Red Deer Airport

2014 Master Plan

InterVISTAS
a company of Royal HaskoningDHV

MMM GROUP

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EXECUTIVE SUMMARY

A INTRODUCTION

In February 2014, the Red Deer Regional Airport Authority retained the services of MMM Group / Inter*VISTAS* Project Team to prepare a comprehensive Master Plan for the Red Deer Airport, which would act as the overall vision for the airport and the systematic, controlled development of the airport's infrastructure to its fullest potential. This report is the culmination of an in-depth analysis and a comprehensive stakeholder consultation process resulting in a series of recommendations to help guide the continued growth of this important community asset. The Master Plan provides recommendations within a short-, mid- and long-term (20-year) horizon, while complementing and supporting local / regional initiatives and development.

Preparation of this Master Plan commenced on March 3, 2014, and was followed by stakeholder interviews on March 5 and 6, 2014. Following preparation of the Preliminary Master Plan, a Public Information Session was held on June 10, 2014, to present the Preliminary Plan and to solicit input and feedback. Following the Public Information Session, comments from the public were incorporated into the Master Plan.

B PHYSICAL AND SOCIAL ENVIRONMENT

The Red Deer Airport is located within Red Deer County, approximately 8 km south southwest of the City of Red Deer.

The Red Deer Airport was built during World War II to train Allies forces. The airport was a former Canadian Air Force pilot training base for NATO pilots from 1951 until 1965 and was originally named CFB Penhold. In 1965, the Air Force training was relocated to Moose Jaw, Saskatchewan. As the result of the relocation the City of Red Deer took over operation of the airport in 1965. In 1982 the Province of Alberta rebuilt and extended the main runway (Runway 16-34) to 5,528 feet. The ownership of the airport was taken over on September 1, 1999 by the Red Deer Regional Airport Authority (RDRAA), which includes the City of Red Deer and Red Deer County as stakeholders. Where it was previously considered an industrial airport, today the Airport Authority has taken initiatives to attract scheduled airline services and to create a 'centre of excellence' for general aviation-related business in the region.

Red Deer is an underserviced market with a large and rapid growing population (see the socio-economic profile in Section B 6.0). Red Deer is the third largest city in Alberta with major corporate demand from the oil and gas, agricultural and manufacturing industries. The overall demographic trend highlights Red Deer as a wealthy and young demographic with a high propensity to travel due to high disposable income.

Currently, Northwestern Air successfully services a specific regional origin and destination market (Kelowna and Fort McMurray) and Air Canada Express provides connectivity services via Calgary to 180 world-wide destinations.

Historically, the residents in Red Deer and the surrounding areas have used the airports in Calgary and Edmonton for almost all of their air travel, as there were limited direct services provided to the travellers' desired destinations. A recent analysis of point-of-sale ticket booking data suggests that with the increase in services in 2013, YQF captures approximately 4-7% of total

catchment traffic, indicating 93-96% leaked to either Edmonton or Calgary. This suggests a considerable potential for YQF to recapture this leakage if new air services can be developed to tap into this promising and ever-growing market in Red Deer and surrounding communities.

The annual direct impacts of ongoing operations at Red Deer Airport are estimated to be 210 direct person years of employment (approximately 225 jobs), earning approximately $13 million in direct wages and salaries. Direct employment generates nearly $26 million in direct gross domestic product and $56 million in direct economic output in the regional economy annually. Including indirect and induced multiplier impacts, ongoing economic impacts of Red Deer Airport include a total of 400 person years of employment. Total earnings of all employees amount to $26 million in wages and salaries. Furthermore, the airport's operations contribute an estimated $52 million in total gross domestic product (GDP) and $99 million in total economic output, respectively, to the provincial economy.

C EXISTING LAND USE

The airport's municipal zoning and development framework is set out by Red Deer County through such key documents as the Municipal Development Plan, 2012 (MDP), the Red Deer Regional Airport Area Structure Plan, August 2013 (ASP), and the Land Use Bylaw, Bylaw No. 2006/6 (LUB).

