

## **INTRODUCTION AND BACKGROUND**

The City of Venice is currently updating its Airport Master Plan. The following discussion paper and 21 exhibits are intended to clarify the safety issues and the Airport Reference Code.

## Discussion Paper

### FAA Guidelines and Standards Applicable to Venice Municipal Airport

#### Introduction

The City of Venice, with the assistance of the MEA Group, Inc., has prepared an Airport Master Plan Update for Venice Municipal Airport (VNC). That study has been substantially completed, and the Venice Municipal Airport Master Plan Final Draft Report has been presented to the Airport Advisory Board and the Venice City Council. Through the public coordination process, airport stakeholders and members of the interested general public have also reviewed the report and provided comments at various meetings.

On June 12, 2007, the plan was presented to the City Council for their consideration. Discussions at the meeting resulted in a request for additional information to be followed by reconsideration of the plan by the Advisory Board and the City Council. The principal areas of concern were the effects of various Federal Aviation Administration (FAA) planning standards, guidelines, and requirements upon the Airport, the Lake Venice Golf Club, and other features on the airport and in the airport vicinity.

This discussion paper and associated drawings provide the additional information requested. The paper includes the following:

- Identification and definition of the FAA guidelines, standards, and requirements that, when applied to VNC, would produce impacts.
- Discussion of these impacts under 2 potential scenarios –
  1. Scenario 1: Strict Adherence to FAA Guidelines, Standards, and Requirements (Strict Adherence). Drawings associated with this scenario identify the areas impacted and illustrate the effects of rigorous application of the guidelines and standards at VNC, should the FAA determine such application is required; and
  2. Scenario 2: What the City Will Request on Behalf of the Community (City's Request). This scenario and associated exhibits reflect the City's desire to moderate the impacts of FAA standards and guidelines insofar as feasible while maintaining safe operating conditions as evidenced by the FAA's approval of Modifications to Standards requested by the City.
- A comparison of Runway 5-23's affected areas based upon both C-II and B-II standards and guidelines.

Subsequent sections of this discussion paper expand upon each of these subjects.

## Definition of FAA Guidelines, Standards, And Requirements

### 1. Standards from Advisory Circular 150/5300-13 Airport Design

The FAA provides guidance for airports and, in some cases, stipulates requirements using a variety of publications and documents. The three most notable for the purposes of this discussion are Federal Aviation Regulations (FARs), FAA orders, and advisory circulars (ACs). FARs are integral to the U.S. Code of Federal Regulations and should be considered at the top of the hierarchy. FAR Part 77 *Objects Affecting Navigable Airspace* is commonly applied in airport master planning. Part 77 defines height standards for areas around airports that are the basis for most height restrictions especially those found in zoning ordinances.

FAA orders are generally considered documents internal to the FAA but are available for use by others. Orders generally apply to specific issues or concern. For example, FAA Order 5300.1F *Modifications to Agency Airport Design, Construction, and Equipment Standards* describes the process for consideration of requests for deviations from FAA standards for a variety of standards such as permitted land uses in Runway Protection Zones (RPZs).

Advisory circulars provide guidelines and standards for application in several aspects of airport planning, design, operations, and many other subjects. The ACs in particular include standards recommended for application in airport master planning.

Implementation of the provisions of FARs, FAA orders, and ACs is frequently accomplished through grant assurances, which airport sponsors must sign when accepting federal grants for airport projects. The FAA's standard grant assurances require sponsors to "...carry out the project in accordance with policies, standards, and specifications approved by the Secretary of the U.S. Department of Transportation...". (Italics added.)

The primary source of guidelines and standards for addressing airfield geometry in master plans for airports such as Venice Municipal is Advisory Circular AC150/5300-13 Airport Design. The Venice Municipal Airport Master Plan Final Draft Report reflects consideration of these guidelines and standards with definition of several notable examples provided below. (Note: All quotes are taken from AC150/5300-13 unless otherwise noted.)

**Runway Safety Area (RSA)** – "A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway."

In simpler terms, this is the area immediately adjacent to the runway along the sides and off the runway ends. It is intended under dry conditions to be able to support an aircraft in emergencies as well as aircraft rescue and firefighting and

snow removal equipment, if applicable. Its size varies depending upon the types of aircraft for which the runway is designed. Key airplane characteristics considered in defining the RSA are approach speed and wingspan, which are used to identify the Airport Reference Code (ARC). In the case of VNC, the ARC for both runways is C-II as established by the previous Airport Master Plan and re-confirmed by the Final Draft Airport Master Plan now under consideration.

