Morisset Transport Scoping Study

Lake Macquarie City Council

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P5629.001R Morisset Transport Scoping Study	R. Tuputala / B. James / E. Seconds	D. Bitzios	B. James	27/06/2022	Tom Boyle - Lake Macquarie City Council tboyle@lakemac.nsw.gov.au

EXECUTIVE SUMMARY

Study Background, Scope, and Vision

The purpose of this Scoping Study is to inform preparation of the Morisset Place Strategy and the revision of the Morisset Structure Plan. This study included:

- A review of the relevant background information
- An assessment of 'Movement and Place' aspects of the Morisset Town Centre and its surrounds
- Identification of opportunities for network upgrades including for testing using strategic traffic modelling (the Hunter STFM)
- Modelling the proposed network upgrades (for upgrade types where this was possible) under three (3) future year growth scenarios (Business as Usual (Base), Low Growth and High Growth)
- Interpretation of outputs and the growth projections generally, to understand where further analysis and assessment is required
- Completing 'high-level' cost estimates of network upgrade proposals
- A preliminary review of public transport needs, heavy vehicle routes and local parking needs to inform the preparation of an outline scope for a future Multi-Modal study.

The primary purpose of this study is to set the scene for a Multi-Modal Integrated Land Use and Transport Plan which is to follow. It is focused on the Morisset Town Centre as the key transport hub for the region and considers the influences of growth in surrounding areas to the Town Centre.

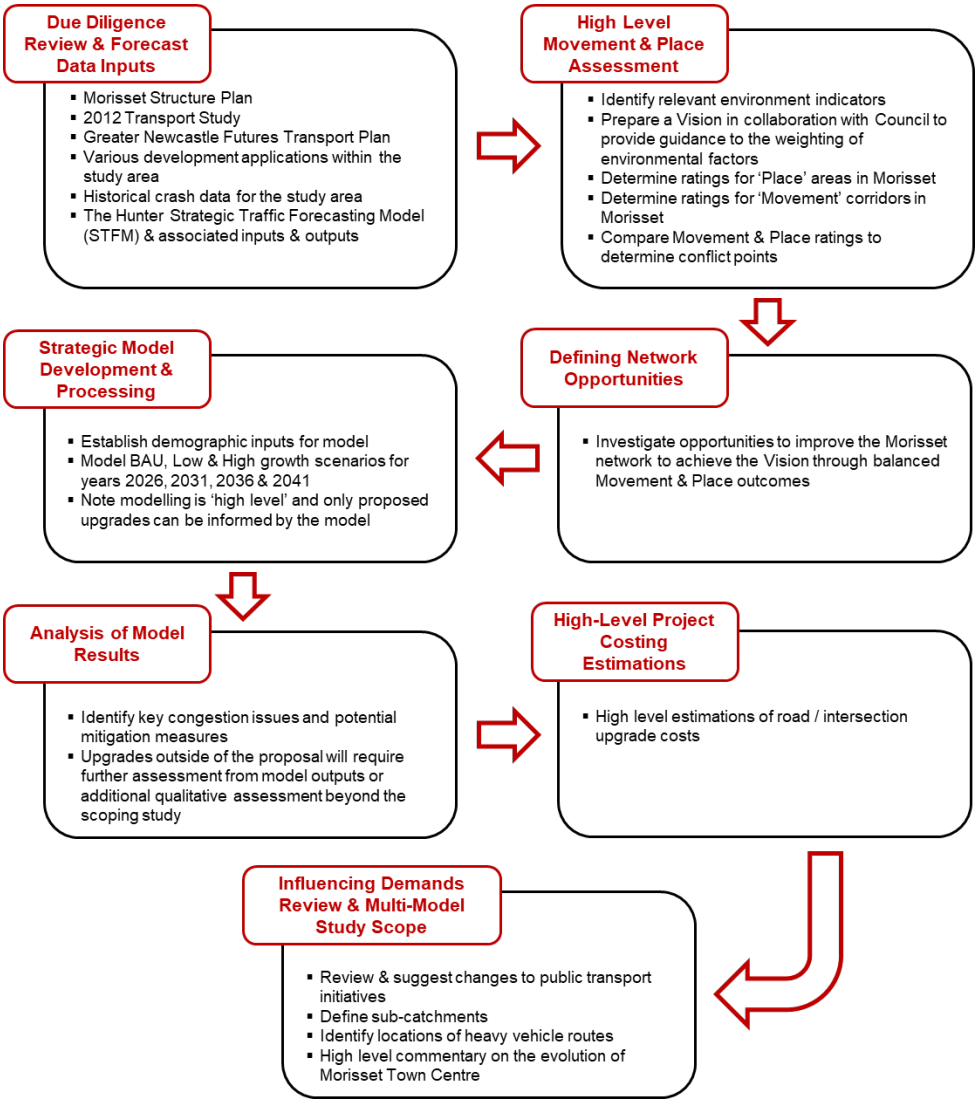


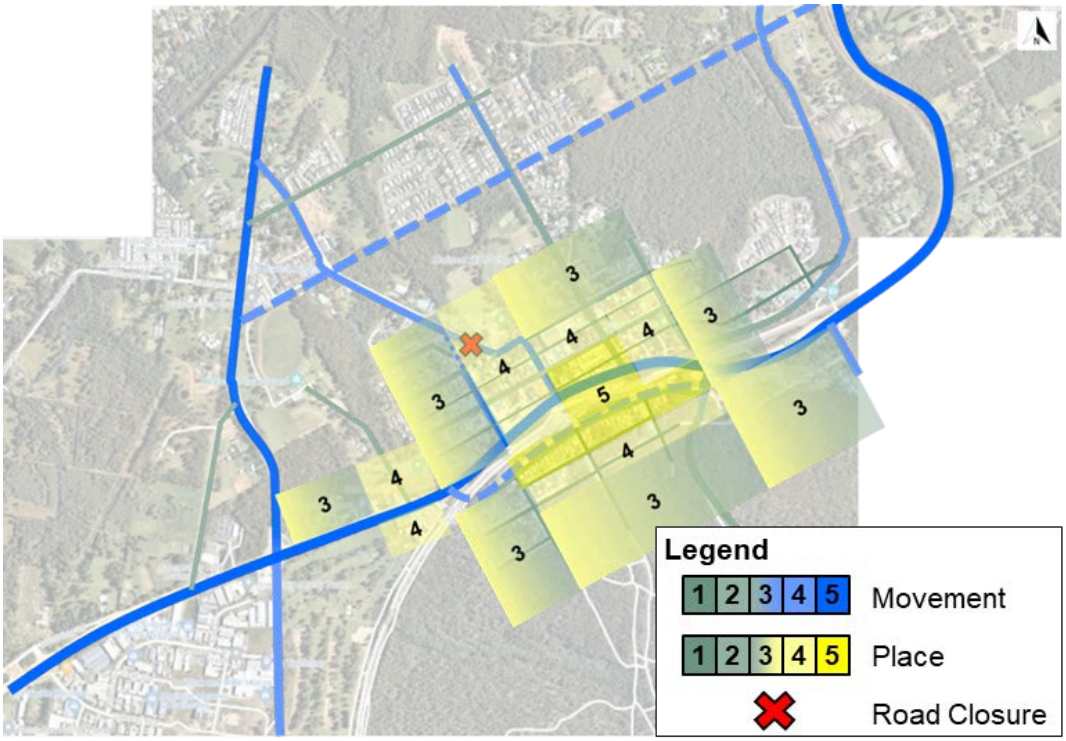
Figure E.1: Study Scope and Process

Investigation and Analysis

Both local growth and 'through' traffic growth on the region's major road network (i.e. Main Road (217) / Dora Street) connections have been considered, along with other regional centres and the Pacific Motorway.

The areas of potential conflict for the future of Morisset transport network can be visualised by overlaying the Movement and Place ratings established with key stakeholders, as shown in Figure E.2. Areas with both high 'Place' and high 'Movement' sites are those with the highest conflict; shown as Dora Street through the Town Centre.

Other key conflict locations are those with a key role in the future growth of the Centre, such as the Golf Course and entertainment centre, and schools / parks on the northern edge. Movement or Place needs at these locations should be balanced to provide both a safe and more attractive centre as growth occurs.



**This Scoping Study has conducted a high-level movement and place assessment only to inform potential network improvements. More detailed Movement & Place assessment should be undertaken as part of future planning studies with a focus on the Place value of local centre streets.*

Figure E.2: Movement and Place Conflicts

Key conflict points identified to have both high Movement and high Place values include:

- Dora Street (generally) through the Morisset Town Centre
- Dora Street / Morisset Country Club intersection
- Areas in proximity of the Morisset Train Station (along Dora Street and Macquarie Street)
- Station Street and Bridge Street.

Doyalson Street also has the potential for conflicts between Movement and Place due to the closure of Kahibah Street for the new town park, however, the closure will likely reduce vehicle movements on Station Street and reduce these conflicts.

Several network upgrades were identified to manage these conflicts and included in the three modelled growth scenarios. Noting that, while a range of active transport, intersection, road link, and other opportunities were identified, only those with ***direct*** road link changes were able to be tested in the STFM, as shown in Table E.1.

Table E.1: Upgrade Works Modelling by Scenario

Growth Scenario	Upgrades tested in the STFM
Base Growth	Closure of Kahibah Street
	Two lanes each way on approach to the Town Centre (Mandalong Road and Dora Street)
Low Growth	Closure of Kahibah Street
	Two lanes each way on approach to the Town Centre (Mandalong Road and Dora Street)
	Town Centre bypass via Macquarie Street, connecting to Dora Street at Stockton Street and Wharf Street
	40km/h speed zone for the Morisset Town Centre
High Growth	Closure of Kahibah Street
	Two lanes each way on approach to the Town Centre (Mandalong Road and Dora Street)
	Town 'bypass' via Awaba Street, including Awaba Street capacity upgrade and increase in speed to 70km/h
	30km/h HPAA in main pedestrian areas of Morisset Town Centre
	40km/h speed zone for the wider Morisset Town Centre
	One-way circulation in the Town Centre via Short Street, Yambo Street and Station Street (in an anti-clockwise direction)

The transport model zones in the Hunter STFM are much larger than the identified growth precincts and had to be disaggregated into smaller zones based on a combination of meshblock zones, the spatial areas used for the Place scoring, and existing land uses to sensitively model the growth areas. Similarly, the model network was too coarse and had to be detailed further in and around the Town Centre.

First principles-based traffic generation was applied to the disaggregated zone demographic data from the base STFM matrices to enable traffic demands to be created for each growth scenarios for 2026, 2031, 2036 and 2041 and for both AM and PM peak periods.

In summary, interpretation of the network modelling outputs revealed:

- Base Case:
  - Fishery Point Road and Campview Road requires further investigation to identify extent of road capacity and intersection improvements are required (2036)
  - Mandalong Road/Gateway Boulevarde intersection can operate successfully, inclusive of the proposed Life & Home major development
  - The Dora Street / Freemans Drive roundabout requires an upgrade (2026).
- Low Growth Scenario:
  - Wyee Road, Freemans Drive, Awaba Street and Main Road (217) requires further investigation (2036)
  - Mandalong Road/Gateway Boulevarde intersection requires upgrade
  - The Macquarie Street upgrade does attract the traffic passing through the Town Centre (2041)
  - The Dora Street / Freemans Drive roundabout requires an upgrade (2026).
- High Growth Scenario:
  - Wyee Road, Freemans Drive, Main Road (217), and Dora Street requires further investigation (2036)
  - Mandalong Road/Gateway Boulevarde intersection requires upgrade
  - The Awaba Street capacity improvement provides an effective alternative route away from the Town Centre for northbound traffic (2041)
  - The Dora Street / Freemans Drive roundabout requires an upgrade (2026).

A key feature of the High Growth scenario was to make an Awaba Street improvement for the east-west through traffic connection, diverting traffic away from the Town Centre. The results from this scenario showed trips travelling north along Campview Road and onto Main Road (217) would take Awaba Street. Given that Awaba Street is a residential street, Council requested a 'sensitivity test' be modelled to make the Awaba

Street's capacity improvement less attractive to east-west traffic and more focused on new trips to/from the north (noting that heavy vehicle access to this route would be restricted).

The High Growth Alternate Route Sensitivity Test Scenario showed that traffic is diverted away from Dora Street and onto Newcastle Street and Stockton Street, 'splitting' though traffic onto Awaba Street and through the Town Centre. This 'downgrading' of the proposed through traffic role of Awaba Street provided a reasonable balance between attracting too much traffic into this residential area and moving too much 'passing trade' off Dora Street.

Modelling Conclusions and Recommendations

Low Growth Scenario Modelling Recommendations

The works identified via interpretation of the modelling results for the Low Growth Scenario were:

- **Intersection upgrades:** Dora Street / Mandalong Road / Wyee Road / Freemans Drive, Awaba Street / Freemans Drive, Awaba Street / Main Road (217), and Fishery Point Road / Main Road (217)
- **Four Laning:** Doyalson Street and Dora Street
- **New Bypass:** Via Macquarie Street
- **Posted Speed Limit Changes:** 40km/h on Dora Street, Bridge Street, Station Street and Yambo Street.

These items are shown in Figure E.4.

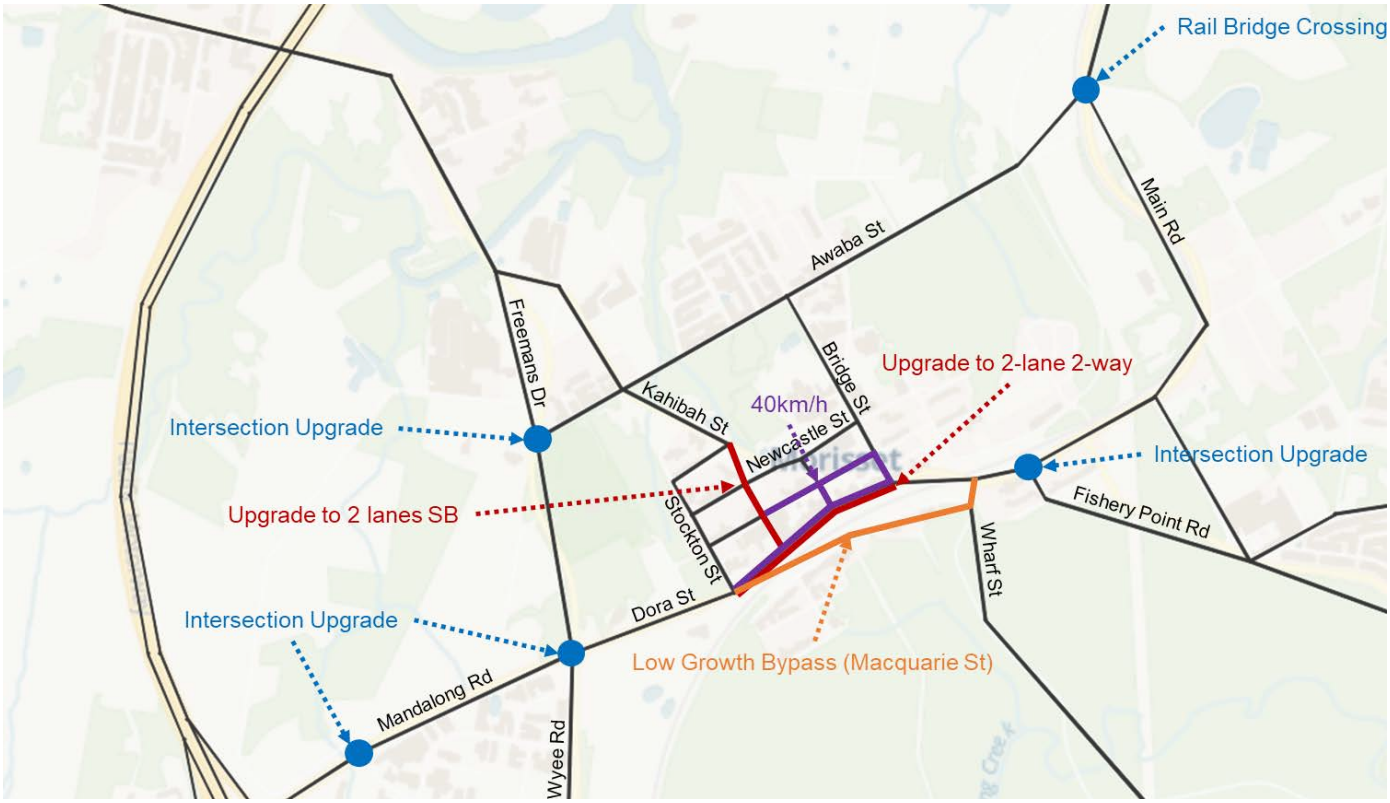


Figure E.4: Low Growth Scenario Recommendations

High Growth Scenario Modelling Recommendations

The works identified via interpretation of the modelling results for the High Growth Scenario were:

- **Intersection upgrades:** Dora Street / Mandalong Road / Wyee Road / Freemans Drive, Awaba Street / Freemans Drive, Awaba Street / Main Road (217), and Fishery Point Road / Main Road (217)
- **Four Laning:** Doyalson Street and Dora Street
- **New Alternate Route:** Via Awaba Street
- **Posted Speed Limit Changes:** 40km/h on Dora Street, Stockton Street, Doyalson Street, Station Street, Yambo Street, Bridge Street and 30km/h on Yambo Street and Station Street
- **One-way circulation:** Yambo Street and Station Street as an anti-clockwise loop.

These items are shown in Figure E.5.

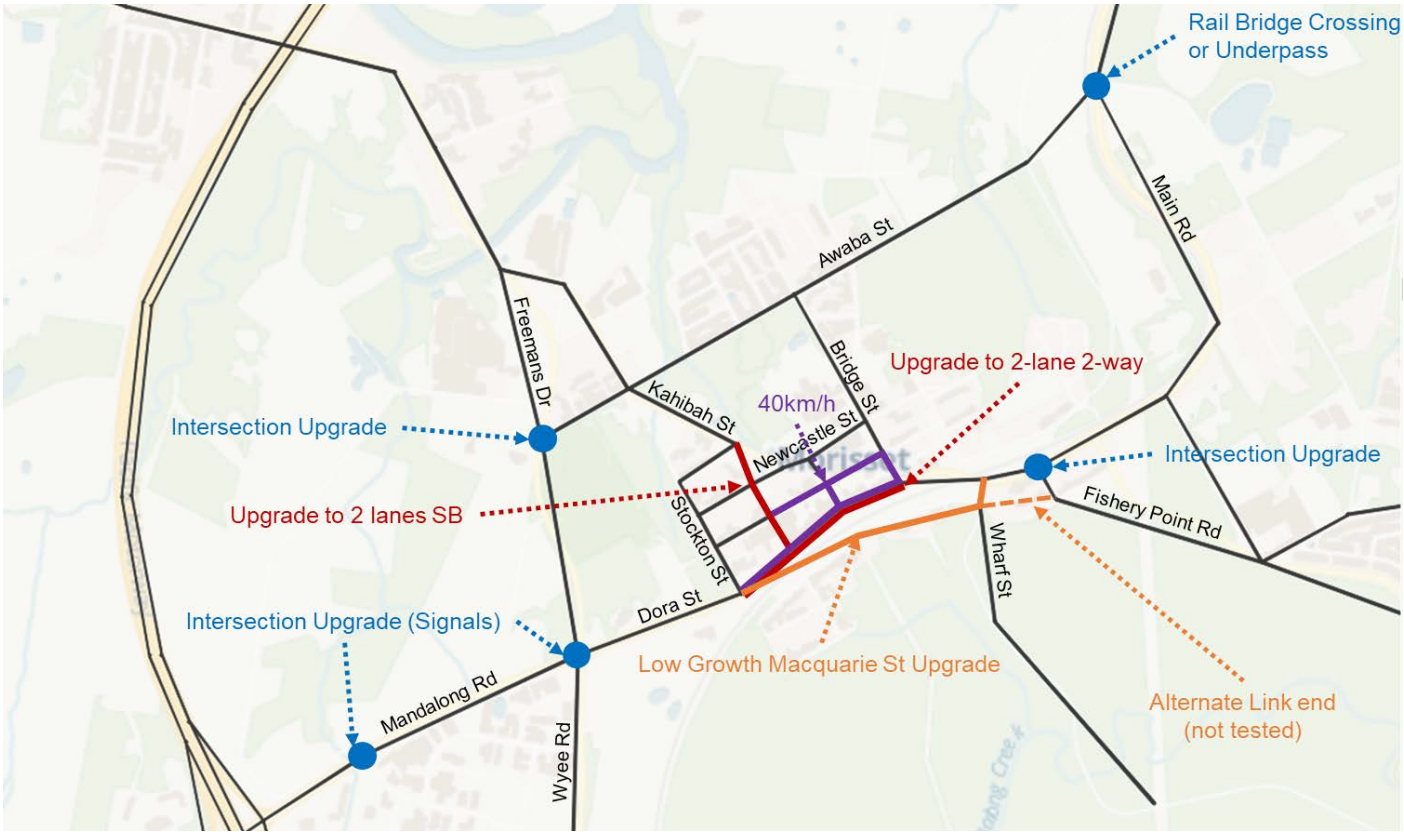


Figure E.5: High Growth Scenario Recommendations

The complete list of potential upgrade works for further testing and evaluation (including those items not able to be modelled) are listed at **Appendix D** along with indicative implementation timeframes.

Potential Upgrade Works

The following figures summarise the key upgrade proposals for each of the scenarios considering:

- Outcomes of the Movement and Place assessment
- Upgrade opportunities for the town centre and surrounds based on both Movement and Place considerations and outcomes from Workshops with Lake Macquarie Council
- Outcomes and recommendations from the modelled network scenarios
- Proposed upgrades already within Council's planning documents.

Only 'significant' Council, State and 'Scoping Study suggested' projects from the tested scenarios have been included below.

Base Growth Scenario

Figure E.7 shows a map of key Base Growth projects, noting the Kahibah Street closure is included within the figure for reference, though it is a 'confirmed' project and has been excluded from the potential upgrade works lists and costs in this Scoping Study.

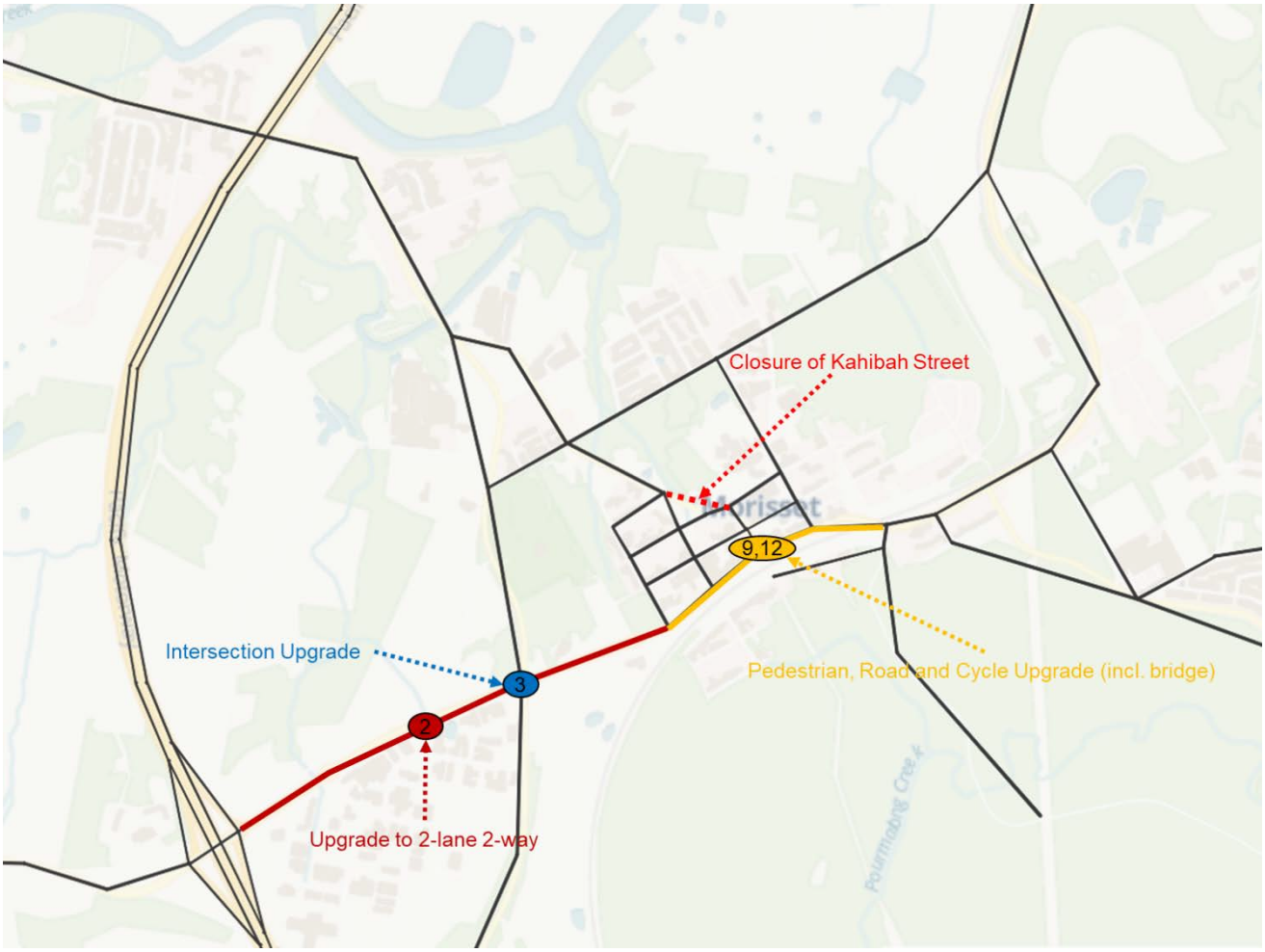
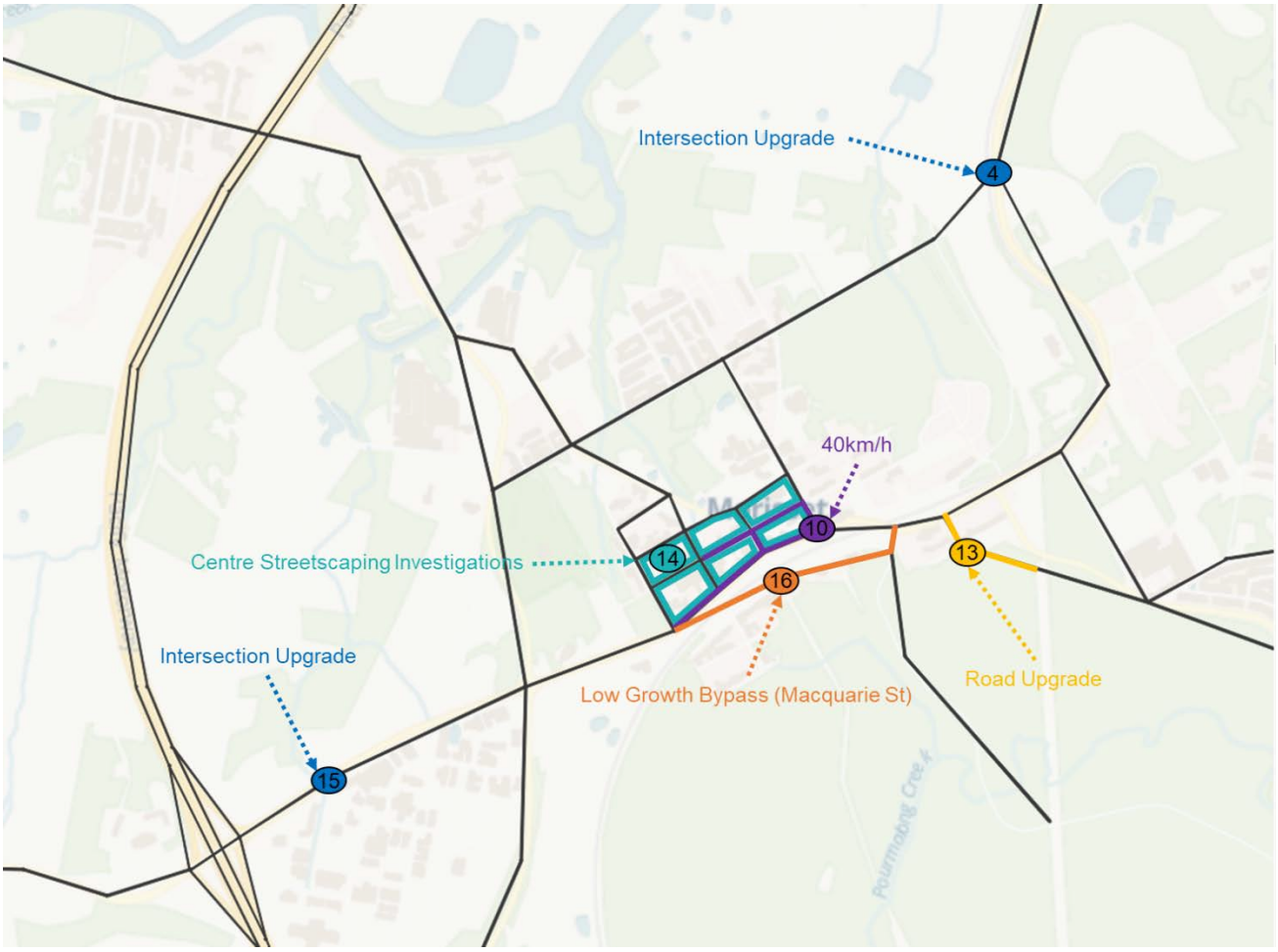


Figure E.6: Base Consolidated Key Upgrade Proposals

Estimated total costs for the key Base projects is $76,250,000 (including $73,000,000 committed funding for the 2-laning of Mandalong Road and upgrade of the Mandalong Road / Freemans Drive & Mandalong Road / Gateway Drive intersections).

Low Growth Scenario

Figure E.7 shows a map of key Low Growth projects, noting that only projects additional to those for Base are shown.



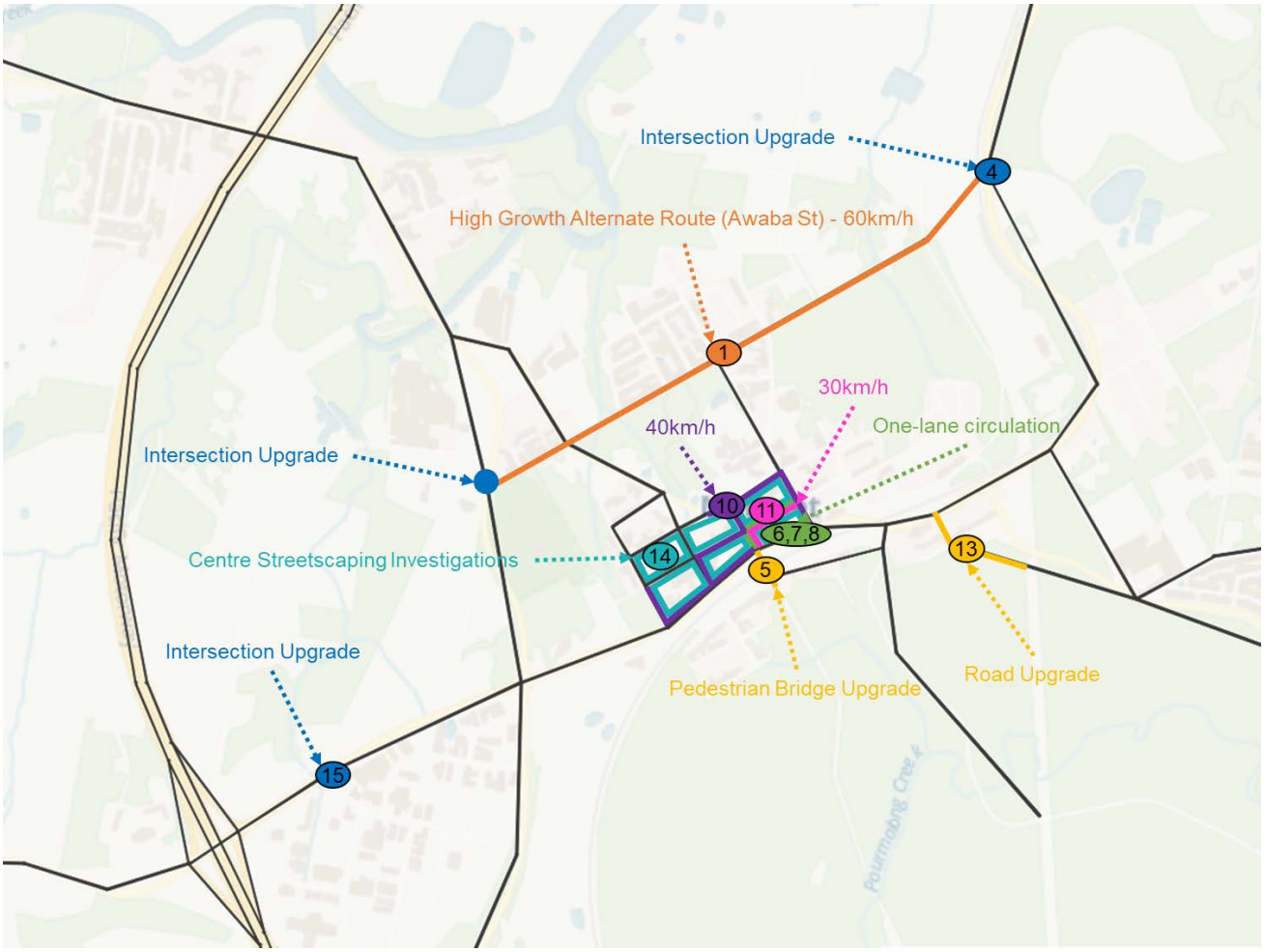
**It is understood that Item 15 to be completed as part of Mandalong Road upgrade project (Item 2 identified within Base scenario)*

Figure E.7: Low Growth Consolidated Key Upgrade Proposals (additional to Base projects)

Estimated total costs for the key Low Growth Scenario projects is $51,600,000 (excluding Base projects).

