Pat and family

Program Manager of Civil Infrastructure

Dallas/Fort Worth International Airport's Design, Code and Construction Department

- 24 years of experience
- Specialty in large airfield construction projects
- Experience at airports across the world
- Second tour of DFW Airport
- Currently managing five large-scale airfield projects and numerous landside public works projects

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17,207 ACRES
THIRD LARGEST IN THE WORLD
45 YEARS OLD
10-YEAR INFRASTRUCTURE PLAN
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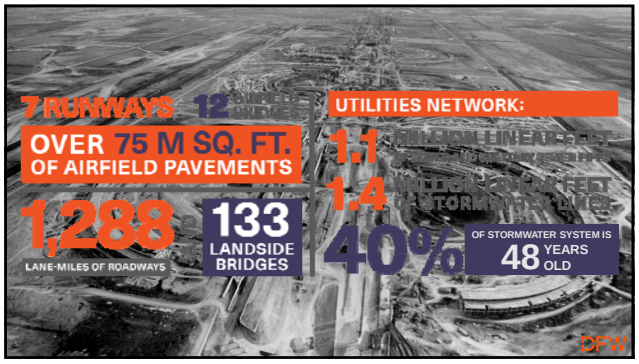
7 RUNWAYS
OVER 75 M SQ. FT.
OF AIRFIELD PAVEMENTS
1,288
LANE-MILES OF ROADWAYS
133
LANDSIDE
BRIDGES
UTILITIES NETWORK:
1.1
1.4
40%
OF STORMWATER SYSTEM IS
48 YEARS
OLD
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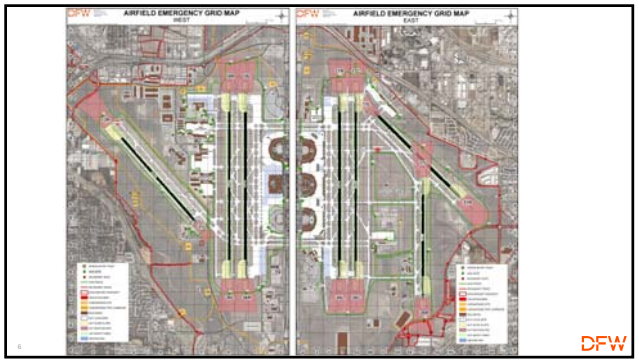
AIRFIELD EMERGENCY GRID MAP
WEST
AIRFIELD EMERGENCY GRID MAP
EAST
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P401 and 17C/35C

Runway 17C/35C

Significant need of rehabilitation

650,000
arrivals and departures were experienced at DFW, the fourth busiest airport in the world, in 2017.

40%
of daily arrivals are handled by runway 17C/35C.

1983
is the original completion year for Runway 17C/35C construction.

Rehabilitation Solution Requirements

- Shortest downtime
- Longest possible pavement life
- Minimal need for future interruption for scheduled maintenance
- A cost-effective design and method of construction that emphasizes sustainability and helps to maintain DFW's carbon-neutral airport status

Scenario Analysis

Eight potential rehabilitation scenarios

- Considered full removal/replacement
- After extensive alternatives analysis and stakeholder input, the team chose an asphalt overlay design, a DFW first
- Ultimately selected a keel-only reconstruction, which included approximately 6,000 feet plus a full-width and full-length six-inch-thick HMA overlay

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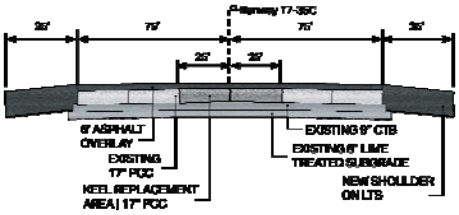
Selected Scenario



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"All the stakeholders involved with DFW, along with the end user and the FAA… all of us came together to create what I consider a think tank, and really think outside the box. We looked at what was best for DFW and then went forward with what was ultimately selected."

