A Falling Weight Deflectometer Testing Strategy to Develop Forward Works Programmes

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LOW VOLUME ROADS WORKSHOP - THE KEY ISSUES
18 – 20 July 2007
Rutherford Hotel, Nelson
Forward Works Programming in HBC

**dTIMS**
- Pavement Performance Prediction Model

**RAMM**
- Treatment Selection Algorithm

**Network Engineers**
- Local Knowledge Experience Strategic Factors

Field Validation and Economic Evaluations

**Forward Works Programme**
Data Required for Pavement Modelling in Simple Terms

- Pavement Inventory & Traffic
- dTIMS Models
- Pavement Structural Condition
- Pavement Functional Condition
Falling Weight Deflectometer Data

- Only means of determining measurable pavement structural strength in RDC.

- SNP is the primary strength parameter in pavement deterioration relationships (i.e. cracking, rutting, etc.)

- In turn, SNP affects the triggering of most treatment predictions.

- More coverage of network – “More Confident” forward work programmes
Preparation of FWD Testing Guidelines

Key Objectives

✓ Determine most effective testing frequency
✓ Determine most effective test spacing

While

✓ Maximising network coverage of FWD data
✓ Aligning with annual funding availability

How

✓ By prioritising road sections for FWD testing
Rodney District Council

Falling Weight Deflectometer (FWD) Testing Guidelines

RDC RAMM Road Hierarchy
1. Strategic Roads
2. Regional Arterials
3. District Arterials
4. Principal Roads
5. Collector Roads
6. Local Roads (as required)
7. Access Ways
8. Service Lanes

Sealed Roads
Testing Strategy
Select Priority (AADT)
Select Spacing (Length)

FWD Priority 1
All Regional Arterials
District Arterials ≥ 5000 AADT
Other Roads ≥ 5000 AADT
Test Annually

FWD Priority 2
District Arterials ≤ 5000 AADT
Other Roads 500 ≤ AADT ≥ 501
Test Every 3 Years

FWD Priority 3
Other Roads 500 ≥ AADT ≥ 201
Test Every 5 Years

FWD Priority 4
Other Roads 200 ≥ AADT
Test As Required

Test Spacing
Spacing Based on Length of Road

All Lengths
Test Every 50m Staggered Between Lanes

0m – 200m
Test Every 50m Staggered Between Lanes

201m – 2000m
Test Every 100m Staggered Between Lanes

≥ 2001m
Test Every 200m Staggered Between Lanes

Unsealed Roads
Not Included in FWD Testing Programme

Area Wide Pavement Treatment (AWPT)
Test Every 25m Staggered Between Lanes
Effect of FWD Testing Strategy

**Before:**
All Roads > 500AADT only Tested (1-2 year intervals)
All other roads – SNP assumed on engineering judgement
Common practice

**After:**
All sealed roads tested in 2007 – Benchmark network
Future testing according to the flowchart
Less assumptions on network pavement strength

**Result:**
Strategy ensures more network coverage – better forecasting
Improved confidence expected in dTIMS FWP
Guidelines also ensure cost effective data collection
Effect of FWD Testing Strategy

- Past Strategy
- New Strategy

![Bar Chart showing the comparison of Lane-km Tested between Past and New Strategy from 2007 to 2012](chart)

Year
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- Total

Lane-km Tested
- 0
- 1000
- 2000
- 3000
- 4000
- 5000
- 6000
- 7000

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ROAD ENGINEERING ASSOCIATION OF ASIA & AUSTRALASIA (NZ)
Key Points on FWD Guidelines

Can customise FWD Testing Guidelines to suit:

- Type of Road Network (i.e. Low Volume Roads, etc.)
- Local Requirements
- Funding Availability

Best value for your data collection money
Key Points on FWD Guidelines (cont…)

- Increased Network Coverage of FWD Testing
- Better Picture of the “Actual” Structural Condition of Network
- “More Confident” Forward Works Programmes
Forward Works Programming in HBC

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Field Validation and Economic Evaluations

**Forward Works Programme**

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Annual Forward Works Programme in Maps
Final Comment

Key to ‘practical’ asset management

➢ A good understanding of the client’s requirements
➢ Recognise there is no one answer suitable for all

"Best for Roads"

- Technically
- Financially
- Politically
- Strategically
- Practically

Project Level Application

Network Level Application
Thank You!

Fulton Hogan Ltd
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