# Best Practices for Longitudinal Joint Maintenance on Airfields

**Research Team:** National Center for Asphalt Technology, Applied Pavement Technology, and Iowa State University **Sponsored by:** AAPTP, in partnership with FAA and NAPA

Longitudinal joints are often the first location of distress in airfield asphalt pavements. Lower density and higher permeability near the joint allow water infiltration, oxidation, and premature aging, leading to cracking and raveling that can appear after only a few years of service. These deteriorated areas not only shorten pavement life but can also produce foreign object debris, a major concern for aircraft safety.

Although current Federal Aviation Administration (FAA) specifications (Advisory Circular 150/5370-10H) require cutback joints and a tack coat before placing adjacent lanes, distress along these joints continues to be a leading cause of maintenance needs. This research provides airport owners, engineers, and contractors with clear guidance for maintaining longitudinal joints and evaluates whether newer materials and technologies can improve long-term performance.

## Project Benefits

- Summarizes proven maintenance strategies for airfield longitudinal joints.
- Identifies new preservation materials that may enhance performance.
- Improves pavement life and reduces the risk of foreign object debris.
- Clarifies FAA requirements and where modification of standards (MOS) approval is needed.
- Supports consistent, cost-effective maintenance planning across airports.

Source: NAPA

Crews pave a longitudinal joint on a runway in Leitchfield, KY.

## Approach

This Airport Asphalt Pavement Technology Program (AAPTP) research project consolidates FAA guidance, best practices, and emerging technologies into a 3-volume report. In volume 1, the research team reviewed FAA specifications, airport maintenance reports, and highway agency experience to identify effective treatments for early cracking and severe joint distress. In volume 2, field data from airfield inspections and demonstration projects, combined with laboratory testing, informed material evaluations. Volume 3 is a best practices manual for airfield longitudinal joint maintenance.

## Results

*Volume 3: Best Practices Manual for Longitudinal Joint Maintenance* provides detailed recommendations for preserving and repairing joints based on distress severity and pavement condition.

For low-severity cracking, the preferred approach is crack sealing, which slows moisture infiltration by cleaning, routing, and filling cracks with a hot-poured sealant.

For moderate distress, partial-depth crack repair is recommended. This method removes a 2-foot-wide band centered along the crack to a depth of 2–3 inches, applies tack, and replaces the removed material with asphalt mixture.

For severe cracking or structural distress, a full-depth repair is necessary. This involves removing all asphalt in a 2-foot-wide area, recompacting the base, applying a tack coat, and replacing the material in lifts no thicker than 3 inches.

Crews pave a longitudinal joint on a runway in Leitchfield, KY. Source: NAPA

When joint deterioration extends over longer sections, slot paving may be used to mill a narrow strip (typically 2 feet wide and 2–4 inches deep) along the joint and replace it with new asphalt. This approach restores surface integrity but requires care to ensure adequate density in the new material.

Mastic sealants provide a more durable alternative for cracks wider than 1.5 inches, particularly when compaction is not feasible. They can extend the service life of distressed joints but currently require an FAA MOS for use on federally funded projects.

The manual also identifies emerging technologies like joint adhesives, void-reducing asphalt membranes (VRAM), rapid-penetrating emulsions (RPE), and penetrating sealers. These can enhance joint density, reduce permeability, and delay cracking. Because they are not yet in FAA specifications, their use requires MOS approval.

## Implementation

This guidance helps airport engineers and maintenance managers select effective treatments for pavement conditions. Recommendations can be applied immediately using existing FAA specifications for crack sealing and partial- or full-depth repairs. For innovative materials like mastic sealants, joint adhesives, VRAM, RPE, and penetrating sealers, airports can seek project-specific FAA MOS approval. Demonstration projects in Illinois, Alabama, and Kentucky will track long-term performance to support future FAA consideration.

The ***Volume 3: Best Practices Manual for Longitudinal Joint Maintenance*** is free to download at: go.asphaltpavement.org/air-006.

## Additional Resources

For more details, visit: airportasphalt.com

Watch the “Improving Performance of Longitudinal Joints in Airfield Asphalt Pavements” webinar: go.asphaltpavement.org/web-184

Watch the AAPTP Longitudinal Joints video: bit.ly/LongJoints

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### About AAPTP

The Airport Asphalt Pavement Technology Program (AAPTP) is a cooperative agreement effort between the National Asphalt Pavement Association (NAPA) and the Federal Aviation Administration (FAA) to advance asphalt pavements and pavement materials. The AAPTP advances solutions for asphalt pavement design, construction, and materials deemed important to airfield reliability, efficiency, and safety. The program leverages NAPA’s unique technology implementation capabilities with assistance from the FAA and industry to advance deployment and adoption of innovative asphalt material technologies.

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