



FME
WORLD TOUR
2019

FME and Banana Shire Council Roads Re-segmentation Project

Peter Lefel



PRESENTATION AGENDA

- | | | |
|---|----------------------------|--|
| 1 | Project background | |
| 2 | Road Assets Review process | |
| 3 | Data processing | |
| 4 | Final steps | |
| | | |
| | | |
| | | |
| | | |

START



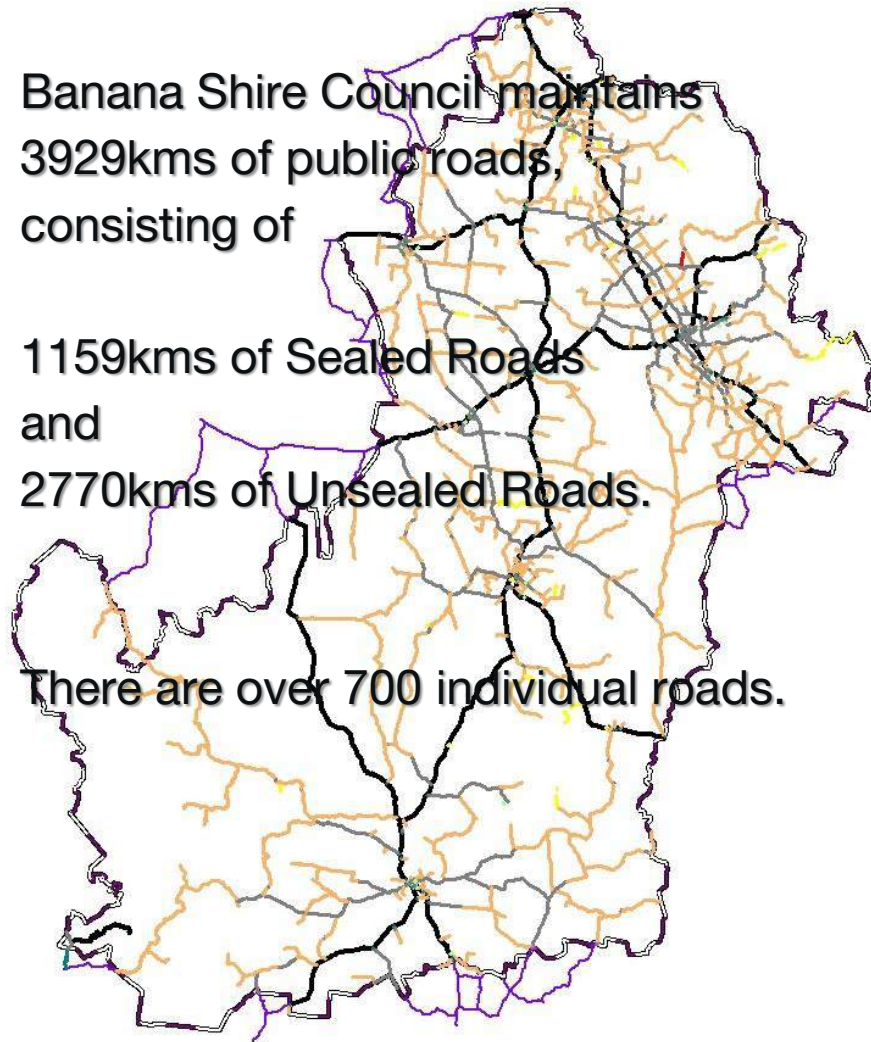
Project background



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 myData - Roads

File Edit Reports Tools Data Integration Asset Register Strategic Maintenance Planning Help

Template

Assetic

Asset Register

Name: Annamaroo Road - 0 - 2680 [Copy Asset URL](#)

Asset ID: RD-11_1 Zone:

Timeline: Current

Summary Inventory Attributes Traffic Count Condition Fair Value Documents Photos Risk Management Associated Assets Maintenance Planning Treatments Contacts Assessments

Inventory

Asset Class	Transport
Asset ID	RD-11_1
Asset Name	Annamaroo Road - 0 - 2680
Asset Sub Class	Rural
Asset Sub Type	Rural Access Road
Asset Type	Unsealed Road
Financial Class	Roads and Drainage
Financial Sub Class	Roads
Locality	Taroon
Segment/Group Name	RD-11 - Annamaroo Road
Suburb	
Zone	

Map: Banana Shire Council - Road Segments

Legend

- Unsealed
- Unformed
- Current Segment
- DD06

Asset ID: RD-11_1

Road Name: Annamaroo Road

Locality: Taroon

Length: 2680m

Width: 3m

Date: 1/1/1980

Start Point: 1 + 30

Asset Name	Asset ID	Asset Category
ANNAMAROO ROAD	RD-11	Roads
Annamaroo Road - 1394	RD-11_0632-CUL	Culverts
Annamaroo Road - 0 - 2680	RD-11_1	Roads
Annamaroo Road Sign-124	RD-11_P-0012R-SH	Signs

Advanced Settings

Show Dependent Assets

Customise View



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



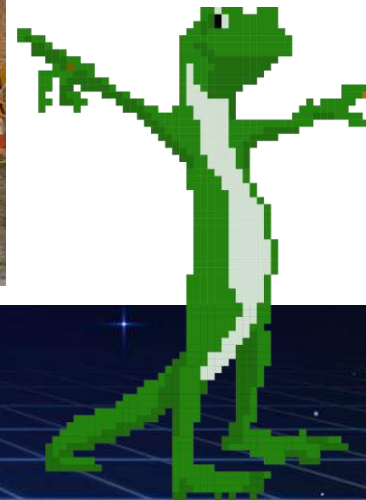


Rural Roads example



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 maintenance 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.

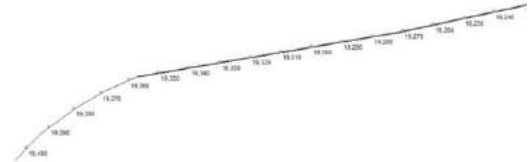
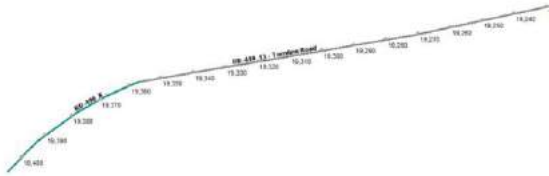




As well as the new segments, new road centre lines and new road chainage files, consisting of points at 10m and 100m intervals, were generated from the new segments.

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.





