Queanbeyan-Palerang

Timing of Works Analysis 2023

PREPARED FOR Queanbeyan-Palerang Regional Council | July 2023

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Quality statement

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Executive summary

Stantec has been asked to assess what road network improvements will be necessary to return the future QPRC road network back to a Level of Service no worse that LOS D (for those locations highlighted in "**Queanbeyan-Palerang: Future Do-minimum Network Deficiencies 2022**" report) and to assess an appropriate timing of implementation of those works. The improvements were proposed to directly improve a road or intersection suffering from a poor level of service in BOTH the AM and PM periods. Several additional intersection improvements have been indicated as possible improvements (but not fully assessed) based on poor single period performance.

The tables below provide a recommended timeline for the implementation of each network improvement. The following map shows the locations of these improvements and possible improvements on the wider network.

Table 1-1: Link Improvement Timing

Link Improvement Timing							
Location	**Item**	**By 2024**	**By 2027**	**By 2031**	**By 2036**	**By 2041**	**By 2046**
4L Cooma St (ELP to Southbar)	4L		✓				
4L Southbar Rd (Lanyon to North Terrace)	4L			✓			
6L Old Cooma Rd (ELP to Googong)	6L					✓	

Table 1-2: Intersection Improvement Timing

Intersection Improvement Timing							
Location	**Item**	**By 2024**	**By 2027**	**By 2031**	**By 2036**	**By 2041**	**By 2046**
Yass / Ellerton / Bungendore	Traffic Signals		✓				
Canberra / Cameron / Campbell	Traffic Signals			✓			
Lanyon / Southbar	Traffic Signals			✓			
Yass / Silva / Waterloo	Ban Right Turn					✓	
Yass / Shropshire	Ban Right Turn					✓	
Yass / Hincksman / Endurance	Traffic Signals					✓	
Bungendore / Thurralilly	Ban Right Turn		✓*****				
Canberra / Kealman	Ban Right Turn		✓*****				
Old Cooma / Wickerslack	Upgrade				✓*****		
Canberra / Gilmore	Traffic Signal upgrade					✓*****	
Kings Hwy / Captains Flat	Roundabout Upgrade				✓*****		

✓***** Possible improvement based on one period deficiency but not included in full analysis


Key Improvements
Improved intersections
Intersections to note
Improved links
Canberra Airport
Fairbairn Forest
Mount Reedy 764 m
The Ridgeway
B52
Oaks Estate
Beard
Mahon Hill
Canberra Avenue
Symonston
Crestwood
Queanbeyan East
Coumbeun Nature Reserve
Queanbeyan
A23
Queanbeyan West
Greenleigh
Jerrabomberra West Grassland Nature Reserve
Jerrabomberra Grassland Reserve
Canberra Nature Park
Mount Jerrabomberra 783 m
Karabar
Jerrabomberra
Hume
Cooma Road Quarry
Environa
Googong
Nangi Pimble 810 m
1 km
5000 ft

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1 Introduction

The purpose of this report is to consider the improvements needed to the road network up to 2046 to return it to a similar Level of Service to that currently provided in the 2021 network and to assess during which 3-5 year period (between the present and 2046) each work should be introduced.

2 Background

2.1 Summary of the Model

Please refer to **Section 2** of the **Queanbeyan-Palerang Regional 2016 Transportation Model Update Report August 2022** for a detailed account of the model structure for the 2016 base year and future year road networks and land use information.

The land use for the future years were generated by using development projections within the QPRC area as provided by Council and interpolating development projections within each of the ACT districts as provided by ACT planning staff. The ACT district projections are the same as those used in the current 2021 Canberra Strategic Transport Model but converted into the QPRC model zone structure.

Table 2-1 shows the breakdown of Total Households and Total Jobs for each future year period for each of the following regions: ACT, Googong, South Jerrabomberra, Jumping Creek development areas, the Fernleigh/Burra/Royalla infill areas, Bungendore infill and the various Bungendore development areas.

Table 2-1: Total Households and Total Jobs for each future year period

Land Use								
Year	**Googong**	**South Jerrabomberra**	**Misc Infill**	**Jumping Creek**	**Bungendore**	**Rest of QPRC**	**ACT**	**Total**
Occupied Private Dwellings								
2016	462	-	799	-	1,116	15,550	142,244	160,171
2021	1,988	30	827	-	1,368	16,579	168,121	188,913
2024	3,015	480	857	65	1,850	16,940	176,069	199,276
2027	3,840	930	887	131	2,031	17,269	184,128	209,216
2031	4,680	1,500	927	218	2,357	17,709	195,171	222,562
2036	6,030	1,500	977	218	2,767	18,254	208,322	235,068
2041	6,200	1,500	1,027	218	3,038	18,779	221,473	252,235
2046	6,200	1,500	1,027	218	3,237	19,279	228,662	260,123
Employment								
2016	412	3	79	-	1,173	12,062	220,654	234,385
2021	576	219	96	-	1,653	13,591	265,949	282,084
2024	1,645	572	96	-	1,653	13,596	283,161	300,723
2027	2,033	1,019	96	-	1,653	13,596	300,585	318,982
2031	2,789	1,354	96	-	1,653	13,596	324,386	343,874
2036	3,410	1,354	96	-	1,653	13,596	343,730	363,838
2041	3,410	1,354	96	-	1,653	13,596	363,074	383,182
2046	3,410	1,354	96	-	1,653	13,596	382,418	402,526

3 Network Deficiencies

The level of traffic used in the vehicle network modelling is calculated from land use data which focuses on the QPRC and ACT areas and includes the number of dwellings, vehicles, school rolls, employment and job distribution. All of this data has been based on 2016 census data and projected for each future year by QPRC and ACT planners. A model of the QPRC area has been created and tested against traffic counts and it replicates the economic and environmental conditions that existed in 2016.

The 2016 and future year land uses cover both the QPRC and ACT LGAs so that the interaction between the two areas can be correctly taken into account. The Queanbeyan study area however is bordered on the west and south by the ACT-NSW border and in the east as far as Bungendore. The QPRC study area of the model is divided into sub areas to form a zone system. The QPRC study area consists of 599 zones, but the total model consists of 1800 zones representing QPRC and ACT.

An iterative approach was used to identify deficiencies arising within each future 3-5 year period. A deficiency was identified as needing improvement if the relevant intersection or network link was at LOS E or worse in BOTH the AM and PM peak periods. However, it is possible that a network element may be considered as 'requiring upgrading' if a deficiency in EITHER the AM or PM was extreme enough that it warranted reconstruction anyway. These possible extreme "single period" deficiencies were not considered in this analysis.

Once the deficiencies arising at or before 2021 were identified, the improvements necessary to resolve those deficiencies were built into the next base model for the 2024 network. That new 2024 base network highlighted new deficiencies arising from future growth and a new set of 2024-based improvements were identified and so on for each future year.

3.1 2021 Base Model

Modelling the existing 2021 network with 2021 Land Use identified the following deficiencies in the QPRC area, shown in Table 3-1, as arising if no further works are implemented before 2021:

Table 3-1: 2021 Base Model Deficiencies

Location	Period	LOS	Issue
Lanyon / Southbar (Sth)	AM	F	Int LOS F - (750v) on south approach
Canberra Ave / Tharwa Rd	AM	F	Int LOS F – Left turn
Yass / Ellerton / Bungendore (Sth)	AM	F	Int LOS F - (600v) on south approach
Bungendore / Thurralilly (Nth)	AM	E	Int LOS E - (10v) on north app turning right
Canberra Ave / Cameron Rd	AM	E	Int LOS E - (250v) on South approach
Canberra / Kealman (SW)	PM	F	Int LOS F - (10v) on sw app turning right
Lanyon / Canberra (NE)	PM	F	Int LOS E - (300v) on merge of nth to east slip lane
Lanyon / Gilmore (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / Canberra (Nth)	PM	E	Int LOS E - (900v) on nth app
Cooma Rd (Southbar to Ellerton)	AM	E	Link LOS E NB on this stretch

LOS plots highlighting deficiencies at 2021 are shown in Figure 3-1 and Figure 3-2 below and AM and PM peak hour traffic volumes are plotted in Figure 3-3 and Figure 3-4.

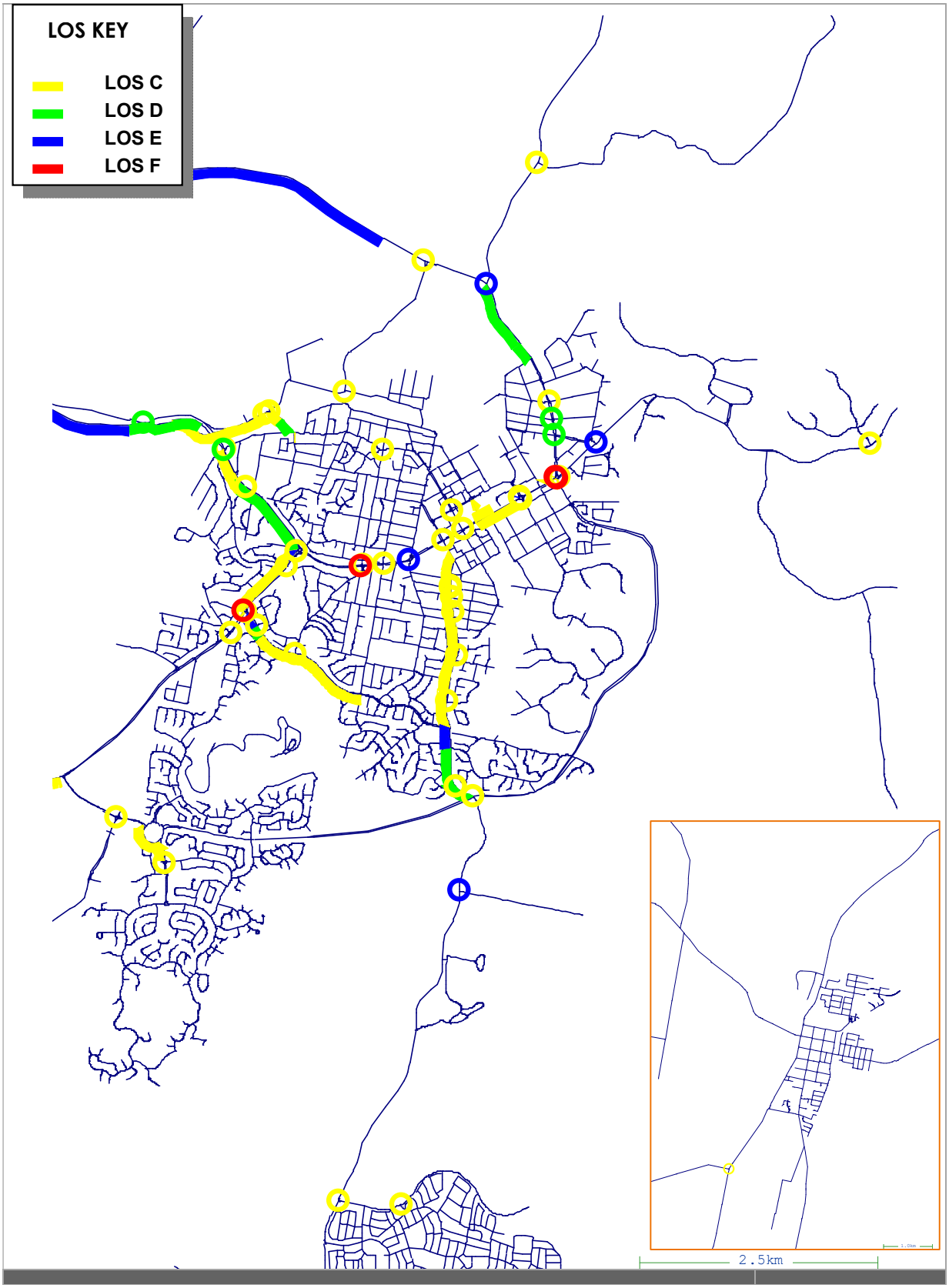


Figure 3-1: 2021 Base Network Levels of Service Plot AM Peak

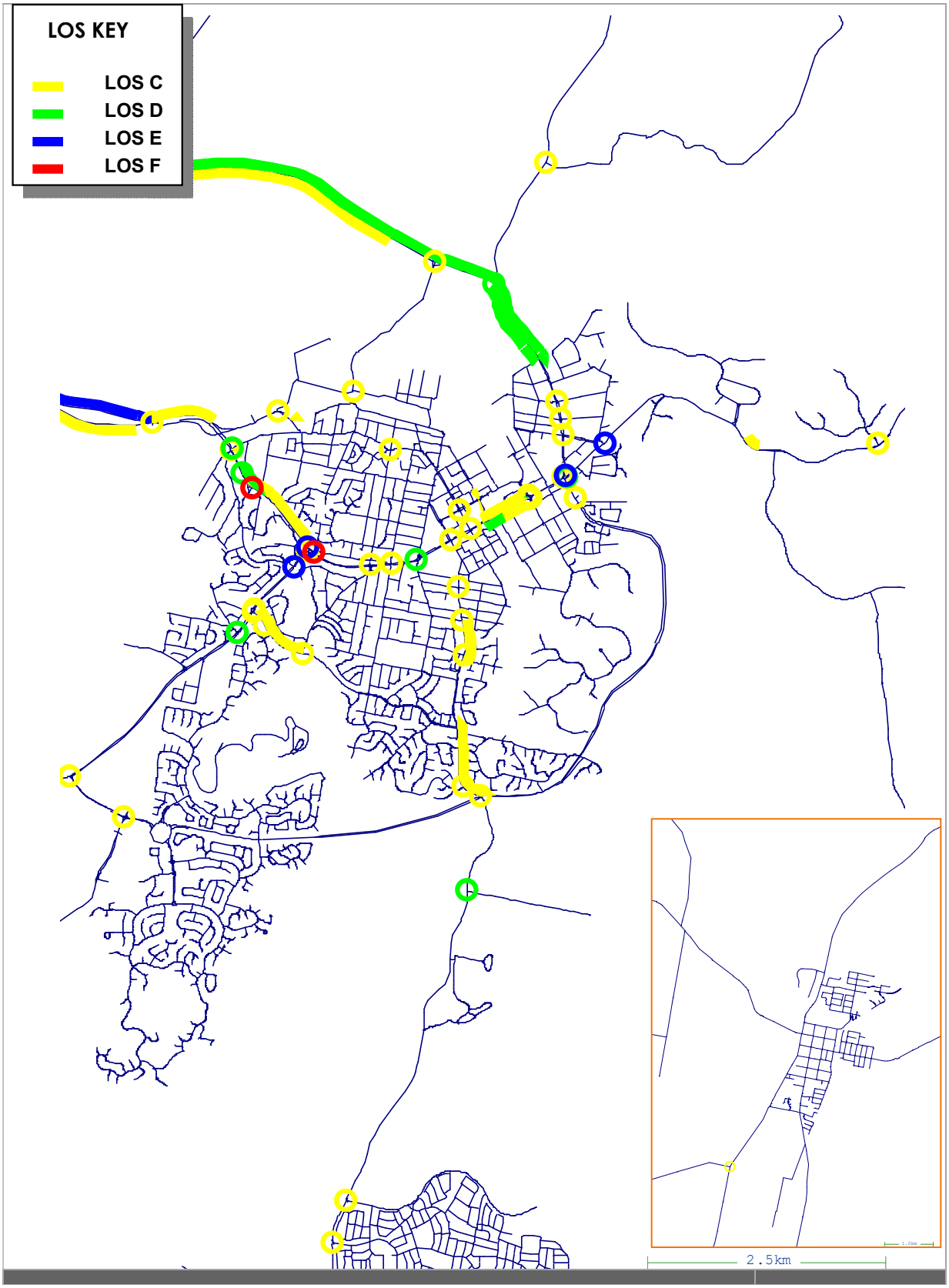


Figure 3-2: 2021 Base Network Levels of Service Plot PM Peak

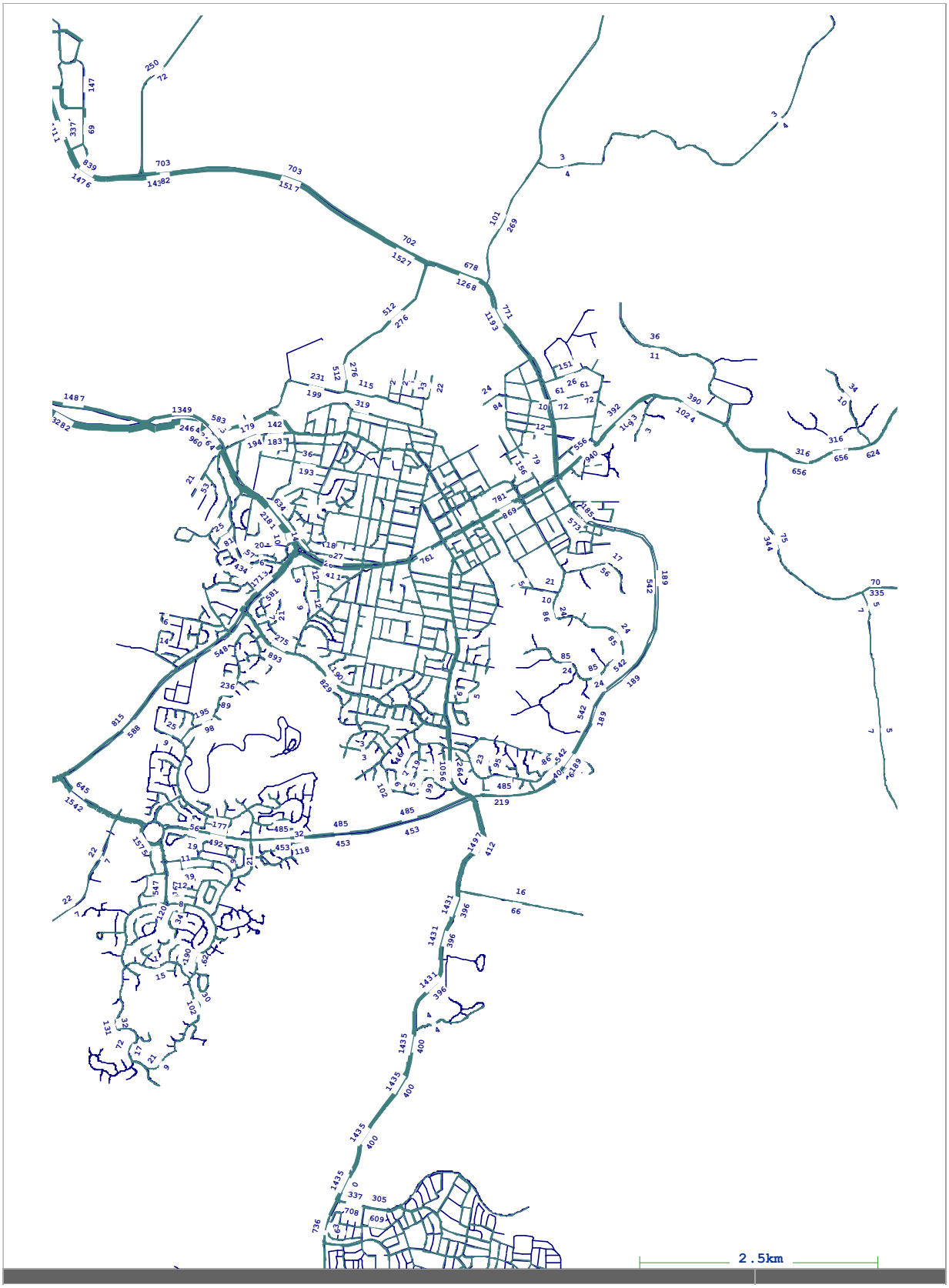


Figure 3-3: 2021 Base Network Traffic Volume Plot AM Peak

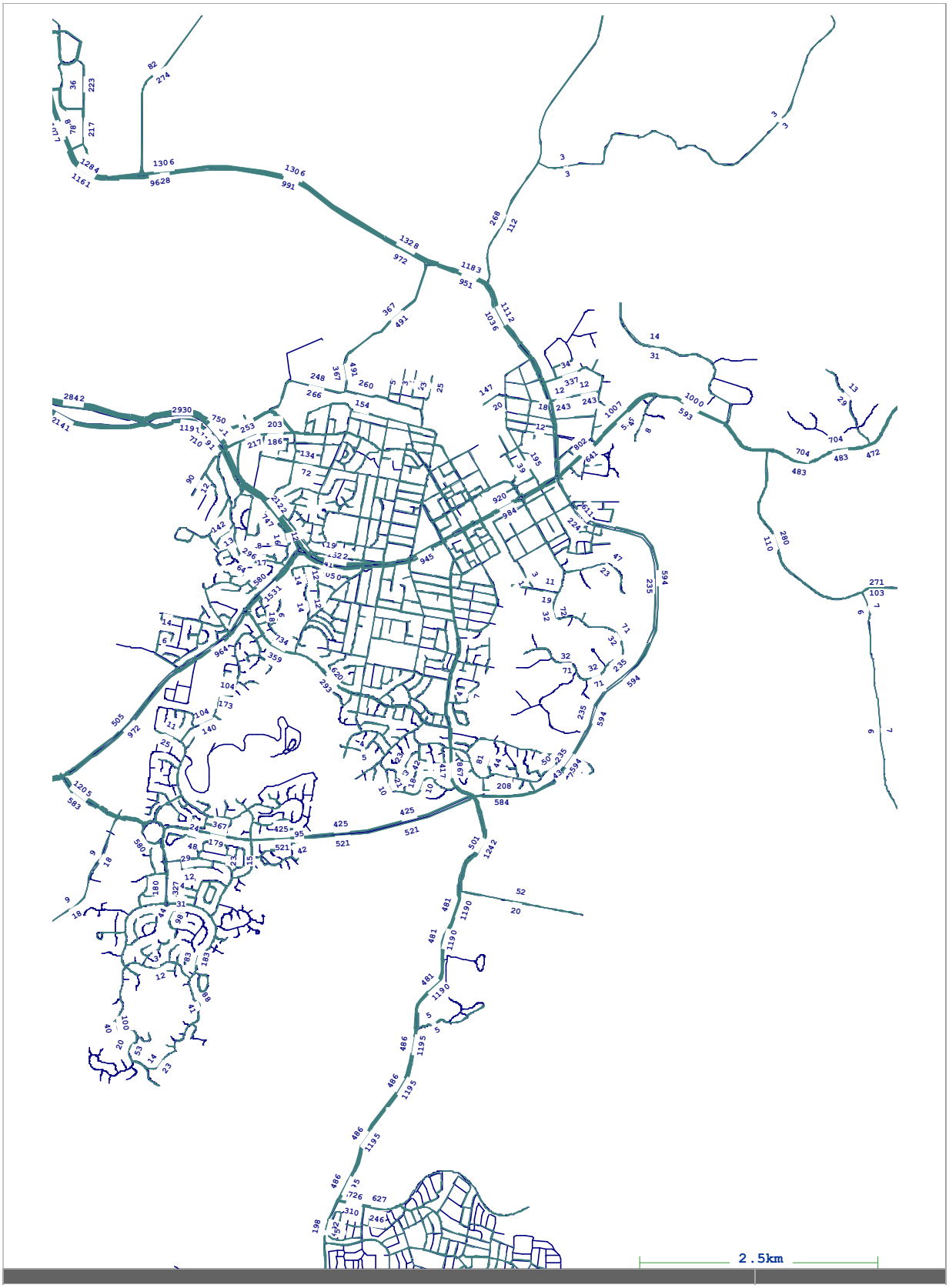


Figure 3-4: 2021 Base Network Traffic Volume Plot PM Peak

3.2 2024 Base Model

The 2024 base network was built from the 2021 network along with the improvements outlined in Section 2.3 of the "Queanbeyan-Palerang Regional Future Do-minimum Network Deficiency Analysis 2023" report as necessary to resolve deficiencies at or before 2021:

- None recommended as no intersection or link is expected to be LOS E or worse in both the AM and PM in 2021.

The 2024 land use was applied to this network and the following deficiencies in the QPRC area, shown in Table 3-2, were identified as arising if no further works are implemented before 2024:

Table 3-2: 2024 Base Model Deficiencies

Location	Period	LOS	Issue
Yass / Ellerton / Bungendore (Wst)	AM & PM	F	Int LOS F - (700v) on west approach
Lanyon / Southbar (Sth)	AM	E	Int LOS E - (750v) on south approach
Yass / Ellerton / Bungendore (Sth)	AM	E	Int LOS E - (600v) on south approach
Canberra / Cameron (Sth)	AM & PM	E	Int LOS E - south app turning right (35v)
Bungendore / Thurralilly (Nth)	PM	F	Int LOS F - (10v) on north app turning right
Canberra / Kealman (SW)	PM	F	Int LOS F - (10v) on SW app turning right
Lanyon / Gilmore (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / Canberra (NE)	PM	F	Int LOS F - (300v) on merge of north to east slip lane
Cooma Rd (Southbar to Ellerton)	AM	E	Link LOS E NB on this stretch
Southbar Rd (Lanyon to Nth Terrace)	AM	E	Link LOS E NB

There are SEVERAL locations within the base 2024 network that appear to require improvements as a result of reduced LOS in both the AM and PM periods:

- LOS E/F – Yass / Ellerton / Bungendore roundabout. The south and western approaches to the roundabout are expected to experience high delays in the AM and PM periods. Whilst these issues could be scheduled for improvement in 2024, the complexity of replacing this critical roundabout with traffic signals has been taken into consideration and delayed until after 2024 will allow sufficient time for design and construction. It is noted that Transport for New South Wales (TfNSW) have scheduled the construction of a signalised intersection at this location in the next two years.
- LOS F - the Wickerslack Ln approach to the Old Cooma Rd / Wickerslack Ln is expected to experience LOS F during the AM and PM periods. Due to the low volumes involved it has not been highlighted but this may become a greater issue if additional development occurs in the area or if Old Cooma Rd is 6-laned. This similarly occurs at the Old Cooma Rd / Heights Rd due to low volumes.
- LOS E – the right turns from the south approach at the Canberra Ave / Cameron Rd intersection is expected to experience LOS E conditions in the peak periods. Due to the low volumes involved it has not been highlighted.