High Growth Scenario

Unless a project shown directly replaces or supersedes another (e.g. Project 16 by Project 1) then capacity improvement projects from the Low Growth Scenario should be assumed to be included when considering High Growth projects. Figure E.8 shows a map of key High Growth projects, noting that only projects for the scenario are shown, Base scenario projects should considered within both Low and High scenarios.



**It is understood that Item 15 to be completed as part of Mandalong Road upgrade project (Item 2 identified within Base scenario)*

Figure E.8: High Growth Consolidated Key Upgrade Proposals (Additional to Low Growth)

Estimated total costs for the key High Growth Scenario projects is $83,680,000 (excluding Base & Low Growth Scenario projects).

Supporting Advice

This study has also included a preliminary review of broader transport issues and needs to inform a future Integrated Transport Study (ITS). Key outcomes of the review included:

- Improvements should be made to the cycling and walking infrastructure with consideration to an aging demographic in the study area
- Traffic upgrades between the Town Centre and the Pacific Motorway should consider both long-term levels of access required for the entertainment centre at the edge of the Town Centre and access for heavy vehicles to the new industrial area on the northern of Mandalong Road adjacent to the motorway
- New or upgraded and consolidated off-street parking locations should be considered along Macquarie Street or at the future Entertainment Centre as growth occurs to minimise traffic circulating in the centre.

A recommended Study Process for the ITS is included at Section 6.6 of this Scoping Study.

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Tables

Figures

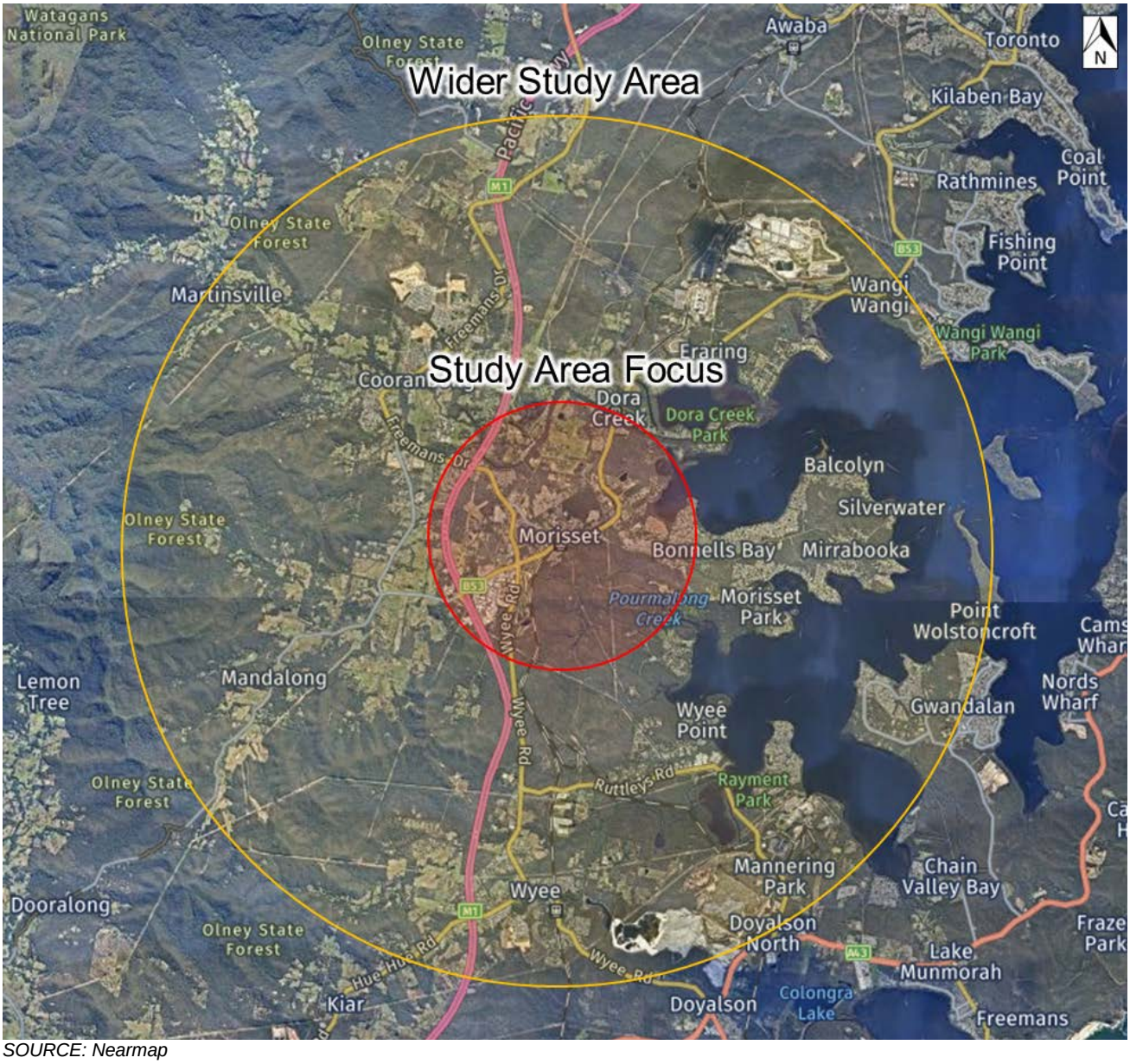
Appendices

1. INTRODUCTION

1.1 Background

Bitzios Consulting (Bitzios) has been engaged by Lake Macquarie City Council (Council) to undertake a Transport Scoping Study to inform preparation of the Morisset Place Strategy and revision of the Morisset Structure Plan. Two technical notes have previously been prepared for this study: A Due Diligence review of the relevant background information and an assessment of Movement and Place aspects of the Morisset Town Centre and its surrounds.

This Scoping Study has a focus on the Morisset Town Centre as the key transport hub for the region with the most transport activity. Due consideration has also been given to the surrounding area and its growth influences on the transport network within and surrounding the Town Centre. The study area is shown in Figure 1.1.

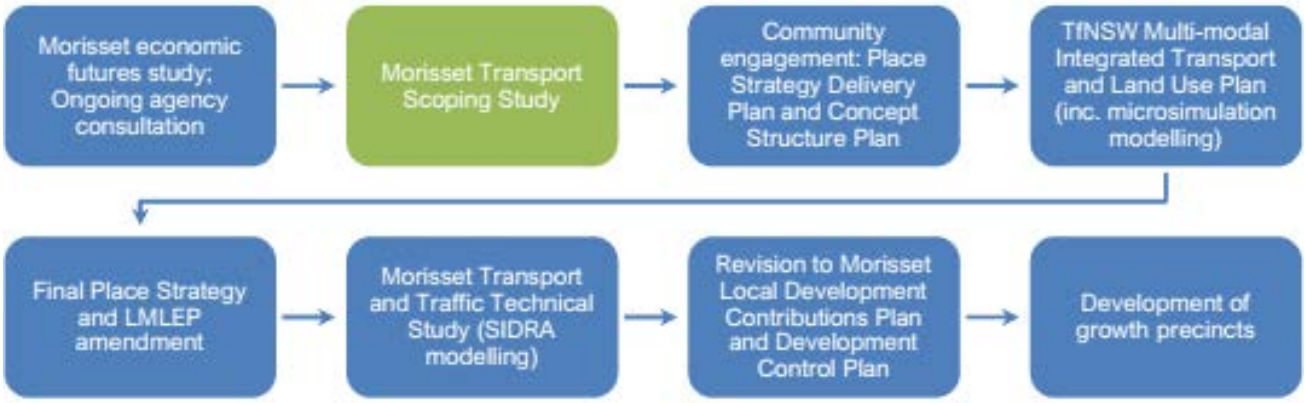


SOURCE: Nearmap

Figure 1.1: Study Area

1.2 Purpose, Approach and Study Process

Morisset is a strategic centre that sits between the major NSW hubs of Newcastle, Central Coast and Sydney. The aim of this Scoping Study is to set the scene for a Multi-Modal Integrated Land Use and Transport Plan which is to follow, as shown in Figure 1.2.



Source: Lake Macquarie City Council

Figure 1.2: Scoping Study and Subsequent Studies

Morisset has become a centralised growth area within the Hunter Region, acting as a linkage town for travellers. The vision for Morisset is to expand the central precinct for commercial and retail trade within the growing community while still providing a robust network for traffic movements to / from the region.

This Scoping Study assesses the Movement and Place aspects of the Morisset Town Centre and surrounds to inform the development of network improvement opportunities. These opportunities were subsequently modelling (where possible) under three (3) future year growth scenarios and analysed to inform what impacts changes may have and identify where further analysis and assessment is required. The study also includes a high-level costing of network upgrade opportunities as well as a high-level review of public transport, local sub catchments, heavy vehicle routes, and local parking supply challenges to inform the development of an outline scope for the future Multi-Modal study.

The approach and process taken for this study is summarised in Figure 1.3.

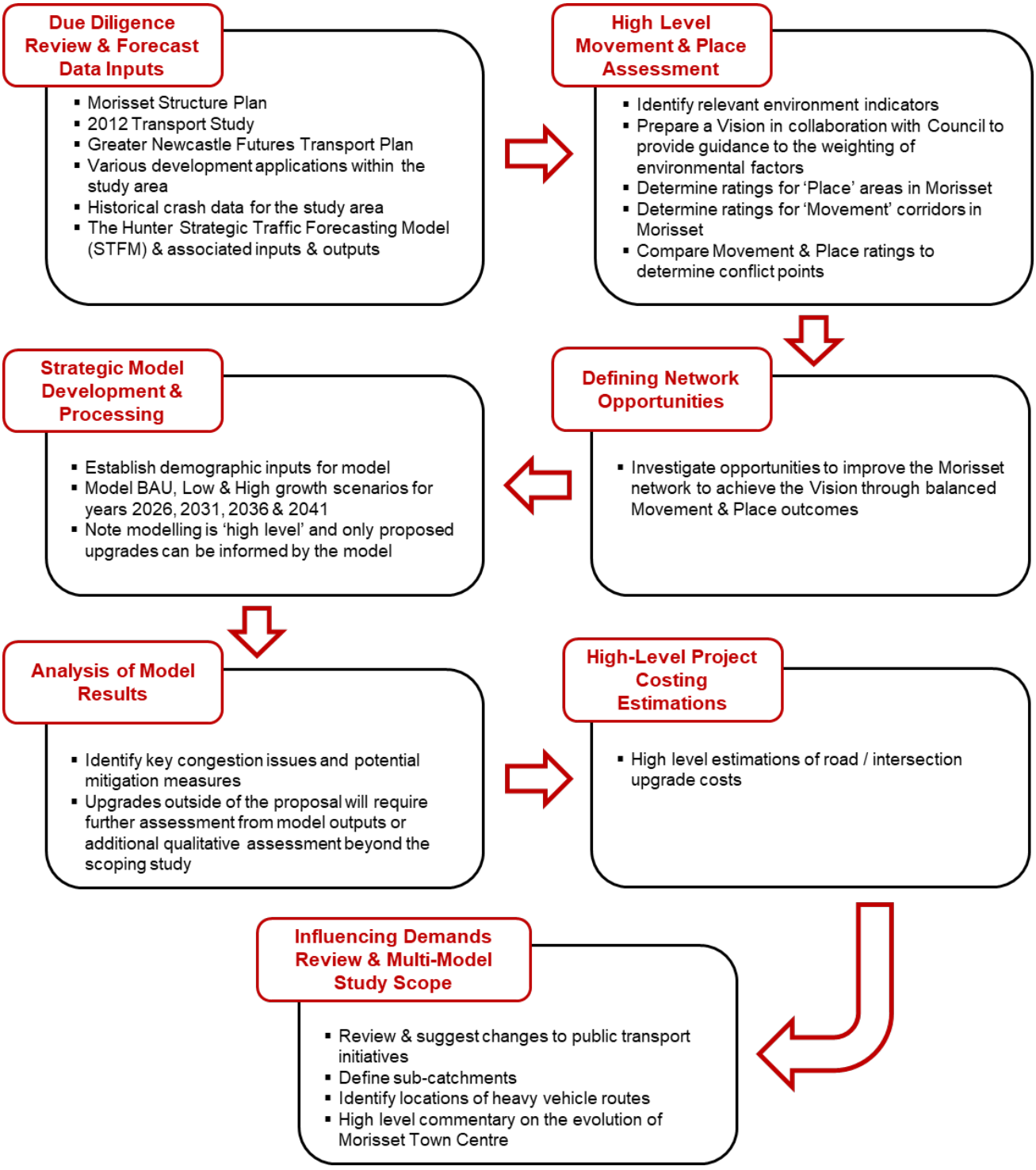


Figure 1.3: Study Scope and Process

2. INFORMATION REVIEW

2.1 Review of Growth Planning

Figure 2.1 identifies the growth precincts within Councils LGA surrounding Morisset. Most development is proposed within and near Morisset Town Centre, as shown in Figure 2.2. Growth in regional areas outside of the Town Centre includes Mandalong, Wyee, Cooranbong, Eraring, Myuna Bay Dora Creek, Bonnells Bay, Windermere Park, Morisset Park, Brightwaters, Sunshine, Silverwater, Balcolyn and Yarrawonga Park.

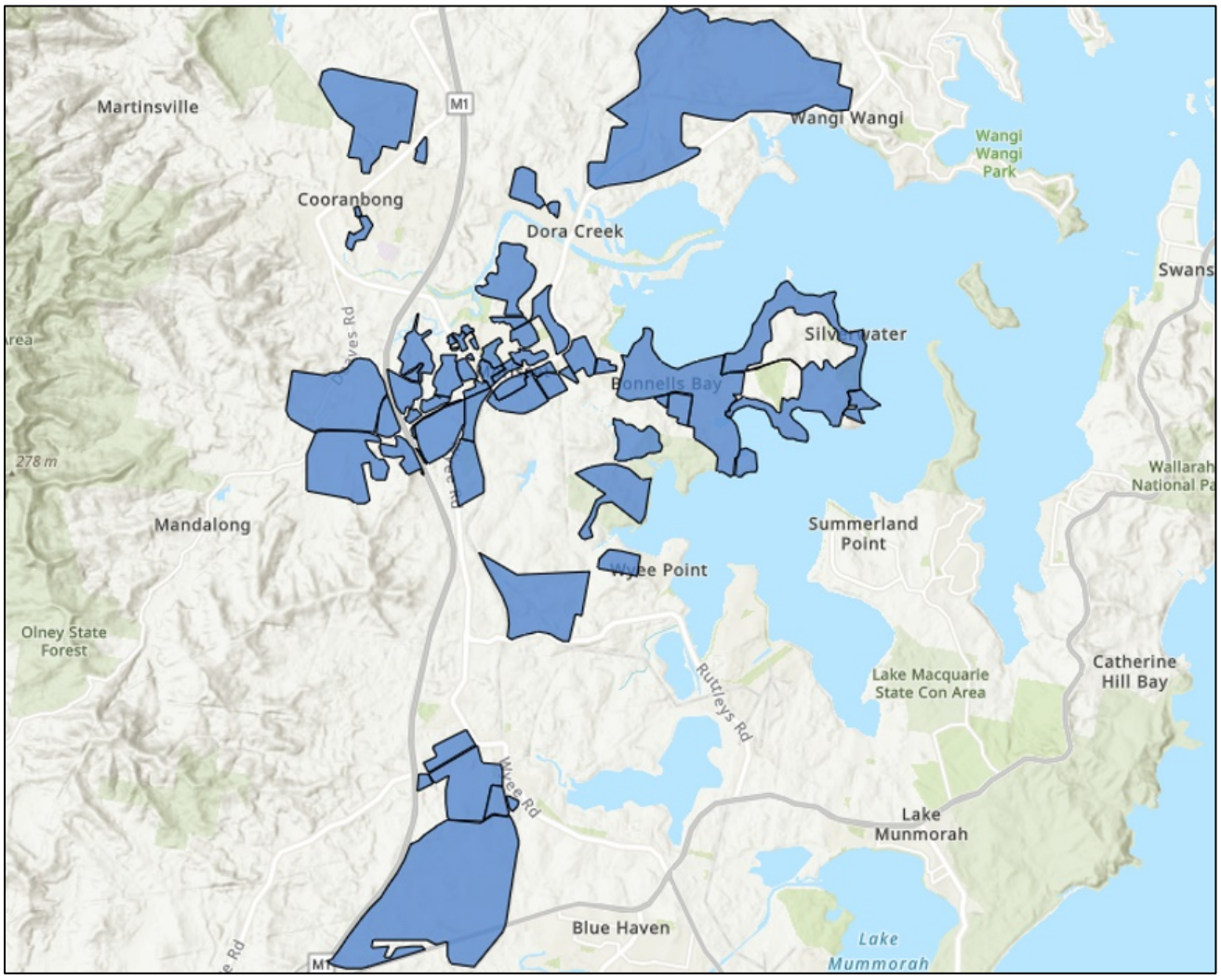


Figure 2.1: Growth Precincts Under Investigation (Region)

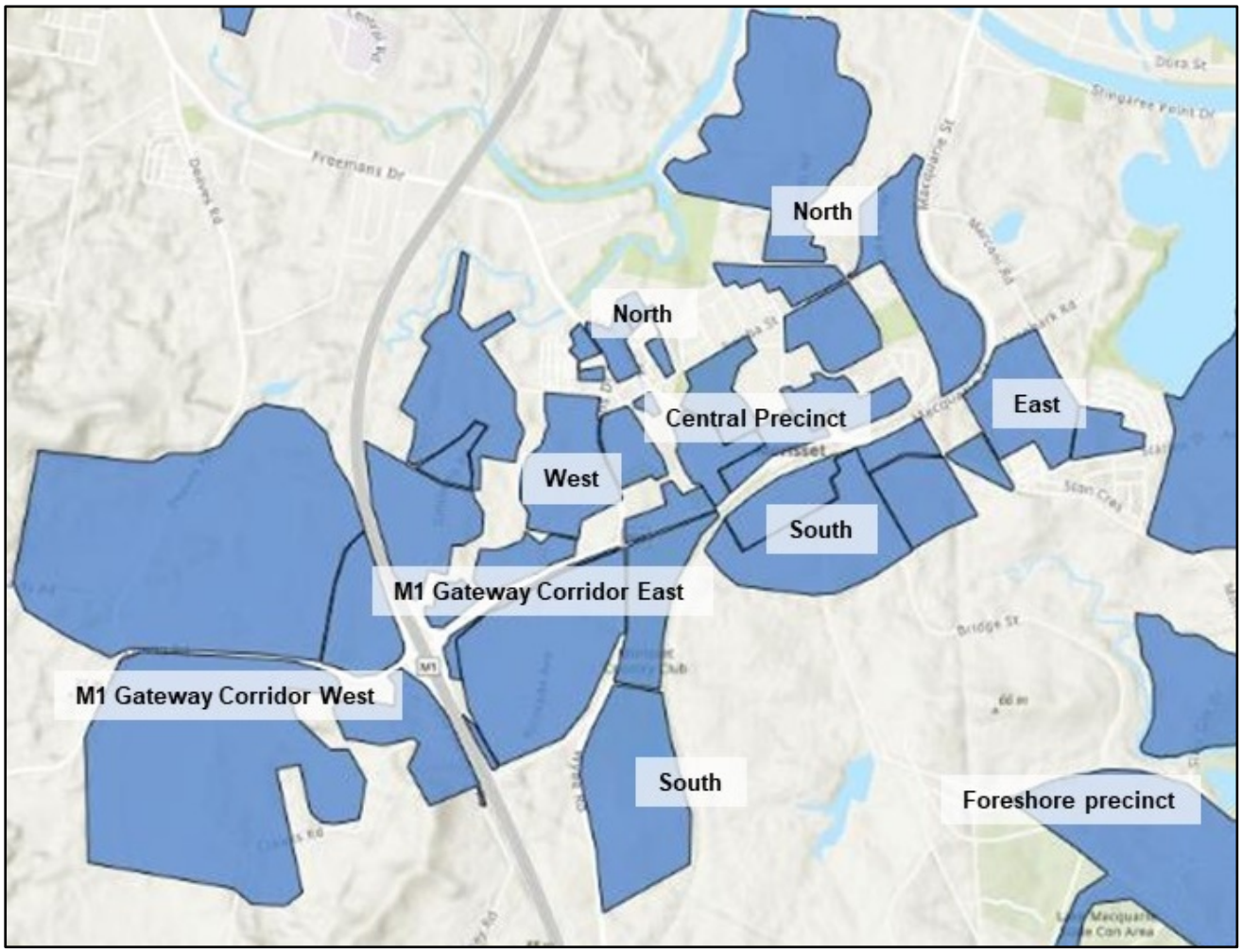


Figure 2.2: Growth Precincts Under Investigation (Near Town Centre)

Table 2.1 summarises forecast population, households, industrial Ground Floor Area (GFA), and commercial GFA growth in the broader Morisset area for the zones within the Hunter Strategic Transport Model (STFM) and Figure 2.3 provides the zoning system.

Table 2.1: Population and Employment Growth (2021 – 2041)

STFM Zone	POPULATION		HOUSEHOLDS		INDUSTRIAL (GFA, sqm)[1]		COMMERCIAL (GFA, sqm)[1]	
	Low Growth	High Growth	Low Growth	High Growth	Base Growth	High Growth	Base Growth	High Growth
6206	71	71	29	29	0	0	0	0
6207	1,341	2,644	637	1,212	0	0	0	0
6216	300	300	120	120	0	0	0	0
6217	0	0	0	0	0	0	0	0
6219	140	140	396	396	0	0	0	0
6220	5,223	5,223	2,089	2,089	0	0	0	0
6221	5,126	18,099	2,306	7,145	140,000	35,000	27,245	4,000
6222	2,494	3,390	1,365	1,729	0	0	3,500	4,000
6223	0	0	0	0	36,842	141,842	0	0
6224	483	483	193	193	0	0	0	0
6225	2,739	5,430	1,119	2,287	0	0	0	0

[1] *Subject to change based on finalisation of University of Newcastle Economic Study*

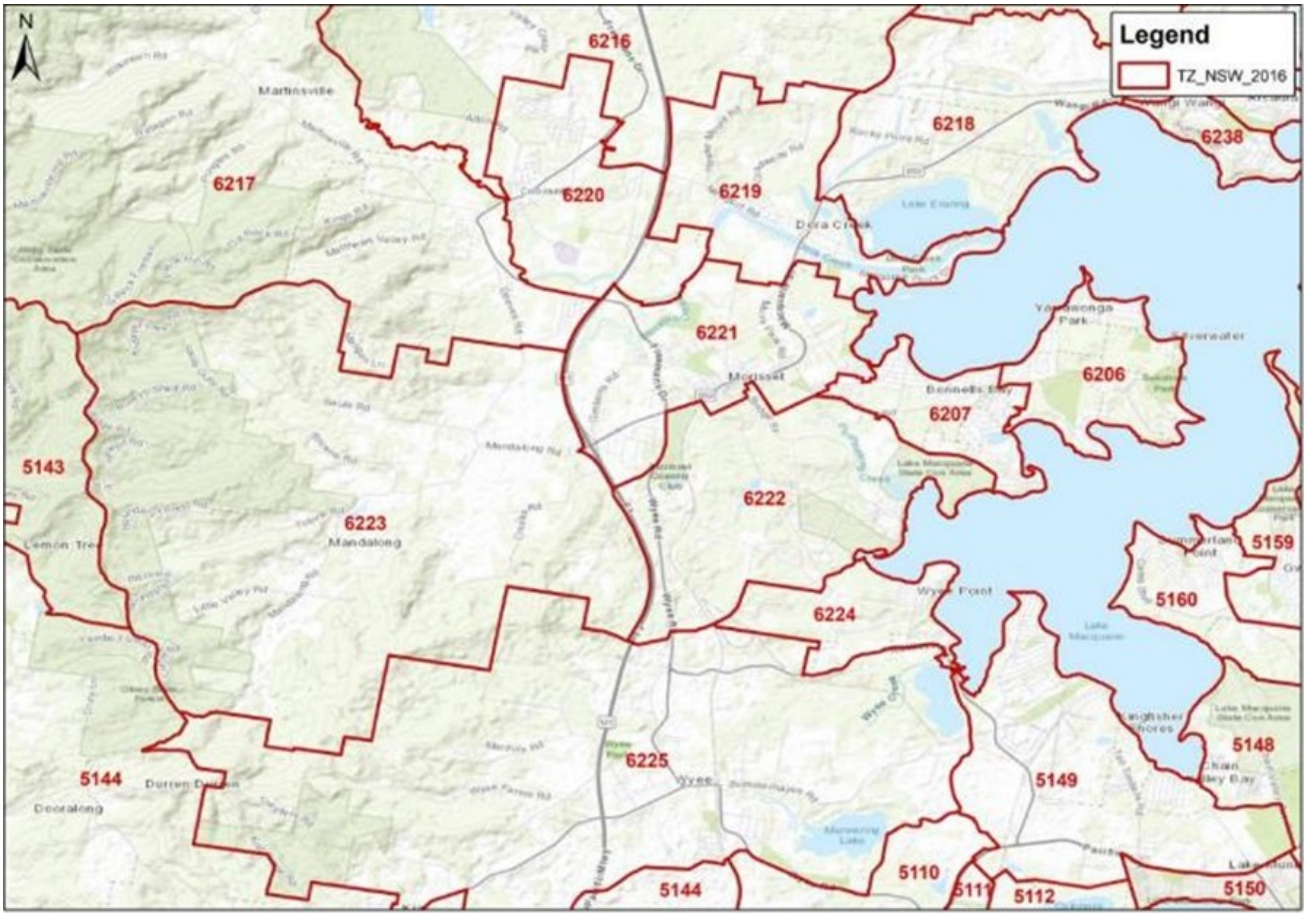


Figure 2.3: Hunter STFM Zones near Morisset

Major developments proposed within vicinity of the Town Centre are summarised in Table 2.2 and shown in Figure 2.4.

Table 2.2: Proposed Major Developments

Name	Location	Land Use / Proposed Development
Life and Home*	56-76 Mandalong Road, Morisset	Bulky goods, hardware retail, commercial retail shops and takeaway food and drink premises
-	136, 158, 170 Gimberts Road, Morisset	Industrial Subdivision
-	7 Stockton Street, Morisset	Medium Density Residential Development
Trinity Point Stage 2 Marina	81 Trinity Point Drive, Morisset Park	Stage 2 Marina extension
Cedar Mill*	126 Dora Street, Morisset	New concert venue, cafes and restaurants, tourist accommodation and 90ha aquatic play park
Biraban / Landcom*	12 Mandalong Street, Morisset	Residential Development
Radcliffe Estate Wyee	Hue Road, Wyee	Residential Development
Gimberts	138 Gimberts Road, Morisset	Industrial Precinct

**Included in low and high growth scenario, not included in base case scenario.*

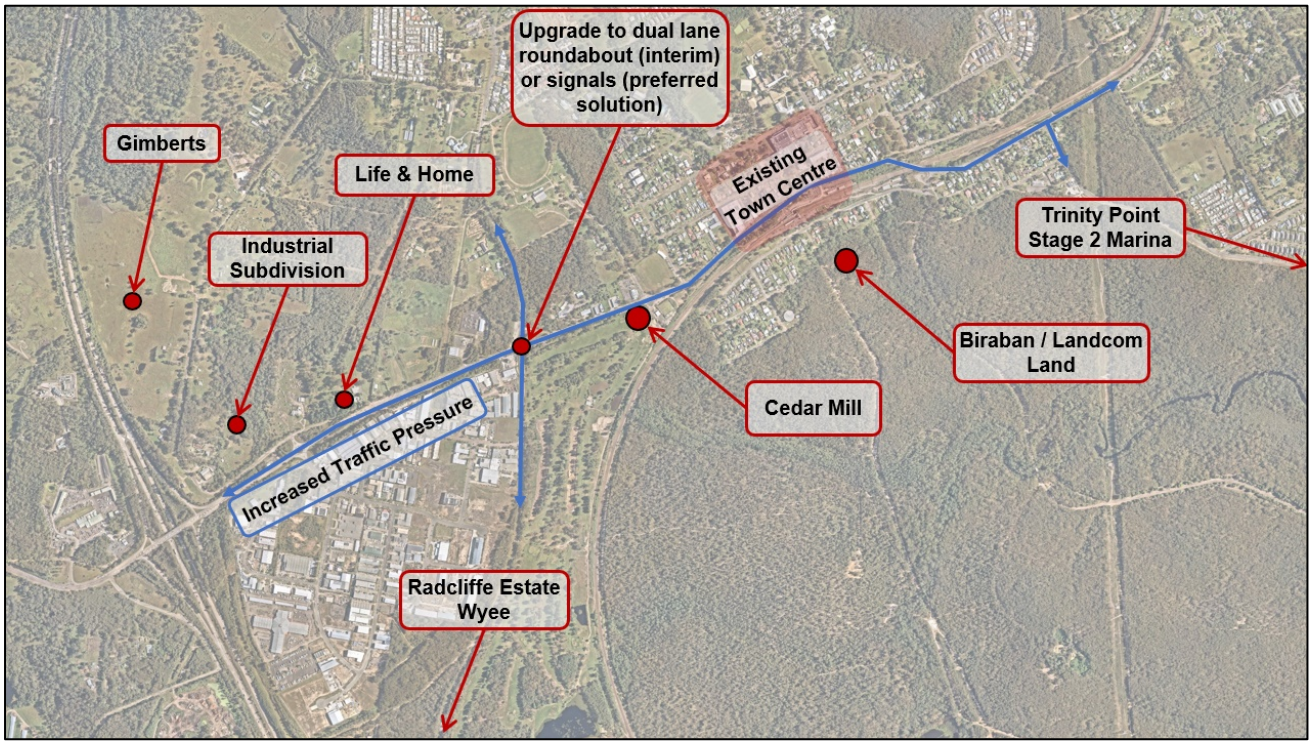


Figure 2.4: Current Structure Plan and Development Proposals

Several industrial developments such as Life and Home, Gimberts and 170 Gimberts Road are proposed within proximity to the M1 and accessed via the Mandalong Road / Gimberts Road / Gateway Boulevard roundabout.

The Dora Street / Wyee Road / Freemans Drive single lane roundabout currently experiences long queues during peak hours and, considering the level of proposed development near it, an interim upgrade of it to two circulating lanes will be required until the intersection can be signalised.

2.2 Review of Traffic and Transport Planning

2.2.1 Council Proposals

Figure 2.5 illustrates Council's road and intersection upgrade proposals in and near the Morisset Town Centre, by source and status.

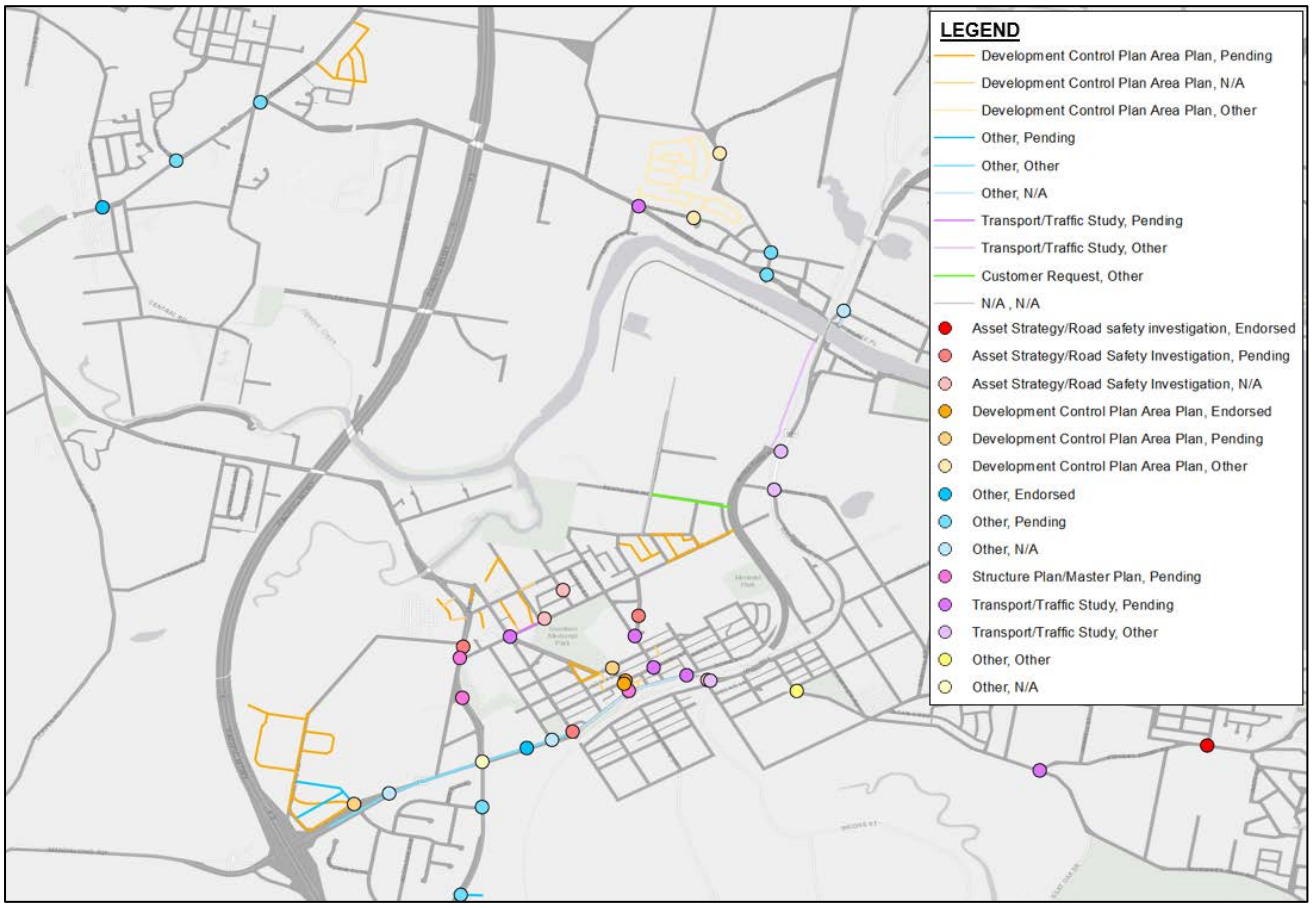


Figure 2.5: Upgrade Proposals by Source and Status

Table 2.3 summarises the proposed intersection and crossings upgrade proposals by source and status. There are a total of 38 proposed upgrades with five (5) endorsed for implementation, 20 noted as 'pending' and 13 with no official status.