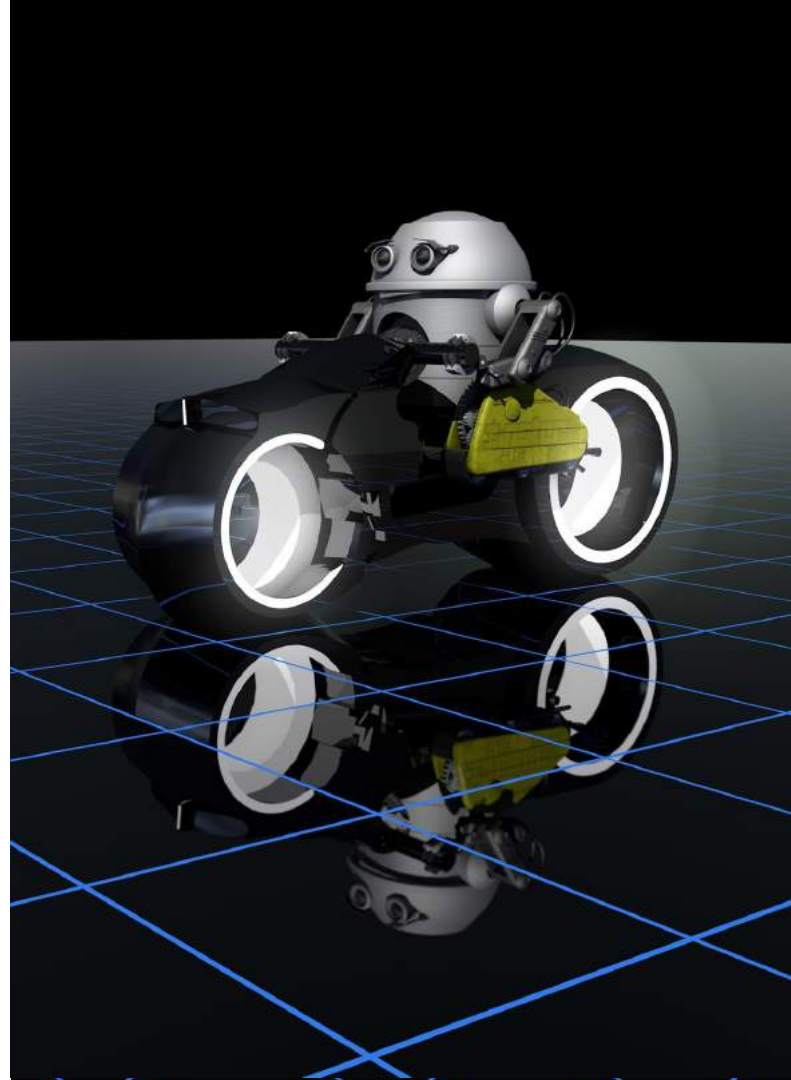
Road assets review

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



Spreadsheet Asset review comments example

Asset ID	RESL	ASSET ID	ROAD NAME	Asset Sub Type	Asset Type	Pravel	Surface Ty	Surfs	Start Chai	End Chains	Segment	CHAINAGES START	CH	CHAIN	CHAMA	DEPOT
433	OK	RD-171_3	Freemans Road	Rural Access Road	Sealed Road	6	Spray Seal	5	494	501	97	Leichhardt Hwy				
434	OK	RD-171_4	Freemans Road	Rural Access Road	Unsealed Road	5			501	1305	864	Leichhardt Hwy				
435	OK	RD-171_5	Freemans Road	Rural Access Road	Unsealed Road	5										in the intarnam 0 i w Mark Ho
436	OK	RD-172_1	Freemans Road East	Rural Access Road	Unsealed Road	5			0	1209	1209	Forestry Road				
437	OK	RD-173_1	Freemans Road West	Rural Access Road	Sealed Road	6	Spray Seal	5	0	2410	2410	Dawson Hwy				
438	OK	RD-173_2	Freemans Road West	Rural Access Road	Unsealed Road	4			3430	3079	649	Dawson Hwy				
439	OK	RD-174_1	Frenchs Road	Rural Access Road	Unsealed Road	5			0	3543	3543	Edswild Theodores Road				
440	Y	RD-175_1	Froctys Road	Rural Access Road	Unsealed Road	4			3	885	882	Floods Road				
441	OK	RD-176_1	Gairdners Road	Rural Access Road	Unsealed Road	4			0	523	523	McLaughlins Road				
442	OK	RD-177_1	Geigors Road	Rural Access Road	Unsealed Road	4			0	562	562	Goovigun Rannos Rd (ends at Martins Rd)				
443	OK	RD-177_2	Geigors Road	Rural Access Road	Unsealed Road	4			562	5420	2858	Goovigun Rannos Rd (ends at Martins Rd)				
444	OK	RD-178_1	Genevua Road	Rural Access Road	Unsealed Road	5			0	8198	8198	Dubala Banerita Rd				
445	OK	RD-179_1	Genevua Road	Rural Access Road	Unsealed Road	4			6621	9127	3706	Northern Jois to Leichhardt Hwy				
446	OK	RD-179_2	Genevua Road	Rural Access Road	Unsealed Road	5			2782	6021	3839	Leichhardt Hwy				
447	OK	RD-179_3	Genevua Road	Rural Access Road	Unsealed Road	5			0	2782	2782	Leichhardt Hwy				
448	Y	RD-180_1	Ghinginda Road	Rural Minor Collector	Unsealed Road	6				15969	15969	Fitzroy Dev Road				
449	Y	RD-180_2	Ghinginda Road	Rural Minor Collector	Unsealed Road	6				15969	15969	Fitzroy Dev Road				
450	OK	RD-182_1	Gilber Gungyah Connector	Rural Minor Collector	Sealed Road	6	Spray Seal	5	0	1007	1007	Leichhardt Hwy				
451	OK	RD-182_2	Gilber Gungyah Connector	Rural Minor Collector	Sealed Road	6	Spray Seal	5	1007	4612	3605	Leichhardt Hwy				
452	OK	RD-182_3	Gilber Gungyah Connector	Rural Minor Collector	Sealed Road	6	Spray Seal	5	4612	5977	3265	Leichhardt Hwy				
453	OK	RD-182_4	Gilber Gungyah Connector	Rural Minor Collector	Sealed Road	6	Spray Seal	5	5977	7154	177	Leichhardt Hwy				
454	OK	RD-182_5	Gilber Gungyah Connector	Rural Minor Collector	Sealed Road	6	Spray Seal	5	7154	7971	817	Leichhardt Hwy				
455	OK	RD-182_6	Gilber Gungyah Connector	Rural Minor Collector	Sealed Road	6	Spray Seal	5	7971	8310	339	Leichhardt Hwy				
456	OK	RD-182_7	Gilber Gungyah Connector	Rural Minor Collector	Sealed Road	6	Spray Seal	5	8310	8409	99	Leichhardt Hwy				
457	OK	RD-182_8	Gilber Gungyah Connector	Rural Minor Collector	Sealed Road	6	Spray Seal	5	8409	8763	383	Leichhardt Hwy				
458	OK	RD-183_1A	Gilbds Road	Rural Access Road	Sealed Road	6	Spray Seal	3	0	154	154	Edswild Theodores Road				
459	OK	RD-183_1	Gilbds Road	Rural Access Road	Unsealed Road	5			154	2829	2675	Edswild Theodores Road				
460	OK	RD-184_1	Gilbhi Road	Rural Major Collector	Sealed Road	8	Asphalt	8	8818	12078	3860	Theodore Moura Road				what i yes he should run the section
461	OK	RD-184_2	Gilbhi Road	Rural Major Collector	Sealed Road	8	Asphalt	7	8322	8818	496	Theodore Moura Road				what i yes he should run the section
462	OK	RD-184_3	Gilbhi Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	7615	8322	703	Theodore Moura Road				what i yes he should run the section
463	OK	RD-184_4	Gilbhi Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	8635	7615	548	Theodore Moura Road				what i yes he should run the section
464	OK	RD-184_5	Gilbhi Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	9675	8635	560	Theodore Moura Road				what i yes he should run the section
465	OK	RD-184_6	Gilbhi Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	1919	5975	2050	Theodore Moura Road				what i yes he should run the section
466	OK	RD-184_7	Gilbhi Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	2835	3919	1044	Theodore Moura Road				what i yes he should run the section
467	OK	RD-184_8	Gilbhi Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	1455	2835	1380	Theodore Moura Road				what i yes he should run the section
468	OK	RD-184_9	Gilbhi Road	Rural Major Collector	Sealed Road	8	Spray Seal	7	0	1455	1455	Theodore Moura Road				what i yes he should run the section
469	OK	RD-188_1	Glebe Weir Road	Rural Access Road	Unsealed Road	5			0	8738	8738	Craxton Road				
470	OK	RD-189_1A	Glebe Weir Road	Rural Minor Collector	Sealed Road	7	Spray Seal	6	13096	11788	1128	Leichhardt Hwy				
471	OK	RD-189_1	Glebe Weir Road	Rural Minor Collector	Sealed Road	7	Spray Seal	6	0	14900	14900	Leichhardt Hwy				
472	OK	RD-189_2	Glebe Weir Road	Rural Minor Collector	Sealed Road	7	Spray Seal	6	17200	21059	3851	Leichhardt Hwy				
473	OK	RD-189_3A	Glebe Weir Road	Rural Minor Collector	Sealed Road	7	Spray Seal	6	21059	24297	3238	Leichhardt Hwy				
474	OK	RD-189_3	Glebe Weir Road	Rural Minor Collector	Sealed Road	7	Spray Seal	6	24296	25716	1420	Leichhardt Hwy				
475	OK	RD-190_1	Glen Heaton Road	Rural Access Road	Unsealed Road	5			0	6752	6752	Caproom Hwy				
476	OK	RD-192_1	Glenhar Road	Rural Minor Collector	Unsealed Road	5			0	3609	3609	Glenmaral Roundstone Rd				
477	OK	RD-192_2	Glenhar Road	Rural Access Road	Unsealed Road	5			3609	3142	624	Glenmaral Roundstone Rd				Mark Ho
478	OK	RD-193_1	Glenbarung Road	Rural Access Road	Unsealed Road	6			0	4039	4039	Leichhardt Hwy				
479	OK	RD-194_2	Glongowan Road	Rural Access Road	Unsealed Road	5			0	7166	6660	end of Playfields Rd (basically just keep following the road)				
480	OK	RD-194_3	Glongowan Road	Rural Access Road	Sealed Road	5	Spray Seal	5	7166	7442	500	end of Playfields Rd (basically just keep following the road)				

