

2006-224

King County International Airport

13R-31L Runway Rehabilitation Project



PROJECT JUSTIFICATION



King County
Department of Transportation
Airport Division

KCIA RUNWAY REHABILITATION PROJECT JUSTIFICATION

BACKGROUND

King County International Airport/Boeing Field (KCIA) is designated by the FAA as a FAR Part 139 Class II Primary Commercial Service Non-Hub Reliever Airport. As the weather alternate for SeaTac, KCIA regularly receives passenger and cargo aircraft diversions each year.

The main runway was last rehabilitated in 1985 and has reached the end of its economic 20 year life expectancy. In 2001 the Nisqually Earthquake caused extensive damage to the runway pavement and drainage systems. Repairs totaling approximately \$2.75 million were made to return the runway to full operation within a 2 week time period. However, at the time it was recognized these repairs were temporary measures, permanent resolution would occur with full runway rehabilitation.

PROBLEM ISSUES

An analysis following the 2001 Nisqually Earthquake determined the runway's longitudinal profile no longer met FAA standards which presented a significant problem for Boeing during its B-777 200 ER flight test and certification program. The non-compliant profile encompasses a significant portion of the runway; intermediate or short term measures are not available to correct this (see figure 1). The status quo is an unacceptable option given the planned flight test and certification programs planned by Boeing in 2007.

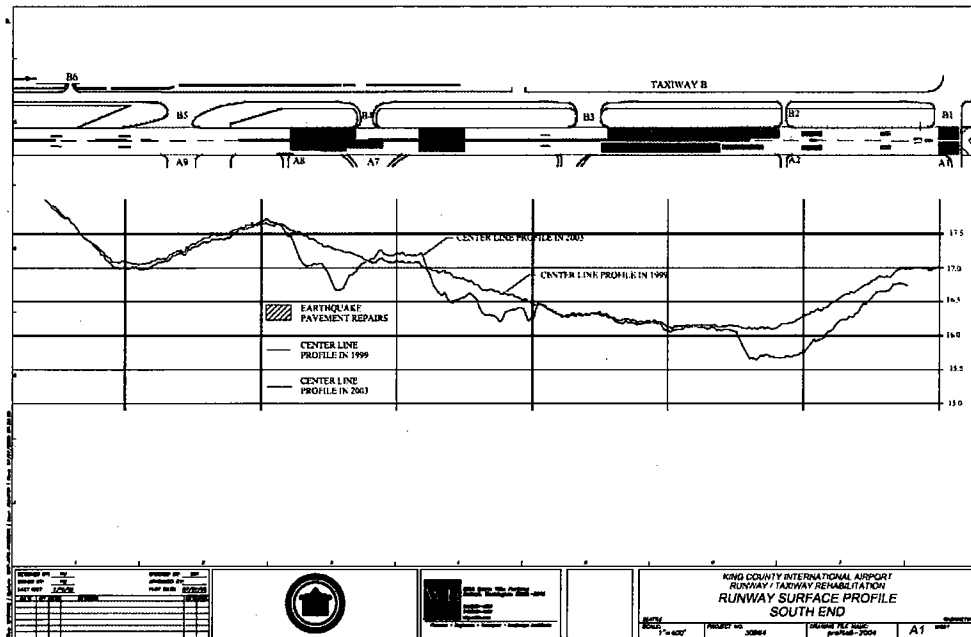


Figure 1: Runway surface profile of south end.

Repairs have been made to this area with limited success (see figure 2 & 3). Recently, commercial cargo operator (BAX Global) met with Airport Management to express their concerns regarding the potential safety hazard created for large aircraft on departure.

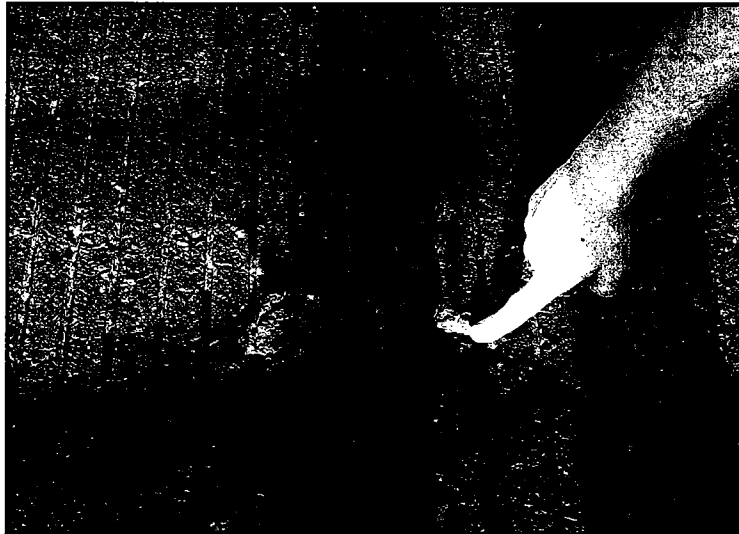


Figure 2: Continuing pavement failure subsequent to crack sealing.