Johnny Jackson

Program Manager for the Engineer of Record, Jacobs

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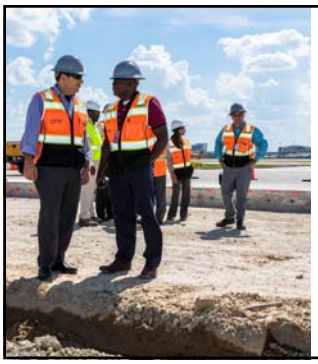

Selection of Asphalt

- Consideration of project costs (initial and long-term maintenance)
- Minimizes runway closure durations (initial and long-term maintenance)
  - Ability to quickly mill and replace the wearing course of the runway in future
- Shortest downtime
- Minimal future disruption
- Preserves good performing existing assets

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"Ultimately, the asphalt advanced our capabilities with weather resistance and operational performance. It also provided us a cost-effective solution that allows us to plan for future rehabilitation projects that return our airfield to full operations in less time than what other products offered. That's better for the airport and our airline partners."

Khaled Naja

DFW's Executive Vice President of Infrastructure and Development Division

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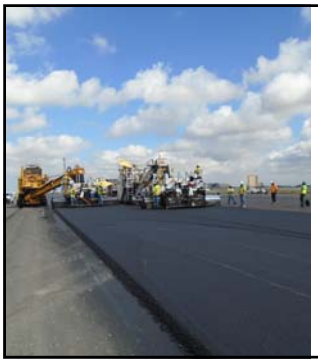

P 401 Mix Design

A key to success

- Much success attributed to the HMA mix design (PG 82-22)
- Helped meet production schedules and achieve mat densities
- Designed to enhance the logistics of getting enough material in a timely manner, and enable the team to achieve density out on the runway
- P-401 specification is relatively stringent; the project's mix design played within the allowable parameters

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Four Lane Echelon HMAC Paving

An innovative solution

- Minimized need for longitudinal joints in the middle section of the pavement
- Four machines were able to pave one half of the 150-foot-wide runway
- The 13,401-foot runway was paved in two passes
- Except for the transverse joints where daily/planned work ended, all joints were "hot" joints that did not require additional effort

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3D Automatic Grade Control

Use of technology

- Four paving trains were linked together
- GPS coordinates allowed for automatic grade control
- System accuracy allowed the paving to meet all surface smoothness requirements, both in the transverse and longitudinal direction
  - Paving variances less than ¼ inch in 12 feet, anywhere in the 2,010,150 sq. ft. of asphalt paving

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Intelligent Compaction

Advanced, equipment-based technology

- HMAC compaction using "Intelligent Compaction" (IC)
- Provides better quality control
- Involves the use of an accelerometer to measure changes in the amplitude wave of a vibratory roller or compactor
- Real time data, position and compaction, is graphically presented to the operator
- A real time decision can be made to stop application of compactive effort

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Runway 17C/35C Rehabilitation

Opened March 10

- CMAA Award Winner (projects >$100M)
- First major rebab of original runways
- Hot mix asphalt overlay ~220K tons
- Complete lighting system replacement
- East airfield runway status lights
- Successful, under budget project valued at $100 million will lead the way for $1 billion in runway rehabilitation projects for DFW's remaining six runways

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Future Projects

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"17C/35C is the first full runway rehabilitation we have embarked on and that's important because we'd like it to be the archetype for what we're going to do moving forward on the other runways. We have a lot of lessons learned and we must stay fluid as we learn things."

Smitha Radhakrishnan

DFW's Assistant Vice President of Design and Project Management

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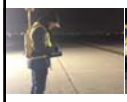
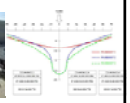
2019 Airfield Pavement Assessment

Evaluating future projects







Visual pavement condition index (PCI)

Rolling Dynamic Deflectometer (RDD) testing

Heavy Weight Deflectometer (HWD) testing

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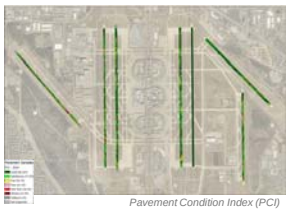
Airfield Assessment Status: Pavement and Electrical



Pavement Condition Index (PCI)

Rolling Dynamic Deflectometer (RDD), Heavy Weight Deflectometer (HWD), Geotechnical

- Airfield vault locations and electrical system design standards (equipment, transmission, controls)
- Predictive pavement performance with planned maintenance

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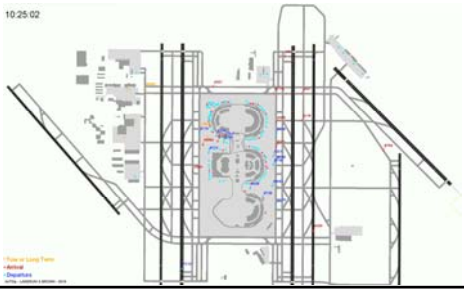
Airfield Simulation



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Next Runway: 18R/36L Rehabilitation

✓ **Implement lessons learned from Runway 17C/35C rehab**

- 100M+ major rebab of critical arrival runway
- Full-width and depth shoulder reconstruction
- PCC keel replacement + miscellaneous panel repairs
- Complete lighting system replacement
- Hot Mix Asphalt (HMA) overlays
- Conversion to mostly landside project

100% design complete in October 2019

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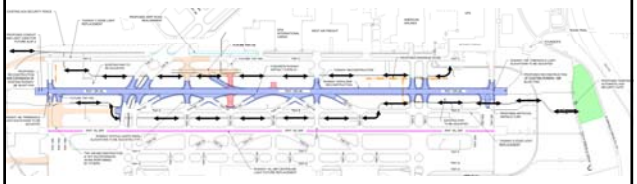
Project Overview

Major Scope Items

- Temporary landside conversion
- Keel section reconstruction
- HMA overlay
- Shoulders & blast pad reconstruction
- Drainage improvements
- New electrical infrastructure and LED conversion
- NAVAID adjustments
- 18R ARFF Road realignment
- North AOA access gate



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Project Efficiencies

Enabling Work

- RW 18L-36R centerline light LED conversion
- RW 13R-31L storm drain improvements
- Electrical on TWs C and E

SW-EAT Work Under 18R Contract

- SW EAT: TWs D2, WR, WQ, and E extension

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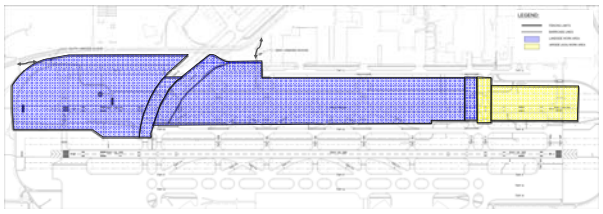
Project Efficiencies

Provide large portions of the project to be constructed landside without the access constraints required by AOA



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Runway Closures

	Mar 2020	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020
Runway 13R	March 6- May 4								
Runway 18L			May 5 – August 3						
Runway 18R			May 5 – August 17						

	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021
Runway 13R									
Runway 18L									
Runway 18R						May 1 – August 30			

OPEN
NIGHT CLOSURES
CLOSED

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Coming Next

17R/35L: Departure Runway

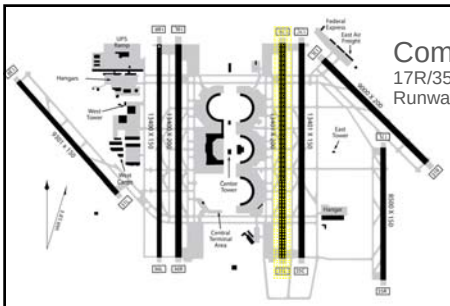

Image source: FAA.gov

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Thank You
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