Inclement Weather, exploring the issue and concepts to address a known industry risk

The move from road builders to journey facilitators and how to minimise disruption

Presented by: Ben Lin
The Problem

- Wet weather
- Water entering permeable pavement layers
- Unpredictability
The Stats

Wet Days - Mean Number Of Days per month With 1mm Or More Of Rain 1981 - 2010
# The Stats

Days lost due to wet weather (average per month)

<table>
<thead>
<tr>
<th>Capital Works</th>
<th>FY16 - FY17</th>
<th>FY17 - FY18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationwide</td>
<td>4.1</td>
<td>3.8</td>
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<tr>
<td>Auckland/Northland</td>
<td>3.2</td>
<td>2.6</td>
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<tr>
<td>Waikato / BOP</td>
<td>4.3</td>
<td>4.4</td>
</tr>
<tr>
<td>Central/Lower North Island</td>
<td>6.2</td>
<td>4.9</td>
</tr>
<tr>
<td>South Island</td>
<td>4.6</td>
<td>4.3</td>
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<table>
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<tr>
<th>NOC Contracts</th>
<th>FY16 - FY17</th>
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<tbody>
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<td>Nationwide</td>
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<tr>
<td>Auckland/Northland</td>
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<td>Waikato / BOP</td>
<td>5</td>
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<td>Central/Lower North Island</td>
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</tr>
<tr>
<td>South Island</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>
Impact

- Disruption
- Project Programme Effects
- Costs
Impact

- Disruption
- Commuters
- Social
- Environmental
Worst of all…
Impact

- Project Delays
  - Remedial work
- Compliance
- Reputation
Impact

Cost

Rework

3 days lost per month due to wet weather

Time required to dry out basecourse
Time required to rework basecourse
Assume an additional 2 days lost = 108 days lost per year

Plant = PTR, Three-pin, Steel drum, Watercart, Vehicles
Labour = 3x operators
Overheads = Supervisor, Site Engineer, Project Engineer, Project Manager
Material = ???
Testing
Impact

- Cost
  - Rework

- Regional Economy

50.5km/hr to 56.8km/hr during weekdays
$3.5m per day savings

Assume 40km travel per day
@50.5km/hr = 47.52 min
@56.8km/hr = 42.25 min
Difference of 5.27 min
$3.5m / 5.27min = $663,981.48/min

Assume 3km travel through road works
@100km/hr = 1.8 min
@80km/hr = 2.25min
Difference of 0.45min
$663,981.48/min x 0.45min = $298,791.67/day

That’s based on free flowing motorway speeds!
Impact

- Cost
  - Rework
    - $298,791.67 \times 108 \text{ days}
    - $32,269,500 !!!

- Regional Economy
Normal response

- Accept the wet weather
- Accept the rework
- Additional resources to accelerate programme
Concepts

- Prevent water rather than accept it as a norm
  - Protective cover over permeable pavement
  - Tent over workspace
  - Develop product to waterproof surface
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- Prevent water rather than accept it as a norm
  - Protective cover over permeable pavement
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- Seasonal Reprogramming/Alternative Pavement Designs
  - Change Design based on weather conditions
  - Cement Treated Basecourse
  - Structural Asphalt
This is a Real Issue
Questions?