No improvements are proposed for 2024.

LOS plots highlighting these deficiencies are shown in Figure 3-5 and Figure 3-6 below and AM and PM peak hour traffic volumes are plotted in Figure 3-7 and Figure 3-8.

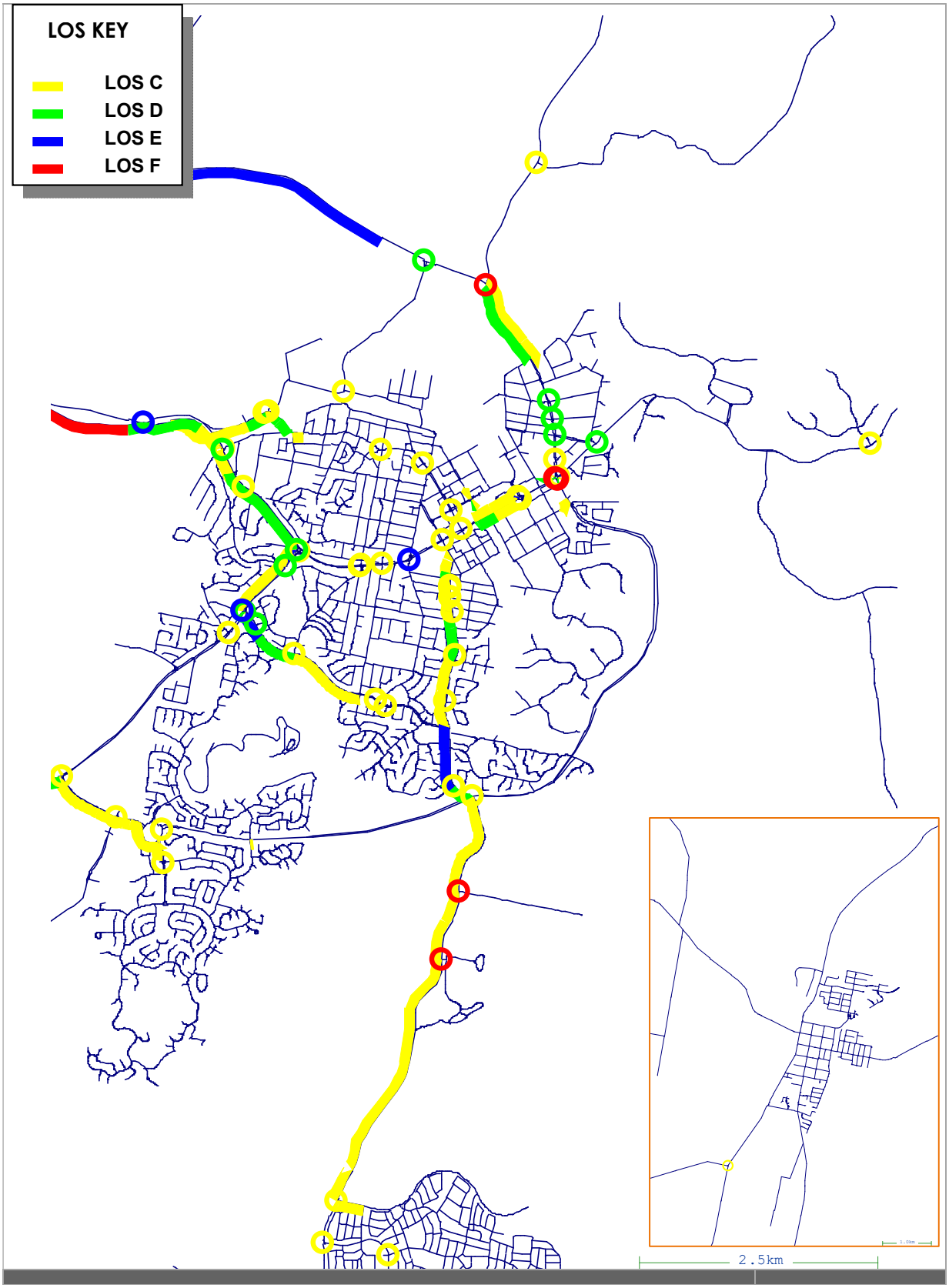


Figure 3-5: 2024 Base Network Levels of Service Plot AM Peak

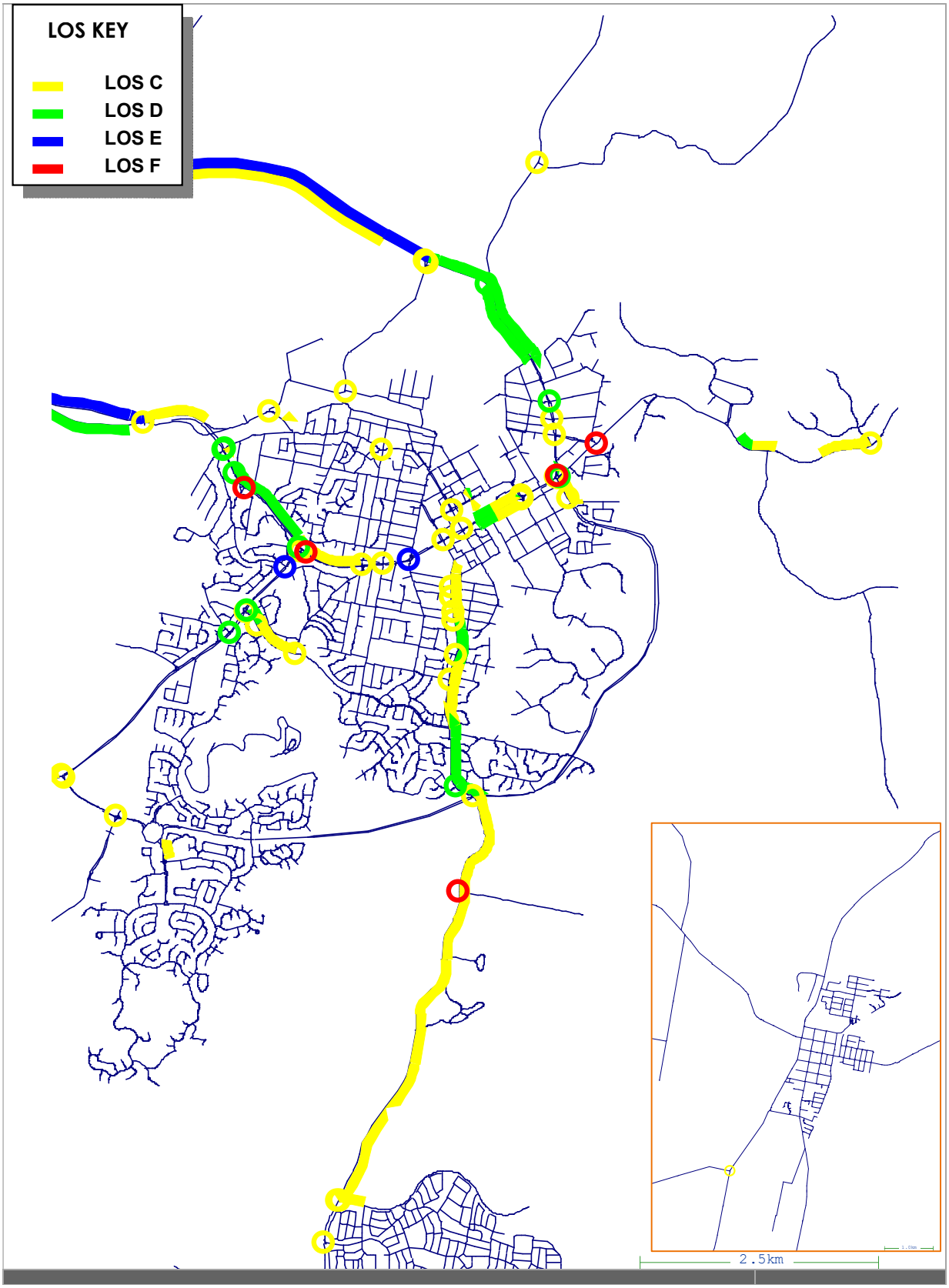


Figure 3-6: 2024 Base Network Levels of Service Plot PM Peak

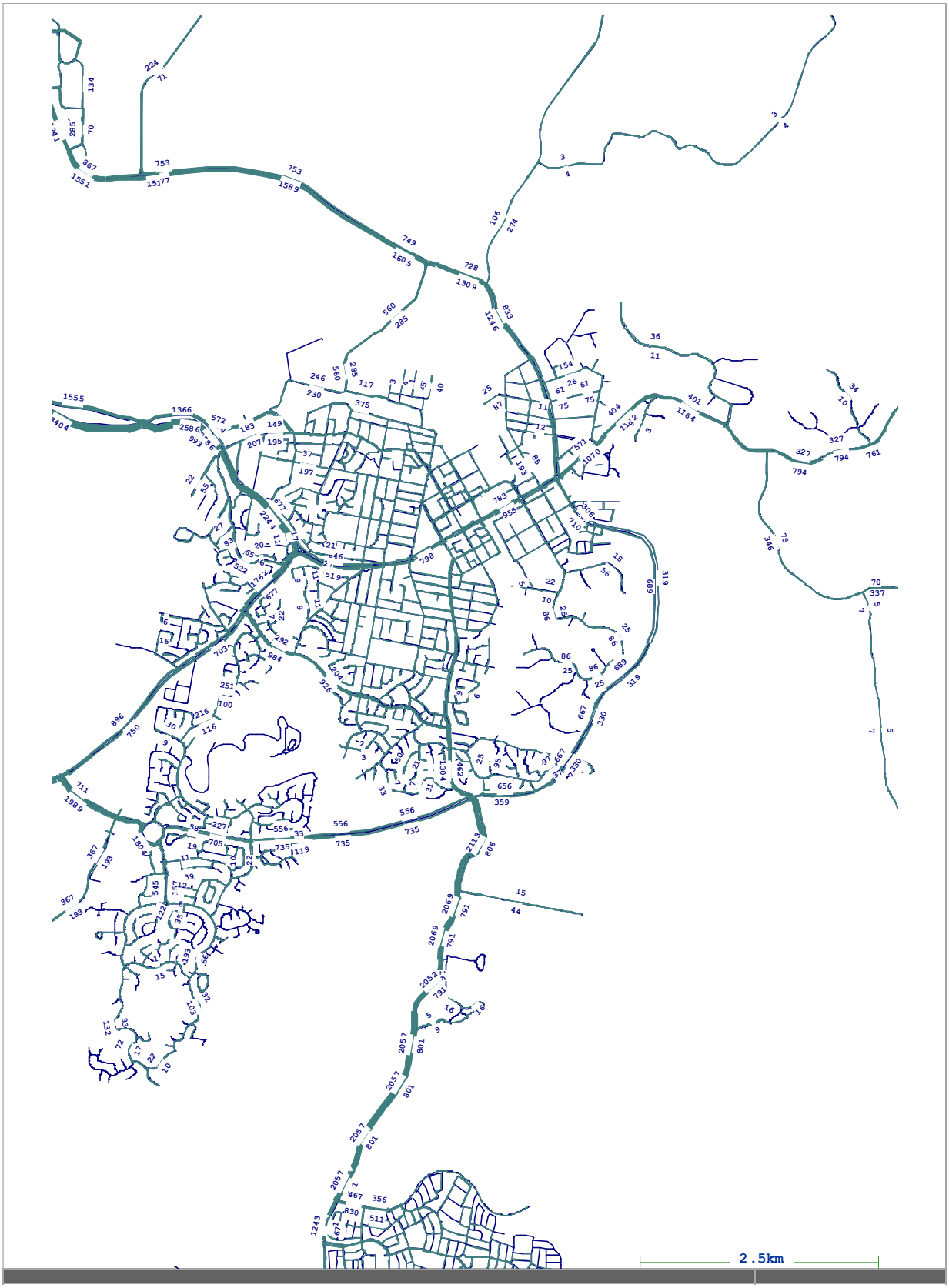


Figure 3-7: 2024 Base Network Traffic Volume Plot AM Peak

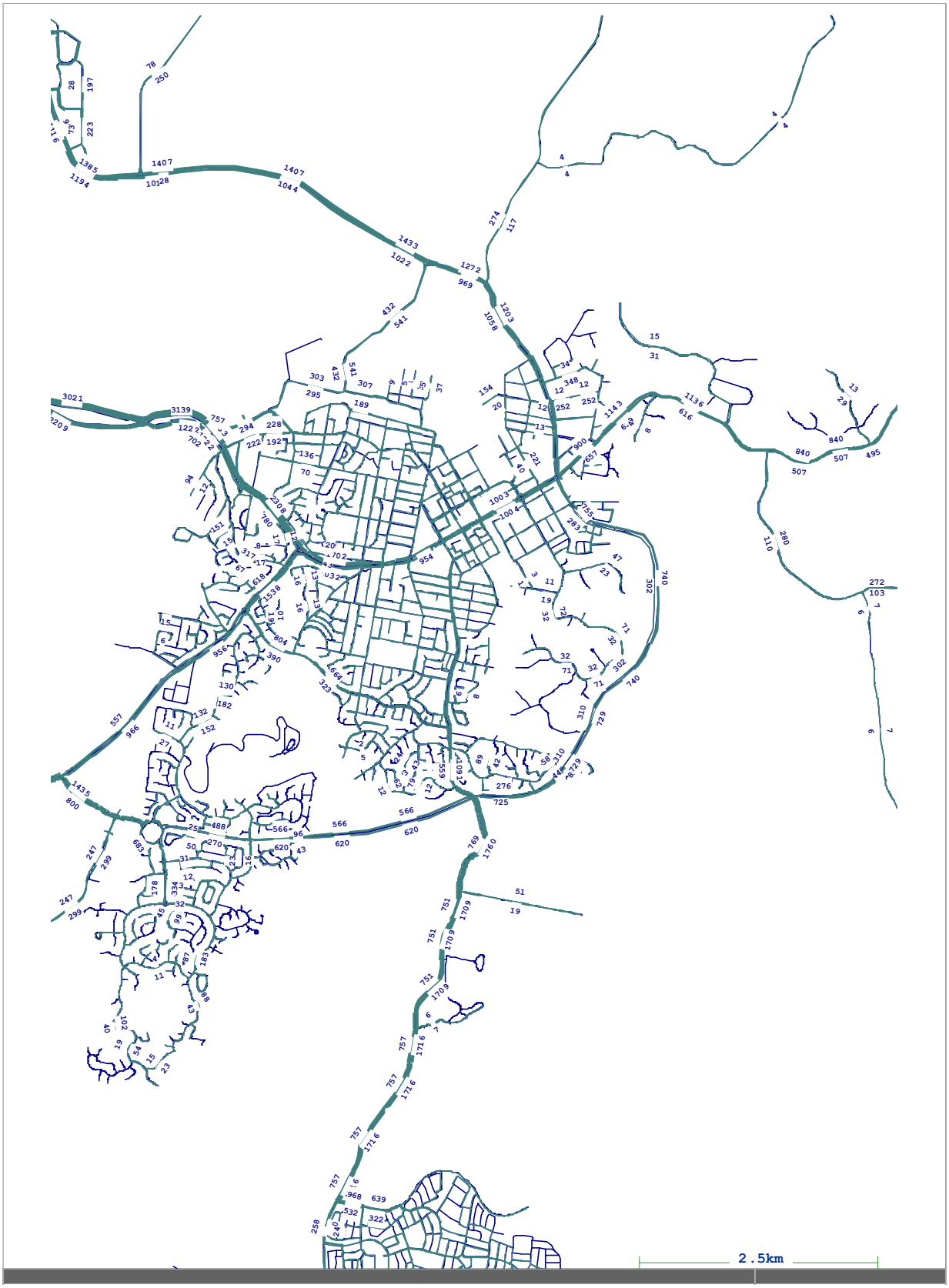


Figure 3-8: 2024 Base Network Traffic Volume Plot PM Peak

3.3 2027 Base Model

The 2027 base network was built from the 2024 network along with the improvements outlined in Section 2.3 of the "Queanbeyan-Palerang Regional Future Do-minimum Network Deficiency Analysis 2023" report as necessary to resolve deficiencies at or before 2024. The 2027 land use was applied to this network and the following deficiencies in the Queanbeyan area, shown in Table 3-3, were identified as arising if no further works are implemented before 2027:

Table 3-3: 2027 Base Model Deficiencies

Location	Period	LOS	Issue
Yass / Ellerton / Bungendore (Sth)	AM	F	Int LOS F - (700v) on south approach
Yass / Ellerton / Bungendore (Wst)	AM & PM	F	Int LOS F - (700v) on west approach
Jerrabomberra Circle	AM	E	Int LOS E on east app (Edwin Land Pkwy)
Lanyon / Southbar (Sth)	AM & PM	F-E	Int LOS F - (750v) on south approach
Canberra / Cameron (Sth)	AM & PM	E	Int LOS E - south app turning right (35v)
Bungendore / Thurralilly (Nth)	PM	F	Int LOS F - (10v) on north app turning right
Canberra / Kealman (SW)	PM	F	Int LOS F - (10v) on SW app turning right
Lanyon / Gilmore (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / McCrae (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / Canberra (Nth)	PM	E	Int LOS E - (900v) on north app
Lanyon / Canberra (NE)	PM	F	Int LOS F - (300v) on merge of north to east slip lane
Southbar Rd (Lanyon to Nth Terrace)	AM	E	Link LOS E NB
Cooma Rd (Southbar to Ellerton)	AM & PM	E	Link LOS E NB and SB

LOS plots highlighting these deficiencies are shown in Figure 3-9 and Figure 3-10 below and AM and PM peak hour traffic volumes are plotted in Figure 3-11 and Figure 3-12.