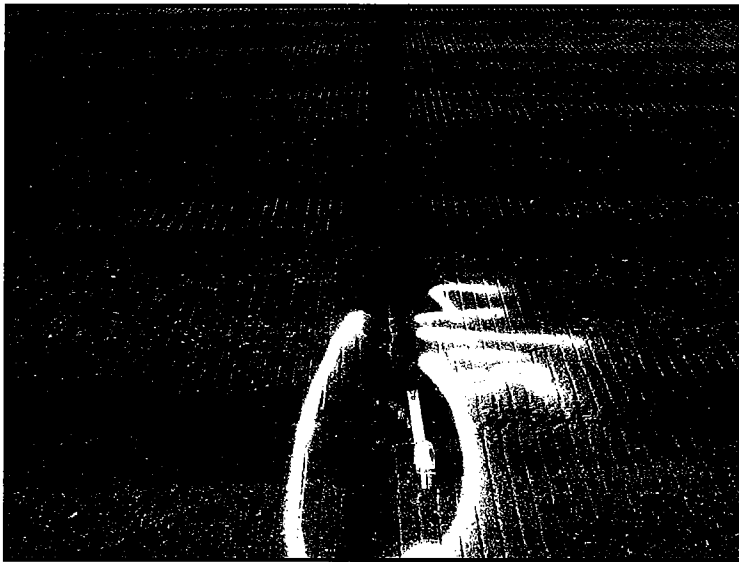


Figure 3: Pavement failure due to reflective cracking. Ongoing monitoring and maintenance is required.

The runway pavement has continued to deteriorate creating significant safety issues. In addition to extensive cracking, the pavement is showing signs of stripping in localized areas as well as overall degradation throughout, resulting in generation of FOD (see figures 4, 5, 6, 7 & 8). The runway rehabilitation project will resurface the entire runway surface and will also include installation of perimeter drains to prevent future pavement delaminating, and improvements to surface drainage (see figures 9, 10 & 11).



Figure 4: Pavement damage due to advance wear.



Figure 5: FOD generated at runway/taxiway intersection.



Figure 6: Representative of pavement degradation generating FOD.

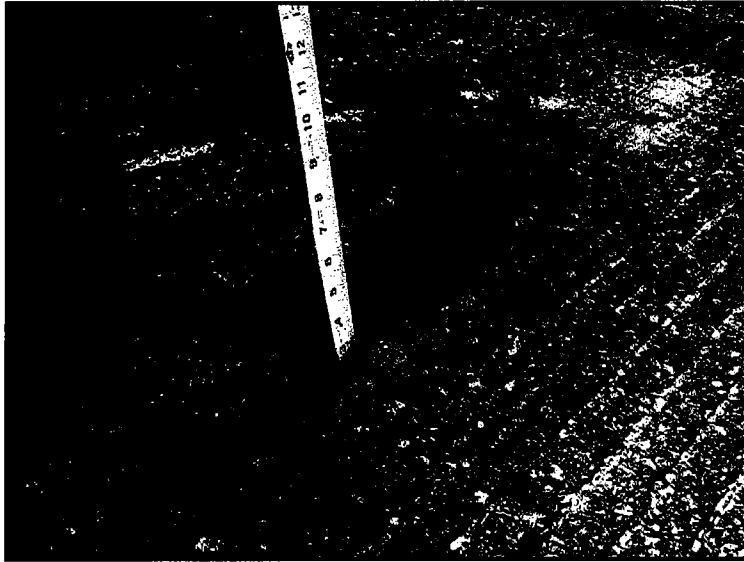


Figure 7: FAR Part 139 violation; Runway immediately closed for repair.



Figure 8: Pavement failure due to stripping.

Catastrophic pavement failures from delaminating or stripping of overlying pavement may be expected if project implementation is delayed (see figures 12 & 13). The potential for acceleration of failures is increased given the lack of proper drainage combined with the pavement age. This is unacceptable from a safety perspective due to the magnitude of the pavement failure problems currently experienced.



Figure 9: Standing water due to improper storm water drainage.

