aircraft now operating at the airport, Merritt Airport is classified as a CODE 2B airport. This primary designation is based on the Transport Canada classification system of TP 312(e), which relates to aircraft wing span and wheelbase. Aircraft with higher approach speeds need longer runway lengths to land and to take off safely. Aircraft wingspan and wheelbase relates primarily to runway and taxiway separation criteria.

Over the years, and currently, there has been some commercial service activity with more general aviation activity at the airport. Commercial aircraft currently operating at Merritt Airport include the Cessna Citation II, Cessna Conquest, Cessna 414 and 340, Beech King Air and 1900. We have had Dash 7 and 8, and Convair traffic during the fire season bringing in crews from all over Canada.

Typical general aviation aircraft operating at Merritt vary from smaller aircraft such as homebuilts to the Cessna 172 and twin engine 6 seaters. Currently, there are approximately 6 aircraft based at the airport.

Merritt is a busy fuel stop for many transiting helicopters.

1.2 Airport Management

Merritt Airport is owned and operated by the City of Merritt. The Merritt flying Club since 1991 has managed the Airport. The Airport Manager is responsible for handling emergency situations, promoting the airport to the aviation community, and for communicating with local interest groups, City Council, the news media, and concerned citizens regarding airport operations. Further responsibilities include daily operation of the airport and ensuring that the needs of all users of the airport (businesses, general aviation, military, and governments) are being met.

1.3 Airport Advisory Commission

The Airport Advisory commission consists of seven members appointed for up to three-year terms. The commission recommends policies at the airport and recommends policies for marketing, land development, lease rates and for land use adjoining and nearby the facility. The Commission is not responsible for supervising airport business. The Airport Manager meets periodically with the Commission to discuss issues and policies relevant to the airport. The Airport Manager reports directly to City Council.

1.3.1 Commission Members 2006 - 2009

Claude Lelievre

- Active Mountain Resort Inc.
- Active Mountain Raceway
- Active Mountain Entertainment

Claude has expressed a keen interest in the Merritt Airport and actively supports the Club's desire to establish an Airport Commission. He brings a diverse set of skills to help in the development of the airport. His long list of skills and business experience will greatly add to overall strength of the group.

Willy Trinker

- Canadian Mountain Holidays Heli Skiing
- SilverTip Lodge Manager
- Commercial pilot

Willy has been an active participant in the development of the Flying Club's property and the leader in the Hangar construction project. He owns the only hangar situated on the airport. Willy has built many airplanes and currently owns an aircraft based at the airport. Willy is a commercial fixed wing and rotary wing pilot. He is currently being checked out on a Beaver floatplane.

Gordon Bjorkman

- BC Hydro, retired electrical foreman
- Private pilot

Gordon has been very active, aviation enthusiast. He is currently using the hangar on the Club property, to store his airplane. He has built his own airplane and is active in the recreational, homebuilt aircraft community. Gordon brings a lengthy experience, and management expertise from BC Hydro. He was instrumental in setting up the Airport weather station and security cameras. Gordon has brought web page development experience to the group.

Frank Rizzardo

- EMCON Services
- Nicola Lakeshore Estates

Frank offers his expertise, experience, contacts and skills in many areas – marketing, land development, promotional activities, and transportation. His latest project on Nicola Lake has already brought more traffic to the Merritt Airport.

Fred Fandrich

- Valley Helicopters, Owner/Chief Pilot
- Valley Helicopter Training Division

Fred's involvement with the Merritt Airport began in the late 1980's when he established the first Rotary wing Fixed Base Operation on the Airport. After many years of trying to establish a permanent base, he was forced off the airport property and set up a hangar on the Garthwaite property adjacent to the field. Fred brings an amazing set of skills from his extensive business experience as well as a lengthy career and highly respected expertise in the aviation industry in B.C. He has been actively supporting the development of the airport.

Community Member

- A member of the community appointed from application to the commission.

Flying Club Member

- A non-executive member nominated to the commission from the Merritt Flying Club

Airport Manager
Ian Gordon

1.4 Airside Facilities

Airport facilities are divided into two groups: airside and landside. The airside facilities at Merritt Airport include runways, taxiways, airport lighting, and aircraft parking apron, hazard beacons, and navigational aids, hangars, among others. The buildings, and auto parking areas, areas that are outside of the fence, are considered landside facilities.

1.4.1 Runway Facilities

Merritt Airport has one operating runway. The runway configuration was designed to accommodate the prevailing winds in the area, which are from the Coldwater Valley. 03-21 is 4000 feet long and 73 feet wide. The runway has an operational weight bearing strength of 44,000 pounds. The runway was constructed of asphalt in 1981 and is in good condition. Runway 03-21 is a non-instrument runway; therefore, it has non-instrument runway markings, without lighting, and has a runway strip of 30 meters.

1.4.2 Taxiways

The taxiway system at Merritt Airport is a parallel and connecting taxiway. Transport Canada designates all taxiways Code A, B, C, D, E, or restricted depending on the pavement width. Code A taxiways should have a width of not less that 7.5 meters. Code B not less than 10.5 meters and code C not less than 15 meters. The taxiway designation is designed to correspond with aircraft coding. For example a code B aircraft similar to the Cessna Citation would require a code B taxiway to operate within safety limits.

Taxiway Alpha is a code C, parallel to the Runway. The current condition of the taxiway is gravel and based upon visual inspection, is not in good condition, and is not being used. Low wing aircraft would certainly not use the taxiway for fear of damaging the propellor.

1.4.3 Runway and Taxiway Lighting

There are no lighting aides available at the Merritt Airport at the current time. Surveys have been completed and beacon locations identified to satisfy future lighting requirements.

With the establishment of lighting aides at the airport, this would help in the identification, approach, landing, and taxiing operations at night or in poor weather conditions. The pilot would key up the lighting system. The following paragraphs describe typical airside lighting aids that would be installed at the Merritt Airport.

The runway system 03-21 would be equipped with medium intensity edge lighting on either side of the runway, with Precision Approach Path Indicators - 1 systems (PAPI-1). PAPI's provide visual decent information to the pilot. PAPI's help the pilot determine whether the approach is high, on line or low while descending toward the runway threshold.

Threshold lights would be located at the immediate ends of each lighted paved runway at airports and are critical for the safe landing of aircraft. The lights consist of two-color red/green lens. The green half of the lens faces approaching aircraft and indicates the beginning of the usable runway. The red half of the lens faces the aircraft during takeoff, again indicating the end of the usable runway.