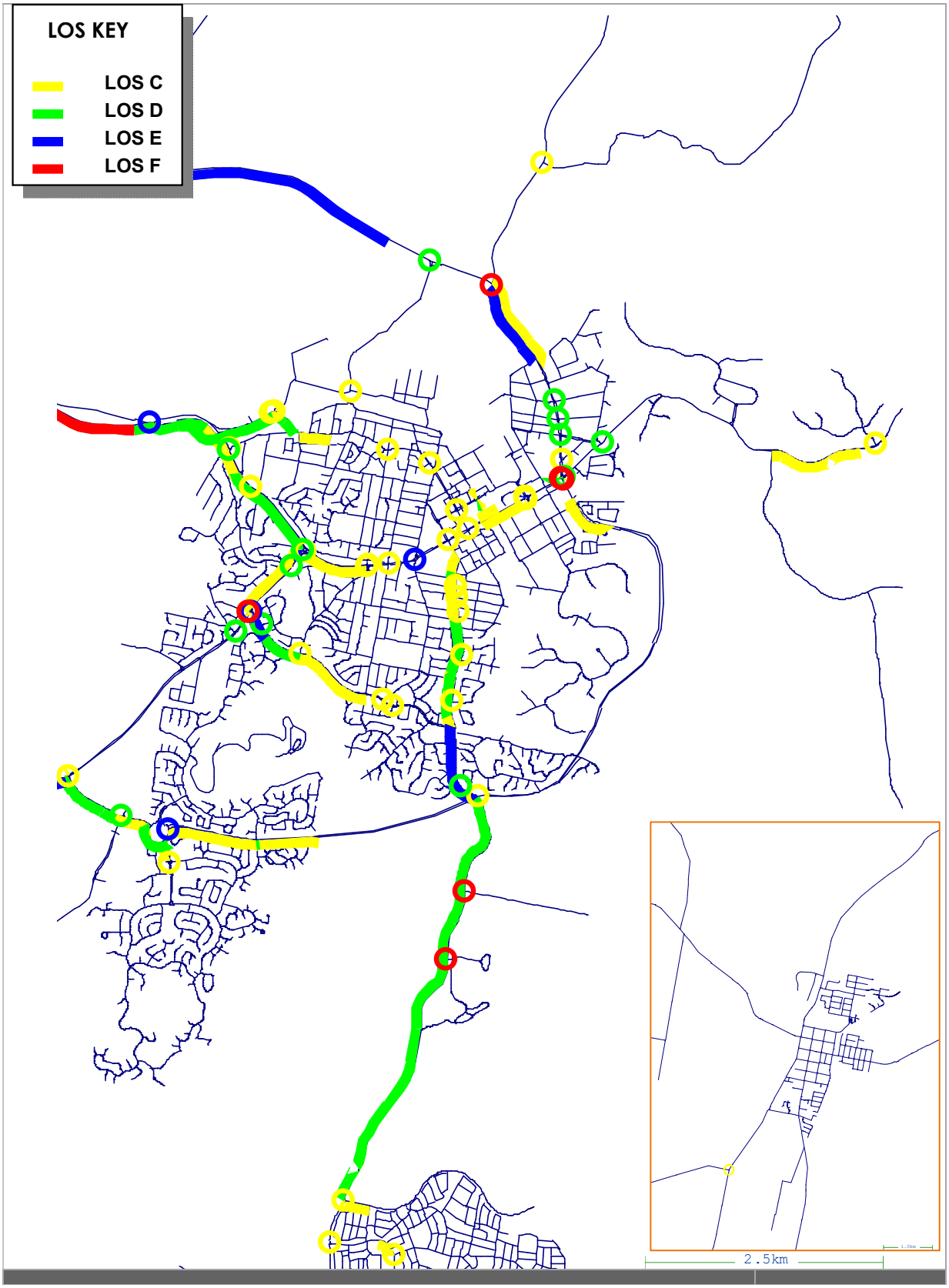


Figure 3-9: 2027 Base Network Levels of Service Plot AM Peak

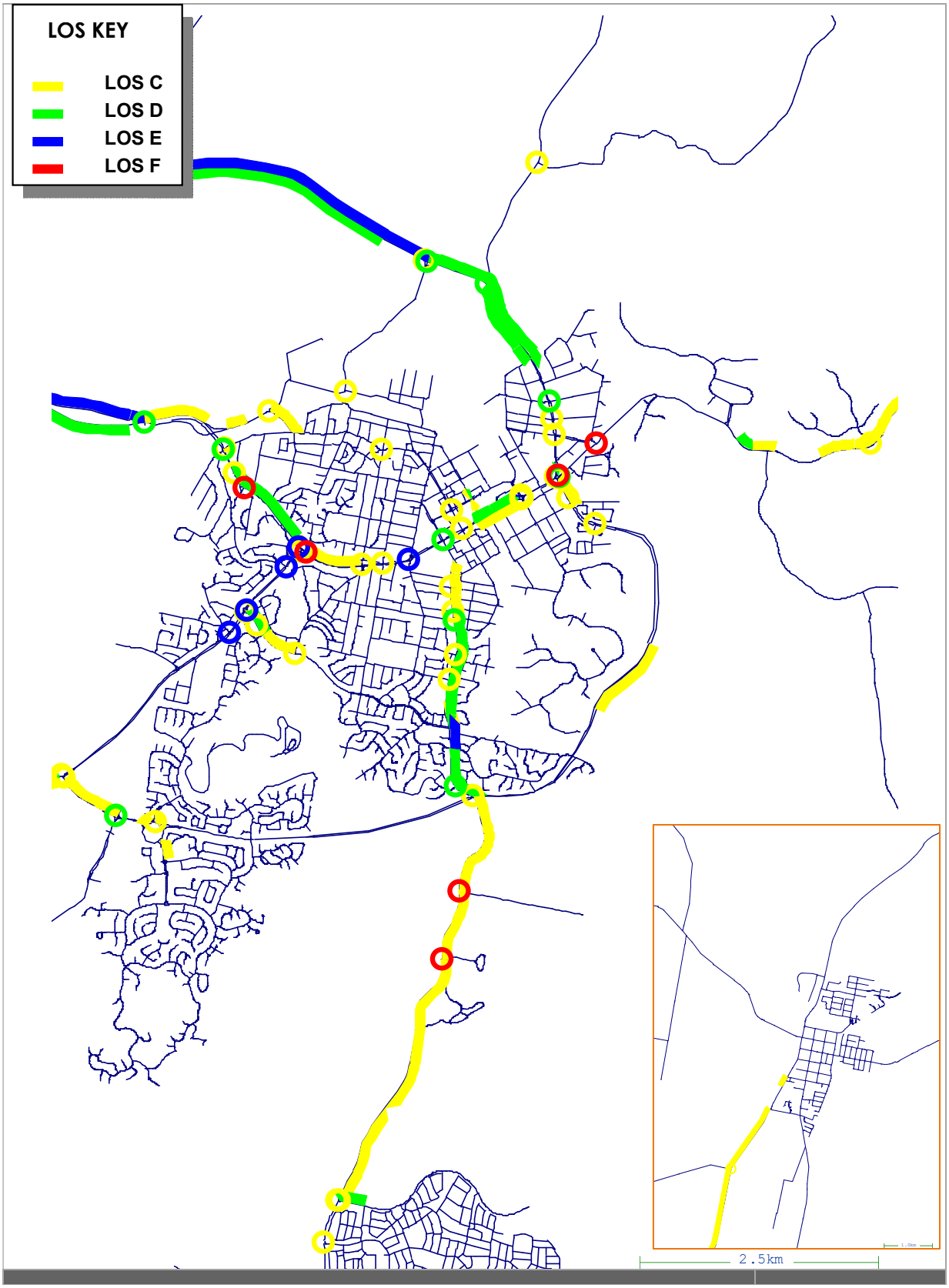


Figure 3-10: 2027 Base Network Levels of Service Plot PM Peak

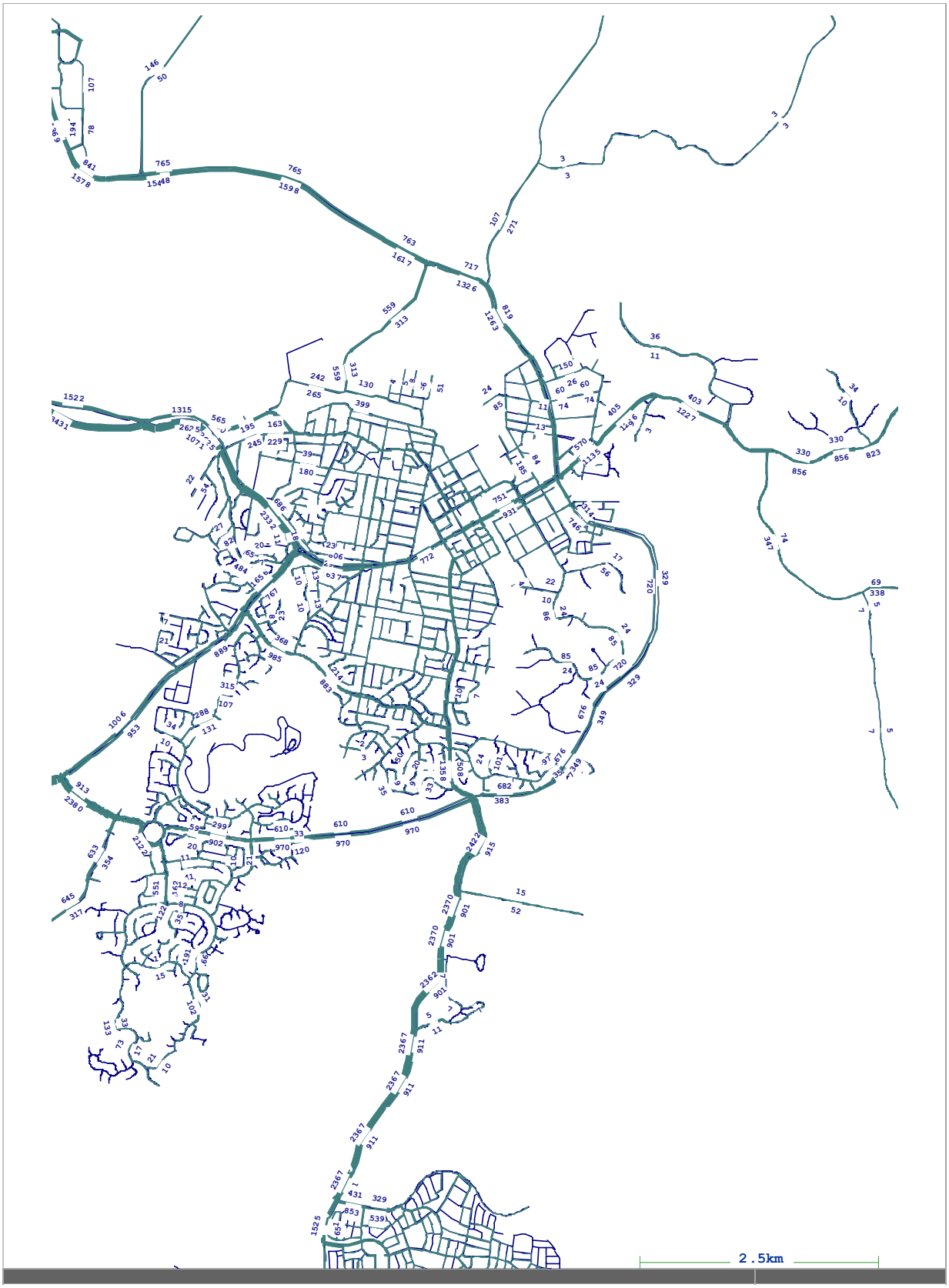


Figure 3-11: 2027 Base Network Traffic Volume Plot AM Peak

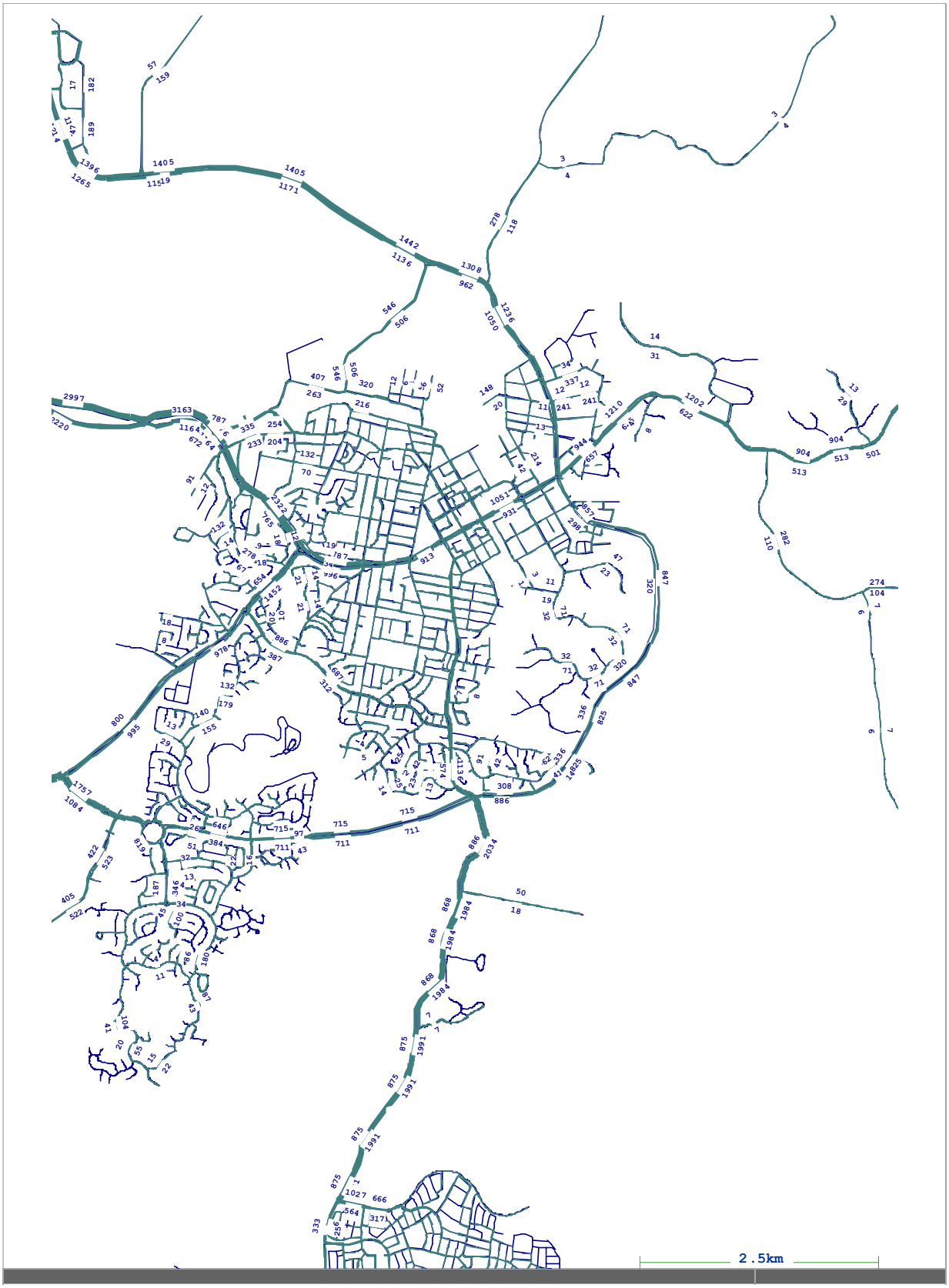


Figure 3-12: 2027 Base Network Traffic Volume Plot PM Peak

3.4 2027 Model with Improvements

The following improvements are proposed for 2027:

- Add traffic signals at the following intersections:
  - Yass / Ellerton / Bungendore
- Add lanes to the following roads:
  - 4 lane Cooma Road: Ellerton Drive to Southbar Road

No major intersection improvement is suggested at this time for the Lanyon Dr / Southbar Rd roundabout as the LOS E conditions apply to movements that may be improved by converting the circulation of the roundabout from 1 lane in places to a full 2 lanes circulation. It is clear however that designs for replacing the roundabout with traffic signals need to start in anticipation of construction in 2031. In addition, the right turns from the south approach at the Canberra Ave / Cameron Rd intersection is expected to experience LOS E conditions in the peak periods. Due to the low volumes involved it has not been highlighted for improvement at this time.

The north approach right turn at the Kings Hwy / Thurralilly Rd intersection is expected to experience LOS F conditions in both peaks. The volumes experiencing this high delay is low and the operation of the new traffic signals at the Yass/Ellerton/Bungendore intersection is expected to produce sufficient gaps in the Kings Hwy traffic stream to allow vehicles to exit.

Implementing these improvements result in a 2027 improved network that still has the following individual LOS E or worse deficiencies, shown in Table 3-4:

Table 3-4: 2027 Model with Improvements Deficiencies

Location	Period	LOS	Issue
Lanyon / Southbar (Sth)	AM & PM	E	Int LOS E - (750v) on south approach
Yass / Ellerton / Bungendore (Wst)	AM	E	Int LOS E - (700v) on west approach
Bungendore / Thurralilly (Nth)	AM & PM	F	Int LOS F - (50v) on north app turning right
Canberra / Kealman (SW)	PM	F	Int LOS F - (10v) on SW app turning right
Canberra / Cameron (Sth)	AM & PM	E	Int LOS E - south app turning right (35v)
Lanyon / McCrae (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / Gilmore (Wst)	PM	E	Int LOS F - (100v) on west app turning right
Lanyon / Canberra (Nth)	PM	E	Int LOS E - (900v) on north app
Lanyon / Canberra (NE)	PM	F	Int LOS F - (300v) on merge of north to east slip lane
Jerrabombera Circle (Est)	AM	E	Int LOS E on east app (Edwin Land Pkwy)
Yass / Silva	AM	E	Int LOS E - (140v) on east app turning right
Southbar Rd (Lanyon to Nth Terrace)	AM	E	Link LOS E NB – (1370v) east approach

Figure 3-13 and Figure 3-14 below show Levels of Service of the 2027 network with the above improvement and AM and PM peak hour traffic volumes are plotted in Figure 3-15 and Figure 3-16.

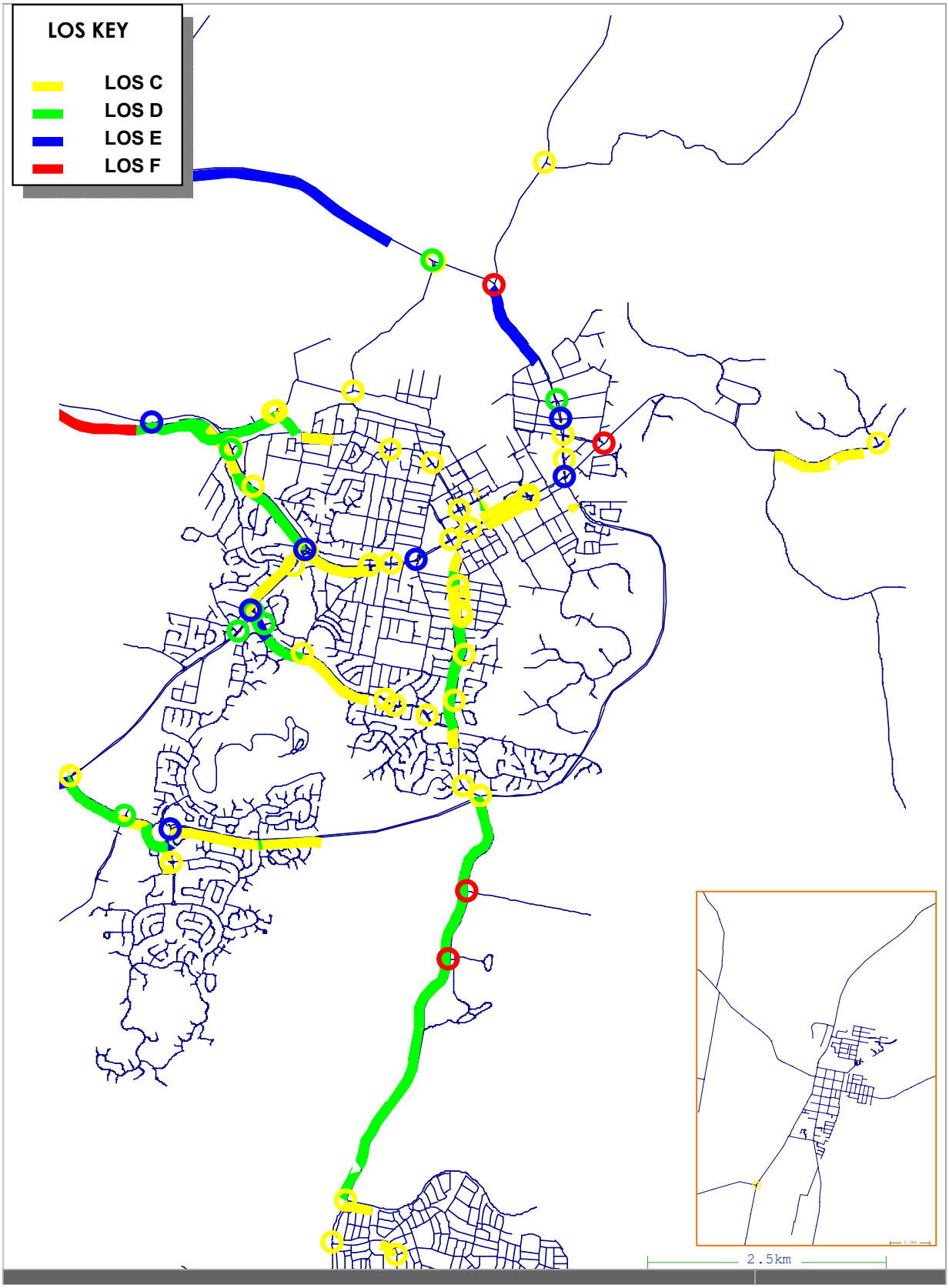


Figure 3-13: 2027 Network with Improvements Levels of Service Plot AM Peak

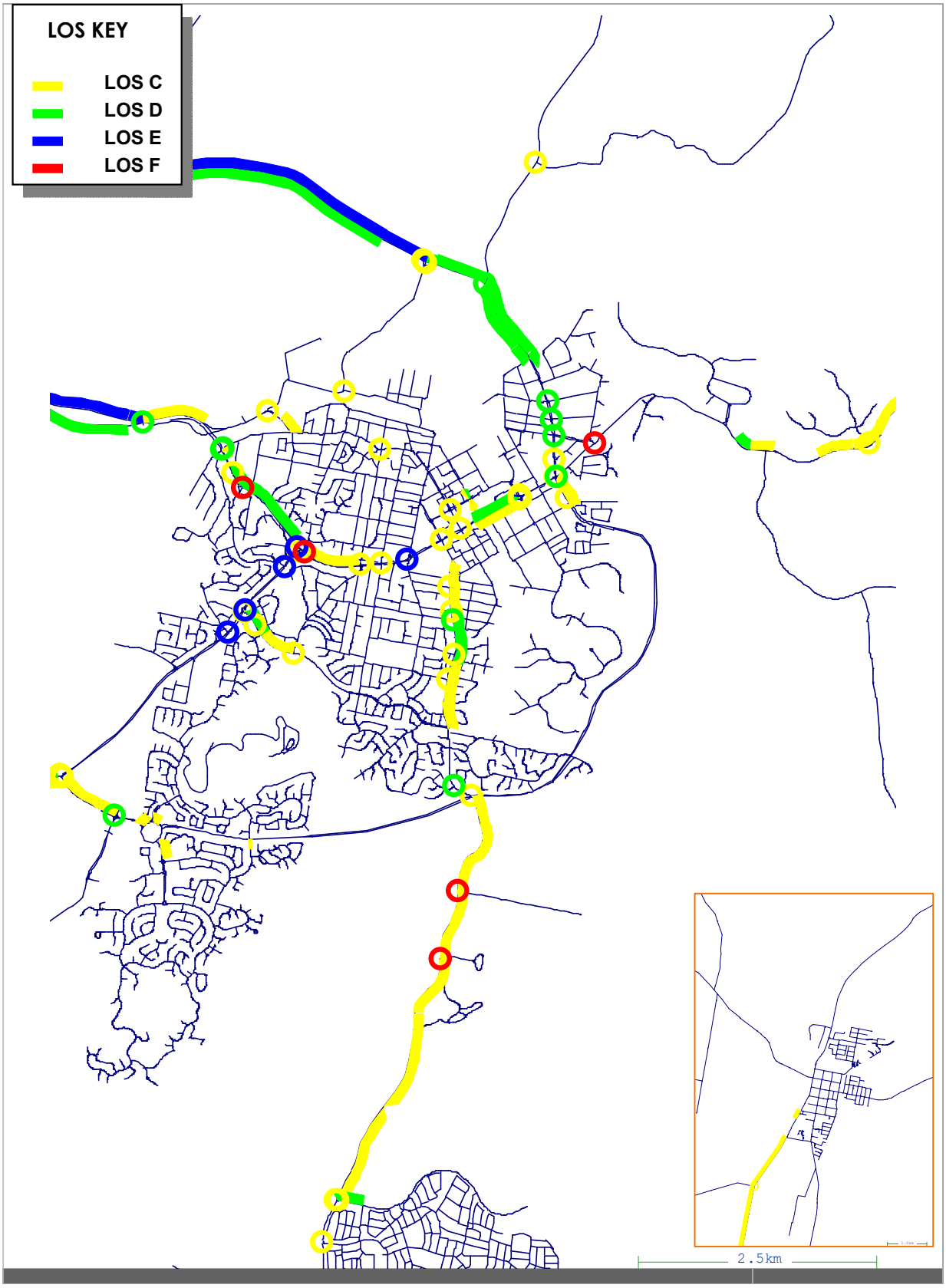


Figure 3-14: 2027 Network with Improvements Levels of Service Plot PM Peak

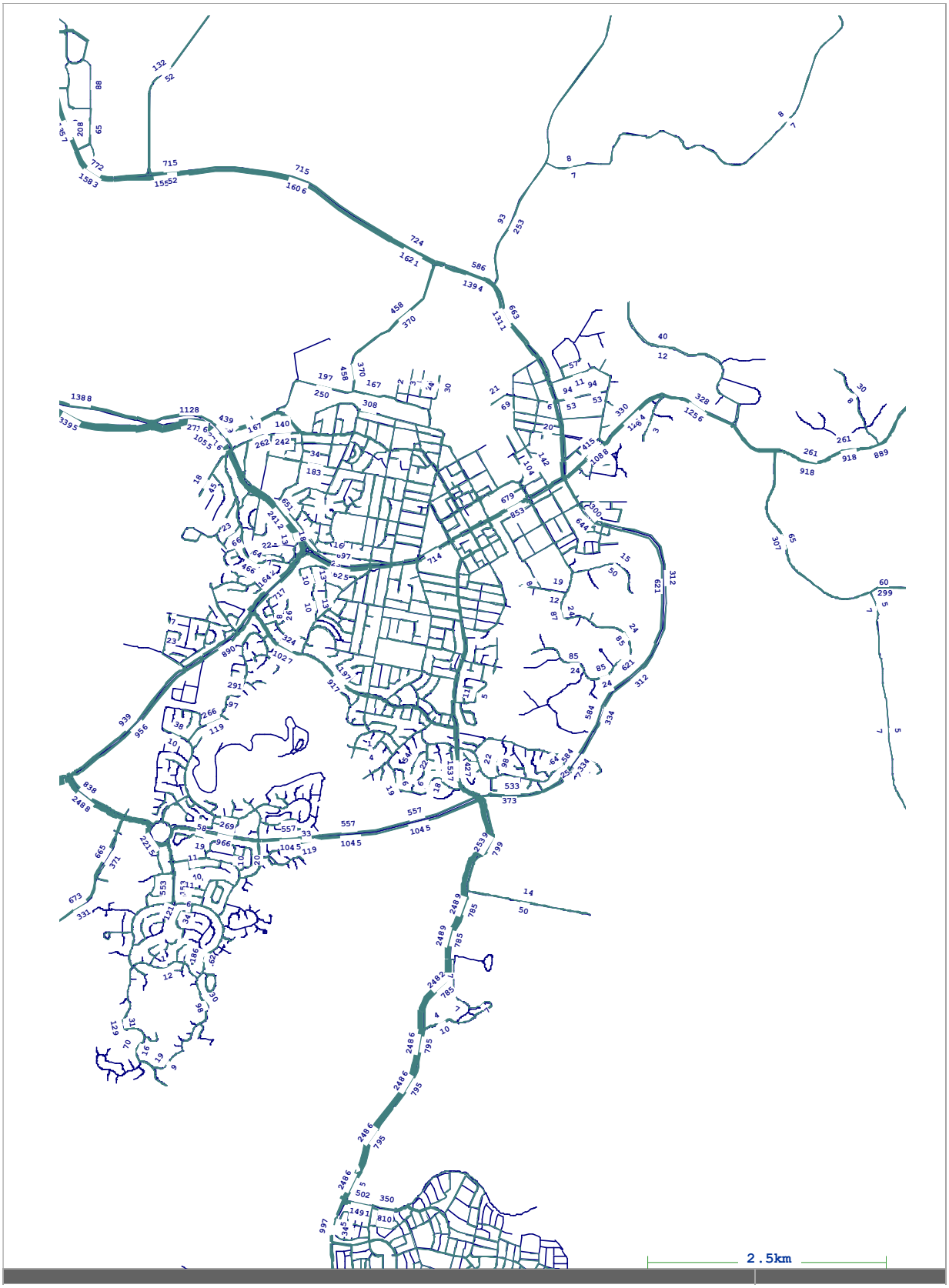


Figure 3-15: 2027 Network with Improvements Traffic Volume Plot AM Peak

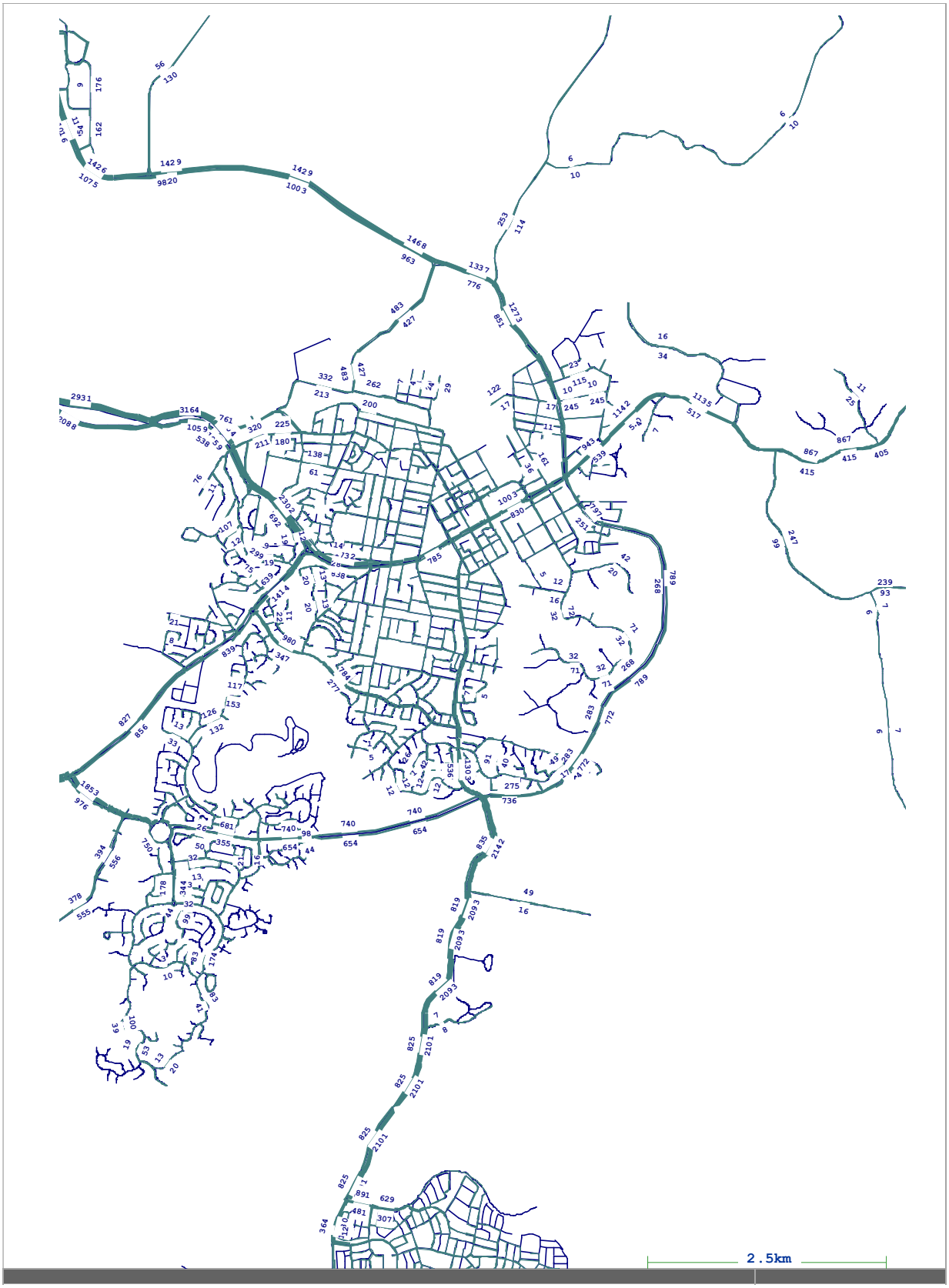


Figure 3-16: 2027 Network with Improvements Traffic Volume Plot PM Peak

3.5 2031 Base Model

The 2031 base network was built from the 2027 network along with the improvements outlined in Section 2.3 in the "Queanbeyan-Palerang Regional Future Do-minimum Network Deficiency Analysis 2023" report as necessary to resolve deficiencies at or before 2027. The 2031 land use was applied to this network and the following deficiencies in the Queanbeyan area, shown in Table 3-5, were identified as arising if no further works are implemented before 2031:

Table 3-5: 2031 Base Model Deficiencies

Location	Period	LOS	Issue
Lanyon / Southbar (Sth)	AM & PM	F-E	Int LOS F at various approaches
Yass / Ellerton / Bungendore (Nth)	AM & PM	E	Int LOS E
Bungendore / Thurralilly (Nth)	PM	F	Int LOS F - (10v) on north app turning right
Canberra / Kealman (SW)	PM	F	Int LOS F - (10v) on SW app turning right
Canberra / Cameron (Sth)	AM & PM	F-E	Int LOS F - south app turning right (35v)
Canberra / Gilmore (Sth)	AM	E	Int LOS E
Lanyon / McCrae (Wst)	PM	E	Int LOS E - (110v) on west app turning right
Lanyon / Gilmore (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / Canberra (NE)	AM & PM	E-F	Int LOS F - (300v) on merge of north to east slip lane
Yass / Silva	AM	E	Int LOS E - (150v) on east app turning right
Jerrabombera Circle (Est)	AM	E	Int LOS E on east app (Edwin Land Pkwy)
Tompsitt / Environa	AM & PM	E	Int LOS E
Southbar Rd (Lanyon to Nth Terrace)	AM & PM	E	Link LOS E NB and SB (1490v) on east approach
Cooma Rd (Southbar to Thorpe)	AM	E	Link LOS E NB (1300v)

LOS plots highlighting these deficiencies are shown in Figure 3-17 and Figure 3-18 below and AM and PM peak hour traffic volumes are plotted in Figure 3-19 and Figure 3-20.