Table 2.3: Intersections and Crossings Upgrade Proposals by Source and Status

Source	Endorsed	Pending	None	TOTAL
Asset Strategy/Road safety investigation	1	3	3	**7**
Development Control Plan	2	2	2	**6**
Other	2	6	5	**13**
2008 Structure Plan/Master Plan	0	3	0	**3**
2011 Transport/Traffic study	0	6	3	**9**
TOTAL	**5**	**20**	**13**	**38**

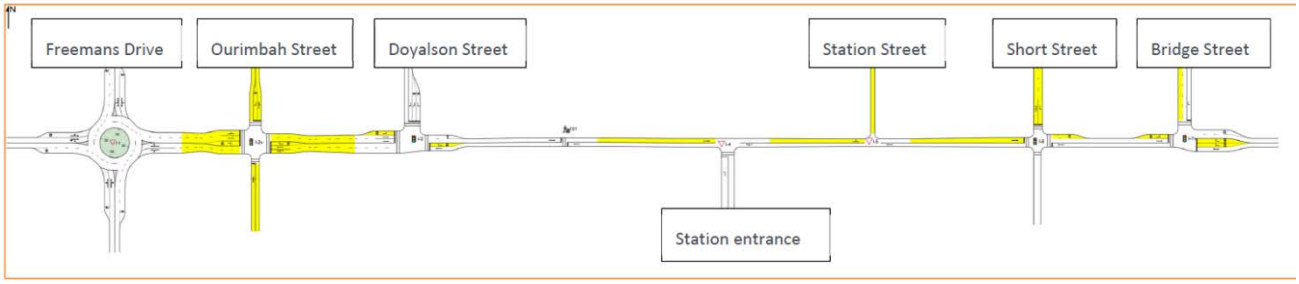
Table 2.4 summarises the proposed roads and laneways for the study area by source and status. There are a total of 55 proposed roads and laneways upgrades with 28 noted as 'pending' and 27 with no official status.

Table 2.4: Roads and Laneways Upgrade Proposals by Source and Status

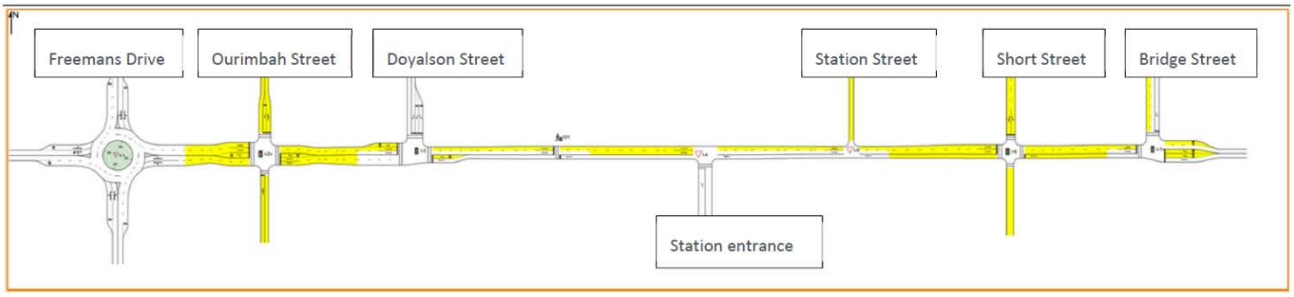
Source	Pending	None	TOTAL
Customer Request	0	1	**1**
Development Control Plan Area Plan	24	21	**45**
Other	3	4	**6**
2011 Transport/Traffic study	1	1	**2**
TOTAL	**28**	**27**	**55**

2.2.2 TfNSW Planning

TfNSW has previously considered intersection upgrades and clearways along Dora Street between Freemans Drive and Bridge Street, as shown in Figure 2.6. Some of these works are required as development approval conditions whereas the clearway proposal has no current status.



AM Peak



PM Peak

Figure 2.6: Road and Intersection Upgrade Proposals by Source and Status

2.3 Traffic Data and Crash Data Analysis

2.3.1 Traffic Counts

No recent, relevant traffic counts are available from either Council or TfNSW for the study area.

2.3.2 Crash Data

Crash data for the 5-year period between January 2015 and November 2020 was provided by TfNSW for the Morisset area. A total of 173 crashes were recorded as categorised below:

- Killed/serious injury (KSI): Four (4) fatal crashes and 39 serious injuries
- Other: 42 moderate injuries, 30 minor/other injuries and 58 non-casualties (towaway).

Of the 173 crashes, 27 occurred within the Morisset Town Centre and none were KSI crashes. KSI crashes appear to have occurred mostly on the outskirts of centre / residential areas and along the motorway (i.e. roads with higher speeds). Crash locations are shown in Figure 2.7.

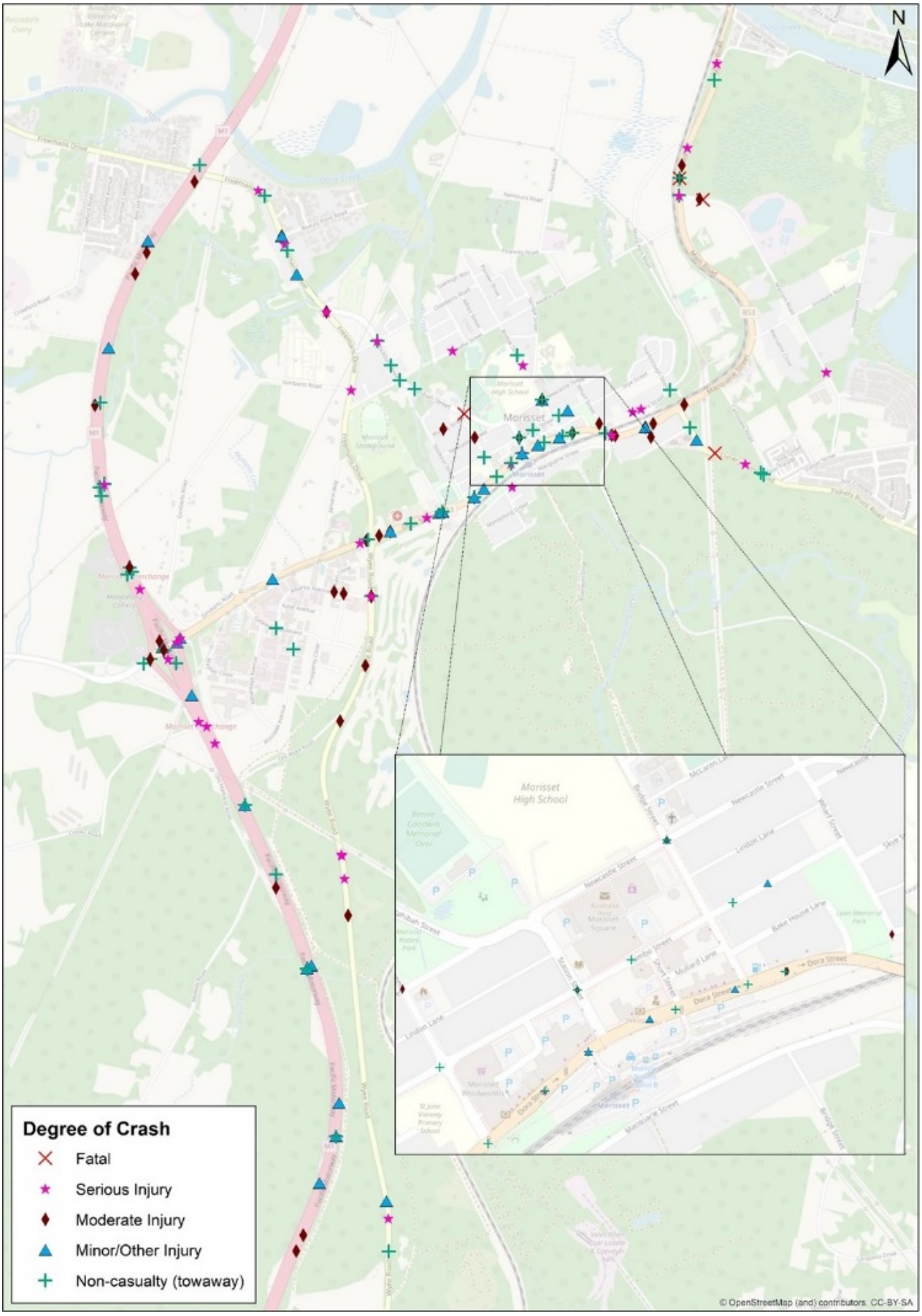


Figure 2.7: Crash Data by Severity (2015-2020)

2.4 Previous Movement and Place Assessment

A Movement and Place assessment was completed in 2018 for the Morisset Town Centre with the outputs of this process shown in Figure 2.8. Since that assessment, 'Movement Corridors' have been renamed in the TfNSW guidelines to 'Main Roads' and 'Vibrant Streets' have been renamed to 'Main Streets'.

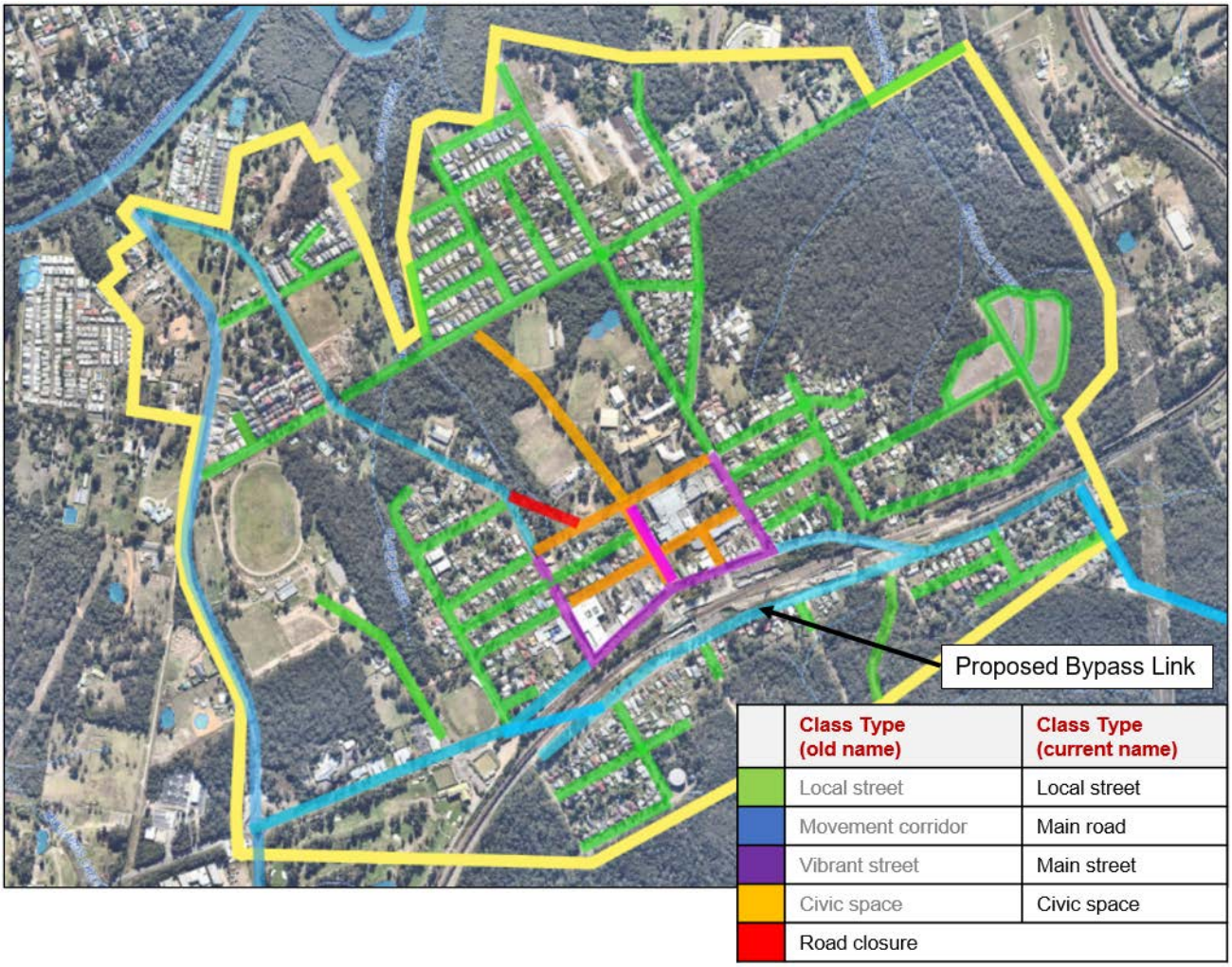


Figure 2.8: 2018 Movement and Place Street Categories

As part of the previous study, an east-west 'bypass link' was identified along the southern side of Morisset train line and connecting Dora Street to Macquarie Street. The aim of this link was to address the conflict between *Movement* and *Place* objectives along Dora Street between the Town Centre and the rail station. The bypass was intended to remove through traffic from this area. It is understood that TfNSW has completed preliminary investigations of this bypass and identified several geometrical constraints to its implementation, and that these investigations are ongoing.

Other identified potential changes to the network identified in the 2018 assessment included:

- Closing the section of Kahibah Street that connects Stockton Street to Newcastle Street / Station Street to realign Doyalson Street onto Kahibah Street
- Extending Station Street to Awaba Street as a civic space passing through the Bernie Goodwin Park and Morisset High School.

2.5 Review of the STFM

2.5.1 Growth Projections

TfNSW has provided the latest version of the Hunter STFM which was subsequently used for the modelling for this Scoping Study. The Hunter STFM zoning system within the study area is shown in Figure 2.9, overlaid by a map of Council's growth precincts.

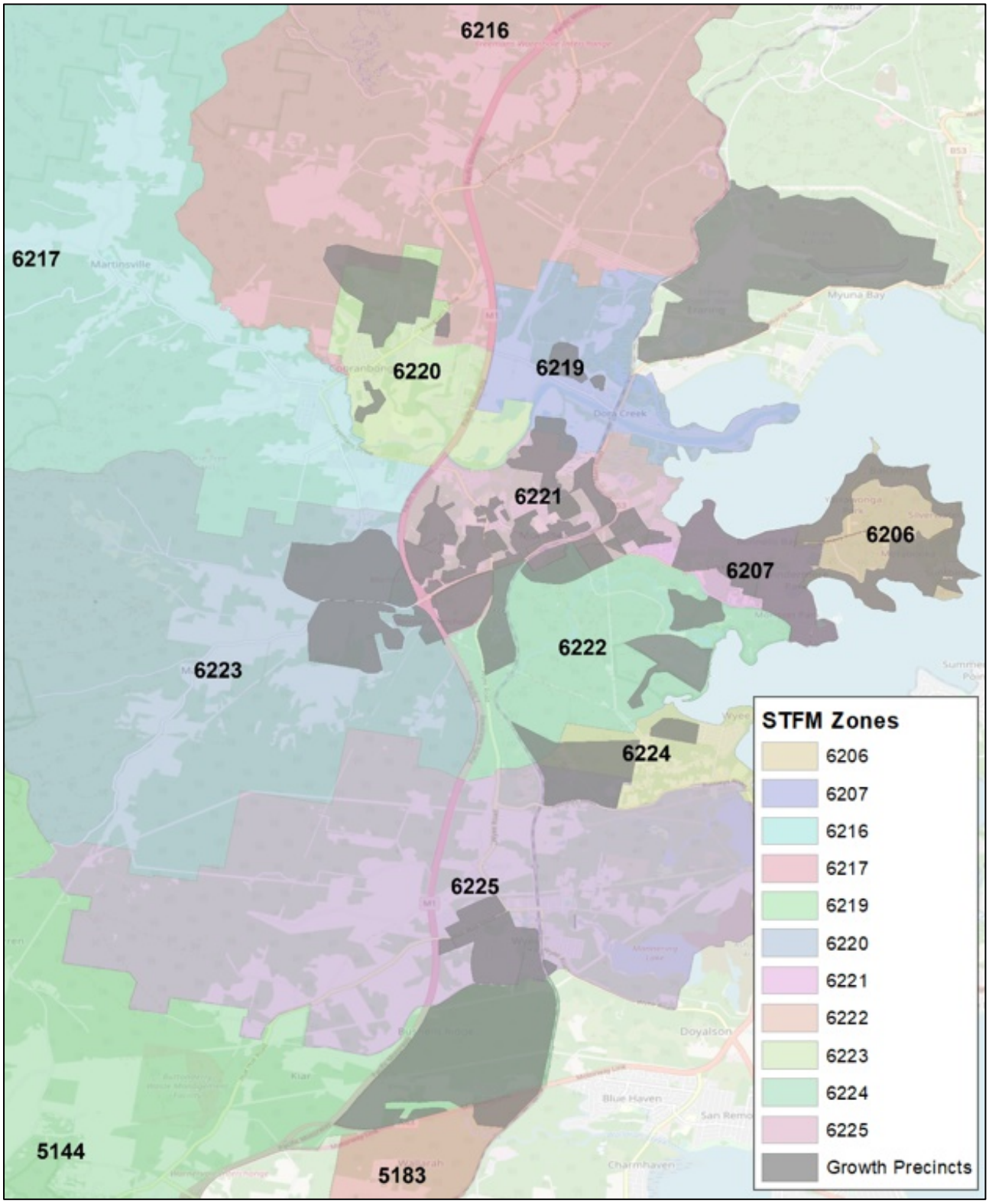


Figure 2.9: STFM Zones

As shown in Figure 2.9, the STFM zones are much larger than the identified growth precincts. The STFM zones must be disaggregated ('broken down') significantly to allow for the sensitive testing of traffic growth impacts and needs.

Table 2.5 summarises the demographics in the STFM zones detailing population, households, and employment numbers for the years 2021, 2031 and 2041.

Table 2.5: STFM Population, Household and Employment Projections

STFM Zones	Population (POP)			Household (HH)			Employment (EMP)		
	2021	2031	2041	2021	2031	2041	2021	2031	2041
6206	4,622	4,996	5,373	1,982	2,139	2,295	504	542	579
6207	4,822	5,235	5,651	1,966	2,131	2,295	599	644	689
6216	357	386	414	167	182	195	156	172	181
6217	2,718	2,988	3,247	1,115	1,223	1,324	331	355	381
6219	1,814	1,968	2,113	821	890	955	352	381	405
6220	3,342	3,672	4,011	1,308	1,421	1,528	1,421	1,523	1,653
6221	3,437	3,781	4,139	1,589	1,726	1,854	2,968	3,202	3,421
6222	0	0	0	0	0	0	382	413	439
6223	470	509	545	173	188	201	572	657	698
6224	1,580	1,719	1,848	647	704	757	187	205	218
6225	2,303	2,511	2,717	805	872	935	696	742	790

The growth projections in the Hunter STFM have been compared to a Business as Usual (Base) growth of 1% p.a. (linear), and Council's Low Growth and High Growth population scenarios as shown in Table 2.6. The data shows a major difference between Council's growth to what has been included in the STFM in the key zones of 6220, 6221 (Morisset Town Centre), 6222 and 6225.

Table 2.6: Comparison of STFM and Council's Population Growth (2021-2041)

STFM Zone	Growth (STFM)	Base Growth (1.0% p.a. linear)	Low Growth (Council)	High Growth (Council)
6206	751		71	71
6207	829		1,341	2,644
6216	57		300	300
6217	529		0	0
6219	299		140	140
6220	669		5,223	5,223
6221	702		5,126	18,099
6222	0		2,494	3,390
6223	75		0	0
6224	268		483	483
6225	414		2,739	5,430
TOTAL	**4,593**	**4,168**	**17,917**	**35,780**

2.5.2 Network Detail

The road network included in the Hunter STFM for the study area is shown in Figure 2.10.

Figure 2.10: STFM Road Network within the Study Area

Both the zoning system and the road network were far too aggregated in the Hunter STFM for meaningful assessment of future upgrade needs under various land use and street configuration options. Disaggregation of the STFM zones and network detail was required for this study and is discussed further in Section 4.

3. MOVEMENT AND PLACE AND SCENARIOS DEVELOPMENT

3.1 Scope and Vision

3.1.1 Scope

Movement and Place is a cross-disciplinary, 'place-based' approach to planning, design, delivery, and operation of transport networks. It recognises the network of public spaces formed by roads and streets and the spaces they adjoin and impact. There are four (4) street environment classifications as shown in Figure 3.1.

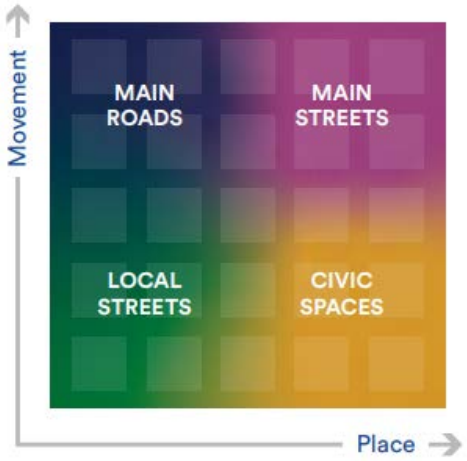


Figure 3.1: Four Street Environments

The Movement and Place outcomes were needed to inform two subsequent pieces of work:

- Identification of key movement and place conflicts under the Base Growth, Low Growth and High Growth scenarios to inform identification of treatments to manage these conflicts
- Identification of which of the conflict management measures could be tested in the STFM to inform their influence on traffic capacity needs.

The 'high-level' Movement and Place assessment process involved:

1. Identifying the relevant indicators (built environment, demographics, levels of traffic, etc), as well as future planning objectives applicable to defining Movement and Place aspects of Morisset
2. Preparing a Vision (in collaboration with Council) to provide guidance to which environment indicators have greater weight within the context of Morisset's future
3. Determining high-level 'ratings' for Place areas in Morisset
4. Determining high-level 'ratings' for Movement corridors in Morisset
5. Comparing Place and Movement ratings to determine key conflict areas
6. Investigating opportunities to improve the Morisset transport network to achieve the Vision through better balancing movement and place outcomes.

The Movement and Place assessment process is shown in Figure 3.2.

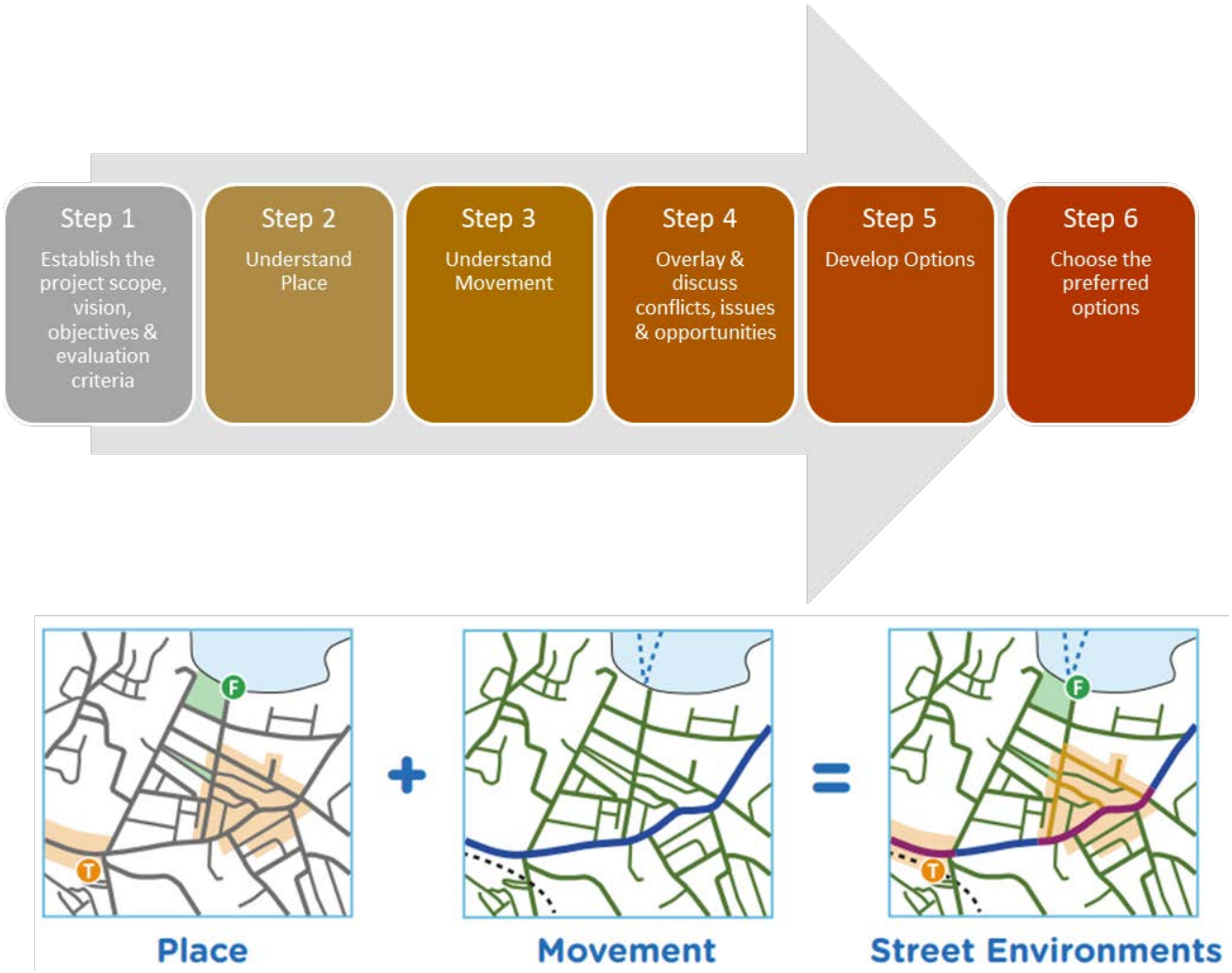


Figure 3.2: Movement and Place Process

3.1.2 Councils Vision

In collaboration with Council, an indicative vision statement for Morisset was created as follows:

*Morisset will be the **largest key significant growth area in the Hunter**, southern gateway to the Lake Macquarie foreshore and the Watagans. Morisset Central Precinct will grow to provide apartment and townhouse living taking advantage of views to the Watagans and surrounding bushland.*

*Ground-floor commercial and retail trade will support vibrant, pedestrian-oriented local streets for locals and visitors. Surrounding precincts to the north, west, south, and east will grow to provide a diverse range of medium and low-density housing choices within a **convenient 15-20 minute walk to the Central Precinct**. Residents within and surrounding the Central Precinct will enjoy access to an **inner green belt** with natural bushland corridors, open space and recreation facilities, and improved access to the lake foreshore in the east.*

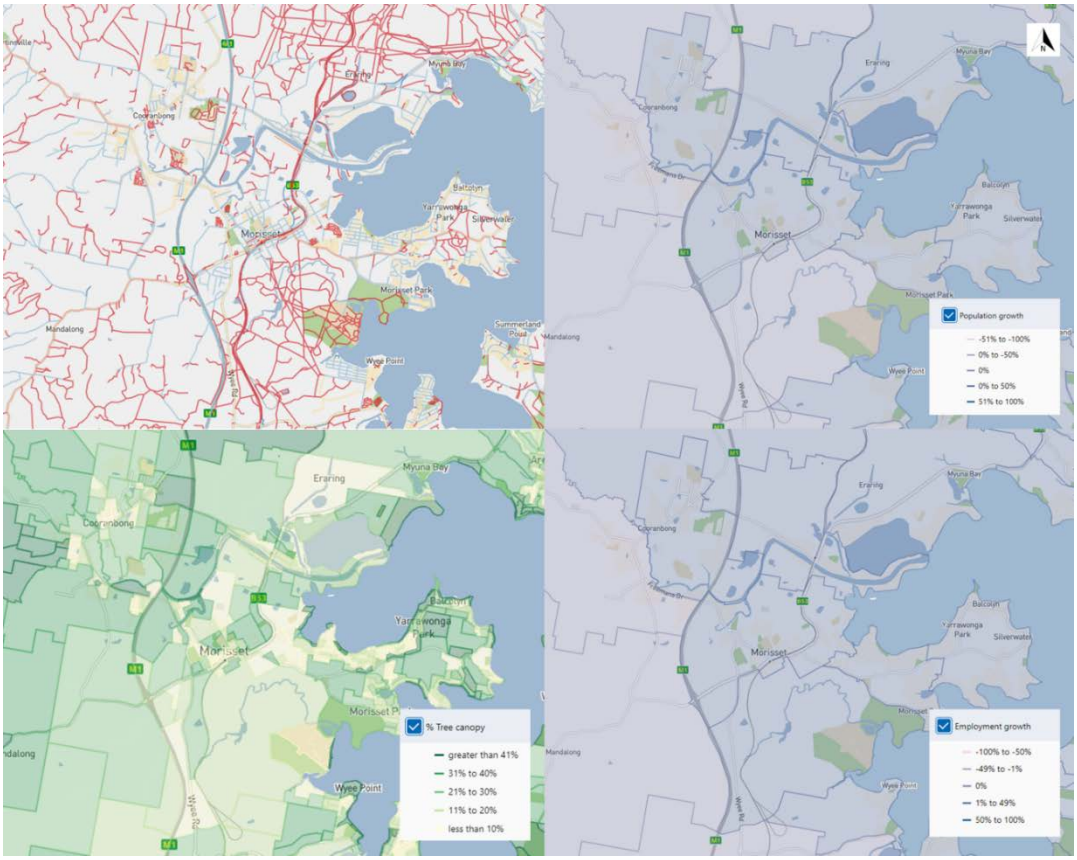
*West of the Central Precinct, the M1 Gateway Corridor Dora Street precinct will become a premiere **mixed-use destination anchored by a regional entertainment venue**, expanding the commercial area and positioning Morisset as a competitive major regional centre. Further west, the **M1 Gateway Corridor will expand to support local jobs** growth in industrial and specialised retail land uses, taking advantage of Morisset's strategic location between the Hunter, Central Coast and its proximity to Sydney.*

3.2 Built Environment Indicators

There are 36 Built Environment Indicators that provide inputs into assessing Movement and Place. The Built Environment Indicators include a range of aspects relating to an area's transport network function, identity, and design. The key transport indicators used in the Movement and Place assessment for Morisset were:

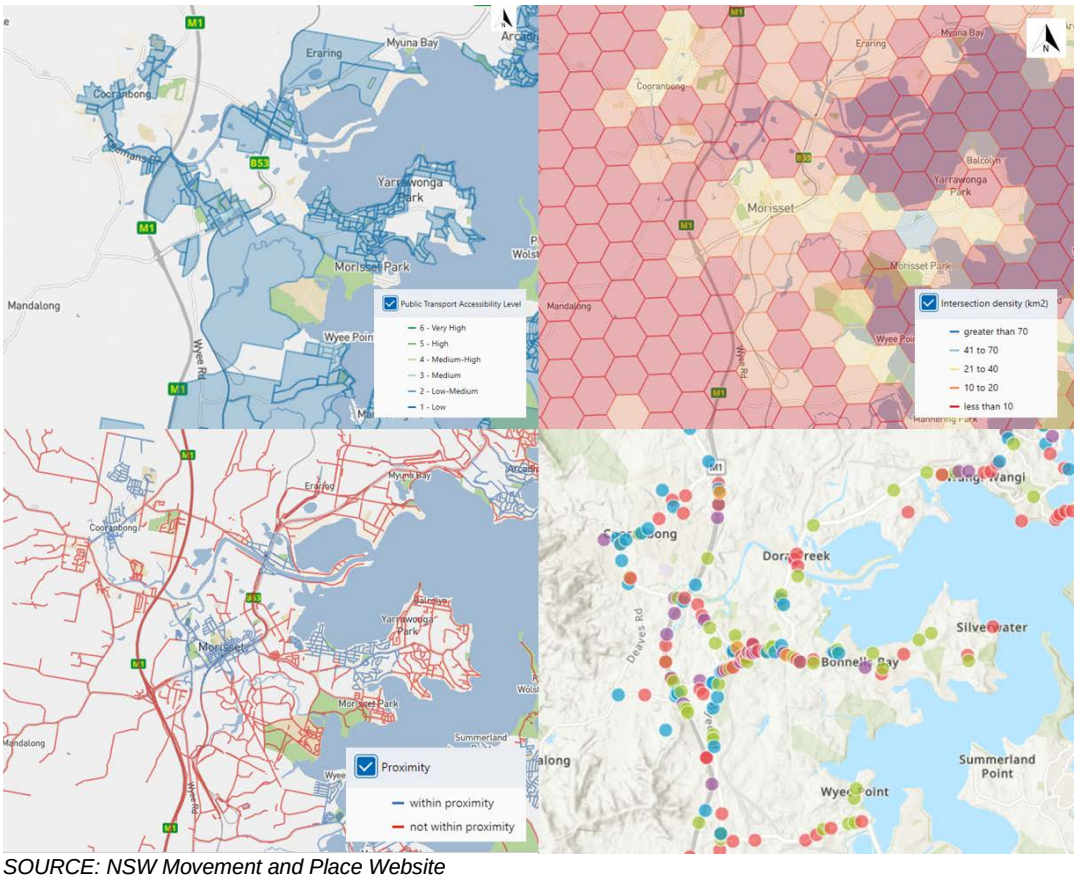
- **Mode share** indicators produce transport choices for user outcomes. The objective is to measure the proportion of sustainable travel mode usage by transport users
- **Public transport** accessibility measures the level of interaction between land use and transport services in terms of how well people are served by public transport
- **Freight network** accessibility measures the efficiency of access for freight. This indicator assists practitioners to understand the access and connectivity of high productivity vehicles across successful places. Assisting in determining the level of adequacy of the movement of goods across the network or if segments of the road can be re-classified to provide alternate route options based on the outcomes
- **Public space** measures pedestrian access to public spaces and the proportion of land that is reserved for public space. This indicator assists practitioners to understand how accessible public space is to a community. Assists in determining whether consideration should be given to increase access to public space, either through creating new public space, decreasing housing density, or additional pedestrian access routes based on the outcomes
- **Mix of uses** measures the proximity of the road segment to locally oriented business land use zones which increase the social capital of the local population. The design of places can affect the demand for movement, particularly in areas of more convenient for pedestrians and cyclists than vehicles. This indicator assists in understanding whether people can access a mix of uses within a reasonable distance by walking or riding a bicycle.

