



GEO SOLVE

ENGINEERING CONSULTANTS



Optimising Treatment Lengths

Closely Spaced Pavement Strength Data



Two Coat Seal,
2002
19mm thick

Asphaltic Concrete,
2000
25mm thick

?



Terminal Distress Year
2022

Terminal Distress Year 2040

NZ Road Networks Today

Stuff

Potholes are increasing on the roads. The experts explain why

Michael Daly and Ella Morgan · 20:24, Oct 03 2022



“Sections of road that are due for renewal are often the worst affected areas as the pavement and surface are weaker and starting to fail”

“inadequate funding from pay-as-you-go road user charges”

“largest ever road renewal season”

NZ Herald

NEW ZEALAND

Ashburton council expects improvements from roading contractors

By [Jonathan Leask](#)
Local Democracy Reporter - Mid Canterbury

28 Sep, 2022 05:00 AM · 3 mins to read

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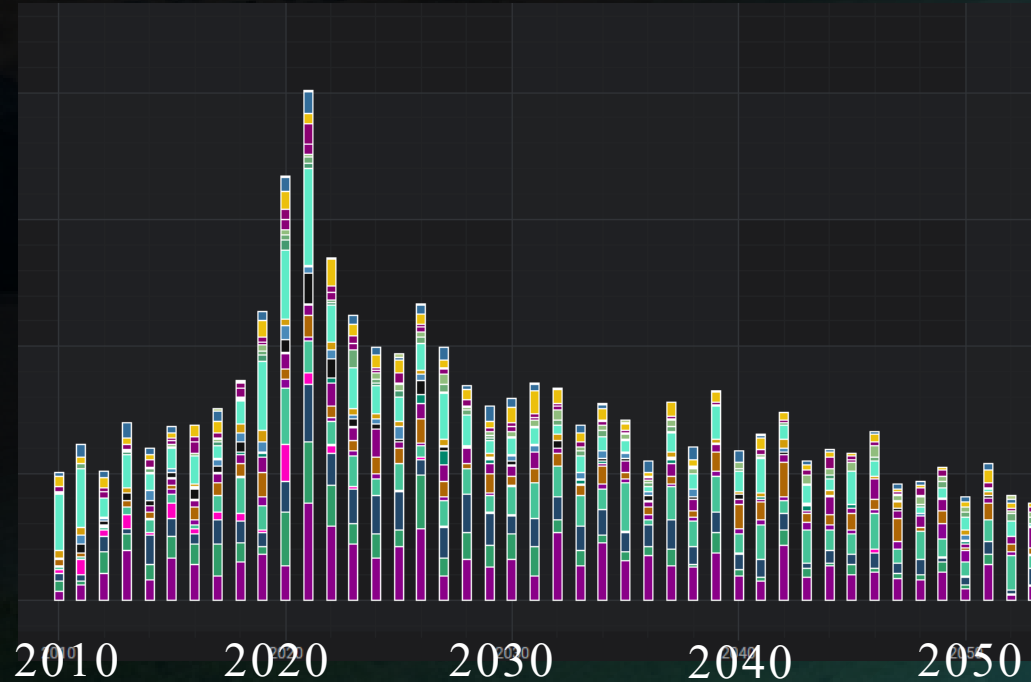
“insufficient funding across New Zealand to maintain the network”

“how do we make our scarce resources go a bit further”

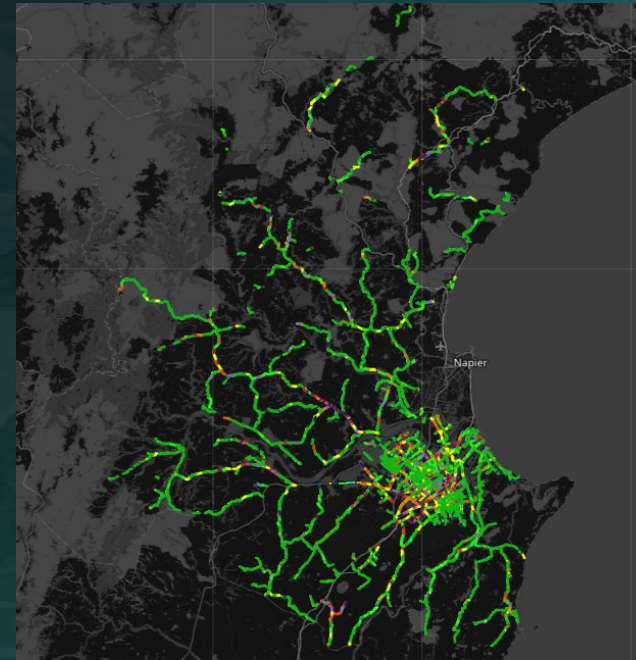
“how they can do things differently and improve on the maintenance of our roading network”

“improve the maintenance of our roading network”

When?



