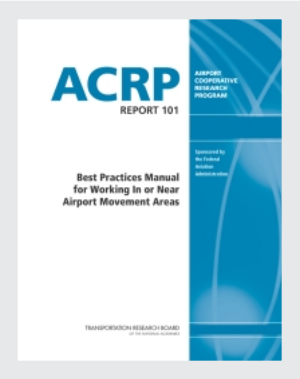

Best Practices Manual for Working In or Near Airport Movement Areas

DETAILS

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AIRPORT COOPERATIVE RESEARCH PROGRAM

ACRP REPORT 101

Best Practices Manual for Working In or Near Airport Movement Areas

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AIRPORT COOPERATIVE RESEARCH PROGRAM

Airports are vital national resources. They serve a key role in transportation of people and goods and in regional, national, and international commerce. They are where the nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of state and local governments that own and operate most airports. Research is necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the airport industry. The Airport Cooperative Research Program (ACRP) serves as one of the principal means by which the airport industry can develop innovative near-term solutions to meet demands placed on it.

The need for ACRP was identified in *TRB Special Report 272: Airport Research Needs: Cooperative Solutions* in 2003, based on a study sponsored by the Federal Aviation Administration (FAA). The ACRP carries out applied research on problems that are shared by airport operating agencies and are not being adequately addressed by existing federal research programs. It is modeled after the successful National Cooperative Highway Research Program and Transit Cooperative Research Program. The ACRP undertakes research and other technical activities in a variety of airport subject areas, including design, construction, maintenance, operations, safety, security, policy, planning, human resources, and administration. The ACRP provides a forum where airport operators can cooperatively address common operational problems.

The ACRP was authorized in December 2003 as part of the Vision 100-Century of Aviation Reauthorization Act. The primary participants in the ACRP are (1) an independent governing board, the ACRP Oversight Committee (AOC), appointed by the Secretary of the U.S. Department of Transportation with representation from airport operating agencies, other stakeholders, and relevant industry organizations such as the Airports Council International-North America (ACI-NA), the American Association of Airport Executives (AAAE), the National Association of State Aviation Officials (NASAO), Airlines for America (A4A), and the Airport Consultants Council (ACC) as vital links to the airport community; (2) the TRB as program manager and secretariat for the governing board; and (3) the FAA as program sponsor. In October 2005, the FAA executed a contract with the National Academies formally initiating the program.

The ACRP benefits from the cooperation and participation of airport professionals, air carriers, shippers, state and local government officials, equipment and service suppliers, other airport users, and research organizations. Each of these participants has different interests and responsibilities, and each is an integral part of this cooperative research effort.

Research problem statements for the ACRP are solicited periodically but may be submitted to the TRB by anyone at any time. It is the responsibility of the AOC to formulate the research program by identifying the highest priority projects and defining funding levels and expected products.

Once selected, each ACRP project is assigned to an expert panel, appointed by the TRB. Panels include experienced practitioners and research specialists; heavy emphasis is placed on including airport professionals, the intended users of the research products. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, ACRP project panels serve voluntarily without compensation.

Primary emphasis is placed on disseminating ACRP results to the intended end-users of the research: airport operating agencies, service providers, and suppliers. The ACRP produces a series of research reports for use by airport operators, local agencies, the FAA, and other interested parties, and industry associations may arrange for workshops, training aids, field visits, and other activities to ensure that results are implemented by airport-industry practitioners.

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FOREWORD

By Marci A. Greenberger
Staff Officer
Transportation Research Board

ACRP Report 101: Best Practices Manual for Working In or Near Airport Movement Areas provides guidance to airports, tenants, and contractors in identifying best practices for a myriad of airport activities through (1) a best practices database; (2) training tools, aids, and checklists; and (3) a 45-minute video that is a useful resource for introducing new employees, tenants, or contractors to the airport environment. The video, *Staying Safe on the Airfield*, follows an airport operations supervisor training a new employee by discussing hazards and the appropriate best practices for eliminating or mitigating risks while working in or near the airport movement area. The database, video, and training tools, and aids and checklists (also referred to as templates) are in electronic format on the associated CRP-CD-150.

Airport operators are challenged by the competing interests of safely conducting activities in the airport movement areas while minimizing impacts on flight operations. Yet many operational, maintenance, and construction activities occur in or near airport movement areas out of necessity. Airports across the country utilize various practices to help ensure the safety of employees and the flying public when the activities themselves cannot be eliminated or deferred to periods when the airfield is not in operation.

Ricondo & Associates, through ACRP Project 09-02, researched these practices by surveying and talking to many airport operators. They were able to compile over 500 practices into a database that can be filtered by the type of user in the field (i.e., vehicle, pedestrian, aircraft). Because airports differ on policies and practices, some practices may be mutually exclusive, so the database provides a range of options for each airport to determine what will best work within its environment.

The manual, tools, database, and video can be used as a foundation for an airport's training program or to supplement and enhance existing training materials for its own personnel, tenants, contractors, service providers, and others. Therefore, *ACRP Report 101* will be useful to all sizes of airports.

CONTENTS

Note: Many of the photographs, figures, and tables in this report have been converted from color to grayscale for printing. The electronic version of the report (posted on the Web at www.trb.org) retains the color versions.

CHAPTER 1

Introduction

Airports are dynamic environments: aircraft landing, departing, and taxiing in airfield movement areas; changing weather conditions that affect visibility minimums and drive changes in runway use configurations; airfield operational changes to accommodate operational restrictions or temporary conditions; ground vehicle movements on the airfield; snow removal and aircraft deicing operations; airport operations and inspection activities; airport construction and maintenance activities; and even emergencies or special events. Although activities on the airfield are varied, all happen in a complex operating environment and the careful and controlled accommodation of these activities is critical to protecting the safety and security of aircraft operations, aircraft passengers, ground vehicles, and personnel (e.g., airport, tenant, contractor, and agency) on the airfield. Awareness and a thorough understanding of potential risks, appropriate practices, and the airport environment—including the potential risk of accidents, incidents, and incursions—are paramount to ensuring overall safety.

Movement Areas

Airport movement areas are defined as the runways, taxiways, and other areas of an airport that aircraft use for taxiing, takeoff, and landing (exclusive of loading ramps and parking areas) under the control of an air traffic control tower (ATCT).[1] ACRP Project 09-02 identified the range of activities that occur in the movement areas of airports. Table 1-1 summarizes the diverse activities that occur in these critical and safety-sensitive airport areas. Understanding these types of activities will help users understand the potential benefits of defining and implementing best practices for working in these areas at airports. The activities summarized in Table 1-1 can be affected by variables that influence ways to protect the safety of these activities. These variables can include, but are not limited to, the following:

- Aircraft fleet (size, diversity, evolution)
- Airline/aircraft operator flight schedules
- Airfield size/configuration
- On-airport facility locations
- Time of day that activities occur
- Size/type/location of construction projects
- Weather/visibility

When operating at 14 CFR Part 139 airports, vehicle and equipment operators who need to be in the airport movement areas are required by regulation to have specialized training and demonstrate, through testing, an acceptable understanding of the safety requirements, communications protocols, and required operating procedures. Although specialized training is not required at

[1] FAA, *Advisory Circular 150/5210-20*, Change 1, *Ground Vehicle Operations on Airports*, March 31, 2008.

Table 1-1. Activities within airport movement areas.

Type	Activities
Aircraft	Aircraft Air Conditioning/Electrical
	Aircraft Air Starting
	Aircraft Pushback
	Aircraft Taxi Operations (Taxi Mechanic)
	Aircraft Taxiing Operations
	Aircraft Towing
	Aircraft Watering
	Animal Transporting
	Baggage Cart Loading/Unloading
	Baggage Transporting/Transferring
	Cabin Servicing
	Cargo and Freight Loading/Unloading
	Catering
	Deicing
	Employee Transporting
	Freight/Mail/Cargo Transporting
	Fueling
	Lavatory Servicing
	Maintenance
	Passenger Transporting (Non-Aircraft)
	Private Vehicle Driving Operations
	Ramp Snow Removal
	Remote Hardstand Loading/Unloading
	Supervising (Vehicle Transport)
Operations	Title 14 Code of Federal Regulations Part 139 (14 CFR Part 139) Self-Inspections
	Continuous Surveillance Inspections
	Daily/Regular Inspections
	Periodic Condition Inspections
	Special Inspections/State Inspections
	Abnormal/Emergency Aircraft Operations
	Air Shows/Static Displays
	Aircraft Taxi Escort "Follow-Me" Services
	Aircraft Landing and Takeoff
	Aircraft Rescue and Firefighting (ARFF)
	Airfield "Hot Spots"
	Airport Security
	Airport Tours
	Contractor/Tenant Escorting, Concessions Deliveries
	Deicing (Runways, Taxiways, Hold Pads, Ramps)
	Foreign Object Debris (FOD) Inspections
	Hazardous Materials Response/Tri-annual Disaster Emergency Drill
	Hijacking Response
	Movement Area Power Failure
	Natural Disaster Response
	Airplane Design Group (ADG) VI Taxiway/ADG VI Runway Inspections
	Off Airfield ARFF Support
	Private Security
	Private Vehicles
	Public Events/Public Tours
	Service Road Deviations
	Snow Removal
	Structural Fire Response
	Surface (Pavement) Friction Testing
	Terrorism Threats
	VIP Movements
	Water Landing Rescue
	Wildlife Control

Table 1-1. (Continued).

Type	Activities
Maintenance	Airport Maintenance Vehicle Escorting Building Maintenance Disabled Aircraft Removal Electrical Maintenance (Lights, Signs, etc.) Garbage/Refuse Collection Inspections (Runway, Taxiway, Engineered Material Arresting System [EMAS], Surface Movement Guidance and Control System [SMGCS]) Landscaping/Spraying Insecticide, Herbicide Loading Bridge Maintenance Mowing Pavement Maintenance (Patching, Painting, etc.)
Construction	Airport Paving/Concrete Pouring Air Operations Area (AOA) Electrical Construction AOA Landscaping Operations AOA Pavement Closures Barricade Placement Construction Contractor Escort Surveying/Inspections Construction Haul Routes Crane Operations Directional Boring/"Mining" Operations/Natural Gas Drilling Drainage and Grading Excavation Hauling Materials Staging Patching Crews Pavement Marking and Painting Pavement Sweeping Operations Pull Back (Give-Way) Procedures Runway Grooving Pavement Saw and Seal Operations
FAA/Government	14 CFR Part 139 Annual Inspection Customs (onsite and/or on demand) Immigration (onsite and/or on demand) Incident Response (Police, Transportation Security Administration [TSA], National Transportation Safety Board [NTSB])/Emergency Drills Navigational Aids Flight Check Navigational Aids/Visual Aids Inspection and Maintenance Police Security (TSA) TSA Inspections Training
Other	Seaplane Base Operations Public Utilities Access (Water Wells/Natural Gas)

airports not certificated under 14 CFR Part 139, the benefits of a pedestrian/ground vehicle training program are recognized. However, even with the appropriate training, the often incompatible nature of vehicle operations and activities within airport movement areas, coupled with aircraft operations, introduces the potential for severe or catastrophic consequences.

Some activities in airport movement areas, potentially involving numerous personnel, are infrequent and relatively short term, such as construction projects. In such cases, it is not feasible or desirable for an airport operator to certify all individuals who may access the AOA for movement area driving privileges. Because some activities may occur close to active runways, taxiways, or other airfield facilities (e.g., hold pads, deicing facilities, and engine run-up areas), the personnel involved require safety and operational training in conducting activities in or near an aircraft operating environment. Airport management adopts practices and procedures that guide

personnel during various airport activities to prevent the unauthorized, unplanned, inadvertent, or accidental entry of vehicles, equipment, and/or personnel into the airport movement area.

At many airports it can be difficult to accomplish necessary airfield operations and maintenance activities without creating an operational impact; runway closures, modified taxi routings, and other operational restrictions can cause delays and affect airline schedule integrity. The resulting operational restrictions, particularly if they create unfamiliar conditions for cockpit crews, can have safety impacts.

A best practices manual that addresses working in or near airport movement areas provides comprehensive and consistent guidance to the industry for use in refining and adopting those practices relevant and applicable to specific airport situations, configurations, and operational profiles. A comprehensive inventory of best practices helps ensure that airport representatives (including airlines, tenants, agencies, consultants, and so forth) have a resource for identifying relevant and applicable practices when reviewing or enhancing operational guidance for activities in the airport movement areas or confronting new or unusual situations.

Purpose of the Best Practices Manual

The objectives of the ACRP Project 09-02 applied research project were to identify and document best practices for personnel working in or near airport movement areas and to develop candidate tools, techniques, and training aids that can be used by airport operators and others in the aviation industry to (1) define best practices at specific airports for those operating in this environment, (2) communicate required and desired practices to relevant parties, and (3) enhance the training of personnel, tenants, and contractors regarding these best practices. These best practices are documented in *ACRP Report 101* (the Manual) and provided electronically on the associated product, CRP-CD-150, which is available by searching the TRB website for ACRP Report 101.

The Manual provides for the application of consistent practices and procedures that safely accommodate necessary activities in the airport movement areas while minimizing potential adverse operational impacts on aircraft activity. The Manual is intended to serve as a tool for minimizing the interaction between aircraft operations and other activities on the airfield as airport operators strive to maintain a balance in the airport operating environment by safely accommodating aircraft activity with other activities necessary to maintain, operate, and improve airports.

The ACRP Project 09-02 research made clear that airfield and runway incursions, incidents, and surface deviations occur at airports of all sizes, types, and operational profiles. Among the group of airports that actively supported this research project by providing specific information (believed to be representative of and relevant to most airports of similar size and operational characteristics), airport operators have developed and implemented practices to guide activities in and near the movement areas so as to protect the safety of personnel, vehicles, and aircraft operations. However, practices are not required to be standardized or consistent in how comprehensive they are, so long as all comply with relevant FAA requirements. The Manual enables airport operators and other airport users who seek to improve or enhance their current practices, while acknowledging the uniqueness of each airport, to refer to a collection of best practices as a foundation for such effort.

This Manual and CRP-CD-150 are intended to serve as a planning resource for airport operators and others who conduct activities in or near airport movement areas or for those who manage entities engaged in these activities. The Manual includes a dataset that can be filtered by predefined codes assigned to specific practices. Exploration of the dataset can yield reports to be exported for use in other materials (e.g., training manuals, construction documents, instruction presentations, and tenant agreements).

The Manual is designed to be informative and practical, as well as flexible, so that users can tailor the filters to address specific types of situations or general and overarching needs that

are less sensitive to certain types of activities, airport size, geographic location, and other factors. The dataset included as the primary component of the Manual, compiled using Microsoft Access, is structured for ease of use by individuals with varying levels of experience with and exposure to database software. The database tool is available for download from the TRB website at http://www.trb.org/ACRP/.

This research project was guided by an ACRP project panel of aviation professionals with a thorough understanding of (1) the AOA, (2) activities that take place in the airfield environment, and (3) the challenges of remaining constantly attentive and vigilant when engaged in any activity in the airport movement areas. The underlying research for the Manual included information gathered from staff at 25 U.S. airports and from various industry publications and guidance materials. Priority was placed on physical, operational, and geographical diversity in gathering information from airports.

Manual Organization

This Manual provides guidance on (1) the use of this document as a source for best practices that may be applicable for specific airports, events, and activities, and (2) the use of training tools and aids to support and reinforce safety in the airfield environment. Specifically, the Manual consists of the following:

- **Chapter 1, Introduction:** This chapter presents background on the research project and explains the purpose and organization of the Manual.
- **Chapter 2, Applications:** This chapter describes the potential uses and applications of the material covered in the Manual.
- **Chapter 3, Manual Structure:** This chapter describes how the Manual was compiled and defines the coding system that is the basis for filtering the dataset.
- **Chapter 4, How to Use the Manual and Collection of Practices:** This chapter provides guidance on how to use the Manual to extract desired best practices for specific airport characteristics.
- **Chapter 5, Introduction to Tools, Training Aids, and Techniques:** This chapter introduces various tools, training aids, and techniques that can be used to reinforce messaging on safety in the airport operating environment. An overview of different options is provided, as well as templates for the implementation of some tools, and guidance on how to best implement other tools.

In addition, a list of references, a list of abbreviations, and a glossary of terms are included. The Manual is best used in conjunction with CRP-CD-150.

Limitations of the Manual

Although this Manual encompasses many best practices, additional practices will either be in use at airports or subsequently developed that are "best" for the situation that drove their development and that could benefit other airports. Representatives of 25 airports served as a source of both practices in use and information on challenges that could benefit from such practices. Although these 25 airports are considered representative of all airports, it was not possible through this research project to gather input from an exhaustive number of airports. Therefore, the collected practices, supplemented by additional practices defined during the research to address gaps, are considered to be representative and comprehensive, but not all-inclusive.

Industry events and developments can influence the applicability of the practices contained in this Manual. Such events and developments include regulatory changes (new or amended), revisions to planning and design standards, modifications to standards at specific airports, and emerging practices not yet documented. Users of the Manual are encouraged to view this material as a foundation and to supplement the practices contained herein with other sources as appropriate or available.

CHAPTER 2

Applications

This Manual is intended to be a flexible tool for use in guiding operations in varying situations, activities, and conditions that may exist or occur at an airport.

Identification of Best Practices

Although multiple definitions of "best practices" exist—many tailored to specific industries—generally best practices are methods, techniques, or procedures that reliably deliver desired and consistent outcomes. In some cases, these practices are considered to be benchmarks, superior to other practices that may deliver a similar outcome. In the context of this Manual, best practices are those considered to be desirable in reducing the potential for runway or taxiway incursions, surface incidents, injuries or accidents, equipment damage, and other related adverse outcomes, as well as those that enhance the safety of aircraft, vehicles, equipment, passengers, and personnel in the airport movement areas.

Because of the diversity among airports, it is challenging to define practices that would be considered "best" in all applications. A practice that may be "best" for use at a GA airport may not be appropriate for use at a large-hub airport because of the differences in users, activities, equipment, technology, and other factors. The best practices included in this Manual must be interpreted and evaluated prior to use in each case. It is the user's responsibility to assess whether any practice included in the Manual is "best" for application in a given situation or to accomplish a targeted outcome at a specific airport. Ultimately, characterization of the practices included in this Manual as "best" for each specific application is the responsibility of the user.

This Manual offers (1) a compilation and synthesis of practices gathered from airports, industry sources and references and (2) an assessment of how well the aggregate practices address activities that can occur in the airport movement areas (relying on the collective professional judgment of the research team). In refining the best practices included in the Manual, the research team strove to ensure a level of applicability to a wide range of airports, while providing enough flexibility to be adapted for individual areas and airport characteristics and without diluting the effectiveness of individual practices. For specific applications, the "best" practices presented in the Manual can be refined (e.g., reworded, expanded, and streamlined) to improve their benefit and relevance in specific applications. The opportunity and, in some cases, the need for refinement to derive the most benefit from the "best" practices does not diminish their aggregate utility or contradict their inclusion in a manual of best practices.

Applications of the Best Practices Manual

The Manual has multiple applications, depending on the needs of the users. Safety is the responsibility of every individual who drives, operates equipment, conducts inspections or maintenance tasks, or engages in any other activity in the airport movement areas, whether in a vehicle/equipment or on foot.

