CITY OF
FREMONT
NEBRASKA PATHFINDERS

TERMINAL AREA PLAN UPDATE

PRE-FINAL DECEMBER 2014

TERMINAL AREA PLAN UPDATE
FREMONT MUNICIPAL AIRPORT (FET)

PRE-FINAL

DECEMBER 2014

Prepared for the:

CITY COUNCIL OF THE CITY OF FREMONT

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1.0 INTRODUCTION

The City of Fremont as owner, operator and sponsor of the Fremont Municipal Airport (FET) has initiated this update of its airport planning to assess FET's existing and future role and to provide direction and guidance related to short- and long-term on-airport development.

This study will find a course of action over a period of 20 years and beyond for on-airport development. This course of action will be advanced pursuant to City Council prerogative and provide compliance with current Federal Aviation Administration (FAA) airport design standards.

This project and its process will be shepherded through Mr. Dave Goedeken, P.E., Public Works Director coordinated through Fremont's various aviation and non-aviation constituencies as they may wish to participate and approved by the City Council.

The planning, and this resulting document, is intended to be both a forward-looking and flexible document. Resolutions and solutions are proposed well in advance of the likely need; and the plan is flexible enough to change with the need. Federal and state agencies are then similarly able to program funding and be responsive to financing needs.

FAA, the City and the specifically the State of Nebraska Department of Aeronautics (NDA) have formulated the need and some funding for terminal area facilities improvements. The current FET Capital Improvement Plan (CIP) identifies approximately $2 million to that end.

Three alternative layouts are within fielded for City Council consideration followed by an updated Airport Layout Plan (ALP) drawing and Terminal Area Plan (TAP) drawing for FET.

The remainder of this chapter describes plan purpose, issues, and project participants.

1.1 PURPOSE

The purpose of the planning effort is to use developed methods to objectively evaluate and assess on-airport facilities from an aviation use, land use, and development perspective. The potential need for infrastructure and additional facilities will be considered while looking to the future to determine how the airport may more fully participate in the local and regional economy. Further, this planning will assist City leadership to guide local airport infrastructure investment decisions.

The product of this effort will provide the City with a development program to meet aviation needs in the short- intermediate- and long-range planning periods. It is anticipated that benefits derived from the plan will positively affect the airport, its users, City and County residents and the surrounding area.

1.2 ISSUES

The City last completed formal airport planning in 2003. The City, FAA and the Nebraska Department of Aeronautics (NDA) determined that a terminal area plan update would be beneficial given current activity, on-airport land use concerns and economic conditions. The City of Fremont consulted with FAA and NDA and the planning consultant to consider current potential issues and craft a work plan which addresses resolution. Some of those issues are described as follows and will be given particular attention through the planning process.

Issue Number One:
Existing Terminal Building Disposition

The existing general aviation terminal building has likely reached the end of its useful life without rehabilitation. Inadequacies identification along

with potential new sites will be considered. Specifically, focus will be made to a new facility perhaps in a different location.

Issue Number Two:
Accommodate Potential Landside Demand

Landside in this context relates to portions of FET's ramp/aprons, the terminal building function/location, aircraft fueling and other services provided to the flying public, automobile access and parking, and other important features which serve to support airside operations. Accommodation hereto will be considered in an alternatives context.

A sufficient number of demanding aircraft may now, or in the future, use the airport to suggest that some portion of the landside should be designed to accommodate larger airport design standards, including pavement strengths, clearance widths and other on-the-ground features. Again, accommodation hereto will be considered in an alternatives context.

1.3 PLANNING PROCESS AND PARTICIPANTS

A planning process is primary and accompanies this narrative. This planning process and participation through the process from those with interests in the overall aviation community is important to creation of this narrative and its drawings.

The planning process begins with preparation of the necessary data and mapping to be used in the study to prepare this narrative, along with its updated ALP and TAP drawings for FET.

The narrative and the ALP and TAP drawings will be prepared in accordance with FAA guidelines, policies and procedures and applicable federal and state laws and standards. Previous reports and associated work will be reviewed, as necessary for baseline information.

The project process will be engaged in full coordination with the City Council, federal, state and local planning agencies, the representatives of which will be consulted for input and invited to attend progress meetings. The end result will provide a planning document that recommends a responsive course of action and a financially-unconstrained plan, complete with current planning-level cost estimates for improvements.

Various airport constituencies, including the general public will be solicited through the public participation process. This process includes two public meetings and a presentation to the City Council. The first meeting introduces the planning and previews the alternatives planning. The second meeting will detail the alternatives and work to build consensus on an acceptable configuration.

FAA and NDA will advise on project progress and documents at key project points. The planning consultant, Airport Development Group, Inc., will prepare project documentation, guide project progress, and solicit guidance.

2.0 INVENTORY INTRODUCTION

This planning effort is intended to instruct and supplement NDA airport planning and programming efforts, as necessary. This plan is a more detailed look at the FET's landside, while national and state planning step back and generally consider the larger role FET plays in the overall system of airports.

FET is part of the US national transportation system and the FAA's National Plan of Integrated Airport Systems (NPIAS). Of the nation's nearly 5,200 public-use airports, the NPIAS comprises nearly 3,400 airports which are considered significant by FAA to the national airspace system. As a participating facility in the program, the

Authority as sponsor is eligible to receive federal funds for airport improvements.

FET is eligible to receive funding through NDA, and other state agencies. The Nebraska Airport System Plan Update (2002) identifies FET as a National General Aviation Airport in the Nebraska system of airports. State system planning for airports generally includes a more detailed analysis not only of commercial service, but general aviation airports like FET.

2.1 LOCATION AND SETTING

FET is located in extreme southeastern Dodge County in eastern Nebraska near 41° 26′ 59.6″ North, 96° 31′ 12.7″ West. FET is entirely within the City of Fremont boundaries due west of the residential and business areas of the City. FET is approximately 30 miles due northwest from Omaha, Nebraska, via U.S. Highway 6 to U.S. Highway 275 to U.S. Highway 30. Airport properties currently approximate 353 fee acres and 75 acres under avigation easement. The airport beacon is adjacent to the main apron. The Airport Surface Observing System (ASOS) and segmented circle with wind indicator units are found near midfield.

Runway 14-32 is approximately 6,353 feet long and 100 feet wide. It is constructed of concrete with an estimated 28,000 pounds single-wheel gear (SWG) and 48,000 pounds duel-wheel gear (DWG) design pavement strength. 850-foot displacements are found on either end and declared distances restrict use. The effective runway longitudinal gradient is less than 0.1 percent and runway longitudinal line of sight is met. Runway pavements are in excellent condition as reported by NDA. The runway is equipped with a Medium Intensity Runway edge-Lighting (MIRL) system. Both runway ends are equipped with a two-light Precision Approach Path Indicator (PAPI) VGSI (Visual GlideSlope Indicator) lighting systems and Runway 14 is equipped with a Runway End Identifier Lighting Systems (REIL). Each runway end is marked with elements appropriate for non precision aircraft operation including aiming points.

Runway 1-19 is approximately 2,316 feet long and 50 feet wide. It is constructed of asphalt with an estimated 12,500 pounds single-wheel gear (SWG) design pavement strength. The effective runway longitudinal gradient is less than 0.1 percent and runway longitudinal line of sight is met. Runway pavements are in poor condition as reported by NDA. Each runway end is marked with elements appropriate for visual aircraft operation excluding aiming points.

Aircraft traffic pattern turns are prescribed:

- ✓ Left Traffic for Runway 14
- ✓ Right Traffic for Runway 32
- ✓ Left Traffic for Runway 1
- ✓ Right Traffic for Runway 19

Both runway alignments, individually, meet FAA's recommended 95 percent coverage of wind in all-weather conditions. Wind data gathered from the AWOS at Columbus Regional Airport (OLU) was used to create the all-weather wind for FET. The wind rose is found on Exhibit E following this page.

Three instrument approach procedures are written to accommodate aircraft operation in inclement weather. Table 1-1 below tabulates data and notes best minima for straight-in and circling operation. Note that departure minima are specified for Runway 14 and 19 and departure procedures and minima are specified for Runway 14.

Runway 14-32 is equipped with partial parallel Taxiway A. All taxiway pavements are 35 feet wide, equipped with a Medium Intensity Taxiway edge-Lighting (MITL) system, with holdlines and airfield signage no closer than 250 feet from runway centerline on connecting taxiways.

Taxiway B connects the A/A3 intersection with Runway 1-19, is 35 feet wide and equipped with MITL. Taxiway C connects near the Runway 19 end to the main apron and is 50 feet wide. Taxiway B and C have holdlines and signage no closer than 125 feet from runway centerline.

The main apron approximates 7,777 square yards of recently rehabilitated asphalt with marked tiedown positions along the apron edge. Note that not this entire yardage is available for public aircraft operations as some fronts hangars.

This apron is functionally-constrained as to accommodate (in accordance with FAA design standards) only smaller aircraft (Group I). A 2,400 (±60'x±40') square foot terminal building fronts the northern apron edge. This building accommodates the FBO and the transient and local pilot with offices, lounge, and pilot area. Approximately 850 square yards of paved auto parking (22 stalls) is found adjacent to and north of the building. 100LL and Jet-A aviation fuels are for retail sale via two 10,000 gallon tanks.

These tanks are found adjacent to the across the apron, south from the terminal building. Eight hangars constitute the remainder of the aeronautical facilities of the main terminal area and are accessed by way of West 23rd St.

The west-side terminal area (connected via Taxiway B) accommodates two executive and three T-hangars. These hangars also access via West 23rd St.

A combination of chain-link and three-strand barbed fencing surrounds the airport with gates along Airport Road, West 23rd St and the main terminal area.

A depiction of these airfield facilities is Exhibit E, Existing Airport Layout on the previous page.

2.2 AVIATION ACTIVITY

NDA inspects FET on an annual basis to assess facilities and activity. Data from the annual airport inspection for the year ended December 12, 2013 indicates that FET accommodates 3,600 air taxi (16%) and 6,350 itinerant general aviation (28%) along with 12,200 local (55%) and 150 military (<1%) aircraft operations, totaling 22,300 total aircraft operations, 10,100 of which (45%) are itinerant in nature. The inspection notes 40 single-engine (83%), 7 multi-engine (14%) and 1 (<1%) helicopter for the based aircraft count.

FAA maintains a based aircraft and aircraft operations record and forecasting effort for NPIAS airports termed the Terminal Area Forecast (TAF). Aircraft operations identified within the TAF for FET are the same as above since the year 2008 and remain the same 20 years hence.

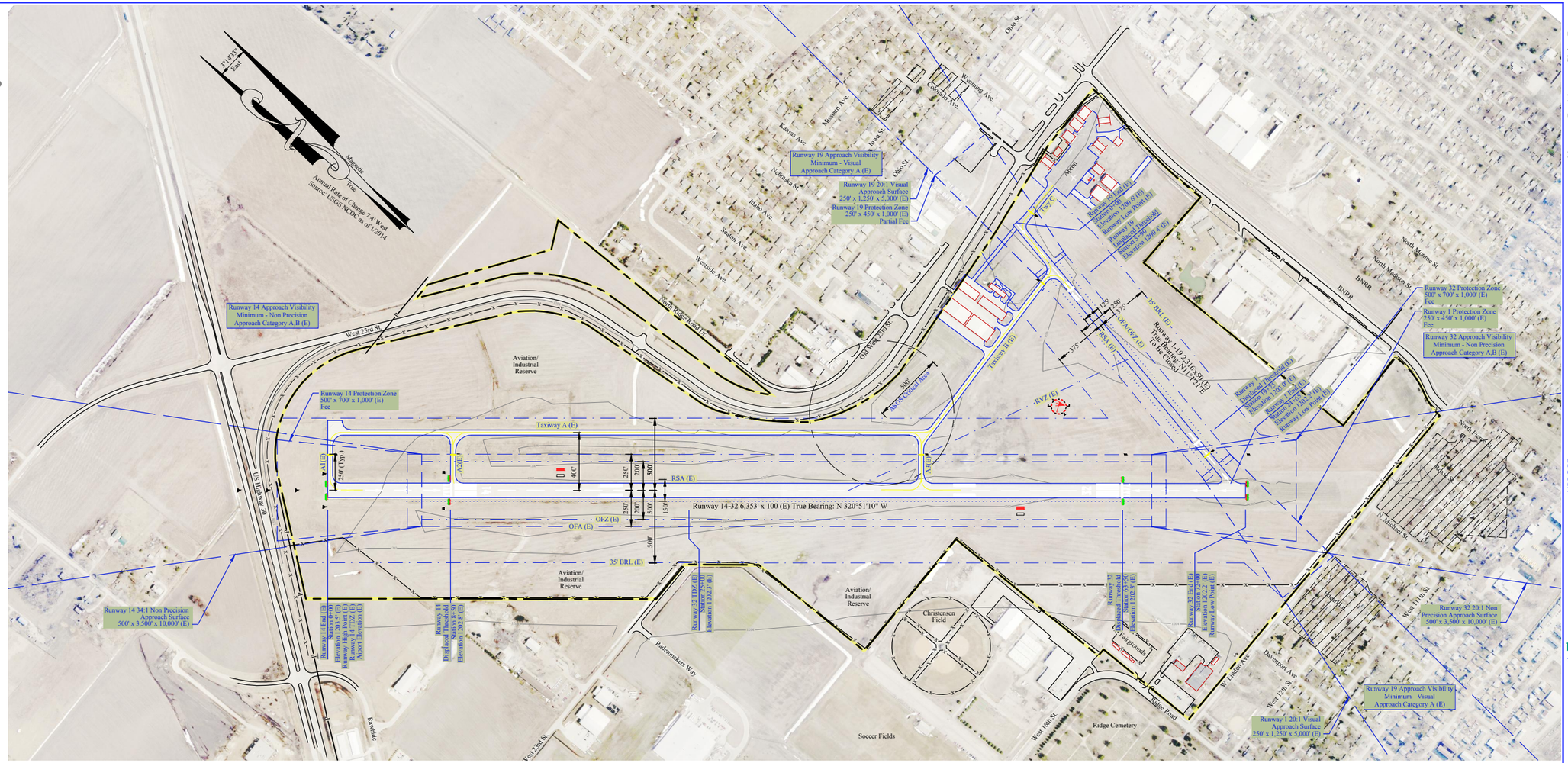
Current information, as of August 15, 2014 via the Fixed Base Operator, Fremont Aviation updates the based aircraft quantity: 3 Twin-Turbo prop, 1 Jet and 2 helicopter.

Table 1
FET Instrument Approach Procedures (IAPs)

IAP Name	A-Minima	B-Minima	C-Minima	D-Minima
RNAV (GPS) RWY 14 (Circling)	600-1	600-1	900-2½	Not Authorized
RNAV (GPS) RWY 14 (Straight-in LPV)	300-1	300-1	300-1	Not Authorized
RNAV (GPS) RWY 32 (Circling)	600-1	600-1	900-2½	Not Authorized
RNAV (GPS) RWY 32 (Straight-in)	300-1	300-1	300-1	Not Authorized
VOR/DME-RWY 14 (Circling)	700-1	700-1	900-2½	Not Authorized
VOR/DME-RWY 14 (Straight-in)	700-1	700-1	700-1¾	Not Authorized

Legend

(E)	Existing
	Existing Property Line
	Building Restriction Line (35' BRL)
	Runway Protection Zone (RPZ)
	Approach Surface
	Object Free Area (OFA)
	Runway Safety Area (RSA)
	Obstacle Free Zone (OFZ)
	Runway Visibility Zone (RVZ)
	Existing Fence
	Existing Pavement
	Existing Paved Roads
	Existing Buildings
	Avigation Easement
	Drainage Line
1200	Contour Line
	Threshold/Edge Lights (MIRL)
	Runway End Identifier Lights (REIL)
	Section Corner
	Precision Approach Path Indicators (PAPI-2/4)
	Runway Hold Position Sign
	Segmented Circle With Lighted Wind Cone
	Rotating Beacon



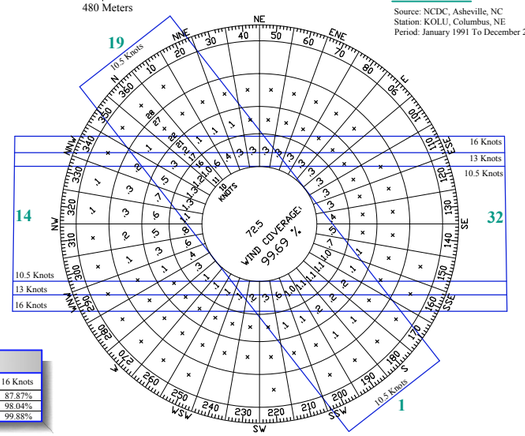
Graphic Scale

400 0 200 400 800 1600 Feet

120 0 60 120 240 480 Meters

All-Weather Wind Rose

Source: NCDC, Asheville, NC
Station: KOLU, Columbus, NE
Period: January 1991 To December 2001



Wind Coverage

Runway	10.5 Knots	13 Knots	16 Knots
14-32	91.34%	96.75%	87.87%
1-19	90.94%	94.90%	98.04%
14-32 & 1-19 Combined	98.34%	99.47%	99.88%

Runway End Coordinates

Runway	Existing	Future
14	North Latitude 41°27'27.32" West Longitude 96°31'50.35"	
14 Displaced	North Latitude 41°27'20.80" West Longitude 96°31'43.30"	
32	North Latitude 41°26'38.72" West Longitude 96°30'58.33"	
32 Displaced	North Latitude 41°26'45.18" West Longitude 96°30'04.75"	
1	North Latitude 41°27'02.39" West Longitude 96°30'52.01"	
1 Displaced	North Latitude 41°26'02.39" West Longitude 96°30'53.56"	
19	North Latitude 41°27'02.39" West Longitude 96°30'52.01"	
19 Displaced	North Latitude 41°26'38.72" West Longitude 96°30'58.33"	

The preparation of these drawings was financed, in part, through a planning grant from the Federal Aviation Administration (FAA), as provided under Section 505 of the Airport and Airway Improvement Act of 1982, and as amended by the Airport and Airway Safety and Capacity Expansion Act of 1987, as amended. The contents do not necessarily reflect the official views of the FAA. Acceptance of these drawings does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein, nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