After crossing the threshold, the aircraft must complete a touchdown and roll out on the runway. Runway edge lights are used for this landing phase. Edge lights give pilots information on alignment, roll, and distance.
Taxiway edge lighting would also be necessary, if used at night, to enable pilots to taxi aircraft safely to and from the Ramp area to the runway. At Merritt Airport, blue edge lights would be provided on taxiways Alpha and the Apron area.

The rotating beacon identifies the location and presence of the airport. The beacon is equipped with an optical system that projects two beams of light, both white, 180 degrees apart. The typical location of the beacon would be to locate on the roof of the terminal building or adjacent to it.

1.4.4 Obstruction Lighting

Surrounding hills may cause a hazard to approaching aircraft at night. Merritt Airport has 7 locations mapped for the required flashing red hazard beacons to alert incoming aircraft of the highest peaks in the area. With today's increased reliability and functionality with solar panels, Transport Canada has approved these for installation and use.

1.5 Area Airspace

The airspace structure in the Merritt Area is uncontrolled. Uncontrolled airspace is defined as all airspace that has not been designated as controlled, and which Air Traffic Control (ATC) has neither the authority nor responsibility for control. Controlled airspace, on the other hand, is supported by ground/air communications, navigational aids, and air traffic services.

Virtually all airspace between 12,500 & 18,000 feet mean sea level is considered controlled. Airspace under that altitude can be either controlled or uncontrolled, depending upon the air traffic density, proximity to an airport, and geographic factors.

Merritt is located very close to many High-level airway intersections, with international IFR traffic transiting from Europe and domestic north/south traffic.

1.6 Air Traffic

1.6.1 Procedures

The purpose of this section is to describe the management of airspace in the vicinity of Merritt Airport. Merritt airspace reaches a 5 nautical mile radius from the geometric center of the facility to an altitude of 5100' ASL and is uncontrolled. It has a designation of a Mandatory Air Traffic Frequency that operates on frequency 123.2 Mhz AM VHF. Pilots are expected to operate using standard uncontrolled aerodrome procedures as indicated in the Canadian Air Regulations (CARS). The airport elevation is 2080 feet ASL. The circuit altitude is 3100 ft ASL. The preferred circuit is RH 03.

1.6.2 NDB /GPS Approaches

A Non Directional Beacon (NDB), if established could establish an approach as a cloud break procedure over the Merritt NDB. Similarly, if a GPS approach were calculated, this would increase safety for aircraft operating in poor weather conditions.

1.7.2 Imaginary Surfaces

Ideally, airports should be located so that the surrounding airspace is free and clear of obstructions that could be hazardous to aircraft on takeoff or approach paths or when operating in the airport vicinity. It is therefore necessary to maintain the surrounding airspace free from obstacles by preventing the installation, development, or growth of obstructions to airspace that could cause the airport to become unusable. The regulations for the protection of airspace in the vicinity of airports are established by the definition of imaginary surfaces, the penetration of which represents an obstruction to air navigation. Again, the geometry of the imaginary surfaces is governed by regulations set forth in TP312E. The protected airspace around Merritt Airport is made up of five principal imaginary surfaces, two of which are explained in the following charts.

Runway Protection Zone

Runway	Approach	Zone Length	Zone Width
03	Non-Instrument	200 feet	196 feet
21	Non-Instrument	200 feet	196 feet

Runway Approach Surfaces

Runway	Approach	Approach Slope	Length	Transition Slope	Length
03	Visual	1:25	2500 M	1:5	216 M
21	Visual	1:25	2500 M	1:5	216 M

Approach Surface: Is a horizontal plane from the established airport elevation. Arcs of specified dimensions set the plane dimensions of the horizontal surface forth from the end of the protection zone, connected by tangents with a slope of 25:1.

Transition Surface: Is an inclined plane with a slope of 5:1 extending upward and outward from the protection zone and approach surfaces, terminating at the point where they intersect with the horizontal surface or any other surface where more critical restrictions apply.

1.8 Facilities and Services

Facilities are defined as that portion of the airport other than the aircraft operating areas. Facilities include a terminal building area, auto parking, and the airport access road. Fixed base operations (FBOs) are also a part of landside facilities and include: general aviation passenger, waiting areas, pilot lounges, aircraft maintenance, fuel storage, and aircraft rental, storage, and sales.

1.8.1 Aviation Fuel Storage

Table 1-5 lists the present fuel facilities and capacities at the Airport. The airport offers 100LL and Jet B fuels. Fuel is distributed to aircraft by Fixed on-site, in-ground storage.

Airport Fuel Facilities

Company	Fuel Available	Capacity	Type
Merritt Flying Club	Jet B 100/ LL Jet B Storage*	22,728 L 22,728 L 22,728 L	In ground
Total Capacity		68,164 L	

* The 80/87 tank will be used for future expansion for Jet B storage. Conversion will take place in the near future – within the short-term goals of this planning period.

1.8.2 Terminal Area

The Merritt Airport has a public terminal facility that is located on the northeast side of the airport properties. This facility has a flight planning room, passenger-waiting area, washrooms, and a public phone is also available. At the current time, the terminal building houses the Merritt Flying Club and the Merritt Search and Rescue group as an EOC. The current structure, size and location of the terminal building is excellent, and will not need any upgrading within the current planning period.

1.9 Existing Airport Land Use

Merritt Airport is currently situated on a site containing a total of approximately 30 hectares. The property can be divided into seven functional areas based upon current airport use patterns. These areas include:

Airport Runway and Taxiway System Area
Aircraft Tie-down Area
Terminal Apron Area
Commercial/Industrial (southwest side)
Commercial/Industrial (southeast side)
Private Hangar Area – adjacent south the apron
Rotary Wing Area – southwest corner and north of the fuel pumps.

1.10 Aircraft Operations

Aircraft operations refers to either the take-off or landing of an aircraft -- commercial, general aviation, or military. The table below details the number of annual aircraft operations in the past five years with an estimate for the years 2006 and 2007.

