Federal Aviation Administration
Washington, D.C.

Matter: **IN THE MATTER OF COMPLIANCE WITH FEDERAL OBLIGATIONS BY THE CITY OF SANTA MONICA, CALIFORNIA**

Docket No.: **16-02-08**

Appearances:

For the City of Santa Monica:	Marsha Jones Moutrie, Esq., City Attorney Joseph Lawrence, Esq., Assistant City Attorney Lance S. Gams, Esq., Ivan O. Campbell, Esq., Deputy City Attorneys Thomas R. Devine, Esq. W. Erik Pilsk, Esq. Kaplan Kirsch & Rockwell LLP
For the FAA Office of Airport Safety and Standards:	Elizabeth J. Weir, Esq. Stephen W. Brice, Esq. FAA Office of the Chief Counsel
Other Participants:	Mr. Martin Rubin, Concerned Residents Against Airport Pollution Mr. Rob Kadota, Mar Vista Community Council Ms. Zina Josephs, Friends of Sunset Park

INITIAL DECISION OF THE HEARING OFFICER

I. INTRODUCTION

This Initial Decision arises from a dispute between the Federal Aviation Administration ("FAA") Office of Airport Safety and Standards ("AAS") and the City of Santa Monica, California ("City"), the proprietor of the Santa Monica Municipal Airport (hereinafter "SMO" or "Airport"). More specifically, the dispute involves an ordinance enacted by the City that purports to ban certain categories of aircraft from operating at SMO. *See* Santa Monica Municipal Code §10.04.06.220 ("Ordinance"). Following an investigation and related proceedings conducted pursuant to regulations found at 14 C.F.R., Part 16, entitled "RULES OF PRACTICE FOR FEDERALLY-ASSISTED AIRPORT ENFORCEMENT PROCEEDINGS" ("Part 16") the Acting Director of AAS issued a May 27, 2008 Determination ("Director's Determination") concluding that the Ordinance is inconsistent with: the City's obligations under two assurances contained in grant agreements between the FAA and the City ("Grant Assurances"); provisions of the Surplus Property Act of 1944, 49 U.S.C. §§ 47151-153 ("SPA"); and the terms of a Settlement Agreement entered into between the FAA and the City on January 31, 1984 ("1984 Agreement") between the parties. Director's Determination at 66. Finally the Director's Determination also concludes that the Ordinance "is preempted under Federal Law." *Id.* at 67. [1] This Part 16 proceeding constitutes a case of first impression before the Hearing Officer. The instant action represents the first time the FAA has conducted a formal investigation with regard to a safety-based restriction of access imposed by the City (*i.e.*, the categorical ban on use of the Airport by C and D aircraft). Direct Testimony of David L. Bennett ("Bennett Direct") ¶ 49.[2]

[1] Additionally, the FAA, through the United States Department of Justice, sought and obtained injunctive relief, effectively preventing the City's enforcement of the Ordinance pending the outcome of this Part 16 proceeding. Finding of Fact ("FF") No. 217, *infra*.

[2] In the interest of clarity and ease of reference, Appendix A of this decision contains a table listing the significant short citations and acronyms used in this Decision.

In accordance with the Part 16 provisions at 14 C.F.R. §§ 16.109 and 16.201 *et seq.*, the City timely requested a hearing regarding the Director's Determination and a Hearing Officer was appointed to: conduct proceedings in accordance with Part 16; prepare findings of fact and conclusions of law; and issue this Initial Decision. *See* Hearing Order dated June 23, 2008 ("Hearing Order").[3]

A formal adjudication process was conducted in this dispute in accordance with Subpart F of Part 16. The adjudication process included: a formal discovery process; motions practice, the submission of pre-hearing briefs by the parties; a full evidentiary hearing held at the Long Beach, California Federal Building on March 16 through March 19, 2009 and telephonically on March 26, 2009; post-hearing briefs by the parties filed on April 2, 2009;[4] and reply briefs filed by the parties on April 14 and 15, 2009; whereupon the record closed.

Having reviewed and given due consideration to the record evidence, as well as the arguments of the parties and the other participants, I conclude, based on the findings of fact and the applicable law discussed herein, as follows:

1. The Ordinance unreasonably and unjustly discriminates against classes of aeronautical activities, and, thus, is inconsistent with the City's obligations under Assurance 22 of the Grant Agreements between the FAA and the City;

[3] At the joint request of the parties, the adjudication process herein was suspended and the Initial Decision deadline set forth in the Hearing Order was extended to permit completion of an alternative dispute resolution effort. Pursuant to the Second Revised Procedural Schedule, this Initial Decision is due to be issued by no later than May 14, 2009.

[4] Post-Hearing briefs also were submitted by three community-based organizations ("Other Participants"), in accordance with the Part 16 Rules. *See* Discussion at 66 *infra*.

2. The Ordinance does not grant an "exclusive right" within the meaning of 47 U.S.C.§ 47107(a)(4), and, thus, is not inconsistent with the City's obligations under Assurance 23 of the Grant Agreements between the FAA and the City;

3. The Ordinance unreasonably and unjustly discriminates in the operation of the Airport, and, thus, is inconsistent with the obligations of the City under the Instrument of Transfer of the Airport property completed pursuant to the SPA;

4. The Ordinance unreasonably and unjustly discriminates in a manner inconsistent with the 1984 Agreement that expressly reserved final authority over issues of safety to the FAA; and

5. The concept of preemption provides context to consideration of whether, under the circumstances here, the City acted properly in adopting an ordinance that precludes categories of aircraft from utilizing SMO solely on the grounds of safety. The Preemption Doctrine, however, does not provide an independent basis for FAA administrative action against the City under Part 16 inasmuch as the Doctrine is not one of the enumerated "authorities" that authorize and govern Part 16 proceedings involving Federally-assisted airports. *See* 14 C.F.R. § 1601.

II. FINDINGS OF FACT

A. General Background

1. SMO is a public-use airport owned and operated by the City of Santa Monica, California. Director's Determination Item ("DD Item") 26. The Airport is used by general aviation aircraft and provides access to Santa Monica and other surrounding communities in the Los Angeles metropolitan area. The Airport is the base of operations for over 400 aircraft, and serves as a reliever airport for Los Angeles International Airport ("LAX"). DD Item 40.

2. The primary function of a reliever airport is to ease the air traffic congestion at air carrier airports. Direct Testimony ("Direct") of Bryon Huffman ("Huffman") 34:19-20.

3. Implementation of the Ordinance would result in Category C and D aircraft being redirected to other Los Angeles area airports, which would have an impact on the Region's airspace system. Huffman Direct 23:3-6.

4. SMO is capable of accommodating a wide range of business and personal aircraft, including corporate jets. DD at 2. As such, SMO is able to accommodate over 90 percent of aircraft types in the general aviation fleet, and it is capable of serving the vast majority of general aviation aircraft with a maximum take off weight greater than 12,500 pounds. DD at 2 citing Advisory Circular ("AC") 150/5325-4B, *Runway Length Requirements for Airport Design*, 7/1/2005, Chapter 3. SMO is not an airport regulated by Part 139 of the Federal Aviation Regulations ("FAR"). Revised Direct Testimony ("Rev. Direct") of James E. Hall ("Hall") ¶ 21.

5. The City reported 130,000 annual operations in 2004. DD Item 3 at 8. In 2007, the Airport had 165,130 operations. DD Item 26. Annual jet operations have risen from 1,176 operations in 1983 to 18,000 in 2004. DD Item 31 at 8. There were approximately 9,000 jet operations by Category C and D aircraft at SMO in 2007 and 7,670 in 2008. Robert D. Trimborn ("Trimborn") Direct ¶ 30.

6. Category C and D aircraft operations at SMO increased from approximately 6,700 for the year ending in June, 2000 to about 9,000 annually by 2007. DD Item 4 at 42.

7. The City expects the number of aircraft operations at SMO to increase. Trimborn Hearing Transcript ("Hr. Tr.") 420:14-421:10; Patrick Carey ("Carey") Hr. Tr. 624:6-10.

8. The Airport's runway 03-21 is 4,973 feet long and 150 feet wide. There are parallel taxiways on both sides, each 40 feet wide. The runway-taxiway centerline separation is 240 feet on the northwest side and on most of the southwest side. However, there is a taxiway on the south side, 1,100 feet in length, whose centerline is only 200 feet away from the runway centerline. This precludes operation of certain aircraft based on wingspan considerations. DD Item 2, Trimborn Declaration ¶ 6.

9. The Airport sits on a plateau with significant down slopes of approximately 30 to 60 feet on both the East and West ends of the Airport. Trimborn Direct ¶ 6.

10. A steep downward slope extends from an area just beyond either runway to the Airport property boundary. Trimborn Direct ¶ 6.

11. There are public streets just beyond the down slopes on both the East and West ends of SMO. Trimborn Direct ¶ 6.

12. Just across the streets at both the East and West ends of SMO are densely populated residential neighborhoods. Trimborn Direct ¶ 6.

13. The closest residential buildings to the northeast and southwest of the Airport property are approximately 300 feet from the end of the runway. DD Item 2, Trimborn Declaration ¶ 9.

14. Hundreds of homes are in residential neighborhoods to the East and West of SMO, between 300 feet and 1,000 feet from the ends of the runway. Trimborn Direct ¶ 6; Rebuttal Testimony ("Rebuttal") of Trimborn ¶¶ 3-6.

15. Residential buildings are located across a two-lane road from the Airport's property to the Southwest. DD Item 2, Trimborn Declaration ¶ 9.

16. The proximity of the residential buildings to the runway at the Airport is not unusual in comparison with the situation at a number of other airports. Carey Hr. Tr. 618:2-10; Dennis Pratte II ("Pratte") Hr. Tr. 182:1-14.