Runway Data

	Runway 14/32				Runway 1/19	
	14 Existing	32 Existing	14 Future	32 Future	1 Existing	19 Existing
Runway Length and Width	6,353 x 100, Concrete				2,316 x 50, Asphalt	
Runway Pavement Strength (SWG/DWG/DTWG)(1,000 lbs.)	28 SWG, 48 DWG				N/A	
Runway Lighting	MIRL				None	
Runway Marking (V, NP, PI)	Non Precision	Non Precision			Visual	Visual
Crosswind Component and Percent Coverage	13 Knots/96.75%				10.5 Knots/90.94%	
Blast Pad Width/Length	N/A	N/A			N/A	N/A
Runway Development/Reference Code (RDC/RRC)	A/B-II, 1 Mile				A-I, Visual	
Critical/Design Aircraft	Cessna Citation 525				Cessna 150	
-Approach Speed, Wingspan, Weight, Haul	115 kts., 49.8', 13,870 lbs, <500 mi.				55 kts., 32.7', 1,600 lbs, <500 mi.	
Associated Taxiway Design Group (TDG), Width, Lighting	2, 35', MITL				1, None, None	
Approach Surface (Table 3-2)	20:1; Row 6	20:1; Row 6			20:1; Row 2	20:1; Row 2
Departure Surface	N/A				N/A	
FAR Part 77 Approach Surface	34:1 NP, 500'x 3,500' x 10,000'	34:1 NP, 500'x 3,500' x 10,000'			20:1 V, 250's 1,250' x 5,000'	20:1 V, 250's 1,250' x 5,000'
Landing/Navigational Aids	GPS,PAPI,REIL	GPS, PAPI			None	None
Runway End Elevation	1,203.5'	1,202.2'			1,202.2'	1,200.6'
Highest/Lowest Runway Elevation	1,203.5' / 1,202.2'				1,200.6' / 1,202.2'	
Runway Touchdown Zone Elevation (TDZ)	1,203.5'	1,202.9'			1,202.2'	1,202.2'
Runway Intersection Elevation	N/A				N/A	
Effective Longitudinal Runway Gradient	<0.1%				<0.1%	
Maximum Longitudinal Runway Gradient	<0.1%				<0.1%	
Line of Sight Standards Met (Longitudinal/RVZ)	Yes/Yes				Yes/Yes	
Runway Safety Area (RSA) Beyond End/Prior To	300'/300'	300'/300'			240'/240'	240'/240'
Runway Safety Area (RSA) Width	150'				120'	
Runway Object Free Area (ROFA) Beyond End/Prior To	300'/300'	300'/300'			240'/240'	240'/240'
Runway Object Area (ROFA) Width	500'				250'	
Obstacle Free Zone (ROFZ) Length Beyond End/Width	200'/400'				200'/250'	
Precision Obstacle Free Zone (POFZ) Length/Width	N/A	N/A			N/A	N/A
Runway Protection Zone (RPZ) AAC, Visibility, Dimensions Accommodated, Dimensions and Nature of Ownership	A-B, 1 mi., 500' 750'x1,000' Fee	A-B, 1 mi., 500' 750'x1,000' Fee			A, Vis., 250' 450'x1,000' Fee	A, Vis., 250' 450'x1,000' Fee/Ease&ROW
Runway Centerline Separations; Taxiway, Hold and Parking	240', 200', 250'				150', 125', 125'	
Displaced Threshold Elevation	1,202.8'	1,202.3'			1,200.4'	1,203.0'
Takeoff Runway Available (TORA)	5,500'	5,500'			1,974'	1,844'
Takeoff Distance Available (TODA)	5,500'	5,500'			1,974'	1,844'
Accelerate Stop Distance Available (ASDA)	5,500'	5,500'			2,444'	2,284'
Landing Distance Available (LDA)	4,650'	4,650'			1,844'	1,844'

Airport Data

	Existing	Future
Airport Elevation	1,203'	
Airport Reference Point (ARP)	North Latitude 41°26'56.9" West Longitude 96°31'12.7"	
Airport Electronic Aids	GPS RNAV, VOR DME	
Mean Maximum Temperature of Hottest Month	88.6° Fahrenheit (July)	
Most Demanding Runway Design Code	A/B-II, 1 Mile	
NPIAS/State Role	General Aviation	
Most Demanding Critical/Design Aircraft	Cessna Citation 525	

Sponsor Approval

City Of Fremont, Nebraska — Date

Notes

1. Base Mapping from 2010 ALP obtained from the City of Fremont, January 2014 supplemented by 1-meter ortho-referenced *Pictometry* imagery obtained January 2014. Ground contours via the 2010 ALP. Supplemental airspace survey not conducted.
2. No Obstacle Free Zone Penetrations or Threshold Siting Surface Penetrations exist. No Modification to Design Standards approved and no Non Standard Conditions identified.
3. All Coordinates 1983 North American State Plane Projection, all elevations North American Vertical Datum, Epoch Year 1988.
4. Existing airport-related city property approximates 353 acres, and easement acreage approximates 75 acres.
5. See Terminal Area Plan for more detailed building information.
6. Planned (But Not Shown) improvements include:
   - 6.1. Closure of Runway 1-19 to serve as taxiway
   - 6.2. Full-parallel taxiway for Runway 14-32
   - 6.3. Improved IAP visibility (from 1-mile to 3/4-mile) for Runway 14 while simultaneously removing the Runway 14 displacement and updating declared distances
   - 6.4. Adoption of C&D Design Standards for Runway 14-32
   - 6.5. Planned Terminal Area hangars, apron, access and other landside features

No.	Revision	Ckd	Date

Fremont Municipal Airport
City of Fremont, Nebraska

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NDA Project Number:

Project No.:	FET1437M		
Designed By:	SPM		
Drawn By:	MTP		
Approved By:	SPM		
Date:	February 2014		

Existing Airport Layout

Exhibit:

E

of VII Exhibits

2.3 AIRFIELD DESIGN STANDARDS

FAA specifies a coding scheme for airport design that relates airfield design criteria to the operational and physical characteristics of aircraft using an airport in a meaningful quantity, along with IAP visibility. This scheme, and standards compliance thereto, relates to individual runways and runway ends at certificated and/or obligated airports. FET is an obligated airport as the City has accepted federal grant-in-aid funds from FAA. The scheme relates to runways, along with their associated IAPs and taxiways/aprons.

The first portion of the overall scheme relates to a given runway, and runway end, and has three criterion. Table 2 shows the criterion collectively, the Runway Design Code (RDC).

The first, represented by a letter, is the Aircraft Approach Category (AAC). It relates to aircraft approach speed, an aircraft operational characteristic (1.3 x Vso/Vref {the speed of an aircraft in the landing configuration}). The second designator, Airplane Design Group (ADG), is represented by a roman numeral. It is related to aircraft wingspan and aircraft tail height; physical characteristics.

A given runway end may accommodate an IAP with various FAA-approved visibilities. These visibilities are segregated and expressed in terms of Runway Visual Range (RVR). RVR is a real-time meteorological measurement noted feet and related to ¼ mile visibility increments. RVR measurements are made at the runway location. Figure 1 on the following page shows representative aircraft grouped only by Airplane Design Group (ADG).

These criterion, the AAC speed, ADG wingspan and tail height, along with IAP capability, combine to identify each runway's RDC and classify design standards, primarily related to runway and runway protection. A RDC is associated with a particular runway end. A field with multiple

Table 2
Runway Design Code (RDC) Criterion

Aircraft Approach Category (AAC)	**Aircraft Speed Range (Knots)**
A	Less than 91
B	More than 91, but less than 121
C	More than 121, but less than 141
D	More than 141, but less than 166
E	More than 166

Airplane Design Group (ADG)	**Aircraft Wingspan Range**	**Aircraft Tail Height Range**
I	Up to but not including 49'	Up to but not including 20'
II	49' up to but not including 79'	20', up to but not including 30'
III	79' up to but not including 118'	30', up to but not including 45'
IV	118' up to but not including 171'	45', up to but not including 60'
V	171' up to but not including 214'	57', up to but not including 60'
VI	214' up to but not including 262'	66', up to but not including 80'

IAP Capability in Terms of Visibility (Statute Mile)	
RVR 4000	Lower than one mile but greater than ¾ mile
RVR 2400	Lower than ¾ Mile but not lower than ½ mile
RVR 1600	Lower than ½ Mile but not lower than ¼ mile
RVR 1200	Lower than ¼ Mile

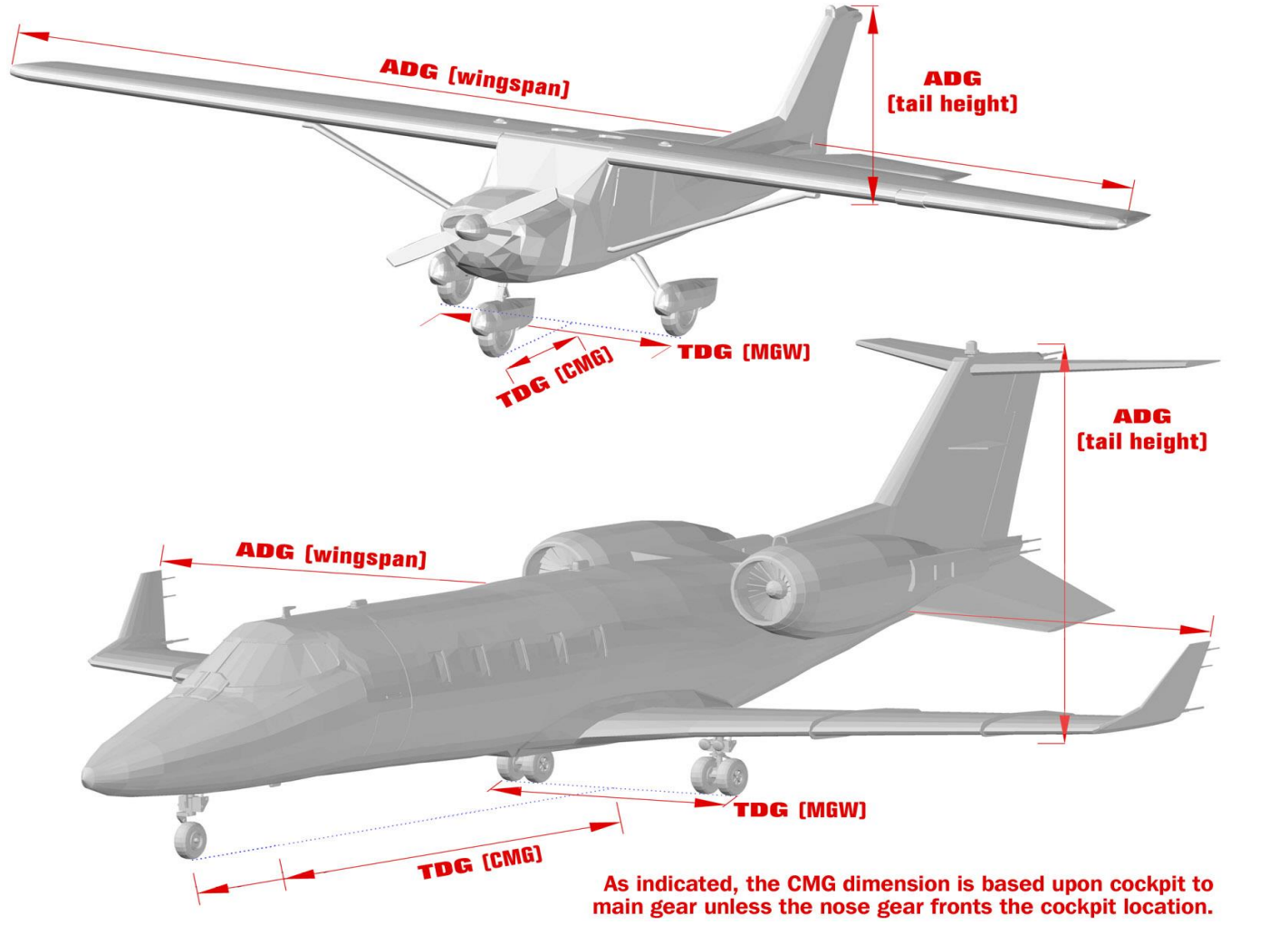
runways may have multiple RDCs.

Beyond RDC, Taxiway Design Group (TDG) is an additional criteria; it is based upon the dimensions of aircraft undercarriage, specifically the distance between the outer edge of the main gear, termed the Main Gear Width (MGW) with the distance between the Cockpit to Main Gear, termed CMG. Note that if the nose wheel fronts the cockpit, the CMG distance increases. Various MGW and CMG ranges combine to make TDG's 1 through 7, with 7 accommodating the largest ranges, and aircraft. The visualization on the following page, as Figure 1-4, shows the physical aircraft characteristics associated with ADG and TDG. In many instances ADG and TDG for individual airplanes will be within the same grouping; for example, ADG-I with TDG-1, ADG-II with TDG-2, and AGD-III with TDG-3. Notable exceptions generally include aircraft with a relatively long fuselage.

Finally, aircraft weight is an additional criterion to be able to determine suitable application of all airport planning and design at FET.

Aircraft which weigh less than 12,500 pounds (maximum certificated gross), regardless of wheel configuration, are termed utility or small aircraft.

Figure 1
Select Airport Design Criterion



Those which weight more are termed non-utility or large aircraft. Note that the runway, taxiway and the main apron pavement strengths are currently 12,500 pounds SWG.

The most demanding aircraft or group of aircraft with alike physical and operational characteristics that use the airport regularly; generally conducting at least 500 annual takeoffs or landings, is termed the design aircraft.

The current criterion for Runway 14-32 are:

A&B-II; TDG-2, Large Aircraft; >RVR4000; and, the current criterion for Taxiway A, its connectors and aprons is **TDG-2, Large Aircraft.** The current design aircraft is the **Cessna Citation CJ4 (C525C); a B-II, TDG-2, large aircraft.**

Runway 1-19 is planned to be closed.

Design standards encompass various areas, zones, surface gradients and separations standards; select standards are described and tabulated within Table 3 based upon the current design aircraft:

- ✓ A Runway Protection Zone (RPZ) is a trapezoidal area off each runway end, established to enhance protection of people and property by clearing incompatible land uses.
- ✓ The Runway Safety Area (RSA) and Taxiway Safety Area (TSA) are established to ensure that the ground surface adjacent to runways and taxiways is suitably prepared to reduce the risk of damage in the event of an aircraft deviation from paved surfaces. Safety area specifications are dimensional, grade-specific and material-specific.
- ✓ The Runway Object Free Area (ROFA) and Taxiway Object Free Area (TOFA) are established to ensure the safety of aircraft operations by having an area free of objects, except those frangibly-mounted objects, necessary for air navigation or ground maneuvering purposes.
- ✓ The Obstacle Free Zone (OFZ) is a volume of airspace up to 150 feet above airport elevation, centered on runway centerline, primarily established to preclude taxiing and parked aircraft. The runway holdline is sometimes located to coincide with limits of the OFZ.
- ✓ The purpose of the Approach and Departure

Table 3
Select FET Airport Design Standards for Runway 14-32

Standard/Specification	Standard	Existing
Runway Width	75 Feet	100 Feet
Effective Runway Longitudinal Grade	Within ±2% Maximum	Within ±2% Maximum
Runway Pavement Strength (Pounds)	Recommended 12,500 SWG	>12,500 SWG
Runway Protection Zones	500'x700'x1,000'	500'x700'x1,000'
Runway Safety Area Width/Beyond End	150'/300'	150'/300'
Runway Object Free Area Width/Beyond End	500'/300'	500'/300'
Taxiway Safety Area Width	79'	79'
Taxiway/Taxilane Object Free Area Width	131'/115'	131'/115'
Runway to Parallel Taxiway A	240'	400'
Runway to Aircraft Holdline on Taxiway A	200'	250'
Runway to Aircraft Parking	>250'	>250'
Obstacle Free Zone Width/Beyond End	400'/200'	400'/200'
Approach Surfaces (20:1)	800'x3,800'x10,000'	800'x3,800'x10,000
Part 77 Primary Surface Width/Beyond End	500'/200'	500'/200'
Part 77 Approach Surfaces Dimension/Slope	500'x3,500x5,000'; 34:1	500'x3,500x5,000'; 34:1

Clearance Surfaces is to provide obstacle clearance for visual approaches and instrument approach procedures. These surfaces are generally three-dimensional trapezoids with 20:1 or 34:1 surfaces extending upward and outward away from each end of runway.

Note that these are the minimum specifications and exceeding the specifications, for an individual project is generally acceptable, but may not be eligible for federal or state funds.

Title 14 of the Code of Federal Regulations, Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace* specifies various imaginary surfaces considered to protect the airspace around FET from objects of natural growth or man-made features, termed obstructions. These surfaces are the primary, approach, transitional, horizontal and conical as described in Section 77.25 and as follows:

- ✓ The primary surface is longitudinally centered on the runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on centerline. The width of the primary surface is based on the type of approach available or planned for each runway.
- ✓ The approach surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based on the type of approach available or planned for that runway end.
- ✓ The transitional surfaces extend outward and upward at right angles to the runway centerline and runway centerline extended at a slope of 7:1 (±8.13 degrees) from the sides of the primary surface and from the sides of the approach surfaces.
- ✓ The horizontal surface is a level horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of either 5,000 or 10,000 feet from the center of each end of the primary surface of each runway and connecting the adjacent arcs with lines of tangency.
- ✓ The conical surface extends outward and upward from the periphery of the horizontal surface at a slope of 20:1 (±2.86 degrees) for a horizontal distance of 4,000 feet.

3.0 FORECASTS INTRODUCTION

The forecasts of aviation demand are the basis for determining current and future airport facility requirements. These requirements are then used to plan airport development such as runways and taxiways, apron area, hangar space and selection of the appropriate airfield design standards. The forecasts establish the nature and magnitude of aeronautical activity and the associated need for airport development for the 20-year planning period.

History has repeatedly demonstrated that airport utilization will vary significantly, depending upon the level of service provided for the public and regional economic conditions. Due to the highly elastic nature of the aviation industry, most aviation forecasts tend to follow trends rather than fluctuations in any given year.

3.1 FORECASTS OF AVIATION DEMAND

No formal forecasting is to be conducted for this planning; only percentage estimates are derived. Existing and historical data was simply reviewed and a *constrained*, subjective judgment was made and tabulated as is found in Table 4. Note that percentage increase estimates are found next to the forecast value within the table.

The most current master plan and system plan are perhaps out of date for purposes herein. Several other sources may be reviewed to determine an appropriate level of forecasting, including the onsite interview conducted in late January 2014 to estimate operations by aircraft type.