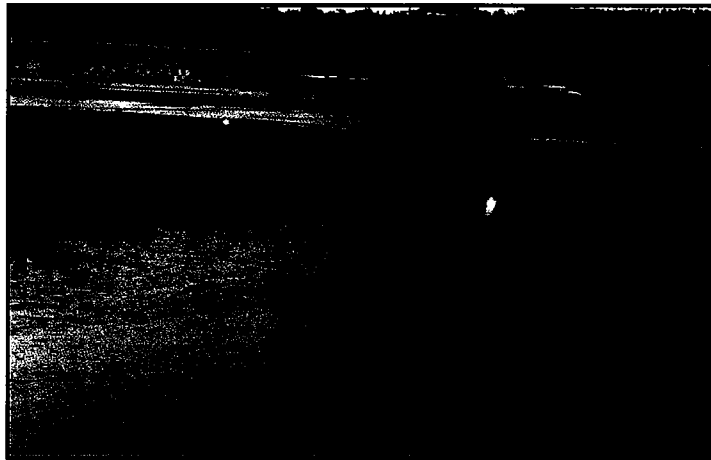


Figure 10: Severe ponding at runway/taxiway intersection obscuring pavement markings.



Figure 11: Current runway conditions.



Figure 12: Typical example of asphalt stripping on runway.



Figure 13: Pavement degradation generating FOD.

The airport has implemented increased inspection and maintenance programs to mitigate the potential for FOD ingestion by aircraft. This involves scheduled runway closures for pavement and repair work. However continued pavement degradation may be expected due to its age, extensive use (over 300,000 annual operations) by aircraft of all sizes as well as due to environmental conditions. Given these conditions, delaying its full rehabilitation until 2007 increases the likelihood of FOD damage to aircraft. Recent airport experiences concerning FOD related issues make this completely unacceptable. More serious measures will be required to prevent this including permanent closure of the worst areas as well as imposing weight restrictions pending a complete rehabilitation (see figures 14, 15, 16, 17, 18 & 19).

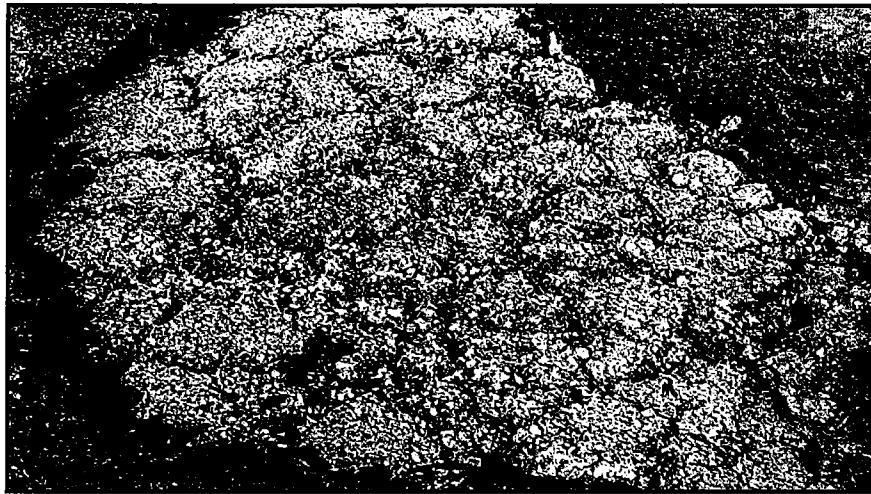


Figure 14: Pavement failure.



Figure 15: FOD generated at runway threshold.



Figure 16: Asphalt bonding failure created FOD.

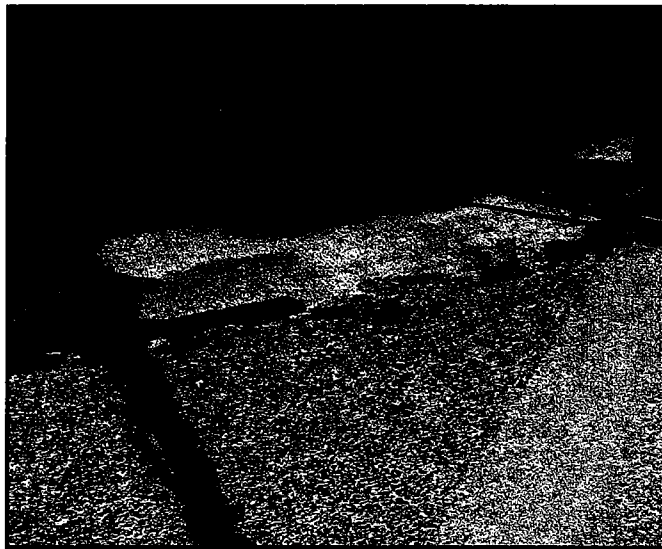


Figure 17: Pavement bonding failure.

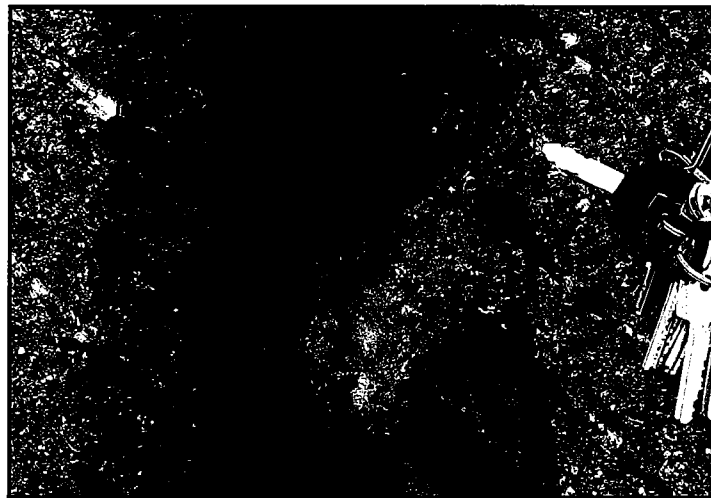


Figure 18: Representative of pavement degradation generating FOD.

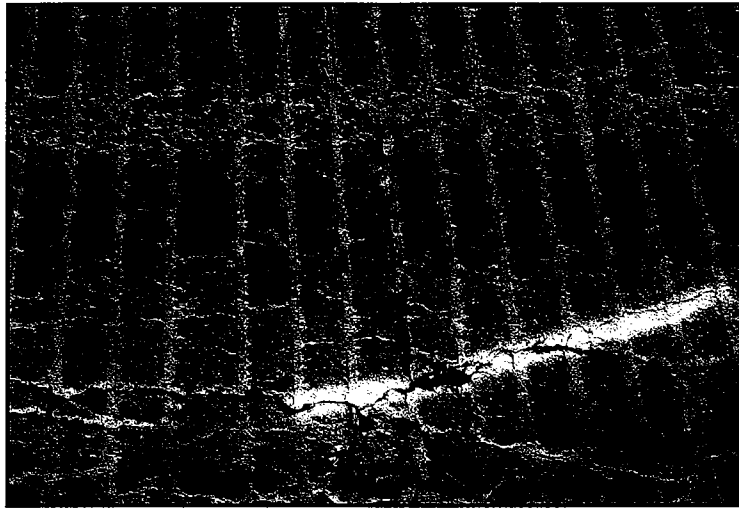


Figure 19: Representative of runway centerline conditions.

Imposing weight restriction would have a significant impact to our major tenant customers such as the Boeing Company, UPS, DHL, & BAX Global.

Lastly, the Regional Runway Safety Action Team (RSAT) identified the installation of guard lights at selected taxiway intersections to improve safety. These improvements were recommended following a near catastrophic runway incursion involving two large cargo aircraft. The recommendations have been incorporated into the rehabilitation project and are integral to our program to improve runway safety. Due to lack of visual lighting cues, delaying the project until 2007 will continue to expose aircraft operators to potential runway safety problems.

ECONOMIC IMPACTS

Air cargo and aircraft manufacturing are important components of KCIA business operations and provide significant economic contributions to the region. The Boeing Company operates three lines of business at KCIA: Flight Test Department, Military Flight Center and Commercial Delivery Center. These all provide a strategic contribution to the tenant's business plan. Representatives from Boeing senior management have worked closely with Airport Management for nearly 2 years to coordinate the activities of each line of business with the planned runway rehabilitation. Specifically, the Boeing Company has scheduled many significant activities to coincide with the completed runway rehabilitation project in the fall of 2006. Rescheduling the project to 2007 or phasing it over two years will have a negative impact of significant proportions. These impacts are outlined in further detail below.

FLIGHT TEST DEPARTMENT

Commencing in summer 2007 Boeing will initiate certification testing of its B-787 prototype aircraft at KCIA. This will involve a fleet of the first six B-787's produced in a very challenging, complex program of multi-aircraft testing. Several thousand hours of

flight testing are planned commencing in summer 2007 into 2008. Slippage of the airport's runway rehabilitation to 2007 will delay implementation of Boeing's B-787 flight test and certification, impacting its new commercial programs worth billions of dollars. Further, to do nothing to correct the runway settlement and profile problems may negatively impact aircraft certification in similar manner as the B 777 200 ER in 2004.

