SAFE SOFTWARE

FME and Banana Shire Council Roads Re-segmentation Project

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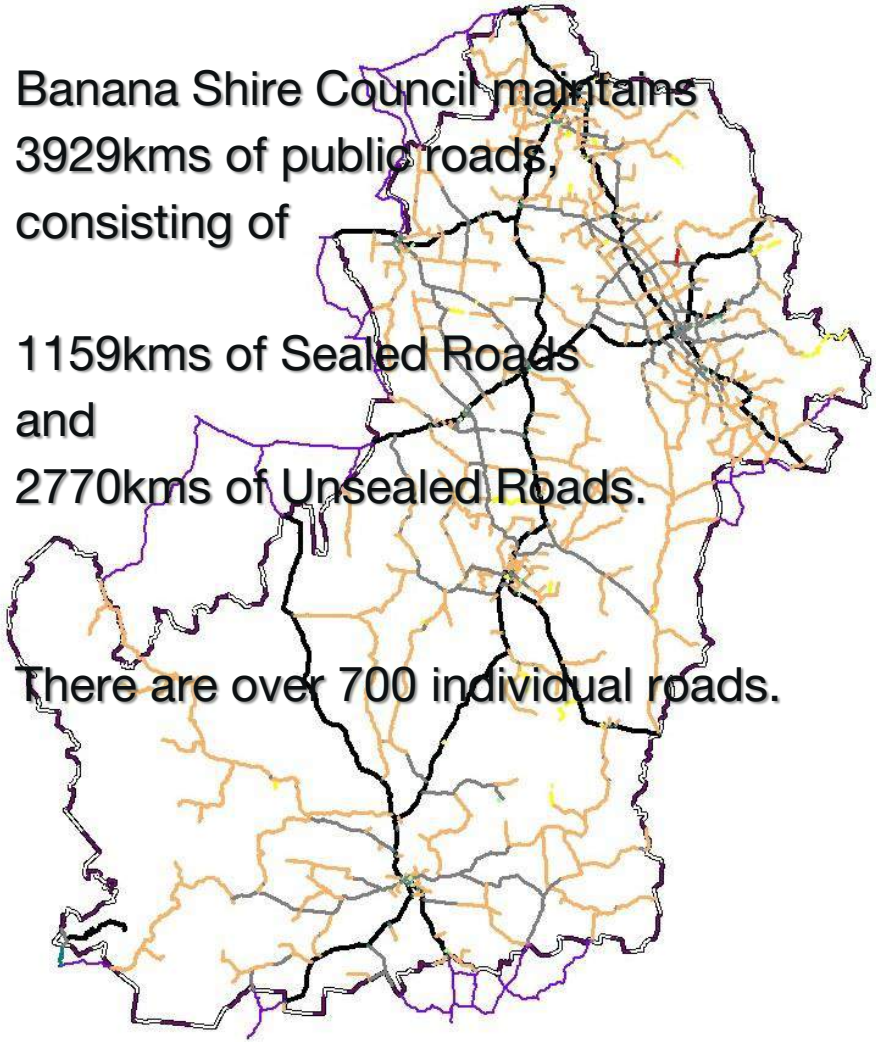
WORLD TOUR
2019
PRESENTATION AGENDA
1 Project background
2 Road Assets Review process
3 Data processing
4 Final steps
START

Project background

Banana Shire Council maintains 3929kms of public roads, consisting of

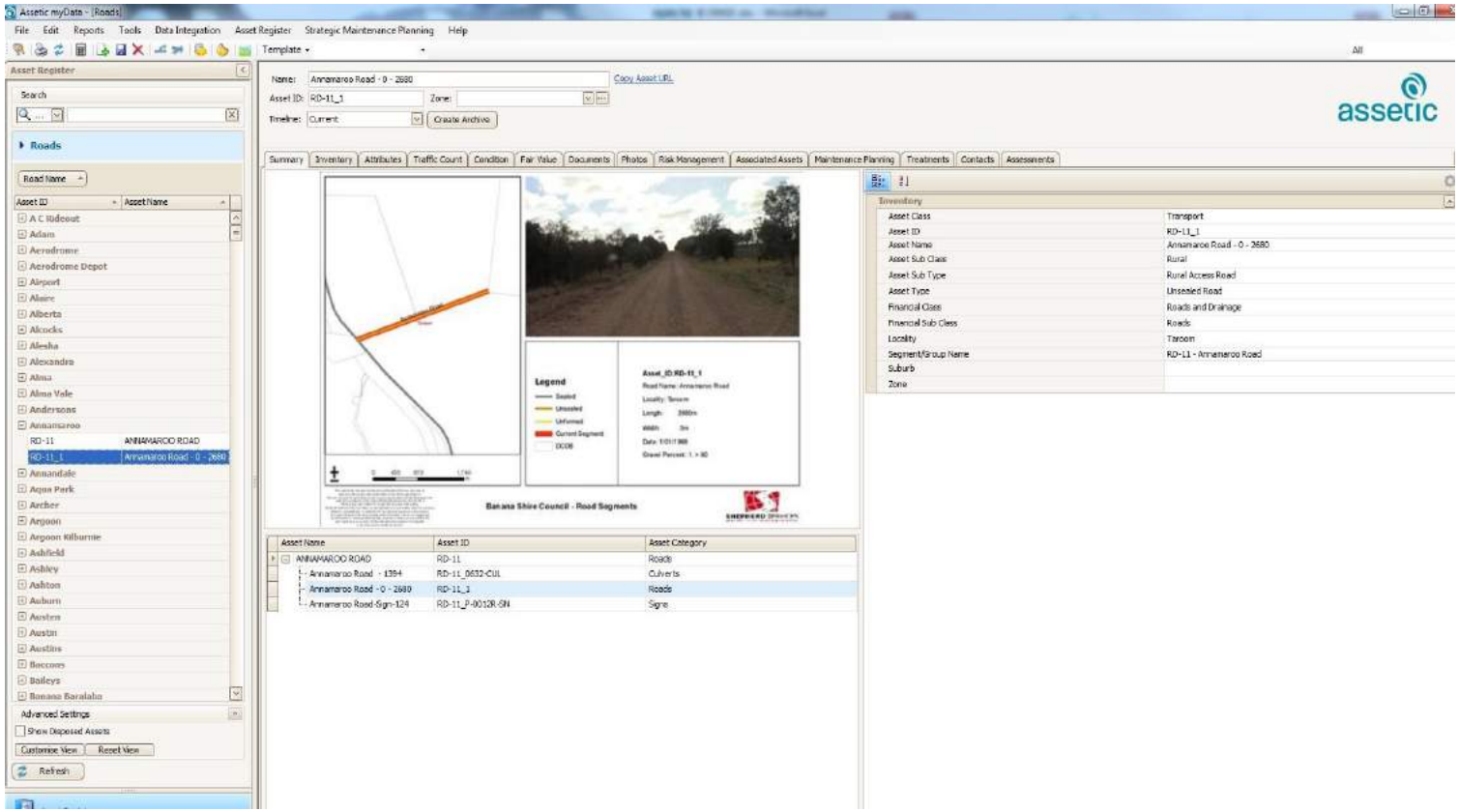
1159kms of Sealed Roads
and
2770kms of Unsealed Roads.

There are over 700 individual roads.



Council is currently undertaking a revaluation of its road assets and as part of this process, the Asset Team has determined that the previous method of road segmentation was not a practical and sustainable method.

Each asset has a unique ID that is identical in Councils asset management system;
Assetic MyData
and
in the GIS MapInfo table.



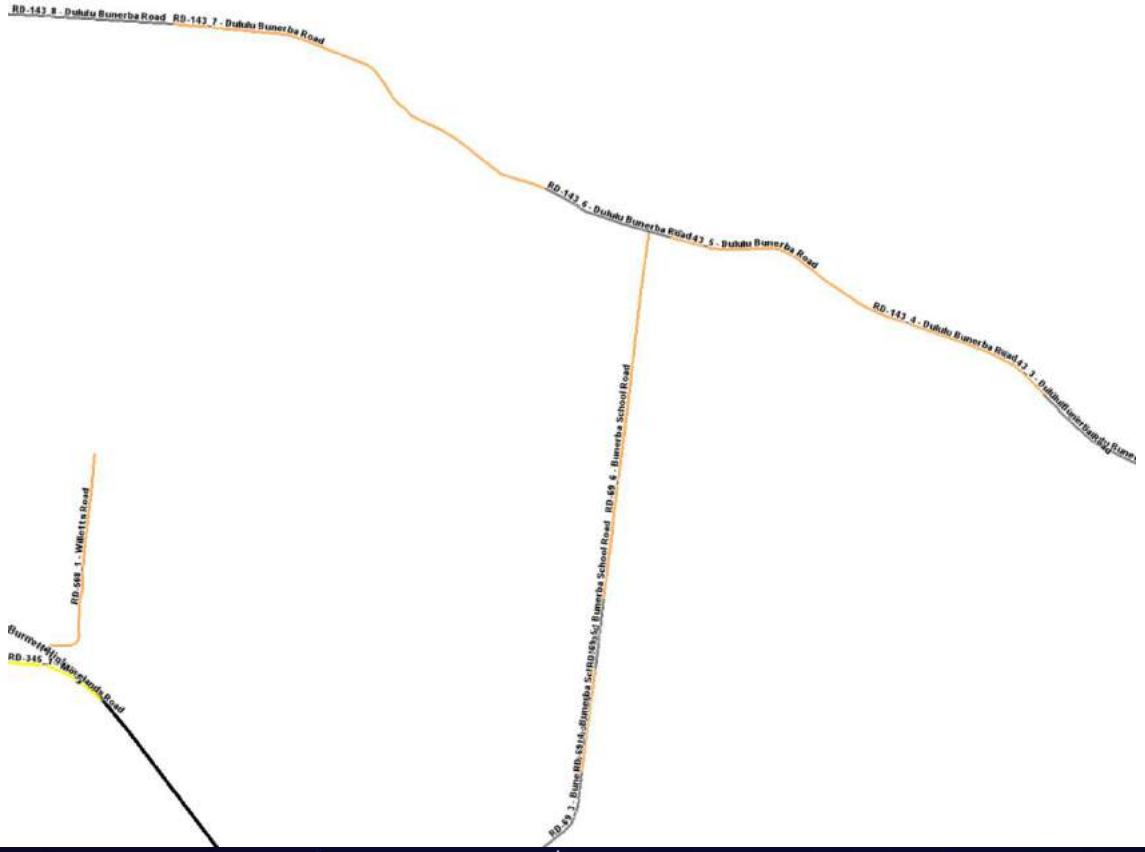
Assetic Database Road example

Urban roads are currently reasonably well segmented, generally from intersection to intersection,

However,
Rural roads are currently segmented where there is a change in surface, eg. from sealed to unsealed.