Forecast information, for purposes herein, is valuable not for formal FAA purposes, but for planning an adequate amount of apron, for example. More specifically with respect to apron, FAA has created modeling software based upon *Airport Design* which provides an eligible (but not necessarily funded) quantity of apron for future planning purposes based upon the number of itinerant operations.

3.1.1 Aircraft Operations

The following is of subject for the forecast for aircraft operations as found in Table 4:

1. Planning Years:
   - ✓ 2014, 2019, 2024, 2033
2. Airport Reference Code/Class:
   - ✓ A&B-I Small
   - ✓ A&B-II Small
   - ✓ A&B-II Business
   - ✓ C&D-II Corporate
   - ✓ C&D-II Large Corporate

With respect to the above Airport Reference Code/Class, note that:

- *A&B-I Small* forecasts all aircraft types weighing less than 12,500 pounds, with approach speeds up to 121 knots, and wingspans up to 49 feet, inclusive.

  Example aircraft include:
  - ✓ Cessna 152,172, 210, 206, 414, 441
  - ✓ Piper Cub, Arrow, Comanche, Saratoga
  - ✓ Beechcraft Bonanza, Duke
  - ✓ Cirrus, Mooney, Diamond, Glasair
  - ✓ Helicopters, Ultralights

- *A&B-II Small* forecasts all aircraft types weighing less than 12,500 pounds, with approach speeds up to 121 knots and wingspans up to 79 feet, inclusive.

  Example aircraft include:
  - ✓ Cessna 441, Mustang
  - ✓ Beechcraft King Air 90/100, Premier
  - ✓ Embraer Phenom, Eclipse 500

- *A&B-II Business* forecasts all aircraft types weighting greater than 12,500 pounds, with approach speeds up to 121 knots and wingspans up to 79 feet, inclusive.

  Example aircraft include:
  - ✓ Cessna Citation 550, 650, Sovereign
  - ✓ Dassault Falcon 20,50,200
  - ✓ Hawker 400, 850XP,

- *C&D-II Corporate* forecasts all aircraft types weighting up to 60,000 pounds, with approach speeds up to 166 knots and wingspans up to 79 feet, inclusive.

  Example aircraft include:
  - ✓ Cessna Citation X
  - ✓ Bombardier Challenger 300, 605
  - ✓ Lear 35, 45, 60, 85 (Weight Excepted)
  - ✓ Dassault Falcon 900, 2000

- C&D-II Large Corporate forecasts all aircraft 60,000 pounds or greater, with approach speeds up to 166 knots and wingspans up to 79 feet, inclusive.

  Example aircraft include:
  - ✓ Bombardier Global Express, Challenger
  - ✓ Gulfstream II, III, 550, 650
  - ✓ Falcon 7X
  - ✓ Hawker Horizon

3.1.2 Based Aircraft

The following is of subject for the forecast of based aircraft as found in Table 4:

1. Planning Years:
   - ✓ 2014, 2019, 2024, 2033
2. Aircraft Type:
   - ✓ Single-Engine Piston
   - ✓ Multi-Engine Piston
   - ✓ Twin-Turbo Prop
   - ✓ Jet
   - ✓ Helicopter/Other

3.1.3 Operations Mix

The following is of subject for the forecast of aircraft operations mix as found in Table 4:

1. Planning Years:
   - ✓ 2014, 2019, 2024, 2033
2. Operations Type:
   - ✓ Local Operations (those operations performed by aircraft that remain in the local traffic pattern, execute simulated instrument approaches or low passes at the airport, and the operations to or from the airport and a designated practice area within a 20−mile radius of the tower)
   - ✓ General Aviation Itinerant (those non-local operations under FAR Part 91)
   - ✓ Air Taxi Itinerant (those non-local operations under FAR Part 135)
   - ✓ Itinerant Military

3.1.4 Peaking Operations

The following is of subject for both the forecast of peak aircraft operations as found in Table 4:

1. Planning Years:
   - ✓ 2014, 2019, 2024, 2033
2. Operations Type:
   - ✓ Total Operations (from 3.1.1)
   - ✓ Peak Month (total operations divided by 10%)
   - ✓ Peak Day (peak month operations divided by 30)
   - ✓ Peak Hour (peak day operations divided by 15%)

Table 4
Forecasts of Aviation Demand

Aircraft Operations	**2014**	**2019**	**2024**	**2033**
A&B-I Small	18,120	18,664 *(3%)*	19,207 *(6%)*	19,932 *(10%)*
A&B-II Small	2,500	2,575 *(3%)*	2,650 *(6%)*	2750 *(10%)*
A&B-II Business	1,200	1,248 *(4%)*	1,248 *(4%)*	1344 *(12%)*
C&D-II Corporate	330	347 *(5%)*	347 *(5%)*	376 *(14%)*
C&D-II Large Corporate	150	155 *(5%)*	159 *(5%)*	171 *(14%)*
Total Operations	**22,300**	**22,988**	**23,611**	**24,573**
Based Aircraft	**2014**	**2019**	**2024**	**2033**
Single-Engine Piston	40	41	43	45
Multi-Engine Piston	7	7	7	8
Twin-Turbo Prop	3	3	3	4
Jet	1	1	2	4
Helicopter/Other	2	2	3	3
Total Based Aircraft	**53**	**54**	**58**	**64**
Operations Mix	**2014**	**2019**	**2024**	**2033**
Local Operations	12,265 *(55%)*	12,643 *(55%)*	12,750 *(54%)*	13,024 *(53%)*
Itinerant; GA (Part 91)	6,244 *(28%)*	6,437 *(28%)*	6,729 *(28.5%)*	7,126 *(29%)*
Itinerant; Air Taxi (Part 135)	3,568 *(16%)*	3,678 *(16%)*	3,896 *(16.5%)*	4,177 *(17%)*
Itinerant; Military	223 *(1%)*	230 *(1%)*	236 *(1%)*	246 *(1%)*
Total Operations	**22,300**	**22,988**	**23,611**	**24,573**
Peaking Operations	**2014**	**2019**	**2024**	**2033**
Total Operations	22,300	22,988	23,611	24,573
Peak Month	2,230 *(*.1)*	2,299 *(*.1)*	2,361 *(*.1)*	2,457 *(*.1)*
Peak Day	74 *(/30)*	77 *(/30)*	79 *(/30)*	82 *(/30)*
Peak Hour	11 *(*.15)*	11 *(*.15)*	12 *(*.15)*	12 *(*.15)*

4.0 LANDSIDE FACILITY REQUIREMENTS AND ALTERNATIVES

Given that future aviation activity levels are determined, the ability of existing facilities to satisfy this demand is to be evaluated. Landside deficiencies identified determine airport needs throughout the 20-year planning period. This chapter examines impacts to the airport due to the forecasts of aviation demand. Shortcomings in the ability to serve forecasted demand are highlighted, and recommendations are made regarding physical improvements needed to correct identified shortcomings.

Then, a series of three phased-development alternatives are prepared and visualized to address aggregate demand over the 5, 10 and 20 -year periods.

Specific aims for landside development in this regard include:

1. Plan aviation land uses and propose aviation-related facilities which will meet anticipated demand, and which will also allow for continued demand accommodation in case aviation and regional economic activity is more robust than anticipated.
2. Plan aviation-related land uses and propose facility locations which will allow the FET to be as financially self-sufficient as possible.
3. Minimize runway and taxiway crossings from one side of the runway to another, and provide for an efficient airfield design.

Examples of aviation-related land uses include:

1. General Aviation Terminal/Ramp
2. Corporate Aviation Terminal/Ramp
3. Air Cargo
4. Aircraft Maintenance and Support
5. Aircraft Rescue and Structural Firefighting
6. On-Field Agricultural/Agricultural Lease
7. Aviation-Related Light Industrial
    a. Parts Manufacturing and Assembly
    b. Flight Simulator
    c. Defense Contractor
    d. Aerial Photography/Photogrammetry
    e. Aerial Spray
8. Fixed Base Operation (FBO)
    f. Aircraft Charter, Storage, Sales
    g. Aircraft Repair and Wash
    h. Pilot Supplies
    i. Pilot Lounge, Flight Planning
    j. Flight Training
    k. Food Services/Catering
    l. Office/Overnight Accommodations
    m. Restrooms
9. Aircraft Storage
    n. T-Hangar
    o. Executive Hangar
    p. Mixed-Use Hangar
    q. T-Shade
10. US Government
    r. Military
    s. Air Traffic Control
    t. Navigational Aids
    u. Homeland Security
    v. Public Safety and Emergency Facilities
    w. Weather Collection and Dissemination
    x. Satellite Communications

Again, landside facilities are those portions of the airfield which are not directly related to the landing and take-off of aircraft but support it.

Importantly, several current predispositions are foundational for a landside and terminal area planning at FET. Current circumstances and the historical airport planning define current City priorities. These follow and are partially the basis for Table 5's *future* column standards.

1. Runway 1-19 is to be closed in the very near future.
2. A new configuration for West 23rd Street is imminent. The primary consequence of this modification is that the road alignment claims much of the existing terminal building's auto parking area

3. Given that FET is expected to continue to accommodate larger, faster and heavier aircraft, a transition from a Business (B-II) Class facility to a more Corporate (C-II) Class facility should be planned.
4. US Highway 30 is planned for relocation away from the Runway 14 end in the future. Although the time frame for this relocation is a bit of a moving target, road relocation planning has been formalized and funding moves ever-closer to consummation. This highway is the defining obstruction which requires the current Runway 14 displacement. Were the highway moved, the displacement could be reclaimed and visibility improved to ¾-mile for the current RNAV and perhaps the VOR IAP to Runway 14. Fee land acquisition would also be necessary.
5. The current terminal building is a relatively aged facility and rehabilitation will be necessary to extend its useful life, should that be specified by the City. More detail in this regard is provided in Appendix D. This appendix contains an architectural reporting of building insufficiencies.

4.1 RECOMMENDED LANDSIDE FACILITIES

Various landside recommendations are derived based upon the forecasts of aviation demand. These relate to apron and circulation area, terminal building and aircraft hangar area requirements, and automobile access area.

4.1.1 Apron

The existing terminal apron provides an area of approximately 7,777 square yards, not all of which is available for circulation. This aircraft parking area currently accommodates several aircraft parking areas with tie-downs, and is primarily used on an unassigned basis because of area constraints. Planning for both based and itinerant apron is made.

53 aircraft currently base at FET and based

Table 5
Existing (A/B-II, Large Aircraft, Greater Than ¾ Mile) and
Future (C/D-II, Large Aircraft, ¾ Mile) Airfield Design Standards for Runway 14-32

Standard/Specification	Existing	Future
Runway/Taxiway Width	75′/35′	100′/35′
Runway Longitudinal Grade[1]	Within ±2% Maximum	Within ±1.5% Maximum
Runway Pavement Strength (Pounds)	48,000 DWG	48,000 DWG or greater
Runway 14 Protection Zone	500′x700′ x1,000′	1,000′x1,510′x1,700′
Runway 32 Protection Zone	500′x700′ x1,000′	1,000′x1,010′x1,700′
Runway Safety Area Width/Beyond End	150′/300′	500′/1,000′
Runway Object Free Area Width/Beyond End	500′/300′	800′/1,000′
Taxiway Safety Area Width	79′	79′
Taxiway/Taxilane Object Free Area Width	131′/115′	131′/115′
Runway 14-32 to Parallel Taxiway	240′	300′
Runway 14-32 to Aircraft Holdline	200′	250′
Runway 14-32 to Aircraft Parking	200′	500′
Obstacle Free Zone Width/Beyond End	400′/200′	400′/200′
Runway 14 Approach Clearance (20:1)	800′x3,800′x10,000′	800′x3,800′x10,000′
Runway 14 Departure Clearance (40:1)	1,000′x6,466′x10,200′	1,000′x6,266′x10,200′
Runway 32 Approach Clearance (20:1)	800′x3,800′x10,000′	800′x3,800′x10,000′
Runway 32 Departure Clearance (40:1)	1,000′x6,466′ x 10,200	1,000′x6,266′x10,200′
FAR Part 77 Primary Surface Width/Beyond End	500′/200′	1,000′/200′
FAR Part 77 Approach Surface, Runway 14	500′x3,500x10,000′; 34:1	1,000′x4,000x10,000′;34:1
FAR Part 77 Approach Surface, Runway 32	500′x3,500x10,000′; 34:1	1,000′x3,500x10,000′;34:1

Table 6
Apron Area Recommendations

Based Aircraft Apron Area	**2014**	**2019**	**2024**	**2033**
Single-Engine (Not Hangared)	1	1	1	1
Apron Recommendation (Square Yards)	600	600	600	600
Multi-Engine (Not Hangared)	1	1	1	1
Apron Recommendation (Square Yards)	800	800	800	800
Itinerant Aircraft Apron Area	**2014**	**2019**	**2024**	**2033**
Apron Recommendation (Sq. Yards)	21,755	22,426	23,034	23,972
Total Recommended Apron Area	**23,155**	**23,826**	**24,434**	**25,372**
Apron Area Deficiency (Square Yards)	*16,778*	*17,449*	*18,057*	*18,995*

aircraft apron area is, and will continue to be required. All current aircraft owners hangar their aircraft due to personal choice and weather, but reserving one or two spots on the apron for an aircraft pending new hangar construction, for example, is recommended.

A standard 600 square yards of area per single-engine aircraft and 800 for multi-engine aircraft is used for based aircraft apron area. Note that these area calculations do not include necessary taxiway/taxilane to parking positions.

Apron requirements for itinerant aircraft activity are estimated a bit differently. As previously noted, FAA has created modeling software entitled *Apron Size Calculations for Transient Aircraft* based upon *Airport Design* which provides an eligible (but not necessarily funded) apron area for future planning purposes predicated upon the number of itinerant aircraft operations.

Table 6 shows recommendations for both based and itinerant aircraft apron area, while noting deficiencies. As can be seen from the analysis and based upon the forecasts of aviation demand, additional aircraft apron is necessary now and in the longer-term.

4.1.2 Buildings and Auto Parking

A general aviation terminal and administration building should typically provide office space, a waiting room for pilots and passengers, a small area for food and drink vending, a public telephone, and public restrooms.

Terminal floor space requirements are a function of the anticipated number of peak hour operations and airport users. Peak hour users are computed as 1.5 passengers per each local aircraft arrival and 2.5 passengers per itinerant arrival. This is an older estimating methodology, but perhaps valuable for planning purposes. An approximate 55/45 percent mix of local/itinerant activity is planned.

Typical floor space requirements, expressed in square feet per user are as follows for general aviation terminal facilities:

- Waiting Lounge: 15
- Office Space: 3
- Public Conveniences 1.5
- Concession/Vending; 5 and
- Storage, Circulation and HVAC; 24.5.

Terminal building area recommendations are shown in Table 7. The airport's 2,400 square foot terminal will be adequate for the planning period, if refurbishment is in order.

Table 8
Automobile Parking Area Recommendations

	2014	2019	2024	2033
Peak Hour Users	11	11	12	12
Tenants/Employees	10	10	11	13
Automobile Parking Positions Required	21	21	23	25
Total Automobile Parking Area Required (Square Yards)	735	735	805	875

FET currently accommodates 12 conventional hangars and 3 T-hangars, totaling approximately 104,000 square feet of aircraft storage area. It is presumed that 100 percent of future based aircraft will require hangar space given current owner preferences. Note that future aircraft may be located in T-hangar units, in executive conventional, small box hangars, or collocated with other aircraft in a larger hangar. Furthermore, a single aircraft, only requiring 1,200 square feet, may be located in a hangar 2,500 square foot hangar, as is the case in several instances at FET now. The City currently maintains a waitlist for hangars.

Hangar area recommendations found within Table 7 are based upon: 1,200 square feet for single-engine piston aircraft, 2,200 square feet for multi-engine piston, 4,000 square feet for smaller jet and twin-turbo prop aircraft, aircraft, 12,000 square feet for larger jet aircraft, and 1,500 square feet for helicopter/other.

Table 7
Building Area Recommendations

Aircraft Storage Area	**2014**	**2019**	**2024**	**2033**
Single-Engine Based Aircraft (Not on Apron)	*39*	*40*	*42*	*44*
Single-Engine Hangar Area Required	46,800	48,000	50,400	52,800
Multi-Engine Based Aircraft (Not on Apron)	*6*	*6*	*6*	*7*
Multi-Engine/Twin-Turbo Prop Hangar Area Required	13,200	13,200	13,200	15,400
Jet (Small) and Twin Turbo-Prop Based Aircraft	*3*	*3*	*4*	*4*
Jet (Small) Hangar Area Required	12,000	12,000	16,000	16,000
Jet (Large) Based Aircraft	*1*	*2*	*2*	*4*
Jet (Large) Hangar Area Required	12,000	24,000	24,000	48,000
Helicopter/Other Based Aircraft	*2*	*2*	*3*	*3*
Helicopter/Other Hangar Area Required	3,000	3,000	4,500	4,500
Total Aircraft Storage Recommended (Square Feet)	87,000	100,200	108,100	136,700
Terminal Building Area	**2014**	**2019**	**2024**	**2033**
Peak Hour Operations	*11*	*11*	*12*	*12*
Peak Hour Users	*11*	*11*	*12*	*12*
Waiting Lounge	161	161	176	176
Office Space	32	32	35	35
Public Conveniences	16	16	18	18
Vending/Concession	54	54	59	59
Storage, Circulation, HVAC	263	263	287	287
Total Terminal Building Area Recommended (Square Feet)	526	526	573	573

Approximately 22 paved automobile parking spaces are near the terminal building. A formal parking lot is recommended and adequate space should be strategically planned and protected. The number of automobile parking spaces required is a function of peak hour users and tenant/employee demand. The peak hour user count was previously derived for the terminal building analysis. The number of tenants and employees at an airport like FET is estimated to be one person per five based aircraft. A standard 35 square yards per automobile is used to complete Table 8.