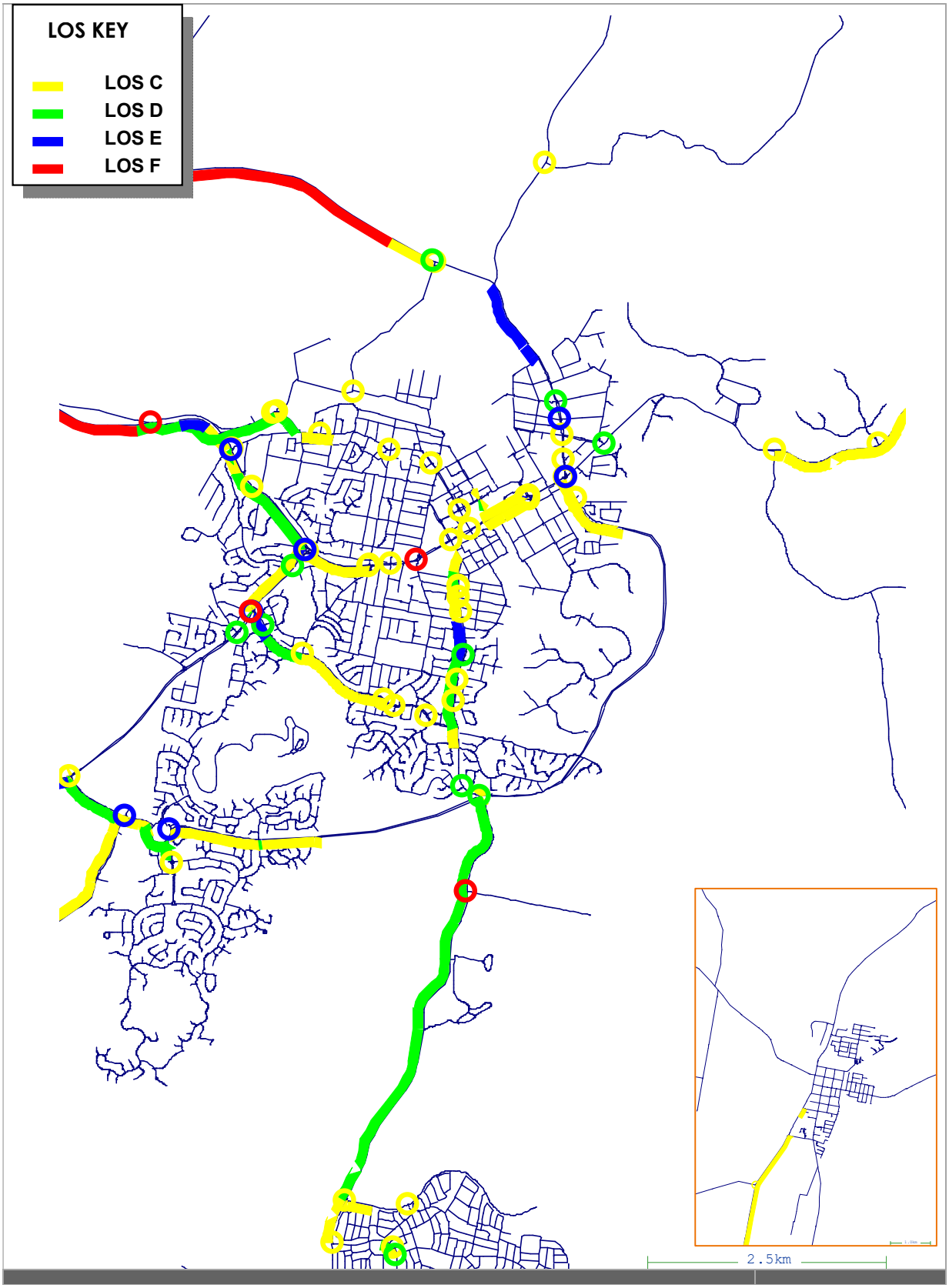


Figure 3-17: 2031 Base Network Levels of Service Plot AM Peak

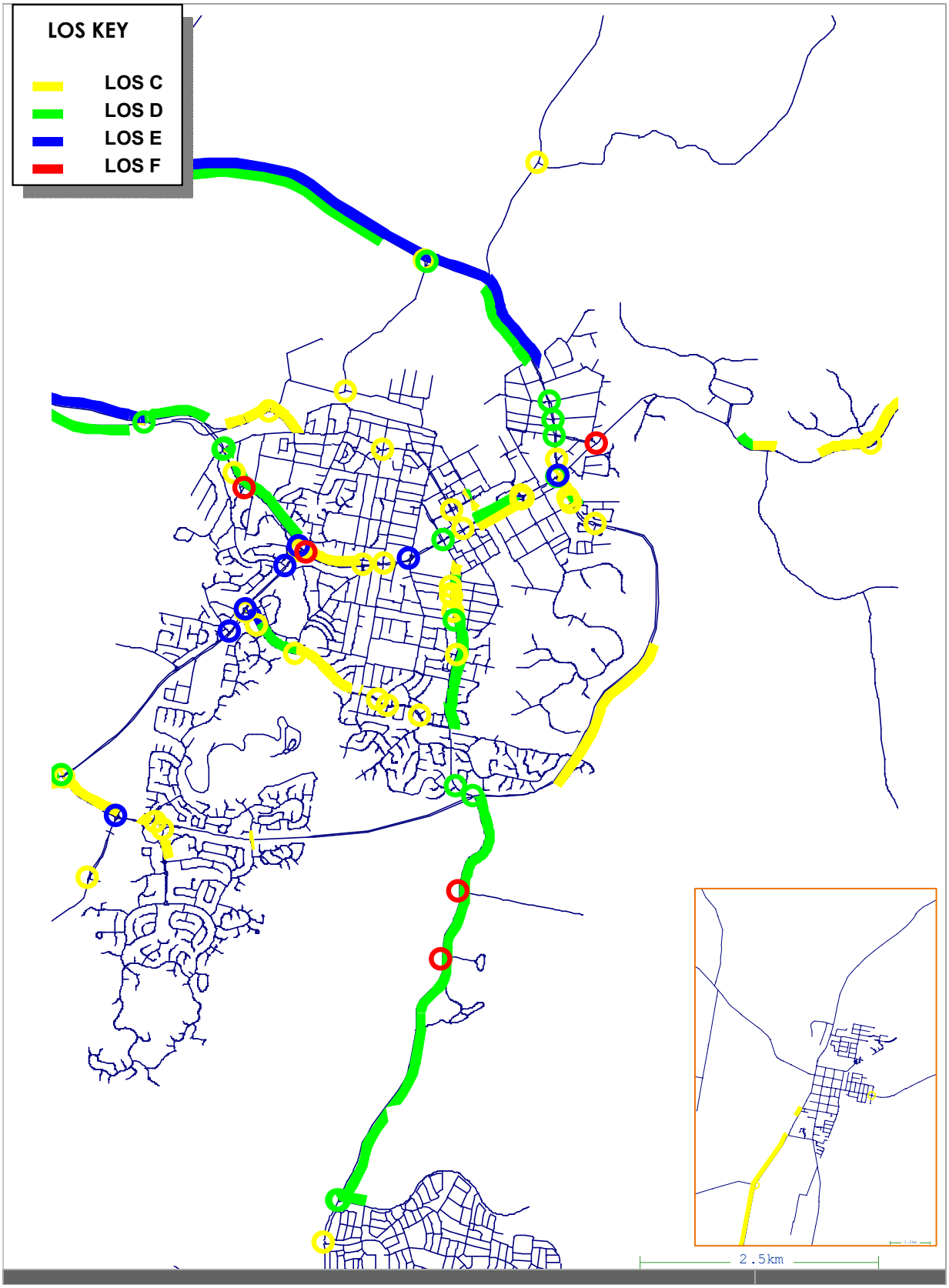


Figure 3-18: 2031 Base Network Levels of Service Plot PM Peak

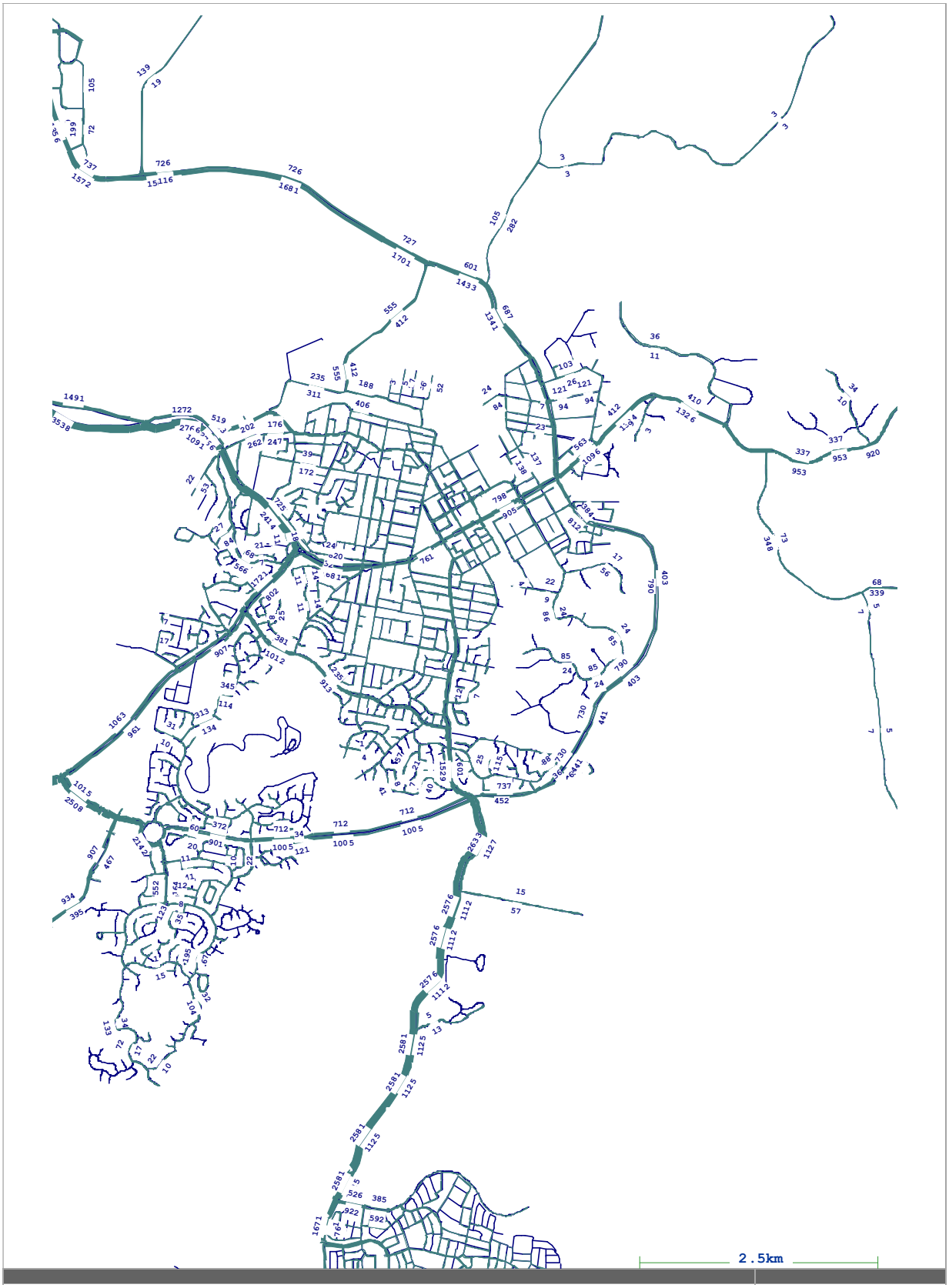


Figure 3-19: 2031 Base Network Traffic Volume Plot AM Peak

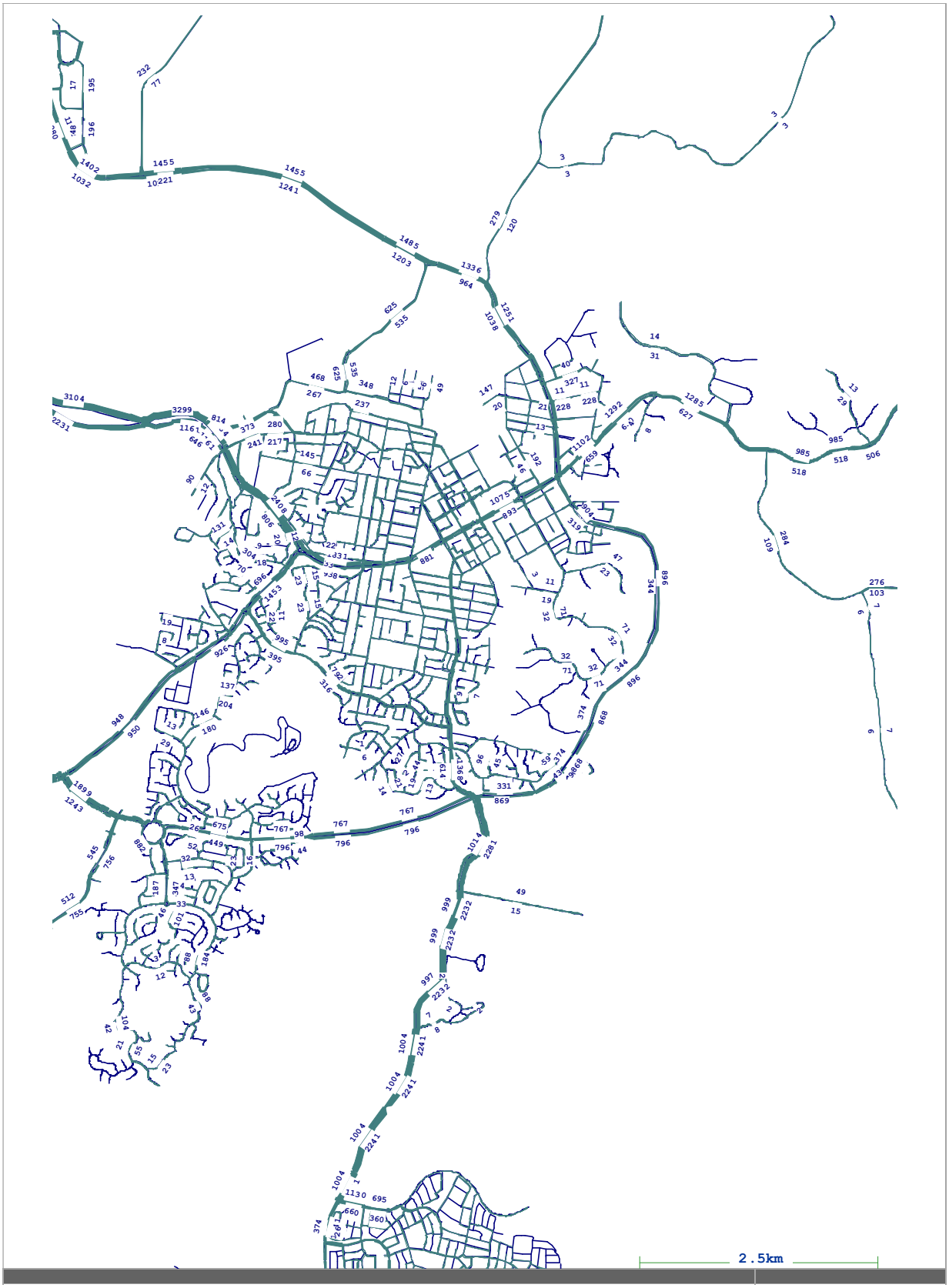


Figure 3-20: 2031 Base Network Traffic Volume Plot PM Peak

3.6 2031 Model with Improvements

The following improvements are proposed for 2031:

- Add traffic signals at the following intersections:
  - Canberra / Cameron / Campbell
  - Lanyon / Southbar
- Add lanes to the following roads:
  - 4 lane Southbar Road: Lanyon Dr to North Terrace Road

The Tompsitt Dr / Environa Dr traffic signals have also not been included in the improvement list as the South Jerrabomberra development is expected to implement an additional access onto roads leading to the proposed ACT interchange upgrade to the Monaro / Isabella intersection.

Implementing these improvements result in a 2031 improved network that still has the following individual LOS E or worse deficiencies, shown in Table 3-6:

Table 3-6: 2031 Model with Improvements Deficiencies

Location	Period	LOS	Issue
Yass / Ellerton / Bungendore (Nth)	AM & PM	E	Int LOS E
Bungendore / Thurralilly (Nth)	PM	F	Int LOS F - (10v) on north app turning right
Canberra / Kealman (SW)	PM	F	Int LOS F - (10v) on SW app turning right
Lanyon / McCrae (Wst)	PM	E	Int LOS E - (110v) on west app turning right
Lanyon / Gilmore (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / Canberra (Nth)	PM	F	Int LOS F - (1000v) on north app
Lanyon / Canberra (NE)	PM	F	Int LOS F - (400v) on merge of north to east slip lane
Yass / Silva / Waterloo	AM	E	Int LOS E - (140v) on east app turning right
Jerrabombera Circle (Est)	AM	E	Int LOS E on east app (Edwin Land Pkwy)
Cooma Rd (Southbar to Thorpe)	AM	E	Link LOS E NB (1300v)
Norse Rd (Railway to Uriarra)	AM	E	Link LOS E WB (1250v)

Figure 3-21 and Figure 3-22 below show Levels of Service of the 2031 network with the above improvement and AM and PM peak hour traffic volumes are plotted in Figure 3-23 and Figure 3-24.