MILITARY FLIGHT CENTER (MFC)

Boeing contracts with the U.S. Government Department of Defense (DOD) for services at the MFC, including AWAC's maintenance and development operations. Many of these contracts are for classified programs pertaining to issues of national security involving precise coordination with dedicated satellite time. Several of such programs are scheduled to commence in fall 2006 and continue in the following year. There is no latitude for rescheduling. The unique facilities at Boeing MFC preclude relocation to another airport anywhere in the country.

COMMERCIAL DELIVERY CENTER (CDC)

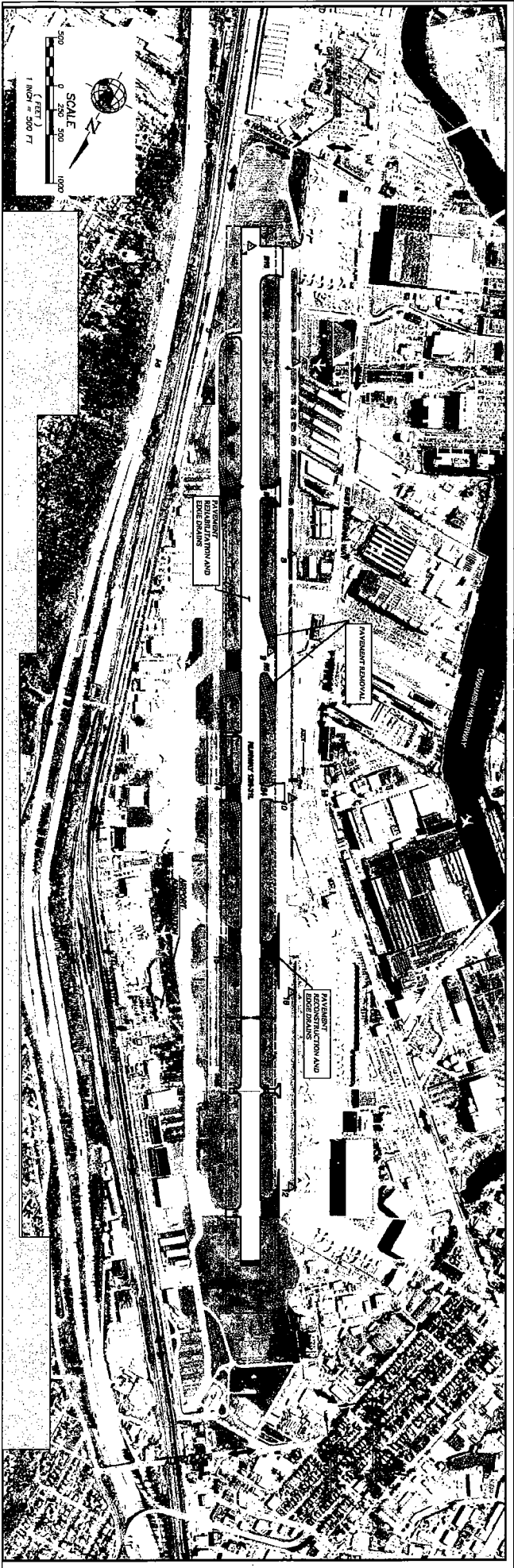
Boeing facilities at KCIA include a Commercial Delivery Center for its narrow body B-737 product line, including an aircraft painting facility. To date over 5000 B-737 aircraft have been manufactured and delivered to customers worldwide, making the 737 the most popular aircraft in commercial aviation history. Extensive negotiations with Boeing's scheduling and manufacturing have taken place to make production adjustments during the summer 2006 construction season to facilitate the runway project. Delaying the work to 2007 will further impact Boeing's delivery programs next year, creating a loss of goodwill to Boeing customers in a very volatile, competitive industry.

AIR CARGO

UPS, DHL and BAX Global currently operate from KCIA. In 2004, KCIA ranked 32nd in the nation for cargo activity with nearly 900 million pounds in total landed weight. Any restrictions in runway length or weight will severely impact all major cargo carriers and their associated feeders such as Ameriflight, AirPac, Northern Thunderbird, Mountain High Aviation, Penn Air, Aeroflight and Air Tahoma.

CONCLUSION

The project design has been completed and advertised for competitive bid, for which two bids were received. The lowest bid was \$21,825,029. KCIA is seeking discretionary funding in addition to its entitlements to cover this amount. Deferring the project to 2007 will not mitigate the safety hazards and economic impacts previously described and will only increase the project costs.



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