Therefore current road segments can range from a length of 5ms up to 42kms.

Urban Roads example



Rural Roads example

Over many years of capital renewal and upgrade work, the initial road segments had become fragmented, with the new segments being the exact size of the length of renewal activity applied, for example, a 5km single road segment could now have had numerous sections of re-sheeting , resealing or rehabilitation applied and these could be ranging in length from 50m to the length of whatever was done, all requiring a new Asset ID.

Rural Roads maïntenance examples

It has been determined that Council needs to develop a new process of planning, delivering and recording its Capital renewal and upgrade program in a realistic and sustainable way.

Therefore, the decision has been made to re-segment all roads to a specific length, and
only plan, deliver and record work in multiples of these segments.

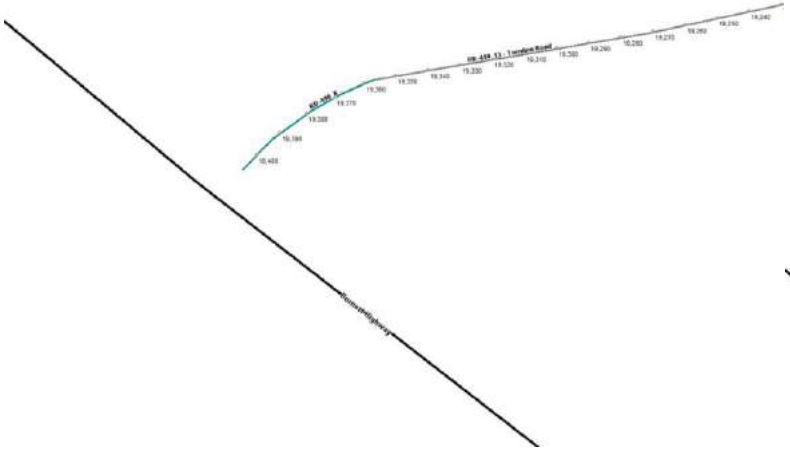
The segments need to be of a size that is financially manageable to deliver, for example, if a 380m section of a rural road has been identified as requiring a reseal, it is financially manageable to allocate funds for the 500m to be sealed, or if a 2.7km length of road is requiring a re-sheeting, then funds for 3km can be allocated.

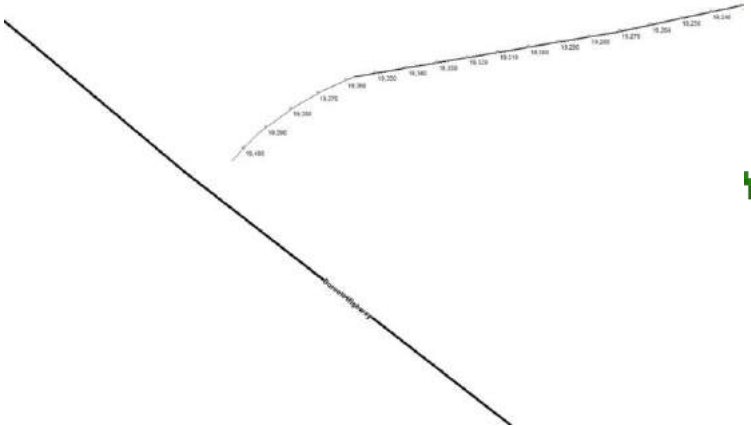
The new segmentation rules adopted by the Asset Team are as follows:
In Urban areas, all road segments are to be 250m in length, or from intersection to intersection, and
In Rural areas, all road segments are to be 500m in length

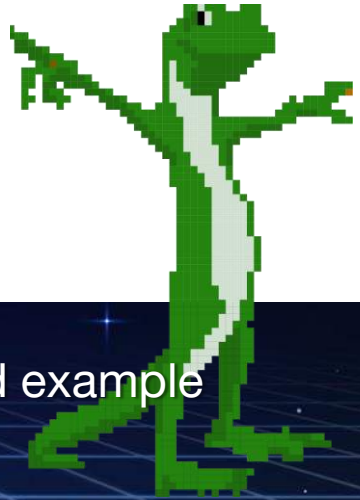
These length rules are not hard and fast, especially in regards to roads segments that, due to processing, might be as small as 2m. These smaller segments are combined with the adjoining full length segment.

As well as the new segments, new road centre lines and new road chainage files, consisting of points at 10m and 100m intervals, were generated from the new segments.

Depending on the road location, for example, when intersecting with Highways and Roads maintained by State, a centre line can be longer than a road segment.







Chainages and centre line impact due to intersection with State Road example

Three FME workbenches are used to:

- First step: Generate the new road segments, at the required lengths, depending on whether an Urban or Rural road, and ensuring the sections of sealed/unsealed road along are road are maintained, and generate the new road centre lines
- Second step: Generate the two new chainage files from the new road centre lines
- Third step: Populate the road segment file start and end chainage attributes from the new 10m chainage file

All roads were processed individually, and reviewed at each step, as the original data contained issues, due to segment line mis-joins and vector line orientations, that impacted on the output.

Some roads could be overly complex with numerous sections of a Sealed road interspersed along an Unsealed road.

A simple road would take as little as 15 minutes to apply all 3 steps, but complex roads with many different segments and various data issues could take up to 4 hours to complete.

