Easy as 123 NPV

Colin Scott
My Background

- Pavement Rehabilitation Design
- Waikato District Alliance (2 Years)
- New to asset management
Waikato District Alliance

- Single largest pure alliance in NZ
- Commenced 1 July 2015
- Partnership between WDC and Downer NZ (and a host of supply partners)
- Tenure 5+5 years
Waikato District Alliance

- Maintenance and renewal activities within the road corridor
- Staffing numbers range from 160 to in excess of 250
WDC Network Stats

- Sealed: 1813km
- Unsealed: 601km
- Rural: 87%
- Low Volume Roads: 79%
  (Secondary Collector or Lower)
Renewals

- Rehabilitation 18km
  74% LV
- Resealing 115km
  77% LV
Expected Growth

Next 10 Years

• Roads from new developments (19km)
• Revocation of state highways (63km)
Network Challenges

Maintenance Cost Heat Map

- Growth (Pokeno/Te Kauwhata)
  - Slips
- Peat subgrades
The Challenge

• Justifying rehabs on low volume roads
• Using data based evidence
• No fudge
What we know

- The cost of renewal treatments
- The cost of maintenance treatments
- Existing maintenance trends
- Maintenance spend per annum
Gaps

- Maintenance costs after a rehab
- The difference in these costs between classifications of roads
Gaps

Modelling Maintenance Costs

• If you haven’t done any work, you never will
• If you’ve done work, you made it worse
Possible Solution

Post rehabilitation, maintenance cost curves
That can be filtered on a variety of attributes
What it looks like

Using all the data:

$50,000 in 33 years compared to $50,000 in 15 years

Arterials on peat subgrade:

$y = 32.437x^2 + 431.92x$

$R^2 = 0.9965$

$y = 62.423x^2 + 2013.6x$

$R^2 = 0.9741$
Secondary Collectors on Peat

45 year view

Would you use a 25 year design life in this area???
Benefits

• Data based evidence
• Consistent process
• Further analytics
Output

- NZTA SP1 spreadsheet
- Data driven
- Better understanding of cost/savings
- Better understanding of network performance
Constraints

- Quality of data
- Quantity of data
- Historic rates
- Conservative
The future

- More data available
- Adjustment for today’s rates
- Better data in = better data out
- Improved model outputs
Other considerations

Current modelling process

Network Level
- Collect data (All Faults/HSD)
- Run dTIMS Model (recommends treatments)
- Field Validate Treatments

Project Level
- Compile relevant data
- Determine the best strategy
- Justify Treatments

Could the model produce already justified treatments?
Other considerations

• Low volume roads require less % defects before a rehab can be justified. (Lower cost renewals)

• Will future NPV’s require an ONRC weighting to be used in justifications?
Other Considerations

- VKT’s vs proportion of maintenance spend
- Balancing the cost of renewals with the cost of ongoing maintenance
Thanks for listening

Questions??

There are two kinds of people in the world: those who can extrapolate from incomplete data.