Where?



What?

- Subgrade spreading, rutting, shear
- Subbase spreading, rutting, shear
- Shallow instability
- Basecourse spreading, shear, rutting
- Bound base cracking (top down, bottom up)

Current Practice

Current Industry Practice: 1-3 Year Forward Works Programmes
Developed from the Candidate Selection Algorithm (CSA), Previously TSA

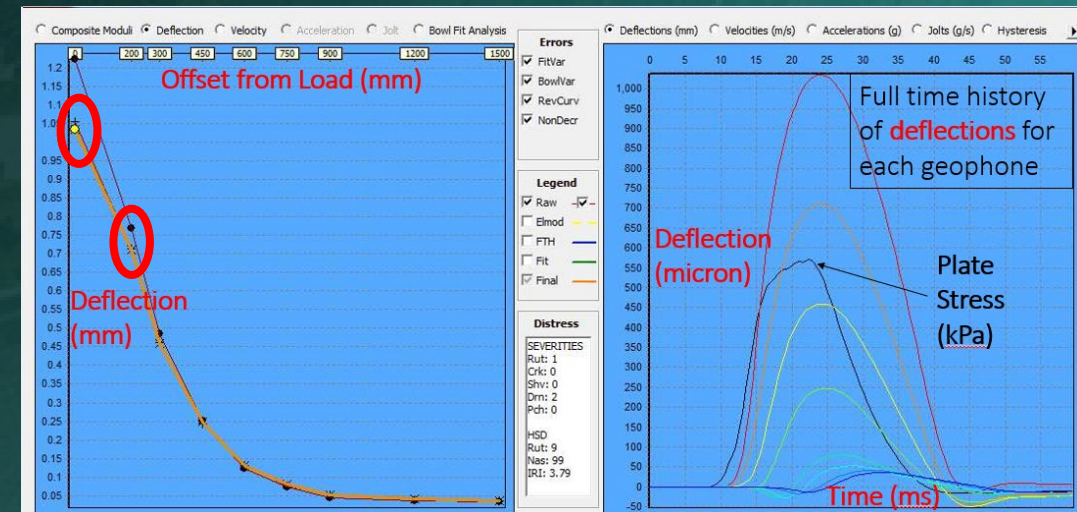
CSA Inputs To Focus On:

- Surface treatment length extents
- Falling Weight Deflectometer (FWD) empirical parameters (central deflection and curvature)

