Testimony of James M. Crites

Executive Vice President of Operations

Dallas / Fort Worth International Airport

Before the Subcommittee on Aviation

Committee on Transportation and Infrastructure

U.S. House of Representatives

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Chairman Costello, Ranking Member Petri and members of the House Transportation and Infrastructure Subcommittee on Aviation, thank you for inviting me to participate in this hearing. I am James M. Crites, the Executive Vice President of Operations for Dallas/Fort Worth International Airport, the third busiest airport in the world in terms of flight operations, making use of seven runways to ensure sufficient capacity and safe flight.

I am also proud to serve as the Aviation Group Chair for the Transportation Research Board, one of the National Academies of Sciences. As part of my chairmanship duties, I also serve on the Airport Cooperative Research Program Oversight Committee which is providing real world solutions to present day issues facing airport operators of all size airports. I am sincerely grateful for your empowerment of, and continued commitment to, this important research program.

I greatly appreciate this subcommittee's leadership for holding this hearing on runway safety as it provides an opportunity for major aviation stakeholders to share with you the progress we are making in this most important endeavor, as well as providing an opportunity for us to collaboratively explore the challenges that still face us as a community, thus enabling us to identify new approaches for achieving safer flight.

Enhanced Communication, Collaboration and Coordination of Airports, Airlines, Pilots, Air Traffic Controllers, FAA and Aviation Stakeholders to Improve Runway Safety

I would first like to echo the remarks of my colleague, John K. Duval, Airport Safety and Security Coordinator, at the Beverly Municipal Airport, who testified before this committee during your February 13, 2008 hearing. He stated that, "there is no easy fix and no magic bullet to improving runway safety and reducing runway incursions. As in security, runway safety must be a multi-layered approach with numerous checks and balances. Airports, airlines, FAA and industry must continue to work together to make safety improvement." I believe

he provided keen insight into both the challenge we face and approach to addressing the challenge. I would also offer that I have experienced more communication, collaboration and coordination of activities across all aviation stakeholder communities now than I have seen in my prior twenty years in this industry, and I believe it is bearing significant fruit. I would now like to provide you with additional information for your consideration.

The Challenge Posed by Runway Crossings: Runway crossings are probably the most complicated activity for air traffic controllers, pilots and drivers of ground vehicles to collaboratively and safely execute. This is primarily due to the communications challenges posed by the number of parties whose activities must be coordinated in order to affect a runway crossing. This is also due to the high volume and tempo of other runway operations that are occurring simultaneously on the same runway where a crossing is taking place, namely high speed runway arrival and departure operations.

Furthermore, as the tempo of operations builds, so does the volume and rate of communications and complexity of conducting a runway crossing. As such, aviation stakeholders have worked to enhance situational awareness as well as reducing communications and complexity through a number of runway safety initiatives.

Situational Awareness: Situational awareness, as it relates to knowing one's current location, is critical to all parties involved in a runway crossing. As such, the enhanced visual references called for by the FAA in their Advisory Circular of 2005, and extended to all Part 139 airports as recommended by the NTSB, has been well received by the entire aviation community. This approach is proving beneficial as it addresses the needs expressed by pilots for enhanced signage visibility and consistency across airports of all sizes and complexity.

Situational awareness also refers to knowing the status of active runways. The FAA's successful testing of Runway Status Lights at both DFW and San Diego International Airport represents a marked improvement in runway status as it provides a real-time visual reference for pilots, air traffic controllers and vehicle drivers. The status lights provide the current status of the runway, that is, whether it is safe to make use of the runway for either an aircraft departure or a runway crossing. I find it best to think of this system as a traffic light for runways which provides clear, simple to understand, real-time visual situational awareness that is having an immediate positive effect on runway safety. Although Air Traffic Controller clearance of an operation is still required prior to performing any activity, the runway status system serves as a significant, additional layer of safety.

