GOAA Sustainability Speaker Series
ANATOMY OF A RUNWAY REHABILITATION

GOAA GREEN
On the flightpath to a greener tomorrow

Kimley-Horn
KIMLEY-HORN OFFICE WITH AVIATION

Airports We’ll Be Discussing Today

- RSW - Southwest Florida International Airport
- FLL - Fort Lauderdale-Hollywood International Airport
- PGD - Punta Gorda Airport
- PIE - St. Pete-Clearwater International Airport
- TPA - Tampa International Airport
- MCO - Orlando International Airport
Julia Focaracci, P.E.
Visual Inspection

- Alligator Cracking*
- Longitudinal Cracking
- Slippage Cracking*
- Shattered Slab*
- Linear Cracking*
- Faulting*
Visual Inspection
Conceptual Pavement Life

MINIMUM SERVICE LEVEL FOR PART 139 AIRPORT RUNWAYS
PCI = 70
RSW Pavement Condition Index Map
Types of Pavement Evaluation

- Pavement Cores
- Soil Borings
- Falling Weight Deflectometer
- Ground Penetrating Radar

Destructive Testing

Nondestructive Testing

REDUCES TRAFFIC DISRUPTIONS

MINIMIZES NEED FOR DESTRUCTIVE TESTS
Nondestructive Testing (NDT)

Falling Weight Deflectometer
Nondestructive Testing (NDT)

Ground Penetrating Radar
Additional Subsurface Investigation

In areas where karst features may be present, additional destructive testing is required to confirm.

- Deep soil boring
- Electrical Resistivity Imaging (ERI)
NORTH RUNWAY
HMA
Hot Mix Asphalt
LAST MAJOR REHAB IN 2004

SOUTH RUNWAY
PCC
Portland Cement Concrete
LENGTHENED AND RECONSTRUCTED IN PCC IN 2014
Rehabilitation of North Airfield Pavement & EMAS Beds

Runway Rehabilitation
Taxiway Rehabilitation
Demolition of old RW 13-31
New Taxiway Geometry
Hot Spot Mitigation
Electrical and Signage Improvements
Updated Navigational Aids and Runway Status Lights
Drainage Improvements
EMAS Replacements
Extension of EMAS on East End

$64.4 MILLION in overall project construction costs

15 subcontractors & 150-200 workers during runway construction

up to 4 MONTHS of runway closure
Engineering Material Arresting Systems (EMAS)

- The EMAS technology improves safety benefits in cases where land is not available, or it’s not possible to have the standard 1,000-ft overrun.
- An EMAS arrestor bed can help slow or stop an aircraft that overruns the runway.
Runway 10L-28R

Why is it being rehabilitated?
- 15 years since any major rehabilitation
- North Runway (10L-28R) was the only active runway for 18 months during construction of the South Runway (10R-28L) and experienced heavy usage
- North Runway is in need structural, drainage, safety, lighting, and signage upgrades
- Improvements will increase rehabilitation cycle to 30 years
Project Schedule

- Project Award: February 26, 2019
- Begin Phase 2 - Taxiway A Work: March 25, 2019
- Begin Phase 3 - Runway Closure: June 3, 2019
- Phase 4 - Taxiway B & C Work: October 2019
- Overall Project Substantial Completion: March 2020
10L-28R & Taxiway A

Provided by General Asphalt
Jared Moreng, P.E.
St. Pete-Clearwater International Airport RW 18-36 Rehabilitation
Typical Design Process

- Record Information
  - PCI (Pavement Condition Index)
    - FDOT SAPMP
  - Published PCN vs. Anticipated ACN
  - Record Drawings/As-Built Data
  - Master Plan Data
- Geotech/Survey/NDT
- NO SUCH THING AS “ENOUGH”
  - Relatively inexpensive compared to “contractor discovered” issues
- Review Strategy With Potential Contractors
MINIMUM SERVICE LEVEL 75

Longitudinal Cracks

Bleeding
Typical Design Process

- Pavement Rehabilitation Strategies should be determined through a combination of Factors:
  - Pavement Cores
  - Non-Destructive Testing – Falling Weight Deflectometer
  - Soils Penetration Tests
No Runway, No Airplanes, No Airport!

- **Challenge #1 – Maintaining Critical Operations During Construction**
  - Air Carrier and Cargo Operator Needs
    - (Flight Schedule, Seasonal Variations, Length of Runway Required)
  - DoD/USCG/FEMA – Disaster Preparedness
  - On-Airport Businesses
    - (Flight Schools, Skydiving)
  - General Aviation
Airport Operators (YOU) Are Stuck With The Results!

- **Challenge #2 – Balancing Airport Operational Needs with Construction Cost, Efficiency, and Quality**
  - Larger work areas are typically better for construction
  - Haul route distances
  - Work hours – Night-time only? Re-open runway after shift?
  - Weather – Not just a local factor
  - Air shows, fly-ins, peaks in operations
Expect The Un-Expected!

• Challenge #3 – Planning for Unforeseen Circumstances in Construction
  • Unsuitable subgrade materials
  • Asphalt delamination/scabbing
  • Schedule difficulties
  • Failed test sections or Quality Assurance (QA) tests
  • Material Availability Issues/Equipment Procurement Lead-Time
  • Poor contractor performance
  • Commissioning of Navigational Aids (NAVAIDs) and/or flight procedures – FAA dependent
Best Practices

• Coordination & Communication
  • Early & Often
  • Program Validation - What do we need to achieve?
  • Agency Coordination
    • FDOT
    • FAA
      • ADO, FAA Flight Procedures, FAA Flight Standards, FAA Technical Operations/Engineering, FAA Flight Inspections, etc. – Many lines of business
  • SRM Panel – ATCT, FAA Facilitators/Stakeholders
  • Permitting (FDEP Water Management District, ACOE, Local, etc.)
Opportunities For Sustainability
Opportunities for Sustainability

- Use of Recycled Concrete Base Course (FAA Specification P-219)
- In-place pulverization
Opportunities for Sustainability

- Asphalt Millings – High Value
  - Saleable Material – possibly better asphalt prices
  - Armoring of vehicle service roads/contractor laydown areas
  - Recycled Asphalt Pavement (RAP)
    - 30% RAP Content or Less for FAA P-401 HMA
    - Not used in surface course unless on paved shoulders
Opportunities for Sustainability

• Full-Depth Reclamation
  • Reconstruction method that pulverizes asphalt surface and combines with underlying aggregate base
  • 60,000 lbs or less 😞
Cory Sitler, E.I.
Sustainability in Stormwater

• Reducing impacts downstream and improving stormwater quality
• Low Impact Development (LID)
  • Reduce pollutants in stormwater by natural processes
  • Infield areas, swales, permeable pavements
Stormwater Management is Important
Master Stormwater Planning

• Having foresight to develop stormwater facilities for future buildout
• GOAA has shown long history of planning for the future
“Satisfying today’s needs without compromising the needs of future generations.”
Orlando International Airport

1978
Asset Management & Proactive Maintenance

- Pond & Stormwater Infrastructure maintenance is crucial to preventing flooding
- Siltation is large contributor to ponds performing poorly
- Dredging – Efficient, cost-effective, low-impact to airport operations
- Take advantage of R/W Rehabilitation projects to replace pipes
Design Aides

- Drainage Atlas
- Flood Control Manual & Pump Plan
- Impervious Area Matrix
QUESTIONS?