NORTHERN COLORADO
REGIONAL AIRPORT

Northern Colorado Regional Airport

Passenger Terminal Site Analysis

FINAL REPORT | February 2018

Dibble
Engineering

Northern Colorado Regional Airport

Passenger Terminal Site Analysis

Final Report

Prepared for

Northern Colorado Regional Airport

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I. Introduction

A. Scope of Study

To assist the Northern Colorado Regional Airport Commission (Commission) with the near-term and long-term planning needs for potential air carrier service at the Northern Colorado Regional Airport (Airport), a *Passenger Terminal Site Analysis* (study) has been prepared by Dibble Engineering to evaluate two locations for a future passenger terminal and associated facilities, and recommend a preferred location based on various criteria presented herein. The first location is at an undeveloped area at the southern end of the airport property east of Runway 15-33 centerline, referred to as Development Concept – 1 *(South)* herein. The second location is in the area of the existing terminal, centrally located to the Airport, also east of Runway 15-33, referenced as Development Concept – 2 *(North)* herein.

The development concepts prepared as part of this study are preliminary only and are based on information and documentation provided by the Airport. Updated aviation demand forecasts and facility requirements have not been prepared as part of this study. Rather, the findings of the 2007 Master Plan Update and other supporting information will be the basis for evaluating the two future passenger terminal locations. Planning-level costs of construction (2018 dollars) have also been developed and included as one of the evaluation criteria considered in recommending a preferred location for the passenger terminal.

B. Airport Setting

The Northern Colorado Regional Airport (formerly the Fort Collins-Loveland Municipal Airport) serves a wide variety of users ranging from privately owned aircraft, flight schools and charter service. The Airport is one of only 14 federally certified commercial airports in Colorado and operates under a limited Federal Aviation Regulation (FAR) Part 139 certificate. Located in the heart of Northern Colorado along Interstate 25, the Airport is minutes away from downtown Loveland, Fort Collins, Greeley, Windsor, Estes Park, and is 50 miles north of downtown Denver. See **Figure 1-1 Airport Vicinity Map**.

The Airport has two active runways; Runway 15-33 is the primary runway and Runway 6-24 is the designated crosswind runway. Runway 15-33 is 8,500 feet in length and has a width of 100 feet. This runway has been recently reconstructed with asphalt pavement, grooved and has high intensity runway edge lighting. Runway 6-24 is 2,273 feet in length and 40 feet in width and is also constructed of asphalt pavement and has runway edge reflectors. Available navigational aids at the Airport include a Very High Frequency (VHF) Omni-directional Range (VOR), an Instrument Landing System (ILS), and a Global Positioning Satellite (GPS).

According to the Airport's website, in October 2015 the Northern Colorado Regional Airport was selected as the official test facility for new Virtual Air Traffic Control Tower technology, or "Remote Tower". This leading edge aviation technology will employ ground-based video and aircraft ground detection components to provide data monitored by air traffic controllers working in a central off-airport location. The high-tech array will provide an enhanced level of air safety at a cost dramatically lower than the expense required to construct and staff a traditional air traffic control tower.

The current (January 2018) Federal Aviation Administration (FAA) Airport Master Record (FAA Form 5010-1) for the Airport indicates there are 216 based aircraft comprised of single and multi-engine aircraft, jet aircraft and 45 helicopters. The Airport Master Record also reports 94,896 annual operations at the Airport.

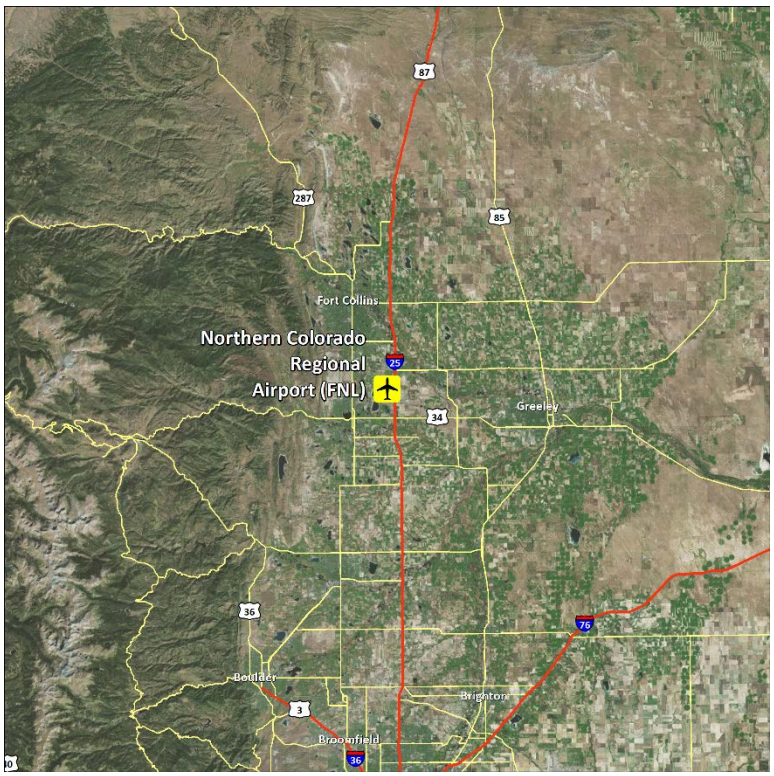


Figure 1-1 Airport Vicinity Map

II. General Planning

The pavement geometry and location of supporting facilities is unique to each individual airport in the United States. It is also common for an airport to begin as a military facility and then later be converted to a civilian use airport. The Northern Colorado Regional Airport is not a former military facility, but was jointly built as a regional airport by the Cities of Fort Collins and Loveland in 1963.