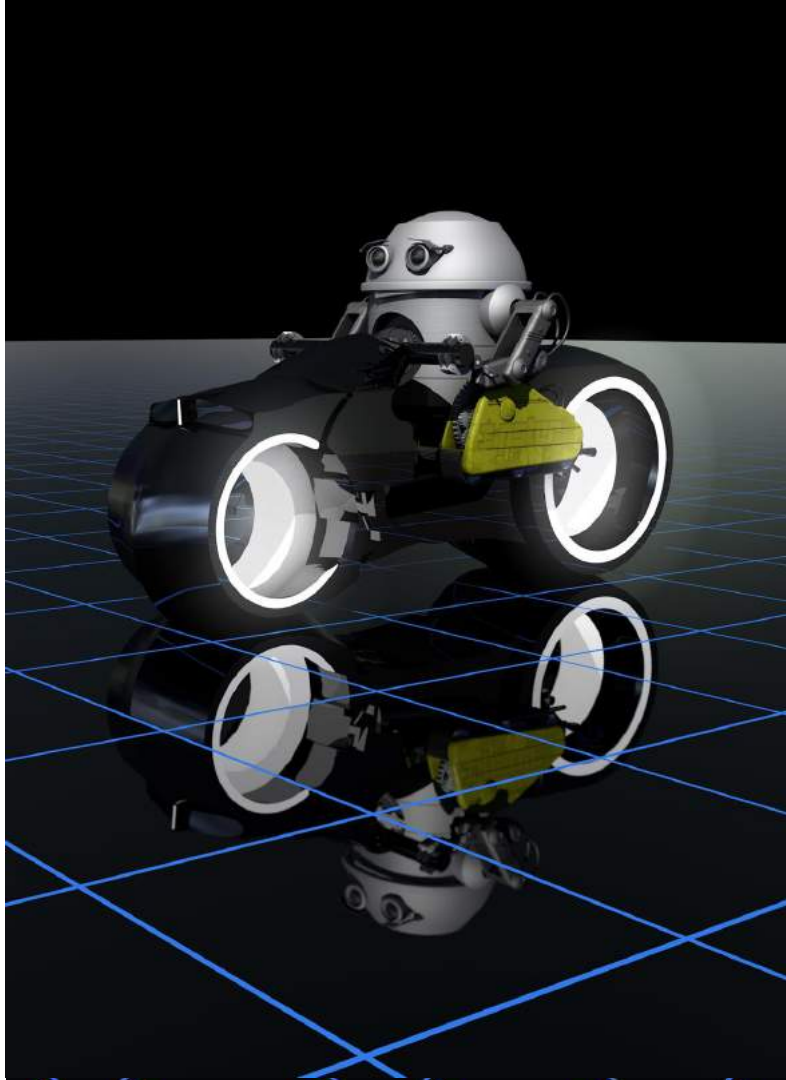
Road assets review

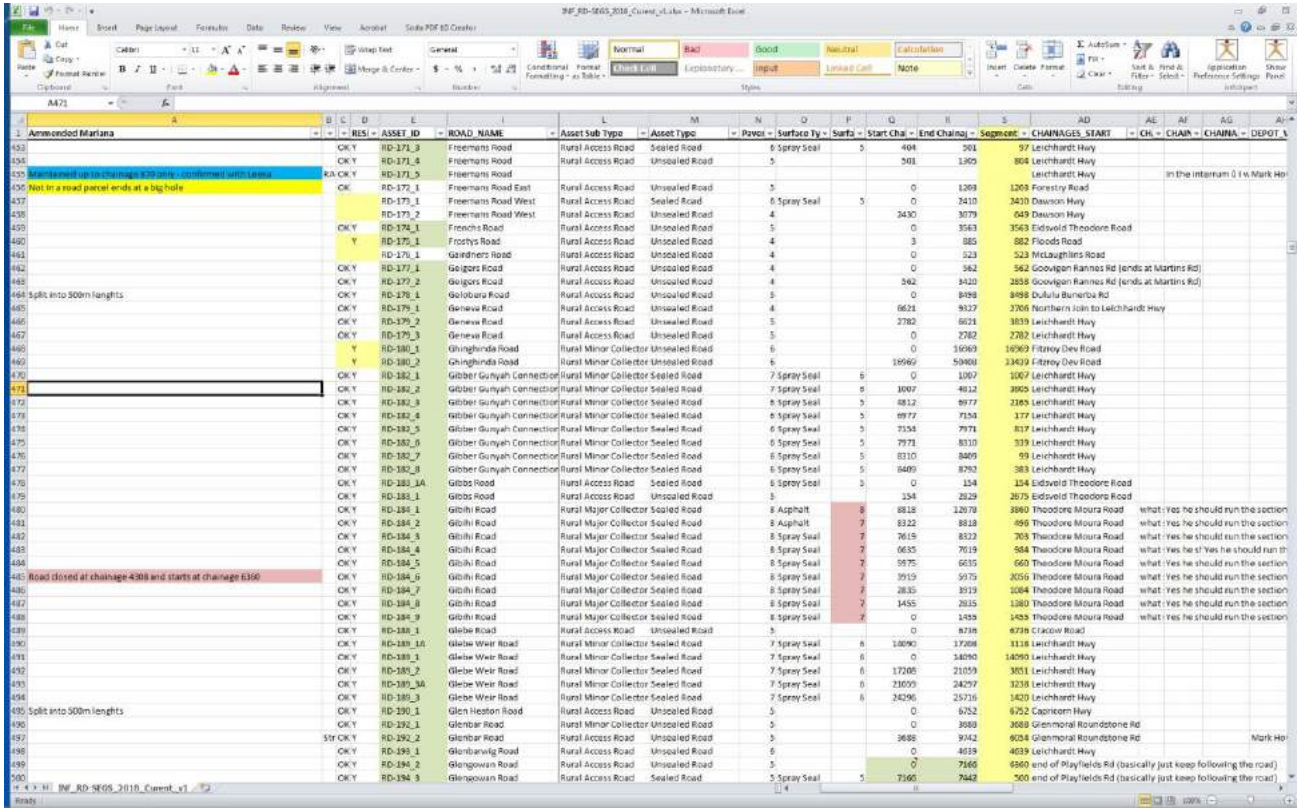
Spreadsheet input

Contains comments on each road from all the Works Coordinators responsible for the roads within their individual areas of maintenance,

comments on correct road start and end points, and

any issues around road names/road signs/chainage direction/rural addressing





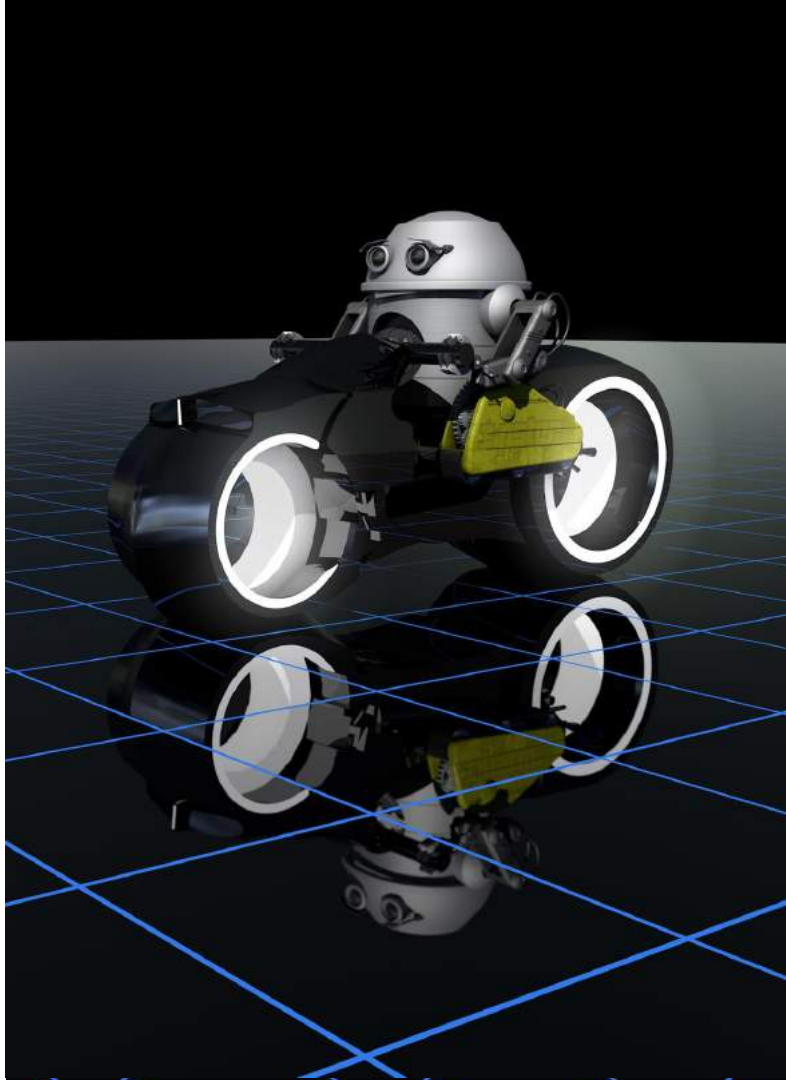
	A	B	C	D	E	I	L	M	N	O	P	Q	R	S	AD	AE	AF	AG	AI
1	Ammended Mariana			RES	ASSET_ID	ROAD_NAME	Asset Sub Type	Asset Type	Paver	Surface Ty	Surfa	Start Chai	End Chainag	Segment	CHAINAGES_START	CH	CHAIN	CHAINA	DEPOT_L
453				OK Y	RD-171_3	Freemans Road	Rural Access Road	Sealed Road	6	Spray Seal	5	404	501	97	Leichhardt Hwy				
454				OK Y	RD-171_4	Freemans Road	Rural Access Road	Unsealed Road	5			501	1305	804	Leichhardt Hwy				
455	Maintained up to chainage 420 only - confirmed with Leeu	KA	OK Y		RD-171_5	Freemans Road									Leichhardt Hwy		In the interium (i w Mark Ho		
456	Not in a road parcel ends at a big hole		OK		RD-172_1	Freemans Road East	Rural Access Road	Unsealed Road	5			0	1269	1269	Forestry Road				
457					RD-173_1	Freemans Road West	Rural Access Road	Sealed Road	6	Spray Seal	5	0	2410	2410	Dawson Hwy				
458					RD-173_2	Freemans Road West	Rural Access Road	Unsealed Road	4			2430	3079	649	Dawson Hwy				
459			OK Y		RD-174_1	Frenchs Road	Rural Access Road	Unsealed Road	5			0	3563	3563	Eidsvold Theodore Road				
460			Y		RD-175_1	Frostys Road	Rural Access Road	Unsealed Road	4			3	885	882	Floods Road				
461					RD-176_1	Gairdners Road	Rural Access Road	Unsealed Road	4			0	523	523	McLaughlins Road				
462			OK Y		RD-177_1	Goigors Road	Rural Access Road	Unsealed Road	4			0	562	562	Goovigan Rannes Rd (ends at Martins Rd)				
463			OK Y		RD-177_2	Goigors Road	Rural Access Road	Unsealed Road	4			562	3420	2858	Goovigan Rannes Rd (ends at Martins Rd)				
464	Split into 500m lenghts		OK Y		RD-178_1	Golobara Road	Rural Access Road	Unsealed Road	5			0	8498	8498	Dululu Bunerba Rd				
465			OK Y		RD-179_1	Geneva Road	Rural Access Road	Unsealed Road	4			6621	9327	2706	Northern Join to Leichhardt Hwy				
466			OK Y		RD-179_2	Geneva Road	Rural Access Road	Unsealed Road	5			2782	6621	3839	Leichhardt Hwy				
467			OK Y		RD-179_3	Geneva Road	Rural Access Road	Unsealed Road	5			0	2782	2782	Leichhardt Hwy				
468			Y		RD-180_1	Ghinghinda Road	Rural Minor Collector	Unsealed Road	6			0	16969	16969	Fitzroy Dev Road				
469			Y		RD-180_2	Ghinghinda Road	Rural Minor Collector	Unsealed Road	6			16969	50408	33439	Fitzroy Dev Road				
470			OK Y		RD-182_1	Gibber Gunyah Connection	Rural Minor Collector	Sealed Road	7	Spray Seal	6	0	1097	1097	Leichhardt Hwy				
471			OK Y		RD-182_2	Gibber Gunyah Connection	Rural Minor Collector	Sealed Road	7	Spray Seal	6	1097	4812	3865	Leichhardt Hwy				
472			OK Y		RD-182_3	Gibber Gunyah Connection	Rural Minor Collector	Sealed Road	6	Spray Seal	5	4812	6977	2165	Leichhardt Hwy				
473			OK Y		RD-182_4	Gibber Gunyah Connection	Rural Minor Collector	Sealed Road	6	Spray Seal	5	6977	7154	177	Leichhardt Hwy				
474			OK Y		RD-182_5	Gibber Gunyah Connection	Rural Minor Collector	Sealed Road	6	Spray Seal	5	7154	7971	817	Leichhardt Hwy				
475			OK Y		RD-182_6	Gibber Gunyah Connection	Rural Minor Collector	Sealed Road	6	Spray Seal	5	7971	8310	339	Leichhardt Hwy				
476			OK Y		RD-182_7	Gibber Gunyah Connection	Rural Minor Collector	Sealed Road	6	Spray Seal	5	8310	8409	99	Leichhardt Hwy				
477			OK Y		RD-182_8	Gibber Gunyah Connection	Rural Minor Collector	Sealed Road	6	Spray Seal	5	8409	8792	383	Leichhardt Hwy				
478			OK Y		RD-183_1A	Gibbs Road	Rural Access Road	Sealed Road	6	Spray Seal	5	0	154	154	Eidsvold Theodore Road				
479			OK Y		RD-183_1	Gibbs Road	Rural Access Road	Unsealed Road	5			154	2829	2675	Eidsvold Theodore Road				
480			OK Y		RD-184_1	Gibilli Road	Rural Major Collector	Sealed Road	8	Asphalt	8	8818	12078	3260	Theodore Moura Road		what i Yes he should run the section		
481			OK Y		RD-184_2	Gibilli Road	Rural Major Collector	Sealed Road	8	Asphalt	7	8322	8818	496	Theodore Moura Road		what i Yes he should run the section		
482			OK Y		RD-184_3	Gibilli Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	7619	8322	703	Theodore Moura Road		what i Yes he should run the section		
483			OK Y		RD-184_4	Gibilli Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	6635	7619	984	Theodore Moura Road		what i Yes he sl Yes he should run th		
484			OK Y		RD-184_5	Gibilli Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	5975	6635	660	Theodore Moura Road		what i Yes he should run the section		
485	Road closed at chainage 4308 and starts at chainage 6360		OK Y		RD-184_6	Gibilli Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	3919	5975	2056	Theodore Moura Road		what i Yes he should run the section		
486			OK Y		RD-184_7	Gibilli Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	2835	3919	1084	Theodore Moura Road		what i Yes he should run the section		
487			OK Y		RD-184_8	Gibilli Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	1455	2835	1380	Theodore Moura Road		what i Yes he should run the section		
488			OK Y		RD-184_9	Gibilli Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	0	1455	1455	Theodore Moura Road		what i Yes he should run the section		
489			OK Y		RD-188_1	Glebe Road	Rural Access Road	Unsealed Road	5			0	6738	6738	Cracow Road				
490			OK Y		RD-189_1A	Glebe Weir Road	Rural Minor Collector	Sealed Road	7	Spray Seal	6	14090	17208	3118	Leichhardt Hwy				
491			OK Y		RD-189_1	Glebe Weir Road	Rural Minor Collector	Sealed Road	7	Spray Seal	6	0	14090	14090	Leichhardt Hwy				
492			OK Y		RD-189_2	Glebe Weir Road	Rural Minor Collector	Sealed Road	7	Spray Seal	6	17208	21059	3851	Leichhardt Hwy				
493			OK Y		RD-189_3A	Glebe Weir Road	Rural Minor Collector	Sealed Road	7	Spray Seal	6	21059	24297	3238	Leichhardt Hwy				
494			OK Y		RD-189_3	Glebe Weir Road	Rural Minor Collector	Sealed Road	7	Spray Seal	6	24296	25716	1420	Leichhardt Hwy				
495	Split into 500m lenghts		OK Y		RD-190_1	Glen Heston Road	Rural Access Road	Unsealed Road	5			0	6752	6752	Capricorn Hwy				
496			OK Y		RD-192_1	Glenbar Road	Rural Minor Collector	Unsealed Road	5			0	3688	3688	Glenmoral Roundstone Rd				
497			Str OK Y		RD-192_2	Glenbar Road	Rural Access Road	Unsealed Road	5			3688	9742	6054	Glenmoral Roundstone Rd				Mark Ho
498			OK Y		RD-193_1	Glenbarwig Road	Rural Access Road	Unsealed Road	6			0	4639	4639	Leichhardt Hwy				
499			OK Y		RD-194_2	Glengowan Road	Rural Access Road	Unsealed Road	5			0	7166	7166	end of Playfields Rd (basically just keep following the road)				
500			OK Y		RD-194_3	Glengowan Road	Rural Access Road	Sealed Road	5	Spray Seal	5	7166	7442	500	end of Playfields Rd (basically just keep following the road)				