The RSA is the most restrictive of the FAA's various areas that are intended to foster runway safety, and, in the language of AC150-5300-13 "RSA standards cannot be modified or waived like other airport design standards." The dimensional standards remain applicable, and substandard RSAs are subject to "continuous evaluation of all practical alternatives" for improving the RSA.

The FAA also uses a type of publication, termed orders, to expand and implement policy related to certain guidelines and requirements. FAA Order 5200.8 Runway Safety Area Program describes the process used to determine compliance with RSA requirements. One possible outcome of the determinations is noted therein as finding that "The existing RSA does not meet current standards, and it is not practicable to improve the RSA."

**Runway Object Free Area (ROFA)** – "An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the (R)OFA for air navigation or aircraft ground maneuvering purposes." <sup>1</sup>

This area is supplemental to the RSA. Conformity to FAA's recommended standards is not as rigorously required and is subject to FAA's approval of requests to modify airport design standards in view of specific local conditions. (See below.)

**Runway Protection Zone (RPZ)** – "An area off the runway end to enhance the protection of people and property on the ground." FAA recommends ownership or jurisdictional control of land within the RPZ to prevent incompatible land uses.

This area is trapezoidal in shape and extends beyond the Runway Safety Area on each runway end. The RPZ's size depends upon the types of aircraft for which the runway is planned/designed as well as the instrument approach capability of the runway end. (Nonprecision approaches are used at many airports. Nonprecision means that the pilot is provided with lateral guidance in executing landings under adverse weather conditions. Precision approaches provide both lateral and vertical guidance and, therefore, permit aircraft operations under lower visibility and ceiling conditions than is permitted under nonprecision approaches.)

In the consultant's experience, standards for RPZs are commonly subject to modification, especially when considering existing runways for which no

expansion is proposed. At VNC the Final Draft Airport Master Plan recommends consideration of a nonprecision instrument approach to Runway 5 that would increase the size of the existing RPZ for that runway; however, the proposed RPZ is consistent with that presented in the previous Airport Master Plan. The current Final Draft Airport Master Plan also recommends a nonprecision approach for Runway 31; the previous Master Plan recommended a precision approach. As a result, the Approach Surface for Runway 31 is smaller under the Final Draft report.

***Modification of Airport Design Standards to Meet Local Conditions*** – “Modification to Standards’ means any change to FAA design standards other than dimensional standards for runway safety areas. Unique local conditions may require modification to airport design standards for a specific airport. A modification to an airport design standard related to new construction, reconstruction, expansion, or upgrade to an airport which received Federal aid requires FAA approval.”

Modifications to Standards are common. The previous Airport Master Plan for VNC, for example, referenced proposed modifications to Runway Object Free Areas (ROFA) and runway-taxiway separations. The process for obtaining approval of modifications to standards is supplemental to the airport master planning process. It requires submission of documentation that specifically identifies the requested modification and provides analysis to show that “... the modification will provide an acceptable level of safety, economy, durability and workmanship.”

## **2. Standards from Federal Aviation Regulations (FAR) Part 77 Objects Affecting Navigable Airspace**

FAR Part 77 establishes and defines three-dimensional geometric surfaces on and around airports that are used in the FAA’s determinations related to obstructions to navigable airspace, which are considered hazards. Three such surfaces are most prominent in the consideration of issues at Venice Municipal Airport. These are as presented in FAR Part 77 and described below.

***Primary Surface*** – “A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway.... The elevation of the primary surface is the same as the elevation of the nearest point on the runway centerline.”

Prior to the implementation of AC150/5300-13, the primary surface was, in the consultant’s experience, more rigorously required. Although still important, the primary surface is now somewhat subordinated to the RSA and to other FAA standards. It still provides definition of areas around a runway that are subject to clearing of trees, manmade objects, etc.

**Approach Surface** – “A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.”

These surfaces are similar in shape to RPZs but slope upward from the ends of the primary surface(s); the RPZ extends outward at runway level. The slope, or angle, of the approach surfaces depends upon the type of runway to which it applies and the type of approach, i.e., visual, nonprecision, precision.

The approach surface is used to identify obstructions that could affect safe operations. Termed “penetrations to the FAR Part 77 surfaces”, these objects, terrain features, trees, and other features may be characterized as hazards to air navigation based upon FAA determinations. Remediation for penetrations/hazards can include removal via grading or trimming as well as marking and lighting for features such as buildings and towers which cannot be removed on a practical basis.

**Transitional Surfaces** – These surfaces are inclined planes that slope upward at a rate of 7:1. They extend upward and outward from the primary and approach surfaces and terminate at the points where they intersect with the horizontal surface (150’ above the airport elevation) or any other surface that imposes more critical restrictions.

