SAFE SOFTWARE

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

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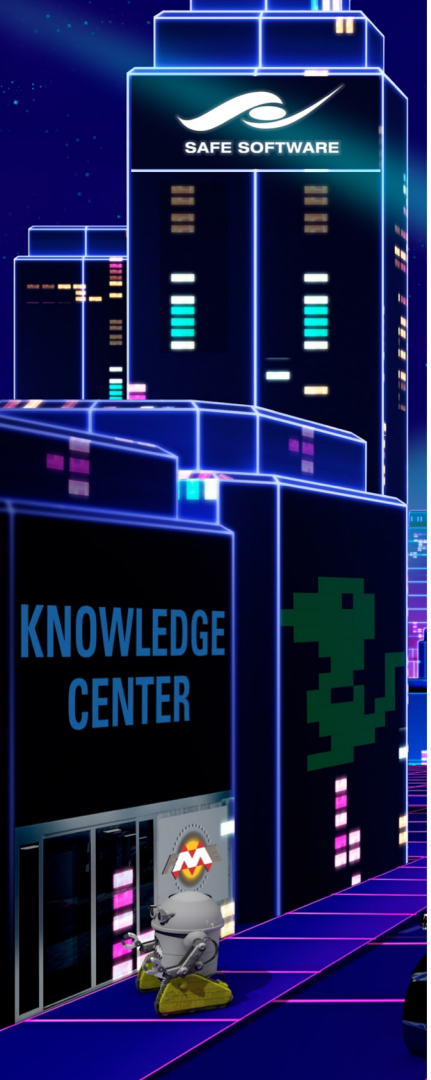
WORLD TOUR
2019
PRESENTATION AGENDA
1 Background
2 The problem
3 Exploring solutions
4 Future tech
START



What we do

- Ableyis a specialist professional services company, long experienced in transportation planning and engineering, spatial and data intelligence
- Ableyempower 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