4.2 LANDSIDE ALTERNATIVES

Two alternative exhibits are fielded for purposes herein in order to visualize, estimate costs and provide a meaningful basis for City decision making about FET's landside future:

- Terminal Area Alternative No. 1 (Improve Existing Terminal Area)
- Terminal Area Alternative No. 3 (Develop Along Airport Road)
- Terminal Area Alternative No. 5 (Western-Most Development)

Several items are worth noting for decision-making purposes at this point:

- ✓ Section 4.1 identifies area which according to FAA modeling and estimating methodologies may be eligible for FAA or NDA financial participation. This in no way obligates FAA, NDA, or City financial participation. The current reality is that general aviation terminal area improvements generally do not compete well for FAA aviation funds. The City may be limited to an annual $150,000 in Non Primary Entitlement funding. Additional funding is the prerogative of FAA and NDA.
- ✓ Planned development is conceptual only, and can be changed at the will of the City Council with a planning update, now or at any time in the future. This narrative and its accompanying planning process is intended to create a 20-year 'road map'; and, figuratively speaking, roads are sometimes improved, modified or relocated. The selected alternative, or modification to make a selected alternative, serves as an informal agreement with FAA and NDA for FET's future development.
- ✓ Environmental clearance, pursuant to the National Environmental Policy Act of 1969, will be necessary for FAA financial participation.
- ✓ FAA or perhaps NDA may require justification beyond that demonstrated in this narrative for improvements eligibility. For example, FAA may wish letters substantiating large aircraft use to make a given portion of a future apron eligible for FAA financial participation.
- ✓ Upon construction, planned development must be shown on the approved Airport Layout Plan (ALP), receive a favorable determination via filing of FAA Form 7460, and the City or the State may have various permits which need approvals prior to commencement.

Overall, a selected course of action for the future represents the formulation of a development policy as much as the process of concept selection. The development policy should:

1. Comply with FAA standards/guidelines,
2. Be compatible with other existing and proposed uses on and off the airport,
3. Dovetail with City comprehensive planning,

Brief alternative descriptions supplement the alternative exhibits following this page. The alternatives shows 5, 10 and 20-year planned, phased development for demand identified in the forecast of aviation demand, and beyond. The mention of *beyond* in this instance is important because it is important to show robust in case demand exceeds forecast or a given tenant(s) wish more robust facilities. The first five years of planned development is shown in blue, years 6-10 is shown in brown and the final 10 years of the 20-year planning term is shown as purple.

4.2.1 Alternative No. 1

Alternative No. 1 shows:

1. A rehabilitated terminal building with the terminal area remaining where it is for all intents and purposes.
2. The hangar due west of the current terminal building to be removed/relocated.
3. A proposed larger aircraft apron due south of the proposed terminal building along the to-be-closed Runway 1-19.
4. Proposed auto parking west of the rehabilitated terminal building and south of West 23rd Street.
5. The current apron marked to accommodate small aircraft only.
6. An executive hangar area due south of the current terminal area.
7. Two proposed T-hangars due south of the proposed auto parking area.

4.2.2 Alternative No. 2

Alternative No. 3 shows:

1. A proposed terminal building and area along Airport Road south of the current terminal area.
2. A proposed larger aircraft apron due west of the proposed terminal building area all the way to the to-be-closed Runway 1-19.
3. Proposed auto parking between the proposed terminal building and Airport Road.
4. The current apron marked to accommodate small aircraft only.
5. An executive hangar area due west of the current terminal area and south of West 23rd Street.
6. The current terminal building to be removed with a ground-leased hangar in its place.
7. Two proposed T-hangars due east of the proposed auto parking area.

4.2.3 Alternative No. 3

Alternative No. 5 shows:

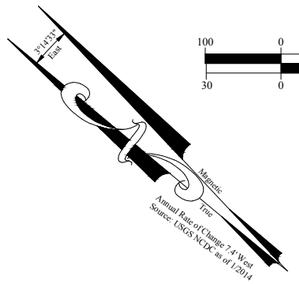
1. A proposed terminal building and area west of the western-most hangar area.
2. A proposed larger aircraft apron due south of the proposed terminal building along Taxiway B.
3. Proposed auto parking between the proposed terminal building and West 23rd Street.
4. The current apron marked to accommodate small aircraft only.
5. An executive hangar area due south and east of the current terminal area
6. The current terminal building to be removed with a ground-leased hangar in its place.

4.3 DISCUSSION

Given that Runway 1-19 is to be closed, a larger amount of land would then perhaps be available to suit future landside aviation needs. FET would be in the enviable position of more than adequate landside area to meet forecast aviation demand should a terminal area be selected within.

ADG notes that it is important but not compulsory for terminal business operations to view the entire runway; and preferentially, approaches to both runway ends. ADG notes that these alternatives are designed to somewhat allow a 'picking and choosing' of hangars. That is, generally speaking, T-hangars and box hangars are interchangeable at a given location with relatively minor modifications.

Terminal Area Alternative No. 1
(Improve Existing Terminal Area)



Graphic Scale

100 0 50 100 200 400 Feet

30 0 15 30 60 120 Meters

Notes

Regardless of alternative, planned improvements, include:
- -Closure of Runway 1-19 to serve as taxiway
- -Full-parallel taxiway for Runway 14-32
- -Improved IAP visibility (from 1-mile to 3/4-mile) for Runway 14 while simultaneously removing the Runway 14 displacement and updating declared distances
- -Adoption of C&D FAA Design Standards for Runway 14-32
- -Planned Terminal Area hangars, apron, access and other landside features

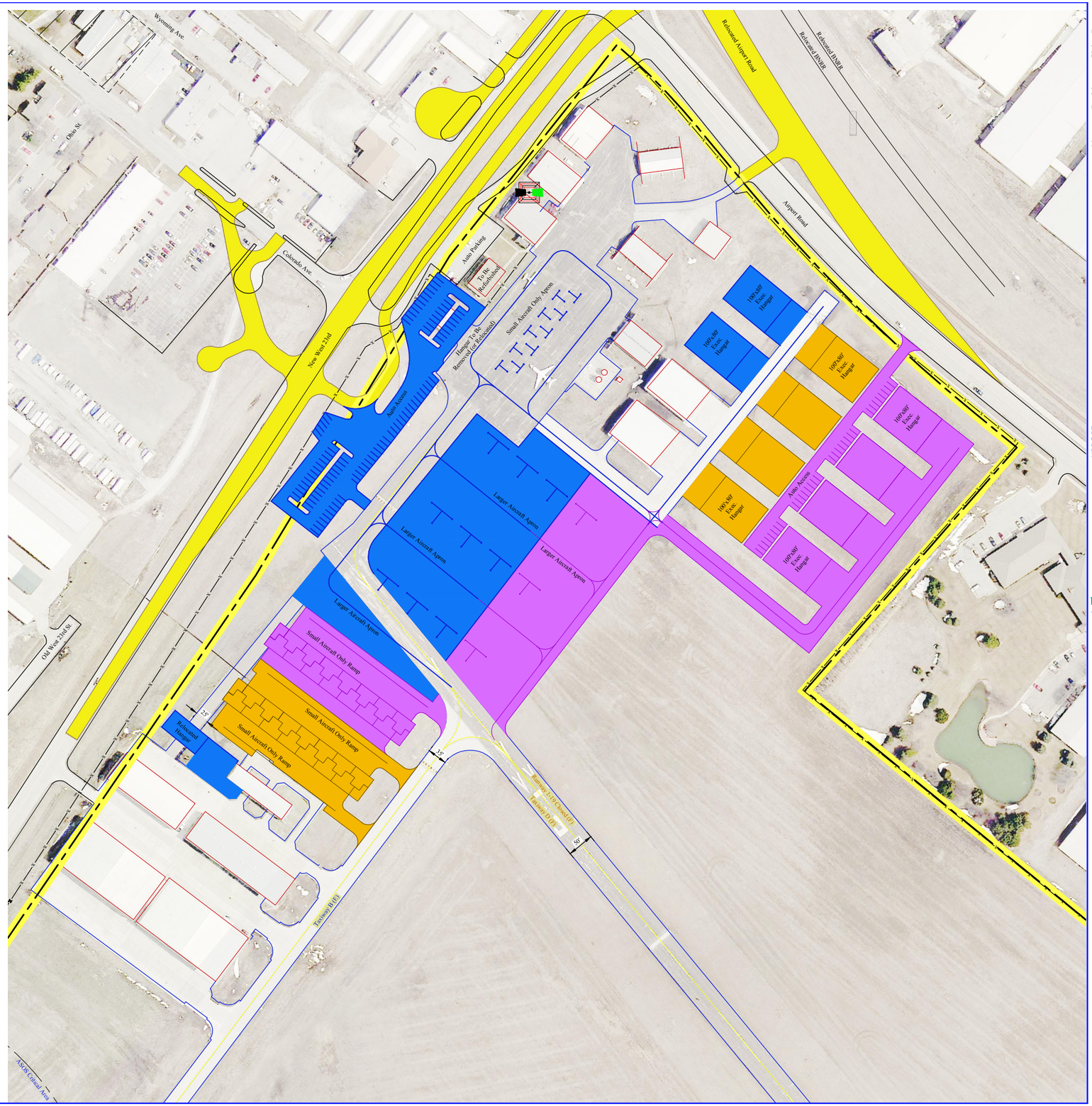
Legend

(E), (F)	Existing, Future
	Existing Property Line
x x x	Existing Fence
	Existing Pavement
	Existing Paved Roads
	Future Paved Roads
	Existing Buildings
	Avigation Easement
	Rotating Beacon

Alternative No. 1 Improvements

	FAA	NDA	City	Others	Totals
Short-Term	$1,200,000	$350,000	$580,000	$150,000	$2,280,000
Intermediate-Term	$125,000	$0	$565,000	$0	$690,000
Long-Term	$670,000	$175,000	$645,000	$0	$1,490,000
Totals:	$1,995,000	$525,000	$1,790,000	$150,000	$4,460,000

Note: Costs associated with box/executive hangar development are not prepared because ground leasing is planned, except eligible portions of access taxiways.



No.	Revision	Ckd	Date

Fremont Municipal Airport
City of Fremont, Nebraska

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 200
Denver, Colorado 80210-3802
303.782.8686 / 303.782.8691 fax
www.ADGAirports.com

NDA Project Number:

Project No.:	FET1437M		
Designed By:	SPM		
Drawn By:	MTP		
Approved By:	SPM		
Date:	December 2014		

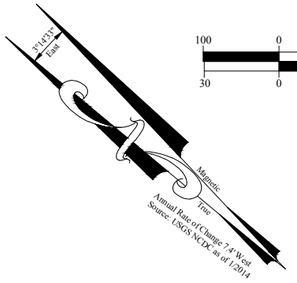
Terminal Area Alternative No. 1 (Improve Existing Terminal Area)

Exhibit:

A1

of VII Exhibits

Terminal Area Alternative No. 2
(Develop Along Airport Road)



Graphic Scale

100 0 50 100 200 400 Feet

30 0 15 30 60 120 Meters

Notes

Regardless of alternative, planned improvements, include:
- -Closure of Runway 1-19 to serve as taxiway
- -Full-parallel taxiway for Runway 14-32
- -Improved IAP visibility (from 1-mile to 3/4-mile) for Runway 14 while simultaneously removing the Runway 14 displacement and updating declared distances
- -Adoption of C&D FAA Design Standards for Runway 14-32
- -Planned Terminal Area hangars, apron, access and other landside features

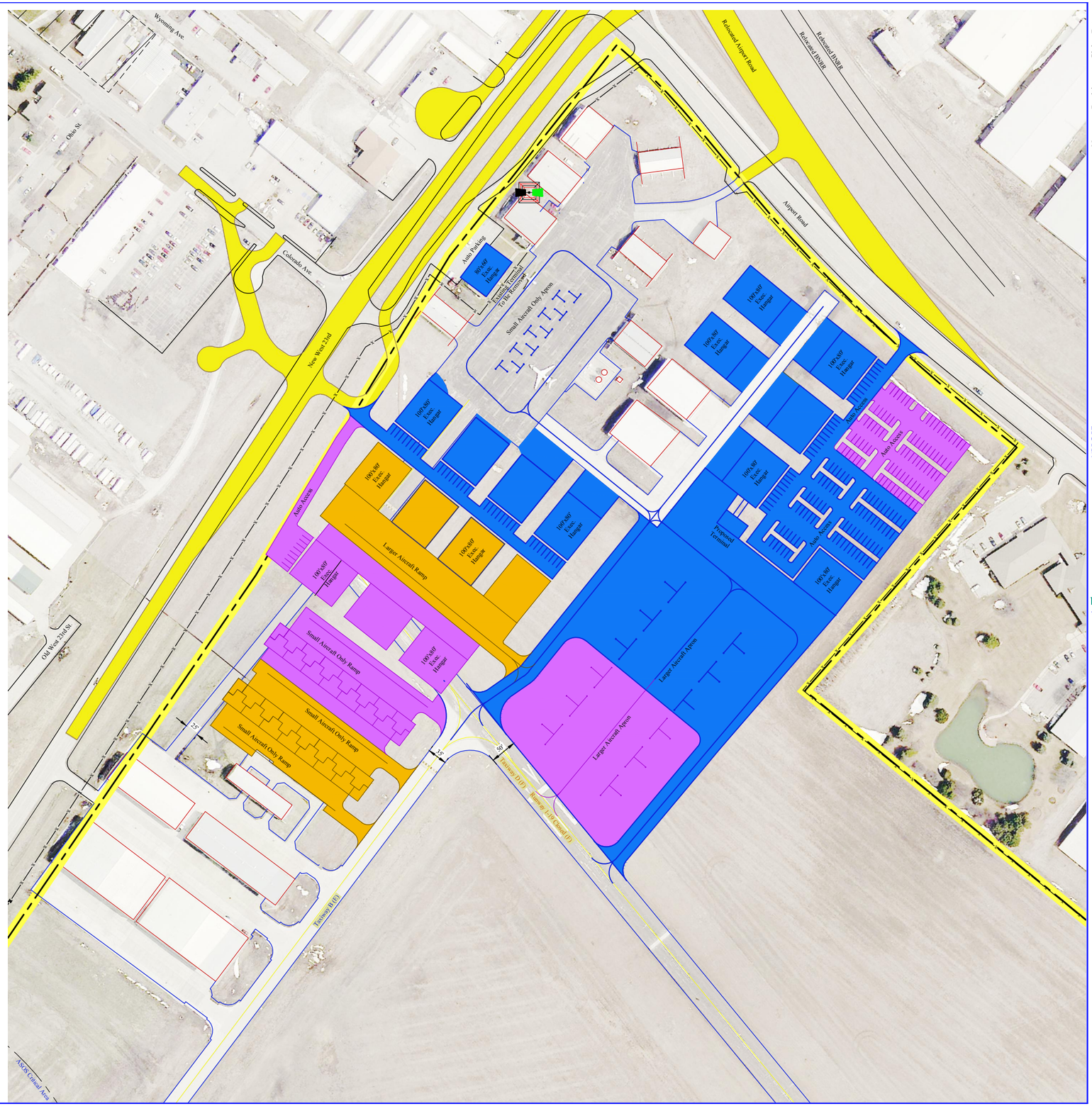
Legend

- (E), (F) — Existing, Future
- Existing Property Line
- Existing Fence
- Existing Pavement
- Existing Paved Roads
- Future Paved Roads
- Existing Buildings
- Avigation Easement
- Rotating Beacon

Alternative No. 2 Improvements

	FAA	NDA	City	Others	Totals
Short-Term	$1,000,000	$350,000	$580,000	$150,000	$2,080,000
Intermediate-Term	$125,000	$0	$565,000	$0	$690,000
Long-Term	$670,000	$175,000	$345,000	$0	$1,190,000
Totals:	$1,795,000	$525,000	$1,490,000	$150,000	$3,960,000

Note: Costs associated with box/executive hangar development are not prepared because ground leasing is planned, except eligible portions of access taxiways.



No.	Revision	Ckd	Date

Fremont Municipal Airport
City of Fremont, Nebraska

AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 200
Denver, Colorado 80210-3802
303.782.8080 / 303.782.8087 fax
www.ADGAirports.com

NDA Project Number: FET1437M

Project No.	FET1437M
Designed By:	SPM
Drawn By:	MTP
Approved By:	SPM
Date:	December 2014

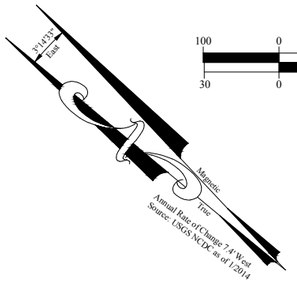
Terminal Area Alternative No. 2 (Along Airport Road)

Exhibit:

A2

of VII Exhibits

Terminal Area Alternative No. 3
(Western-Most Development)