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Recommended Future Practice

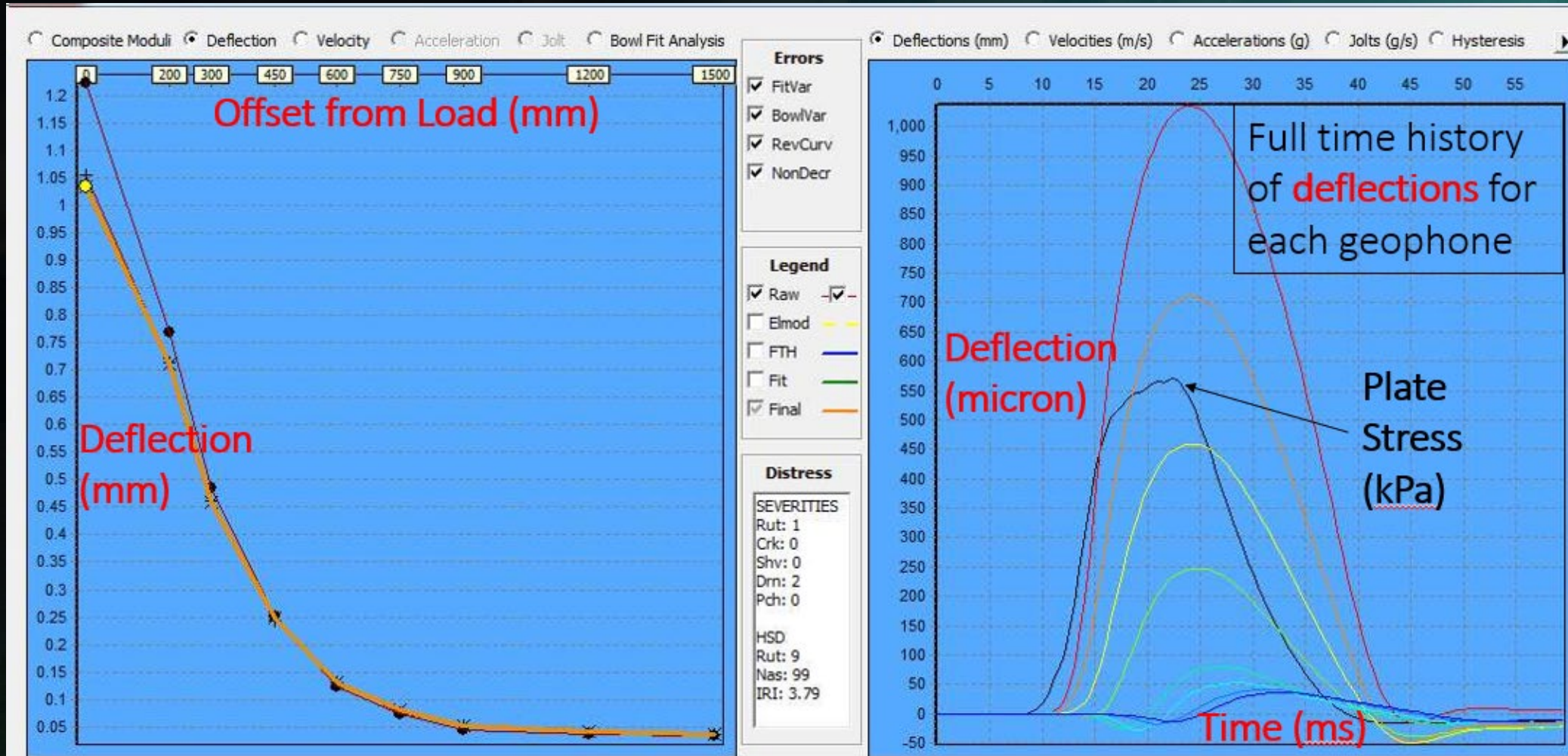
1-30 Year Forward Works Programmes

Developed from the Candidate Selection Algorithm (CSA), Previously TSA

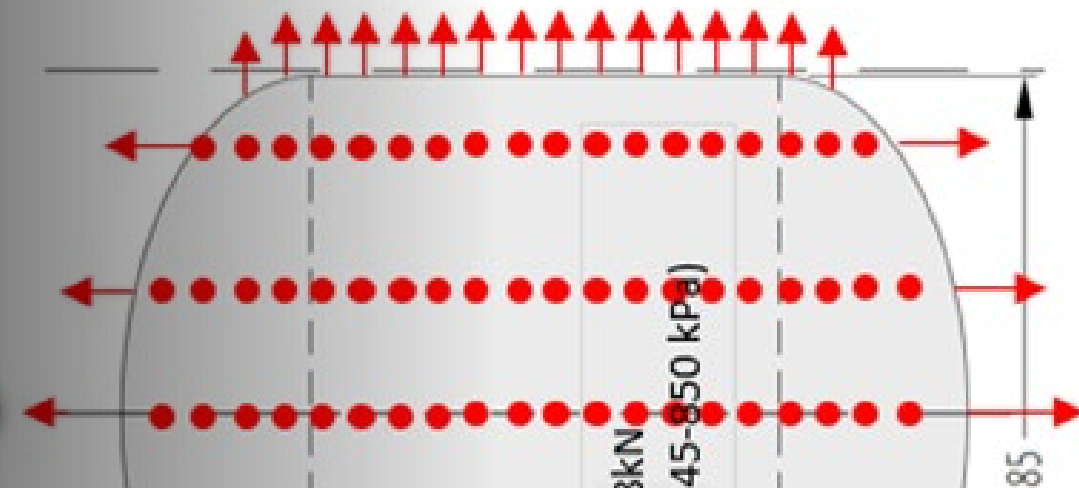