The airport occupies approximately 360 hectares of land roughly bounded by Township Road 372 to the south, Township Road 374 to the north, Range Road 282 to the west and the hamlet of Springbrook to the east. The land located immediately north, south, and west of Red Deer Airport is primarily used as farmland and is zoned as Agricultural District (AG) in the Red Deer Land Use Bylaw. The Hamlet of Springbrook is located immediately east of the airport and north of Airport Drive.

The Red Deer County Municipal Development Plan (MDP) is the primary planning and policy document for use at the municipal level. Specific policies within the MDP that address development at the airport include:

- *"The County shall encourage the development of appropriate commercial and industrial uses in proximity to Red Deer Regional Airport with the intent of creating multimodal development nodes that combine rail, trucks, and other types of transportation modes."*
- *"In order to facilitate the intent of Policy 8.4.1, Development in Proximity to Red Deer Regional Airport, the County may prepare or update Area Structure Plans or Master Plans for the Red Deer Regional Airport."*

In accordance with the MDP, the Red Deer Regional Airport Area Structure Plan (ASP) was prepared and approved by the County in August 2013. The ASP sets out the airport planning concept through the use of five land use districts, including: Airfield; Airside Commercial; Groundside Commercial; Terminal Reserve; and Aviation Support. Refer to Figure C-1 for Red Deer Airport Area Structure Plan – Conceptual Future Land Use.

In accordance with the Red Deer County Land Use Bylaw (LUB), the entire airport property is zoned as Business Service Airport (BSA) District. This district covers both airside and landside property currently managed by the RDRAA. The BSA District, under Section 28 of the bylaw, allows for a wide cross-section of permitted uses, including:

- Accessory Building and Accessory Use Airport;
- Commercial Recreation Facility – Outdoor
- Hotel, motel, office;

- Manufacturing, Processing or Assembly Facility;
- Outdoor storage as an accessory use only; and
- Warehousing and storage.

The BSA provides for the following "Additional Regulations" under sections 118.5 and 118.6, respectively:

"The standards and development criteria listed in an approved Airport Master Plan shall apply to every development in this district."

"The Development Authority will not accept or process any development permit application occurring at Red Deer Airport unless the application is authorized by the Red Deer Regional Airport Authority."

A copy of the Red Deer County Land Use Bylaw Map is provided as Figure C-2.

Airport zoning requirements have been established by Transport Canada as documented in TP312E (4th Edition, March 1993), to ensure a satisfactory level of safety at an aerodrome, and are enforced through the Federal Aeronautics Act (1985). The zoning requirements serve to establish a set of imaginary surfaces which extend beyond the boundary of the airport, the penetration of which represents an obstacle to air navigation. In general, airport zoning is comprised of a runway strip, takeoff / approach, transition and outer surfaces.

Recent field investigations have revealed that there is a small infringement of the OLS at the northwest end of Runway 29 where the existing ground penetrates the OLS approach surface. The infringement can be removed by regrading the existing ground near the threshold or introducing a displacement on Runway 11. Field investigations have also shown that some of the existing trees on the south side of Township Road 372 are very close to the approach surface to Runway 29. It is recommended that the airport remove or trim these trees. The existing OLS surface in accordance with TP312E is shown on Figure C-3.

Part 35 of the Land Use Bylaw indicates that no structure or building shall be erected if it would penetrate the obstacle limitation surface set out in the bylaw. It should be noted, however, that the agreement with Transport Canada which would give the County the ability to enforce this bylaw is not in place at this time. This agreement will be established in conjunction with the proposed new OLS, which is set out in Section G of this Master Plan.

D FACILITY INVENTORY ASSESSMENT

An in-depth inventory assessment of the airport's facilities and services was carried out as part of this Master Plan. This information was obtained through on-site investigations, interviews with airport management, tenants and users, and from a review of available documents and studies concerning the Red Deer Airport. As well, a pavement condition survey was carried out by Thurber Engineering Ltd. in June 2014, to determine the density and severity of distresses on the pavement at Red Deer Airport and to establish timelines for its rehabilitation.