Graphic Scale

100 0 50 100 200 400 Feet

30 0 15 30 60 120 Meters

Notes

Regardless of alternative, planned improvements, include:
- -Closure of Runway 1-19 to serve as taxiway
- -Full-parallel taxiway for Runway 14-32
- -Improved IAP visibility (from 1-mile to 3/4-mile) for Runway 14 while simultaneously removing the Runway 14 displacement and updating declared distances
- -Adoption of C&D FAA Design Standards for Runway 14-32
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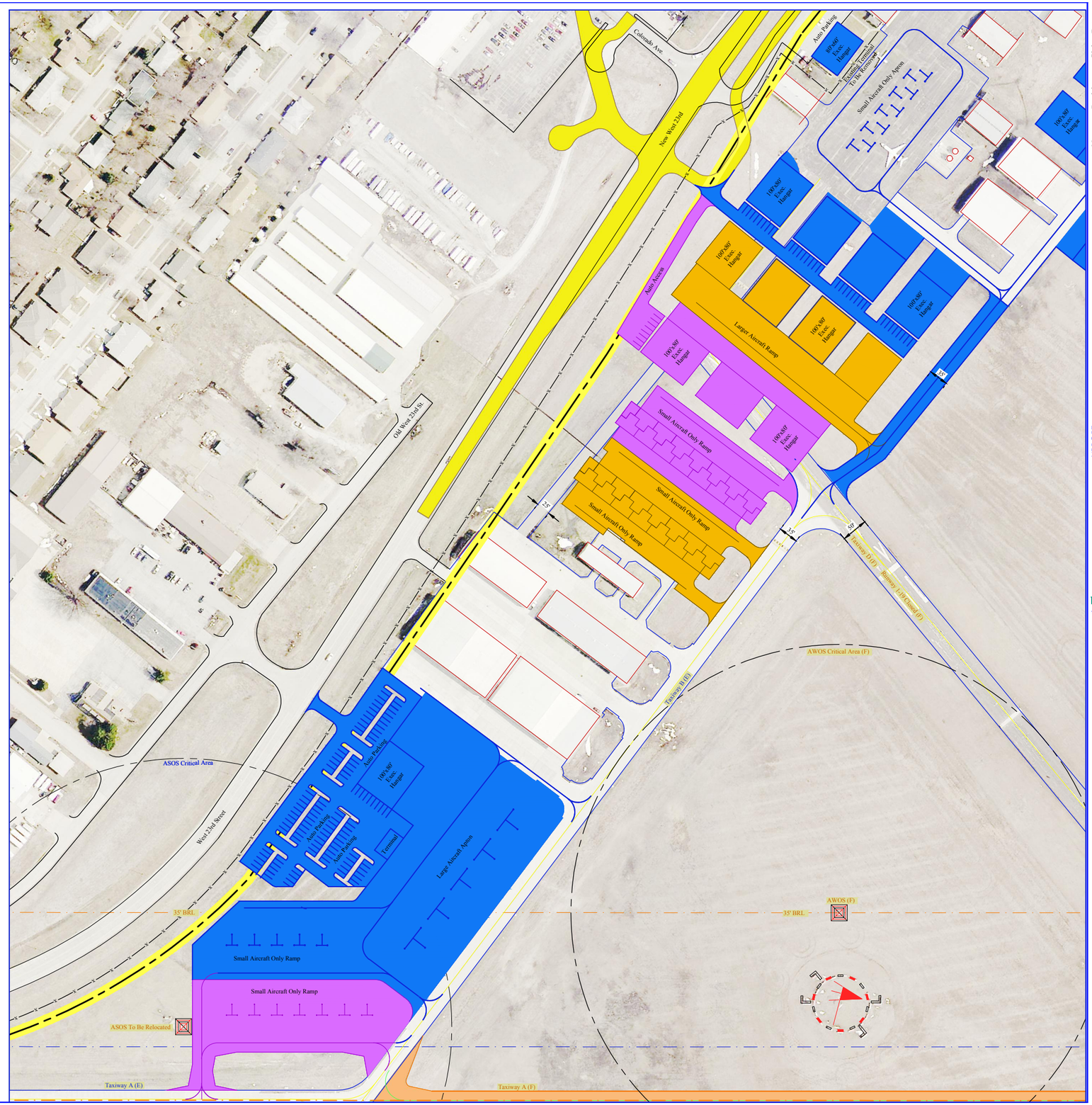
Legend

- (E), (F) — Existing, Future
- Existing Property Line
- Existing Fence
- Existing Pavement
- Existing Paved Roads
- Future Paved Roads
- Existing Buildings
- Avigation Easement
- Rotating Beacon

Alternative No. 3 Improvements

	FAA	NDA	City	Others	Totals
Short-Term	$1,200,000	$750,000	$580,000	$150,000	$2,680,000
Intermediate-Term	$125,000	$0	$565,000	$0	$690,000
Long-Term	$670,000	$175,000	$645,000	$0	$1,490,000
Totals:	$1,995,000	$925,000	$1,790,000	$150,000	$4,860,000

Note: Costs associated with box/executive hangar development are not prepared because ground leasing is planned, except eligible portions of access taxiways.



No.	Revision	Ckd	Date

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NDA Project Number:

Project No.:	FET1437M		
Designed By:	SPM	Approved By:	SPM
Drawn By:	MTP	Date:	December 2014

Terminal Area Alternative No. 3 (Western-Most Development)

Exhibit:

A3

of VII Exhibits

5.0 UPDATED AIRPORT LAYOUT PLAN AND TERMINAL AREA PLAN

This final section describes and depicts the necessary improvements derived from landside facility requirements and alternatives section and shows airport features, not limited to existing airfield and landside configurations, future developments, airport airspace, land uses and other planned development.

The Airport Layout Plan (ALP) is a scaled graphic representation of existing and proposed airport development including pertinent clearance and dimensional information required to show conformance with design standards.

The ALP is a legal document and represents an agreement between FAA, NDA and the City. This agreement primarily concerns design standards compliance, future development locations and obstruction disposition. On-airport development must be depicted on the ALP and it should be kept reasonably current. A reduced-size ALP along with and other drawings can be found at the end of this chapter.

The ALP depicts the City Council-specified location of facilities proposed to accommodate the 20-year demand (and beyond) as discussed in the preceding sections and synthesized through the planning process. These include the five predispositions from previous planning as identified on page 13.

The data table provides basic information concerning airport elevation, airport reference point location, airport land ownership, etc. The Runway Data tables provide information such as airport role, approach surface information and end coordinates/elevations. A scale, legend, and north arrow orient the reader.

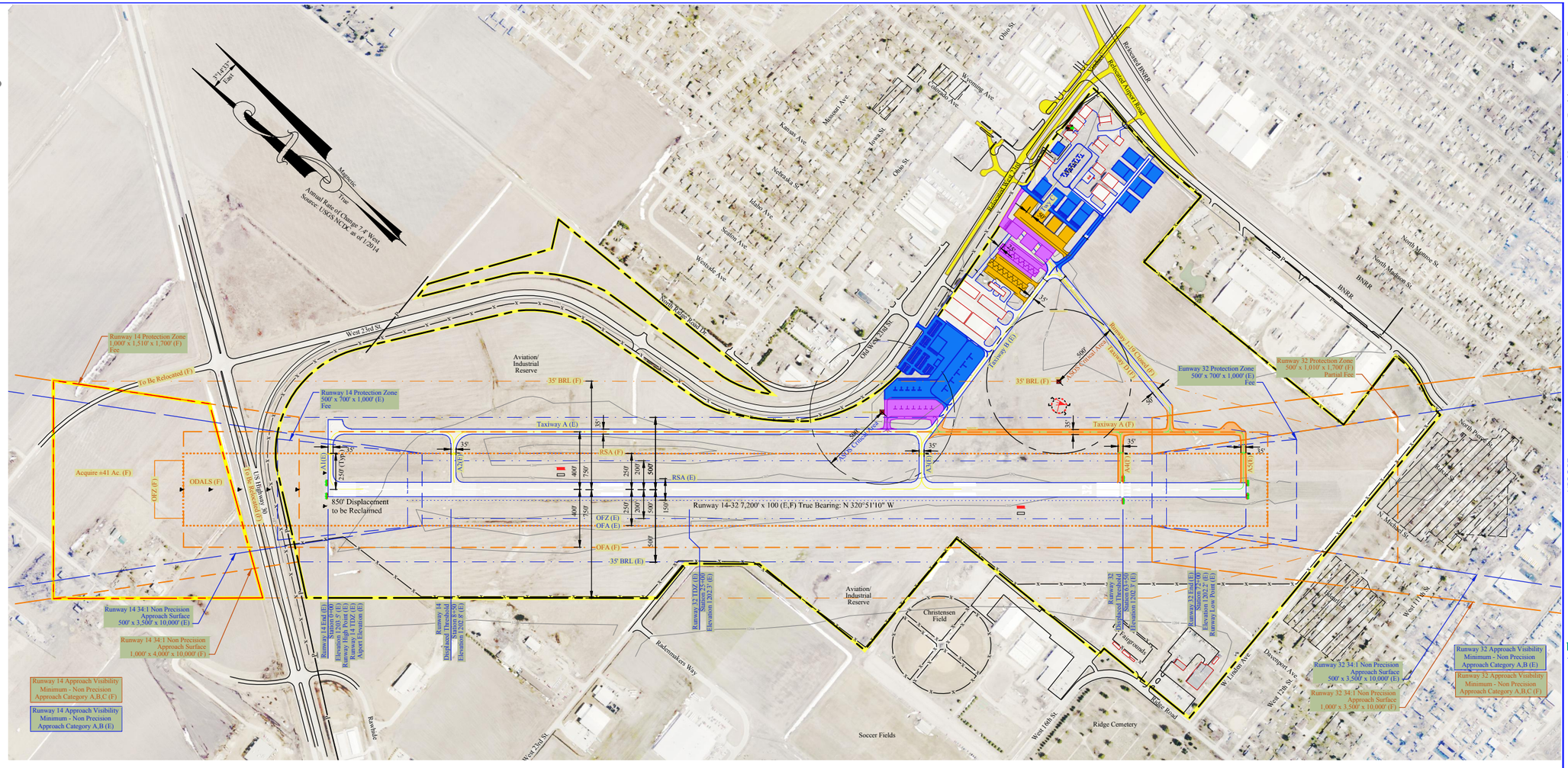
While the single-sheet ALP drawing shows most airport-related features, the terminal area plan shows closer in features at 1"=100' scale. A number of changes are depicted on the Terminal Area Plan for FET. City and potential private hangar developments are planned for the short, intermediate and long-term, as well as a phased expansion of the existing hangar area. This general aviation area includes phased development for apron, hangar and other aviation facilities.

Phased facility construction, utility extension, landscaping, auto access and parking area are planned. Improvements should be constructed as funding and demand allows and are planned to accommodate the expected activity. The proposed size and location in this regard are for planning purposes only and specific plans should be evaluated on a case-by-case basis for general conformance to the ALP.

The Terminal Area Plan was updated based upon Council selection of Alternative No. 3 as the preferred site for the new terminal building and building development. The updated ALP and Terminal Area Plan exhibits follow.

Legend

(E), (F)	Existing, Future
	Existing Property Line
	Future Property Line
	Building Restriction Line (35' BRL)
	Runway Protection Zone (RPZ)
	Approach Surface
	Object Free Area (OFA)
	Runway Safety Area (RSA)
	Obstacle Free Zone (OFZ)
	Runway Visibility Zone (RVZ)
x x x	Existing Fence
	Existing Pavements
	Short-Term Improvements
	Intermediate-Term Improvements
	Long-Term Improvements
	Existing Paved Roads
	Future Paved Roads
	Existing Buildings
	Avigation Easement
	Drainage Line
1200	Contour Line
	Threshold/Edge Lights (MIRL)
	Runway End Identifier Lights (REIL)
	Section Corner
	Precision Approach Path Indicators (PAPI-2/4)
	Runway Hold Position Sign
	Segmented Circle With Lighted Wind Cone
	Rotating Beacon

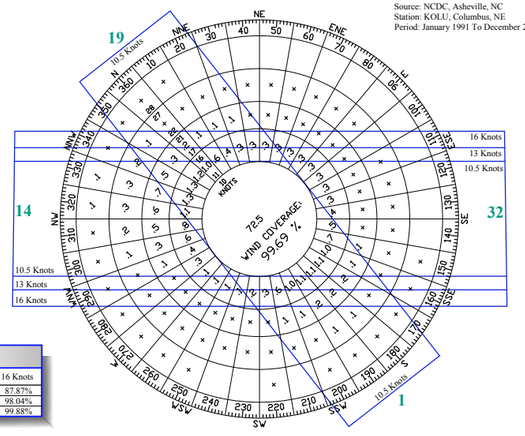


Graphic Scale

400 0 200 400 800 1600 Feet

120 0 60 120 240 480 Meters

All-Weather Wind Rose



Source: NCDC, Asheville, NC
Station: KOLU, Columbus, NE
Period: January 1991 To December 2001

Wind Coverage

Runway	10.5 Knots	13 Knots	16 Knots
14-32	91.34%	96.75%	87.87%
1-19	90.94%	94.90%	98.04%
14-32 & 1-19 Combined	98.34%	99.47%	99.88%

Runway End Coordinates

Runway	Existing	Future
14	North Latitude 41°27'27.32" West Longitude 96°31'50.35"	North Latitude 41°27'27.32" West Longitude 96°31'50.35"
14 Displaced	North Latitude 41°27'20.80" West Longitude 96°31'43.30"	N/A
32	North Latitude 41°26'38.72" West Longitude 96°30'58.33"	North Latitude 41°26'38.72" West Longitude 96°30'58.33"
32 Displaced	North Latitude 41°26'45.18" West Longitude 96°30'04.75"	North Latitude 41°26'45.18" West Longitude 96°30'04.75"
1	North Latitude 41°27'02.39" West Longitude 96°30'52.01"	To Be Closed
1 Displaced	North Latitude 41°26'02.39" West Longitude 96°30'53.56"	To Be Closed
19	North Latitude 41°27'02.39" West Longitude 96°30'52.01"	To Be Closed
19 Displaced	North Latitude 41°26'38.72" West Longitude 96°30'58.33"	To Be Closed

The preparation of these drawings was financed, in part, through a planning grant from the Federal Aviation Administration (FAA), as provided under Section 505 of the Airport and Airway Improvement Act of 1982, and as amended by the Airport and Airway Safety and Capacity Expansion Act of 1987, as amended. The contents do not necessarily reflect the official views of the FAA. Acceptance of these drawings does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein, nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

Runway Data

	Runway 14/32				Runway 1/19	
	14 Existing	32 Existing	14 Future	32 Future	1 Existing	19 Existing
Runway Length and Width	7,200 x 100, Concrete		7,200 x 100, Concrete		2,316 x 50, Asphalt	
Runway Pavement Strength (SWG/DWG/DTWG)(1,000 lbs.)	28 SWG, 48 DWG		28 SWG, 48 DWG		N/A	
Runway Lighting	MIRL		MIRL		None	
Runway Marking (V, NP, PI)	Non Precision	Non Precision	Non Precision	Non Precision	Visual	Visual
Crosswind Component and Percent Coverage	13 Knots/96.75%		13 Knots/96.75%		10.5 Knots/90.94%	
Blast Pad Width/Length	N/A	N/A	N/A	N/A	N/A	N/A
Runway Development/Reference Code (RDC/RRC)	A/B-II, 1 Mile		C-II, 3/4 Mile		A-I, Visual	
Critical/Design Aircraft	Cessna Citation 525		Cessna Citation X		Cessna 150	
-Approach Speed, Wingspan, Weight, Haul	115 kts., 49.8', 13,870 lbs, <500 mi.		130 kts., 69.2', 36,600 lbs, <500 mi.		55 kts., 32.7', 1,600 lbs, <500 mi.	
Associated Taxiway Design Group (TDG), Width, Lighting	2, 35', MITL		2, 35', MITL		1, None, None	
Approach Surface (Table 3-2)	20:1; Row 6	20:1; Row 6	20:1; Row 6	20:1; Row 6	20:1; Row 2	20:1; Row 2
Departure Surface	N/A	N/A	N/A	N/A	N/A	N/A
FAR Part 77 Approach Surface	34:1 NP, 500'x 3,500' x 10,000'	34:1 NP, 500'x 3,500' x 10,000'	34:1 NP, 500'x 3,500' x 10,000'	34:1 NP, 500'x 3,500' x 10,000'	20:1 V, 250'x 1,250' x 5,000'	20:1 V, 250'x 1,250' x 5,000'
Landing/Navigational Aids	GPS,PAPI,REIL	GPS, PAPI	GPS,PAPI,REIL	GPS,PAPI,REIL	None	None
Runway End Elevation	1,203.5'	1,202.2'	1,203.5'	1,202.2'	1,202.2'	1,200.6'
Highest/Lowest Runway Elevation	1,203.5' / 1,202.2'		1,203.5' / 1,202.2'		1,200.6' / 1,202.2'	
Runway Touchdown Zone Elevation (TDZ)	1,203.5'	1,202.9'	1,203.5'	1,202.9'	1,202.2'	1,202.2'
Runway Intersection Elevation	N/A		N/A		N/A	
Effective Longitudinal Runway Gradient	<0.1%		<0.1%		<0.1%	
Maximum Longitudinal Runway Gradient	<0.1%		<0.1%		<0.1%	
Line of Sight Standards Met (Longitundal/RVZ)	Yes/Yes		Yes/Yes		Yes/Yes	
Runway Safety Area (RSA) Beyond End/Prior To	300'/300'	300'/300'	1,000'/1,000'	1,000'/1,000'	240'/240'	240'/240'
Runway Safety Area (RSA) Width	150'		500'		120'	
Runway Object Free Area (ROFA) Beyond End/Prior To	300'/300'	300'/300'	1,000'/1,000'	1,000'/1,000'	240'/240'	240'/240'
Runway Object Area (ROFA) Width	500'		800'		250'	
Obstacle Free Zone (ROFZ) Length Beyond End/Width	200'/400'		200'/400'		200'/250'	
Precision Obstacle Free Zone (POFZ) Length/Width	N/A	N/A	N/A	N/A	N/A	N/A
Runway Protection Zone (RPZ) AAC, Visibility, Dimensions Accommodated, Dimensions and Nature of Ownership	A-B, 1 mi., 500' 750'x1,000' Fee	A-B, 1 mi., 500' 750'x1,000' Fee	C, 3/4 mi., 500' 750'x1,000' Fee	C, 1 mi., 500' 750'x1,000' Fee	A, Vis., 250' 450'x1,000' Fee	A, Vis., 250' 450'x1,000' Fee/Ease&ROW
Runway Centerline Separations, Taxiway, Hold and Parking	240', 200', 250'		300', 250', 400'		150', 125', 125'	
Displaced Threshold Elevation	1,202.8'	1,202.3'	N/A	1,202.3'	1,200.4'	1,203.0'
Takeoff Runway Available (TORA)	5,500'	5,500'	6,350'	5,500'	1,974'	1,844'
Takeoff Distance Available (TODA)	5,500'	5,500'	6,350'	5,500'	1,974'	1,844'
Accelerate Stop Distance Available (ASDA)	5,500'	5,500'	6,350'	5,500'	2,444'	2,284'
Landing Distance Available (LDA)	4,650'	4,650'	5,500'	5,500'	1,844'	1,844'

Airport Data

	Existing	Future
Airport Elevation	1,203'	1,203'
Airport Reference Point (ARP)	North Latitude 41°26'56.9" West Longitude 96°31'12.7"	North Latitude 41°26'59.5" West Longitude 96°31'16.0"
Airport Electronic Aids	GPS RNAV, VOR DME	GPS RNAV, VOR DME
Mean Maximum Temperature of Hottest Month	88.6° Fahrenheit (July)	
Most Demanding Runway Design Code	A/B-II, 1 Mile	C-II, 3/4 Mile (Runway 14)
NPIAS/State Role	General Aviation	General Aviation
Most Demanding Critical/Design Aircraft	Cessna Citation 525	Cessna Citation X

Sponsor Approval

City Of Fremont, Nebraska — Date

Notes

1. Base Mapping from 2010 ALP obtained from the City of Fremont, January 2014 supplemented by 1-meter ortho-referenced *Pictometry* imagery obtained January 2014. Ground contours via the 2010 ALP. Supplemental airspace survey not conducted.
2. No Obstacle Free Zone Penetrations or Threshold Siting Surface Penetrations exist. No Modification to Design Standards approved and no Non Standard Conditions identified.
3. All Coordinates 1983 North American State Plane Projection, all elevations North American Vertical Datum, Epoch Year 1988.
4. Existing airport-related city property approximates 353 acres, and easement acreage approximates 75 acres.
5. See Terminal Area Plan for more detailed building information.
6. Planned improvements include:
   - 6.1. Closure of Runway 1-19 to serve as taxiway
   - 6.2. Full-parallel taxiway for Runway 14-32
   - 6.3. Improved IAP visibility (from 1-mile to 3/4-mile) for Runway 14 while simultaneously removing the Runway 14 displacement and updating declared distances
   - 6.4. Adoption of C&D Design Standards for Runway 14-32
   - 6.5. Planned Terminal Area hangars, apron, access and other landside features

No.	Revision	Ckd	Date

Fremont Municipal Airport
City of Fremont, Nebraska

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 200
Denver, Colorado 80210-3822
303.782.0918 / 303.782.0915 fax
www.ADGAirports.com

NDA Project Number:

Project No.: FET1437M
Designed By: SPM
Drawn By: MTP
Approved By: SPM
Date: December 2014

Airport Layout Plan

Exhibit:

I

of VII Exhibits

Legend

(E), (F)	Existing, Future
	Existing Property Line
	Future Property Line
	Building Restriction Line (35' BRL)
	Runway Protection Zone (RPZ)
	Approach Surface
	Object Free Area (OFA)
	Runway Safety Area (RSA)
	Obstacle Free Zone (OFZ)
	Runway Visibility Zone (RVZ)
x x x	Existing Fence
	Existing Pavements
	Short-Term Improvements
	Intermediate-Term Improvements
	Long-Term Improvements
	Existing Paved Roads
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	Existing Buildings
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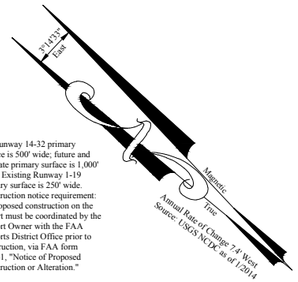
	Drainage Line
1200	Contour Line
	Rotating Beacon



Notes:
Existing Runway 14-32 primary surface is 500' wide; future and ultimate primary surface is 1,000' wide. Existing Runway 1-19 primary surface is 250' wide. Construction notice requirement: all proposed construction on the airport must be coordinated by the Airport Owner with the FAA Airports District Office prior to construction, via FAA form 7460-1, "Notice of Proposed Construction or Alteration."