To facilitate the natural growth of airports, there are some general principles used by planners to help guide the development of an airport. Airside development is regulated by FAA for which runways, taxiways, aprons and navigational aids are designed and constructed. Landside development is less regulated and allows for more flexibility in where facilities can be located. This study focuses more on the landside development areas of the airport due to the nature of this study's scope.

When planning an airport, aircraft are typically grouped together based on their size, type (fixed wing and rotor) and operation. For example, single-engine aircraft (based and itinerant) are commonly grouped together while larger, corporate jets are commonly parked closer to the Fixed Based Operator (FBO) for easier access to their services. To enhance safety, helicopter operations and parking are typically

separated from fixed-wing aircraft. Commercial service operations and parking are commonly separated from single-engine, corporate jet, and helicopter operations. If an airport has a permanent military presence, it is always separated from civilian operations and facilities.

Commercial service operations on an airport are ideally located at mid-field, when possible. The rationale for locating the commercial service operation mid-field is:

- Maximizes the overall efficiency of an airport by reducing the taxiing time of aircraft (departure and arrival) to the passenger terminal.
- The impact to the capacity based on the number and configuration of the runways, taxiways, and other elements. According to FAA, an airport's capacity is the hourly throughput that an airport's runways are able to sustain during periods of high demand. To maximize the capacity of an airport, having the terminal mid-field will typically help to enhance capacity and reduce delay.
- Reduced aircraft taxiing time which saves on fuel.
- Potentially allows for more efficient expansion of commercial service operations.

There are examples at airports across the country in which passenger terminals are not located mid-field, based on many different reasons. One common explanation for this is the proximity of the terminal to the existing transportation network serving the airport. Because every airport is unique, planners need to locate passenger terminals where it makes the most sense, while considering the individual variables of each airport.

A. Planning Criteria

In order to adequately evaluate and recommend a preferred location for the new passenger terminal building, planning criteria and assumptions need to be defined. Based on discussions with the Airport, the following represent the planning criteria and assumptions for this study.

1. Design Aircraft

The anticipated design aircraft will drive the space requirements for airside development. For the purpose of this study, the Boeing 737 series and Airbus A320 were selected as the design aircraft.

2. Design Standards

To accommodate a new passenger terminal, additional airside development will be necessary. The existing runway and taxiway system meet the design standards for the anticipated design aircraft (Boeing 737 series and Airbus A320). According to FAA Advisory Circular 150/5300-13A, *Airport Design*, both design aircraft meet the following parameters:

- Aircraft Approach Category (AAC): **C**
- Airplane Design Group (ADG): **III**
- Taxiway Design Group (TDG): **3**

3. Annual Enplanement Forecast

For planning purposes, the annual enplanement projections used for this study were provided by the Airport and are not based on updated aviation demand forecasts. The annual enplanement assumptions are:

- Near-term annual enplanements (within 5 years) will reach 50,000 passengers.
- Long-term annual enplanements (within 10 years) will reach 250,000 passengers.

To determine the appropriate terminal building program, facility requirements are prepared based on forecasted annual operations and passenger enplanements. For the purpose of this study, general planning assumptions for the terminal building program will be as follows:

- Near-term (50,000 annual enplanements) terminal building size: 25,000 SF
- Long-term (250,000 annual enplanements) terminal building size: 95,000 SF.

III. Airside Development Envelope

A. Introduction

The definition of *airside* is the portion of the airport (typically within the public safety and security fenced perimeter) in which aircraft, support vehicles, and equipment are located, and in which aviation-specific operational activities take place.

B. Airfield Infrastructure

An existing 5,100 square yard (SY) concrete aircraft parking apron is provided and delineated to accommodate two aircraft. Based on the above planning criteria and assumptions, both development concepts would require additional aircraft parking apron and access to the existing taxiway system.

Development Concept – 1 (South): would require that a new 40,000 SY aircraft parking apron and access taxiways be constructed and relocation of Taxiway A1 to accommodate the planned passenger terminal building. The site for the planned passenger terminal appears generally flat and well drained.

FAA initiated the Runway Incursion Mitigation (RIM) program in 2015 with the focus of addressing airfield surface movement safety, more specifically, airfield geometry such as runway/taxiway intersections. An option that would be considered includes relocating the existing connector Taxiway A1 to the Runway 33 threshold to avoid direct access from the proposed aircraft apron to an active runway. The existing connector Taxiway A1 would no longer meet current FAA design standards if left in place once a new aircraft apron was constructed. A second option that would be considered is constructing the connector taxiway from the aircraft apron north creating an off-set from the aircraft apron to Taxiway A.

A precision instrument runway is required to have a Precision Obstacle Free Zone (POFZ). Runway 15-33 is a precision instrument runway with visibility minimums lower than ¾ miles on the Runway 33 approach, therefore the POFZ needs to be considered. The POFZ is a volume of airspace above an area beginning at the threshold at the threshold elevation and centered on the extended runway centerline and is 200 feet long by 800 feet wide. The POFZ is only in effect during instrument meteorological conditions and the area is to remain clear with the exception of a wing of an aircraft.

Development Concept – 2 (North): would use the existing aircraft parking apron and access taxiway in the near-term. For long-term planning, approximately 17,500 SY of additional apron and a new access taxiway would need to be constructed to accommodate an expanded passenger terminal building.