The best practices compiled, developed, and refined through the project research and presented in this Manual are intended for application in multiple scenarios, including an airport's daily/routine, special event-related, weather-related, tenant, construction, and maintenance activities. Example uses are as follows:

- Airport Operations Training: The Manual is intended for use at all types of airports, from general aviation (GA) to large-hub facilities. Larger and busier airports will tend to have more robust training programs and resources available than smaller and GA facilities. Similarly, larger airports will be more likely to have larger staffs with narrower responsibilities than the staff at smaller airports, who may be responsible for airfield operations, maintenance activities, tenant coordination, special event planning, and other diverse duties. Use of the Manual for various airports is expected to range from a primary resource supporting airport movement area training to an optional resource available to supplement or enhance other effective training materials.
- Airport Tenants: Tenants at many airports may have individual training programs and operations materials; this Manual is intended to enable those tenants to enhance their available materials to emphasize specific challenges or needs at specific airports/facilities. This Manual can also be used to provide consistent guidance to all tenants on airport management's expectations for safe activities in and around the movement areas.
- Special Events Planning: In planning special events (e.g., air shows and on-airfield events), significant coordination is necessary between the staff of the airport where the event is being held and the organizer/host of the event. Part of that coordination is establishing guidance to protect the safety of event participants, spectators, and aircraft operations. This Manual can be used to generate specific guidance for safe practices during these events and to ensure that the event planning addresses safety issues appropriately.
- Service Providers: At many airports, service providers are contracted to provide airline and aircraft servicing support (e.g., catering, fueling, and aircraft deicing). Service providers often operate vehicles in the airport movement areas, making it critical that they fully understand the need to adhere to safe practices when operating in the airfield environment. This Manual can be used as a source of best practices to help ensure safety on the airfield, as well as to communicate airport management's expectations for safe activities in and around the movement areas.
- Construction Contractors: Typically, construction contractors are a transient population in the airfield operating environment—whether daily or seasonal. The Manual can help provide best practices for incorporation into construction documents or to support training efforts in advance of the start of construction projects.
- Maintenance Contractors: Some airport operators rely on contractors to provide maintenance support (e.g., mowing, snow removal, rubber removal, and lamp replacement). The contractor employees who provide these services may be a transient population, particularly as contracts are rebid. This Manual can be used to support the training of contractor employees and to provide continuously available reference materials.
- Airport Management: When airport management may be establishing policies relating to safety at their specific airport, the Manual can be a source of material to be considered in supporting or enhancing broader policy statements.

- Assessing an Airport's Current Operational Practices/Guidance Material: Airport operators (or tenants, users, etc.) may undertake occasional or routine assessments of practices in use at the airport so as to identify potential gaps, deficiencies, and opportunities for clarification, or to meet other objectives. An assessment may also be predicated on a pending or recent change at an airport (e.g., new tenant, increased air service, and aircraft fleet evolution).
- Responding to an Identified Issue or Incident: In addressing issues or incidents identified or recorded at an airport, users may refer to the Manual to determine whether adjusted or expanded practices would help minimize the potential for adverse outcomes or repeated incidents.
- Justifying Physical Alterations or Operational Adjustments: The Manual may help justify proposed changes (e.g., capital budgeting for relocating service roads and budgeting time and resources for an update to existing airport guidance).
- Other: The Manual may provide other useful information for airport users, tenants, agencies, students, and other industry participants.

CHAPTER 3

Manual Structure

The Manual is to be used in conjunction with CRP-CD-150, which is a Microsoft Access-based collection of practices structured to allow the filtering and retrieval of practices based on the criteria applied. This collection includes practices intended to preserve the safety of aircraft, equipment, vehicles, and personnel when conducting activities in or near airport movement areas.

Specific categories were defined for the practices gathered and to compile and clean the data appropriately. Data compilation was performed to define practices that could be coded to facilitate subsequent analysis and extraction of relevant conclusions/practices. The first step involved categorizing the raw data into practices and non-practices; non-practices were then removed from the dataset. Once the dataset reflected a set of actual practices, the practice descriptions were generalized or globalized to make the practices more broadly applicable to a range of airports. This process often involved defining a general practice based on a specific activity that an airport operator discussed during the interview. Following the generalization or globalization of practices, duplicate practices from a single source (e.g., one airport) were removed or combined, as appropriate. Figure 3-1 illustrates the process used to compile and clean the datasets.

The initial primary categories defined for the data included the following:

- Practice: This category captured the practices, eliminating non-practice information that, although relevant to the topic, was not a practice that could be implemented by users.
- Activities to which the Practice Pertains: This category captured the range of activities that can reliably be expected to occur in AOAs.
- Activity Zone to which the Practice Pertains: This category identified zones within the overall AOA in which practices may vary based on aircraft activity, aircraft speed, and other considerations.
- Airfield Conditions to which the Practice Pertains: This category focused on the conditions that can exist on the airfield that can influence the applicability of specific practices.
- Risk the Practice Addresses: This category addressed risks to different entities in the AOA that the practices can mitigate.
- Responsibility for Conducting or Implementing the Practice: This category encompassed the entities that can have responsibility for implementing specific practices.

Once the collected data were compiled and cleaned and an initial categorization was completed, each practice in the dataset was coded within each category to provide a way to filter the practices. The coding used within each primary category is presented in Table 3-1.

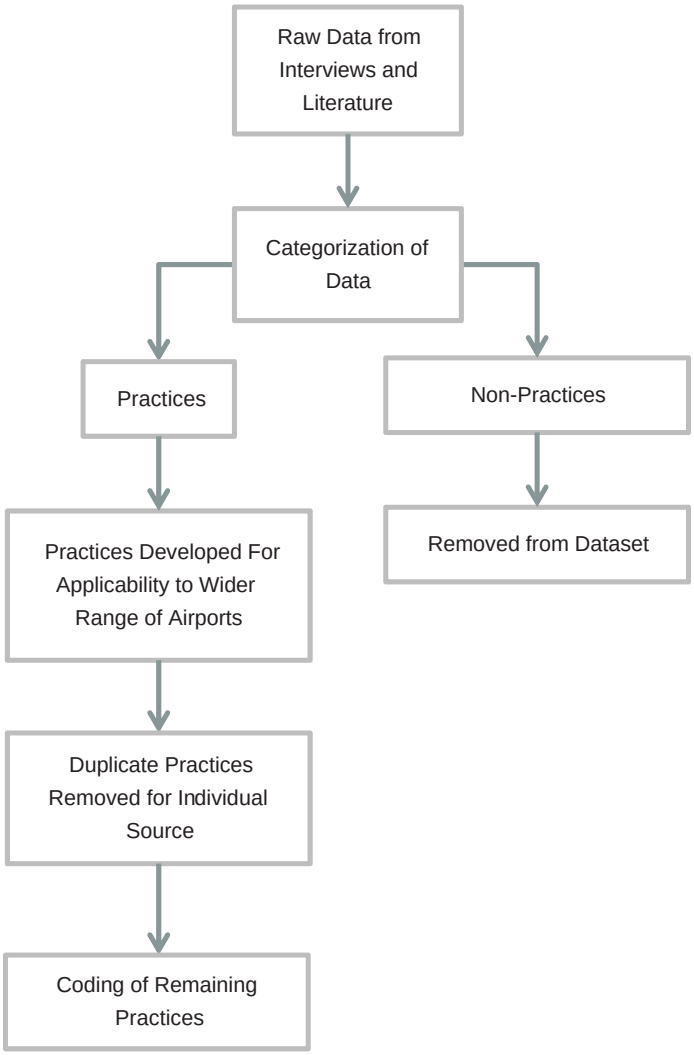


Figure 3-1. Dataset compilation and cleaning.

Table 3-1. Coding of practices.

Category to which the Practice Pertains	Name	Description
General	General	Practice is predicted to have a measure of benefit at airports irrespective of size, type, configuration, location, operational characteristics, or other factors.
	GA Practical	Practice is predicted to have a measure of benefit at GA airports.
	Towered/Non-towered	Practice pertains to a towered airport, a non-towered airport (or towered, but outside of tower operating hours), or both.
Practice	Policy	Practice is defined as a policy (principle or rule to guide decisions and achieve desired results). Some practices are coded as both a policy and a procedure, given the different ways in which the practice can be implemented.
	Procedure	Practice is a particular way or method of accomplishing something, generally via a series of steps. Some practices are coded as both a procedure and a policy, given the different ways in which the practice can be implemented.
	Physical Airfield Configuration	Practice involves recommending a modification to the physical configuration or aspects of the physical configuration of the airfield. The physical configuration includes signage, lighting, and marking.
	Technology	Practice involves recommending a new or improved technology on the airfield. Technology can apply to equipment, vehicles, or other elements on the airfield.
Activities	Training	Practice pertains to training or is a training-related activity.
	Aircraft Servicing	Practice pertains to an activity related to aircraft servicing (e.g., fueling and deicing).
	Airport Operations	Practice pertains to an activity related to airport operations.
	Airport Maintenance	Practice pertains to an activity related to airport maintenance (e.g., snow removal, mowing, light/lamp replacement, and rubber removal). Maintenance activities do not overlap with construction activities.
	Construction	Practice pertains to a construction or construction-related activity.
	FAA/Government	Practice pertains to an FAA or other governmental-related activity.
	Special	Practice pertains to a special activity (e.g., an airshow).
	Nonspecific	Practice is not applicable to an activity or not specific enough to be categorized in any of the codes in this category. Practices recommended for all or nearly all activities that may occur in the airport movement areas are captured through this coding.

(continued on next page)

Table 3-1. (Continued).

Category to which the Practice Pertains	Name	Description
Activity Zone	Near the Movement Areas	Practice pertains to an activity that takes place near the movement areas (e.g., in any nonmovement areas within the AOA) or nonmovement areas that abut the movement areas (e.g., leased apron).
	Taxiways	Practice pertains to an activity that takes place on or in the immediate vicinity of taxiways.
	Runways	Practice pertains to an activity that takes place on or in the immediate vicinity of runways.
Airfield Conditions	Adverse Weather and Low Visibility	Practice addresses adverse weather or low-visibility conditions.
	Dark/Low Light	Practice addresses activities that most typically occur in darkness or low-light conditions. Although such activities are not specifically coded, many activities can occur during nighttime hours (e.g., construction escorting).
	Construction	Practice addresses construction conditions or activities that may be required by construction conditions (e.g., barricaded and lighted work areas).
	Security Event	Practice addresses security events (e.g., an incident response).
	Other	Practice addresses unique conditions taking place on the airfield (e.g., an air show or other special event).
	Nonspecific	Practice is not applicable to an activity or not specific enough to be categorized in any of the codes in this category. Practices recommended to address all or nearly all conditions that may occur in the AOA are captured through this coding.
Risk the Practice Addresses	Aircraft	Practice addresses a risk to an aircraft on or in the vicinity of the airport.
	Vehicles	Practice addresses a risk to a vehicle or equipment that is in the AOA.
	Pedestrians	Practice addresses a risk to pedestrians on or near the movement areas, including maintenance personnel, construction contractor personnel, and others.
Party Responsible for Conducting or Implementing the Practice	Vehicle Driver	Practice would be implemented by a vehicle or equipment driver.
	Pedestrian	Practice would be implemented by a pedestrian, including any person who may have exited a vehicle while in the movement area.
	Airport Operator	Practice would be implemented by the airport operator (through any department, section, or other organizational component).
	Training Entity	Practice would be implemented by the party responsible for airport training, which can include non-airport personnel who may have responsibility for training.

CHAPTER 4

How to Use the Manual and Collection of Practices

The Manual is intended for use in multiple formats, depending on the needs of the user. The electronic version of the Manual (CRP-CD-150) is a Microsoft Access-based collection of best practices that can be searched and filtered to identify practices potentially relevant to the user and the specific airport environment.

Filtering Best Practices

Each of the codes used in evaluating and coding the best practices can be used to filter the overall dataset to extract a desired subset of practices. Users can filter for these codes singly or in any combination. The more filters applied by users of the electronic version of the Manual, the smaller the resulting subset of candidate best practices. This filtering is intended to allow the user to extract best practices that are appropriately focused on topics or activities of interest. With over 500 best practices included in the dataset, maximum utility of the Manual will be derived when users are not required to review the full dataset to identify those practices relevant in a particular situation, but rather are allowed to extract a subset of focused and pertinent practices for review.

Some best practices in the dataset are coded as universally applicable when conducting activities in or near a movement area. These are characterized in the dataset as "general" practices. A user can opt to extract these practices by selecting "List of General Practices Only" from the initial database screen. The availability of this subset of universal (general) best practices emphasizes that some practices are considered productive and beneficial at all times in protecting safety during activities in the movement area.

Figure 4-1 illustrates the Manual's main menu, i.e., the first screen the user views. This menu allows the user to view all general practices as a consolidated group and to explore all practices included in the dataset. Figure 4-2 illustrates the filters that can be selected by users in identifying the subset of practices of interest.

Creating Reports

Several options exist for creating reports of best practices. Reports that summarize the filtered set of best practices can be viewed on the computer screen or created and exported in either Adobe Acrobat format (.pdf), Microsoft Word format (.doc/.docx), or Microsoft Excel format (.xls/.xlsx). Exporting the best practices enables users to incorporate those best practices into other documents, drawings, figures, and reports. Creating files for export also enables users to refine or more specifically focus any particular best practice to meet specific needs.

Figure 4-3 depicts options users have for creating reports in the available formats.

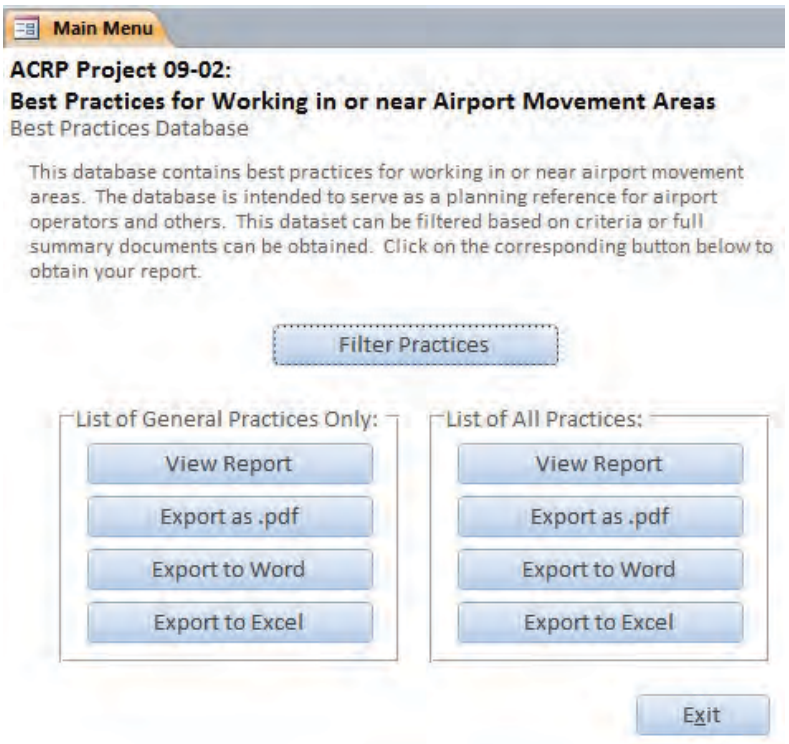


Figure 4-1. Database main menu.

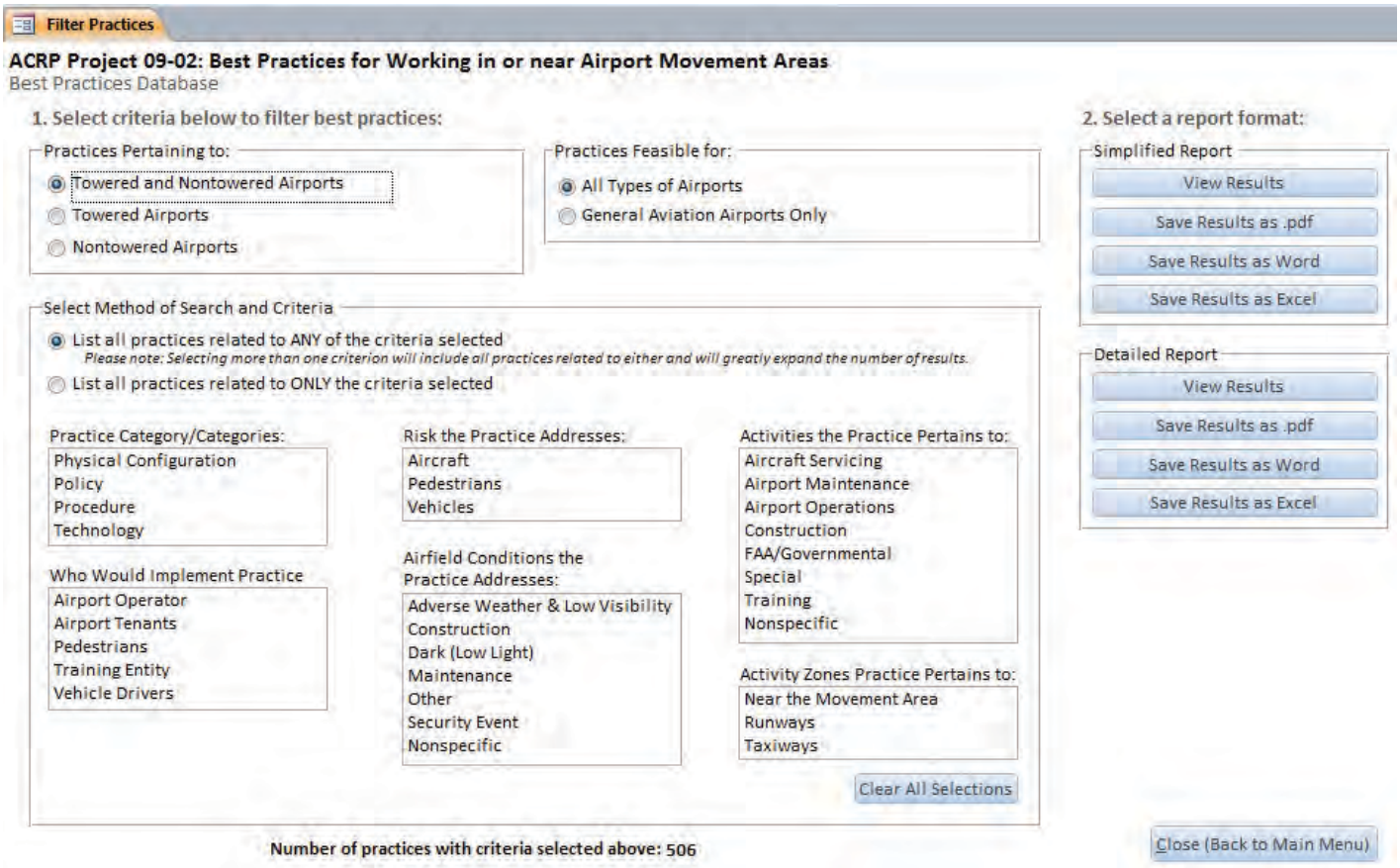


Figure 4-2. Available filters in the manual.