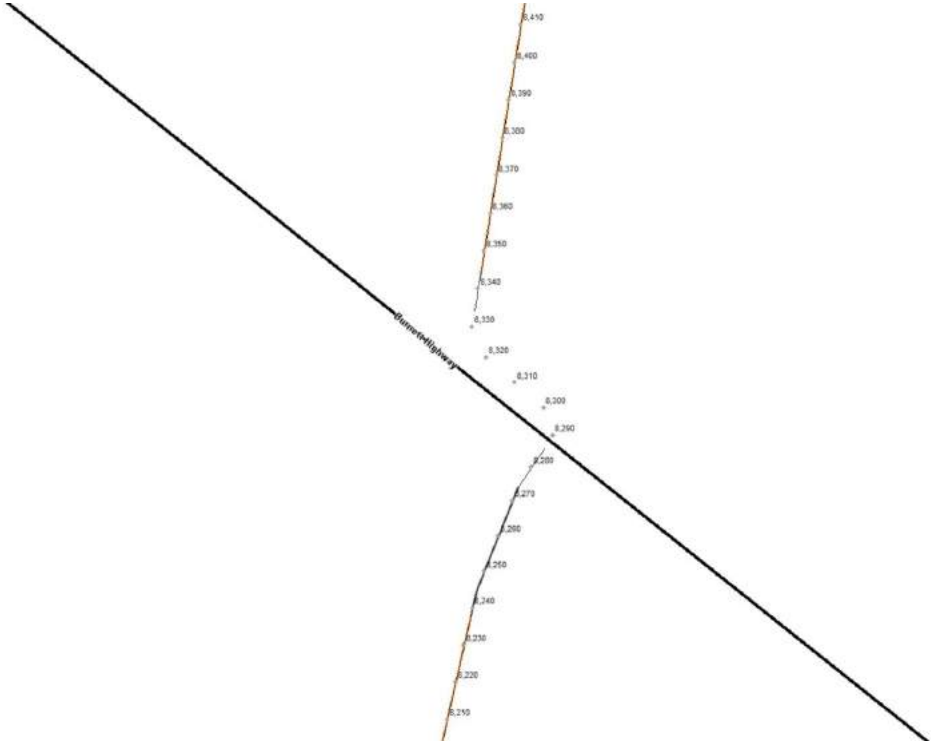
Spreadsheet Asset review comments example

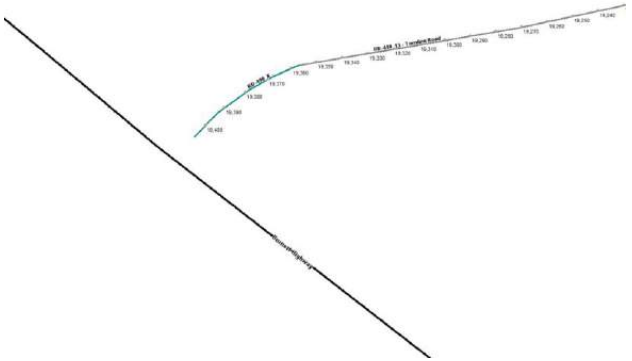
Roads Vector data input

Reviewed by Asset Management Coordinator.

The working roads MapInfo Table data set edited to identify all road segments impacted by the demarcation rules adopted for Council controlled roads intersections with Transport and Main Roads (TMR) State controlled roads. This rule impacts where the chainages start and the different location for the start, and end in some cases, of the road centre lines and segments. In Urban areas, all roads were broken at each intersection as per the new rule







Intersections with State Road examples

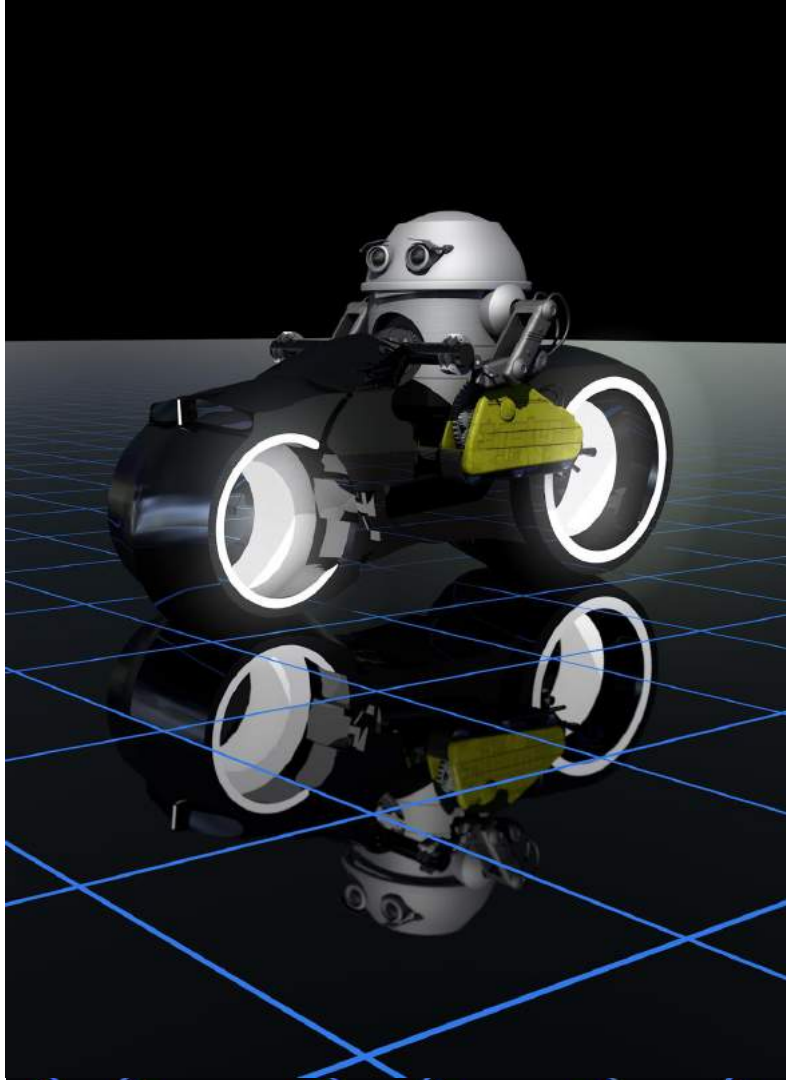
Single road and road that continues through State Road