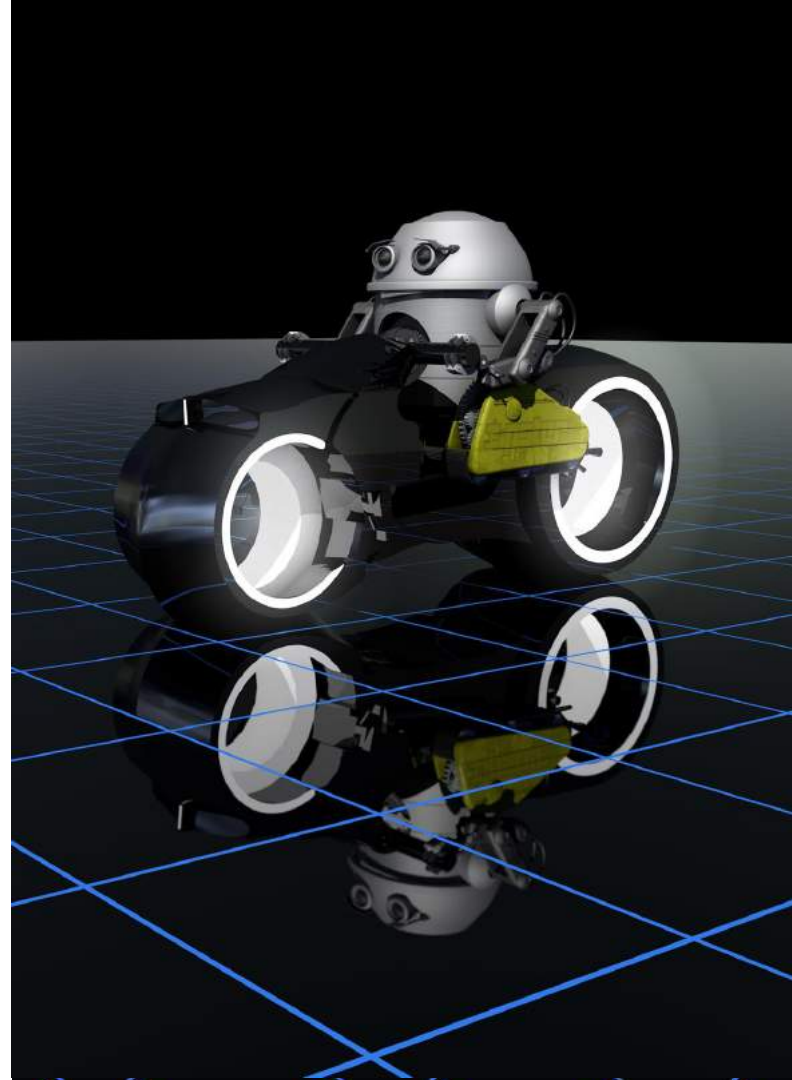


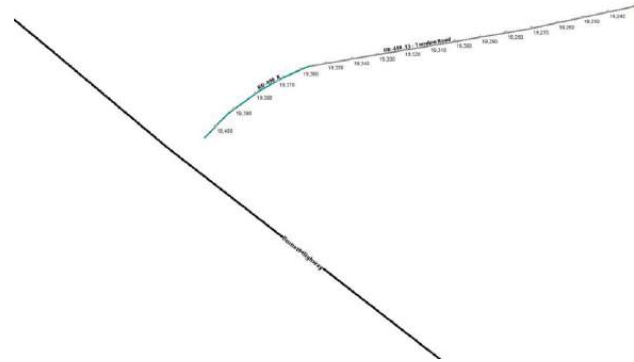
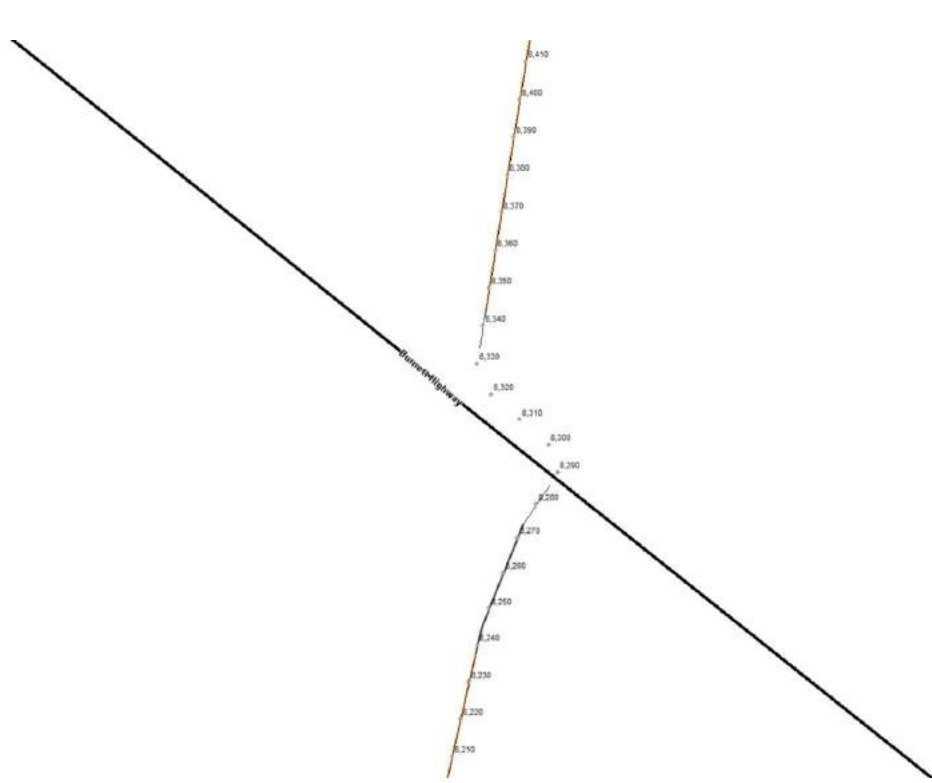
Spreadsheet Asset review comments example

