



**FME**  
WORLD TOUR  
2019

# Where do we draw the line? Evaluating text based feature mapping in FME

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# PRESENTATION AGENDA

- |   |                     |  |
|---|---------------------|--|
| 1 | Background          |  |
| 2 | The problem         |  |
| 3 | Exploring solutions |  |
| 4 | Future tech         |  |
|   |                     |  |
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|   |                     |  |

START



# What we do



- Abley is a specialist professional services company, long experienced in transportation planning and engineering, spatial and data intelligence
- Abley empower our clients to make effective decisions by providing clear and insightful advice
- Legacy of transportation and spatial capabilities, expertise working with a wide range of data



Partners



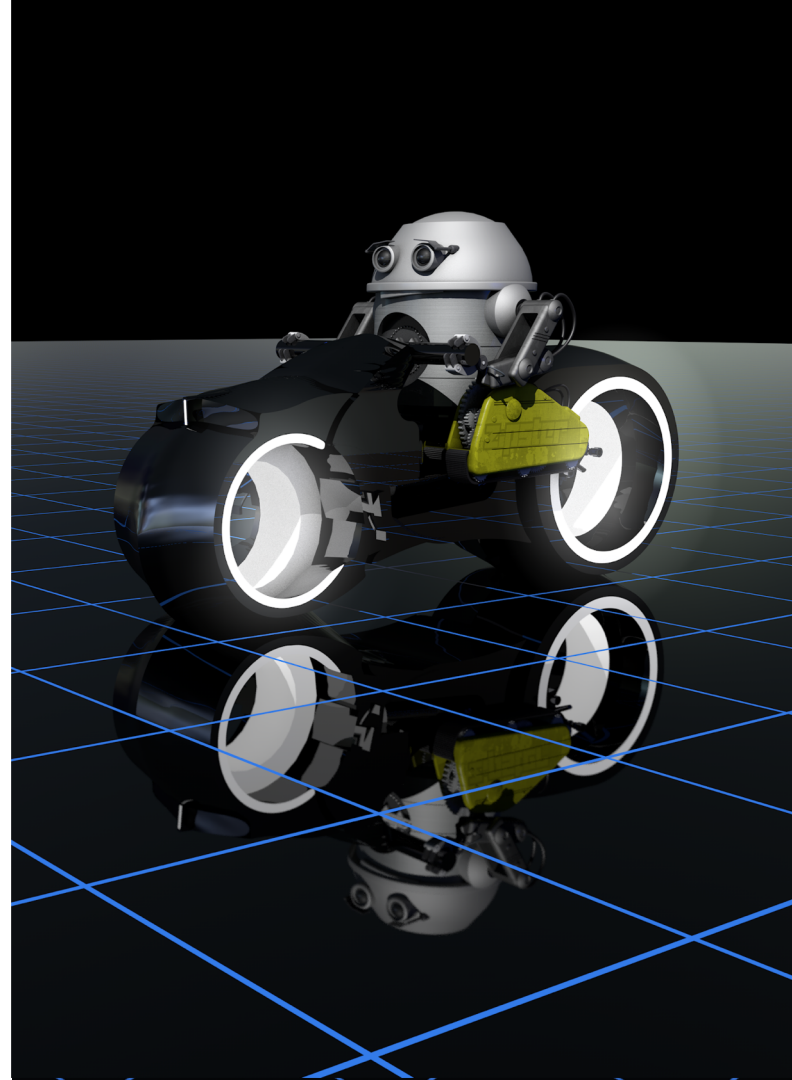
# Unifying NZ's Speed Limits

Building a National speed limit management platform for New Zealand



# Unifying NZ's Speed Limits

- Application will serve the public, the police, NZTA, RCA's and commercial stakeholders
- 68 Road Controlling Authorities (RCA's)
- Speed Limit Registers (SLR's) come in all shapes and sizes
- 2 phases to the project:
  - Application build
  - Data migration