Existing Airfield Separation Standards

Standard Item	Separation
Runway Centerline To Parallel Taxiway/Taxilane Centerline	240'
Runway Centerline To Edge Of Aircraft Parking	250'
Runway Centerline To Fixed Or Movable Object	250'
Runway Centerline To Holdline	200'
Taxiway Centerline To Parallel Taxiway/Taxilane Centerline	105'
Taxiway Centerline To To Fixed Or Movable Object	65.5'
Taxilane Centerline To To Parallel Taxilane Centerline	97'
Taxilane Centerline To Fixed Or Movable Object	57.5'

*Airplane Design Group II (Wingspans < 79 Feet)

Future Airfield Separation Standards

Standard Item	Separation
Runway Centerline To Parallel Taxiway/Taxilane Centerline	300'
Runway Centerline To Edge Of Aircraft Parking	400'
Runway Centerline To Fixed Or Movable Object	250'
Runway Centerline To Holdline	200'
Taxiway Centerline To Parallel Taxiway/Taxilane Centerline	105'
Taxiway Centerline To To Fixed Or Movable Object	65.5'
Taxilane Centerline To To Parallel Taxilane Centerline	97'
Taxilane Centerline To Fixed Or Movable Object	57.5'

*Airplane Design Group II (Wingspans < 79 Feet)

Existing On-Airport Facilities

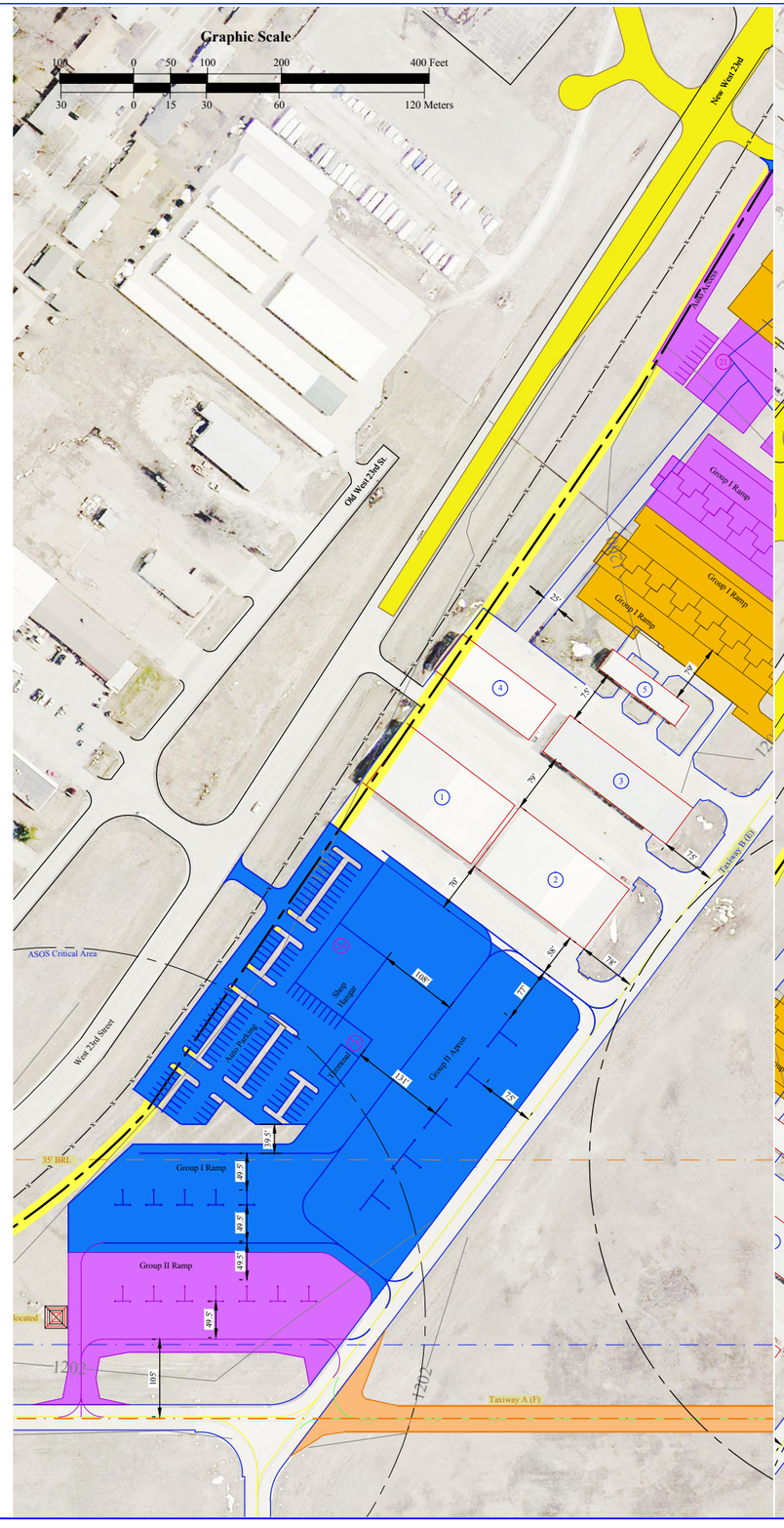
No.	Description	±Height (AGL)	±Top Elev. (MSL)	±Size	Comment
1	City-Owned Hangar	30'	230'	180' x 100'	
2	City-Owned Hangar	30'	230'	180' x 100'	
3	City-Owned T-Hangar	20'	220'	200' x 60'	
4	City-Owned T-Hangar	20'	220'	160' x 60'	
5	City-Owned T-Hangar	12'	212'	75' x75'	
6	Apron	--	--	10,550 sy.	Group I Complaint Only; Not Marked
7	City-Owned Hangar	30'	230'	50' x 315'	
8	Terminal Building	15'	215'	100' x 100'	
9	City-Owned GA Auto Parking	---	--	130'x60' (22 stalls)	New Road Encroaches
10	City-Owned Hangar	30'	230'	75' x 65'	
11	City-Owned Hangar	30'	230'	80' x 60'	
12	City-Owned Hangar	20'	220'	80' x 60'	
13	City-Owned Hangar	15'	215'	80' x 40'	
14	City-Owned Hangar	12'	212'	80' x 40'	
15	City-Owned Hangar	15'	215'	50' x 50'	
16	City-Owned Hangar	20'	220'	75' x 50'	
17	City-Owned Fueling and Farm	15'	230'	--	
18	Ground-Leased Hangar	25'	225'	100' x 85'	
19	Ground-Leased Hangar	25'	225'	100' x 75'	
20					

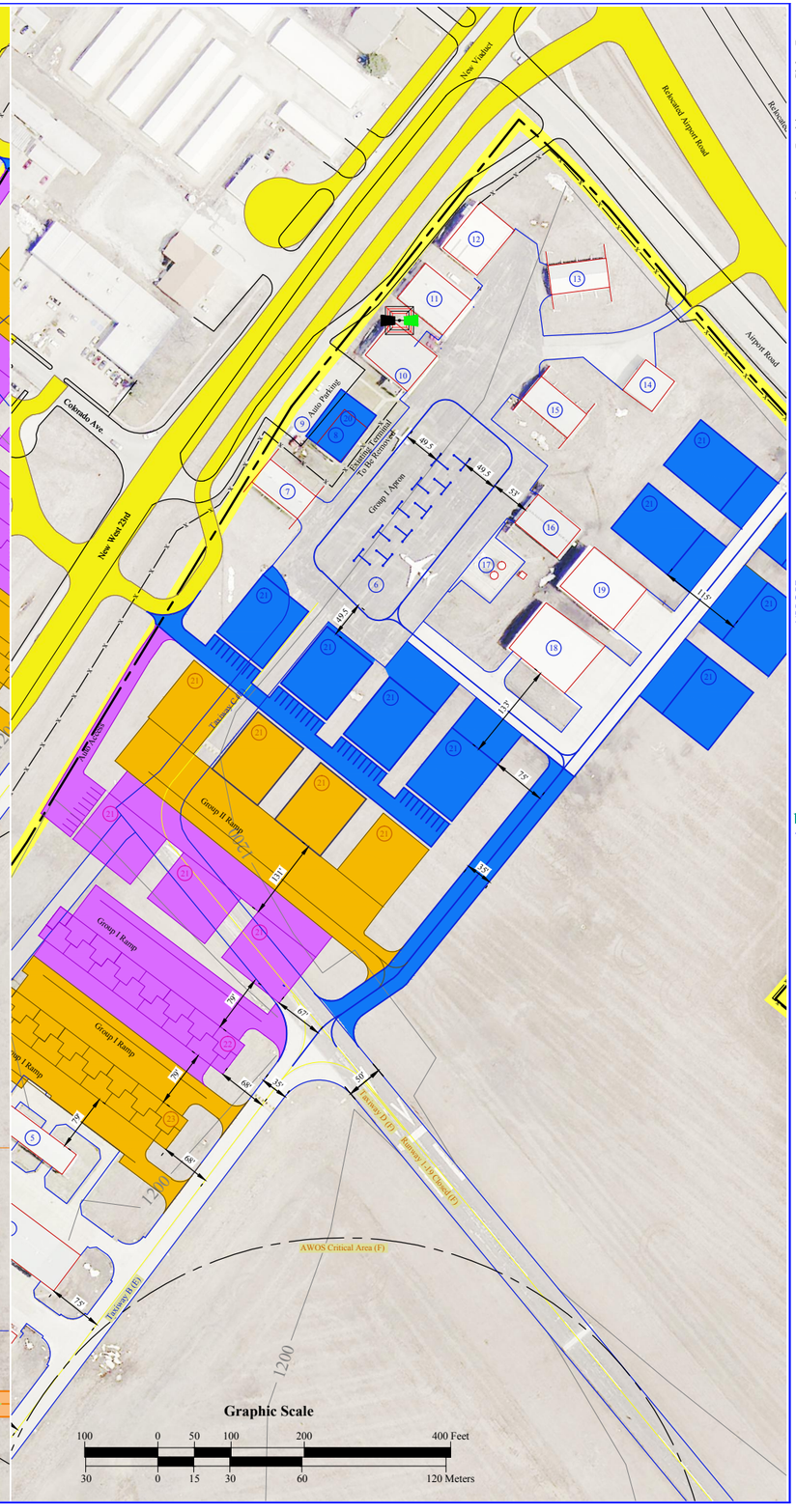
Building Height Estimated; No Survey Performed

Future On-Airport Facilities

No.	Description	±Height (AGL)	±Top Elev. (MSL)	±Size	Comment
20	Ground-Leased Hangar	30'	230'	60' x 80'	In Place of Current Terminal Building
21	Ground-Leased Hangar	30'	230'	100' x 85'	
22	Ground-Leased Hangar	30'	230'	100' x 85'	
23	Ground-Leased Hangar	30'	230'	100' x 85'	
24	Ground-Leased Hangar	30'	230'	100' x 85'	
25	Proposed Terminal Building	20'	220'	50' x 30'	

Building Height Estimated; No Survey Performed





No.	Revision	Ckd	Date

Fremont Municipal Airport
City of Fremont, Nebraska

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 200
Denver, Colorado 80210-3822
303.782.8686 / 303.782.8687 fax
www.ADGAirports.com

NDA Project Number:

Project No.:	FET1437M		
Designed By:	SPM		
Drawn By:	MTP		
Approved By:	SPM		
Date:	December 2014		

Terminal Area Plan

Exhibit:
II
of VII Exhibits

APPENDIX A

PRE-FINAL PRESENTATION; *OCTOBER 2014*

CITY OF FREMONT
NEBRASKA PATHFINDERS

Fremont Municipal Airport

Terminal Area Plan Update

Council Presentation

October 2014

CITY OF FREMONT
NEBRASKA PATHFINDERS

About ADG

ADG Team:

Steve Marshall and Rick Bryant

-ADG has worked with communities in the state of Nebraska since 1989

-ADG is a professional aviation consultancy in business since 1984

-ADG has completed 82 planning projects in 12 states with strong similarities to this effort

FET
Fremont Municipal Airport

Plan Participants and Roles

-City Council

Consultation and decision-making

-Fremont Public and Aviation Constituencies

Consultation planned to inform and seek comment

-Airport Advisory Committee

Consultation at key project points, makes recommendation to City Council

-Nebraska Aeronautics and FAA

Will advise on project documents and consult at key project points. FAA will be asked for comment and may 'airspace' the final plan

FET
Fremont Municipal Airport

Project Schedule

-Project Meeting No. 1: March

Introduce the Project to Committee, Preview an Alternative

-Project Meeting No. 2: April

Introduce the Project, Present the Alternatives, Discuss and Seek Direction from Council

-Final City Council Presentation: Right Now

Brief the Project, Brief the Alternatives, Confirm Direction from Council, Finalize the Planning

FET
Fremont Municipal Airport

Planning Objectives

-Provide terminal area planning that is able to safely and effectively accommodate demand, should it materialize

-Provide terminal area planning with development suited to a 'highest and best' use

FET
Fremont Municipal Airport

What this work is about…

-Functions as a phased (5, 10 and 20 year) development 'road map' to accommodate anticipated demand as Council sees fit

-Does not obligate development or dollars, but may set the ground work for future funding… *the beginning of the conversation*

FET
Fremont Municipal Airport

Why is this work being done…

-The upcoming West 23rd Street Viaduct may constrain the terminal building's auto parking

-A waitlist for hangars exists and new hangar and apron area should be planned

-The current terminal building has aged and is perhaps past is useful life without rehabilitation

-FAA and NDA encourage a review and update of FET's planning every so often

FET
Fremont Municipal Airport

What is being done…

Project Focus: 5 Down to 3 Alternatives

-Phased development (5, 10 and 20-year periods)

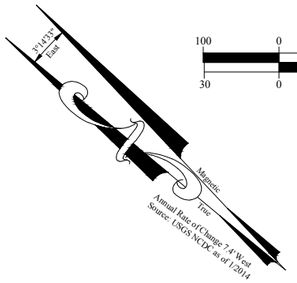
-Visualization of hangars, buildings, apron, auto parking, taxiways and other aviation facilities

-Planning-level cost estimates for each phase

Alternative No. 1: Improve Existing Terminal Area
Alternative No. 2: Develop Along Airport Road
Alternative No. 3: Western-Most Development

FET
Fremont Municipal Airport

Terminal Area Alternative No. 1
(Improve Existing Terminal Area)



Graphic Scale

100 0 50 100 200 400 Feet

30 0 15 30 60 120 Meters

Notes

Regardless of alternative, planned improvements, include:
- -Closure of Runway 1-19 to serve as taxiway
- -Full-parallel taxiway for Runway 14-32
- -Improved IAP visibility (from 1-mile to 3/4-mile) for Runway 14 while simultaneously removing the Runway 14 displacement and updating declared distances
- -Adoption of C&D FAA Design Standards for Runway 14-32
- -Planned Terminal Area hangars, apron, access and other landside features