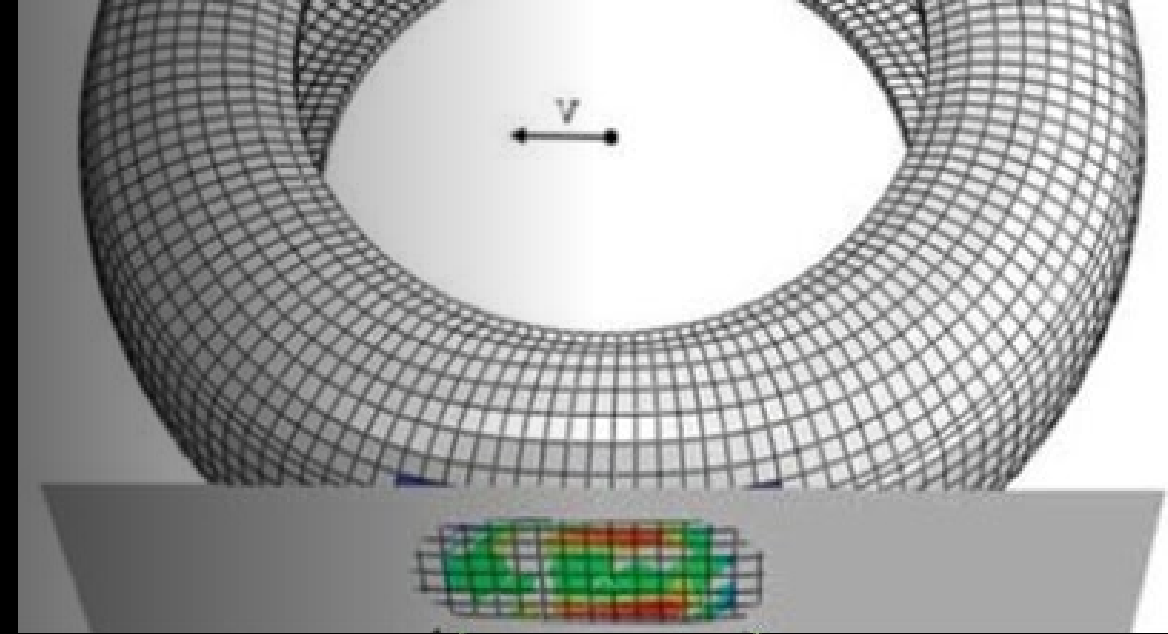
CSA Inputs:

- Surface treatment length extents
 1. Falling Weight Deflectometer (FWD) full deflection bowl
 2. Multi Speed Deflectometer (MSD) high test density structural indicators
 3. Structural treatment lengths

FWD Full Deflection Bowl

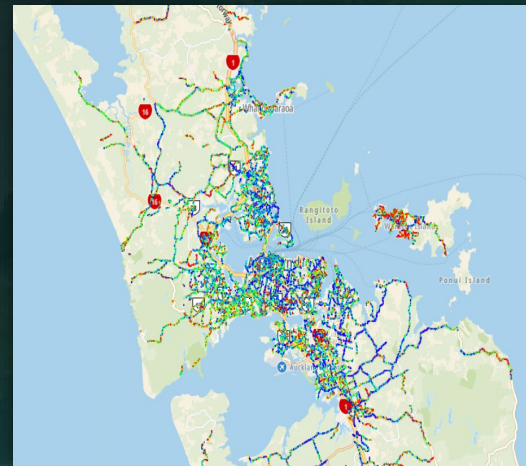


Multi Speed Deflectometer



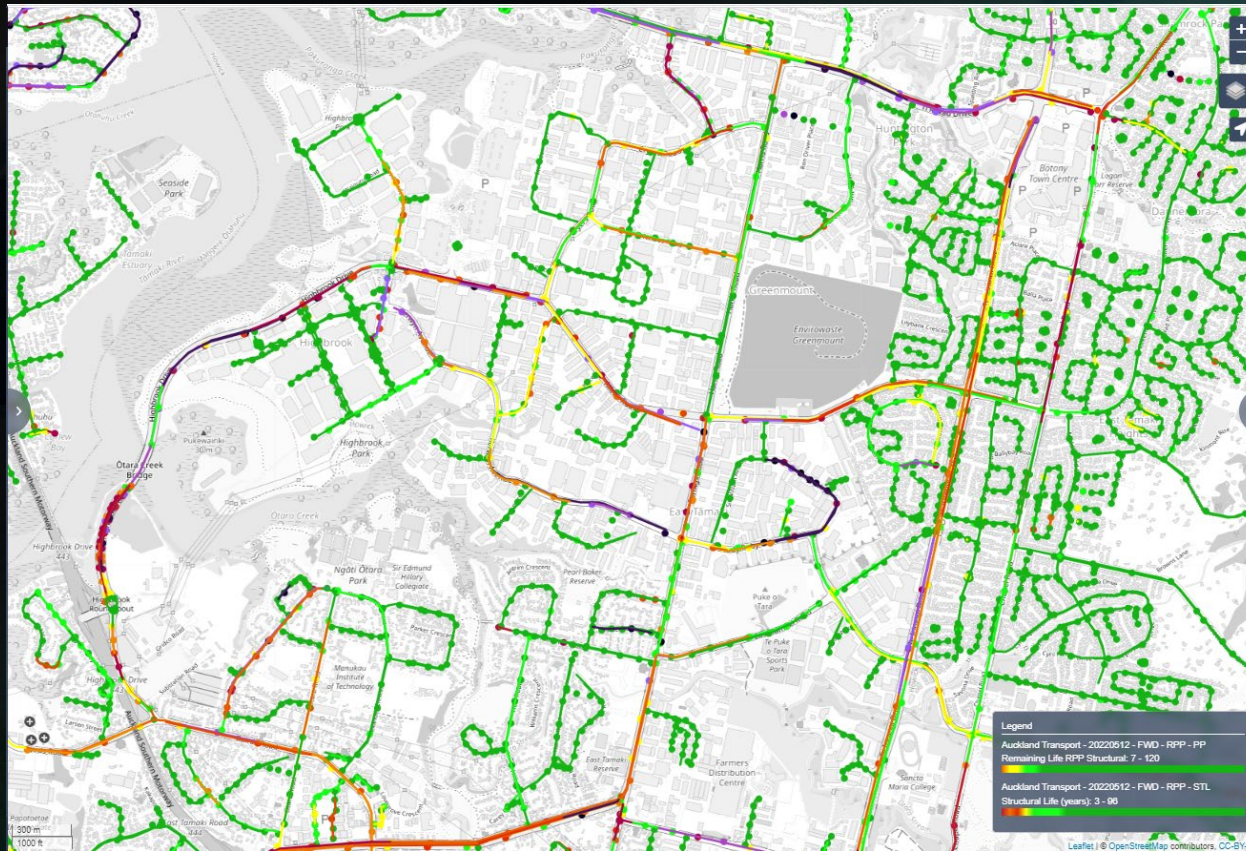
The Multi-Speed Deflectometer (MSD)

- 1m sampling – dual wheel path
- Traffic speed data collection
- Accessible to full network
- Significantly lower cost per lane km at 10-20m test spacings
- No weather dependency
- Easily mobilized
- Use local vehicles and personnel
- Easy to use and train
- Calibrated to Falling Weight Deflectometer Data empirical parameters (central deflection, curvature, SNP)



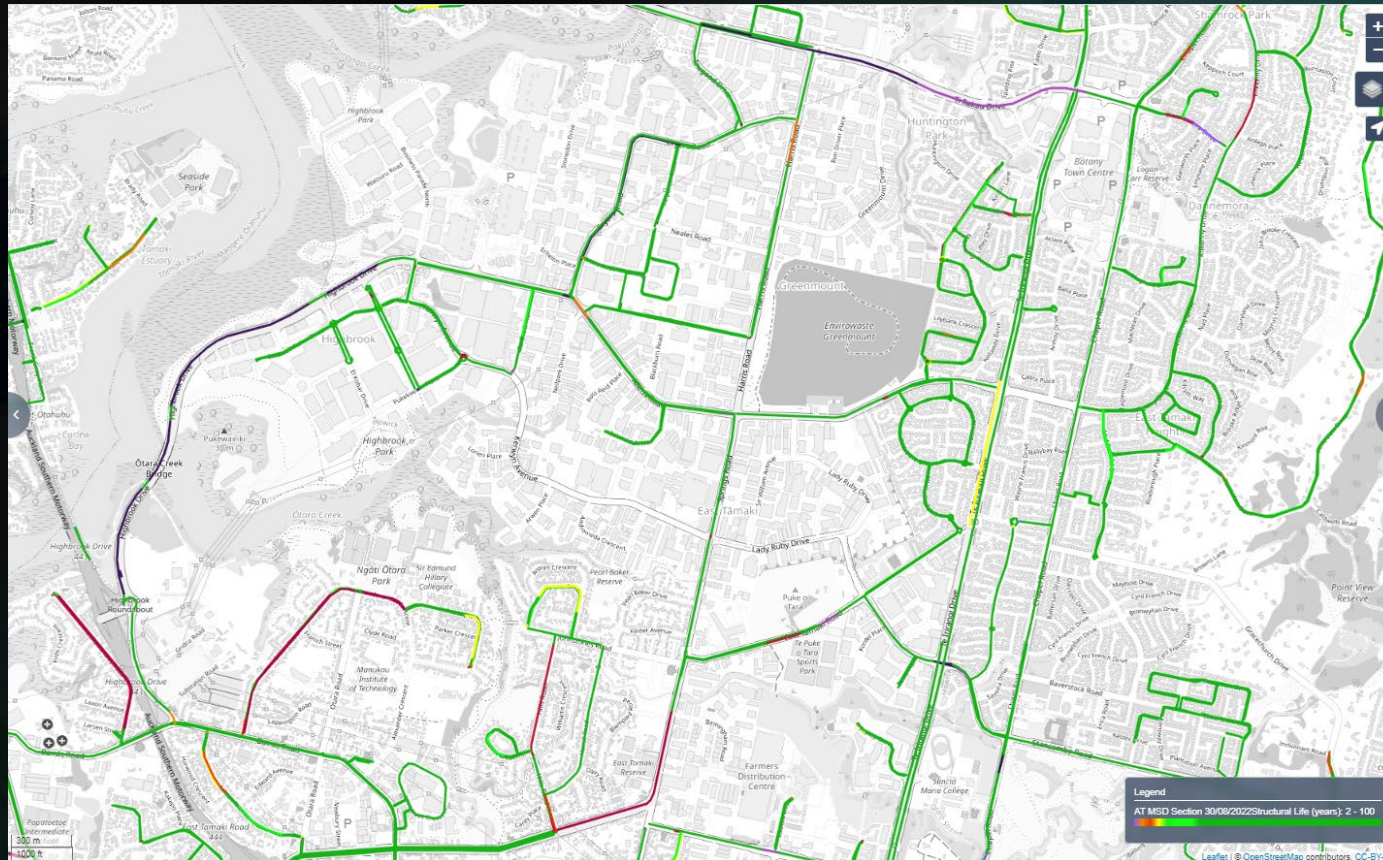
Structural Treatment Lengths: FWD

From Points to Lines (Sections)

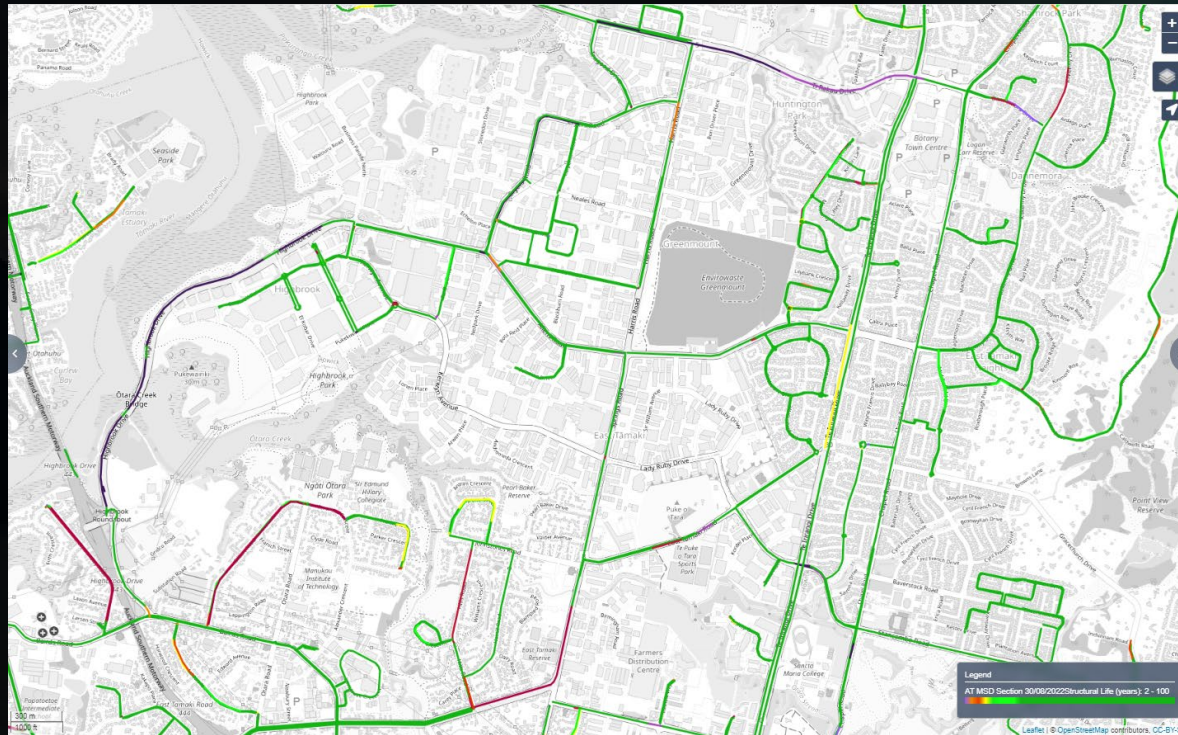


Structural Treatment Lengths: MSD

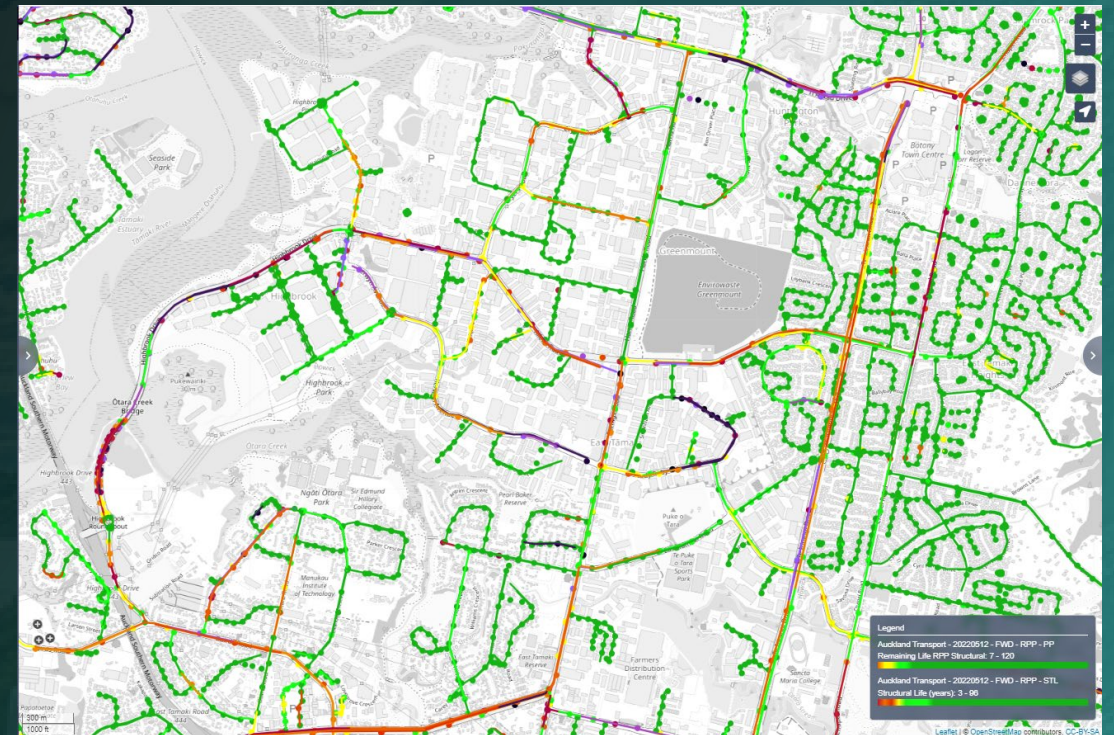
From Points to Lines (Sections)



Structural Treatment Lengths: MSD and FWD



MSD



FWD

Auckland Transport Case Study

Kahikatea Flat Road – 2022/2023 Rehab Site



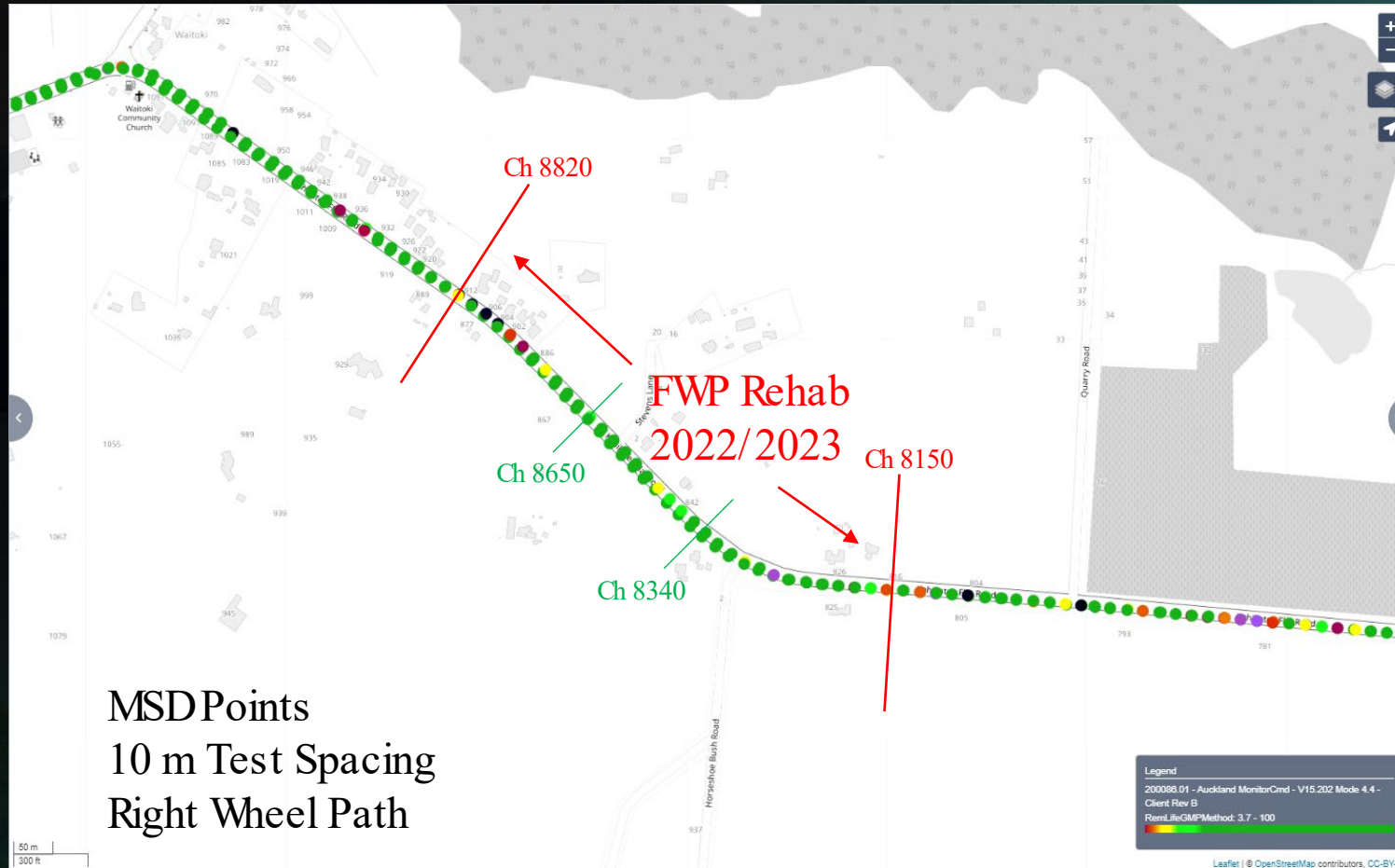
- Section 8150 – 8820m
- Cost \$1.78 million to rehab out of \$35 million budget

End sections displayed more defects including flushing, alligator cracking, rutting and pumping of fines on both the increasing and decreasing direction.

- Cost of rehabilitation mid section (Ch 8340 – 8650):
\$765,600
- Does this section need rehab?

Auckland Transport Case Study

Kahikatea Flat Road



Recommendations

- Utilise new (MSD) and existing (FWD) structural data
- Develop structural treatment lengths for long term planning (30 years)
- Screen with MSD first, then concentrate FWD testing by priority
- Include structural data in renewal decision making

QUESTIONS