Some examples of indicator values from the NSW Movement and Place website are shown in Figure 3.3 and Figure 3.4.



SOURCE: NSW Movement and Place Website

Figure 3.3: Place Parameter Examples



SOURCE: NSW Movement and Place Website

Figure 3.4: Movement Parameter Examples

3.3 Safe Systems Framework

The primary objective of the Safe System approach is to achieve zero fatalities and serious injuries on NSW roads. The four (4) elements of the Safe System approach are shown in Figure 3.5. With all these elements working together as a whole, the system is more forgiving of human or mechanical error and the impact of a mistake made on the road does not result in a fatality or serious injury. Safety is paramount to protect locals on NSW roads.

Figure 3.5: Towards Zero - A Safe System Approach

In terms of Movement and Place relationships, Main Streets pose a challenge for 'Towards Zero' objectives because there is often a need to balance high pedestrian activity and high densities volumes of through traffic, and often heavy vehicle traffic.

Under the Safe Sytem asseement methodology safety is rated on a scale of 0 to 4 and based on the following risk elements:

- **Exposure:** The number of road users that have the potential to be involved in a crash
- **Likelihood:** The probability that an individual road user will be involved in a crash
- **Severity:** The likely severity outcome in the event of a crash (minor, moderate, serious, or fatal).

3.4 Understanding Place

Each element is individually scored and multiplied accordingly to determine an overall score for various types of treatement that can be applied to improve safety (Primary, Supporting, or Enhancing treatments) as shown in Figure 2.3. A various treatments may satisfy any of the following:

- Provides/reduce opportunity for blue-green infrastructure
- Improve/worsen comfort and personal security
- Improve/worsen connectivity and access
- Improve/worsen activation / human-scale engagement
- Slow or increase vehicle speeds
- Increase/decrease catering to people walking and cycling movements.

Figure 3.6: Place Intent Classifications

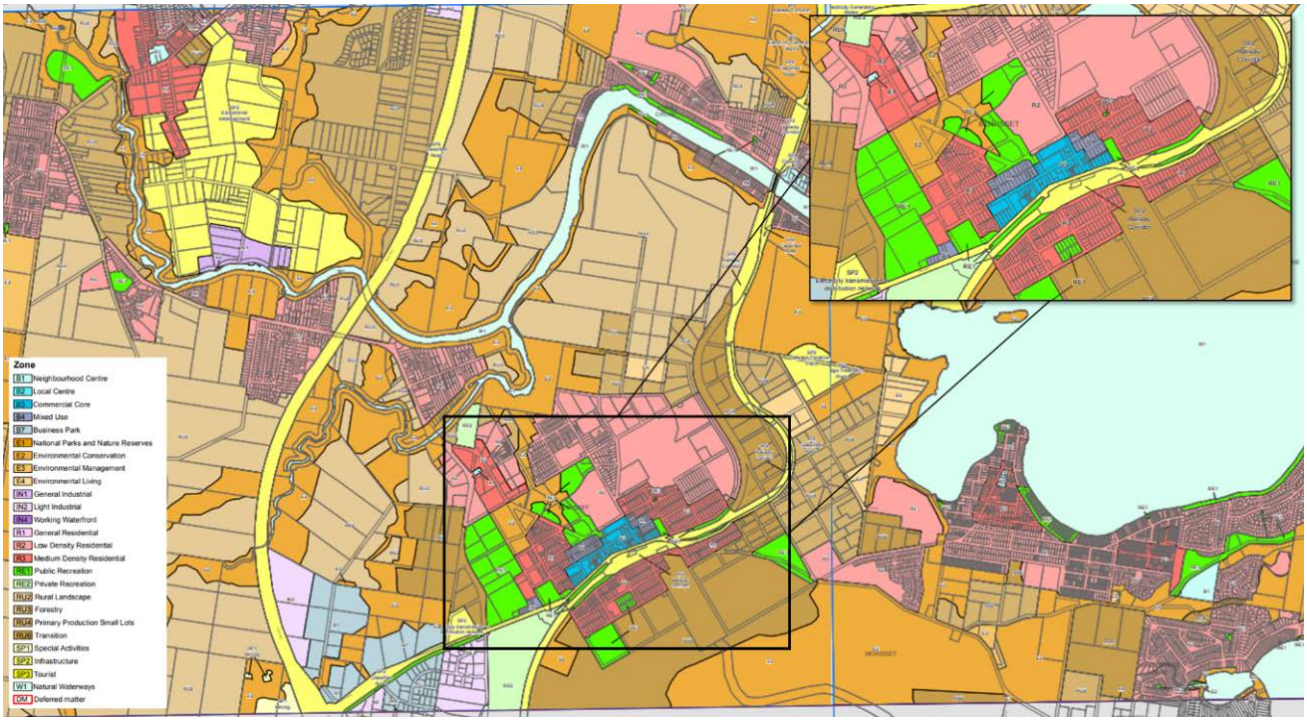
Place 'ratings' from 1 to 5 for areas within the Morisset Town Centre have been developed using following parameters:

- Population Density (ppl / ha)
- Population Projections (ppl / ha)
- Job Density (jobs / ha)
- Job Projections (jobs / ha)
- Number of Visitors
- Public Transport (catchments)
- Building Volume (footprint + height)
- Floor Space Ratio (maximum floor area / site)
- Intersection Density
- Average Pedestrian and Cycle Crossing Space
- Percentage (%) of Single vs. Multiple Uses by LEP zones
- Business Zones (LEP zone areas)
- Number of Shops / Other
- Heritage Places.

Place ratings are defined as follows:

- **1 - 2:** Lower density of destination demand (i.e. Residential, nature reserves, industrial, etc)
- **3:** Edge of centre with light residential and some commercial. May include schools, parks, etc
- **4:** Edge of centre but with higher trip demand and attractiveness (i.e. park / sporting field, entertainment centre, commercial and retail)
- **5:** Town centre with high demand for foot traffic, denser commercial/retail tenancies ('Main Street' styled area), entertainment (pubs / clubs).

The existing land uses allocated within Councils LEP for Morisset are shown in Figure 3.7. Existing planning provides a good basis for current high value Place areas and where growth of 'Place' may occur.



SOURCE: Lake Macquarie LEP 2015

Figure 3.7: Current Land Use Planning

3.5 Understanding Movement

A 'neutral' place assessment is assigned to treatments that have no ostensible place supporting potential or are highly dependent on contextual factors and/or integration with other treatments. A 'detracting' place assessment is assigned if the treatment has high level of potential to:

- Reduce the opportunity for blue-green infrastructure
- Worsen comfort and personal security
- Worsen connectivity and access
- Worsen activation or human-scale engagement
- Increase vehicle speed and gives vehicles priority.

At the completion of assessing treatments on their place and safety impacts, the treatment is grouped into a treatment matrix as shown in Figure 3.8.

Figure 3.8: Treatment Matrix

Generally, the 'exposure' and 'primary' categories hold the most impactful treatments but nonetheless require other primary, supporting and enhancing elements across all risk elements to be effective.

Similar treatments (with similar place and safety impacts) are bundled together. For example, 'Restrict vehicle access' groups a number of treatment options together including bollards, diverters, signals, and signage, which all have the capacity to limit vehicle access.

Movement within Morisset has been considered using following parameters:

- Cycling Accessibility
- Public Transport Accessibility
- Train Station Accessibility
- Bus Stop Density
- Road Safety
- Street Space for Pedestrians.

The cycle network in the vicinity of Morisset is shown in Figure 3.9.

SOURCE: Lake Macquarie City Council

Figure 3.9: Morisset Cycle Route Map

The pedestrian network in the vicinity of Morisset is shown in Figure 3.10.

SOURCE: Lake Macquarie City Council

Figure 3.10: Principal Pedestrian Network Map

Considering existing and future planning as well as outcomes from a workshop with Council, a 'high level' scoring of 'Movement' for the links within the future Morisset centre was developed, as shown in Figure 3.11. Note that this Scoping Study has conducted a high-level movement and place assessment only to inform potential network improvements. More detailed Movement & Place assessment should be undertaken as part of future planning studies with a focus on the Place value of local centre streets.

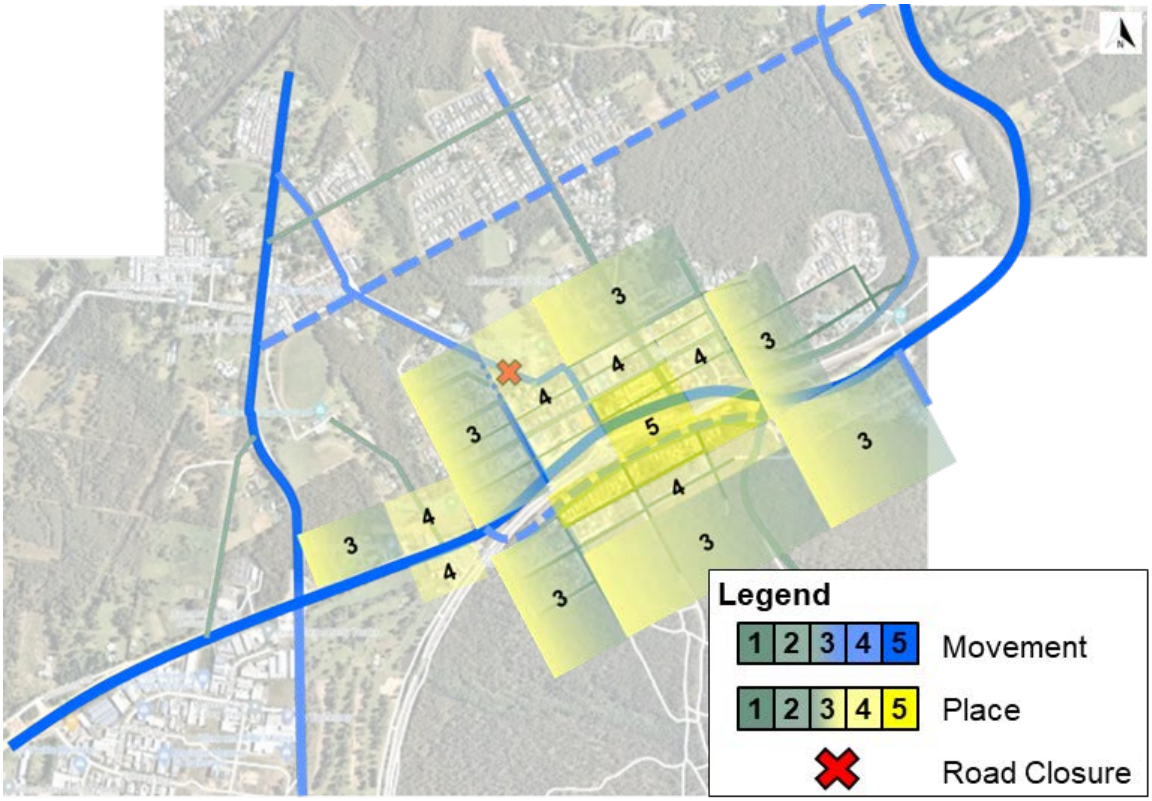
Base Map Source: Nearmap

Figure 3.11: Movement Classifications (5 Highest to 1 Lowest)

3.6 Conflicts and Opportunities

3.6.1 Conflicts Assessment

Figure 3.12 presents the Place scores in the Morisset Town Centre (5 as highest value to 1 as lowest value) on top of the Movement scores from Figure 3.11.



SOURCE: Nearmap

Figure 3.12: Conflicting between Movement Links and Place Areas

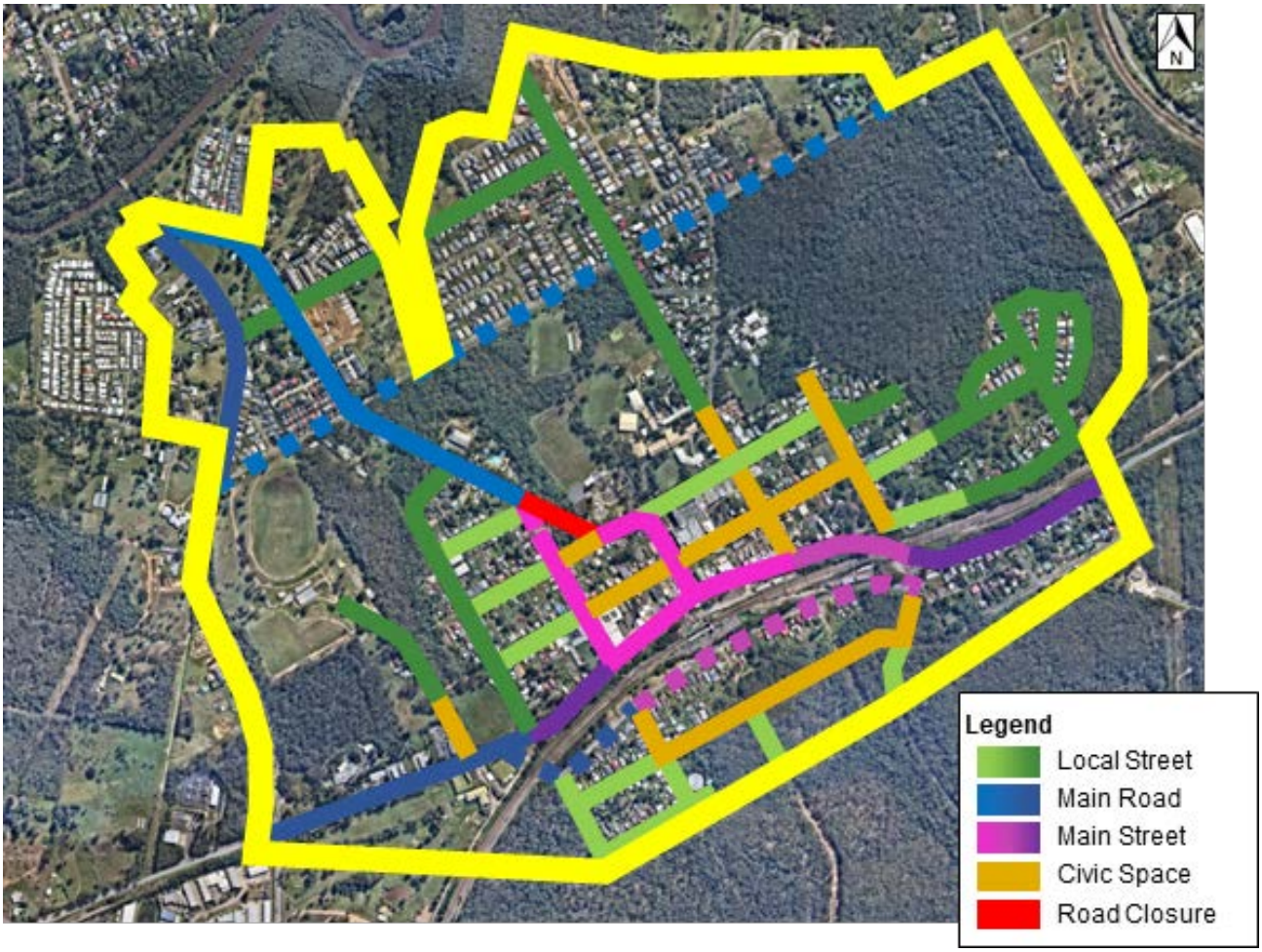
Key conflict points have been identified at those with both high movement (thick dark blue line) and high place value (score of 4 – 5), including:

- Dora Street through the Morisset Town Centre
- Dora Street / Morisset Country Club intersection
- The area in proximity of the Morisset Train Station (Along Dora Street and Macquarie Street)
- Station Street and Bridge Street area.

Doyalson Street also has the potential to create a conflict between Movement and Place due to the proposed closure of Kahibah Street, however, the closure will likely reduce vehicle movements on Station Street, decreasing potential conflicts.

Considering these 'conflict' locations is key to informing what opportunities will have the greatest positive impact for both 'Place' focused areas and 'Movement' focused areas. The majority of opportunities to improve the local network and achieve Council's vision are focused on the Morisset Town Centre.

The categorisation of streets, as shown in Figure 3.13 from the Movement and Place assessment, provides the basis to 'design' transport network 'opportunities' to achieve the intent of each street category nominated.



SOURCE: Nearmap

Figure 3.13: Updated Movement and Place Street Categories

3.6.2 Opportunities to Achieve Street Intents

A number of upgrade opportunities have been identified to achieve street intents in the network and considering the growth scenarios for Morisset. All potential upgrade opportunities considered as part of this study are provided within Maps available at **Appendix A**.

Opportunities have been considered under the three (3) growth scenarios of **Base**, **Low** Population / Employment Growth and **High** Population / Employment Growth.

The key opportunities under each scenario are summarised in Table 3.1.

Table 3.1: Key Opportunities to Achieve Movement and Place Street Categories

Scenario	Upgrade	Justification
Base Growth*	Closure of Kahibah Street Connection	Diverts traffic around the central 'Station Street' promoting better Place and active transport connectivity
	Dual lanes on approach to town centre (i.e. Mandalong Road & Dora Street)	Caters for an increase in Movement factoring in future growth and safety concerns.
	New Signals (Awaba Street / Kahibah Street Intersection)	Based on Councils program. Caters for the new Awaba Street links and potential for increased traffic (Movement) as a result of new subdivisions
	New signals along Freemans Drive to the north, through Cooranbong	Based on Councils program. Understood a requirement due to increasing background traffic volumes. (Note that these have no impact on Morisset Town Centre)
Low Growth	Closure of Kahibah Street Connection	Diverts traffic around the central 'Station Street' promoting better Place and active transport connectivity
	Intersection upgrade for Moira Park Road / Macquarie Street	Provides greater movement capacity and encourages local traffic to utilise multiple access points to town (avoiding travelling through high 'Place' areas)
	Town bypass via Macquarie Street, connecting to Dora Street at Stockton Street and Wharf Street	Improves the Place value of town centre by shifting high traffic movement away from Dora Street *It is understood that TfNSW has (or is currently) undertaking a study of this option as a number of connectivity issues due to the rail-line are prominent*.
	Freeman Drive refuge crossing	Provides safer active transport link from west subdivisions to town (both pedestrian and cycle)
	Upgrade Freemans Drive / Dora Street intersection to signals	This upgrade is an 'if required' based on traffic growth and model outcomes, improving capacity at this major regional intersection
	New bypass lane for Cyclists at the Dora Street rail bridge to the west of the town centre	Improves cyclist safety as well as cycle and traffic 'Movement'
	Range of pedestrian improvements, including: ▪ Additional connections through the town centre ▪ Remove Doyalson Street crossing ▪ Improve intersection crossing points at Station Street and accessibility around the Morisset Station	▪ Creates better permeability for pedestrians ▪ Doyalson Street caters for greater traffic movement due to Kahibah closure and safer crossing points are located at the nearby Yambo Street or Dora Street intersection crossings ▪ Improves accessibility and attractiveness of rail as a mode of travel to the centre. As well as, improving park n ride facilities
	Addition of formal parking with kerb buildouts and streetscaping to Short Street and Yambo Street	Provides a slower traffic environment and encourages the area as a 'Town Centre' with retail and higher pedestrian activity while not removing parking for shopfronts
	40km/h speed zone for the wider Morisset town centre	Improves town centre 'Place' and safety, further encouraging the use of the centre and minimising the impacts of traffic.

Scenario	Upgrade	Justification
High Growth	Closure of Kahibah Street Connection	Diverts traffic around the central 'Station Street' promoting better Place and active transport connectivity
	Town bypass via Awaba Street – including Awaba Street capacity upgrade, upgrade to (or new) intersection with Main Road (217) to the east, and signage relating to bypass	Improves the Place value by shifting high through traffic movements away from the town and local movements. This option provides greater room for expansion of the Morisset centre without the need to cater for the large portion of traffic. It also allows to greater capacity to be added to the network to cater for high traffic volumes to/from the motorway in the future if needed *It is important to provide good separation from High movement and High place roads/ areas to achieve Morisset's vision*
	30km/h HPAA in main pedestrian areas of Morisset town centre	Improve town centre place value and pedestrian safety. This also encourages use of the bypass and reduces the level of traffic within the high activity area of town
	40km/h speed zone for the wider Morisset town centre	Further encourages bypass use and safety. Creating a consistent road speed environment between the entertainment centre (Golf Course), parks and town
	One-way circulation between Short Street, Yambo Street and Station Street (Anti-clockwise)	Opens opportunity for streetscaping, outdoor retail space. Large improvements to 'Place' value in the centre
	Improve pedestrian rail bridge to Macquarie Street and open for public access	Connects north and south sides of the rail line. Creating potential for centre expansion with the Morisset Station at its heart. *Also encourages visitors from the east of the centre to park south of the rail line, reduces the need to drive through any part of the existing centre*

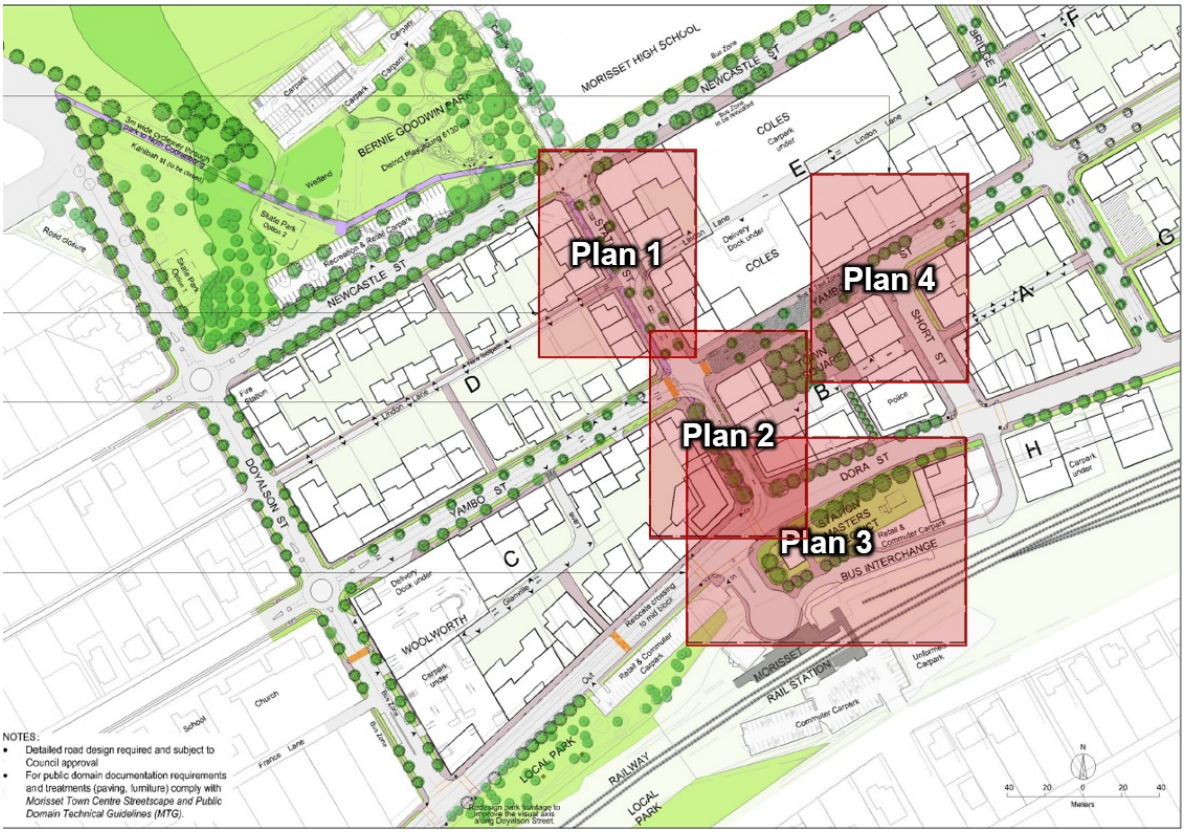
Note: All Base Growth projects are proposed to be retained/carried over to the Low and High Growth scenarios. Where relevant, Low Growth projects have also been carried over to the High Growth scenario.

Other opportunity types for future, more detailed consideration include:

- The design of new roads in new subdivisions
- New pedestrian crossing locations in the Town Centre
- Other intersection upgrades (i.e. Signalised intersections, roundabouts, priority control)
- Changes to streetscaping for enhancing place and / or managing movement.

3.6.3 Council-Identified Streetscaping Opportunities

Council has provided street change recommendations for four (4) areas which are shown in Figure 3.14. Based on the Movement and Place assessment, these proposed changes are considered to be effective for promoting the Place value of the centre and warrant further investigation as to how best incorporate them with the opportunities in Table 3.1.

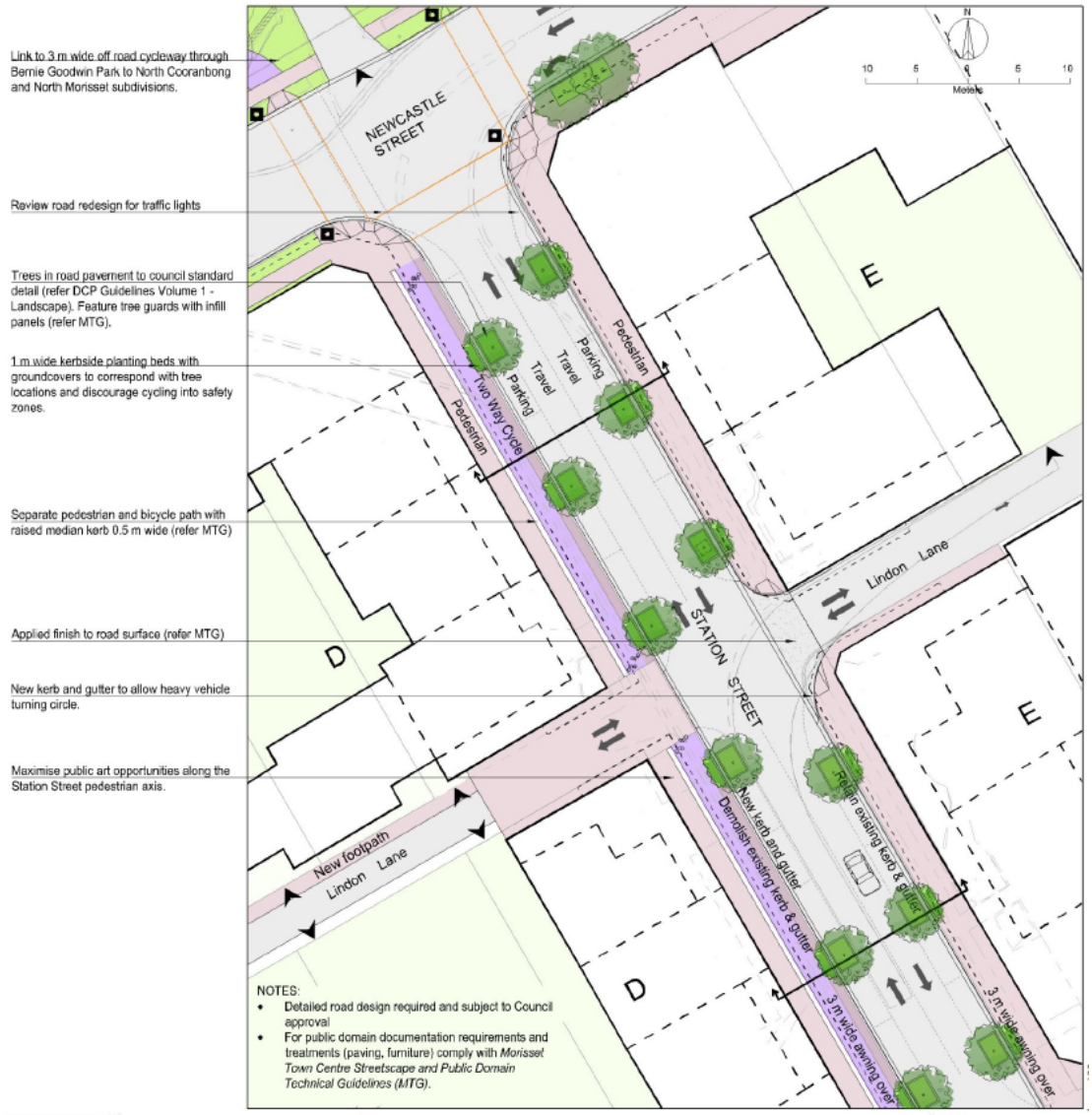


SOURCE: Council's DCP 2014

Figure 3.14: Street Improvement Plan Overview

Plan 1 - Lower Station Street (Yambo Street to Newcastle Street)

Lower Station Street between Yambo Street and Newcastle Street is proposed to be 2 lane two-way with parking on both sides and a two-way cycle lane on the western side of the street, as shown in Figure 3.15.



SOURCE: Council's DCP 2014

Figure 3.15: Lower Station Street (Yambo Street to Newcastle Street)

Plan 2 - Upper Station Street (Dora Street to Yambo Street)

Upper Station Street between Dora Street and Yambo Street is proposed to be one way travel with parking and a two-way cycle lane on the western side, as shown in Figure 3.16.

SOURCE: Council's DCP 2014

Figure 3.16: Station Street (Dora Street to Yambo Street)

Plan 3 - Station Masters Cottage Precinct

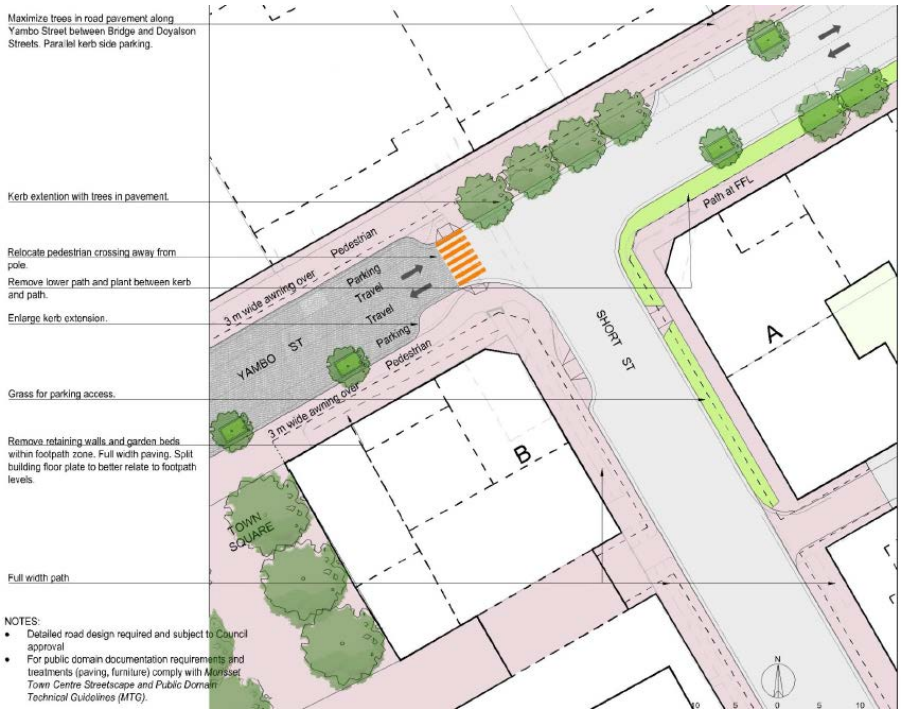
Minor street improvements are proposed for the Stationmaster's cottage on Dora Street with opportunities for visual enhancements Figure 3.17. Importantly, the kiss and ride will retain access for the bus interchange.

SOURCE: Council's DCP 2014

Figure 3.17: Station Masters Cottage Precinct

Plan 4 - Café Precinct Proposal

The Yambo / Short Street intersection will have kerb extensions to enhance the foliage along Yambo Street as shown in Figure 3.18.



SOURCE: Council's DCP 2014

Figure 3.18: Café Precinct Proposal

3.7 Modelling Limitations

The STFM is a link-based strategies model. It does not explicitly model intersection delays and is primarily used for assessing the influence of new or modified road links and speed and capacity changes. Due to the limitations on what an STFM can test not all the defined opportunities are able to be modelled with many requiring additional investigations beyond this scoping study. The 'opportunities' presented in this study have been assessed via either:

- **Direct Analysis**: Changes to road links (i.e. road closures, speed changes) that can be *directly* tested within the STFM
- **Indirect Analysis**: Using traffic volume outputs from the STFM to infer intersection performance and the likely need for upgrading subject to future intersection analysis
- **Qualitative Review**: All other proposed changes have been considered based on a *Qualitative Review* of traffic flows, conflict, desire lines and safety improvements including for pedestrian, cycle, and public transport movements.

3.8 Scenarios for Modelling

Considering the abovementioned limitations, the following opportunities were noted for 'Direct Analysis' and applied within the STFM for testing under three (3) traffic demand scenarios:

- **Base Growth** (Historic population growth in the region to 2041)
- **Low Growth** (Some level of Council-identified additional growth to 2041)
- **High Growth** (Significant additional Council-identified growth to 2041).

Table 3.2 summarises the 'Direct Analysis' opportunities tested within the model for each scenario.