Generally, results indicated that while certain infrastructure components within the airport boundary were in good condition, the majority of the existing airside pavement surfaces at the airport will need to be rehabilitated within the next five years.

E AIR TRAFFIC FORECASTS

Forecasts for this Master Plan were generated to cover the periods from 2013 to 2033 (in five-year increments). More specifically, the following forecasts were made:

- Annual enplaned/deplaned (E/D); passengers;
- Annual aircraft movements; and
- Peak hour passengers.

Due to the historically low traffic volumes at Red Deer Airport, econometric analysis was not possible. Instead, a combination of trend analysis, market analysis, and scenario modelling were used to generate the forecasts.

A scenario-based approach was used to forecast aviation activity for passenger and aircraft movement traffic. These scenarios describe potential air services and traffic based upon the outlook for the aviation industry alongside the local and regional socio-economic environment. These scenarios take account of the potential for existing services to grow and for new services to develop at Red Deer Airport (YQF).

Low, medium and high forecasts were generated. The Medium Forecast scenario is a realistic scenario under which additional traffic at YQF could be further stimulated, and greater market penetration achieved. It reflects the realistic development of new air service at YQF over the forecast period, taking into account the regional air market, potential carriers to operate at YQF and the impact from competition from other airports. The moderate forecast projects A320/B737 service at Red Deer Airport by 2018.

Notably, the forecasts represent unconstrained forecasts and have been developed without consideration of the ability of the current airport facilities to handle the forecast traffic. This is appropriate for forecasts designed to highlight future facility requirements.

In the Medium Forecast, enplaned passenger traffic is forecast to grow at 10.0% per annum between 2014 and 2032, reaching 247,000 by 2033. Growth is most rapid in the first 5-10 years, averaging 21.1% per annum between 2014 and 2018 and 11.2% per annum between 2018 and 2023. Growth then starts to attenuate as traffic levels increase.

In the Medium Forecast, aircraft movements are forecast to grow by an average of 1.8% per annum between 2013 and 2033, reaching 70,200 movements by 2033. The growth in movements is considerably lower than that of passengers (13.8% per annum over the same period) for two reasons:

- The majority of aircraft movements at YQF are not passenger aircraft movements, so are projected to grow at relatively low rates; and
- Air carrier movements are forecast to grow at a lower rate than passenger numbers due to increases in average aircraft size over the forecast period.

The current (2013/2014) passenger services at YQF are operated with 18-19 seat aircrafts. Based on the 2014 schedule, there are occasions when two services overlap (i.e., there are two arrivals or two departures within an hour of each other). Therefore, assuming a fully-loaded aircraft, the current peak is a maximum of 38 passengers for either arrivals or departures.

Under the Medium Forecast, this peak is likely to be increased by the introduction of A320/B737 services. Assuming a 160-seat aircraft and a peak-time load factor of 85%, this would generate a peak of 136 passengers. As additional services develop at YQF, there is the potential for services to overlap, particularly as carriers seek to serve high demand periods (e.g., early morning and

afternoon/evening). By 2033 and holding through to 2033, the passenger peak is projected to be 155 passengers.

F STAKEHOLDER AND PUBLIC CONSULTATION

Stakeholder and public input are crucial elements to consider in the development of any master plan. In order to gather this input, the study team conducted numerous meetings with key airport stakeholders and tenants. As well, surveys were undertaken to gather further input from the public. This input was considered in preparation for the Public Consultation Session where additional input was provided by the public.

During the stakeholder interviews, comments and key issues were provided from key tenants at the airport to the study team in early March 2014.

An Airport Users' Survey, as well as a Passenger Users' Survey, was conducted between mid-March and the end of May 2014. The Airport Users' Survey received 14 responses and 103 responses were received for the Passenger Users' Survey. Examples of these surveys are available in the Appendix C.