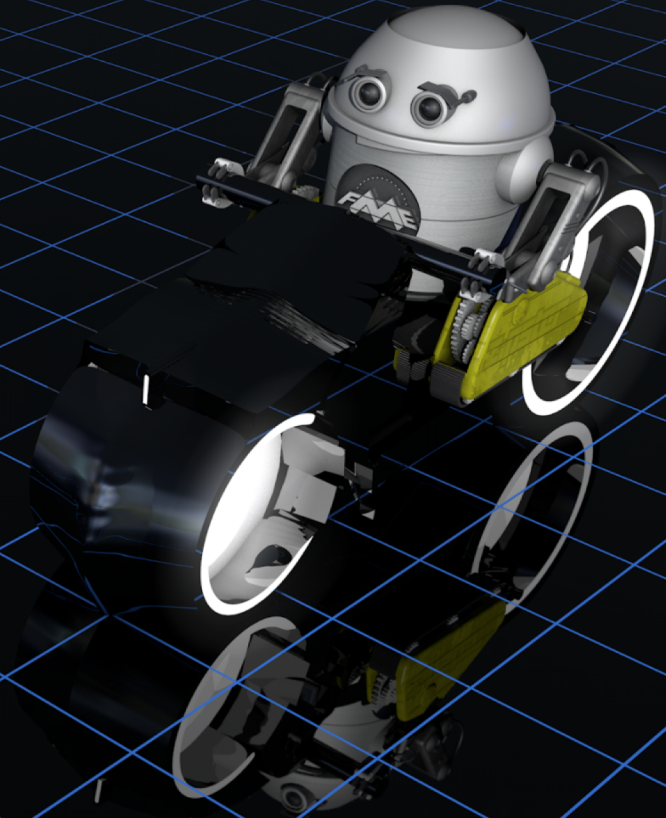


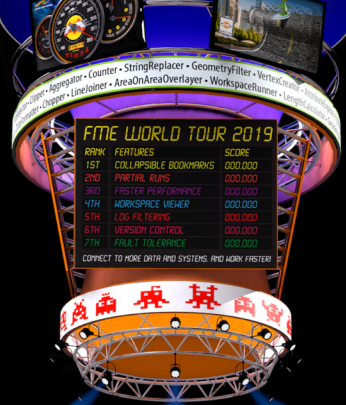


Tackling the migration problem

# What does the data look like?

- Sample of RCA registers:
- Static GIS Data and Maps
- AGOL feature services, API's
- Text/Excel based Speed limit registers
- ...?





# Geolocating Speed Limits from Non- Spatial SLRs

The challenge is finding the balance between automation, repeatability and efficiency

...and accurately adding the spatial component in SLR's where no native spatial data exists.



# Migrating:

Line No.	Region	SH No	Locality	Description	Speed Limit (km/h)	Effective date
8	1	1N	Okaihau	From 150m west of Settlers Way (Horeke Road) to 350m east, generally, of Settlers Way.	70	29/09/2010
9	1	1N	Ohaeawai	From 340m north-west of the junction with SH12 to 300m east of the junction with SH12.	60	29/09/2010
9A	1	1	Pakaraka	From 150m north of State Highway 10 to 150m south of State Highway 10	See Schedule 2	17/10/2013
10	1	1N	Moerewa	From 60m west of Snowden Avenue to Leaty Street.	50	29/09/2010
11	1	1N	Moerewa	From Leaty Street to 330m east of Sir William Hale Crescent.	70	29/09/2010
12	1	1N	Moerewa	From 330m east of Sir William Hale Crescent to 120m east of	80	29/09/2010
13	1	1N	Kaw			
13B	1	1	Kal			

# Into:

The screenshot displays the 'National Speed Limit Register' web application. The main view is a map showing speed limit zones. A green line highlights a section of Leatymau Road, and an orange line highlights a section of Leatymau Road further east. The sidebar on the left is titled 'Enter Speed Limits' and contains the following fields:

- Speed category:** Permanent
- Speed limit:** 70 km/h
- Effective legal date:** (optional)

At the bottom of the sidebar, there are buttons for 'Delete Speed Limit', 'Save Draft', 'Back', and 'Step 3 >'. The top navigation bar includes 'Drafts', 'Search', and 'Draft Submissions'. The user's name 'Dena Emanuel - NZTA Speed Manager' is visible in the top right corner.