Additional taxiway edge lighting, signage, and electrical building upgrades would be necessary for both development concepts. The amount of earthwork and other drainage related infrastructure is likely to be similar for both development concepts.

C. Colorado Remote Tower Project

The innovative Remote Air Traffic Control Tower Project at the Northern Colorado Regional Airport is transitioning from concept to reality. According to the Airport's website, "in October 2015 the Northern Colorado Regional Airport was selected as the official test facility for new Virtual Air Traffic Control Tower technology, 'Remote Tower'. This leading edge aviation technology will employ ground-based video and aircraft ground detection components to provide data monitored by air traffic controllers working in a central off-airport location. The high-tech array will provide an enhanced level of air safety at a cost dramatically lower than the expense required to construct and staff a traditional air traffic control tower".

The proposed passenger terminal building needs to consider how the Remote Tower Project may be impacted by the potential locations of the two terminals. According to the December 31, 2017, Airport Director's Report to the Northern Colorado Regional Airport Commission the Central Mast will be 56 feet above ground level and will be adjacent to the Air Traffic Controller's workstation facility, which is located next to the existing passenger terminal building. There will also be two (2) distributed masts 22 feet above ground level, each located approximately 1,000 feet from the runway thresholds, adjacent to Taxiway A.

Development Concept - 1 (South): There should not be interference with the proposed distributed mast described above. Although, because of the scope of this study, confirmation that no interference would take place should be verified by FAA.

Development Concept - 2 (North): The near-term passenger terminal program has the potential to possibly interfere with the Central Mast and may also impact the Air Traffic Controller's workstation. Additional coordination would be required to ensure the Central Mast and Air Traffic Controller's workstation facility would be able to remain under the long-term passenger terminal program. The facility is modular and therefore temporary allowing flexibility in the ultimate location.

IV. Landside Development Envelope

A. Introduction

The definition of *landside* is the portion of the airport designed to serve passengers or other users typically located outside of the public safety and security fencing perimeter; landside facilities include terminal building(s), vehicle parking areas, entrance roadways, and other buildings that may not necessarily conduct aviation related activities.

B. Passenger Terminal

The existing passenger terminal at the Airport is located approximately mid-field and is used for charter service. The existing terminal is approximately 4,500 square feet (SF) and is in fair condition. The configuration of a new passenger terminal building will drive the amount of area required to accommodate the building and necessary support facilities.

For planning purposes, there are four general types of passenger terminal building configurations to consider:

- The **Linear Terminal** concept is common in small airports with low levels of air carrier activity. It is generally the most economical to construct because the concourse and secured holding rooms are integrated as part of a rectangular terminal building.
- The **Pier Terminal** concept is the most common type of layout at medium to high activity airports. The design is the most flexible in terms of expansion and modification of gate positions. In this concept, the secure holding rooms and vendors can be integrated into the concourse.
- The **Satellite Terminal** concept is generally seen at major airports with very high levels of air carrier activity. It is possibly the most expensive to construct because of its inherent complexity. In this concept, the secured holding rooms, and sometimes vendor areas, are contained in the satellite at the end of the concourse walkway (which may also contain vendor areas).
- The **Remote Terminal** concept consists of a passenger terminal that relies upon a transportation system such as vans, buses, or trains to deliver passengers from a secured hold room to the aircraft, or to a secondary structure that contains only the secured hold rooms.

It is reasonable to consider that the most likely terminal concept for the Airport in the near-term and long-term will be the linear terminal concept described above. The pier terminal concept should be considered only if annual enplanements reach considerably higher levels than those anticipated in this study.

C. Gate Operations

The type of gate parking procedures affects the gate and movement area space requirements. There are two types of parking procedures that are considered, taxi-in/push-back and taxi-in/taxi-out operations. They are described as follows:

Taxi-In/Push-Back is the most common procedure used at high activity airports. The process involves the taxiing of arriving aircraft directly into the gate position under their own power. Parking is generally nose-in and perpendicular to the Terminal Building or Pier, but may be angled depending upon the available apron space. Departing aircraft are typically backed out by towing or pushing with a tractor or tug to a clear apron area where they can safely proceed under their own power. Aircraft that can use reverse thrust can power out on their own. This procedure is generally the most costly for the serving airlines from an operational standpoint. At low volume airports, airlines will be hesitant to invest in equipment and additional personnel for taxi-in/push-back operations. However, this procedure utilizes minimum gate area and therefore permits additional gates for the same building or pier length. It also typically requires shorter loading bridges and may allow for more efficient use of apron space and service equipment.

Taxi-In/Taxi-Out is typically used at lower activity airports. Aircraft taxi into and away from gate positions under their own power. Parking may be designed to be either parallel to the building or pier, or (more typically) at an angle determined by the design of the aircraft. Although the taxi-in/taxi-out procedure is less costly operationally because there is no need for tug equipment and additional personnel, it requires more apron area and permits a fewer number of gates per available building or pier length.

For the purposes of this study, it should be assumed that the taxi-in/taxi-out gate procedure will be used because of the relatively low projected airline traffic volumes in the near-term. The taxi-in/push-back gate procedure would be considered for long-term planning to accommodate the use of additional gates for the higher number of enplanements.

To support the proposed passenger terminal building, the aircraft parking apron should consider the demands of both procedures presented and should be sized to accommodate both the near-term and long-term parking needs.

