Narrative Report
for
Airport Layout Plan
for the
Muscatine Municipal Airport
2018

PREPARED FOR

MUSCATINE

215 Sycamore Street
Muscatine, IA 52761

PREPARED BY

ANDERSON BOGERT

4001 River Ridge Drive NE
Cedar Rapids, IA 52402

U.S. Department
of Transportation

**Federal Aviation
Administration**

Central Region
Iowa, Kansas
Missouri, Nebraska

901 Locust
Kansas City, Missouri 64106
(816) 329-2600

August 14, 2018

Mr. David Gobin
Community Development Director
City of Muscatine
City Hall
215 Sycamore Street
Muscatine, IA 52761

Dear Mr. Gobin:

Airspace Analysis Determination – No Objections with Provisions
Muscatine Municipal (MUT), Muscatine, IA
14 CFR Part 77 – Airspace Case No. 2018-ACE-2715-NRA

We conducted a review of the subject Airport Layout Plan (ALP) based on considerations relating to the safe and efficient utilization of airspace, factors affecting the control of air traffic, conformance with FAA design criteria, and Federal grant assurances or conditions of a Federal property conveyance. Our determination of No Objections with Provisions is derived from the analysis of information supplied in the ALP. We conclude that the proposal will not adversely affect the safe and efficient use of navigable airspace by aircraft provided the conditions are met as explained in the enclosed FAA Memorandum dated August 13, 2018.

We have reviewed the proposal from an airport's planning viewpoint and the effect on airport programs. We have coordinated the proposal with the appropriate FAA offices, and their comments are contained in the enclosed FAA Memorandum. We have reviewed the ALP for structures that may adversely affect the flight or movement of aircraft, cause electromagnetic interference to NAVAIDs, communication facilities, or, when applicable, derogate the line-of-sight visibility from a control tower. Comments on objects that exceed the obstruction standards of 14 CFR Part 77 are enclosed. Comments on the development of the ALP, which are based on requirements contained in FAA Advisory Circular (AC) 150/5070-6, *Airport Master Plans*, and AC 150/5300-13A, *Airport Design*, have already been provided.

This determination does not constitute a commitment to provide Federal financial assistance to implement any development contained on the ALP. An ALP is a graphic depiction of the existing and future airport facilities showing the clearance and dimensional requirements to meet applicable standards. The ALP serves as a record of aeronautical requirements and is used by the FAA in its review of proposals that may affect the navigable airspace or other missions of the FAA.

This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making this determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA), and known natural objects within the affected area would have on the airport proposal.

The FAA cannot prevent the construction of structures near an airport. The airport environs can only be protected through such means as local zoning ordinances, acquisitions of property in fee title or aviation easements, letters of agreement, or other means.

As a reminder, the sponsor is advised to coordinate the completion of project construction with the cycle of FAA publications, and to notify the FAA with the required information before the cut-off date coinciding with the next publication cycle.

This determination does not constitute a commitment of Federal funds and does not indicate that the proposed development is environmentally acceptable in accordance with applicable Federal laws. An environmental finding is a prerequisite to any major airport development project when Federal aid will be granted for the project. This approval is given subject to the condition that the proposed airport development identified below shall not be undertaken without prior written environmental approval by the FAA. These items include:

- Displacing/relocating the Runway 30 threshold
- Realigning taxiways
- Constructing hangars and taxilanes

If you have any questions regarding this project please call me at at (816) 329-2637 or via email at jeff.deitering@faa.gov.

Sincerely,

Jeffrey D. Deitering, P.E.
Iowa State Planner

Enclosures

CC: Jayne DeCoste, Anderson-Bogert Engineers & Surveyors, Inc.
Shane Wright, Iowa Office of Aviation

Memorandum

U.S. Department of Transportation
Federal Aviation Administration

Date: August 13, 2018

Subject: MUSCATINE MUNICIPAL (0K7) Muscatine, IA

Aeronautical Study Number: 2018-ACE-2715-NRA

Airport Layout Plan Review

From: Airports Airspace Specialist, ACE-620F Reply To: John D. Karrasch, ext 2617

To: Mr. Jeff Deitering, ACE 611D

We have completed an airspace analysis of:

(MUT) ALP Review

Our aeronautical study has determined that the proposed updates will not adversely affect the safe and efficient use of airspace by aircraft. Therefore, we have no objection to the proposal.

***** FPT Airspace Comment:** Any time a runway's landing threshold coordinates change more than 3 feet vertically, 10 feet across centerline axis, or 50 feet along centerline axis, the airport must have new survey and coordinates corresponding to the type of IFP requested. Only after FAA Airports AGIS accepts the new runway and obstacle data, and FAA flight procedures has the reliable data, can new procedures be designed.

Future structures and/or construction equipment were not evaluated as part of this study. These must be submitted separately in accordance with 14 CFR Part 77.

This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making the determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA) and known natural objects within the affected area would have on the airport proposal. This aeronautical study was not circulated to the public for comments.

The FAA cannot prevent the construction of structures near an airport. The airport environs can only be protected through such means as local zoning ordinances, acquisitions of property in fee title or aviation easements, letters of agreements, or other means. This determination in no way preempts or waives any ordinances, laws, or regulations of any government body or agency.

This aeronautical study was not circulated to the public for comments.

RESOLUTION NO. 94566-1218

RESOLUTION APPROVING THE AIRPORT LAYOUT PLAN

WHEREAS, the City Council of Muscatine, Iowa, does hereby deem the Airport Layout Plan (ALP) as complete and acceptable, and;

WHEREAS, the City Administrator is hereby authorized and directed to take the necessary steps to execute any ministerial conditions of the approval of the ALP, and;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MUSCATINE, IOWA, that the resolution accepting and the ALP by the City is hereby approved.

CITY COUNCIL OF THE CITY OF MUSCATINE, IOWA

Diana Broderson, Mayor

ATTEST:

Gregg Mandsager, City Clerk

1. EXISTING CONDITIONS

1.1 GENERAL

The City of Muscatine retained Anderson Bogert to update the Muscatine Municipal Airport (MUT) Master Plan. The City received Federal Airport Improvement Program (AIP) funding to complete this project. The notice to proceed was issued on September 14, 2016.

On December 12, 2016, a Master Plan Development Stakeholders Meeting was held at the airport. The minutes from this meeting have been included in Appendix A, along with the attendee list.

The scope of this project includes updating the existing Airport Layout Plan (ALP) drawing set to meet current FAA standards, along with the accompanying Narrative Report. The ALP is a graphic representation of existing and future facilities at the airport. The Narrative Report provides supporting documentation and justification for future facilities shown on the ALP.

The importance of updating the ALP is demonstrated by the following requirement from the AIP Sponsor Guide:

> In order for a development project to be considered eligible for AIP participation, the improvement must be identified on an approved ALP.

This document is the Narrative Report for the Muscatine, Iowa, Municipal Airport. It features information on current and projected activity levels at the airport, facility requirements, alternatives and recommendations, and an implementation plan.

The following is the general procedure that will be utilized in developing the Narrative Report and Airport Layout Plan for Muscatine Municipal Airport.

> **Current and Projected Activity Levels –** Aeronautical demand is forecasted using historical and current information to project levels for short (1-5 years), intermediate (6-10 years), and long-range (11-25 years) timeframes.

Facility Requirements – The capability of the existing airport to support the forecast demand is determined. Facilities required to meet the airport's ultimate needs are determined.

Implementation Plan – A proposed plan for development is presented, which includes concepts and schedules for proposed development.

This Narrative Report will provide an assessment of the general aviation needs of the Muscatine and Muscatine County area. The goal of this Narrative Report is to determine how to best accommodate these needs in a responsible and economical manner. The Narrative Report will provide analysis and recommendations from which local authorities may take action to continue improvement to the operation of the airport.

1.2 Iowa Aviation System Plan

The state has 109 publicly owned airports and seven privately owned airports, which are divided into a five-level system in the 2010-2030 Iowa Aviation System Plan, which can be viewed at http://www.iowadot.gov/aviation/studiesreports/systemplanreports.html.

These levels include commercial service airports (8), enhanced service airports (15), general service airports (30), basic service airports (19), and local service airports (44). The Muscatine Municipal Airport Aviation System Plan Individual Airport Report has been included in Appendix B.

The Muscatine Municipal Airport is considered an enhanced service airport. Enhanced Service airports have runways 5,000 feet or greater in length, with facilities and services that can accommodate a full range of general aviation activity, including most business jets. These airports serve business aviation and are regional transportation centers and economic catalysts. Specific criteria for this role include:

- 5,000 foot or greater paved runway
- Airport Reference Code (ARC) of C-II or greater
- Full-time staffing during regular weekday and weekend business hours
- Airport or Fixed Base Operator (FBO) staffing 24 hours a day
- Availability of jet fuel
- Weather observing system located on airport (ASOS or AWOS)

* Availability of the following based services:
  - Aircraft maintenance and repair
  - Flight training
  - Rental aircraft
  - Aircraft charter

The primary goal of the system plan is to provide a framework that supports informed decisions related to planning and developing the Iowa aviation system. This framework consists of the following six goals: safety and security, infrastructure and user support, accessibility, economic support, planning, and education and outreach.

In comparing the existing Muscatine Municipal Airport facilities to the system plan objectives, the plan recommends the following six actions to meet the objectives and service targets:

- Create an airport emergency plan and update annually
- Create additional hangars to provide covered storage for all based aircraft
- Establish a regular communication program to inform interested parties on airport news and events through newsletters, press releases, web sites, and social media
- Coordinate with the FAA, industry associations, and other aviation organizations to host pilot safety programs
- Increase efforts to host annual aviation events such as fly-ins and air shows, public open houses, tours, conferences, meetings, and organized youth educational activities
- Provide based rental aircraft
- Provide based aircraft maintenance and repair

1.3 National Plan of Integrated Airport Systems (NPIAS)

The Muscatine Municipal Airport is a General Aviation Airport in the National Plan of Integrated Airport Systems (NPIAS). The NPIAS is a Federal Aviation Administration (FAA) report to the United States Congress which reviews and

considers recommendations on the status of the national airport system. It identifies the needs of the system to meet future demands and also identifies the role of each airport. The NPIAS also provides an estimated cost of maintenance to assure the airports will continue their role in the success of the national system.

The NPIAS plan identifies more than 3,400 existing and proposed airports that are significant to the national air transportation system. The NPIAS includes a section on the condition and performance of the airport system, highlighting six topics: safety, capacity, environmental, runway pavement condition, surface accessibility, and financial performance. The findings are generally favorable, indicating that the system is safe, convenient, well maintained, and largely supported by rents, fees, and taxes paid by users.

The Muscatine Municipal Airport is identified in the NPIAS as a nonprimary regional general aviation airport. Regional airports are typically near metropolitan areas and serve relatively large populations. The metropolitan areas in which regional airports are located can be metropolitan statistical areas with an urban core population of at least 50,000 or micropolitan statistical areas with a core urban population between 10,000 and 50,000. These airports support regional economies with interstate and some long-distance flying and have high levels of activity, including some jets and multiengine propeller aircraft.

The entire NPIAS report can be viewed online at https://www.faa.gov/airports/planning_capacity/npias/reports/

1.4 Regional Airport Significance

The function of the Muscatine Municipal Airport is to serve the general aviation needs of the Muscatine and Muscatine County area. General aviation includes every type of civil flying activity, but excludes certified air carriers. It is the largest and possibly the most significant element of the air transportation system in the United States today. General aviation aircraft constitute 97 percent of all civil aircraft in use, and general aviation airports comprise approximately 90 percent of all public-use airports nationwide. General aviation is a major contributor to the national air transportation system, the aviation industry, and our national economy.

General aviation activity provides a variety of aviation services that commercial aviation is unable to accommodate. This is a possible reason why industries in the United States have relocated to smaller communities away from larger

metropolitan areas. It is not the only factor, but a community's airport can be a principle consideration when potential industries evaluate a possible site location. Larger and more sophisticated aircraft are becoming popular with businesses and corporations. Smaller communities, such as Muscatine, need to provide the airport facilities to accommodate these aircraft to increase the economic attractiveness of their community.

1.5 AIRPORT BACKGROUND

The Muscatine Municipal Airport is a city-owned, public-use airport located six (6) miles southwest of the central business district of Muscatine, the County Seat of Muscatine County, Iowa. The airport covers an area of 692 acres and has two runways: 6/24 and 12/30.

1.6 Inventory and Description of Existing Facilities

1.6.1 Based Aircraft

Table 1-1

EXISTING BASED AIRCRAFT FROM VARIOUS SOURCES						
SOURCE	**SINGLE ENGINE**	**MULTI ENGINE**	**JETS**	**HELICOPTERS**	**GLIDERS**	**TOTAL**
FBO (2/22/2017)	24	4	1	1	4	34
FAA AIRPORT MASTER RECORD - 5010 (2/21/2017)	25	2	1	1	2	31
FAA TAF (YEAR 2017 IN 2016 NATIONAL FORECAST)	26	2	1	1	0	30
IOWA AVIATION SYSTEM PLAN (2010)	28	1	1	0	1	31
IOWA AVIATION SYSTEM PLAN (2004)	23	3	4	0	2	32
2001 ALP UPDATE						34
1993 ALP UPDATE						38
1988 AIRPORT MASTER PLAN	34	7	0	1	0	42

1.6.2 Existing Operations

Table 1-2

ANNUAL EXISTING AIRCRAFT OPERATIONS FROM VARIOUS SOURCES							
	ITINERANT				LOCAL		
SOURCE	AIR TAXI & COMMUTER	AIR CARRIER	GA	MILITARY	GA	MILITARY	TOTAL
FAA AIRPORT MASTER RECORD - 5010 (2/21/2017)	900	0	6,603	0	6,603	0	14,106
FAA TAF (YEAR 2017 IN 2016 NATIONAL FORECAST)	900	0	6,603	0	6,603	0	14,106
IOWA AVIATION SYSTEM PLAN (2010)							11,200
IOWA AVIATION SYSTEM PLAN (2004)			8,852		6,732		15,584
2001 ALP UPDATE	900		6,603		6,603		14,106
1993 ALP UPDATE			13,875		8,325		22,200
1988 AIRPORT MASTER PLAN			14,041		8,425		22,466

An original copy of the 5010 Master Record has been included in Appendix C, along with a copy of the Terminal Area Forecast for MUT and a copy of the Airport/Facilities Directory for MUT.

At the airport layout plan meeting held on December 12, 2016, attendees suggested reaching out to the military to assess if they would like additional use of the airport. Currently, the FAA Terminal Area Forecast and the Airport Master Record (5010) lists no military operations at MUT. However, the Iowa National Guard has a facility adjacent to the airport and leases the property from the City of Muscatine.

According to Greg Wilbur (563.391.3635) at the Iowa National Guard post in Davenport, this is how the National Guard uses MUT:

- They have used MUT on a regular basis out of Davenport since the 1970s.
- All the aircraft they fly out of Davenport are helicopters.
- They typically land on the apron at MUT; although, some of their helicopters have wheels and can land on a runway and then taxi to the terminal area.
- They use the northwest corner of Runway 12/30 for slope operation practice.
- They use MUT for sling load operation practice with concrete blocks.
- They estimate approximately 3,000 takeoffs and landings per year at MUT.
- 40% of the time, their flights are touch and go.
- This year, their Chinooks are deployed overseas, so they are reporting not as much usage of MUT, but they plan to come back.
- Their night vision goggles work well at MUT, since the airport is in a fairly isolated/dark area.
- The National Guard has a "fly neighborly program"; that's why they like to utilize MUT, since they do not receive any noise complaints.
- They utilize GPS, ILS, and VOR at MUT.
- The Muscatine Iowa National Guard post is a ground unit; therefore, they typically do not need direct aviation support. However, they do occasionally transport VIPs in and out of MUT. (The National Guard facility at Muscatine does not have a heliport pad.)
- The nearest National Guard aviation unit is based out of Davenport, and MUT is in the Davenport traffic pattern; therefore, MUT is in a favorable location for their practice flights.

According to Mr. Wilbur, the Iowa National Guard will continue to use MUT as they have in the past; however, he does not anticipate any expanded usage.

1.6.3 Atmospheric Conditions

Local weather conditions have a significant role in the planning and development of an airport. Temperature, wind direction, and speed are influential components in deciding runway length and optimum runway orientation.

Muscatine has a temperate climate with a long-term mean annual precipitation of about 37 inches and an average snowfall of 26 inches. Average temperatures range from a low of 15 degrees during the winter, to a high of 86 degrees during the summer. It is important in airport planning to note the mean daily maximum temperature of the hottest month for Muscatine is 86°F. This information will help determine the optimal runway lengths in the Section Three, Facility Requirements.

FAA AC 150/5300-13A, Airport Design, recommends crosswind runways should be made available when the primary runway orientation provides less than 95 percent wind coverage for any aircraft forecast to use the airport on a regular basis. The 95 percent wind coverage is based on a cross wind not exceeding 10.5 knots (12 mph) for categories A-I and B-I, 13 knots (15 mph) for category B-II, and 16 knots (19 mph) for category C-II.

Wind data specific to Muscatine is available and that data, from years 2007 through 2016, was used for the wind coverage analysis. The following table summarizes the wind coverage for the Muscatine Municipal Airport.

Table 1-3

WIND COVERAGE								
RUNWAY	ALL WEATHER				IFR CONDITIONS			
	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
6/24	87.78%	92.90%	97.66%	99.48%	90.47%	94.27%	97.87%	99.41%
12/30	92.44%	95.85%	98.67%	99.69%	92.38%	95.63%	98.40%	99.45%
COMBINED	97.55%	99.31%	99.84%	99.98%	97.96%	99.33%	99.75%	99.93%

Source: National Climatic Data Center

Wind Rose diagrams for the Muscatine Municipal Airport are included on the Airport Layout Plan.

1.6.4 Pavement

- **Runway 6/24**
  - In 1981, Runway 6/24 was increased in width from 60 feet to 100 feet and in length from 4,000 feet to 4,700 feet. The runway strength was rated at 28,000 pounds single wheel loading.
  - In 1994, the existing runway was extended by 800 feet to the southwest to 5,500 feet in length.
  - In 2016, the runway was reconstructed with 8 inch Portland Cement Concrete (PCC) over a 6-inch recycled concrete aggregate base course.
  - Runway 24 and Runway 6 have approach procedures for aircraft categories A, B, C, and D.
- **Crosswind Runway 12/30**
  - In 1988, Runway 12/30 was 2,726 feet in length by 55 feet in width.
  - In 1999, Runway 12/30 was offset to the northeast by approximately 300' and was moved longitudinally to the northwest. The runway was reconstructed with 6 inch Portland Cement Concrete (PCC) over a 6-inch aggregate base course to a length of 4,000' and a width of 75'.
  - According to the 2014 Iowa Department of Transportation (DOT) Pavement Management Report, which can be viewed at http://www.iowadot.gov/aviation/pavementmanagement/data/documents/docs_reports/muscatine_report_2014.pdf, the average Pavement Condition Index (PCI) of the runway 12/30 pavement was 91. The inspection comments stated that runway 12/30 exhibited medium and high severity joint seal damage throughout, with isolated amounts of low severity small patching, low severity joint spalling, and medium severity corner spalling.
  - Runway 12 and Runway 30 have approach procedures for aircraft categories A and B.

- **Taxiways**
  - Both runways have parallel taxiways, and all taxiways are 35' wide.
  - The 2014 Iowa DOT report indicated the Runway 6/24 parallel taxiway had an average 85 PCI rating.
  - The connecting taxiways to Runway 6/24, within its runway safety area, were reconstructed with the runway project in 2016.
  - The Runway 12/30 connecting taxiway, Taxiway B1 was constructed in 1999. This taxiway has a PCI rating of 93.
  - The runway 12/30 parallel taxiway was constructed in 2009, along with connecting Taxiway B2. These taxiways have a PCI rating of 97.
- **Apron**
  - The apron was reconstructed in 1992. The pavement section is 7" PCC pavement over a 6" aggregate base course. Approximately 22,472 square yards of PC concrete apron area and 5,620 square yards of asphalt apron area.

  - The 2014 Iowa DOT report indicated the apron had an average 93 PCI rating.
  - Eight tiedowns available
  - The apron provides space for aircraft refueling, itinerant aircraft parking, and access to the tee hangar area and to the conventional hangars.

1.6.5 Visual and Navigational Aids (NAVAIDS)

- **Lighting**

  - Runway 6/24 and Taxiway A have medium intensity edge lights that were installed in 2011. The signs were replaced in 2016.
  - Runway 12/30 and Taxiway B have medium intensity edge lights that were installed with their respective paving projects, along with signage.
  - Runway End Identifier Lights (REILs) are operational on Runway 6/24 and Runway 12/30.

- **Airfield Aids**

  - Lighted Wind Indicator
  - Rotating Beacon (recently rehabilitated)
  - Pavement Markings - Precision on Runway 6/24 and non-precision on Runway 12/30.

- **Navigational Aids**

  - The non-Directional Beacon (NDB) is still in place, but is no longer operational.

- A list of NAVAIDs and ownership are provided in Table 1-4 below:

Table 1-4

NAVAIDS		Runway	Owner
Acronym	**Facility**		
ABN	Beacon	All	City
AWOS	Automated Weather Observing System - All Weather Unit IIIP	All	City
GS	Glideslope	24	FAA
LOC	Localizer	24	FAA
MALSR	Medium Intensity Approach Lighting System with Runway Alignment	24	FAA
PAPI	Precision Approach Path Indicator	24, 12, 30	FAA (24), City (12/30)
REIL	Runway End Identifier Light	6, 12, 30	FAA (6), City (12/30)
VASI	Visual Approach Slope Indicator	6	FAA
VOR	VHF Omnidirectional Range	6	FAA
	Runway Lights & Signs	All	City
	Taxiway Lights & Signs	All	City
	Wind Cone	All	City

1.6.6 Landside Facilities

- **Terminal Building**
  - Reconstructed in 2005
  - Approximately 5,900 square feet

- **Aircraft Hangars**
  - Four (4) corporate-style hangars
  - One (1) municipal hangar
  - Twenty (20) tee hangars (all within the 45 to 65-year-old range)

- **Fuel Facilities**
  - 100LL
  - Jet A
  - No self-serve

- **Vehicle Parking**

  - PC Concrete pavement, except for spaces adjacent to the northerly corporate hangar, which are asphalt.

  - Twenty-two (22) parking spaces in terminal building parking lot southeast of building, along with six (6) parking spaces north of the building. Six (6) spaces adjacent to westerly corporate-style hangar. Twelve (12) spaces adjacent to northerly corporate-style hangar.

- **Access to Airport Facilities**

  - Public access to the airport terminal building is provided by an entrance off Highway 61 with a dedicated westbound right turn lane. Highway 61 is a four-lane facility that provides access from downtown Muscatine, Interstate 80 via Iowa Highway 38, and Interstate 280.

  - Access to the westerly hangar area is provided by a separate entrance off Highway 61, which is shared with the Iowa National Guard. This entrance is gated and requires a card key for entry.

  - The airport has a perimeter security fence that has four additional locked gated entrances, which are used by FAA and City employees for airport maintenance purposes.

- **Utilities/Drainage**

  - The City provides water service to the airport; a fire hydrant is located at the main airport entrance.
  - The City provides sewer service to the airport; a lift station is located to the southeast of the terminal building.
  - Drainage within the main apron area is provided via three intakes and connecting storm sewer (reinforced PC concrete pipe) that outlets into a detention pond to the northwest of the apron. Additional intakes and storm sewer (PC concrete pipe) exist along the third row of T-hangars; these also outlet into the same detention pond. An oil water separator exists at the outlet to the detention pond. The areas between the runways and their parallel taxiways are drained by reinforced PC concrete culverts.

- **Snow Removal Equipment**

  - 2009 M2 106V Conventional Chassis Freightliner Truck VIN #: 1FVDC3DJX9HAH3066.
  - 14-foot Reversible Plow Henke 50R14TTP equipped with pneumatic tire running gear. Serial #12406.

  - 11-foot Power Reversible Plow red Henke 41R111S.
  - 2010 John Deere 7830 165 HP Tractor.
  - Pick-up Truck with 7'-6" Western plow.

- **Existing Services provided by the Fixed Base Operator (FBO)**
  - Fuel
  - Aircraft Maintenance and Repair
  - Charter Services
  - Pilot Instruction
  - Aircraft Rental and Sales
  - Tee Hangar Rental
  - Pilot Lounge & Snooze Room
  - Conference Room
  - Rest Rooms/Shower
  - Wireless Internet
  - Weather Computers
  - Crew Cars

1.7 Description of Regional Setting and Land Use

1.7.1 Geographic Service Area

The City of Muscatine is located in Muscatine County Iowa, adjacent to the Mississippi River. The community is approximately 150 miles east of Des Moines, Iowa. Access to the Muscatine Municipal Airport is provided by U.S. Highway 61.

The Muscatine Municipal Airport Service Area coincides, for the most part, with the geographical area of Muscatine and Louisa Counties. However, the northern most townships within Muscatine County lie within a fringe area that is served by airport facilities located in Iowa City, Davenport, and Moline. Consequently, the service area may be defined in terms of a primary and secondary (fringe) service area. The primary airport service area is defined as that geographic area where a majority of the general aviation traffic originates from.

1.7.2 Competing Airports

Area public owned general aviation airports are located in:

- Burlington
- Davenport
- Iowa City
- Mount Pleasant
- Tipton
- Washington

The extent of facility development at each of the public owned airports is summarized below:

Table 1-5
Facility Development at Neighboring Airports

Burlington

RWY	SURFACE	WIDTH	LENGTH	RWY LGTS
12/30	CONC	100	5,350	MIRL
18/36	ASPH-CONC	150	6,702	HIRL

Davenport

RWY	SURFACE	WIDTH	LENGTH	RWY LGTS
03/21	CONC	100	4,001	MIRL
15/33	CONC	100	5,511	HIRL

Iowa City

RWY	SURFACE	WIDTH	LENGTH	RWY LGTS
07/25	CONC	100	5,004	MIRL
12/30	CONC	75	3,900	MIRL

Mount Pleasant

RWY	SURFACE	WIDTH	LENGTH	RWY LGTS
03/21	TURF	120	1,965	NONE
15/33	ASPH	75	4,001	MIRL

Muscatine

RWY	SURFACE	WIDTH	LENGTH	RWY LGTS
06/24	CONC	100	5,500	MIRL
12/30	CONC	75	4,000	MIRL

Tipton

RWY	SURFACE	WIDTH	LENGTH	RWY LGTS
11/29	CONC	60	3,000	MIRL

Washington

RWY	SURFACE	WIDTH	LENGTH	RWY LGTS
13/31	CONC	60	3,400	MIRL
18/36	CONC	75	4,000	MIRL

1.7.3 Local Ordinances

The airport lies within the A-P Airport Zoning District, which is defined in Title 10 of the City Code and can be viewed online at http://muscatineiowa.gov/DocumentCenter/View/12143. The zoning regulations for this district do address height restrictions and restrict the use of land within the vicinity of the airport. The zones established in the code are illustrated on the Muscatine Municipal Airport Zoning Map, consisting of two (2) sheets and dated October 16, 1975, which have been included in Appendix D.

The City's height zoning ordinance dates back to 1976. Since that time, the airport instrument landing system has been added, which changed many of the imaginary surfaces for the main runway. Also, since that time, the crosswind runway was relocated. Therefore, it is likely this ordinance needs to be updated. In addition, the airport's imaginary surfaces extend out into Muscatine County, Louisa County, and the City of Fruitland; these entities do not have airport specific height zoning ordinances.

The City currently has a grant from the Iowa Department of Transportation to update these four (4) ordinances and has a contract with Anderson Bogert to complete these zoning ordinance updates. It is anticipated that this separate zoning ordinance update project will start as the Airport Master Plan project is entering its final stages and will take approximately one year to complete.

The Boards and Commissions Section (Title 2) of the City Code (effective July 1, 2015) provides for a Planning and Zoning Commission and an Airport Advisory Commission.

The City's website provides the following information about those commissions:

Planning & Zoning Commission
5-year terms; 7 members appointed by the Mayor
Meetings are held the 2nd Tuesday of the month at 5:30 PM at the City Hall Council Chambers

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Rochelle Conway

Jody Hansen

Wendi Ingram

Gary Mowl

Steve Nienhaus

Jordan Pahl

John Sayles

Airport Advisory Commission
5-year terms
Meetings are held the 4th Monday of the month, as needed, at 5:00 PM at the Airport Terminal Building

---

Jerry Page

Bill Leddy

Scott Natvig

Steven Bradford

Stacy Lewis

This ALP update marks the first step in establishing appropriate airport zoning. The ALP depicts the land the airport should own in fee, as well as land for which easements may be necessary. The airspace drawing shows obstructions to navigation and indicates areas that may need to be regulated in order to prevent or remove such obstructions. The Part 77 imaginary surfaces shown on this drawing should be protected through height limitations on development both on and around the airport and especially in the approach areas and departure areas of the runways. The FAA has developed Advisory Circular AC 150/5190-4A "A Model Zoning Ordinance to Limit the Height of Objects Around Airports" for this purpose. This advisory circular can be viewed at the FAA Central Region website at the following link:

https://www.faa.gov/documentLibrary/media/advisory_circular/150-5190-4A/150_5190_4A.PDF

Also, the Iowa Department of Transportation Office of Aviation has developed the Iowa Airport Land Use Guidebook, which is an excellent reference for establishing appropriate airport zoning. It can be viewed at:

http://www.iowadot.gov/aviation/studiesreports/compatibleland.html

1.8 SOCIOECONOMIC DATA

There are many factors that can be evaluated to give an indication of future demands on an airport facility. Past aviation trends can sometimes be extrapolated to indicate future activity. Trends in demographics such as population and economic factors can be important indicators. As the population and/or economy grow, so does aviation activity. Conversely, as the population and/or economy decline, aviation activity decreases. The perceptions and expectations of the airport users can also provide important insight into the future of the airport.

Since so many factors play a part in the direction future demand may take, it must be remembered a forecast is still only a general prediction of what can be anticipated to occur. For this reason, long-range planning must incorporate some flexibility to respond to actual activity.

1.8.1 Population

Since 1995, Muscatine County has shown a steady increase in population, along with the State of Iowa. Table 1-6 shows historic and projected population figures for the City of Muscatine, Muscatine County, and the State of Iowa.

Table 1-6

POPULATION			
YEAR	MUSCATINE	MUSCATINE COUNTY	STATE OF IOWA
1970	22,410	37,310	2,830,460
1975		39,800	2,880,690
1980	23,470	40,590	2,915,500
1985		40,420	2,829,750
1990	22,880	39,970	2,781,020
1995	23,330	41,440	2,867,370
2000	22,920	41,790	2,929,070
2005		41,890	2,964,450
2010	22,886	42,760	3,050,300
2015	23,819	43,020	3,117,430
2020		43,770	3,181,320
2025		44,500	3,244,950
2030		45,160	3,304,940
2035		45,630	3,353,560
2040		45,910	3,388,650
2045		46,020	3,412,990
2050		46,010	3,430,440

Source: Woods and Poole Economics, Inc.

Muscatine is conveniently located at a focal point of numerous different modes of transportation for both commuters and freight travel. These include Interstate 80, U.S. Highways 61 and 6, and State Highways 22 and 38, which all provide regional commuting options for the growing workforce. Muscatine's location also benefits from easy access to the Muscatine Municipal Airport, the Canadian Pacific Railroad service, and freight service on the Mississippi River and its connecting waterways. The 300-mile market radius includes the seven major metropolitan areas of Chicago, Indianapolis, Kansas City, Milwaukee, Minneapolis-St. Paul, Omaha, and St. Louis, with a total population of nearly 39 million.

1.8.2 Employment

Employment levels correlate well with aviation activity. Historic total employment for Muscatine County and for the State of Iowa have established positive trends.

Table 1-7 shows historic and projected total, service, and manufacturing employment figures for Muscatine County and the State of Iowa.

Table 1-7

	TOTAL EMPLOYMENT		SERVICE EMPLOYMENT		MANUFACTURING EMPLOYMENT	
YEAR	MUSCATINE COUNTY	STATE OF IOWA	MUSCATINE COUNTY	STATE OF IOWA	MUSCATINE COUNTY	STATE OF IOWA
1970	17,590	1,294,610	2,740	176,250	5,030	212,550
1975	20,490	1,406,930	3,070	198,030	5,910	224,190
1980	22,830	1,536,820	2,540	235,190	7,230	239,100
1985	22,900	1,495,080	2,740	259,720	7,580	199,700
1990	24,390	1,634,990	1,250	301,300	8,120	231,590
1995	25,840	1,784,930	1,160	344,290	7,320	245,580
2000	27,640	1,913,420	1,660	387,310	8,140	255,680
2005	28,000	1,934,810	1,490	414,490	7,860	234,910
2010	26,320	1,945,120	1,710	425,730	6,690	206,670

	TOTAL EMPLOYMENT		SERVICE EMPLOYMENT		MANUFACTURING EMPLOYMENT	
2015	28,000	2,060,010	2,010	458,380	7,650	226,860
2020	29,380	2,186,160	2,300	488,180	7,930	233,460
2025	30,500	2,299,530	2,600	519,720	8,020	234,690
2030	31,430	2,401,080	1,990	550,520	8,030	233,510
2035	32,180	2,490,150	2,240	578,870	8,000	231,210
2040	32,810	2,569,690	2,480	606,510	7,940	228,190
2045	33,340	2,642,300	2,690	633,900	7,860	224,730
2050	33,780	2,708,910	2,890	660,210	7,770	220,940

Source: Woods and Poole Economics, Inc.

In 1892, after a nationwide investigation, H.J. Heinz Company decided to locate one of their principal canning plants in Muscatine, which represented the company's first expansion outside of Pittsburgh. The numerous additions made to the plant since that time now make it the largest Heinz plant outside of Pittsburgh and the largest canning plant between the Mississippi River and the Rocky Mountains.

Due to its rich soils, Muscatine is well known for producing some of the highest quality agricultural products in the world, with the Muscatine Melon being perhaps the most famous.

Muscatine is home to HNI (HON Corporation) and Bandag, which both began in Muscatine as small businesses. HNI is now a leading global provider of office furniture, while Bandag is now a part of Bridgestone, the world's largest manufacturer of tires and other rubber products.

Other companies have major facilities in Muscatine, and a number of these small and medium sized companies have become known nationally and internationally for their products.

Major employers in the City of Muscatine are shown in Table 1-8, along with the number of employees:

Table 1-8

Company Name	Number of Employees
HNI Corporation/The HON Company, Allsteel*	3,600
Grain Processing/Kent Feeds*	900
Muscatine Community School District	855
Trinity Muscatine (formerly Unity Health Care)	485
Hy-Vee Food Store	430
Monsanto Company	400
Heinz, USA	370
Musco Sports Lighting*	320
Wal-Mart Superstore	325
Muscatine Power & Water	290
Stanley Consultants	280
City of Muscatine	225
Raymond-Muscatine, Inc.*	285
Bridgestone Bandag LLC*	200
Muscatine County	200
Carver Pump Company	100
TOTAL	**9,265**

Source: City of Muscatine, Iowa Community Profile

*Local businesses with airport needs/past airport needs/potential future airport needs include: HNI Corporation, Grain Processing/Kent Feeds, Wittich-Lewis Funeral Home, Meeker Farms, Carver Aero, American Engineering, Raymond-Muscatine, Musco Sports Lighting, and Bridgestone Bandag.

Due to its robust and diverse economy, Muscatine placed in the top four percent among Micropolitan Statistical Areas in economic strength ranking in 2016, as determined by the Policom Corporation. The City's ranking climbed from 419th in 2004 to 21st in 2016, among 536 Micropolitan Statistical Areas. Policom examines 23 different economic factors when determining the rankings.

According to a 2014 study by the University of Iowa Marketing Institute, even though Muscatine is the headquarters for many well-known companies, the City did not appeal as a place to live for a significant portion of people employed by these companies, which led to import commuting. The City and local business leaders have been very concerned with this phenomenon and have begun to invest a great deal of resources to make the City a more attractive and self-contained community. The referenced study, Muscatine: Insights and Rebranding Recommendations, has been included in Appendix E.

Focus group members from the study indicated that a strength of Muscatine was availability of employment opportunities. They elaborated by saying that Muscatine companies provide a great environment to work in and that employers take good care of their employees.

One of the weaknesses identified by the focus group was lack of hotel options. In September 2015, construction crews broke ground on the $42 million Merrill Hotel and conference center in downtown Muscatine. The six-story hotel, which is expected to be completed by December 2017, will have 122 rooms, along with 13,500 square feet of conference room space and expects to bring in anywhere from 70 to 80 people per night. In the past, most of the larger Muscatine corporations held their shareholder and board meetings at venues outside the City. Once the new hotel and convention center are complete, the corporations are expected to move these meetings inside the City.

A study completed by PKF hotel experts, a leading hotel consultant, and reviewed by two independent economists from the University of Iowa and the University of Georgia, indicates the hotel will have a significant economic impact, as summarized below.

* Summary of Merrill Hotel Economic Impact:
  - On State of Iowa from Construction = $81 Million/548 jobs
  - On Muscatine County from Construction = $19 Million/100 jobs
  - On Muscatine County from Hotel Operations = $13 Million over 10 years/ 83 jobs
  - On City of Muscatine
    - Hotel Occupancy Tax Revenues: $8 Million/20-year span
    - Hotel Tax Revenues: $5.5 Million/10-year span
    - Projected Tax Revenues: $4.5 Million/20-year span

* Port of Muscatine
  - On another economic development note, the City of Muscatine is studying the feasibility of building a container port facility; the study is funded by an Iowa DOT LIFTS grant (Linking Iowa's Freight Transportation System), along with a match from Kent Corporation. Muscatine was one of six projects funded out of 25 total LIFTS Grant applications received by the Iowa DOT. The LIFTS program aims to fill voids in the multimodal funding system by assisting in strengthening the freight transportation system by using truck, train, barge, airplane, or other modes. With Iowa being a producer state, products grown or made in Iowa travel on multiple modes of transportation throughout the United States and the world.