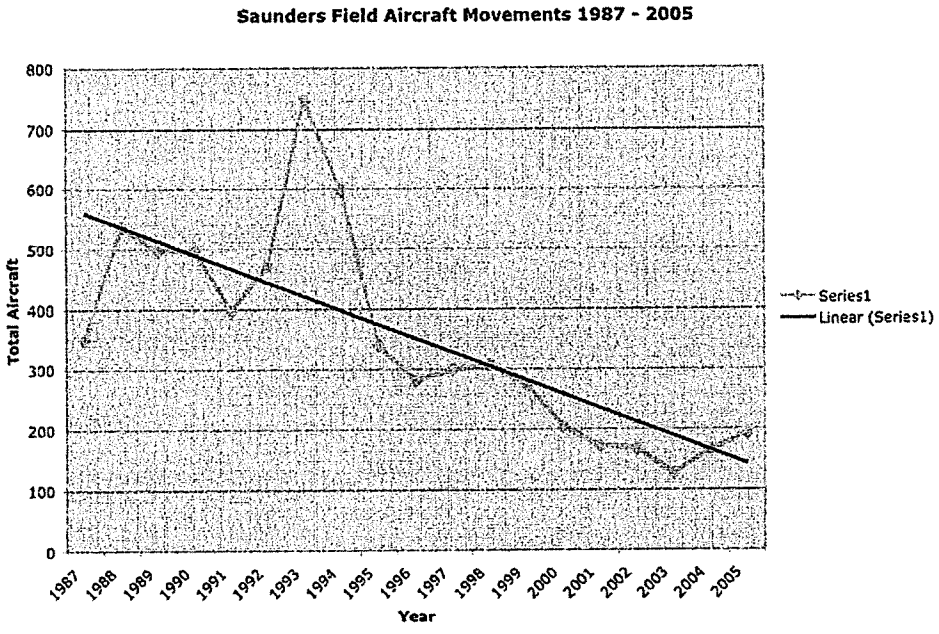
2000	207
2001	175
2002	171
2003	129
2004	168
2005	194
2006 (estimate)	225
2015 (projected)	1000

1.10.1 Historic Airport Activity Levels

Merritt does not have a control tower and thus it is difficult to confirm exact aircraft movements. Figures are based upon pilots signing the Airport Log Book that the Merritt Flying Club set in place in 1978. It should be noted that ~ 80% of the recorded movements over the past 2 years, have been private, locally based aircraft.

Aircraft Movements Saunders Field 1987 – 2005

Year	# Of Movements
1987	353
1988	539
1989	500
1990	500
1991	400
1992	475
1993	750
1994	600
1995	342
1996	283
1997	302
1998	309
1999	276
2000	207
2001	175
2002	171
2003	129
2004	168
2005	194



1.10.2 Based Aircraft

A based aircraft is an aircraft that is permanently stationed or housed at an airport. The number of aircraft that can be expected to locate at an airport is an important factor in the planning of future airfield and landside facilities, primarily for general aviation users. There are currently 6 aircraft based at the airport, with 2 flying regularly.

1.11 Merritt Airport Study Area Characteristics

The historic and future levels of activity at an airport will depend, to a great extent, on the economic vitality, growth, and level of development in the airport's area of influence. For these reasons, defining the historical, present, and future characteristics of the airport's study area is a very important step in master planning. Past and present conditions are readily determined; however, selecting a future growth scenario is much less precise. This section describes the study area and defines its historic and existing socioeconomic characteristics.

An area's socioeconomic profile can have a direct relationship on its demand for aviation - related activities. Experience has shown that the most significant factors typically in this profile are population, and income.

1.11.1 Population

Current numbers available on population in terms of growth stem from the 1996 and 2001 Census Profile. Overall the Thompson - Nicola has seen an increase in population of 1.0% between the years of 1996 and 2001. The City of Merritt has seen a decrease in population of 7.1%, over the same span.

Area Population

Area	Population (1996)	Population (2001)	Percentage Change
Merritt	7631	7088	-7.1%
Health Region	11742	11298	-3.8%
Ashcroft	118801	119222	0.4%
Kamloops	76394	77281	1.2%
Princeton	2826	2610	-7.6%

BC Government Statistics projects the population increase of 6.8% from 2006 – 2015 in the Thompson Nicola Region.

[1] BCSTATS – Statistics Canada

1.11.2 Area Income

Statistics Canada Average Family income for the region.

Year	Thompson Nicola	Province of B.C.
1995	$45910	$56527
2000	$53532	$64821

The Thompson Nicola Region has an average family income of $53532. A projected increase in the average disposable income in the region gives way to increased recreational activities, including aviation related functions, and an eventual increase in the demand for charter operations and sight seeing tours may happen within the panning period.

The Merritt Airport currently has had only volunteers operating the Airport.

1.12 Surrounding Land Use

An examination of community-wide land use and growth patterns is necessary in determining where future concentrations of residential, commercial, and industrial uses are likely to occur. Land use conflicts can be avoided by carefully studying alternatives for airport development while taking into consideration these land use patterns.

Land uses currently surrounding Merritt Airport include agricultural, residential, commercial, and recreational. The airport is city-owned and operated, and lies inside the contiguous city limits. In the past, commercial development has been allowed to encroach on the airport and, the City selling off adjacent properties, has greatly impacted future expansion possibilities.

1.13 Surface Transportation Network

Transportation access to the airport is through road only. There is taxi service available. Time to the airport from Downtown Merritt is 5 minutes.

Merritt is located at the hub of a major transportation network. In and out of Merritt by Hwy 5, 5A north to Kamloops (45 Min by car) and south to Vancouver, (3.0 hours) Hwy 8 west to Spences Bridge (45 Min) and 97C northeast to Kelowna (1.5 hr.)

1.14 Climate

The climate in the City of Merritt is affected by its desert like topography and is susceptible to extreme summer temperatures and moderate winters.

Summer months are warm and the average daily maximum temperature is 30C during July. Winter temperatures are moderate and mild winter temperatures are not uncommon. Prevailing winds are from the south and shift to the north, northeast during the passage of cold fronts. The moderate summer heat coupled with an elevation of 2080 feet ASL brings the Merritt Airport runway length of 4000 to the forefront for larger high performance aircraft.

1.14.1 Climate Statistics

Annual Mean Total Rainfall	189.3 mm
Annual Mean Total Snowfall	99.6 mm
Hours of Sunshine	2,030 hours
Annual Mean Daily Temperature	6.7° C
July Daily Maximum Temperature	26.2° C
January Daily Minimum Temperature	-10.8° C
Average Frost Free Days	250 days
Average Growing Season 5 Months	5 Months

1.15 Inventory Summary

The information provided within the Inventory-Chapter One provides a background upon which the remaining elements of the master plan are produced. Information on current airport facilities and utilization will serve as a basis for the development of the forecasts of aviation activity and for the determination of future facility requirements.