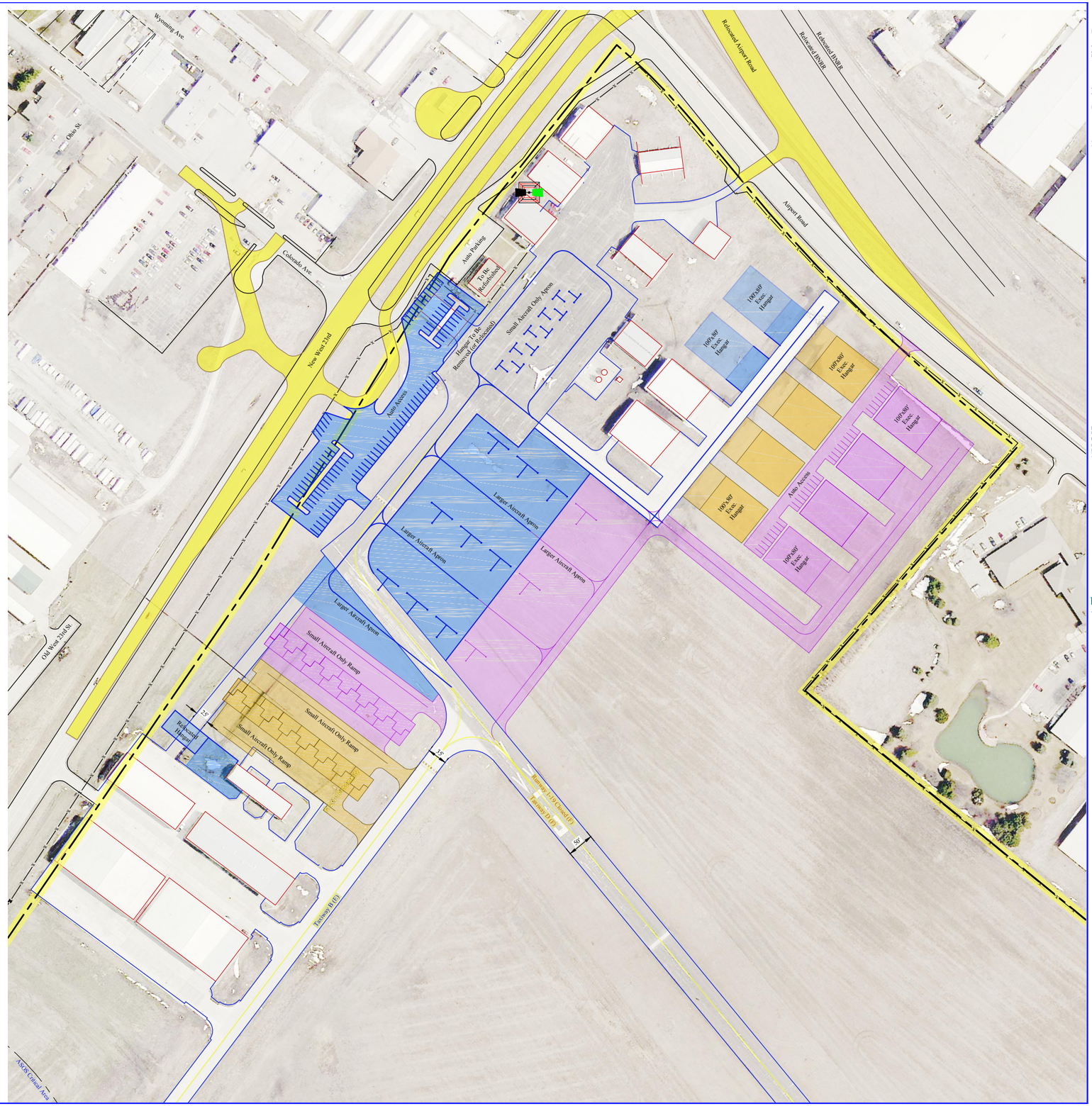
Legend

(E), (F)	Existing, Future
	Existing Property Line
x x x	Existing Fence
	Existing Pavement
	Existing Paved Roads
	Future Paved Roads
	Existing Buildings
	Avigation Easement
	Rotating Beacon

Alternative No. 1 Improvements

	FAA	NDA	City	Others	Totals
Short-Term	$1,200,000	$350,000	$580,000	$150,000	$2,280,000
Intermediate-Term	$125,000	$0	$565,000	$0	$690,000
Long-Term	$670,000	$175,000	$645,000	$0	$1,490,000
Totals:	$1,995,000	$525,000	$1,790,000	$150,000	$4,460,000

Note: Costs associated with box/executive hangar development are not prepared because ground leasing is planned, except eligible portions of access taxiways.



No.	Revision	Ckd	Date

Fremont Municipal Airport
City of Fremont, Nebraska

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 200
Denver, Colorado 80210-3802
303.782.8686 / 303.782.8691 fax
www.ADGAirports.com

NDA Project Number:

Project No.:	FET1437M		
Designed By:	SPM		
Drawn By:	MTP		
Approved By:	SPM		
Date:	June 2014		

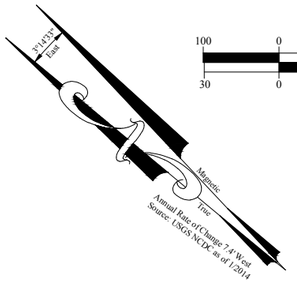
Terminal Area Alternative No. 1 (Improve Existing Terminal Area)

Exhibit:

A1

of VII Exhibits

Terminal Area Alternative No. 2
(Develop Along Airport Road)



Graphic Scale

100 0 50 100 200 400 Feet

30 0 15 30 60 120 Meters

Notes

Regardless of alternative, planned improvements, include:
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- -Full-parallel taxiway for Runway 14-32
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- -Adoption of C&D FAA Design Standards for Runway 14-32
- -Planned Terminal Area hangars, apron, access and other landside features

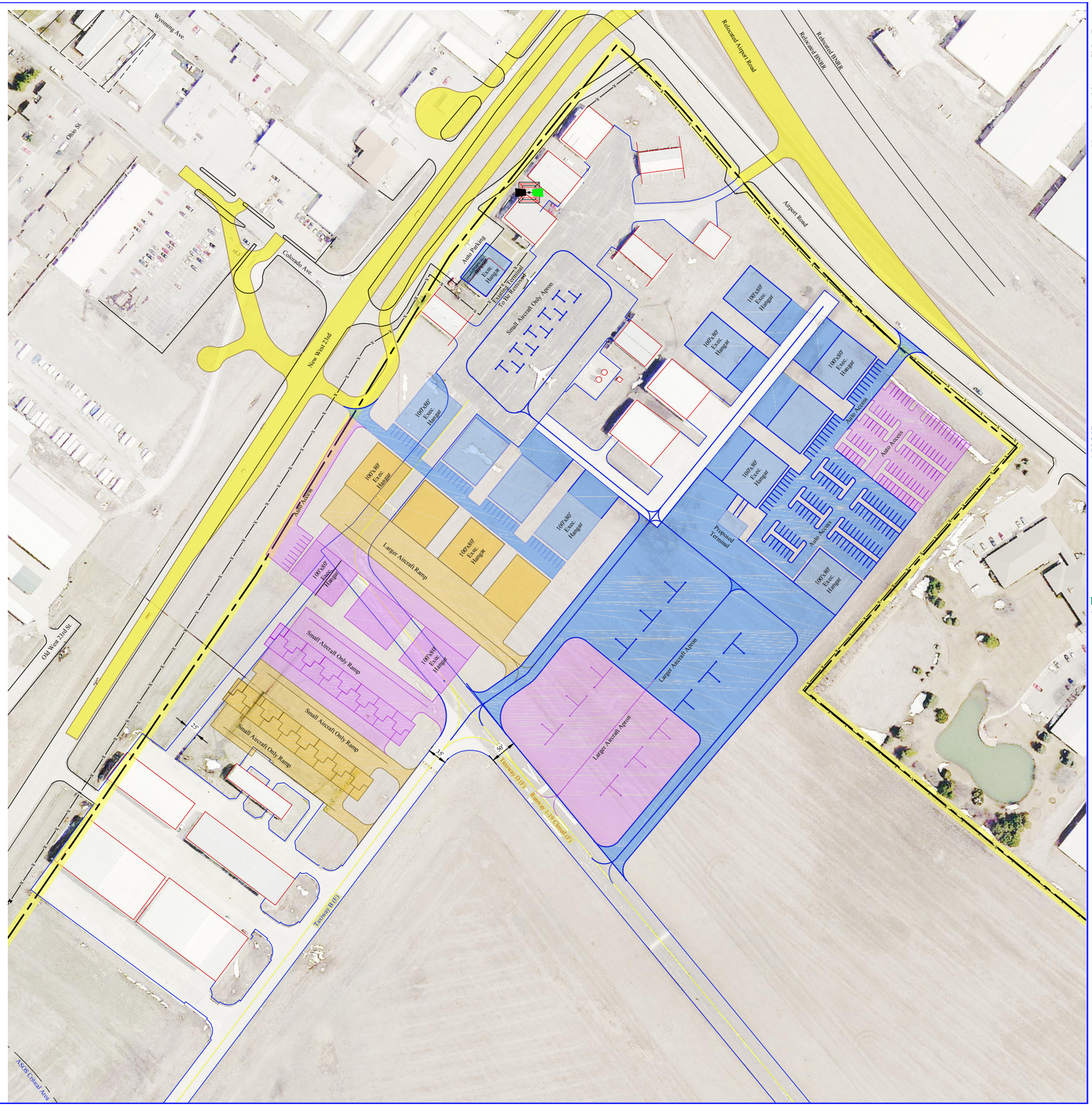
Legend

- (E), (F) — Existing, Future
- Existing Property Line
- Existing Fence
- Existing Pavement
- Existing Paved Roads
- Future Paved Roads
- Existing Buildings
- Avigation Easement
- Rotating Beacon

Alternative No. 2 Improvements

	FAA	NDA	City	Others	Totals
Short-Term	$1,000,000	$350,000	$580,000	$150,000	$2,080,000
Intermediate-Term	$125,000	$0	$565,000	$0	$690,000
Long-Term	$670,000	$175,000	$345,000	$0	$1,190,000
Totals:	$1,795,000	$525,000	$1,490,000	$150,000	$3,960,000

Note: Costs associated with box/executive hangar development are not prepared because ground leasing is planned, except eligible portions of access taxiways.



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www.ADGAirports.com

Fremont Municipal Airport
City of Fremont, Nebraska

No.	Revision	Ckd	Date

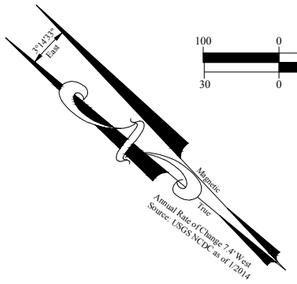
NDA Project Number:

Project No.: FET1437M
Designed By: SPM
Drawn By: MTP
Approved By: SPM
Date: June 2014

Terminal Area Alternative No. 2 (Along Airport Road)

Exhibit:
A2
of VII Exhibits

Terminal Area Alternative No. 3
(Western-Most Development)



Graphic Scale

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Notes

Regardless of alternative, planned improvements, include:
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- -Adoption of C&D FAA Design Standards for Runway 14-32
- -Planned Terminal Area hangars, apron, access and other landside features

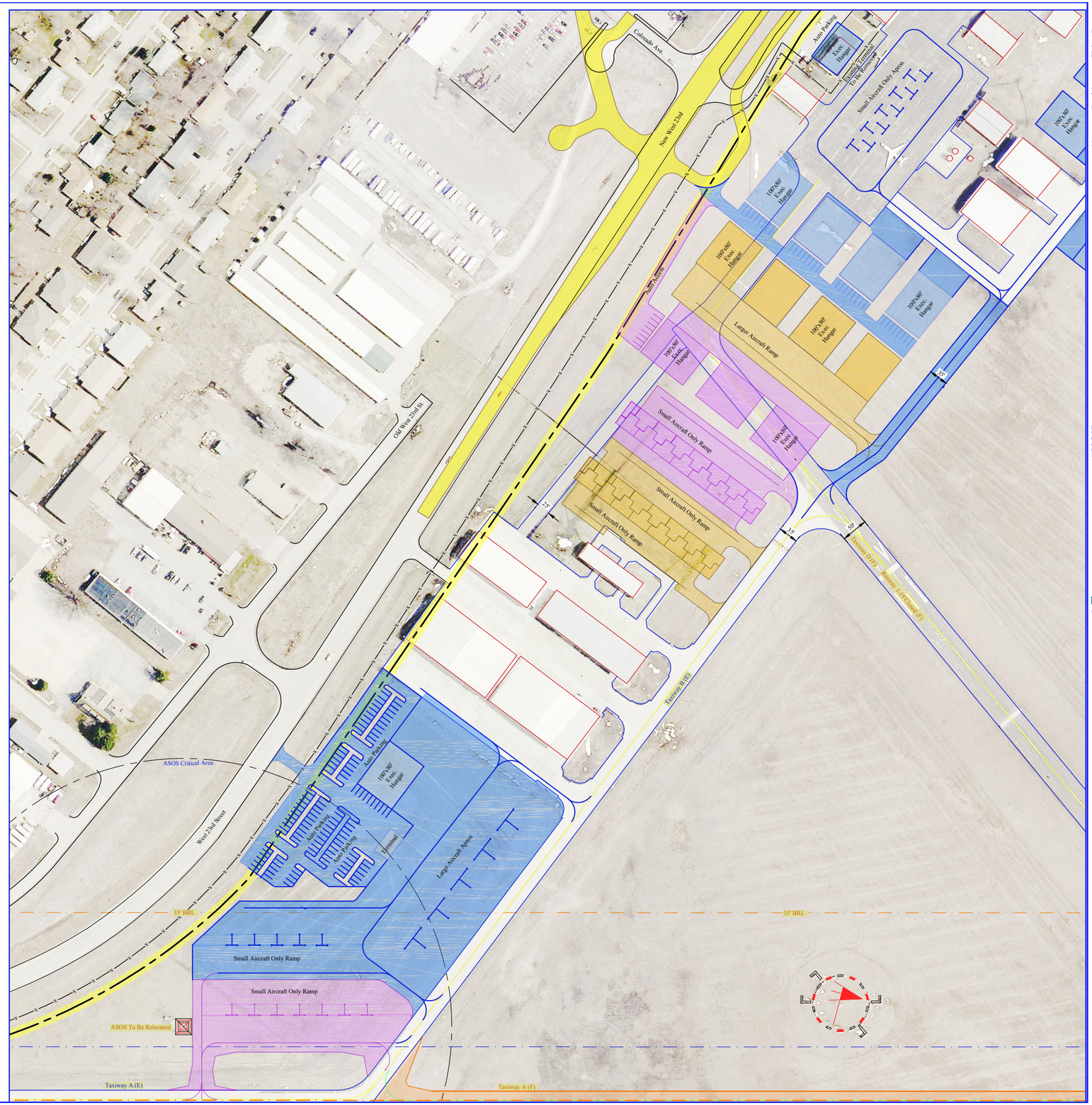
Legend

- (E), (F) — Existing, Future
- Existing Property Line
- Existing Fence
- Existing Pavement
- Existing Paved Roads
- Future Paved Roads
- Existing Buildings
- Avigation Easement
- Rotating Beacon

Alternative No. 3 Improvements

	FAA	NDA	City	Others	Totals
Short-Term	$1,200,000	$750,000	$580,000	$150,000	$2,680,000
Intermediate-Term	$125,000	$0	$565,000	$0	$690,000
Long-Term	$670,000	$175,000	$645,000	$0	$1,490,000
Totals:	$1,995,000	$925,000	$1,790,000	$150,000	$4,860,000

Note: Costs associated with box/executive hangar development are not prepared because ground leasing is planned, except eligible portions of access taxiways.



No.	Revision	Ckd	Date

Fremont Municipal Airport
City of Fremont, Nebraska

AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 200
Denver, Colorado 80210-3822
303.782.8080 / 303.782.8085 fax
www.ADGAirports.com

NDA Project Number:

Project No:	FET1437M		
Designed By:	SPM		
Drawn By:	MTP		
Approved By:	SPM		
Date:	June 2014		

Terminal Area Alternative No. 3 (Western-Most Development)

Exhibit:

A3

of VII Exhibits

And who pays for all this…

-This planning will be 90% reimbursed by FAA

-FET is 'entitled' to an annual $150,000, more than that is FAA/NDA prerogative

<u>On-The Ground Improvements:</u>

-Apron, Taxiway and Taxilanes are eligible for 90% FAA grants.

-Terminal Buildings are sometimes eligible for 90% FAA grants.

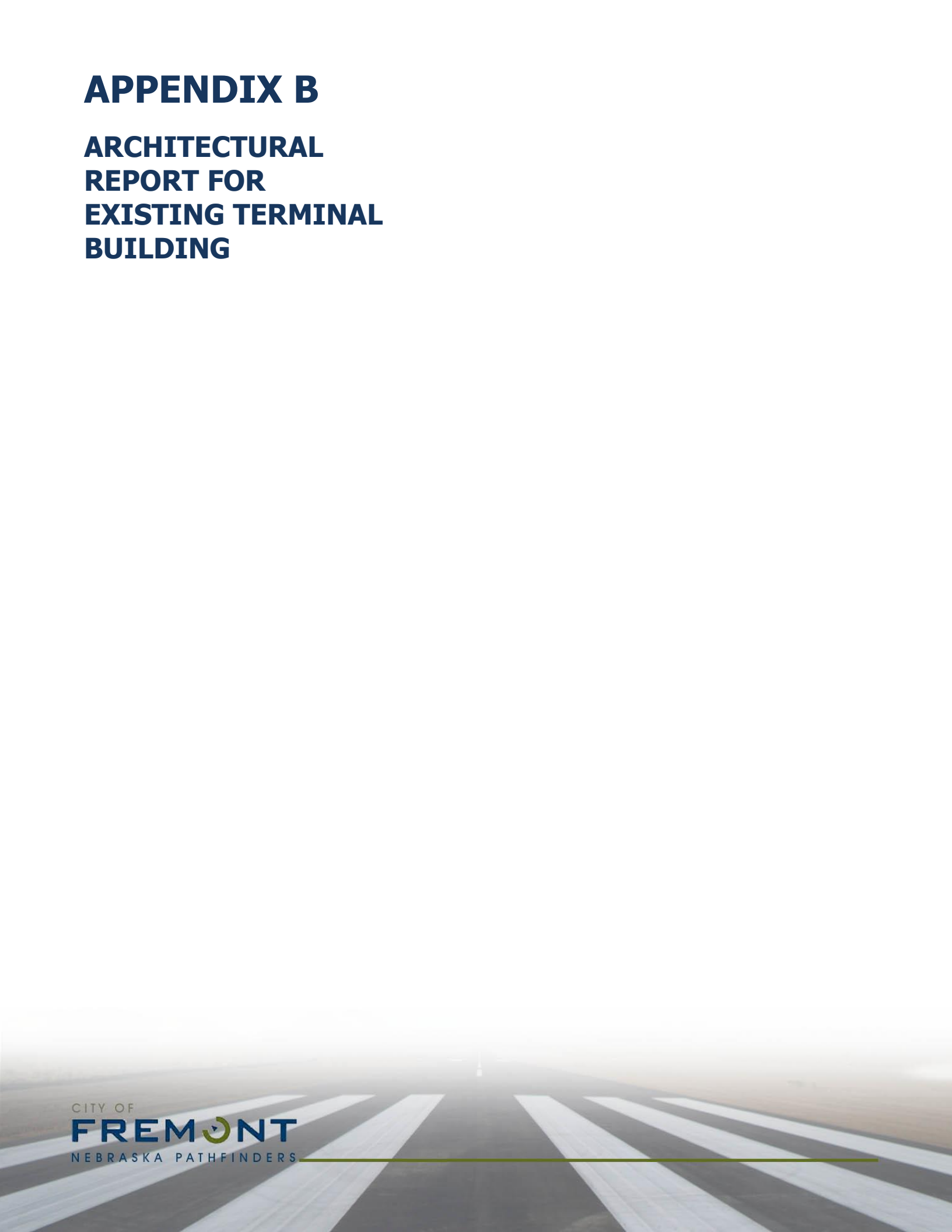
-Hangar and T-Hangars are generally not eligible for 90% FAA grants.

-$600,000± 'in FAA's bank for FET'

FET
Fremont Municipal Airport

APPENDIX B

ARCHITECTURAL REPORT FOR EXISTING TERMINAL BUILDING



Fremont Municipal Airport

Terminal Building Report

HGM Project No. 103214

March 10, 2014

Fremont Municipal Airport

Building Report
HGM Project No. 103214
March 10, 2014

EXISTING FACILITY

The existing Fremont Airport Terminal was established in 1947. The terminal building was constructed in 1962. (See Photos 1 and 2)

The entrance to the terminal is somewhat hidden and isolated from view from the parking lot and as visitors approach the airport. (See Photo 3)

The building is constructed of masonry load bearing walls that are uninsulated. The roof is a pre-cast concrete inverted T system. The masonry walls and roof structure appear to be stable and solid, but there is moisture damage on the north side of the building. (See Photo P4)

The windows are old, deteriorating and not energy efficient. (See Photo P5)

The buildings' roof is old and reached the end of its useful life and should be replaced. (See Photo P7). This sloping roof surface is difficult and problematic to re-roof. Also there are cracks developing with the concrete roof system. (See Photo P6)

A new lay in ceiling was updated and installed in 1985 with insulation added above the lay in ceiling. This is not a suggested way of insulating the ceiling. It makes access to wiring, lights, etc. difficult.

Carpet was recently replaced and is in good shape.

The reception area is cramped and is open to the lobby with a lack of privacy for phone calls and other work. (See Photo P8)

The existing FBO office is cramped with no view of the lobby and minimal view of the apron and runway. (See Photo P9)

The lobby is comfortable with plenty of seating for guests and visitors. (See Photo P10)

There is only one large room which serves as a combination conference room, flight planning area, and break room. There is no privacy area for pilots to plan flights. There is no sink for water. There is no private meeting or training room that could be used for press conferences, political rallies, meetings or training sessions. (See Photo P11)

There are no sleeping rooms or privacy areas for pilots to sleep or take a break when they are waiting for flights. Currently they sleep in the lobby area.

Storage is lacking throughout the facility. Some storage is handled in the mechanical room which is a safety issue. (See Photo P12 and P13)

The drinking fountain appears to not meet current ADA standards and electrical cords provide a safety issue. (See Photo P14)

Photo P15 shows vending machines located where visitors enter the terminal restricting space.

The restrooms are small and not ADA compliant. (See Photo P16)

TERMINAL IMPROVEMENTS

To better facilitate visitors and provide a more helpful work area for the receptionist a glass separation wall should be included between the lobby and the receptionist work area. A drop box for loaner vehicles would be nice and a dedicated security monitor would be preferred. More file storage and a more efficient work area is needed in the reception area.

FBO OFFICE

The FBO office should have visibility of the lobby, receptionist and taxiway. More file storage is needed and a security system should be provided to monitor activities.

FLIGHT PLANNING AREA

A dedicated area should be provided for pilots to plan their flights with a regional map, access to telephone, internet access, and a view of the runway.

TRAINING ROOM

There should be a dedicated training area for use by staff. It could also be used as a conference room or political rally room if needed.

BREAK ROOM

A separate break room should be provided for staff and visitors to use.

SLEEPING ROOM

Probably two private sleeping rooms should be included in the new terminal facility with access to toilets and showers with TV's and a lounging area accessible to pilots 24 hours a day.

MECHANICAL SYSTEM

The HVAC system is comprised of a natural gas fired furnace with condensing unit. The Whirlpool furnace is original to the building and is at the end of its useful life per 2007 ASHRAE Handbook – HVAC Applications, Table 4, page 36.3. The Ruud outdoor condensing, model RAKA, has been replaced since the original system, but information on the unit was not available on site. The system has a single White-Rodgers thermostat for the entire building. The thermostat did not appear to be 7-day programmable to meet current energy codes. The HVAC system does not have outdoor air, which is a violation of ASHRAE Standard 62.1, and the International Mechanical Code. The supply ductwork for the HVAC system is installed below the floor slab, and some sections of this ductwork are collapsed, or have required

heavy maintenance in the past. Without access to the supply ductwork, required maintenance cannot be completed. Each restroom has a wall fan exhauster that is original to the building.

The plumbing system is comprised of a ¾" water service which supplies water to the two (2) restrooms, a service sink, a drinking fountain, a refrigerator ice maker, and the lawn sprinkler system. The cold water piping is expanded to 1" or larger once it enters the building at the Mechanical closet, likely in an attempt to accommodate the lack of pressure required in the building. The building operator reports that if the lawn sprinkler system is operating, the toilets in the restrooms will not flush. The water service size is inadequate and must be redone to accommodate plumbing code. The domestic water heater is an A.O. Smith, 30 gallon, and is not original to the building, but appears to be at the end of its useful life. The restroom plumbing fixtures appear to meet ADA requirements. The drinking fountain in the main corridor does not meet ADA requirements.

ELECTRICAL

The existing electrical system is 120/240V, 1-phase with a 100A main circuit breaker on the exterior of the building. There is a 100A main lug only branch circuit panel located in the mechanical room. The panel is an obsolete ITE Pushmatic type panel. For any future renovations a new electrical service will be required including larger service to the building and new branch circuit panelboard(s).

The existing lighting system throughout uses T12 linear fluorescent fixtures. There does not appear to be any emergency egress lighting or exit lighting. New energy efficient lighting will need to be provided throughout to meet State Energy Codes, including lighting controls. New LED type exit lighting and emergency egress will need to be provided throughout including outside all exterior egress doors.

The existing receptacles are grounded type, however they are minimal and not in a quantity that would meet current needs. Most outlets are recessed in blocks walls which will make it difficult to extend, with the use of surface mounted raceway. Light switches throughout are installed above height allowed by ADA.

There is an existing CCTV system which appears to be newer and in good condition.

The existing telephone entrance is in the mechanical room adjacent to the panelboard.

SUMMARY

The existing terminal is too small for current needs, is not easily expandable and the structure has several integral issues that might warrant its replacement and possible relocation to a better location to serve the public and the airport.

Photo #1 – Overall view of terminal area

Photo #2 – Terminal building

Photo #3 – Terminal entrance not visible from parking

Photo #4 – Moisture issues

Photo #5 – Deteriorated windows and moisture issues

Photo #6 – Cracked, deteriorated concrete roof

Photo #7 – Worn out built up roof system

Photo #8 – Cramped reception area

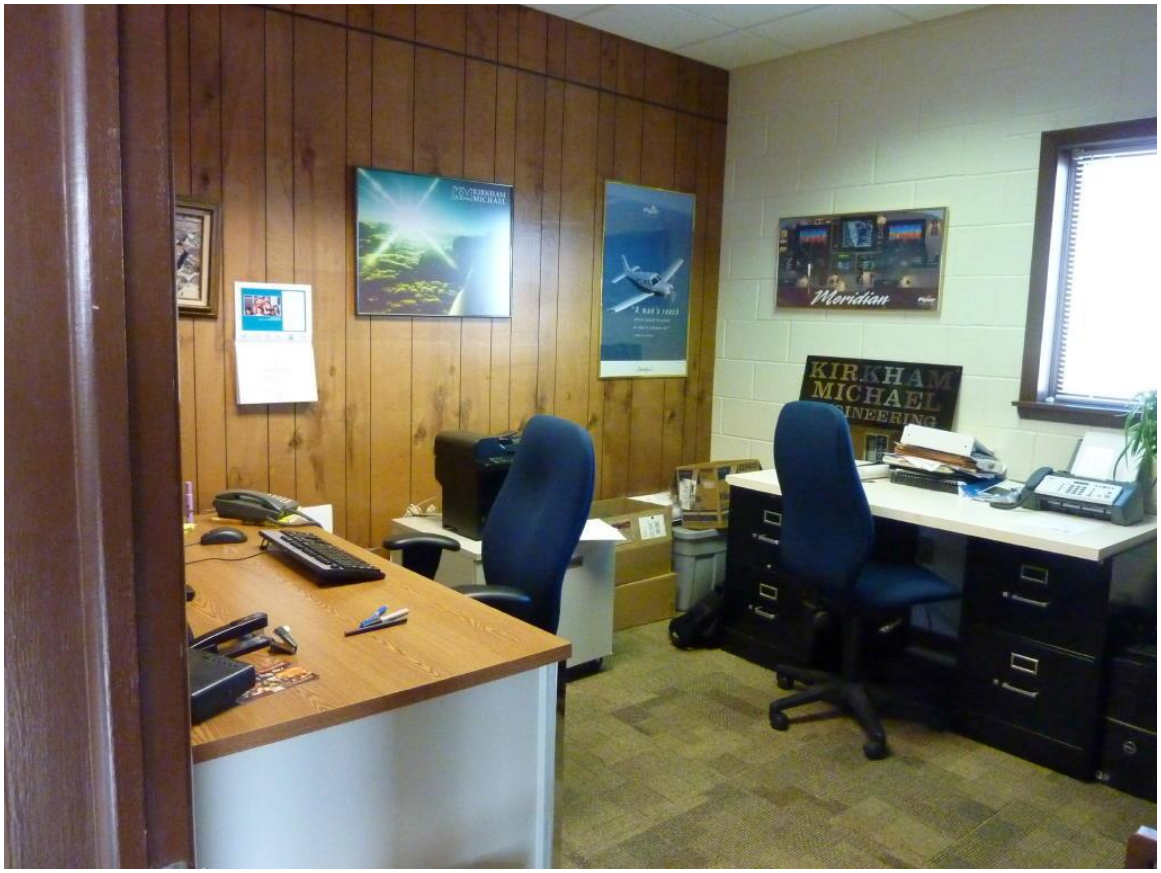


Photo #9 – Cramped FBO Office

Photo #10 - Lobby

Photo #11 – Breakroom/training room/ conference room

Photo #12 – Storage in mechanical room

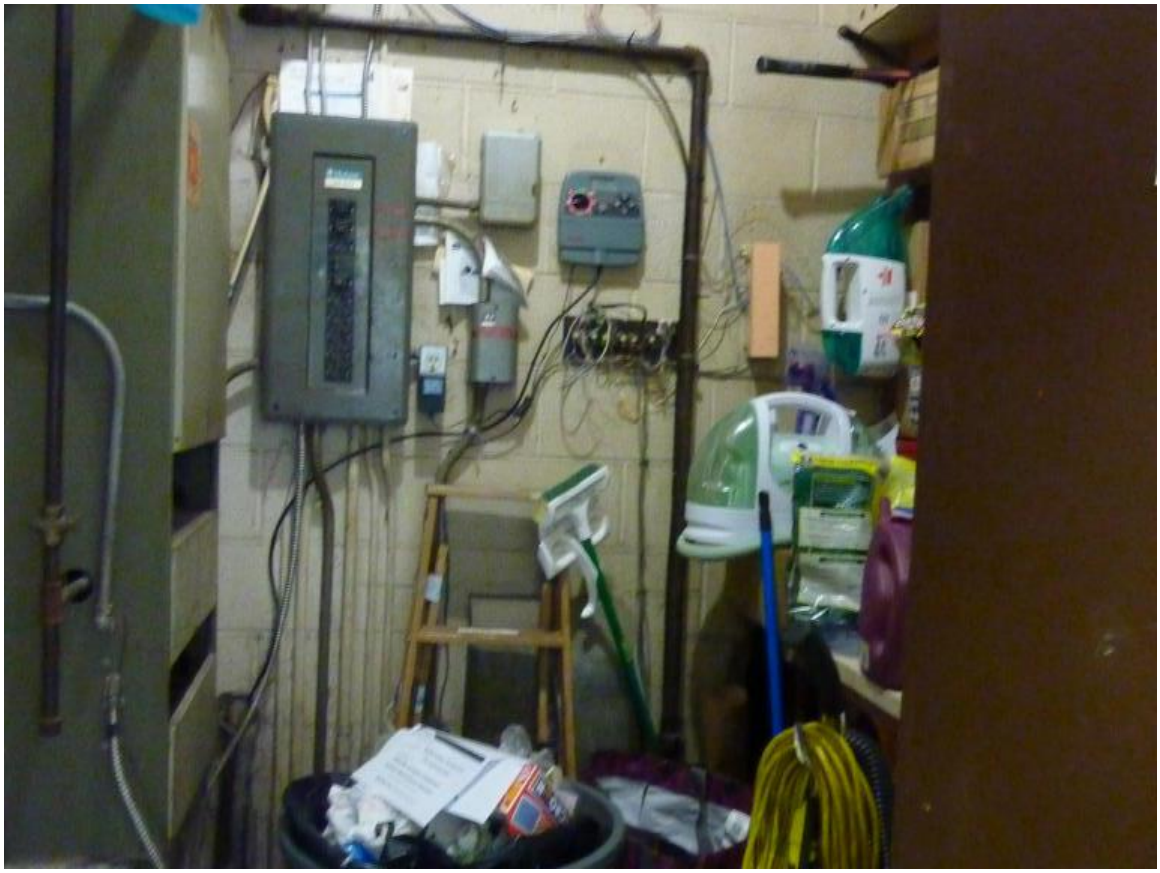


Photo #13 – Storage in mechanical room

Photo #14 – Non ADA compliant drinking fountain and unsafe cords

Photo #15 – Vending machines limit access into terminal building

Photo #16 – Non ADA compliant toilets

hgm
ASSOCIATES INC.

TERMINAL COST ANALYSIS
Fremont Municipal Airport Terminal Building
Fremont, Nebraska
March 17, 2014
HGM / ADG

OPTIONS	**COST**

Renovate Existing Terminal – 1750 SF $175,000

- New Roof
- Windows
- Insulate and Finish Existing Walls
- New Energy Efficient Lights
- New Furnace
- More Outlets
- New Finishes

Renovate / Expand Existing Terminal – 4950 SF $850,000

- Add Training Room
- Sleeping Rooms
- Larger Lobby
- Conference Room
- Flight Plan Room
- Line Workers Room

New Terminal – 4850 SF $950,000

- New Facility with Lobby
- Reception Office
- FBO Offices
- Training Room
- Conference Room
- Break Room
- Line Workers Room
- Flight Plan Rooms
- Sleeping Rooms
- Showers
- Restrooms
- File Storage

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640 FIFTH AVENUE, COUNCIL BLUFFS, IOWA 51501-6427, (712) 323-0530, FAX (712) 323-0779

APPENDIX C

PLANNING-LEVEL COST ESIMATES

Fremont Municipal Airport (FET); City of Fremont, Nebraska; Planning Costs

Alternative No. 1
Improve Existing Terminal Area

Short-Term Improvements	Area	Units	Unit Cost	Total
Auto Parking Area	5140	SQYDS	$40	$205,600
Apron Area	12587	SQYDS	$57	$717,459
Terminal Building New	1	EA	$950,000	$950,000
Relocation/Demolitions/Utilities	1	EA	$400,000	$405,000
Short-Term Improvements Totals				$2,278,059

Intermediate-Term Improvements	Area	Units	Unit Cost	Total
Taxiway Area	2450	SQYDS	$32	$78,400
T-Hangar	1	EA	$610,000	$610,000
Intermediate-Term Improvements Totals				$688,400

Long-Term Improvements	Area	Units	Unit Cost	Total
Apron Area	8371	SQYDS	$57	$477,147
Taxiway Area	7290	SQYDS	$48	$349,920
T-Hangar	1	EA	$665,000	$665,000
Long-Term Improvements Totals				$1,492,067
Alternative No. 1 TOTALS				$4,458,526

Alternative No. 2
Develop Along Airport Road

Short-Term Improvements	Area	Units	Unit Cost	Total
Auto Parking Area	5132	SQYDS	$35	$179,620
Apron Area	11501	SQYDS	$53	$609,553
Taxiway Area	5255	SQYDS	$30	$157,650
Terminal Building New	1	EA	$950,000	$950,000
Utilities	1	EA	$210,000	$210,000
Short-Term Improvements Totals				$2,106,823

Intermediate-Term Improvements	Area	Units	Unit Cost	Total
Taxiway Area	6085	SQYDS	$30	$182,550
T-Hangar	1	EA	$565,000	$565,000
Intermediate-Term Improvements Totals				$747,550

Long-Term Improvements	Area	Units	Unit Cost	Total
Auto Parking Area	2079	SQYDS	$32	$66,528
Apron Area	8211	SQYDS	$55	$451,605
Taxiway Area	1506	SQYDS	$34	$51,204
T-Hangar	1	EA	$565,000	$565,000
Long-Term Improvements Totals				$1,134,337
Alternative No. 2 TOTALS				$3,988,710

Alternative No. 3
Western Most Development

Short-Term Improvements	Area	Units	Unit Cost	Total
Auto Parking Area	6091	SQYDS	$34	$207,094
Apron Area	14822	SQYDS	$57	$844,854
Taxiway Area	1802	SQYDS	$38	$68,476
Terminal Building New	1	EA	$950,000	$950,000
Utilities	1	EA	$485,000	$485,000
Short-Term Improvements Totals				$2,555,424

Intermediate-Term Improvements	Area	Units	Unit Cost	Total
Taxiway Area	5891	SQYDS	$36	$212,076
T-Hangar	1	EA	$565,000	$565,000
Intermediate-Term Improvements Totals				$777,076

Long-Term Improvements	Area	Units	Unit Cost	Total
Apron Area	11222	SQYDS	$57	$639,654
T-Hangar	1	EA	$665,000	$665,000
Long-Term Improvements Totals				$1,304,654
Alternative No. 3 TOTALS				$4,637,154

Updated as of December 12, 2014