Table 3.2: Network Opportunities Modelling by Growth Scenario

Scenario	Projects/Upgrades
Base	Closure of Kahibah Street
	Two lanes each way on approach to the Town Centre (Mandalong Road and Dora Street)
Low Growth	Closure of Kahibah Street
	Two lanes each way on approach to the Town Centre (Mandalong Road and Dora Street)
	Town Centre bypass via Macquarie Street, connecting to Dora Street at Stockton Street and Wharf Street
	40km/h speed zone for the Morisset town centre
High Growth	Closure of Kahibah Street
	Two lanes each way on approach to Town Centre (Mandalong Road and Dora Street)
	Town 'bypass' via Awaba Street, including Awaba Street capacity upgrade and increase in speed to 70km/h
	30km/h HPAA in main pedestrian areas of Morisset Town Centre
	40km/h speed zone for the wider Morisset Town Centre
	One-way circulation in the Town Centre via Short Street, Yambo Street and Station Street (in an anti-clockwise direction)

4. SCENARIO ANALYSIS

4.1 Background Scenario

4.1.1 Zone Disaggregation in/near Town Centre

The STFM zones of 6221, 6222 and 6206 were disaggregated based on a combination of meshblock zones, the spatial areas used for the Place scoring process and the boundaries of existing land uses. A total of 42 zones were created from the three (3) STFM zones, as shown in Figure 4.1.

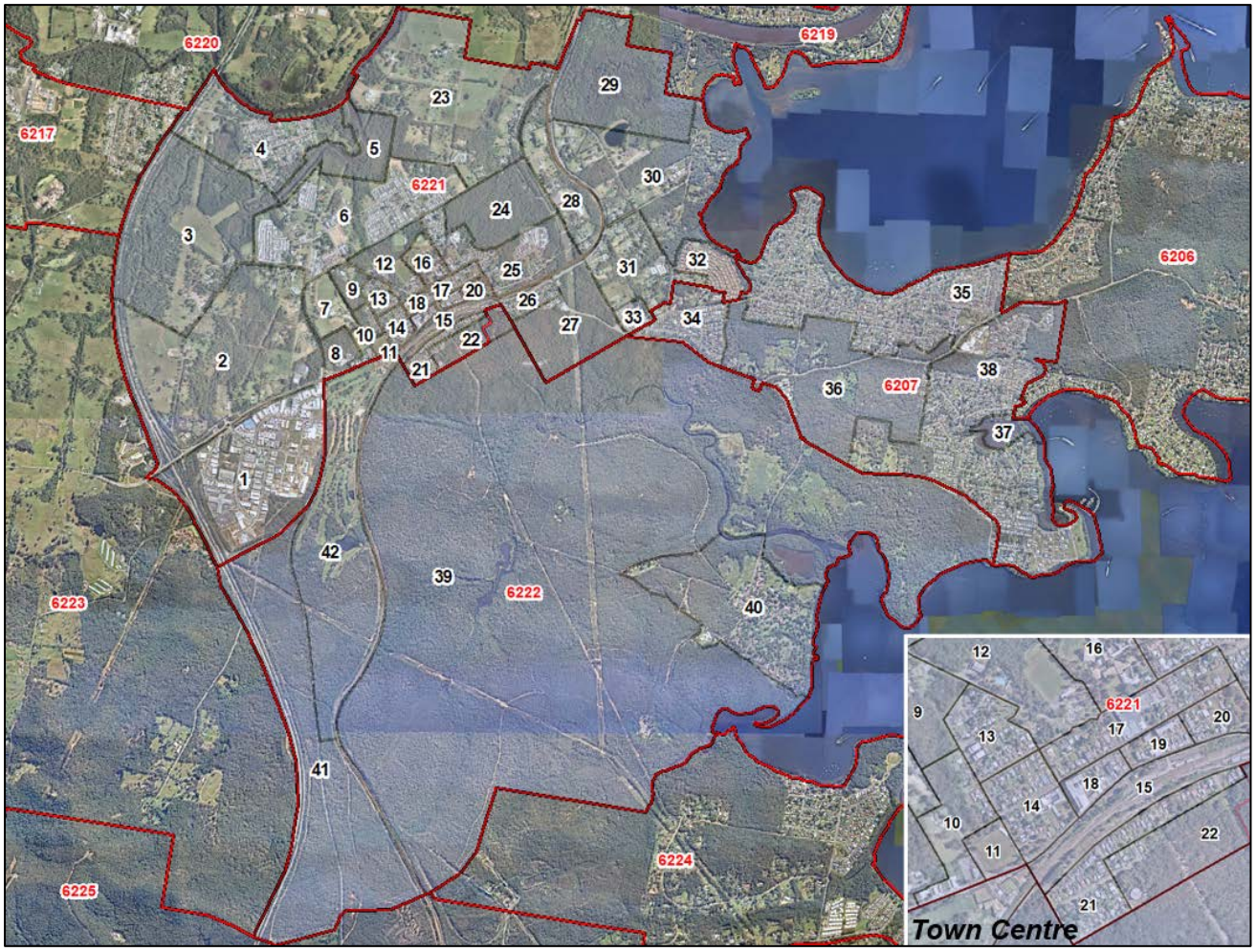


Figure 4.1: Zone Disaggregation

4.2 Network Disaggregation

4.2.1 Base Growth Scenario

The network in the as-provided STFM was very coarse for Morisset and its surroundings and had to be detailed to sensitise it to the movements travelling to, from and within the town centre. This was required to enable the proposed upgrades to be evaluated. Figure 4.2 shows the detailed network coding added to the STFM within the Town Centre.

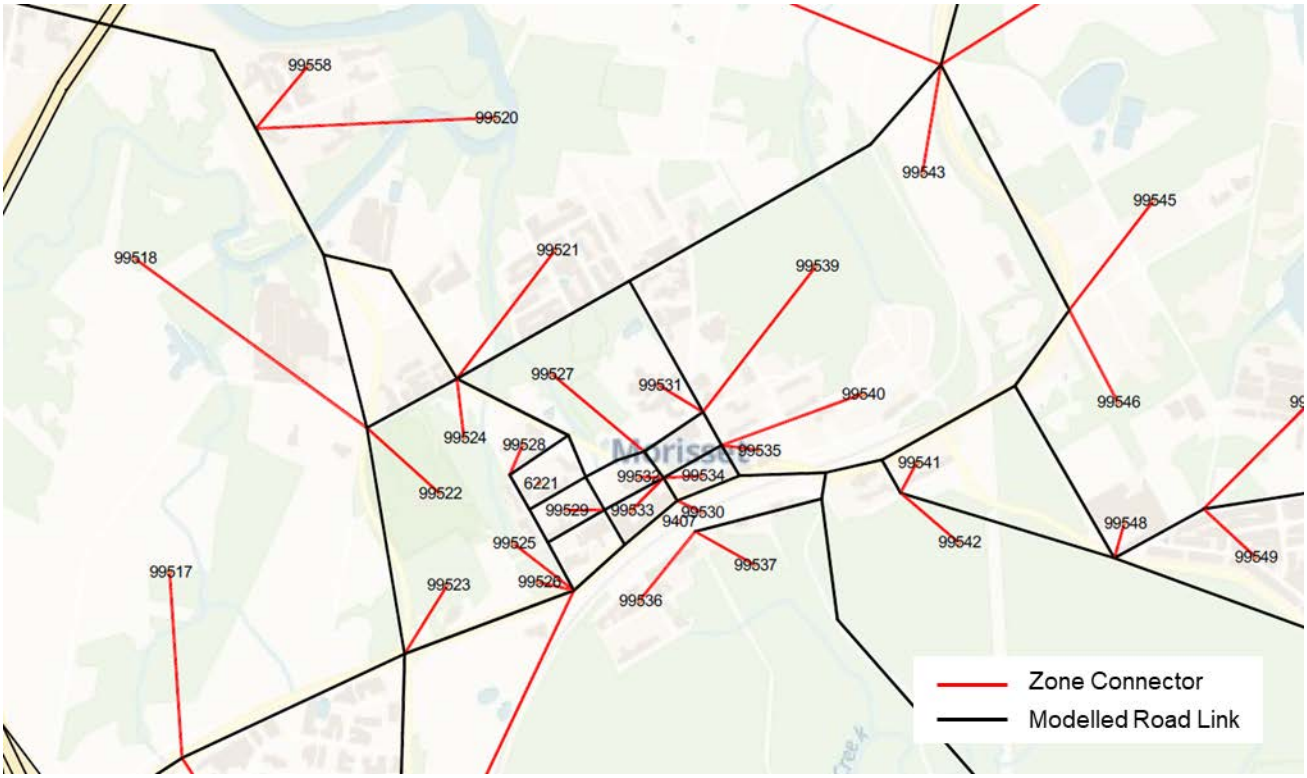


Figure 4.2: Network Specification (Base Scenario)

4.2.2 Low Growth Scenario

Figure 4.3 shows the network for the Low Growth scenario which includes the Macquarie Street Bypass and the 40km/h links in the town centre.

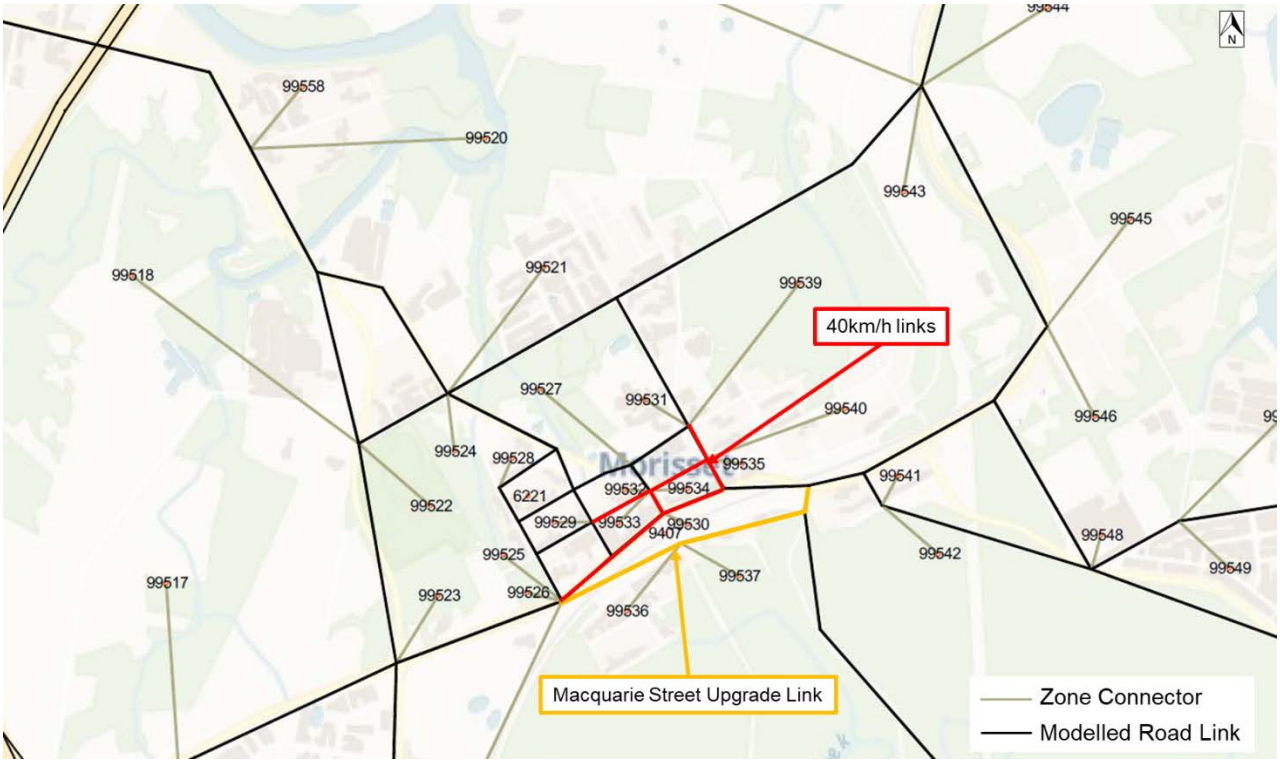


Figure 4.3: Network Specification (Low Growth Scenario)

A Council provided alternative southern link road through to Fishery Point Road (instead of Wharf Street) was not explored in this study. However, this link would likely have a similar effect on traffic movements as the tested Wharf Street / Macquarie Street option.

4.2.3 High Growth Scenario

Figure 4.4 shows the network for the High Growth scenario which includes the Awaba Street Bypass and the 30km/h, 40km/h, and one-way links in the town centre.

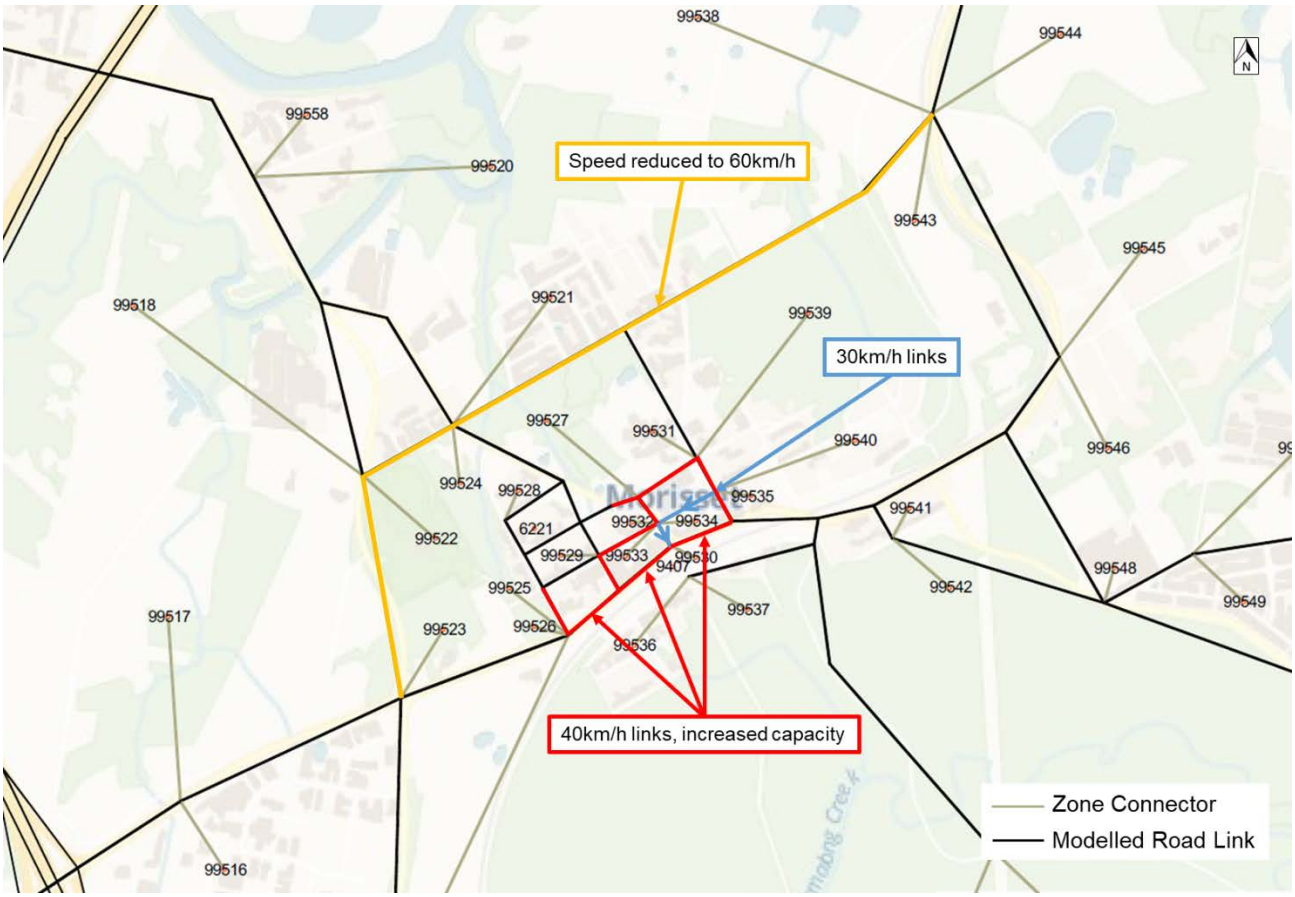


Figure 4.4: Network Specification (High Growth Scenario)

4.3 Scenario Traffic Matrices Adjustments

4.3.1 Method

Low Growth and High Growth demographics were provided by Council that included proposed dwellings, industrial GFA and commercial GFA. This was then overlayed in a mapping software with the disaggregated STFM zone scheme to calculate area splits for each smaller zone.

Given that the provided STFM contains traffic matrices and not trip generation formulae, first principles-based traffic generation had to be calculated using the Low Growth and High Growth scenarios using the provided demographics inputs. This traffic generation was then applied to the disaggregated zone demographic data from the base STFM matrices to enable traffic demands to be created for both uplift scenarios for 2026, 2031, 2036 and 2041 both AM and PM peak periods.

4.4 Base Scenario

4.4.1 Link Volume to Capacity Ratios

Figure 4.5 shows the volume of capacity ratios for the Business-as-Usual scenario for 2026 and 2041 for the AM and PM peaks.

Figure 4.5: Business as Volume to Capacity Ratios

The Base Scenario shows some reductions in performance of Fishery Point Road and Campview Road in 2041. It is important to note that Campview Road is currently a 50km/h gravel road with the Fishery Point Road intersection being the preferred intersection when heading to / from Bonnells Bay. More detailed modelling of this area should be undertaken in the future.

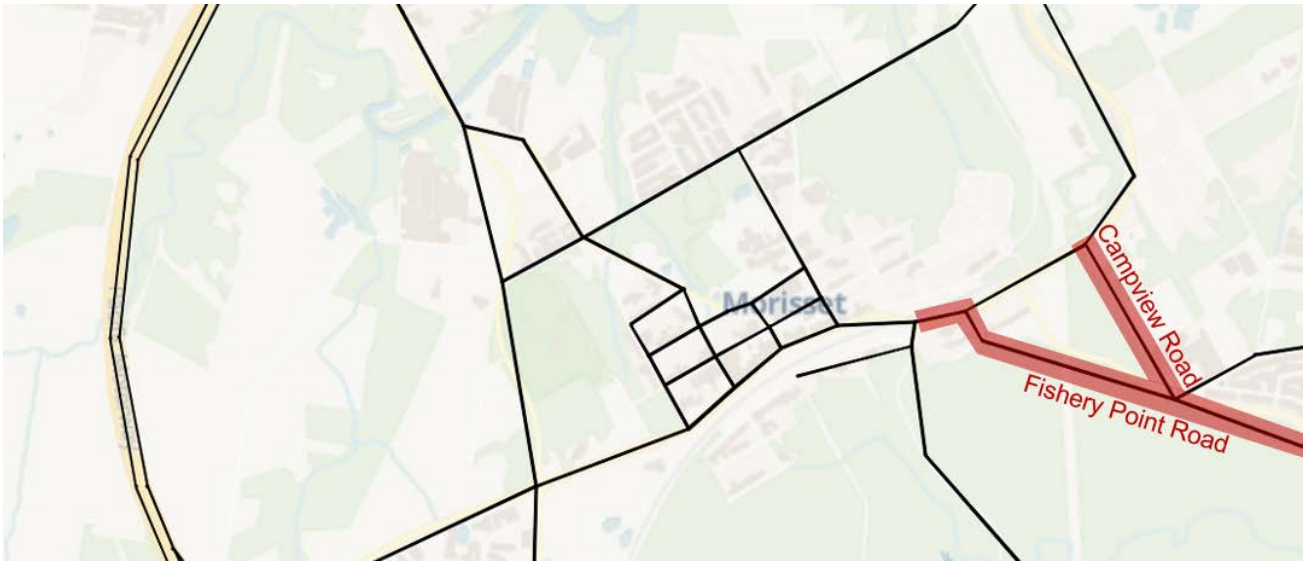


Figure 4.6: Base Growth – Likely Link Upgrades to be Required

Dora Street does not appear to have high Volume to Capacity ratios on a line basis and its future congestion is more likely aligned to intersection capacity limitations.

4.4.2 Intersection Performance Review

Traffic volumes from the STFM, coupled with existing intersection geometries were used to complete a preliminary assessment of key intersections. Results from testing the preliminary review of the two signalised intersections in the Base scenario are shown in Table 4.1. From this review, no major issues were identified however, it is recommended that the Dora Street / Station Street intersection is investigated further as turn movements from minor roads are likely to warrant upgrades considering the movement and place changes in the Morisset town centre.

Table 4.1: Base Intersection Stress Testing Results - Signals

Intersection	Peak	Hourly Approach Flow	Approach Lanes	Saturation (V/C)
Dora Street / Doyalson Street	AM	1693	6	0.184
Dora Street / Doyalson Street	PM	1713	6	0.187
Dora Street / Station Street	AM	1781	3	0.388
Dora Street / Station Street	PM	17278	3	0.376

Key roundabouts were also tested considering the capacity of their circulating lanes. The results were that the Dora Street / Freemans Drive intersection is likely to require upgrading and further investigation would be required to determine whether dual lanes or an upgrade to a signalised intersection is appropriate. Results from the review of the roundabout intersections in the Base scenario are shown in Table 4.2.

Table 4.2: Base Intersection Stress Testing Results - Roundabouts

Intersection	Peak	Hourly Approach Flow	Circulating Lanes	Saturation (V/C)
Dora Street / Freemans Drive	AM	3285	1	0.966
Dora Street / Freemans Drive	PM	3535	1	1.663
Doyalson Street / Yambo Street	AM	209	1	0.098
Doyalson Street / Yambo Street	PM	378	1	0.178
Mandalong Road / Gateway Blvd	AM	2951	2	0.694
Mandalong Road / Gateway Blvd	PM	2670	2	0.628

Priority-controlled intersections were reviewed for the worst-case movement typically being the right turn out upgrades to existing priority-controlled intersections in the Base scenario. No upgrades were flagged for priority-controlled intersections in the Base scenario, as shown in Table 4.3. It should be noted that the approximate methods used do not account for excessively unsafe delays to low volume side street movements which may otherwise warrant an upgrade.

Table 4.3: Base Intersection Saturation Stress Testing Results – Priority Controlled

Intersection	Peak	Type	Hourly Approach Flow	Approach Lanes	Saturation (V/C)
Freemans Drive / Awaba Street	AM	T Intersection	861	3	0.045
Freemans Drive / Awaba Street	PM		991	3	0.023
Freemans Drive / Stockton Street	AM		767	3	0.020
Freemans Drive / Stockton Street	PM		838	3	0.016
Dora Street / Stockton Street	AM		1,741	3	0.005
Dora Street / Stockton Street	PM		1,805	3	0.000
Dora Street / Bridge Street	AM		1,806	4	0.003
Dora Street / Bridge Street	PM		1,750	4	0.004
Dora Street / Wharf Street	AM		1,832	3	0.002
Dora Street / Wharf Street	PM		1,977	3	0.018
Macquarie Street / Fishery Point Road	AM		1,958	6	0.140
Macquarie Street / Fishery Point Road	PM		1,961	6	0.079
Macquarie Street / Campview Road	AM		1,526	3	0.091
Macquarie Street / Campview Road	PM		1,401	3	0.030
Main Road (217) / Moira Park Road	AM		1,439	3	0.007
Main Road (217) / Moira Park Road	PM		1,682	3	0.048
Main Road (217) / Newport Road	AM		1,963	3	0.119
Main Road (217) / Newport Road	PM		2,214	3	0.145
Freemans Drive / Newport Road	AM		644	3	0.031
Freemans Drive / Newport Road	PM		688	3	0.031
Kahibah Street / Awaba Street	AM	4-way intersection	481	5	0.034
Kahibah Street / Awaba Street	PM		578	5	0.036
Station Street / Yambo Street	AM		149	4	0.004
Station Street / Yambo Street	PM		286	4	0.032

4.5 Low Growth Scenario

4.5.1 Link Volume to Capacity Ratios

Figure 4.7 shows the Volume to Capacity ratios for the Low Growth scenario for 2026 and 2041 for the AM and PM peaks.

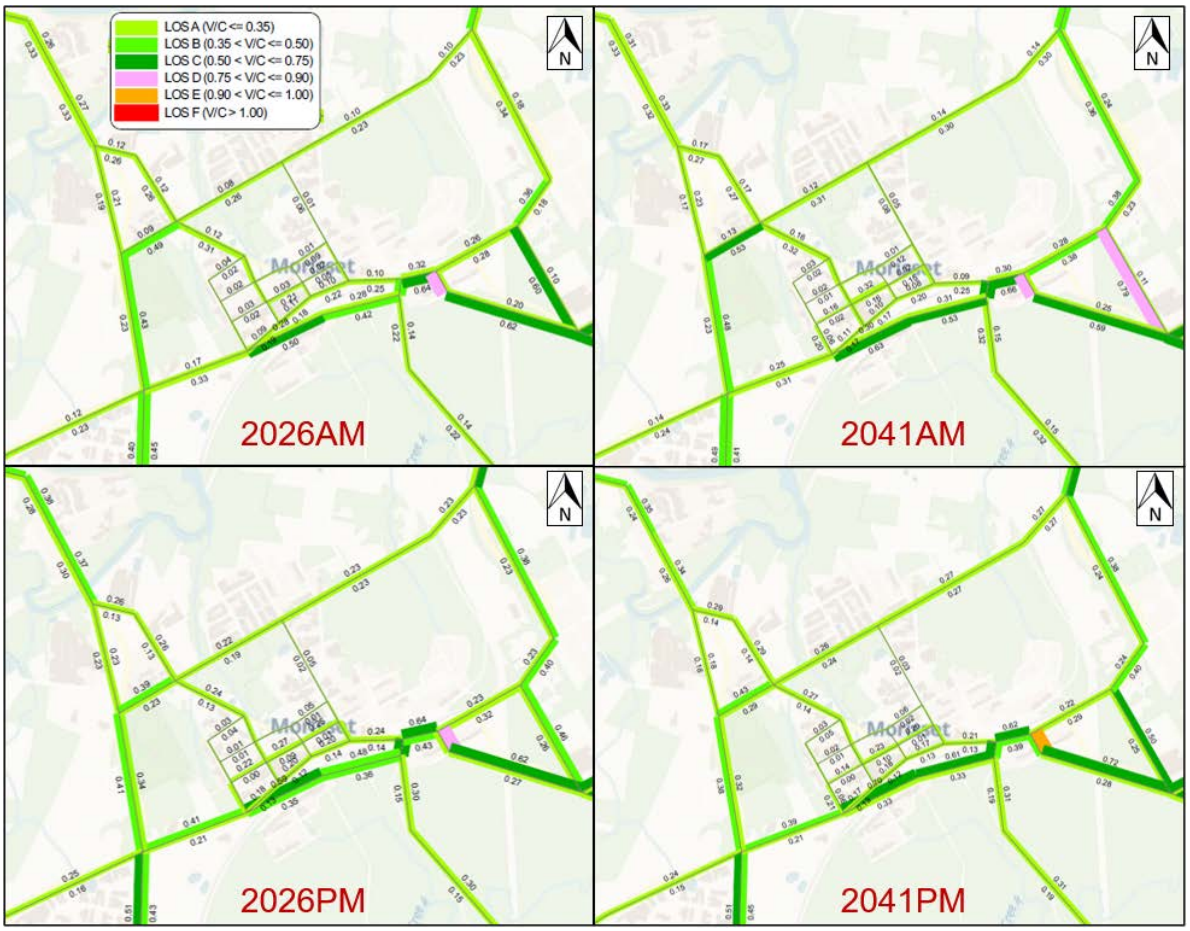


Figure 4.7: Low Growth Scenario Volume to Capacity Ratios

The Low Growth scenario increases pressure on the capacity of several sections on the southern end of the town centre such as Wyee Road, Freemans Drive, Awaba Street and Main Road (217), as well as showing the Fishery Point Road link at (or nearing) capacity. The Macquarie Street bypass is shown to attract the bypassing traffic from through the Town Centre.

Likely required future link upgrades under the Low Growth scenario are shown in Figure 4.8.

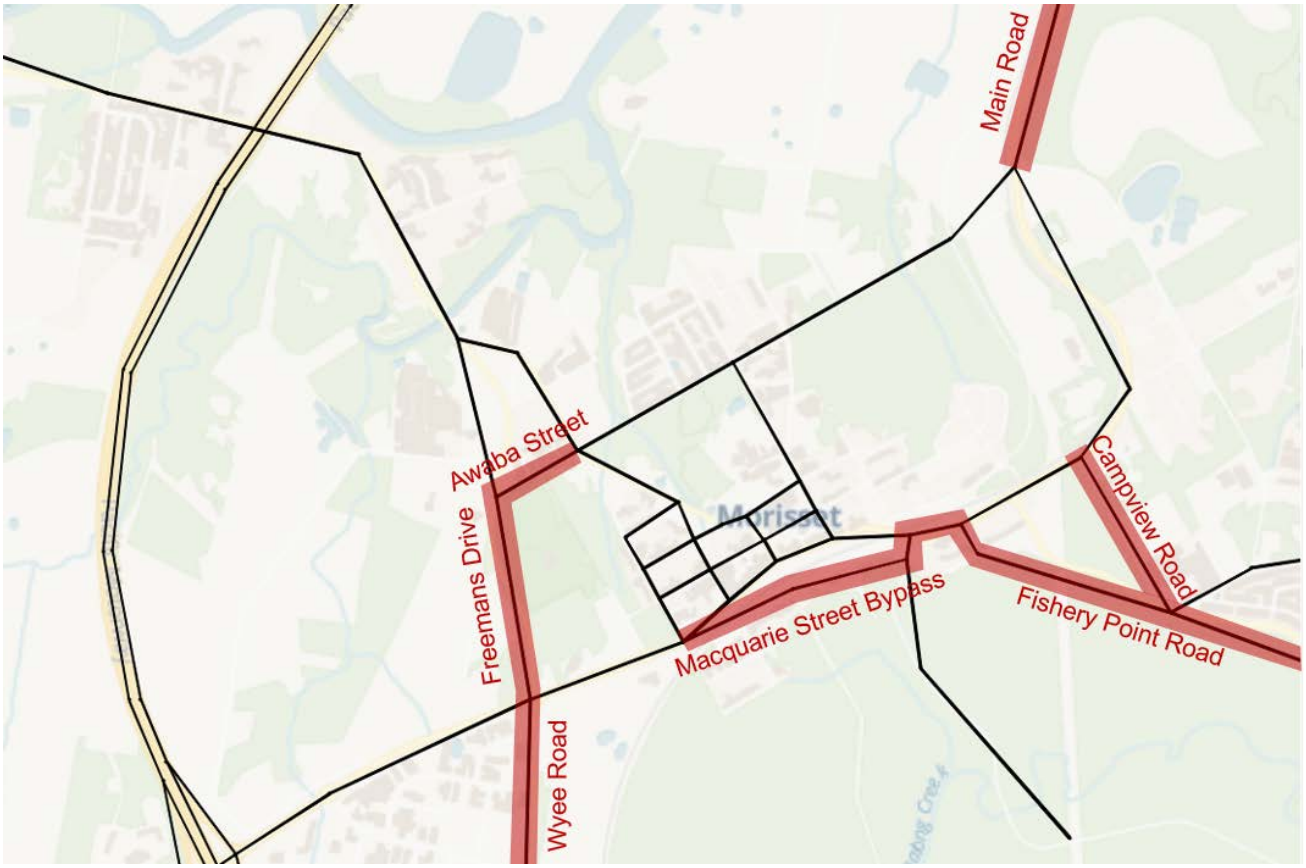


Figure 4.8: Low Growth Scenario Likely Required Link Upgrades

4.5.2 Intersection Performance Review

From the review of the signalised intersections no significant capacity were identified. However, it is recommended that the Dora Street / Station Street intersection is investigated further as turn movements from minor roads are likely to warrant upgrades considering the movement and place changes in the Morisset Town Centre. Results from reviewing the signalised intersections are shown in Table 4.4.

Table 4.4: Low Growth Intersection Stress Testing Results - Signals

Intersection	Peak	Hourly Approach Flow	Approach Lanes	Saturation (V/C)
Dora Street / Doyalson Street	AM	1,650	6	0.180
Dora Street / Doyalson Street	PM	1,643	6	0.179
Dora Street / Station Street	AM	1,610	3	0.351
Dora Street / Station Street	PM	1,690	3	0.368

The performance of roundabouts was reviewed considering the capacity of their circulating lanes. Both the Dora Street / Freemans Drive and Mandalong Road / Gateway Blvd roundabouts are likely to require upgrades and further investigations are needed to determine whether dual lanes or upgrades to signalised intersections is appropriate. Results from testing the roundabout intersections are shown in Table 4.5.

Table 4.5: Low Growth Intersection Stress Testing Results - Roundabouts

Intersection	Peak	Hourly Approach Flow	Circulating Lanes	Saturation (V/C)
Dora Street / Freemans Drive	AM	5425	1	1.595
Dora Street / Freemans Drive	PM	5662	1	2.664
Doyalson Street / Yambo Street	AM	451	1	0.212
Doyalson Street / Yambo Street	PM	661	1	0.311
Mandalong Road / Gateway Blvd	AM	4846	2	1.140
Mandalong Road / Gateway Blvd	PM	4878	2	1.148

Priority-controlled intersections were reviewed to assess the worst-case movement. Where the right turn with the highest approach volume was tested. Results did not warrant the need for upgrades to existing priority-controlled intersections in the Low Growth scenario. Results from testing the priority-controlled intersections in the Low Growth scenario are shown in Table 4.6. It should be noted that the approximate methods used do not account for excessively unsafe delays to low volume side street movements which may otherwise warrant an upgrade.