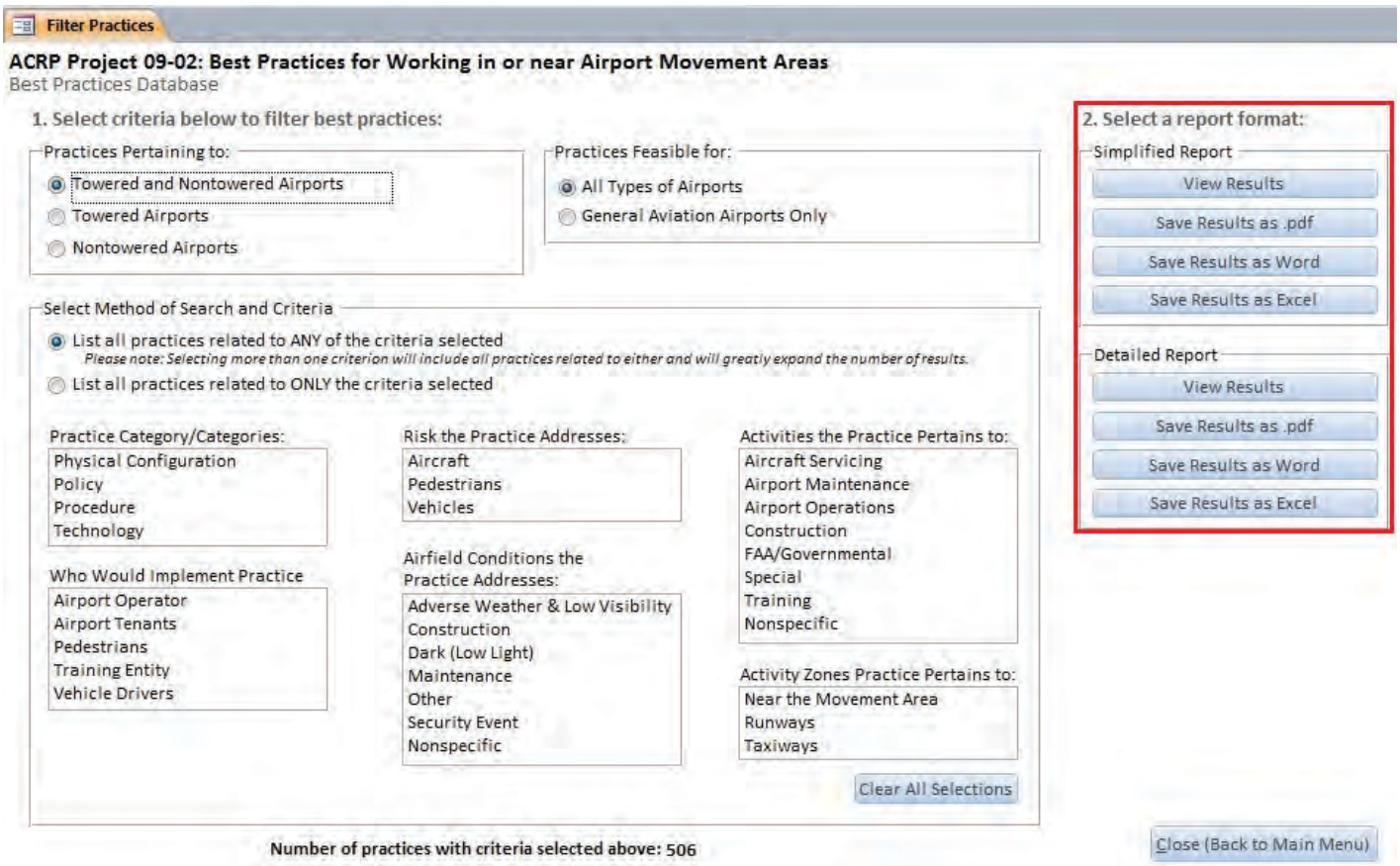


Figure 4-3. Available report options in the manual.

Use of Extracted Best Practices

The Manual includes more than 500 best practices; some are general and near universally appropriate for use at airports irrespective of size, type, location, or candidate activity. The practices are worded to make them as useful as possible in the widest range of situations and for the widest range of users; however, given the diversity of airport characteristics, physical configurations, geographical locations, operational profiles, organizational structures, and other factors, the practices extracted from the Manual can be refined to maximize their benefit and utility in any application or use.

The Manual user will benefit most by following several specific steps once one or more subsets of practices have been generated. These steps include

- Review the full subset of practices to identify practices not relevant in a particular situation, at a specific location, for a particular airfield configuration, or other considerations. Practices not relevant to the situation should be deleted. For example, depending on the filters applied, a user generating best practices for an airport in an arid and warm area of the country may find a practice in the subset report that relates to snow removal operations. In this case, no benefit would be anticipated for continuing to carry this practice and the user should consider deleting it. Similarly, best practices defined to support movement area activities at a complex (e.g., multiple-runway, geographically expansive) airfield may not be useful or productive for application at a GA airport or even at a single-runway commercial service airport.

- Review the remaining practices (after those without relevance are deleted) to identify whether or not there is any conflict with existing policies or practices in place at the airport of interest. For example, some airport operators *prohibit* the use of cell phones when operating a vehicle or equipment in the movement areas, whereas other airport operators *rely on* the use of cell phones as a means of communication between the driver of a vehicle or equipment in the movement areas and airport operations personnel. Those practices that present conflicts should be deleted or revised to resolve the conflicts.
- Review the remaining practices (after those without relevance or that present conflicts are deleted) to refine the wording of practices that could be enhanced for a specific use or situation. Given that the Manual user knows about the airport or activity for which the best practices are to be applied, informed and beneficial refinements will help ensure that the derivative best practices ultimately used enhance safety in the movement areas.

The Manual user should evaluate the list of best practices following the review and refinement steps listed above to assess whether additional practices may be needed to address a specific situation or activities in a specific area at an airport.

The extracted subset of best practices can be used in multiple ways, including the following:

- Incorporation into training programs (e.g., airport personnel, contractors, tenants, service providers, emergency personnel, and fixed-base operators [FBOs])
- Incorporation into operating procedures and manuals
- Incorporation into construction documents (e.g., plans, specifications, and construction safety and phasing plans)
- Development of handbooks for tenants to clarify expectations and requirements
- Distribution to construction and maintenance contractors to clarify expectations during construction

All uses of the best practices, in any form, should be appropriately coordinated before implementation to ensure that no confusion or conflicts would undermine the benefits of the practices or compromise safety in any way.

Safety is the responsibility of everyone engaged in any activity in or near the airport movement areas.

CHAPTER 5

Introduction to Tools, Training Aids, and Techniques

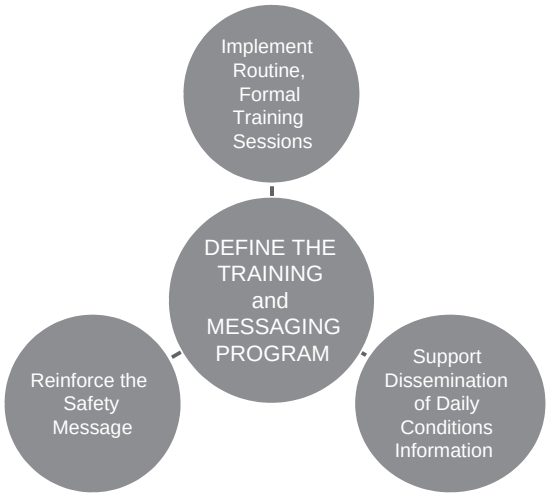
Airport operators are responsible for (1) conveying how to safely conduct activities in the airport movement areas to airport and tenant employees and (2) keeping that message prominent in the minds of airport employees working in the airport movement areas. Airport operators use many training and messaging tools and techniques to convey this message during defined training activities, as well as through ongoing reinforcement activities.

Several representative tools, training aids, and techniques were prepared as part of ACRP Project 09-02. (These are provided in electronic format on CRP-CD-150 and are available on the TRB website by searching for ACRP Report 101.) Training for the safe conduct of activities in or near the movement areas is most beneficial when tailored to a specific facility. Therefore, the ACRP Project 09-02 tools, training aids, and techniques are intended as a resource for airport operators and are adaptable to various airport conditions, configurations, and sizes. Some airport operators have implemented robust training programs and supporting tools to convey the message of safe operations in the aircraft operations area. A review of the materials outlined in this chapter can identify opportunities to update, refresh, or supplement existing training materials. Other airport operators may choose to enhance a training program by adopting many of the training aids and tools highlighted in this Manual. Similarly, the tools, training aids, and techniques can be used by airport tenants, service providers, agencies, and other organizations that require employees to access the airfield in the course of fulfilling their responsibilities.

ACRP Project 09-02 encompassed the development of multiple tools, techniques, and training aids with the intent to enable airport operators, tenants, service providers, and other users to select and tailor, as needed, materials and techniques that will maximize their effectiveness for each application. It is unlikely that all tools, techniques, and training aids will be equally effective at all airports given operational, weather, physical size and configuration, and other relevant differences. The optimal use of these materials will be achieved through the deliberate selection and, in some cases, modification of elements to reflect the most critical and significant aspects of each airport, operation, activity, or other consideration.

The primary training tool developed as part of ACRP Project 09-02 is a 45-minute training video, *Staying Safe on the Airfield*. The video highlights a sampling of the best practices identified in this Manual through a "day in the life of an airport operations supervisor" storyline. This illustrates best practices for activities in or near the movement areas and provides perspective on equipment, activities, technologies, and communications common in the airfield operating environment. Given the extensive list of candidate best practices compiled as part of this research project, it is not possible to highlight a significant number in this training video; however, where shown in the video, an effort was made to provide context for those practices.

Figure 5-1 provides an overview of the four key components of a training and messaging program to communicate and reinforce the message of safety while conducting activities in or near airport movement areas. Tools, training aids, and techniques recommended for consideration



Source: Ricondo & Associates, Inc., July 2013.

Figure 5-1. Training and messaging program elements.

for each of the training and messaging program elements are discussed below. Because the effectiveness of the proposed training and messaging materials is maximized when the materials reflect the conditions of the individual airport at which they are used, these materials are provided in template format so that airport operators and others responsible for training and messaging can adapt the materials to reflect local conditions.

Define the Training and Messaging Program

As indicated in Figure 5-1, a training and messaging program typically consists of three components: (1) routine, formal training sessions; (2) communication of daily conditions information (e.g., construction areas and haul routes, weather, and nonstandard operations); and (3) methods to continually reinforce the safety message. The training and messaging program should define activities, tools, and aids to support each of these components.

To support airport operators in defining or refreshing a training and messaging program, Table 5-1 lists tools, training aids, and techniques developed as part of ACRP Project 09-02, as well as a brief description of each. Each item, as well as how an airport operator or trainer

Table 5-1. Tools, training aids, and techniques to define and implement a training program.

Tool, Training Aid, or Technique Name	Description
Training Program Checklist and Template	Checklist of training topics and template for trainer modification to track components of an airside training program.
Training Program Checklist and Template for Contractors and Other Temporary Airfield Workers	Checklist of training topics specific to contractors and other temporary workers and template for trainer modification to track components of an airside training program and communicate training needs to contractors.
New Employee Mentoring Program Checklist and Template	Checklist to aid in developing and implementing a mentoring program for employees who are new to working in or near airport movement areas.
Training Record Database	Guidance for developing a training program database for tracking types of training programs and training program needs for employees.

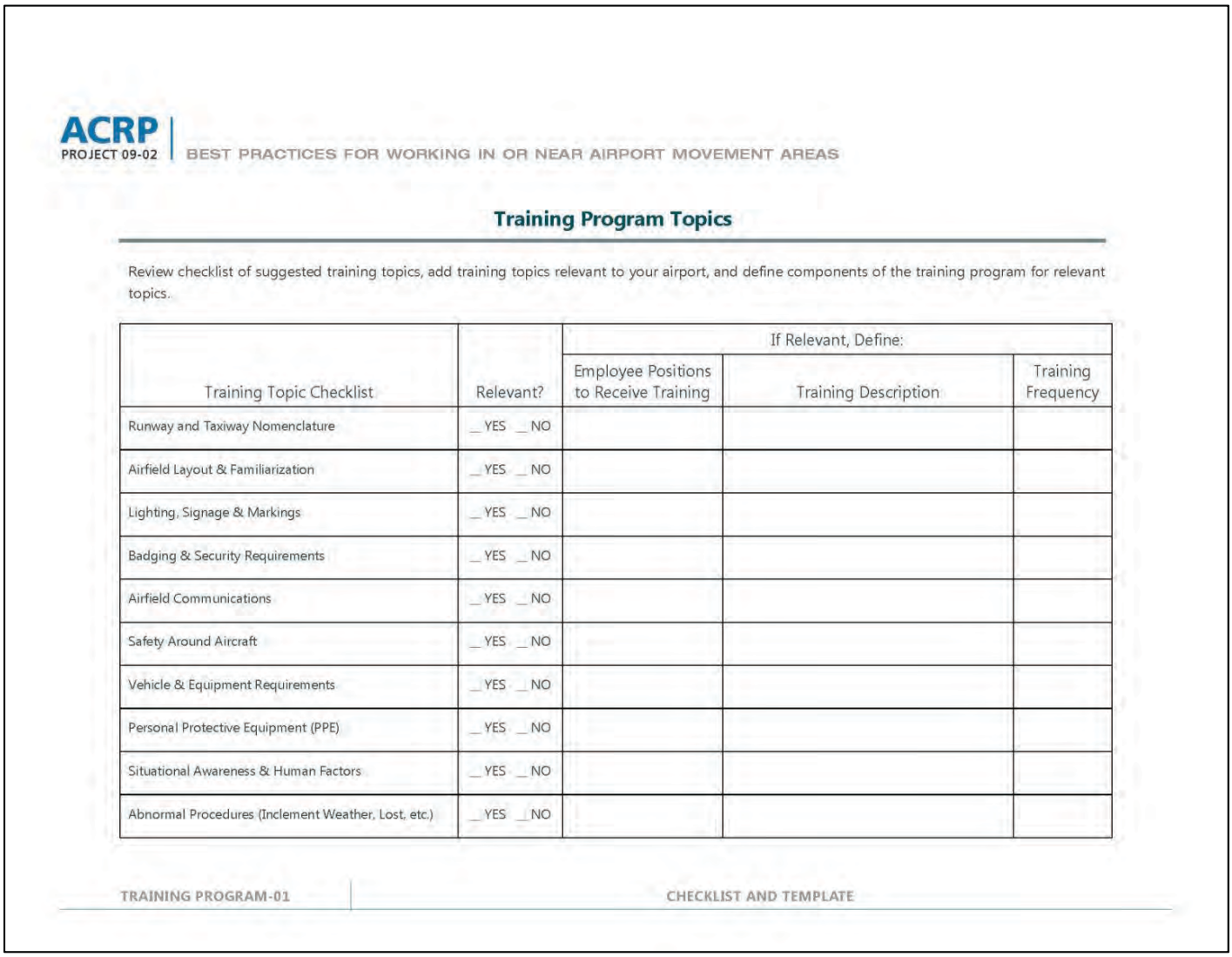
may adapt the item, is discussed in this section, with references to templates provided on CRP-CD-150.

Tools, training aids, and techniques to support the three components of a training and messaging program are summarized in the following subsections.

Training Program Checklist and Template

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**TRAINING PROGRAM-01**

For use in developing or refreshing a training program for airfield workers and those who will have access to airport movement areas, the training program checklist identifies suggested training topics for those working in or near airport movement areas. Circumstances at individual airports may suggest the need for additional training topics, so trainers should supplement the checklist to meet individual airport needs. The checklist is designed in a template format to allow trainers to modify the training topics and to track additional details for each training topic.



ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Training Program Topics

Review checklist of suggested training topics, add training topics relevant to your airport, and define components of the training program for relevant topics.

Training Topic Checklist	Relevant?	If Relevant, Define:		
		Employee Positions to Receive Training	Training Description	Training Frequency
Runway and Taxiway Nomenclature	_ YES _ NO			
Airfield Layout & Familiarization	_ YES _ NO			
Lighting, Signage & Markings	_ YES _ NO			
Badging & Security Requirements	_ YES _ NO			
Airfield Communications	_ YES _ NO			
Safety Around Aircraft	_ YES _ NO			
Vehicle & Equipment Requirements	_ YES _ NO			
Personal Protective Equipment (PPE)	_ YES _ NO			
Situational Awareness & Human Factors	_ YES _ NO			
Abnormal Procedures (Inclement Weather, Lost, etc.)	_ YES _ NO			

TRAINING PROGRAM-01 | CHECKLIST AND TEMPLATE

Training Program Checklist and Template for Contractors and Other Temporary Airfield Workers

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**TRAINING PROGRAM-02**

For use in developing or refreshing a training program for contractors and other temporary airfield workers, the training program checklist identifies suggested training topics for those working in or near airport movement areas. Circumstances at individual airports may suggest the need for additional training topics, so trainers should supplement the checklist to meet individual airport needs. The checklist is designed in a template format to allow trainers to track project details, modify the checklist of training topics, and track additional information for each training topic.

ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Training Program Topics for Contractors and Other Temporary Airfield Workers

Review checklist of suggested training topics, add training topics relevant to your airport, and define components of the training program for relevant topics.

Airport Project:	Contractor Name:
Airport Project Contact:	Contractor Contact:

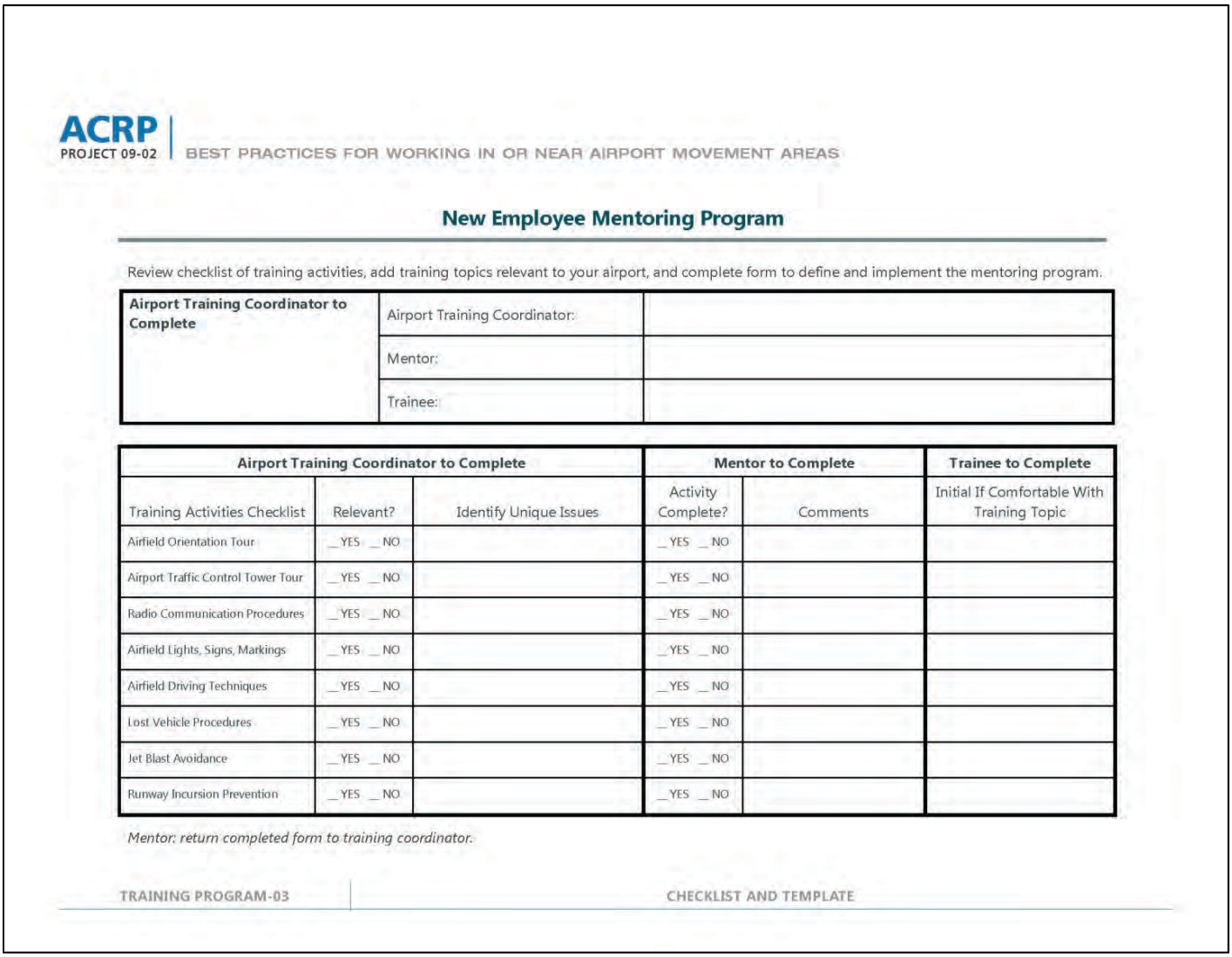
Training Topic Checklist	Relevant?	If Relevant, Define		
		Training Frequency	Person or Group Responsible for Conducting Training	Describe Process for Documenting or Tracking Training
Vehicle/Equipment Requirements	_ YES _ NO			
Construction Near Runways, Taxiways, Navigational Aids	_ YES _ NO			
Haul Routes and Construction Access	_ YES _ NO			
Escort Requirements	_ YES _ NO			
Badging & Security Requirements	_ YES _ NO			
Communications	_ YES _ NO			
Other	_ YES _ NO			

TRAINING PROGRAM-02 CHECKLIST AND TEMPLATE

New Employee Mentoring Program Checklist and Template

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**TRAINING PROGRAM-03**

The new employee mentoring program checklist identifies suggested training activities to include in a new airfield worker's mentoring program. Circumstances at individual airports



ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

New Employee Mentoring Program

Review checklist of training activities, add training topics relevant to your airport, and complete form to define and implement the mentoring program.