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

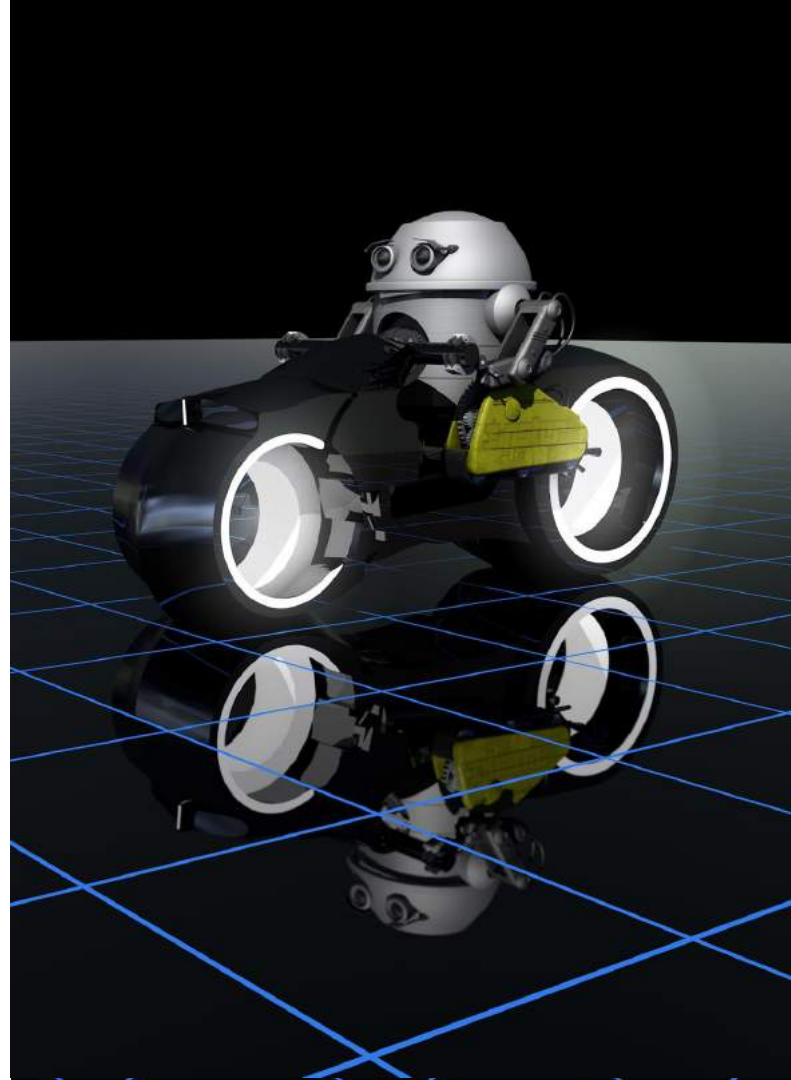
Single road and road that continues through State Road

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



Info

Asset_ID: RD-136_2

Road_Number: 136

Segment_No: 2

Street_Road: Doonays Road

Locality: GODVIGENDOXALEA

Ownership: BSC

Description:

Assettype:

Rural_Urban: R

Chge_From: 8,339

Chge_To: 10,065

Length: 1,776

Origin:

Sealed_Unsealed: Unsealed

Sealtype: n/a

Sealwidth: 0.0

Sealdepth: 0.006

Sealdate:

Pavewidth: 5.0

Paveddepth: 0.130

Pavedate: 01/07/2003

Formwidth: 8.0

Formdate: 01/06/1988

Gravelpct: 1. > 80

Gravelpctd: 01/03/2014

Hierarchy: Rural Access Road

Subhierarchy: Access 3

Grantclass: r1

Datasource: RACAS

Jobno:

LRRS:

AADT: 22

Speedav: 0

Schoolbus:

Comments:

Gislink: Rd_Segs - 867

Road_No_2:

<< >> List rd_segs_WORKING_2018OCT03

Info

Asset_ID: RD136.19

Road_Number: 136

Segment_No: 19

Street_Road: Doonays Road

Locality: DIXALEA

Ownership: BSC

Description:

Assettype:

Rural_Urban: R

Chge_From: 8,340

Chge_To: 8,840

Length: 500.0

Origin:

Sealed_Unsealed: Unsealed

Sealtype:

Sealwidth: 0.0

Sealdepth: -9,999.000

Sealdate:

Pavewidth: -9,999.0

Paveddepth: -9,999.000

Pavedate:

Formwidth: -9,999.0

Formdate:

Gravelpct:

Gravelpctd:

Hierarchy: Rural Access Road

Subhierarchy:

Grantclass:

Datasource:

Jobno:

LRRS:

AADT: 0

Speedav: 0

Schoolbus:

Comments:

Gislink:

Road_No_2:

UPDATED_BY_MFR: Y

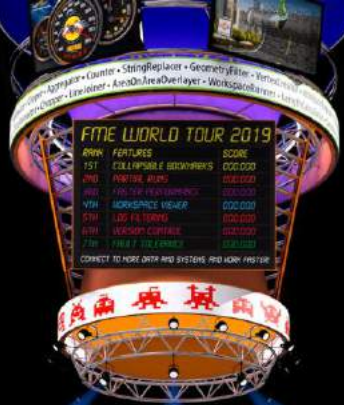
<< >> List RD_136_UPDATE_NEW_RD_SEG_WITH_