D. Vehicle Parking

Public vehicle parking is provided at the Airport via a parking lot located adjacent to the existing passenger terminal and can accommodate approximately 355 vehicles. The anticipated annual enplanements, both near-term and long-term, would drive the required vehicle parking demand at the Airport. For planning purposes, both Development Concepts allocate a sufficient amount of land for vehicle parking. Consideration for the various types of parking demand (short-term, long-term, cell phone lot, ride share, taxi, bus, shuttle service, and potential autonomous vehicles) would be accommodated in the land identified for vehicle parking in each Development Concept. A detailed parking analysis would be required to determine the actual capacity needed to satisfy the demand generated by the annual enplanements.

Development Concept – 1 (South): Vehicle parking would be provided within an envelope of approximately 10.2 acres. If additional vehicle parking was needed at some point in the future, expansion of the vehicle parking may be constrained by available land.

Development Concept – 2 (North): Vehicle parking would be provided within an envelope of approximately 13.8 acres. If additional vehicle parking is needed at some point in the future, expansion of the vehicle parking could be achieved. Consideration should be given to preserving additional land for future vehicle parking demand.

E. Utilities

The following analysis was done using the North Airport Utilities – Approximate Locations, the South Airport Utilities – Approximate Locations and the Passenger Terminal Development Concepts 1 and 2 exhibits provided by the Northern Colorado Regional Airport. The exhibits did not include utility line sizing and thus it was assumed that the existing lines have sufficient capacity to serve the two potential new passenger terminal locations.

Development Concept - 1 (South): It appears that water and sewer have extended beyond the site in the past, but approximately 1,200 feet of the southernmost portions of the water and sewer lines were abandoned in 2010 according to the exhibits provided. Therefore, it appears that the water and sewer

lines may need to be extended approximately 500 feet south to serve the proposed south terminal location. It is assumed that the existing lines that are to be extended will have the capacity to serve the terminal. It appears that gas, electric and communications main lines are available along the airports east boundary. These lines should be able to be extended west approximately 600 feet to serve the new passenger terminal. These lines appear to be trunk lines and should have the capacity to serve the new passenger terminal. It does not appear that there are any barriers that would prevent these utilities from being extended to the passenger terminal site.

Development Concept - 2 (North): It appears that existing terminal is served with both water and sewer. It is assumed that the existing lines can be used and will have the capacity to serve the new passenger terminal. It appears that gas and electric services extend to the existing passenger terminal. It is assumed that the existing lines can be used and will have the capacity to serve the new passenger terminal. The existing passenger terminal has communication service provided by both Century Link and internet/fiber service provided by the city of Loveland. However, it appears communication lines are nearby and could be extended approximately 100 feet north to serve the new north passenger terminal. It does not appear that there are any barriers that would prevent these utilities from being reused/extended to the passenger terminal site, however the switching of the services from the existing passenger terminal building to the new facility would need to be carefully coordinated to provide continuous service.

F. Fuel Storage

Aircraft fueling is provided by the FBO who operates three (3) 10,000-gallon above-ground fuel storage tanks located on the east side of the main aircraft parking apron, north of the FBO hangar. Two (2) of the storage tanks are used for Jet A fuel and the remaining tank is used for AvGas.

To accommodate a new passenger terminal building, it is likely that additional fuel storage capacity would be needed for both development concepts. The location of the fuel storage facility has also been considered in both development concepts.

Development Concept – 1 (South): The passenger terminal building in this location could use the existing fuel storage facility for the near-term planned development, although it may not be ideal from an operational perspective. To service aircraft at the new passenger terminal from the existing fuel storage facility, fuel trucks would travel across the general aviation ramp and along a taxiway for a distance of approximately 3,000 feet (one-way). To improve efficiency of the fuel delivery to aircraft and enhance airfield safety, consideration should be given to a constructing a new fuel storage facility located adjacent to the passenger terminal building.

Development Concept – 2 (North): Depending on the actual layout of the passenger terminal building in the near-term, the existing fuel storage facility may need to be relocated. The location of the existing fuel storage conflicts with the long-term needs of a new passenger terminal building and would need to be relocated.

G. Aircraft Rescue and Fire Fighting (ARFF) Facility

The existing ARFF facility is located on the south side of the airport entrance road, east of the terminal and FBO buildings. The ARFF facility is approximately 7,545 SF and has five (5) vehicle stalls along with

other support facilities, such as a kitchen, training area, etc. The ARFF facility should be adequate for the near-term needs of a new passenger terminal and may need to be expanded to accommodate the long-term anticipated growth of the airport and commercial service operations.
The location of the existing ARFF facility should be acceptable for either of the proposed passenger terminal locations presented in the study.

H. Transportation Network

The transportation network surrounding an airport is integral to the long-term planning needs. In the case of the Northern Colorado Regional Airport, the Intermediate Traffic Impact Study (TIS) prepared by Delich Associates for the Hach Company was reviewed. To determine the potential impacts to a proposed passenger terminal at the Airport, the following assumptions were made:

- WAPA land grant for Rocky Mountain Ave ½ right-of-way
- Brands West development to build Rocky Mountain Avenue
- Majority of Traffic to Airport from I-25
- I-25 trip origins 50% from north and 50% from south
- Boyd Lake causes west traffic originating from the west to use US 34 to either I-25 or Rocky Mountain Avenue north to the airport or either County Road 30 or County Road 32 to I-25 Frontage Road south to the airport
- Primary access to Brands West development will use Byrd Dr.