Airport Training Coordinator to Complete	Airport Training Coordinator:	
	Mentor:	
	Trainee:	

Airport Training Coordinator to Complete			**Mentor to Complete**		**Trainee to Complete**
Training Activities Checklist	Relevant?	Identify Unique Issues	Activity Complete?	Comments	Initial If Comfortable With Training Topic
Airfield Orientation Tour	_YES _NO		_YES _NO		
Airport Traffic Control Tower Tour	_YES _NO		_YES _NO		
Radio Communication Procedures	_YES _NO		_YES _NO		
Airfield Lights, Signs, Markings	_YES _NO		_YES _NO		
Airfield Driving Techniques	_YES _NO		_YES _NO		
Lost Vehicle Procedures	_YES _NO		_YES _NO		
Jet Blast Avoidance	_YES _NO		_YES _NO		
Runway Incursion Prevention	_YES _NO		_YES _NO		

Mentor: return completed form to training coordinator.

TRAINING PROGRAM-03 | CHECKLIST AND TEMPLATE

may suggest the need for additional training activities, so trainers should supplement the checklist to meet individual airport needs. The checklist is designed in a template format to allow trainers to tailor the program to individual trainees and track implementation of the mentoring and training activities.

Training Record Database Development Guidance

A training record database can be developed in a spreadsheet program (e.g., Microsoft Excel) or a database program (e.g., Microsoft Access). Suggested items to include in a training record database are as follows:

- List of employee classifications (as relevant to airfield training needs).
- List of training programs, correlated to employee classifications and training frequency requirements.
- List of employees who receive training, correlated to the training programs.
- Record of dates training was provided to each employee for each training program.

In addition to tracking the implementation of training programs administered, a database can be developed to highlight upcoming training session needs and lists of employees or employee

22 Best Practices Manual for Working In or Near Airport Movement Areas

classifications that must participate in the upcoming training sessions. Given the varying complexity of training programs, employee classifications, and employees at U.S. airports of varying sizes and operational characteristics, development of a template database was not feasible; however, the following ideas are offered to help develop a database:

- Ensure consistency of the database by establishing and following consistent nomenclature practices (e.g., employee classification names and training program names).
- Set security restrictions that allow no more than one or two people full administrative rights to update and edit the database. Other database users may be restricted to query rights.
- Fully document the database structure with schematic diagrams and instructions to facilitate future database updates and provide query instructions for database users.
- Partition the database into tables and establish links (i.e., relations) to avoid repetition and strengthen query results.
- Develop recognizable column titles and a unique identifier for each row.
- Maintain backups of the database.
- Have others review and test the database.

Implement Routine, Formal Training Sessions

Routine, formal training sessions educate new workers and re-educate and refresh experienced workers about working safely in and near airport movement areas. Such training sessions are conducted routinely and often involve presentations by trainers, reading materials, videos, and quizzes covering standardized material. Although the material covered in the training sessions at an airport is typically standardized, the material will vary among airports to meet each airport's individual training needs.

To support airport operators in defining or refreshing a training program, Table 5-2 lists tools, training aids, and techniques, along with a brief description of each. A discussion of each item, as well as how an airport operator or trainer may adapt the item or use the provided information, is provided in this section, with references to templates and tools provided on the CD-ROM accompanying this Manual.

Table 5-2. Tools, training aids, and techniques to support routine, formal training.

Tool, Training Aid, or Technique Name	Description
ACRP Project 09-02 Training Video: *Staying Safe on the Airfield*	Training video addressing safety in the airport movement areas.
Quiz for ACRP Project 09-02 Training Video: *Staying Safe on the Airfield*	Quiz template to support the retention of concepts introduced in the training video.
Toolbox Talks	Template to facilitate the development of toolbox talks, a training technique based on a construction industry practice to reinforce safety topics.
Role-play Guidance	Guidance on role-play scenarios to enable a trainee to practice responses to a real-life situation in a safe environment and receive objective feedback from the trainer on performance.
Training Presentation Template	Presentation template in Microsoft PowerPoint that complements the style of the ACRP Project 09-02 Video: *Staying Safe on the Airfield.*
Other Training Videos	Listing of FAA and other industry training videos related to working on and near airport movement areas.

ACRP Project 09-02 Video: *Staying Safe on the Airfield*

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**TRAINING VIDEO**

As part of ACRP Project 09-02, a 45-minute training video, *Staying Safe on the Airfield,* was developed to teach and reinforce best practices for working in or near airport movement areas. The video generally covers the following topics:

- Runway incursion simulation.
- Critical areas of the airfield.
- Lighting, signage, and markings.
- Safety around aircraft.
- Airfield construction activities.
- Complacency, situational awareness, and human factors.
- ATCT familiarization.
- Lost vehicle procedures.

Trainers should supplement this video with discussion that relates the training topics addressed in the video to circumstances at the individual airport.

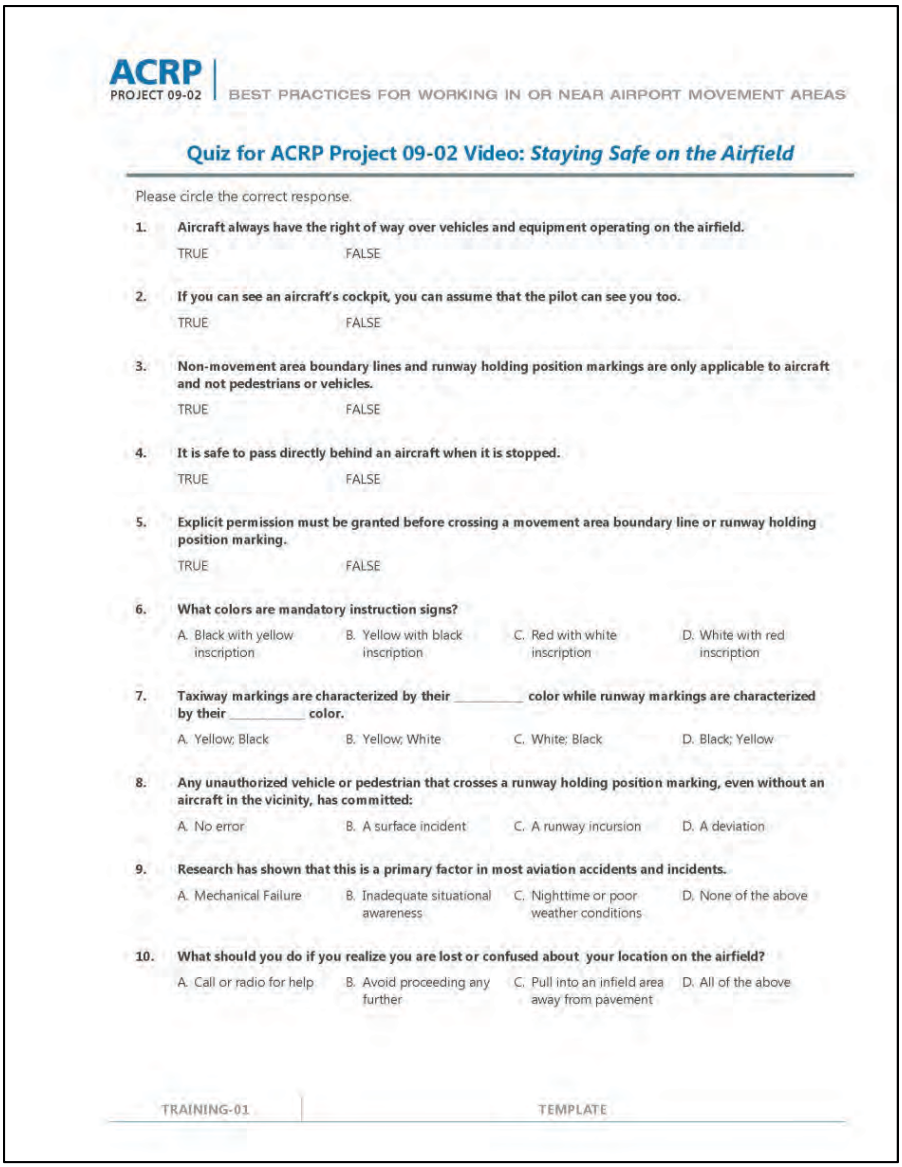
Quiz Template for ACRP Project 09-02 Video: *Staying Safe on the Airfield*

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**TRAINING-01**

To support retention of the concepts addressed in *Staying Safe on the Airfield,* a quiz template was developed with sample questions related to the video. Although sample questions are provided, trainers are encouraged to tailor the quiz to apply the video training concepts to conditions at the individual airport. Trainers may also use the quiz to facilitate discussion during the training session.

The quiz template is designed with a mix of true-false and multiple choice questions in a table format that allows airport operators to add and delete content in the quiz while retaining the general quiz format. If desired, quiz developers can

- Add questions to the quiz by copying and pasting the two table rows associated with either a true-false or multiple choice question.
- Change the mix of true-false and multiple choice responses by copying and pasting the desired response format over the existing response format.



ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Quiz for ACRP Project 09-02 Video: *Staying Safe on the Airfield*

Please circle the correct response.

1. **Aircraft always have the right of way over vehicles and equipment operating on the airfield.**
   TRUE FALSE

2. **If you can see an aircraft's cockpit, you can assume that the pilot can see you too.**
   TRUE FALSE

3. **Non-movement area boundary lines and runway holding position markings are only applicable to aircraft and not pedestrians or vehicles.**
   TRUE FALSE

4. **It is safe to pass directly behind an aircraft when it is stopped.**
   TRUE FALSE

5. **Explicit permission must be granted before crossing a movement area boundary line or runway holding position marking.**
   TRUE FALSE

6. **What colors are mandatory instruction signs?**
   A. Black with yellow inscription B. Yellow with black inscription C. Red with white inscription D. White with red inscription

7. **Taxiway markings are characterized by their _____ color while runway markings are characterized by their _____ color.**
   A. Yellow; Black B. Yellow; White C. White; Black D. Black; Yellow

8. **Any unauthorized vehicle or pedestrian that crosses a runway holding position marking, even without an aircraft in the vicinity, has committed:**
   A. No error B. A surface incident C. A runway incursion D. A deviation

9. **Research has shown that this is a primary factor in most aviation accidents and incidents.**
   A. Mechanical Failure B. Inadequate situational awareness C. Nighttime or poor weather conditions D. None of the above

10. **What should you do if you realize you are lost or confused about your location on the airfield?**
    A. Call or radio for help B. Avoid proceeding any further C. Pull into an infield area away from pavement D. All of the above

TRAINING-01 | TEMPLATE

Toolbox Talks Template

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**TRAINING-02**

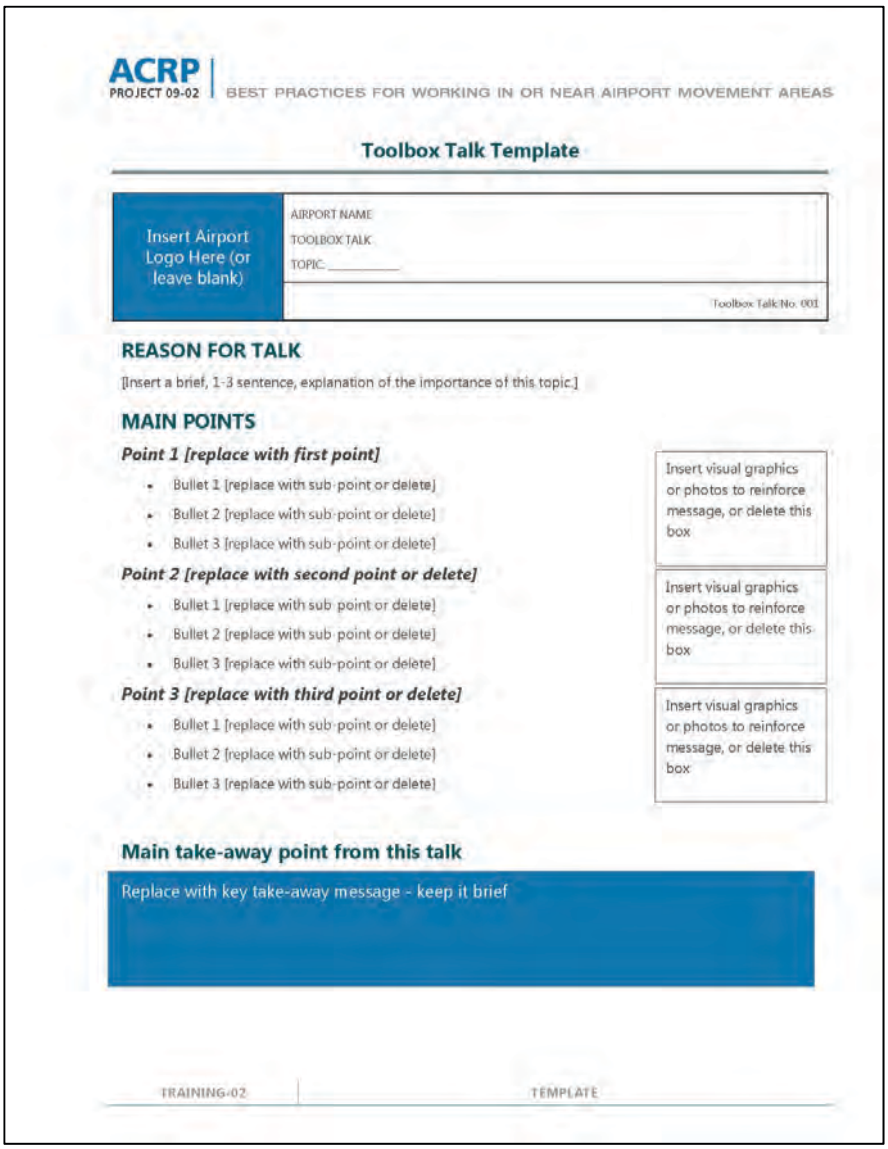
Toolbox talks are a training technique adapted from the construction industry and used to deliver a safety message during workplace activities rather than during a formal training session. A toolbox talk addresses a specific subject with a pointed safety message and is brief (about 5 to 10 minutes). This training technique is intended to regularly raise awareness about safety issues. Attendance at talks is recorded.

A template for developing toolbox talk technical content and an attendance record is on the CD-ROM accompanying this Manual. The level of detail an airport operator provides in the toolbox talk summary can be high level to guide the discussion by outlining key points to be covered, or the toolbox talk summary can be a detailed discussion of a particular issue, which is distributed to attendees following the talk to reinforce the message or serve as reference material.

CASE STUDY

The City of Chicago, Department of Aviation has developed toolbox talks for the following topics, among others:

- Surface Incident Awareness
- Snow Operations – Precautions
- Mandatory Hold Bars
- What If I'm Lost on the Airfield?
- Runway Lighting
- Airport Service Roads
- Foreign Object Debris (FOD)
- Advanced Driver – Human Factors and Situational Awareness
- New Taxiway Construction Setback Distance
- Nonmovement Area Driving
- Construction Vehicles and Equipment on the Airfield



ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Toolbox Talk Template

Insert Airport Logo Here (or leave blank)

AIRPORT NAME

TOOLBOX TALK

TOPIC: _____

Toolbox Talk No. 001

REASON FOR TALK

[Insert a brief, 1-3 sentence, explanation of the importance of this topic.]

MAIN POINTS

Point 1 [replace with first point]

- Bullet 1 [replace with sub-point or delete]
- Bullet 2 [replace with sub-point or delete]
- Bullet 3 [replace with sub-point or delete]

Point 2 [replace with second point or delete]

- Bullet 1 [replace with sub-point or delete]
- Bullet 2 [replace with sub-point or delete]
- Bullet 3 [replace with sub-point or delete]

Point 3 [replace with third point or delete]

- Bullet 1 [replace with sub-point or delete]
- Bullet 2 [replace with sub-point or delete]
- Bullet 3 [replace with sub-point or delete]

Insert visual graphics or photos to reinforce message, or delete this box

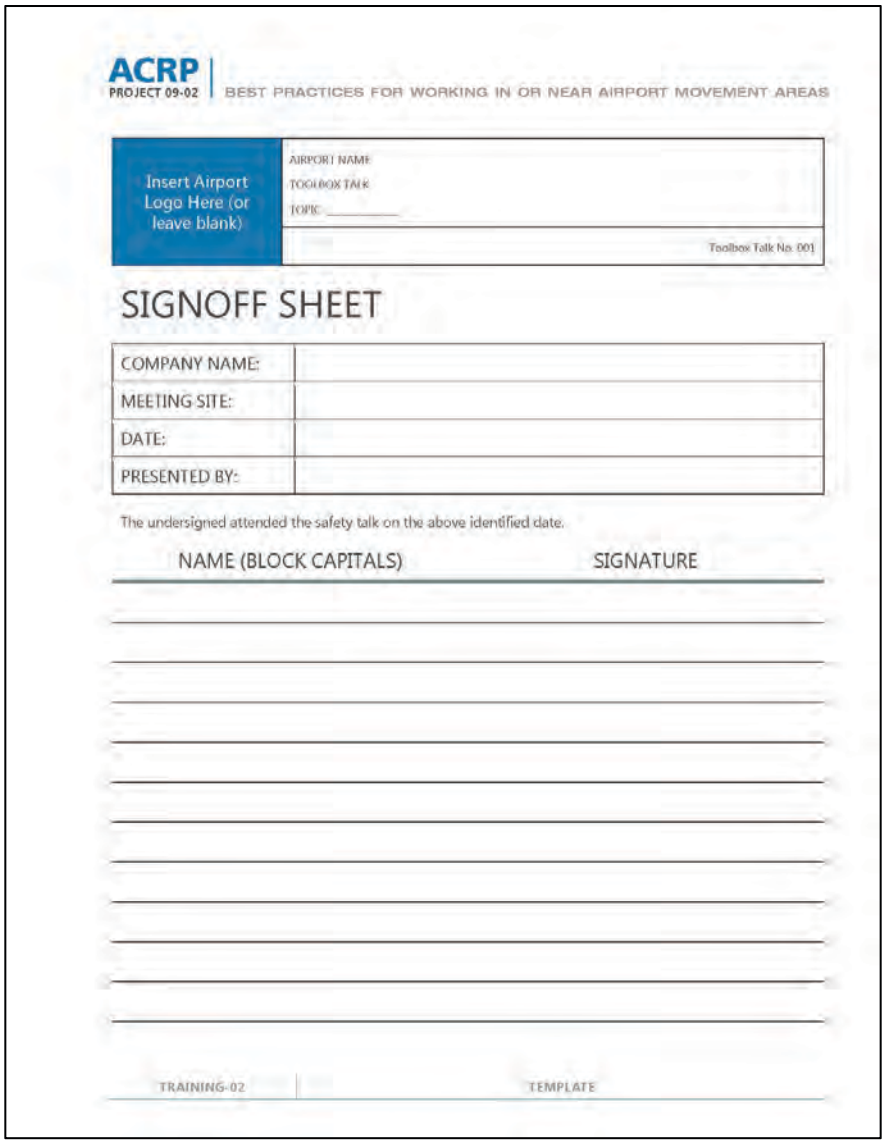
Insert visual graphics or photos to reinforce message, or delete this box

Insert visual graphics or photos to reinforce message, or delete this box

Main take-away point from this talk

Replace with key take-away message - keep it brief

TRAINING-02 | TEMPLATE



ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Insert Airport Logo Here (or leave blank)

AIRPORT NAME
TOOLBOX TALK
TOPIC: _____

Toolbox Talk No. 001

SIGNOFF SHEET

COMPANY NAME:	
MEETING SITE:	
DATE:	
PRESENTED BY:	

The undersigned attended the safety talk on the above identified date.