# Extracting the important syntax using FME

Line No.	Region	SH No.	Locality	Description	Speed Limit	Effective date	Date revoked	Speed limit rule	New Zealand Gazette Reference
840	11	8	Washdyke	From SH1 to 270m north-west of Martin Street.	70	14/04/2011		Setting of Speed Limits 2003	17/3/2011, No 32, p 867

Target Road: **State Highway 8**

Heading To: **North West**

Heading From: \_\_\_\_

Distance to: **270m**

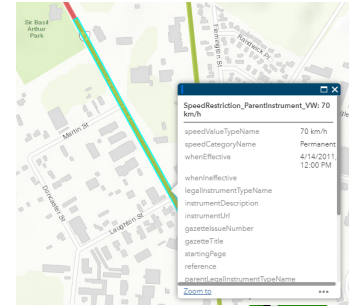
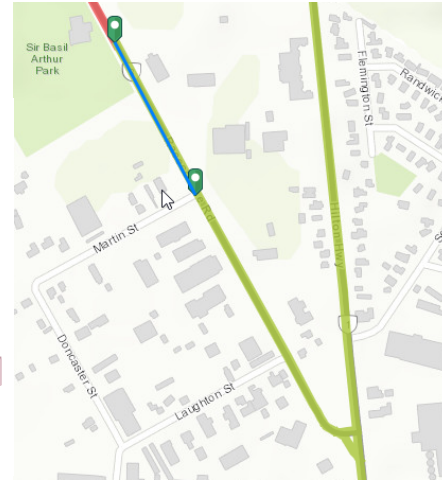
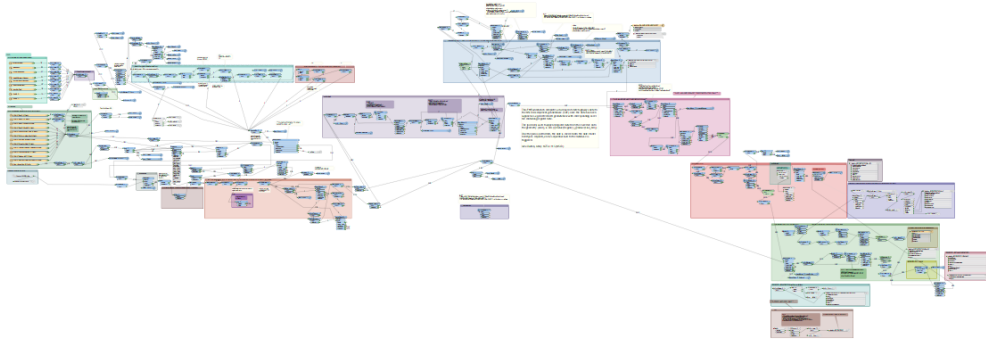
Distance From: \_\_\_\_

Road To: **Martin Street**

Road From: **State Highway 1**



# Plus some processing to geocode target roads, snip at locations, headings and distances, orientate and validate



Creates a spatially accurate feature from the legal instrument



# Testing

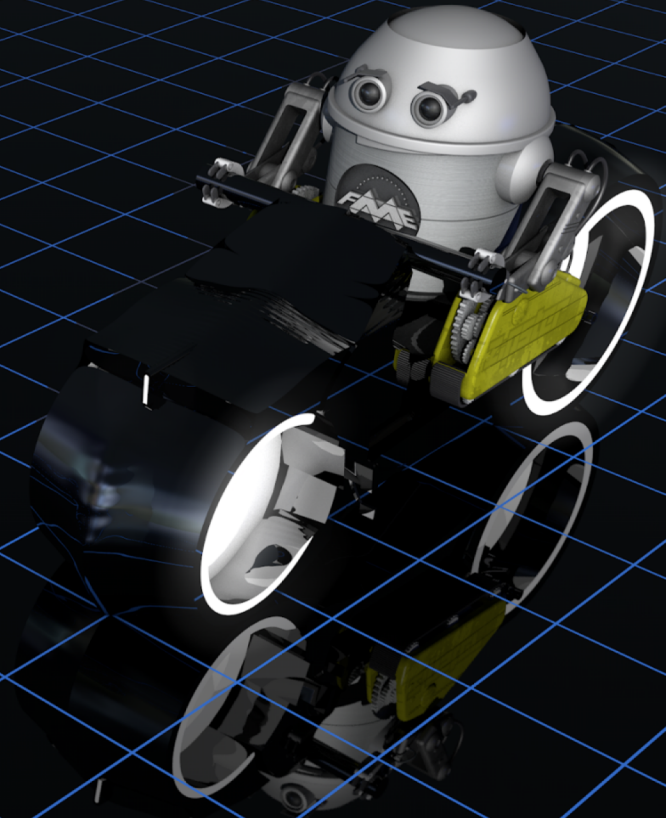
And adapting...