Based on a review of the TIS and the assumptions described above, advantages and disadvantages were established to assist in the evaluation of the passenger terminal building development concepts.

Development Concept – 1 (South):

Advantages
- Wayfinding from Principal Arterial (I-25) clearest
- Wayfinding from Arterial (Crossroads Blvd) clearest
- Less travel time from north on I-25 and from south on I-25 to Crossroads Blvd

Disadvantages
- Wayfinding from Collector (Earhart Rd) left turn and ½ mile travel to south terminal
- Terminal access road intersection with Rocky Mountain Avenue may include traffic to Brands West development decreasing ease of access and increasing delays

Development Concept – 2 (North):

Advantages
- Wayfinding from Collector (Earhart Rd) straight west into terminal
- Roadway upgrades (Earhart Rd) 1,800 feet of improved road
- Separation of the two major destinations, the Airport Terminal and the commercial development, disperses the turning movement associated with each

Disadvantages

- Cost to reconstruct Lindbergh Dr. for connection to south
- Travel time approximately 1.5 minutes longer when Rocky Mountain Avenue is constructed
- Access from south will require widening of Lindbergh Dr. and/or Lear Dr.

Traffic/Transportation/Wayfinding Findings

- With Rocky Mountain Avenue in place, access to Airport will be easiest and quickest using I-25 to Crossroads Blvd
- The Rocky Mountain Avenue extension benefits both sites
- The travel time difference of 90 seconds more to reach the north site is not significant

V. Development Concepts

Based on the planning criteria and assumptions presented herein, development concepts have been created for a new passenger terminal and associated support facilities. The development concepts are preliminary only and would require further refinement to reflect updated aviation demand forecasts and facility requirements as part of a comprehensive airport master plan update. Development concepts are depicted on **Figures 1 through 3** at the end of this section.

VI. Project Costs

Development costs presented in this study are for planning purposes only, are based on 2018 dollars and reflect the level of magnitude costs. The costs are derived from the consultant's knowledge of contractors, construction material suppliers, and work performed at comparable facilities. The costs are not intended to represent the full range of costs associated with the proposed passenger terminal building and supporting facilities. Additional costs such as operation and maintenance are not included. The objective of quantifying construction costs is to aid in the decision-making process. A breakdown of the projected costs are included in **Appendix A.**

Development Concept - 1 *(South):*	**Development Concept - 2 *(North):***
Short-term Costs $27,400,000	Short-term Costs $23,700,000
Long-term Costs $38,800,000	Long-term Costs $31,300,000
Total Estimated Costs: $66,200,000	**Total Estimated Costs: $55,000,000**

VII. Passenger Terminal Evaluation Matrix

The overall objective of the study is to evaluate and recommend a location for the proposed passenger terminal building. Evaluation criteria was established and assigned a comparative rating to arrive at a total summary score. The ratings correlate to a simplified non-weighted score. The Development Concept with a higher summary score has an overall positive impact based on the evaluation criteria. The Development Concept evaluation scores and rankings are presented in **Table 1-1**.

Table 1-1 Passenger Terminal Evaluation Matrix

		Development Concept-1 (South)	Development Concept-2 (North)
● 2 – Positive ◐ 1 – Neutral ○ 0 - Negative			
Evaluation Criteria and Rationale			
Traffic Impacts	The passenger terminal will result in increased vehicle traffic in the near-term and long-term. Consideration of the vehicle traffic impacts on the surrounding transportation network.	◐	◐
Flexibility	The ability to adapt to the changing needs of commercial service carriers is an important aspect of a passenger terminal.	◐	●
Development Phasing	Expansion of the planned passenger terminal with minimal disruption to other airport operations is a key consideration.	◐	○
Long-Range Expansion Capability	The location of the planned passenger terminal needs to be able to serve the public for several decades. Having the terminal in a location that can be expanded in a logical and systematic manner is an important consideration.	○	●
Financial Feasibility	The development concept that will most likely be supported by the FAA and other stakeholders would be key to determining the financial feasibility.	○	◐
Potential Environmental Impacts	Consideration of the potential environmental impacts of both locations is required by statute.	◐	◐
Compatibility with other Projects	Compatibility of the development concept with the surrounding planned development on and off the airport.	◐	●
Utility Infrastructure	The availability of supporting infrastructure (utilities) for the planned development.	◐	◐
Landside/Airside Infrastructure	The availability of existing landside (parking, roads) and airside (aprons, access taxiways) infrastructure.	○	●
Impacts to Remote Tower Project	The location of the planned passenger terminal needs to consider potential impacts to the location of Air Traffic Controller's workstations, Central Mast and Distributed Masts.	●	○
Access to Support Facilities	The ability of the required support facilities (ARFF and fuel) to service the passenger terminal from their present locations.	○	●
Impact on Stakeholders	The operational impacts the development concept may have on other stakeholders/tenants on the airport.	○	◐
Construction Costs	Probable costs for the development concept based on planning level estimates need to be considered.	○	●
Summary Score		**8**	**17**
Ranking		**2**	**1**