NAME (BLOCK CAPITALS) SIGNATURE

TRAINING-02 TEMPLATE

Airport operators should define a routine schedule for toolbox talks (e.g., biweekly or monthly) and deliver the toolbox talks during a routine meeting (e.g., a daily briefing).

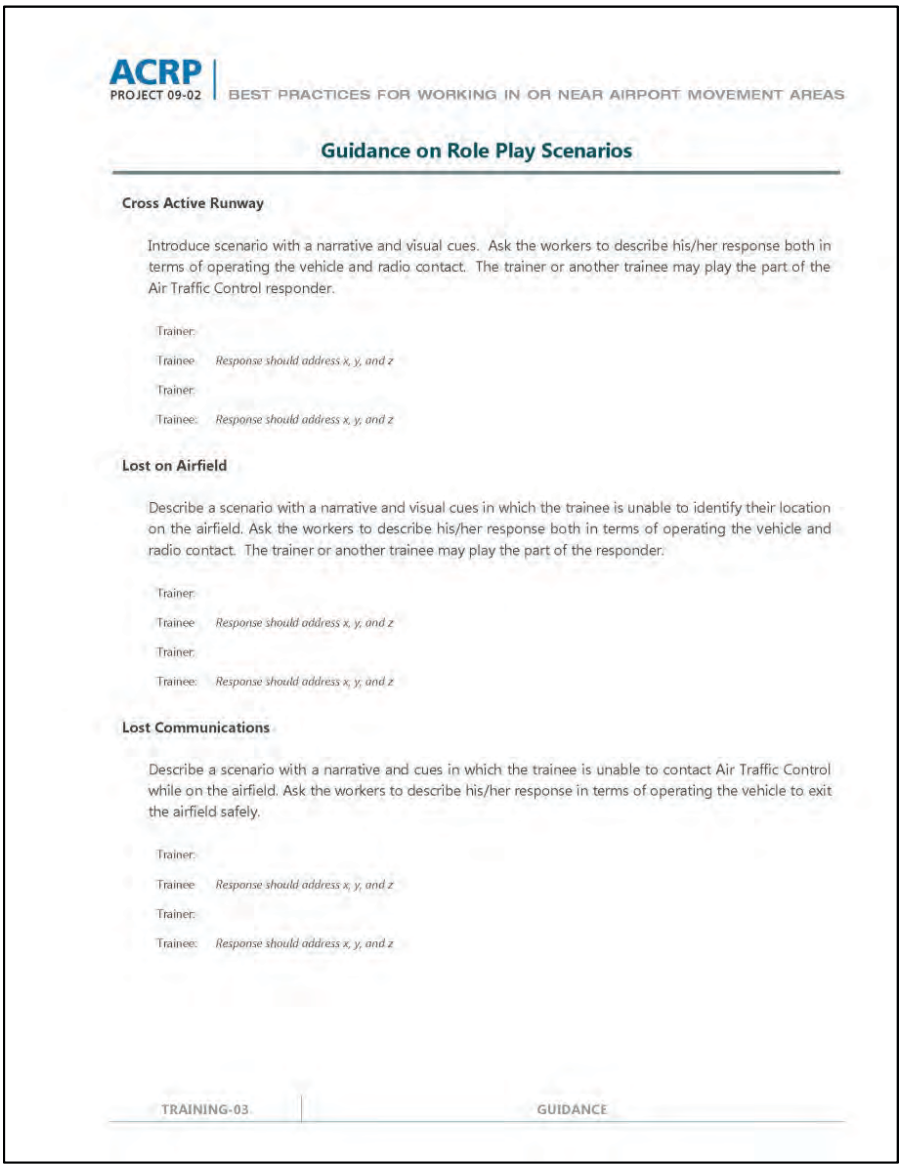
Guidance on Role-Play Scenarios

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**TRAINING-03**

Role playing reinforces training concepts through active participation. The trainee practices responses to a real-life situation in a safe environment and receives objective feedback from the trainer on performance. Active participation in training enriches the learning experience and builds the confidence of those being trained.

Because role playing involves real-life situations, an airport operator should develop a conceptual narrative or dialog that reflects specific airport conditions for one or several role-play scenarios. Several role-play scenarios are outlined in the training guidance and it is recommended that airport operators adapt the discussion and the response expectations to such conditions and likely situations at the individual airport as follows:

- Crossing active runway.
- Lost on airfield.
- Lost communications.
- Disabled vehicle/equipment on the airfield.
- Unusual or unexpected activity on the airfield.
- Stopped aircraft (introducing the potential for unanticipated jet blast impacts).
- Assist a vehicle or aircraft requiring guidance to leave the airfield ("follow-me" support).
- Other.



ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Guidance on Role Play Scenarios

Cross Active Runway

Introduce scenario with a narrative and visual cues. Ask the workers to describe his/her response both in terms of operating the vehicle and radio contact. The trainer or another trainee may play the part of the Air Traffic Control responder.

Trainer:
Trainee: *Response should address x, y, and z*
Trainer:
Trainee: *Response should address x, y, and z*

Lost on Airfield

Describe a scenario with a narrative and visual cues in which the trainee is unable to identify their location on the airfield. Ask the workers to describe his/her response both in terms of operating the vehicle and radio contact. The trainer or another trainee may play the part of the responder.

Trainer:
Trainee: *Response should address x, y, and z*
Trainer:
Trainee: *Response should address x, y, and z*

Lost Communications

Describe a scenario with a narrative and cues in which the trainee is unable to contact Air Traffic Control while on the airfield. Ask the workers to describe his/her response in terms of operating the vehicle to exit the airfield safely.

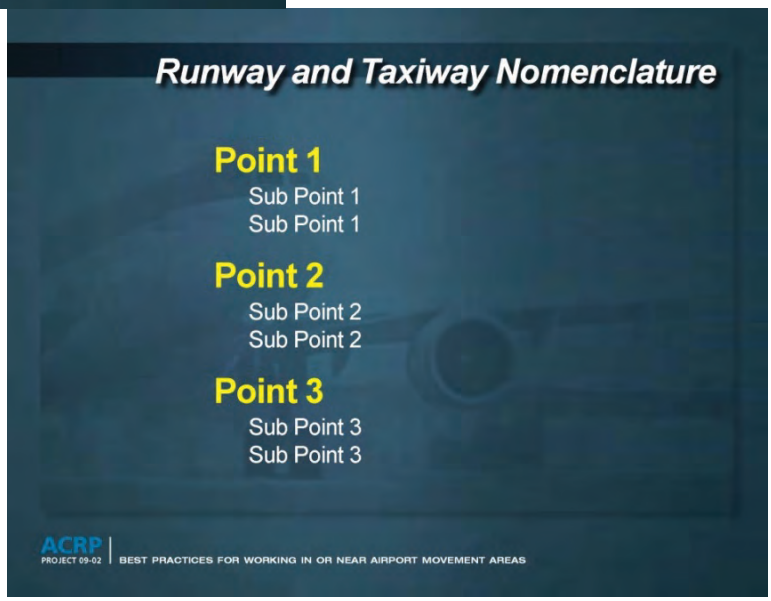
Trainer:
Trainee: *Response should address x, y, and z*
Trainer:
Trainee: *Response should address x, y, and z*

TRAINING-03 GUIDANCE

Training Presentation Template

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**TRAINING-04**

A PowerPoint presentation template was developed that complements the style of the ACRP Project 09-02 Video: *Staying Safe on the Airfield*. For ideas on topics to address in the training



presentation, view the training topics identified on the Training Program Checklist and Template (see TRAINING PROGRAM-01).

Those responsible for developing and delivering training presentations are best able to develop the training content to reflect local conditions and operational practices, so this tool is provided in template form.

Other Training Videos

In addition to the tools, training aids, and techniques developed as part of this research project, the FAA and other industry organizations make training tools and aids available for industry use. Table 5-3 lists several FAA and industry videos available to airport operators as of 2012, and airport operators are encouraged to check for additional materials available since that date as well as contact their local FAA Airports District Office to check on the availability of additional FAA-generated training videos.

Table 5-3. Industry training videos.

			TRAINING Topics					
TITLE	**PRODUCED BY, YEAR**	**AVAILABILITY**	**AIRFIELD FAMILIARIZATION**	**SIGNAGE, MARKINGS, AND LIGHTING**	**DRIVING**	**COMMUNICATIONS**	**SAFETY**	**SECURITY**
Driving on the AOA	FAA, 2001	Online at YouTube	X	X	X	X	X	
Safe Tug and Tow Operations	FAA, 2011	CD ROM	X	X	X	X	X	
Airfield Safety and Incursion Prevention Series	AAAE, 2007	AAAE website	X	X	X	X	X	
FAA Part 139 Operations Required Training Series	AAAE, 2007–2012	AAAE website	X	X	X	X	X	
Nonmovement Area Driver Training	AAAE, 2011	AAAE website	X	X	X			
SIDA Training Series	AAAE, 2010–2012	AAAE website						X
Ramp Safety Series	AAAE, 2009	AAAE website			X		X	
Driver Training at the Nation's Airports Series	AAAE, 2003	AAAE website			X			X
Preventing Runway Incursions	AAAE, 2000	AAAE website		[SUMMARY OF TRAINING VIDEO NOT AVAILABLE]				
Interactive Employee Training (IET) customizable videos	AAAE, n/a	Through AAAE	X	X	X	X	X	X

AAAE = American Association of Airport Executives
AOA = Air Operations Area
FAA = Federal Aviation Administration
n/a = Not Available
SIDA = Secure Identification Display Areas

Table 5-4. Tools, training aids, and techniques to facilitate daily conditions tracking.

Tool, Training Aid, or Technique	Description
Airport Diagram Highlights Checklist	Checklist of permanent and temporary items to annotate on an airport layout plan (ALP) for use as a focal point during daily operations briefings.
Emergency Contact Information Template	Template to note emergency contact information if contact information changes daily.
Airport Diagram Notepad Template	Template for developing an airport diagram notepad for use by airfield workers to note locations of daily activities.
Daily Conditions Notepad or Form Template	Template that captures key information provided in a typical daily briefing.
Vehicle and Equipment Inspection Checklist and Template	Checklist to guide daily vehicle or equipment inspection for safe airfield operating conditions.

Support Dissemination of Daily Conditions Information

Suggested tools, training aids, and techniques to facilitate the delivery and retention of information that changes daily and is typically provided during a daily briefing are listed in Table 5-4.

Airport Diagram Highlights Checklist

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**DAILY-01**

During daily operations briefings of staff working in or near airport movement areas, it is beneficial to use and reference an airport diagram, ALP, aerial photograph, or other representative illustration of airport facilities. This checklist provides a list of items to consider highlighting during daily operations briefings or other similar activities; an airport operator should supplement this checklist, as needed, to highlight other facilities or activities relevant to daily working conditions.

Emergency Contact Information Template

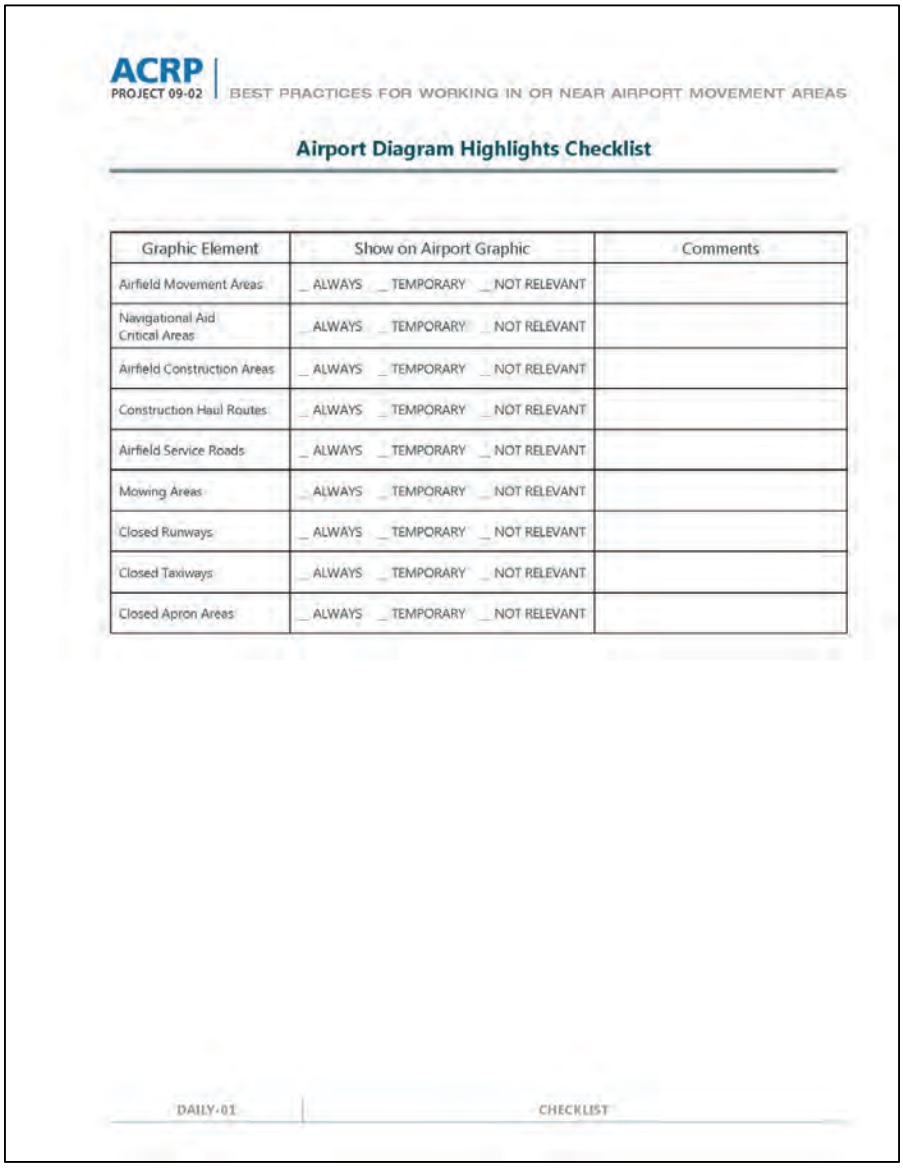
REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**DAILY-02**

For airports at which contact information (for positions such as operations supervisors) changes daily, this template allows airport operators to create a form or notepad for staff use in recording daily emergency contact information. Form production considerations are noted on the template.

Airport Diagram Notepad Template

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**DAILY-03**

Providing airfield workers with a preprinted airport diagram facilitates their ability to note locations of daily activities. Considerations for producing an airport diagram for note-taking are provided on the template.



ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Airport Diagram Highlights Checklist

Graphic Element	Show on Airport Graphic	Comments
Airfield Movement Areas	_ ALWAYS _ TEMPORARY _ NOT RELEVANT	
Navigational Aid Critical Areas	_ ALWAYS _ TEMPORARY _ NOT RELEVANT	
Airfield Construction Areas	_ ALWAYS _ TEMPORARY _ NOT RELEVANT	
Construction Haul Routes	_ ALWAYS _ TEMPORARY _ NOT RELEVANT	
Airfield Service Roads	_ ALWAYS _ TEMPORARY _ NOT RELEVANT	
Mowing Areas	_ ALWAYS _ TEMPORARY _ NOT RELEVANT	
Closed Runways	_ ALWAYS _ TEMPORARY _ NOT RELEVANT	
Closed Taxiways	_ ALWAYS _ TEMPORARY _ NOT RELEVANT	
Closed Apron Areas	_ ALWAYS _ TEMPORARY _ NOT RELEVANT	

DAILY-01 | CHECKLIST

ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Emergency Contact Information Template

If airfield workers are required to note emergency contact information because it changes daily, this template provides a form for airport operators to print that allows airfield workers to note emergency contact information. All or some of the following contacts may be appropriate to list on the emergency contact template:

Airport Operations	Radio Frequencies / Channels Telephone Number
FAA Control Tower	Radio Frequencies / Channels (Ground and Tower) Telephone Number
Emergency	Telephone Number
Airport Maintenance	Radio Frequencies / Channels Telephone Number
Direct Supervisor	Telephone Number

Ideas for distributing this template, either preprinted or as a form for airfield workers to complete, include:

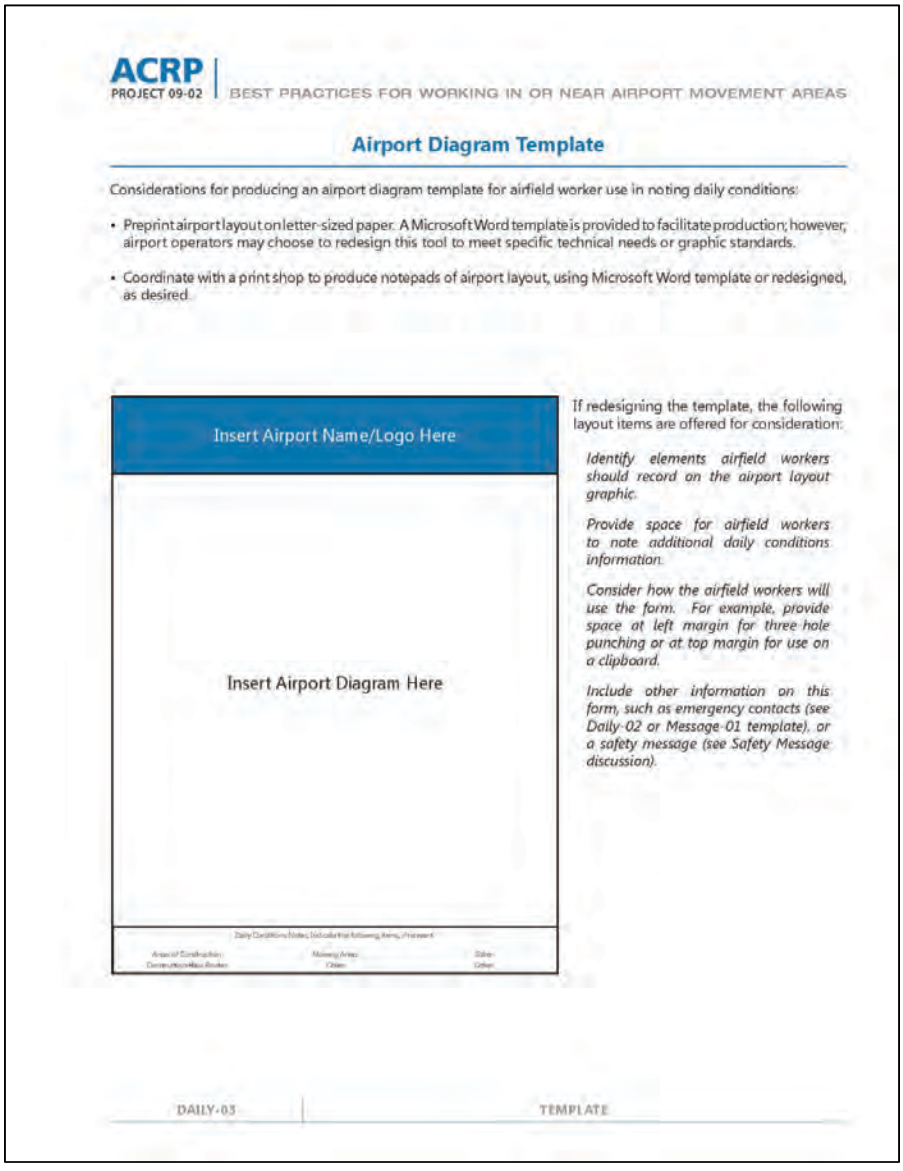
- Produce template on pre-diecut name badge inserts, such as Avery or other similar brand. Inserts can be laser printed and inserted into a badge holder or attached to a lanyard. Consult with those responsible for the badging process on sizing and other requirements.
- Distribute electronic file (e.g., .jpg or .png) that can be assigned to smartphone home screen and lock screens.
- Distribute via email or text blast to airfield workers' smartphones.
- Produce laser printed stickers that can be applied to the daily Airport Diagram Notepad (Daily-03) or other daily handout.