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

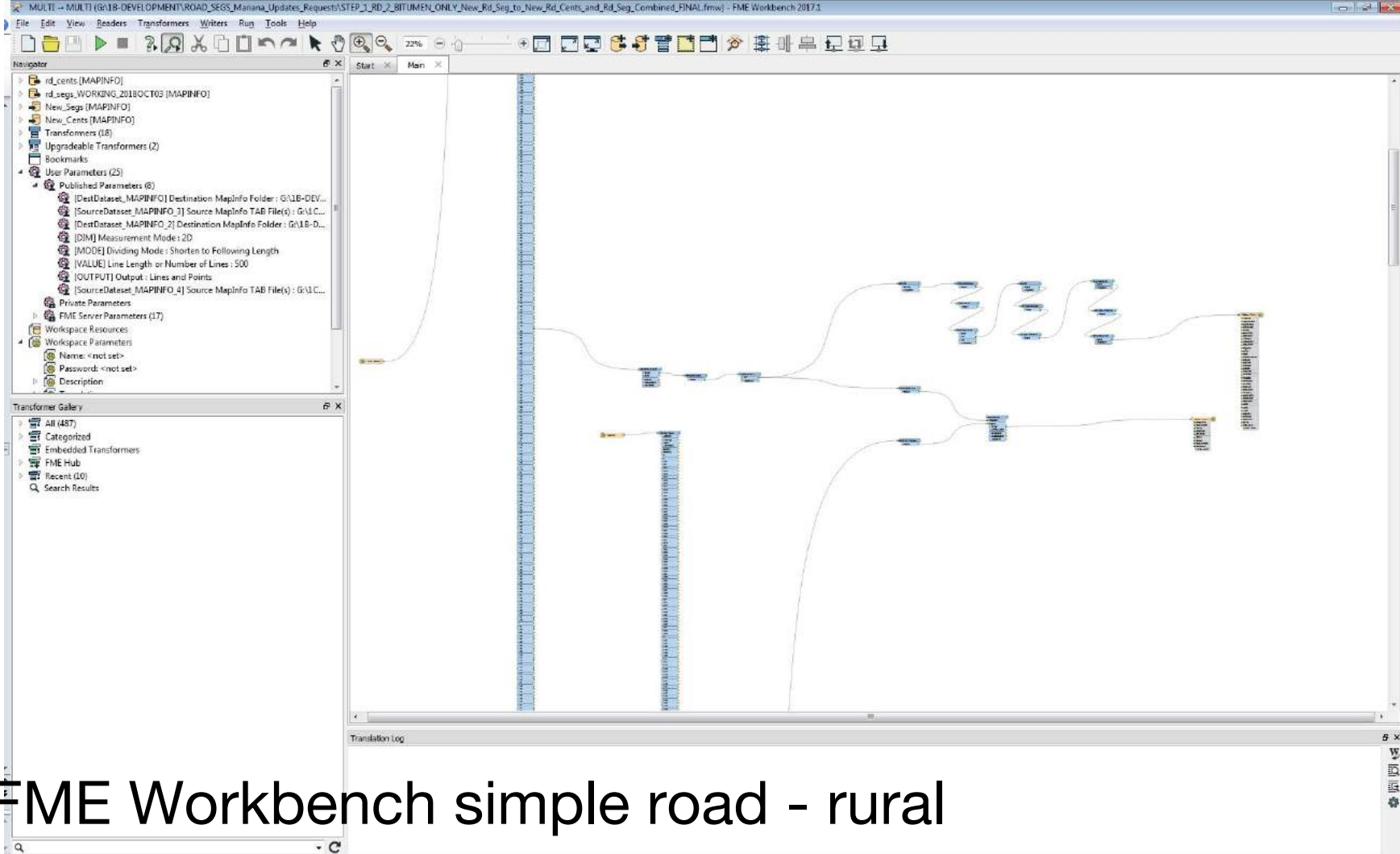


Step 1

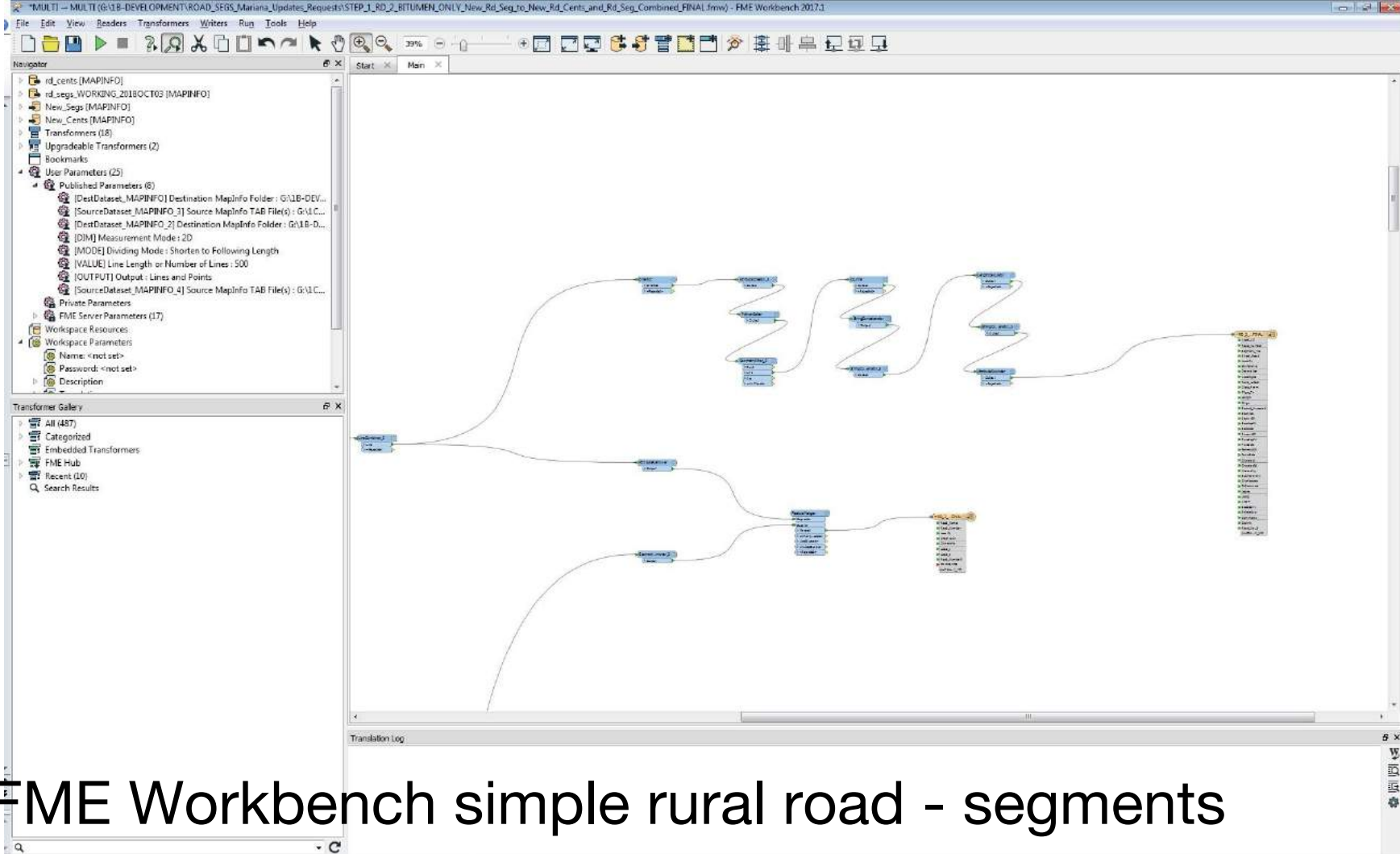
New segments and new centre lines

Uses two data sets for this process;

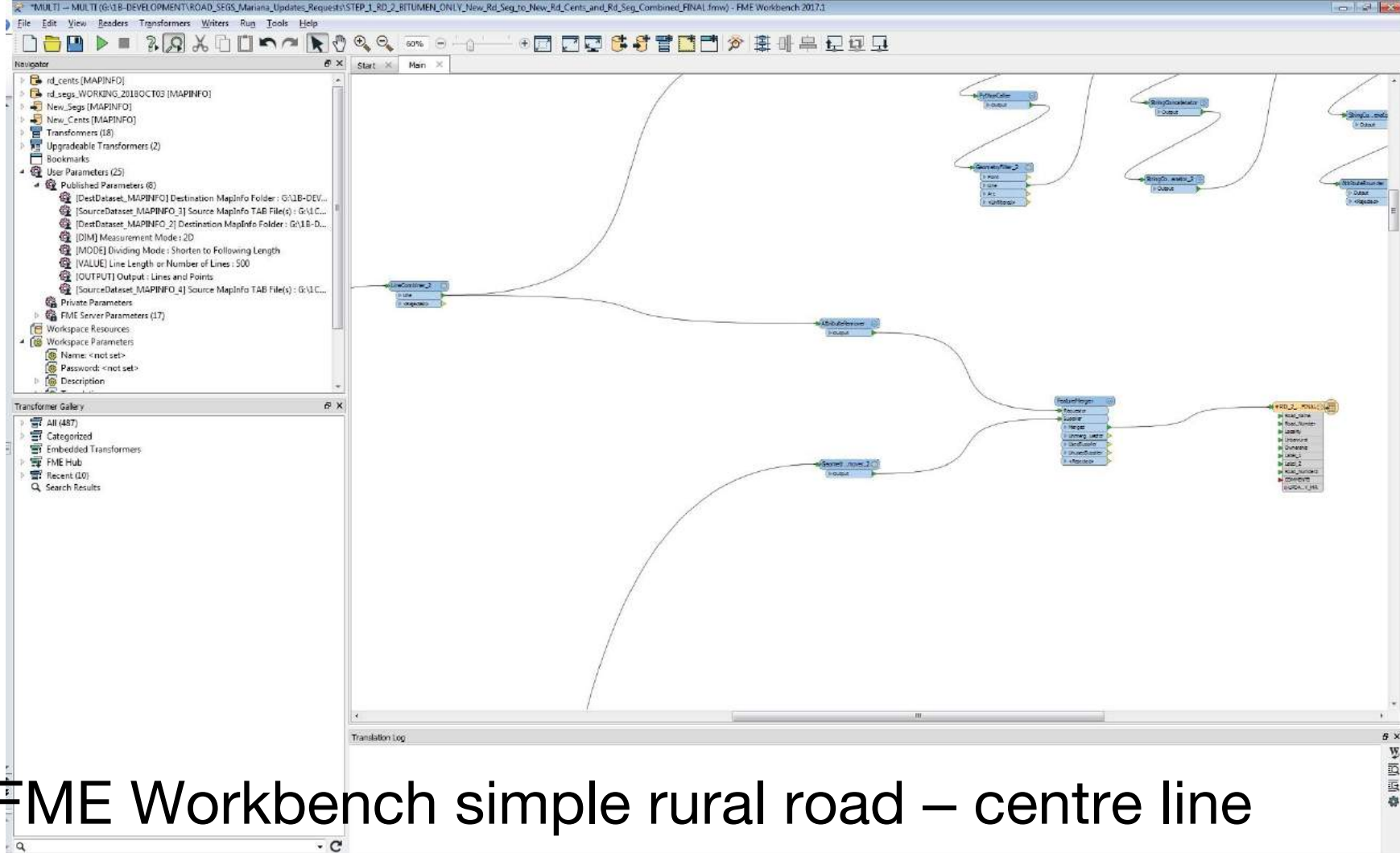
- the Road segments MapInfo Table with review additions as noted above, for the generation of the new road segments and the new road centre line, and
- the original Road centre lines MapInfo Table – source of attributes for the new centre line