    This project will help strengthen the economic well-being of Muscatine, Muscatine County, and all of Eastern Iowa and Western Illinois by ensuring efficient, diverse, and economical freight transportation options for area businesses, with extended access to world markets. Currently, no intermodal container facilities exist north of St. Louis on the Mississippi River.

1.9 SUMMARY

The information discussed in Section One establishes the foundation for this plan upon which the remaining components of the airport planning processes will be developed. Information on the basic existing conditions of the airport and local community affect the use of the airport and are important when projecting future activity and facility requirements. Notably, population, total employment, manufacturing employment, and service employment are all expected to grow within the twenty-year planning period, both in Muscatine County and in the state of Iowa. Employment levels correlate well with aviation activity and will be used to help project future aviation activity and the resulting facility requirements.

2. CURRENT AND PROJECTED AVIATION ACTIVITY

This section reviews the past and current aviation activity and develops forecasts which define future air transportation demands for the Muscatine Municipal Airport. These forecasts will be the foundation for identifying the facility requirements to meet the aviation needs of Muscatine and the surrounding area.

This section will examine local and regional aviation trends; it is the analysis of these trends and other important influences that will form the underlying decision in the development of forecast models.

2.1. FORECASTING APPROACH

Information at the local, regional, and national levels is needed for the understanding of historical aviation trends and the forecasting of facility requirements demands. Aviation demand forecasts are developed by combining these past trends in aviation activity, the aviation industry, and the local perception of the airport and its activity. Past trends include information on based aircraft, recorded operations, and operational mix. Analyzing these trends is the initial process of developing aviation demand forecasts.

The second process of demand forecasting is to project the trends into the future using various techniques and assumptions. These projections will form a range of tendencies in which the actual growth should be identified. These tendencies may be altered by possible changes in employment, aviation, and/or new construction in the region and around the airport. Employment opportunities, especially service industries and manufacturing, can have a large impact on aviation activity. The expansion or removal of an industry can essentially shift the level and nature of aviation demand in a community, like Muscatine. New legislation and advances in aviation technology can also alter these aviation trends.

Aviation forecasts should only be used as general indication of future demand. There are many factors that may have a tendency to be altered; any one can change aviation trends. Variations in the demand forecast should be expected, anticipated, and airport decisions need to have some flexibility in order to respond to actual activity and changes in aviation.

2.2. Designating a Forecast Model

Selecting the appropriate forecast model is possibly the most important factor in determining future aviation activity. Trends such as population, employment, based aircraft, aircraft operations, and airport user beliefs need to be analyzed. Forecast models can then be compared and contrasted and a suitable methodology and technique can be chosen.

A trend line projection model has been selected for Muscatine Municipal Airport based on the information available. This model is possibly the simplest and most familiar technique used in airport planning and also has very reliable predictions when compared to the other types of projections. Trend line projections utilize historic trends to develop growth curves and extend them into the future. This technique does not take into account any unforeseen exterior influences; rather, this technique makes projection based solely on past trends.

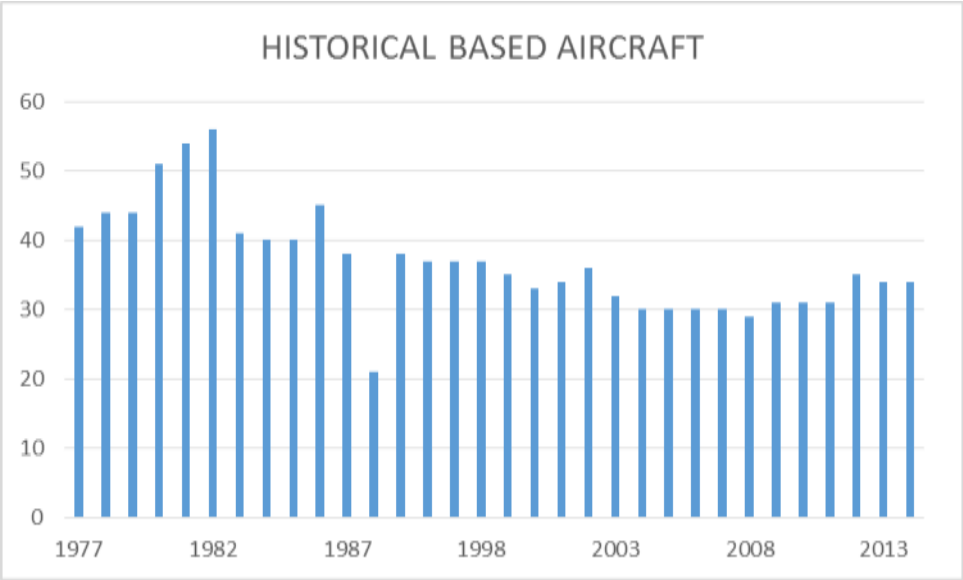
2.3. Air Traffic Activity

Air traffic activity is an important factor in determining the appropriate types of facilities which should be planned for the Muscatine Municipal Airport. These factors include based aircraft, aircraft operations, and information on the current and projected use of the airport.

2.3.1. Based Aircraft

The historic based aircraft information from 1999 to 2013 for the Muscatine Municipal Airport was obtained from the Iowa Department of Transportation. This data was supplemented with data from the 1988 Master Plan report and the 1993 Airport Layout Plan Narrative Report and is summarized in the following chart.

Table 2-1



Source: Iowa Department of Transportation Office of Aviation, 1988 Master Plan Report, and 1993 ALP Narrative Report

As of 2/22/2017, the Fixed Based Operator (FBO) reported thirty-four (34) based aircraft at the Muscatine Municipal Airport. These aircraft include one (1) helicopter, four (4) multi engine, one (1) jet, four (4) gliders, and twenty-four (24) single engine. The following table exhibits information about these based aircraft:

Table 2-2

DETAILED BASED AIRCRAFT		
AIRCRAFT	N-NUMBER	HANGAR LOCATION
2013 Cessna TTX	N101FR	4
2002 Zenith Zodiac (experimental)	N1095J	15
2002 Gulfstream 200 (jet)	N110WA	
Glider	N126MD	
1982 Cessna 182R	N2427E	14
Glider	N2521X	
1965 Cessna 310 (twin engine)	N3048L	8

DETAILED BASED AIRCRAFT		
AIRCRAFT	N-NUMBER	HANGAR LOCATION
1980 Piper Warrior	N394DS	7
1967 Piper Cherokee 6	N3991W	3
Glider	N414KR	
1983 Piper Saratoga	N42942	22
1975 Cessna 150M	N45327	27
1944 Beech Staggerwing	N4612N	31
1977 Piper Archer	N47786	2
1979 Cessna 172N	N5279G	6
1981 Cessna 172P	N53437	24
1974 Piper Warrior	N544CA	21
1993 Lear 60 (jet)	N588BA	
2016 Cessna Citation XLS+ (jet)	N62WA	28
1975 Cessna 172M	N64340	5
2005 Lancair	N654P	23
1981 Mitsubishi MU-2 (turboprop)	N68CL	29
1960 Cessna 175A	N7068E	19
1946 Luscombe 8A	N71306	16
1957 Piper Tri Pacer	N7422D	12
1957 North American T-28	N75947	30
Glider	N7644	
2000 Aviat Huskey	N76HY	13
1946 Piper Super Cruiser	N7847H	10

DETAILED BASED AIRCRAFT		
AIRCRAFT	N-NUMBER	HANGAR LOCATION
2001 Raytheon Hawker 800Xp (jet)	N793RC	
1970 Cessna 177RG	N8007G	20
1992 Beech Baron (twin engine)	N8123N	9
1982 Cessna Citation II (jet)	N82ML	
2001 Skystar Kitfox Classic (experimental)	N927CW	18

Source: Muscatine Fixed Base Operator on 12/9/2016

In determining the average annual growth rate to use at the Muscatine Municipal Airport to forecast the based aircraft over the 20-year planning period, the growth rates in the following table were considered. These rates range from 0% to 3.39% and average to 1.33%.

Table 2-3

AVERAGE ANNUAL GROWTH RATE SUMMARY	
SOURCE	Annual Average Growth Rate
1987 MUT ALP	3.39%
1993 MUT ALP	2.76%
2001 MUT ALP	1.65%
Iowa Aviation System Plan 2010-2030	1.25%
Total Employment 2015-2040	0.64%
Service Employment 2015-2040	0.89%
FAA Terminal Area Forecast 2016	0%
FAA Aerospace Forecast 2017-2037 Total General Aviation Fleet	0.10%
FAA Aerospace Forecast 2017-2037 General Aviation Hours Flown	0.90%
FAA Aerospace Forecast 2017-2037 General Aviation Aircraft Fuel Consumption	1.70%
Average	**1.33%**

Since a close correlation exists between employment and aviation activity, future-based aircraft are often projected to increase at a rate parallel to the projected increase of employment in an airport service area. In Muscatine, according to Woods and Poole, the average annual growth rate for total employment will be 0.64%, while the average annual growth rate for service employment will be 0.89%, over the 20-year planning period.

These two growth rates are much lower than those used in previous master plan studies at the Muscatine Municipal Airport and lower than the rate used in the Iowa Aviation System Plan. Since the City is expecting greater employment growth due to its overall economic strength rating and due to the specific projects discussed in Section One (Rebranding Muscatine initiative, Merrill Hotel, and the Port of Muscatine), the annual average growth rate of 1.25% used in the Iowa Aviation System Plan, which is very close to the average of the values in

the preceding table, will be used to forecast the based aircraft over the 20-year planning period at Muscatine.

Projected based aircraft are presented in the following table.

Table 2-4

PROJECTED BASED AIRCRAFT	
YEAR	*BASED AIRCRAFT using 1.25% Annual Growth Rate*
2016	*34*
2020	*36*
2025	*38*
2030	*41*
2035	*44*
2040	*46*

Source: Anderson Bogert and City of Muscatine

2.3.2. Aircraft Operations

An aircraft operation is a landing (arrival) or a take-off (departure) from an airport. Aircraft operations are difficult to quantify at airports without control towers, since continuous monitoring does not exist.

A commonly accepted method of projecting aircraft operations is to develop a ratio of operations to the number of based aircraft. In the Iowa Aviation System Plan, aircraft operations were projected by multiplying the forecasted number of based aircraft by an adopted Office of Aviation estimation guideline outlined in FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS). According to the system plan, this is an acceptable procedure to forecast operations where limited or no historical data may be available. In the system plan, airports with 31 to 99 based aircraft were assigned 350 operations per based aircraft.

The following table presents projected operation levels, using 350 operations per based aircraft.

Table 2-5

PROJECTED OPERATIONS			
YEAR	BASED AIRCRAFT using 1.25% Annual Growth Rate	OPERATIONS PER BASED AIRCRAFT	TOTAL
2016	34	350	11,900
2020	36	350	12,600
2025	38	350	13,300
2030	41	350	14,350
2035	44	350	15,400
2040	46	350	16,100

Source: Anderson Bogert and City of Muscatine

There are two types of operations associated with general aviation, local, and itinerant. In general, local operations are arrivals and departures of aircraft which operate in the local traffic pattern and are known to be arriving from within a 20-mile radius. Also, simulated instrument approaches or low passes are considered to be a local operation. Itinerant operations include all arrivals and departures other than local. The Fixed Based Operator estimates that itinerant operations account for approximately 50 percent of total operations.

2.4. Critical Aircraft and Reference Code

Future airport facilities at Muscatine need to be planned in such a manner they will safely accommodate anticipated aircraft operations in order to accomplish transportation and economic goals.

The designation of the appropriate Federal Aviation Administration Design Standards for the planning and development of the airport facilities is based primarily on the operational and physical characteristics of the aircraft expected to operate at the airport. The FAA defines the *Critical Design Aircraft* as the most demanding category of aircraft which makes 500 or more

operations per year. These 500 operations are required by the FAA to justify the construction of new or improved facilities. The *Airport Reference Code* (ARC) of the aircraft has important characteristics which related to its approach speed and size and are defined in two categories. The first component, depicted by a letter, is the *Aircraft Approach Category* (AAC)and relates to aircraft approach speed. The second component, depicted by a Roman numeral, is the *Airplane Design Group (ADG)* and relates to aircraft wingspan.

The types of facilities to plan for are based on these components and are characterized as:

Aircraft Approach Category (AAC)

Category A:	Speed less than 91 knots
Category B:	Speed between 91 knots and 121 knots
Category C:	Speed between 121 knots and 141 knots
Category D:	Speed between 141 knots and 166 knots
Category E:	Speed 166 knots or greater

Airport Design Group (ADG)

Group I:	Wingspan up to, but excluding 49 feet
Group II:	Wingspan 49 feet up to, but excluding 79 feet
Group III:	Wingspan 79 feet up to, but excluding 118 feet
Group IV:	Wingspan 118 feet up to, but excluding 171 feet
Group V:	Wingspan 171 feet up to, but excluding 214 feet
Group VI:	Wingspan 214 feet up to, but excluding 262 feet

Examples of aircraft in various ARC's are as follows:

- Small Airplane
  (An aircraft of 12,500 pounds or less maximum certified takeoff weight.)
  - A-I Beech Baron E55, Beech Bonanza A-36, Cessna 150, Cessna 177
  - B-I Beech Baron 58, Beech King Air B100, Cessna 402, Piper Navajo
  - B-II Beech King Air B200

- Large Airplane
  (An aircraft of more than 12,500 pounds maximum certified takeoff weight.)
  - B-I Gates Learjet 28/29, Rockwell Sabre 40, Rockwell Sabre 60
  - C-I Gates Learjet 24, Gates Learjet 25, Jet Commander, Westwind

- B-II Cessna Citation II, Cessna Citation III, Gulfstream I, Sabre 65
- C-II Gulfstream III, Rockwell Sabre 80

Source: FAA AC 150/5300-13. – Airport Design

Combining the critical aircraft's approach category and design group identifies a coding system which sets criteria for airport layouts. The aircraft approach speed relates to the runway and runway related facilities, while the aircraft wingspan relates to separation criteria involving taxiways and turnarounds. In order to develop this system, the ARC of the critical aircraft at Muscatine needs to be determined. This will enable the application of the airport design criteria.

The Iowa Aviation System Plan identifies the Muscatine Municipal Airport as an Enhanced Service airport, which has the following specific criteria:

- 5,000 foot or greater paved runway
- Airport Reference Code (ARC) of C-II or greater
- Full-time staffing during regular weekday and weekend business hours
- Availability of the following based services:
  - Aircraft maintenance and repair
  - Flight training
  - Rental aircraft
  - Aircraft charter
  - Airport or Fixed Base Operator (FBO) staffing 24 hours a day
  - Availability of jet fuel
  - Weather observing system located on airport (ASOS or AWOS)

The Iowa Aviation System Plan identifies fifteen airports in Iowa as Enhanced Service airports. All of these airports have an airport reference code of C-II, except for Ottumwa, which has a reference code of C-III. The following table summarizes based aircraft and operations for these airports based on their FAA Airport Master Record.

Table 2-6

Iowa Enhanced Service Airports						
Airport	Based Aircraft			Operations		
	Single Engine	Multi Engine	Jet	Local	Itinerant	Total
Ames Municipal	62	7	2	12,639	18,957	33,751
Ankeny Regional	86	9	5	19,440	29,160	48,600
Arthur N. Neu (Carroll)	11	4	0	3,910	3,123	7,700
Clinton Municipal	33	3	1	5,855	8,782	15,400
Council Bluffs Municipal	60	14	3	22,157	22,157	46,350
Davenport Municipal	88	12	3	12,160	14,567	28,251
Fairfield Municipal	17	2	2	3,737	3,078	7,700
Independence Municipal	30	2	0	5,297	2,638	9,100
Iowa City Municipal	70	7	7	3,700	13,100	19,287
Keokuk Municipal	16	3	0	3,949	3,645	8,050
Marshalltown Municipal	42	4	0	5,546	7,299	13,650
Muscatine Municipal	**26**	**2**	**1**	**6,603**	**6,603**	**14,106**
Newton Municipal	21	2	1	4,896	3,436	9,000
Ottumwa Industrial	24	5	6	7,102	9,348	16,450
Spencer Municipal	34	3	1	4,672	6,748	15,090

Source: FAA Airport Master Record

The FAA Airport Master Plans Advisory Circular states:

1. Short-term forecasts (up to 5 years) are used to justify near-term development and support operational planning and environmental improvement programs.
2. Medium term forecasts (6-10-year time frame) are typically used in planning capital improvements, and
3. Long-term forecasts (beyond 10 years) are helpful in general planning.

According to the Fixed Based Operator, the six jet aircraft shown on the Table 2-7 use the airport on a regular basis. The table also shows the FBO's estimate of percentage of the total jet operations by each aircraft.

In 2008, when the global financial crisis occurred, Muscatine temporarily lost some of its corporate jet traffic and corporate based jets. Before that time, Bandag (now Bridgestone Bandag LLC) had a 1993 Lear 60 (CI ARC) based at MUT, while HNI (HON Corporation) had two early 1990s Cessna 560 Citation V's (B-II ARC) based at MUT. With the new hotel/convention center opening soon in Muscatine, increased jet traffic (charter flights) and increased based jet aircraft are highly expected.

Table 2-7

JET OPERATIONS									
ID	**YEAR/ MAKE/ MODEL**	**ESTIMATED % OF JET OPERATIONS**	**AAC**	**ADG**	**TDG**	**APPROACH SPEED (KTS)**	**WINGSPAN (FT)**	**LENGTH (FT)**	**MTOW (LBS)**
N110WA	2002 Israel Aircraft Industries Gulfstream G200	12%	C	II	1B	125	58.0	62.0	35,360
N257H	1993 Gulfstream Aerospace G-IV	3%	C	II	1B	125	77.8	88.3	74,600
N588BA	1993 Lear 60	5%	C	I		125	44.0	59.0	23,500
N62WA	CESSNA CITATION XLS	71%	B	II	1B	106	55.8	51.8	20,000
N793RC	2001 Raytheon Hawker 800XP	6%	B	II		113	51.4	51.0	28,000
N82ML	1982 Cessna 550 Citation II	3%	B	II		108	51.7	47.0	14,800

Source: Muscatine Fixed Base Operator and FAA Aircraft Characteristics Database

Using the Appendix F data, approximately 88% of the jet operations are currently estimated to be by B-II aircraft, while 6% are by C-II aircraft, 4% are by B-I aircraft, and 2% are by C-I aircraft. The Fixed Based Operator estimated 80% of the jet operations to be by B-II aircraft, while 15% are by C-II aircraft and 5% are by C-I aircraft. The Fixed Based Operator's estimates are in reasonably close conformity with the FAA's TFMSC 2016 data for MUT, especially considering the closure of the main runway and the length modifications to the crosswind runway that occurred last year.

In reviewing the FAA TFMSC data for 2016, it was noted that many of the Airport Reference Code B-I and B-II operations at Muscatine were by aircraft that are not jets. The following table summarizes the FAA TFMSC 2016 operation data by Airport Reference Code (ARC), which is divided into Airport Approach Category (AAC) and Airport Design Group (ADG).

Table 2-8

FAA TFMSC DATABASE SUMMARY - 2016

AAC	ADG	# OF OPERATIONS (with Flight Plans)	% OF TOTAL OPERATIONS (with Flight Plans)
A	I	364	35.4%
A	II	5	0.5%
B	I	93	9.0%
B	II	533	51.5%
C	I	8	0.8%
C	II	22	2.1%
D	III	2	0.2%
UNK	UNK	8	0.8%
TOTAL		**1,035**	**100.0%**

Source: FAA TFMSC Database and FAA Aircraft Characteristics Database

The information in Table 2-8 will be used to form the basis for breaking down the overall projected operations into the individual Airport Reference Code (ARC) categories. The FAA TFMSC data will be the baseline for estimated itinerant operations, except for Category A-I. Since the majority of the operations at the

airport are by ARC A-I aircraft, any remaining operations will be assigned to that category. The following table summarizes the annual operations forecast by Airport Reference Code.

Table 2-9

ANNUAL OPERATIONS FORECAST BY AIRPORT REFERENCE CODE

	ITINERANT								LOCAL							
YEAR	A-I	A-II	B-I	B-II	C-I	C-II	D-III	UNK	A-I	A-II	B-I	B-II	C-I	C-II	D-III	UNK
2016	5,261	5	93	533	8	40	2	8	5,261	5	93	533	8	40	2	8
2020	5,567	5	98	564	8	45	2	8	5,567	5	98	564	9	45	2	8
2025	5,851	6	104	596	9	52	2	9	5,851	6	104	596	9	52	45	9
2030	6,332	6	112	643	10	61	2	10	6,332	6	112	643	10	61	2	10
2035	6,790	6	120	690	10	70	3	10	6,790	6	120	690	10	70	3	10
2040	7,091	7	126	721	11	81	3	11	7,091	7	126	721	11	81	3	11

Source: FAA TFMSC Database, FAA Aircraft Characteristics Database, FBO, and FAA Aerospace Forecast.

Please note for Table 2-9,

1. FBO estimates of C-II activity from 2015 have been used to adjust the baseline C-II operations to account for the runway closures in 2016.

2. The growth rate (3.0%) used for C-II operations was obtained from Table 29 of the FAA Aerospace Forecast, Fiscal Years 2017-2037.

3. An annual growth rate of 1.25% was used for all other categories, except A-I.

The ARC used when establishing existing safety dimensional criteria at Muscatine was DII, as shown on the 2001 FAA approved ALP.

Runway 24 has a precision approach, which means the minimum runway width = 100', which is also the width of the newly reconstructed runway (2016

construction). No matter if Aircraft Approach Category C or D is chosen in AC 150/5300-13A, Runway design standards matrix, the resulting runway width is 100'.

Currently, no DII aircraft are based at MUT or use MUT on a regular basis. DII aircraft are typically fast corporate jets and are very rare; in the FAA Aircraft Characteristics Database, only two aircraft out of 728 are listed as DII. In addition, according to the Iowa Aviation System Plan, only one airport in Iowa (presumably Muscatine) currently has the D-II Airport Classification. For these reasons, a C-II aircraft is a more realistic choice than a DII for the design aircraft and is consistent with the Iowa Aviation System Plan. C-II is also consistent with the 1988 Master Plan Study. As a comparison, the 1993 Airport Layout Plan Narrative Report listed the design aircraft as a large aircraft 60,000 pounds or less (no ARC given), while the 2001 Airport Layout Plan Narrative Report listed the design aircraft as a Learjet 35 (DI), which also represents a rare combination of AAC and ADG.

However, as shown in Table 2-9, it is estimated that less than 500 operations occurred in 2016 in the C-II category. By the FAA definition, to determine federal funding eligibility for new and improved facilities, at least 500 operations are required. Using that definition, the existing critical design aircraft category is B-II, since that category is estimated to have greater than 500 annual operations currently. Changing the airport critical aircraft design standards from C/D-II to B-II would reduce the size of the Runway Safety Area, the Runway Object Free Area, and the Runway Protection Zone. Since 1991, it is estimated that nearly $13,000,000 in federal funding has been spent on improvements to the Muscatine Airport to meet the C-II/D-II standards. And this estimate does not include the Instrument Landing System and related improvements. Decreasing the size of the safety dimensional criteria at MUT would not enhance or protect the sizable federal investment already made in MUT. In addition, since no site constraints exist in the vicinity of MUT to impede the implementation of the C-II/D-II safety dimensional criteria, we recommend maintaining the C-II/D-II safety dimensional standards at MUT for this ALP update by using the C-II family of aircraft as the Ultimate Critical Design aircraft.

The primary runway (6/24) has wind coverage of 92.9% for the 13 knot crosswind component (applicable to B-II aircraft), which is below the recommended 95% wind coverage. With the addition of the crosswind runway (12/30) to the analysis, the combined 13 knot wind coverage with the primary runway is 99.3%. Accordingly, the crosswind runway is necessary for safe operation of B-II aircraft and for smaller than B-II aircraft. According to the FBO, the crosswind runway is used by B-II aircraft, when the prevailing wind is in that direction. The FBO estimates that the prevailing wind blows along the crosswind runway alignment

approximately 65% of the time during the colder months and approximately 25% of the time during the warmer months. Those numbers average to approximately 50% of the time over the whole year, and judging from the FAA-provided TFMSC data, the B-II flights are spread throughout the year. Using the data in Table 2-9, Runway 6/24 currently experiences approximately 533 B-II flights per year, while Runway 12/30 also currently experiences approximately 533 B-II flights per year. Consequently, the B-II designation is justified for the crosswind runway, since the annual B-II operations are greater than 500.

The 2004-2024 Iowa Aviation System Plan estimated the annual instrument approaches for the Muscatine Airport to be 24% of the total itinerant operations. Using the estimated percentage in the System Plan, results in the following forecasted instrument approaches.

Table 2-10

ANNUAL INSTRUMENT APPROACHES			
YEAR	TOTAL OPERATIONS	ITINERANT OPERATIONS	ANNUAL INSTRUMENT APPROACHES
2016	11,900	5,950	1,428
2020	12,600	6,300	1,512
2025	13,300	6,650	1,596
2030	14,350	7,175	1,722
2035	15,400	7,700	1,848
2040	16,100	8,050	1,932

Source: Anderson Bogert and 2004-2024 Iowa Aviation System Plan

2.5. SUMMARY

Section Two has generated the future trends in various aviation demand categories that can be anticipated at the Muscatine Municipal Airport. Based aircraft are projected to increase from 34 in 2016 to 46 in 2040, and operations are projected to increase from 11,900 in 2016 to 16,100 in 2040. The existing critical aircraft is the B-II family, and the ultimate critical aircraft if the C-II family. Section Three will translate these forecasts and analyze the existing airport facilities to determine what facilities will need to be improved or added to accommodate the projected demand.

3. FACILITY REQUIREMENTS

3.1 AIRSIDE REQUIREMENTS

3.1.1 Airfield Capacity

The capacity of airfield facilities can be measured to identify and plan for additional development needs. A demand/capacity analysis shows the capacity of a single runway with a parallel taxiway far exceeds 150,000 annual operations. Runway 6/24 and Runway 12/30 both have parallel taxiways. Operations at Muscatine Municipal Airport are expected to remain well below this 150,000 annual operation level; therefore, further analysis is unnecessary.

3.1.2 Runway Orientation

The primary runway of an airport should be oriented as close as possible and practical in the direction of the predominant winds. This type of orientation will minimize the time a runway will be unusable due to strong cross winds. Muscatine Municipal Airport's primary runway, 6/24, is 5,500 feet long and is oriented in a southwest to northeast direction. Muscatine's crosswind runway, 12/30, is 4,000 feet long and is oriented in a northwest to southeast direction.

FAA AC 150/5300-13, Airport Design, recommends a crosswind runway when the main runway orientation provides less than 95 percent wind coverage for any aircraft forecasted to use the airport on a regular basis. The 95 percent wind coverage is based on a cross wind not exceeding 10.5 knots (12 mph) for categories A-I and B-I, 13 knots (15 mph) for category B-II, and 16 knots (19 mph) for category C-II.

Existing runway 6/24 has a 10.5-knot wind coverage of 87.8%, a 13- knot wind coverage of 92.9%, and a 16-knot wind coverage of 97.7%.

Existing runway 12/30 has a 10.5-knot wind coverage of 92.4%, a 13- knot wind coverage of 95.9%, and a 16-knot wind coverage of 98.7 %.

Both runways combined have a 10.5-knot wind coverage of 97.6%, a 13- knot wind coverage of 99.3%, and a 16-knot wind coverage of 99.8%.

Wind data specific to Muscatine is available and was used for this analysis. As required in the FAA ALP checklist, wind data from the latest 10 year period was obtained and utilized for the wind coverage analysis. A Wind Rose for the Muscatine Municipal Airport is included in the Airport Layout Plan.

In comparing the overall layout/orientation of Runway 12/30 and Runway 6/24 to current FAA design standards, specifically FAA AC 150/5300-13A, paragraph 304. Runway geometry, paragraph 3. Non-intersecting runways, the following runway safety area related issue has been identified: The Runway 30 runway safety area overlaps with the Runway 6/24 safety area, which is in conflict with this standard. According to the referenced AC, this condition should exist only at existing constrained airports, where non-overlapping safety areas are impracticable, which is the case at MUT, due to the location of the Muscatine Slough to the north. This situation will be discussed further in Part 3.1.3 Runway Length and Width and in Section 4, Alternatives.

No changes to runway orientation are proposed for the twenty year planning period.

3.1.3 Runway Length and Width

According to FAA Advisory Circular 150/5325-4B, Runway Length Requirements for Airport Design, required runway length is based on the following variables:

- Critical design aircraft.
- Airport elevation.
- Maximum difference in runway centerline elevation.
- Mean daily maximum temperature of the hottest month.
- Pavement surface conditions (wet or slippery vs. dry).

Aircraft performance decreases as runway elevation, runway gradient, and temperature increase.

At the Muscatine Municipal Airport, the ultimate critical design aircraft family for Runway 6/24 is C-II, the ultimate critical design aircraft family for Runway 12/30 is B-II, the existing airport elevation is 547.1 feet, the mean daily maximum temperature is 86.2°F, and the maximum difference in runway centerline elevation is 5.71 feet for Runway 6/24 and 7.38 feet for Runway 12/30. The runway surface is assumed to be wet and slippery; however, this variable only

applies to runways serving jet traffic. At Muscatine, jets use both Runway 6/24 and Runway 12/30 on a regular basis. Based on these variables, runway lengths recommended by the FAA Advisory Circular for various aircraft at the Muscatine Municipal Airport are as follows:

Small airplane with less than 10 passenger seats:

- 95 percent of these small airplanes ..... 3,200'
- 100 percent of these small airplanes ..... 3,800'

Small airplanes with 10 or more passenger seats ..... 4,200'

Large airplanes of 60,000 pounds or less:

- 75 percent of these large airplanes at 60 percent useful load ..... 5,400'
- 75 percent of these large airplanes at 90 percent useful load ..... 7,000'
- 100 percent of these large airplanes at 60 percent useful load ..... 5,500'
- 100 percent of these large airplanes at 90 percent useful load ..... 8,200'

The FAA accepts planning for runway length at 60 percent useful load, unless specific justification can be made for a need to plan for 90 percent useful load.

Of the large airplanes (greater than 12,500 pounds and less than 60,000 pounds) currently using MUT, seven of them fall within the 100 percent of fleet category listed in Table 3-2 of AC 150/5325-4B. Those seven include Bombardier 604 Challenger, Cessna 750 Citation X, Dassault Falcon 900C/900EX, Dassault Falcon 2000/2000EX, IAI Galaxy 1126 (Gulfstream 200), Learjet 60, and Raytheon/Hawker 800/800 XP.

For Federally funded projects, a minimum of 500 annual operations are required to justify consideration of funding an improvement. The current annual operations do not justify present improvements to the facility to accommodate C-II aircraft. Current operations only justify present improvements to accommodate B-II aircraft. While future/ultimate improvements can be planned to accommodate C-II aircraft, all new development and reconstruction of existing pavements will be required to be based on the documented operations at the time of the improvements.

The C-II classification of aircraft includes small jet and turboprop planes which require a 5,500-foot runway. Although it is desirable to plan for a facility that will continue to accommodate the C-II type aircraft, justification of 500 operations of the critical design aircraft or family of aircraft is required before any new development to the C-II standards can begin.

According to AC 150/5325-4B, the design objective for the main primary runway is to provide a runway length for all airplanes that will regularly use it without causing operational weight restrictions, which indicates a minimum ultimate primary runway length of **5,500 feet** is recommended, due to the current and anticipated usage by the forecast fleet mix. The existing crosswind runway length of 4,000 feet would continue to accommodate most of the small airplanes with fewer than 10 passenger seats in the forecast fleet mix. However, the existing Runway Safety Area (RSA) beyond the 30 threshold encroaches onto Runway 6-24. This conflicts with FAA AC 5300-13A, Paragraph 305 e: Non-intersecting runways, which states:

> *Runway separation must take into account the full dimensional requirements of the safety areas of the runway and taxiway systems on the airport. If possible, safety areas should not overlap, since work in the overlapping area would affect both runways. In addition, operations on one runway may violate the critical area of a NAVAID on the other runway.* ***This condition should exist only at existing constrained airports where non-overlapping safety areas are impracticable****. If the RSA of one runway overlaps onto the full strength pavement of a second runway or taxiway, the chance of runway/taxiway incursion incident is increased.*

Therefore, the crosswind runway needs to be reviewed for a shorter length to clear the Runway 6/24 RSA at the 30 end. Section 4, Alternatives, addresses this issue.

The aerial survey for the ALP identified a mound of dirt off the end of Runway 12. We have learned that this mound is sludge that was dredged from the slough. This sludge pile needs to be removed to meet FAA Runway Safety Area standards, in order to avoid displacing the threshold or affecting the approach slope.

In regards to runway length, as a point of comparison, the 2010 - 2030 Iowa Aviation System Plan Individual Report for MUT, which can be viewed in Appendix A, recommends maintaining the primary runway length to at least 5,000' and the crosswind runway length to at least 4,000'.

Recommended runway widths are identified in accordance with FAA Advisory Circular 150/5300-13. The existing and ultimate runway width for Primary Runway 6/24 is 100 feet, while the existing and ultimate runway width for Crosswind Runway 12/30 is 75 feet. In addition, these widths meet the targets shown in the 2010 - 2030 Iowa Aviation System Plan Individual Report for MUT.

No upgrades to runway pavement lengths or widths are proposed over the twenty year planning period, based on the FAA approved forecast.

However, the City expressed an interest in knowing what runway length would be required to serve cargo aircraft, since they are studying the feasibility of building a container port facility. The following summary table shows required runway lengths for a sampling of aircraft used by courier delivery service companies.

Table 3-1

Aircraft	Cargo Volume	Cargo Mass	Cruise Speed	Maximum Range	Courier Delivery Service Companies			Runway Length (ft)
Boeing 737-700C	107.6 m³ (3,800 cf)	18,200 kg (40,000 lb)	931 km/h (503 kn, 578 mph)	5,330 km (2,880 nmi)	FedEx			5,800
Boeing 757-299 Freighter	239 m³ (8,430 cf)	39,780 kg (87,700 lb)	955 km/h (516 kn, 593 mph)	5,834 km (3,150 nmi)	FedEx	UPS	DHL	7,600
Boeing 747-8F	854.5 m³ (30,177 cf)	134,200 kg (295,900 lb)	908 km/h (490 kn, 564 mph)	8,288 km (4,475 nmi)	FedEx	UPS	DHL	11,000
Boeing 767-300 Freighter	438.2 m³ (15,469 cf)	52,700 kg (116,200 lb)	850 km/h (461 kn, 530 mph)	6,025 km (3,225 nmi)	FedEx	UPS		9,800
Boeing 777 Freighter	653 m³ (23,051 cf)	103,000 kg (227,000 lb)	896 km/h (484 kn, 557 mph)	9,070 km (4,900 nmi)	FedEx		DHL	11,500

3.1.4 Taxiway and Taxilane Width and other Taxiway/Taxilane Requirements

The existing taxiway system at MUT consists of two parallel taxiways and seven connecting taxiways. These taxiways were constructed to enhance the safety and efficiency of airfield operations. The two full parallel taxiways at MUT eliminate the need for aircraft to back taxi on the respective runway after landing or before takeoff. Both runways have instrument approaches, which justify their parallel taxiways.

Recommended taxiway width, fillet, and curve dimensions are identified in accordance with FAA Advisory Circular 150/5300-13 and are based on the Taxiway Design Code (TDG) of the critical aircraft identified for use on the taxiway. The TDG is determined from the width of the main gear of the aircraft, along with the distance between the cockpit and main gear of the critical

design aircraft. The TDG classification at MUT is TDG-2, which is associated with a taxiway width of 35 feet. This width is recommended for the 20 year planning period.

Newer updates to FAA AC 150/5300-13A state that any taxiways leading from the apron area directly to a runway should be avoided, in order to reduce the chance of pilots unknowingly taxiing from the terminal area onto or across a runway. In other words, taxiways should not be designed to lead directly from an apron to a runway, without requiring a turn. Such configurations can lead to confusion when a pilot typically expects to encounter a parallel taxiway but instead accidently enters a runway. Currently, MUT's Taxiway B creates a direct path from the apron across Runway 6/24, without a turn. Relocation of this portion of Taxiway B will be discussed in the Alternatives Section of this report.

Other newer updates to FAA AC 150/5300-13A require placing a curve in entrance taxiways to help differentiate them from the adjacent square-end runway. The curved outer edge of the entrance taxiway provides a visual clue to pilots to help them avoid landing on a parallel taxiway. The newest version of the AC also requires geometric changes to other taxiway-runway and taxiway-taxiway intersections.

Taxiways provide access from the runway to the apron area, while taxilanes provide access to hangars and the fuel farm. Taxilanes are typically not as wide as taxiways, and taxilane safety areas and object free areas are typically more narrow, too.

At MUT, both TDG-1A and TDG-2 aircraft use the hangars. The TDG-1A minimum taxilane width is 25', while the TDG-2 minimum taxilane width is 35'. The taxilane object free area is 79' for ADG I aircraft and 115 feet for ADG II aircraft.