Table 4.6: Low Growth Intersection Saturation Stress Testing Results – Priority Controlled

Intersection	Peak	Type	Hourly Approach Flow	Approach Lanes	Saturation (V/C)
Freemans Drive / Awaba Street	AM	T Intersection	1,828	3	0.132
Freemans Drive / Awaba Street	PM		1,780	3	0.080
Freemans Drive / Stockton Street	AM		1,661	3	0.084
Freemans Drive / Stockton Street	PM		1,548	3	0.043
Dora Street / Stockton Street	AM		2,206	3	0.030
Dora Street / Stockton Street	PM		2,742	3	0.044
Dora Street / Bridge Street	AM		1,959	4	0.027
Dora Street / Bridge Street	PM		1,971	4	0.075
Dora Street / Wharf Street	AM		1,845	3	0.114
Dora Street / Wharf Street	PM		2,973	3	0.265
Macquarie Street / Fishery Point Road	AM		3,018	6	0.327
Macquarie Street / Fishery Point Road	PM		3,070	6	0.248
Macquarie Street / Campview Road	AM		2,255	3	0.190
Macquarie Street / Campview Road	PM		1,993	3	0.070
Main Road (217) / Moira Park Road	AM		2,258	3	0.064
Main Road (217) / Moira Park Road	PM		2,534	3	0.134
Main Road (217) / Newport Road	AM		1,816	3	0.306
Main Road (217) / Newport Road	PM		3,152	3	0.333
Freemans Drive / Newport Road	AM		1,245	3	0.075
Freemans Drive / Newport Road	PM		995	3	0.037
Kahibah Street / Awaba Street	AM	4-way intersection	1,298	5	0.080
Kahibah Street / Awaba Street	PM		1,480	5	0.080
Station Street / Yambo Street	AM		919	4	0.040
Station Street / Yambo Street	PM		477	4	0.049

4.6 High Growth Scenario

4.6.1 Link Volume to Capacity Ratios

Figure 4.9 shows the degree of Volume to Capacity ratios for the High Growth scenario for 2026 and 2041 for the AM and PM peaks.

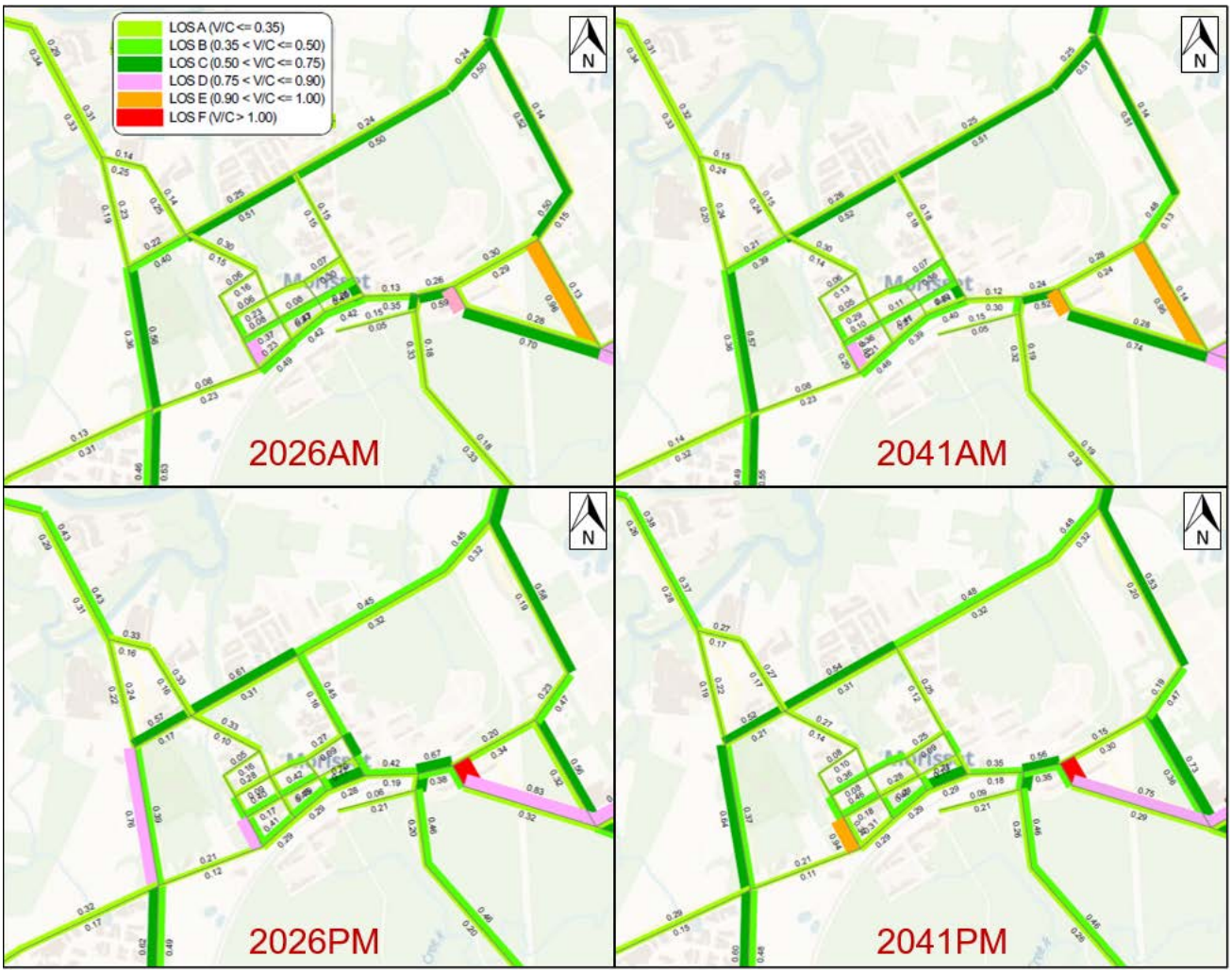


Figure 4.9: High Growth Scenario Volume to Capacity Ratios

The network approaches or reaches capacity on several links including the Awaba Street Bypass to Freemans Drive and Wyee Road. The remaining sections of Main Road (217) were also showing increased pressure. The outputs demonstrate that the modelled network is effective at reducing pressure on Dora Street with the alternative route away from the Town Centre.

Likely required road link upgrades under this scenario are shown in Figure 4.10.

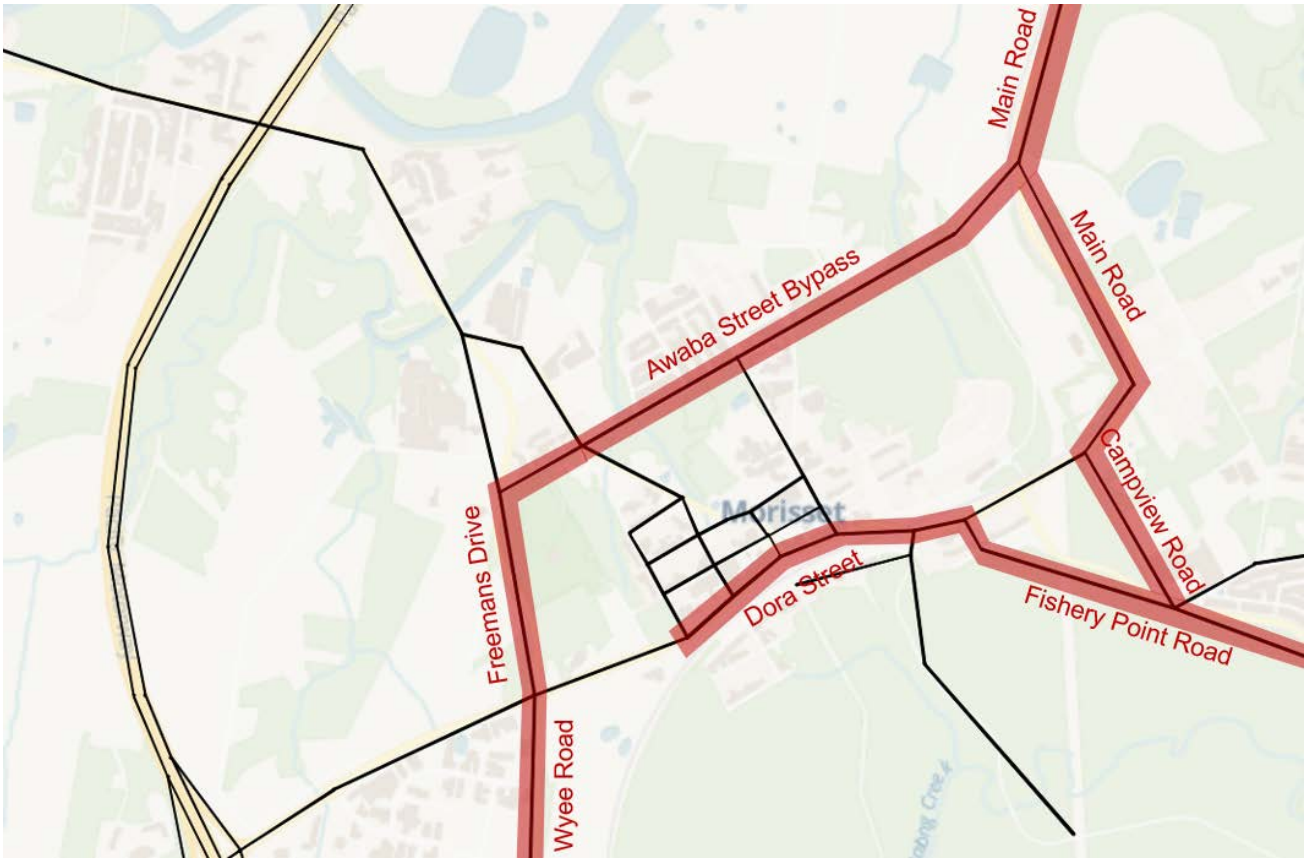


Figure 4.10: High Growth Scenario Likely Required Link Upgrades

4.6.2 Intersection Performance Review

The review of the signalised intersections found no significant concerns mostly because the Awaba Street bypass takes traffic away from these intersections. However, it is recommended that the Dora Street / Station Street intersection is investigated further as turn movements from minor roads are likely to warrant upgrades considering the movement and place changes in the Morisset Town Centre. Results from the review of the signalised intersections are shown in Table 4.7.

Table 4.7: High Growth Intersection Saturation Stress Testing Results - Signals

Intersection	Peak	Hourly Approach Flow	Approach Lanes	Saturation (V/C)
Dora Street / Doyalson Street	AM	1658.5	6	0.181
Dora Street / Doyalson Street	PM	1932.5	6	0.211
Dora Street / Station Street	AM	1548	3	0.337
Dora Street / Station Street	PM	2386	3	0.520

Roundabouts were reviewed considering the capacity of circulating lanes. Results found that the Dora Street / Freemans Drive and Mandalong Road / Gateway Boulevard roundabouts both require upgrades and further investigation is required to determine whether dual lanes or upgrades to signalised intersections is appropriate. Results from the review of the roundabout intersections in the High Growth scenario are shown in Table 4.8.

Table 4.8: High Growth Intersection Stress Testing Results - Roundabouts

Intersection	Peak	Hourly Approach Flow	Circulating Lanes	Saturation (V/C)
Dora Street / Freemans Drive	AM	6,424	1	1.889
Dora Street / Freemans Drive	PM	6,568	1	3.091
Doyalson Street / Yambo Street	AM	952	1	0.448
Doyalson Street / Yambo Street	PM	1,219	1	0.574
Mandalong Road / Gateway Blvd	AM	5,275	2	1.241
Mandalong Road / Gateway Blvd	PM	4,973	2	1.170

Priority-controlled intersections were also reviewed however, the results did not identify the need for upgrades to existing priority-controlled intersections as shown Table 4.9. It should be noted that the approximate methods used do not account for excessively unsafe delays to low volume side street movements which may otherwise warrant an upgrade.

Table 4.9: High Growth Intersection Saturation Stress Testing Results – Priority Controlled

Intersection	Peak	Type	Hourly Approach Flow	Approach Lanes	Saturation (V/C)
Freemans Drive / Awaba Street	AM	T Intersection	2,525	3	0.239
Freemans Drive / Awaba Street	PM		2,714	3	0.187
Freemans Drive / Stockton Street	AM		1,677	3	0.075
Freemans Drive / Stockton Street	PM		1,669	3	0.056
Dora Street / Stockton Street	AM		3,079	3	0.346
Dora Street / Stockton Street	PM		3,353	3	0.333
Dora Street / Bridge Street	AM		2,379	4	0.036
Dora Street / Bridge Street	PM		3,025	4	0.178
Dora Street / Wharf Street	AM		2,641	3	0.173
Dora Street / Wharf Street	PM		3,316	3	0.284
Macquarie Street / Fishery Point Road	AM		2,665	6	0.293
Macquarie Street / Fishery Point Road	PM		3,014	6	0.255
Macquarie Street / Campview Road	AM		2,153	3	0.203
Macquarie Street / Campview Road	PM		2,124	3	0.101
Main Road (217) / Moira Park Road	AM		3,131	3	0.290
Main Road (217) / Moira Park Road	PM		3,713	3	0.627
Main Road (217) / Newport Road	AM		3,451	3	0.423
Main Road (217) / Newport Road	PM		2,569	3	0.569
Freemans Drive / Newport Road	AM		1,306	3	0.080
Freemans Drive / Newport Road	PM		1,134	3	0.041
Kahibah Street / Awaba Street	AM	4-way intersection	2,268	5	0.067
Kahibah Street / Awaba Street	PM		2,736	5	0.149
Station Street / Yambo Street	AM		617	4	0.068
Station Street / Yambo Street	PM		868	4	0.050

4.7 Awaba Street Sensitivity Test

The intent of the High Growth scenario was to make the Awaba Street Bypass the main east-west route, diverting this traffic away from the Town Centre. The modelling showed trips travelling north using Campview Road and Main Road (217) and taking the Awaba Street Bypass.

Given that Awaba Street currently services a residential area with direct frontage access, Council requested a 'sensitivity test' to be modelled where Awaba Street Bypass is made less attractive as a 'bypass' and rather considered as an 'alternative route' to encourage some portion of the through traffic to still travel through the Town Centre.

To achieve this in the modelling this, Awaba Street was reduced from 70km/h to 60km/h with Dora Street increased from 30km/h to 40km/h and its capacity slightly increased, as illustrated in Figure 4.11.

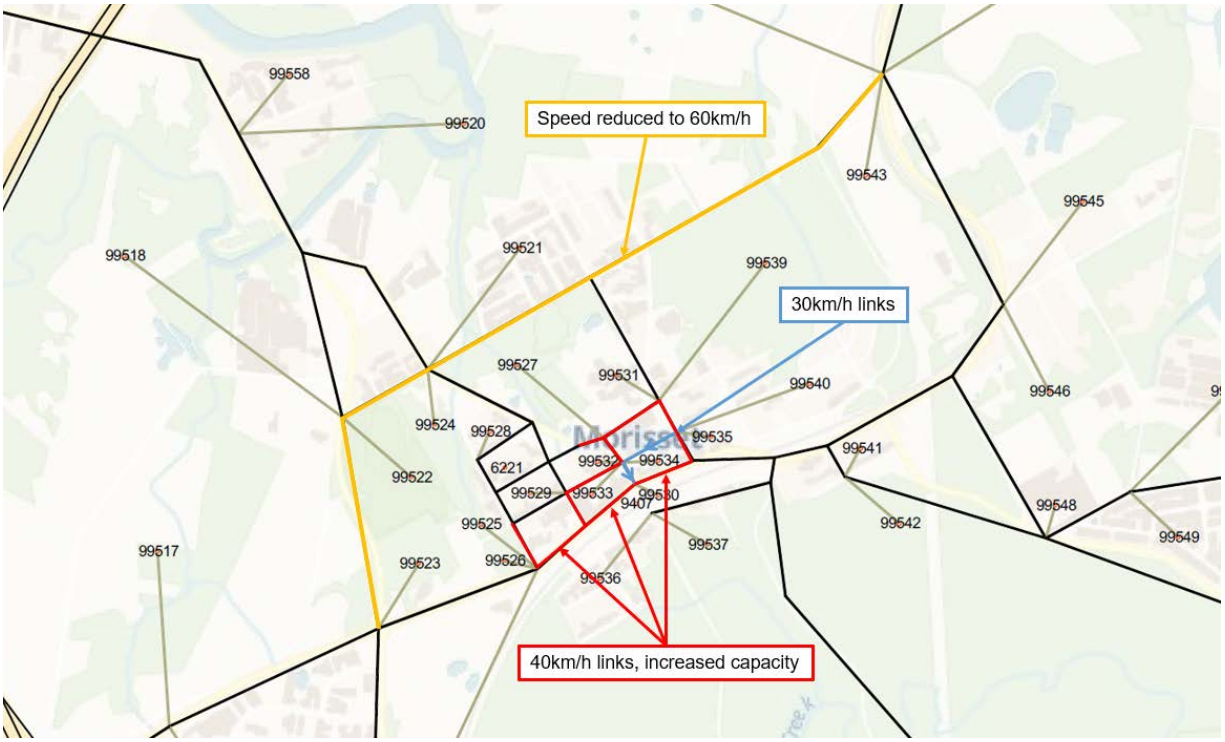


Figure 4.11: Updated Network (High Growth Sensitivity Test Scenario)

Figure 4.12 shows the difference plots comparing the High Growth Sensitivity Test and the High Growth Scenario. The difference plots show the sensitivity test scenario achieves its objective of diverting traffic away from Dora Street and onto Newcastle Street and Stockton Street and provides two (2) alternate routes on Awaba Street and through the town centre.

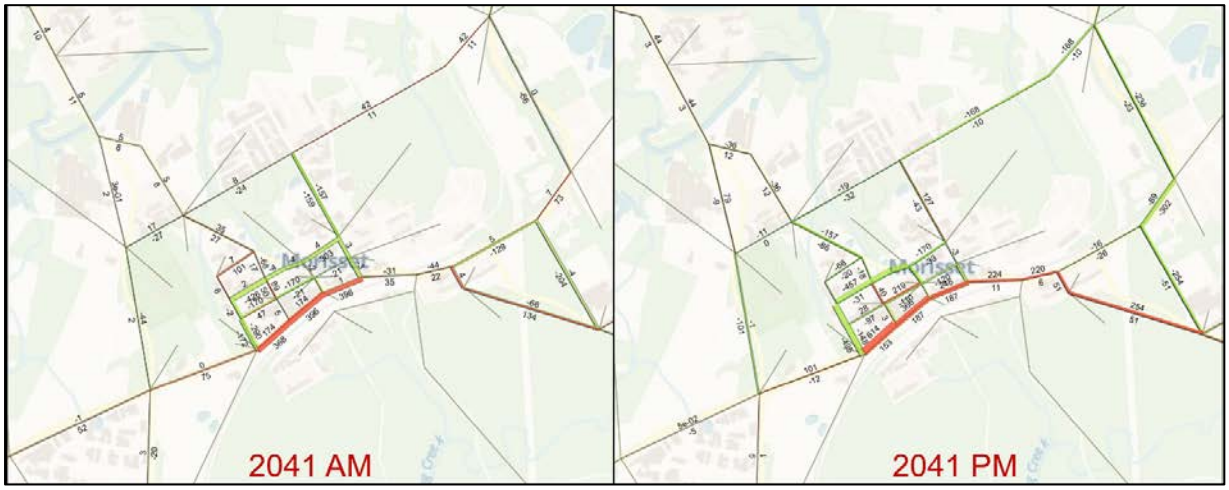


Figure 4.12: High Growth Sensitivity Test minus High Growth Scenario Volumes

The results suggest that allowing Awaba Street to be used as a south-west to north-east alternative route is beneficial to the network, but this route should not be promoted as a 'bypass'.

Awaba Street could therefore maintain its residential character albeit with access managed as subdivisions occurs.

4.8 Potential Traffic Capacity Improvements

Figure 4.13 shows the proposed traffic capacity improvement upgrades for the Low Growth Scenario which identifies intersection upgrades, 40mkm/h zones in the town centre, lane duplication and the Macquarie Street Bypass.

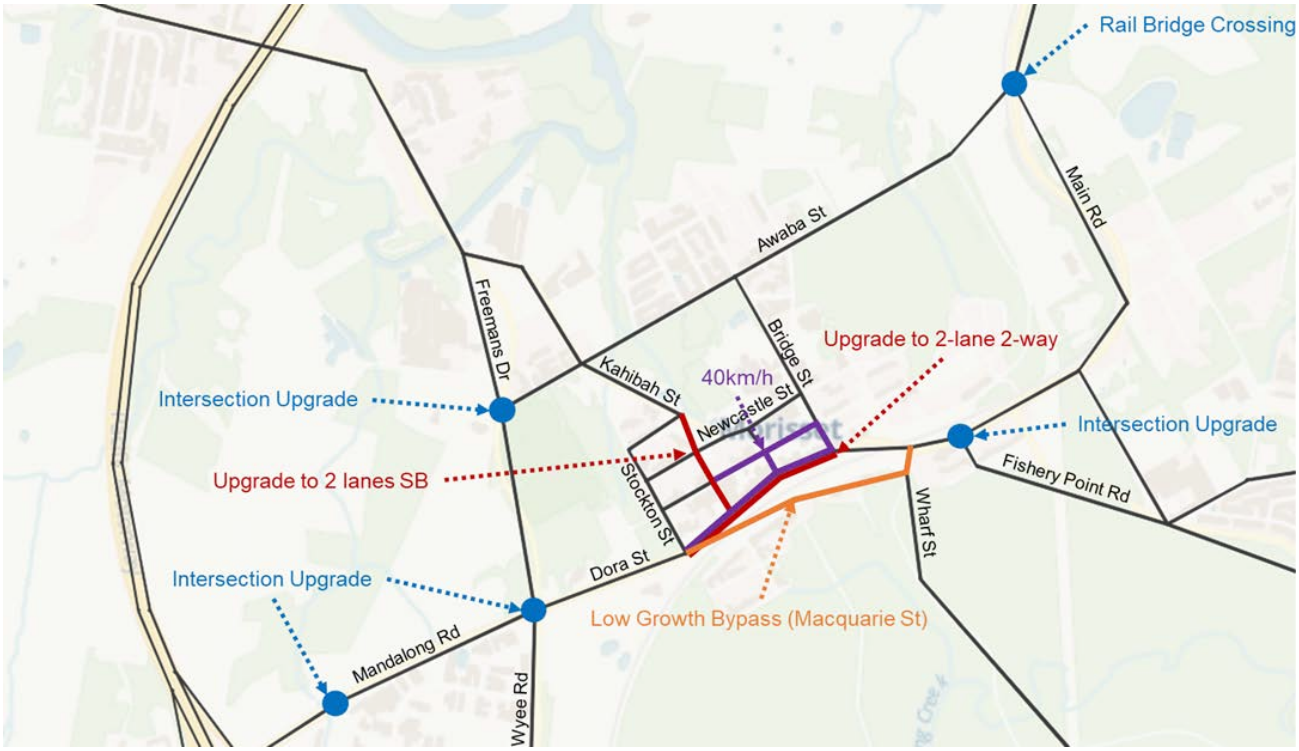


Figure 4.13: Low Growth – Potential Traffic Capacity Improvements

Figure 4.14 shows the proposed traffic capacity improvement upgrades for the High Growth Scenario which identifies intersection upgrades, 30km/h & 40mkm/h zones and one-lane circulation in the town centre, lane duplication and the Awaba Street alternate route.

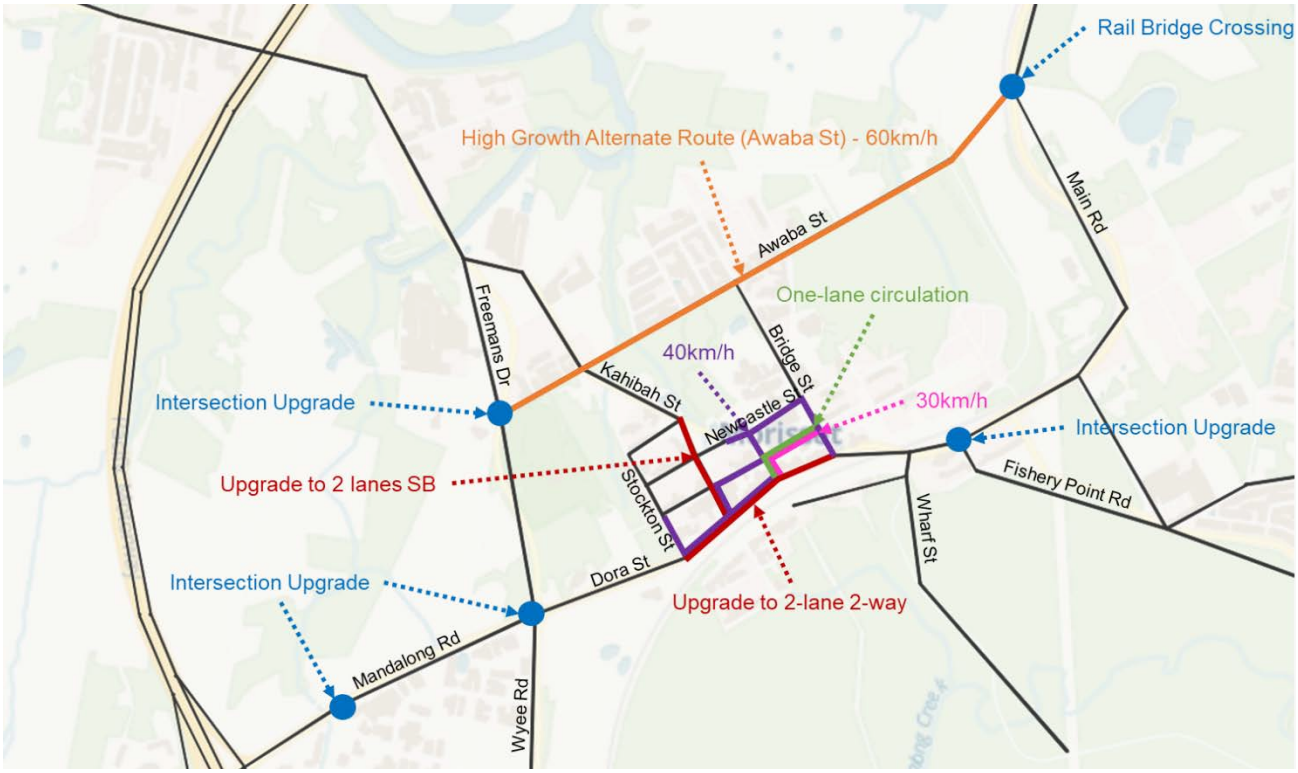


Figure 4.14: High Growth – Potential Traffic Capacity Improvements

5. CONSOLIDATED UPGRADE PROPOSALS

5.1 Overview

The following section outlines all the key upgrade proposals for each of the scenarios considering:

- Outcomes of the Movement and Place assessment
- Upgrade opportunities for the town centre and surrounds based on both Movement and Place considerations and outcomes from Workshops with Lake Macquarie Council
- Outcomes and recommendations from the modelled network scenarios
- Proposed upgrades already within Council's planning documents.

Table 5.1, Table 5.3, and Table 5.5 summarise 'significant' Council and 'Scoping Study suggested' projects from the tested scenarios. These projects are considered 'key' to meeting Morisset network capacity requirements. Each table also lists some examples of non-key 'Other Projects' that should be investigated. All projects defined from the Low Growth and High Growth scenario testing, including 'other' projects and investigations are available at **Appendix D**.

High level cost estimates and potential timing for the delivery of each key upgrade are also provided. Nominated timing is indicative and based on either modelling outputs or experience-based judgement.

5.2 Base Scenario

Table 5.1 lists the key suggested Base upgrade works considering the upgrade opportunities in Section 3.6 and the results from the modelling scenarios.

Table 5.1: Base-Key Upgrade Proposals

Project Number	Upgrade	Description	Benefit
2	Dual Lanes - Mandalong Road and Dora Street	Upgrade to 2 lanes in each direction of travel between Town Centre and M1 Highway	Significant capacity improvements along Mandalong Road
3	Upgrade - Dora Street / Freemans Drive	Upgrade to Signalised Intersection (Dora Street / Freemans Drive)	Capacity improvements to intersection over capacity under all growth scenarios
9	Road and cycle upgrade - Dora Street	Construct new lanes and widen bridge for cyclists parallel to road over Dora Street railway bridge bypass	Part of completing key cycle route to/from Bonnells Bay and provides a safe option for cyclists using the bridge
12	Pedestrian / Cycle Upgrade - Dora Street	Improve Pedestrian/Cycle Corridor on south side of Dora Street	Additional safety and capacity provisions for pedestrians and cyclists travelling to/from Morisset Station. Also improves Place value and encourages slower traffic movements through town
Other Projects			
-	Other intersection upgrade investigations	For example: ▪ Investigate Awaba Street / Kahibah Street intersection ▪ Signalised Intersections along Freemans Drive)	
-	Minor pedestrian improvements throughout town centre	For example: ▪ Kerb ramp improvements on Station Street ▪ Pedestrian refuge on Freemans Drive	
-	Pedestrian improvements surrounding Morisset	For example: ▪ Kerb Build-out extensions on Terrigal Street ▪ Pedestrian refuge on Freemans Drive	

Figure 5.1 shows a map of the key Base projects. The modelling analysis accounts for the Kahibah Street closure for town park proposal as shown in the figure below, though it is a 'confirmed' project and has been excluded from the potential upgrade works lists and costs in this Scoping Study.

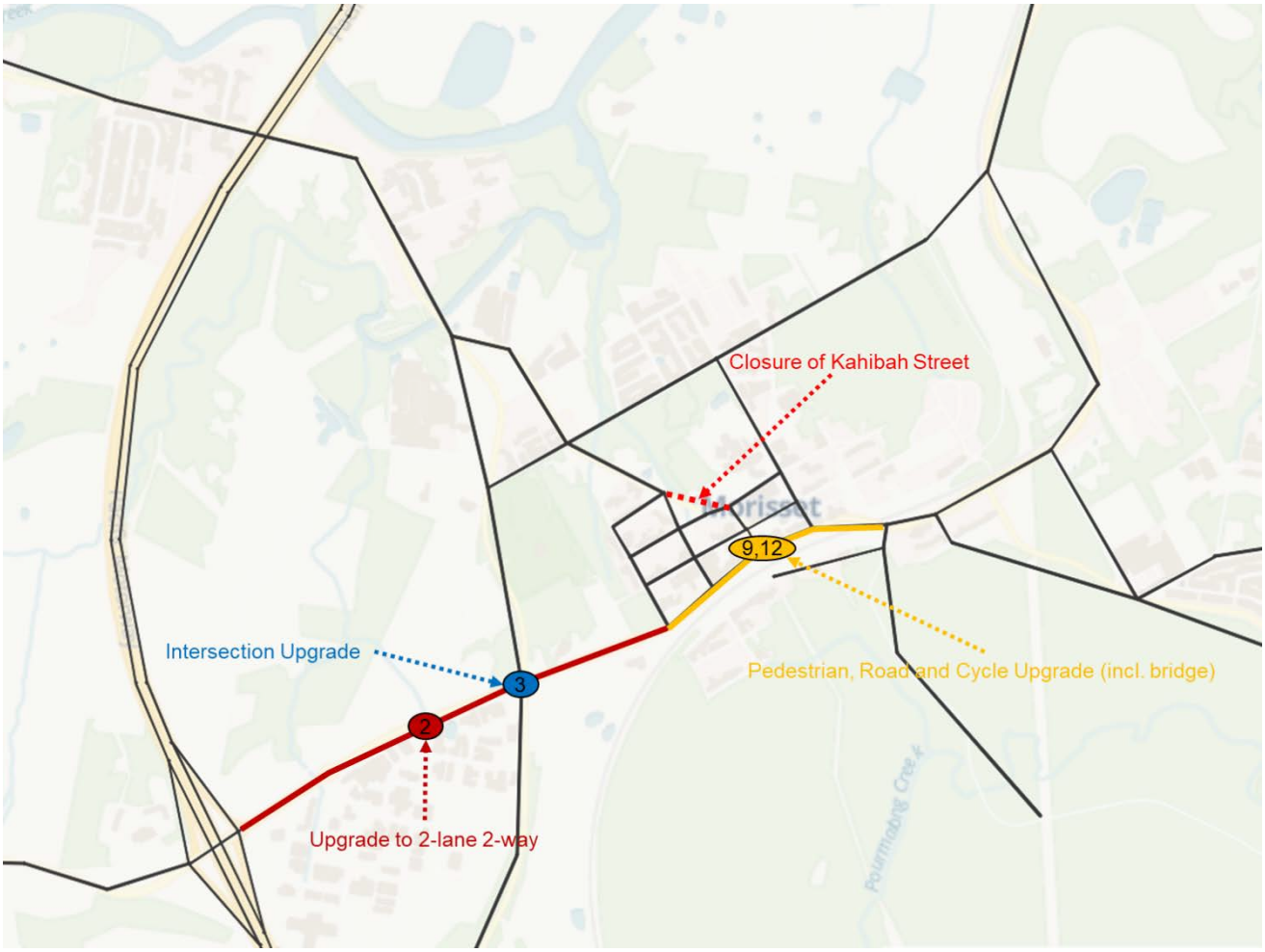


Figure 5.1: Base Consolidated Key Upgrade Proposals

High-level cost estimates of some key projects for the Base scenario are shown in Table 5.2. Noting, most projects are already included in Council's planning, some of which have been included in this Scoping Study for further review and consideration.

Table 5.2: Base Scenario Upgrade Costs

Project #	Upgrade	Considerations	Cost	Suggested Timing
2 /3	Dual Lanes on approach to Town Centre, Dora Street / Freemans Drive & Mandalong Road / Gateway Boulevard intersection upgrade	Confirmed upgrade with funding allocation	$73,000,000	2026
9	Road and cycle upgrade - Dora Street	Includes new wider lanes across rail bridge for cyclists	$3,000,000	2031
12	Pedestrian / Cycle Upgrade - Dora Street	Improve Pedestrian/Cycle Corridor on south side of Dora Street	$250,000	2026

5.3 Low Growth Scenario

Table 5.3 lists the key suggested Low Growth upgrade works considering the upgrade opportunities in Section 3.6 and the results from the modelling.