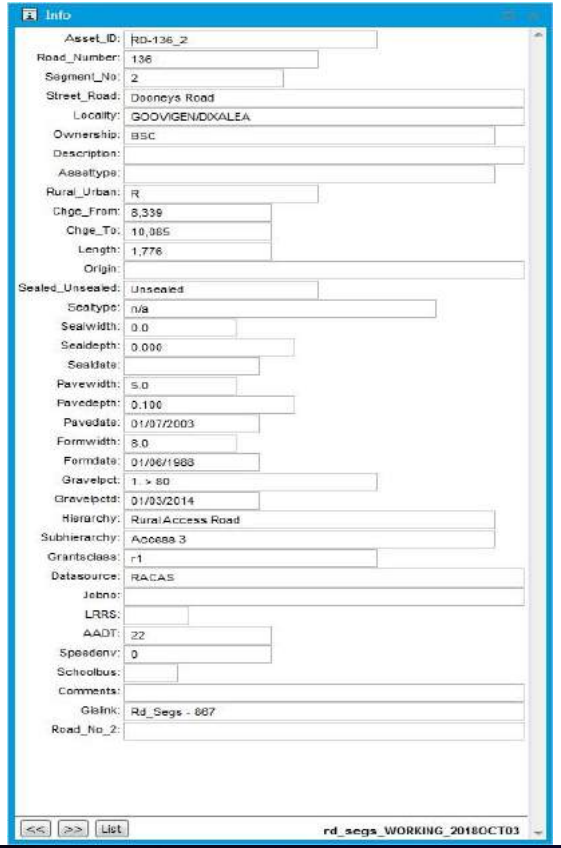
New Asset ID format and Rules

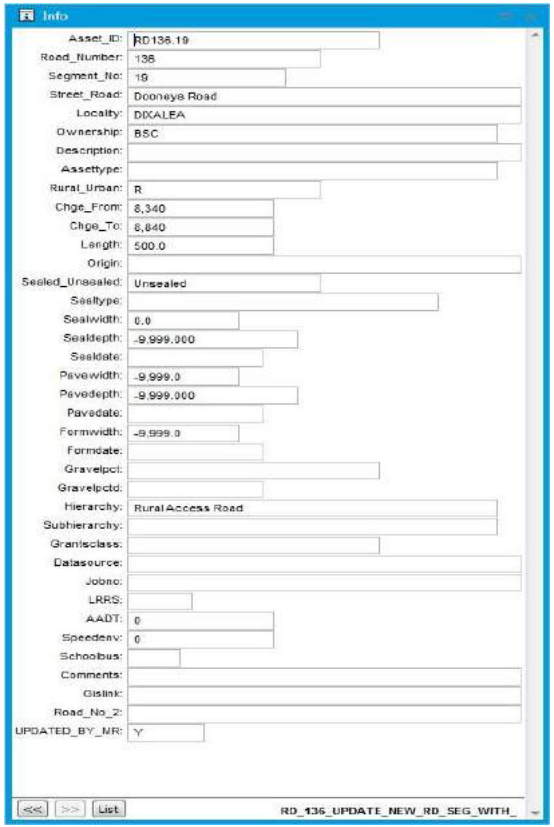
- Adoption of new simpler Asset ID format - change from RD-2_1 to RD2.1 and
- adoption of new road segment length sizes:

Rural roads - 500 metre segment lengths

Urban roads – Road intersection to intersection or 250 metre lengths







Old Asset ID format and New Asset ID format examples

Data processing

Step 1
New segments and new centre lines

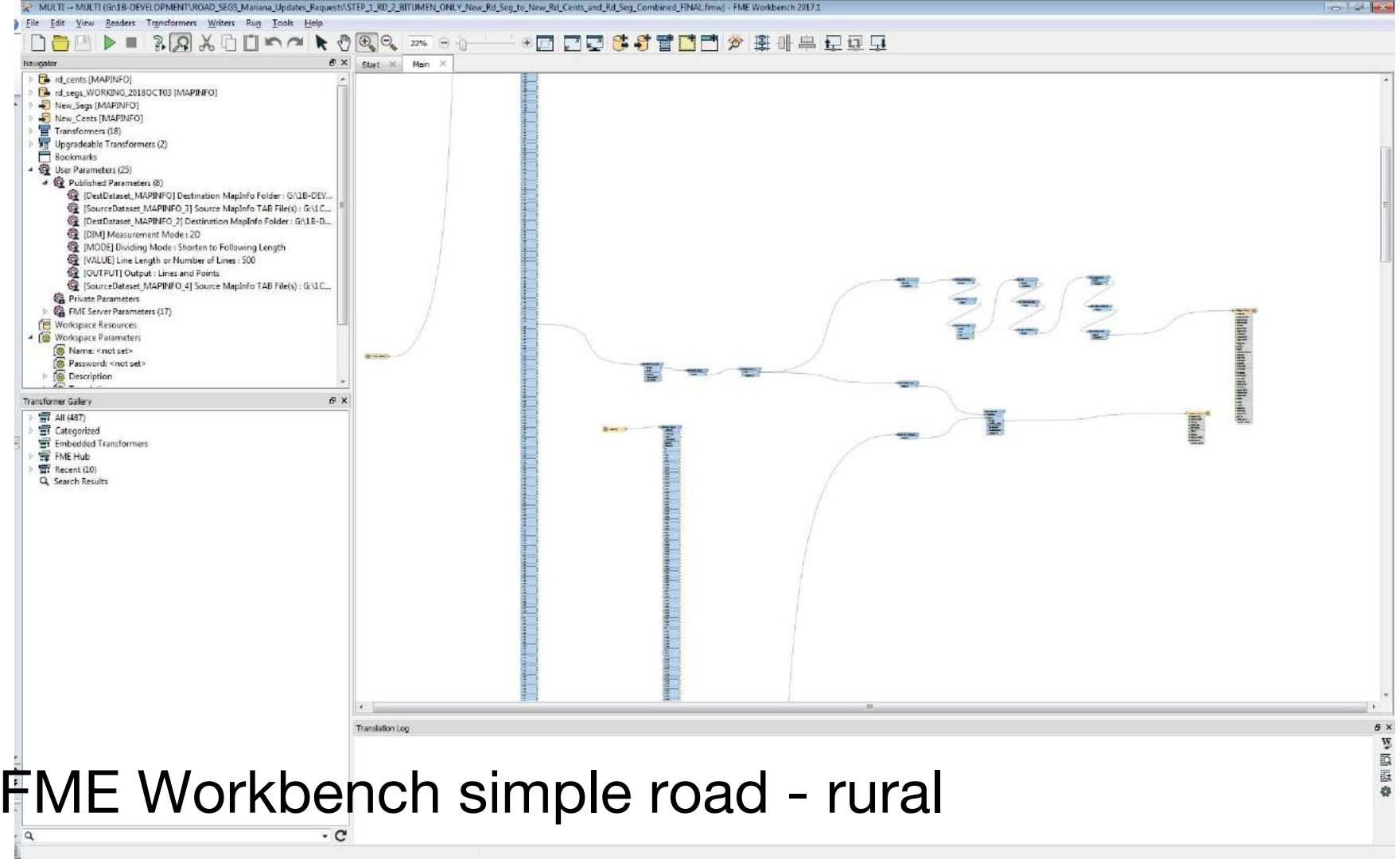
FME workbench generates new road segments, with relevant segment lengths as per the new rules, and

generates the new road centre line as per the corrected alignment from the review vector data

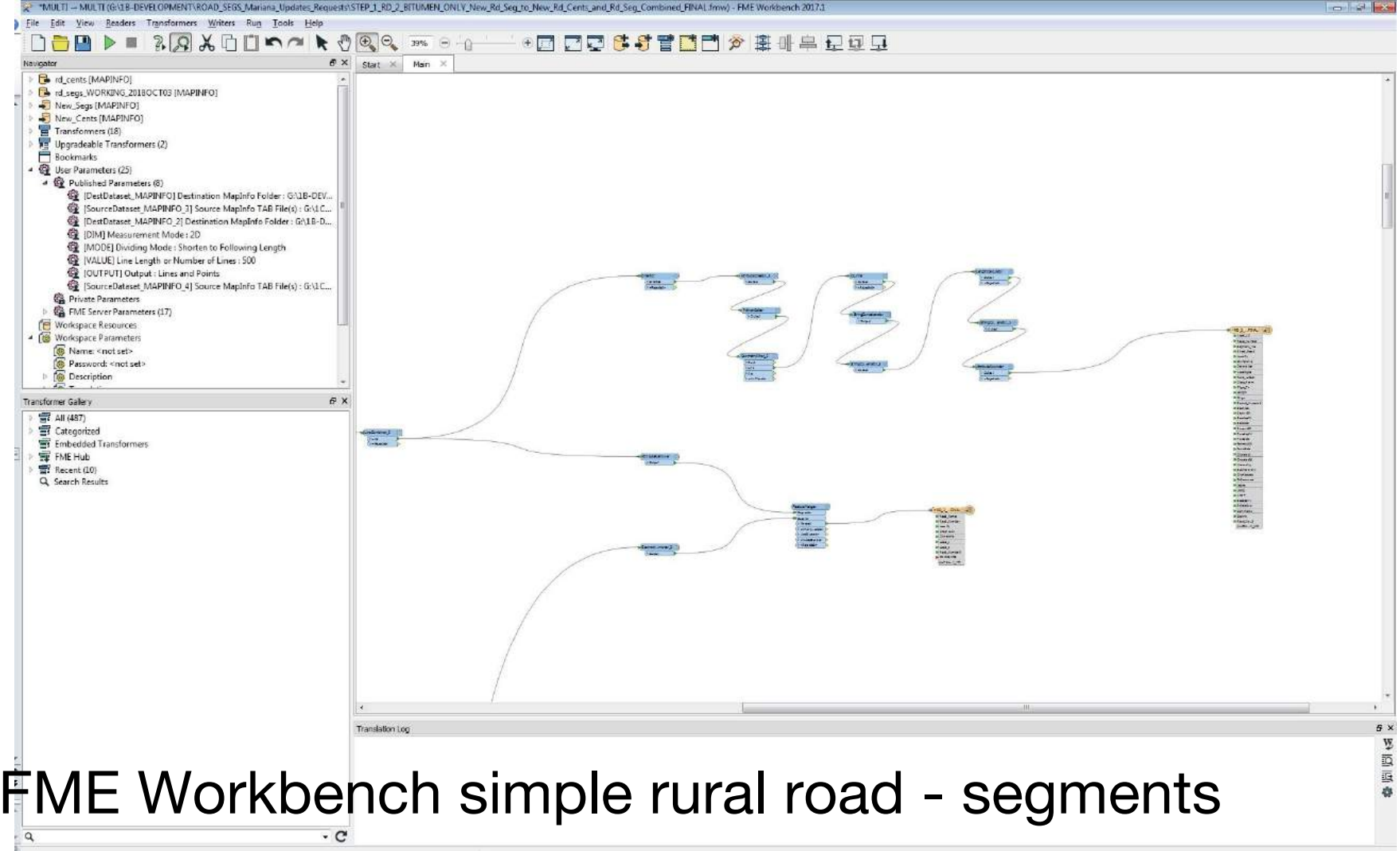
Step 1 New segments and new centre lines