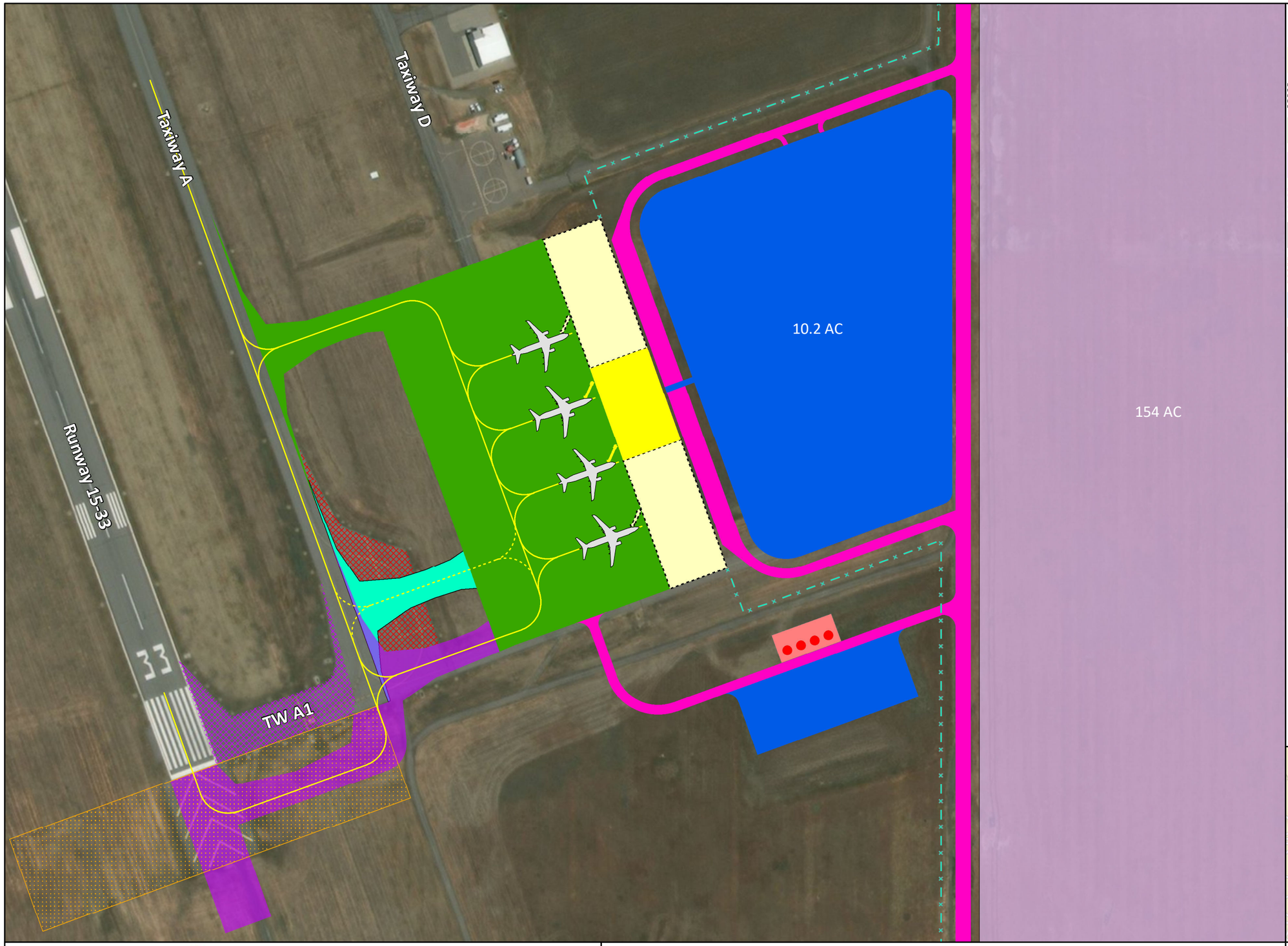
Source: Dibble Engineering

VIII. Recommendations

Based on the quantitative and qualitative findings presented in **Table 1-1,** the recommended location of the proposed passenger terminal is **Development Concept 2 – *(North)*.** It is our opinion that the long-term growth of the airport would be better served by having a mid-field passenger terminal. The potential long-term expansion capability, construction costs, and the impacts on the existing airfield geometry make Development Concept 1 – *(South)* less favorable.

The southern location presented in this study would be a better location for a FBO operation due to its proximity to other similar general aviation activities on the airport. The recommended FBO location would also create significantly less vehicle traffic volume, thereby having a reduced impact on the surrounding transportation network.

It is also recommended that a future airport master plan establish the actual passenger terminal building size, phasing and costs based on updated aviation demand forecasts and facility requirements. Input from a broad and diverse stakeholder group during the planning process will help guide the ultimate location of the passenger terminal building and supporting infrastructure.

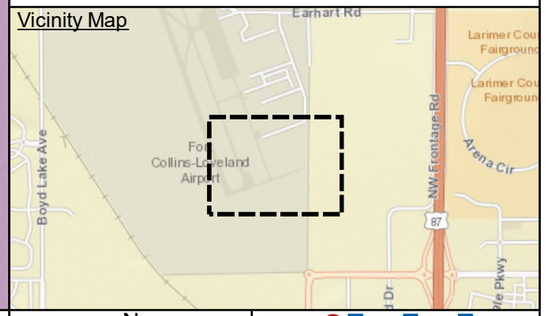


Legend

- Terminal Building (25,000 SF)
- Ultimate Terminal Building (35,000 SF ea)
- Apron and Taxiway (40,000 SY)
- RIM Option 1
- RIM Option 1 - Taxiway Removal
- RIM Option 2
- Taxiway Removal (7,500 SY)
- New Parking
- New Fuel Tanks
- New Fuel Farm
- POFZ
- New Roadway Improvements
- New Fence
- Shopping Center