A public information session was held in Red Deer on June 10, 2014, to solicit input from the public on the proposed expansion plans at the airport. Comments from the public information session were generally supportive of the plan. However, some concern was expressed by individual residents who are located near the flight paths to the existing runways. These individual concerns are being addressed on an individual basis by the airport.

Input and comments from the above consultations were used to shape the final Master Plan.

G FACILITY REQUIREMENTS

To optimally plan for the future of Red Deer Airport, it is necessary to translate forecast aviation demand (as presented in Section E) into the specific improvement requirements for existing facilities, as well as the types and quantities of new facilities needed to adequately serve this identified demand.

The objectives of this effort are to:

- Identify the adequacy or inadequacy of existing airport facilities;
- Outline what new facilities may be needed;
- Suggest alternatives for meeting identified needs; and
- Establish the timing for implementation based on identifiable "trigger" points.

As indicated in Section D, Facility Inventory Assessment, a Pavement Condition Survey (Appendix B) was recently completed for all existing airside and landside pavement surfaces. The pavement rehabilitation timelines set out in this report have been adhered to except where development timelines accelerate the need for refurbishment, or in the case of Aprons IV and V, which are used for aircraft storage, delay the need for refurbishment.

The planning associated with this Master Plan is based on meeting Transport Canada Standards and Recommended Practices for Aerodromes. Existing airport infrastructure was carried out using TC Doc. No. TP312E, 4th Edition, March 1993, alongside related requirements for certified aerodromes (covered under applicable Canadian Aviation Regulations [CAR]). For new airside infrastructure, reference has been made to TP312 5th Edition – Draft, December 12, 2013, given that it is expected that this new edition will be in force

during the implementation phase of this Master Plan.

Key assumptions made during the preparation of the Master Plan include:

- The Airport will remain a certified, public use facility;
- Overall layout and facility locations are to protect for a Non-Precision Approach for Runway 16-34 with a maximum allowable length that can be accommodated within the current property;
- Aircraft manoeuvring surfaces and parking areas are to protect for the physical characteristics of Code C aircraft (< 36 metre wingspan) with specific areas sized to accommodate Bombardier Q400-type aircraft (Code D gear width); and
- Design aircraft for the short-term improvements will be a B-737-700, with select taxiways being widened in the mid-term (or as demand dictates) to accommodate the Bombardier Q400.

The facility improvements at Red Deer Airport are categorized into short-term, medium-term, long-term and ultimate-term development. These time horizons are broken down as follows:

- Short-Term: 2014 to 2018;
- Medium-Term: 2019 to 2023;
- Long-Term: 2024 to 2033; and
- Ultimate: 2034 and beyond.

However, timelines established for the various facility improvements are approximate only, and will be subject to fluctuations in market demand which may expedite or delay estimated timelines.

Several trigger points have the potential to drive the need for expansion or refurbishment at the airport.

These trigger points are summarized briefly below:

- Demand for B737-type service will drive the need to extend, widen and strengthen the primary runway;
- The changeover of regional fleets to Bombardier Q400-type aircraft will trigger the need for wider taxiways and apron planning necessary to accommodate their Code D gear width;
- Pavement rehabilitation will need to occur as per timelines set out in the Pavement Condition Survey (Appendix B); and
- Market demand will impact the need for hangars and other facilities requiring airside access.

Based on the critical aircraft, the Boeing 737-700 (128 to 148 seats), a 2,286 m (7,500 ft) runway length is recommended which would provide sufficient length to reach Toronto with a full passenger load. Larger aircraft such as the 737-800 would need a runway length of approximately 2,896 m (9,500 ft) at a Maximum Take-off Weight (MTOW) of 174,900 lbs., which could not be accommodated on existing airport property.