Uses two data sets for this process;

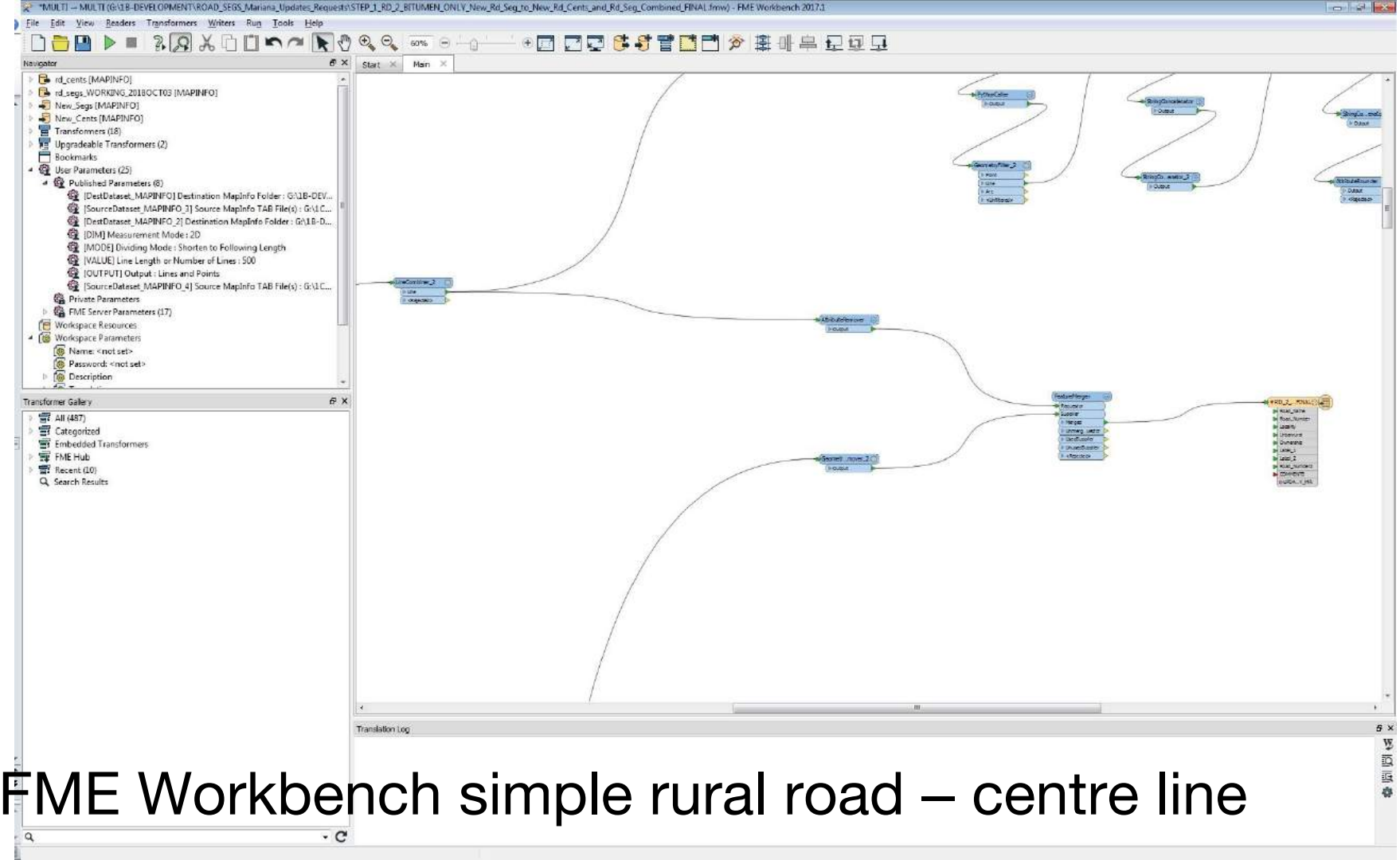
- the Road segments MapInfo Table with review additions as noted above, for the generation of the new road segments and the new road centre line, and
- the original Road centre lines MapInfo Table – source of attributes for the new centre line