EMERGENCY CONTACTS

INSERT AIRPORT LOGO AND/OR NAME HERE

Name / Title	Phone No./Radio Frequency

DAILY-02 | TEMPLATE



ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Airport Diagram Template

Considerations for producing an airport diagram template for airfield worker use in noting daily conditions:

- Preprint airport layout on letter-sized paper. A Microsoft Word template is provided to facilitate production; however, airport operators may choose to redesign this tool to meet specific technical needs or graphic standards.
- Coordinate with a print shop to produce notepads of airport layout, using Microsoft Word template or redesigned, as desired.

Insert Airport Name/Logo Here

Insert Airport Diagram Here

If redesigning the template, the following layout items are offered for consideration:

Identify elements airfield workers should record on the airport layout graphic.

Provide space for airfield workers to note additional daily conditions information.

Consider how the airfield workers will use the form. For example, provide space at left margin for three hole punching or at top margin for use on a clipboard.

Include other information on this form, such as emergency contacts (see Daily-02 or Message-01 template), or a safety message (see Safety Message discussion).

DAILY-03 | TEMPLATE

34 Best Practices Manual for Working In or Near Airport Movement Areas

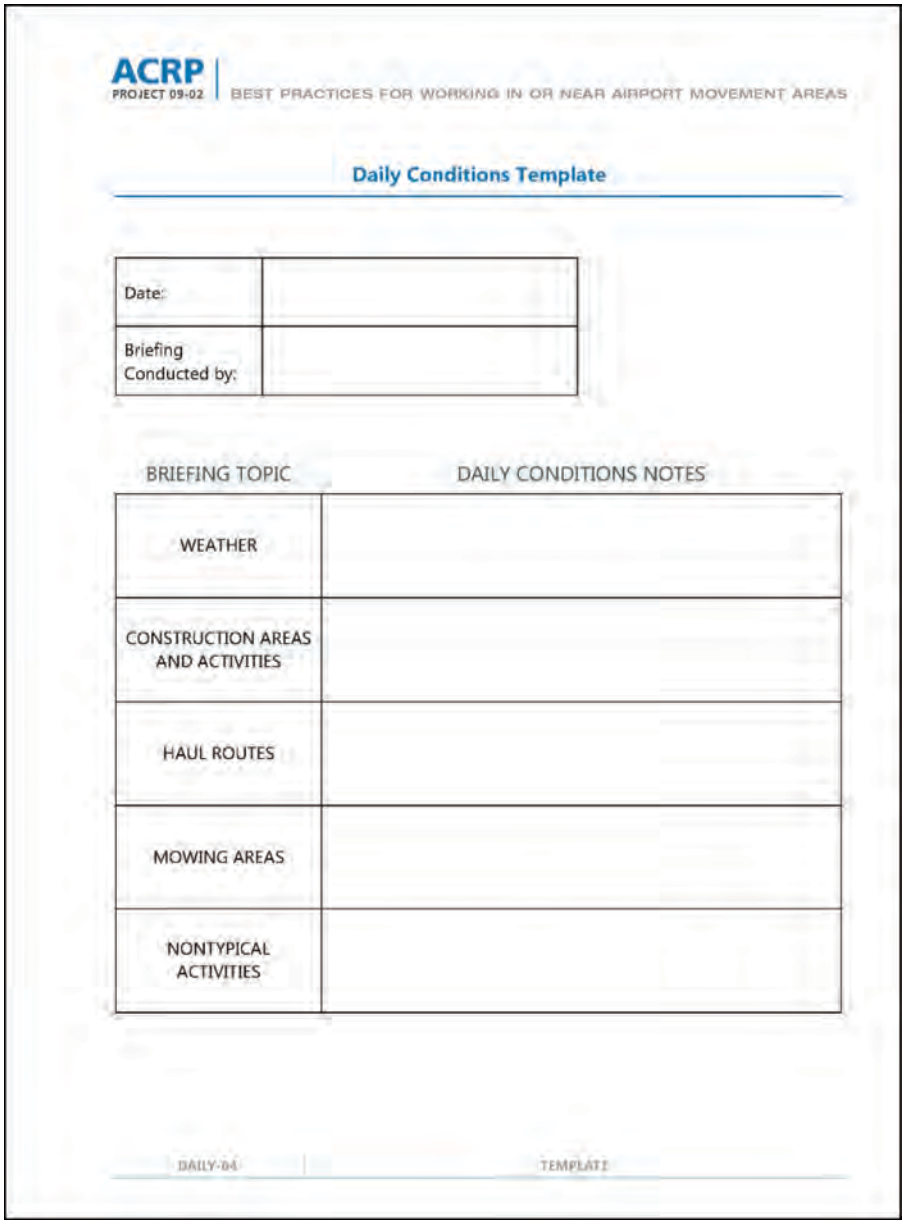
Daily Conditions Notepad or Form Template

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**DAILY-04**

This template provides airfield workers with a consistent format to receive and track daily conditions information during briefings. The template may be used as follows:

- An electronic template to be completed prior to a briefing and then printed and distributed at the briefing; or
- A blank form notepad for airfield workers to note daily conditions received during a briefing.

For use as a blank form notepad, please review notepad printing considerations on the Airport Diagram Notepad Template (see DAILY-03).



ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Daily Conditions Template

Date:	
Briefing Conducted by:	

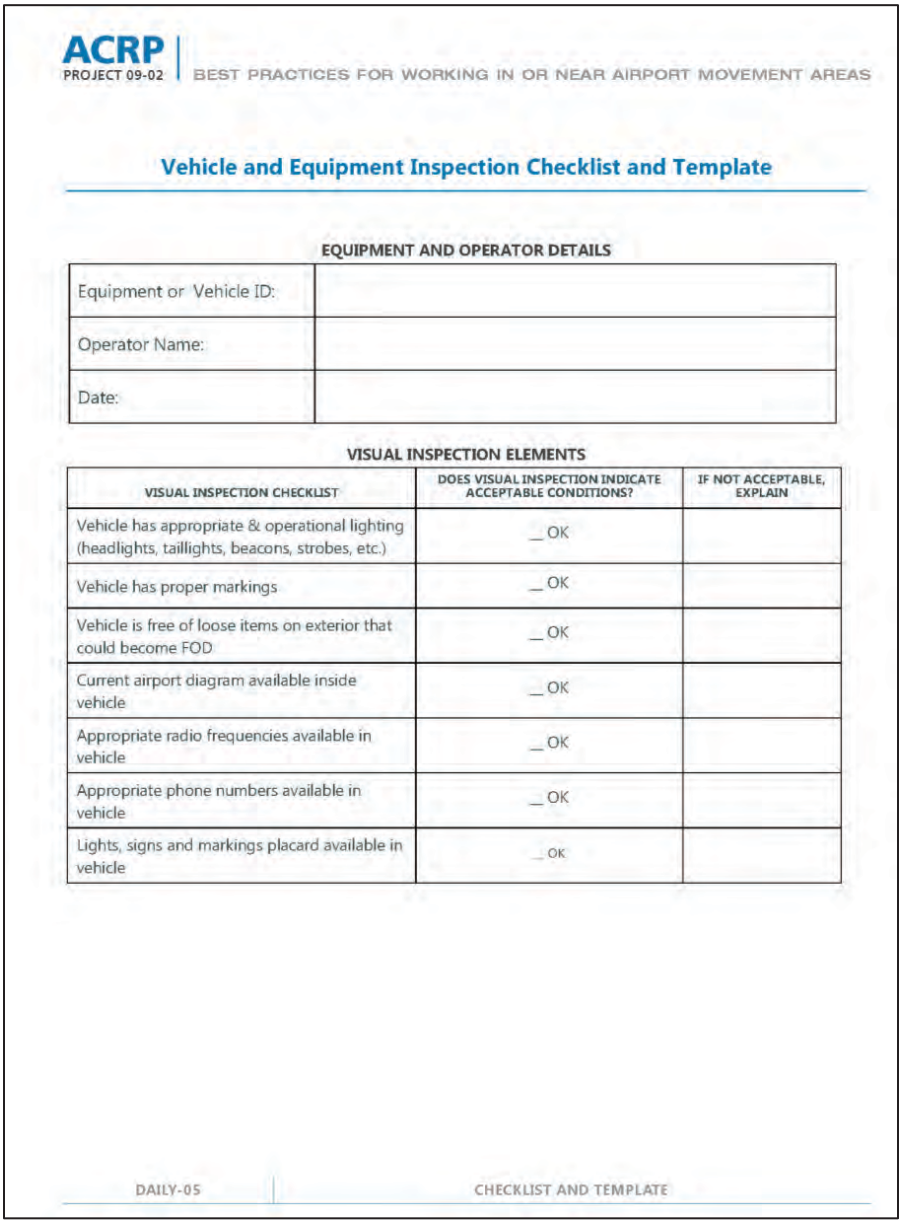
BRIEFING TOPIC	DAILY CONDITIONS NOTES
WEATHER	
CONSTRUCTION AREAS AND ACTIVITIES	
HAUL ROUTES	
MOWING AREAS	
NONTYPICAL ACTIVITIES	

DAILY-04 TEMPLATE

Vehicle and Equipment Inspection Checklist and Template

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**DAILY-05**

This checklist and template is intended for use by vehicle and equipment operators working in or near airport movement areas. The checklist provides a list of items that should be visually inspected daily prior to operating the vehicle or equipment in or near airport movement areas. This checklist is general and should be modified by airport operators to address unique aspects of the vehicles or equipment or of operation at an individual airport. The checklist and template can be used as a reference (consider deleting the "Equipment and Operator Details" section to simplify the form) or as a required paperwork exercise to track completion of daily visual inspections that prompts the completion of both the "Equipment and Operator Details" and the "Visual Inspection Elements" sections.



ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Vehicle and Equipment Inspection Checklist and Template

EQUIPMENT AND OPERATOR DETAILS

Equipment or Vehicle ID:	
Operator Name:	
Date:	

VISUAL INSPECTION ELEMENTS

VISUAL INSPECTION CHECKLIST	DOES VISUAL INSPECTION INDICATE ACCEPTABLE CONDITIONS?	IF NOT ACCEPTABLE, EXPLAIN
Vehicle has appropriate & operational lighting (headlights, taillights, beacons, strobes, etc.)	_ OK	
Vehicle has proper markings	_ OK	
Vehicle is free of loose items on exterior that could become FOD	_ OK	
Current airport diagram available inside vehicle	_ OK	
Appropriate radio frequencies available in vehicle	_ OK	
Appropriate phone numbers available in vehicle	_ OK	
Lights, signs and markings placard available in vehicle	_ OK	

DAILY-05 | CHECKLIST AND TEMPLATE

Table 5-5. Message reinforcement, training aids, and tools.

Aid, Technique, Tool	Description
Emergency Contact Information Template	Template that guides an airport operator in creating an emergency contact reference in a format such as a vehicle dashboard sticker or badge insert.
ICAO Phonetic Alphabet Reference	ICAO phonetic alphabet reference for those working in or near airport movement areas.
Safety Message on Customizable Products	Stylized and modifiable safety message for reproduction on customizable products (e.g., pens, water bottles, stickers, clipboards, posters, and calendars).

Reinforce the Safety Message

In addition to the structured training and practices, it is suggested that airport operators provide ongoing reinforcement of the specific airport's message related to working safely in or near airport movement areas. These message reinforcement tools and aids include references in various adaptable formats, as well as stylized slogans for branding the message on promotional items that workers may use in their daily activities (e.g., on pens, water bottles, and dashboard stickers). Candidate tools and training aids to reinforce the safety message are listed in Table 5-5. The candidate tools and training aids identified in this section may require professional in-house production or vendor production capabilities.

Emergency Contact Information Template

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**MESSAGE-01**

For airports at which emergency contact information does not change frequently, this template enables airport operators to develop a reference sticker or card for airfield workers. The sticker may be placed on a vehicle dashboard. A reference card could be produced for insertion in a badge holder or as an attachment to a lanyard behind a badge. (For airports at which emergency contact information changes frequently, see candidate tools in the discussion of "Support Dissemination of Daily Conditions Information" [see DAILY-02].)

Form production considerations are noted on the template.

ICAO Phonetic Alphabet Reference

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**MESSAGE-02**

An ICAO phonetic alphabet reference card aids in communications related to airfield location. Airport operators may tailor the listing to the specific letters used at the airport. This reference card may be produced for insertion in a badge holder or as an attachment to a lanyard behind a badge.

Safety Message on Customizable Products

REFERENCE FILE ON ACRP PROJECT 09-02 CD-ROM:	**MESSAGE-03**

Stylized safety messages can be developed and used in various media:

- Reproduce on customizable products (e.g., lanyards, pens, water bottles, coffee mugs, stickers, and clipboards).

ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Emergency Contact Information Template

If airfield workers are required to note emergency contact information, this template provides a form for airport operators to print that allows airfield workers to note emergency contact information. All or some of the following contacts may be appropriate to list on the emergency contact template:

Airport Operations	Radio Frequencies / Channels Telephone Number
FAA Control Tower	Radio Frequencies / Channels (Ground and Tower) Telephone Number
Emergency	Telephone Number
Airport Maintenance	Radio Frequencies / Channels Telephone Number
Direct Supervisor	Telephone Number

Ideas for distributing this template include:

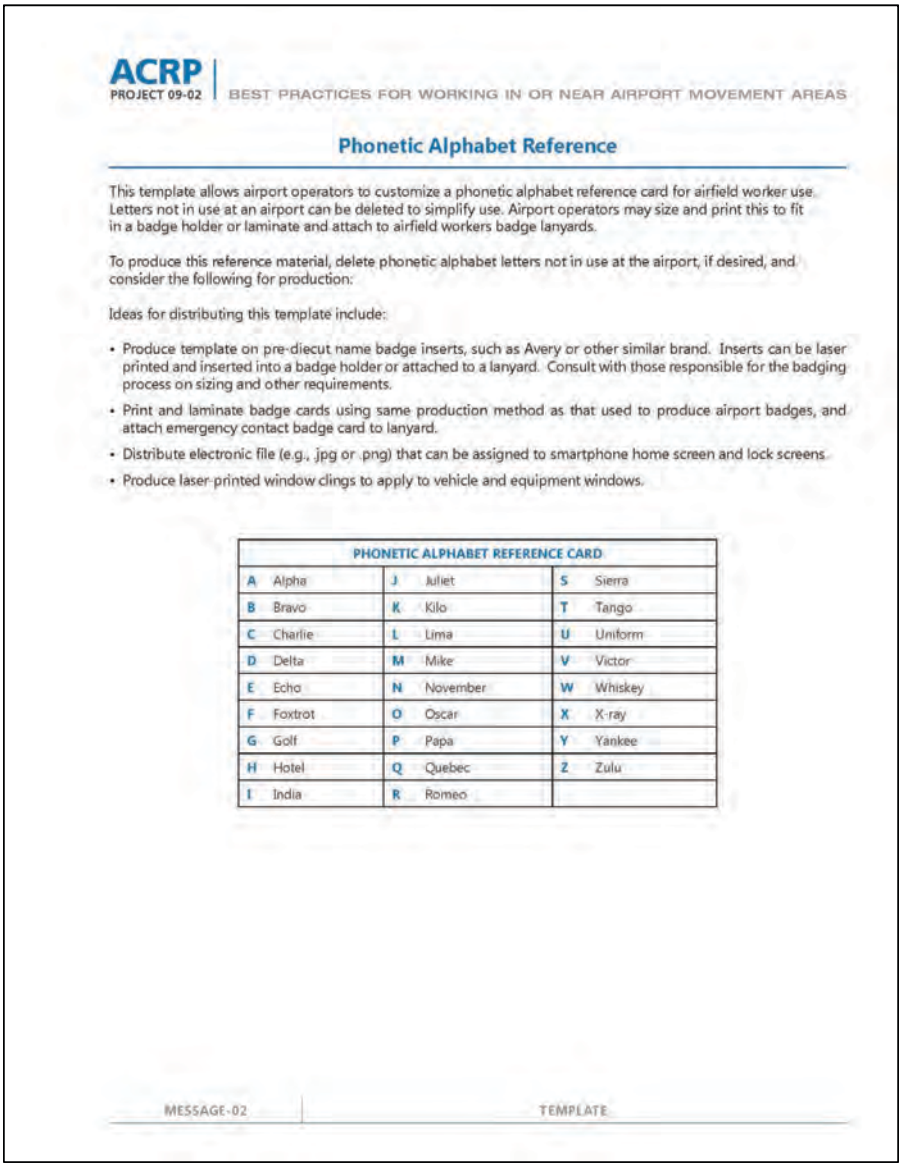
- Produce template on pre-diecut name badge inserts, such as Avery or other similar brand. Inserts can be laser printed and inserted into a badge holder or attached to a lanyard. Consult with those responsible for the badging process on sizing and other requirements.
- Printed and laminated badge cards using same production method as that used to produce airport badges, and attach emergency contact badge card to lanyard.
- Distribute electronic file (e.g., .jpg or .png) that can be assigned to smartphone home screen and lock screens.
- Produce laser-printed window clings to apply to vehicle and equipment windows.