Based on a northerly extension of the runway to 2,286 m (7,500 ft), the runway classification will change from Code 3C non-precision to Code 4D non-precision. TP312E recommends a runway width of 45 m in this case. Based on an Aircraft Group Number (AGN) of AGN IIIB, a minimum runway width of 30 m is required under TP312 5th Edition. A caveat states however, that some aircraft may require additional width to comply with their operational standards. Based on FAA recommendations and current industry practice, it is recommended that Runway 16-34 be widened to 45 m in conjunction with the proposed extension to 2,286 m (7,500 ft). Based on the increase in aircraft loading, the runway will need to be strengthened in conjunction with the proposed

runway extension. As part of the runway extension, a holding bay is recommended at the north end of Runway 16-34. The holding bay will be sized to accommodate a B737 aircraft while allowing arriving aircraft to land. As traffic increases, the extension of a parallel taxiway is anticipated in the long term, in conjunction with development to the east.

The proposed extension, associated widening, and strengthening of Runway 16-34, together with the construction of the holding bay, are scheduled for short-term development prior to, or in conjunction with, the introduction of B737 services as shown on Figure G-1.

Runway 11-29 is currently certified as a Non-Instrument Code 2C runway as per TP-312E. It has a length of 1,053 m (3,454 ft) and a width of 30 m (100 ft). This runway typically supports Code A general aviation (GA) type aircraft, including flight training operations. Given occasional usage by Code B and C aircraft, it is recommended that the Code 2C designation be maintained.

Extension of this runway within the existing property boundaries would not provide sufficient runway length to accommodate aircraft currently being used by existing commercial carriers under normal operating conditions. Although an extended runway would benefit GA-type aircraft, extension of the runway toward the northwest is considered uneconomical given the rising terrain in that direction. Extension of the runway toward the southeast would require relocation of Township Road 372 as well as acquisition of private property. An extension of Runway 11-29 in this direction is also considered uneconomical considering the overall benefit to airport operations. Upgrading of Runway 11-29 from Non-Instrument to Non-Precision was also considered; however, it was determined that the rising terrain to the northwest and the clearances over County Road 372 would not support the flatter approach slopes required by the Non-Precision approach.

It is therefore recommended that Runway 11-29 be maintained at its current length and designation of Non-Instrument Code 2C. Based on the findings of the Pavement Condition Survey (Appendix B), it is recommended that Runway 11-29 be rehabilitated during the short term as shown on Figure G-1.

In order to establish the future obstacle limitation and obstacle identification requirements for Red Deer Airport, the corresponding surfaces were established in accordance with TP312E 5th Edition and were based on the following runway designations:

- Runway 16-34: Non-Precision, AGN IIIB; and
- Runway 11-29: Non-Instrument, AGN IIIA.

These surfaces are illustrated on Figure G-8 and Figure G-9.

Tree removal will be required on airport property in order to accommodate the northerly extension of Runway 34. Beyond Township Roads 372 and 374 there are numerous trees near the extended centreline of both Runway 16 and Runway 34. As a precaution, it is recommended that some supplementary survey work be undertaken in order to confirm their current height. Resulting tree cutting/trimming may be required.

Rehabilitation of Taxiways Alpha, Bravo and Charlie, as identified in the Pavement Condition Survey (Appendix B), is recommended in the short term in conjunction with the strengthening that will be required in order to accommodate B737 services. Rehabilitation of Taxiway Delta is recommended in the medium term, at which time it may be necessary to upgrade the existing retro-

reflective markers to edge lights in accordance with TP312 5th Edition.

With the introduction of Boeing 737 and Bombardier Q400 services at Red Deer Airport, Apron I will require expansion and strengthening to a maximum PLR of 10.1. In the short term, Apron I will be expanded and strengthened to accommodate a Boeing 737, a Q400 and a Code A-type airplane. For the long-term development scenario, an additional 1,060 m^2 of expansion will be required to accommodate two Boeing 737 jets together with a Q400.