CHAPTER TWO

AVIATION DEMAND FORECASTS

The demand for aviation services has, historically, been closely related to the socio-economic character of its area of influence. As population and relative income grow there generally is a corresponding growth in the demand for aviation services. This section of the Airport Master Plan presents a summary of the estimated future levels of activity at the Merritt Airport.

2.1 Purpose

Aviation demand forecasts serve three purposes in development of the master plan. Specifically, they provide the basis for:

- Determining the necessary capacity of the airside, terminal area, aircraft tie-down area, leasable space, fuelling requirements, and ground access system serving the airport;
- Determining the airport's role, and resulting size, and type of existing facility expansion or new construction;
- Evaluating the financial feasibility of alternative airport development proposals.

2.2 Approach

The development of aviation demand forecasts are conducted in two distinct phases: the analytical, followed by the judgmental. In general, past aviation activity data are examined in anticipation of identifying past trends that will give an indication of future activity. Trends in the local economy are factored into future activity levels, as well.

During the analytical process, the past trends of the aviation demand elements are extended into the future using a variety of techniques and incorporating a number of assumptions. Projections are developed by combining historical trends with various analytical procedures. After preparing a number of projections, the analyst is able to identify a range of growth within which the true trend will most likely fall.

The second phase of demand forecasting requires experienced professional judgment. The analyst examines various growth projections for each demand element, studies the character of the community and how it will influence the particular demand element, and then makes a determination as to the "preferred" forecast

2.2.1 Projection Methodology

The most reliable approach to estimating aviation demand is through the use of more than one analytical technique. Methodologies usually considered for airport master planning include, trend line analysis, survey analysis, and forecast development.

Trend Line Analysis

Trend analysis is probably the simplest and most familiar forecasting technique and is one of the

most widely used methods. Historical data is extended into the future, providing an estimate of the aviation demand element in future years.

A basic assumption of this trend analysis technique is that the historical levels for aviation demand will continue and exert a similar influence on future demand levels. As broad as this assumption may be, such a projection method often does serve as a reliable benchmark against which other projections may be compared.

Survey Analysis

Surveys can be developed that will provide an indication of present and future levels of aviation demand. For this study, personal interviews, questionnaires, and structured personal observation were used.

Forecast Development

The analytical projections serve as a basis for developing aviation demand forecasts through the application of experienced, professional judgment.

Informed judgment is perhaps the most valuable factor in forecasting any aviation demand element. Many variables can be accounted for in the analysis and assigned the proper weight, as viewed by the forecaster. Such variables include: development demands from on-site aviation related businesses as well as off site companies, changes in a community's competitive status with reference to job creation, long-term demographic shifts, tourism, and environmental limitations.

2.3 Aviation Demand Elements

Forecasts of aviation demand can be developed for numerous elements. In the case of airports such as Merritt Airport, the key demand elements are fully serviced land, based aircraft, aircraft operations (performance demand), and aircraft types. Other important elements are derived from these basic indicators. For this study, forecasts were prepared for:

1) Land Demand
2) Fuel Sales
3) Aircraft Tie-Downs
4) Aircraft Operations (field length)
5) Instrument Operations
6) Yearly Budget
7) Airport Capital Development Fund

The demand forecasts will serve as the basis for determining aviation facility requirements and staged development throughout the forecast period.

2.4 Land Demand Forecast

In 1990, the Merritt Airport consisted of one hangar, 15 based aircraft and an active Flying Club, an FBO and an air taxi operation. The airport was under the administration of the City with management, and operation of the Merritt Flying Club.

During the late 80's there was intense demand, driven by an economy gaining momentum, for

land at the airport for industrial and private purposes. In the last 11 years leased land at the airport has been made available with no development. No land at the current time is being used for commercial activities.

2.4.1 Kelowna Airport

Kelowna Airport, located 1.5 hr. northeast of Merritt City Center has positioned itself as the center for passenger air travel. It is serviced by Air BC, Canadian Regional, WestJet, Coastal Mountain Air, Horizon Air, and a variety of charter services. An aggressive terminal expansion is currently underway as well as upgrades to their air navigation system.

Kelowna's philosophy is driven by passenger service, encouraging larger air carriers to use their facility and discouraging operations by smaller aircraft. With that said, Merritt Airport finds itself poised to attract smaller industrial based businesses including aircraft manufacturing and maintenance to their facility. The impact of Kelowna's direction was used in the aviation demand forecast for future land demand.

2.4.2 Kamloops Airport

Kamloops Airport is located 1.3 hr. north of Merritt. It is currently serviced by Air BC, Coastal Mountain Air, and Canadian Regional as well as small charter operators.

The airport was operated by Transport Canada and was the subject of a transfer according to the National Airports Policy – the City of Kamloops

2.4.3 Local Demand

There has been little private demand from local interests for developable land at the airport.. There is no hangar space available at this time at the Merritt Airport for long term or transient hangarage.

2.4.4 Land Demand Forecast Conclusion

Taking all of the above factors into consideration, using the application of the trend line analysis, survey analysis, and the development forecast, the Merritt airport would easily accommodate new business development at the airport over the term of this planning period. Over the long term, limited space may result in the airport properties being "built-out". There are no land reserves held for airport expansion.

2.5 AIRCRAFT TIE-DOWNS

There are currently 8 useable aircraft tie-downs on the facility. 6 aircraft currently park outside leaving 2 available tie-down spots available. The parking area is in dire need of maintenance and relocation. Once this is accomplished. There will be space for 20 aircraft.

2.5.1 Kelowna Class D - Mode C airspace

Nav-Canada, in January 1999 upgraded the airspace over Kelowna airport to a Mode C requirement. All aircraft coming in and out of the facility will need to have a mode C encoding

transponder. There is a large number of aircraft housed in Kelowna that do not have the required equipment to operate. It is anticipated that two aircraft a year for the next five years will re-locate to the Merritt, Vernon and Kamloops area because of this requirement, with the rest upgrading with the $3000.00 piece of equipment.

2.5.2 Ramp expansion

Currently the ramp area is more than adequate. Later phases of the master plan with reference to facility requirements refer to a ramp expansion to the southeast and south of the existing ramp. This expansion will force a reorganization of the apron parking areas.

