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Achieving Better, Faster and More Cost-effective Runway Rehabilitation

Improving runway infrastructure can help airports improve daily operations and positively impact long-term planning

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Rehabilitating aging runways is not only important to the safety of passengers and aircraft, but also an airport's overall operation. Achieving needed capacity is dependent on upgraded terminals and surrounding infrastructure, including runways, to keep pace with increases in overall flight operations.

Designers must consider several factors for runway projects to ensure the process is comprehensive, efficient and cost-effective.

Preliminary engineering

When conducting a preliminary study on a runway rehabilitation, there are basic questions that should be answered:

- Who are the key stakeholders?
- What are the rehabilitation options?
- Are there additional improvements that can be made while the runway is closed?
- What is the best construction phasing option for the airport?

Identifying key stakeholders up front helps the development of a project schedule so appropriate coordination can occur between all parties. This process takes time, but it helps avoid additional cost and delays by vetting alternatives and solutions prior to final design and construction, and builds trust between an airport and its stakeholders.

A good preliminary study will help determine the condition of the existing pavement to evaluate all rehabilitation options as well as the infrastructure beneath and around the runway, such as lighting, utilities or drainage systems. Rehabs present an opportunity to address additional items during a planned closure to avoid future disruptions. The study should evaluate all options, not only for initial costs and construction duration, but also life-cycle costs, impacts to approaches, long-term maintenance requirements and constructability/quality.

Developing a realistic phasing plan early in the design process also is important because it can impact construction costs, project duration and environmental review requirements.

Communication and coordination

Runway projects involve ongoing conversations between the designer, airport and a host of stakeholders, including airlines, tenants, FAA, city departments and the public.

The biggest challenge with coordination is getting all stakeholders on the same page, so they understand the project timeline, benefits and what is being done to minimize disruptions. Having a well-defined schedule for runway closures and clearly communicating what the project benefits are can usually generate more receptivity to changes.

A joint outreach effort between the design team and airport is preferable because it helps facilitate >>

meetings in a coordinated fashion to keep all parties informed on a project's progress.

Communication with FAA is particularly key because of the agency's multiple lines of business, each with different roles and objectives. Project teams must be aware of the necessary timelines needed for reviews and approvals, so they can be built into the schedule to minimize delays.

Innovation

Runway rehabilitation and reconstruction offers airports an opportunity to assess their existing capacity while planning for the future. Evaluating the location of exit taxiways, forecasted growth and the fleet mix using the airport can assist in finding the optimal location to reduce runway occupancy times.

Previous FAA guidance for the location of exit taxiways was developed in 1983 and was based on generic aircraft types rather than specific aircraft to estimate exit taxiway cumulative utilization percentages. Designers now have access to quantitative data collected at airports via Airport Surface Detection Equipment, Model X (ASDE-X), that provides information on occupancy times, threshold to exit taxiway distances and deceleration rates for specific aircraft. This data along with the context of each airport's unique layout and terminal configurations helps designers get a clearer picture of the optimal location for exit taxiways based on the actual fleet mix using an airport.

Cost-effective runway rehabilitation requires careful preliminary assessments and engineering, close collaboration and communication with an airport and its stakeholders and a willingness to embrace innovations that will yield long-term efficiencies and cost savings. With continued enhancements to runway infrastructure, airports can provide a better experience for all users and ensure safety, longevity and functionality well into the future. ■

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Mellett has 15 years of specialized experience in providing planning, engineering and construction services to airports throughout the United States. Her expertise encompasses airfield improvements, including runways, taxiways, aprons, drainage, marking and lighting, as well as performing quality control reviews on airfield related projects.

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