B. Airport History

17. The City began operating the Airport in 1926. Trimborn Direct ¶ 8; DD Item 2, Exh. A at 2.

18. In December 1941, the City leased two parcels of Airport property, which it owned in fee simple, to the United States Government ("Government") as part of the World War II defense effort. DD Item 4, Exhs. 25-29.

19. Those parcels included the site of the current runway and additional land. DD Item 4, Exhs. 25-29.

20. The Airport was expanded and used by the Government during World War II to accommodate airplane manufacturing there by the Douglas Aircraft Corporation. DD at 17-18.

21. Between 1941 and 1942, a significant amount of funding by the Civil Aeronautics Administration ("CAA") for national defense was used to improve the Airport to accommodate wartime needs. DD Item 80A/B.

22. On May 7, 1946, the Army granted the City of Santa Monica a revocable Interim Permit for the operation of the Airport, effectively returning some operational control of the Airport back to the City pending the disposition of the property as surplus. DD Items 60 and 80A/B.

23. On July 29, 1946, the War Assets Administration ("WAA") issued Form SPB-5, *Declaration Surplus Real Property,* concerning the Airport property and declaring as surplus all leased land and improvements at the Airport. DD Item 80A/B.

24. The WAA, acting upon the recommendation and approval of the CAA, transferred the Airport land and improvements to the City for use as a public civilian airport. DD at 18; DD Item 80 A/B.

25. The Government conveyed its interests in the Airport property and improvements to the City in accordance with and pursuant to the SPA. DD Items 15-20.

26. In completing this transfer, the Government executed an Instrument of Transfer dated August 10, 1948 ("1948 Instrument of Transfer") through which the Government relinquished to the City several easements, and its leasehold interest in the Airport along with airfield improvements, including the entire landing area and the Airport's concrete 5,000-foot runway and taxiway system. DD Items 15 and 80A/B.

27. The Government condemned a parcel of land near the Airport and conveyed it to the City by Quit Claim Deed in 1949. DD Item 4, Exhs. 26 and 28; DD Item 80A/B, Exh. A.

28. On August 10, 1948, the City confirmed its acceptance of the 1948 Instrument of Transfer, including the restrictions stated above, by passing Resolution No. 183, *Resolution of the City of Santa Monica Accepting An Instrument of Transfer From the United States of America.* DD Item 4, Exh. 31. The 1948 Instrument of Transfer conveyed the Airport pursuant to Surplus Property Administration Regulation 16, November 16, 1945, as amended through April 23, 1946, Part 8316 – Surplus Airport Property ("Regulation 16"), DD Item 16, which included

restrictive covenants, and incorporates a reversion clause at the option of the Government, giving title and right of possession. DD Item 15.

29. Turbojet aircraft have operated at SMO since the 1960s. Trimborn Hr. Tr. 368:21-23.

30. In 1979, the City adopted several ordinances including ones that sought to impose a night curfew, a ban on helicopter flight training, a ban on jet landings, etc, one of which was partially invalidated in subsequent litigation. *Santa Monica Airport Association v. City of Santa Monica*, 481 F.Supp. 927 (C.D. Cal., 1979), *aff'd,* 659 F.2d 100 (9th Cir. 1981).

31. In *Santa Monica Airport Association v. City of Santa Monica*, 481 F. Supp. 927 (C.D. Cal, 1979), *aff' d* 659 F.2d 100 (9th Cir. 1981), the United States Court of Appeals for the Ninth Circuit upheld the City's aircraft-noise abatement ordinance and a night curfew on takeoffs and landings imposed by the City, but struck down the ban on jet aircraft as violating the Commerce and Equal Protection Clauses of the Constitution.

32. In June of 1981, the Santa Monica City Council enacted Resolution No. 6296, which would have closed SMO. That action resulted in further litigation involving the City, airport associations, and the FAA. DD at 3-4.

33. As a result of the litigation described above, the parties entered into the 1984 Agreement. DD Item 4, Exh. 3. The 1984 Agreement primarily is focused on noise abatement. It confirms the terms and conditions under which the City would continue to operate and maintain the Airport as a viable functioning facility without derogation of its role as a general aviation reliever airport until at least July 1, 2015. DD Item 4, Exhibit 3. The 1984 Agreement specifically provides: "The Airport is to be open and available to and for public use as an airport on fair and reasonable terms, without unjust discrimination, and without

granting any exclusive rights prohibited by law." DD Item 4, Exh. 3 at 2-3. The 1984 Agreement was incorporated into Grant Agreements entered into by the City and the FAA on September 19 and 25, 1985. Grant Agreements for Project No. AIP-3-06-0239-02 at 3, Condition 12; and for Project No. AIP-3-06-0239-03 at 3, Condition 12; DD Item 6.

34. The 1984 Agreement further provides that "pursuant to the Federal Aviation Act of 1958, as amended, exclusive authority is vested in the FAA for the regulation of all aspects of air safety, the management and control of the safe and efficient use of the navigable airspace, and movement of aircraft through that airspace." DD Item 4, Exh. 3 at 3.

35. The 1984 Agreement also states that the "Airport will be capable of accommodating most kinds of general aviation aircraft, generally consistent with Group II Design Standards." DD Item 4, Exh. 3 at 9.

36. Section 9 of the 1984 Agreement requires the City to maintain "continuously" one designated runway (3/21) "which is 5,000 feet long and 150 feet wide." DD Item 4, Exh. 3 at 9. The Airport Layout Plan depicting the Airport's existing runway and taxiway configuration was incorporated by reference into the 1984 Agreement for the purpose of guiding "the development of the Airport for the duration of this Agreement." DD Item 4, Exh. 3 at 6.

37. The 1984 Agreement highlights SMO's role in the regional and national system of air transportation and air commerce. SMO serves a "vital and critical role in its functions as a general aviation reliever for the primary airports in the area . . . by diverting aircraft away from the air carrier airports and other heavily used airports located in the Greater Los Angeles Area." DD Item 4, Exh. 3 at 3-4.

38. The 1984 Agreement confirms the Airport Reference Code ("ARC") designation of SMO as a Group B-II airport, and incorporates FAA AC 150/5300.4B, dated February 24, 1983. Trimborn Direct ¶ 10; DD Item 4, Exh. 3.

39. The 1984 Agreement provides that SMO could "be redesigned so as to maintain the current level, quantity, and type of services provided by the Airport. . . ." DD Item 4, Exh. 3 at 5.

40. In the 1984 Agreement, the City committed to "operate and maintain the airport as a viable facility without derogation of its role as a general reliever airport . . . ." DD Item 4, Exh. 3 at 9.

41. Section 8 of the 1984 Agreement also provides that SMO "be capable of accommodating most kinds of general aviation aircraft, generally consistent with Group II Design Standards." DD Item 4, Exh. 3 at 9.

42. The parties also expressed a concern in section 12 of the 1984 Agreement about the effect that displacing the threshold by 500 feet would have on "air safety and the ability of the Airport to provide the level and type of service described in Sections 2(b)(i) and 8." DD Item 4, Exh. 3 at 11.

43. Section 13 of the 1984 Agreement provides: "The mix of aircraft to be accommodated at the Airport shall be consistent with the present mix of aircraft now based at the Airport and the mix forecast for the future as shown in Chapter III of the Airport Master Plan Study dated October 1983." DD Item 4, Exh. 3 at 13.

44. Sections 17 and 18 of the 1984 Agreement refer to "tiered noise levels for different types or kinds of aircraft." DD Item 4, Exh. 3 at 16-17.

C. Categories of Aircraft and Accident Potential

45. Aircraft operations at SMO are in compliance with all FAA safety regulations and requirements. DD at 4. SMO has operated and continues to operate safely. Rick Marinelli ("Marinelli") Direct ¶ 48.

46. The Airport Reference Code ("ARC") is an FAA coding system used to relate airport design criteria to the operational and physical characteristics of the aircraft types for which the airport was designed. AC 150/5300-13, chapter 1 at 19. The ARC code has two components, both relating to the "critical design aircraft" for the airport. AC 150/5300-13, chapter 1 at 19. The first component delineated by letter is the aircraft approach category (operational characteristics). AC 150/5300-13, chapter 1 at 19. The FAA defines critical design aircraft in the National Plan of Integrated Airport Systems ("NPIAS") as the category of aircraft, which conduct 500 itinerant or more operations per year at the airport (the FAA usually requires 500 itinerant operations in order to be included in the NPIAS). DD Item 40 at 38. The second component, depicted by Roman numerals I-VI, is the airplane design group and relates to airplane wingspan. AC 150/5300-13, chapter 1 at 19.

47. The ARC designation for the Airport is B-II, with "B" standing for the airport approach speed category and "II' standing for the design group terms of wingspan and tail height. Marinelli Direct 265:11-21.

48. The ARC is not intended to be used as a basis for determining which airplanes may operate safely at an airport. Marinelli Hr. Tr. 261:12-262:23 and 266:22-267:5.

49. Aircraft are excluded from operating at an airport based on the wingspan if the aircraft cannot operate on a taxiway and maintain the proper clearances between the taxiway and the runway for takeoff and landing. Huffman Direct 37: 10-14.

50. Category A aircraft, as used in AC 150/5300-4B and AC 150/5300-13, are aircraft that have approach speeds less than 91 knots at their maximum certificated landing weight. AAS Exhibit ("AAS Exh.") 3; AC 150/5300-13, chapter 1 at 1; 14 CFR § 97.3.

51. Category B aircraft are aircraft that have approach speeds of 91 knots or above but less than 121 knots at their maximum certificated landing weight. AAS Exh. 3; AC 150/5300-13, chapter 1 at 1; 14 CFR § 97.3.