2.5.3 Private hangar construction

Currently, the only area available for private hangar construction, all to the south and east of taxiway Alpha, is the Merritt Flying Club's property development. The forecast of 10 hangars over the term of this planning period would be conservative.

2.5.4 Local Demand

Using trend-line analysis, there has traditionally been a one aircraft per every 5 years decrease at the facility.

2.5.5 Aircraft Tie-Down Forecast Conclusion

Taking all of the above factors into consideration, using the application of the trend line analysis, survey analysis, and the development forecast, there might be a demand of one to two new tie-down spots per year. The table below shows the projected demand for tie-down requirements into the year 2015.

Aircraft Tie-Down Forecast

Year	Aircraft Demand	Spots	Remaining (Shortage)
1991 (actual)	13	16	3 (0)
2000	8	20	12 (0)
2006	6	20	14 (0)
2010	14	20	6 (0)
2015	20	20	0

2.6 Corporate Philosophy

Merritt has a growing number of large sized businesses in the community, some of whom may require air travel on a regular basis. Corporate flight departments are an economical and convenient way for executives and employees of the said companies to travel to their destination, with little or no effort.

Merritt Airport has the ability to facilitate these companies' needs. This facilitation requires proper planning with reference to runway length, lighting, navigation aides, emergency preparedness, and especially long-term expansion planning, as well as adjacent airport land use.

2.7 Density Altitude

Density is an important factor in the take-off performance of modern aircraft. Low density reduces engine thrust and aerodynamic lift. Density altitude is important in calculating the fuel and payload levels permissible for take-off. Both barometric pressure and temperature affect air density. Density altitude rises with air temperature, giving the aircraft characteristics of a higher altitude, and thus, reducing performance.

2.8 General Aviation Aircraft

General Aviation makes accounts for the majority of aircraft movements at the Merritt Airport. The typical general aviation aircraft is the Cessna 172. Characteristics of this aircraft show takeoff and landing distances below.

Typical Aircraft Performance Numbers – Cessna 172

Temperature	Gross	Field Length required	Field Length Required (50 ft obstacle)
10° C	Loaded	930 ft	1670 ft
20° C	Loaded	1000 ft	1790 ft
30° C	Loaded	1075 ft	1915 ft

The hot Nicola Valley summers create this density altitude phenomenon throughout the summer months.

2.9 Field Length Forecast Conclusion

After review of all the criteria, surveys, and taking the design aircraft into consideration, the ideal field length for the Merritt Airport would be 4420 - 4500 feet, putting the City of Merritt in a position to facilitate a privately registered Cessna Citation II at full gross using the field at 30° Celsius.

Further, an expanded field length will increase the safety margins for the smaller aircraft on the field.

2.9.1 Current Classification

Merritt Airport is classified as a Code 2B non-instrument airport. The current runway strip of 30 meters from centerline dictates this designation.

Runway Classification Requirements

Runway Designation	Required Strip	Runway Designation	Required Strip
Non-Instrument	30 Meters from Center Line	Non-Instrument	30 Meters from Center Line
Non-Precision	45 Meters from Center Line	Non-Precision	45 Meters from Center Line
Precision	60 Meters from Center Line	Precision	60 Meters from Center Line

2.9.2 Corporate Requirements

The corporate flight departments, as well as the charter companies at the Merritt Airport will require an approach to the airport facility. Currently there is no approved approach available. Future growth will require the establishment of an NDB or GPS approach to Merritt. This will greatly aid flight departments, which would be under great pressure to ensure their passengers, reach their destination, and under current conditions need to divert to Kelowna or Kamloops.

2.10 Limitations

Due to the limited land available at the Merritt Airport, especially when it comes to depth west, a designation of more than 30 meters on the runway strip would negate any land available for a taxiway to service private property development.

2.11 GPS

Global Positioning System (GPS) is a technology, which allows aircraft installed with certain encoders, to receive information on position, altitude, speed, and decent rate from an array of satellites currently in orbit.

The technology will be further enhanced with the addition of a Canadian Wide Augmentation System, due in 2004. This system will allow pilots the security of further accuracy with reference to altitude encoding of existing units.

This further accuracy will lead the way to more airports designating GPS approaches instead of the traditional localizer, NDB, and ILS approaches.

2.12 Instrument Operation Forecast Conclusion

The majority (95%) of aircraft movements in and out of the Merritt Airport are through Visual Flight Rules (VFR.) The airport is a VFR airport and most aircraft on the facility and pilots prefer to fly VFR.

It is logical to assume that the increasing aircraft numbers based at the airport will operate in a VFR environment. Current demand for IFR facilities will not rise, leading to the conclusion that while a NDB approach would be beneficial, the demand for a GPS approach would be beneficial in the near future. Coorporate movements thus far in 2006 have confirmed this.

Chapter Three

Capacity Analysis and Facility Requirements

Chapter Three identifies the long-range facility requirements for the Merritt Airport to satisfy the annual aviation demand through the year 2015. The facility requirements are developed from information assembled in the inventory and forecast analyses and from Transport Canada criteria for design of airport components. The analysis yields estimates of required "airside" improvements such as runways, taxiways, navigational aids, marking and lighting, and "landside" improvements such as the terminal building, vehicle parking spaces, and airport access requirements.

3.1 Airside System

The primary components of the "airside" are those directly related to the arrival and departure of aircraft. These facilities are comprised of the runways and taxiways, navigational aids, and airport lighting and marking.

The development of airport facilities is based primarily on the characteristics of the aircraft, which are expected to use the airport. The most important characteristics are the approach speed and the size (wingspan) of the "design" aircraft expected to use the airport. A "design" aircraft is defined as the most demanding aircraft, which performs regular operations annually at the airport.

Transport Canada groups aircraft according to their performance and size. The categories range from Approach Category A, for slower single-engine piston aircraft, to Approach Category E, for supersonic jet aircraft. The "design" aircraft group now using Merritt Airport falls into Category B (approach speed less than 166 knots/wingspan less than 79-feet/ wheel base less than 19 feet), which is considered a transport aircraft. Based on the forecasts of aviation demand, and for future long-term airport requirements, the "design" aircraft group will remain within Category B.

Along with the aircraft's approach speed, the airplane's wingspan is another principal characteristic, which affects airport design standards. There are six Airplane Design Categories, which range from Category A, for small aircraft with wingspans less than 49 feet, to Category E for the largest air carrier and cargo aircraft.