The principal effect of the transitional surfaces generally occurs to the sides of the primary surface (and runway) where the transitional surfaces are used to identify the allowable heights of objects, buildings, etc. For example, the requirements of the transitional surface are generally used to define the Building Restriction Line.

## **Effects of Scenarios 1 and 2**

The resolution of nonconformities to FAA standards was examined for two scenarios. Scenario 1: Strict Adherence involves compliance with all FAA standards and assumes no modifications to standards. Under this Scenario, measures that may not be “practicable” are illustrated for baseline purposes.

Scenario 1 could require extensive changes both on and off airport property. These include:

- Relocation or closure of portions of Airport Boulevard and Harbor Drive to meet RSA, ROFA, and RPZ standards and guidelines. This would remove access to areas such as Caspersen Beach unless replaced with new roads that conformed to FAA requirements.
- Extensive modifications to the golf course including removal of the facilities within the RSA, ROFA, RPZ, and Primary Surface. These would include several holes

on the golf course, the driving range, the parking lot and access road, and structures including the clubhouse and maintenance building.

- Loss of access to areas identified for development in the Land Use Consensus Plan and Parcel Development Plan unless access could be achieved outside the RPZ for Runway 23.
- Major shortening of Runway 5-23 on the 23 end to remove roads, streets, and the drawbridge from the RPZ.
- Land acquisition and demolition of residences in Golden Beach within the RPZ for Runway 13.

Sheets 1-5 identify the areas affected by the RSAs, ROFAs, and RPZs under Scenario 1 and indicate some of the impacts outlined above. Sheets 6-10 provide similar information related to FAR Part 77 surfaces under Scenario 1. Simply stated, these severe actions are not practical and in the consultant's view and based upon recent consultation with the FAA would not be required.

Scenario 2 identifies the same areas as affected by FAA standards and guidelines but proposes Modifications to Standards for many of the areas impacted. Sheets 11-15 identify the areas affected by the RSAs, ROFAs, and RPZs under Scenario 2 and indicate some of the impacts outlined above. Sheets 16-20 provide similar information related to FAR Part 77 surfaces under Scenario 2.

The general approach under Scenario 2 is to conform to RSA requirements without imposing significant impacts to community assets such as roads, access to beaches, the public golf course, and others. As noted above, the Runway Safety Area (RSA) is the FAA's most restrictive area defined in the Airport Design advisory circular. RSA standards cannot be modified or waived; however, subject to FAA's determination, nonconformity with standards may occur in situations where resolution is not considered practicable. Small portions of Harbor Drive and its right-of-way are affected by the RSAs for Runway Ends 13 and 5; however, the consultant's experience and consultation with the FAA indicate that relocation of the two small affected portions of that road will not be required. This is reflected in Scenario 2.

The area of the golf course and associated facilities within the RSA for Runway End 5 are another matter. The affected area includes a driving range and a portion of the parking lot for the golf course. These are located on airport land that has been leased to the Venice Golf Association. The consultant's experience and consultation with the FAA indicate that the agency will require correction of these conditions. The correction could be accomplished in several ways. The first is removal of the driving range and the portion of the parking lot that are inside the RSA. This is the recommendation made in the Final Draft of the Airport Master Plan and reflected in the Draft Airport Plans set. Two other options, short of runway closure, are available. The first, suggested during the public meetings, is designation of Runway 5-23 as a B-II runway resulting in a

reduction in RSA dimensional requirements. The second is the use of declared distances to reduce the RSA's effects upon the golf course. Both these options would, in the consultant's view, produce reductions in the utility of Runway 5-23 that would limit or eliminate its use by operators of jet equipment. Under most conditions, this traffic would be shifted to Runway 13-31. This change in runway utilization would increase noise impacts in the Golden Beach and South Venice areas.

As a result, Scenario 2 includes removal of the driving range and portion of the golf course parking lot and access road that are within the RSA. Existing trees, fencing, etc. within the RSAs would also be relocated or removed, as appropriate.

The Runway Object Free Areas (ROFA) for both Runways 13-31 and 5-23 do not fulfill the requirements of the FAA's definition above. The consultant's experience and recent consultations with the FAA suggests, however, that the encroachments depicted in the drawings accompanying this discussion paper are subject to negotiations with the FAA regarding Modifications to Standards. Recent consultation with the FAA suggests that conforming to requirements for the ROFA will not be rigidly stipulated. For example, relocation of buildings such as the Golf Course Pro Shop may not be necessary but areas along and closer to both Runways 13-31 and 5-23 may be subject to tree trimming or removal of other objects. Requests for Modifications to Standards would be made for other areas including the following:

- Part 77 surfaces (Primary, Approach, and Transitional) would be subject to trimming or removal/relocation. The continued presence of fences within the Primary Surface is subject to approval by the FAA.
- Modification to Standards for RPZs and ROFAs to permit their being traversed by existing roads, notably Harbor Drive, and to allow continued use of the golf course holes as presently configured, to the extent feasible.