SAFE SOFTWARE

ENGINEERING NEW ZEALAND PROFESSIONAL DEVELOPMENT PARTNER

ACENZ

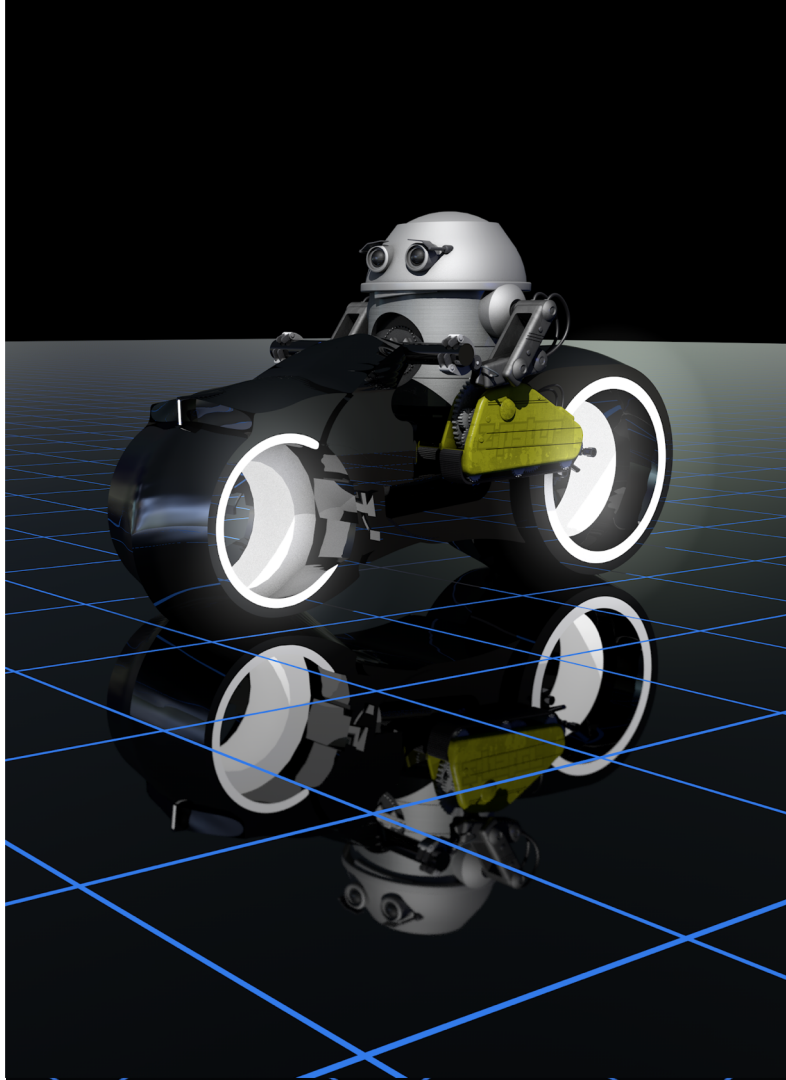
esri Partner Network Silver

Unifying NZ's Speed Limits

Building a National speed limit management platform for New Zealand

Unifying NZ’s Speed Limits

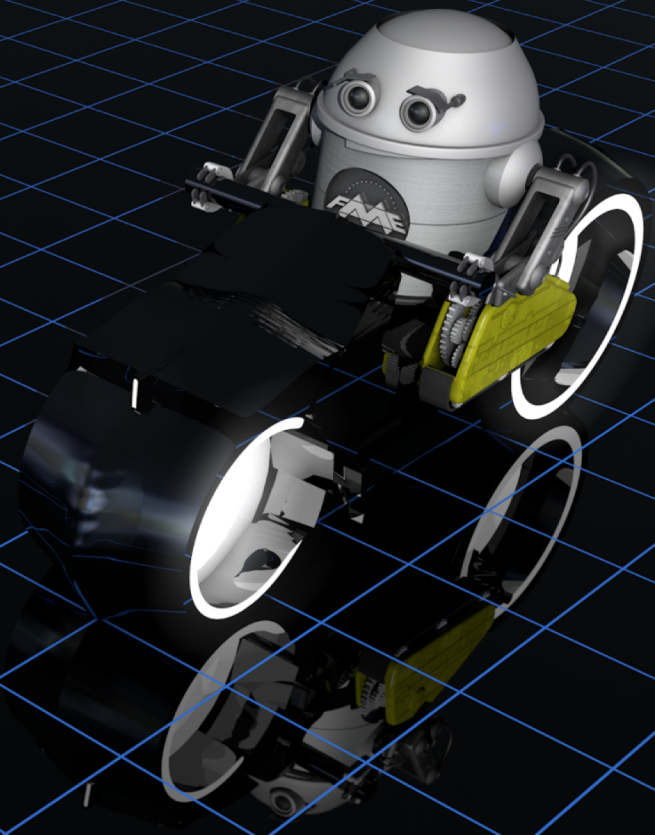
- Application will serve the public, the police, NZTA, RCA’s and commercial stakeholders
- 68 Road Controlling Authorities (RCA’s)
- Speed Limit Registers (SLR’s) come in all shapes and sizes
- 2 phases to the project:
    - Application build
    - Data migration