This technology is a clear demonstration that the FAA and aviation industry have crossed a threshold of technological capability whereby both airborne and surface navigation systems can be integrated to provide solutions to highly complex situations. Together, the FAA and industry are developing the capability to leverage existing systems to provide solutions to long standing safety and capacity issues. Specifically, this system works on the concept of "data fusion" whereby aircraft transponder data is combined and analyzed with Airport Surveillance Radar 9 (ASR-9) and Airport Surface Detection Equipment – X (frequency) band (ASDE-X) to automatically control the runway status lights. This sounds quite complicated, and it is.

We believe that the Runway Status Light System commissioned by the FAA in 2006 prevented two runway incursions at DFW in that year alone. The system has won high praise from the entire aviation community, and we are grateful that expedited deployment of the system by the FAA is being pursued.

Reducing Communications and Complexity: Runway crossings also impact the overall arrival and departure capacity of an airport. This is due to the need to create additional separation in the aircraft arrival or departure stream to allow time for aircraft to safely cross a runway. This is extremely challenging at airports reaching the limits of their peak arrival and departure capacity, where more and more aircraft need to be communicated with and coordinated. This is further complicated when available airspace capacity is already consumed by the high volume of aircraft demand. The increased separation between aircraft results in reduced arrival rates and departure rates at the airport, as well as creating a more complex operating environment for both pilots and air traffic controllers.

Perimeter/End-Around Taxiways are now being constructed at high operational tempo airports in an effort to reduce the likelihood of runway incursion. These taxiways also have the additional benefit of regaining the peak operating capacity of both the airfield and the airspace.

DFW, along with the FAA, NASA, as well as pilots and air traffic controllers, conducted human-in-the-loop simulations at the NASA Ames Research Center in 2001. The demonstration test identified a 27% reduction in air traffic controller and pilot communication as well as a 30% increase in the overall capacity of the airport resulting in a 2 minute per operation reduction in overall taxi time. In short, perimeter taxiways reduced communications and complexity while providing consistent operating flows resulting in enhanced safety as well as capacity and efficiency.

The Hartsfield-Jackson Atlanta International Airport, the world's busiest airport, installed an end-around taxiway in 2007. The FAA indicates that the new taxiway is "expected to eliminate an average of 700 runway crossings per day…." Aviation officials expect that the taxiway will also save the airlines at least $27 million per year.

At DFW, we will be commissioning and placing into operation our first of four perimeter taxiways this November. The first perimeter taxiway is estimated to eliminate between 750 to 1,000 runway crossings per day during south flow operations with the entire project eliminating as many as 1,500 runway crossings per day for all runway configurations. In addition, the taxiways, when fully built out, are expected to save airline operating costs of approximately $100 million per year through increased efficiency. Finally, perimeter taxiways will significantly reduce aircraft emissions; approximately 1.6 Tons Per Year of NOx and 0.9 Tons Per Year of VOCs.

Perimeter Taxiways are receiving high marks, once again, from the entire aviation community as demonstrated first and foremost by airports around the world undertaking efforts to implement them at their airports. Additionally, the Flight Safety Foundation presented its annual Airport Safety Award in 2007 to DFW International Airport for advancing safety issues and for advancing the concept of perimeter taxiways.

We believe that this award reflects great credit upon the entire aviation community because all stakeholders played a role in their development, beginning with the financial empowerment provided by Congress via Airport Improvement Program funding, as well as Passenger Facility Charges that are being used to fund these taxiways. The FAA, NASA, DFW, airlines, pilots and air traffic controllers all came together to address a complex issue by developing a user-oriented, and easy to operate enhancement to runway safety and efficiency.

In addition to these important advancements, the FAA is currently conducting operational testing on a Final Approach Runway Occupancy Signal system. The purpose of this system is to alert pilots of arriving aircraft of a possible runway incursion. When the runway is occupied by a potentially hazardous target, the system, without controller input, automatically flashes the Precision Approach Path Indicator lights as a visual indicator to pilots on approach. We are excited about this new system and believe it will be an important addition to any safety program.