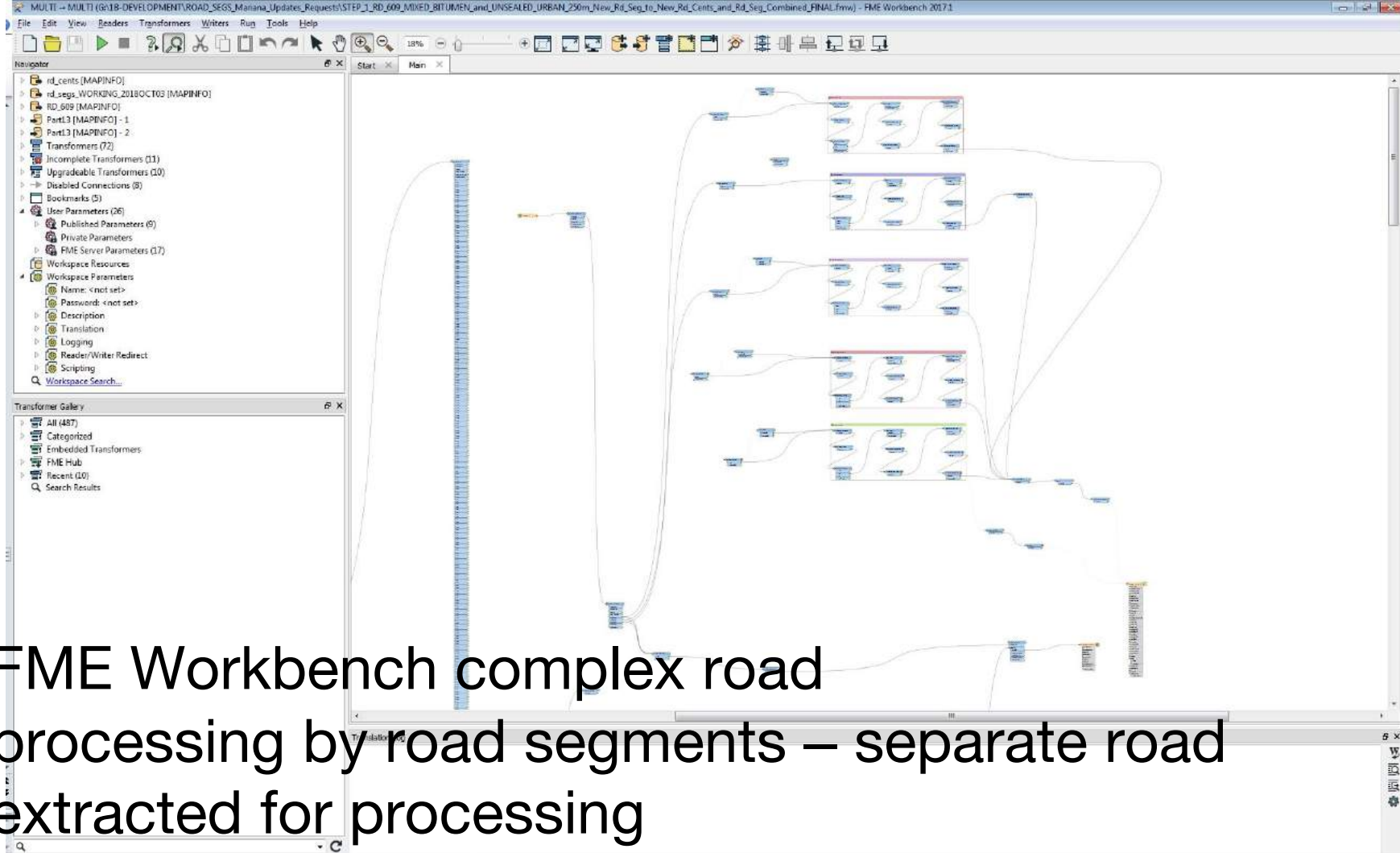
FME Workbench simple road - rural



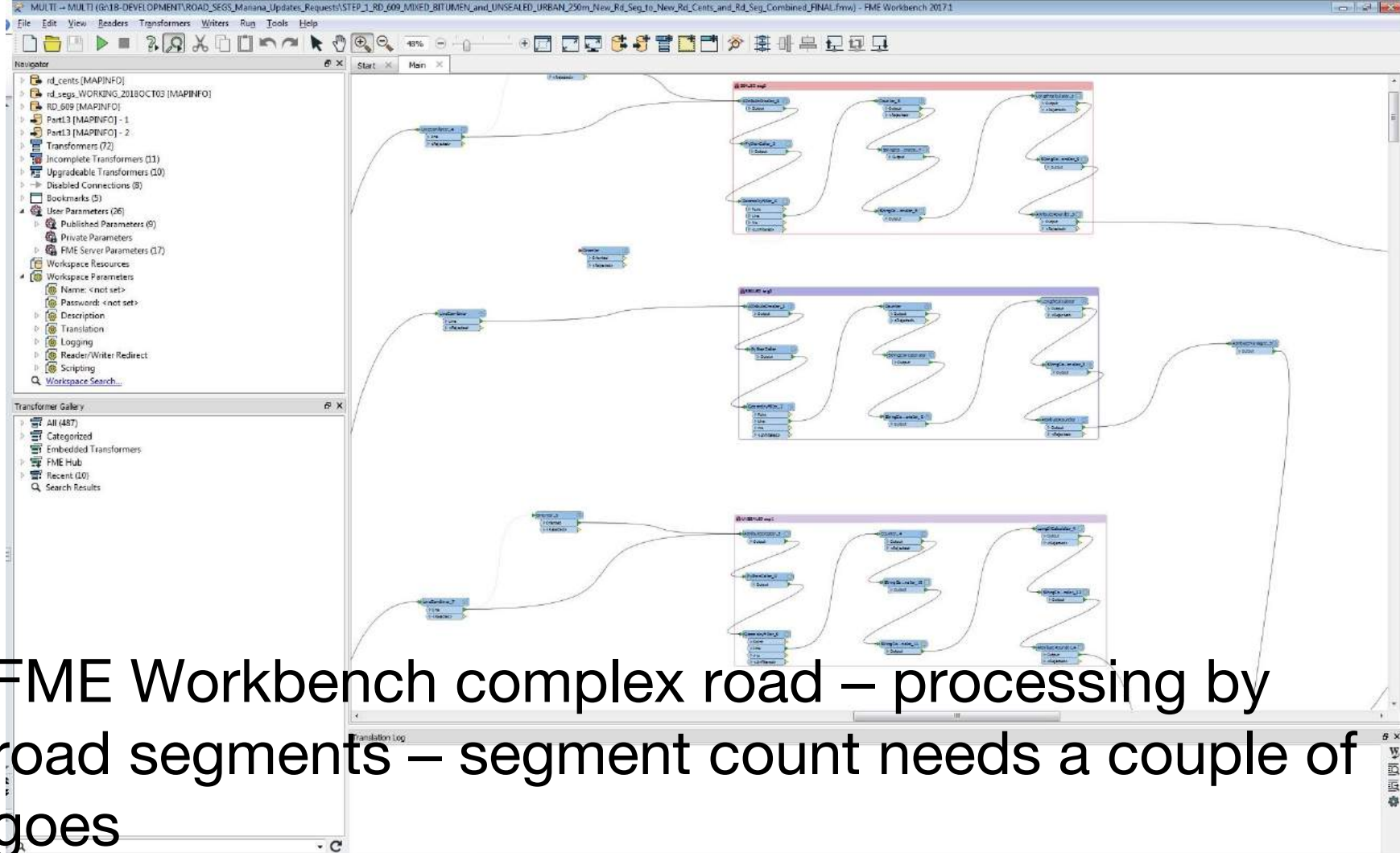
FME Workbench simple rural road - segments