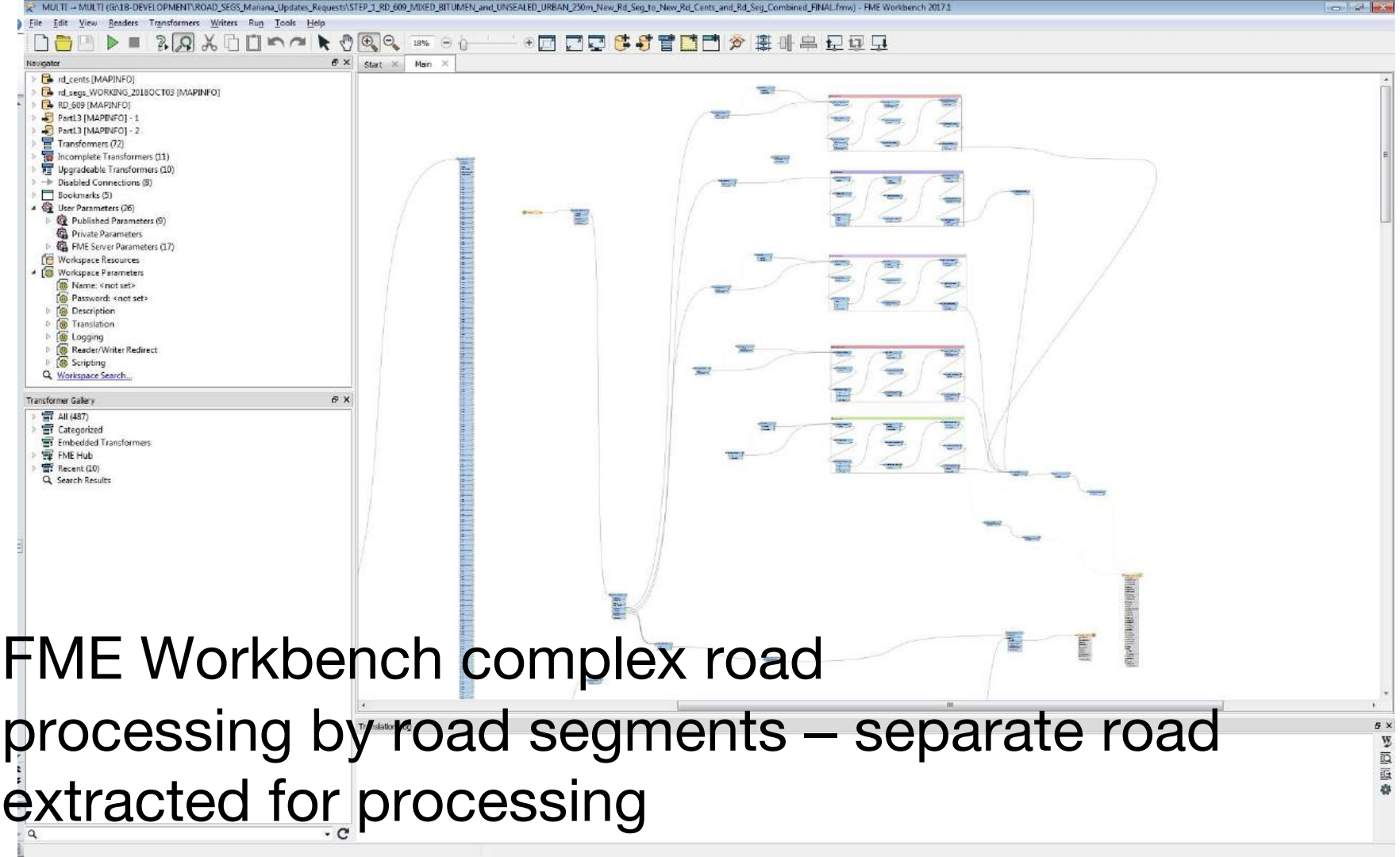
FME Workbench simple road - rural



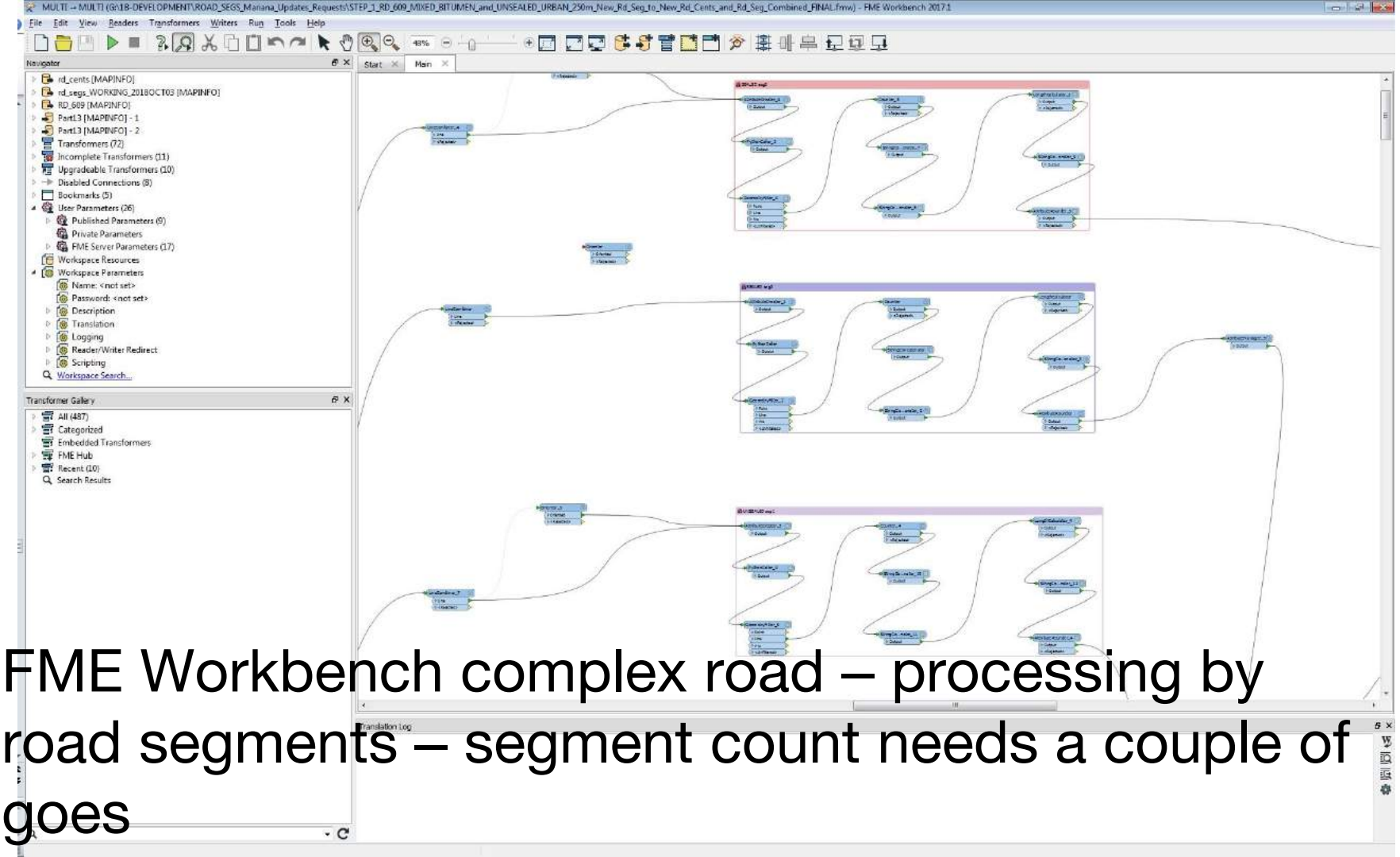
FME Workbench simple rural road - segments



FME Workbench simple rural road – centre line



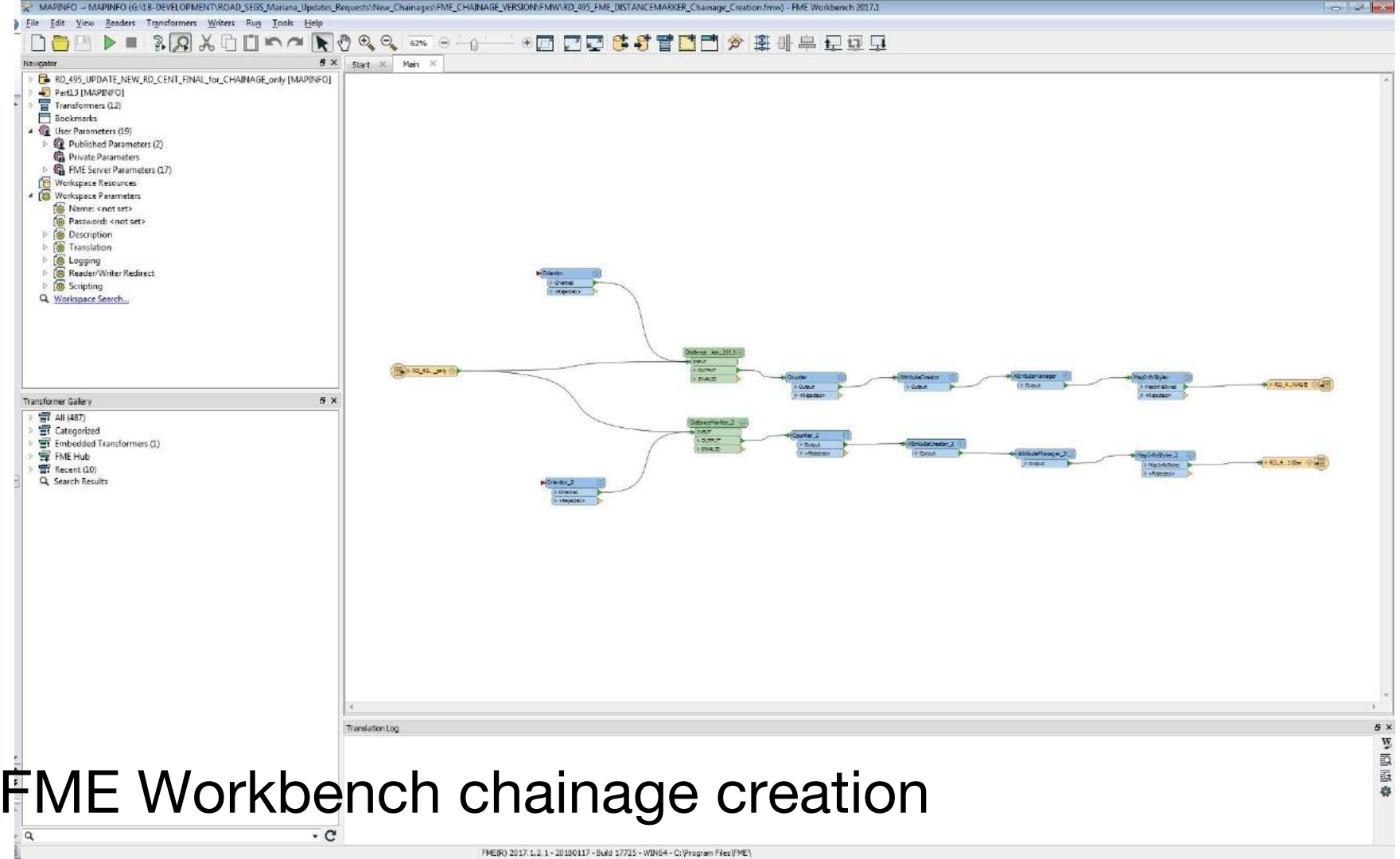
FME Workbench complex road processing by road segments – separate road extracted for processing



FME Workbench complex road – processing by road segments – segment count needs a couple of goes

Step 2
New chainage files

Uses the newly generated road centre line file to create 2 new sets of chainages;
chainage points with intervals of 10m, and
100m,
with start point of 0m but no chainage point for the end point of the complete road segment,
and
with the correct symbology and attributes.



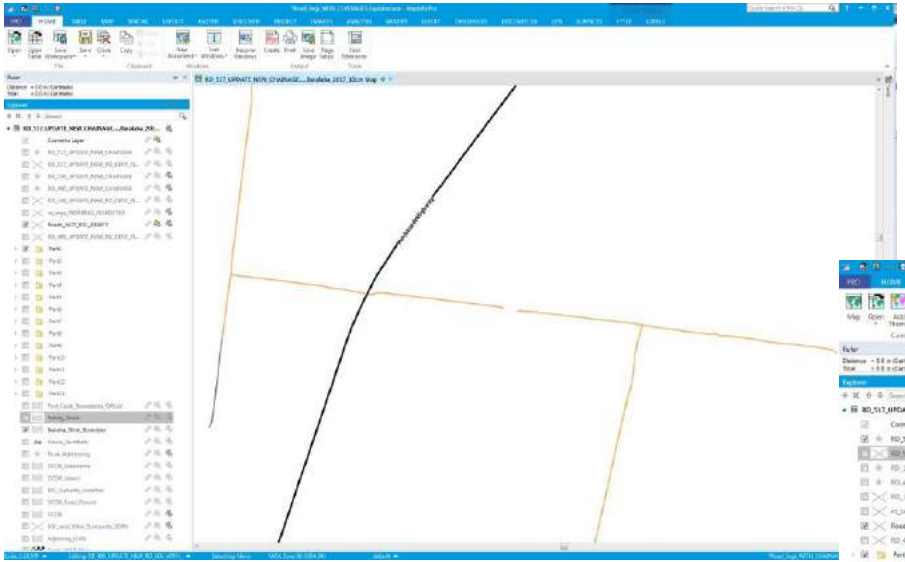
FME Workbench chainage creation

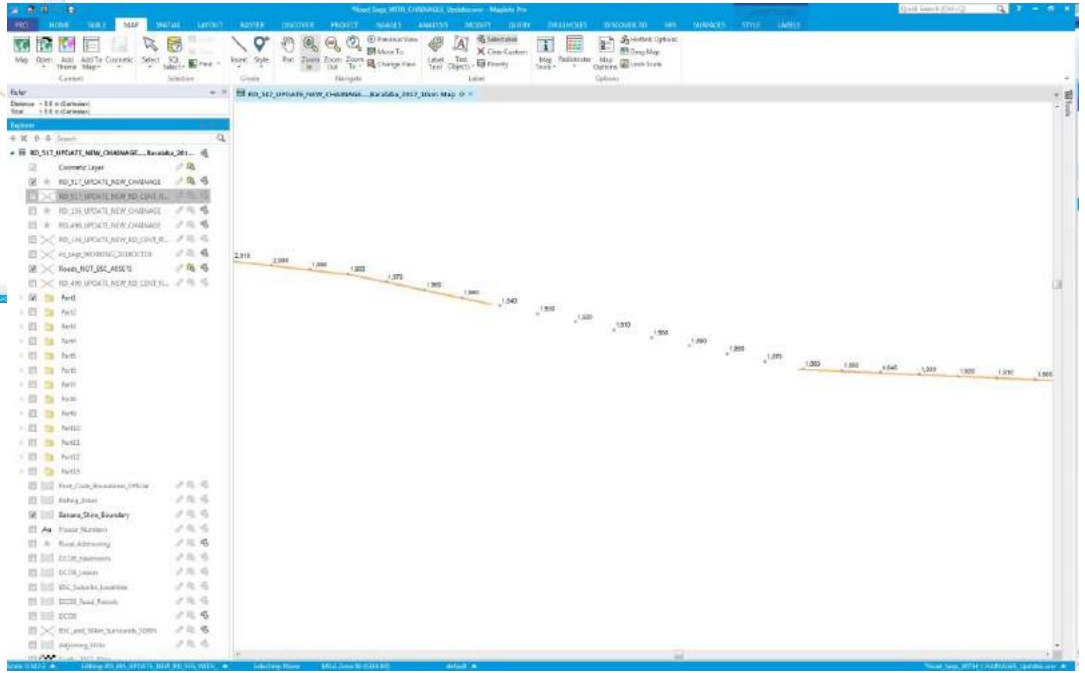
Step 2
New chainage files

Different road aspects affect the start points of the chainages

- due to intersection with State controlled roads, and
- some fragmented roads have chainages the whole length but the final segments and centre line do not exist where there is no road.