EMERGENCY CONTACTS

INSERT AIRPORT LOGO AND/OR NAME HERE

Name / Title	Phone No./Radio Frequency

MESSAGE-01 TEMPLATE



ACRP PROJECT 09-02 | BEST PRACTICES FOR WORKING IN OR NEAR AIRPORT MOVEMENT AREAS

Phonetic Alphabet Reference

This template allows airport operators to customize a phonetic alphabet reference card for airfield worker use. Letters not in use at an airport can be deleted to simplify use. Airport operators may size and print this to fit in a badge holder or laminate and attach to airfield workers badge lanyards.

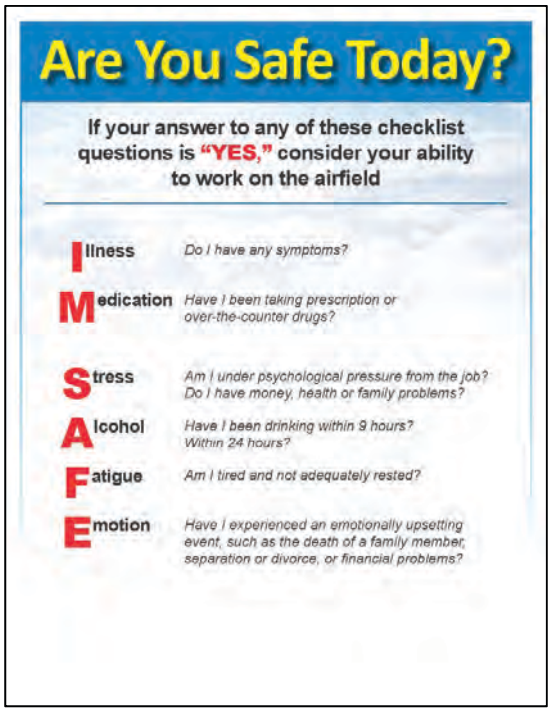
To produce this reference material, delete phonetic alphabet letters not in use at the airport, if desired, and consider the following for production:

Ideas for distributing this template include:

- Produce template on pre-diecut name badge inserts, such as Avery or other similar brand. Inserts can be laser printed and inserted into a badge holder or attached to a lanyard. Consult with those responsible for the badging process on sizing and other requirements.
- Print and laminate badge cards using same production method as that used to produce airport badges, and attach emergency contact badge card to lanyard.
- Distribute electronic file (e.g., .jpg or .png) that can be assigned to smartphone home screen and lock screens.
- Produce laser-printed window clings to apply to vehicle and equipment windows.

PHONETIC ALPHABET REFERENCE CARD		
A Alpha	J Juliet	S Sierra
B Bravo	K Kilo	T Tango
C Charlie	L Lima	U Uniform
D Delta	M Mike	V Victor
E Echo	N November	W Whiskey
F Foxtrot	O Oscar	X X-ray
G Golf	P Papa	Y Yankee
H Hotel	Q Quebec	Z Zulu
I India	R Romeo	

MESSAGE-02 TEMPLATE



- Print posters in house with traditional office printers if sized to letter or tabloid paper size or reproduce by a professional print shop or vendor for professional poster production.
- Distribute an electronic file (e.g., jpg or png) that can be assigned to smartphone home and lock screens.
- Develop and post a calendar in workspaces with monthly safety messages and tips.
- For use during breaks, develop a trivia game that promotes safety messages and reinforces training topics and lessons (e.g., a box of fifty 2-inch by 3-inch cards printed on heavy card-stock with questions on one side and answers on the reverse side).

An "I'M SAFE" poster is included with the ACRP Project 09-02 tools, training aids, and techniques. It is printable as a letter- or tabloid-sized poster and includes space at the bottom for an airport operator to insert a logo, if desired.

In addition to the "I'M SAFE" message, other candidate safety messages for use on customizable products include

- If in doubt, verify!
- If in doubt, verify at __[insert number]__.
- A good safety record does not happen by accident.
- Always take the safest path, never take shortcuts.
- Safety is a state of mind; accidents are an absence of mind.
- Failing to prepare is preparing to fail.
- Get smart! Be safe from the start.
- Be a leader, follow good procedure.
- It's easier to ask a dumb question than it is to fix a dumb mistake.
- Safety doesn't slow down the job, mishaps do.
- Safety rules are there to follow—so take care and we'll see you tomorrow.
- Know safety—no accidents.

References and Bibliography

Air Line Pilots Association International, *White Paper: Runway Incursions, A Call for Action*, March 2007.

This paper provides an analysis of the risk and severity of the runway incursion problem facing the U.S. air transportation system. The paper concludes with a call for action by government and industry to comprehensively address the risk of runway incursions through prompt implementation of all Commercial Aviation Safety Team recommended mitigations.

Airbus, *Flight Operations Briefing Notes, Runway and Surface Operations, Preventing Runway Incursions*, May 2004.

This briefing note discusses runway incursions, their associated contributing factors, and related prevention strategies.

Airport Asphalt Technology Program, *HMA Airport Construction Best Practice Manual*, November 22, 2010.

This webinar provides technical guidance and a comprehensive manual on best construction practices for HMA airport pavements.

ACRP, *ACRP Synthesis of Airport Practice 12: Preventing Vehicle-Aircraft Incidents During Winter Operations and Periods of Low Visibility*, December 18, 2008.

This synthesis examines factors affecting safe winter operations and the prevention of runway incursions by airport snow removal equipment operators.

ACRP, *ACRP Synthesis of Airport Practice 15: Identification of the Requirements and Training to Obtain Driving Privileges on Airfields*, June 22, 2009.

This synthesis explores information on the requirements and training required to obtain driving privileges on airport airfields and the differences and similarities among the various airports throughout the country. The publication also examines information on the types of training programs available to airport employees based on where the employees were authorized to drive.

Airports Council International (ACI), *ACI Airside Safety Handbook*, Third Edition 2006, 2009.

This handbook is a guide to airside safety for airside managers and builds on previous work by ACI—namely the Apron Safety Handbook. The remit of this handbook has been widened to include selected topics relating to safe operations in airside areas.

Airports Council International – North America (ACI-NA), *Movement Area Driver's Best Practices*, August 2011.

This guide of generally recognized best practices can be used to refresh drivers' awareness of issues associated with driving on the movement area.

ACI-NA, *Movement Area Driver's Checklist*, August 2011.

This checklist can be used prior to entering the movement area while in a vehicle.

Aircraft Owners and Pilots Association (AOPA) Air Safety Institute, *Runway Safety*, https://www.aopa.org/asf/osc/loginform.cfm?course=runway_safety&project_code=&. Accessed August 30, 2011.

This website lists various best known practices for airfield safety. Included are best practices for air traffic controllers, pilots, and airport personnel.

Boeing, Challenges to Airport Ramp & Runway Debris Control, October 2010.

This paper provides an analysis of the risk and severity of the runway incursion problem facing the U.S. air transportation system. The paper concludes with a call for action by government and industry to comprehensively address the risk of runway incursions through prompt implementation of all Commercial Aviation Safety Team recommended mitigations.

Eurocontrol, European Action Plan for the Prevention of Runway Incursions, Edition 2.0, April 2011.

This action plan, based on the ICAO standards and recommended practices, is suitable for universal application. These recommendations will enhance runway safety by the consistent and harmonized application of existing ICAO provisions and by improving controller–pilot–vehicle driver communications and working procedures at an aerodrome.

FAA, *AC 120-57A*, Surface Movement Guidance and Control System, December 19, 1996.

This advisory circular describes the standards for and provides guidance in the development of a Surface Movement Guidance and Control System (SMGCS) plan for U.S. airports where scheduled air carriers are authorized to conduct operations when the visibility is less than 1,200 feet runway visual range (RVR). An SMGCS plan facilitates the safe movement of aircraft and vehicles on the airport by establishing more rigorous control procedures and requiring enhanced visual aids.

FAA, *AC 150/5200-28D*, Notices to Airmen (NOTAMS) for Airport Operators, January 28, 2008.

This advisory circular provides guidance on using the NOTAM system for airport condition reporting.

FAA, *AC 150/5200-30C*, Airport Winter Safety and Operations, September 5, 2007.

This advisory circular provides guidance to assist airport operators in developing a snow and ice control plan, conducting and reporting runway friction surveys, and establishing snow removal and control procedures.

FAA, *AC 150/5200-37*, Introduction to Safety Management Systems (SMS) for Airport Operators, February 28, 2007.

This advisory circular introduces the concept of a safety management system (SMS) for airport operators.

FAA, *AC 150/5210-17B*, Programs for Training of Aircraft Rescue and Firefighting Personnel, September 23, 2009.

This advisory circular provides information on courses and reference materials for training of ARFF personnel.

FAA, *AC 150/5210-18A*, Systems for Interactive Training of Airport Personnel, September 29, 2008.

This advisory circular provides guidance in the design of systems for interactive training of airport personnel, eligible for funding under the Airport Improvement Program (AIP) and with Passenger Facility Charge (PFC) revenues.

FAA, *AC 150/5210-20*, Change 1, Ground Vehicle Operation on Airports, March 31, 2008.

This advisory circular contains guidance to airport operators on developing ground vehicle operation training programs.

FAA, *AC 150/5210-21*, Announcement of Availability: Airport Surface Safety Training Programs for Mechanics and Ramp Personnel, September 23, 2003.

This advisory circular announces the availability of two training programs on aircraft taxi procedures and tug and tow procedures and also provides information about how to acquire these programs.

FAA, *AC 150/5210-24*, Airport Foreign Object Debris (FOD) Management, September 30, 2010.

This advisory circular provides guidance for developing and managing an airport FOD program. In addition, this document provides specifications for the equipment used in FOD removal operations. The described program addresses prevention, detection, removal, and evaluation as well as strategies and practices that can help reduce FOD at airports. The guidelines presented in this advisory circular are advisory and can be implemented at the discretion of the airport operator in accordance with the airport operator's approved Airport Certification Manual.

FAA, *AC 150/5210-5D*, Painting, Marking, and Lighting of Vehicles Used on an Airport, April 1, 2010.

This advisory circular provides guidance, specifications, and standards for painting, marking, and lighting of ground vehicles operating in the airport AOA. The approved lights, colors, and markings

described in the advisory circular ensure the conspicuity of vehicles operating in the AOA from both the ground and the air. The advisory circular contains new specifications and recommendations for the painting, marking, and lighting of Towbarless Tow Vehicles.

FAA, *AC 150/5300-13*, Change 15, Airport Design, December 31, 2009.

This advisory circular provides standards and recommendations for airport design.

FAA, *AC 150/5340-18F*, Standards for Airport Sign Systems, August 16, 2010.

This advisory circular contains standards for the siting and installation of signs on airport runways and taxiways, including taxiway ending markers, location signs, runway distance remaining signs, mandatory hold signs associated with POFZ and CAT II/III operations, and many others.

FAA, *AC 150/5340-1K*, Change 1, Standards for Airport Markings, March 22, 2011.

This advisory circular contains the FAA standards for markings used on airport runways, taxiways, and aprons.

FAA, *AC 150/5370-13A*, Off-Peak Construction of Airport Pavements Using Hot-Mix Asphalt, September 29, 2006.

This advisory circular provides guidance for the planning, coordination, management, design, testing, inspection, and execution of off-peak construction of airport pavements using HMA paving materials. It also focuses on HMA airfield pavement construction and applies to other types of airfield improvements where off-peak construction is identified as the preferred delivery method.

FAA, *AC 150/5370-2E*, Operational Safety on Airports during Construction, January 17, 2003.

This advisory circular provides guidance on operational safety on airports—with special emphasis on safety during periods of construction activity—to assist airport operators in complying with Part 139, Certification of Airports.

FAA, Airfield Procedures for Vehicles and Pedestrians, May 2009.

This document describes procedures for vehicles and pedestrians to follow while on or near the airfield movement area.

FAA, Great Lakes Region, Airport Certification Information Bulletin (ACIB), Best Practices for Winter Operations, December 13, 2010.

This ACIB provides best practices for airport operators to use when performing winter operations.

FAA, Great Lakes Region, ACIB, Operational Safety on Airports during Construction, January 3, 2012.

This ACIB provides a brief overview of the new requirements set forth in FAA *AC 150/5370-2F* to maintain operational safety during construction.

FAA, Great Lakes Region, ACIB, Runway Safety Best Practices During Winter Operations, January 4, 2011.

This ACIB provides a best practices poster for airport operators to use when performing snow operations.

FAA, Great Lakes Region, ACIB, Training Frequency: 12 CCM per Subject Area, March 1, 2011.

This ACIB clarifies the requirement that the 12 consecutive calendar month requirement for recurrent training applies to each subject area individually, not a curriculum as a whole.

FAA, Airport Ground Vehicle Operations, An FAA Guide, March 2008.

This guide provides a general overview of safe procedures for driving on an airport.

FAA, *Airport Signs and Marking – Quick Reference Guide*, November 2007.

This guide provides a graphical outline of signs encountered on an airport and their purpose and location/convention.

FAA, *Airport Signs, Markings and Procedures—Your Guide to Avoiding Runway Incursions* (video), date unknown.

This video details the signs, markings, and procedures that vehicle drivers should follow while driving on the AOA.

FAA, *Annual Runway Safety Report 2009*, October 2009.

This report presents the FAA's progress toward performance targets for runway safety. Runway incursion trends are presented to demonstrate the relative contribution of these strategies toward improving runway safety.

FAA, *Annual Runway Safety Report 2010*, September 2010.

This report presents the FAA's progress toward performance targets for runway safety. Runway incursion trends are presented to demonstrate the relative contribution of these strategies toward improving runway safety.

FAA, CertAlert, *Closing Active Runway for FOD Checks Increases Safe Operations*, March 17, 2009.

This CertAlert encourages quick airport action to assessing the threat posed by FOD on or near a runway.

FAA, CertAlert, *Driver Training Simulators*, August 26, 2002.

This CertAlert encourages airport operators to set up driver training programs and simulators on their airports.

FAA, CertAlert, *Personnel and Equipment in the Runway Safety Area*, November 12, 2003.

This CertAlert reinforces the requirements of 14 CFR Part 193.309(b)(4) which states that no object may be located in any safety area, except for objects that must be located in a safety area because of their function.

FAA, CertAlert, *Public Safety Personnel Operating in the Movement Area*, March 30, 2000.

This CertAlert provides recommendations for Public Safety personnel operating in the movement area to reduce runway incursions and surface incidents.

FAA, CertAlert, *Safety During Construction and Reducing Runway Incursions*, July 1, 2009.

This CertAlert (1) reminds airport operators that the summer construction period shows a historical increase in construction-related V/PDs and (2) provides actions airport operators can take to mitigate the risk.

FAA, CertAlert, *Safety Risks for Operating Supertugs (TLTV) in the Movement Area and Air Operations Area (AOA) when Towing Large Air Carrier Aircraft*, November 25, 2008.

This CertAlert provides a checklist for addressing TLTV operations at certificated airports.

FAA, CertAlert, *Stop Runway Incursions & Surface Incidents Now*, April 18, 2006.

This CertAlert provides recommendations and actions for airport operators to review and implement at their airports which may reduce runway incursions and/or surface incidents.

FAA, CertAlert, *Super-tug Operations on Part 139 Airports (All Surfaces)*, July 1, 2008.

This CertAlert recommends certificated airport operators meet with each Part 121 air carrier or contractor using Supertugs to ensure a safety risk management approach is being implemented to address the potential safety concerns posed by the operation of Supertugs.

FAA, CertAlert, *U.S. Government Employees/Contractors Seeking Unescorted Motor Vehicle Access to the Movement Area at a Part 139 Certificated Airport are Required to Meet the Specific Airport's Movement Area Access Requirements*, January 10, 2007.

This CertAlert clarifies the requirement for airport operators certificated under Part 139 to ensure that each U.S. Government employee/contractor seeking unescorted motor vehicle access to the airport movement area completes the airport's movement area drivers training program prior to operating a motor vehicle on the airport movement area.

FAA, CertAlert, *Vehicle Pedestrian Deviation Runway Incursions*, August 10, 2007.

This CertAlert provides recommendations and suggestions that may be useful tools to reduce runway incursions and/or surface incidents.

FAA, Southern Region, CertAlert, *Airfield Self-Inspections*, February 26, 2004.

This CertAlert recommends that airport operators use two individuals per vehicle for airfield self-inspections.

FAA, Southern Region, CertAlert, *AOPA Runway Safety Program*, August 25, 2004.

This CertAlert recommends that airport vehicle operators take the brief AOPA Runway Safety Program course.

FAA, Southern Region, CertAlert, *Beware of Contractors!*, June 15, 2006.

This CertAlert provides recommendations for airport operators to use to enhance safety on the airfield with contractors.

FAA, Southern Region, CertAlert, *Clarification of Training Frequency*, September 23, 2010.

This CertAlert reminds airport operators that each person must receive and document training in all of their required subject areas at least once every 12 consecutive calendar months.

FAA, Southern Region, CertAlert, *FAA Adopts ICAO Definition for Runway Incursions*, November 16, 2007.

This CertAlert informs airport operators that, effective October 1, 2007, the FAA will use the definition for a runway incursion that has been adopted by ICAO.

FAA, Southern Region, CertAlert, *Movement Area Training for FAA Employees*, April 18, 2008.

This CertAlert reminds airport operators that if FAA employees or contractors are working on the movement area of the airport they must undergo drivers training.

FAA, Southern Region, CertAlert, *Runway Incursion: A Construction Lesson Learned, the Hard Way*, September 26, 2002.

This CertAlert reminds airport operators that they must ensure appropriate and effective preventive procedures are established at all points that permit access to the AOA.

FAA, Southern Region, CertAlert, *Spring Means Construction, Air Shows*, April 24, 2009.

This CertAlert provides a checklist for airport operators to use during construction and air shows.

FAA, Southern Region, CertAlert, *V/PD Alert*, October 5, 2011.

This CertAlert provides a checklist for airport operators to utilize to reduce V/PDs.

FAA, *Communications, A Key Component of Safe Surface Operations*, 2nd Edition, September 2005.

This brochure outlines communication procedures for safe surface operations at towered and non-towered airports.

FAA, *Driving on the Airport Operations Area* (video), 2001.

This video details the procedures vehicle drivers should follow while driving on the AOA.

FAA, *Focus on Hotspots, Prevent Runway Incursions*, June 2009.

This brochure describes hotspots, hotspot concerns, and how to issue hotspot notices.

FAA, *Ground Vehicle Guide to Airport Signs & Markings*, July 2009.

This guide provides depictions of signs encountered on an airport and their purpose.

FAA, *Known Best Practices for Airfield Safety*, http://www.faa.gov/airports/runway_safety/bestpractices.cfm. Accessed August 24, 2011.

This website lists various best practices for airfield safety, including best practices for air traffic controllers, pilots, and airport personnel.

FAA, *Reducing Runway Incursions, Driving on the Airport FY 2009*, December 2008.

This brochure provides situation awareness tips and easy steps to avoid runway incursions.

FAA, *Reducing the Potential for Vehicle/Pedestrian Deviations (V/PD) and Runway Incursions*, August 2007.

This PowerPoint presentation emphasizes the importance of taking all possible measures to prevent runway incursions by pedestrians and ground vehicles.