FME Workbench simple rural road – centre line



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



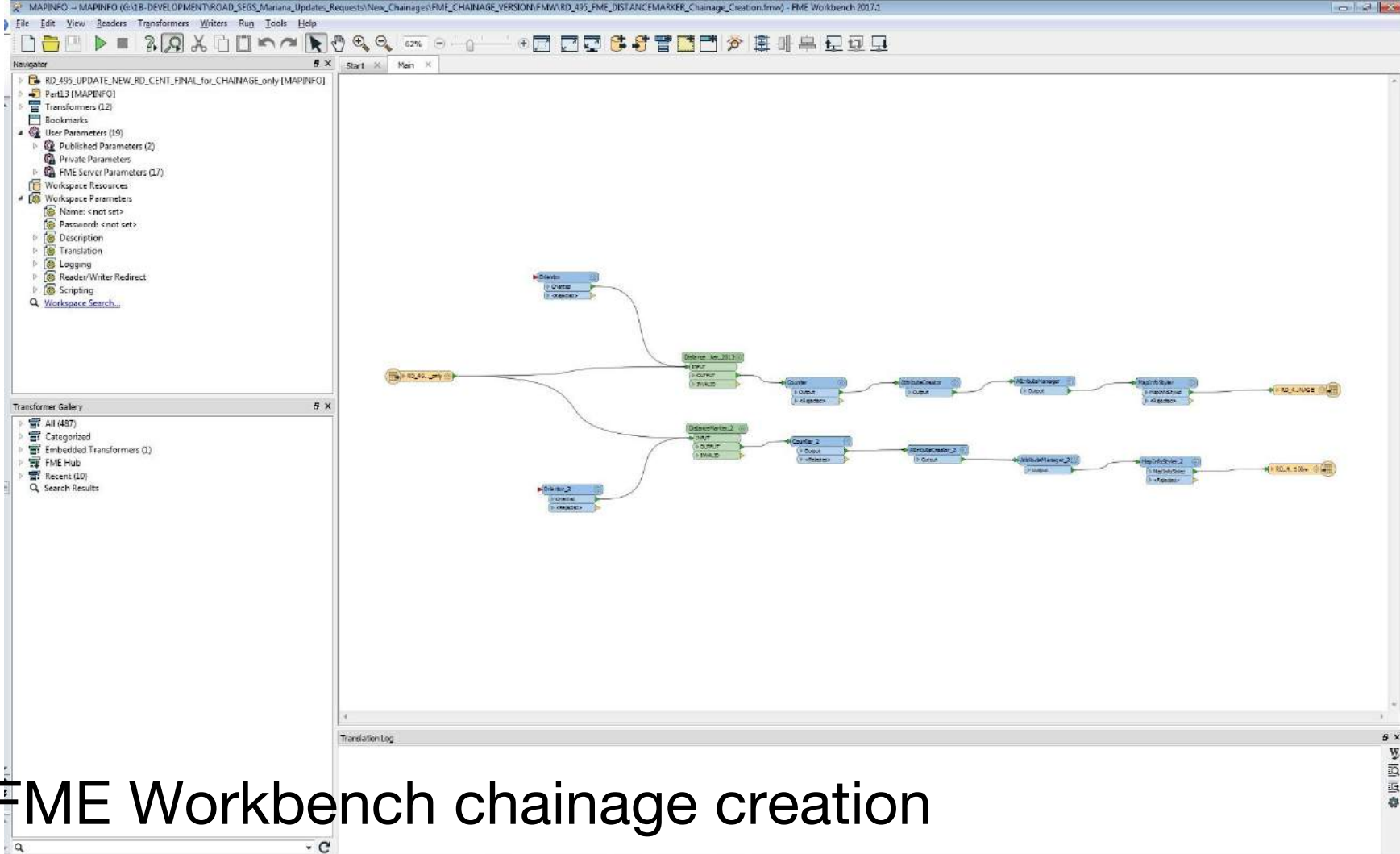
FME Workbench complex road – processing by road segments – segment count needs a couple of goes



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



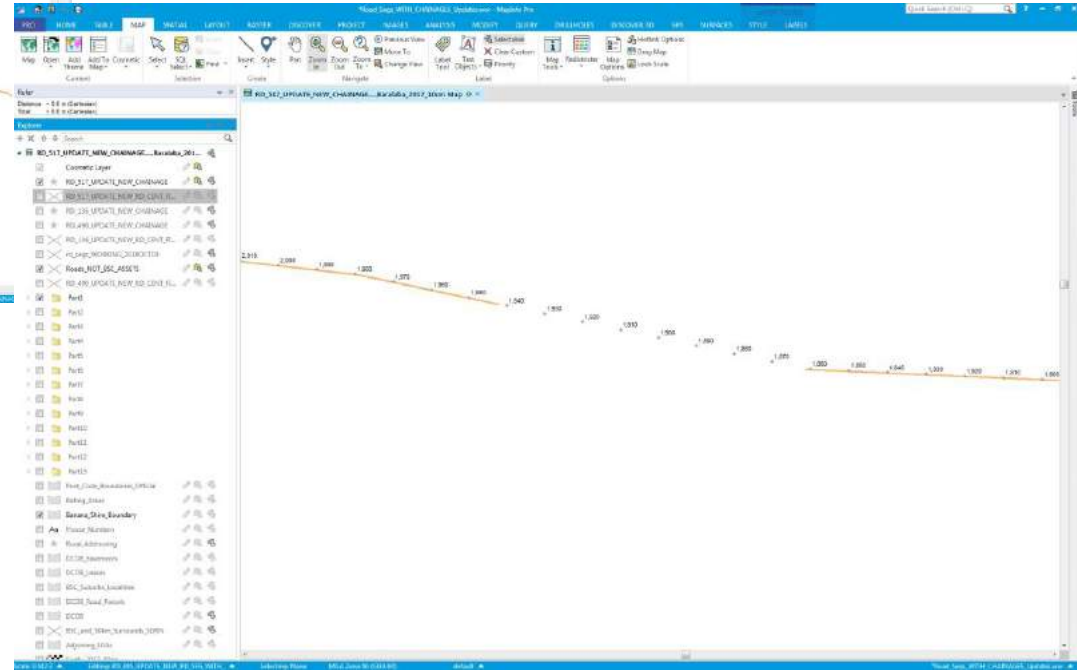
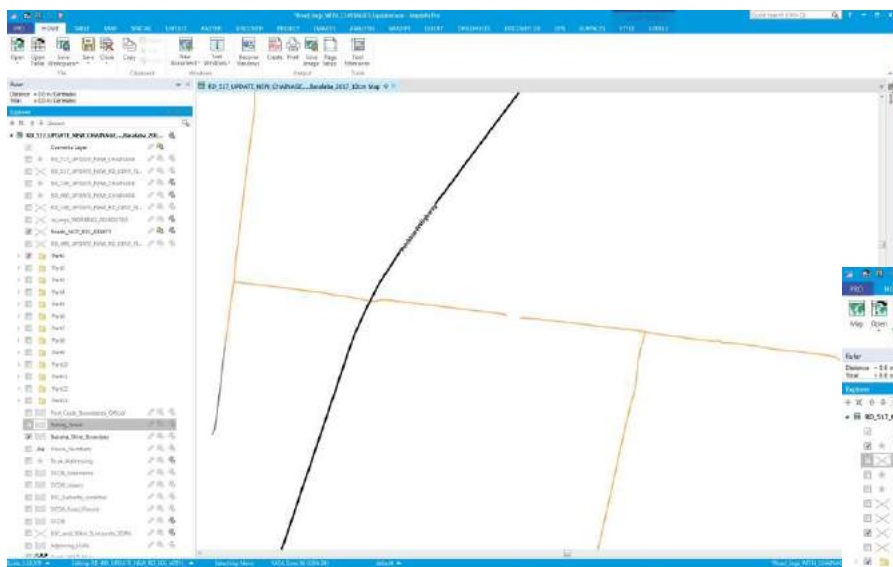
Step 2