Table 5.3: Low Growth-Key Upgrade Proposals

Project Number	Upgrade	Description	Benefit
4	Investigate - Awaba Street / Moira Park Road*	Investigate extent of, and develop, intersection upgrade	Improvements to network capacity and connectivity for traffic growth to the north/north-east of Morisset
10	Speed Reduction - Morisset Town*	Lower speeds around Morisset Town to 40km/h	Improves Morisset 'Place' value as well as significant safety improvements for all travel modes
13	Road Upgrade - Fishery Point Road	Upgrade road capacity of Fishery Point Road and upgrade to signalised intersection with Main Road (217), dual lanes on approach suggested	Improvements to network capacity (noted from model outcomes)
14	Centre Streetscaping Investigations*	Investigate kerb build outs, narrow street lanes, and create parking lanes in Town Centre	Improves Morisset 'Place' value as well as significant safety improvements for pedestrians
15	Intersection Upgrade - Mandalong Road / Gateway Boulevard	Upgrade to Signalised Intersection (Mandalong Road / Gateway Boulevard). *Noted as part of the scope of Item 2 in funding allocation*	Improvements to intersection capacity due to background growth from Motorway and expanding industrial/ commercial areas
16	*Town bypass - Macquarie Street*	*Bypass on Macquarie Street plus 2 intersection upgrades and a rail crossing bridge*	*Reduces through traffic on Dora Street, improving Place value of centre and ensuring high Movement demand is catered for*
Other Projects			
-	Other Intersection upgrade investigations	For example: ▪ Investigate Freemans Drive / Awaba Street intersection ▪ Investigate Macquarie Street / Fishery Point Road intersection	
-	Town centre pedestrian accessibility improvements	For example: ▪ Investigate Removal of Dora Street On-street Parking ▪ Investigation planning strategies to introduce more permeability through centre development lots	

**Proposed in both high and low scenarios, though level of investigation needed may differ.*

The Low Growth Scenario's bypass option on Macquarie Street provides a similar benefit to the Town Centre as the High Growth Scenario's Awaba Street option. The project also is under investigation by TfNSW who have noted significant challenges in providing connections to Dora Street. Considering this, and the limitations it would place on the potential expansion of the town centre to the south of the rail line, it is recommended that Project 1 (High Growth scenario - Table 5.5*) is pursued instead.*

Additionally, the proposed application for a large commercial / industrial site west of Freemans Drive that has access on Gimberts Road to Mandalong Road has been considered in the modelling as employment growth on the northern side of Mandalong Road. Although the impacts of this growth need to be inferred from the modelling outputs, initial indications are that the adjacent Mandalong

Road / Gateway Boulevard roundabout will likely require upgrades under both the Low and High Growth scenarios in 2041 (but not under the Base case). Further investigation is recommended. It is anticipated that these developments alone would have negligible impacts on the M1 interchange.

Figure 5.2 shows a map of key Low Growth projects, noting that only projects additional to those for Base are shown.

Figure 5.2: Low Growth Consolidated Key Upgrade Proposals (additional to Base projects)

High-level cost estimates of some of the suggested 'Low Growth' projects are shown in Table 5.4. A full list of project cost estimates is available at **Appendix D**.

Table 5.4: Low Growth Scenario Upgrade Costs

Project #	Upgrade	Considerations	Cost	Suggested Timing
4	Investigate - Awaba Street / Moira Park Road	*Intersection Upgrade only (excludes consideration of Project 1 impacts (Main Road (217) / Moira Park Road)*	*$5,000,000*	2036
10	Speed Reduction - Morisset Town	Suggested zone focused on town centres main pedestrian streets (i.e. Short Street, Yambo Street, Dora Street). Further investigation may reduce/increase zone.	$100,000	2026
13	Road Upgrade - Fishery Point Road	Only considers short section on approach to intersection with Main Road (217)	$3,000,000	2036
14	Centre Streetscaping Investigations	Streetscaping improvements investigation and implementation	$500,000+	2026+
15	Intersection Upgrade - Mandalong Road / Gateway Boulevard	Investigate upgrade to Signalised Intersection.	*Scoped in Item 2*	2036
16	*Town bypass - Macquarie Street*	*Currently under investigation by TfNSW. Project 1 is recommended for investigation in lieu of this project.*	*$43,000,000*	*NA*

5.4 High Growth Scenario

Table 5.5 lists the key suggested High Growth Scenario upgrade works considering the upgrade opportunities in Section 3.6 and the results from the modelling. Unless a project in the table directly replaces or supersedes another (e.g. Project 16 by Project 1) then capacity improvement projects from the Low Growth Scenario should be assumed to be included when considering High Growth projects list.

Table 5.5: High Growth Key Upgrade Proposals

Project Number	Upgrade	Description	Benefit
1	Alternate Route around Town Centre (Awaba Street)	Upgrade Awaba Street to improve capacity (including 60km/h limit), similar cross section suggested to residential sections of Freemans Drive. Upgrades to intersections with Main Road (217) and Freemans Drive also need to be investigated. Aims to assist in resolving movement delays on Dora Street for Morisset Economic Centre by providing alternate route for northbound traffic	Reduces through traffic on Dora Street, improving Place value of centre and ensuring high Movement demand is catered for. Aims to limit impact to residential areas while also improving traffic levels on Dora Street
4	Investigate - Awaba Street / Moira Park Road	Investigation intersection upgrade and potential staged realignment in collaboration with Project 1	Improvements to network capacity and connectivity for traffic growth to the north/north-east of Morisset

Project Number	Upgrade	Description	Benefit
5	Pedestrian Bridge Upgrade - Dora Street to Macquarie Street	Improve pedestrian bridge across rail from Dora Street to Macquarie Street	Improves connectivity for the public across rail line and encourages the expansion of the town centre commercial area. Also provides opportunities for alternate visitor parking locations allowing park n walk without driving into the centre itself.
6	Reduce to One Way - Short Street	Reduce Short Street to one-way westbound from Station Street to Short Street	Improves pedestrian accessibility and Place value by reducing vehicle speeds and providing more space for commercial/retail
7	Reduce to One Way - Station Street	Reduce Station Street to one-way southbound from Yambo Street to Dora Street	
8	Reduce to One Way - Yambo Street	Reduce Yamba Street to one-way southbound from Station Street to Short Street	
10	Speed Reduction - Morisset Town	Lower speeds around Morisset Town to 40km/h	Improves Morisset 'Place' value as well as significant safety improvements for all travel modes
11	Speed Reduction - Morisset Town Centre	Lower speeds around Morisset Town Centre to 30km/h	Further improves Morisset 'Place' value as well as significant safety improvements for all travel modes
13	Road Upgrade - Fishery Point Road	Upgrade road capacity of Fishery Point Road and upgrade to signalised intersection with Main Road (217), dual lanes on approach suggested	Improvements to network capacity (noted from model outcomes)
14	Centre Streetscaping Investigations	Investigate kerb build outs, narrow street lanes, and create parking lanes in Town Centre	Improves Morisset 'Place' value as well as significant safety improvements for pedestrians
15	Intersection Upgrade - Mandalong Road / Gateway Boulevard	Investigate upgrade to Signalised Intersection (Mandalong Road / Gateway Boulevard)	Improvements to intersection capacity due to background growth from Motorway and expanding industrial/ commercial areas
Other Projects			
-	Other Intersection upgrade investigations	For example: ▪ Investigate M1 interchange capacity under high growth ▪ Investigate Wyee Road / Alliance Avenue intersection	
-	Other network link upgrade investigations	For example: ▪ Investigate Wharf Street impacts due to expanding centre ▪ Campview Road capacity improvements/impacts	

Figure 5.3 shows a map of key High Growth projects, noting that only projects for the scenario are shown, Base scenario projects should considered within both Low and High scenarios.

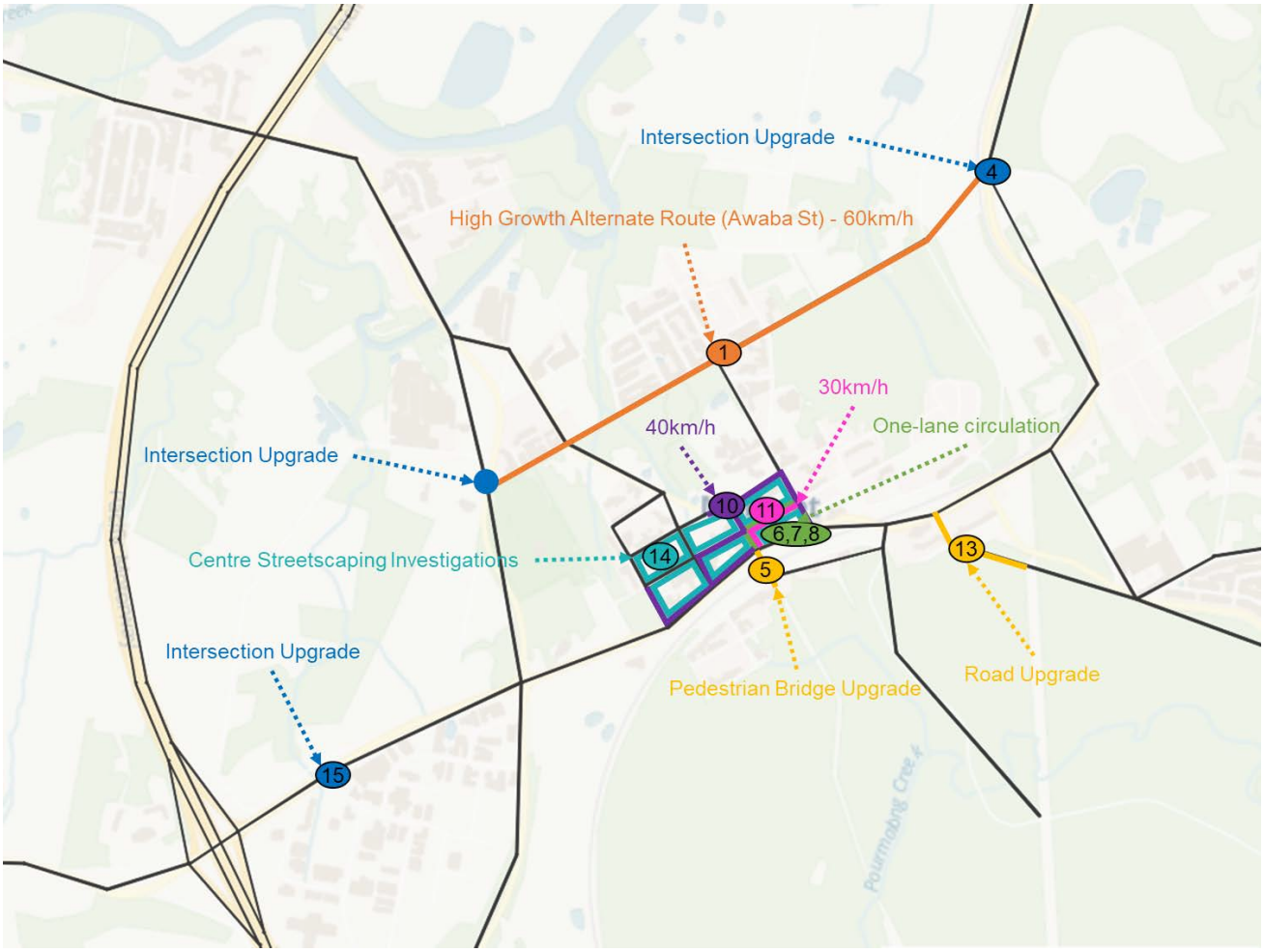


Figure 5.3: High Growth Consolidated Key Upgrade Proposals (Additional to Low Growth)

High-level cost estimates of some of the suggested 'High Growth' projects are shown in Table 5.6. A full list of project cost estimates is available at **Appendix D**.

Table 5.6: High Growth Scenario Upgrade Costs

Project #	Upgrade	Considerations	Cost	Suggested Timing
1	Alternate Route around Town Centre (Awaba Street)	Includes 60km/h zoning, cross section similar to Freemans Drive, upgrades to intersections with Main Road (217) and Freemans Drive.	$40,000,000	2041
4	Investigate - Awaba Street / Moira Park Road	Completed in conjunction with Project 1, considers realignment of intersection priority	$5,000,000	2036
5	Pedestrian Bridge Upgrade - Dora Street to Macquarie Street	Includes upgrading existing pedestrian bridge. Should investigations find a 'new bridge' is favourable, then cost estimation should be adjusted	$5,000,000	2041
6/7/8	One-way circulation for Short Street, Yambo Street and Station Street	Includes investigation and implementation at all 3 streets, noting a suggested anti-clockwise circulation through centre	$15,000,000	2041
10	Speed Reduction - Morisset Town	Suggested zones focused on town centres main pedestrian areas. Further investigation may reduce/increase zone.	$100,000	2026
11	Speed Reduction - Morisset Town Centre		$80,000	
13	Road Upgrade - Fishery Point Road	Considers section from Main Road (217) to Campview Road	$8,000,000	2026+
14	Centre Streetscaping Investigations	Streetscaping improvements investigation and implementation	$500,000+	2036
15	Intersection Upgrade - Mandalong Road / Gateway Boulevard	Upgrade to Signalised Intersection includes investigation and potential upgrade cost	$10,000,000	2036

6. SUPPORTING ADVICE

This chapter provides preliminary advice on each item.

6.1 Overview

In preparation for the larger Multi-Modal Study to come, Council has requested additional advice on:

- Active transport needs / issues
- Heavy vehicle issues
- Parking supply considerations
- Traffic 'sub catchments'
- A specification for the Multi-Modal Study.

6.2 Active Transport and Public Transport

6.2.1 Cycling

Future planning for the cycle network for Morisset and its surrounds appears to be well considered and plans for an extensive cycling network. Key items include:

- Morisset to Bonnells Bay shared pathway: Improvements to facilities along Pulbah Street, Wyee Street and Oscar Lane
- Separate cyclist bypass on Dora Street rail bridge (Project 9) as shown in Chapter 5 with an alternative upgrade of improving the cyclist link on Macquarie Street along with improving the pedestrian bridge connection over the rail bridge (Project 5) to connect to both the rail line and Town Centre
- Principle cycle routes to Cooranbong
- Pathways on either side of the Pacific Motorway underpass on Freemans Drive and improved cyclist wayfinding signage to improve connection to Avondale University (CPTED issues)
- There are limited quality cycleways to the west and northeast of the Morisset Town Centre and conflicts occur with high-speed vehicles. The Awaba Street alternative route could be an opportunity for an additional route for this purpose
- There are currently good facilities to the east in the Bonnells Bay Area. However, consider a full 'loop path' to collect all residential areas in the catchment (i.e. around Fishery Point Road and / or Dandaraga Road).

The Morisset to Bonnells Bay shared pathway is shown in Figure 6.1.

SOURCE: Lake Macquarie City Shared Pathways Guide

Figure 6.1: Morisset to Bonnells Bay Shared Pathway

The types of facilities being provided along these routes require further consideration, for example:

- Bonnells Bay caters for recreational cycling for tourists and locals and a separated path would be preferred in most locations. However, once the principal cycle route extends outside of the Morisset Town Centre the key users of the cycle route are more likely to be sports cyclists and / or 'commuters' and on-road facilities would be more appropriate
- In the Morisset Town Centre, provisions for end of trip facilities should be considered possibly as part of major commercial developments and in conjunction with lower speed zones. Reprioritising on-street space should also be investigated such as considering paths and on-street lanes when reducing Town Centre lanes to one-way.

Some examples of various cycle facilities for different users are shown in Figure 6.2.

SOURCE: Waverley Council / Colourcoat Sydney, Google Streetview

Figure 6.2: Recreational Cycle Paths/Routes

6.2.2 Walking

This scoping study has suggested a range of potential pedestrian improvement / upgrade projects that are tied into improving the 'Place' value within the Morisset Town Centre. Key projects include:

- Improved pedestrian links/facilities to the entertainment centre to the west of the Town Centre
- General streetscaping to enforce lower speed limits (i.e. kerb build outs, line-marking, narrowing lanes, addition of cyclist lanes, street trees etc.)
- Pedestrian permeability links through large blocks
- Improved pedestrian links across the rail line for the expansion of the Town Centre.

Council's current planning has several notable projects to improve pedestrian facilities within Morisset. Whilst the Morisset Town Centre provides high quantity of footpaths, a detailed investigation into the condition and roles of footpaths and crossings in different areas should be undertaken. A 'Main Street' boulevard with wider footpaths could be created to cater for more shops on Yambo Street and / or Short Street) or as shared path with cyclists to provide a continuous link from Bernie Goodwin Park to the Town Centre.

6.2.3 Bus and Rail Facilities

It is understood that Council is currently auditing bus stop infrastructure and that no further analysis on infrastructure condition is required. Some of the key existing stops and routes within the Morisset Centre are shown in Figure 6.3.

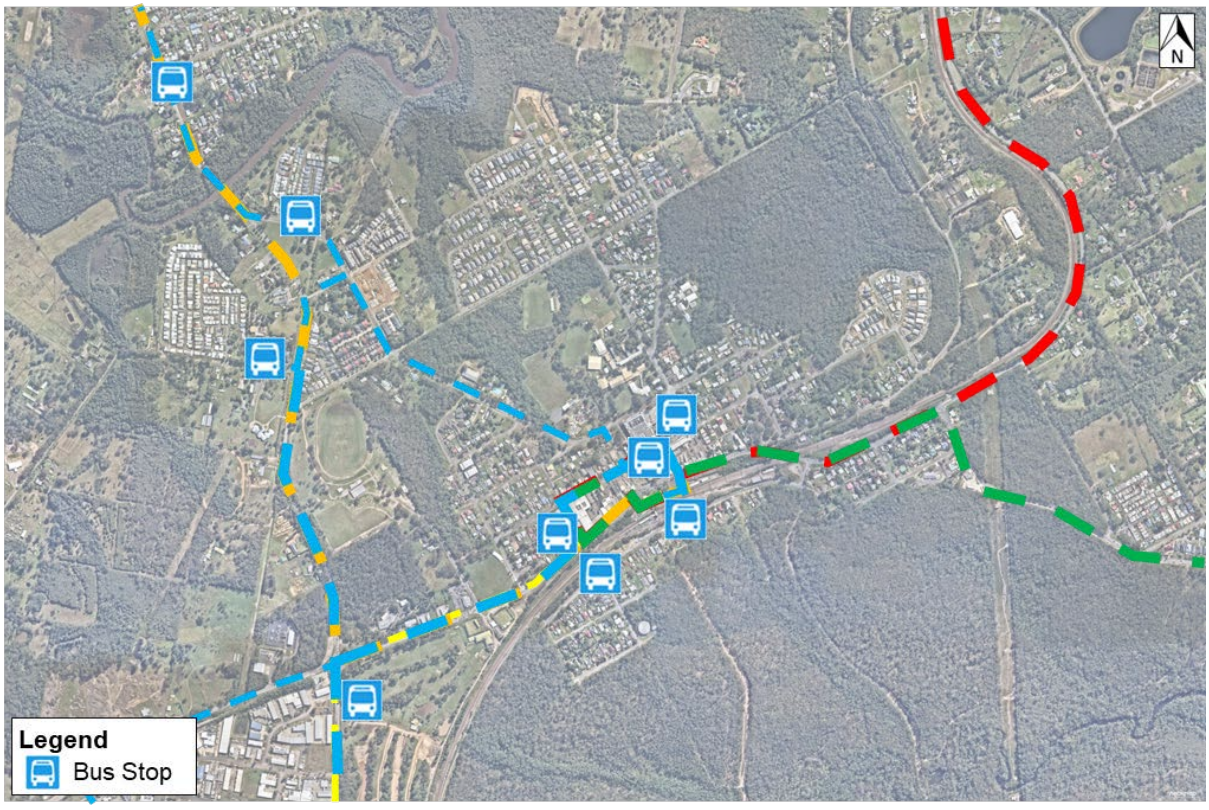


Figure 6.3: Public Transport

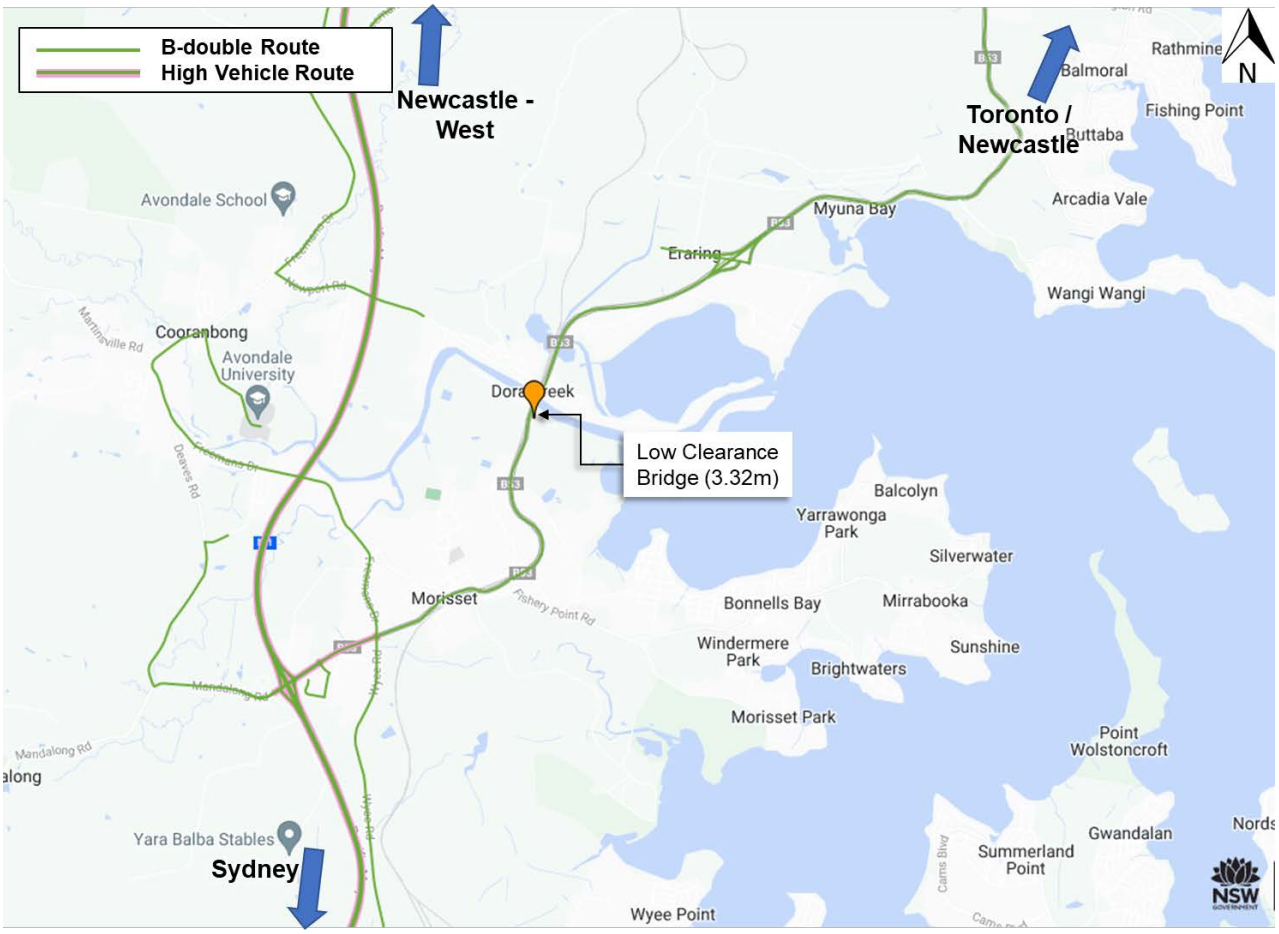
Part of the vision for Morisset is to ensure connectivity through Morisset within the Greater Newcastle 'Metro Frame.' Southern areas of Lake Macquarie have an older and ageing demographic. Mobility needs and the quality of the footpath connections to / from stops, and the station, are a particularly important combination.

It is expected that the proposed faster rail infrastructure will not present local 'Movement' influences. It is important to note however that:

- Morisset Station is identified as a key transport node in the Newcastle region, particularly in the southern region for trips onwards to Sydney
- Planning is currently in the early stages for faster rail between Sydney and the Hunter region, including whether Morisset will have a station
- A faster rail station, for Morisset will be a 'game changer' and will require reconsideration of both lane use and transport strategies.

6.3 Potential Heavy Vehicle Conflicts and Management

Existing heavy vehicle movements through Morisset town centre are restricted to Dora Street. Routes in the wider study area are shown in Figure 6.4.



Source: TfNSW Heavy Vehicle Maps

Figure 6.4: Heavy Vehicle Routes

While the majority of heavy freight between Sydney and Newcastle would use the Pacific Motorway, heavy vehicle traffic that needs to access the central and northern Lake Macquarie region (including Morisset) currently travels through the Morisset town centre along Dora Street. This heavy vehicle traffic conflicts with the vision for the Town Centre.

In the region surrounding Morisset there is a physical constraint on the heavy vehicle network in the form of a Low Clearance bridge at Dora Creek. There are also a number of routes that allow access to industry / agriculture on Deaves Road, access to Cooranbong and access to Avondale. These routes have the potential to be extended to provide a more connected heavy vehicle network and reduce travel times, although the costs of these projects are likely to outweigh their benefits.

Consideration should also be given to level of heavy vehicle access required for the entertainment centre at the edge of the Town Centre and the access for heavy vehicles access needs to the new industrial area on the north side of Mandalong Road adjacent to the motorway.

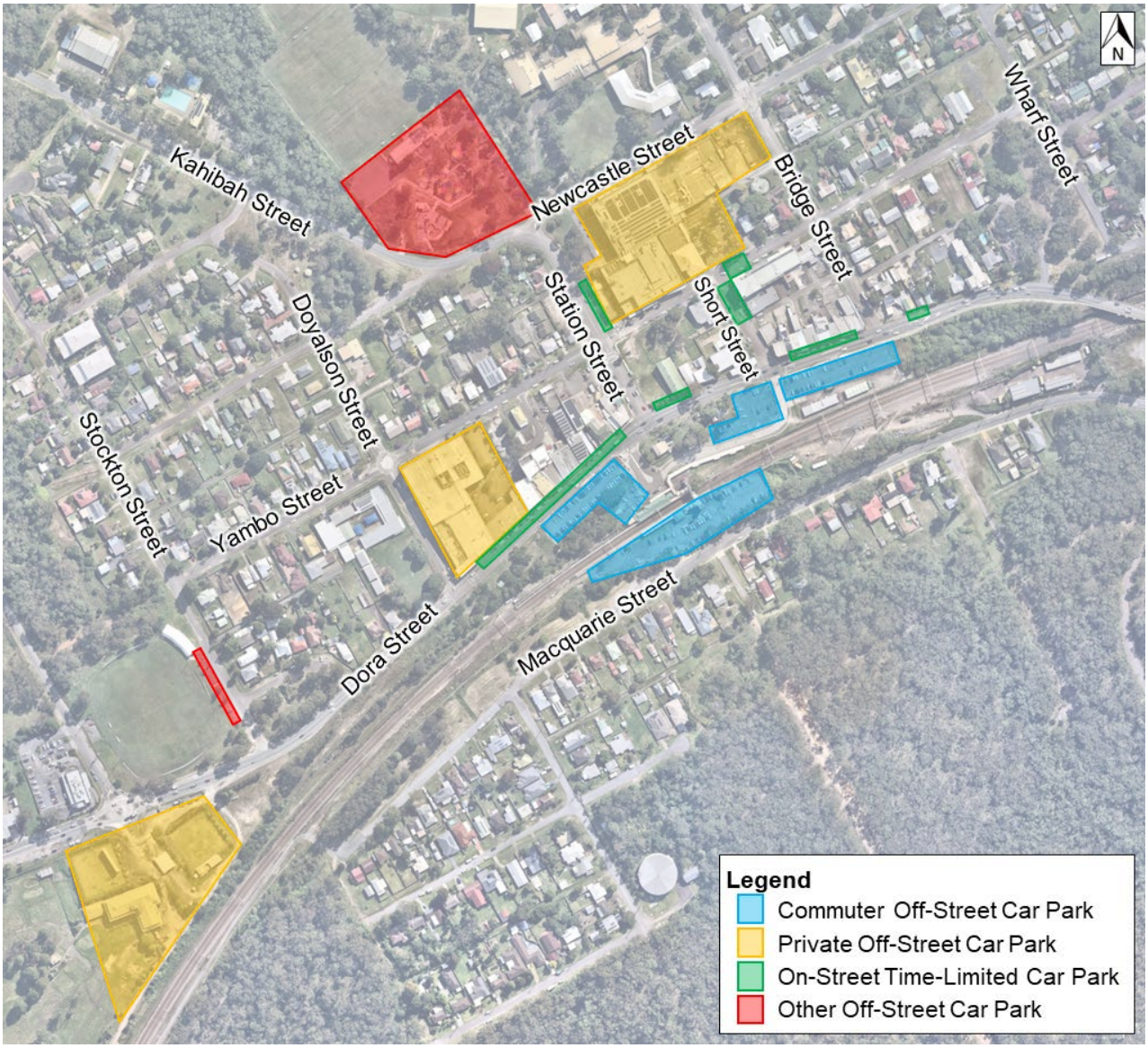
A range of suggestions to initiate further investigations are presented in Figure 6.5. It is understood that Council's vision for Morisset aims to limit heavy vehicle access on Council's road network in order to limit future maintenance impacts as a result of additional heavy vehicle traffic on local roads. The future of heavy vehicle routes, particularly through the Morisset Town Centre, should be investigated further.

Source: TfNSW Heavy Vehicle Maps

Figure 6.5: Suggested Investigations for Heavy Vehicle Routes

6.4 Parking Supply and Management

The key existing parking facilities within the Morisset town centre are shown in Figure 6.6.



Source: Nearmap

Figure 6.6: Morisset Key Parking Facilities

Many of Morisset's larger off-street parking areas are on the edges of the existing the Town Centre, which is an effective way to reduce parking circulation within the 'Main Streets'. This may change as with multi-level building proposals and the prospect of underground parking to service them. As part of future investigations, it is recommended that options for new or upgraded consolidated off-street parking locations are considered (i.e. along Macquarie Street or at the future Entertainment Centre). This should be done in tandem with considering how to manage the existing centre parking demands (i.e. Morisset Station and shopping centres) and whether further parking management initiatives should be employed to help discourage long-stay parking in the centre.

This may require innovative approaches to unbundle parking rom commercial units, or to reduce on-site parking for developments and divert it to the preferred 'communal' off street parking areas.

It is understood that TfNSW is currently investigating an expansion to the Morisset train station commuter car park. Outcomes of this investigation were unavailable for this Scoping Study and should be considered within the future Multi-Modal Integrated Transport Strategy.

6.5 Sub-Catchment Definitions

The sub-catchments were defined as the basis for apportioning the cost of identified upgrades.

Figure 6.7shows the sub-catchments identified in the Morisset Traffic and Transport Study conducted in 2012. Each catchment has been reviewed in terms of its appropriateness as follows:

- **Cooranbong, Martinsville, Mandalong, and Wyee:** These catchments are likely to have minimal nexus with the need for upgrades in / around Morisset Town Centre and hence are satisfactory as presented.
- **Morisset CBD:** Includes development in the Morisset CBD. This catchment includes land south of Newcastle Street, north of the rail line, east of Doyalson Street and west of Wharf Street. It is appropriate to retain this area as a separate catchment.
- **Morisset Catchment:** Excludes the area covered by the Morisset CBD. The catchment includes land east of the M1, south of Dora Creek and north of the rail line to the south of Morisset town centre and west of Mains Road to the east of Morisset town centre. This catchment covers the outskirts of the Morisset CBD catchment that is accessed through Freemans Drive / Main Road (217) to the north, Fishery Point Road to the east, Wyee Road to the south and Mandalong Road to the west. It is appropriate to retain this area as it covers most of the proposed growth area.
- **Morisset Peninsula Catchment:** Includes future development on the Morisset Peninsula southeast of Macquarie Street and east of the rail line to the south of Morisset town centre. The area includes Bonnells Bay, Brightwater, Balcolyn, Silverwater and Sunshine 'zones' which are accessed solely through Fishery Point Road and potentially Campview Road once upgraded. Given this these catchment zones could be aggregated.
- **Rural Catchment:** Includes the remaining land to the west of the M1. It is likely that there will be no need for traffic and transport works in this area due to the dispersed population. This catchment captures the rural areas of Mandalong and Martinsville that has been appropriately grouped together due to the small growth in the areas. Splitting the areas may be considered if significant future development is proposed in these areas but is deemed appropriate at this stage.