The predominant aircraft now using the Merritt Airport fall generally into Design Categories A and B (wingspans less than 79 feet). Based on the forecast analysis, the specific long-range "design" aircraft group for Merritt Airport will fall within Transport Canada Airport Reference Code 2-B. This includes the Cessna Citation II, Beaver, Twin Otter, King Air, Beech 99 and 1900, and Cessna Bravo and V, which in the past have also been used at Merritt Airport, are Code B type aircraft. The de Havilland Dash-8 and Boeing 737 are classified as Code C aircraft.

3.2 Runway Requirements and Orientation

The condition and adequacy of the existing runway system at Merritt Airport, including the runway length, pavement strength, and their orientation relative to area winds were assessed. From this analysis, future runway requirements were determined.

Area wind characteristics were assessed and are a major factor in determining the optimum number and alignment of runways. Wind coverage is not available for the Merritt Airport due to the lack of a weather observation system on the field.

What is known from the re-alignment of the existing runway 03-21 in 1981 is that the winds primarily come up the valley from the North Nicola Valley and thus the current orientation is optimum.

The established goal for wind coverage is ninety-five percent (95%); that is, a light plane should be able to operate at an airport ninety-five percent (95%) of a given period without experiencing a crosswind component greater than 10.5 knots. Wind coverage required for larger, transport-type aircraft are 13 knots. Where a single runway does not provide a ninety-five percent (95%) usability factor, a crosswind runway is recommended. The runway configuration currently in place at Merritt Airport exceeds this established goal and thus a crosswind runway is not required.

Another factor used to determine necessary airside improvements is the comparison between demand and capacity. The most common means of measuring airside efficiency is by determining the airport's operational capacity, or Annual Service Volume. This acts as a reasonable estimate of an airport's annual capacity. Overall, demand/capacity figures establish a time frame for projecting development to preserve and enhance airport operational safety.

3.3.1 Airport Annual Service Volume (A.S.V.)

The A.S.V. takes into account various airside assumptions regarding the following features and operational characteristics that would be encountered over a year's time:

- Runway and taxiway configuration
- Runway use (expressed as a percent-use)
- Visual Meteorological Conditions (VMC)
- Instrument Meteorological Conditions (IMC)
- Touch and Go factors
- Aircraft mix categories (expressed as a percent-use)
- Weather conditions
- Runway lighting

The relationship between capacity, demand and delay is described as:

"As demand approaches capacity, individual aircraft delay is increased. Successive hourly demands exceeding the hourly capacity result in unacceptable delays. When the hourly demand is less than the hourly capacity, aircraft delays will still occur if the demand within a portion of the time interval exceeds the capacity during that interval. Because the magnitude and scheduling of user demand is relatively unconstrained, reductions in aircraft delay can best be achieved through airport improvements which increase capacity."

As a general rule, if aircraft delays develop to exceed 12 minutes, the demand has exceeded the capacity of the existing runway environment.

Using the Vernon Airport as an example,

According to Transport Canada design models, the ultimate annual service volume at the Vernon Airport is approximately 87,600 operations annually. The ASV is based upon number of runways, separations between runways and the configuration of the airside. If airport operations reached this number, Vernon Airport would be at 100% capacity. Current movements are 13,000 operations annually.

To put this in perspective, the Merritt Airport is projected to have reached 1000 annual movements by 2015.

3.3.2 Airside Demand/Capacity Analysis

Ultimate annual operations are estimated to total 1,000 per year by the year 2015. The ASV divided by the total annual operations produces the demand/capacity ratio, as expressed in percent. Given the forecast operating movement level of 1,000 the ultimate ASV is as follows:

Annual Operations/(1,000)

87,600 A.S.V. = 1.14%

As recommended by Transport Canada, airports are recommended to initiate planning to preserve and enhance capacity when 60 percent of the ASV has been reached. With an ASV of 87,600, it would take 53,000 annual operations in Merritt to generate a demand/capacity ratio of 60%.

Some improvements will affect a particular element of the ASV, but will not significantly change the ASV from its present level. For instance, additional connecting taxiways or additional runway length is typically not an alternative means of adding airport capacity. Any runway extension would not increase the ASV, but is an accommodation of aircraft performance.

To increase the ASV at Merritt Airport, an extension of the current parallel taxiway would be required. However, as demonstrated using Vernon's similar airport characteristics, the 60 percent capacity level will definitely not be reached during the planning period.

3.4 Runway Length Requirements

Runway length is generally a function of the performance characteristics of the "design" aircraft and site conditions at the airport. Runway length is also relative to the A.R.C. of the critical aircraft and to the role the airport is forecast to assume. The design aircraft Cessna Citation II has been previously identified in Chapter Two.

The main site conditions that affect runway lengths are airport elevation and the mean temperature of the hottest month of the year. Runway length is usually more dependant on take-off characteristics rather than landing characteristics of aircraft. Take-off requires the aircraft engines to provide thrust, which in turn creates lift over the leading edge of the wing. On hot days, lift is harder to create due to reduced air molecule density. Elevation is also a contributing factor to air density. The higher the airport elevation, the less dense the air becomes. To make up for the lost air density from heat or elevation, the aircraft needs to move faster and farther down the runways to create the lift needed to get airborne.

The runway length requirements at Merritt Airport was determined based on three factors:

- The "design aircraft" expected to use the airport;
- The mean maximum daily temperature of the hottest month: and
- The airport elevation. Based on Merritt Airport site factors MSL is 2080 feet, design temperature = 86F, wet and slippery runways, the required runway lengths were determined and are shown in the table below.

Runway Length Requirements (Takeoff)

Category @ Gross	**Length**	**Width**	**Strength**
Code A aircraft (20°C)	3148	75 ft	N/A
Code A aircraft (30°C)	3540	75 ft	N/A
Citation II (15°C)	3370	75 ft	N/A
Citation II (30°C)	4420	75 ft	N/A

3.4.1 Runway 03-21

The runway was constructed in 1981 and resurfaced in 1998 and will need some structural upgrades during the planning period. General maintenance will be required such as asphalt treatment and crack sealing. Based on current facilities at Merritt Airport, length, width, and strength remains adequate in the short term but inadequate throughout the planning period.

It was identified in chapter two that the ideal runway length for the Merritt Airport is 4420 – 4500 feet, which would allow for the operations of the design aircraft at 30°C using gross weight numbers.