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

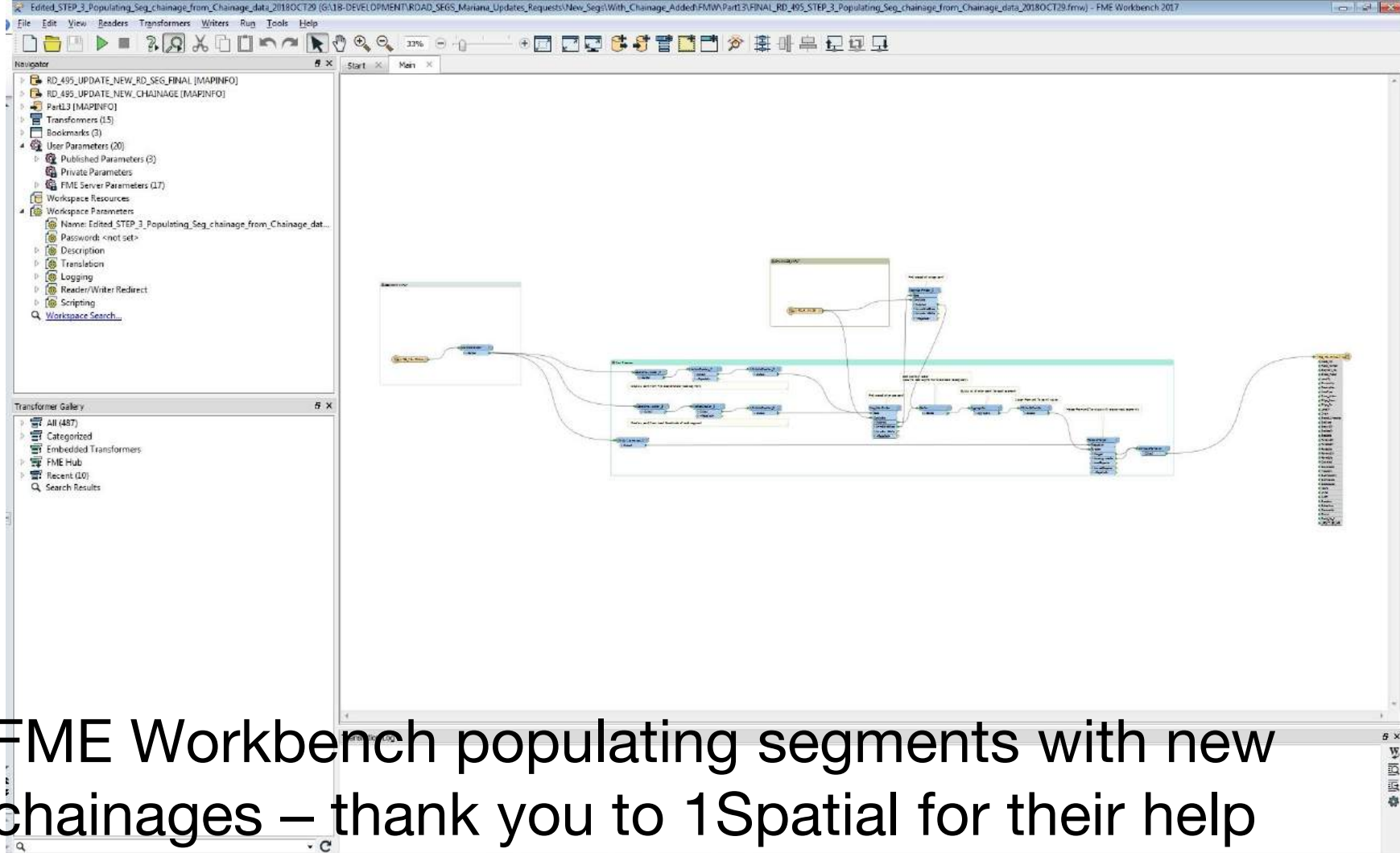
Chainage From

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

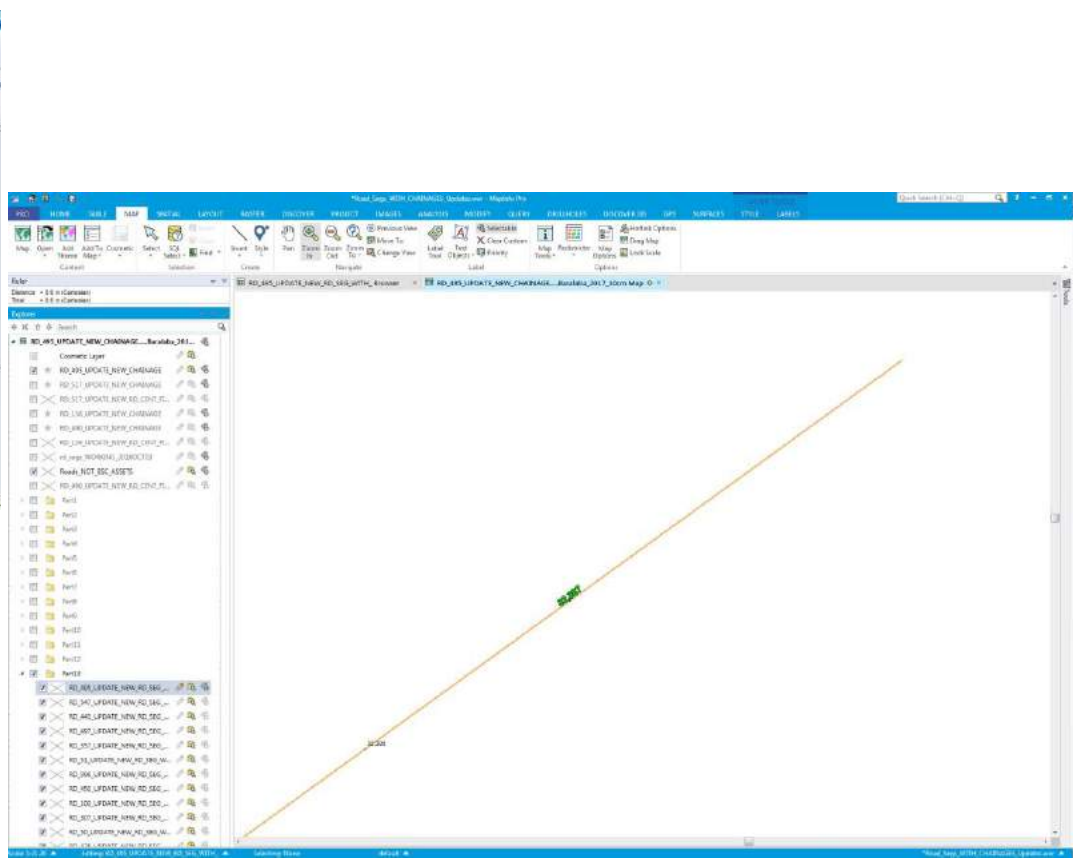


Step 3 Populating Road segments attributes from chainages

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

ID	Name	Description	Value
400001-001
400001-002
400001-003
400001-004
400001-005
400001-006
400001-007
400001-008
400001-009
400001-010
400001-011
400001-012
400001-013
400001-014
400001-015
400001-016
400001-017
400001-018
400001-019
400001-020
400001-021
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400001-100



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