The portion of Apron II outside of the Air Spray hangar can be rehabilitated during medium-term development. The remaining portion of Apron II is in poor condition and should be rehabilitated in the short term. Any additional strength requirements necessary to support the larger aircraft using this apron should be addressed at this time.

Apron III and IV are scheduled for rehabilitation in the medium term as outlined in the Pavement Condition Survey and as shown on Figure G-6.

Existing Apron VI exhibits a mix of pavement conditions. Rehabilitation of this apron can be carried out with the "poor" pavement being rehabilitated in the short term and the "good" pavement being done in the medium term. See Figure G-1 and Figure G-2 for further detail.

Apron VII is scheduled for rehabilitation and extension to the southeast in order to service the Southeast Development Area in the short term. Strengthening of existing Apron VII should be carried out to accommodate the critical Code C aircraft anticipated for this development. See Figure G-1 and Figure G-5 for further detail.

Red Deer Airport users and stakeholders have stated that the existing Air Terminal Building (ATB) is currently undersized. Based on the current peak of 38 passengers and a projected peak of 155 passengers, a two-stage expansion concept was developed for the ATB. Stage 1 expansion would address immediate capacity issues while design of the full build-out is underway and capital funds are being established. Staqe 1 expansion is premised on the existing administration area moving to temporary office space until full build-out is achieved. Stage 1 expansion would include a modest expansion at the southwest corner and north side of the terminal building as well as interior renovation in order to improve the passenger experience.

Stage 2 would further expand the terminal building in order to meet the 155 peak hour passenger requirement established in Section E. Stage 1 expansion of the ATB is recommended as soon as possible, while Stage 2 expansion is recommended shortly thereafter in order to accommodate B737 traffic anticipated in the short term. It is assumed that a new Flight Service Station would be built over the expanded terminal in conjunction with Stage 2 construction. See Figures G-10, G-11 and G-12 for further detail regarding the Stage 1 and Stage 2 floor plans.

Parking lot expansion will be required to accommodate the growth of passengers using the airport. It is proposed that the land located immediately north and south of the current ATB parking lot be developed into additional parking spaces in the short term. The parking lot expansion would be undertaken in two stages.

In Stage 1 development, the land south of the current parking lot will be constructed as a temporary gravel parking lot in order to address the current shortfall in available parking.

In Stage 2, the gravel parking lot from Stage 1 and the land immediately north of the current parking lot will be developed into a full asphalt parking lot.

As indicated in the Pavement Condition Survey (see Appendix B), the existing landside roads are generally in good condition, with localized repair required at the east end of the ATB parking lot. Future rehabilitation of these roads and parking lot, which include Airport Drive, 37th Avenue, the Terminal Access Road and 23rd Street, are not anticipated until the Long-Term Scenario.

Development at Red Deer Airport is expected to take place in response to market demand. This demand will vary between aviation and non-aviation related businesses. In order to respond to this demand, this Master Plan sets out the various land uses and locations to optimize airport facilities. In addition, phasing of airport development has been recommended in order to ensure a logical progression of development at the airport to benefit all stakeholders, the local community, and all potential customers who will benefit from the opportunities that extend from the promising advancements that await the Red Deer Airport.

The proposed land uses and their locations are based on the Area Structure Plan. The airport has been divided into the following geographical areas:

- Southeast Development Area;
- Central Development Area;
- North Development Area; and
- Southwest Development Area.

The Southeast Development Area is located in the southeast corner of the airport property and is bounded by Township Road 372, Airport Drive and Apron VII. Development within this area, as depicted on Figure G-5, could potentially consist of three Code A hangars and a single Code C hangar. It is expected that this area would be developed in the short term in response to pent-up demand. Development of this area will require the extension of Apron VII as well as the extension of sanitary and water service from Springbrook. It is anticipated that the extension of municipal services to the airport would be the responsibility of the County, while servicing on airports lands would be the shared responsibility between the airport and the developer.

Development within the Central Development Area will generally consist of the provision of landside access to Aprons II and III, as well as the development of airside and landside commercial areas located northeast of Aprons II and III.