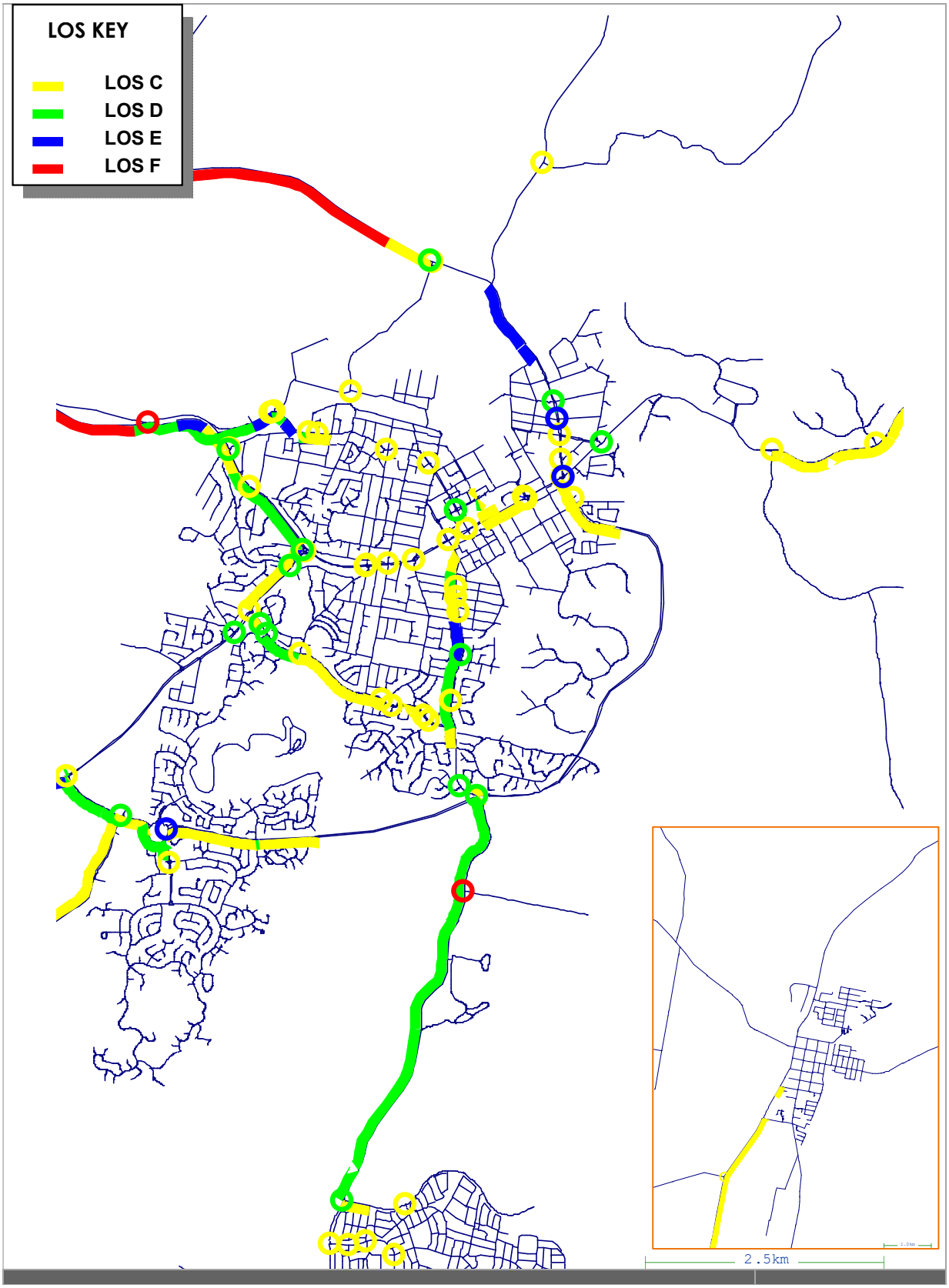


Figure 3-21: 2031 Network with Improvements Levels of Service Plot AM Peak

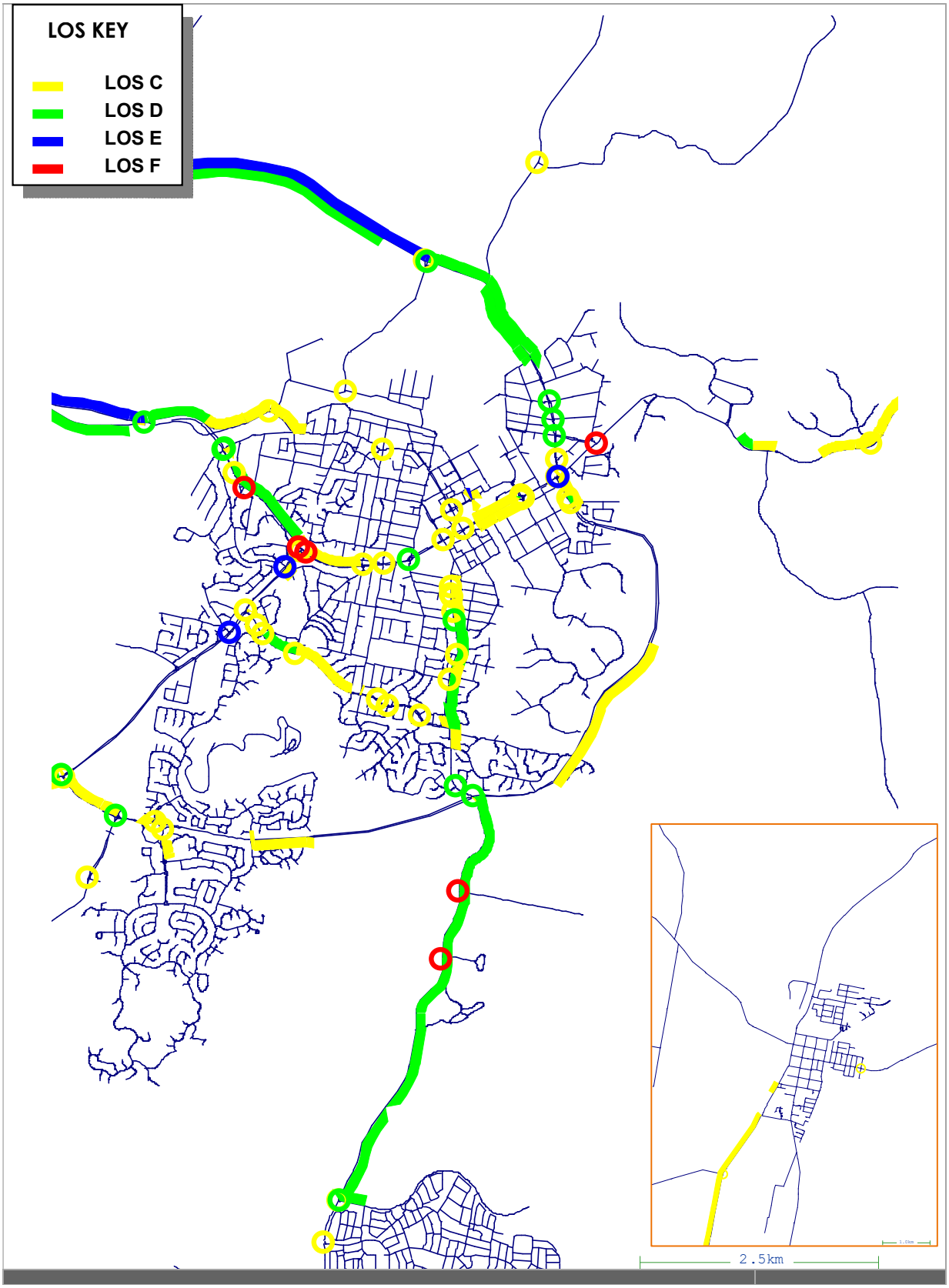


Figure 3-22: 2031 Network with Improvements Levels of Service Plot PM Peak

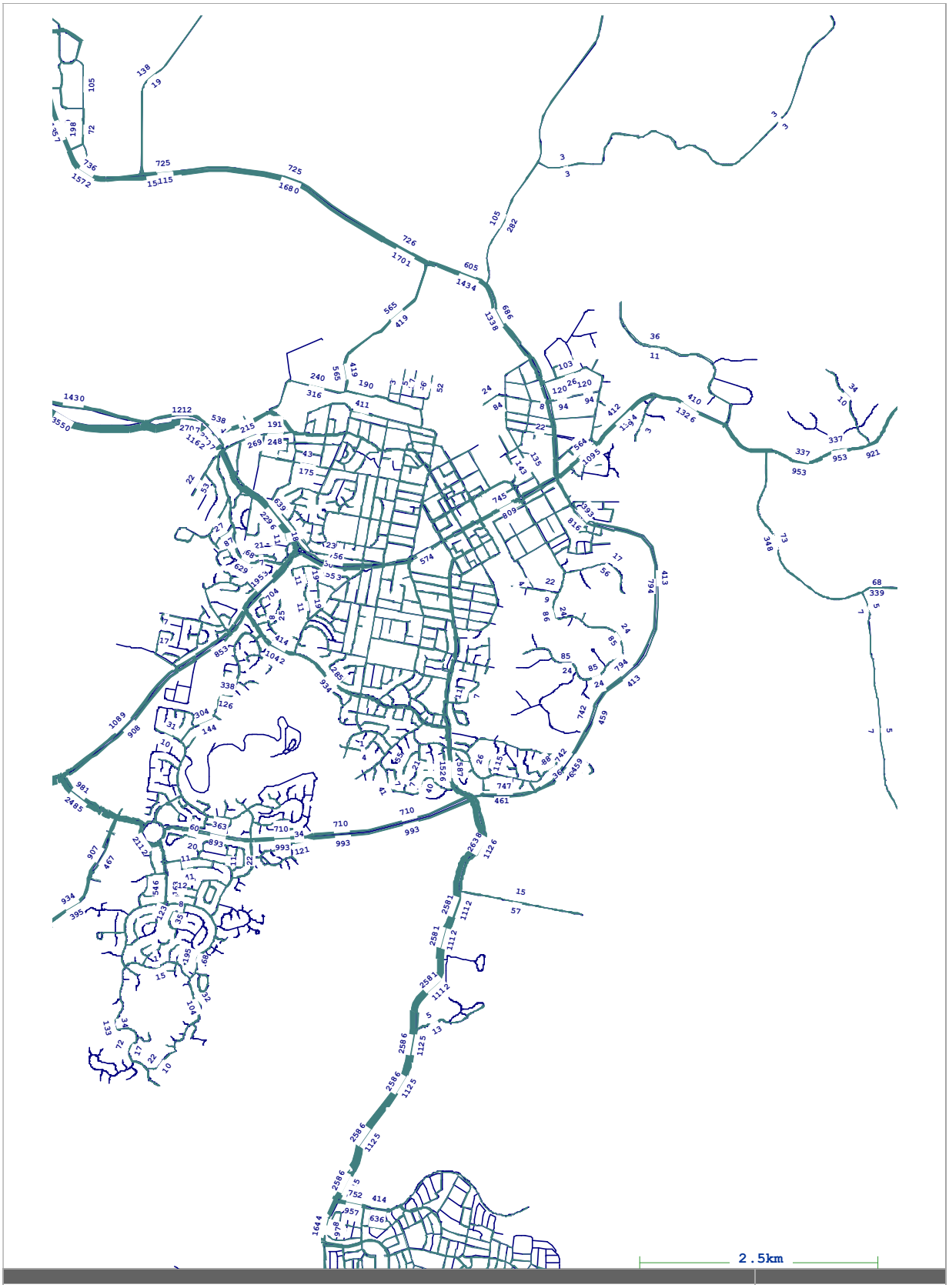


Figure 3-23: 2031 Network with Improvements Traffic Volume Plot AM Peak

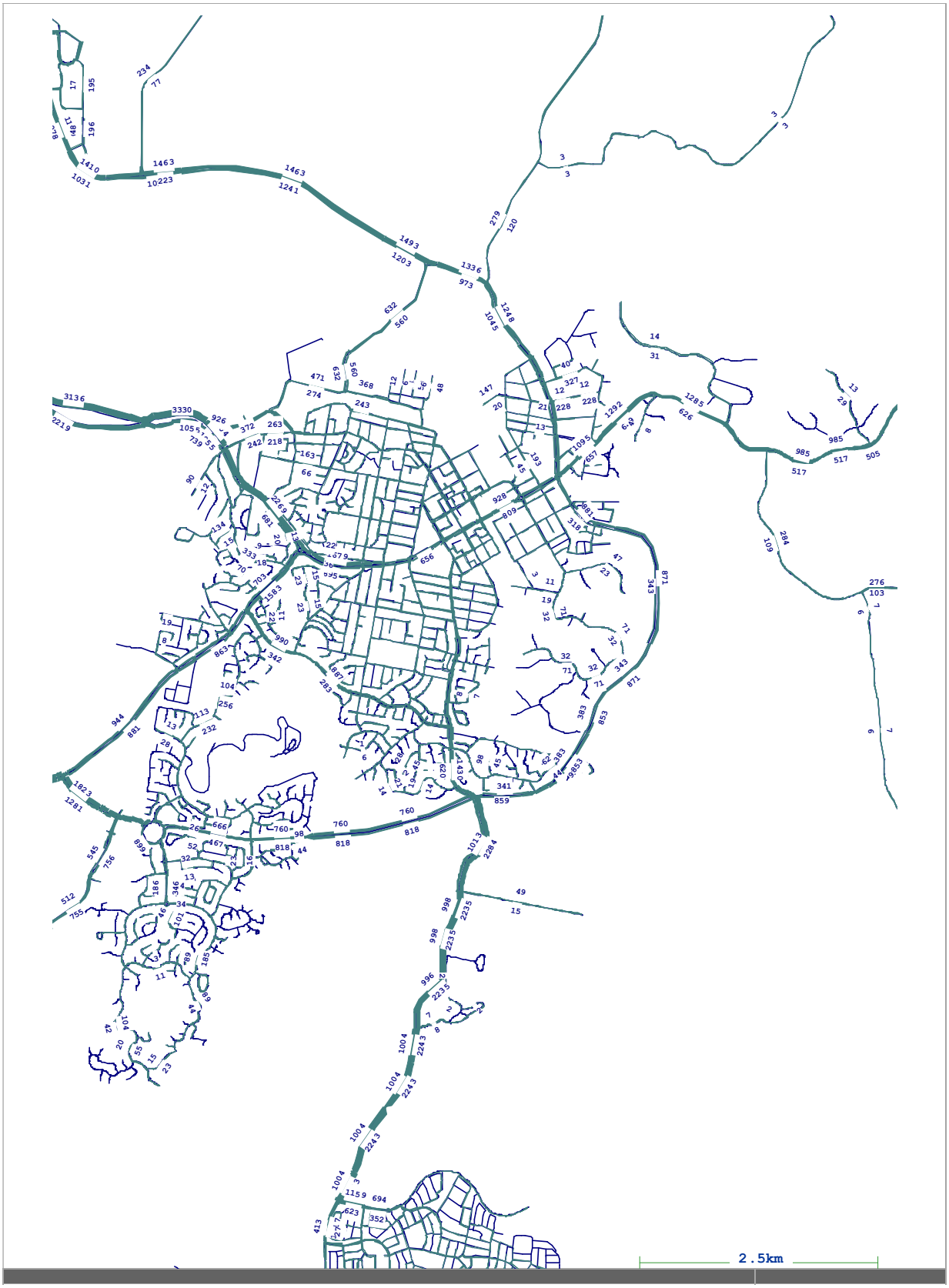


Figure 3-24: 2031 Network with Improvements Traffic Volume Plot PM Peak

3.7 2036 Base Model

The 2036 base network was built from the 2031 network along with the improvements outlined in Section 2.3 of the "Queanbeyan-Palerang Regional Future Do-minimum Network Deficiency Analysis 2023" report as necessary to resolve deficiencies at or before 2031. The 2036 land use was applied to this network and the following deficiencies in the Queanbeyan area, shown in Table 3-7, were identified as arising if no further works are implemented before 2036:

Table 3-7: 2036 Base Model Deficiencies

Location	Period	LOS	Issue
Yass / Ellerton / Bungendore (Nth)	AM	E	Int LOS E
Bungendore / Thurralilly (Nth)	PM	F	Int LOS F - (40v) on north app turning right
Canberra / Kealman (SW)	PM	F	Int LOS F - (10v) on SW app turning right
Lanyon / McCrae (Wst)	AM	E	Int LOS E - (40v) on west app turning right
Lanyon / Gilmore (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / Canberra (Nth)	PM	F	Int LOS F - (1000v) on north app
Lanyon / Canberra (NE)	PM	F	Int LOS F - (400v) on merge of north to east slip lane
Yass / Silva	AM	E	Int LOS E - (140v) on east app turning right
Cooma / Fergus	PM	E	Int LOS E - (240v) on west app right turn
Cooma / Candlebark	PM	E	Int LOS E - (40v) on west app
Kings Hwy / Captains Flat	AM	E	Int LOS F on east app single lane capacity
Cooma Rd (Southbar to Thorpe)	AM	E	Link LOS E NB (1400v)
Old Cooma Rd (Googong to Ellerton)	AM	E	Link LOS E NB (2800v)

LOS plots highlighting these deficiencies are shown in Figure 3-25 and Figure 3-26 below and AM and PM peak hour traffic volumes are plotted in Figure 3-27 and Figure 3-28.

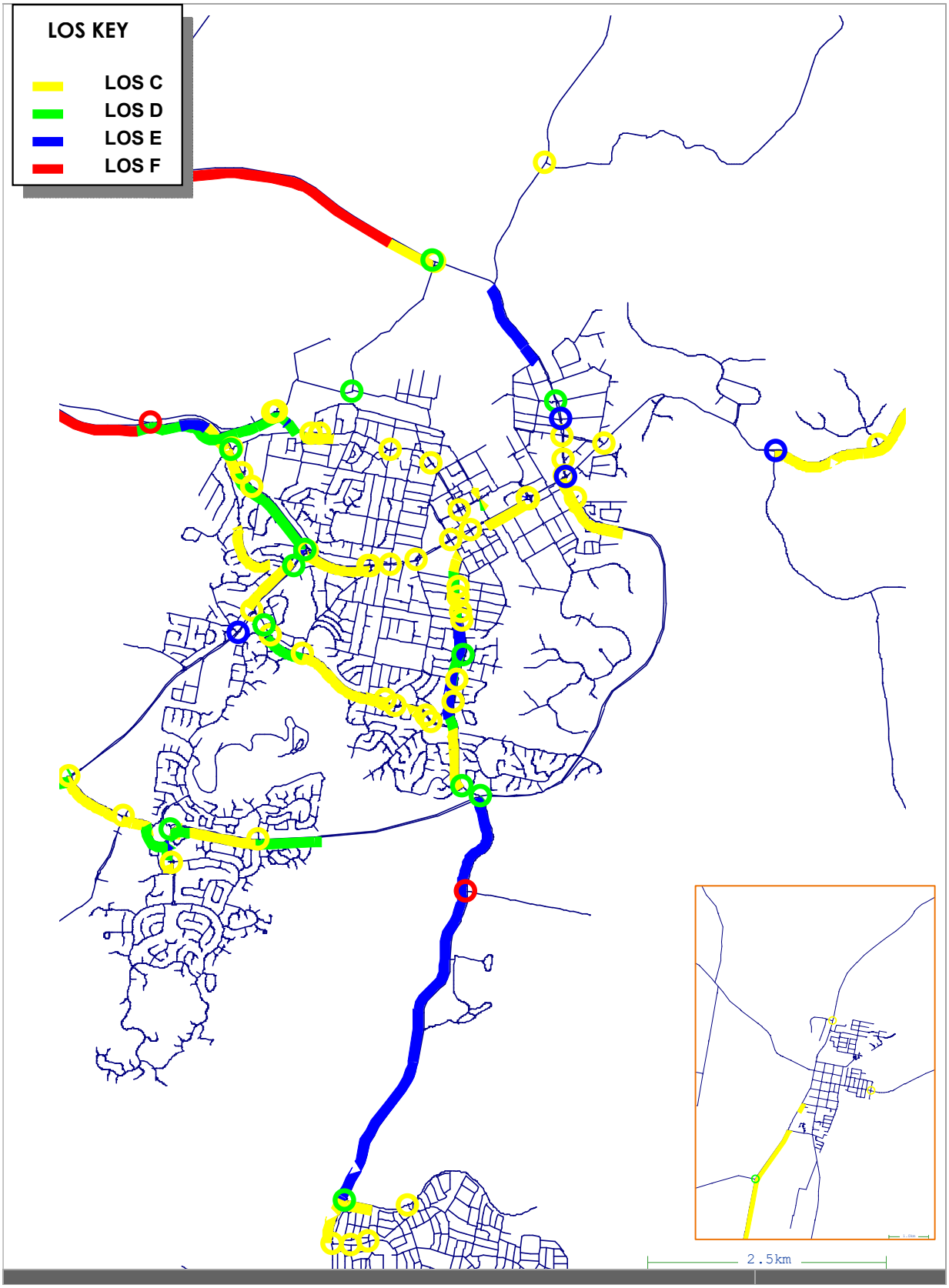


Figure 3-25: 2036 Base Network Levels of Service Plot AM Peak

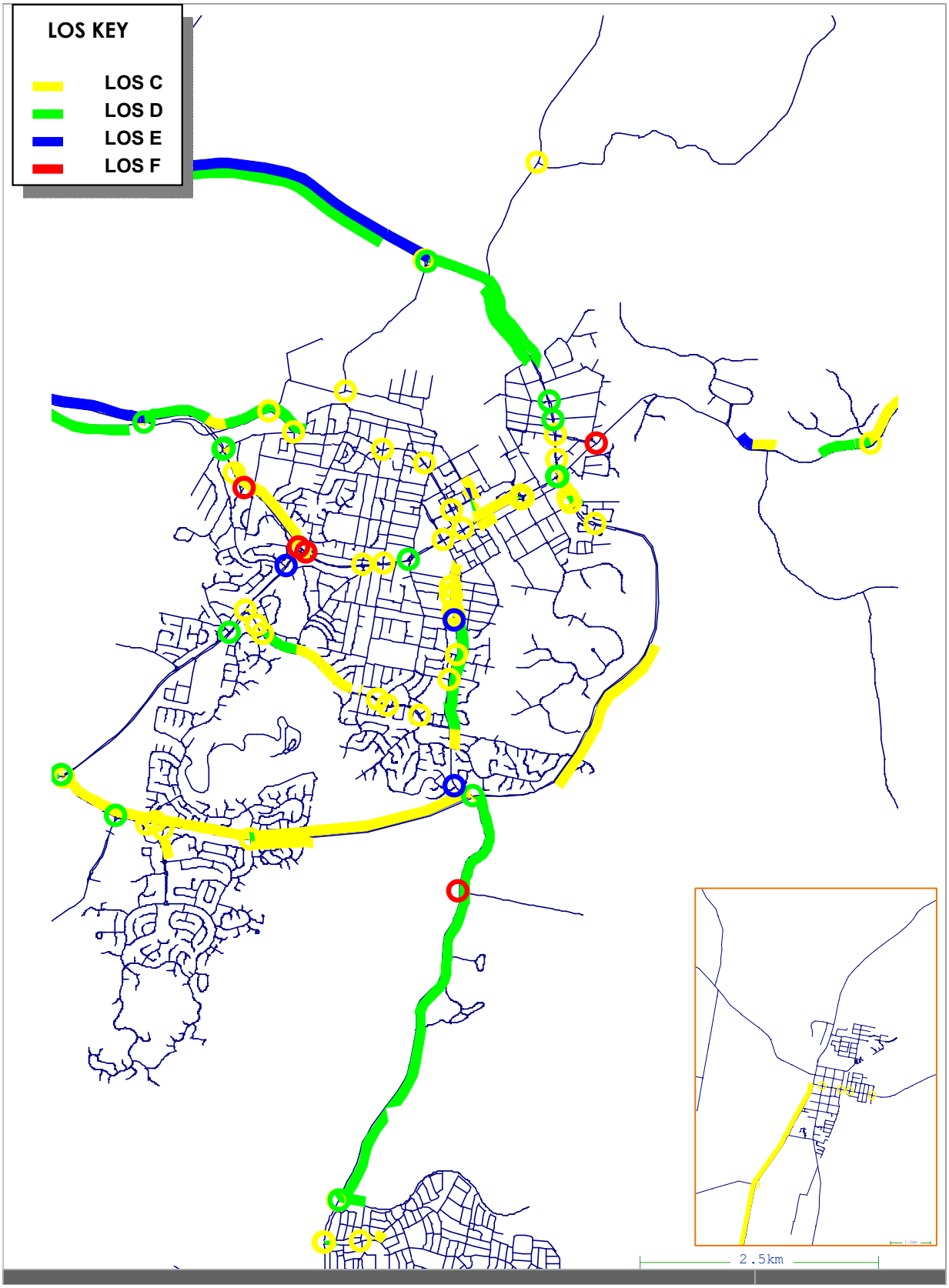


Figure 3-26: 2036 Base Network Levels of Service Plot PM Peak

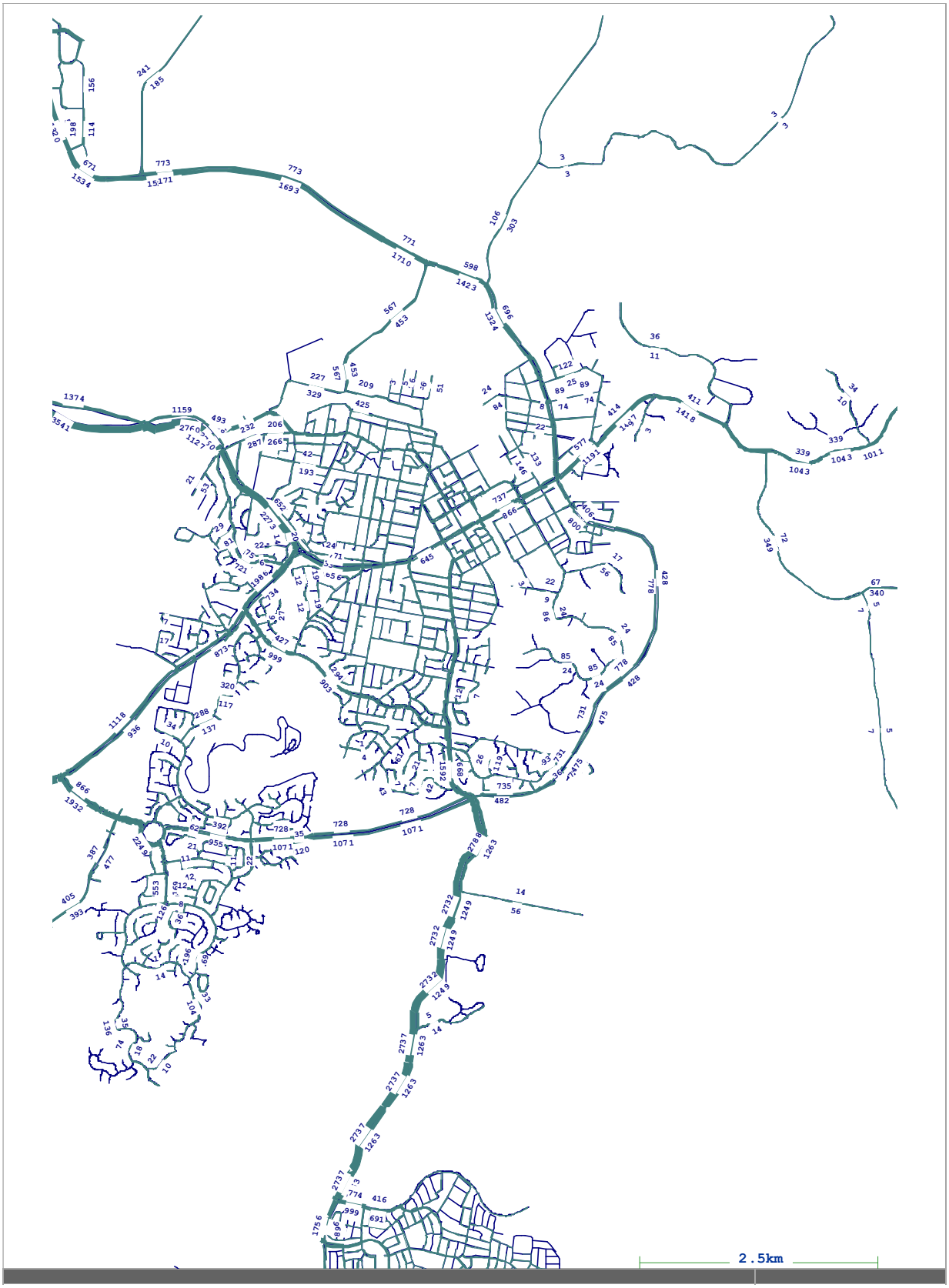


Figure 3-27: 2036 Base Network Traffic Volume Plot AM Peak

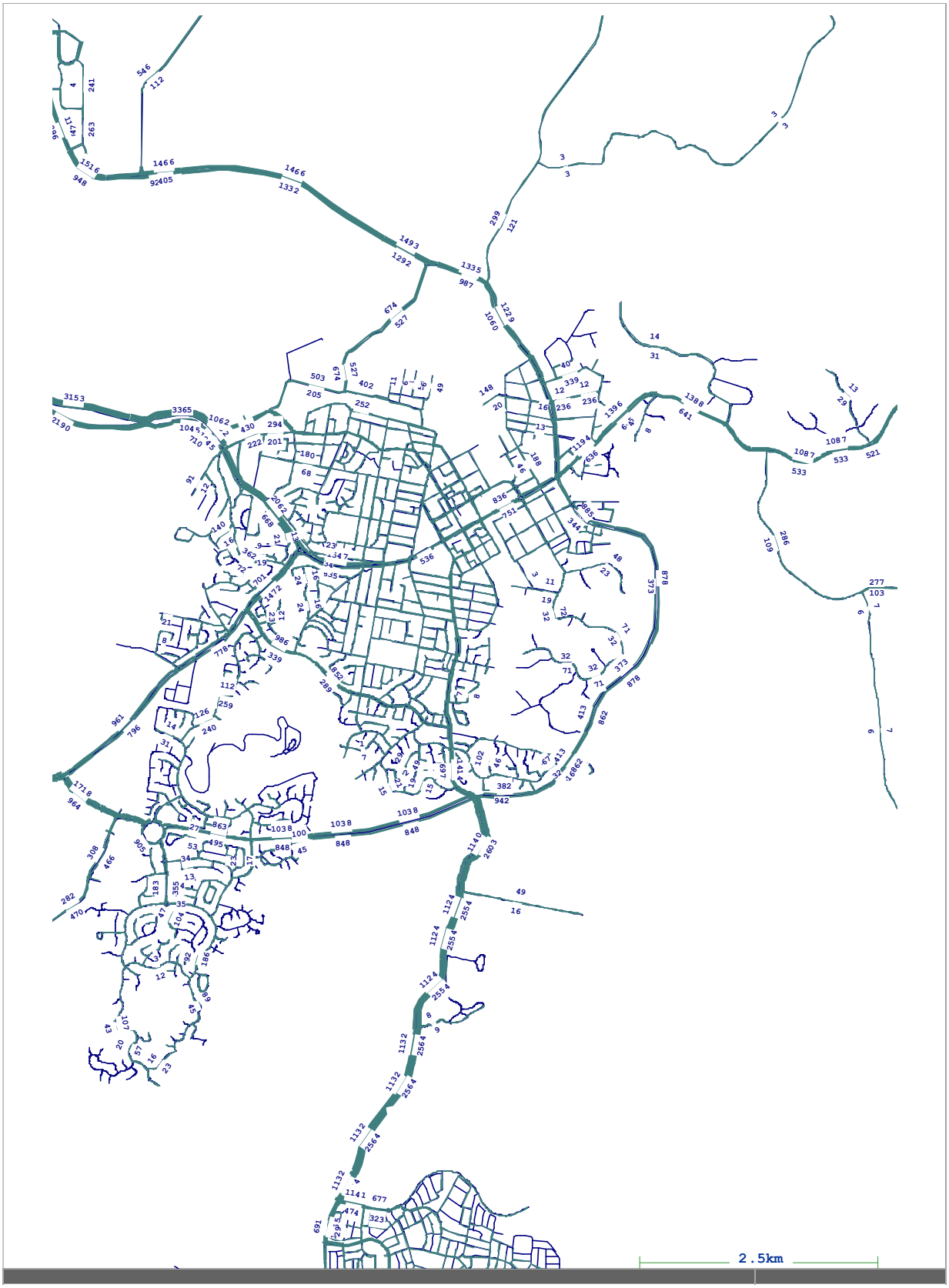


Figure 3-28: 2036 Base Network Traffic Volume Plot PM Peak

3.8 2036 Model with Improvements

The following improvements are proposed for 2036:

- No traffic signals at any intersections were added.
- No roads were upgraded.

