Estimating the Value and Cost of the Australian Airport Pavement Asset Base

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Introduction

• Non-technical but critically important
• How many airports are there in Australia?
• What is the value of the airport pavements?
• What is the cost of maintaining pavements?
• Are the Government grants adequate?

711 airports in the ERSA
- 480 (of 711) have a paved runway
  - Excluding heliports
  - Excluding unsealed gravel runways
- 130 (of 480) have a 5,700 kg strength rating
- 350 (of 480) have a Pavement Classification Number
- Around 80 (of 480) have an asphalt runway surface
- The other 400 have a sprayed seal or microsurfacing (around 12)
How many airports?

Location (State)

Subgrade (category)
How many airports?

Pavement Type

Surface Type

- Rigid
- Flexible

- Asphalt
- Sealed
- Concrete paver
- Microsurfacing
How many airports?

<table>
<thead>
<tr>
<th>Strength Rating</th>
<th>Number of Airports</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCN &lt; 15</td>
<td>180</td>
</tr>
<tr>
<td>PCN 5-14</td>
<td>160</td>
</tr>
<tr>
<td>PCN 15-24</td>
<td>60</td>
</tr>
<tr>
<td>PCN 25-34</td>
<td>40</td>
</tr>
<tr>
<td>PCN 35-44</td>
<td>20</td>
</tr>
<tr>
<td>PCN 45-54</td>
<td>10</td>
</tr>
<tr>
<td>PCN 55-64</td>
<td>5</td>
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<tr>
<td>PCN 65-74</td>
<td>2</td>
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<tr>
<td>PCN 75-84</td>
<td>1</td>
</tr>
<tr>
<td>PCN 85-95</td>
<td>1</td>
</tr>
<tr>
<td>PCN &gt; 95</td>
<td>1</td>
</tr>
</tbody>
</table>
Value of airport pavements?

- Categorised analysis
  - Category 1. Busiest 15 airports (by PAX) - detailed analysis of each
  - Category 1.1. 22 military (Defence) airfields - detailed analysis of each
  - Category 2. > 10,000 PAX (in 2019) – 20 analysed in detail
  - Category 3. Others with a PCN – 20 analysed in detail
  - Category 4. Sealed runway with 5,700 kg – 20 analysed in detail
- Category 2, 3 and 4 used proxy models
- Bulk all-in cost rates for typical pavement materials
Value of airport pavements?

• Selected aircraft with difference ACN values
• Typical pavement structures
• Cost rates and thickness for typical costs
• Separate for rigid and flexible
• Separate for each category

Cost ($/m^2) = f (PCN, subgrade category, pavement type)
Value of airport pavements?

- Extrapolated over the pavement areas
  - Rigid and Flexible
  - Different strengths
- Areas from *Nearmaps*
- Measured areas for Category 1 and 1.1
- Relationships (proxy models) for Category 2, 3 and 4

\[
\text{Area (rigid/flexible)} = f (\text{runway length}, \text{runway width})
\]
Value of airport pavements?

Example Category 1
Perth airport
Three strengths
Rigid and flexible
Value of airport pavements?

Example Category 3
Gympie airport
One strength
All flexible
Value of airport pavements?
• 38.3 million square meters of flexible pavement
  • Around 65% is regional (Category 2, 3 and 4)
  • 22 military airfields 20% more than the 15 busiest airports

• 5.6 million square meters of rigid pavement
  • Around 4% is regional (Category 2, 3 and 4)
  • 22 military airfields around two-thirds of the 15 busiest airports

• Total value of the asset $5.8 billion
• Majority at Category 1 and 1.1 airports
Value of airport pavements?

**Category**

1
1.1
2
3

**Location (State)**

Q
W
V
N

- Category 1
- Category 1.1
- Category 2
- Category 3
- Category 4

- QLD
- NSW
- VIC
- TAS
- NT
- SA
- WA
- ACT
- OTH
Value of airport pavements?

Queensland
- Back soil
- Q400 flights

Western Australia
- Pilbara gravel
- Perth sand
- FIFO
Cost to maintain?

• Resurfacing
  • Asphalt
  • Sprayed seal

• Routine maintenance
  • Cracks and patching
  • Linemarking and rubber

• Rehabilitation
  • Occasional reconstruction
Cost to maintain?

• Resurfacing
  • Asphalt
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• Routine maintenance
  • Cracks and patching
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• Rehabilitation
  • Occasional reconstruction

• Resurfacing
  \$110 M per annum

• Routine maintenance
  \$98 M per annum

• Rehabilitation
  \$48 M per annum
Cost to maintain?

Category

Location (State)

- Category 1
- Category 1.1
- Category 2
- Category 3
- Category 4

- QLD
- NSW
- VIC
- TAS
- NT
- SA
- WA
- ACT
- OTH

W: Queensland
Q: Queensland
N: New South Wales
V: Victoria
Are Government grants adequate?

- Regional airports (Category 2, 3 and 4)
- Critical community infrastructure
- Reliant on State and Federal grants
- Around 400 airports
- Estimated value of $2.2 billion
- Require $135 million per annum to maintain
  - Excludes lengthening, widening and PCN increases
  - Limited to serviceability and compliance issues
Conclusions

• Australian airport pavements are diverse
• Using proxy models and representative samples
• Total pavement asset value $5.8 billion
• Requires annual maintenance of $255 million
• Grant dependent airports (Category 2, 3 and 4)
  – Require $135 million per annum
  – Compliance and serviceability
  – Long term commitment
QUESTIONS?