Source: Esri World Imagery and World Street Map
(Updated: Jan 31, 2018)

Vicinity Map



NORTHERN COLORADO
REGIONAL AIRPORT

Passenger Terminal Development
Development Concept-1 (South)

N

0 100 200 Feet

Figure 1-2

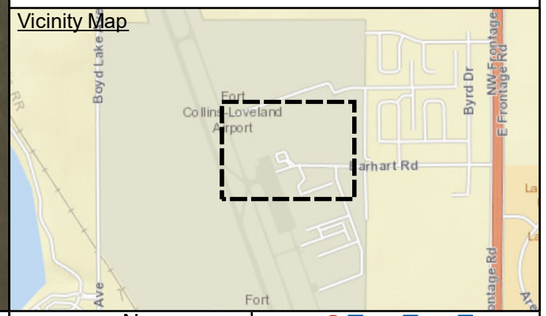
Dibble Engineering

Legend

- Terminal Building (25,000 SF)
- Terminal Expansion (35,000 SF ea)
- Apron and Taxiway (17,500 SY)
- New Parking
- New Fuel Tank
- New Fuel Farm
- New Roadway Improvements
- New Fence

Source: Esri World Imagery and World Street Map
(Updated: Jan 31, 2018)

Vicinity Map



NORTHERN COLORADO
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Passenger Terminal Development
Development Concept-2 (North)

N

0 100 200 Feet

Figure 1-3

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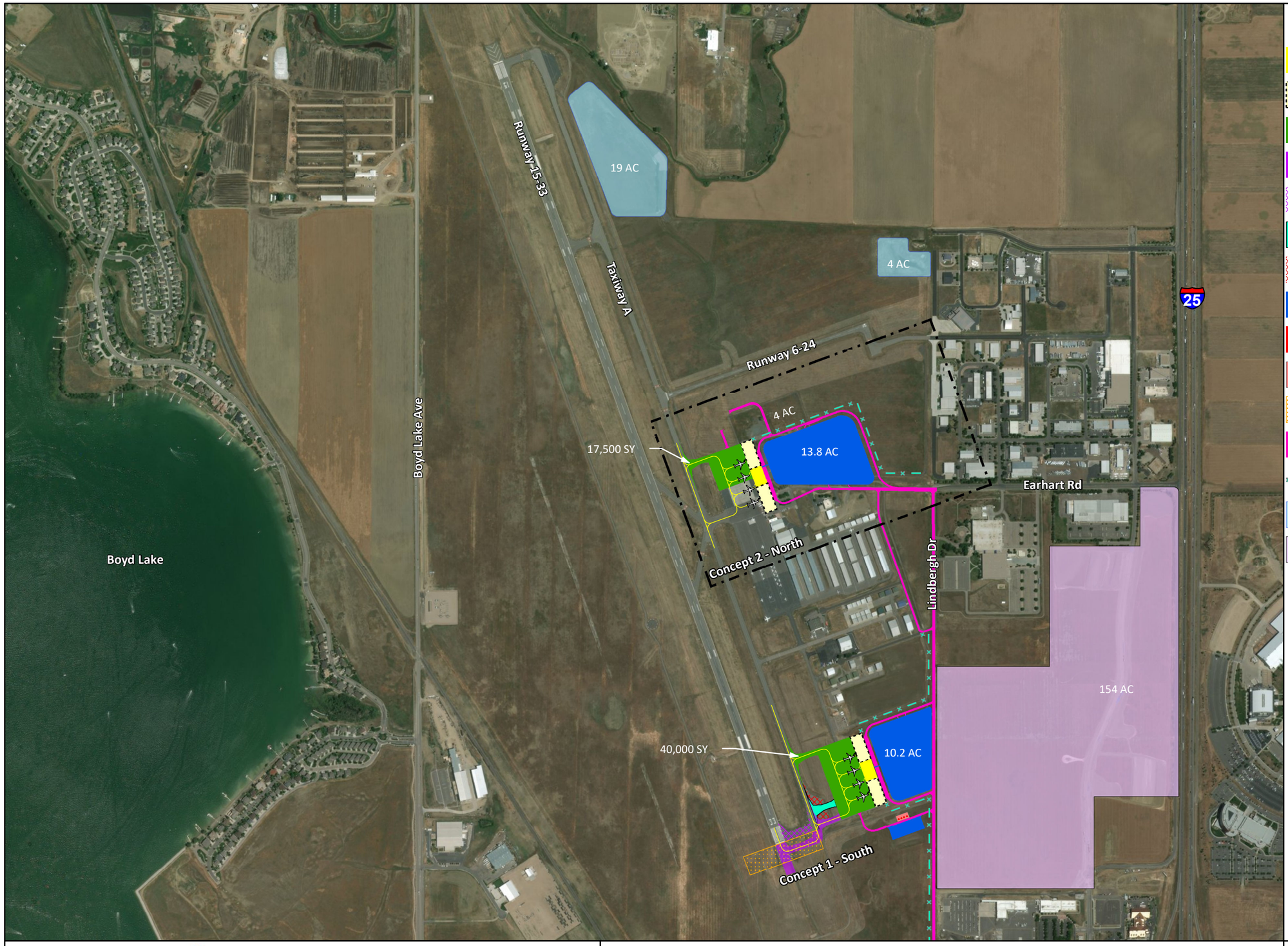