The resulting 2036 network is the same as the 2036 Base network and still has the following individual LOS E or worse deficiencies, shown in Table 3-8:

Table 3-8: 2036 Model with Improvements Deficiencies

Location	Period	LOS	Issue
Yass / Ellerton / Bungendore (Nth)	AM	E	Int LOS E
Bungendore / Thurralilly (Nth)	PM	F	Int LOS F - (40v) on north app turning right
Canberra / Kealman (SW)	PM	F	Int LOS F - (10v) on SW app turning right
Lanyon / McCrae (Wst)	AM	E	Int LOS E - (40v) on west app turning right
Lanyon / Gilmore (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / Canberra (Nth)	PM	F	Int LOS F - (1000v) on north app
Lanyon / Canberra (NE)	PM	F	Int LOS F - (400v) on merge of north to east slip lane
Yass / Silva	AM	E	Int LOS E - (140v) on east app turning right
Cooma / Fergus	PM	E	Int LOS E - (240v) on west app right turn
Cooma / Candlebark	PM	E	Int LOS E - (40v) on west app
Kings Hwy / Captains Flat	AM	E	Int LOS F on east app single lane capacity
Cooma Rd (Southbar to Thorpe)	AM	E	Link LOS E NB (1400v)
Old Cooma Rd (Googong to Ellerton)	AM	E	Link LOS E NB (2800v)

Figure 3-29 and Figure 3-30 below show Levels of Service of the 2036 network with the above improvement and AM and PM peak hour traffic volumes are plotted in Figure 3-31 and Figure 3-32.

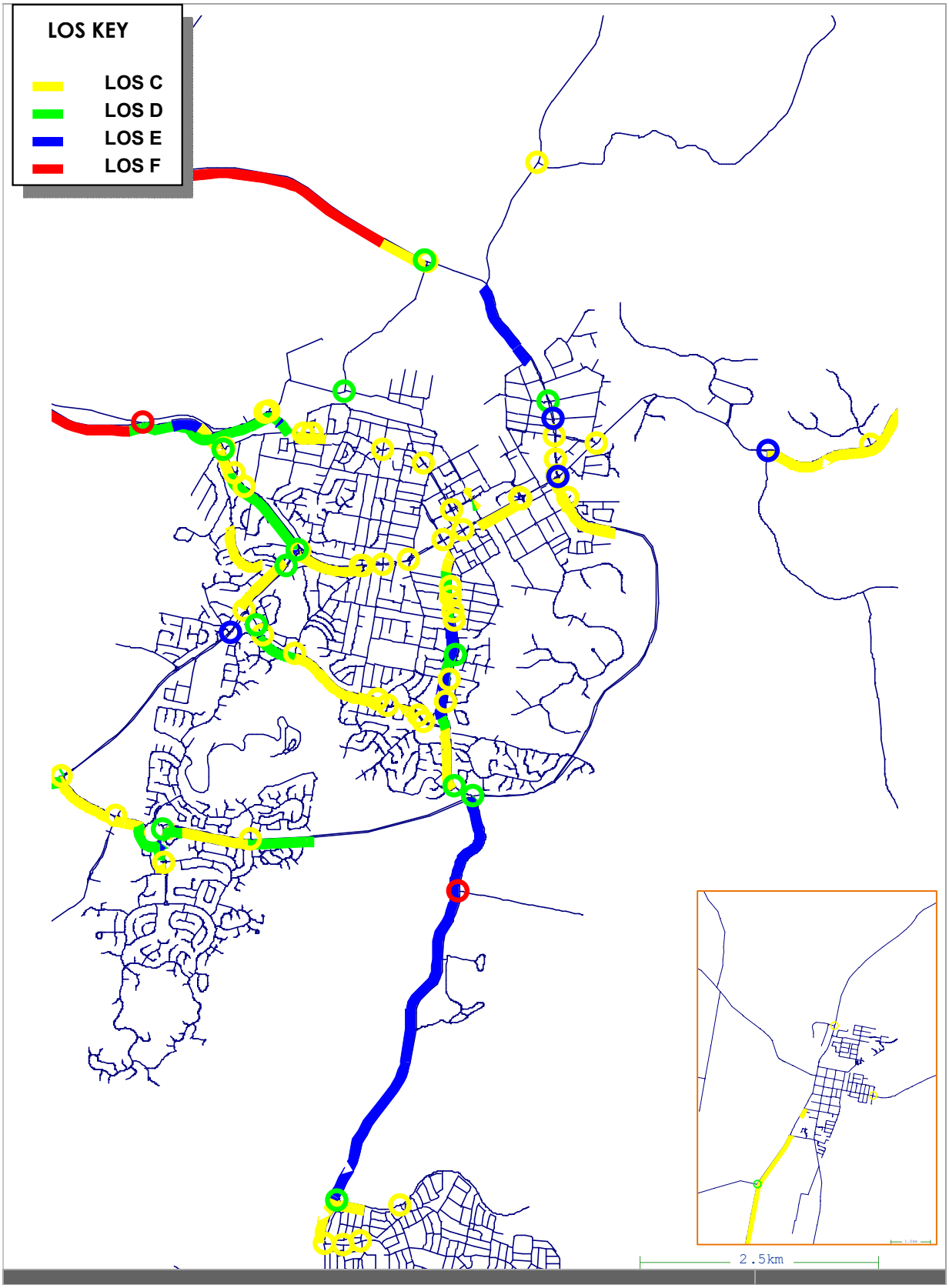


Figure 3-29: 2036 Network with Improvements Levels of Service Plot AM Peak

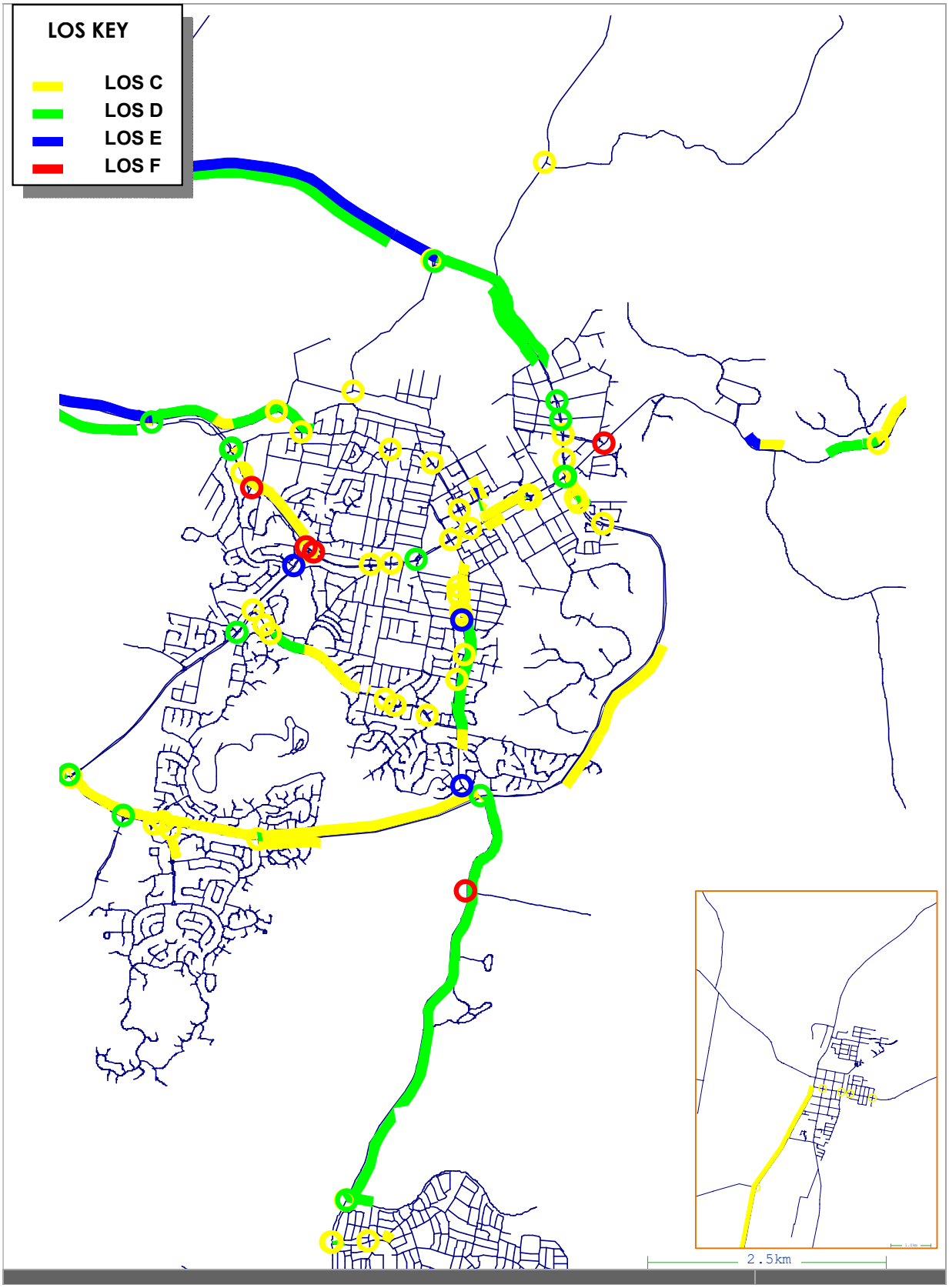


Figure 3-30: 2036 Network with Improvements Levels of Service Plot PM Peak

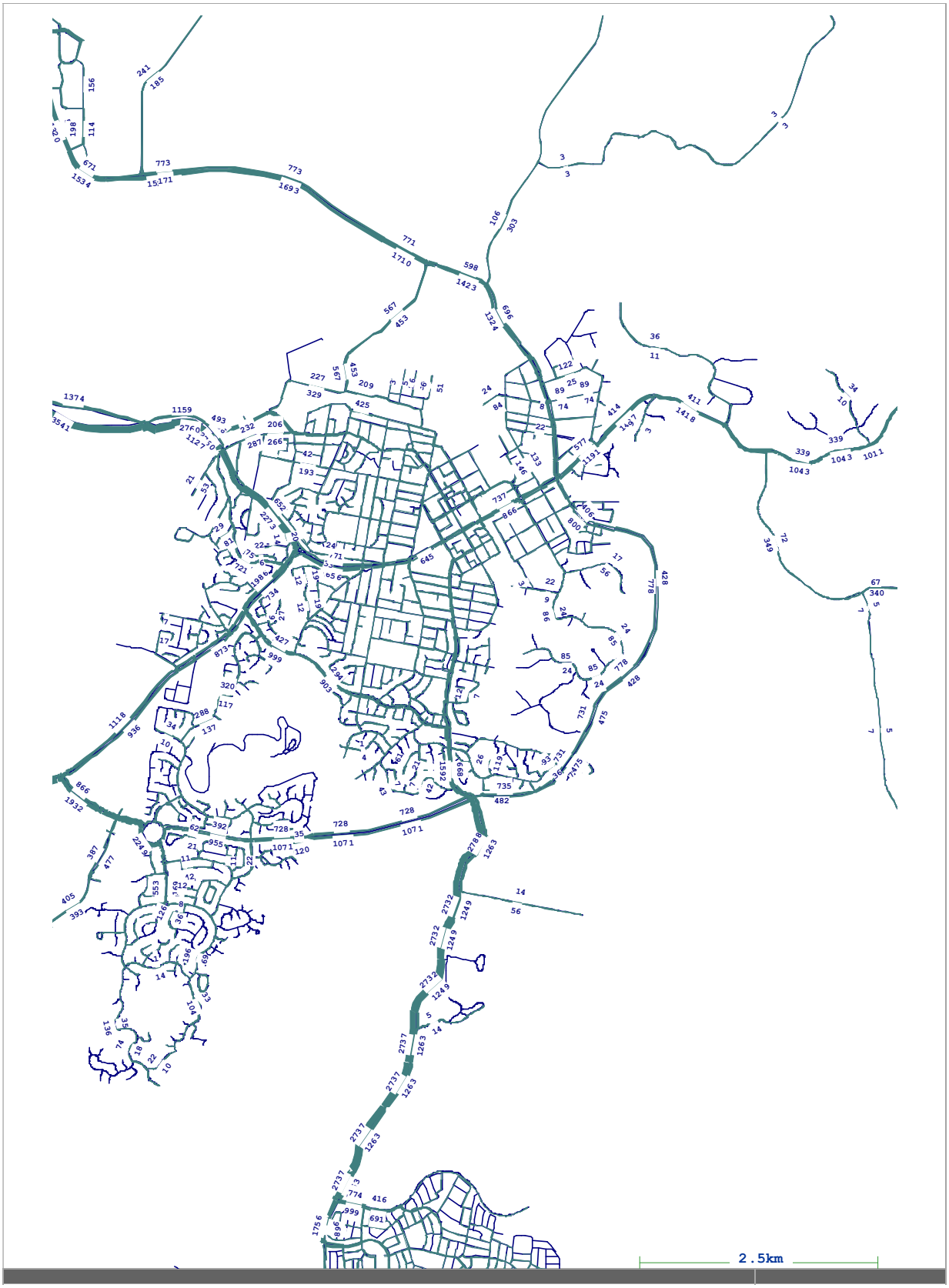


Figure 3-31: 2036 Network with Improvements Traffic Volume Plot AM Peak

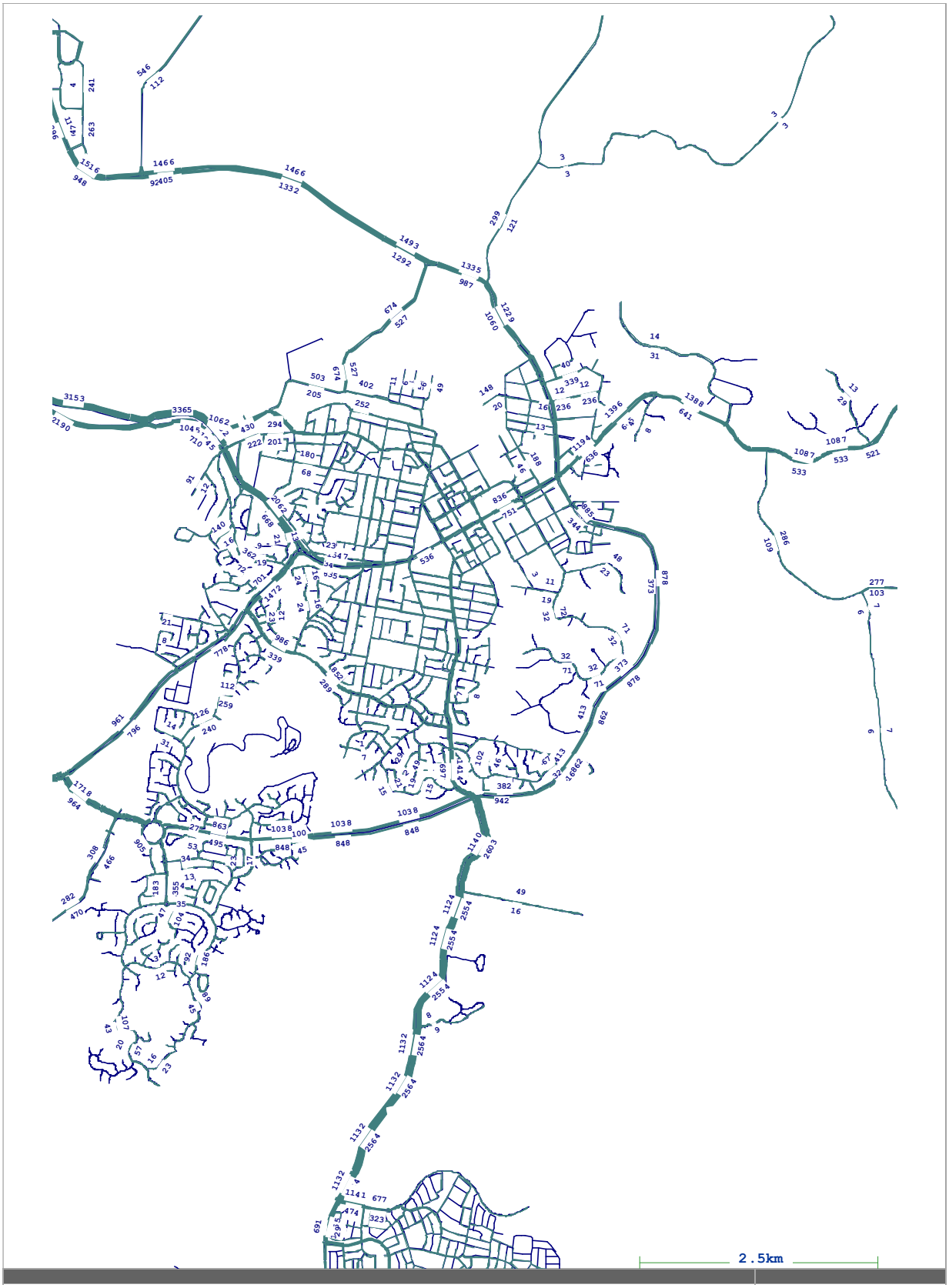


Figure 3-32: 2036 Network with Improvements Traffic Volume Plot PM Peak

3.9 2041 Base Model

The 2041 base network was built from the 2036 network along with the improvements outlined in Section 2.3 of the "Queanbeyan-Palerang Regional Future Do-minimum Network Deficiency Analysis 2023" report as necessary to resolve deficiencies at or before 2036. The 2041 land use was applied to this network and the following deficiencies in the Queanbeyan area, shown in Table 3-9, were identified as arising if no further works are implemented before 2041:

Table 3-9: 2041 Base Model Deficiencies

Location	Period	LOS	Issue
Yass / Ellerton / Bungendore (Nth)	AM	E	Int LOS E
Bungendore / Thurralilly (Nth)	PM	F	Int LOS F - (40v) on north app turning right
Canberra / Kealman (SW)	PM	F	Int LOS F - (10v) on SW app turning right
Lanyon / McCrae (Wst)	AM	E	Int LOS E - (40v) on west app turning right
Lanyon / Gilmore (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / Canberra (Nth)	PM	F	Int LOS F - (1000v) on north app
Lanyon / Canberra (NE)	PM	F	Int LOS F - (400v) on merge of north to east slip lane
Yass / Silva	AM & PM	F-E	Int LOS E - (120v) on east app
Yass / Hincksman	AM & PM	F-E	Int LOS E - (100v) on east app
Yass / Thurralilly	AM	E	Int LOS E - (10v) on east app
Cooma / Candlebark	PM	E	Int LOS E - (50v) on west app
Jerrabombera Circle (Est)	AM	E	Int LOS E on east app (Edwin Land Pkwy)
Kings Hwy / Captains Flat	AM	F	Int LOS F on east app single lane capacity
Norse Rd (Railway to Uriarra)	AM	E	Link LOS E WB (1300v)
Cooma Rd (Southbar to Thorpe)	AM	E	Link LOS E NB (1400v)
Old Cooma Rd (Googong to Ellerton)	AM & PM	E	Link LOS E NB (2900v) AM, SB (2700v) PM

LOS plots highlighting these deficiencies are shown in Figure 3-33 and Figure 3-34 below and AM and PM peak hour traffic volumes are plotted in Figure 3-35 and Figure 3-36.