3.1.5 Pavement Strength

Runway 6/24 had a 2015 FAA approved airport pavement design with a gross allowable aircraft weight (kips) of 60,000 Dual Wheel Load (DWL). This pavement strength will accommodate the C-II aircraft that are forecast over the next 20 years, along with the other aircraft forecast to use this runway.

Runway 12/30 has a pavement strength of 30,000 pound Single Wheel Load (SWL). This pavement strength will accommodate the B-II aircraft that are forecast over the next 20 years, along with the other aircraft forecast to use this runway.

The Iowa DOT completed pavement inspections at the Muscatine Municipal Airport in the fall of 2017 and will be generating Pavement Classification Numbers (PCNs) for both runways at the airport.

3.1.6 Landing and Safety Devices

Airport navigational aids and lighting shall be designed in accordance with FAA Standards in FAA AC 150/5300-13A, Change 1, Airport Design Standards, Chapter 6. Navigation Aids (NAVAIDs) and On-airport Air Traffic Control Facilities (ATC-F). This involves specific standards for the following:

- Navigational Aids
- Global Positioning Systems
- Visual Glide Path Indicators
- Runway Identification Lighting
- Wind Direction and Weather Reporting

3.1.6.1 Navigational Aids

Navigational aids (NAVAID) at airport facilities serve two primary functions for airport operations; they provide guidance to a specific runway or to the airport itself. The difference between a precision and a non-precision navigational aid is that a precision approach provides electronic descent, alignment, and position guidance on a unique glide path. A non-precision navigational aid provides position and alignment, or possibly only position information. The need for navigational aids is determined by design standards based on safety considerations and operational needs. The eligibility of an airport for federal funding for navigational aids is determined by its type, purpose, and volume of aviation activity expected at the airport.

At MUT, a rotating beacon flashes alternating green and white light, allowing pilots to visually locate the airport.

In addition, Runway 24 has a precision approach (ILS OR LOC RWY 24) with an Instrument Landing System, including an Approach Lighting System (ALS). Both the ILS and ALS systems are owned/maintained by the FAA.

The non-directional beacon (NDB) located on the field is no longer operational. The NDB is owned by the City of Muscatine.

3.1.6.2 Global Positioning Systems

The technology of Global Positioning Systems (GPS) has become an important component in aviation. It will soon become the dominant instrument approach system and most aircraft will be equipped with it. GPS requires a series of 24 satellites in orbit that can give precise measurements in the location, speed, elevation, and direction of an aircraft. It can be precise within a few meters by using the relative positions of at least three satellites and a wide area augmentation system.

GPS equipment has the ability to replace electronic navigational aids; however, GPS approaches typically require the same visual aids and clearance requirements as conventional approaches. The Muscatine Municipal Airport currently has the following GPS approaches: RNAV (GPS) RWY 06, RNAV (GPS) RWY 24, RNAV (GPS) RWY 12, and RNAV (GPS) RWY 30.

3.1.6.3 Visual Glide Path Indicator

Visual glide path indicators (VGI) are systems of lights located at the side of each runway and provide visual descent guidance information during an approach to the runway. Muscatine currently has a Visual Approach Slope Indicator (VASI) for Runway 6, which is owned/maintained by the FAA, and Precision Approach Path Indicators (PAPIs) for Runway 12/30, which are owned by the City of Muscatine. No changes to these VGIs are recommended at this time or during the twenty year planning period.

3.1.6.4 Runway Identification Lighting

Runway identification lighting provides the pilot of an approaching aircraft with a quick and positive identification of runway sides and ends. The most basic system involves runway end identifier lights (REILs) and runway edge lights. REILs help identify the end of the runway and distinguish it from other lights around the airport. Runway edge lights help define the landing area. Runway ends 6, 12, and 30 are currently equipped with REILs; both runways are equipped with medium intensity runway lights (MIRLs) along the entire edge of both runways. These lights are pilot controlled and remain on at their lowest setting from dusk until dawn. As an aircraft approaches, the pilot may switch the light setting to medium or high intensity. A timer will reduce the lights back to the low setting after the aircraft has landed.

The FAA owns/maintains the Runway 6 REIL, while the Runway 12/30 REILs are owned by the City of Muscatine.

The runway identification lighting at the Muscatine Municipal Airport is currently adequate for the existing facilities at their present state. Lighting maintenance and modifications need to be included in any improvement plan, in order to preserve the effectiveness and safety which this system provides.

3.1.6.5 Wind Direction and Weather Reporting

Wind information is currently provided by a lighted wind indicator that is located to the southeast of the intersection of Taxiway B and Runway 6/24.

In addition, the Muscatine Municipal Airport has an Automated Weather Observing System (AWOS), which is located between Taxiway A and Highway 61, on the Runway 24 side. The AWOS allows pilots to obtain real time weather conditions at the airport. Real-time accurate information on wind speed and direction, ceiling, visibility, and altimeter settings is crucial for flight plan preparation. This data allows pilots to make informed decisions regarding fuel management, diversions, alternate planning, and making an instrument approach to landing, when visibility is low. The AWOS is owned by the City of Muscatine.

3.1.6.6 Very High-Frequency Omnidirectional Range (VOR)

A VOR is a type of air navigation system with a ground-based electronic system that provides azimuth information for high and low altitude routes and airport approaches. Though older than GPS, VORs are very commonly used and have been a very reliable source of navigation information since the 1960s and still serve as a useful navigational aid for many pilots without GPS.

The FAA is in the process of shutting down older navaid equipment, including approximately 308 VORs. An FAA owned VOR is currently present at Muscatine but is planned to be decommissioned by the FAA.

In summary, no changes are recommended to Landing and Safety Devices during the twenty year planning period.

3.2 LANDSIDE REQUIREMENTS

3.2.1 Aircraft Apron and Parking

The aircraft parking area required can generally be projected based on the forecast of itinerant operations. A general design practice provides for computing apron space and tie-down spaces for itinerant aircraft as follows:

- Assume 50 percent of busiest day itinerant aircraft are on the apron at a given time,
- the busiest itinerant day is assumed to be 10 percent busier than an average day, and
- a tie-down is provided for each itinerant aircraft on the apron.

Based on this discussion and the projected number of itinerant operations, the number of recommended apron tie-down spaces can be viewed in Table 3-2.

Table 3-2
Projected Aircraft Tie-Downs

Year	Itinerant Operations	Total Tie Downs
2016	5,950	4
2020	6,300	5
2025	6,650	5
2030	7,175	5
2035	7,700	6
2040	8,050	6

Source: Anderson-Bogert Engineers & Surveyors, Inc.

Currently, thirteen tie downs are available for itinerant and local aircraft. In addition to tie downs for itinerant aircraft, one or two tie downs should be provided for local aircraft, typically. The preceding analysis indicates no new tie-downs are needed in the twenty year planning period. At the airport layout plan meeting, stakeholders indicated the current number of tie downs is sufficient.

Total apron area requirements should provide adequate space for the following:

- Tie-down of itinerant aircraft
- Tie-down of local aircraft
- Fueling area
- Short-term parking, loading, and unloading
- FBO operations
- Aerial spray operations

With proper planning, the apron will accommodate the maximum number of aircraft while maintaining ease of ingress and egress. The apron should be planned with a certain degree of flexibility and expandability.

The FAA General Aviation Apron Design Spreadsheet was used to estimate the recommended apron area for itinerant aircraft. This spreadsheet has been included in Appendix G. With the existing operations, approximately 11,148 square yards of apron pavement is recommended for itinerant aircraft. Calculations indicate 13,900 square yards are currently available. For year 2040, 15,082 square yards of apron pavement is recommended for itinerant aircraft. Both of the above recommended apron pavement areas include taxilanes.

3.2.2 Hangars

Hangar space requirements are in two forms, T-hangars and conventional hangars. The majority of aircraft owners will prefer to store their aircraft in T-hangars, the most economical form of aircraft storage for individual owners. Some owners, typically corporate aircraft owners, may prefer to hangar their aircraft in an individual conventional hangar.

Hangar space should be provided for the number of based aircraft at the airport. In addition, providing for one or two extra spaces for itinerant aircraft is desirable; this also provides a space for attracting new based aircraft. Refer to Table 3-3 for the projection of required hangar spaces.

Table 3-3
Projected Hangar Spaces

Year	Based Aircraft	Hangar Spaces
2016	34	36
2020	36	38
2025	38	40
2030	41	43
2035	44	46
2040	46	48

Source: Anderson-Bogert Engineers & Surveyors, Inc.

The Muscatine Municipal Airport currently has:

- four corporate-style hangars
- one municipal hangar
- twenty tee hangars (all within the 45 to 65 year-old range).

The need for more hangar space was discussed at the stakeholder meeting. Stakeholders also stated that wider hangars are needed (62' wide was specifically mentioned). The 2010-2030 Iowa Aviation System plan individual report, which can be seen in Appendix B, also recommends construction of additional hangars at MUT to provide covered storage for all based aircraft.

The City of Muscatine provided the following T-Hangar waiting list information:

T-Hangar Waiting List

- *Waiting list: 18*
  - *Some have been on the list since 2008*
- *Waiting list to upgrade: 12*
  - *Many are in row 3*
  - *Others in first row in need of larger hangar*
  - *Needing larger hangar so they can purchase larger aircraft*

Note: City of Muscatine residents are given priority on the waiting list over Muscatine and Louisa County residents.

The FBO provides temporary hangar space to aircraft waiting for a permanent location. On 4/18/2017, the FBO was providing hangar space to one twin engine and three single engine planes that would most likely move over to the T-Hangars, given the opportunity.

The terminal area plan shows more development than may be necessary for the 20 year planning period; however, the plan provides flexibility, in the event demand for hangars grows more rapidly than expected.

3.2.3 General Aviation Terminal

Terminal facilities for general aviation airports need to serve several required functions. Requirements for these facilities include space for passenger waiting, flight planning, a pilot's lounge, concessions, restrooms, charging station access, management services, storage, and various other needs.

Currently, the Muscatine Municipal Airport terminal building has the following facilities that serve these functions: pilot lounge, shower, restrooms, vending machines with drinks and snacks, weather computers, wireless internet, snooze room, general waiting area, and conference room.

The recommended public space in a terminal building can be estimated using approximately 50 square feet per passenger during the peak operational hour. The peak hourly operations can be estimated as follows:

- FAA Guidance assumes the busiest month at a general aviation airport accounts for 14.8% of the annual operations.
- The number of operations for the busiest day in the busiest month is the preceding number divided by 30.
- FAA Guidance assumes the peak hour is 20% of the peak daily operations, at a general aviation airport.

At MUT, the estimated existing peak hourly operations are 12 and the estimated 2040 pear hourly operations is 16. Using two persons per flight, the existing activity at MUT supports 1,174 square feet of public terminal building area, while the ultimate activity at MUT supports 1,589 square feet of public terminal building area. The following table summarizes these estimates.

Table 3-4

Year	Annual Operations	Busiest Month	Busiest Day	Peak Hour	Public Terminal Area (SF)
2016	11,900	1,761	59	12	1,174
2040	16,100	2,383	79	16	1,589

The existing public area in the MUT terminal building is roughly 4,000 square feet; therefore, the existing terminal building will be suitably sized for the next twenty years.

3.2.4 Fueling Facility

The airport's current fueling system is at least thirty years old, and some feel the existing storage system is probably nearing the end of its life. The existing underground fuel tanks, which are owned by the City, include a 10,000 gallon tank for Jet A fuel and a 10,000 gallon tank for 100LL fuel. The FBO operates the fueling system and reports that the 100LL above-ground pump has always been problematic. In addition, both 100LL and Jet A lines have had freezing issues under the apron pavement and have been excavated with portions replaced.

The FBO owns a 2,200 gallon Jet A fuel truck and a 1,200 gallon 100LL fuel truck. Almost all jet fuel sales come from the truck, unless the truck is under repair. For the 100LL fuel sales, approximately 60% are truck sales and 40% are pump sales.

Since 2011, a Fuel Facility Upgrade project has been included on the airport's 5 year Capital Improvement Program (C.I.P.) with various scopes (with and without self-serve), with various funding sources, and with various estimated costs. At the Airport Layout Plan Public/Stakeholder Information meeting on December 12, 2016, the attendees' wish list included a self-service fueling station that may or may not include both 100LL and Jet A. Also, the addition of 90 octane fuel for sport-type planes was discussed.

Annual fuel sales data, along with the average forecasted number of annual operations are used to estimate fuel storage requirements. On 8/1/2017, the FBO provided the following fuel sales data for the last ten years.

Table 3-5

Year	Jet A (gallons)	100LL (Gallons)
2007	211,311.0	16,142.1
2008	159,211.0	13,278.4
2009	70,503.4	18,266.2
2010	63,933.0	14,197.0
2011	85,758.0	13,674.0
2012	88,672.9	13,183.8
2013	74,975.0	16,397.5
2014	86,473.0	12,995.1
2015	81,273.9	8,749.2
Average (2009-2015)	**78,798.5**	**13,923.3**
Peak Month	***15,759.7***	***2,784.7***
2016	64,997.0	10,026.2
2017	51,481.0	6,661.3

The average shown in the above table is from 2009-2015. Values for 2007-2008 were left out of the average, since they were identified as outliers for this ten year period. The considerable drop in fuel sales after 2008 can most likely be associated with the 2008 Recession. In addition, the value for 2016 was identified as an outlier and was not included in the average, due to the runway shutdowns that occurred in 2016 that were required to reconstruct the main runway. Lastly, 2017 values were left out of the average, since they do cover the entire year.

The peak month fuel sales estimated in the above table represent 20% of the average annual fuel sales for 2009-2015. The minimum criterion for airport tank capacity is the ability to store peak month fuel sales on site. However, consideration should be given to installing tanks large enough to accept a full tanker load of fuel, especially for Jet A, since it sells much more quickly than 100LL. In addition, for emergencies, a good rule of thumb is to always have at least five days of jet fuel on hand. For Jet A fuel, most tankers are carrying approximately 7,200 to 7,800 gallons of fuel, and half loads are more expensive to deliver than full loads. On the other hand, for 100LL, the FBO reports that a half load can last them around 3 months, and they have been getting it that

way for several years, so that they are not sitting on a full load when a large price change happens.

For the proposed fueling system at Muscatine, based on their fuel sales, we are proposing the following to best meet the needs of the airport:

- 6,000 gallon 100LL fuel tank (with self serve)
- 16,000 gallon Jet A Fuel tank
- 500 gallon 90 octane tank

The approximate area required for the fueling system is 40' x 26'. Depending on the type of tank wall specified, the minimum required distance between a tank and a building is generally between 10' and 50'. For the tanks typically specified for self-serve, that distance is 10'.

3.3 SUMMARY

The purpose of this chapter has been to gain insight into the facilities needed to meet aviation demands that are projected for the Muscatine Municipal Airport through the year 2040. These demands include improvements to both the airside and the landside facilities at the airport. It is planned for the airport to continue to accommodate C-II aircraft, however, new development and reconstruction of existing pavements will be based on the documented operations at the time of the projects.

The next step after determining the facility requirements is to develop alternatives to accommodate the demands; these alternatives are discussed in the following section.

4. ALTERNATIVES

4.1 GENERAL

The Facility Requirements section of this report outlined the basic parameters defined for use in the analysis of airport alternatives. This section's analysis will evaluate alternative airport layouts and facilities that will accommodate future operations at the Muscatine Municipal Airport.

The concepts and alternatives discussed in this section will examine the Airport's ability to handle projected aviation demand in a productive and effective manner. The fundamental goal of this section will be the selection of the development concept that provides the ultimate level of service with the least cost. The benefits and costs of each alternative will be given at least a cursory review. A degree of flexibility will be considered in the selection process to allow for changing design standards and/or service levels. Analysis of these development alternatives will provide the basis for the detailed Airport Layout Plan.

4.2 STAKEHOLDER/PUBLIC INVOLVEMENT

A stakeholder meeting was held December 12, 2016 with the following attendees: airport manager, representatives from the airport commission, pilots, city staff, and consultant staff. Minutes from this meeting have been included in Appendix A, along with an attendee list, notice of meeting, and comment forms. The following items, which will have a direct impact on the alternatives analyzed and selected, were discussed at the stakeholder meeting:

- In the future, it is clear in conversation that replacing and adding hangars are needed to meet the needs of current and future pilots – it was mentioned they are not meeting demand today
- In the future, various improvements could include: Hangars, maintenance/equipment storage building, additional apron pavement (including drainage improvements), self-fueling, connecting taxiway layout considerations, runway length considerations, and possible industrial development
- Attendees were concerned with funding, particularly for hangars

- Attendees discussed the need to stage any replacement of hangars, adding hangars, hangar improvements (insulation, restroom facility, etc.)
- Possible drainage issues will need to be addressed with hangars/apron pavement improvements
- Repurposing certain hangars for different activities was discussed, such as for a maintenance facility or for additional hangar space, with the addition of a dedicated maintenance facility
- Wider hangars needed (62' width)
- Pavement surface between hangar rows 2 & 3 is creating debris that has potential to damage planes.
- Existing fuel storage system for both AVGAS and JET-A is nearing the end of its life.
- Look at the possibility of siting privately owned hangars between Highway 61 and the Runway 24 building restriction line.
- Self-service fuel station – may or may not include both AVGAS and jet fuel. For terminal area layout: show location for new above ground self-contained system; two suggested locations - at the compass rose marking and where the fuel trucks park now (north of electrical vault building)
- Add 91 octane fuel for sport-type planes
- Dedicated maintenance building - 2007 main ALP drawing shows this building to the west of the HON hangar; investigate alternate locations nearer to the terminal building.
- City mentioned that industrial development could occur in the over 100 acres on the north side of the airport property, but this activity would more than likely be for a commercial business that would use the airport, such as FedEx, UPS, etc.

4.3 Do Nothing Alternative

The Do Nothing Alternative might initially appear to be the most favorable alternative from an environmental point of view. This alternative involves maintaining the airport in its present condition and not provide for expansion. The adverse impacts and other factors discussed elsewhere in this report would seem to be avoided. However, this is not necessarily the case.

Airport usage is predicted to increase. This increased activity results in certain environmental effects. Therefore, even if no facility expansion is realized, some adverse environmental effects will occur just with increased airport operations and activity.

The Do Nothing Alternative may also have a negative effect upon the economic development of the Muscatine area. The employment opportunities associated with construction and operation of the proposed facilities would not be realized. Also, economic gains through industrial activity can be directly tied to the existence of improved airport facilities. Without development of the proposed enhancements to the Muscatine airport, the effect on economic growth can only be viewed as negative.

For the above reasons, the do nothing alternative is not considered an acceptable alternative.

4.4 Alternative Sites

Generally speaking, developing a new greenfield regional airport at a new site is not feasible from an economic point of view, since the cost would likely be between 30 and 50 million dollars. The significant capital outlay required for a new airport would far exceed that required for improvements to the existing facilities. In addition, the investment in the existing facilities would be lost.

Also, the environmental impacts of developing a new airport site would be greater than expanding/improving the existing site. These increased impacts would be difficult to justify.

The present investment in airport facilities, together with the ability of the existing site to accommodate future improvements and facilities, preclude the necessity of considering alternative airport locations. Therefore, moving to an alternative site was eliminated from further consideration.

4.5 SERVICE FROM ANOTHER AIRPORT

The impacts of relying on the service from another airport could be significant to the local economy. Muscatine and Muscatine County would need to rely on the airport facilities of other communities, such as Davenport, Iowa City, or Moline, that are considered competitors in attracting new business and industry. In addition, drive times to these three neighboring airports are between 45 and 49 minutes. Relying on these airports would place Muscatine and Muscatine County at a competitive disadvantage.

Local firms requiring improved air service would need to evaluate the benefits and costs of the time and travel to another airport, relocating to another area, utilizing less than adequate airport facilities or doing without air transportation. All of these would result in negative impacts on the local economy.

Due to economic disadvantages, service from another airport is not considered a feasible substitute.

4.6 DEVELOPMENT AT THE EXISTING SITE

The existing site does have some constraints that must be dealt with, when considering expansion. These include:

- Existing terminal area location and investment in existing terminal facilities
- Existing roads and highways
- Existing residential and commercial development
- Farms and farmsteads
- Agricultural operations including center pivot irrigation systems
- Muscatine slough drainageway
- Powerlines, overhead transmission lines, and towers.
- Mississippi River bluff area to the west and north
- TVOR facility
- Existing runway alignments and investment in existing runways

However, as compared to many other general aviation airports in Iowa, the site constraints at and around the Muscatine Municipal Airport are much less formidable. On-site topography, unlike that found at many Iowa airports, is not a constraint. The major constraints include manmade features and the Muscatine slough drainageway.

Feasible development alternatives for hangars and for a new fueling system within the existing airport property are not adversely limited by site constraints. However, future expansion of the main runway to accommodate larger cargo aircraft is limited by existing property ownership, the bluff to the west, and developed properties to the east. The alternatives considered are discussed below.

4.7 SAFETY IMPROVEMENTS

In addition to any potential expansion, minor adjustments are recommended to be made to the existing layout, regarding the following items, in order to improve safety:

- Deconflicting the Runway 12/30 and the Runway 6/24 Runway Safety Areas.
- Refiguring square-end taxiways adjacent to runway thresholds and eliminating direct runway access from the apron.

4.7.1 Deconflicting the Runway 12/30 and Runway 6/24 Safety Areas

As mentioned in the Facility Requirements section of this report, the Runway 12/30 and Runway 6/24 Runway Safety Areas are in conflict.

When the MUT ALP update was completed in 1993, prior to getting the ILS/precision approach, the Runway 6/24 RSA was less wide, and the Runway 30 threshold was right at the edge of the Runway 6/24 RSA. With the 2001 ALP update, the ILS/precision approach was added, and the Runway 6/24 RSA got wider. However, it does not appear that the non-intersecting runway separation standard existed at that time.

The existing length of 4,000 feet is important to the existing users at the airport. The pilot of the based GPC jet (Cessna XLS+) indicates that they try to limit their operations to runways with a minimum length of 4,000'. They prefer to use Runway 6/24 at MUT, but they do use Runway 12/30 on days when a strong wind

is blowing down that runway. Completely removing the Runway 30 RSA from the Runway 6/24 RSA, which would require a 421' displaced threshold, would substantially reduce the landing and takeoff distance of Runway 12/30 to a length that will likely be too short for some aircraft that use Runway 12/30 on days when the crosswind component is too high for Runway 6/24 or when Runway 6/24 is closed for other reasons, such as for construction. In 2016, when Runway 6/24 was reconstructed, during Phase 2, the Runway 30 threshold was temporarily relocated 454' to the north, which resulted in the runway length being reduced to 3,546'. During that time, the based GPC jet (Cessna XLS+) moved to Davenport.

With the constraints that are in place at the 30 end, lengthening the runway to the north (at the Runway 12 end) appears to be the next logical alternative to consider. However, lengthening the runway in that direction is financially unrealistic, due to the Muscatine slough, since crossing the slough would require a bridge. Also, the trees on the bluff in that direction would likely become obstructions, if the runway would be extended to the north. As a compromise, the City proposes to displace the Runway 30 threshold by 105', which will remove its threshold from the Runway 6/24 Runway Safety Area. This change will improve safety at the airport, while still allowing the based GPC jet (Cessna XLS+) to use Runway 12/30. The relocation of the threshold will require changes/additions to the runway pavement marking and relocating the REILs and threshold lights. No changes and anticipated for the PAPIs.

4.7.2 Taxiway Layout Reconfiguration

In order to increase safety at MUT, and to be in compliance with updates to FAA AC 150/5300-13A, the following two taxiway layout modifications are recommended:

- Relocate Taxiway B (the portion between the apron and Runway 6/24), from its existing direct path from the apron across Runway 6/24, to approximately 250' to the northeast.

- Reconfigure all three square-end entrance taxiways to curved ends, adjacent to runway thresholds. These improvements apply to the entrance taxiways adjacent to the thresholds of Runways 6, 24, and 12.

In addition to the above safety improvements, geometric changes are recommended for all other taxiway-runway and taxiway-taxiway intersections to meet the newer geometric requirements of AC 150/5300-13A.

4.8 PRIMARY RUNWAY EXTENSION

For the current fleet mix of aircraft using the airport, the existing primary runway length of 5,500' is sufficient. With that being said, the City is interested in knowing what runway length is required for cargo aircraft to serve their proposed container port facility. From the analysis completed in the facility requirements section of this report, a 300' to 6,000' runway extension would be required to accommodate cargo aircraft, depending on the size and type of aircraft.

- *Primary Runway Extension to the West*
  Potential limiting factors for extending the primary runway to the west include the 100 year flood plain, wetlands, the Muscatine Slough, poor soils, Burlington Road, a $290,000 residence and associated 26 acre lot, the driveway to this residence, farm buildings along Burlington Road, Highway 61, and trees on the bluff.

  To avoid the wetlands with any of the associated work, the runway could be extended approximately 600', which would take the runway to a length of 6,100'. The residence does not appear to be a limiting factor in this scenario.

  To avoid the 100 year flood plain with the work, the runway could be extended approximately 1,600', which would take the runway to a length of 7,100'. While the residence in this scenario is most likely not an obstruction to the departure surface, its driveway would lie within the RPZ.

  Lastly, to avoid crossing the slough with any of the proposed work, the runway could be lengthened 2,500' to a total length of 8,000'; however, with a 2,500' extension, Highway 61 appears to become an obstruction to the 40:1 departure surface. In addition, the residence off the end of Runway 6 would most likely be an obstruction to the 40:1 departure surface, and it would lie within the RPZ, along with its driveway. The residence and its driveway would also lie within the runway safety area and the object free area.

  A 2,100' extension to 7,600' of total runway length avoids the above mentioned issue with Highway 61, but the trees on both sides of the highway appear to be obstructions to the 40:1 departure surface and will most likely need to be cleared. With the extension to 7,600', even though the bluff itself will not be an obstruction to the departure or approach surfaces, it may be considered an obstruction to the

horizontal surface and to the conical surface. However, penetrating a Part 77 surface only means that further analysis is needed by the FAA to determine if a true hazard exists. In this scheme, the residence and its driveway fall within the RPZ; although, they would most likely not be considered an obstruction to the departure surface. Also, the driveway clips the corner of the object free area and would need to be relocated.

Finally, any extension of runway 6 to the west will require the relocation of the FAA Localizer facility.

- *Primary Runway Extension to the East*
  Any extension of the primary runway to the east would like require the purchase of the Mairet's Garden Center, LLC property and potentially the A&E Convenience, LLC property. These properties are developed with multiple buildings; therefore, purchase of these properties may not be financially feasible. In addition, extension of the runway to the east would require relocation of the MALSR Approach lights and infrastructure related to the ILS approach, which will likely be very costly. Also, an overhead transmission line exists along 41st Street, which would likely become an obstruction to the approach surface. For these reasons, extension of the primary runway to the east is eliminated from consideration.

  The first steps in the preparing for a runway extension is an environmental assessment and land/easement acquisition. Where practical, it is recommended to purchase property in fee that lies within the proposed runway protection zone.

4.9 Visual and Navigational Aids

When it is time to make runway improvements, consideration should be given to updating Runway 12/30 Precision Approach Path Indicators (PAPIs) and Runway End Identifier Lights (REILs), since this equipment is approaching 20 years in age. The crosswind runway edge light system should also be evaluated at that time to identify any needed upgrades; LED lighting and cable-in-conduit should be considered for that runway.

4.10 Terminal Area Development

4.10.1 Hangar Space

A primary need of the Muscatine Municipal Airport is hangar space. This need has been identified by the airport manager, the airport commission, and the Iowa Department of Transportation.

The substantial investment in the terminal building, hangars, apron, and other infrastructure precludes any consideration to the relocation of the terminal area. Therefore, the existing terminal area is considered a development constraint as it relates to airside components.

The terminal area can be expanded to accommodate additional apron and hangar facilities. U.S. Highway 61 and the Runway 12/30 runway protection zone limit expansion directly to the east, as does Runway 6/24 directly to the west and to the north. In addition, Runway 12/30 inhibits expansion to the north. However, some room for expansion is available to the south and to the southwest of the existing T-hangars. In addition, some room for expansion is available to the east and to the northeast of the existing terminal building, within the strip of land along Highway 61 that was purchased in 2003. At the public information meeting, the suggestion was made to look at the possibility of siting privately owned hangars between the Highway 61 north right-of-way line and the Runway 24 building restriction line.

The expansion area to the south and to the southwest of the existing T-hangars is bounded by the National Guard Armory leased property to the west, the frontage road to the south, and a corporate-style hangar to the east. This area is the most financially feasible general development area, since it would require the least amount of additional paving infrastructure to service the proposed hangars, as compared to the potential development areas to the east of the terminal building. To utilize this space the maximum efficiency, it makes the most sense to continue the T-Hangar row pattern to the west and then to add a perpendicular row of conventional-style hangars to the south that are parallel with the frontage road. In order to construct these conventional style hangars, the remaining non-directional (NDB) equipment, which is no longer in use, will need to be removed.
The existing third row of T-hangars is in very bad condition and is shown to be replaced. In addition, a fourth and fifth row of proposed T-hangars are shown on the terminal area plan. The first and second row of T-hangars had an elastomeric coating applied to their roofs in 2012. It is assumed these two sets of T-hangars can continue to be used through the 20 year planning period, as long

as routine maintenance is completed. The dimensions of the four conventional-style hangars to the south are shown to be 70' by 70', which exceeds the stakeholder criteria of greater than 62' wide. Of course, these dimensions will remain flexible, based on demand.

Looking north from frontage road at westerly expansion area for hangars.

Looking east from the frontage road at the site of future conventional-style hangars

The expansion area to the east is divided into two areas: a smaller area directly between the existing terminal building and the runway 12/30 runway protection zone and then a larger area farther to the northeast, between the runway 6/24 building restriction line and US Highway 61. The smaller area is shown with three corporate style hangars, each with the dimensions of 70' x 70'. The advantage of the smaller area is its close proximity to the terminal building and the fuel farm. This is an advantage to both the hangar tenants and to the FBO to be able to watch over this area.

The larger area is shown with eleven hangars of various sizes, from 70' x 70' to 150' x 150'. From west to east, this area narrows in width; therefore, only smaller hangars are shown on the east end. However, on the west end, more flexibility is available to construct larger hangars, if the demand for larger hangar arises. Access to this area will be provided by an independent gated entrance off Highway 61.

Security measures and overhead lighting should be considered for both of these areas.

4.10.2 Snow Removal Equipment Building/Municipal Hangar

The existing dilapidated municipal hangar is nearing the end of its life and replacement or demolition of this structure will likely be required in the twenty year planning period. The existing building is used for aircraft maintenance and temporary aircraft storage. Proposed uses for a replacement building include aircraft maintenance and temporary aircraft storage, along with snow plow removal equipment storage.

On a previous version of the Airport Layout Plan, the future maintenance hangar was shown in the area between E14 and U6 on the current terminal area plan. At the public meeting, stakeholders requested that a dedicated maintenance facility be shown nearer the terminal building. The only location available nearer the terminal building is the site of the existing municipal hangar, which is in disrepair and may need to be reconstructed. Therefore, the future maintenance hangar/snow removal equipment storage hangar was proposed to be shown on the terminal area plan, in the same location as the existing municipal hangar. However, at the ALP presentation to the Airport Advisory Commission on 10/22/2018, the group said they would like to keep the existing municipal hangar as long as possible and show the snow removal equipment (SRE) building to the east of the terminal building at location U2 on the terminal area plan.

Snow removal equipment was purchased with AIP funding in 2008 and in 2010; this equipment included a conventional truck, two reversible plows, and a tractor. This equipment is currently stored in a corporate hangar, which will be made available to a corporation for their use, when the need arises. The existing municipal hangar is in need of replacement and is not laid out for snow removal equipment storage and maintenance and does not have enough room for these items. AC 150/5200-30A indicates that wherever possible, snow and ice control equipment should be housed in heated garages during the winter to prolong the life of the equipment and to enable rapid response to operational needs. In addition, the AC indicates that onsite repair facilities should be available for the snow removal equipment.

Federally eligible portion of this building, according to AC 150/5220-18:

Table 4-1

2 snow plows	2,000 SF
1 spreader	600 SF
1 front end loader	800 SF

Maintenance support area	1,600 SF
Material storage	1,000 SF
TOTAL	**6,000 SF**

However, according to the FAA Iowa planner, a 3,000 SF (50' x 60') building is standard to fit AIP funded equipment, and anything larger to be funded by AIP will need justification. Storage space for ineligible equipment will need to be locally funded. In addition, the FAA Iowa planner pointed out that end loaders are typically not AIP funded at GA airports and that AIP funding for snow removal equipment is limited to one carrier vehicle plus a blade/broom, per FAA Order 5100.38D, Table M-1, d(2).

4.10.3 Fuel Farm

As another part of the overall terminal area improvements, it is proposed to relocate and upgrade the fuel farm.

Initially, it is being proposed that just the single 100LL self serve tank/unit be installed, with the airport continuing to use the existing underground Jet A tank/pump, until it is no longer usable. Then they would add the new Jet A above ground tank to the initial 100 LL installation. And as a separate option, the possible addition of the 90 octane tank for sport-type planes is being shown.

While the **north** side of the apron would be convenient for pilots, the fueling system would fall just inside the building restriction line. In addition, tanker trucks would likely need to travel across the apron to refill the tanks. For these reasons, this location is not recommended.

While the **south** side of the apron (in the vicinity of the electrical vault building and beacon) would be an ideal location for servicing and refilling the tanks and would provide easy access for the FBO, it does not appear that enough space exists for the new fuel facility in this area, beyond the existing apron pavement, in the grassy area adjacent to the electrical vault building. Therefore, this location was eliminated from consideration.

As another option, an open area on the **west** side of the apron was considered, between corporate hangar E12 and T-hangar E15. This area has many advantages, as follows: in general, this area is relatively open as compared to other areas, due to the flatter pavement in this area, planes are less likely to roll away than in other areas, this area would be away from the main taxiway leading to the apron, which will increase safety, and the tanks can be serviced and refilled from the hangar access road, without the tanker truck needing to

drive across the apron. However, this location would block the taxilane needed for larger ADG-II aircraft that may be housed in future box hangars to the southwest. Therefore, this location is not favorable.

Consequently, the only available space left is where the existing fueling facilities exist. About the only way that the new fueling facility will work well at the existing locations will be to swap the location of the 100 LL and Jet A cabinets, so that a flatter pavement slope will be adjacent to the new 100LL self-serve pump, and so that the facility will not be right in front of the municipal hangar and terminal building. If only the 100 LL tank is placed on the existing Jet A side of the terminal building, then it may be possible to fit the tank in the grassy area adjacent to the electrical vault building, if the minimum required distance between the proposed tank and a building is between 10' and 12'. By the same reasoning, the Jet A tank will fit between the terminal building and the municipal hangar.

The approximate area required for the entire fueling system is 40' x 26', which totals to approximately 116 square yards. In analyzing various locations to install the fueling system, it was assumed that it would not be advantageous to locate the above ground tanks on existing apron pavement, since doing so would reduce the aircraft parking area.

Overhead lighting should be considered at the edge of the apron pavement for any fuel farm project.

Photo of Existing Jet A Fuel Cabinet

Photo of Existing 100 LL Fuel Cabinet

4.11 VEHICLE PARKING

Currently, the main terminal area building parking includes 22 parking spaces, including two handicapped spaces. In addition, 6 spaces are available to the north of the building; employees usually park in this area.

An airport needs to furnish sufficient vehicle parking to accommodate employees, pilots, passengers, and visitors. Parking at MUT meets the requirements in the Iowa Aviation System Plan for an Enhanced Service Airport, since the airport provides a paved entrance road and available parking by the terminal/FBO building. Within the twenty year planning period, no additions are recommended to the terminal building/FBO parking area.

Looking east at terminal building parking area.

Looking north towards terminal building from terminal building parking area

In addition to the terminal/FBO parking needs, corporate hangar tenants have parking needs for employees and visitors. Existing corporate hangars have sufficient parking. However, when additional corporate style hangars are constructed, additional parking will likely be needed. Parking should be dispersed throughout the terminal area and located in close proximity to the terminal and hangar structures. On the terminal area plan, additional parking has been shown for both groups of ultimate hangars to the east of the terminal building. For the hangar expansion shown on the west side of the terminal building, dedicated parking could be added between hangar U6 and hangar E14, if it is decided this area does not need to be reserved for a building.

Potential future vehicle parking area to the south of the existing T-hangars.

Parking area on landside of GPC hangar (E12 on terminal area plan).

Parking area on landside of Bandag/Bridgestone hangar (E1 on terminal area plan).

4.12 SUMMARY

As previously mentioned, alternatives at the Muscatine Municipal Airport are somewhat limited by the existing site constraints. However, the recommended improvements required by current and projected operations within the twenty year planning period can be made at the existing airport site without land acquisition.

The recommended alternatives listed in this section should be carried out in the following order:

1.) Airside Improvements
2.) Terminal Area Improvements
3.) General Aviation Improvements

The recommended alternatives described in this section can be divided into primary and secondary elements. The primary elements are ones that require larger, contiguous land areas, like an apron expansion. Secondary elements, such as facility security improvements, have greater planning flexibility and can be included as a part of another project, rather than as a stand alone project.

In addition to the above recommended alternatives, a substantial amount of the airport's resources should be dedicated to the maintenance of the existing facilities. The forecasted levels of activity do not support a great deal of expansion of the airside; therefore, maintenance becomes an important aspect of the capital expenditure.