Partnering For Success: Both Runway Status Lights and Perimeter Taxiways exemplify how the aviation community is partnering to address complex runway safety issues through the development of new technologies and the construction of additional infrastructure. However, these examples take considerable time

and effort to successfully implement. The question that remains is, “what is the aviation community doing to address today’s issues today?”

The FAA Administrator’s Call to Action Safety Summit in the summer of 2007 resulted in the FAA, as well as organizations such as AAAE and ACI-NA, holding numerous workshops and conferences regarding runway safety. What made these activities different than past endeavors was that all aviation stakeholders at all levels of their organizations were invited to participate. Pilots and air traffic controllers along with airport operations personnel who work side-by-side in the aircraft movement area joined with senior representatives of the FAA, airports and airlines. This enabled a clearer dialog of local issue identification along with the development of creative, empowered solutions enabling immediate action to take place to address issues of concern while simultaneously providing valuable insights for the development of longer-term solutions.

The insights gleaned from these workshops and conferences not only have enabled the immediate resolution of issues through the fielding of physical improvements such as additional signage and markings, but more importantly, they have provided operators with an insight as to how valued they and their ideas are as exemplified by the actions taken by senior management.

Vigilance and Human Factors: A critical issue that remains is how to consistently maintain a heightened state of vigilance. It is the nature of highly repetitive routine tasks that complacency is prone to set in, and exceptions to a normally safe environment can go unnoticed by an operator leading to an inadvertent runway incursion. Both the Runway Status Lights and Perimeter Taxiways, we believe, will go a long way in addressing this critical issue.

Runway Safety Action Teams have been formed at most airports to consistently address local safety issues and general vigilance issues with considerable success through the development of “Hot Spot Maps” and special communiqués that bring special attention to the specific challenges operators encounter at an airport.

Enhanced computer-based interactive training capabilities are now available to airport operators as well as computer-based driver training simulators designed to provide a real experience of the actual operating environment that vehicle drivers will encounter prior to allowing them to operate in the Aircraft Movement Area. Both types of systems are proving to be quite effective in validating a vehicle operator’s abilities and capabilities while simultaneously reducing the overall cost of driver training and certification.

However, concern remains regarding vehicle-deviation-induced runway incursions, whereby a vehicle operator driving in the Aircraft Movement Area will lose track of where they are in relationship to an active runway and inadvertently

cause an incursion. It should be noted that 29% of runway incursions are caused by vehicle deviations, most of which we find are due to lost situational awareness.

As such, we have partnered with the University of Texas, Texas Workforce Commission, and local businesses to explore the leveraging of off-the-shelf technologies which will provide both visual and audible alerts to vehicle operators who come within a defined safety area boundary surrounding a runway. The intent is to provide an early warning to vehicle operators so as to preclude a runway incursion. Given the high number of vehicles that operate in the aircraft movement area, our secondary goal is to find a product that is relatively inexpensive.

We are discovering a wide variety of promising technologies from somewhat expensive independent computer-based systems to low cost systems that leverage the use of the vehicle's existing onboard computer system, lights, radio, and traffic horn. Our hope is to identify a small subset of candidate systems to further explore and certify with the FAA within the next year or so.

Additional Low-Tech Improvements: In addition to the important safety improvements described above, DFW has also implemented a host of low-tech solutions that combined have greatly increased safety on our runways. These technologies are all integrated into what we term our Runway Safety Plan. The significance of these integrated practical initiatives is evidenced by the International Civil Aeronautics Organization (ICAO) adopting our Runway Safety Plan in 2003 as the model for best practices for airports.

All of the initiatives fall under the leadership umbrella of our Runway Safety Action Team (RSAT) comprised of representatives from the FAA, airlines and various airport staff who work collaboratively to coordinate and oversee all of our collective runway safety programs. The RSAT also reviews all runway safety incidents, and as part of their efforts, has developed what they term a "Hot Spot" chart which outlines specific areas of the airport or operating conditions that pose challenges to pilots, air traffic controllers and vehicle operators. This simple chart provides guidance as well as instilling a heightened state of awareness to all operators.