FAA, *Runway Safety – Vehicle Drivers*, http://www.faa.gov/airports/runway_safety/vehicle/. Accessed August 24, 2011.

This website for vehicle drivers is best suited for those personnel operating on the AOA to learn and use tools that help improve safety on the runway. It includes best practices, educational tools and resources, airport diagrams and hot spots, training and instruction, and briefings or meetings held by the Runway Safety Office.

FAA, Runway-Taxiway Construction Best Practices & Lessons Learned, Revision D, May 26, 2011.

This document outlines best practices and lessons learned at airports around the United States regarding construction on or near taxiways and runways.

FAA, *Safe Tug & Tow Operations* (video), April 2011.

This video presents standardized concepts, along with practices and procedures determined to be best practices by the FAA. The video addresses markings, signs and lights; phraseology and communications; typical tug and tow operations; and an FAA-developed review quiz.

ICAO, Annex 13, *Aircraft Accident and Incident Investigation*, July 2001.

ICAO Annex 13 contains the international Standards and Recommended Practices for aircraft accident and incident investigation.

ICAO, Annex 14, *Aerodromes*, Vol. 1, July 2009.

ICAO Annex 14, Volume I, contains Standards and Recommended Practices that prescribe the physical characteristics, obstacle limitation surfaces, and visual aids to be provided at aerodromes, as well as certain facilities and technical services normally provided at an aerodrome.

ICAO, *Document 9137, Airport Services Manual*, Vol. 6, 1983.

This Volume includes information intended to provide guidance on the control of obstacles in the vicinity of an airport. This part of the manual includes information on obstacle surfaces, controlling obstacles at an airport, temporary hazards, obstacle survey, and airport equipment and installations that might constitute obstacles.

ICAO, *Document 9157, Aerodrome Design Manuals*, Vol. 1 (2006), 2 (2005) & 4 (2004).

Volume 1 provides guidance on the geometric design of runways and the aerodrome elements normally associated with runways and discusses runway configuration, runway length, airplane performance parameters affecting runway length, and planning to accommodate future aircraft. Volume 2 contains material on the general layout and description of the design criteria for taxiway physical characteristics, including taxiway fillets, shoulders, and strips, as well as typical apron layouts and their design requirements. Holding bays, dual or multiple taxiways and the advantages and disadvantages of each are discussed. In addition, guidance is given on taxiway fillet design and planning for future aircraft. Volume 4 provides information on the characteristics of visual aids used at airports. Topics include functional requirements of visual ground aids, surface marking and markers, approach lighting systems; light characteristics for precision approach runways and taxiways; runway lead-in lighting systems, runway and taxiway lighting, surface movement guidance and control systems, taxiing guidance signs, and obstacle lighting.

ICAO, *Document 9859, Safety Management Manual*, 2006.

This manual provides detailed guidance on the principles and practices of aviation safety management. It is designed to assist States, aircraft and aerodrome operators, and air traffic services (ATS) providers in implementing the Annex provisions with respect to safety programs and safety management systems.

ICAO, *Document 9870, Manual on the Prevention of Runway Incursions*, 2007.

This manual provides guidance to States, international organizations, aerodrome operators, ATS providers, and aircraft operators on implementing runway safety programs. The manual addresses aspects such as contributory factors, establishing runway incursion prevention programs, recommendations for the prevention of runway incursions, incident reporting and data collection, classification of the severity of runway incursions. The manual includes a compendium of best practices applicable to communications, flight deck, air traffic control, and airside vehicles as well as references to runway safety toolkits.

46 Best Practices Manual for Working In or Near Airport Movement Areas

Transport Canada, National Civil Aviation Safety Committee, Subcommittee on Runway Incursions, Final Report, September 14, 2000.

This report documented the activities of the subcommittee on runway incursions and includes data related to runway incursions and preventive strategies that could be implemented.

United States GAO, Testimony Before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, House of Representatives, FAA Has Increased Efforts to Address Runway Incursions, September 25, 2008.

This statement is based on the GAO's November 2007 report issued to this Subcommittee on runway safety. GAO's work on that report included surveying experts on the causes of runway incidents and accidents and the effectiveness of measures to address them, reviewing safety data, and interviewing agency and industry officials. This statement also contains information from FAA on recent incursions and actions taken since November 2007.

Abbreviations

ACIB	Airport Certification Information Bulletin
ADG	Airplane Design Group
AIP	Airport Improvement Program
ALP	airport layout plan
AOA	air operations area
AOPA	Aircraft Owners and Pilots Association
ARFF	Airport Rescue and Firefighting
ATC	air traffic controller
ATCT	Airport Traffic Control Tower
ATS	Air traffic service
CFR	Code of Federal Regulations
CTAF	Common Traffic Advisory Frequency
EMAS	Engineered Material Arresting System
FBO	fixed-base operator
FOD	Foreign Object Debris
GA	General aviation
GAO	Government Accountability Office
HMA	Hot-mix asphalt
ICAO	International Civil Aviation Organization
IET	Interactive Employee Training
ILS	Instrument Landing System
LEO	law enforcement officer
LIR	Low-Impact Resistant
MLS	Microwave Landing System
NAVAID	Navigational Aid
NOTAM	Notice to Airmen
OCS	Obstacle Clearance Surface
OD	operational deviation
OE	operational error
OFA	Object Free Area
OFZ	Obstacle Free Zone
PAPI	Precision Approach Path Indicator
PD	pilot deviation
PFC	Passenger Facility Charge
PLASI	Pulse Light Approach Slope Indicator
POFZ	Precision Obstacle Free Zone
RPZ	Runway Protection Zone
RSA	Runway Safety Area

RVR	Runway visual range
SIDA	Secure Identification Display Area
SMGCS	Surface Movement Guidance and Control System
SMS	Safety management system
TLTV	Towbarless Tow Vehicle
V/PD	vehicle or pedestrian deviation
VASI	Visual Approach Slope Indicator
VGSI	Visual Glide Slope Indicator
VOR	Very High Frequency Omnidirectional Range

Glossary of Terms

Accident—A collision between one aircraft or vehicle and another aircraft, vehicle, person, or object that results in property damage, personal injury, or death.

Air Carrier Ramp—A ramp for commercial air carriers. Only authorized personnel and vehicles may operate on this ramp. Private vehicles and aircraft are prohibited from operating on it.

Air Operations Area (AOA)—Any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An AOA includes paved or unpaved areas used or intended to be used for the unobstructed movement of aircraft in addition to associated runways, taxiways, and aprons.

Aircraft—A device used or intended to be used for flight in the air.

Aircraft Support Vehicles—Vehicles routinely used in the AOA to support aircraft operations (e.g., aircraft pushback tractors, baggage/cargo tractors or trucks, and air conditioning and aviation fuel trucks). These vehicles are typically owned by airlines, vendors, or contractors.

Airfield—Portions of an airport, excluding both the terminal aircraft apron and cargo aircraft apron, provided for landing, taking off, and taxiing of aircraft.

Airfield Service Vehicles—Vehicles routinely used in the AOA for airfield service, maintenance, or construction (e.g., snow blowers, snowplows, maintenance trucks, and tractors).

Airport Emergency Vehicles—Vehicles authorized in the AOA for emergency purposes (e.g., ambulances, ARFF vehicles, and emergency response vehicles) as authorized by the airport traffic control tower (ATCT) or an authorized onsite accident/incident commander.

Airport Layout Plan (ALP)—A graphical plan of an airport showing the layout of existing and proposed airport facilities.

Airport Operations Vehicles—Vehicles routinely used by airport operations personnel for airport inspection and duties associated with airfield operations (e.g., airfield condition reporting and incident command) on the AOA and movement area.

Airport Rescue and Firefighting (ARFF)—A special category of firefighting that involves response, hazard mitigation, and evacuation and possible rescue of passengers and crew of an aircraft involved in an airport ground emergency.

Airport Security Vehicles—Vehicles authorized in the AOA for security purposes, as needed (e.g., police cars).

Airport Traffic Control Tower (ATCT)—A service operated by an appropriate authority to promote the safe, orderly, and expeditious flow of air traffic.

Airside—Those areas of an airport that support aircraft activities.

Apron or Ramp—A defined area on an airport or heliport intended to accommodate aircraft for the purposes of parking, loading and unloading passengers or cargo, refueling, or maintenance.

Boundary Signs—Boundary signs are used to identify the location of the boundary of the Runway Safety Area (RSA)/Obstacle Free Zones (OFZ) or Instrument Landing System (ILS) critical area for a pilot exiting the runway. The sign has a black inscription on a yellow background.

Certificated Airport—An airport that has been issued an Airport Operating Certificate by the FAA under the authority of 14 CFR Part 139, Certification and Operation: Land Airports Serving Certain Air Carriers, or its subsequent revisions.

Clean-as-you-go—The practice of cleaning one's surroundings before, during, and after a shift, especially when working with items that may become FOD.

Common Traffic Advisory Frequency (CTAF)—Radio frequency designed for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating ATCT or when the tower is closed. The CTAF may be a UNICOM, MULTICOM, FSS, or tower frequency and is identified in appropriate aeronautical publications.

Construction—The presence and movement of construction-related personnel, equipment, and materials in any location that could infringe on the movement of aircraft.

Destination Signs—A destination sign has a black inscription on a yellow background and always contains an arrow. These signs indicate the general direction to a remote location.

Direction Signs—A direction sign has a black inscription on a yellow background and always contains arrows. The signs indicate directions of taxiways leading out of an intersection. The signs may also be used to indicate a taxiway exit from a runway.

Displaced Threshold—A threshold at a point on the runway other than the designated beginning of the runway.

FAA Form 7460-1, Notice of Proposed Construction or Alteration—The form submitted to the FAA Regional Air Traffic or Airports Division Office as formal written notification of any kind of construction or alteration of objects that affect navigable airspace, as defined in 14 CFR Part 77, Objects Affecting Navigable Airspace.

Fixed-Base Operator (FBO)—A person, firm, or organization engaged in a business that provides a range of basic services to general aviation. Services may include the sale and dispensing of fuel, line services, aircraft parking and tie-down, pilot and passenger facilities, airframe and power plant maintenance, aircraft sales and rental, and pilot instruction.

Fixed by Function NAVAID—An air navigation aid that must be positioned in a particular location to provide an essential benefit for civil aviation is fixed by function.

Exceptions are as follows:

1. Equipment shelters, junction boxes, transformers, and other appurtenances that support a fixed by function NAVAID are not fixed by function, unless operational requirements require them to be located close to the NAVAID.
2. Some NAVAIDs, such as localizers, can provide beneficial performance even when they are not located at their optimal location. These NAVAIDs are not fixed by function.

Foreign Object Debris (FOD)—Any object, live or not, located in an inappropriate location in the airport environment that can injure airport or air carrier personnel and damage aircraft. NOTE: The FAA is cooperating with international aviation organizations to develop a standard,

international definition of FOD. If, and when, such a definition is developed and adopted by the ICAO, that definition will take precedence.

Foreign Object Debris (FOD) Damage—Any damage attributed to a foreign object that can be expressed in physical or economic terms and that may or may not downgrade the product's safety or performance characteristics.

Frangible Navigational Aid—A NAVAID that retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields so as to present the minimum hazard to aircraft. The term NAVAID includes electrical and visual air navigational aids, lights, signs, and associated supporting equipment.

General Aviation (GA)—That portion of civil aviation that encompasses all facets of aviation except air carriers holding a certificate of public convenience and necessity.

Ground Vehicle—All conveyances, except aircraft, used on the ground to transport persons, cargo, fuel, or equipment.

Hazard—A condition, object, or activity that can cause damage, loss, or injury.

Hazard to Air Navigation—An object which, as a result of an aeronautical study, the FAA determines will have a substantial adverse effect on the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities, or existing or potential airport capacity.

Incursion—Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft. Incursions are classified as follows:

An operational error (OE) is an action of an air traffic controller (ATC) that results in

1. Less than the required minimum separation between two or more aircraft, or between an aircraft and obstacles (e.g., vehicles, equipment, and personnel on runways).
2. An aircraft landing or departing on a runway closed to aircraft.

An operational deviation (OD) is an occurrence attributable to an element of the air traffic system in which applicable separation minima were maintained, but an aircraft, vehicle, equipment, or personnel encroached on a landing area that was delegated to another position of operation without prior coordination and approval.

A pilot deviation (PD) is an action of a pilot that violates any Federal Aviation Regulation. For example, a pilot fails to obey air traffic control instructions to not cross an active runway when following the authorized route to an airport gate.

A vehicle or pedestrian deviation (V/PD) includes pedestrians, vehicles, or other objects interfering with aircraft operations by entering or moving on the movement area without authorization from air traffic control. This runway incursion type includes mechanics taxiing aircraft for maintenance or gate re-positioning.

Information Signs—These signs are installed on the airside of an airport and provide information other than mandatory holding positions, taxiway guidance, and runway distance remaining signs. An information sign has a black inscription on a yellow background.

Instrument Landing System (ILS) Critical Area—An area provided to protect the signals of the localizer and glideslope.

These include the

1. Localizer Critical Area
2. Glideslope Critical Area

Jet Blast—Jet engine exhaust or propeller wash (thrust stream turbulence).

Law Enforcement Officer (LEO)—Any person vested with police power of arrest under Federal, state, county, or city authority and identifiable by uniform, badge, and other indication of authority.

Light Gun—A hand-held, directional light-signaling device that emits a bright narrow beam of white, green, or red light, as selected by the tower controller. The color and type of light transmitted can be used to approve or disapprove anticipated pilot or vehicle actions where radio communication is not available. The light gun is used for controlling traffic operating in the vicinity of the airport and on the airport movement area.

Location Signs—These signs identify the taxiway or runway on which the aircraft is located. The sign has a yellow inscription with a yellow border on a black background. The yellow border must be set in from inner edge of the sign to yield a continuous black margin.

Low-Impact Resistant (LIR) Structure—Structural supports designed to resist operational and environmental static loads and to fail when subjected to a shock load such as that from a colliding aircraft.

Mandatory Instruction Signs—A mandatory instruction sign has a white inscription (legend) with a black outline on a red background. They denote taxiway/runway intersections, runway/runway intersections, ILS critical areas, POFZ boundaries, runway approach areas, CAT II/III operations areas, military landing zones, and no entry areas.

Movement Area—The runways, taxiways, and other areas of an airport/heliport that are used for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports/heliports with an operating ATCT, specific approval for entry onto the movement area must be obtained from ATC.

Navigational Aid (NAVAID)—A device or system (e.g., radar beacon) that provides a navigator or pilot with navigational data.

Nonmovement Areas—Taxiways, aprons, and other areas not under the control of air traffic or at airports without an operating ATCT.

Nonprecision Runway—A runway end having an instrument approach procedure that provides course guidance without vertical path guidance.

Notice to Airmen (NOTAM)—Used to provide timely information or conditions essential to flight operations.

Object—Includes, but is not limited to, aboveground structures, NAVAIDS, people, equipment, vehicles, natural growth, terrain, and parked aircraft.

Object Free Area (OFA)—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 OFA for air navigation or aircraft ground maneuvering purposes.

Obstacle Clearance Surface (OCS)—An inclined obstacle evaluation surface associated with a glidepath. The separation between this surface and the glidepath angle at any given distance from GPI defines the MINIMUM required obstruction clearance at that point.

Obstacle Free Zone (OFZ)—The airspace below 150 feet (45 m) above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of

their function, in order to provide clearance protection for aircraft landing or taking off from the runway and for missed approaches.

Obstruction to Air Navigation—An object of greater height than any of the heights or surfaces presented in Subpart C of Title 14 Code of Federal Regulation (14 CFR), Part 77, *Objects Affecting Navigable Airspace.*

Operator—Any person in actual physical control of an aircraft or a motor vehicle.

Other Vehicles—Vehicles not routinely authorized in the AOA (e.g., construction vehicles). These vehicles are typically owned by airlines, vendors, or contractors.

Owner—A person who holds the legal title of an aircraft or a motor vehicle.

Precision Runway—A runway end having an instrument approach procedure that provides course and vertical path guidance conforming to ILS or Microwave Landing System (MLS) precision approach standards in ICAO Annex 10, Compliance Statement, Aeronautical Telecommunications.

Primary Runway—A runway expected to be used under the existing atmospheric and storm event conditions where most of the takeoff and landing operations will take place.

Reduced Visibility—Prevailing visibility is less than one statute mile (1609 meters) and/or the runway visual range (RVR) is less than 6,000 feet (1830 meters).

Restricted Areas—Areas of the airport posted to prohibit or limit entry or access by the general public. All areas other than public areas.

Runway—A defined rectangular area on an airport prepared for the landing and takeoff run of aircraft along its length.

Runway in Use or Active Runway—Any runway or runways currently being used for takeoff or landing. When multiple runways are used, they are all considered active runways.

Runway Protection Zone (RPZ)—An area off the runway end to enhance the protection of people and property on the ground.

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.

Runway Visual Range (RVR)—A system that uses transmissometers or forward scatter meters to provide runway visibility information to the pilot for landing or takeoff purposes.

Secondary Runway—A runway that supports a primary runway. Takeoff and landing operations on such a runway are generally less frequent than on a primary runway.

Shoulder—An area adjacent to the edge of paved runways, taxiways, or aprons providing (1) a transition between the pavement and the adjacent surface; (2) support for aircraft running off the pavement; (3) enhanced drainage; and (4) blast protection.

Surface Movement Guidance and Control System (SMGCS)—A system comprising the provisions for guidance to, and control or regulation of, all aircraft, ground vehicles, and personnel of the airport during low-visibility operations. Guidance relates to facilities and information necessary for pilots and ground vehicle operators to find their way about the airport. Control or regulation means the measures necessary to prevent collisions and to ensure that traffic flows smoothly and efficiently.

Taxilane—The portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

Taxiway—Those parts of the airside designated for the surface maneuvering of aircraft to and from the runways and aircraft parking areas.

Taxiway Safety Area—A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

Threshold—The beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced.

Tie-Down Area—An area used for securing aircraft to the ground.

Towbarless Tow Vehicle (TLTV)—A type of aircraft support vehicle whose main purpose is to tow aircraft in the AOA by way of nose gear capture.

Uncontrolled Airport—An airport without an operating ATCT or when ATCT is not operating.

UNICOM—A non-Federal communication facility that may provide airport information at certain airports. Locations and frequencies of UNICOMs are shown on aeronautical charts and publications.

Vehicle—All conveyances, except aircraft, used on the ground to transport persons, cargo, or equipment, or those conveyances required for maintenance, construction, service, and security duties.

Vehicle Roadway Signs—Located on the airfield and intended solely for vehicle operators.

Vehicle Service Road—A designated roadway for vehicles in a nonmovement area.

Very High Frequency Omnidirectional Range (VOR)—A ground-based electronic NAVAID transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the National Airspace System.

Visual Glide Slope Indicator (VGSI)—This device provides a visual glide slope indicator to landing pilots. These systems include

1. Precision Approach Path Indicators (PAPIs),
2. Visual Approach Slope Indicators (VASIs), and
3. Pulse Light Approach Slope Indicators (PLASIs).

Visual Runway—A runway without an existing or planned straight-in instrument approach procedure.

Wake Turbulence—Phenomena resulting from the passage of an aircraft through the atmosphere. Phenomena include vortices, thrust stream turbulence, jet blast, jet wash, propeller wash, and rotor wash both on the ground and in the air.

Abbreviations and acronyms used without definitions in TRB publications:

A4A	Airlines for America
AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
MAP-21	Moving Ahead for Progress in the 21st Century Act (2012)
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation