

# TREC's FME Journey

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Transport Rebuild East Coast



Te Kāwanatanga o Aotearoa  
New Zealand Government



**Emma Winthrop** - **Setting Up For Good**  
TREC Team Lead, NZTA

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TREC FME Lead, Aurecon

**Transport Rebuild East Coast**



# Setting up for Good

**Transport Rebuild East Coast**



# Natural Disaster : Recovery

## • 2023 Cyclone Gabrielle

- the deadliest cyclone to hit New Zealand since 1968, surpassing Cyclone Bola in 1988
- affecting huge numbers of people, enormous areas

Response

Recovery

Rebuild

Maintenance and Operations

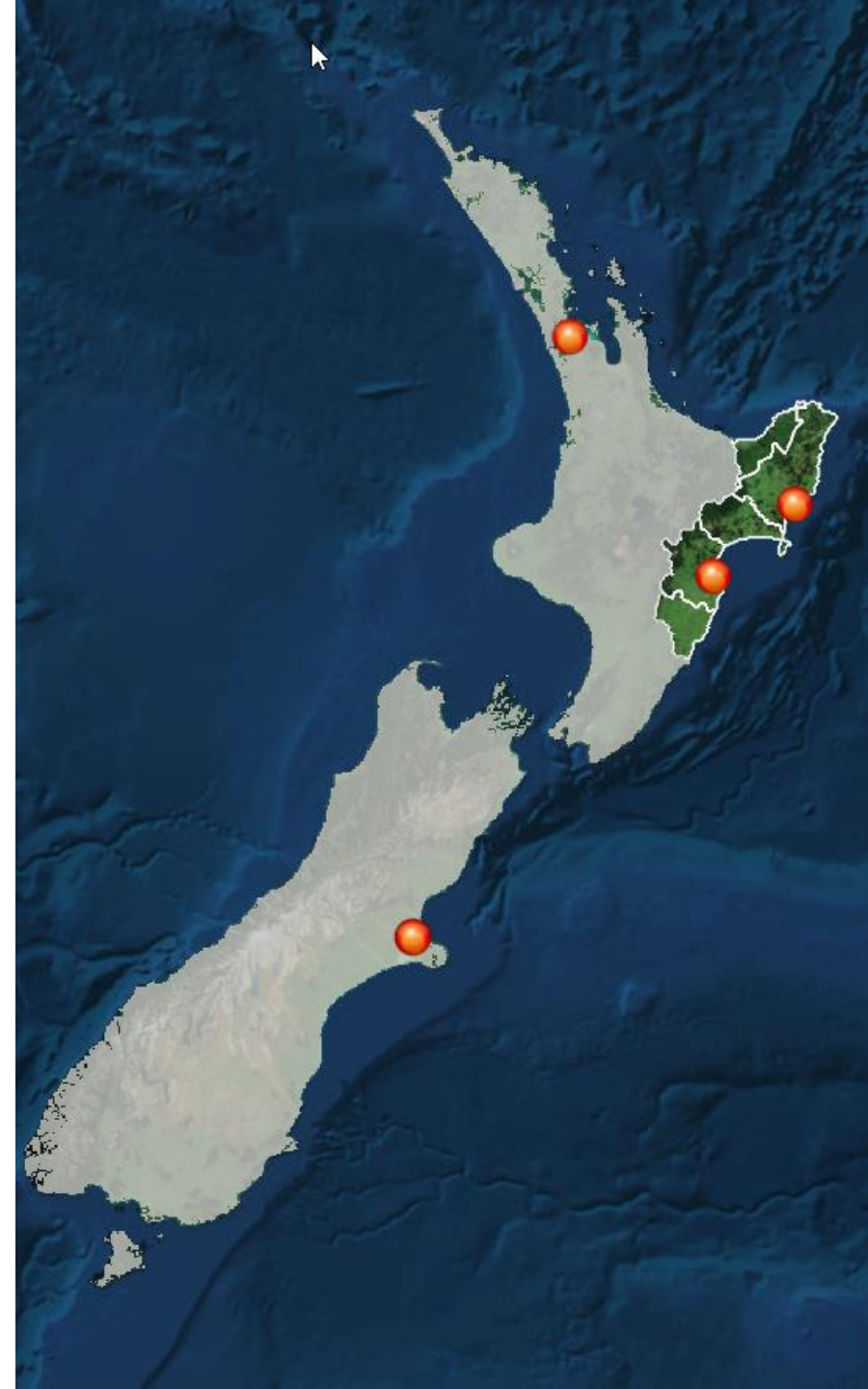
TREC

# Transport Rebuild East Coast

## What's the difference?

- Funding model
  - Rebuild business cases
- Geographic spread
  - (Napier, Gisborne, Christchurch, Auckland)
- Client involvement
  - Geospatial enablement
- Puns:
  - SCIRT – hemline
  - NCTIR – the Hive
  - TREC...

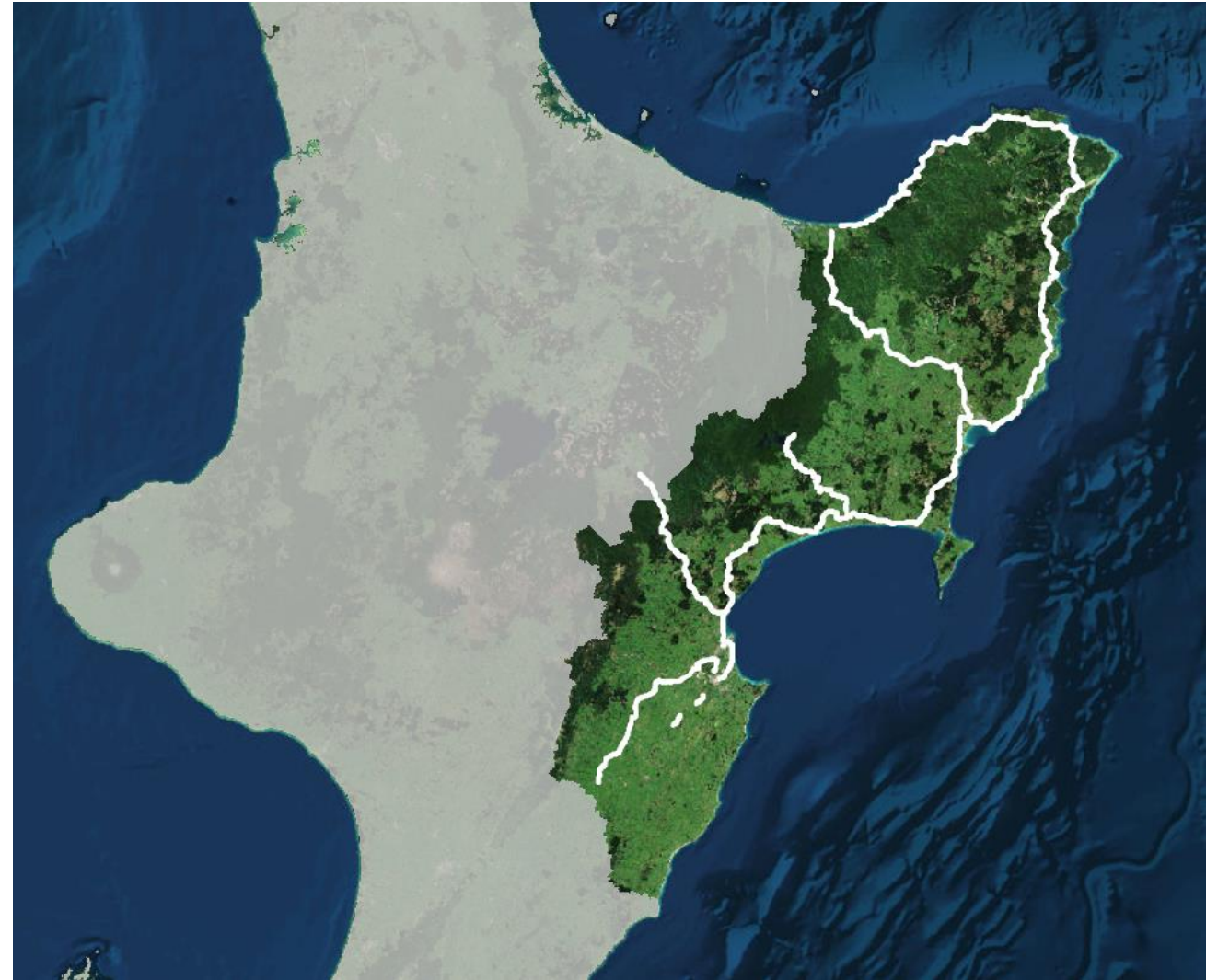
*“It's life, Jim, but not as we know it, not as we know it, not as we know it”*



# Captain's Log

## The TREC Programme of Works

- Alliance members are
  - Owner Participants: NZTA, KiwiRail,
  - Non-owner Participants: Downer, Fulton Hogan, and Higgins
  - Sub-alliance: Aurecon, WSP, Tonkin and Taylor
- Alongside local contractors and suppliers
- East Coast first approach



# NZTA Digital Enablement Strategy

- Guidance for handing back project information
- Embedding AMDS into projects (Asset Management Data Standard)
- Extending NZTA geospatial capability to alliance partners
- System of Systems



# TREC Universe

...in a nutshell

- Recovery (funded)
- Maintenance and Operations
  - NOCs brought in for lifetime of TREC
- Rebuild
  - Programme of Works plus Major Projects - Business Cases





# TREC Universe

- Recovery
- Rebuild

Recovery work budget numbers

**\$384M**  
recovery funding

**419**  
sites identified for recovery work

**134**  
recovery sites are complete and being maintained by TREC

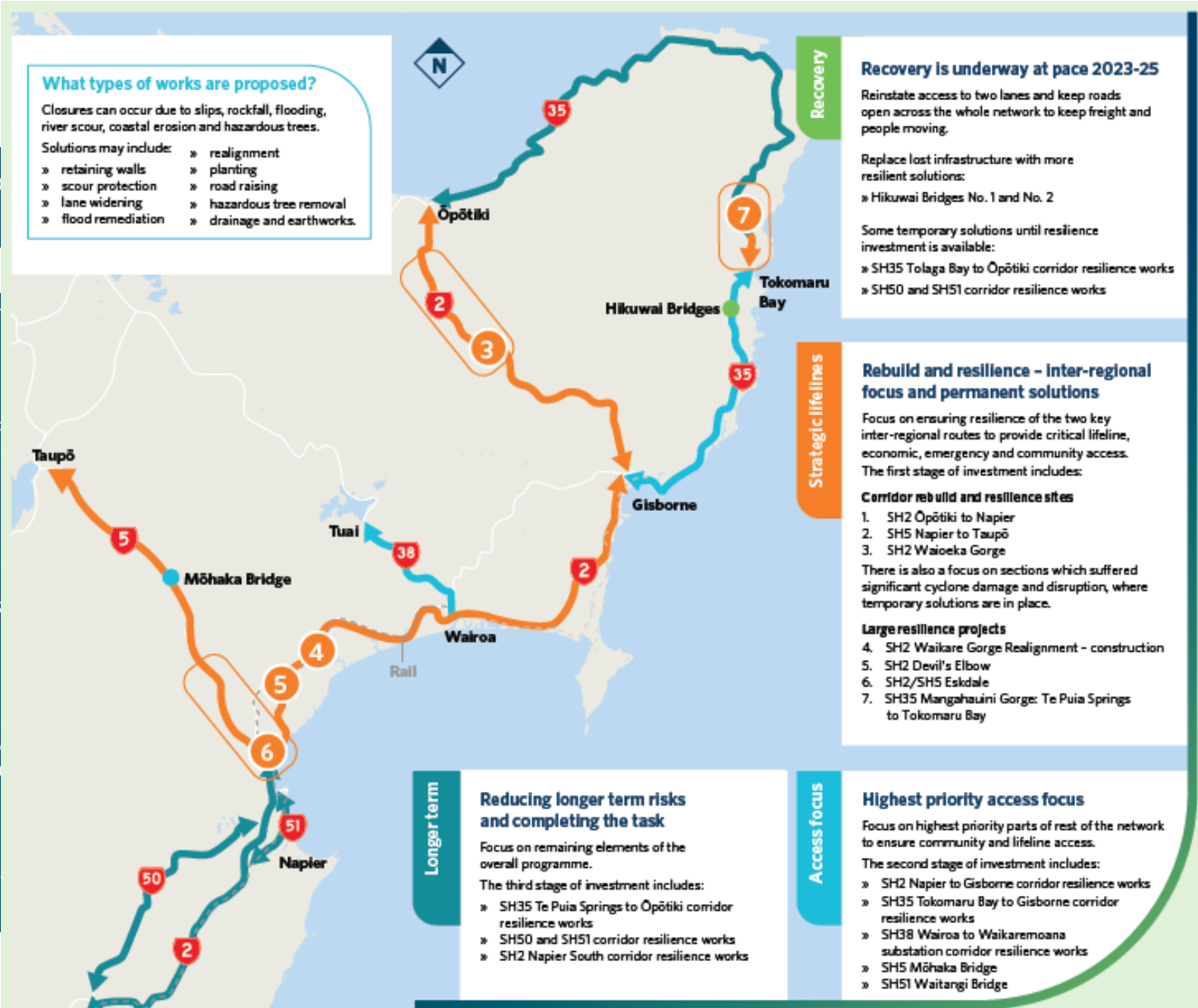
**58**  
recovery sites are in construction or construction planning

**131**  
recovery sites are in design

## What types of works are proposed?

Closures can occur due to slips, rockfall, flooding, river scour, coastal erosion and hazardous trees.

- Solutions may include:
- » retaining walls
  - » scour protection
  - » lane widening
  - » flood remediation
  - » realignment
  - » planting
  - » road raising
  - » hazardous tree removal
  - » drainage and earthworks.



**Recovery**

**Recovery is underway at pace 2023-25**

Reinstate access to two lanes and keep roads open across the whole network to keep freight and people moving.

Replace lost infrastructure with more resilient solutions:

- » Hikuwai Bridges No. 1 and No. 2

Some temporary solutions until resilience investment is available:

- » SH35 Tolaga Bay to Opōtiki corridor resilience works
- » SH50 and SH51 corridor resilience works

**Strategic lifelines**

**Rebuild and resilience - Inter-regional focus and permanent solutions**

Focus on ensuring resilience of the two key inter-regional routes to provide critical lifeline, economic, emergency and community access. The first stage of investment includes:

**Corridor rebuild and resilience sites**

1. SH2 Opōtiki to Napier
2. SH5 Napier to Taupō
3. SH2 Waioeka Gorge

There is also a focus on sections which suffered significant cyclone damage and disruption, where temporary solutions are in place.

**Large resilience projects**

4. SH2 Waikare Gorge Realignment - construction
5. SH2 Devil's Elbow
6. SH2/SH5 Eskdale
7. SH35 Mangahauini Gorge: Te Puia Springs to Tokomaru Bay

**Longer term**

**Reducing longer term risks and completing the task**

Focus on remaining elements of the overall programme.

The third stage of investment includes:

- » SH35 Te Puia Springs to Opōtiki corridor resilience works
- » SH50 and SH51 corridor resilience works
- » SH2 Napier South corridor resilience works

**Access focus**

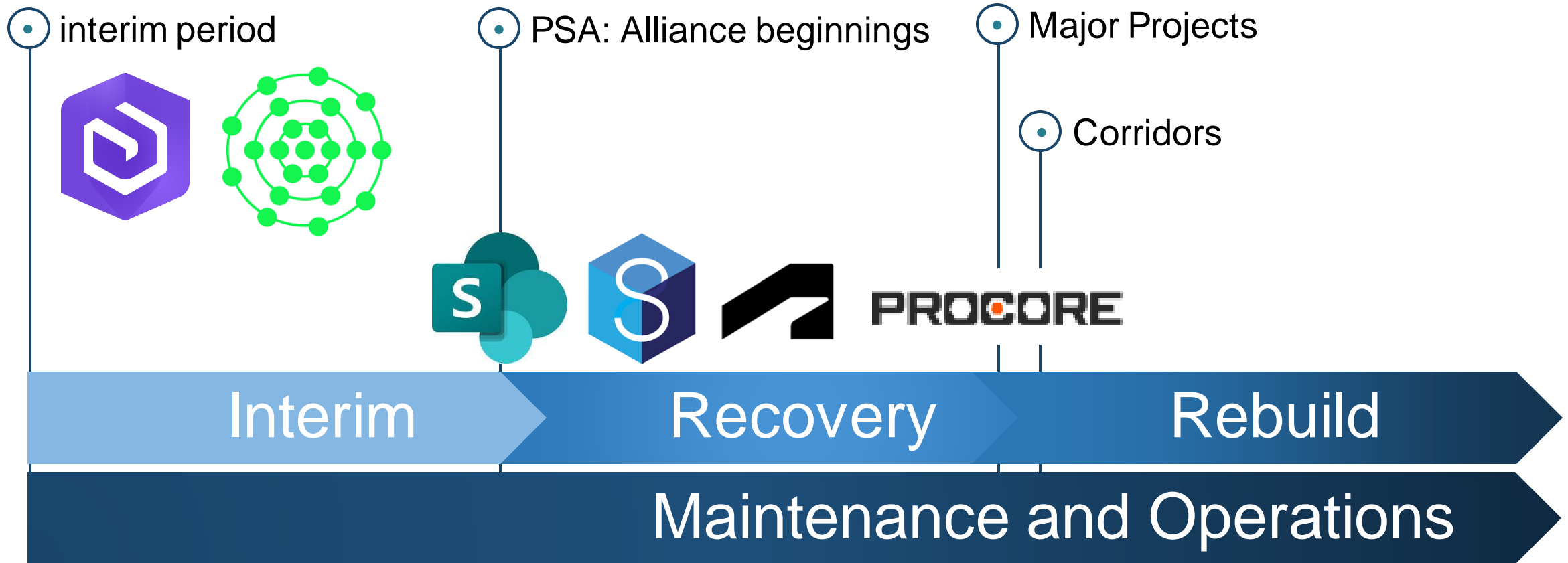
**Highest priority access focus**

Focus on highest priority parts of rest of the network to ensure community and lifeline access.

The second stage of investment includes:

- » SH2 Napier to Gisborne corridor resilience works
- » SH35 Tokomaru Bay to Gisborne corridor resilience works
- » SH38 Wairoa to Waikaremoana substation corridor resilience works
- » SH5 Mōhaka Bridge
- » SH51 Waitangi Bridge

# TREC Universe



# Solutions

- Pou Arahi
- Geotech
- Property
- Maintenance & Operations
- Landscape and Urban Design
- Survey
- Progress

☰

## Recovery Progress Reads from Procore and P6 exports

**Filter by Zones**

BCDEFGH

No Filter

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**Subjobs by state highway**

00200505SH 2

SH 35SH 38SH 5SH 50

51All

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**Subjobs by funding type**

Recovery
No Filter

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**Subjobs by Current Phase**

Construction

Construction Planning

Detailed Design
Handover

Preliminary Design

Project Definition
Proposal

None

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**Subjobs by Lead**

No Filter

Eagle Technology, LINZ Powered by Esri

Road Projects

1

Subjobs

1

Faults

60

Projects

B1004  
White Pine Bush

B1041

B1101

Subjobs by Project

B1004A

B1004B

B1004C

B1004D

B1004E

B1004F

B1004H

B1004J

B1004K

<table style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;">1-Identification</td><td style="padding: 2px;">Actual</td></tr> <tr><td style="padding: 2px;">2-Project Definition</td><td style="padding: 2px;">Actual</td></tr> <tr style="background-color: #007bff; color: white;"><td style="padding: 2px;">2-Project Definition</td><td style="padding: 2px;">Baseline</td></tr> <tr><td style="padding: 2px;">3-Preliminary Design</td><td style="padding: 2px;">Actual</td></tr> <tr style="background-color: #007bff; color: white;"><td style="padding: 2px;">3-Preliminary Design</td><td style="padding: 2px;">Baseline</td></tr> </table>	1-Identification	Actual	2-Project Definition	Actual	2-Project Definition	Baseline	3-Preliminary Design	Actual	3-Preliminary Design	Baseline	<p><b>Project Number:</b> B1004 - <b>Subjob:</b> B1004B</p> <p><b>Last Gate:</b> GATE 6 <b>Passed</b> <b>On:</b> 21 February 2024</p> <p><b>Current Phase:</b> Construction <b>Owner:</b></p> <p><b>Description:</b> Underslip, 24m long, 9m above the river</p>
1-Identification	Actual										
2-Project Definition	Actual										
2-Project Definition	Baseline										
3-Preliminary Design	Actual										
3-Preliminary Design	Baseline										

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# FME in Action

Project examples and Opportunities on TREC

**Transport Rebuild East Coast**

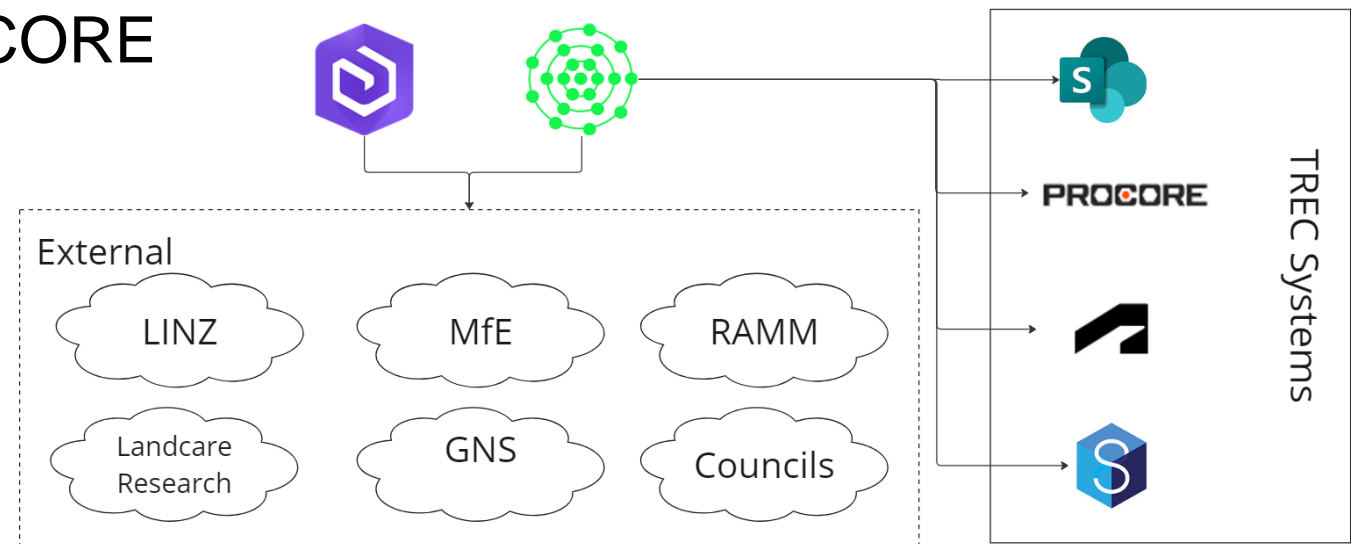
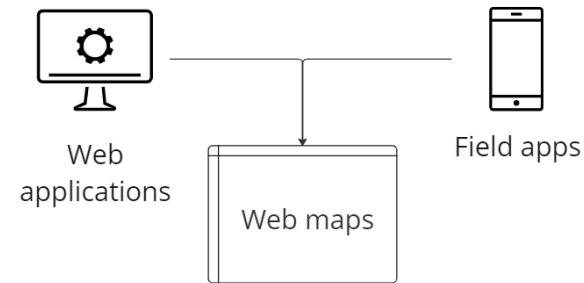


# FME: Navigating TREC Software Universe

Multiple alliance authentication environments, adopted tech and standards



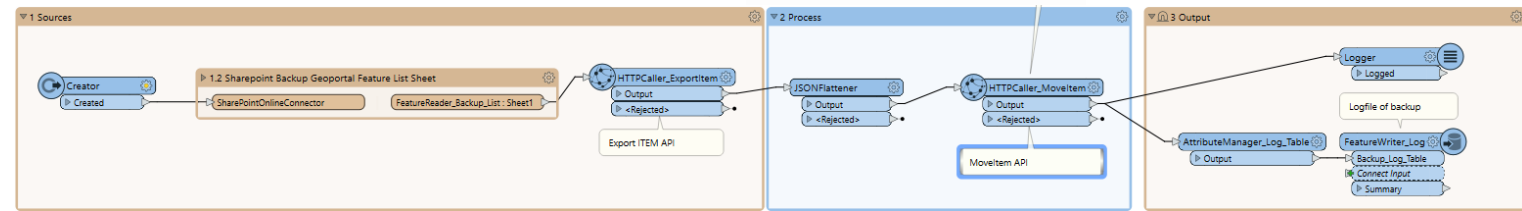
- BYOD
- CDEs: Sharepoint
- CDEs: 12d Synergy
- Documents and Workflow: PROCORE



# On the bridge: Operations

TREC Production workflows for key processes:  
FORM and FLOW

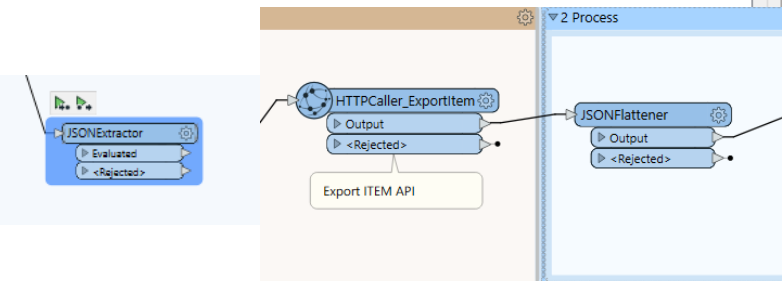
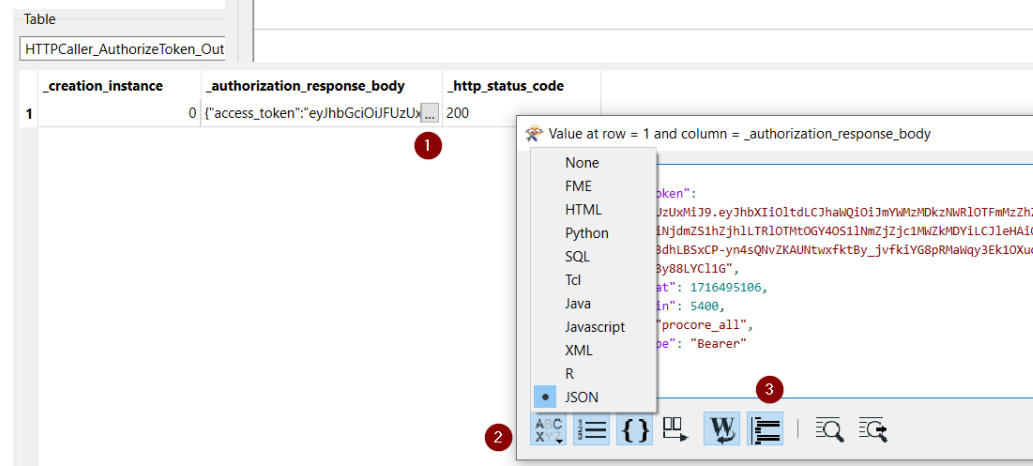
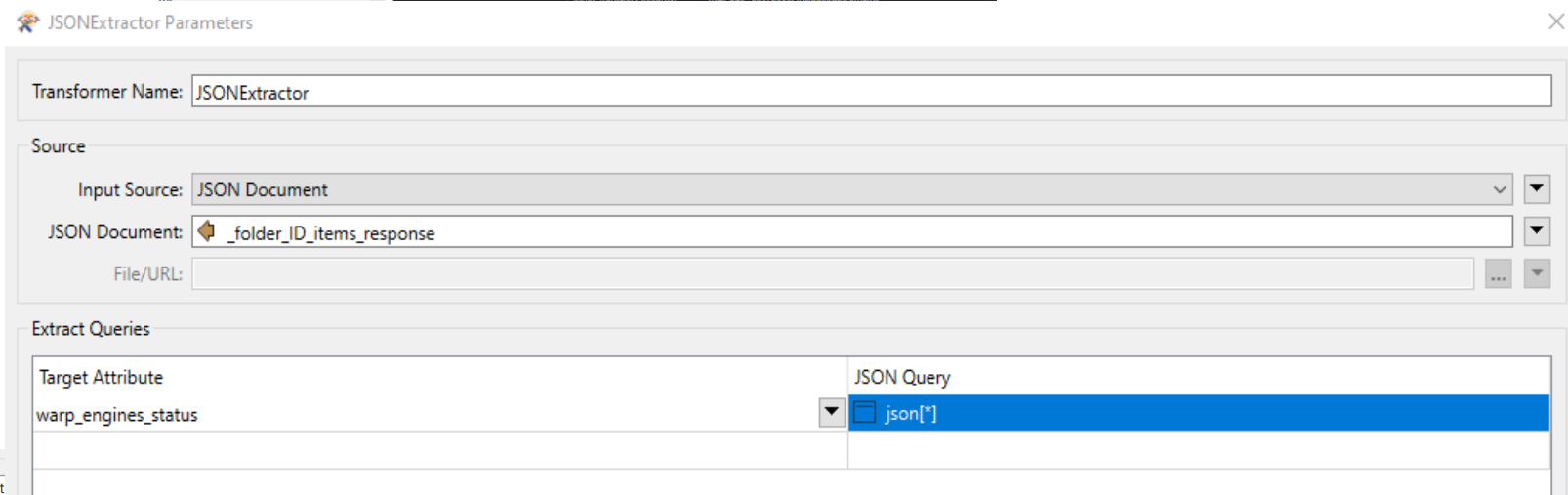
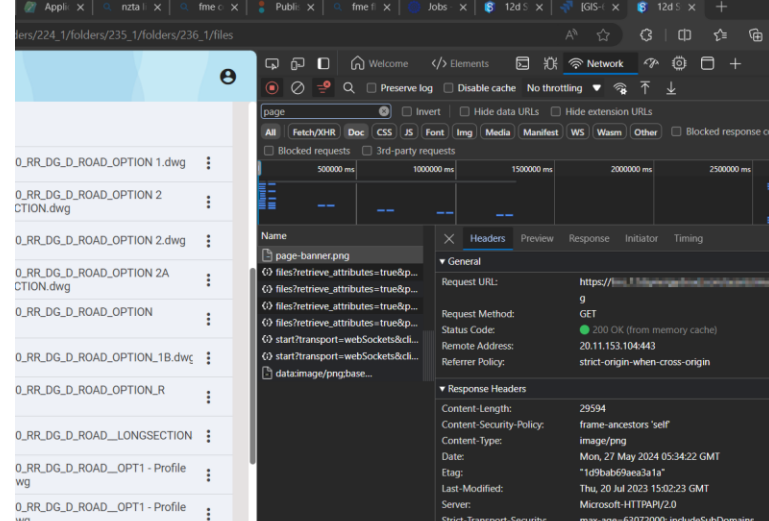
- LRP: Desktop processing combined with ArcGIS PRO map series
- Auto Feature Backups – ESRI REST service API calls to endpoints
- Daily RAMM snapshots
- FLOW Self serve – CAD from GIS content



# In the Engine Room

HttpCaller: “Universal” key to unlock cloud strategic and operational data sources

- Scotty of integrations: APIs – will engineer a warp factor connection no matter the odds
- TREC connects to Synergy, ESRI and others
- Nuts N Bolts: Exploring data structures and API responses in concert with JSON utilities and query language



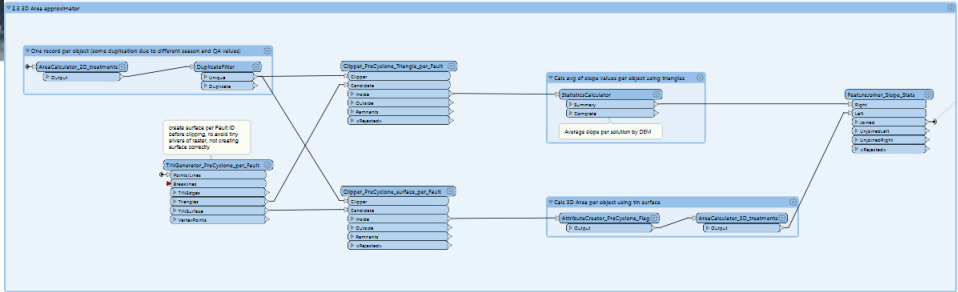
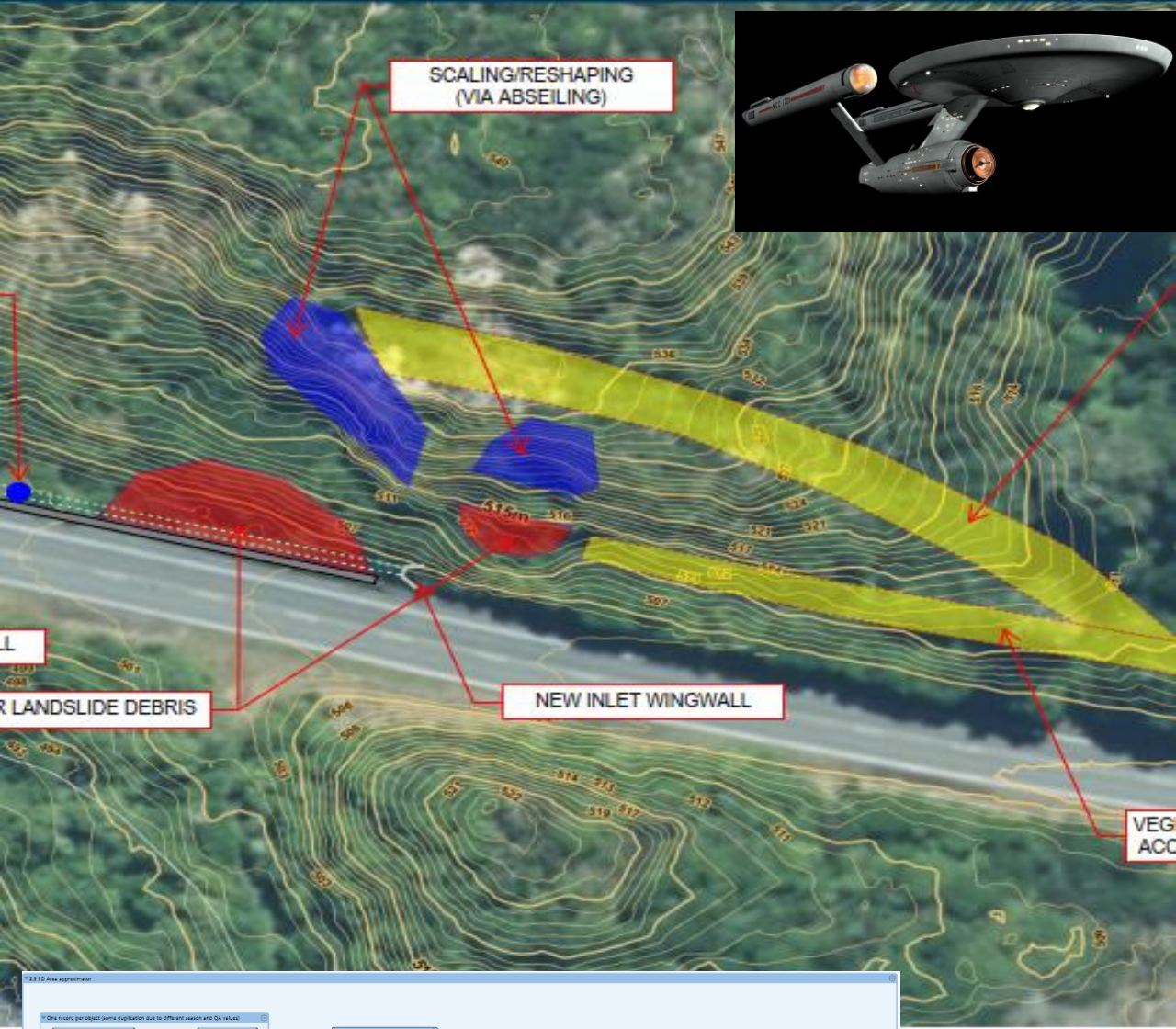




# Boldly going where ...

TREC: Breaking the mold on traditional AEC workflows.

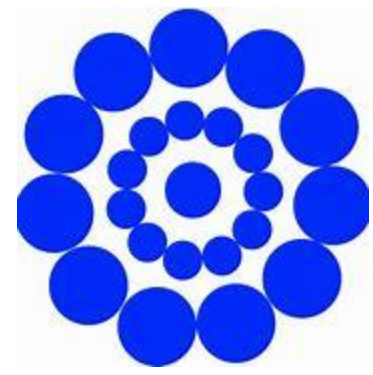
- Concept Design + QS integration
- Key Challenge: Business case inputs for SH2 & SH5 corridors including 123 Fault locations
- Concept designs with rich calculated attribution derived and merged from multiple data domains (~40 solution types) by FME to provide quantities output as XLSX for QS
- Uniform, automated, repeatable results - avoiding CutNPaste
- Recent experience of more “traditional” approach took ~25 people about 8 weeks of design time for 100 sites
- Integrated GIS/FME process used a design team of 6 FTEs to complete all the pricing of 123 sites in approx. 10 weeks (including 2 for the QS)
- Future options to automate QS calculations directly



# Ongoing mission:

To seek out new applications, collaborations and integrations

- Real time TomTom API data for KPI metrics on road network
- Autodesk Construction Cloud
- Self Serve FLOW apps
- Design Integration – Synergy source
- AMDS model schema and data validation



Connect



Transform



Automate



# Questions?

Live long and prosper



**Transport Rebuild East Coast**