**It must be emphasized that final approval of these requests rests with the FAA; therefore, stating that requests will be made for Modifications to Standards should not be construed to mean that the statements herein are in any way final. Consultation with the FAA's representatives also suggests that the Modifications to Standards would apply only for the durations of any existing leases of airport property by third parties. Following the lease period and without consideration of extensions of the lease period, upgrading to standards would be required where practicable, notably in the areas of the golf course within the primary surfaces and Runway Object Free Areas.**

The RSAs, OFAs, and RPZs were established by the FAA with the publication in 1989 of AC150/5300-13 Airport Design. The standards established for these areas were retroactively applied to airports such as Venice Municipal. Many of these facilities throughout the nation are recognized by the FAA as not being capable of meeting the most rigorous, or literal, application of the standards.

The approach taken by the FAA, in the consultant's experience, has been one of establishing conformity to the guidelines where "practicable" especially with respect to RPZs. None of the RPZs at Venice Municipal conform to a strict interpretation and application of these guidelines. Scenario 2 incorporates the City's desires with the consultant's experience regarding Modifications to Standards that the FAA will consider. Final acceptance of these modifications remains with the FAA.

### **B-II versus C-II Airport Reference Codes**

The graphics associated with this discussion paper include a side-by-side comparison of the effects of the B-II and C-II Airport Reference Code (ARC). Key airplane characteristics considered in defining certain critical safety areas on airport surfaces (such as the Runway Safety Area (RSA) and others), are approach speed and wingspan. These characteristics are also used to identify the Airport Reference Code (ARC). The ARC is a system of classification employed by the FAA to apply development standards and guidelines.

In the case of Venice Municipal Airport (VNC), the ARC for both runways is C-II. This was established by the previous Airport Master Plan and re-confirmed through analysis outlined in the Final Draft Airport Master Plan. Airport Reference Code (ARC) is applied to each runway and as previously noted, is defined based upon a combination of approach speed and wingspan of the design aircraft for the subject runway. The FAA stipulates that in order to qualify as the design aircraft, an individual airplane type or a combination of types with similar characteristics should perform or be forecast to perform 500 operations annually on the subject runway. (An operation is a take-off or a landing.) The data and analysis included in the Final Draft Airport Master Plan Report show that aircraft in the C-II category meet this stipulation at VNC.

A runway classified as ARC B-II has smaller RPZs, RSAs, and ROFAs, but, in the consultant's view, requesting reclassification of Runway 5-23 as a B-II runway has both positive and negative aspects. These are summarized in Table 1.

**Table 1**  
**B-II Designation for Runway 5-23**

<i>Pros</i>	<i>Cons</i>
1. Reduces sizes of Runway Safety Area and Object Free Area; reduces some impacts on the golf course primarily off the Runway 5 end.	1. Reduces justification for FAA's funding of reconstruction of Runway 5-23 at present length, width, and strength. "B-II" aircraft types typically justify approximately 4,200-foot length (or less) and 75-foot width. Current dimensions are 5,000' x 150'.
2. Facilitates access to east side due to reduced RSA and ROFA for Runway 5 end.	2. Shorter runway length would reduce the effectiveness of the existing voluntary noise abatement procedure and shift more jet operations to Runway 13-31.
3. Reduces other standards for Runway 5-23 including runway centerline to taxiway centerline separations.	3. Shifting of traffic to 13-31 would increase noise impacts on areas to northwest (Golden Beach) and southeast (South Venice). The Golden Beach area is already the most significantly noise impacted area around the airport.
	4. Does not respond to existing and forecast aviation demand, and FAA guidelines for airport planning and would, therefore, reduce project priority for funding.
	5. Reduces utility of Runway 5-23 if an emergency or other condition requires closure of Runway 13-31.
	6. Per recent discussions with FAA representatives an environmental study would be required. Additional analyses would likely also be needed.
	7. Would likely require the City to assume a greater portion of costs such as redesigning the runway to B-II standards.

On balance the consultant's view is that the negative aspects, in particular the potential for shifting jet traffic to Runway 13-31, outweigh the positive considerations. FAA approval is also considered unlikely.

### Land Use Plan

The public design charrette process will refine the community's vision for future uses of the airport.