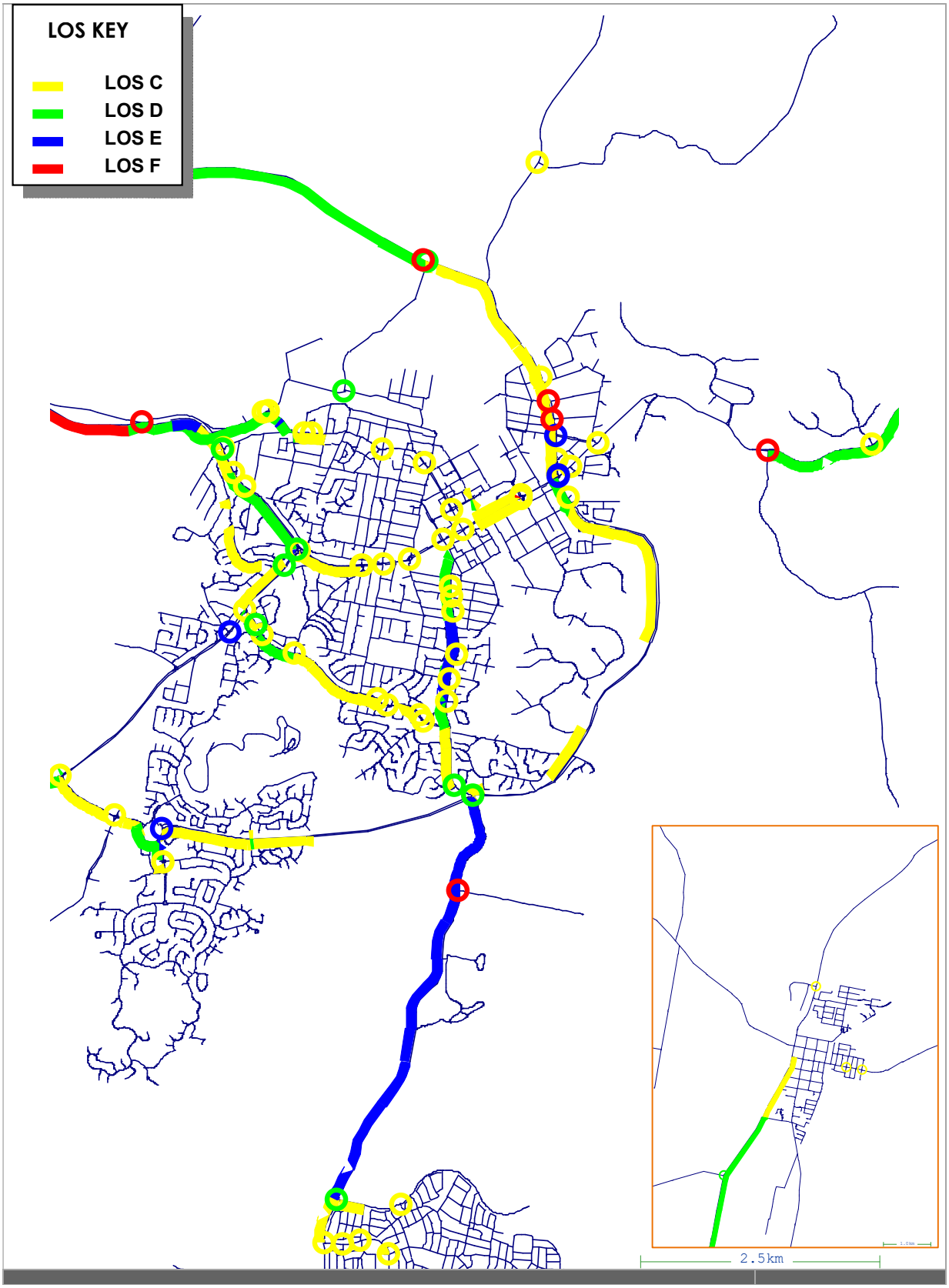


Figure 3-33: 2041 Base Network Levels of Service Plot AM Peak

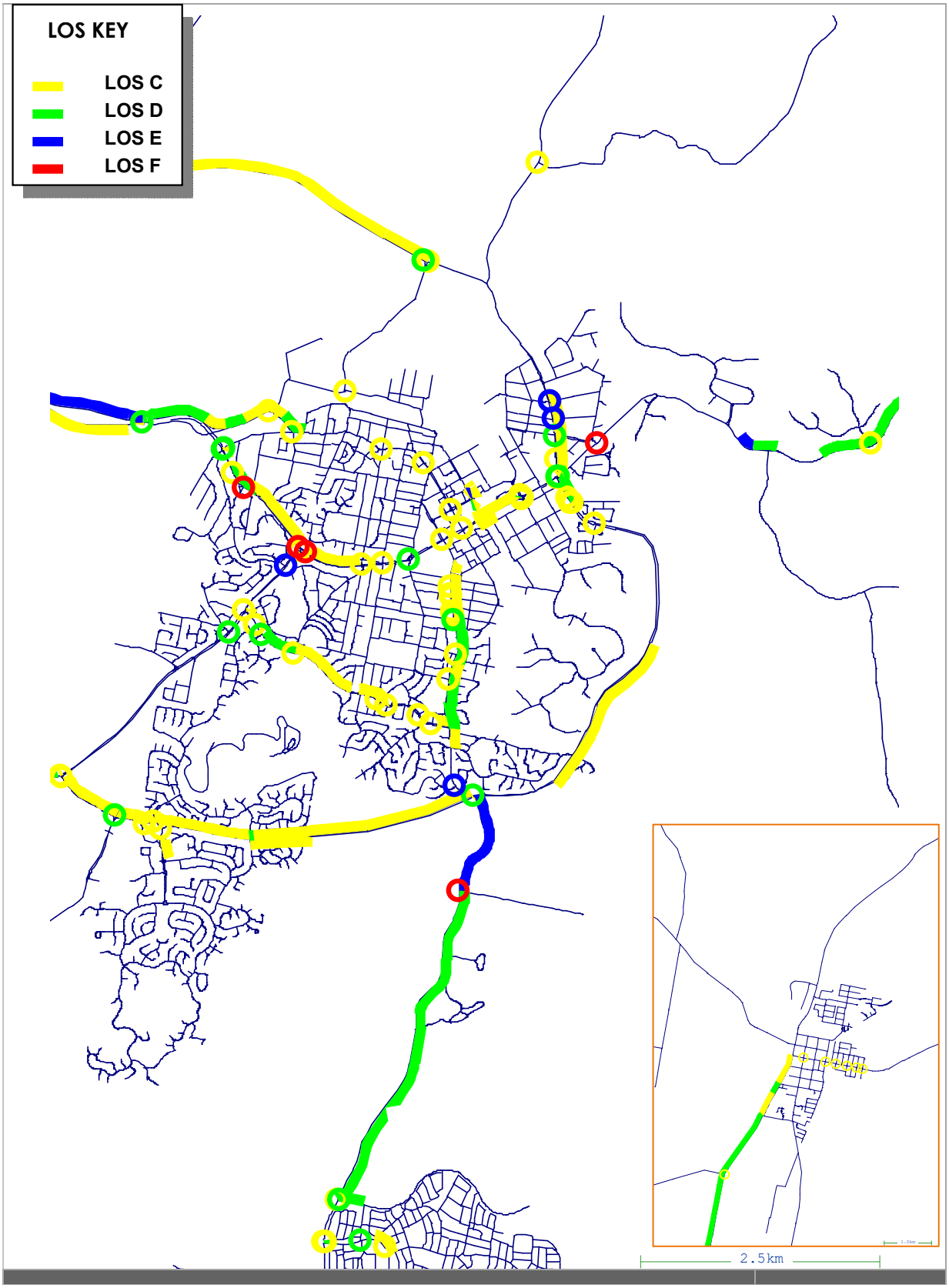


Figure 3-34: 2041 Base Network Levels of Service Plot PM Peak

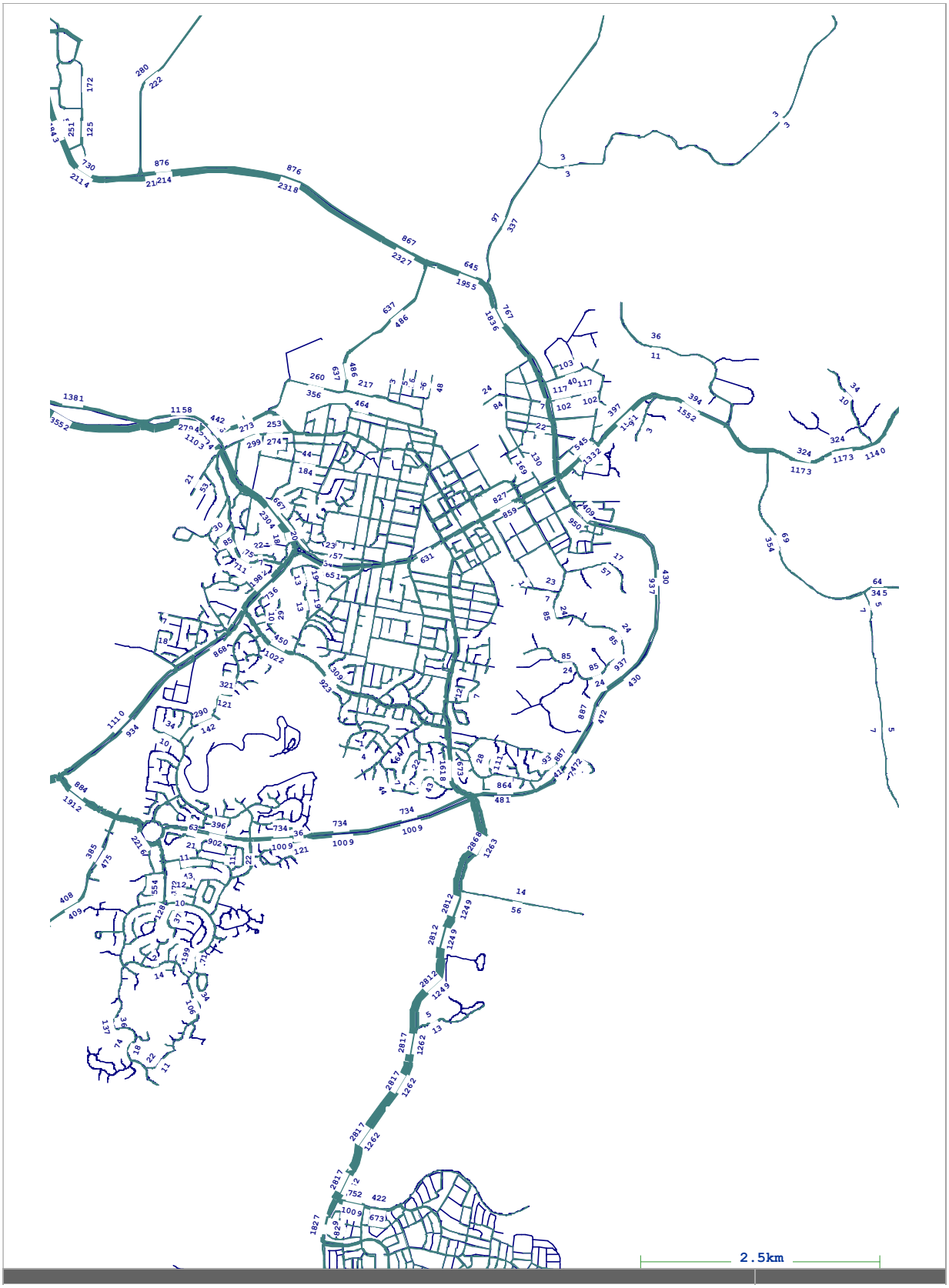


Figure 3-35: 2041 Base Network Traffic Volume Plot AM Peak

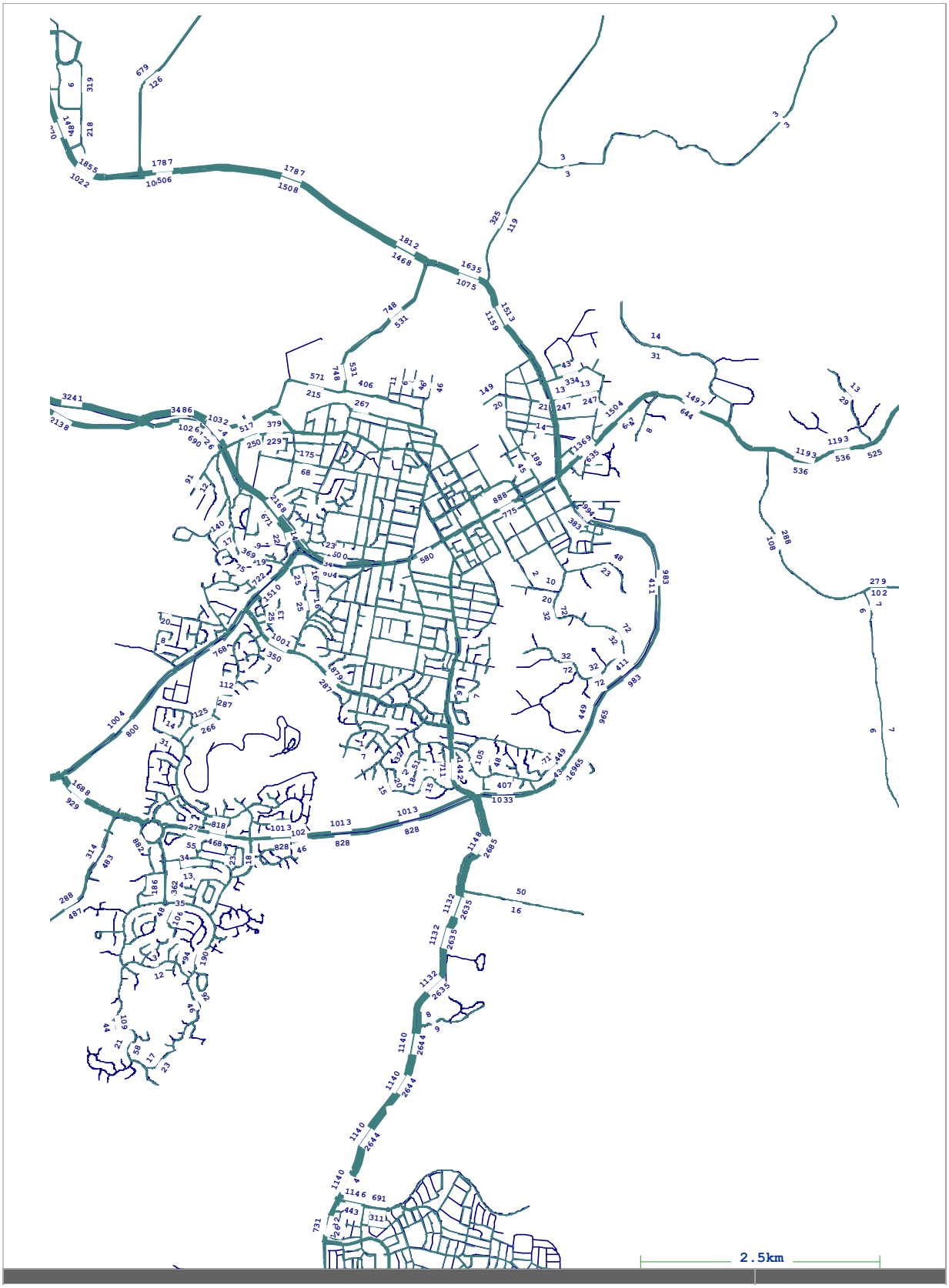


Figure 3-36: 2041 Base Network Traffic Volume Plot PM Peak

3.10 2041 Model with Improvements

The following improvements are proposed for 2041:

- Ban movements at the following intersections:
  - Yass / Silva / Waterloo right turns banned
  - Yass / Shropshire right turn out banned
- Add traffic signals at the following intersections:
  - Yass / Hincksman / Endurance
- Add lanes to the following roads:
  - 6 lane Old Cooma Rd – Googong Rd to Edwin Land Parkway

The Kings Hwy / Captains Flat Rd seagull roundabout is expected to come under significant capacity pressure in the AM from westbound traffic travelling to Queanbeyan having to use a single lane at the roundabout. In addition, eastbound traffic in the PM start to run out of capacity on the one-lane section of the Kings Hwy leading to the roundabout. It is recommended that roundabout design be revisited to allow for two lanes westbound through the roundabout and provide an extension of the existing four-lane Kings Hwy to the west of the roundabout.

No changes are proposed for the Lanyon / McCrae and Cooma / Candlebark intersections at this time due to the low turning volumes affected.

Implementing these improvements result in a 2041 improved network that still has the following individual LOS E or worse deficiencies, shown in Table 3-10:

Table 3-10: 2041 Model with Improvements Deficiencies

Location	Period	LOS	Issue
Yass / Ellerton / Bungendore (Nth)	AM	E	Int LOS E
Bungendore / Thurralilly (Nth)	AM & PM	E-F	Int LOS F - (40v) on north app turning right
Canberra / Kealman (SW)	PM	F	Int LOS F - (10v) on SW app turning right
Canberra / Gilmore	PM	E	Int LOS E – (430v) on north app slip lane and south app
Lanyon / McCrae (Wst)	AM	E	Int LOS E - (40v) on west app turning right
Lanyon / Gilmore (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / Canberra (Nth)	PM	F	Int LOS F - (1000v) on north app
Lanyon / Canberra (NE)	PM	F	Int LOS F - (400v) on merge of north to east slip lane
Cooma / Candlebark	PM	E	Int LOS E - (50v) on west app
Jerrabombera Circle (Est)	AM	E	Int LOS E on east app (Edwin Land Pkwy)
Kings Hwy / Captains Flat	AM	F	Int LOS F on east app single lane capacity
Cooma Rd (Southbar to Thorpe)	AM	E	Link LOS E NB (1400v)
Norse Rd (Railway to Uriarra)	AM	E	Link LOS E WB (1300v)

Figure 3-37 and Figure 3-38 below show Levels of Service of the 2041 network with the above improvement and AM and PM peak hour traffic volumes are plotted in Figure 3-39 and Figure 3-40.