Pedestrian and vehicular access to the hangars and businesses fronting onto Aprons II and III is currently gained through Gate 10, which is controlled by proximity cards. As there are no landside roads providing access to these lots mixing of landside and airside traffic occurs. In order to minimize the risk of near misses (or worse) between landside and airside traffic, a landside road would be provided access to Aprons II, III and IV. The landside road would initially be extended to provide access to Aprons II and III in the short term with further extension in the mid term in order to provide access to Code A hangars contemplated along Apron IV. Details of this scheme are shown on Figures G-5 and G-6.

Airside and landside development within the Central Development Area is proposed in the area northeast of Apron II and III and along the airport's east boundary as envisioned in the Area Structure Plan. Development within the Airside Commercial Area could include aviation-related businesses such as maintenance, overhaul and hangars for larger aircraft. Development within the Landside Development Area located further to the northeast could potentially consist of warehouse-type commercial and manufacturing facilities. Landside access to this area would initially be provided from the Airside Development Area located to the southwest. Figure G-6 shows how this area might

be configured. Development within the Central Development Area is not anticipated until the mid-term with municipal services being provided through Springbrook to the east.

Airside and landside development within the North Development Area is envisioned along the east side of Runway 16-34 in the long term. Development in the Airside Commercial Area could include aviation related businesses such as maintenance, overhaul and hangars for Code B and C type aircraft. Airside access to the Airside Commercial Area would be provided from Taxiway Alpha which would need to be extended in conjunction with this development. Two parcels of land are designated for Landside Commercial development. They are located on either side of the Airside Commercial Area between Taxiway Alpha and the east boundary of the airport. Landside access to this area would be provided from Township Road 373 and Range Road 281 as shown on Figure G-4. It is envisioned that municipal servicing would be extended to the area by the County through the Springbrook community.

Airside and landside development within the Southwest Development Area is not anticipated within the Master Plan time horizon. Possible development within this area is shown on Figure G-4.

H ENVIRONMENTAL IMPACTS

Virtually all new airport development invokes some form of impact on the adjacent lands and/or social environment. The key is to try to balance the specific negative impacts associated with development alongside the positive long-term benefits the plan brings to the overall community.

The predominant impacts identified within the recommended Master Plan relate to:

- Vegetation removal and habitat loss;
- Removal of wetlands and marsh communities; and
- Increased aircraft noise.

Project works that would impact vegetation, trees, wetlands and marsh communities, as well as dependent wildlife, during the planning horizon of this Master Plan, include:

- Extension of Runway 16-34 to 2,286 m (7,500 ft) in the short term;
- Extension of Taxiway Alpha to the north in the long term; and
- New airside and groundside lot development in the medium term and long term.

The location of these impacts is shown on Figure H-1.

Prior to the detailed design stage of the first phase of development, it is recommended that the following detailed environmental investigations be carried out:

- Field surveys to confirm SAR and SAR habitat at or in the vicinity of the airport and the corresponding actions required by SAR legislation;
- Confirmation of vegetation community types and boundaries on airport property and checks for significant plant species and exotic invasive plant species;
- Classification of wetlands, if determined to be present, and, to comply with Water Act obligations:
    - compensation with wetland replacement for any non-ephemeral wetlands to be removed, and
    - compensation without wetland replacement for any ephemeral wetlands to be removed;

- Identification of wildlife on and immediately adjacent to the airport property and checks for significant wildlife species.

The primary social impact associated with airports is most often aircraft noise. In order to assist municipalities in planning development surrounding airports, Transport Canada developed document TP 1247E entitled "Aviation Land Use in the Vicinity of Airports". This document provides numerous recommended practices and policies, including establishing noise impacts of aircraft activity and mitigation requirements specifically related to new development.

These impacts can be established by preparing Noise Exposure Forecast contours. The data necessary to prepare NEF contours is currently not available from Nav Canada. It is expected that this data will be available by the end of 2014.