52. Category C aircraft are aircraft that have approach speeds of 121 knots or above but less than 141 knots at their maximum certificated landing weight. AAS Exh. 3; AC 150/5300-13, chapter 1 at 1; 14 CFR § 97.3.

53. Category D aircraft are aircraft that have approach speeds of 141 knots or above but less than 166 knots at their maximum certificated landing weight. AAS Exh. 3; AC 150/5300-13, chapter 1 at 1; 14 CFR § 97.3.

54. Category C and D aircraft have been operating at SMO since the 1980s. Trimborn Hr. Tr. 368:13-20.

55. The City commenced a study in 2001 to evaluate safety measures to address potential overrun accidents at SMO. DD Item 2, Exh. A.

56. Twenty-three accidents have occurred at SMO in the past 21 years, each of which involved an A or B category aircraft, including one experimental aircraft. Pratte Direct ¶ 28. In its briefs on this issue, the City did not indentify an accident involving a Category C or D aircraft.

57. According to National Transportation Safety Board ("NTSB") data, from 1981 to 2008, eight accidents occurred at the Airport, two involving fatalities, and were

comprised of seven overruns and one undershoot. DD at 8-9; DD Item 82. Seven of these accidents involved single-engine aircraft with 1 involving a multi-engine aircraft, all of which were small piston propeller driven A-1 or B-1 aircraft. DD at 8-9; DD Item 82. Specifically, Piper PA-28s single-engine piston aircraft had accidents in May 1981 and December 2004, a Mooney M-20 had an accident in July 1995, a Cessna 177RG in December 1993, two Cessna 182s in January 1982 and September 1992, and a twin-engine Cessna 340A in November 2001 (2 fatalities). DD at 11; Trimborn Direct ¶ 32. There was also an overrun in 2008 by an experimental Jabiru J400 single-engine aircraft. Trimborn Direct ¶ 33; DD Items 18 and 82.

58. The Aviation Safety Reporting System ("ASRS") data base shows that from 1988 to 2006, there were between 156 and 223 reports with regard to the Airport, none of which identified the runway length or runway safety areas at SMO as an issue. *Compare* DD at 9 *with* DD Item 17. The incidents all involved small (6,000 lb. and under) propeller driven aircraft, *i.e.*, not Category C and D aircraft. DD at 9. The ASRS is an FAA and National Aeronautics and Space Administration ("NASA") effort to collect incident reports related to aviation safety from pilots, controllers, and others in order to identify deficiencies and discrepancies in the National Aerospace System (NAS). DD at 9, fn. 17. The City has not presented evidence that aggregated incidents or accidents at the Airport.

59. NTSB data shows that jet aircraft (Category C and D) possess a better safety record than propeller driven aircraft (Category A and B). DD at 11. The data shows that jets as a class of aircraft have an accident rate 8 times lower than single-engine propeller aircraft, 5.75 times lower than twin-engine piston, and 4.6 times lower than twin-engine turboprops. DD at 11.

60. An overrun is an accident during the takeoff or landing phase of an aircraft operation in which the aircraft, while in contact with the surface, rolls beyond the end of the pavement designated for the runway. AAS Exh. 1, Appendix 1 at

4(m); AC 91-79; AAS Exh. 2 at 1; AC 150/5220-22A. Hall noted that FAA Advisory Circular 91-79 states that runway overruns during the landing phase are estimated at 10 incidents or accidents annually. Hall Rev. Direct ¶¶ 17; AC 91-79; City Exh. 23 at 2-3. Ninety percent of overruns are by aircraft traveling at a speed of 70 knots or lower. Marinelli Direct ¶ 51.

61. Two overrun accidents at SMO reached the Airport perimeter service road. Trimborn Hr. Tr. 383: 2-3.

62. No overrun accidents have occurred at SMO involving C or D category aircraft. Pratte Direct ¶ 28.

63. No safety reports provided to NASA pursuant to the Aviation Safety Reporting Program have indicated a potential hazard concerning the runway length or lack of runway safety areas at SMO. DD at 9.

64. Overruns have occurred at airports in the United States in the past ten years involving Category C or D aircraft, including but not limited to Little Rock, AK (1999), Burbank, CA (2000), Teterboro, NJ (2005), Midway Airport/Chicago, IL (2005), and Columbia Metropolitan Airport, Columbia, SC (2008). Trimborn Direct ¶34; City Exhs. 4-9; Hall Rev. Direct ¶¶ 19 and 33

65. The actual Challenger CL-600 that was involved in the Teterboro accident had flown into and out of SMO on June 23, 2004, and that aircraft make/model routinely operates into and out of SMO. Trimborn Direct ¶ 35.

66. The Learjet 60, the make/model that was involved in the Columbia, SC accident, is a make/model of aircraft that routinely operates into and out of SMO. Trimborn Direct ¶ 34.

67. Overruns involving Category C and D aircraft that exited the airport have occurred at airports where there had been no previous overruns by such aircraft. Hall Rev. Direct ¶ 53.

68. Historical data shows that Category C and D aircraft are involved in fewer overruns than Category A and B aircraft. Marinelli Direct ¶ 40.

69. Because the stopping performance of a given Category C or D aircraft may be better than that of a given Category B aircraft, the Category C or D aircraft may be able to land in a shorter distance than the Category B aircraft even if the landing approach speed is higher. Donald K. Stimson ("Stimson") Direct ¶ 24.

70. Undershoots and overruns are related to the operational characteristics of the aircraft rather than to the airport runway. For example, if an aircraft lands too fast or too far down a runway, or for a host of operational reasons, an excursion could occur. The fact that a runway is brand new or 50 years old does not impact the aircraft's operation. Huffman Direct 97: 12-17.

71. Based on a simple ballistic arc that would be followed by any falling object with an assumed initial velocity, aircraft exiting the end of the runway at SMO at 70 knots would not reach the residential area at the west end of the runway. Marinelli Direct ¶ 60. To reach the neighborhood area, an aircraft would have to be flying, or at least have lift on the wings. Marinelli Direct ¶ 61.

72. There is no guarantee that an overrun or undershoot of a runway by an aircraft will not occur at any given airport, including at SMO. Hall Rev. Direct ¶¶ 17 and 56.

73. Pilot error is the leading cause of aircraft overruns. City Exh. 24 at 16 (AAS Interrogatory Responses); Trimborn Direct ¶ 31; Hall Rev. Direct ¶ 17; Miguel Vasconcelos ("Vasconcelos") Direct 121: 9-19; Hall Hr. Tr. 160: 9-17.

74. Historical data shows that Category C and D aircraft are involved in fewer overruns than Category A and B aircraft. Marinelli Direct ¶ 40. There are also more operations of Category A and B aircraft as compared with Category C and D aircraft. Benjamin Harris ("Harris") Hr. Tr. 655:13—656:7. Even allowing for the greater number of operations of Category A and B aircraft as compared with Category C and D aircraft, there is a higher accident rate for Category A and B aircraft. Harris Hr. Tr. 654:19-65.

D. Pilot Certification

75. FAA aircraft certification standards apply to aircraft that operate at airports throughout the United States, including SMO. Troy Zwicke ("Zwicke") Direct 146:6-147:16.

76. FAA-approved flight manuals govern the operation of aircraft at airports throughout the United States, including SMO. Zwicke Direct 146:6—147:16.

77. Pilot training addresses the risk of undershoots and overruns because the pilot has to demonstrate his or her ability to fly the aircraft within its limitations. Stephen Ford ("Ford") Direct 98:1-4.

78. Some of the training also deals with emergencies and abnormal, system-related issues that could occur, so the pilot knows how to deal with those situations should they arise while the pilot is operating the aircraft. Ford Direct 98:8-15.

79. The 60 Percent Rule is a calculation of the shortest runway length that a pilot can use in landing the aircraft and comply with FAR 135. Ford Direct 100:1-4. It is calculated by taking the actual landing distance and dividing it by 60 to determine the maximum legal landing distance for a runway. Ford Direct

100:15-18. The resulting number has to be less than the actual length of the runway. Ford Direct 100: 15-18.

80. Pilots operating Category C and D aircraft possess commercial or airline transport pilot certificates with an instrument rating, as well as an aircraft-specific type rating. Pratte Direct ¶ 12.

81. Category A or B aircraft can be flown by a private pilot with as little as 35 total flight hours of experience. Ford Direct 100:15-18; Pratte Direct ¶¶ 11-12.

82. C and D category pilots have more experience, more training, and meet the highest safety standards. Pratte Direct ¶ 12.

E. Aircraft Certification

83. The probability of a defect leading to a runway excursion or overrun is much higher in a Category A or B aircraft when compared with a Category C or D aircraft. Pratte Direct ¶ 28.

84. With respect to takeoff performance, data shows that Category C and D aircraft have fewer engine failures than Category A and B aircraft. Pratte Direct ¶ 28.

85. Category C and D aircraft are predominantly certificated under Part 25 of the FAR as Transport Category Airplanes ("TCA"). Stimson Direct ¶ 7; Pratte Direct ¶ 8.

86. The Category A and B aircraft operating out of the Airport are predominantly certificated under Part 23 of the FAR. Stimson Direct ¶ 7; Pratte Direct ¶ 7.

87. Certification requirements under the Part 25 regulations are more stringent and set at a higher standard of safety than those under Part 23. Pratte Direct ¶ 12.

88. Pilots acting as pilots in command ("PIC") of a TCA certificated under Part 25 are required to hold type ratings and meet the highest safety standards for the TCA pilot certificate. Pratte Direct ¶ 12.

89. Pilots of aircraft certificated under Part 25 receive greater training and proficiency reviews as opposed to those who do not hold ATP certificates and do not operate Part 25 aircraft. Pratte Direct ¶ 12.

90. Many of the Category C and D aircraft operating at the Airport are certificated under Part 135 of the FAR. Trimborn Hr. Tr. 371:6-8; Trimborn Direct ¶ 39.

91. Operators of aircraft certificated under Part 135 are held to higher level of safety. Pratte Direct ¶ 13.

92. Operators of aircraft certificated under Part 135, Part 121, or Part 91, Subpart K for fractional ownership programs, are required to insure that the aircraft they operate can land, as per the Airplane Flight Manual limitations, within 60 percent of the usable runway (the "60 Percent Rule"), or within 80 percent for eligible on-demand operations that meet certain standards. Pratte Direct ¶ 15; 14 CFR § 135.385(b), (f); 14 CFR § 91.1037(b), (c). *Large aircraft* is defined as an aircraft of more than 12,500 pounds, maximum certificated takeoff weight. 14 CFR § 1.1. The aircraft identified in AAS Exhs. 31-52, which are representative of those operating at SMO, are large transport category aircraft.

93. 47.3 percent of all Category C and D aircraft operations at the Airport are operated pursuant to fractional ownership programs. Trimborn Hr. Tr. 371:1-5; Trimborn Direct ¶ 39.

94. Many corporate jets are Category C and D aircraft certificated under Part 25. Pratte Direct ¶ 8.

95. Corporate jet operations statistically have a good safety record. Hall Hr. Tr. 156:20-24. Incidents involving Category C and D aircraft are rare. Harris Hr. Tr. 655:8-12.

96. Part 23 aircraft are typically used in general aviation, crop dusting, banner towing, aerial surveying, and aerobatics, though they are also used in corporate, air taxi, on demand, and fractional ownership operations. Stimson Direct ¶ 10. Part 23 aircraft generally fall within Categories A or B. *Id.*

97. Part 25 aircraft are typically used in air carrier, corporate, air taxi, on demand, and fractional ownership operations, and generally fall within Categories C or D. Stimson Direct ¶ 11.

98. Part 25 aircraft are required to meet more stringent certification requirements than Part 23 aircraft, including more stringent requirements addressing takeoff and landing performance. Stimson Direct ¶ 12.

99. Part 25 aircraft typically have certain design features that provide added safety benefits compared with Part 23 aircraft, such as enhanced takeoff and/or landing safety devices such as auothrottles, anti-skid and autobrake systems, automatic spoiler deployment, enhanced flight deck displays, and thrust reversers. Stimson Direct ¶ 20.

100. The regulations under which pilots operate aircraft under Part 135 require a higher level of safety than operations under Part 91 because they offer a service to the public. The pilots have to obtain a type rating for a particular aircraft because the aircraft weighs over 12,500 pounds, so the training is specific to that make and model aircraft. The pilot certification requirements to fly such aircraft require a minimum 1,500 hours for PIC. Ford Direct 97:2-22.

101.Part 135 has a requirement that a PIC is reviewed every six months to demonstrate that the PIC can operate the aircraft under instrument conditions. Ford Direct 97:2-22.

F. Advisory Circulars and FAA Orders

102. AC 150/5300-4B, *Utility Airports Air Access to National Transportation Purpose*, dated June 24, 1975, establishes design, operation, and maintenance standards for utility airports. DD Item 24.

103.AC 150/5300-13, *Airport Design*, October 1, 2002; AAS Exh. 3 includes, among other things, the following provisions:

> **2. DEFINITIONS**. As used in this publication, the following terms mean:
>
> *Aircraft Approach Category*. A grouping of aircraft based on 1.3 times their stall speed in the landing configuration at the certificated maximum flap setting and maximum landing weight at standard atmospheric conditions. The categories are as follows:
> Category A: Speed less than 91 knots.
> Category B: Speed 91 knots or more but
> less than 121 knots.
> Category C: Speed 121 knots or more but
> less than 141 knots.
> Category D: Speed 141 knots or more but
> less than 166 knots. . . .
>
> ****
>
> *Runway Protection Zone (RPZ)*. An area off the runway end to enhance the protection of people and property on the ground.
>
> **6. 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 on an airport which received Federal aid requires FAA approval. . . .

300. INTRODUCTION. This chapter presents standards for runways and runway associated elements such as shoulders, blast pads, runway safety areas, obstacle free zones (OFZ), object free areas (OFA), clearways, and stopways. . . . At new airports, the RSA and ROFA lengths and the RPZ location standards are tied to runway ends. At existing constrained airports, these criteria may, on a case-by-case basis, be applied with respect to declared distances ends. . . .

305. RUNWAY SAFETY AREA (RSA). The runway safety area is centered on the runway centerline. . . .
****

a. **Design Standards**. The runway safety area shall be:
(1) cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;
(2) drained by grading or storm sewers to prevent water accumulation;
(3) capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft;
and
(4) free of objects, except for objects that need to be located in the runway safety area because of their function. Objects higher than 3 inches (7.6 cm) above grade should be constructed, to the extent practicable, on low impact resistant supports (frangible mounted structures) of the lowest practical height with the frangible point no higher than 3 inches (7.6 cm) above grade. Other objects, such as manholes, should be constructed at grade. In no case should their height exceed 3 inches (7.6 cm) above grade.
b. **Construction Standards**. Compaction of runway safety areas shall be to FAA specification P-152 found in AC 150/5370-10.
c. **Sub-standard RSAs**. RSA standards cannot be modified or waived like other airport design standards. The dimensional standards remain in effect regardless of the presence of natural or man-made objects or surface conditions that might create a hazard to aircraft that leave the runway surface. Facilities, including NAVAIDs,that would not normally be permitted in an RSA should not be installed inside the standard RSA dimensions even when the RSA does not meet standards in other respects. A continuous evaluation of all practicable alternatives for improving each sub-standard RSA is required until it meets all standards for grade, compaction, and object frangibility. FAA Order 5200.8, Runway

Safety Area Program, explains the process for conducting this evaluation. Each FAA regional Airports division manager has a written determination of the best practicable alternative(s) for improving each RSA. Therefore, runway and RSA improvement projects must comply with the determination of the FAA regional Airports division manager.

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8. RUNWAY PROTECTION ZONE (RPZ).
Approach protection zones were originally established to define land areas underneath aircraft approach paths in which control by the airport operator was highly desirable to prevent the creation of airport hazards. Subsequently, a 1952 report by the President's Airport Commission (chaired by James Doolittle), entitled "The Airport and Its Neighbors," recommended the establishment of clear areas beyond runway ends. Provision of these clear areas was not only to preclude obstructions potentially hazardous to aircraft, but also to control building construction as a protection from nuisance and hazard to people on the ground. The Department of Commerce concurred with the recommendation on the basis that this area was "primarily for the purpose of safety and convenience to people on the ground." The FAA adopted "Clear Zones" with dimensional standards to implement the Doolittle Commission's recommendation. Guidelines were developed recommending that clear zones be kept free of structures and any development which would create a place of public assembly. In conjunction with the introduction of the RPZ as a replacement term for clear zone, the RPZ was divided into "object free" and "controlled activity" areas. The RPZ function is to enhance the protection of people and property on the ground. Where practical, airport owners should own the property under the runway approach and departure areas to at least the limits of the RPZ. It is desirable to clear the entire RPZ of all aboveground objects. Where this is impractical, airport owners, as a minimum, shall maintain the RPZ clear of all facilities supporting incompatible activities. Incompatible activities include, but are not limited to, those which lead to an assembly of people.

104.AC 91-79, *Runway Overrun Prevention*, dated November 6, 2007; AAS Exh. 1; provides as follows:

1. PURPOSE. This advisory circular (AC) provides ways for pilots and operators of turbine-powered airplanes to identify, understand, and mitigate risks associated with runway overruns during the landing phase of flight. It also provides

operators with detailed information that may be used to develop company standard operating procedures (SOP) to mitigate those risks.

2. BACKGROUND. According to Federal Aviation Administration (FAA) and National Transportation Safety Board (NTSB) information, runway overruns during the landing phase of flight account for approximately 10 incidents or accidents every year with varying degrees of severity, with many accidents resulting in fatalities. The FAA is working in partnership with industry to develop strategies to reduce the number of landing overrun incidents/accidents. A review of runway overrun events indicates that most occur due to either a lack of or nonadherence to SOP. These events continue to occur despite efforts by the FAA and industry to ensure that operators develop SOPs and that flight crewmembers are properly trained and operate in accordance with the SOPs. Therefore, an emphasis on SOP development and a risk mitigation approach is employed in this AC.

a. Focused training and testing of crewmembers along with practical planning tools are the keys to avoiding runway overrun events. This emphasis on training and checking should be targeted at initial pilot certification as well as recurrent training and checking events. The training and checking should not be merely academic in nature. These events should emphasize real world aeronautical decision making and use scenario based presentations in order to increase pilot recognition of high risk landing operations.

b. Proper identification of the risks will help pilots employ mitigation strategies or eliminate certain risks prior to the landing event.

c. Operators are responsible for developing SOPs, and all pilots are responsible for ensuring that they are well-trained, qualified for the intended flight, and meet all of the regulatory requirements for the flight. This responsibility includes the self-discipline to follow company SOPs and/or industry best practices and safety procedures that can prevent runway overrun incidents/accidents regardless of the level of managerial or government oversight. Even the best procedures are ineffective if they are not followed.

6. HAZARDS ASSOCIATED WITH RUNWAY OVERRUNS. In order to develop risk mitigation strategies and tools, hazards associated with runway overruns must be identified. A study of

FAA and NTSB data indicates that the following hazards increase the risk of a runway overrun:

• A nonstabilized approach,

• Excess airspeed,

• Landing beyond the intended touchdown point, and

Failure to assess required landing distance to account for slippery or contaminated runway conditions or any other changed conditions existing at the time of landing.

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7. RISK MITIGATION.

a. SOPs. Well-developed SOPs are the primary risk mitigation tools used to prevent runway overruns. These procedures must be relevant and focused on the end user—the flight crew. Once SOPs are developed, it is imperative that the flight crew execute them faithfully to help prevent runway overruns. As a minimum, the SOPs should contain the following procedures directly related to runway-overrun prevention:

- Stabilized approaches, including procedures for executing a go-around if the approach parameters are outside of the stabilized approach criteria,

- Landing distance reassessment at the time of arrival, and

- Use of brakes and other deceleration devices.

b. Training. An effective training program is a secondary tool that provides academic knowledge about the subjects related to landing performance. Effective training also reinforces the practical application of the knowledge and the associated SOPs in the cockpit. At a minimum, the operator's training program should contain the following elements directly related to runway-overrun prevention:

- SOPs-operator specific;

- Stabilized approaches;

• Source and conditions of landing distance data contained in aircraft flight manuals or FAA approved destination airport analysis (airplane type specific);

• Landing distance calculation—preflight;

• Landing distance calculation—reassessment at time of arrival;

• Consequences of excess airspeed;

• Consequences of landing beyond the intended touchdown point;

• Use of brakes to include autobrakes, if installed, and deceleration devices (airplane type specific);

• Landing distance rules of thumb; and

• Reasons to initiate a go-around and execution of the go-around maneuver.

105. AC 150/5220-22A, *Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns*, September 30, 2005, (9/30/2005); AAS Exh. 2, provides as follows:

> **1. PURPOSE**. This advisory circular (AC) contains standards for the planning, design, installation, and maintenance of Engineered Materials Arresting Systems (EMAS) in runway safety areas (RSA). Engineered Materials means high energy absorbing materials of selected strength, which will reliably and predictably crush under the weight of an aircraft.
>
> **3. BACKGROUND**. Aircraft can and do overrun the ends of runways, sometimes with devastating results. An overrun occurs when an aircraft passes beyond the end of a runway during an aborted takeoff or while landing. Data on aircraft overruns over a 12-year period (1975 to 1987) indicate that approximately 90% of all overruns occur at exit speeds of 70 knots or less (Reference 7, Appendix 4) and most come to rest between the extended runway edges within 1000 feet of the runway end (Reference 6, Appendix 4).
>
> To minimize the hazards of overruns, the Federal Aviation Administration (FAA) incorporated the concept of a safety area

beyond the runway end into airport design standards. To meet the standards, the safety area must be capable, under normal (dry) conditions, of supporting the occasional passage of aircraft that overrun the runway without causing structural damage to the aircraft or injury to its occupants. The safety area also provides greater accessibility for emergency equipment after an overrun incident. There are many runways, particularly those constructed prior to the adoption of the safety area standards, where natural obstacles, local development, and/or environmental constraints, make the construction of a standard safety area impracticable. There have been accidents at some of these airports where the ability to stop an overrunning aircraft within the runway safety area would have prevented major damage to aircraft and/or injuries to passengers.

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4. APPLICATION. Runway safety area standards cannot be modified or waived. The standards remain in effect regardless of the presence of natural or man-made objects or surface conditions that might create a hazard to aircraft that overrun the end of a runway. A continuous evaluation of all practicable alternatives for improving each sub-standard RSA is required. FAA Order 5200.8, *Runway Safety Area Program*, explains the evaluation process. FAA Order 5200.9, *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems*, is used in connection with FAA Order 5200.8 to determine the best practicable and financially feasible alternative for an RSA improvement. The FAA does not require an airport sponsor to reduce the length of a runway or declare its length to be less than the actual pavement length to meet runway safety area standards if there is an operational impact to the airport. An example of an operational impact would be an airport's inability to accommodate its current or planned aircraft fleet. Under these circumstances, installing an EMAS is another way of enhancing safety. A standard EMAS provides a level of safety that is generally equivalent to a full RSA built to the dimensional standards in AC 150/5300-13, *Airport Design*. It also provides an acceptable level of safety for undershoots.

The FAA recommends the guidelines and standards in this AC for the design of EMAS. In general, this AC is not mandatory and does not constitute a regulation. It is issued for guidance purposes and to outline a method of compliance. However, use of these guidelines is mandatory for an airport sponsor installing an EMAS funded under Federal grant assistance programs or on an airport certificated under Title 14 Code of Federal Regulations (CFR) Part 139, *Certification of Airports*. . . . If an airport sponsor elects to follow an alternate method, the alternate method must have been determined by the FAA to be an acceptable means of complying with this AC, the runway safety area standards in AC 150/5300-13, and 14 CFR Part 139.

8. SYSTEM DESIGN REQUIREMENTS. For purposes of design, the EMAS can be considered fixed by its function and frangible since it is designed to fail at a specified impact load. An aircraft arresting system such as EMAS is exempt from the requirements of 14 CFR Part 77, *Objects Affecting Navigable Airspace*. When EMAS is the selected option to upgrade a runway safety area, it is considered to meet the safety area requirements of 14 CFR Part 139. The following system design requirements must prevail for all EMAS installations:

a. Concept. An EMAS is designed to stop an overrunning aircraft by exerting predictable deceleration forces on its landing gear as the EMAS material crushes. It must be designed to minimize the potential for structural damage to aircraft, since such damage could result in injuries to passengers and/or affect the predictability of deceleration forces. An EMAS should be design for a 20-year service life.

b. Location. An EMAS is located beyond the end of the runway and centered on the extended runway centerline. It will usually begin at some setback distance from the end of the runway to avoid damage due to jet blast and undershoots (Figure A1-2, Appendix 1). This distance will vary depending on the available area and the EMAS materials. Where the area available is longer than required for installation of a standard EMAS designed to stop the design aircraft at an exit speed of 70 knots, the EMAS should be placed as far from the runway end as practicable. Such placement decreases the possibility of damage to the system from short overruns or undershoots and results in a more economical system by considering the deceleration capabilities of the existing runway safety area.

The resulting runway safety area must provide adequate protection for aircraft that touch down prior to the runway threshold (undershoot). Adequate protection is provided by either: (1) providing at least 600 feet (or the length of the standard runway safety area, whichever is less) between the runway threshold and the far end of the EMAS bed if the approach end of the runway has vertical guidance or (2) providing the full length standard runway safety area when no vertical guidance is provided.

An EMAS is not intended to meet the definition of a stopway as provided in AC 150/5300-13. The runway safety area and runway object free area lengths begin at a runway end when a stopway is not provided. When a stopway is provided, these lengths begin at the stopway end (AC 150/5300-13).

The airport sponsor, EMAS manufacturer, and the appropriate FAA Regional Airports Division/Airport District Office (ADO) should consult regarding the EMAS location to determine the appropriate location beyond the end of the runway for the EMAS installation for a specific runway.

c. Design Method. An EMAS design must be supported by a validated design method that can predict the performance of the system. The design (or critical) aircraft is defined as that aircraft using the associated runway that imposes the greatest demand upon the EMAS. This is usually, but not always, the heaviest/largest aircraft that regularly uses the runway. EMAS performance is dependent not only on aircraft weight, but landing gear configuration and tire pressure. In general, use the maximum take-off weight (MTOW) for the design aircraft. However, there may be instances where less than the MTOW will require a longer EMAS. All configurations should be considered in optimizing the EMAS design. To the extent practicable, however, the EMAS design should consider both the aircraft that imposes the greatest demand upon the EMAS and the range of aircraft expected to operate on the runway. In some instances, this composite design aircraft may be preferable to optimizing the EMAS for a single design aircraft. Other factors unique to a particular airport, such as available RSA and air cargo operations, should also be considered in the final design. The airport sponsor, EMAS manufacturer, and the appropriate FAA Regional Airports Division/ADO should consult regarding the selection of the design aircraft that will optimize the EMAS for a specific airport. . . .

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> **g. Entrance Speed**. To the maximum extent possible, the EMAS must be designed to decelerate the design aircraft expected to use the runway at exit speeds of 70 knots (approach category C and D aircraft) without imposing loads that exceed the aircraft's design limits, causing major structural damage to the aircraft or imposing excessive forces on its occupants. Contact the FAA's Airport Engineering Division (AAS-100) at 202-267-7669 for guidance when other than approach category C and D aircraft is proposed for the EMAS design. Standard design conditions are no reverse thrust and poor braking (0.25 braking friction coefficient).
>
> Generally, when there is insufficient RSA available for a standard EMAS, the EMAS must be designed to achieve the maximum deceleration of the design aircraft within the available runway safety area. However, a 40-knot minimum exit speed should be used for the design of a non-standard EMAS. For design purposes, assume the aircraft has all of its landing gear in full contact with the runway and is traveling within the confines of the runway and parallel to the runway centerline upon overrunning the runway end. . . .

106.FAA Order 5200.9, *Financial Feasibility of Runway Safety Area Improvements and Engineered Material Arresting Systems*, dated March 15, 2004; AAS Exh. 7, provides:

> **1. PURPOSE.**
>
> This is guidance for (a) comparing various runway safety area (RSA) improvement alternatives with improvements that use Engineered Material Arresting Systems (EMAS); and (b) determining the maximum financially feasible cost for RSA improvements, whether they involve EMAS or not. . . .
>
> *****
>
> **5. BACKGROUND**
>
> Improving RSAs that do not meet current dimensional standards is often difficult. Terrain and environmental considerations can result in improvements that cost in the tens of millions of dollars.

Analysis shows that for aircraft overruns, EMAS can provide a safety enhancement, while requiring less land disturbance and lower construction costs, thereby reducing significant overall costs. EMAS does not provide a benefit for short landings, so a standard EMAS installation might also include a displaced threshold. In order to preserve existing runway dimensions where one end of the runway meets RSA dimensional standards, and the other end does not, a runway extension and second EMAS may be required. This does not mean that EMAS should never be installed in other than this standard configuration. EMAS will often be the appropriate safety enhancement even when undershoot protection cannot be provided, if a standard solution is not available.

6. STANDARD EMAS INSTALLATION

a. A standard EMAS installation provides a level of safety that is generally equivalent to a full RSA constructed to the standards of AC 150/5300-13 for overruns. It also provides an acceptable level of safety for undershoots. Studies have shown that a standard EMAS installation will arrest 90% of overruns and accommodate 90% of undershoots. Follow the EMAS design requirements in AC 150/5220-22 in the event of any conflicts with this guidance. A standard EMAS installation must meet the following conditions:

(1) The EMAS is constructed in accordance with AC 150/5220-22.

(2) The EMAS must be capable of safely stopping a design aircraft that leaves the runway traveling at 70 knots. . . .

7. NON-STANDARD EMAS INSTALLATION

a. It will often not be practicable to provide either a standard RSA or a standard EMAS installation, either because the cost of both is above the maximum feasible cost, or because displacing the landing threshold will adversely affect operations. Consider not only the possible loss of runway length, but also effects on taxiing aircraft, including changes in required holding positions. When neither a standard RSA nor a standard EMAS system can be provided within maximum feasible costs, a non-standard EMAS that will stop the design aircraft traveling at 40 knots or more should be considered. An EMAS that cannot provide at least this minimum performance is not considered a cost-effective safety enhancement.

b. While relative benefits have not been quantified, protection against overruns appears to be more valuable than protection against short landings. Short landings are less common and usually occur close to the runway threshold. Therefore, consider eliminating the displaced threshold when a standard RSA or a standard EMAS is not financially feasible-- i.e. install EMAS to provide maximum protection against overruns by the design aircraft exiting the runway at 70 knots (but no less than 40 knots), and provide protection against short landings to the maximum extent feasible, up to the maximum feasible improvement cost.

107. FAA Order 5200.8 *Runway Safety Area Program*, dated October 1, 1999; AAS Exh. 6, provides:

1. PURPOSE.

This order establishes
a. The Federal Aviation Administration's (FAA) Runway Safety Area (RSA) Program and
b. The procedures that FAA employees will follow in implementing that program.

4. BACKGROUND.

The RSA is an integral part of the runway environment. RSA dimensions are established in AC 150/5300-13, **Airport Design** and are based on the Airport Reference Code (ARC). The RSA is intended to provide a measure of safety in the event of an aircraft's excursion from the runway by significantly reducing the extent of personal injury and aircraft damage during overruns, undershoots and veer-offs.

5. OBJECTIVE

The objective of the Runway Safety Area Program is that all RSAs at federally obligated airports and all RSAs at airports certificated under 14 Code of Federal regulations (CFR) part 139 shall conform to the standards contained in AC 150/5300-13 Airport Design, to the extent practicable.

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Appendix 2. Supporting Documentation for RSA Determinations

2. CONSIDERATIONS IN EVALUATING ALTERNATIVES.

In evaluating alternatives for obtaining or improving RSAs, there are many factors that could affect the viability of the alternative. What may be viable at one airport may not be viable at another. Factors to be considered include:

a. Historical records of airport accidents/incidents.
b. The airport plans as reflected in current and forecast volume of passengers, number of operations, design aircraft and percent runway use, both for all weather and IFR operations,
c. The extent to which the existing RSA complies with the standard. High performance aircraft, operating at higher loads and speeds have greater requirements than small, low performance aircraft.
d. Site constraints. These include, for example, precipitous terrain drop-off, the existence of bodies of water, wetlands, a major highway, a railroad at a runway end, etc.
e. Weather and climatic conditions. These include conditions such as low visibility, rain, snow, and ice and the frequency of these conditions. Overruns on contaminated runways constitute a significant percentage of runway excursions.
f. Availability of visual and electronic aids for landing.

3. ALTERNATIVES TO BE CONSIDERED.

The first alternative to be considered in every case is constructing the traditional graded area surrounding the runway. Where it is not practicable to obtain the entire safety area in this manner, as much as possible should be obtained. Then, the following alternatives shall be addressed in the supporting documentation. The applicability of these alternatives will vary, depending on the location.

a. Relocation, shifting, or realignment of the runway.
b. Reduction in runway length where the existing runway length exceeds that which is required for the existing or projected design aircraft.
c. A combination of runway relocation, shifting, grading, realignment, or reduction.
d. Declared distances.
e. Engineered Materials Arresting Systems (EMAS).

G. Risk Mitigation at SMO

108. The FAA has undertaken an effort to improve Runway Safety Areas ("RSA") at airports throughout the United States. Between 1983 and 2008, the FAA expended $1.98 billion dollars on the installation or improvement of RSAs at airports, of which $1.972 billion dollars was spent since 1991. City Exhs. 30, 35 and 45; Hall Rev. Direct, ¶¶ 28-29; and the FAA expected to spend $1.68 billion in Fiscal Year 2005. City Exh. 35 at 25.

109. An RSA is "[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." Hall Rev. Direct ¶ 22 quoting AC 150/5300-13, *Airport Design*, Appendix 8. An RSA "allow[s] for a potential overrun of an aircraft." Kelvin Solco ("Solco") Direct 77:10-12. Creation of a Runway Protection Zone ("RPZ") involves having "the airport acquire the land so that they can prevent what I call the congestion of people." Solco Direct 77:17-19.

110. The design purpose of an RPZ is to protect persons and property adjacent to the airport in the event of an aircraft accident. Solco Direct 77:17-19.

111. RSAs are established at Part 139 certificated commercial airports, and at federally funded airports, like SMO, "to the extent practicable." AAS Exh. 6 at 1; FAA Order 5200.8. Some factors used to determine practicability at an airport include cost, terrain, and the presence of adjacent structures, highways, waterways, rivers, oceans, lakes, etc. Solco Direct 121:20-123:8.

112. If a runway is shortened too much, the impact on operations could lead to aircraft that previously operated on that runway not being able to operate there anymore. Huffman Direct 98:12-21.

113. RSAs are not intended to provide protection to the residents near the ends of the runway. An RSA provides an additional area to decelerate an aircraft that is in the process of stopping. Marinelli Direct ¶ 59.

114. Whether an airport has an RSA is not a consideration during aircraft certification; nor does it enter into the determination of the minimum runway length required under aircraft operating rules. Aircraft must be able to safely takeoff and land regardless of the presence or absence of an RSA. Stimson Direct ¶ 21.

115. Engineered Materials Arresting Systems ("EMAS") are composed of "Engineered Materials," which are "high energy absorbing materials of selected strength, which will reliably and predictably crush under the weight of an aircraft." AAS Exh. 2; AC 150/5220-22A. Several major airport runways operate without RSAs and EMASs, including Los Angeles International, Boston Logan, and Chicago Midway. City Exh. 22 at 5, 8, and 9.

116. FAA design standards call for RSAs to extend 1,000 feet beyond the runway ends for runways serving Category C or D aircraft. AAS Exh. 3 at 25-26.1; AC 150/5300-13.

117. FAA design standards call for RSAs to extend 300 feet beyond the runway ends for runways serving Category A or B aircraft. AAS Exh. 3 at 25-26.1; AC 150/5300-13.

118. FAA design standards for RSAs were developed through analysis of empirical data of accidents by Category A and B versus Category C and D Aircraft. Marinelli Direct ¶ 51.

119. The design standards for RSAs were established by determining the distance from the runway end within which 90 percent of historical overruns had stopped.

AAS Exh. 2 at 1; AC 150/5220-22A; AAS Exh. 3, Appendix 8 at 139-40; AC 150/5300-13.

120. The design purpose of an RSA is to minimize damage to the aircraft in the event of an overrun and protect the aircraft's occupants. AAS Exh. 6 at 1; FAA Order 5200.8.

121. Advisory Circular 150/5300-13, *Airport Design,* contains the specifications for RSAs and RPZs. AAS Exh. 3.

122. No RPZs have been established in the geographic area abutting SMO. Trimborn Rebuttal ¶¶ 1 and 3.

123. Design standards for an EMAS are discussed in AC 150/5220-13. AAS Exh. 2.

124. RSAs are established at commercial airports certificated pursuant to Part 139 of the FAR and at federally funded airports "to the extent practicable." AAS Exh. 6 at 1; FAA Order 5200.8.

125. Factors that enter into the practicability evaluation include cost, terrain, and the presence of adjacent structures, highways, waterways, rivers, oceans, lakes, etc. Solco Direct 121:20-123:8.

126. The current operations at SMO meet every FAA safety requirement for aircraft operation; operators of C and D Category aircraft not only must comply with the same requirements as operators of Category A and B aircraft, in many cases, the requirements for operation of these aircraft are more stringent. DD at 4.

127. There are no designated RSAs at either end of Runway 3/21 at SMO. Trimborn Direct ¶ 7; Hall Rev Direct ¶ 38.

128. RSAs and RPZs are not a mandatory requirement for an airport such as SMO. AAS Exh. 6 at 1; FAA Order 5200.8.

129. Hundreds of airports in several states throughout the country lack standard RSAs. City Exh. 22.

130. An RSA protects only the people who would have been in that 500 by 1,000 foot rectangle had the RSA not been there. An EMAS is not designed to provide protection in the event an aircraft has sufficient lift to become airborne, only an RPZ will make a difference in the event of an accident. Marinelli Hr. Tr. 317: 14-20.

131. In order to achieve full RSA dimensional standards at SMO would require shortening the runway to the extent that the critical aircraft on which the standard is based would no longer be able to operate at SMO. Marinelli Direct ¶ 46.

132. The City proposed to adopt 1,000 foot overrun areas, which would have severely limited operations due to the shortened runway. Marinelli Direct ¶ 45.

133. The most effective safety enhancements at SMO would be the installation of an EMAS at the west end of the Airport runway for the protection of aircraft and occupants, and the development of RPZs for the protection of nearby residents. Marinelli Direct ¶ 49.

134. An initial evaluation of SMO indicates that with associated earthwork, an EMAS providing 70 knot performance is feasible on one end of the runway. Marinelli Direct ¶ 53. 90 percent of overruns are at 70 knots or lower. AAS Exh. 7 at 3-4; Marinelli Direct ¶ 51; DD Item 7.

135. The current slope at the end of the runway has been associated with a fatal accident. Installing a retaining wall would provide approximately 200 feet of

additional runway length in which an aircraft could stop before reaching the drop-off. Marinelli Direct ¶ 57. Retaining walls are common in airport construction. Marinelli Direct ¶ 58.

136. No airport operator, other than the City, has restricted aircraft based on approach speed category due to lack of an RSA. Pratte Hr. Tr. 191:6-21.

137. The NTSB has accepted, in response to NTSB Recommendations A-03-11 and -12, the FAA's policies and program to address airports with non-standard RSAs. City Exh. 5A at 43.

138. The NTSB has never issued a recommendation to the FAA, as a result of an investigation, that any category of aircraft be restricted from operating at an airport due to non-standard RSAs or the lack of RSAs. City Exhs. 4-8 and 18-20.

139. Category C and D aircraft are predominantly certificated pursuant to Part 25 of the FAR as TCA. Stimson Direct ¶ 7.

140. Category A and B aircraft are predominantly certificated pursuant to Part 23 of the FAR. Stimson Direct ¶ 7.

141. Part 25 certification requirements are more stringent and encompass higher safety standards than Part 23. Stimson Direct ¶ 12 and 20.

142. Pilots acting as PIC of a Part 25 Transport Category Airplane must hold type ratings and meet the highest safety standards for the Airline Transport pilot certificate. Pratte Direct ¶ 11.

143. Pilots of Part 25 aircraft receive greater training and proficiency reviews as opposed to pilots who do not hold ATP certificates or operate Part 23 aircraft. Pratte Direct ¶ 11 and 13.

144. Many of the Category C and D aircraft operations at SMO are conducted pursuant to Part 135 of the FAR. Trimborn Hr. Tr. 371:3-5.

145. Operations conducted pursuant to Part 135 are held to high safety standards. Pratte Direct ¶ 13-15.

146. Operators conducting flights under Part 135, Part 121, or Part 91, Subpart K for fractional ownership programs, must ensure that the airplane can land, as per the Airplane Flight Manual limitations, within 60 percent of the usable runway, or 80 percent for eligible on-demand operations that meet certain higher standards. Pratte Direct ¶ 15; 14 CFR § 135.385(b) and (f); 14 CFR § 91.1037(b) - (c). *Large aircraft* is defined as an aircraft of more than 12,500 pounds, maximum certificated takeoff weight. 14 CFR § 1.1. The aircraft identified in AAS Exhs. 31-52, which are representative of those operating at SMO, are large transport category aircraft.

147. 47.3 percent of the operations of Category C and D aircraft at SMO are operated pursuant to fractional ownership programs. Trimborn Hr. Tr. 371:1-2.

148. Corporate jets are predominantly C and D category airplanes certificated under Part 25. Stimson Direct ¶ 11; Pratte Direct ¶ 8.

149. Corporate jet operations have a good safety record. Hall Hr. Tr. 156:20-24. Events involving Category C and D aircraft are rare. Harris Rebuttal ¶3; Harris Hr. Tr. 655:8-12.

150. The City's airport manager and safety expert believes that the steep 4-degree glide path approach mandated by the City at SMO enhances the risk of an overrun. Trimborn Direct ¶ 38. Hall also stated that "the terrain steeply drops off shortly after both runway ends which makes construction of an RSA or an

equivalent EMAS bed installation extremely difficult without shortening the runway." Hall Rev. Direct ¶ 27.

151. The City has not brought its steep glide path approach to a standard 3 degrees to eliminate risk caused by a steeper slope. Trimborn Hr. Tr. 413:20-415:19.

152. The City's airport manager and safety expert believe that the "full throttle" departure procedure required by the City at SMO for noise abatement purposes enhances the risk of an overrun. Trimborn Direct ¶ 38.

153. The City has not amended the "full throttle" departure procedure to eliminate the overrun risk caused by that procedure. Trimborn Hr. Tr. 416:5-11.

154. The City is concerned about a hazard presented by the location of gasoline station on Bundy Drive across from airport property. Trimborn Direct ¶ 6. The City has not investigated whether the City of Los Angeles approved the gasoline station's location or assessed the potential of a hazard due to its proximity to the Airport runway. Trimborn Hr. Tr. 381:21-382:10.

155. The City has not looked into establishing a partial RPZ that would encompass the same geographic area as an RSA. *See generally* Trimborn Rebuttal ¶ 3-6.

156. The FAA has enacted and amended regulations under Part 97, Standard instrument approach procedures, of the FAR. Harry Hodges ("Hodges") Direct ¶ 7.

157. Part 97 contains instrument procedures for Category C and D aircraft. AAS Exhs. 23-26, 28-30; Hodges Direct ¶ 5; DD Item 27.

158. Amendments to Part 97 are coordinated with the SMO Airport Manager. AAS Exhs. 28-30; Hodges Direct ¶ 11.

159. Proposed Part 97 amendments are published in the Federal Register for public notice and comment pursuant to the Administrative Procedures Act. AAS Exhs. 23-26; Hodges Direct ¶ 13.

160. The City had the opportunity to express its position to the FAA with respect to the FAA's approval of Category C and D aircraft use of the instrument procedures pursuant to Part 97. AAS Exhs. 23-26, 28-30; Hodges Hr. Tr. 235:12-236:12, 239:20-240:1, 240:23-241:7, and 241:13-242:22.

161. The City submitted no comments with respect to the Part 97 regulations pertaining to Category C and D aircraft instrument approach procedures. Trimborn Hr. Tr. 418:1-5.

162. In 2001, the City submitted comments concerning the establishment of regulatory safety standards governing the operation of fractional ownership program aircraft, which includes Category C and D aircraft, but submitted no comments relating to their operation at airports with non-standard or no RSAs. Trimborn Hr. Tr. 375:25-377:12.

163. The minimum requirements with respect to cloud ceiling height and visibility for instrument operations at SMO are high compared to other airports, and close to Visual Flight Rule minimums. Ford Hr. Tr. 443:25-445:2, 441:10-442:15.

164. The runway acquisition program the FAA proposed to the City included the removal of 15 to 20 homes from the most critical areas within the runway safety area. Vasconcelos Direct 127:15-18.

165. The City's proposal of 2002 considered the removal of all homes in an RPZ. The FAA believed that removal of some homes from the runway safety area was a more reasonable consideration. Vasconcelos Direct 130:1-12.

166.The City believes that the Hawthorne, California airport is a viable alternative for Category C and D aircraft. Trimborn Direct ¶ 42.

167.Hawthorne is a B-II ARC airport. Trimborn Hr. Tr. 375:1-6. The overrun hazards for operators of Category C and D aircraft are the same at Hawthorne and at SMO. Trimborn Hr. Tr. 421:23-422:12.

168.At Hawthorne, as at SMO, there are buildings across from runway ends. Carey Hr. Tr. 616:18-24.

169.The Hawthorne airport has made improvements within its boundaries for hangar space. Vasconcelos Direct 218:21-22. However, it is limited for future development and physically limited. Vasconcelos Direct 219:1-2.

170.The State of California, pursuant to its Public Utilities Code, issues state operating permits to Public-Use and Special-Use airports and heliports in California, including SMO. The California Department of Transportation, Aeronautics Division, conducts regular permit compliance safety inspections of all permitted facilities. Gary A. Cathey ("Cathey") Direct ¶ 2.

171.On November 12, 1997, the California Department of Transportation, Aeronautics Program, conducted an FAA Airport Master Record and State permit compliance inspection of SMO. It found, among other things, that SMO did not have standard RSAs. As a result, the California Department of Transportation, Aeronautics Program, recommended that the City work with the FAA to establish declared distances at both ends of the runway. Cathey Direct ¶ 3.

172.On November 30, 1999, the California Department of Transportation, Aeronautics Program, conducted another FAA Airport Master Record and State permit compliance inspection of SMO. It found, once again, that SMO did not have standard RSAs. As a result, the California Department of Transportation, Aeronautics Program, again recommended that the City work with the FAA to establish declared distances at both ends of the runway. Cathey Direct ¶¶ 4-5.

173. The California Public Utilities Code does not grant the State jurisdiction to regulate aircraft operations. Carey Hr. Tr. 501:4-5.

H. Airport Improvement Grants

174. Title 49 U.S.C. § 47101, *et seq*., provides for Federal airport financial assistance for the development of public-use airports under the Airport Improvement Program ("AIP") established by the Airport and Airway Improvement Act ("AAIA"), as amended. Section 47107, *et seq*., which sets forth assurances to which an airport sponsor agrees as a condition of receiving Federal financial assistance. Upon acceptance of an AIP grant, the assurances become a binding obligation between the airport sponsor and the Government. The FAA has a statutory mandate to ensure that airport owners comply with these sponsor assurances. FAA Order 5190.6A, *Airport Compliance Requirements* (1989) ("Airport Compliance Handbook"), provides the policies and procedures to be followed by the FAA in carrying out its legislatively-mandated functions related to Federally-obligated airport owners' compliance with their sponsor assurances. AAS Exh. 9.

175. FAA records indicate that the planning and development of SMO has been financed, in part, with funds provided by the FAA. Between 1985 and 1994, the Airport has received a total of $10,190,163 in Federal airport development assistance. DD Items 6 and 41.

176. The grants supported many projects at the Airport between 1985 and 2003. The table below summarizes the grant history at SMO:

Year	Project No.	General Purposes	Total Amended Amount
1985	3-06-0239-01	Improve service road and apron	$ 1,100,000
1985	3-06-0239-02	Improve service road, apron, taxiway; acquire rescue, firefighting and safety equipment	1,100,000
1985	3-06-0239-03	Rehabilitate aprons, improve lighting and drainage	3,300,000
1989	3-06-0239-04	Improve drainage	300,000
1991	3-06-0239-05	Improve drainage and construct runway	2,304,263
1994-2003	3-06-0239-06	Rehabilitate taxiway and lighting; expand apron; acquire rescue, fire fighting, and safety equipment; improve draining, install NAVAIDS, etc.	2,085,900
		Total Grant Funding to SMO:	$10,190,163

DD Items 6 and 41. The final grant transaction in the record was *Amendment No. 2 to Grant Agreement/or Project No. 3-06-0239-06*, in August 27, 2003. DD Item 6.

177. The record includes the grant assurances for projects 3-06-0239-02 and 3-06-0239-04 through 3-06-0239-06. Each grant includes Grant Assurance 22, which states in relevant part:

> **22. Economic: Nondiscrimination.**
> a. Will make its airport available as an airport for public use on fair and reasonable terms and without unjust discrimination, to all types, kinds, and classes of aeronautical uses.
> * * * *
> i. The sponsor may prohibit or limit any given type, kind, or class of aeronautical use of the airport if such action is necessary for the safe operation of the airport or necessary to serve the civil aviation needs of the public.

DD Item 6.

178. The grant documentation for projects 3-06-0239-02 and 3-06-0239-04 through 3-06-0239-06 also include Grant Assurance 23, which states in full:

> **23. Exclusive Rights.** [Sponsor] will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. For purposes of this paragraph, the providing of the services at an airport by a single fixed-based operator

> shall not be construed as an exclusive right if both of the following apply:
>
> > a. It would be unreasonably costly, burdensome, or impractical for more than one fixed-based operator to provide such services, and
> >
> > b. If allowing more than one fixed-based operator to provide such services would require the reduction of space leased pursuant to an existing agreement between such single fixed-based operator and such airport.
>
> It further agrees that it will not, either directly or indirectly, grant or permit any person, firm, or corporation, the exclusive right at the airport to conduct any aeronautical activities, including, but not limited to charter flights, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, air carrier operations, aircraft sales and services, sale of aviation petroleum products whether or not conducted in conjunction with other aeronautical activity, repair and maintenance of aircraft, sale of aircraft parts, and any other activities which because of their direct relationship to the operation of aircraft can be regarded as an aeronautical activity, and that it will terminate any exclusive right to conduct an aeronautical activity now existing at such an airport before the grant of any assistance under the Airport and Airway Improvement Act of 1982.

DD Item 6.

I. Regulatory Activities of the City and the FAA

179. In 1991, the City submitted a revised Airport Layout Plan that designated the SMO as an ARC B-II Airport. The 1991 Airport Layout Plan was approved by the FAA. DD Item 8B.

180. With the assistance of Coffman and Associates, the Airport Staff developed a proposal called the Aircraft Conformance Program ("ACP") that would preserve the Airport's use as a B-II facility by reserving the Airport's facility for aircraft consistent with the Airport's design capacity and by creating RSAs for Category

A and B aircraft consistent with published FAA standards. The Airport Commission held public hearings in May and July of 2002 as part of the process of formulating the ACP and presenting it to the City Council for consideration. DD Item 8B.

181. On July 22, 2002, the Santa Monica Airport Commission voted to recommend that the Santa Monica City Council implement, by ordinance, the ACP. DD Item 8A.

182. Before the City Council could take up the ACP, the FAA initiated a Part 16 investigation on October 8, 2002. DD Item 8B.

183. A Notice of Investigation ("NOI") dated October 8, 2002, was initiated by the Director of the Office of Airport Safety and Standards, and supplemented by his March 26, 2008 Order to Show Cause. The NOI and Order to Show Cause were issued in accordance with the FAA Rules of Practice for Federally Assisted Airport Enforcement Proceedings, 14 Code of Federal Regulations Part 16. DD Item 1.

184. The City responded to the NOI in November 2002, and did not adopt the proposed ACP but entered into discussions with the FAA. These initial discussions continued until the City adopted the Ordinance. The FAA expedited its investigation because the Ordinance was scheduled to take effect thirty days after it was adopted by the City Council. DD Item 2.

185. On December 10, 2002, the City Council received the Airport Commission's recommendation to approve the ACP and a report on the pending administrative proceeding. Following a public hearing, the City Council approved the ACP concept of implementing 300 foot RSAs at either end of the runway, a 300 foot relocated threshold from the departure end of the runway, and a ban on Category C and D aircraft using SMO. DD Item 8B.

186. On October 1, 2002, FAA representatives from the Air Traffic, Flight Standards, and Airports Divisions and the Regional Counsel for Western Pacific Region met with City officials to discuss the ACP. DD Item 2 at 5.

187. Between 2002 and 2008, there were several meetings and discussions between SMO officials and the FAA that addressed new proposals and counterproposals as alternatives to the ACP. Trimborn Direct ¶¶ 13-29.

188. The City and FAA engaged in negotiations from 2002 to 2007 in an attempt to resolve the City's concerns about SMO. Trimborn Direct ¶¶ 14-29.

189. The FAA rejected the City's proposal to install 300 foot RSAs at both ends of the runway. Trimborn Direct ¶¶ 18-19.

190. The FAA rejected the City's proposal to establish declared distances at both ends of the runway. Trimborn Direct ¶¶ 14-29.

191. The FAA recommended that the City institute a voluntary program by which the City would attempt to acquire, with the FAA's financial assistance, in the residential neighborhoods to the east and west of SMO. Trimborn Direct ¶¶ 26-29; DD Item 4, Exh. 18.

192. There are approximately 647 homes located within the dimensions of what the FAA would define as a standard RPZ, in which City estimates approximately 2,000 people reside. Trimborn Rebuttal ¶¶ 3-6.

193. The acquisition costs for these 647 homes are estimated by the City at $560 million dollars, which does not include administrative costs, relocation expenses, and legal fees. Trimborn Rebuttal ¶¶ 3-6.

194. From communications with neighborhood groups and individual residents, the City believes that there would be near unanimous opposition if one or more governmental entities attempt to acquire the homes within the projected RPZs. Trimborn Rebuttal ¶¶ 3-6.

195. In December of 2006, the FAA hosted a presentation by the City to users of the Airport concerning the City's latest proposal, which included the installation of a 250-foot EMAS unit at the end of Runway 3/21 and a 600- foot declared distance applied off the length of Runway 3/21, for a total loss of approximately 800 feet of runway. Trimborn Direct ¶ 18.

196. A displaced threshold is a point on the runway other than the designated beginning of the runway. Displacement of a threshold reduces the length of runway available for landings. The portion of runway behind a displaced threshold is available for takeoffs in either direction and landings from the opposite direction. AAS Exh. 3, AC 150/5200-13.

197. Declared distances are the distances the airport owner, with FAA concurrence, declares available for the airplane's takeoff run, takeoff distance, accelerate-stop distance, and landing distance requirements. AAS Exh. 3, AC 150/5200-13.

198. The current available EMAS is a bed of highly crushable concrete blocks that is installed at the ends of the runway. When an aircraft leaves the runway traveling at speed, the landing gear will crush the EMAS bed and the aircraft will come to a quick and safe stop. AAS Exh. 2, AC 150/5220-22A.

199. Between December 2006 and March 2007, the FAA and the City received user comments. The City also provided the FAA with public comments. DD Items 19A and 19B.

200. On July 31, 2007, an FAA letter proposed the installation of one EMAS at each end of the runway. Each EMAS would be contained in a 130 foot bed with 25 foot lead-in ramps on each end of the runway. DD Item 7.

201. On August 28, 2007, the FAA participated in a public meeting on SMO in the City. At the meeting, D. Kirk Shaffer, then the FAA's Associate Administrator for Airports, reiterated that the FAA's proposal provided an actual, physical stopping effect on overrunning aircraft that would directly benefit both persons on the aircraft and the areas off the ends of the runway. He explained that the proposal would significantly enhance safety at SMO while maintaining the utility of the Airport. DD Item 7. The City rejected the FAA's proposal as inadequate. DD Item 4 at 6-7.

202. On November 27, 2007, the proposed Ordinance was read for the first time at the City Council meeting. DD Item 8A. The City Council met in closed session on November 27, 2007 to discuss the proposed Ordinance to "protect public safety, particularly the safety of residents living immediately adjacent to the Santa Monica Airport runway ends and those individuals using and working at the Airport, by conforming Airport usage to the Airport's federal designation which defines it as a facility suitable for Category A and B aircraft." DD Item 8B.

203. On March 7, 2008, the FAA presented an integrated safety enhancement proposal which included modifications to its earlier EMAS proposal, revisions to the hold lines, revision to the departure procedures to achieve better coordination with LAX departures; and sending two electronic Notices to Airmen ("NOTAMs") advising pilots filing flight plans of the absence of RSAs and giving them information on the Santa Monica "Fly Neighborly" program. DD Item 7. The modified EMAS installation would be a 70-knot capable unit to be installed on the departure end of runway 21, on the west side of the Airport, in the direction of 90 percent of the Category C and D aircraft departing the Airport. DD Item 7.