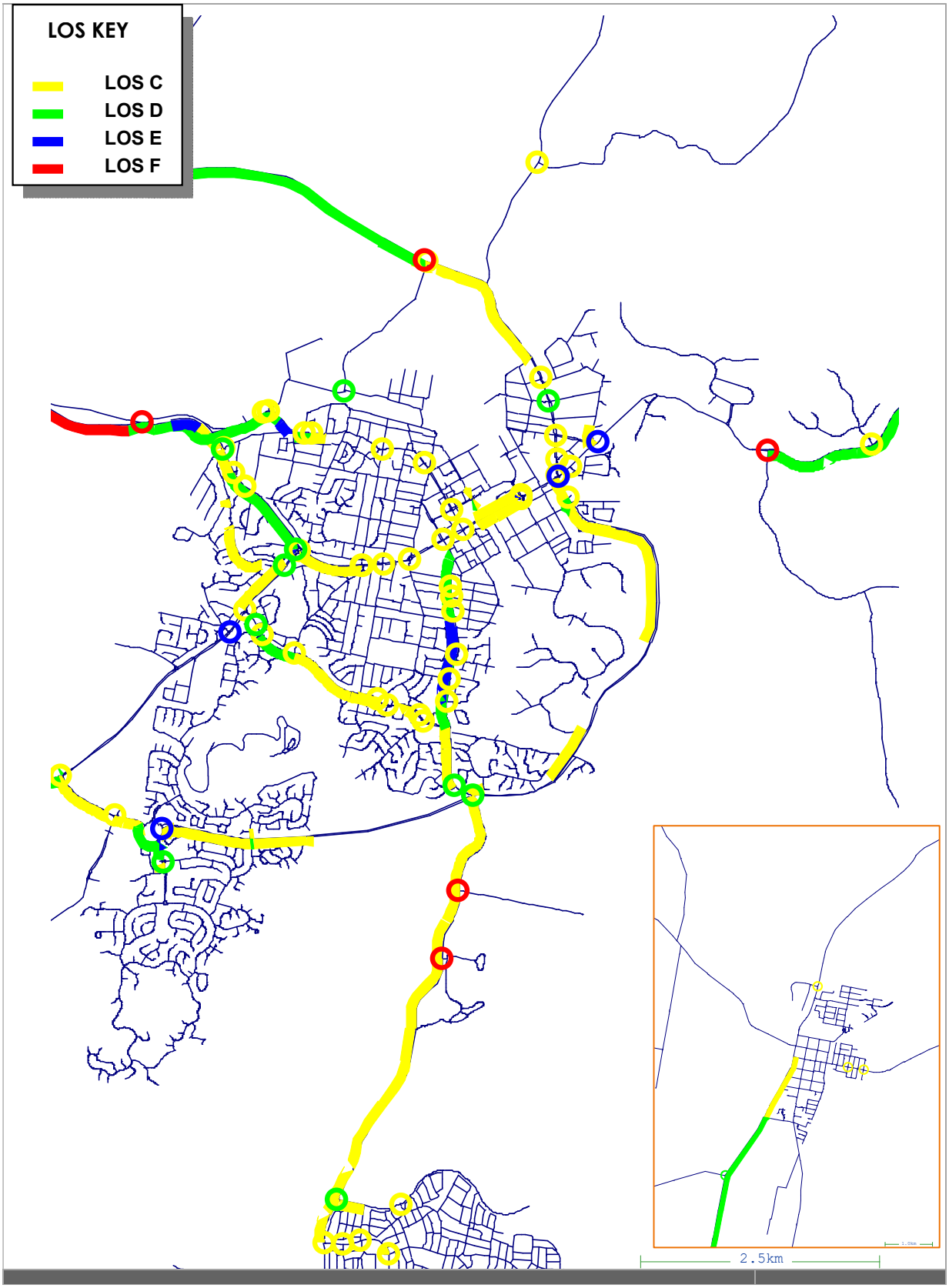


Figure 3-37: 2041 Network with Improvements Levels of Service Plot AM Peak

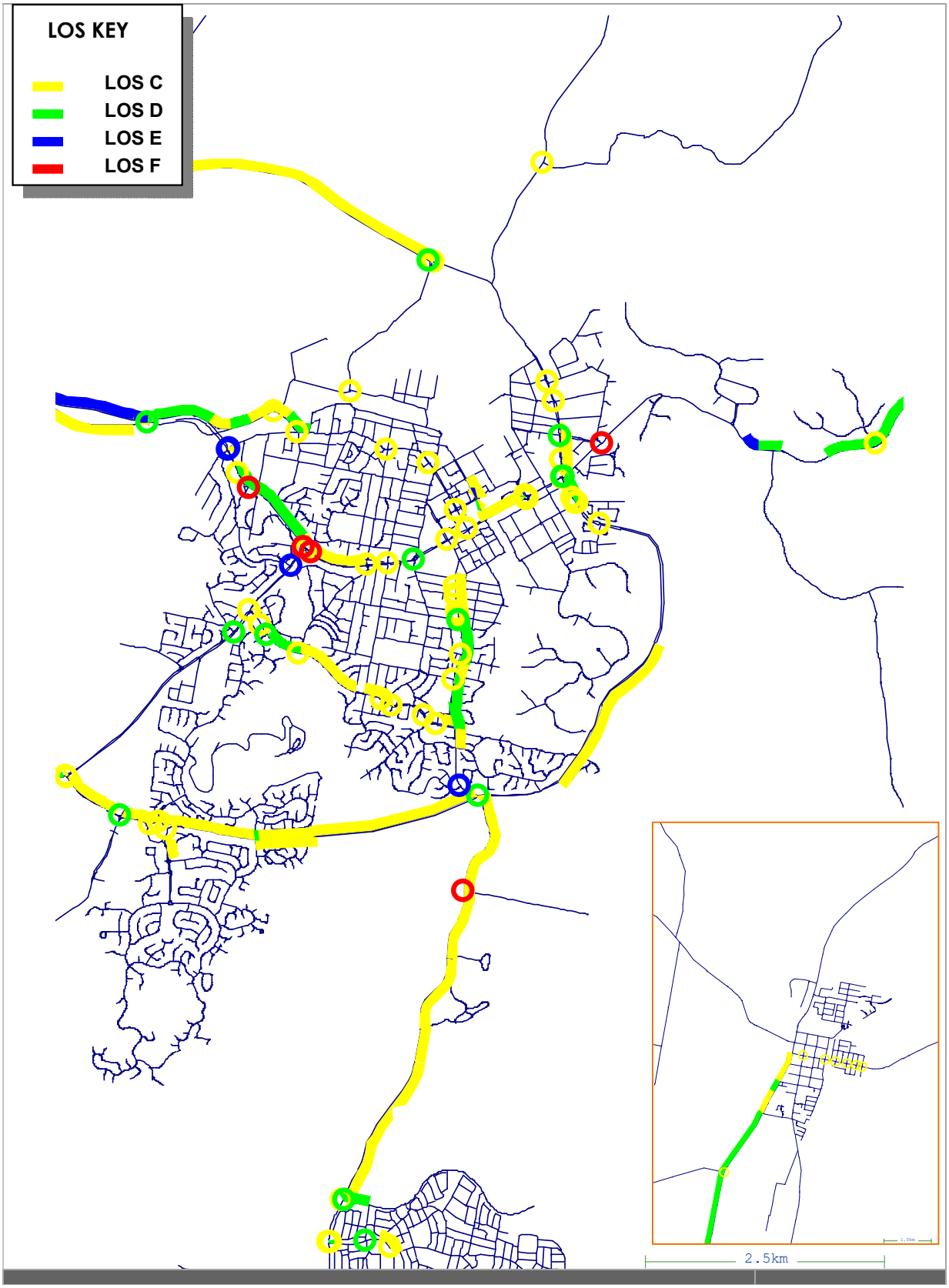


Figure 3-38: 2041 Network with Improvements Levels of Service Plot PM Peak

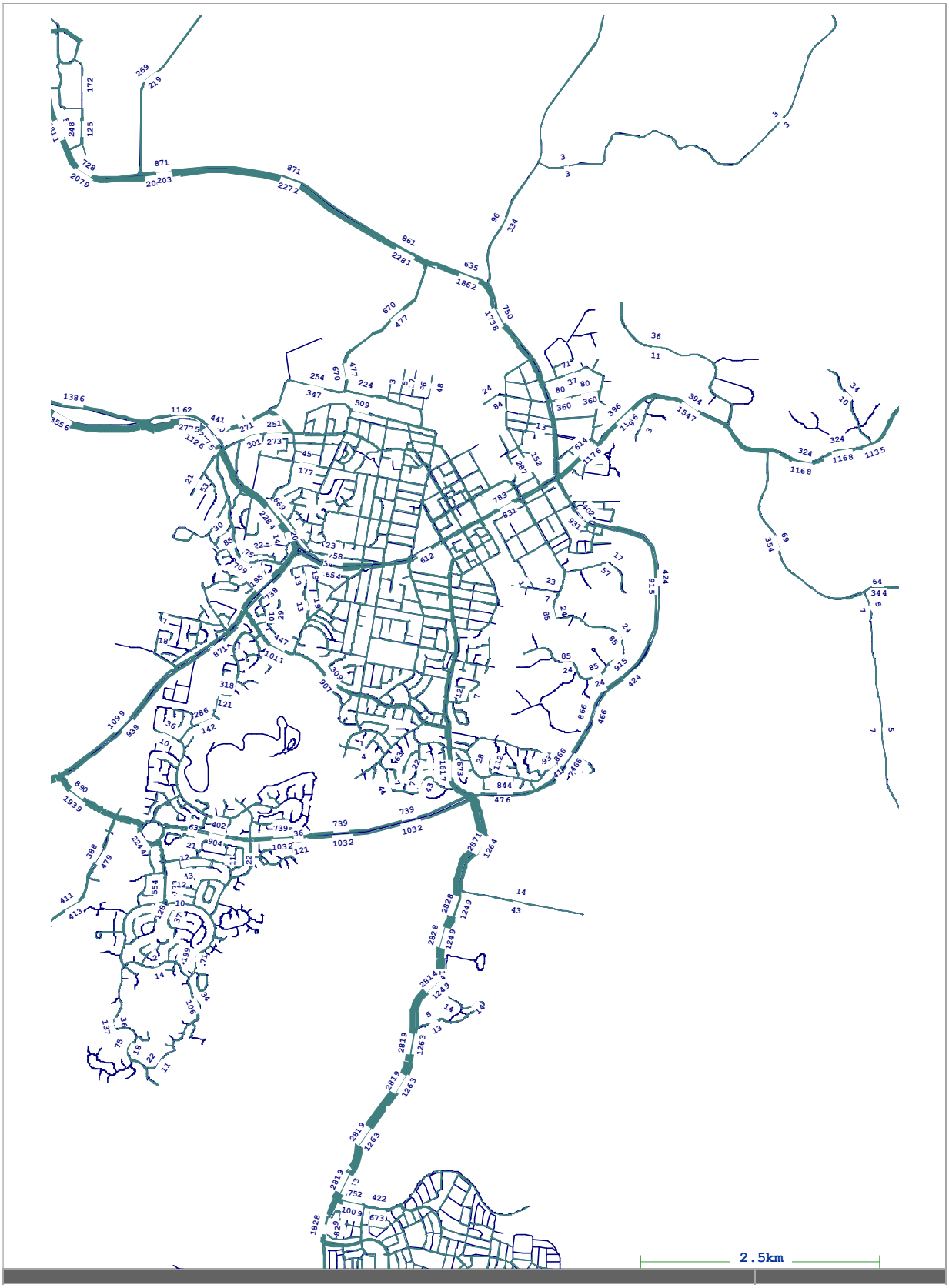


Figure 3-39: 2041 Network with Improvements Traffic Volume Plot AM Peak

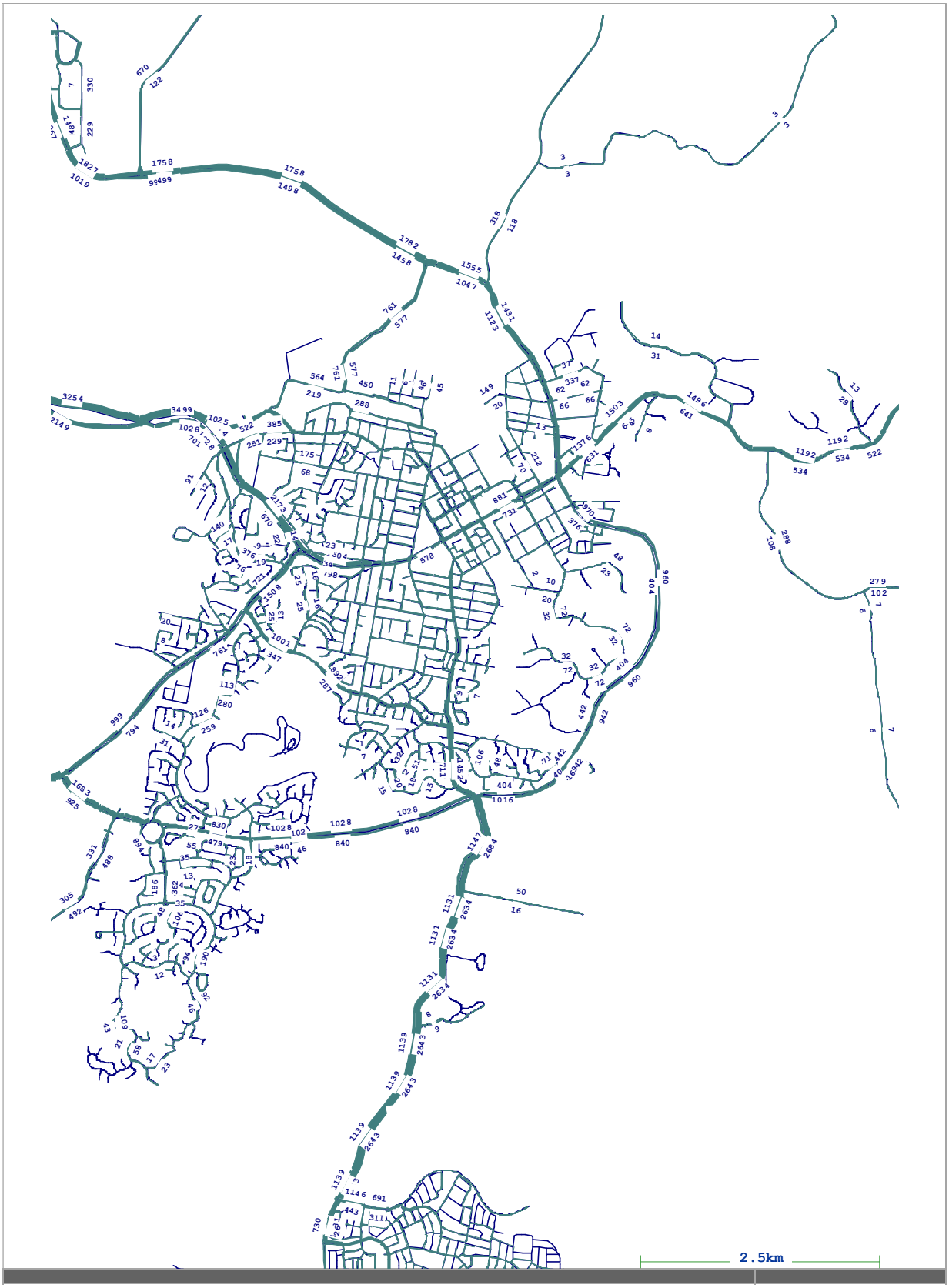


Figure 3-40: 2041 Network with Improvements Traffic Volume Plot PM Peak

3.11 2046 Base Model

The 2046 base network was built from the 2041 network along with the improvements outlined in Section 2.3 of the "Queanbeyan-Palerang Regional Future Do-minimum Network Deficiency Analysis 2023" report as necessary to resolve deficiencies at or before 2041. The 2046 land use was applied to this network and the following deficiencies in the Queanbeyan area, shown in Table 3-11, were identified as arising if no further works are implemented before 2046:

Table 3-11: 2046 Base Model Deficiencies

Location	Period	LOS	Issue
Yass / Ellerton / Bungendore (Nth)	AM	E	Int LOS E
Bungendore / Thurralilly (Nth)	PM	F	Int LOS F - (40v) on north app turning right
Canberra / Kealman (SW)	PM	F	Int LOS F - (10v) on SW app turning right
Lanyon / McCrae (Wst)	AM & PM	E	Int LOS E - (40v) on west app turning right
Lanyon / Gilmore (Wst)	PM	E	Int LOS E - (100v) on west app turning right
Lanyon / Canberra (Nth)	PM	F	Int LOS F - (1000v) on north app
Lanyon / Canberra (NE)	PM	F	Int LOS F - (400v) on merge of north to east slip lane
Cooma / Fergus	PM	E	Int LOS E - (270v) on west app right turn
Cooma / Candlebark	PM	E	Int LOS E - (60v) on west app
Southbar / North Terrace	AM	E	Int LOS E - (1250v) on north app
Jerrabombera Circle (Est)	AM	E	Int LOS E on east app (Edwin Land Pkwy)
Kings Hwy / Captains Flat	AM	F	Int LOS F on east app single lane capacity
Cooma Rd (Southbar to Thorpe)	AM	E	Link LOS E NB (1400v)
Norse Rd (Railway to Uriarra)	AM	E	Link LOS E WB (1300v)

LOS plots highlighting these deficiencies are shown in Figure 3-41 and Figure 3-42 below and AM and PM peak hour traffic volumes are plotted in Figure 3-43 and Figure 3-44.

- No improvements are proposed for 2046.

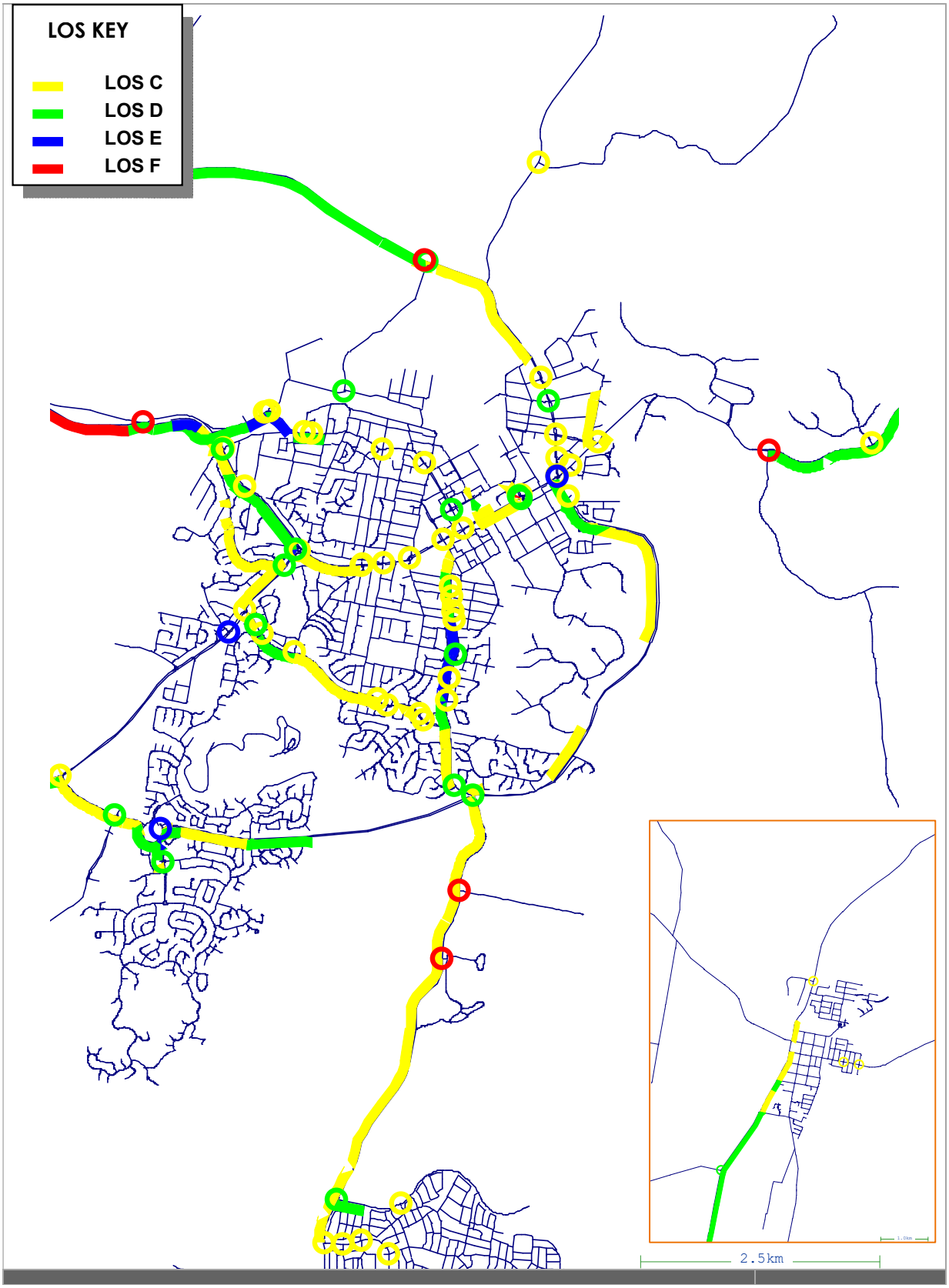


Figure 3-41: 2046 Base Network Levels of Service Plot AM Peak

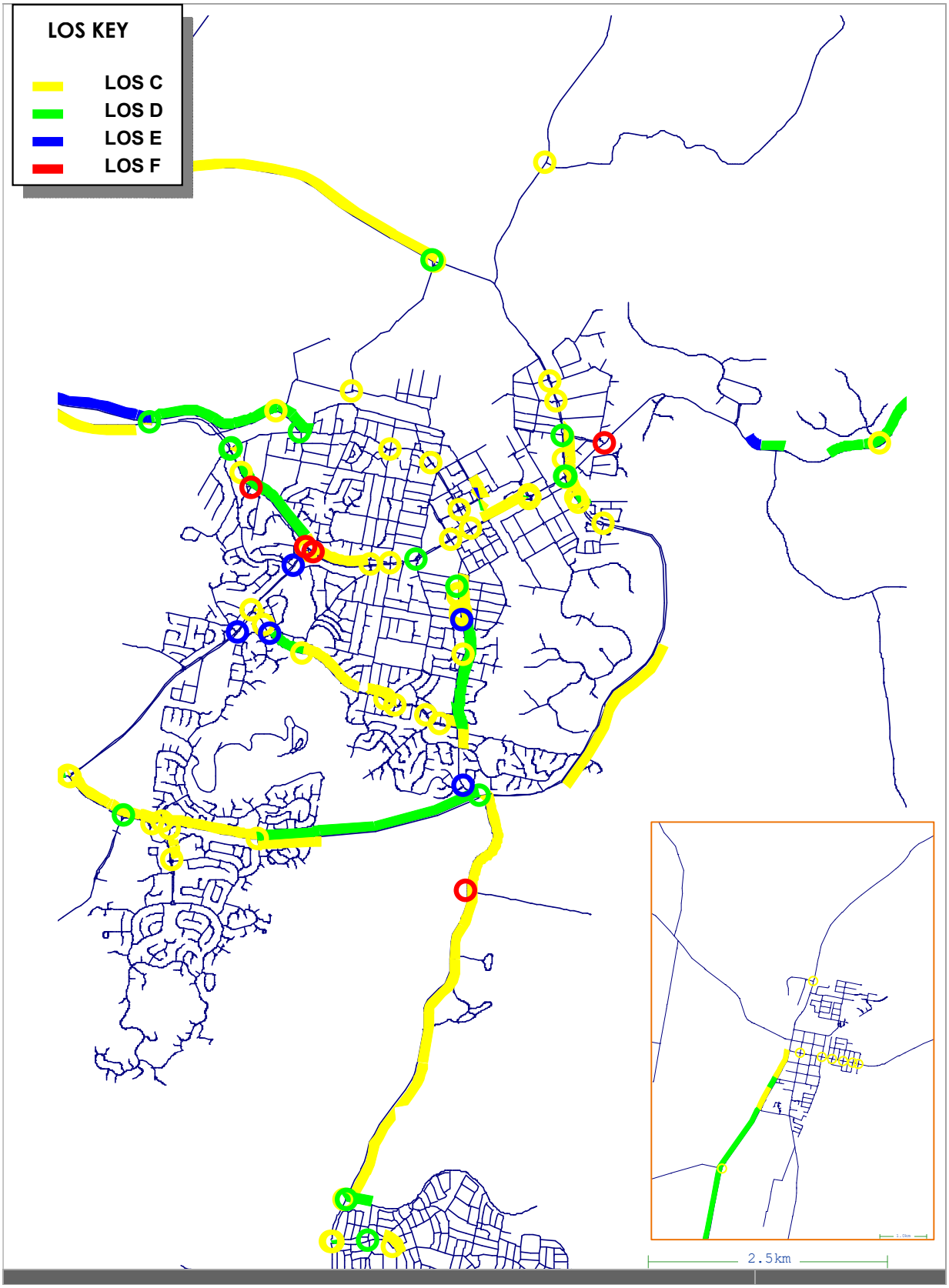


Figure 3-42: 2046 Base Network Levels of Service Plot PM Peak

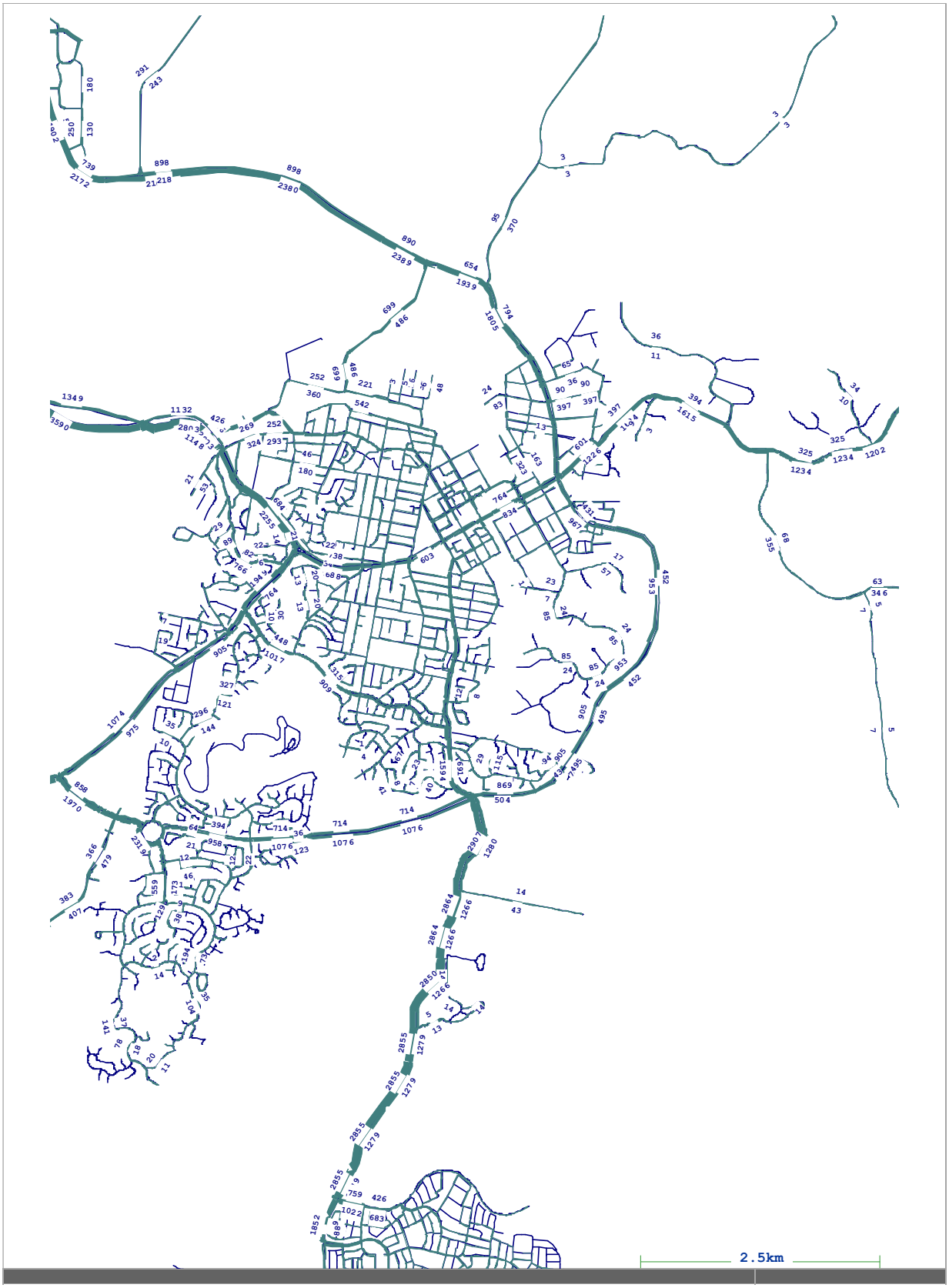


Figure 3-43: 2046 Base Network Traffic Volume Plot AM Peak

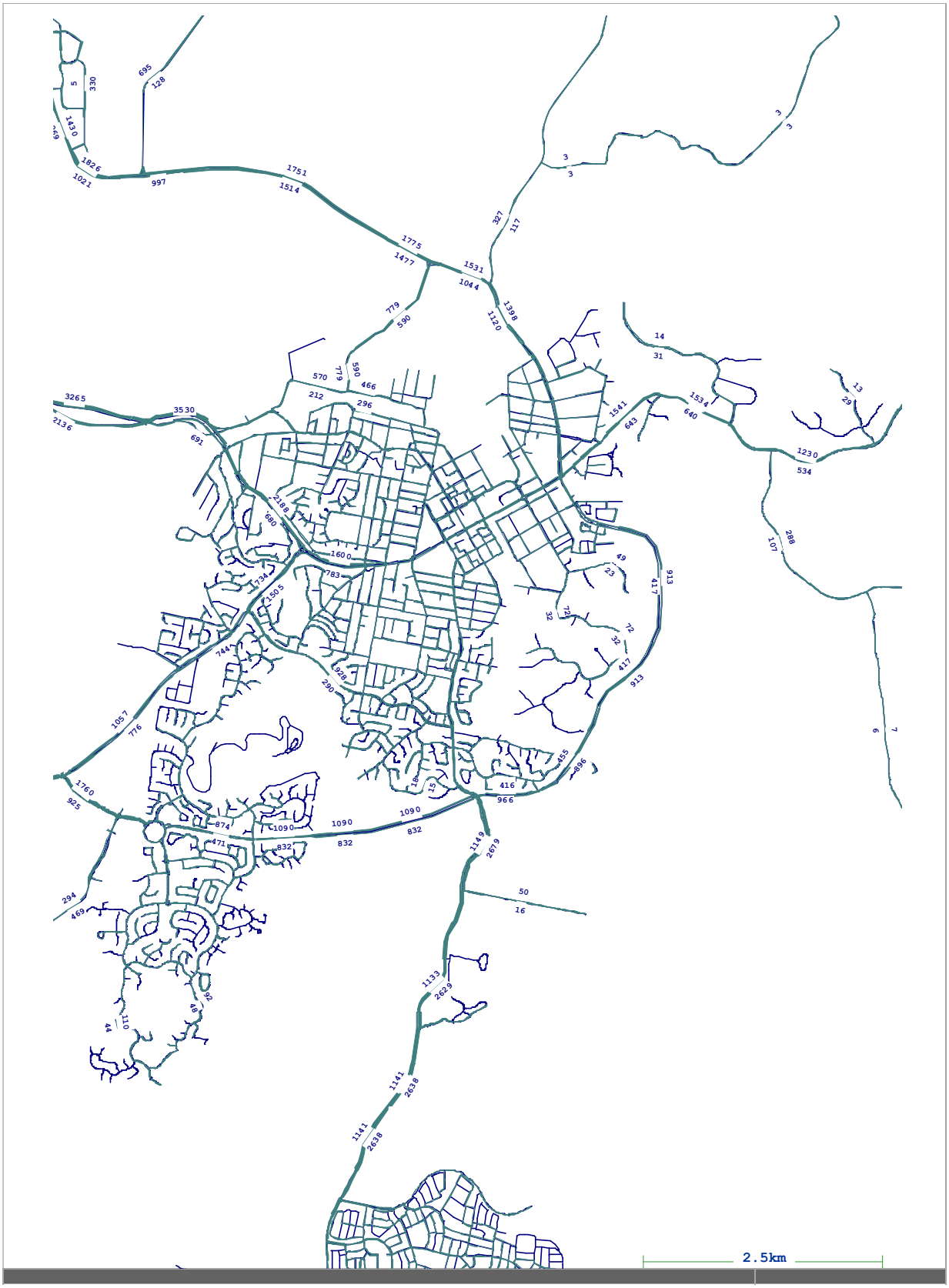


Figure 3-44: 2046 Base Network Traffic Volume Plot PM Peak

4 Timeline of Required Network Improvements

A LOS E or worse shown in both the AM and PM future Base Network LOS figures above, at the end of each 3-5 year period, indicates the likely need for construction of the proposed improvement work aimed at resolving that deficiency within the preceding 3-5 years. Based on this premise, improvement works have been added to the base 2021 network iteratively to resolve deficiencies as they arise. The timing of these works are shown below in Table 4-1 and Table 4-2 for network links and intersections separately.

Table 4-1: Link Improvement Timing

Link Improvement Timing							
Location	**Item**	**By 2024**	**By 2027**	**By 2031**	**By 2036**	**By 2041**	**By 2046**
4L Cooma St (ELP to Southbar)	4L		✓				
4L Southbar Rd (Lanyon to North Terrace)	4L			✓			
6L Old Cooma Rd (ELP to Googong)	6L					✓	

Table 4-2: Intersection Improvement Timing

Intersection Improvement Timing							
Location	**Item**	**By 2024**	**By 2027**	**By 2031**	**By 2036**	**By 2041**	**By 2046**
Yass / Ellerton / Bungendore	Traffic Signals		✓				
Canberra / Cameron / Campbell	Traffic Signals			✓			
Lanyon / Southbar	Traffic Signals			✓			
Yass / Silva / Waterloo	Ban Right Turn					✓	
Yass / Shropshire	Ban Right Turn					✓	
Yass / Hincksman / Endurance	Traffic Signals					✓	
Bungendore / Thurralilly	Ban Right Turn		✓*****				
Canberra / Kealman	Ban Right Turn		✓*****				
Old Cooma / Wickerslack	Upgrade				✓*****		
Canberra / Gilmore	Traffic Signal upgrade					✓*****	
Kings Hwy / Captains Flat	Roundabout Upgrade				✓*****		

✓***** Possible improvement based on one period deficiency but not included in full analysis

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We care about the communities we serve—because they're our communities too. This allows us to assess what's needed and connect our expertise, to appreciate nuances and envision what's never been considered, to bring together diverse perspectives so we can collaborate toward a shared success.

We're designers, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe.

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