It is therefore recommended that NEF contours for the airport be prepared in early 2015. This analysis should examine both the existing noise levels based on current aircraft movements as well as the projected noise contours in 2033 based on the Moderate-Growth Scenario.

I RECOMMENDED LAND USE PLAN

The intent of the Land Use Plan is to identify the various land uses and their locations in order to maximize the use of airport lands.

The proposed Land Use Plan for the Red Deer Airport Master Plan is set out on Figure I-1. This plan is similar to that proposed in the Area Structure Plan, 2013, as described in Section C.

It should be noted, however, that this Master Plan recommends that the southeast corner of the airport be developed in the short term as Airside Commercial rather than Landside Commercial given current demand and its proximity to existing airside, landside and municipal infrastructure.

Sequencing of the various development areas is described in Section G and has been developed based on various development triggers and systematic land assignment.

J IMPLEMENTATION AND CAPITAL COST ESTIMATES

Implementation of the Master Plan development concept over the 20-year time horizon has been divided into short-term, medium-term and long-term time horizons. Activities within each time-frame have been further divided into: Rehabilitation; New Construction; and Other Improvements.

The short-term improvements include extensive rehabilitation of airside pavements which are necessary in order to protect and maintain the community's investment at the airport and the resulting benefits and prosperity the community will experience.

As well, significant expenditures in new construction will be required which include:

- Northerly extension of Runway 16-34 to 2,286 m (7500 ft) including widening to 45 m, and strengthening in order support 737- type traffic;
- Construction of a holding bay at the end of the extended Runway 16 - 34;
- Strengthening of Taxiway Alpha and Bravo;
- Widening of Taxiway Alpha to 23 m to accommodate Q400 traffic;
- Expansion and strengthening of Apron I;
- Stage 1 and 2 expansion of the terminal building and parking lot; and

- Extension of municipal services, landside roads and Apron VII in order to support development within the Southeast Development Area.

Short-term costs for rehabilitation and new construction are estimated to be approximately $10 million and $52 million, respectively. See Table J-1.

Medium-term improvements will be significantly less costly than in the short term and will be approximately $4 million and $12 million for rehabilitation and new construction, respectively. Rehabilitation costs will include Taxiway Delta, the existing ATB parking lot as well as Aprons II, III, IV and V. New construction costs will include:

- Widening of Taxiway Alpha to 23 m for Q400 traffic;
- Access road and utilities for Apron IV and Apron V;
- New Code C taxiway within Central Development Area; and,
- Groundside access roads and utilities within the Central Development Area.

Long-term improvements will include the rehabilitation of Apron VI and the landside access roads estimated to be approximately $0.5 million. New construction will generally support the development of the North Development Area and will include:

- Taxiway Alpha extension to the north;
- Code C Taxiway construction in the North Development Area;
- Additional expansion on Apron I to accommodate two large jets;
- Landside access road and utilities for the North Development Area;
- Reconfiguration of terminal parking spaces and pavement maintenance; and
- Construction of garage to accommodate two fire trucks (contingent on triggering of CARs 303).

Additional improvements would include the purchase of two fire trucks in order to meet the requirements of CARs 303. See Table J-1.

Table J -1: Capital Cost Estimates - Summary

Timeline	Estimated Cost
Short-Term	
Rehabilitation	$10,110,000
New Construction	$52,300,000
Other	$250,000
Sub-Total	$62,660,000
Medium-Term	
Rehabilitation	$3,930,000
New Construction	$12,250,000
Other	$100,000
Sub-Total	$16,280,000
Long-Term	
Rehabilitation	$540,000
New Construction	$26,240,000
Other	$610,000
Sub -Total	$27,390,000
Grand Total	**$106,330,000**

Note: Estimates are in 2014 dollars.

As traffic and business development advances at Red Deer Airport, it is expected that the current $100 million in total estimated economic output will increase and provide substantial additional economic benefit to the provincial economy.