Legend

- Terminal Building (25,000 SF)
- Ultimate Terminal Building (35,000 SF ea)
- Apron and Taxiway (40,000 SY)
- RIM Option 1
- RIM Option 1 - Taxiway Removal
- RIM Option 2
- Taxiway Removal (7,500 SY)
- New Parking
- New Fuel Tanks
- New Fuel Farm
- POFZ
- New Roadway Improvements
- New Fence
- Drainage Pond
- Shopping Center

Source: Esri World Imagery (Updated: Jan 31, 2018)

NORTHERN COLORADO REGIONAL AIRPORT

Passenger Terminal Development
Development Concept Composite

N

0 500 1,000 Feet

Figure 1-4

Dibble Engineering

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Appendices

NORTHERN COLORADO REGIONAL AIRPORT DEVELOPMENT CONCEPT-1 (SOUTH) NEAR-TERM COST ESTIMATE

LINE No.	DESCRIPTION	AMOUNT
1	Civil Site - Airside	$ 3,100,000
2	Civil Site - Landside	$ 3,900,000
3	Utilities	$ 500,000
4	Facilities	$ 7,600,000
5	Fuel Storage Facility	$ 300,000
6	Contractor's Quality Control (±2%)	$ 400,000
7	Mobilization (±4%)	$ 700,000
8	Location of Underground Utilities (±1%)	$ 200,000
9	Airfield Safety and Security (±1%)	$ 200,000
10	SWPPP (±1.5%)	$ 300,000
11	**CONSTRUCTION SUBTOTAL**	**$ 17,200,000**
12	Contingency (±25%)	$ 4,300,000.00
13	**CONSTRUCTION TOTAL**	**$ 21,500,000.00**
14	Construction Management Fee (±12%)	$ 2,400,000
15	Sponsor Administration Fee (±5%)	$ 1,100,000
16	Design Fee (±12%)	$ 2,400,000
17	**TOTAL**	**$ 27,400,000.00**

NORTHERN COLORADO REGIONAL AIRPORT DEVELOPMENT CONCEPT-1 (SOUTH) LONG-TERM COST ESTIMATE

LINE No.	DESCRIPTION	AMOUNT
1	Civil Site - Airside	$ 800,000
2	Civil Site - Landside	$ -
3	Utilities	$ -
4	Facilities	$ 21,100,000
5	Fuel Storage Facility	$ -
6	Contractor's Quality Control (±2%)	$ 500,000
7	Mobilization (±4%)	$ 1,000,000
8	Location of Underground Utilities (±1%)	$ 300,000
9	Airfield Safety and Security (±1%)	$ 300,000
10	SWPPP (±1.5%)	$ 400,000
11	**CONSTRUCTION SUBTOTAL**	**$ 24,400,000**
12	Contingency (±25%)	$ 6,000,000.00
13	**CONSTRUCTION TOTAL**	**$ 30,400,000.00**
14	Construction Management Fee (±12%)	$ 3,400,000
15	Sponsor Administration Fee (±5%)	$ 1,600,000
16	Design Fee (±12%)	$ 3,400,000
17	**TOTAL**	**$ 38,800,000.00**

NORTHERN COLORADO REGIONAL AIRPORT
DEVELOPMENT CONCEPT-2 (NORTH)
NEAR-TERM COST ESTIMATE

LINE No.	DESCRIPTION	AMOUNT	
1	Civil Site - Airside	$	1,400,000
2	Civil Site - Landside	$	3,800,000
3	Utilities	$	100,000
4	Facilities	$	7,600,000
5	Fuel Storage Facility	$	400,000
6	Contractor's Quality Control (±2%)	$	300,000
7	Mobilization (±4%)	$	700,000
8	Location of Underground Utilities (±1%)	$	200,000
9	Airfield Safety and Security (±1%)	$	200,000
10	SWPPP (±1.5%)	$	300,000
11	**CONSTRUCTION SUBTOTAL**	**$**	**15,000,000**
12	Contingency (±25%)	$	3,700,000.00
13	**CONSTRUCTION TOTAL**	**$**	**18,700,000.00**
14	Construction Management Fee (±12%)	$	2,000,000
15	Sponsor Administration Fee (±5%)	$	1,000,000
16	Design Fee (±12%)	$	2,000,000
17	**TOTAL**	**$**	**23,700,000.00**

NORTHERN COLORADO REGIONAL AIRPORT DEVELOPMENT CONCEPT-2 (NORTH) LONG-TERM COST ESTIMATE

LINE No.	DESCRIPTION	AMOUNT
1	Civil Site - Airside	$ 500,000
2	Civil Site - Landside	$ -
3	Utilities	$ -
4	Facilities	$ 21,000,000
5	Fuel Storage Facility	$ -
6	Contractor's Quality Control (±2%)	$ 300,000
7	Mobilization (±4%)	$ 600,000
8	Location of Underground Utilities (±1%)	$ 200,000
9	Airfield Safety and Security (±1%)	$ 200,000
10	SWPPP (±1.5%)	$ 300,000
11	**CONSTRUCTION SUBTOTAL**	**$ 23,100,000**
12	Contingency (±25%)	$ 3,500,000.00
13	**CONSTRUCTION TOTAL**	**$ 26,600,000.00**
14	Construction Management Fee (±12%)	$ 1,900,000
15	Sponsor Administration Fee (±5%)	$ 900,000
16	Design Fee (±12%)	$ 1,900,000
17	**TOTAL**	**$ 31,300,000.00**

Dibble Engineering