3.4.2 Runway Turnabouts

In order to increase safety and aircraft operations for larger aircraft, runway turnabouts should be installed on opposite end and sides, of each runway end. The City of Merritt has acknowledged the need and has received cost proposals. The initial design submitted to the City , was simply to add a half circle extension, with a 20 foot diameter, on the pilot side taxiing down on departing runways 21 and 03. Transport Canada has suggested that they be built to satisfy the current weight limitations for the existing runway. These should be in place by the end of the planning period.

3.4.3 Extension options

In order to reach the absolute optimum runway length of 4500 feet, a 500-foot extension must be realized. At such time that demand requires and we need to look at a 1000 foot extension, the

impact will be significant on adjacent lands – land will need to be purchased and the ~ 60 foot difference in elevation will have to be addressed.

Upon initial evaluation of either of the 420 or 500 foot extension, it has been identified that there will be minimal impact on the adjacent lands and the current land use should an extension take place. Because of this, three options have been identified for runway extensions in the following table.

Extension options

Runway Length	Extension Required	Impact on Surrounding lands	Runway Length
4420	420	Minimal	4420
4500	500	Moderate	4500
5000	1000	Significant	5000

3.4.3.1 420 or 500 Foot Extension

This option, although short in comparison to other options, it is moderate in that the extension must come from both the 03 and 21 runways of 210 - 250 ft., with the removal of the gravel safety strips. There is one major issue, however, engineering restrictions due to the Gas pipeline under the north extremity – Threshold of 21, will significantly increase well above the estimated cost for this project of $100000.

3.4.3.2 1000 Foot Extension

In order to attain a 5000-foot runway through 1000 feet of runway extension to the north, three projects must be initiated.

1. The property north of the airport, owned by Nicola Ranch. The current value of property needed would exceed $1.3 million.
2. Land fill to address the 60 foot difference in elevation with construction costs ~ $200000
3. Address the natural gas pipeline encasing

The new runway length of 5000 feet would ensure safe operations for existing aircraft, and aid in attracting larger industry to the airport site. Traditionally 5000 feet is the benchmark for code C aircraft with reference to balanced field length and serves as the optimal safety margin for smaller code A aircraft.

3.5 Taxiway Requirements

Taxiways are one of the most important factors in determining and maintaining the operational safety of an airport. As airport activity increases (take-offs, landings, and touch and go maneuvers), faster access from the runways to the taxiway system is required to maintain safety.

Because taxiways are considered critical areas, they should be constructed to the same pavement strengths as the runways they serve. Taxiway Alpha, which is deteriorating and will require a proper surfacing, during the study period.

The lack of land available to the north east of the runway negate the possibility of constructing a parallel taxiway to service the North end of runway 03. This will certainly affect the total ASV when aircraft movements increase beyond the 10000 annually.

The current taxiway environment is adequate throughout the planning period at the Merritt Airport.

3.6 Airport Lighting and Marking

In order to obtain the maximum utilization of the airport, lighting is necessary to accommodate aircraft during night and adverse weather conditions. There are several different types of lighting aids recommended to facilitate and enhance the identification, approach, landing, and taxiing operations. Recommended systems include: Runway Lighting, Taxiway Lighting/Marking Visual Guidance Indicators. Merritt is planning on establishing a lighted circuit over the planning period with a Transport Canada approved retro reflective lighting system.

3.6.1 Runway Lighting

Runway edge lighting is the standard lighting system used to define the lateral and longitudinal limits of the usable landing area. This lighting system is classified according to its intensity and brightness. Airports with over 10,000 annual operations, or runways with visual or non-precision instrument approaches should be equipped with standard medium intensity runway lighting (MIRL). Light posts are placed along the edge of the runway sides and separated by a maximum of 200 feet. Runways with an Instrument Landing System (ILS) are required to have High Intensity Runway Lights (HIRL).

3.6.2 Taxiway Lighting/Marking

Taxiway edge lights emit blue light and are used to outline the edges of the taxiway system. The existing and ultimate taxiway system has Medium Intensity Taxiway Lights (MITL) for use on taxiways and aprons. MITL's are recommended in conjunction with a runway having MIRL's or HIRL's. Taxiway lights can also be pilot-controlled and wired to the same remote system as the runway lights.

3.6.3 Visual Guidance Indicators

Visual slope descent indicators are used as an approach aid during the final transition to a runway end. Precision Approach Path Indicators (PAPI) are a system of lights, normally installed on the left side of the runway, which provide continuous visual descent guidance information (5 miles for daytime and up to 20 miles at night) during a visual or instrument approach to the runway. These lights are primarily intended for use during visual flight rules weather conditions. PAPI's are recommended for all runways used by turbojet and air carrier type aircraft.

3.7 Airport Signs

Standard airport signs provide taxiway and runway directional and identification guidance for aircraft movement on the ground. A system of standard signs is currently in-place and is recommended to distinguish runway, taxiway and aircraft parking destinations. As improvements to the runway and taxiway system at Merritt Airport are implemented, runway intersections and connecting taxiways should be identified through adequate signage. Transport Canada reviews the airport signage during annual inspections. Improvements to the signs will have to be made during the planning period.

3.8 Electronic Navigation

Airport navigation aids (NAVAIDS) are facilities and equipment installed on or near the airport for the purpose of providing pilots with electronic guidance and visual references for executing an approach to the airport and landing on a specific runway. The purpose of installing and/or upgrading navigational aids is to increase an airport's reliability. The use of this equipment depends on the ratings of the pilot and the instrumentation capability of the aircraft. Each facility in the NAVAID development process adds greater reliability but at increasing cost.

Progressively, each additional NAVAID allows aircraft to fly during lower ceiling and visibility minimums. The traditional development process is as follows:

1.) Non-directional beacon (NDB);
2.) VOR or VORTAC.;
3.) Localizer, and;
4.) Precision Instrument Landing System (ILS/MLS).
5) GPS approved approach.

On the forefront of navigational systems for aircraft is the Global Positioning System (GPS). Transport Canada has approved non-precision approaches but has yet to established precision approaches. GPS is a navigational system that links on board aircraft receivers to satellite transmitters. Merritt Airport does not currently have non-precision GPS instrument approaches to the Runway.

Installation of a navigational aid system is usually accomplished with federal fund assistance from the ATAP (Provincial) or ACAP (federal) Airport Improvement / Assistance Program or through initiations by NavCanada, Canada's facilitator of Nav Aids. Eligible items include visual navigational aids, electronic navigational aids, and weather aids. Application will be made to establish a NAVAID at the Merritt Airport during the planning period.