And requires a separate centre line for these chainage creations compared to the centre line for the segments

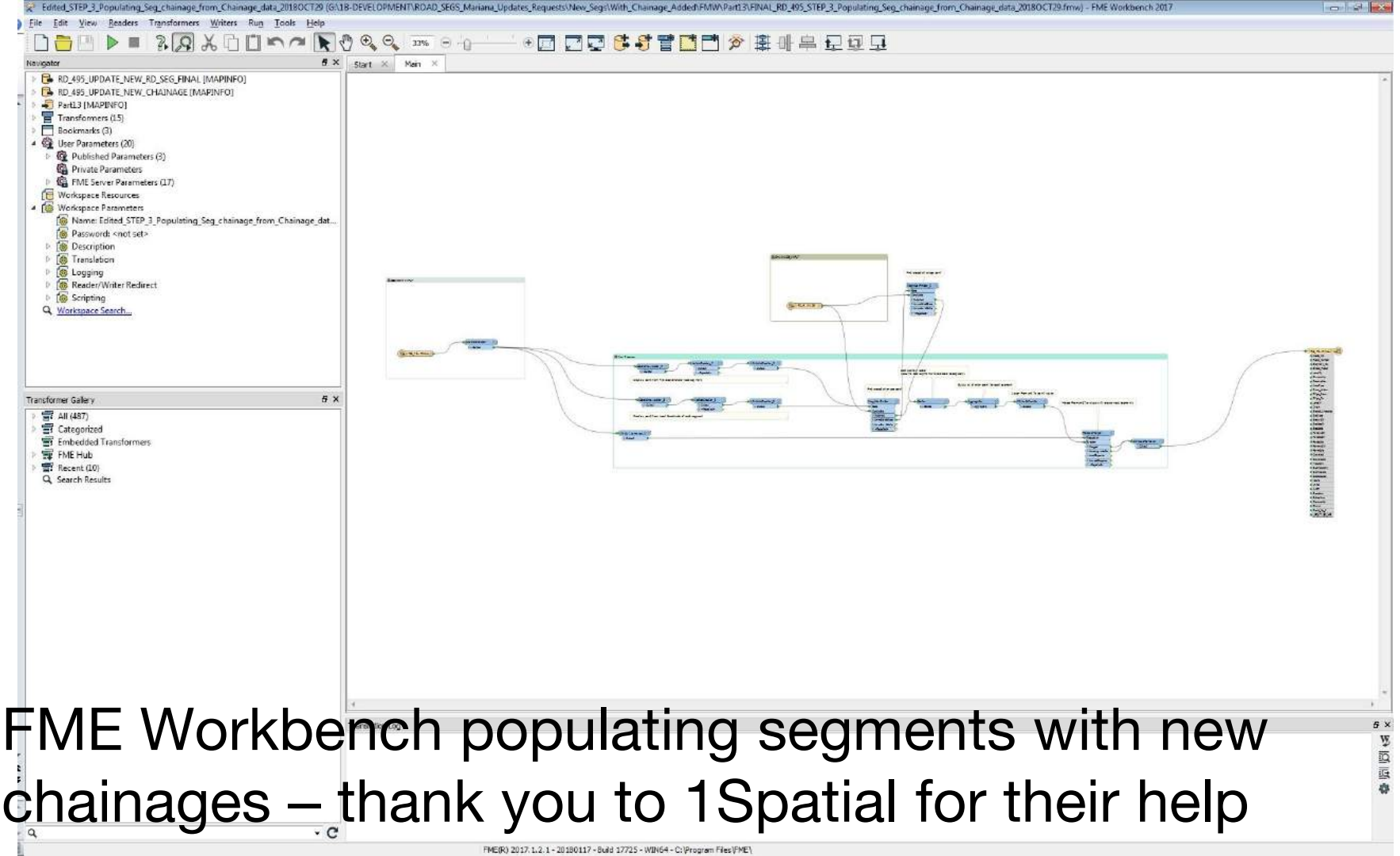




No road exists but centre line and chainage does

Step 3 Populating Road segments attributes from chainages

Populating the new road segments
Chainage From
and
Chainage To
Fields with the values from the new 10m chainage file.
And requires a separate centre line for these chainage creations compared to the centre line for the segments

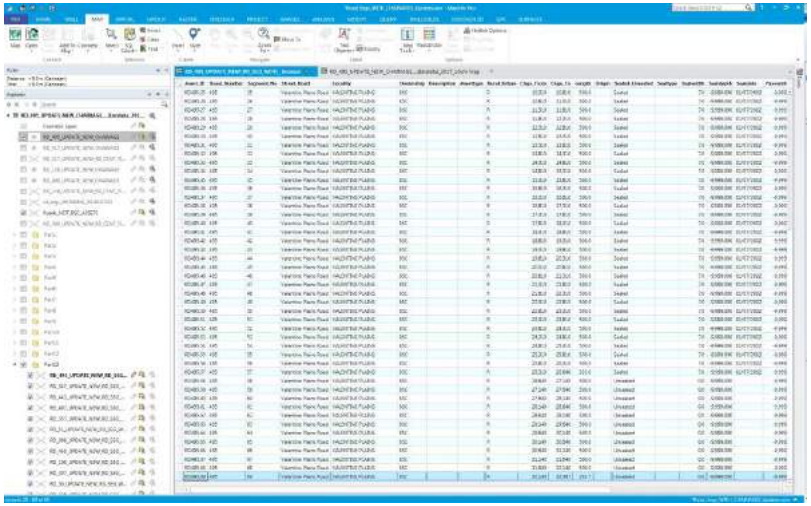


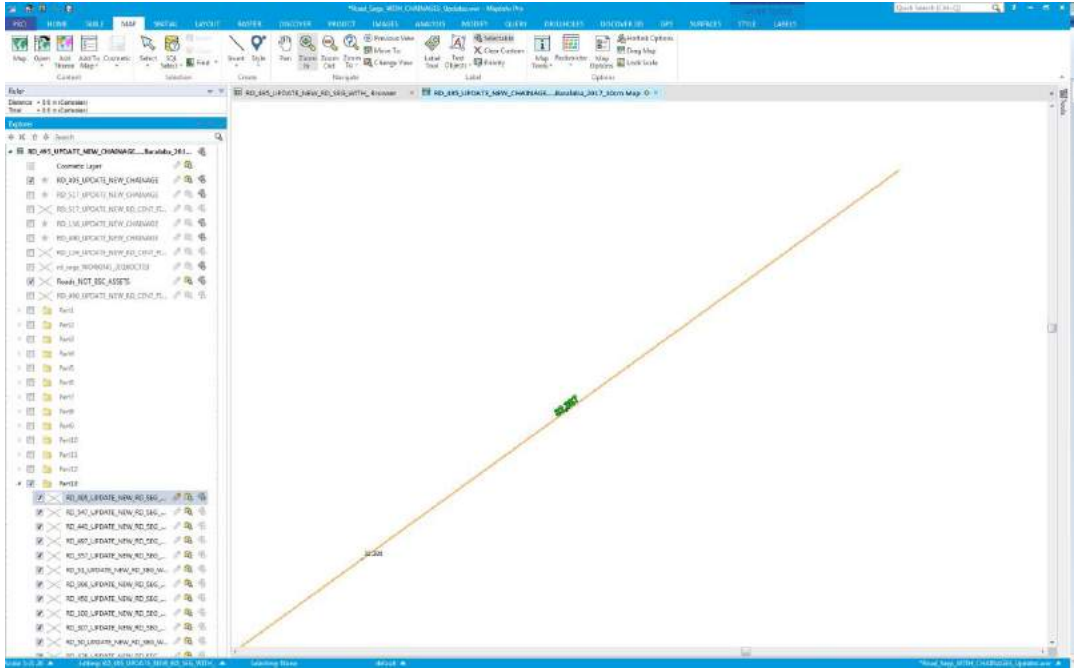
FME Workbench populating segments with new chainages – thank you to 1Spatial for their help

Step 3 Populating Road segments attributes from chainages

The final road segment Chainage To field is a manual input
with the exact distance as measured along the segment from the last valid 10m chainage point to the end of the road segment.

In addition, fragmented roads also have a manual measurement added to the Chainage From/To field – example Theodore road





Populating Chainage To field with manual measurement

Data processing final steps

Currently, this project is still going.

I have completed approx. 475 roads out of over 700 shire public roads.

Upon completion of the processing of all the Roads, and

after review by all parties, and acceptance of the new segments , centre lines and chainages,

all the separate files will be combined as follows

1. Road Segment files will be combined into a single Production Road Segments file

using an FME workbench to sort by Road Number and Asset ID

2. Road Centre Line files will be combined into a single Production Road Centre Lines file

using an FME workbench to sort by Road Number

3. The 10m and 100m Road Chainage files will be combined into a single Production 10m Chainage file
and
a single Production 100m Chainage file

using an FME workbench to sort by Road Number and Chainage (0m value is the chainage start point)

THANK YOU!

https://www.banana.qld.gov.au/
peter.lefel@banana.qld.gov.au