~50-60% of all records automatically migrated from source after verification using existing workflow

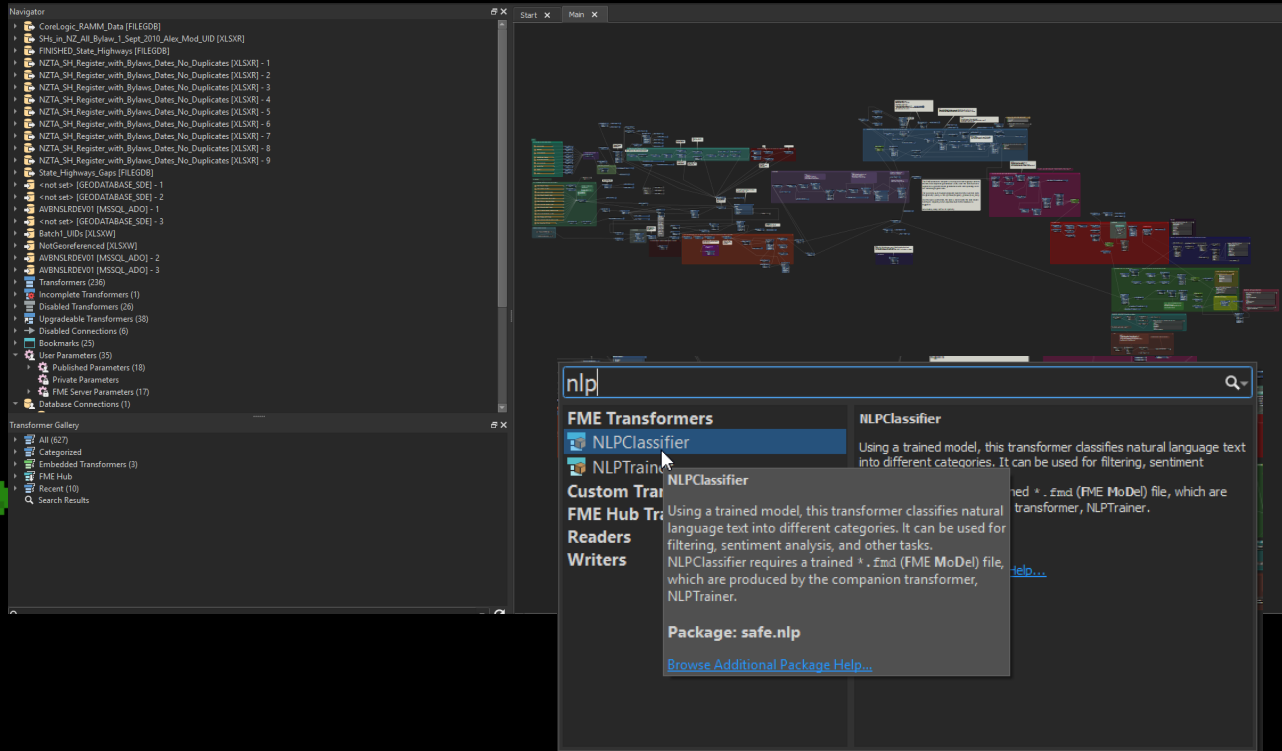
## Blockers:

- Data consistency
- Spelling/syntax errors
- Unlocatable Objects (e.g. “From East gate of Port to....”, Maori place names.)
- Solving the ‘rats and mice’ programmatically would be costly using existing technology, because of the sheer number of exception types which need to be trapped and accounted for.

With efficiency in mind,  
some pre-processing  
steps were put in place  
involving FME/Desktop  
GIS for unsolved cases



# In FME 2019, there could be a better way...

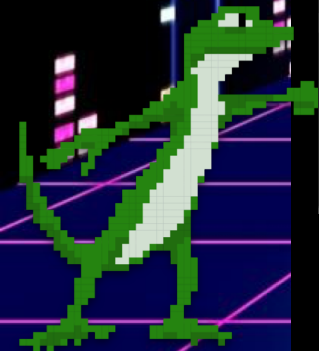


The screenshot displays the FME 2019 software interface. On the left is the Navigator pane, listing various data sources and transformers. The main workspace shows a complex workflow diagram with numerous transformers connected by lines. A search window is open in the foreground, showing search results for the transformer 'nlp'. The search results are as follows:

Package	Transformer Name	Description
FME Transformers	NLPClassifier	Using a trained model, this transformer classifies natural language text into different categories. It can be used for filtering, sentiment
Custom Transformers	NLPClassifier	Using a trained model, this transformer classifies natural language text into different categories. It can be used for filtering, sentiment analysis, and other tasks. NLPClassifier requires a trained *.fmd (FME MoDel) file, which are produced by the companion transformer, NLPTrainer.

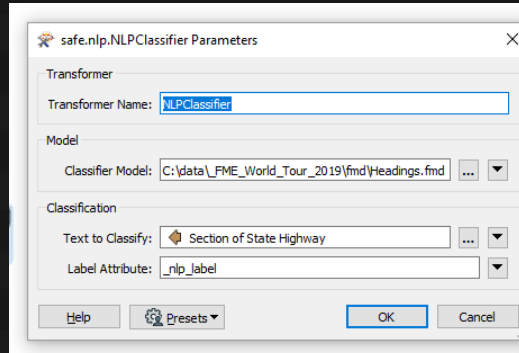
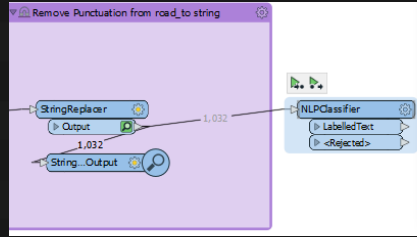
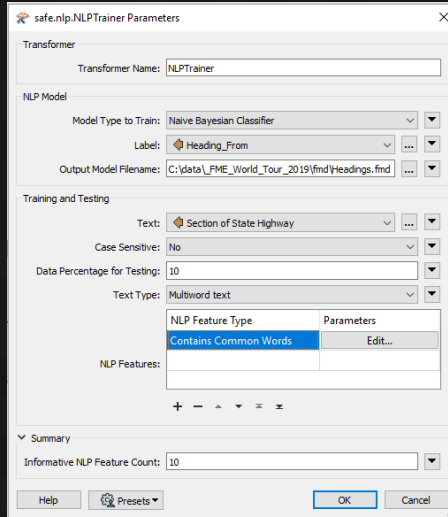
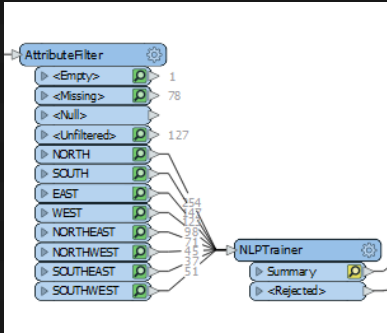
Additional details from the search window:

- Package: safe.nlp
- [Browse Additional Package Help...](#)



# Natural Language Processing

We are now exploring the new set of NLP transformers, to see how they can help us with our migration gains.





# Natural Language Processing

Extremely powerful transformer set with huge potential, and a really strong indicator of the direction FME is taking in data science and analytics

I have only scraped the surface, but can see retrofitting these transformers to extend and upgrade a lot of my legacy processes....often replacing python callers 😊





How Can NLP solve 'rats and mice' and improve the process?

Fixing syntax inconsistencies (headings, directions, units (m, km))

Aligning road naming between data sources (yet to train a model on the entire set of NZ road names!)

Description classification: 1 heading, 2, None?

Combining machine learning tools with NLP to classify SLR's into fuzzy sets based on description methodologies



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## Natural Language Processing | v 0.1.7

Transformers that allow you to train a model for natural language classification and use that model to classify texts.

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### Natural Language Processing (safe.nlp)

This FME package contains the NLPTrainer transformer and the NLPClassifier transformer. Note: these transformers require Python 3.x. The NLPTrainer trains a natural language processing (NLP) classification model based on the user's specifications and the provided data. Using a trained model, the NLPClassifier transformer classifies natural language text into different categories. It can be used for filtering, sentiment analysis, and other tasks. The NLPTrainer and NLPClassifier transformers are typically used together to train a model for natural language classification and then classify texts with that model.

[View this package on FME Hub...](#)

#### Usage

Using a specified set of learning data and NLP features (specific types of information about the text), the NLPTrainer creates and writes a model to a \*.fmd file. The NLPClassifier uses these \*.fmd files to perform natural language classification, sorting texts into the categories labelled in the training data.

#### Overview

Item Type	FME Desktop Package
Downloads	↓ 260 Downloads
Visibility	Public
Updated on	April 2, 2019
Created on	April 2, 2019

#### Contributor

Created by	Safe Software Official
Level	Official

#### Requirements

FME Build 19231 or higher

<https://hub.safe.com/publishers/safe/packages/nlp>





**THANK YOU!**

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