3.9 Terminal Area Requirements

The terminal is defined as that portion of the airport used by itinerant aircraft for flight planning, washroom, and food services. It is also used as a holding area by departing and arriving passengers of charter and possible future scheduled carriers. The location of the terminal facility is adjacent to the main ramp on the east side of the airside. The terminal area is approximately 250 x 70 feet. The current facility has the following:

- 250 hundred square feet of common area for passenger with furnishings
- Public washroom space, including a handicapped facility.
- Office space to house various businesses. This number may vary depending on the anticipated demand.
- Airport Managers office.
- A public telephone.
- Ample parking.
- Future Terminal building extension on the north end.

Future development should include:

- A restaurant/coffee shop, including a kitchen and an airside outdoor patio.
- A flight-planning room.

Total size of the facility is 17500 square feet.

3.9.1 Terminal Building Operator Options

There are two option available for the operation and future expansion of the existing terminal facility:

1) Private run facility

This model entails a proponent who will lease the building from the City of Merritt and will operate, finance, design, construct, and manage the terminal facility. The operator will become the lessee of the land as set out by the leaseholder's agreement. The operator will manage and operate the facility, and to deal directly with all shareholder's interest. Additional agreement between the City and the proponent may be required. A leaseback of a small space for the airport manager's office, will have to calculated, while the rest will be the responsibility of the proponent. The common area will be deemed public and thus, access will be available to the general public.

2) Publicly funded facility

The City of Merritt operates the facility. The upside of this option is the control that the City will have of the facility and how it is run; the facility becomes a truly public facility with revenues coming from lease tenants and commissions on parking and vending machines, office leases, etc..

3.10 Automobile Parking

Parking demand is a function of the number of persons utilizing the airport, either as passengers, meters and greeters, vendors, or employees and customers of on-site businesses. The size of parking facilities varies depending on the amount of employees and customers that use the airport as their destination.

Due to land constraints and the tight quarters, each business will be required to supply adequate parking for their own facility. This leaves the Merritt Airport in a position to only provide itinerant parking on the facility. Space at this time on the east side, for the existing terminal building is ample, and will be for the duration of the planning period.

3.11 Commercial Apron

At regional airport locations, aircraft are generally taxied in-and-out of parking positions under their own power. This is the most cost-effective operating procedure but requires more space between parked aircraft.

One parking position is necessary per aircraft. During the summer months, and as activity increases at the airport, apron space will continue to be in demand. Currently there are very infrequent occurrences when itinerant aircraft must park on the grass or private tie-down area due to lack of ramp space. Further, large aircraft are confined in their maneuvering capabilities and require more space for parking operations. Existing apron space is projected to be adequate well beyond the planning period.

A land reserve adjacent to the existing apron to the south, on the east side of the airport, will be held during the planning period. This property is currently under lease with the Merritt Flying Club until 2013.

3.12 Aircraft Rescue and Fire Fighting (ARFF) Requirements

Currently there are no requirements for ARFF at the Merritt Airport. There is however proposed amendments to the Canadian Aviation Regulations (CAR's 308), which are designed to require specific emergency response standards at all non-designated airports that serve commercial passenger aircraft. Merritt Airport does not currently have commercial passenger service but for discussion purposes will project that scheduled service will be available during the planning period.

The draft regulations and standards are based on the number of aircraft movements handled per day and the type of operation. Types of operations are grouped as follows; air taxis are defined as aircraft authorized to carry fewer that 10 passengers, commuter aircraft authorized to carry between 10 and 19 passengers; and airlines authorized to carry 20 or more.

Category A airports - which handle air taxis or fewer that eight commuter aircraft movements per day - would be required to have an alerting system to a community-based fire service, as well as on-site fire extinguishers.

Category B airports - which handle eight or more commuter aircraft movements or fewer than eight airliners per day - would be required to have an alerting system to a community based fire

service, along with either an on-site trained emergency responder, vehicle and equipment, or community fire response within 10 minutes.

Category C airports - which handle eight or more airliner movements per day - would be required to have trained emergency personnel, vehicles and extinguishing agents on site, and a communications and alerting system, along with a response capability of three minutes.

Merritt Airport is within a 20 minute response area of the Merritt Volunteer Fire Department and must acquire onsite fire extinguishers, beyond those available to fueling aircraft. The cost of which has been estimated at $1500

With the installation of a Fire Station, (which could be built onto the north wall of the existing Terminal building or along side the windsock adjacent the vehicle parking area) housing the extinguishers, the Aircraft Rescue and Fire Fighting Requirements will be adequate for the duration of the planning period. Expanding to a Category B airport, would create either an on-site trained emergency responder, vehicle and equipment, or community fire response within 10 minutes.

3.13 Conclusion

The Master Plan for the Merritt Airport represents a unique and important opportunity to construct a clear vision of where the airport is in the present and where it should be going in the future. The Airport Master Plan is intended to serve as a medium for assembling community opinion, spirit, and concurrence and has been built with the help of all the tenants and current stake holders.

The Merritt Airport is in a position to capitalize on the growing economy and makeup of the surrounding airports during the next 15 years. With the increasing demand for aviation related industrial sites, coupled with the increased passenger activity at all surrounding airports, that we are at the hub of the provincial highway network, Merritt finds itself a near perfect fit for specialty aircraft storage / manufacturing / operations, and serving corporate and general flight operations in a very safe and efficient environment.

Financial considerations for execution of the capital projects discussed in the Airport Master Plan are broken down below and reflect 2006-dollar values.

3.14 Projected Capital Costs

Project	2006 - 2010	2010 - 2015	2015 +
Runway Extension			
Construction Costs (420 Ft Extension)		$ 100 000	
Land Purchase (1000 Ft Extension)			$1 300 000
Construction Cost (1000 Ft Extension)			$200 000
Aircraft Rescue Fire Station	$ 1 500		
Phase I Runway Repair	$ 15 000		
Phase II Apron Maintenance	$ 5 000		
Phase III Turnabouts		$20 000	
Leaseable Property Development	$ 20 000		
Taxiway	$ 30 000		
East Side/Terminal Water/Sanitary/Storm	$ 80 000		
Airport Lighting			
Maneuvering / Approach		$12 000	
Beacons		$7 000	
NAVAID NDB GPS	$12 000 $5 000		
Security Fencing		$60 000	
Fuel Facility Upgrades	$21000		
Total	$189500	$199000	$1 500 000