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

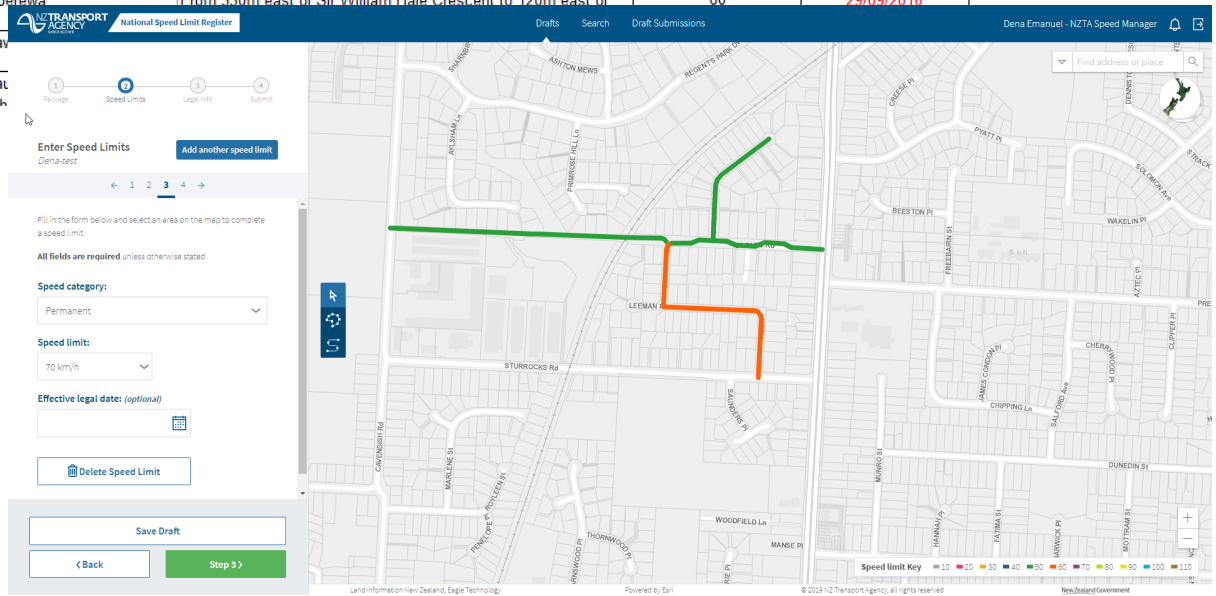
The challenge is finding the balance between automation, repeatability and efficiency

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

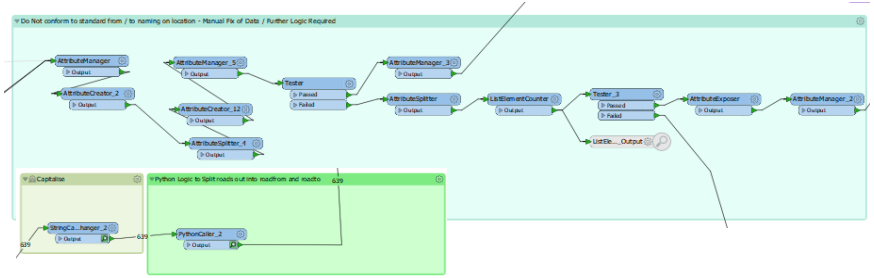
Migrating:

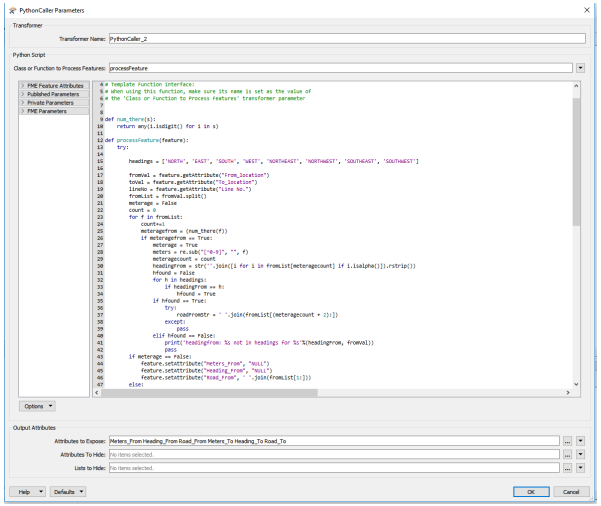
Line No.	Region	SH No	Locality	Description	Speed Limit (km/h	Effective date
8	1	1N	Okaihau	From 150m west of Settlers Way (Horeke Road) to 350m east, generally, of Settlers Way.	70	29/09/2010
9	1	1N	Ohaeawai	From 340m north-west of the junction with SH12 to 300m east of the junction with SH12.	60	29/09/2010
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 Leaity Street.	50	29/09/2010
11	1	1N	Moerewa	From Leaity 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	Kav			
13B	1	1	Kau			

Into:



FME list/string manipulation, and python combine to extract the key syntax





Extracting the important syntax using FME

Line No.	Regior	SH No	Locality	Description	Speed Limit	Effective dat	Dave revoke	Speed limit ru	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 From: ___

Distance From: ___

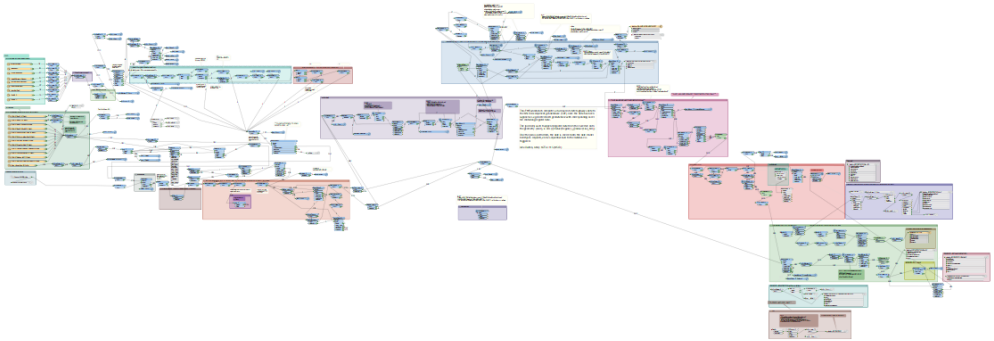
Road From: **State Highway 1**

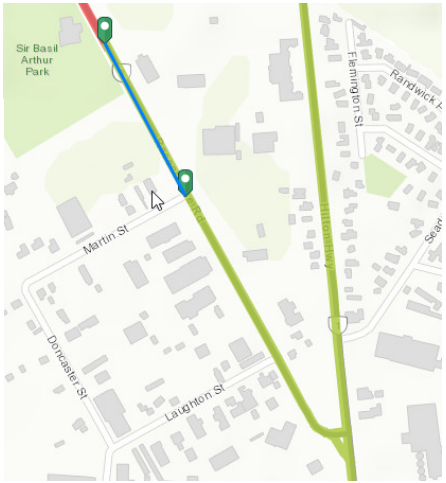
Heading To: **North West**

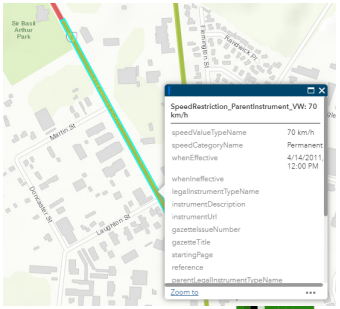
Distance to: **270m**

Road To: **Martin Street**

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

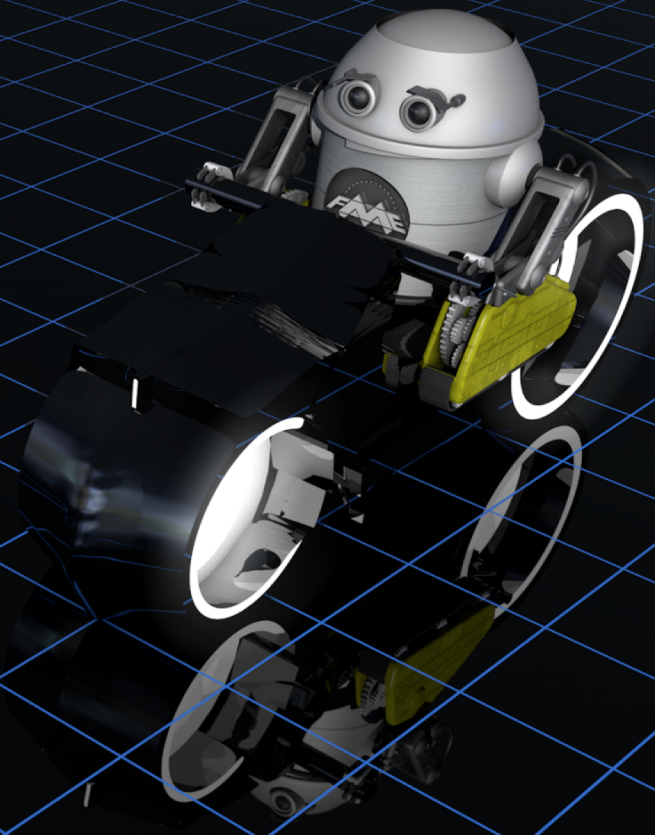
And adapting…

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

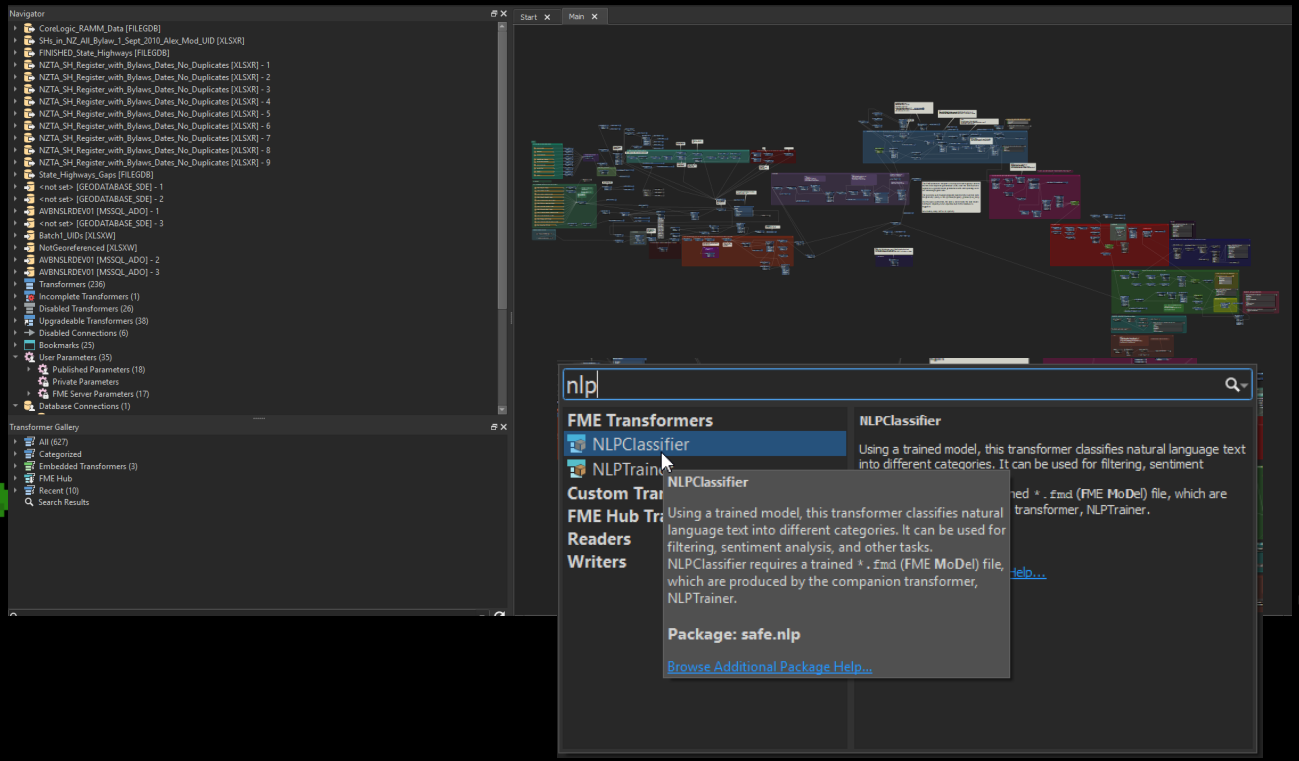
Blockers:

- 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

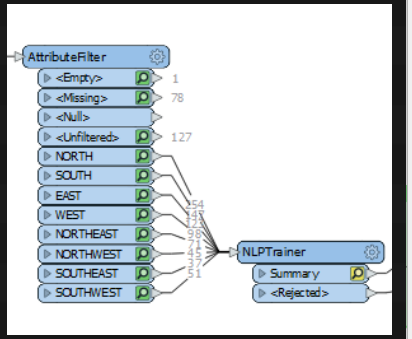


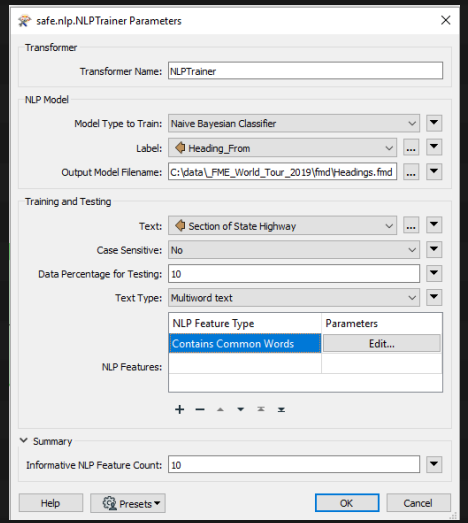
In FME 2019, there could be a better way…

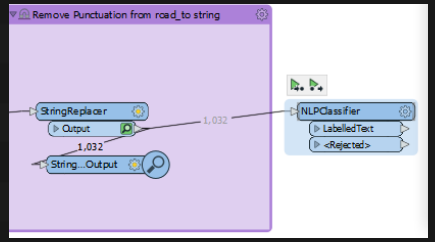


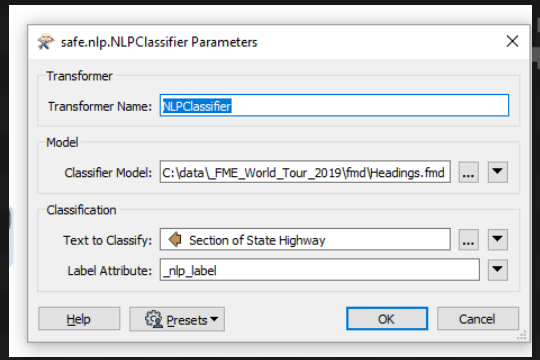
Natural Language Processing

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





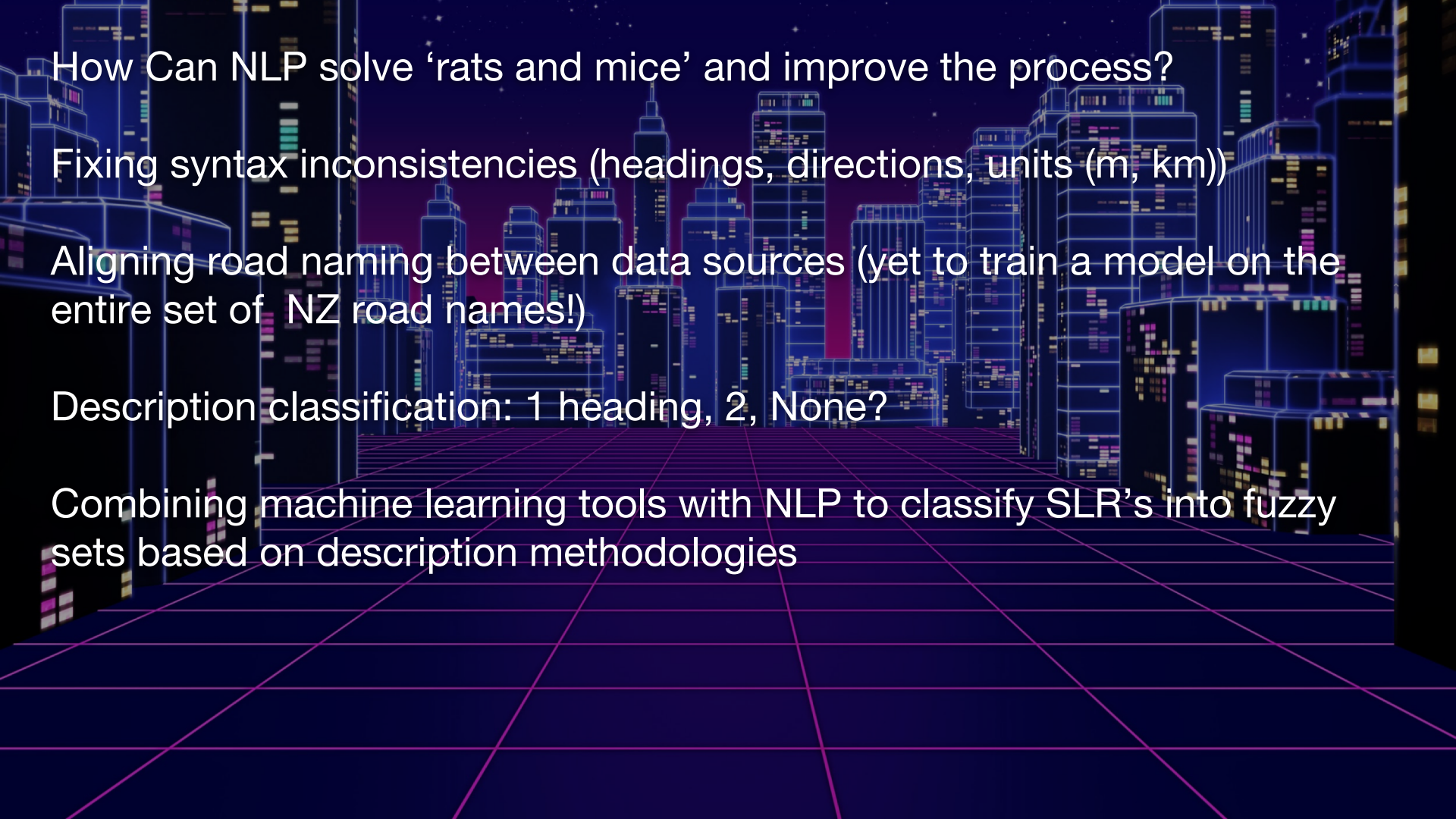


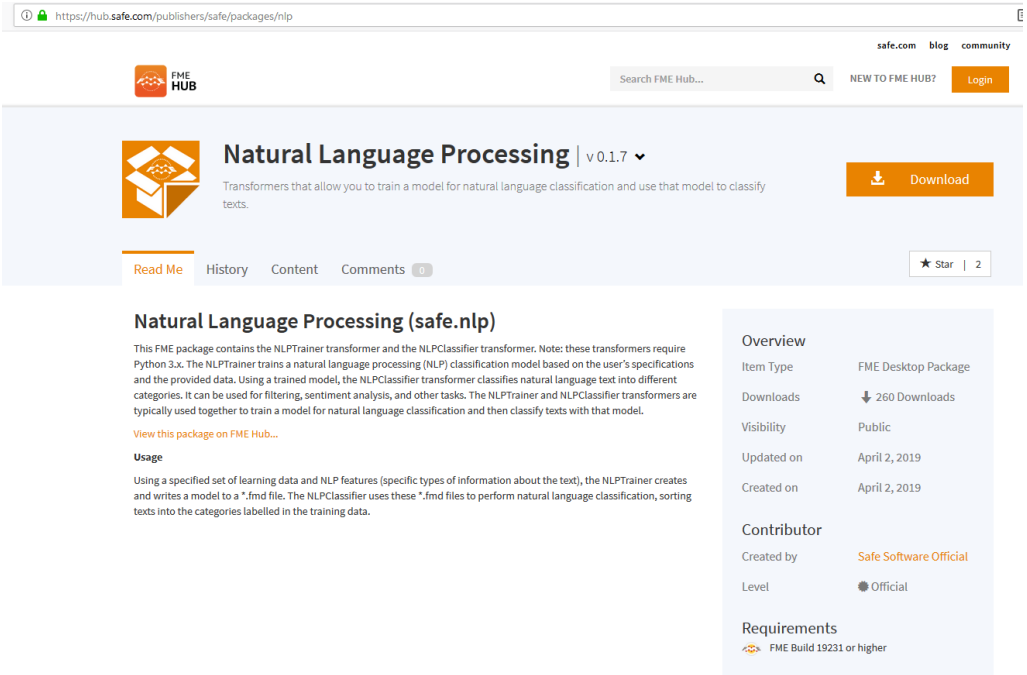


Natural Language Processing

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



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

THANK YOU!

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