Continuous inspection and maintenance of the airport operations area infrastructure is a significant aspect of our Runway Safety Plan as it ensures the safest operating environment for both pilots and vehicle operators. Coupled with this is the vehicle escort service (Follow-me Cars) to escort all non-airport or non-FAA vehicles operating in the aircraft movement area to better ensure that operators unfamiliar with the complex operating environment of DFW can safely conduct their business without jeopardizing flight safety.

Runway closures provide their own set of challenges due to the fact that they change the normal operating environment. As such, for short runway closures of one hour or less, we position Airfield Operations Staff at the approach end of a closed runway to monitor FAA Tower transmission and to observe aircraft movement toward a closed runway. For longer duration closures we place a lighted "X" at both ends of the closed runway.

Enhanced signage and visibility initiatives have been undertaken to ensure better situational awareness for pilots during inclement weather and periods of darkness. We have placed runway hold position signs, combined with yellow strobes, at various critical runway/taxiway intersections and high speed exits, along with Runway Guard Lights (red in color) that are functional 24 hours per day. Additionally, we have widened runway hold position markings, outlined all pavement markings in black, and use beaded glass in pavement marking paint to enhance visibility during periods of precipitation. Alternating amber and green centerline line lights on all exit taxiways serve as an aid for pilots to recognize when a Runway Obstacle Free Zone and/or ILS Critical Area has been cleared. Finally, we changed High Speed Taxiway centerline light lens from bi-directional to uni-directional leading off of runways to ensure no ambiguity for pilots as to what direction they may taxi.

Special attention has been paid to safety enhancements that have proven quite beneficial to vehicle operators. Non-standard augmentation signage such as "Stop," "Yield," and "Contact Tower" signs have been installed at Aircraft Rescue Fire Fighting roads intersecting runways. Enhanced interactive training has been specifically tailored to aircraft mechanics that taxi or tow aircraft, as well as air traffic controllers who receive familiarization tours of the aircraft movement area so as to see the airfield through the eyes of a pilot. Finally, we have developed a video for safe ramp driving criteria with an instructional pamphlet augmented by periodical runway safety awareness programs such as "I Brake for Runways" so as to periodically reinforce the importance of vigilance in affecting runway safety.

These are just of few of the low-tech, low-cost improvements we have implemented to increase safety on the DFW airfield. Combined with the more sophisticated and complex technologies, these improvements have had a significant impact. And, we are constantly working to improve.

What Congress Can Do
To Help Airports Improve Runway Safety

Invest in the Airport cooperative Research Program: As Chairman of the Aviation Group for the Transportation Research Board, I want to express my sincere appreciation to this subcommittee which helped to create and fund this highly effective program as part of Vision 100. We are currently entering our fourth year of research aimed at finding practical, near-term solutions to the aviation safety, security and environmental challenges facing airports today.

The ACRP is in high gear with over 100 topics under study today and a consistent stream of operator-oriented solutions being deployed to the entire aviation community. Once again, the format for this program is similar to that of the highly successful FAA Runway Status Lights and Perimeter Taxiways where all aviation stakeholders actively participate in research problem definition as well as solution identification, yielding research with a high degree of practicality, relevance and acceptance by airports of all sizes.

Congress appropriated $10 million for ACRP in FY08. Airports are most grateful that the House-passed version of the FAA reauthorization bill authorized another $15 million per year for the program between FY09 and FY11. The reauthorization bill also includes specific recommendations endorsed by the House Science and Technology Committee that would specify how that funding is distributed. In FY09, for instance, the bill calls for $5 million for capacity research, $5 million for environmental research and $5 million for safety research.

Some of my colleagues who are involved with the ACRP have expressed concerns that the bill would unnecessarily prescribe how limited funding for the program is to be spent. Given the wide variety of engagement in the selection and development of research problem statements, they would prefer that the final version of the FAA reauthorization bill eliminate those restrictions so funding could be spent on the various categories of research the airport community has identified as important. We hope that you will consider making this modification in conference and truly appreciate your support of this highly regarded research program.

Again, thank you for the opportunity to participate in this hearing.