5. AIRPORT LAYOUT PLAN

5.1 GENERAL

Section Four evaluated possible airport development alternatives for the Muscatine Municipal Airport. The best alternative was selected based on development costs, airport layout, and the ability to accommodate projected aviation activity at the airport. This section will summarize the recommended development at the airport to meet forecasted aviation demand.

The future recommendations for the airport are shown on the **Airport Layout Plans**. These are a set of drawings that graphically depict the recommended improvements for the airport layouts, airspace, and land use. An 11" x 17" set of Airport Layout Plans have been included at the end of this section. They have also been printed in 22" x 34" format to meet current FAA standards and include the following sheets:

- Title Sheet
- Airport Layout Plan
- Airport Data Sheet
- Airport Airspace Plan
- Runway 24 Inner Approach Surface
- Runway 6 Inner Approach Surface
- Runway 12 Inner Approach Surface
- Runway 30 Inner Approach Surface
- Obstruction Tables
- Runway 6/24 Centerline Plan and Profile
- Runway 12/30 Centerline Plan and Profile
- Terminal Area Plan
- Land Use Plan
- Airport Property Map

5.2 Primary Runway

The Airport Layout Plan maintains the existing 5,500' long X 100' wide primary runway. Lengthening or widening is not planned at this time or within the twenty year planning period.

5.3 Cross Wind Runway

The Airport Layout Plan maintains the existing 4,000' long X 75' wide crosswind runway pavement. Lengthening or widening is not planned at this time or within the twenty year planning period. However, the ultimate layout has been changed to show a 105' displaced threshold on the 30 end, in order to remove the Runway 30 threshold from the Runway 6/24 Runway Safety Area.

5.4 Terminal Area

Future development of the terminal facilities will consist of construction of additional tee hangars and box hangars, expansion of the aircraft apron, construction of a snow removal equipment storage building, and relocation and upgrades to the fuel farm.

5.5 Airport Reference Code

The facilities presented in the Airport Layout Plan for the primary runway will meet Airport Reference Code C-II requirements. However, all new development and reconstruction of existing pavements will be based on the documented operations at the time of the projects. Current operations only justify Airport Reference Code B-II.

The purpose of the Airport Layout Plan (ALP) is to provide City officials with basic guidelines for making decisions associated with future development at the Muscatine Municipal Airport. The ALP uses projected aviation activity to plan development to accommodate short, intermediate, and long range needs. Airport planning is successful only if flexibility is adopted into future development at the airport. Aviation demands are not likely to develop on an even time line, creating the importance of the ALP becoming a working document that changes as the needs of the airport change. By following the recommendations and guidelines established in the ALP and in future updates of the ALP, the City and the airport can maintain its long term success of

providing high quality air transportation services to the community and to its users.

6. FINANCIAL ANALYSIS AND IMPLEMENTATION PLAN

6.1 DEVELOPMENT PHASES

The analysis conducted in the previous sections considered various alternatives that would accommodate existing and future levels of aviation activity. The proposed capital improvements program shall consider safety first, as well as the preservation of existing facilities. Implementation of proposed capital facilities is expected to occur over the 20-year planning period. The priorities will likely vary depending on the growth of the community and its aviation needs. Hangars and landside facilities are typically constructed in response to demand for such facilities.

Projects that should be given first preference are those that enhance the level of safety and preserve existing facilities. The development schedule is presented in two (2) five-year phases and one (1) ten-year phase. Phase One extends from 2018 to 2022. Phase Two covers the period 2023 through 2027, while Phase Three extends from 2028 to 2038.

- Phase One 2018 – 2022
- Phase Two 2023 – 2027
- Phase Three 2028 – 2038

6.2 EXISTING FACILITIES

Inspections of public airports are conducted by the Iowa DOT on a three year cycle, typically. Muscatine was scheduled for a PCI inspection in the fall of 2017.

The Iowa DOT uses the Pavement Condition Index (PCI) procedure to inspect the pavements; this procedure provides a numerical indication of overall pavement condition. The types and amounts of deterioration are used to calculate the PCI value of the section. The PCI ranges from 1 to 100, with 100 representing a pavement in excellent condition.

In general terms, pavements with a PCI of 65 to 100 that are not exhibiting significant load-related distress will benefit from preventative maintenance

actions, such as crack sealing and surface treatments. Pavements with a PCI of 40 to 65 may require major rehabilitation, such as an overlay. Current PCI data for Muscatine Municipal Airport is shown in the table below. The corresponding Network Definition Map has been included in Appendix H; this map shows the locations of the various section listed in the table. The data in the table can also be viewed at https://www.iowadot.gov/aviation/pavementmanagement/index.html#path=2/54

Table 6-1

Section	2014 PCI	2017 PCI
A01MU-01	93	85
A01MU-02		100
R06MU-01	65	98
R06MU-02	84	98
R12MU-01	91	87
T01MU-01	93	87
T02MU-02	88	100
T03MU-01	80	68
T03MU-02	93	85
T04MU-01	74	80
T05MU-01	59	68
T06MU-01	87	76
T06MU-02	90	71
T06MU-03	75	82
T07MU-01	93	93
T07MU-02	93	91
T08MU-01	98	88
T08MU-02	97	88
T09MU-01	97	88
TH01MU-01		2
TH01MU-02		41

Partially Reconstructed in 2016

Reconstructed in 2016

All pavements should be monitored on a regular basis and remedial actions taken as required. Delaying such action will exacerbate the pavement distresses that appear, resulting in higher future repair costs and eventually will pose an operational safety problem. This could also lead to liability risks. Therefore, the airport should have a pavement maintenance plan in place to schedule periodic pavement inspections and to record the findings. Currently, the IDOT does not fund pavement maintenance projects; however, they do fund immediate safety enhancements that include emergency pavement patching. In addition, federal entitlement funding can be used towards pavement maintenance.

6.3 Capital Costs

Preliminary cost opinions for each project included in the development plan presented are included in the following tables. The cost opinions were based upon recent average pricing. Since final design has not been completed for these projects, the cost associated with the improvements may vary from the preliminary opinion of cost provided. Other capital costs may also vary depending on several parameters, such as construction condition, specification requirements, and time of construction. Future costs may be updated by comparing Engineering News Record Construction Cost Indexes or IDOT Cost Indexes and applying those to the cost opinions. Phase 1 costs are summarized in the following Table.

Table 6-2

Phase 1 Development Cost						
Year	**Project Description**	**Federal**	**State**	**Local**	**Total**	**Notes**
2018	T-Hangar Row 4 Expansion (Includes Hangar Security Upgrades)	$0	$353,567	$228,923	**$582,490**	State GAVI + State AIP
2019	Taxiway A Rehabilitation	$373,500	$0	$41,500	**$415,000**	Federal Entitlement + Federal Discretionary Funds
2019	Upgrade Fuel Facility Including Self Serve - Phase 1		$200,000	$50,000	**$250,000**	State GAVI + State AIP

Phase 1 Development Cost						
Year	**Project Description**	**Federal**	**State**	**Local**	**Total**	**Notes**
2019	Lighted Windsock					
2020	Facility Security Improvements (Replace Analog Camera System)	$0	$34,000	$6,000	**$40,000**	State AIP
2020	T-Hangar Row 3 Reconstruction	$0	$400,000	$150,000	**$550,000**	State GAVI + State AIP
2021	Runway 12/30 & Taxiway B Pavement Rehabilitation and Joint Sealing	$150,000	$0	$16,667	**$166,667**	Federal Entitlement
2021	Apron Pavement Rehabilitation and Maintenance		$187,000	$33,000	**$220,000**	State AIP
2022	Accrue Federal Entitlement (Future Hangar Expansion)	$250,000	$150,000	$314,295	**$714,295**	State GAVI + Federal Entitlement
2022	Corporate Hangar Apron Expansion		$238,000	$42,000	**$280,000**	State AIP
	TOTAL	**$550,500**	**$648,750**	**$720,545**	**$1,919,295**	

The costs in the above Table come from the Five-Year Airport Capital Improvement Program (CIP) prepared by City staff, dated 4/20/2017, except for the Taxiway A Rehabilitation project.

Improvements identified for Phase One (2018-2022) include T-Hangar Row 4 Expansion, Taxiway A Rehabilitation, Upgrading the Fuel Facility including Self Serve, Facility Security Improvements, T-Hangar Row 3 Reconstruction, Runway 12/30 & Taxiway B Pavement Rehabilitation and Joint Sealing, Apron Pavement Rehabilitation and Maintenance, and Corporate Hangar Apron Expansion. Phase One improvements total to $1,919,295.

Displacement of the Runway 30 threshold has not been included in the development cost tables. Runway 12/30 is scheduled for pavement rehabilitation and joint sealing in 2021. Displacement of the Runway 30 threshold could be considered as an addition to that project. The estimated cost to

relocate the threshold and REILs and modify the pavement marking totals to approximately $75,000.

Previously, for 2019, Taxiway A was shown for reconstruction, with a total cost to reconstruct at $2,999,402. The adjacent runway pavement, Runway 6/24 was reconstructed in 2016. Both pavements were constructed in 1994 and in recent years had been experiencing alkali-silica reaction (ASR) related expansion in the concrete that slowly caused the control and expansion joints in the pavement to close, making the pavement vulnerable to blow-ups in hot weather. Originally, the City proposed to repave the parallel taxiway (Taxiway A) at the same time as the runway. However, the FAA recommended splitting the project into at least two phases, runway and parallel taxiway, due to funding constraints. Currently, FAA discretionary funding mostly is spent mostly on runway reconstruction, and the FAA is not expecting discretionary funding for anything other than runway reconstruction projects to be available for the next several years. After visiting the airport and viewing the pavement firsthand, the FAA disagrees that total reconstruction is needed at this time. Currently, the FAA is recommending a less extensive rehabilitation project that includes items such as crack repairs, adding asphalt expansion joints, and select panel replacements. As a part of this project, consideration could be given to including the relocation of Taxiway B and geometric changes to the intersections, square-ends, and turnarounds. However, with the cost of constructing these items estimated to be approximately $1,700,000, the overall project cost would total to approximately two thirds of the estimated cost to completely reconstruct the entire taxiway. Since AIP funding for a taxiway project of this magnitude is not likely to be available in the near term, the cost of a project involving taxiway B relocation and taxiway A geometric changes has not been included in the development cost tables.

In 2021, apron pavement rehabilitation and maintenance is shown as a state funded project. Currently, the state does not fund pavement rehabilitation projects; however, this could change in the future. Phase Two improvements are shown on the following Table.

Table 6-3

Phase 2 Development Cost						
Year	**Project Description**	**Federal**	**State**	**Local**	**Total**	**Notes**
2023	T-Hangar Row 5 Design & Apron Expansion	$0	$200,000	$60,000	**$260,000**	
2023	Accrue Federal Entitlement (Future Hangar Expansion)	$0			**$0**	$150,000
2024	T-Hangar Row 5 T-Hangar Construction	$300,000	$150,000	$100,000	**$550,000**	
2025	T-Hangar Row 1-3 Apron Pavement Replacement		$148,750	$26,250	**$175,000**	
2026	Snow Removal Equipment (End Loader)	$0	$0	$220,000	**$220,000**	End Loader not AIP Eligible
2027	Snow Removal Equipment Building*	$270,000	$0	$30,000	**$300,000**	
	TOTAL	**$570,000**	**$498,750**	**$436,250**	**$1,505,000**	

*does not include pavement, which is included in 2028 under Phase 3.

Except for the snow removal equipment building, the costs in the above Table come from the Federal Long Range Needs Assessment prepared by City staff, dated 11/6/2015.

Phase Two improvements (2023-2027) include T-Hangar Row 5 Design and Apron Expansion and T-Hangar Construction, T-Hangar Row 1-3 Apron Pavement Replacement, Snow Removal Equipment, and Snow Removal Equipment Building. These improvements are estimated to have a total cost of $1,505,000.

If the snow removal equipment building is combined with the municipal hangar (to replace the existing municipal hangar), project shares are estimated as shown in the following tables.

Table 6-4
Federally Eligible Portion - Snow Removal Equipment Storage (3,000 SF)

Building Demolition	0.22	$53,779	$11,831
Construction	0.22	$645,350	$70,988
Architect/Engineer	0.22	$96,802	$10,648
SUBTOTAL			**$93,468**

Table 6-5
State Eligible Portion of Municipal Hangar (10,685 SF)

Building Demolition	0.78	$53,779	$41,948
Construction	0.78	$645,350	$503,373
Architect/Engineer	0.78	$96,802	$75,506
SUBTOTAL			**$620,827**

However, in recent years, the maximum request allowed for general aviation vertical infrastructure (new construction) is $150,000.

Table 6-6

Local Match Municipal Hangar		**% of Total**	**Min. Share (dollars)**	**Min. Share (%)**
Total Project Cost	$714,295	100%		
Less Federal Entitlement	-$250,000	35%	$25,000.00	10%
Less State Eligible Portion	$150,000	21%	$66,858.26	15%
SUBTOTAL - Local Match	**$314,295**	44%	***$91,858.26***	

Phase Three improvements are shown on the following Table.

Table 6-7

Phase 3 Development Cost						
Year	**Project Description**	**Federal**	**State**	**Local**	**Total**	**Notes**
2028	U2/U3/U4 Apron & Taxiway	$0	$509,204	$89,859	**$599,063**	
2028	Accrue Federal Entitlement					$150,000
2029	Fuel Farm Phase 2	$67,500	$382,500		**$450,000**	*
2029	Accrue Federal Entitlement					$150,000

Phase 3 Development Cost						
Year	**Project Description**	**Federal**	**State**	**Local**	**Total**	**Notes**
2030	Runway 12/30 PAPIs & REILs + Cable in Conduit + LED edge lighting	$450,000		$113,000	**$563,000**	Runway 12/30 PAPIs are City Owned
2031	Runway 6/24 Pavement Maintenance	$150,000		$16,667	**$166,667**	
2032	ALP Update	$150,000		$16,667	**$166,667**	
2033	U14-U32 Frontage Road Phase 1	$0	$193,067	$34,071	**$227,138**	
2034	Accrue Federal Entitlement				**$0**	$150,000
2035	U14-U32 Apron & Taxiway Phase 1	$300,000	$150,000	$78,413	**$528,413**	
2036	Airfield Pavement Maintenance	$150,000		$16,667	**$166,667**	
2037	Snow Removal Equipment	$150,000		$16,667	**$166,667**	**
2038	U14-U32 Frontage Road Phase 2	$0	$193,067	$34,071	**$227,138**	
2038	Accrue Federal Entitlement					$150,000
2039	U14-U32 Apron & Taxiway Phase 2	$300,000	$150,000	$78,413	**$528,413**	
	TOTAL	**$1,717,500**	**$1,577,837**	**$494,492**	**$3,789,830**	

*Per FAA Order 5100.38D, Table D-1, c., fuel farm projects may be eligible at nonprimary airports using entitlements. The sponsor must make adequate provisions for financing higher priority airfield projects that are currently required before this revenue-producing work is funded.
**Per FAA Order 5100.38D, Table M-1, d.(2), snow removal equipment is limited to one carrier vehicle plus one blade/broom.

Phase Three improvements (2028-2038) include apron and taxiway construction for conventional style hangars on the east side of the terminal building, phase 2 of the fuel farm improvements, replacement of Runway 12/30 navigational aids and edge lighting, Runway 6/24 pavement maintenance, ALP update, and snow removal equipment. These improvements have a total cost of $3,789,830.

For the paving related projects, the total project cost was calculated based on $90 per square yard for paving area. This unit cost was based on previous

paving projects at the airport. When these projects become a higher priority and funding is applied for, more detailed cost opinions will be needed.

Based on funding constraints and on projected demand, the U14-U32 apron and taxiway has been divided into four phases.

Any remaining improvements shown on the ALP are currently identified as long-range needs and are dependent on further increases in airport operations.

In regards to a potential runway extension to serve cargo aircraft, the following preliminary estimate is for extending the runway to 7,600' long.

Table 6-8

Item	Quantity	Unit	Unit Price	Total Price
Environmental Assessment	1	LS	$100,000	$100,000
Land Acquisition	88	Acres	$7,700	$680,672
Acquire Residence	1	Each	$300,000	$300,000
Tree Clearing & Seeding	385	Acres	$550	$211,495
Wetland Remediation	11	Acres	$30,000	$324,953
Runway Extension	35,000	SY	$100	$3,500,000
Runway Widening	30,556	SY	$100	$3,055,556
Relocate Localizer	1	Each	$750,000	*$750,000*
SUBTOTAL				*$8,922,675*
Add 25% Contingency				**$11,153,344**

To serve the larger aircraft, the runway would need to be widened from 100' to 150', in addition to being lengthened. Prices in the table were derived from previous similar projects at the Muscatine Airport and adjusted for inflation to the current year. If the City is interested in pursuing this runway extension, then a more detailed cost opinion should be calculated for funding purposes.

6.4 Airport Revenue/Expenditures

Revenues generated at the airport are only expected to satisfy annual operating and maintenance (O&M) expenditures at best. Intergovernmental revenues and revenues from other sources will be required to satisfy local obligations associated with the implementation of major capital projects.

6.5 FEDERAL ASSISTANCE

Public law 97-24B (Airport and Airway Improvement Act of 1982) required the publication of a National Plan of Integrated Airport Systems (NPIAS) by September 3, 1984, and created the Airport Improvement Program (AIP). The Airport and Airway Trust Fund created in 1970 acts as a repository for the tax monies paid by aviation users to support federal programs. Airports in Iowa have benefited from the various Federal Airport Assistance Programs since FAAP was created in 1946.

At present, the Federal Aviation Administration provides grants-in-aid up to 90 percent of the project cost on eligible items. In general, eligible airside items include:

- Runway construction/rehabilitation
- Taxiway construction/rehabilitation
- Apron* construction/rehabilitation
- Airfield Lighting
- Airfield Signage
- Airfield Drainage
- Land Acquisition
- Weather Observation Stations (AWOS)
- Navaids such as REILs & PAPI's
- Planning Studies
- Environmental Studies
- Safety Area Improvements
- Snow Removal Equipment
- Snow Removal Equipment Storage

*The pavement directly adjacent to a hangar but beyond the taxilane is not eligible for FAA funding as a part of an apron project; it is considered a part of

the building project. In addition, pavement adjacent to a fuel farm is not apron funding eligible; it is considered a part of the fuel farm project.

The following items are allowed if the airside needs are met:

- Fuel farms (only if capacity upgrade can be justified)
- Stand along credit card reader for fueling
- Aircraft Hangars
- General Aviation Terminal Buildings
- Parking Lots
- Approaches to Hangars

AIP funding provides both discretionary and entitlement funds. Non-primary airports, like Muscatine, currently receive an annual entitlement of up to $150,000. This annual amount may increase if the Passenger Facility Charge (PFC) increases at primary airports. The entitlements can be accrued up to four years for funding a particular project. Funding of costs exceeding entitlements depends on available state apportionment and on available federal discretionary funding. Projects are prioritized to determine which ones receive the discretionary funding. All entitlement funds are subject to appropriation by Congress.

Projects are prioritized, as follows:

1. Aircraft Rescue and Fire Fighting (ARFF)
2. Existing Pavement Rehabilitation
3. New Pavement (runways, then taxiways, then aprons)
4. Snow Removal Equipment
5. Terminal Buildings
6. Revenue Producing (hangars, etc.)

6.6 Iowa Airport Improvement Program

The aviation fund was re-established by the Iowa Legislature in 2008. Beginning that year, one half of the aircraft registration fees and one half of aviation fuel taxes collected began being deposited into an aviation fund to be

appropriated for the aviation development program. The FY 2018 State Airport Improvement Program totaled to over 3.7 million dollars. The overall FY 2018 State aviation Program also included $900,000 for Commercial Service Vertical Infrastructure and $500,000 for General Aviation Vertical Infrastructure. Available funds for FY 2018 and beyond for both the Airport Improvement Program and the vertical infrastructure programs are dependent on yearly appropriations by the state legislature.

6.6.1 General Aviation Vertical Infrastructure Program

This program includes new construction and rehabilitation of hangars, terminals, maintenance buildings, fuel facilities, and other vertical infrastructure located on the airport. Applications are accepted once each year through the annual state application process. State share is up to 85%. Local participation will be considered when prioritizing projects. Both new and rehabilitation projects will be funded each year. In recent years, the maximum request allowed for new construction has been $150,000 and for rehabilitation has been $75,000.

6.6.2 Airport Improvement Program

6.6.2.1 Airfield and Security Projects

This program includes airside improvements and security related projects. Applications are accepted once each year through the annual state application process. State share is up to 85%. Local participation will be considered when prioritizing projects.

Eligible projects include:

- runway, taxiway, apron, and ramp development
- communication and navigational equipment
- security lighting or access control
- airfield lighting
- obstruction removal
- airfield drainage
- airfield signage
- planning studies

6.6.2.2 Windsocks

Windsocks are available to public use airports. They may be ordered through the annual application process on the Sponsor/Program Identification sheet, or at any time by contacting the Office of Aviation 515-239-1875.

6.6.2.3 Immediate Safety Enhancements (ISE)

This program includes emergency repair to communication and navigational equipment, airside infrastructure, lighting, and other safety related components. Applications are accepted throughout the year. State share is 70% of project up to a maximum of $10,000.

Implementation of the capital projects proposed in each of the phases is dependent to some extent on the availability of grants-in-aid from either the Iowa DOT and/or Federal Aviation Administration (FAA). Equally important, the City of Muscatine will have to provide the local match to projects eligible for participation in cost by Iowa DOT and/or the FAA.

6.7 Private Sector Investment

The investment of public funds should also provide an impetus for private investment. One of the single most valuable assets available to an airport is the leasable land with access to the runway/taxiway system. For aviation related businesses, being located on an airport is critical. Airport property is available for long term lease but in most cases, this land cannot be sold. Long term leases can lead to grant assurance compliance problems. Leases must be for fair market value, for fewer than 50 years, with the rent reevaluated ever five years, approximately, to ensure the lease is still fair market value. Typically, the lease length is for the same period as the financing/loan for the structure.

An area in which private investment may be used effectively is for the development of hangar facilities. Hangars benefit specific airplane owners. Consequently, it is reasonable to place at least part of the responsibility for hangar development with the private sector.

Such facilities constructed with private capital on the airport facility may be deeded to the airport owner in trade for a long-term lease. The advantage of such an arrangement is it relieves the airport owner (sponsor) of the burden of

financing private hangars facilities, while retaining possession and control of all real property on the airport.

Typical airport development policy assumes the private sector will construct future hangar facilities and taxiway pavement within twenty (20) feet of the hangar. After 20 to 30 year amortization period, the hangars constructed by the private sector could become airport property. Revenue generated from hangar rental would at this point be available to the airport owner.

However, the private development of facilities on a ground lease, especially on government owned property, produces a unique set of concerns. In particular, obtaining private financing is more difficult, as only the improvements and the right to continue the lease can be claimed in the event of a loan default. Since ground leases typically provide for the reversion of improvements to the lessor at the end of the lease term, their potential value to the lender is reduced. In addition, companies that want to own their property, as a matter of corporate financial policy, may not choose to locate where land is available for lease only.

In order for this arrangement to make financial sense to the private developer and/or financer, most ground leases include term extension opportunities, along with the opportunity to periodically review the lease and adjust the rate.

Ground rentals/land leases can also be applied to non-aviation development on the airport. Under certain circumstances, an airport sponsor may utilize portions of the airport for non-aviation purposes such as commercial and/or industrial development, if certain areas are not needed to satisfy aviation demand or are not accessible to aviation activity. Prior to an airport sponsor pursuing a ground lease with a commercial operator for non-aviation purposes, the sponsor must formally request from the FAA a release from certain land parcels that may not be needed for aviation-related uses.

In addition to leasehold financing, the airport sponsor can enter into some form of public/private partnership for various improvements on the airport property. Typically, this scenario would be used for hangar construction, but a private developer could construct, for example, a taxilane, and then deed it to the airport sponsor for ongoing maintenance. However, the sponsor must be sure that the private developer does not gain an economic advantage over other airport tenants.

6.8 Airport Maintenance

The primary emphasis of the Airport Development Plan is placed upon identifying those facility needs required to bring the airport up to current design standards and satisfy aviation demand activity. However, once the facility component is constructed, maintenance becomes a major emphasis. Not only should the public investment in facilities be enhanced, those actions required to maintain a high degree of safety must be undertaken, and hazardous conditions should be corrected immediately. A daily airport inspection program should be established and deficiencies noted. This action should be undertaken by the airport manager, with deficiencies reported to the City for correction. The Iowa DOT Pavement Management Report combined with a daily inspection program will continue to enable the City of Muscatine to identify areas where deficiency exists.

6.9 Airport Economic Impact

Iowa's air transportation industry is vital to its economy. In addition to the aviation-based employment opportunities that airports provide for Iowans, they facilitate new and continued economic growth in the State's business, industrial, and agricultural sectors.

The State's airport network directly supports a multi-modal transportation system that helps Iowa stay competitive in an increasingly global economy. It attracts new employers, improves the state job market, and increases job retention. The magnitude of their impact sets airports apart as vital investment opportunities for growing communities within the state.

According to the *Iowa Aviation System Plan 2010–2030 Technical Report,* allocating additional funding to the continued development of the State's aviation system is key to ensuring that the state can reap the return on its investment. The report states: ***Significant funding has been invested into the existing infrastructure of Iowa airports. Between 2005 and 2010, $290 million has been invested through federal, state and local sources to develop and maintain the aviation system. In order to maintain the level of service at these airports and invest in appropriate future development, funding from the federal Airport Improvement Program (AIP), the state, and local communities continues to be necessary.***

These investments already yield impressive returns to the state economy and

job market. The aforementioned report suggests that air transport in Iowa contributes an estimated $5.4 billion to the state economy and creates more than 47,000 jobs.

The economic reach of airports extends far beyond the direct impact that they have on the communities within which they operate. Airports improve the efficiency of business throughout the state and contribute to the infrastructure upon which Iowa's multi-billion dollar agricultural industry relies.

According to the *Uses and Benefits of Aviation in Iowa (2009 Economic Impact report)* published by the Iowa Department of Transportation, airports increase productivity in the agricultural industry by an estimated $214 million and increase productivity in the private sector by $12.8 billion. The 2009 Economic Impact Report calls for the sustained support for airports saying:

The magnitude of the economic impact Iowa receives from all facets of air transportation is significant. From analysis completed in this study, it is estimated that roughly 12 percent of the state's jobs, annual payroll, and gross state product are in some way linked to aviation. These findings reinforce the need to sustain and invest in a healthy air transportation system in Iowa.

In addition to the increased productivity that the Iowa economy sees as a result of the airports within the state, the state also sees more than one million visitors a year who arrive by air. Spending by these visitors helps support notable volumes of additional economic activity. The reported economic impact of visitor spending reaches approximately $220 million each year. This is coupled with the nearly 7,500 jobs and $241 million in annual payroll that are directly supported by general aviation. When all on-airport activity is accounted for, airports in the 2009 Economic Impact Report contributed almost 16,470 jobs, $587 million in annual payroll, and over $1.5 billion in annual economic activity.

Airports make invaluable contributions to off-airport productivity as well. They attract business to Iowa with the promise of increased efficiency and increased accessibly to various markets within the state. These off-airport contributions account for an estimated economic impact of $12.8 billion and over 140,000 jobs with an annual payroll of $5.8 billion. While the contributions that general aviation airports make to the surrounding communities are intrinsically substantial, they increase in magnitude when these airports actively partner with these communities.

The following table, which includes data from the above mentioned report, demonstrates the specific economic impact derived from the Muscatine Municipal Airport. The table identifies the total number of jobs associated with on-airport aviation related activities, businesses, and capital improvement projects (CIP), the number of jobs supported by spending from visitors arriving at MUT, and the total number of jobs supported by activities at MUT.

Table 6-9 Employment Impact from MUT

Employment Associated with On-Airport Activity @ MUT		
Direct Employment	**Induced Employment**	**Total Employment**
25.5	19.5	45.0

Employment from General Aviation Visitor Spending for MUT		
Indirect Employment	**Induced Employment**	**Total Employment**
16.5	4.5	21.0

Total Airport-Related Employment for MUT		
Direct and Indirect Employment	**Induced Employment**	**Total Employment**
42.0	24.0	66.0

The next table shows the estimated annual visitor impact from MUT, the total annual payroll impact, and the output from on-airport activities and tenants, as well as from visitor spending.

Table 6-10 Output Associated with MUT

Estimated Annual Visitor Expenditures (Output) for MUT			
Estimated Transient Arrivals	**Annual Visitors**	**Total Annual Days Stayed**	**Annual Visitor Expenditures**
3,231	11,469	6,881	$589,000

Annual Payroll from On-Airport Activities and Visitor Spending for MUT		
Direct and Indirect Payroll	**Induced Payroll**	**Total Payroll**
$1,415,300	$1,011,300	$2,426,600

Output from On-Airport Activity and Visitor Spending for MUT		
Direct and Indirect Output	**Induced Output**	**Total Output**
$2,817,800	$1,853,200	$4,671,000

This final table is a summary of the preceding tables from the *Uses and Benefits of Aviation in Iowa (2009 Economic Impact report):*

Table 6-11 Summary of MUT's Impact

Total Annual Economic Impact from MUT		
Total Employment	**Total Payroll**	**Total Output**
66.0	$2,426,600	$4,671,000

Appendix A Public Meeting Information

November 28, 2016

RE: AIRPORT LAYOUT PLAN UPDATE
CITY OF MUSCATINE, IOWA
FAA AIP PROJECT NUMBER: 3-19-0063-021

Dear Airport Stakeholder:

The City of Muscatine has secured a grant from the Federal Aviation Administration to update their Airport Layout Plan, also known as an Airport Master Plan. The last time an update was completed was 2002. This update will give the City of Muscatine a more complete picture of development needs and priorities at the airport and will help provide a long-term comprehensive planning strategy. Anderson Bogert of Cedar Rapids, Iowa, is assisting the City with plan preparation of the Airport Layout Plan.

The Airport Layout Plan (ALP) is the document used for the planning the improvement of the airport. These improvements include the expenditure of $150,000 per year of General Aviation Airport Entitlement Grant Funds. These funds can only be used to support or provide the facilities shown on the Airport Layout Plan.

An important part of the planning process is gathering information from the community and sharing information among the airport manager, users, tenants, public agencies, City officials, City staff, the airport advisory commission, neighboring property owners, the FAA, and the general public. As a stakeholder, we would appreciate your input early on in the planning process.

Therefore, you are invited to a public information meeting on *Monday, December 12, 2016 at the Muscatine Municipal Airport Conference Room, 5701 U.S. Hwy 61, Muscatine*. The meeting will begin at *5:30 p.m.* and will include a formal presentation with an agenda. You will also have the opportunity to speak with City representatives about the project.

We encourage you to attend the meeting, so that we may have your input concerning stakeholder needs, and so that the City can understand the stakeholder perspective. We have attempted to notify all airport stakeholders; however, in case we have missed someone, we encourage you to share this information with others that you think could be interested. If you have any questions, please contact Ms. Jayne DeCoste, with Anderson Bogert at 319-377-4629 or jdecoste@anderson-bogert.com or me at 563-262-4141 or athompson@muscatineiowa.gov.

Sincerely,

THE CITY OF MUSCATINE DEPARTMENT OF COMMUNITY DEVELOPMENT

Adam J. Thompson
Planning & Community Development Coordinator

cc: Jeff Deitering, FAA Central Region Airports Division
Jayne C. DeCoste, Anderson Bogert

AGENDA
STAKEHOLDER MEETING
MUSCATINE MUNICIPAL AIRPORT - AIRPORT LAYOUT PLAN
December 12, 2016

I. Introductions

II. Airport Layout Plan

a. What is it?
b. How is it used?

III. Planning Process

a. Existing Conditions, Aviation Forecast, and Design Aircraft (Winter 2017)
b. Develop Facility Requirements and Alternate Development (Spring 2017)
c. Develop Selected Plan, Implementation Schedule, and Financial Feasibility (Summer 2017)
d. Final Plan Submittal (Fall 2017)

IV. Stakeholder Participation

a. Current Use and Activity
b. Current Compliance Issues
c. Known Needs and Problems
d. Wish List

V. Closing Comments

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Airport Layout Plan Meeting Minutes
City of Muscatine, Iowa
FAA AIP Project #3-19-0063-021
Meeting date: December 12, 2016

Meeting Attendees: See attached sign-in sheet.

GENERAL AIRPORT LAYOUT PLAN (ALP) DISCUSSION

- Discussed that last ALP for the Muscatine Municipal Airport was completed in 2001.
- All drawings date back to 2001, except: the main ALP drawing was updated in 2009, after the parallel taxiway project was completed, and the property map was updated in 2007, after land acquisition was completed to the new building restriction line, in association with the ILS installation.
- Along with the drawings, a narrative report will be filed with the FAA, which will justify the improvements shown in the drawings.
- An ALP is typically updated every 8 to 10 years
- The development schedule presented in the narrative report is typically broken into 3 phases: 1) Years 1-5, 2) Next 5 years, and 3) Following 10 years; this gives 20 years of planning.

PLANNING PROCESS AND SCHEDULE

- Existing Conditions, Aviation Forecast, and Design Aircraft (Winter 2017)
- Develop Facility Requirements and Alternate Development (Spring 2017)
- Develop Selected Plan, Implementation Schedule, and Financial Feasibility (Summer 2017)
- Final Plan Submittal (Fall 2017)
- Separate Zoning Ordinance Update project can start as the ALP Update project is entering the final stages.

ASSESSING CURRENT AND FUTURE AVIATION ACTIVITY

- Part of the ALP report is to assess overall community growth in population and employment
- Attendees suggested not only looking at Woods and Poole data, but also verifying that data with the local community, chamber of commerce, city, etc.
- Local activity: Port, new hotel/convention center, other economic development and growth
- Also see Brand Muscatine project
- Attendees suggested reaching out to the military to assess if they would like additional use of the airport
- In the future, it is clear in conversation that replacing and adding hangars are needed to meet the needs of current and future pilots – it was mentioned they are not meeting demand today
- In the future, various improvements could include: Hangars, maintenance/equipment storage building, additional apron pavement (including drainage improvements), self-fueling, connecting taxiway layout considerations, runway length considerations, and possible industrial development

FUNDING

- Funding needs will be addressed in the ALP narrative report
- Attendees were concerned with funding, particularly for hangars
    - Attendees discussed how hangars are currently built/leased and if there are other funding avenues, such as a ground lease only, where users own the building with the ability to sell in future
    - In report, will explore different ways to finance hangars
- Financial feasibility of any future plans need to be considered

CURRENT USE AND ACTIVITY

- Attendees suggested reaching out to the military to assess if they would like additional use of the airport; if so, military will pay for improvements.
- The width and length of the runway was discussed and if it is sufficient for future aircraft
- It was discussed that the current number of tie-downs is sufficient

CURRENT COMPLIANCE ISSUES

- Attendees discussed possible compliance issues with building heights
    - Zoning ordinance update project will help make this clearer
- Changes to the main connecting taxiway alignment are driven by FAA changes to how the taxiway can be laid out in relation to other taxiways/runways.

KNOWN NEEDS AND PROBLEMS

- Attendees discussed the need to stage any replacement of hangars, adding hangars, hangar improvements (insulation, restroom facility, etc.)
- Possible drainage issues will need to be addressed with hangars/apron pavement improvements
- Repurposing certain hangars for different activities was discussed, such as for a maintenance facility or additional hangar space with the addition of a dedicated maintenance facility
- Wider hangars needed (62' width)
- Approach to Runway 12 concern: don't clear trees by much
- Airspace needs were discussed and the need to work with City of Muscatine, Muscatine County, Louisa County and the town of Fruitland for zoning ordinance updates
- Pavement surface between hangar rows 2 & 3 is creating debris that has potential to damage planes.
- Existing fuel storage system for both AVGAS and JET-A is nearing the end of its life.

WISH LIST

- Additional hangars - during the terminal area plan development, will provide some optional hangar layouts to the City (different combinations of T-hangars and box hangars). Also will look at the possibility of siting privately owned hangars between Highway 61 and the Runway 24 building restriction line.
- Self-service fuel station – may or may not include both AVGAS and jet fuel
    - Research advantages and disadvantages of self-serve fuel for various types of fuel
    - For terminal area layout: show location for new above ground self-contained system; two suggested locations - at the compass rose marking and where the fuel trucks park now (north of electrical vault building)

- Fuel at low price, if possible, to attract pilots into the airport
- Add 91 octane fuel for sport-type planes
- Discussion of a grass runway, but there is not enough space for this runway with current property
- Research possible future backup to other airports in some way (ie, lengthen runway, so that can be a backup to other larger airports when they have a runway under reconstruction)
- Dedicated maintenance building - 2007 main ALP drawing shows this building to the west of the HON hangar; investigate alternate locations nearer to the terminal building.
- Windsock repair

OTHER DISCUSSION

- City mentioned that industrial development could occur in the over 100 acres on the north side of the airport property, but this activity would more than likely be for a commercial business that would use the airport, such as FedEx, UPS, etc.
    - Attendees seemed in favor of this but expressed concerns with lack of existing infrastructure and possible competition with existing industrial parks
    - Infrastructure concerns include: roadway, utilities, etc.
    - May be some property acquisition needs for ingress/egress to the site from the north.
- City mentioned that a restaurant or gas station could be nice addition
    - Attendees didn't seem in favor of this and preferred that airport users frequent existing neighboring establishments
- VOR slated to shutdown; although schedule is not known. Shutdowns are occurring nationwide on similar installations.
- Economic impact of airports - add section to the report for the City Council's benefit
- Early February bidding apron expansion for T-hangars. Row 4 T-Hangars estimate = $800,000 (includes apron pavement). Row 3 T-Hangar replacement estimate = $350,000

AIRPORT LAYOUT PLAN
CITY OF MUSCATINE, IOWA
FAA AIP PROJECT #3-19-0063-021

STAKEHOLDER INFORMATION MEETING
Muscatine Municipal Airport
December 12, 2016 from 5:30 p.m.

ATTENDANCE SIGN-IN

PLEASE PRINT

NAME	ADDRESS	PHONE NUMBER	E-MAIL ADDRESS
Jim Meade	2331 340th St SW Tiffin, IA 52340	319-330-5548	jnmeade@southslope.net
D. Stacy Lewis	2907 Mulberry Ave	563-263-8112	splewis@machlink.com
Gary Zeck	1704 Duncan Dr	563-299-2939	gzpilot@hotmail.com
Steve Ellsworth	2006 Mulberry	563-260-9740	scekellsworth@gmail.com
Adam Thompson	215 Sycamore St	563-262-4141	athompson@muscatineiowa.gov
Greg Ferris	1923 Charles Way	563-506-5774	ferrisgreg@allsteeloffice.com
Steven Bradford	408 E 2nd St	563-272-4919	bradfords@hnicorp.com
Mike Woerly	5817 63rd Ave W	563-299-8725	mwoerly@carveraero.com
Bill Leddy	317 Pine St	563-506-3932	leddybill@stanleygroup.com
Dave Gobin	215 Sycamore St	603-477-9000	dgobin@muscatineiowa.gov
Jerry Page	615 Maiden Ln	563-607-3526	pagej@machlink.com

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PLEASE PRINT

NAME	ADDRESS	PHONE NUMBER	E-MAIL ADDRESS
Jayne DeCoste	4001 River Ridge Dr NE Cedar Rapids, IA 52402	319-377-4629	jdecoste@anderson-bogert.com
Megan Moffitt	4001 River Ridge Dr NE Cedar Rapids, IA 52402	319-377-4629	mmoffitt@anderson-bogert.com

COMMENT FORM

AIRPORT LAYOUT PLAN
CITY OF MUSCATINE, IOWA
FAA AIP PROJECT #3-19-0063-021

Stakeholder Information Meeting; December 12, 2016; 5:30 p.m.

Are you a pilot? (Yes) No *(circle one)*

How do you use the airport?

Business Rarely

Pleasure X Often

Don't use it because _____

I believe the airport is important to Muscatine because gain access to recreational activities. Reliever airport for Moline. Quick access to Iowa City & Cedar Rapids via air.

I would like to see the following improvements made to the airport

GRASS Runway
91 Octane Fuel
More & better hangars

Any other comments

Fix the windsock

Please return comments to:

Jayne C. DeCoste, P.E.
Anderson Bogert
4001 River Ridge Drive NE
Cedar Rapids, IA 52402
Phone: (319) 377-4629, Fax: (319) 377-8498
Email: jdecoste@anderson-bogert.com

Name *(optional)* _____

Phone _____ Email _____

Appendix B

Aviation System Plan 2010-2030
Individual Airport Report
Muscatine Municipal Airport

Prepared for:

IOWA DEPARTMENT OF TRANSPORTATION

OFFICE OF AVIATION

The preparation of this document was financed in part through an Airport Improvement Program grant from the Federal Aviation Administration (Project Number 3-19-0000-15-2009) as provided under Section 505 of the Airport and Airway Improvement Act of 1982, as amended. The contents do not necessarily reflect official views or the policy of the DOT or the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein not does it indicate the proposed development is environmentally acceptable in accordance with appropriate public laws.

Individual Airport Report
Muscatine Municipal Airport

The *Iowa Aviation System Plan* Individual Airport Report provides an overview of the aviation system in Iowa, as well as specific information related to the Muscatine Municipal Airport. Iowa's air transportation system plays a critical role in the economic development of the state and quality of life for Iowans. The *Iowa Aviation System Plan* evaluates existing conditions and makes recommendations for future development of the air transportation system to meet the needs of users over the next 20 years.

Airport sponsors and airport management can use the Individual Airport Report to better understand the role their airport plays in the state and use it as a guide to improve facilities and services for their aviation users. The Individual Airport Report is divided into two sections: Section One provides an overview of the statewide aviation system; and Section Two provides specific information for the Muscatine Municipal Airport. Additional information regarding the *Iowa Aviation System Plan* can be found at http://www.iowadot.gov/avaition.index.html.

Section One – System Plan Overview

1.1 System Planning Process

Development of a meaningful and useful planning document centered on the analysis of data collected for the system's inventory and input received from public involvement on issues, concerns, and needs affecting aviation in Iowa. A comprehensive data collection effort, analysis, and significant public involvement guided the development of the 2010 *Iowa Aviation System Plan*. Contributions from the System Plan Technical Advisory Committee, comprised of individuals involved in different aspects of aviation across the state, as well as input received from the public at five input meetings, also guided the planning process. The process to complete the *Iowa Aviation System Plan* included the following steps:

- Identify goals, objectives, and performance measures.
- Inventory of existing aviation facilities and infrastructure.
- Update airport roles.
- Identify facility and service targets for airport roles.
- Forecast of aviation activity.
- Discuss emerging trends and technologies.
- Develop system recommendations.

1.2 System Plan Goals, Objectives, and Performance Measures

The identification of goals establishes the framework necessary to guide future development and maintenance of the system's airports based on key areas of existing and anticipated user needs. Meeting these goals allows airports to provide facilities and services that meet the air transportation demands of the economy, citizens, and visitors of the state.

The following six goals were established for the system to adequately meet user demands and achieve the overall vision of aviation in Iowa:

- **Safety and Security** – Provide a safe and secure system of airports.
- **Infrastructure and User Support** – Provide an airport system that meets existing and future user needs.
- **Accessibility** – Provide a system of airports that is adequately accessible from both the ground and the air.
- **Economic Support** – Support economic development through the air transportation system.
- **Planning** – Establish airport-related local planning to guide the development and operation of airports in Iowa.
- **Education and Outreach** – Provide local aviation education opportunities that promote understanding, safety, utilization, and career development.

Objectives identify specific means and methods needed to achieve each goal based on an assessment of existing and future user needs. Some objectives may target facilities or services, while others quantify future needs. Not all objectives will be applicable to each airport as some may be adapted to the role it serves within the aviation system.

Performance measures establish criteria to evaluate whether the system is meeting the objectives. Performance measures identify desired levels of the objectives to determine the system's progress towards achieving the goals. Typically expressed as a percentage, the performance measures are used to identify strengths and weaknesses that contribute towards the development of the Plan recommendations. The following lists the objectives and performance measures for each goal.

Goals, Objectives, and Performance Measures

Objectives	Performance Measures
Goal: Safety and Security	
• Airports have clear approaches to primary runways. • Airports have clear approaches to all runways. • Airports have emergency response plans. • Airports develop and implement security plans.	• Percent of airports with clear primary runway approaches. • Percent of airports with clear approaches to all runways. • Percent of airports with emergency response plans. • Percent of airports with airport security plans.
Goal: Infrastructure and User Support	
• Airports meet facility targets identified for their specific role. • Airports meet service targets identified for their specific role. • Primary runways maintained to PCI of 70 or higher. • Airports maintain an overall PCI of 70 or higher. • Based aircraft stored in covered hangars.	• ** Percent of airports meeting facility targets.* • ** Percent of airports meeting at least 75% of service targets.* • Percent of airports with primary runway PCI of 70 or greater. • Percent of airports with overall airport PCI of 70 or greater. • Percent of airports with aircraft storage for all based aircraft.
Goal: Accessibility	
• A 30-minute or less drive time to a commercial or enhanced service airport. • A two-hour or less drive time for most Iowans to a commercial service airport • A 30-minute or less drive time to an airport with weather reporting equipment. • A 30-minute or less drive time to an airport with an instrument approach for most Iowans. • A 30-minute or less drive time to an airport with a vertically guided approach.	• Percent of population 30 minutes from a commercial service or enhanced service airport. • Percent of population within two hours of a commercial service airport. • Percent of population within 30 minutes of an airport with weather reporting equipment. • Percent of population within 30 minutes of an airport with an instrument approach. • Percent of population within 30 minutes of an airport with a vertically guided approach.
Goal: Economic Support	
• Airports coordinate with local economic development offices, chambers of commerce, and city and county officials to include airport information in business promotion materials. • Most of the employment is within a 30 minute drive time of a commercial or enhanced airport. • Airports support aircraft owned and operated by companies doing business in proximity to an airport.	• Active coordination with local economic development offices, chamber of commerce, city, and county officials to include airport in business materials. • Percent of employment within 30 minutes of a commercial service or enhanced airport.
Goal: Planning	
• Airports have a current master plan or ALP. • Airports are protected by local height zoning ordinances. • Airports are included in city/county comprehensive plans or land use plans that address compatible land use around airports.	• ** Percent of airports with a current master plan and/or ALP.* • Percent of airports protected by airport height zoning. • Percent of airports with compatible land use planning through city/county comprehensive planning or land use plans.
Goal: Education and Outreach	
• Airports establish regular communication programs (newsletters, press releases, web sites, or social media.) • Airports have based rental aircraft and availability of regular flight instruction. • Airports host pilot safety programs. • Airports host annual aviation events such as fly-ins, air shows, and static aircraft displays. • Airports host additional types of public events such as business after hours receptions or open houses. • Airports host organized youth education activities such as Young Eagles events or youth camps.	• Percent of airports with regular communication programs. • Percent of airports that have based rental aircraft and regular flight instruction. • Percent of airports that host pilot safety programs. • Airports host annual aviation events. • Airports host additional types of public events. • Airports host organized youth education activities.

Note: * = Measurement criterion to evaluate performance varies by role.

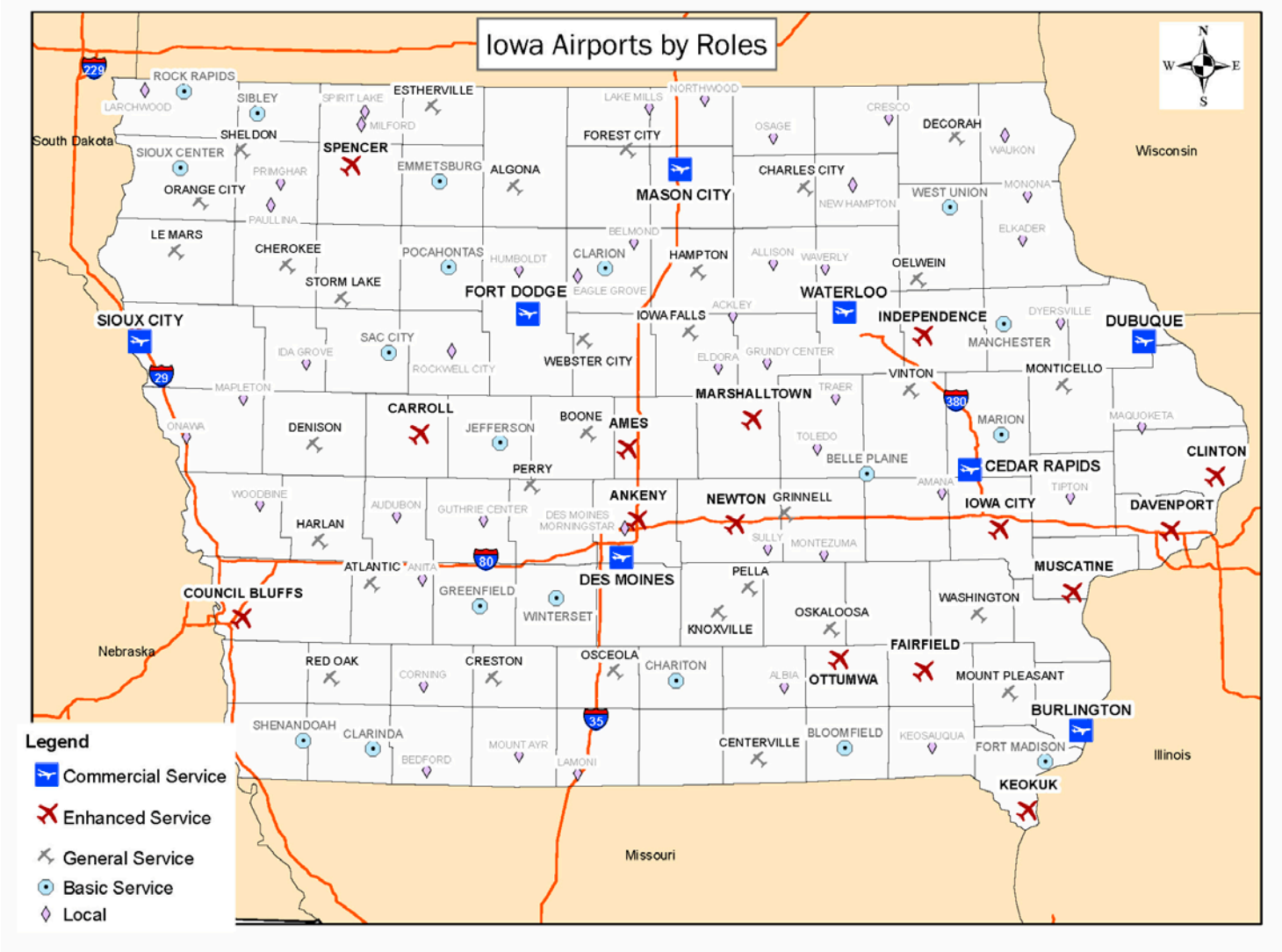
1.3 Airport Roles

Airports in Iowa serve varying types of users and levels of demand. Airports were classified into one of five airport roles based upon their capability to support various types of aircraft and aviation users. Airports were assigned to a role based on currently meeting specific facility and services criteria. As conditions change and an airport meets the criteria for a higher level role, the plan is flexible to recognize role changes. The following table lists each role and its classification criteria while the following graphic identifies the location of each system airport.

Role Classification Criteria

System Role	Criteria
Commercial Service – Commercial Service airports support some level of scheduled commercial airline service, have the infrastructure and service available to support a full range of general aviation activity, meet most needs of the aviation system, and serve as essential transportation and economic centers of the state.	• Commercial airline service.
Enhanced Service – Enhanced Service airports have runways of 5,000 feet or greater in length, facilities and services that can accommodate a full range of general aviation activity including most business jets, serve business aviation, and are regional transportation centers and economic catalysts.	• 5,000 foot or greater paved runway. • Airport Reference Code (ARC) of C-II or greater. • Full time staffing during regular weekday and weekend business hours, available 24 hours a day. • Availability of most based services including aircraft maintenance, flight training, rental aircraft, and aircraft charter. • Availability of jet fuel. • Weather observing system located on airport.
General Service – General Service airports have runways 4,000 feet or greater in length, facilities and services customized to support most general aviation activity including small to mid-size business jets, and service as a community economic asset.	• 4,000 foot or greater paved runway. • Availability of some based services including aircraft maintenance, flight training, rental aircraft, and aircraft charter. • Staffing during regular business hours.
Basic Service – Basic Service airports have runways 3,000 feet or greater in length with facilities and services customized to meet local aviation demands.	• 3,000 feet or greater paved runway. • Availability of aircraft fuel. • Some availability of airport or FBO personnel or on-call availability 24 hours.
Local Service – These airports support local aviation activity, offer few airport services, have turf runways, or are unable to meet criteria defining any other role.	• Turf runways. • Airports not meeting criteria in any other roles.

Iowa Airports by Roles



1.4 Facility and Service Targets

Facility and service targets were established to help airports, within a specific role, meet the needs of their users. While not all targets are required for inclusion in a particular role, these are recommended levels of service and/or facility targets appropriate for the type of use associated with each role. Airports are encouraged to meet or exceed suggested targets for their role to satisfy local and aviation system needs.

The targets are separated into two main categories: airside and landside facilities, and services. Targets for each role vary based on the needs of aviation users for that role. The Enhanced Service airports, for example, will have more targets to meet the needs of business users. There are fewer targets for Local Service airports since they serve users with fewer requirements for operation. In the table below, targets for Commercial Service airports are combined with Enhanced Service targets, since in most categories, Commercial Service airports will exceed targets. Targets required for inclusion in a role are highlighted in red in the following facility and service tables.

Facility Targets

Target Description	Commercial/Enhanced Service Targets	General Service Targets	Basic Service Targets	Local Service Targets
Airside				
Airport Reference Code	**C-II**	B-II	B-I or below	A-I
Primary Runway Length	**Minimum 5,000 ft**	**Minimum 4,000 ft**	**3,000 ft**	Not an objective
Primary Runway Width	Minimum 100 ft	Minimum 75 ft	Minimum 60 ft	Minimum 50 ft
Type of Parallel Taxiway	Full parallel	Turnarounds meet standards (both ends)	Exits as needed	Not an objective
Type of Runway Approach	Vertical guidance	Non-precision	Visual	Visual
Runway Lighting	MIRL	MIRL	LIRL	Not an objective
Taxiway Lighting	MITL	MITL	Not an objective	Not an objective
Visual Guidance Slope Indicator	Both runway ends (or ILS)	Both runway ends	Not an objective	Not an objective
Runway End Indentifier Lights (as required)	Both runway ends (or ILS)	Both runway ends	Not an objective	Not an objective
Rotating Beacon	Yes	Yes	Yes	Not an objective
Lighted Wind Indicator	Yes (multiple as needed)	Yes	If open for night	If open for night
RCO Facilities	Tower or RCO	Not an objective	Not an objective	Not an objective
Wind coverage or crosswind runway	Crosswind runway or 95% wind coverage for NPIAS facilities	Crosswind runway or 95% wind coverage for NPIAS facilities	Not an objective	Not an objective
Landside				
Covered storage	100% of based aircraft	100% of based aircraft	100% of based aircraft	Not an objective
Overnight storage for business aircraft	Typical average aircraft/ business user demand	Typical average aircraft/ business user demand	Not an objective	Not an objective
Aircraft apron	100% of average daily transients	100% of average daily transients	50% of average daily transients	Not an objective
Terminal/administration building	Yes	Yes	Waiting area	Not an objective
Paved entry/terminal parking	Yes	Yes	Not an objective	Not an objective

Note: Targets highlighted in **RED** are requirements for role classification

Service Targets

Target Description	Commercial/Enhanced Service Targets	General Service Targets	Basic Service Targets	Local Service Targets
Services				
Fuel (type & hours)	**100LL & Jet A - 24 hour - single point**	**100LL**	**100LL**	Not an objective
Weekday hours of operation	**Standard business hours, after hours on-call**	**Standard business hours, after hours on-call**	**On-call**	Not an objective
Weekend hours of operation	**Standard business hours, after hours on-call**	**Standard business hours, after hours on-call**	**On-call**	Not an objective
Ground transportation	Courtesy car/car rental available	Courtesy car/car rental available	Not an objective	Not an objective
Food & Beverage	Vending	Vending	Not an objective	Not an objective
Posted contact info	Yes	Yes	Yes	Yes
Internet access	Yes	Yes	Not an objective	Not an objective
Restroom	Yes	Yes	Yes	Not an objective
Pilot area	Yes	Yes	Not an objective	Not an objective
Security	Security plan	Security plan	Security plan	Security plan
Snow removal	Timely snow removal	Timely snow removal	Snow removal	Not an objective
Rental aircraft	**Based**	Based	Not an objective	Not an objective
Flight training	**Available**	Available	Available	Not an objective
Aircraft maintenance/repair	**Based**	Based	Not an objective	Not an objective
Aircraft charter	**Based**	Available	Available	Not an objective
Weather reporting/flight planning capabilities	**Yes**	Yes	Not an objective	Not an objective

Note: Targets highlighted in **RED** are requirements for role classification

1.5 System Forecasts, Trends, and Technology

During the past decade, aviation activity was impacted by economic conditions and events that were difficult to predict. Projections for the next twenty years indicate commercial airline enplanements, based aircraft, and operations are expected to experience slow growth. The 2010-2030 Federal Aviation Administration (FAA) Aerospace Forecast projects that the number of active aircraft throughout the planning period will increase at one percent (1.0%) annually, while the number of based aircraft in the state is projected to be slightly higher at 1.25 percent (1.25%). Aircraft operations are anticipated to increase at one-half of one percent annually.

Several anticipated trends and developing technologies will affect aviation in Iowa throughout the planning period. It is important the system is prepared to adapt to these changes to meet the short- and long-term needs of aviation users. Topics that could significantly impact aviation in Iowa include the implementation of the Next Generation Air Transportation System (NextGen), environmental sustainability, and future aircraft types.

1.6 System Plan Recommendations

Federal, state, and local airport sponsors all have a role in providing adequate infrastructure and services to support the demands of the air transportation system. Review of the system's performance and comments received from the public and the System Plan Technical Advisory Committee identified recommended improvements and initiatives. Recommendations address specific goals and general concepts for the system. A cooperative approach towards the implementation of plan recommendations is necessary for the Iowa aviation system to meet the air transportation demands of the state. Continued management of essential programs and services by the Iowa Department of Transportation (Iowa DOT) Office of Aviation helps strengthen the safety and security of the state aviation system.

Airport sponsors own and operate the airports, having ultimate responsibility for daily and long term operations and maintenance. Recommendations in the *Iowa Aviation System Plan* provide a guide for airport sponsors to assess their role to ensure that Iowa has safe, quality facilities and services to meet the air transportation needs. Recommendations to enhance safety of the system include actively mitigating obstructions, developing and enforcing compatible land use controls, actively mitigating wildlife hazards, and developing emergency response plans. Airport sponsors are encouraged to engage their community leaders and stakeholders in developing a strategic plan to guide the future of the airport and its role in economic development. More specific recommended actions are detailed beginning on Page 13 of this report.

1.7 System Plan Summary

The Iowa aviation system is an integrated network of users, aircraft, businesses, airports, technologies, and services that supports the economy and serves as a transportation resource for both the state and the nation. The Iowa DOT, in conjunction with the FAA and individual owners and operators of each airport, continue to strive towards meeting system goals and objectives to maintain a safe, efficient, and effective aviation system. As airports respond to changing needs of aviation users and the communities they serve, it is important to consider both facilities and services identified in the targets established for airport roles.

Maintaining and developing the airports' infrastructure and services is critical to the continued health of Iowa's economy and the quality of life for Iowans. Through addressing needs identified in the recommendations, the *Iowa Aviation System Plan* will help ensure users of the aviation system are offered safe, quality facilities and services that support the air transportation demands of Iowa for the next twenty years.

Section Two – Individual Airport Overview

This section provides information specific to the Muscatine Municipal Airport, including a brief history of the airport, forecasts of operations and based aircraft, performance measure recommendations, a summary of capital improvement projects, and an airport fact sheet.

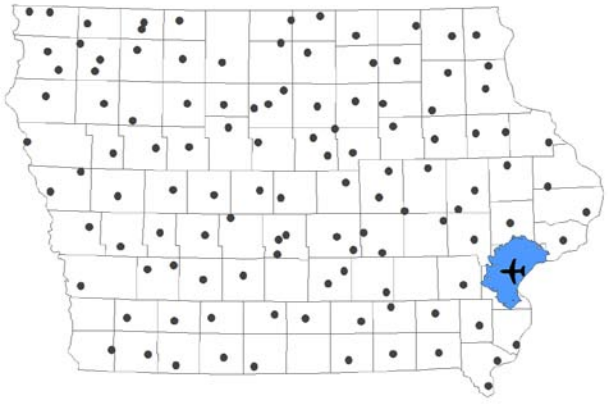
2.1 Airport Summary

The Muscatine Municipal Airport is owned and operated by the City of Muscatine. The FAA recognizes the airport as playing a role in the national airport system and includes the airport in the National Plan of Integrated Airport Systems (NPIAS) as a general aviation airport, which makes the airport eligible for federal funding.

The Muscatine Municipal Airport is identified in the *Iowa Aviation System Plan* as an Enhanced Service airport. Enhanced Service airports have runways 5,000 feet or greater in length with facilities and services that accommodate a full range of general aviation activity, including most business jets. The airport serves business aviation and is a regional transportation and economic center in the state. Specific airport information can be found in the Airport Fact Sheet located in the appendix of this report.

The Muscatine Municipal Airport provides aviation services to the City of Muscatine and Muscatine County. The airport is located approximately 5 miles southwest of the central business district. Access to the airport is provided from US Highway 61.

30 Minute Drive Time



Airport Location

2.2 Airport Current Conditions & Facilities

A summary of general airport information, facilities, and services at the Muscatine Municipal Airport is included in the Fact Sheet at the end of this report. Airport information in the Fact Sheet reflects updated information and may vary from the 2010 data used in the *Iowa Aviation System Plan* technical report. The Muscatine Municipal Airport has been classified as an Enhanced Service airport. This classification is relevant to specific facility and service targets as well as performance measures.

2.3 Airport Forecasts

Aviation demand projections for based aircraft and aircraft operations were prepared for each of the 117 public use airports in Iowa's aviation system. A number of different FAA forecasting techniques were utilized in the projection of aviation activity at each airport ranging from subjective judgment to mathematical modeling based on historical trends. Data obtained from airport managers, the Office of Aviation, the 2010-2030 FAA Aerospace Forecast, and the FAA Air Traffic Activity Data System (ATADS) also contributed to the projections developed for each airport.

Based aircraft projections were developed for each airport by multiplying a compound annual growth rate (CAGR) of 1.25 percent (1.25%) to the number of current (2010) based aircraft at each airport as reported by airport managers. Aircraft operations were projected by multiplying the forecasted number of based aircraft by an adopted Office of Aviation estimation guideline outlined in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS).* This is an acceptable procedure to forecast operations where limited or no historical data may be available, permitting a single methodology to be applied to all airports. Airports with 1 to 30 based aircraft forecasted were assigned 250 operations per aircraft, while airports with 31 to 99 based aircraft were assigned 350 operations per aircraft. Airports forecasted with 100 or more aircraft were assigned 450 operations per aircraft. The based aircraft and operations projections developed for Muscatine Municipal Airport using the methodologies as described previously are presented in the following table.

Airport Forecasts

Forecast Year	Based Aircraft	Operations
2010	32	11,200
2015	34	11,900
2020	36	12,600
2025	39	13,650
2030	41	14,350

Sources
Based aircraft: 2010 Airport Manager Survey, Mead & Hunt, Inc.
Operations: FAA Order 5090.3C, FAA Aerospace Forecast 2010-2030, FAA ATADS

2.4 System Performance by Airport

Although progress has been made to achieve the goals and objectives, continuous improvements are necessary to provide Iowa with an air transportation system that supports the economy and quality of life demands. Muscatine Municipal Airport has a role in meeting these goals by striving to meet the individual performance measures that are applicable to its current role as an Enhanced Service airport. Each airport plays a role in meeting the goals and objectives. Individual airports can assess their specific performance, to determine what is appropriate to meet their needs, taking into account the recommendations from the system plan. It is understood that full implementation of some of the targets may not be feasible; however, it is important to identify goals and work to attain those that are reasonable.

2.4.a Recommendations to Support the System Plan Goals

Evaluation of how well the Muscatine Municipal Airport is meeting the objectives identified areas that could be improved to achieve the system plan goals. Focusing future improvements to enhance facilities, services, and planning to meet the objectives, while maintaining existing performance in areas meeting or exceeding desired conditions, contributes to a vibrant aviation system. Recommendations included on Page 14 list actions the airport may consider to benefit users of aviation in Iowa. In addition to specific recommendations to meet system goals and objectives, the *Iowa Aviation System Plan* recommends that airport sponsors and managers take the following actions to enhance a safe and effective operating environment:

- Reduce on-airport wildlife habitat and mitigate hazardous wildlife activity to limit potential safety concerns.
- Engage community leaders and stakeholders in developing a strategic plan to guide the development of the airport, coordinating with economic development interests.
- Develop a welcome image for visitors arriving by air and provide directional signage to the business community to ensure a connection.
- Actively work to protect runway approaches by developing or enforcing height and compatible land use zoning.

2.4.b Recommendations to Achieve the Facility and Service Targets

Facility and service targets identify levels of infrastructure and services that are desirable to effectively meet user needs. Though it may not be feasible to meet or exceed all targets, the airport is encouraged to develop and maintain facilities and services to levels defined for the Enhanced Service role. The tables presented on Page 15 and Page 16 identify what is recommended for the Muscatine Municipal Airport to achieve each target.

Airport Recommendations to Support the Goals of the Iowa Aviation System

Objective	Achieving Performance/Recommendation
Goal: Safety and Security	
• Airport has clear approaches to primary runway.	YES - Continue to preserve clear approaches to primary runway.
• Airport has clear approaches to all runways.	YES - Continue to preserve clear approaches to all runways.
• Airport has an emergency response plan.	NO - Create an airport emergency plan and update annually.
• Airport develops and implements a security plan.	YES - Continue to update security plan annually.
Goal: Infrastructure and User Support	
• Airport meets facility targets identified for its role.	NO - Improve facilities to meet or exceed targets by role. Continually maintain and preserve infrastructure to meet or exceed targets.
• Airport meets service targets identified for its role.	YES - Continue to provide services that meet or exceed targets by role.
• Primary runway maintained to PCI of 70 or higher.	YES - Continue to maintain primary runway to a PCI of 70 or higher. *Primary runway PCI: 72*
• Airport maintains overall PCI of 70 or higher.	YES - Continue to maintain all pavement surfaces to achieve an overall airport PCI rating of 70 or higher. *Overall PCI Rating: 86*
• All based aircraft stored in covered hangars.	NO - Construct additional hangars to provide covered storage for all based aircraft.
Goal: Economic Support	
• Airport coordinates with local officials to include information in business promotional materials.	Establish cooperative relationships with local economic development offices, chambers of commerce, and city and county officials to include airport information in business promotional materials.
Goal: Planning	
• Airport has a current master plan or ALP.	YES - Airport continue to update Airport Layout Plan at least every 8 years. Last Airport Layout Plan update: 2005
• Airport is protected by local height zoning ordinances.	YES - Update height zoning ordinance as needed and monitor its enforcement.
• Airport compatible land use is included in city/county comprehensive or land use plans.	YES - Review compatible land uses addressed in plan and revise as needed during each comprehensive or land use plan update.
Goal: Education and Outreach	
• Airport has a regular communication program.	NO - Establish a regular communication program to inform interested parties on airport news and events through newsletters, press releases, web sites, and social media.
• Airport has based rental aircraft and availability of flight instruction.	YES - Continue to offer based rental aircraft and the availability of flight instruction.
• Airport hosts pilot safety programs.	NO - Coordinate with the FAA, industry associations, and other aviation organizations to host pilot safety programs.
• Airport hosts annual aviation events, additional types of public events, and organized youth educational activities.	Increase efforts to host annual aviation events such as fly-ins and air shows, additional types of public events such as open houses, tours, conferences, and meetings, and organized youth educational activities such as aviation camps, Young Eagles programs, and internships.

Airside and Landside Facility Target Needs

Target Description	Existing Condition		Target	Recommendation
Airside Facilities				
Airport Reference Code	D-II		C-II	Maintain airfield to at least C-II design standards
Primary Runway Length	5,500 ft		Minimum 5,000 ft	Maintain runway length to at least 5,000 ft
Primary Runway Width	100 ft		Minimum 100 ft	Maintain 100 ft runway width
Type of Parallel Taxiway	Full parallel		Full parallel	Maintain full parallel taxiway
Type of Runway Approach	Precision		Vertical Guidance	Maintain an approach that provides at least vertical guidance
Runway Lighting	MIRL		MIRL	Maintain MIRL runway lighting
Taxiway Lighting	MITL		MITL	Maintain MITL taxiway lighting
Visual Guidance Slope Indicator	Rwy 06	Rwy 24	Both runway ends (or ILS)	Maintain a VGSI on both runway ends
	VASI	PAPI		
Runway End Identifier Lights (as required)	Yes	Yes	Both runway ends (or ILS)	Maintain REILs on both runway ends
Rotating Beacon	Yes		Yes	Maintain rotating beacon
Lighted Wind Indicator	Yes		Yes - Multiple as needed	Maintain lighted wind indicator
RCO Facilities	RCO		Tower or RCO	Maintain RCO
Wind coverage or crosswind runway	Crosswind runway		Crosswind runway or 95% coverage for NPIAS facilities	Maintain crosswind runway
Landside Facilities				
Covered storage for based aircraft	77% of based aircraft		100% of based aircraft	Construct additional storage for 100% of based aircraft
Overnight storage for business aircraft	Yes		Typical average aircraft/ business user demand	Continue to provide overnight storage for itinerant business aircraft
Aircraft apron	100% of average daily transients		100% of average daily transients	Maintain apron size to park 100% of average daily transients
Terminal/administration building	Free standing		Yes	Maintain terminal building
Paved entry/terminal parking	Entry & parking		Entry & parking	Maintain paved entry road & parking lot

Service Target Needs

Target Description	Existing Condition	Target	Recommendation
Services			
Fuel (type & hours)	Type: Jet A & 100LL 24 hour availability: Yes	100LL & Jet A (24 hrs & single point)	Continue to provide 100LL & Jet A fuel with 24 hour availability
Weekday hours of operation	7am-6pm	Standard business hours; after hours on-call	Continue to maintain staffing during standard business hours and after hours on-call
Weekend hours of operation	7am-6pm	Standard business hours; after hours on-call	Continue to maintain staffing during standard business hours and after hours on-call
Ground Transportation	Courtesy car & car rental	Courtesy car/ car rental available	Continue to provide a courtesy car and/or car rental availability
Food & Beverage	Yes	Vending	Continue to provide at least vending services
Posted contact info	Yes	Yes	Continue to post and update after hours contact information
Internet access	Computer & wireless	Yes	Continue to provide a method to access the internet
Restroom	Number of restrooms: 3	Yes	Continue to provide restrooms
Pilot area	Yes	Yes	Continue to maintain a pilot area
Security plan	Yes	Security plan	Continue to maintain and update security plan annually
Snow removal	Plowing	Timely Snow Removal	Continue to provide timely snow removal
Rental aircraft	Available	Based	Provide based rental aircraft
Flight training	Based	Available	Continue to provide flight training
Aircraft maintenance/repair	On-call	Based	Provide based aircraft maintenance and repair
Aircraft charter	Based	Based	Continue to offer based aircraft charter
Weather reporting/ flight planning capabilities	Yes	Yes	Continue to provide weather reporting & flight planning capabilities

2.5 Potential Projects

Although significant investment has been made to improve the overall condition of system infrastructure, it is important to continue to preserve and develop infrastructure to meet the needs of aviation users. In addition to needed facility and service target improvements, specific airport needs identified on Capital Improvement Plans (CIPs) and Long Range Needs Assessments (LRNAs) were evaluated to project the anticipated level of investment that will be required by airports throughout the twenty year planning period.

To determine the anticipated level of investment needed at the Muscatine Municipal Airport, the following resources were referenced:

- Cost estimates for airports to achieve 100% of the system plan facility targets.
- 2011-2016 Airport Capital Improvement Program (CIP) plans.
- Airport Long Range Needs Assessments (LRNA).
- Cost estimates to meet the system plan Airport Layout Plan objective, focusing on the development and continual update of electronic ALPs (e-ALPs).
- Cost estimates to maintain pavement condition index at 70 using pavement rehabilitation projects identified in the Iowa Statewide 2010 Pavement Management Report.
- Because of the wide variation in methods to mitigate runway approach obstructions, separate costs were not identified to address the clear approach objective. These costs are included in many of the airport CIP and LRNA, and will be identified through specific annual initiatives.

A summary of funding needed to address development needs and other potential projects at the Muscatine Municipal Airport is presented on Page 18.

2011-2030 Development Needs

Project Description	Funding Needed
Construct t-hangar	$400,000
Construct hangar	$600,000
Airport Layout Plan (ALP) update (2013, 2021, 2029)	$1,350,000
TOTAL	**$2,350,000**

Source: 2011-2016 CIP Plans, LRNA plans, Iowa Statewide 2010 Pavement Management Report, Mead & Hunt, Inc.

2011-2030 Other Potential Projects

Project Description	Funding Needed
Rehabilitate runway lighting	$313,554
Rehabilitate hangar drainage	$80,000
Obstruction survey/obstruction removal	$68,537
Airfield pavement maintenance	$148,600
Improve hangar access security	$20,000
Design for apron expansion and rehabilitation for t-hangars	$58,000
Replace Automated Weather Observing System equipment	$131,580
Expand apron	$180,000
Reconstruct hangar	$450,000
Pavement Maintenance	$158,000
Acquire snow removal equipment	$158,000
Upgrade fuel facility	$50,000
Snow removal equipment building	$403,000
Snow removal equipment	$158,000
TOTAL	**$2,377,271**

Source: 2011-2016 CIP Plans, LRNA plans, Iowa Statewide 2010 Pavement Management Report, Mead & Hunt, Inc.

Muscatine Municipal Airport

Fact Sheet

General Information	Based Aircraft
Airport name: Muscatine Municipal Airport	**Single engine:** 28
Associated city: Muscatine	**Multi engine:** 1
FAA identifier: MUT	**Jets:** 1
Iowa Aviation System Plan Role: Enhanced Service	**Military:** 0
Manager: Janet Lewis	**Helicopters:** 0
Phone: 563-263-8672	**Ultralights:** 1
Latitude: 41° 22' 04" N	**TOTAL:** 31
Longitude: 91° 08' 53" W	
Elevation: 547 ft	

Airside Facilities	Landside Facilities
Type of taxiway system: Full parallel	**Apron aircraft tie-down locations:** 20
Taxiway lighting: MITL	**Total hangar parking spaces:** 24
Rotating beacon: Yes	**Overnight storage for itinerant aircraft:** Yes
Weather reporting equipment: AWOS	**Type of terminal/admin building:** Free standing
Lighted wind indicator: Yes	**Paved surfaces:** Entry & parking
Remote Communication Outlet (RCO): RCO	

Runway Information

Runway	Length	Width	ARC	PCI rating	Lighting System
06/24	5,500 ft	100 ft	D-II	72	MIRL
12/30	4,000 ft	75 ft	B-II	81	MIRL

Runway Approach Information

Runway	Published approaches	Approach categories	Approach Slope	VGSI	REIL
06	RNAV (GPS) Rwy 06 VOR Rwy 06	LPV DA: 529-2; LNAV MDA: 573-1 S-6 (DME MIN): 593-1	34:1	VASI	Yes
24	ILS or LOC Rwy 24 RNAV (GPS) Rwy 24	S-ILS 24: 535-1/2 LPV DA: 267-1/2; LNAV MDA: 415-1/2	50:1	PAPI	Yes
12	None	Visual	20:1	PAPI	Yes
30	None	Visual	20:1	PAPI	Yes

Muscatine Municipal Airport

Fact Sheet

Planning	Fueling Capabilities
Security plan: Yes	**Fuel types:** Jet A & 100LL
Emergency response plan: No	**24 hour fueling available:** Yes
Last Airport Layout Plan update: 2005	
Local height zoning: Yes	
Inclusion in local comprehensive plan: Yes	

Staffing

Weekday hours of personnel: 7am-6pm

Weekend hours of personnel: 7am-6pm

Posted after hours contact information: Yes

Services & Programs

Aircraft maintenance & repair: On-call	**Aircraft charter:** Based
Flight instruction: Based	**Rental aircraft:** Available
Snow removal: Plowing	**Internet:** Computer & wireless
Food & beverage: Yes	**Restrooms:** 3

Pilot area: Yes

Type of ground transportation: Courtesy car & car rental

Regular communication program: none

Pilot safety program: none

Employment From General Aviation Visitor Spending (Source: 2009 Uses and Benefits of Aviation in Iowa)

Indirect Employment	Induced Employment	Total Employment
16.5	4.5	21

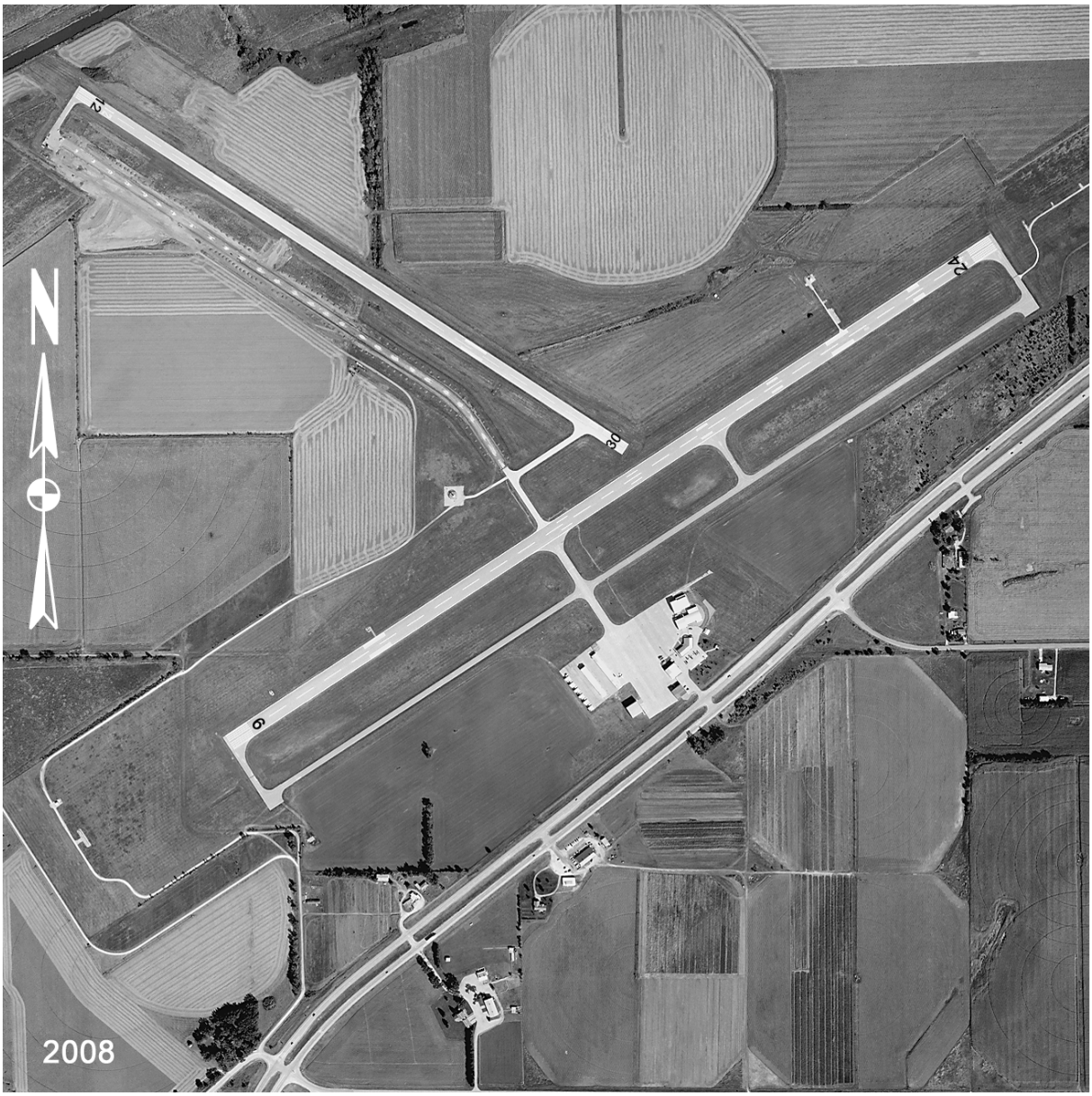
Total Airport-Related Employment

Direct & Indirect Employment	Induced Employment	Total Employment
42	24	66

Economic Output

Direct & Indirect Output	Induced Output	Total Output
$2,817,800	$1,853,200	$4,671,000

Muscatine Municipal Airport



Source: Iowa Department of Transportation

Office of Aviation
800 Lincoln Way
Ames, IA 50010
(515) 239-1691
Iowadot.gov/aviation

Prepared by:

Mead&Hunt

KIRKHAM MICHAEL

The technical report and executive summary for the Iowa Aviation System Plan is available on the Iowa DOT Office of Aviation website at:

http://www.iowadot.gov/aviation.index.html

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AIRPORT MASTER RECORD

PRINT DATE: 2/21/2017
AFD EFF 01/05/2017
FORM APPROVED OMB 2120-0015

> 1 ASSOC CITY: MUSCATINE
> 2 AIRPORT NAME: MUSCATINE MUNI
3 CBD TO AIRPORT (NM): 05 SW
4 STATE: IA
6 REGION/ADO: ACE/NONE
LOC ID: MUT
5 COUNTY: MUSCATINE IA
7 SECT AERO CHT: CHICAGO
FAA SITE NR: 06199.*A

Appendix C

GENERAL

10 OWNERSHIP: PUBLIC
> 11 OWNER: CITY OF MUSCATINE
> 12 ADDRESS: 215 SYCAMORE
MUSCATINE, IA 52761
> 13 PHONE NR: 563-264-1550
> 14 MANAGER: JANET LEWIS
> 15 ADDRESS: 5701 SOUTH HIGHWAY 61
MUSCATINE, IA 52761
> 16 PHONE NR: 563-263-8672
> 17 ATTENDANCE SCHEDULE:

ALL	ALL	0700-1800

18 AIRPORT USE: PUBLIC
19 ARPT LAT: 41-22-04.4000N ESTIMATED
20 ARPT LONG: 091-08-53.6000W
21 ARPT ELEV: 547.2 SURVEYED
22 ACREAGE: 604
> 23 RIGHT TRAFFIC: NO
> 24 NON-COMM LANDING: NO

25 NPIAS/FED AGREEMENTS: NGY
> 26 FAR 139 INDEX:

SERVICES

> 70 FUEL: 100LL A
> 71 AIRFRAME RPRS: MINOR
> 72 PWR PLANT RPRS: MINOR
> 73 BOTTLE OXYGEN: NONE
> 74 BULK OXYGEN: NONE
75 TSNT STORAGE: HGR, TIE
76 OTHER SERVICES:
CHTR, INSTR, RNTL, SALES

FACILITIES

> 80 ARPT BCN: CG
> 81 ARPT LGT SKED : SEE RMK
BCN LGT SKED: SS-SR
> 82 UNICOM: 122.700
> 83 WIND INDICATOR: YES-L
84 SEGMENTED CIRCLE: NONE
85 CONTROL TWR: NO
86 FSS: FORT DODGE
87 FSS ON ARPT: NO
88 FSS PHONE NR:
89 TOLL FREE NR: 1-800-WX-BRIEF

BASED AIRCRAFT

90 SINGLE ENG:	25
91 MULTI ENG:	2
92 JET:	1
TOTAL:	28
93 HELICOPTERS:	1
94 GLIDERS:	2
95 MILITARY:	0
96 ULTRA-LIGHT:	0

OPERATIONS

100 AIR CARRIER:	0
102 AIR TAXI:	900
103 G A LOCAL:	6,603
104 G A ITNRNT:	6,603
105 MILITARY:	0
TOTAL:	14,106
OPERATIONS FOR 12 MONTHS ENDING:	06/10/2014

RUNWAY DATA

	06/24	12/30		
> 30 RUNWAY INDENT:				
> 31 LENGTH:	5,500	4,000		
> 32 WIDTH:	100	75		
> 33 SURF TYPE-COND:	CONC-G	CONC-G		
> 34 SURF TREATMENT:	GRVD	GRVD		
35 GROSS WT: S	28.0			
36 (IN THSDS) D				
37 2D				
38 2D/2D2				
> 39 PCN:				

LIGHTING/APCH AIDS

> 40 EDGE INTENSITY:	MED	MED		
> 42 RWY MARK TYPE-COND:	NPI - F / PIR - F	NPI - F / NPI - F	- / -	- / -
> 43 VGSI:	V4L / P4R	P4L / P4L	/	/
44 THR COSSING HGT.:	37 / 52	44 / 40	/	/
45 VISUAL GLIDE ANGLE:	3.00 / 3.00	3.00 / 3.00	/	/
> 46 CNTRLN-TDZ:	- / -	- / -	- / -	- / -
> 47 RVR-RVV:	- / -	- / -	- / -	- / -
> 48 REIL:	Y / N	Y / Y	/	/
> 49 APCH LIGHTS:	/ MALSR	/	/	/

OBSTRUCTION DATA

50 FAR 77 CATEGORY	C / PIR	A(NP) / A(NP)	/	/
> 51 DISPLACED THR:	/	/	/	/
> 52 CTLG OBSTN:	/	/	/	/
> 53 OBSTN MARKED/LGTD:	/	/	/	/
> 54 HGT ABOVE RWY END:	50 /	/	/	/
> 55 DIST FROM RWY END:	1,990 /	/	/	/
> 56 CNTRLN OFFSET:	45L /	/	/	/
57 OBSTN CLNC SLOPE:	35:1 / 50:1	50:1 / 50:1	/	/
58 CLOSE-IN OBSTN:	N / N	N / N	/	/

DECLARED DISTANCES

> 60 TAKE OFF RUN AVBL (TORA):	/	/	/	/
> 61 TAKE OFF DIST AVBL (TODA):	/	/	/	/
> 62 ACLT STOP DIST AVBL (ASDA):	/	/	/	/
> 63 LNDG DIST AVBL (LDA):	/	/	/	/

(>) ARPT MGR PLEASE ADVISE FSS IN ITEM 86 WHEN CHANGES OCCUR TO ITEMS PRECEDED BY >

> 110 REMARKS

A 011 JERRY PAGE, CHMN ARPT COMM.
A 017 FOR ATTENDANT AFTER HRS CALL (563) 263-8672; ARPT UNATNDD THANKSGIVING; CHRISTMAS; NEW YEARS DAY & EASTER.
A 081 MIRL RYS 06/24 & 12/30 PRESET ON LOW INTST; TO INCR INTST & ACTVT VASI RY 06; MALSR RY 24; PAPI RYS 24, 12 & 30; REIL RYS 06; 12 & 30 - CTAF.
A 110 THIS AIRPORT HAS BEEN SURVEYED BY THE NATIONAL GEODETIC SURVEY.
A 110-001 GLIDER OPN ON ARPT.

111 INSPECTOR: (S)
112 LAST INSP: 06/10/2014
113 LAST INFO REQ:

FAA Terminal Area Forecast: National Forecast 2016 (1) — Based Aircraft

LOCID: MUT — MUSCATINE MUNI

Year	F	Single	Jet	Multi	Helicopter	Other	Total
2012		26	1	1	0	2	30
2013		29	1	2	0	2	34
2014		31	1	2	0	2	36
2015		26	1	2	1	0	30
2016	*	26	1	2	1	0	30
2017	*	26	1	2	1	0	30
2018	*	26	1	2	1	0	30
2019	*	26	1	2	1	0	30
2020	*	26	1	2	1	0	30
2021	*	26	1	2	1	0	30
2022	*	26	1	2	1	0	30
2023	*	26	1	2	1	0	30
2024	*	26	1	2	1	0	30
2025	*	26	1	2	1	0	30
2026	*	26	1	2	1	0	30
2027	*	26	1	2	1	0	30
2028	*	26	1	2	1	0	30
2029	*	26	1	2	1	0	30
2030	*	26	1	2	1	0	30
2031	*	26	1	2	1	0	30
2032	*	26	1	2	1	0	30
2033	*	26	1	2	1	0	30
2034	*	26	1	2	1	0	30
2035	*	26	1	2	1	0	30
2036	*	26	1	2	1	0	30
2037	*	26	1	2	1	0	30
2038	*	26	1	2	1	0	30
2039	*	26	1	2	1	0	30
2040	*	26	1	2	1	0	30
2041	*	26	1	2	1	0	30

2042	*	26	1	2	1	0	30
2043	*	26	1	2	1	0	30
2044	*	26	1	2	1	0	30
2045	*	26	1	2	1	0	30

Report created 2/21/2017 14:19

FAA Terminal Area Forecast: National Forecast 2016 (1) — Airport Operations

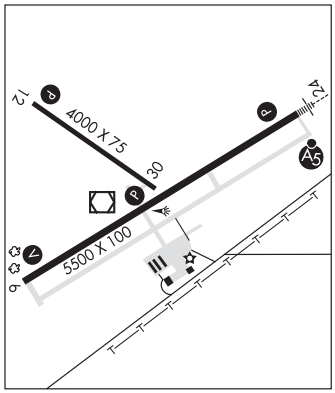
LOCID: MUT — MUSCATINE MUNI

Year	F	Itn Air Carrier	Itn Air Taxi	Itn GA	Itn Mil	Local Civil	Local Mil	Total Airport Ops	Total Overflights	IFR Itn AC	IFR Itn AT	IFR Itn GA	IFR Itn MI
2012		0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2013		0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2014		0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2015		0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2016	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2017	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2018	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2019	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2020	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2021	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2022	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2023	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2024	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2025	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2026	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2027	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2028	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2029	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2030	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2031	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2032	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2033	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2034	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2035	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2036	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2037	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2038	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2039	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2040	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2041	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0

2042	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2043	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2044	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0
2045	*	0	900	6,603	0	6,603	0	14,106	0	0	0	0	0

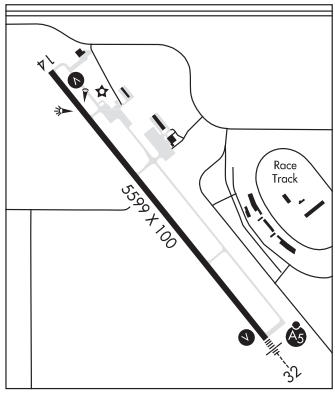
Report created 2/21/2017 14:15

MUSCATINE MUNI (MUT)(KMUT) 5 SW UTC–6(–5DT) N41°22.07′ W91°08.89′ **CHICAGO**
547 B NOTAM FILE MUT **H–5D, L–27B**
RWY 06–24: H5500X100 (CONC–GRVD) S–28 MIRL **IAP**
RWY 06: REIL. VASI(V4L)—GA 3.0° TCH 37′.
RWY 24: MALSR. PAPI(P4R)—GA 3.0° TCH 52′.
RWY 12–30: H4000X75 (CONC–GRVD) MIRL
RWY 12: REIL. PAPI(P4L)—GA 3.0° TCH 44′.
RWY 30: REIL. PAPI(P4L)—GA 3.0° TCH 40′.
SERVICE: S2 **FUEL** 100LL, JET A **LGT** MIRL Rwy 06–24 and Rwy 12–30 preset on low ints, to increase ints and ACTIVATE VASI Rwy 06, MALSR Rwy 24, PAPI Rwy 24, Rwy 12 and Rwy 30, REIL Rwy 06, Rwy 12 and Rwy 30—CTAF.
AIRPORT REMARKS: Attended 1300–0000Z‡. For attendant after hours call 563–263–8672, arpt unattended Thanksgiving, Christmas, New Years Day and Easter. Glider ops on arpt.
AIRPORT MANAGER: 563-263-8672
WEATHER DATA SOURCES: AWOS–3 119.775 (563) 263–0902.
COMMUNICATIONS: CTAF/UNICOM 122.7
Ⓡ **QUAD CITY APP/DEP CON** 133.275 (1130–0430Z‡)
Ⓡ **CHICAGO CENTER APP/DEP CON** 118.75 (0430–1130Z‡)
CLNC DEL 124.25
AIRSPACE: CLASS E svc 1100–0500Z‡ other times CLASS G.
RADIO AIDS TO NAVIGATION: NOTAM FILE MUT.
PORT CITY (L) VORW/DME 116.5 DDD Chan 112 N41°21.98′ W91°08.96′ at fld. 543/1E.
DME unusable:
181°–024° byd 25 NM
ILS/DME 109.15 I–LUC Chan 28(Y) Rwy 24. Class IE. Unmonitored.

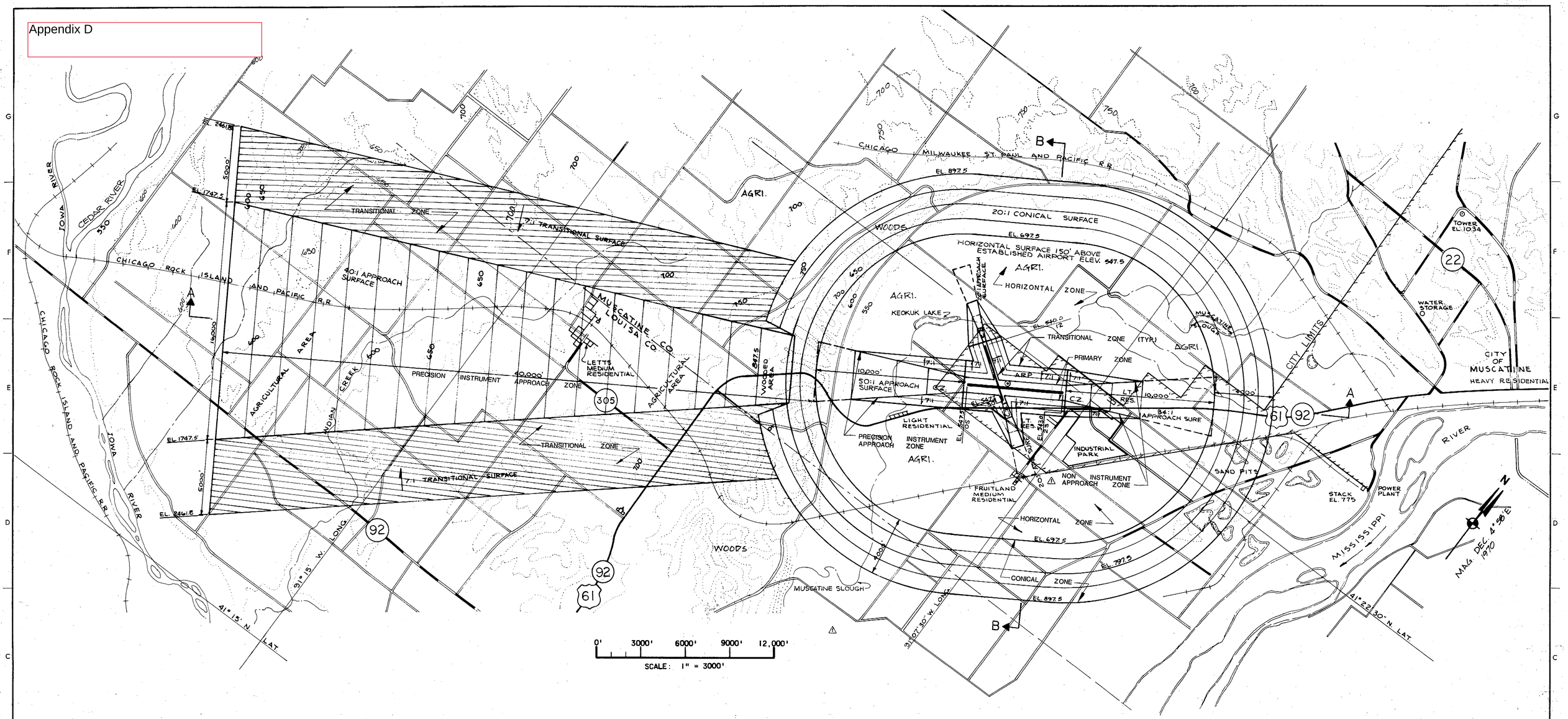


NEW HAMPTON MUNI (1Y5) 2 NW UTC–6(–5DT) N43°05.23′ W92°20.59′ **CHICAGO**
1173 NOTAM FILE FOD
RWY 17–35: H2900X75 (ASPH) S–16
RWY 17: Tree.
RWY 35: Road.
RWY 04–22: 2300X105 (TURF)
RWY 04: Pole.
RWY 22: Road.
AIRPORT REMARKS: Unattended. Arpt CLOSED for night ops. Parachute Jumping. Radio controlled acft ops in area. Rwys 04 and 22 thld and edges marked with yellow cones. Rwy 17 is calm wind rwy.
AIRPORT MANAGER: (641) 330-2448
COMMUNICATIONS: CTAF 122.9

NEWTON MUNI–EARL JOHNSTON FLD (TNU)(KTNU) 2 SE UTC–6(–5DT) N41°40.47′ W93°01.30′ **OMAHA**
953 B NOTAM FILE TNU **H–5D, L–12J**
RWY 14–32: H5599X100 (ASPH) S–45, D–51 MIRL **IAP**
RWY 14: REIL. VASI(V4L)—GA 3.0° TCH 39′. Road.
RWY 32: MALSR. VASI(V4L)—GA 3.0° TCH 49′.
SERVICE: S4 **FUEL** 100LL, JET A **LGT** ACTIVATE MIRL Rwy 14–32, VASI Rwy 14 and Rwy 32, REIL Rwy 14 and MALSR Rwy 32—CTAF. Rwy 32 VASI unusable byd 9° left of course.
AIRPORT REMARKS: Attended Mon–Fri 1330–0000Z‡, Sat–Sun 1400–2300Z‡, after hrs only call 641–791–0590. Seasonal migratory waterfowl invof arpt. Rwy 14 is calm wind rwy. Stadium within 3 NM, check for events.
AIRPORT MANAGER: 641-792-1292
WEATHER DATA SOURCES: AWOS–3 132.275 (641) 791–3302.
COMMUNICATIONS: CTAF/UNICOM 122.8
RCO 122.1R 112.5T (FORT DODGE RADIO)
Ⓡ **DES MOINES APP/DEP CON** 123.9
CLNC DEL 126.3
AIRSPACE: CLASS E
RADIO AIDS TO NAVIGATION: NOTAM FILE TNU.
(L) VOR/DME 112.5 TNU Chan 72 N41°47.03′ W93°06.54′ 146° 7.6 NM to fld. 989/3E.
ILS 109.7 I–MGX Rwy 32. Class IB. Unmonitored.



Appendix D



NOTES:

1. TOPOGRAPHIC CONTOUR INTERVALS ARE 50 FEET. DATUM IS MEAN SEA LEVEL.
2. AERIAL CONTOURS ILLUSTRATE THE HEIGHT LIMITATIONS WITHIN EACH ZONE.
3. AIRSPACE CONFIGURATION REFLECTS ULTIMATE AIRPORT DEVELOPMENT AS PRESENTED IN THE AIRPORT LAYOUT PLAN APPROVED IN JUNE, 1975.

LEGEND

- ULTIMATE RUNWAY
- ZONE BOUNDARY
- 600 TOPOGRAPHIC CONTOUR
- EL. 697.5 AERIAL CONTOUR

REVISIONS	DATE	DWN.	APP.	REVISIONS	DATE	DWN.	APP.	REVISIONS	DATE	DWN.	APP.
								⚠ REMOVE LOWER TRIANGLE OF IND. PARK. CHANGE TITLE	12-18-75	REH	LDK

DRAWN R.HINES
CHECKED L.D.Kosh
APPROVED L.D.Kosh
APPROVED L.J.Larson
DATE 10-16-75

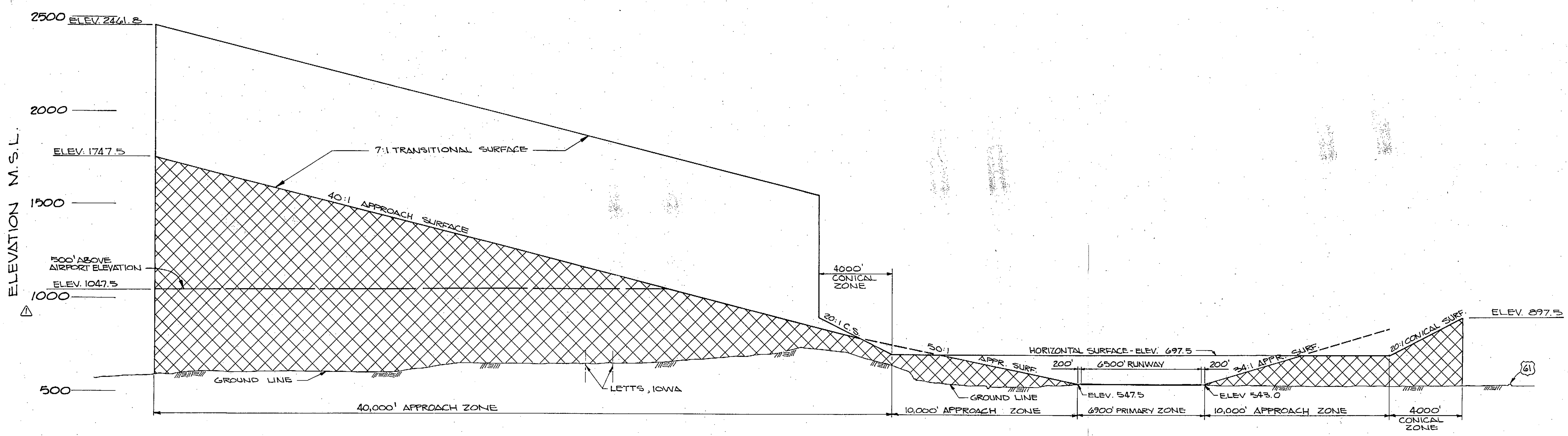
STANLEY CONSULTANTS
INTERNATIONAL CONSULTANTS IN ENGINEERING, ARCHITECTURE, PLANNING, AND MANAGEMENT

MUSCATINE MUNICIPAL AIRPORT
MUSCATINE, IOWA

ZONING MAP
AIRSPACE OBSTRUCTION ZONES
SHEET 1 OF 2

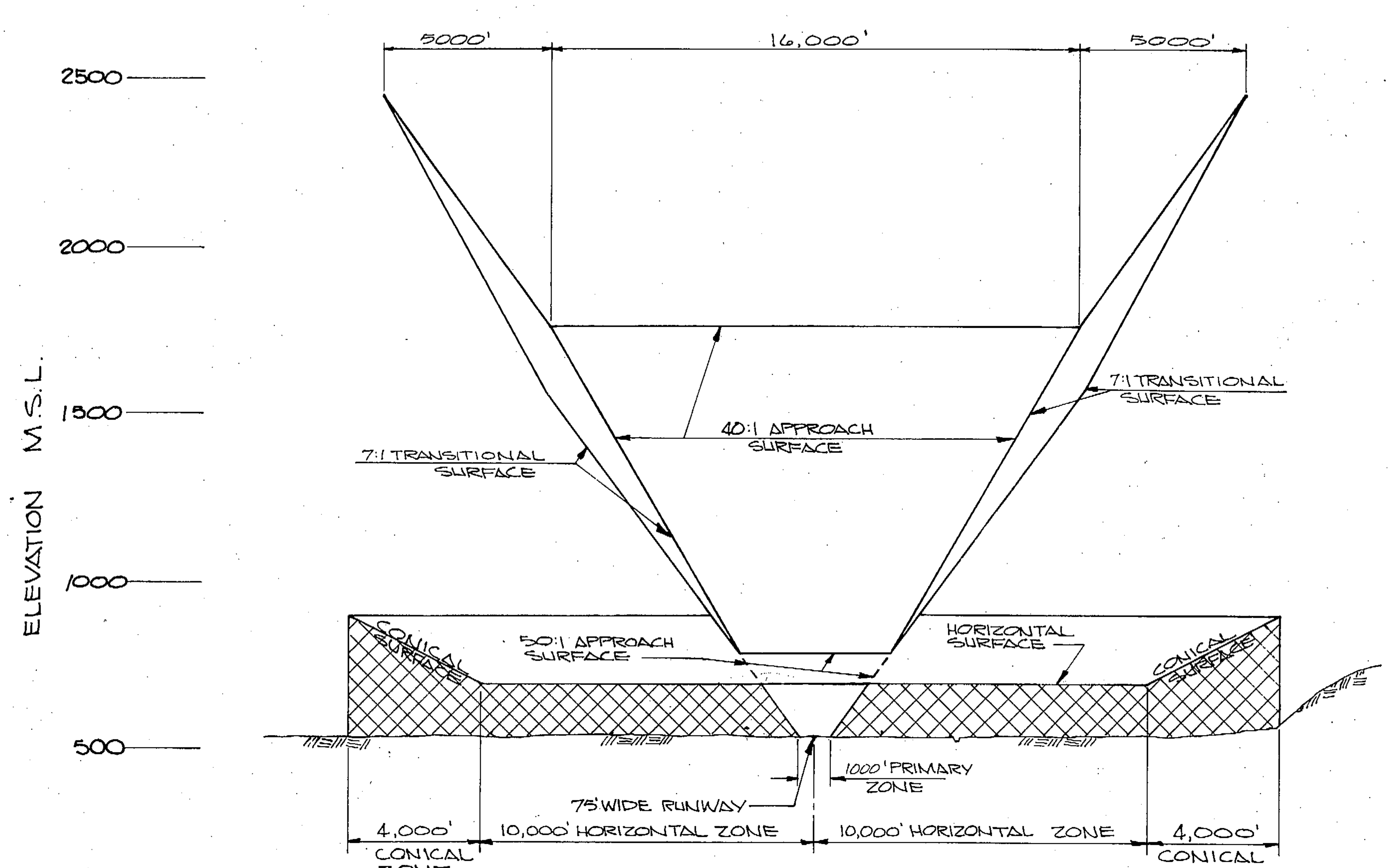
SCALE 1" = 3000'
NO. 6244-5
REV. 1

MUSCATINE AIRPORT ZONING MAP 8/3/80

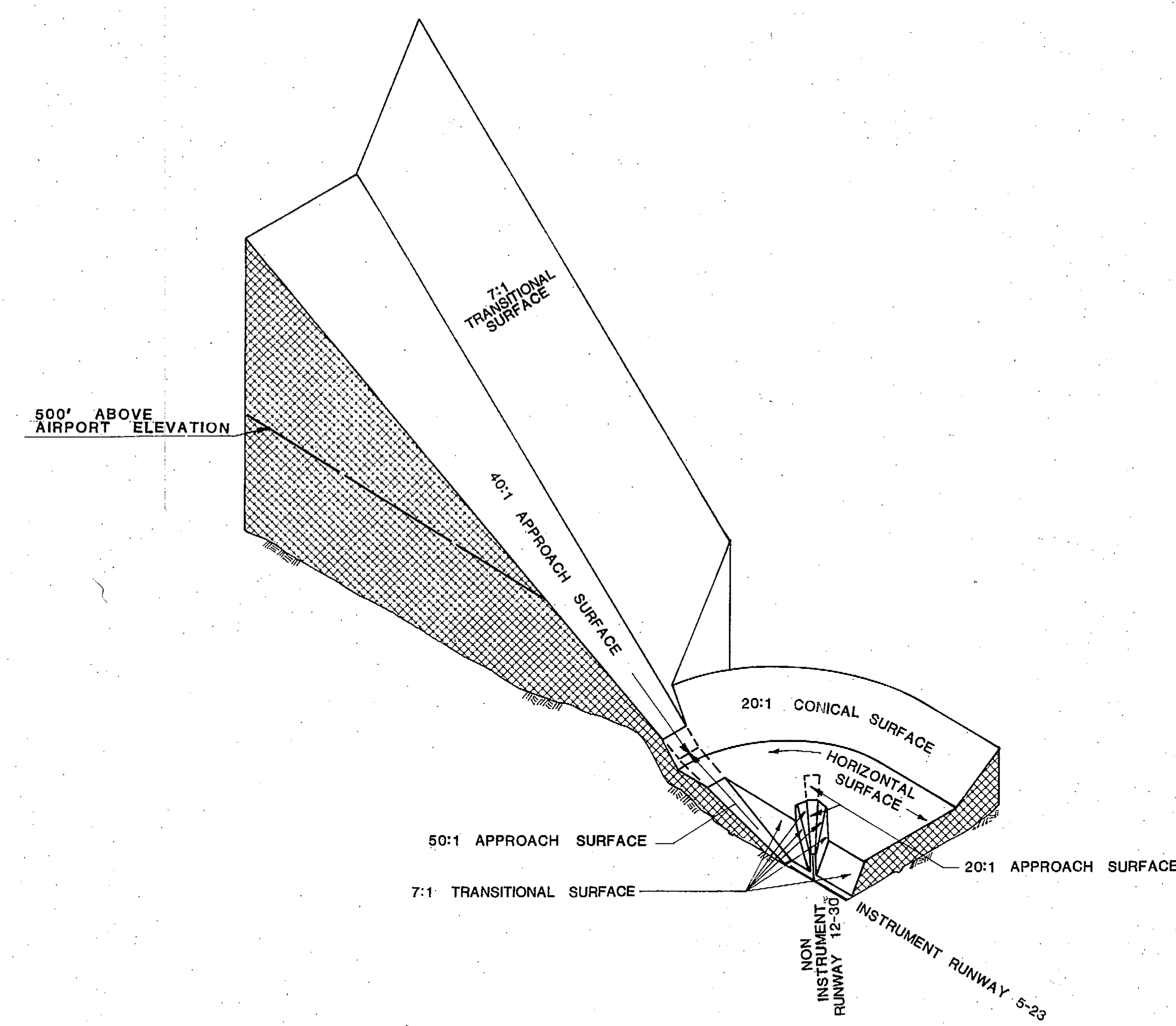


SECTION A-A

SCALE: VERT. 1"= 300'
HORIZ. 1"= 3000'



SECTION B-B



ISOMETRIC VIEW SHOWING IMAGINARY SURFACES

NO SCALE

REVISIONS	DATE	DWN.	APP.
⚠ ADD ELEV. 1047.5	12-18-75	REH	DK

DRAWN R. HINES
CHECKED L.D. Koch
APPROVED L.D. Koch
APPROVED L.J. Larson
DATE 10-16-75

STANLEY CONSULTANTS

INTERNATIONAL CONSULTANTS IN ENGINEERING, ARCHITECTURE, PLANNING, AND MANAGEMENT

MUSCATINE MUNICIPAL AIRPORT
MUSCATINE, IOWA

ZONING MAP
AIRSPACE SECTION

SHEET 2 OF 2

SCALE AS SHOWN
NO. 6244-6
REV. 1

Appendix E

Muscatine: Insights and Rebranding Recommendations

Thursday, May 8th, 2014

The University of Iowa Marketing Institute

Compiled by: Kaileigh Ceurvorst, Emily Olsen, Lauren Patnoe, Bre Tobin

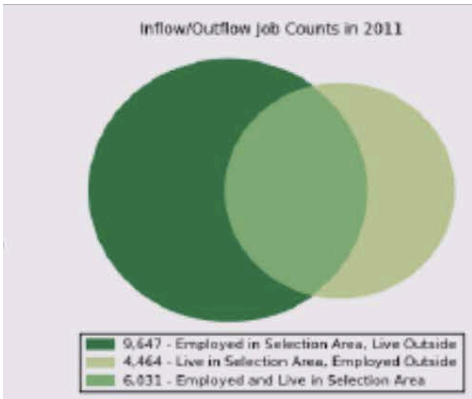
This report summarizes the key finding, implications and recommendations that emerged from an analysis done by members of The Marketing Institute at The University of Iowa.

I. EXECUTIVE SUMMARY

Problem

Despite being the headquarters for well-known companies such as HNI Corporation, Kent Corporation, and numerous other companies (Bridgestone, Monsanto and Heinz to name a few), Muscatine does not appeal as a place to live for a significant portion of people employed by these companies. This has led to the phenomenon known as "import commuting." This has become a major concern to Muscatine's community and business leaders who have invested a great deal of resources to make the city a more attractive and self-contained community for its residents. It's not unusual to meet workers who commute from Iowa City, Cedar Rapids, or even Dubuque (especially younger white collar workers).

Muscatine would like to understand why more of the working population does not choose to live there and start addressing those issues to reverse the trend. Furthermore, based on findings, they would like to develop a marketing plan that includes creating a brand identity.



Inflow/Outflow Job Counts (Primary Jobs)

	2011	
	Count	Share
Employed in the Selection Area	15,678	100.0%
Employed in the Selection Area but Living Outside	9,647	61.5%
Employed and Living in the Selection Area	6,031	38.5%
Living in the Selection Area	10,495	100.0%
Living in the Selection Area but Employed Outside	4,464	42.5%
Living and Employed in the Selection Area	6,031	57.5%

Project Description

The project is to create a new brand identity and marketing plan for the town of Muscatine, in order to reverse the current trend of import commuting. Recommendations will be based on market research done through the use of surveys and focus groups.

Key Deliverables

1. Conduct a market research study using qualitative tools (focus groups and survey questionnaire) to find out why workers opt to commute rather than live in Muscatine; at the same time, find out how other similar size communities, either in Iowa or other areas of the USA, retain their commuters.

2. Analyze data and report key findings from the survey and focus groups; provide recommendations to reverse the trend.

3. Design/create a brand identity that is represented through a logo/slogan.

4. Provide a formal report and presentation that will include: executive summary, methodology, key findings, recommendations and implications.

II. OVERVIEW OF METHODOLOGY

Field Research

Our team analyzed demographic data, current branding strategies, and strengths and weaknesses of the city of Muscatine and the communities it competes with including Iowa City, Dubuque, Bettendorf, and Davenport. The main take-away we found in doing this research was that Muscatine's city programming, housing, and entertainment options are not aligned with the wants and needs of the young professional workforce age group they are trying to target.

Personal Interviews

To gain direction and insight, we reached out to numerous business leaders throughout the community. These interviews consisted of phone conversations with leaders at some of the major corporations in Muscatine including HNI, Heinz, Bridgestone, Carver Pump, Muscatine Power and Water, Stanley Consultants, The Muscatine Arts Center, and Central State Bank. Topics asked about during the interviews included education, recreation, entertainment and housing options, and personal experiences in the city. The main goal of the interviews was to help us model our survey.

We also interviewed Rick Dickinson, the President and CEO of the Greater Dubuque Development Corporation. We believe that Dubuque offers a great model of various programs that would be very successful in attracting young professionals to Muscatine. Rick and his team began a campaign in 1997 based around restructuring their community, building a new brand image, and targeting young professionals, which has been very successful.

Survey

In order to collect the opinions of young professional living and/or working in Muscatine, we created a survey that was emailed to the employees at most major corporations in the city. The survey was also posted on the Chamber of Commerce's website and in the city's newspaper. The survey was set up to collect opinions that could be sorted by whether or not participants lived in Muscatine, what age group they were a part of, and what pay grade they were in. This helped us single out the results of participants in the young professional age group that Muscatine would like to focus on marketing to. We received 438 replies. We used these results to design questions for our focus group.

Focus Group

Our focus group held in Muscatine in December 2013, consisted of participants who currently work in Muscatine. We had asked those who answered our survey to provide their e-mail address if they were interested in joining us in a focus group. We were able

to use our survey results to pre-screen and select participants based on their level of education and age range. The 26 invited participants had some college education with 89% achieving a bachelor's degree or above. 65% of our group was in our target market age group of 21-35, with a few members in the age range of 41-56. The demographic provided us a mix of seasoned and young professionals. During our focus group we focused on perceived strengths and weaknesses of Muscatine.

III. KEY FINDINGS

Personal Interview Insights

Our first personal interviews were conducted with Muscatine business leaders. From these interviews we were able to determine a lot of key insights that aided us in the development of our survey. We asked the business leaders a wide variety of questions regarding living and working in Muscatine. Based on these interviews, we discovered that a majority of the young professionals working in Muscatine do commute due to a lack of entertainment options for young adults in Muscatine. In addition, the positives of Muscatine were discussed such as the ample recreation services. However, the business leaders did mention that some of the weaknesses of Muscatine are in the areas of education and residential options.

We conducted a second personal interview with Rick Dickinson, the President and CEO of Greater Dubuque Development Corp. The interview provided us with great insights regarding programs Dubuque has developed to attract young professionals to the community. Rick first discussed Dubuque's Workforce Solutions project.

Workforce Solutions started in 1997 and provides a vehicle where prospective employees can easily identify opportunities in Dubuque. To aid this project, Dubuquejobs.com was created as a page for employers to post positions they were seeking to fill. The site has been very successful and generates about 80,000 viewers per month. Mr. Dickinson emphasized the importance of seeking out young professionals who are looking at jobs. Dubuquejobs.com aims to make it as easy as possible for young professionals to find great opportunities in Dubuque.

In addition, Mr. Dickinson described a "Concierge Service" that they offer to anyone who is moving to Dubuque. The concierge service offers tours of the community, and classes. The five classes introduce newcomers to other newcomers, provide a tour of the community, and introduce different restaurants, entertainment venues, and hospitality options. Dubuque understands how important it is for young professionals to develop a network, make friends, and feel connected in the community. Furthermore, Dubuque has moved residential opportunities and new businesses to the downtown area. This has allowed Dubuque to create a live-work environment that is very appealing to young professionals. The Dubuque Greater Development Corporation also travels to different Universities to promote businesses in Dubuque and recruit soon to be college graduates.

However, the most important insight we gained from Rick Dickinson and Dubuque was learning the greatest fallacy of community transformation is that a good slogan will solve all problems. Rick claimed, "Cutesiness of verbiage does not matter. Rebuilding a

community takes hard work, study, planning, implementation, collaboration, budgeting, and staying on schedule. There is nothing wrong with a cool logo but that is not going to create any real change". Dubuque has been working on transforming its community for almost twenty years and they are just starting to reap the success of their efforts.

In order to be successful, Muscatine needs to work on some of its key weaknesses and build from the ground up. A great logo and slogan alone will not attract new young professionals to the community. Muscatine must also be perceived as a desirable place for young professionals to start their careers. The logo and slogan are merely visual representations of this brand promise and culture.

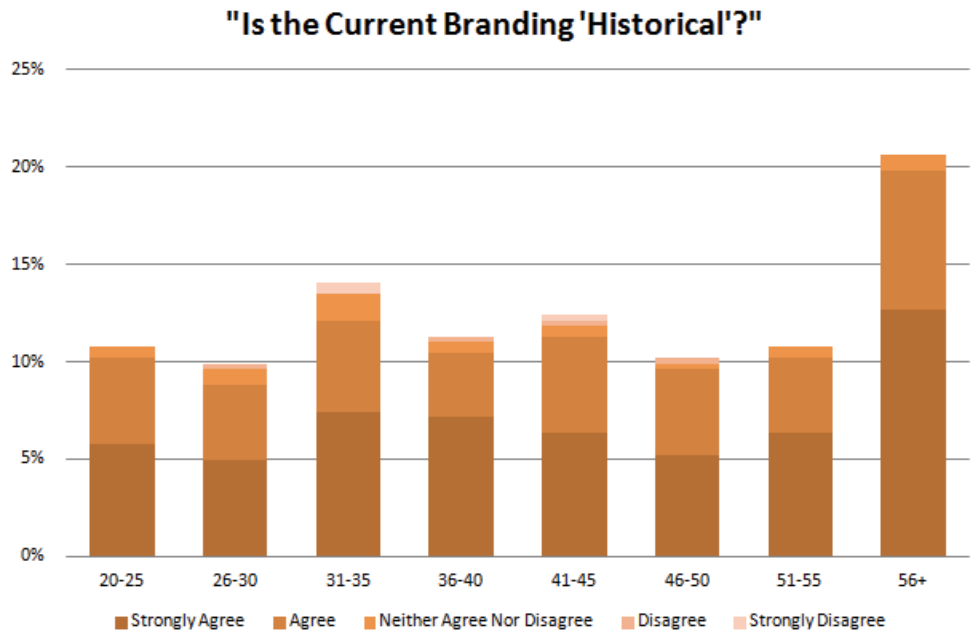
Survey Insights

Due to privacy concerns, we distributed our Qualtrics survey through business leaders sending a link to their employees. Therefore, we were not able to determine how many people actually received our survey. However, we received 438 responses, 199 of which showed interest in participating in our focus groups. This high response provided great insights about people's perceptions.

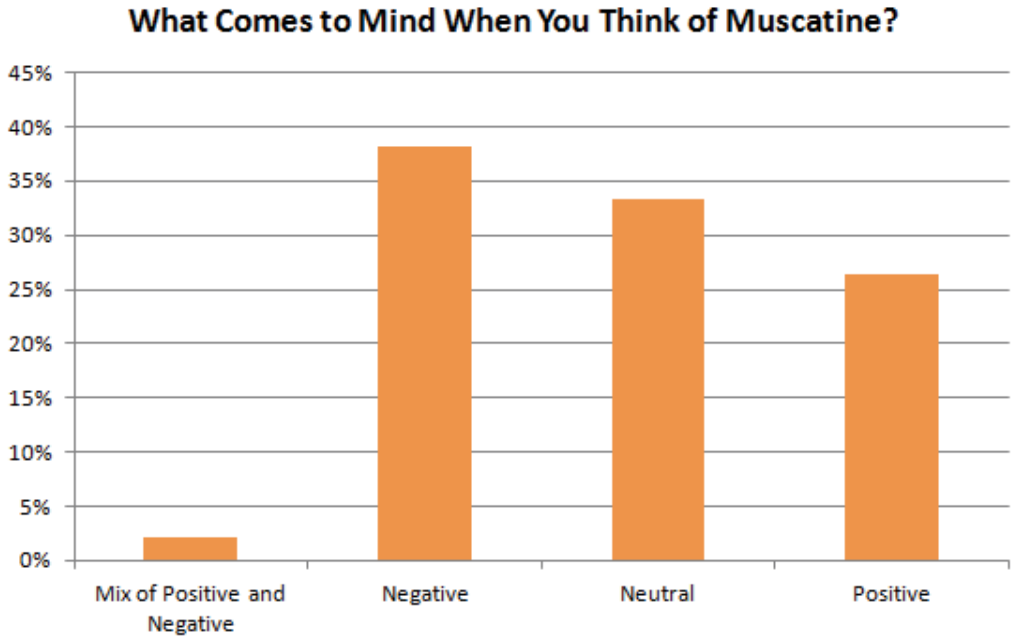
First, we found that 44% of participants that previously lived in Muscatine moved away due to proximity to their family and friends. Additionally, 72% of the respondents who currently live in Muscatine stated they have considered relocating in the near future. Along these lines, participants tended to rank employment opportunities as their top or second most important factor when considering a city to live in. On the other hand, commuters cited three primary factors to their decision to live somewhere other than Muscatine: "to be closer to family", "there is more to do where [they] live", and "Muscatine's education system is lacking."

Participants were asked to rank Muscatine's perceived strengths and weaknesses. The top three resulting strengths were affordability, employment opportunities, and proximity to family and friends. The top three weaknesses participants listed were lack of retail, restaurants and recreation.

We conducted further analysis of information about participants' current perceptions of Muscatine.
As shown in the bar graphs below, we asked participants if they thought Muscatine's current branding, the Pearl of the Mississippi, was historical. The vast majority of participants agreed.

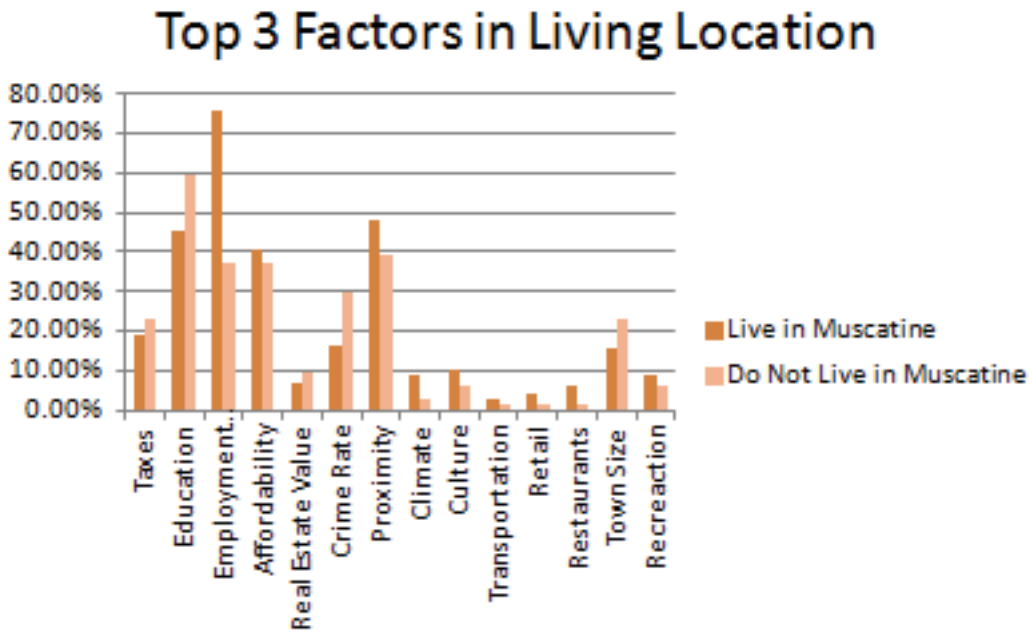


We also asked participants an open-ended question regarding their perceptions of Muscatine. Responses varied greatly and ranged from “river” or “river town” to “stinky” to “great place to live.” In order to show these results objectively we labeled responses as positive, negative, neutral, or mixed. The majority of participants responded with negative or neutral perceptions of Muscatine.

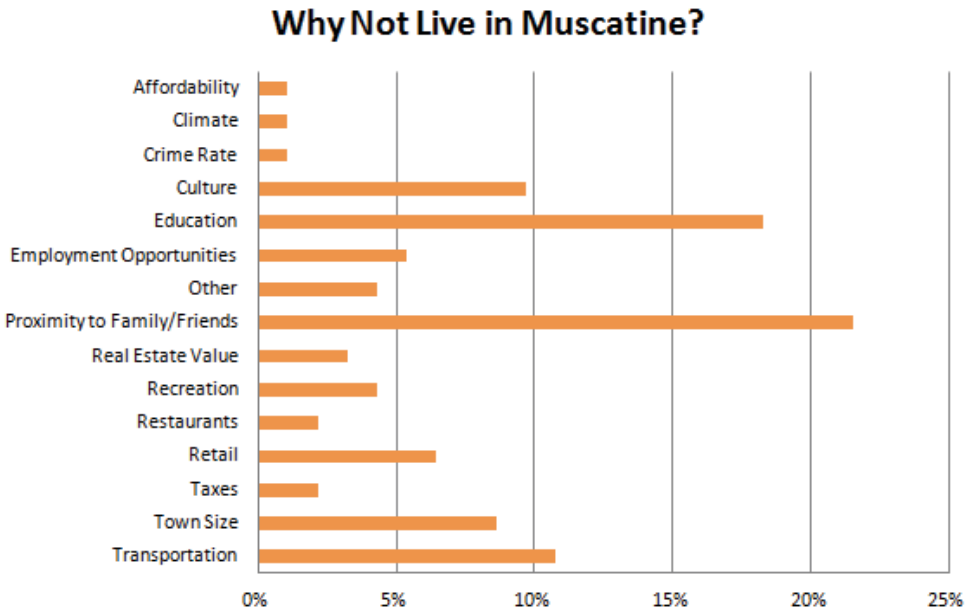


We also asked survey participants to rank criteria in order of most importance to their decision of choosing a location to live. Employment, education and proximity to family

and friends were the top three factors participants cited as factors to their decision about what city to live in.



Along those same lines, we asked participants who indicated they do not live in Muscatine to express why they chose to live elsewhere and commute to Muscatine. Participants commuting to Muscatine to work cited proximity to family and friends, education, transportation and culture as their primary reasons for choosing to live elsewhere.



Focus Group Insights

Our key findings addressed positives and negatives of Muscatine in the minds of people who live there. During our discussions, healthy living was a popular positive topic among participants. Verbatim from the participants include “There's an emphasis on healthy living.” “The YMCA provides low fees and there are other fitness centers, like Anytime Fitness too". Participants also noted the abundant resources for outdoor fitness like trails, and the opening of Discovery Park. However, not everyone in the focus group was familiar with the new park. There was also a lack of recognition of the Blue Zones Project. We asked members in the focus group how they felt about the Blue Zone Initiative, and the majority of the participants needed the project to be explained.

Another key strength identified from the focus groups was the availability of employment in Muscatine. We were able to gather from the group, not only was there plenty of opportunities for work, but also companies that provide a great environment to work for. Quotes from participants included “I live here to be near work” and “Employers take good care of their employees” which support the positive perception those working in Muscatine have about their career opportunities.

Insights we discovered about areas of Muscatine that can be improved include options for late night transportation. We heard from participants there is no cab service, if they were hoping to be out late, and especially if they are choosing to drink. Currently Muscatine has a bus service which was not mentioned in the focus group, hinting at the issue of people being unaware of their options as well as their need of a taxi service.

Another weakness identified in our focus group included the lack of retail, restaurants, and hotel options. A quote from participant included, “We are missing big stores like Target”. The focus group remarked they travel to competitor cities like Iowa City and Dubuque to eat out and shop. They mentioned it would be beneficial if options were within walking distance, as well as their desire to have outdoor dining similar to nearby cities. Our key finding is those who work in Muscatine feel there is a trade off when deciding whether to live in Muscatine. Young professionals feel they will either need to commute on the weekends for leisure or commute during the week. Also during the discussions, people remarked they wish there were more options for their families and friends to stay when they visit. They wished there was a moderately upscale hotel in town (and not a motel). Currently, Muscatine has a bed and breakfast that does not appear to be well advertised as a viable option for this problem.

A final finding discovered in the focus group was the dismay for housing options among young professionals. They discussed the lack of housing options among those with similar financial backgrounds. Young professionals said they can not afford the nicer single family homes offered, but want something nicer than what they have lived in the past. A verbatim from the group included “I’m not in college anymore”. The group seemed to want an improvement from their college apartments until they are ready for the commitment of a home. An apartment complex mentioned as a current viable option for residents in that age range was Cottonwood.

IV. RECOMMENDATIONS

Short-Term Recommendations

Our first short-term recommendation is to implement the Dubuque Model discussed earlier in the report. As seen from our interview with Rick Dickinson, it is of the utmost importance for Muscatine to create a community where young professionals feel connected and welcomed. We believe that by implementing a Concierge Service, young professionals will be able to see all of the great things the Muscatine community has to offer and start creating a professional and social network. In addition, a Muscatine Development group should begin recruiting at college campuses. This would allow students who will be entering the workforce the opportunity to see all of the great employment opportunities in Muscatine in a thriving community. Muscatine would also benefit from the creation of a jobs website. A website promoting all of the jobs in Muscatine would help attract new people to the area.

We also recommend that Muscatine promote and revive its downtown area. Survey results indicated Muscatine's top rated weaknesses were retail, restaurants, and recreation. In addition, from the focus group responses, we found that many young professionals working in Muscatine are looking for more entertainment options. If Muscatine could provide some financial incentives for businesses to move to the downtown area, we believe it will solve two main problems: 1) revitalization of the downtown to make it more appealing and attractive; and 2) keeping its residents in town to spend their money as opposed to surrounding cities.

Muscatine should also do more to advertise the recreation options available on the river and through the Blue Zones project. We believe that recreation opportunities could be one of Muscatine's greatest strengths; however, people need to be informed of the recreational options available. In general, it seems Muscatine can benefit from communicating to current and potential residents about the benefits of the town. As stated in the focus groups not everyone knew about the opening of the new trail or other recreational opportunities.

We think it is important to promote awareness by using social media and advertisements to promote what is great about Muscatine. Furthermore, we recommend that Muscatine create more housing options in the downtown area. This would create more housing for young professionals and would create a great work-life environment that college graduates enjoy.

Finally, Muscatine should work on improving its transportation options. Muscatine offers bus transportation, but as heard in the focus groups, many young professionals complain that there is no taxi service. We would recommend starting a taxi service. A taxi would allow people living in Muscatine and the surrounding area to stay out later and enjoy the downtown area.

Long-Term Recommendations

Our first long-term recommendation is to improve the education system, especially in the high school level. As seen from our survey results, sixty percent of non-residents

included education in their top three factors in choosing a place of residence. In 2013 Muscatine's high school had an average score of 78.2 for math and 71.5 for reading, both which are below the state's average. Muscatine ranked worse that 83% of other Iowa schools in 2013. We recommend while Muscatine is focusing on improving their education they communicate their changes with community members. It is important for the public to be aware of the new change in leadership, the recent change in principal and superintendent.

We suggest working on housing options for young professionals. As seen by our focus group, the young professional employees feel they do not have options in Muscatine. We suggest opening more apartment complexes similar to Cottonwood, but closer to the downtown area. Cottonwood currently offers amenities young professionals seek such as the ability to have different lengths on their lease, as well as modern fixtures, appliances and ambiance in the apartments. We also suggest offering more two bedrooms apartment units as an option for young professionals to offset rent payments with a roommate. We believe a similar complex closer to downtown would be a very attractive and appealing to young professionals who have a tendency to prefer a more eclectic and urban lifestyle. Young professionals seek big city amenities, which include being able to walk to local shops, restaurants, and businesses.

Another option for housing includes offering subsidies for employees of Muscatine to live in town. Currently younger professionals may not have enough to afford the nicer options in Muscatine. By making nicer homes more affordable through a subsidy, current Muscatine workers may be more likely to stay in town.

Muscatine should also seek to improve their ways of communication with the younger demographic. As seen by our focus group, people sometimes have misconceptions or are not seeing the entire story. By developing a social media presence, a conversation can develop between Muscatine and their target market. Muscatine can use their "What's Up Muscatine" as a device to communicate with those living and commuting to Muscatine. We recommend using Twitter and Facebook, in addition to the website, to update people on changes as well as all the wonderful things in the city. For example, programs related to the Blue Zone and resources on how to get involved can be shared on a Facebook post. Or the hash tag #MuscatineBlueZone can be created in order to build excitement on the achievement. When using social media, remember to be engaging with your audience, as it can be another form of market research. Posts can be used to ask questions in order to find out what your audience wants in the city. For example post, "What kind of summer events would you like to see?" This will provide ideas on programming that would be attractive to a younger demographic.

Also Muscatine should focus on developing their downtown area. From the survey results we saw over five percent of responders choose not to live in Muscatine due to the lack of retail. Muscatine can help this issue in two ways. The first is to support the current establishments in downtown Muscatine. During our focus group a few restaurants were mentioned as great places to eat. It is important to give these restaurants support in order to bring positive attention to the downtown area. These restaurants include The Brew, 101 West, and Pearl City Chop House. Finding ways to partner and market current

options will change current perceptions of a lack of restaurants, as well as increase community support. Also, to attract new business and retail, Muscatine can offer subsidies as incentives for business owners to move to Muscatine.

Proposed Branding Strategy

We think it is important to remember that a logo and slogan alone are not a brand; a brand is a culture and perception, and a logo and slogan are a visual representation of the brand's promise. We also want to emphasize that a branding campaign takes a considerable amount of time. When we spoke to Rick Dickinson from Dubuque, he told us the city began its rebranding process in 1997. It wasn't until recently, almost 20 years later, that Dubuque started marketing the rebranding materials. With this in mind, our proposed branding strategy runs parallel to our short-term and long-term recommendations.

We provided three rebranding directions, each with a different logo and slogan option. We also provided a final proposal recommendation.

Proposal 1: Pearls of Opportunity

Our first proposal is "Pearls of Opportunity." This option references the history of the pearl button factory, but could also be interpreted similar to a "hidden gem" concept to someone who doesn't know the history behind the pearl. On the other hand, the mentioned opportunities could be interpreted as employment, community, health, or even education opportunities.

Proposal 2: Great Opportunity. Close Community.

Our second proposal is “Great Opportunity. Close Community.” This option again emphasizes the many vast opportunities available to people living in Muscatine, but also aims to draw attention to the culture of Muscatine and its family-oriented programming and proposed young adult life culture. Overall, “Great Opportunity. Close Community.” aspires to generate perceptions of Muscatine as a “small big city.”

Proposal 3: Opportunity Around Every Bend

Our third proposal is “Opportunity Around Every Bend.” This option offers a subtle historical reference, but places the majority of its focus on the opportunities in Muscatine. It displays optimism and futuristic vision while being versatile and sustainable.

Final Recommendation

As previously mentioned, a brand is a culture and a promise - not logo or a slogan. The logo and slogan are visual representations of the brand promise. We feel the sunrise logo with the "Opportunity Around Every Bend" slogan represents a strong, sustainable brand promise of extensive opportunities through jobs, community involvement, environment, recreation and many other avenues and can be used alongside our short and long term recommendations. It demonstrates a forward-looking vision and the idea of "turning over a new leaf" to make positive changes to the Muscatine community such as the Blue Zones Project and our proposed short and long term recommendations.

The colors yellow, blue and green used in these logo proposals were chosen specifically for common psychology associated with them. Yellow indicates confidence and optimism while blue shows peace, integrity, trust and dependability. Additionally, green signifies harmony, balance, refreshment, health and growth. We feel these colors further represent the brand promise Muscatine should portray to its community.

Appendix F

Appendix F FAA TFMSC Report

From 01/01/2016 To 01/01/2017 | Airport=MUT

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
326	8/2/2016	BE23 - Beech 23 Sundowner	No	No	GA	1	A	I	
13	1/18/2016	BE35 - Beech Bonanza 35	No	No	GA	2	A	I	1A
55	2/18/2016	BE35 - Beech Bonanza 35	No	No	GA	2	A	I	1A
62	2/23/2016	BE35 - Beech Bonanza 35	No	No	GA	1	A	I	1A
93	3/12/2016	BE35 - Beech Bonanza 35	No	No	GA	1	A	I	1A
96	3/13/2016	BE35 - Beech Bonanza 35	No	No	GA	1	A	I	1A
311	7/29/2016	BE35 - Beech Bonanza 35	No	No	GA	2	A	I	1A
445	10/2/2016	BE35 - Beech Bonanza 35	No	No	GA	4	A	I	1A
513	11/4/2016	BE35 - Beech Bonanza 35	No	No	GA	2	A	I	1A
615	12/27/2016	BE35 - Beech Bonanza 35	No	No	GA	2	A	I	1A
18	1/27/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
42	2/6/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
103	3/20/2016	BE36 - Beech Bonanza 36	No	No	GA	2	A	I	1A
112	3/27/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
117	4/1/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
134	4/12/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
181	5/8/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
183	5/10/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
186	5/12/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
195	5/17/2016	BE36 - Beech Bonanza 36	No	No	GA	2	A	I	1A
198	5/19/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
238	6/20/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
250	6/28/2016	BE36 - Beech Bonanza 36	No	No	GA	3	A	I	1A
265	7/4/2016	BE36 - Beech Bonanza 36	No	No	GA	2	A	I	1A
315	7/30/2016	BE36 - Beech Bonanza 36	No	No	GA	3	A	I	1A
321	7/31/2016	BE36 - Beech Bonanza 36	No	No	GA	2	A	I	1A
346	8/13/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
347	8/14/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
357	8/21/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
369	8/26/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
372	8/27/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
375	8/29/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
413	9/16/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
459	10/10/2016	BE36 - Beech Bonanza 36	No	No	GA	2	A	I	1A
487	10/22/2016	BE36 - Beech Bonanza 36	No	No	GA	2	A	I	1A
502	10/29/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
504	10/30/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
528	11/11/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
535	11/14/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
556	11/28/2016	BE36 - Beech Bonanza 36	No	No	GA	4	A	I	1A
559	11/29/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
601	12/14/2016	BE36 - Beech Bonanza 36	No	No	GA	1	A	I	1A
553	11/27/2016	BE76 - Beech 76 Duchess	No	No	GA	2	A	I	
81	3/7/2016	C172 - Cessna Skyhawk	No	No	GA	2	A	I	1A

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
292	7/20/2016	C172 - Cessna Skyhawk	No	No	GA	2	A	I	1A
312	7/29/2016	C172 - Cessna Skyhawk	No	No	GA	2	A	I	1A
431	9/22/2016	C172 - Cessna Skyhawk	No	No	GA	1	A	I	1A
577	12/3/2016	C172 - Cessna Skyhawk	No	No	GA	1	A	I	1A
581	12/5/2016	C172 - Cessna Skyhawk	No	No	GA	1	A	I	1A
97	3/14/2016	C177 - Cessna 177 Cardinal	No	No	GA	1	A	I	
160	4/30/2016	C177 - Cessna 177 Cardinal	No	No	GA	2	A	I	
167	5/3/2016	C177 - Cessna 177 Cardinal	No	No	GA	1	A	I	
184	5/11/2016	C177 - Cessna 177 Cardinal	No	No	GA	1	A	I	
188	5/12/2016	C177 - Cessna 177 Cardinal	No	No	GA	1	A	I	
404	9/12/2016	C177 - Cessna 177 Cardinal	No	No	GA	2	A	I	
592	12/9/2016	C177 - Cessna 177 Cardinal	No	No	GA	1	A	I	
121	4/4/2016	C180 - Cessna 180	No	No	GA	1	A	I	
123	4/5/2016	C180 - Cessna 180	No	No	GA	1	A	I	
145	4/16/2016	C180 - Cessna 180	No	No	GA	2	A	I	
279	7/14/2016	C180 - Cessna 180	No	No	GA	1	A	I	
285	7/16/2016	C180 - Cessna 180	No	No	GA	1	A	I	
335	8/7/2016	C180 - Cessna 180	No	No	GA	1	A	I	
339	8/9/2016	C180 - Cessna 180	No	No	GA	1	A	I	
391	9/7/2016	C180 - Cessna 180	No	No	GA	1	A	I	
399	9/9/2016	C180 - Cessna 180	No	No	GA	1	A	I	
405	9/12/2016	C180 - Cessna 180	No	No	GA	1	A	I	
415	9/16/2016	C180 - Cessna 180	No	No	GA	1	A	I	
514	11/4/2016	C180 - Cessna 180	No	No	GA	1	A	I	
557	11/28/2016	C180 - Cessna 180	No	No	GA	1	A	I	
568	12/1/2016	C180 - Cessna 180	No	No	GA	1	A	I	
179	5/7/2016	C182 - Cessna Skylane 182	No	No	GA	2	A	I	1A
223	6/10/2016	C182 - Cessna Skylane 182	No	No	GA	3	A	I	1A
224	6/11/2016	C182 - Cessna Skylane 182	No	No	GA	1	A	I	1A
392	9/7/2016	C182 - Cessna Skylane 182	No	No	GA	2	A	I	1A
523	11/9/2016	C182 - Cessna Skylane 182	No	No	GA	2	A	I	1A
128	4/8/2016	C210 - Cessna 210 Centurion	No	No	GA	1	A	I	1A
248	6/27/2016	C210 - Cessna 210 Centurion	No	No	GA	1	A	I	1A
295	7/21/2016	C210 - Cessna 210 Centurion	No	No	GA	1	A	I	1A
359	8/22/2016	C210 - Cessna 210 Centurion	No	No	GA	2	A	I	1A
363	8/24/2016	C210 - Cessna 210 Centurion	No	No	GA	2	A	I	1A
436	9/27/2016	C210 - Cessna 210 Centurion	No	No	GA	2	A	I	1A
322	7/31/2016	C320 - Cessna Skyknight	No	No	GA	1	A	I	
15	1/23/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
28	1/31/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
152	4/23/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
227	6/12/2016	COL4 - Lancair LC-41	No	No	GA	2	A	I	
245	6/23/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
258	6/30/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
262	7/3/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
289	7/18/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
304	7/26/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
319	7/30/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
408	9/13/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
412	9/15/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
422	9/18/2016	COL4 - Lancair LC-41	No	No	GA	2	A	I	
433	9/23/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
443	10/1/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
464	10/11/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
472	10/13/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
501	10/28/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
516	11/4/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
554	11/27/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
562	11/29/2016	COL4 - Lancair LC-41	No	No	GA	1	A	I	
164	5/1/2016	DA40 - Diamond Star DA40	No	No	GA	1	A	I	
5	1/10/2016	LNC4 - Lancair 4	No	No	GA	2	A	I	
20	1/27/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
24	1/28/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
37	2/4/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
47	2/11/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
92	3/11/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
119	4/3/2016	LNC4 - Lancair 4	No	No	GA	2	A	I	
150	4/21/2016	LNC4 - Lancair 4	No	No	GA	2	A	I	
153	4/23/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
172	5/4/2016	LNC4 - Lancair 4	No	No	GA	3	A	I	
176	5/5/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
200	5/20/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
215	6/3/2016	LNC4 - Lancair 4	No	No	GA	2	A	I	
222	6/9/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
225	6/11/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
240	6/20/2016	LNC4 - Lancair 4	No	No	GA	2	A	I	
284	7/15/2016	LNC4 - Lancair 4	No	No	GA	2	A	I	
306	7/27/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
323	7/31/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
345	8/12/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
362	8/23/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
364	8/24/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
366	8/25/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
396	9/8/2016	LNC4 - Lancair 4	No	No	GA	2	A	I	
410	9/13/2016	LNC4 - Lancair 4	No	No	GA	2	A	I	
440	9/28/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
447	10/2/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
465	10/11/2016	LNC4 - Lancair 4	No	No	GA	2	A	I	
490	10/23/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
492	10/24/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
550	11/22/2016	LNC4 - Lancair 4	No	No	GA	2	A	I	
579	12/3/2016	LNC4 - Lancair 4	No	No	GA	1	A	I	
599	12/13/2016	LNC4 - Lancair 4	No	No	GA	2	A	I	
30	2/1/2016	M20P - Mooney M-20C	No	No	GA	2	A	I	
101	3/18/2016	M20P - Mooney M-20C	No	No	GA	1	A	I	
309	7/28/2016	M20P - Mooney M-20C	No	No	GA	1	A	I	
349	8/15/2016	M20P - Mooney M-20C	No	No	GA	2	A	I	
387	9/4/2016	M20P - Mooney M-20C	No	No	GA	2	A	I	

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
6	1/10/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
26	1/29/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
38	2/4/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
51	2/15/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
59	2/19/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
64	2/23/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
70	2/26/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
79	3/4/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
100	3/15/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
105	3/20/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
116	3/31/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
120	4/3/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
130	4/8/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
155	4/26/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
157	4/27/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
162	4/30/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
173	5/4/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
177	5/6/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
185	5/11/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
190	5/13/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
192	5/14/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
193	5/15/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
197	5/17/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
201	5/20/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
211	5/30/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
216	6/3/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
217	6/6/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
218	6/7/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
219	6/8/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
226	6/11/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
228	6/12/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
230	6/15/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
236	6/19/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
241	6/20/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
246	6/23/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
252	6/28/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
259	6/30/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
263	7/3/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
266	7/4/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
272	7/8/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
275	7/10/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
290	7/18/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
302	7/25/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
307	7/27/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
337	8/8/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
356	8/19/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
444	10/1/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
451	10/4/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
456	10/8/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
461	10/10/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
466	10/11/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
494	10/25/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
496	10/26/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
506	10/31/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
509	11/2/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
518	11/4/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
526	11/9/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
530	11/11/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
533	11/13/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
543	11/17/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
547	11/21/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
551	11/23/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
555	11/27/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
558	11/28/2016	MU2 - Mitsubishi	No	No	GA	2	A	I	
573	12/1/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
576	12/2/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
593	12/9/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
595	12/11/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
610	12/20/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
612	12/23/2016	MU2 - Mitsubishi	No	No	GA	1	A	I	
1	1/2/2016	P28A - Piper Cherokee	No	No	GA	1	A	I	1A
110	3/25/2016	P28A - Piper Cherokee	No	No	GA	2	A	I	1A
115	3/29/2016	P28A - Piper Cherokee	No	No	GA	2	A	I	1A
267	7/4/2016	P28A - Piper Cherokee	No	No	GA	1	A	I	1A
340	8/9/2016	P28A - Piper Cherokee	No	No	GA	1	A	I	1A
467	10/11/2016	P28A - Piper Cherokee	No	No	GA	1	A	I	1A
491	10/23/2016	P28A - Piper Cherokee	No	No	GA	1	A	I	1A
552	11/23/2016	P28A - Piper Cherokee	No	No	GA	2	A	I	1A
539	11/15/2016	P28B - Piper Turbo Dakota	No	No	GA	1	A	I	1A
426	9/20/2016	P32R - Piper 32	No	No	GA	1	A	I	
597	12/12/2016	P46T - Piper Malibu Meridian	No	No	GA	1	A	I	
423	9/18/2016	P68 - Partenavia P68 Victor	No	No	GA	1	A	I	
333	8/6/2016	PA30 - Piper PA-30	No	No	GA	2	A	I	
314	7/29/2016	PA32 - Piper Cherokee Six	No	No	GA	1	A	I	
367	8/25/2016	PA32 - Piper Cherokee Six	No	No	GA	1	A	I	
534	11/13/2016	PA32 - Piper Cherokee Six	No	No	GA	1	A	I	
541	11/16/2016	PA32 - Piper Cherokee Six	No	No	GA	1	A	I	
56	2/18/2016	PA46 - Piper Malibu	No	No	GA	2	A	I	
234	6/17/2016	PA46 - Piper Malibu	No	No	GA	2	A	I	
320	7/30/2016	PA46 - Piper Malibu	No	No	GA	2	A	I	
611	12/21/2016	PA46 - Piper Malibu	No	No	GA	2	A	I	
82	3/7/2016	RV6 - AIEP Air Beetle	No	No	GA	1	A	I	
111	3/26/2016	RV6 - AIEP Air Beetle	No	No	GA	2	A	I	
237	6/19/2016	RV6 - AIEP Air Beetle	No	No	GA	1	A	I	
260	7/1/2016	RV6 - AIEP Air Beetle	No	No	GA	1	A	I	
264	7/3/2016	RV6 - AIEP Air Beetle	No	No	GA	1	A	I	
382	9/1/2016	RV8 - RV-4/6/7/8; VANS	No	No	GA	1	A	I	
170	5/3/2016	SR22 - Cirrus SR 22	No	No	GA	1	A	I	

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
178	5/6/2016	SR22 - Cirrus SR 22	No	No	GA	1	A	I	
191	5/13/2016	SR22 - Cirrus SR 22	No	No	GA	1	A	I	
194	5/15/2016	SR22 - Cirrus SR 22	No	No	GA	1	A	I	
247	6/26/2016	SR22 - Cirrus SR 22	No	No	GA	1	A	I	
253	6/28/2016	SR22 - Cirrus SR 22	No	No	GA	1	A	I	
334	8/6/2016	SR22 - Cirrus SR 22	No	No	GA	1	A	I	
368	8/25/2016	SR22 - Cirrus SR 22	No	No	GA	2	A	I	
468	10/12/2016	SR22 - Cirrus SR 22	No	No	GA	2	A	I	
519	11/4/2016	SR22 - Cirrus SR 22	No	No	GA	2	A	I	
137	4/12/2016	TBM7 - Socata TBM-7	No	No	GA	2	A	I	
232	6/16/2016	TBM7 - Socata TBM-7	No	No	GA	2	A	I	
457	10/8/2016	TBM8 - Socata TBM-850	No	No	GA	2	A	I	
458	10/9/2016	TBM8 - Socata TBM-850	No	No	GA	2	A	I	
462	10/10/2016	TBM8 - Socata TBM-850	No	No	GA	2	A	I	
477	10/17/2016	TBM8 - Socata TBM-850	No	No	GA	2	A	I	
619	12/29/2016	TBM8 - Socata TBM-850	No	No	GA	1	A	I	
622	12/30/2016	TBM8 - Socata TBM-850	No	No	GA	1	A	I	
244	6/22/2016	TBM9 - Socata TBM	No	No	GA	2	A	I	
600	12/13/2016	TBM9 - Socata TBM	No	No	GA	2	A	I	
380	8/31/2016	P28R - Cherokee	No	No	GA	1	A	I	1A
540	11/16/2016	P28R - Cherokee	No	No	GA	2	A	I	1A
		SUBTOTAL AI				**364**			
174	5/5/2016	C208 - Cessna 208 Caravan	No	No	GA	1	A	II	1A
169	5/3/2016	PC12 - Pilatus PC-12	No	No	GA	2	A	II	
397	9/8/2016	PC12 - Pilatus PC-12	No	No	GA	2	A	II	
		SUBTOTAL AII				**5**			
87	3/10/2016	BE10 - Beech King Air 100	No	No	GA	2	B	I	1A
33	2/3/2016	BE40 - Raytheon/Beech Beechjet 400/T-1	Yes	No	Air Carrier	2	B	I	43.1
40	2/5/2016	BE40 - Raytheon/Beech Beechjet 400/T-1	Yes	No	GA	2	B	I	43.1
574	12/2/2016	BE40 - Raytheon/Beech Beechjet 400/T-1	Yes	No	GA	1	B	I	43.1
584	12/7/2016	BE40 - Raytheon/Beech	Yes	No	GA	1	B	I	43.1
589	12/8/2016	BE40 - Raytheon/Beech Beechjet 400/T-1	Yes	No	GA	1	B	I	43.1
474	10/17/2016	BE55 - Beech Baron 55	No	No	GA	1	B	I	1A
2	1/6/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
19	1/27/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
21	1/28/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
35	2/4/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
43	2/6/2016	BE58 - Beech 58	No	No	GA	2	B	I	1A
63	2/23/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
88	3/10/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
94	3/12/2016	BE58 - Beech 58	No	No	GA	2	B	I	1A
132	4/10/2016	BE58 - Beech 58	No	No	GA	2	B	I	1A
206	5/25/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
207	5/26/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
271	7/8/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
273	7/10/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
277	7/12/2016	BE58 - Beech 58	No	No	GA	2	B	I	1A
280	7/15/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
287	7/18/2016	BE58 - Beech 58	No	No	GA	2	B	I	1A
328	8/3/2016	BE58 - Beech 58	No	No	GA	2	B	I	1A
330	8/4/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
341	8/11/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
373	8/27/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
374	8/28/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
385	9/4/2016	BE58 - Beech 58	No	No	GA	2	B	I	1A
398	9/9/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
402	9/11/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
414	9/16/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
441	9/30/2016	BE58 - Beech 58	No	No	GA	2	B	I	1A
446	10/2/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
453	10/6/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
470	10/13/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
475	10/17/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
481	10/19/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
497	10/27/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
500	10/28/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
503	10/29/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
616	12/27/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
620	12/30/2016	BE58 - Beech 58	No	No	GA	1	B	I	1A
89	3/10/2016	BE60 - Beech 60 Duke	No	No	GA	1	B	I	1A
278	7/12/2016	C25A - Cessna Citation CJ2	Yes	No	GA	1	B	I	
569	12/1/2016	C25A - Cessna Citation CJ2	Yes	No	GA	1	B	I	
614	12/26/2016	C25A - Cessna Citation CJ2	Yes	No	Air Carrier	2	B	I	
76	3/2/2016	C310 - Cessna 310	No	No	GA	2	B	I	
214	6/3/2016	C310 - Cessna 310	No	No	GA	1	B	I	
274	7/10/2016	C310 - Cessna 310	No	No	GA	1	B	I	
281	7/15/2016	C310 - Cessna 310	No	No	GA	2	B	I	
286	7/17/2016	C310 - Cessna 310	No	No	GA	2	B	I	
370	8/26/2016	C310 - Cessna 310	No	No	GA	2	B	I	
407	9/13/2016	C310 - Cessna 310	No	No	GA	2	B	I	
482	10/20/2016	C310 - Cessna 310	No	No	GA	1	B	I	
141	4/14/2016	C421 - Cessna Golden Eagle	No	No	GA	2	B	I	
196	5/17/2016	C421 - Cessna Golden Eagle	No	No	GA	2	B	I	
417	9/17/2016	C421 - Cessna Golden Eagle	No	No	GA	1	B	I	
420	9/18/2016	C421 - Cessna Golden Eagle	No	No	GA	1	B	I	
317	7/30/2016	C525 - Cessna	Yes	No	GA	2	B	I	
416	9/16/2016	C525 - Cessna	Yes	No	GA	4	B	I	
571	12/1/2016	C525 - Cessna	Yes	No	GA	1	B	I	
310	7/28/2016	P180 - Piaggio P-180 Avanti	No	No	GA	2	B	I	
587	12/7/2016	PAY1 - Piper Cheyenne 1	No	No	GA	2	B	I	
144	4/16/2016	AEST - Piper Aero Star	No	No	GA	2	B	I	
298	7/23/2016	AEST - Piper Aero Star	No	No	GA	1	B	I	
299	7/25/2016	AEST - Piper Aero Star	No	No	GA	1	B	I	
		SUBTOTAL BI				**93**			

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
66	2/25/2016	B350 - Beech Super King Air	No	No	GA	4	B	II	2
125	4/6/2016	B350 - Beech Super King Air	No	No	GA	4	B	II	2
151	4/22/2016	B350 - Beech Super King Air	No	No	Air Taxi	2	B	II	2
202	5/23/2016	B350 - Beech Super King Air	No	No	GA	2	B	II	2
204	5/24/2016	B350 - Beech Super King Air	No	No	GA	1	B	II	2
254	6/29/2016	B350 - Beech Super King Air	No	No	GA	3	B	II	2
343	8/12/2016	B350 - Beech Super King Air	No	No	GA	2	B	II	2
361	8/23/2016	B350 - Beech Super King Air	No	No	GA	2	B	II	2
365	8/25/2016	B350 - Beech Super King Air	No	No	GA	1	B	II	2
478	10/18/2016	B350 - Beech Super King Air	No	No	GA	2	B	II	2
480	10/19/2016	B350 - Beech Super King Air	No	No	GA	1	B	II	2
565	11/30/2016	B350 - Beech Super King Air	No	No	GA	3	B	II	2
582	12/6/2016	B350 - Beech Super King Air	No	No	GA	4	B	II	2
7	1/11/2016	BE20 - Beech 200 Super King	No	No	GA	4	B	II	2
9	1/13/2016	BE20 - Beech 200 Super King	No	No	GA	2	B	II	2
12	1/18/2016	BE20 - Beech 200 Super King	No	No	GA	2	B	II	2
31	2/2/2016	BE20 - Beech 200 Super King	No	No	GA	4	B	II	2
32	2/3/2016	BE20 - Beech 200 Super King	No	No	GA	2	B	II	2
34	2/4/2016	BE20 - Beech 200 Super King	No	No	GA	2	B	II	2
39	2/5/2016	BE20 - Beech 200 Super King	No	No	GA	4	B	II	2
67	2/25/2016	BE20 - Beech 200 Super King	No	No	GA	4	B	II	2
69	2/26/2016	BE20 - Beech 200 Super King	No	No	GA	3	B	II	2
72	2/29/2016	BE20 - Beech 200 Super King	No	No	GA	2	B	II	2
83	3/8/2016	BE20 - Beech 200 Super King	No	No	GA	3	B	II	2
158	4/29/2016	BE20 - Beech 200 Super King	No	No	GA	2	B	II	2
205	5/25/2016	BE20 - Beech 200 Super King	No	No	GA	2	B	II	2
221	6/9/2016	BE20 - Beech 200 Super King	No	No	GA	2	B	II	2
353	8/18/2016	BE20 - Beech 200 Super King	No	No	GA	2	B	II	2
469	10/13/2016	BE20 - Beech 200 Super King	No	No	GA	2	B	II	2
545	11/21/2016	BE20 - Beech 200 Super King	No	No	GA	3	B	II	2
588	12/8/2016	BE20 - Beech 200 Super King	No	No	GA	1	B	II	2
594	12/10/2016	BE20 - Beech 200 Super King	No	No	GA	2	B	II	2
604	12/15/2016	BE20 - Beech 200 Super King	No	No	GA	3	B	II	2
324	8/1/2016	BE30 - Raytheon 300 Super	No	No	GA	2	B	II	
338	8/9/2016	BE30 - Raytheon 300 Super	No	No	GA	2	B	II	
350	8/16/2016	BE30 - Raytheon 300 Super	No	No	GA	3	B	II	
354	8/18/2016	BE30 - Raytheon 300 Super	No	No	GA	2	B	II	
376	8/30/2016	BE30 - Raytheon 300 Super	No	No	GA	4	B	II	
383	9/2/2016	BE30 - Raytheon 300 Super	No	No	Air Carrier	1	B	II	
388	9/6/2016	BE30 - Raytheon 300 Super	No	No	GA	2	B	II	
390	9/7/2016	BE30 - Raytheon 300 Super	No	No	Air Carrier	1	B	II	
429	9/22/2016	BE30 - Raytheon 300 Super	No	No	GA	4	B	II	
532	11/13/2016	BE30 - Raytheon 300 Super	No	No	GA	1	B	II	
36	2/4/2016	BE9L - Beech King Air 90	No	No	GA	3	B	II	1A
44	2/8/2016	BE9L - Beech King Air 90	No	No	GA	1	B	II	1A
45	2/9/2016	BE9L - Beech King Air 90	No	No	GA	2	B	II	1A
57	2/19/2016	BE9L - Beech King Air 90	No	No	GA	2	B	II	1A
102	3/19/2016	BE9L - Beech King Air 90	No	No	GA	1	B	II	1A
104	3/20/2016	BE9L - Beech King Air 90	No	No	GA	1	B	II	1A

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
122	4/5/2016	BE9L - Beech King Air 90	No	No	GA	4	B	II	1A
127	4/8/2016	BE9L - Beech King Air 90	No	No	GA	3	B	II	1A
156	4/27/2016	BE9L - Beech King Air 90	No	No	GA	2	B	II	1A
165	5/2/2016	BE9L - Beech King Air 90	No	No	GA	3	B	II	1A
187	5/12/2016	BE9L - Beech King Air 90	No	No	Air Carrier	1	B	II	1A
189	5/13/2016	BE9L - Beech King Air 90	No	No	Air Carrier	1	B	II	1A
208	5/27/2016	BE9L - Beech King Air 90	No	No	GA	2	B	II	1A
210	5/29/2016	BE9L - Beech King Air 90	No	No	GA	1	B	II	1A
212	5/31/2016	BE9L - Beech King Air 90	No	No	GA	3	B	II	1A
213	6/1/2016	BE9L - Beech King Air 90	No	No	GA	4	B	II	1A
291	7/20/2016	BE9L - Beech King Air 90	No	No	GA	2	B	II	1A
300	7/25/2016	BE9L - Beech King Air 90	No	No	GA	1	B	II	1A
308	7/28/2016	BE9L - Beech King Air 90	No	No	GA	2	B	II	1A
316	7/30/2016	BE9L - Beech King Air 90	No	No	GA	2	B	II	1A
377	8/30/2016	BE9L - Beech King Air 90	No	No	GA	1	B	II	1A
411	9/14/2016	BE9L - Beech King Air 90	No	No	GA	2	B	II	1A
419	9/18/2016	BE9L - Beech King Air 90	No	No	GA	2	B	II	1A
430	9/22/2016	BE9L - Beech King Air 90	No	No	GA	2	B	II	1A
566	11/30/2016	BE9L - Beech King Air 90	No	No	GA	2	B	II	1A
608	12/20/2016	BE9L - Beech King Air 90	No	No	GA	1	B	II	1A
613	12/26/2016	BE9L - Beech King Air 90	No	No	GA	1	B	II	1A
327	8/2/2016	C25B - Cessna Citation CJ3	Yes	No	GA	2	B	II	2
437	9/27/2016	C25C - Cessna Citation CJ4	Yes	No	GA	2	B	II	1B
570	12/1/2016	C25C - Cessna Citation CJ4	Yes	No	GA	1	B	II	1B
575	12/2/2016	C25C - Cessna Citation CJ4	Yes	No	GA	1	B	II	1B
61	2/22/2016	C550 - Cessna Citation II/Bravo	Yes	No	GA	2	B	II	
143	4/15/2016	C550 - Cessna Citation	Yes	No	GA	1	B	II	
255	6/29/2016	C550 - Cessna Citation II/Bravo	Yes	No	GA	2	B	II	
282	7/15/2016	C550 - Cessna Citation II/Bravo	Yes	No	GA	2	B	II	
348	8/15/2016	C550 - Cessna Citation	Yes	No	GA	2	B	II	
351	8/16/2016	C550 - Cessna Citation	Yes	No	GA	1	B	II	
355	8/18/2016	C550 - Cessna Citation II/Bravo	Yes	No	GA	2	B	II	
548	11/22/2016	C550 - Cessna Citation II/Bravo	Yes	No	GA	3	B	II	
605	12/15/2016	C550 - Cessna Citation	Yes	No	GA	1	B	II	
607	12/18/2016	C550 - Cessna Citation II/Bravo	Yes	No	GA	1	B	II	
3	1/8/2016	C560 - Cessna Citation	Yes	No	GA	2	B	II	54.1
4	1/10/2016	C560 - Cessna Citation	Yes	No	GA	1	B	II	54.1
10	1/13/2016	C560 - Cessna Citation	Yes	No	GA	1	B	II	54.1
14	1/20/2016	C560 - Cessna Citation	Yes	No	GA	2	B	II	54.1
22	1/28/2016	C560 - Cessna Citation	Yes	No	GA	1	B	II	54.1
25	1/29/2016	C560 - Cessna Citation	Yes	No	GA	1	B	II	54.1
27	1/31/2016	C560 - Cessna Citation	Yes	No	GA	2	B	II	54.1
29	2/1/2016	C560 - Cessna Citation	Yes	No	GA	1	B	II	54.1

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
41	2/5/2016	C560 - Cessna Citation	Yes	No	GA	1	B	II	54.1
46	2/11/2016	C560 - Cessna Citation	Yes	No	GA	2	B	II	54.1
48	2/12/2016	C560 - Cessna Citation	Yes	No	GA	3	B	II	54.1
50	2/15/2016	C560 - Cessna Citation	Yes	No	GA	1	B	II	54.1
52	2/16/2016	C560 - Cessna Citation	Yes	No	GA	2	B	II	54.1
53	2/17/2016	C560 - Cessna Citation	Yes	No	GA	1	B	II	54.1
58	2/19/2016	C560 - Cessna Citation	Yes	No	GA	3	B	II	54.1
60	2/20/2016	C560 - Cessna Citation	Yes	No	GA	2	B	II	54.1
113	3/28/2016	C560 - Cessna Citation	Yes	No	GA	1	B	II	54.1
358	8/21/2016	C560 - Cessna Citation	Yes	No	GA	2	B	II	54.1
560	11/29/2016	C560 - Cessna Citation	Yes	No	GA	2	B	II	54.1
8	1/12/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
11	1/13/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
17	1/26/2016	C56X - Cessna Excel/XLS	Yes	No	Air Carrier	2	B	II	1B
65	2/24/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
68	2/25/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
71	2/28/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
73	2/29/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
75	3/1/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
77	3/2/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
78	3/3/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
80	3/6/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
84	3/8/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
86	3/9/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
90	3/10/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
98	3/14/2016	C56X - Cessna Excel/XLS	Yes	No	GA	3	B	II	1B
99	3/15/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
107	3/23/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
118	4/1/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
124	4/5/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
126	4/6/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
129	4/8/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
133	4/11/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
135	4/12/2016	C56X - Cessna Excel/XLS	Yes	No	GA	3	B	II	1B
138	4/13/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
142	4/14/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
146	4/18/2016	C56X - Cessna Excel/XLS	Yes	No	GA	3	B	II	1B
147	4/19/2016	C56X - Cessna Excel/XLS	Yes	No	GA	3	B	II	1B
148	4/20/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
149	4/21/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
154	4/26/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
159	4/29/2016	C56X - Cessna Excel/XLS	Yes	No	GA	3	B	II	1B
161	4/30/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
163	5/1/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
166	5/2/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
168	5/3/2016	C56X - Cessna Excel/XLS	Yes	No	GA	3	B	II	1B
171	5/4/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
175	5/5/2016	C56X - Cessna Excel/XLS	Yes	No	GA	3	B	II	1B
180	5/7/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
182	5/9/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
229	6/15/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
231	6/16/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
233	6/17/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
235	6/19/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
239	6/20/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
242	6/21/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
243	6/22/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
249	6/27/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
251	6/28/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
256	6/29/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
257	6/30/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
261	7/2/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
268	7/5/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
269	7/6/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
270	7/7/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
276	7/11/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
283	7/15/2016	C56X - Cessna Excel/XLS	Yes	No	GA	3	B	II	1B
288	7/18/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
293	7/20/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
296	7/21/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
297	7/22/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
301	7/25/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
305	7/27/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
313	7/29/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
318	7/30/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
325	8/1/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
329	8/3/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
331	8/4/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
332	8/5/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
336	8/7/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
342	8/11/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
344	8/12/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
379	8/31/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
381	9/1/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
384	9/2/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
386	9/4/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
389	9/6/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
393	9/7/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
400	9/9/2016	C56X - Cessna Excel/XLS	Yes	No	GA	6	B	II	1B
401	9/10/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
403	9/11/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
406	9/12/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
418	9/17/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
421	9/18/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
424	9/19/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
425	9/20/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
428	9/21/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
432	9/23/2016	C56X - Cessna Excel/XLS	Yes	No	Air Carrier	2	B	II	1B

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
438	9/27/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
439	9/28/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
442	10/1/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
449	10/4/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
452	10/5/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
454	10/6/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
455	10/7/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
460	10/10/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
463	10/11/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
471	10/13/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
473	10/14/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
476	10/17/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
479	10/18/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
483	10/20/2016	C56X - Cessna Excel/XLS	Yes	No	Air Carrier	1	B	II	1B
484	10/20/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
485	10/21/2016	C56X - Cessna Excel/XLS	Yes	No	Air Carrier	1	B	II	1B
486	10/21/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
488	10/22/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
489	10/23/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
493	10/25/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
495	10/26/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
498	10/27/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
505	10/31/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
507	11/1/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
508	11/2/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
510	11/3/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
515	11/4/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
520	11/6/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
521	11/7/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
522	11/8/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
524	11/9/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
527	11/10/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
529	11/11/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
531	11/12/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
536	11/14/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
538	11/15/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
542	11/17/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
544	11/20/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
546	11/21/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
549	11/22/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
561	11/29/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
567	11/30/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
572	12/1/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
578	12/3/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
580	12/4/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
583	12/6/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
585	12/7/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
590	12/8/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
598	12/13/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
602	12/14/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
606	12/15/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
609	12/20/2016	C56X - Cessna Excel/XLS	Yes	No	GA	1	B	II	1B
617	12/27/2016	C56X - Cessna Excel/XLS	Yes	No	GA	2	B	II	1B
618	12/29/2016	C56X - Cessna Excel/XLS	Yes	No	Air Carrier	2	B	II	1B
621	12/30/2016	C56X - Cessna Excel/XLS	Yes	No	GA	4	B	II	1B
136	4/12/2016	C680 - Cessna Citation	Yes	No	GA	1	B	II	1B
139	4/13/2016	C680 - Cessna Citation	Yes	No	GA	1	B	II	1B
499	10/27/2016	C680 - Cessna Citation	Yes	No	GA	2	B	II	1B
16	1/24/2016	C750 - Cessna Citation X	Yes	No	GA	2	B	II	1B
394	9/7/2016	C750 - Cessna Citation X	Yes	No	Air Carrier	2	B	II	1B
434	9/25/2016	C750 - Cessna Citation X	Yes	No	Air Carrier	1	B	II	1B
435	9/26/2016	C750 - Cessna Citation X	Yes	No	Air Carrier	1	B	II	1B
603	12/14/2016	E55P - Embraer Phenom 300	Yes	No	GA	4	B	II	
395	9/7/2016	F2TH - Dassault Falcon 2000	Yes	No	GA	2	B	II	
91	3/10/2016	F900 - Dassault Falcon 900	Yes	No	GA	1	B	II	
95	3/12/2016	F900 - Dassault Falcon 900	Yes	No	GA	1	B	II	
49	2/12/2016	H25B - BAe HS 125/700-800/Hawker 800	Yes	No	GA	2	B	II	
74	2/29/2016	H25B - BAe HS 125/700-	Yes	No	GA	2	B	II	
106	3/21/2016	H25B - BAe HS 125/700-800/Hawker 800	Yes	No	GA	2	B	II	
108	3/23/2016	H25B - BAe HS 125/700-800/Hawker 800	Yes	No	GA	2	B	II	
109	3/25/2016	H25B - BAe HS 125/700-800/Hawker 800	Yes	No	GA	2	B	II	
360	8/22/2016	H25B - BAe HS 125/700-	Yes	No	GA	2	B	II	
371	8/26/2016	H25B - BAe HS 125/700-	Yes	No	GA	2	B	II	

#	Date	Aircraft	Business Jet	Regional Jet	User Class	Total Ops	ARC		
							AAC	ADG	TDG
450	10/4/2016	H25B - BAe HS 125/700-800/Hawker 800	Yes	No	GA	2	B	II	
512	11/3/2016	H25B - BAe HS 125/700-800/Hawker 800	Yes	No	GA	2	B	II	
564	11/29/2016	H25B - BAe HS 125/700-800/Hawker 800	Yes	No	GA	2	B	II	
596	12/12/2016	H25B - BAe HS 125/700-800/Hawker 800	Yes	No	GA	1	B	II	
		SUBTOTAL BII				**533**			
352	8/16/2016	LJ40 - Learjet 40; Gates	Yes	No	GA	2	C	I	
378	8/30/2016	LJ60 - Bombardier Learjet 60	Yes	No	GA	2	C	I	
427	9/20/2016	WW24 - IAI 1124 Westwind	Yes	No	GA	4	C	I	1B
		SUBTOTAL CI				**8**			
131	4/9/2016	CL60 - Bombardier Challenger 600/601/604	Yes	No	Air Carrier	2	C	II	1B
140	4/13/2016	CL60 - Bombardier Challenger 600/601/604	Yes	No	Air Carrier	2	C	II	1B
209	5/27/2016	CL60 - Bombardier	Yes	No	Air Carrier	1	C	II	1B
54	2/17/2016	GALX - IAI 1126 Galaxy/Gulfstream G200	Yes	No	GA	2	C	II	1B
85	3/8/2016	GALX - IAI 1126 Galaxy/Gulfstream G200	Yes	No	GA	1	C	II	1B
409	9/13/2016	GALX - IAI 1126	Yes	No	GA	2	C	II	1B
448	10/3/2016	GALX - IAI 1126 Galaxy/Gulfstream G200	Yes	No	GA	2	C	II	1B
511	11/3/2016	GALX - IAI 1126 Galaxy/Gulfstream G200	Yes	No	GA	1	C	II	1B
525	11/9/2016	GALX - IAI 1126 Galaxy/Gulfstream G200	Yes	No	GA	2	C	II	1B
563	11/29/2016	GALX - IAI 1126	Yes	No	GA	1	C	II	1B
586	12/7/2016	GALX - IAI 1126 Galaxy/Gulfstream G200	Yes	No	GA	2	C	II	1B
591	12/8/2016	GALX - IAI 1126 Galaxy/Gulfstream G200	Yes	No	GA	2	C	II	1B
23	1/28/2016	GLF4 - Gulfstream IV/G400	Yes	No	GA	2	C	II	1B
		SUBTOTAL CII				**22**			
114	3/29/2016	GLF5 - Gulfstream V/G500	Yes	No	GA	2	D	III	2
517	11/4/2016	F18 - Boeing FA-18 Hornet	No	No	Military	1		I	
199	5/20/2016	-1 - unknown	No	No	Other	1			
203	5/24/2016	-1 - unknown	No	No	GA	1			
220	6/9/2016	-1 - unknown	No	No	GA	1			
303	7/26/2016	-1 - unknown	No	No	Other	2			
537	11/15/2016	-1 - unknown	No	No	Other	1			
294	7/20/2016	H60 - Sikorsky SH-60	No	No	Military	1			
Total:						**1,035**			

Report created on Thu Jun 8 08:35:00 EDT 2017
Sources: Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM)

Apron Size Calculations for Transient Aircraft

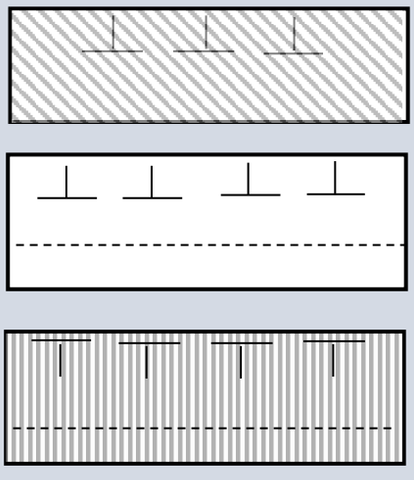
Airport Muscatine Municipal Airport - EXISTING
Location Muscatine, Iowa

Existing Apron
square yards → 13900

Calculations are based upon guidance established within Appendix 5 to AC 150/5300-13. User may calculate size of apron based upon total annual ops or user may develop an estimate of annual operations based upon number of based aircraft.

	Based Aircraft	OR	Total Annual Ops
1. Calculate the total annual operations			
Enter number of based aircraft →	34		
Enter number of operations per aircraft [1] →	350		
Total Annual Operations →	11,900		14,000
2. Busiest Month (% of Annual Ops) [2]			
Enter % of Annual Ops that occur in busiest month →	20		
Busiest Month Operations →	2,380		2,800
3. Busiest Day (10%>Avg Day)			
Enter Busiest Month (e.g. August) →	Jul		
Avg Day Busy Month →	77		90
Busiest Day 10% > avg. day →	84		99
4. # Itinerant Aircraft			
Enter % of Itinerant Operations [3] →	50		
# Itinerant Aircraft operations →	42		50
# Itinerant Aircraft Landing Operations →	21		25
Enter % of Itinerant Operations on ground →	50		
# Itinerant AC on ground (assume 50%) →	11		12
5. Apron area			
# square yards per aircraft [4] →	960		
Apron Area (sq yds) →	10,134		11,923
6. Planned Apron (10%>)			
# square yards →	11,148		13,115

NOTES:
1. Ops/Based Aircraft:
   Small GA-250 Med GA-350 Reliever-450 Busy Reliever-750
2. Amount of activity can be determined from fuel sales or from actual operations counts. For example if month with highest fuel sales accounts for 20% of annual sales, use 20% of annual as busy month. If actual traffic counts available, use those.
3. Assume 50% of operations are itinerant if no records are available.
4. Planning areas shown assume 10' clearance between wingtips. Taxilane @ edge places taxilane on edge of apron.
5. Users requiring assistance or reasonable accommodation may contact the FAA Central Region at 816-329-2600.



Apron Area	w/o Taxilane	w/Taxilane @ edge	w/Taxilane
Group I	360	755	960
Group II	490	1,075	1,385

Apron Size Calculations for Transient Aircraft

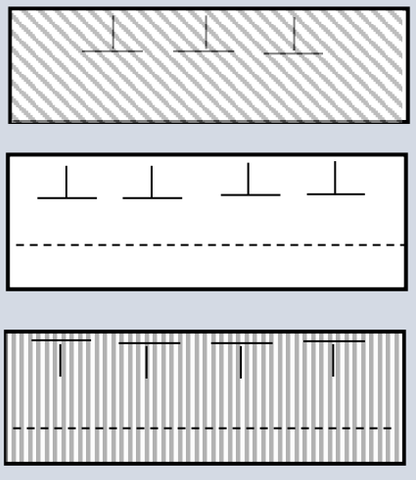
Airport Muscatine Municipal Airport - ULTIMATE
Location Muscatine, Iowa

Existing Apron
square yards → 13900

Calculations are based upon guidance established within Appendix 5 to AC 150/5300-13. User may calculate size of apron based upon total annual ops or user may develop an estimate of annual operations based upon number of based aircraft.

	Based Aircraft	OR	Total Annual Ops
1. Calculate the total annual operations			
Enter number of based aircraft →	46		
Enter number of operations per aircraft [1] →	350		
Total Annual Operations →	**16,100**		**14,000**
2. Busiest Month (% of Annual Ops) [2]			
Enter % of Annual Ops that occur in busiest month →	20		
Busiest Month Operations →	**3,220**		**2,800**
3. Busiest Day (10%>Avg Day)			
Enter Busiest Month (e.g. August) →	Jul		
Avg Day Busy Month →	**104**		**90**
Busiest Day 10% > avg. day →	**114**		**99**
4. # Itinerant Aircraft			
Enter % of Itinerant Operations [3] →	50		
# Itinerant Aircraft operations →	**57**		**50**
# Itinerant Aircraft Landing Operations →	**29**		**25**
Enter % of Itinerant Operations on ground →	50		
# Itinerant AC on ground (assume 50%) →	**14**		**12**
5. Apron area			
# square yards per aircraft [4] →	960		
Apron Area (sq yds) →	**13,711**		**11,923**
6. Planned Apron (10%>)			
# square yards →	**15,082**		**13,115**

NOTES:
1. Ops/Based Aircraft:
   Small GA-250 Med GA-350 Reliever-450 Busy Reliever-750
2. Amount of activity can be determined from fuel sales or from actual operations counts. For example if month with highest fuel sales accounts for 20% of annual sales, use 20% of annual as busy month. If actual traffic counts available, use those.
3. Assume 50% of operations are itinerant if no records are available.
4. Planning areas shown assume 10' clearance between wingtips. Taxilane @ edge places taxilane on edge of apron.
5. Users requiring assistance or reasonable accommodation may contact the FAA Central Region at 816-329-2600.

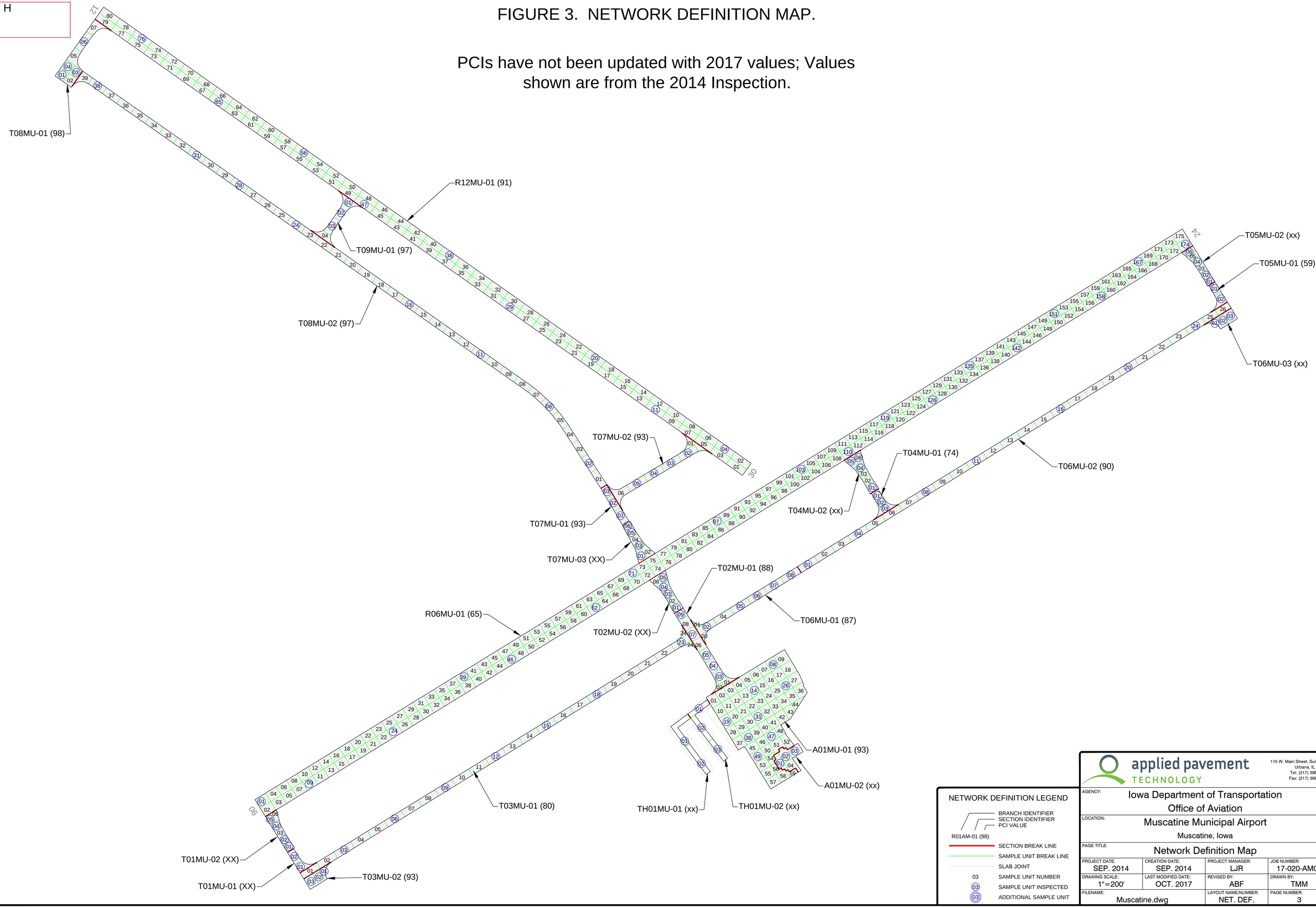


Apron Area	w/o Taxilane	w/Taxilane @ edge	w/Taxilane
Group I	360	755	**960**
Group II	490	1,075	**1,385**

Appendix H

FIGURE 3. NETWORK DEFINITION MAP.

PCIs have not been updated with 2017 values; Values shown are from the 2014 Inspection.



NETWORK DEFINITION LEGEND

R01AM-01 (98) — BRANCH IDENTIFIER, SECTION IDENTIFIER, PCI VALUE

SECTION BREAK LINE

SAMPLE UNIT BREAK LINE

SLAB JOINT

03 — SAMPLE UNIT NUMBER

(03) — SAMPLE UNIT INSPECTED

(03) — ADDITIONAL SAMPLE UNIT

applied pavement TECHNOLOGY

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AGENCY:	Iowa Department of Transportation Office of Aviation
LOCATION:	Muscatine Municipal Airport Muscatine, Iowa
PAGE TITLE:	Network Definition Map

PROJECT DATE:	CREATION DATE:	PROJECT MANAGER:	JOB NUMBER:
SEP. 2014	SEP. 2014	LJR	17-020-AM01
DRAWING SCALE:	LAST MODIFIED DATE:	REVISED BY:	DRAWN BY:
1"=200'	OCT. 2017	ABF	TMM
FILENAME:		LAYOUT NAME/NUMBER:	PAGE NUMBER:
Muscatine.dwg		NET. DEF.	3