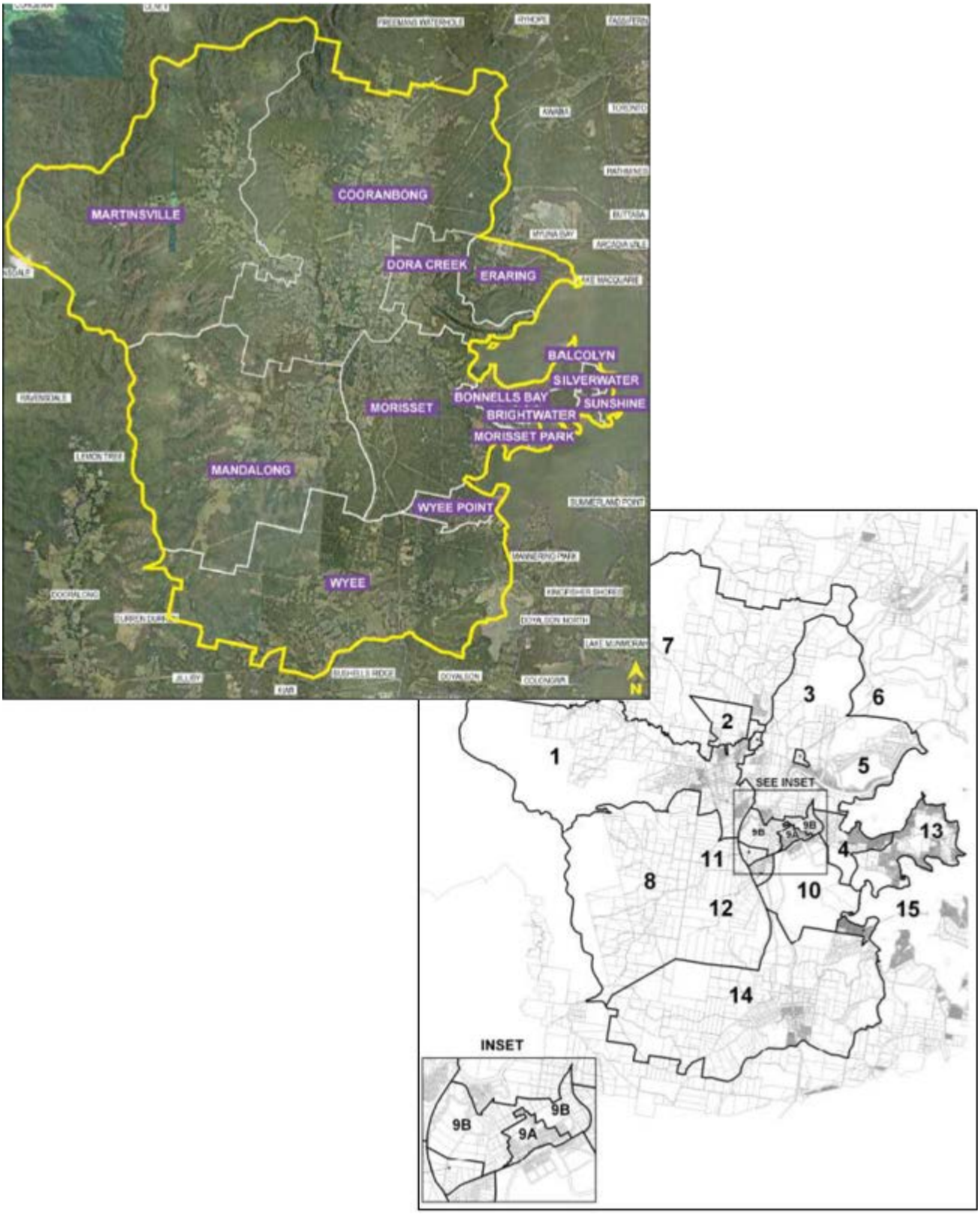


Figure 6.7: **Traffic Sub-Catchments - Morisset Traffic and Transport Study 2012**

6.6 Specification for the Multi-Modal Integrated Transport Study

Following community consultation on this Scoping Study, Council is intending to prepare an Integrated Transport Strategy (ITS) that will expand on the current investigations and inform a comprehensive multi-modal strategy for Morisset and its surrounds.

Bitzios Consulting has conducted several large-scale ITS projects for areas of varying sizes, demographics, and needs, across NSW. The following information provides a suggested ITS process for Morisset. Key elements include:

- **Task 1, Background Review:** A review of background information to summarise what has been done before, what is committed, what is planned (such as Faster Rail) and what are the overarching policies and strategies that the ITS sits within (such as the Greater Newcastle Vision 2036)
- **Task 2, Create the Modelling Tools:** These are likely to require an update of the Hunter STFM, the creation of a *mesoscopic simulation* model for Morisset and surrounds (extending to the growth areas) and SIDRA intersection models for key intersections
- **Task 3, Growth Challenges:** Establish what the transport challenges will be in 2041 with the *preferred growth plan* and only the committed transport improvements in place, for all modes of transport
- **Task 4, Vision and Objectives:** Establish with stakeholders and the community, what the preferred transport vision is for the study area and the objectives that fall out of the vision, by mode of transport, including various transport target metrics
- **Task 5, Strategies Development:** Identify key strategies by type of transport (Roads, Freight, Public Transport, Active Transport) as well as considering the topics of Movement and Place, Parking, Mobility and Access and Emergency Technologies. It is noted Council do not have the maintenance allocation to cater for heavy vehicle access through Morisset. This task will also include modelling and evaluation of road-based options to understand the network upgrades required to achieve the network metrics from Task 2. This is likely to need strategic modelling for broader traffic demand assessment, mesoscopic simulation for localised route choice under the various network upgrade and traffic management scheme options being contemplated and SIDRA intersection modelling to identify intersection upgrade configurations
- **Task 6, Action Plan:** Interim year modelling and stage assessments should be undertaken, along with evaluation of active transport, public transport, and other initiatives to inform a consolidated action plan with Item, Cost, Priority and Responsibility identified. Ideally, each action item should cascade from a mode-specific objective identified in Task 4
- **Task 7, Draft ITS:** The draft Technical Report and Summary Report (high quality, public facing document) should be prepared, approved by Council and exhibited
- **Task 8, Final ITS:** Taking on stakeholder and community feedback, the final document should be prepared.

A range of 'levels' of engagement could be undertaken with stakeholders and the community. At a minimum, engagement is suggested at the 'issue gathering' task and in developing the Vision (Tasks 3 and 4), however, the study could benefit from targeted engagement on specific 'high profile' initiatives in Task 5, such as a potential bypass / alternative route.

Depending on the scale of the engagement and the final study area, the ITS could take up to 12 months to complete.

The preliminary findings from this Scoping Study could inform the transport modeling and multi-modal planning aspects of the ITS.

A hierarchy of transport models is suggested, as follows:

- *Strategic modelling using the STFM:* Finalise demographics inputs, calculate traffic demand growth from the base year to future years to add the Mesoscopic model, test broader road network links that would influence route choice in the growth area (e..g extracting a proportion of through traffic from Dora Street)
- *Mesoscopic modelling:* To assess the route choice implications of LATM treatments, intersection upgrades and local road upgrades and to provide traffic volumes for intersection modelling. Provides network performance statistics for network-options evaluation.
- *SIDRA intersection modelling:* To identify intersection upgrade geometrical requirements and intersection operating performance statistics.

For example, this hierarchy of models could inform ITS planning decisions on:

- Broader routes for through traffic management or diversion (STFM, Mesoscopic model)
- The need for, and impacts of, heavy vehicle restrictions on Awaba Street (Mesoscopic model)
- Intersection upgrade details for the various intersections that have been 'flagged' within this study's high-level analysis such as Bridge Street/Macquarie Street, Main Road / Moria Park Road, and Macquarie Street / Fishery Point Road (Mesoscopic model, SIDRA)
- The form and function of localised intersections within the town centre (Mesoscopic model, SIDRA)
- The benefits and impacts of one-way streets through the town centre such as Short Street, Yambo Street, Station Street, Bridge Street (Mesoscopic modelling)
- The benefits and impacts of speed zone changes and Local Area Traffic Management (LATM) measures (Mesoscopic model)

Recommended extents for the Mesoscopic-simulation model are shown in Figure 6.8.

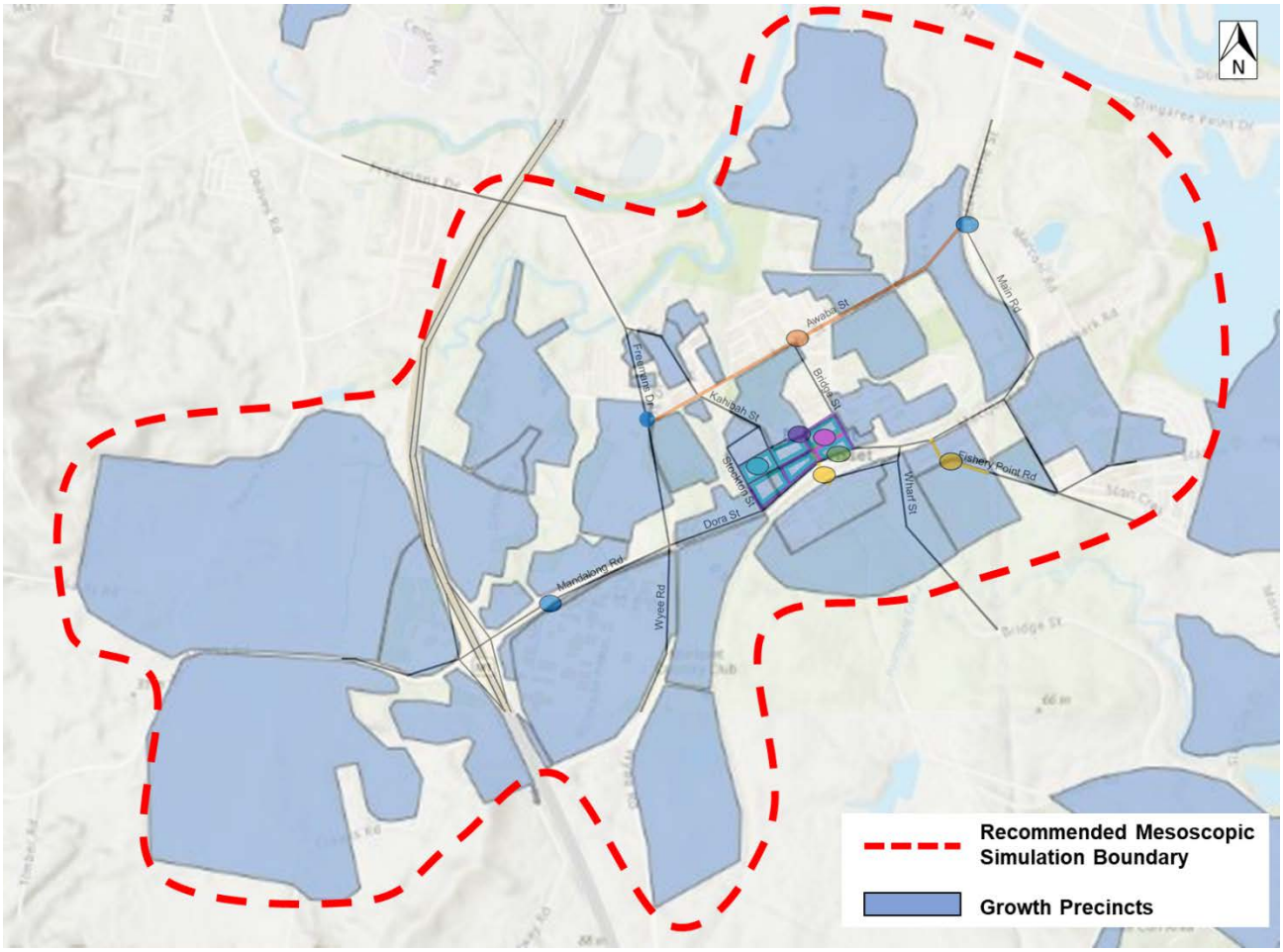


Figure 6.8: Recommended Mesoscopic-Simulation Extent

It should be noted traffic models don't directly assess public transport and active transport options and these issues assessments, options development and options assessments in the ITS would need to be based on established planning principles and qualitative evaluation methods.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 Key Conclusions

Morisset Town Centre has a range of emerging Movement and Place conflicts that would be exacerbated by growth proposals currently under consideration. These conflicts need to be addressed to achieve Council's vision of supporting the "*largest growth area in the hunter*" with a "*convenient 15-20 minute walk to the Central Precinct*" and as a "*mixed-use destination"* that encourages and supports local jobs.

This Scoping Study has focused on the Morisset Town Centre due to its large mix of transport users and travel modes. A range of opportunities to improve the balance between Movement and Place as growth occurs have been highlighted with those opportunities that directly impact the road network tested within the STFM (under Business as Usual (Base), Low Growth, and High Growth scenarios).

The modelling revealed that the majority of the local (and wider) network has the capacity to cater for all growth scenarios, with the exception of a small number of key network links that may require capacity upgrades such as Fishery Point Road, Doyalson Street and high demand intersections such as the Mandalong Drive / Freemans Drive roundabout.

In tandem with the traffic network improvements based on modelling results, a range of other upgrades have been identified, such as upgrading pedestrian / cycle bridges across the rail line, improving permeability through the centre, streetscaping improvements, low speed zones, and one-way streets.

The most significant challenge within Morisset, particularly for a High Growth Scenario, is addressing the competing High-Place and High-Movement demand through the town's main corridor, Dora Street. Through traffic growth conflicts with Council's vision for an active and vibrant Town Centre that has the ability to expand. To address this key concern, two major upgrade options were considered in the Low Growth and High Growth scenarios, respectively. First, a local bypass for through traffic along Macquarie Street and second, an alternative route via Awaba Street to the north.

Considering the constructability challenges with the Macquarie Street alignment and Council's vision for the Town Centre, it is recommended that providing Awaba Street as an 'Alternate Route' to the Town Centre is investigated further in addition to the range of other proposed upgrades that have arisen from this Scoping Study.

Other conclusions include:

- Several active transport proposals by Council are reasonable with enhancements and other considerations identified in the report
- High volume of heavy vehicles currently pass through Dora Street as an approved B-Double route. Whilst these heavy vehicles could be diverted to the Awaba Street Alternative route, this could have substantial impacts on residential amenity and my not be possible
- Existing off-street parking is well located on the fridges of the Town Centre. High growth development in the Town Centre should encourage reduced site-specific parking and diverting this demand to consolidated and planned off street parking areas

7.2 Recommendations

Table 7.1 lists the key suggested upgrade works under each tested scenario. Noting that:

- Proposed Base upgrades should be applied across all scenarios
- Project numbering/order is based upon a project's considered significance in improvement to the wider network capacity in combination with consideration of key projects raised by Council/TfNSW and engineering judgement. The first sixteen projects are considered the most significant network upgrades
- Unless an upgrade in the table is directly replaces/supersedes another (e.g. Project 16 by Project 1) then capacity improvement upgrades from the Low Growth Scenario should be assumed to be included when considering High Growth upgrades list.

High-level cost estimates of some of the suggested 'High Growth' projects are shown in Table 7.1. All cost estimates were completed using approximated current resource costs and are indicative only.

Suggested implementation timing is included in order to provide some guidance to the rollout order of each project. However, this timing is indicative only and does not consider Council's resourcing or funding capacities. Timing outcomes may change as a result of more detailed assessments.

A full list of project cost estimates and timing is available at **Appendix D**.

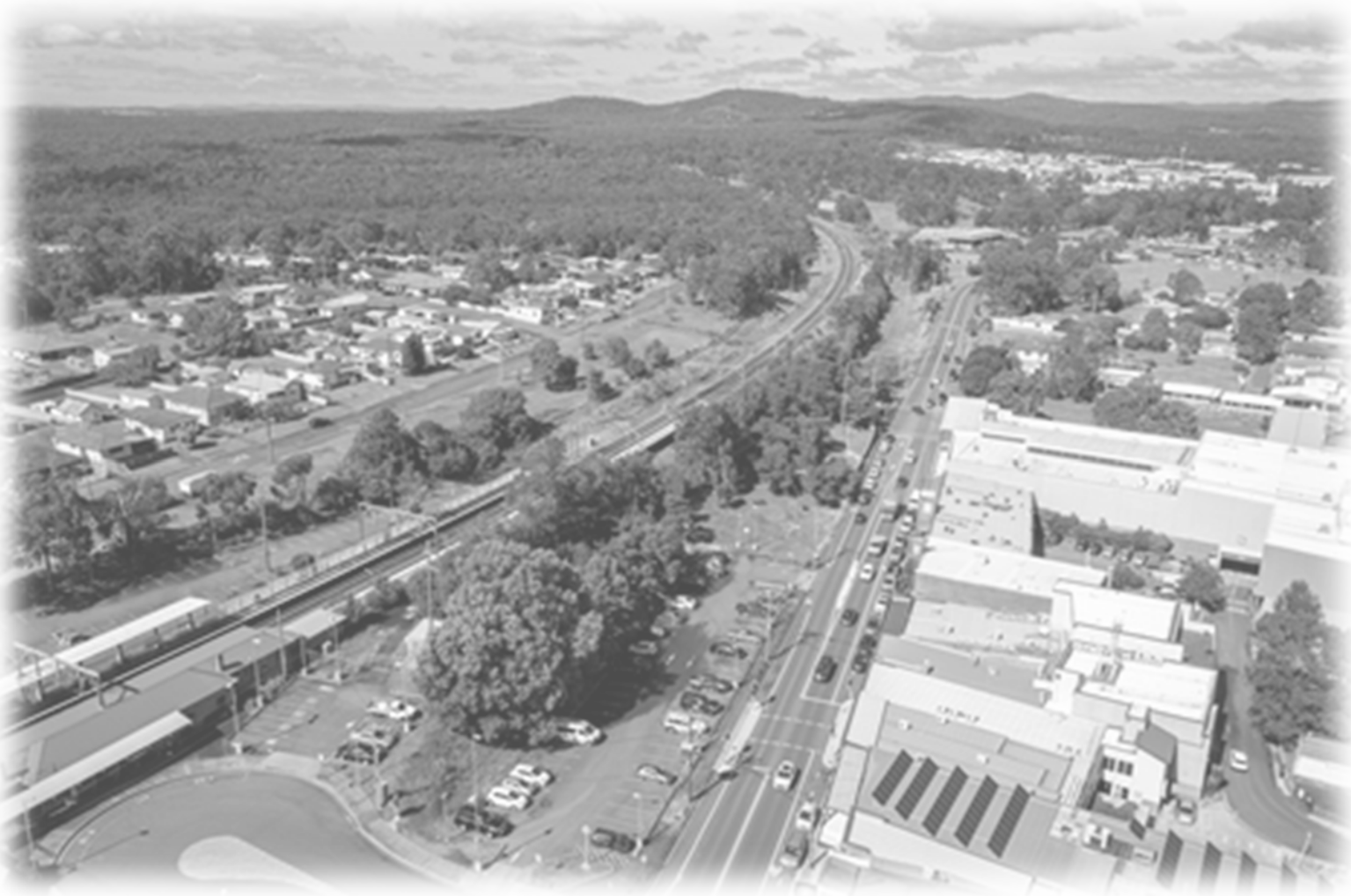
Table 7.1: Key Upgrade Proposals Summary Table

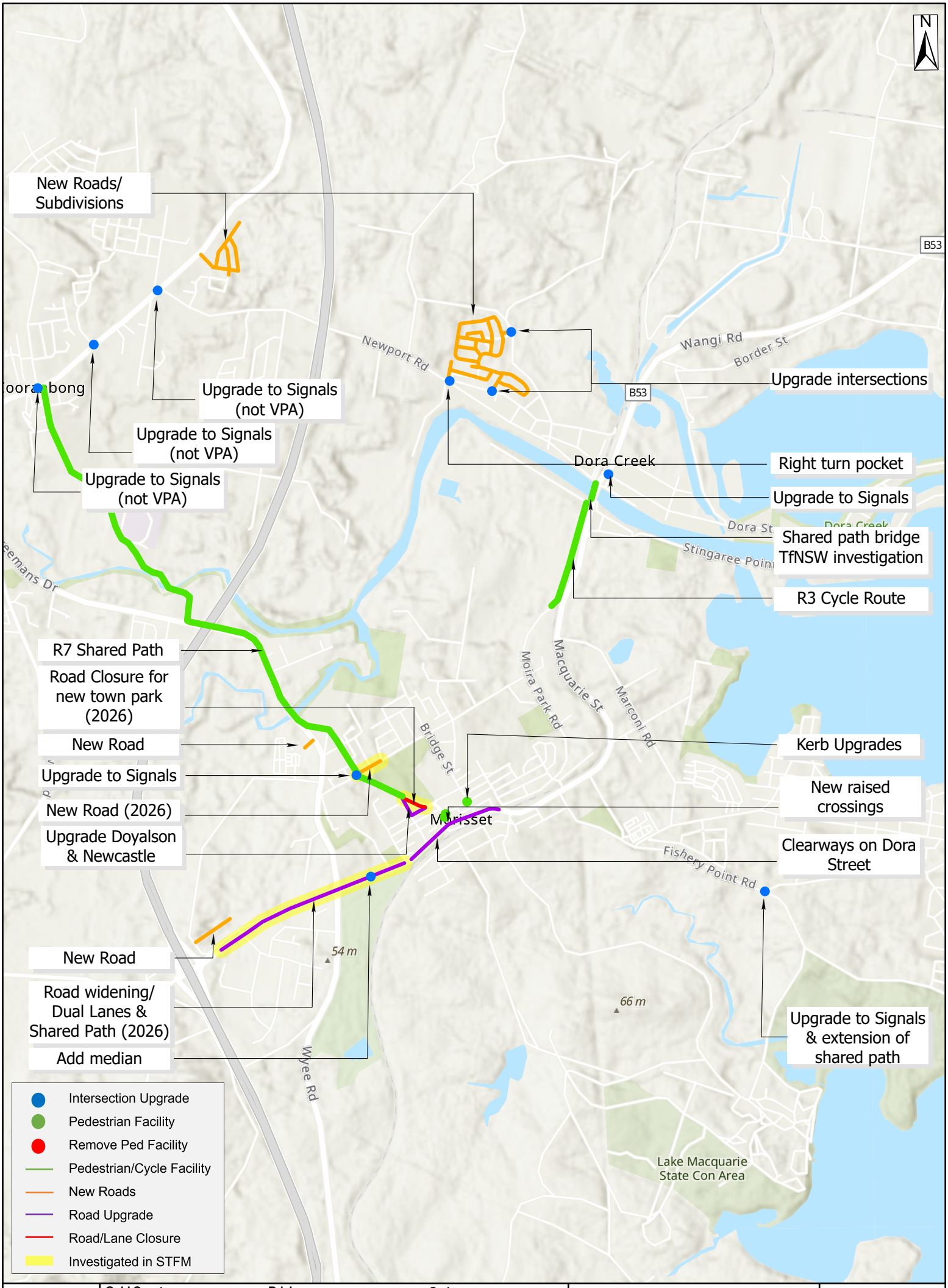
Project Number	Upgrade	Description	Benefit	Scenario	Cost	Suggested Implementation
1	Alternate Route around Town Centre (Awaba Street)	Upgrade Awaba Street to improve capacity (including 60km/h limit), similar cross section suggested to residential sections of Freemans Drive. Upgrades to intersections with Main Road (217) and Freemans Drive also need to be investigated. Aims to assist in resolving movement delays on Dora Street for Morisset Economic Centre by providing alternate route for northbound traffic	Reduces through traffic on Dora Street, improving Place value of centre and ensuring high Movement demand is catered for. Aims to limit impact to residential areas while also improving traffic levels on Dora Street	High	$40,000,000	2041
2	Dual Lanes - Mandalong Road and Dora Street	Upgrade to 2 lanes in each direction of travel between Stockton Street and M1 Highway	Significant capacity improvements along Mandalong Road up to Stockton Street (does not extend to Town Centre)	Base	$73,000,000	2026
3	Intersection Upgrade - Dora Street / Freemans Drive	Upgrade to Signalised Intersection (Dora Street / Freemans Drive)	Significant capacity improvements to intersection that is over capacity under all growth scenarios	Base		
4	Investigate - Awaba Street / Moira Park Road	Investigation intersection upgrade and potential staged realignment in collaboration with Project 1	Improvements to network capacity and connectivity for traffic growth to the north/north-east of Morisset	Low/High	$5,000,000	2036
5	Pedestrian Bridge Upgrade - Dora Street to Macquarie Street	Improve pedestrian bridge across rail from Dora Street to Macquarie Street	Improves connectivity for the public across rail line and encourages the expansion of the town centre commercial area. Also provides opportunities for alternate visitor parking locations allowing park n walk without driving into the centre itself.	High	$5,000,000	2041
6	Reduce to One Way - Short Street	Reduce Short Street to one-way westbound from Station Street to Short Street	Improves pedestrian accessibility and Place value by reducing vehicle speeds and providing more space for commercial/retail	High	$15,000,000	2041
7	Reduce to One Way - Station Street	Reduce Station Street to one-way southbound from Yambo Street to Dora Street				
8	Reduce to One Way - Yambo Street	Reduce Yamba Street to one-way southbound from Station Street to Short Street				

Project Number	Upgrade	Description	Benefit	Scenario	Cost	Suggested Implementation
9	Road and cycle upgrade - Dora Street	Construct new lanes and widen bridge for cyclists parallel to road over Dora Street railway bridge bypass	Part of completing key cycle route to/from Bonnells Bay and provides a safe option for cyclists using the bridge	Base	$3,000,000	2031
10	Speed Reduction - Morisset Town	Lower speeds around Morisset Town to 40km/h	Improves Morisset 'Place' value as well as significant safety improvements for all travel modes	Low/High	$100,000	2026
11	Speed Reduction - Morisset Town Centre	Lower speeds around Morisset Town Centre to 30km/h	Further improves Morisset 'Place' value as well as significant safety improvements for all travel modes	High	$80,000	2026
12	Pedestrian / Cycle Upgrade - Dora Street	Improve Pedestrian/Cycle Corridor on south side of Dora Street	Additional safety and capacity provisions for pedestrians and cyclists travelling to/from Morisset Station. Also improves Place value and encourages slower traffic movements through town	Base	$250,000	2026
13	Road Upgrade - Fishery Point Road	Upgrade road capacity of Fishery Point Road and upgrade to signalised intersection with Main Road (217), dual lanes on approach suggested	Improvements to network capacity (noted from model outcomes)	Low	$8,000,000	2026+
14	Centre Streetscaping Investigations	Investigate kerb build outs, narrow street lanes, and create parking lanes in Town Centre	Improves Morisset 'Place' value as well as significant safety improvements for pedestrians	Low/High	$500,000+	2036
15	Intersection Upgrade - Mandalong Road / Gateway Boulevard	Upgrade to Signalised - Mandalong Road / Gateway Boulevard Intersection (*included within Project 2*)	Improvements to intersection capacity due to background growth from Motorway and expanding industrial/ commercial areas	Low	*Within scope of Project 2*	2036 (2026)
16	*Town bypass - Macquarie Street*	*Bypass on Macquarie Street plus 2 intersection upgrades and a rail crossing bridge*	*Reduces through traffic on Dora Street, improving Place value of centre and ensuring high Movement demand is catered for*	Low	*$43,000,000*	*NA*

The Low Growth Scenario's bypass option on Macquarie Street provides a similar benefit to the Town Centre as the High Growth Scenario's Awaba Street option. The project also is under investigation by TfNSW who have noted significant challenges in providing connections to Dora Street. Considering this, and the limitations it would place on the potential expansion of the town centre to the south of the rail line, it is recommended that Project 1 is pursued instead.

Appendix A: Scenario Opportunities Maps





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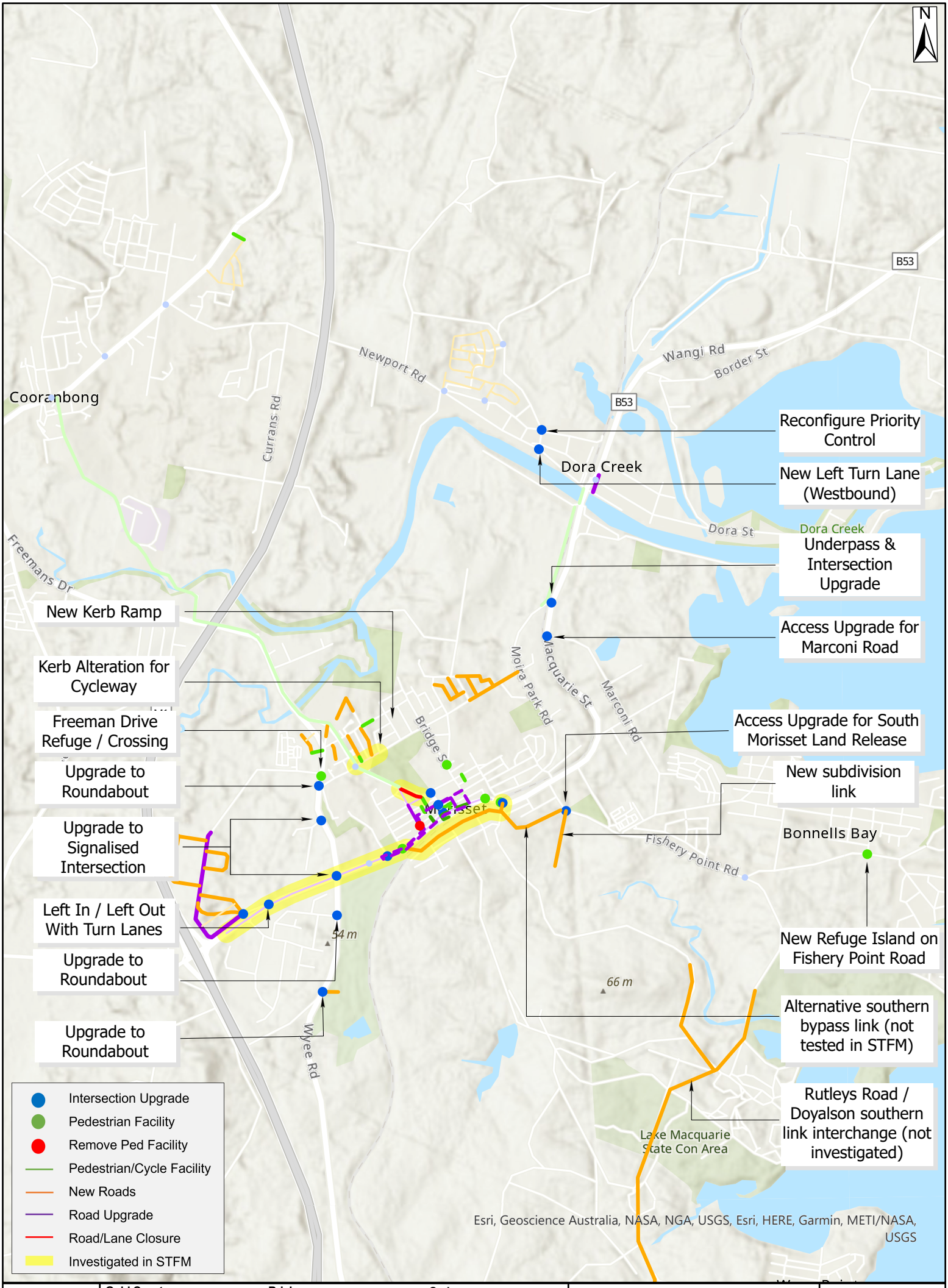
Sydney
Studio 203, 3 Gladstone Street
Newtown NSW 2042
P: (02) 9557-6202

Title:
Morisset Region Map Base Scenario

Project Number:	P5629
Date:	22/06/2022
Issue:	B



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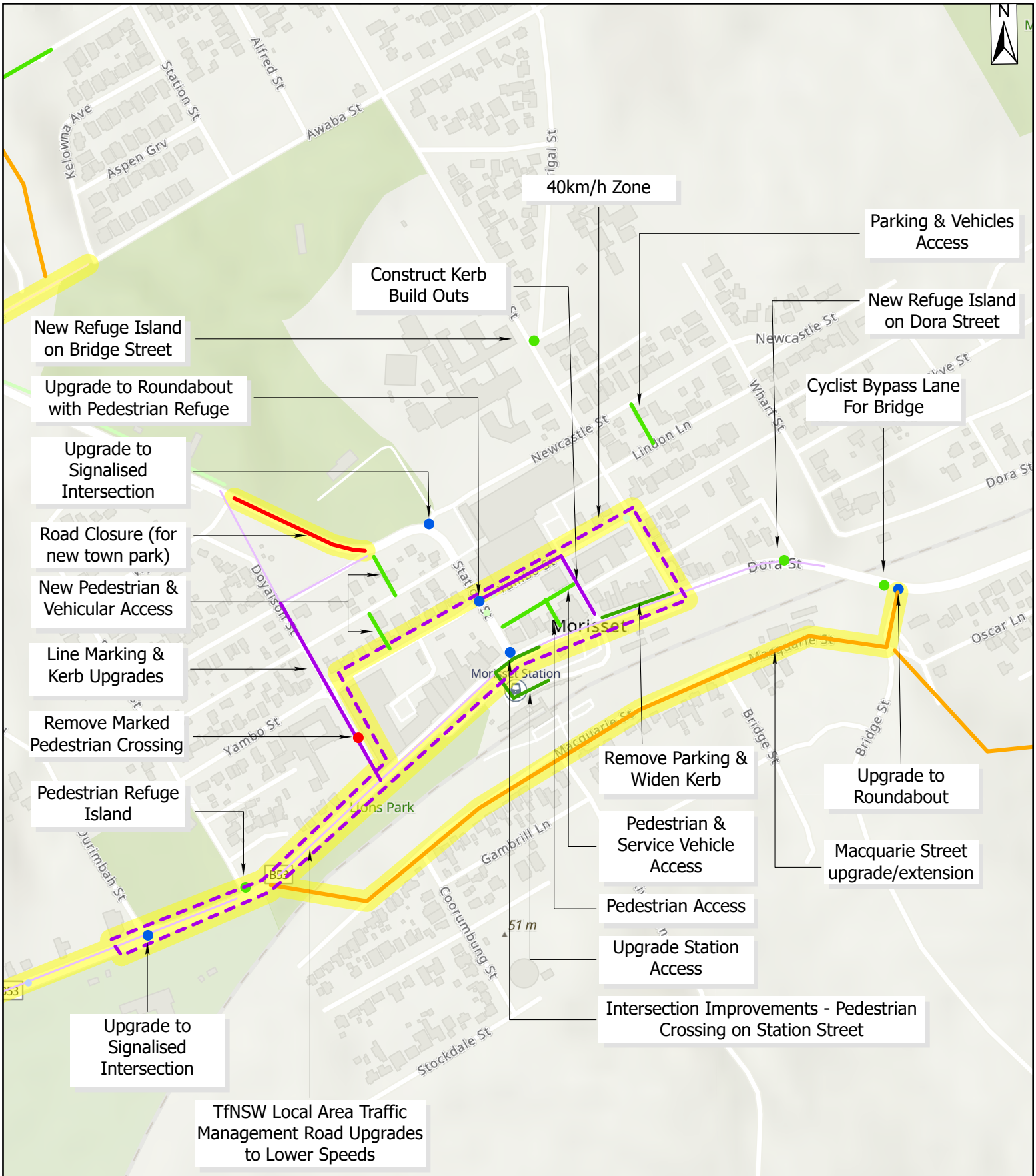
Title:
Morisset Region Map
LOW Growth Scenario

Project Number:	P5629
Date:	24/06/2022
Issue:	B



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community, Esri Community Maps Contributors, Geoscape, Esri, HERE, Garmin, METI/NASA, USGS

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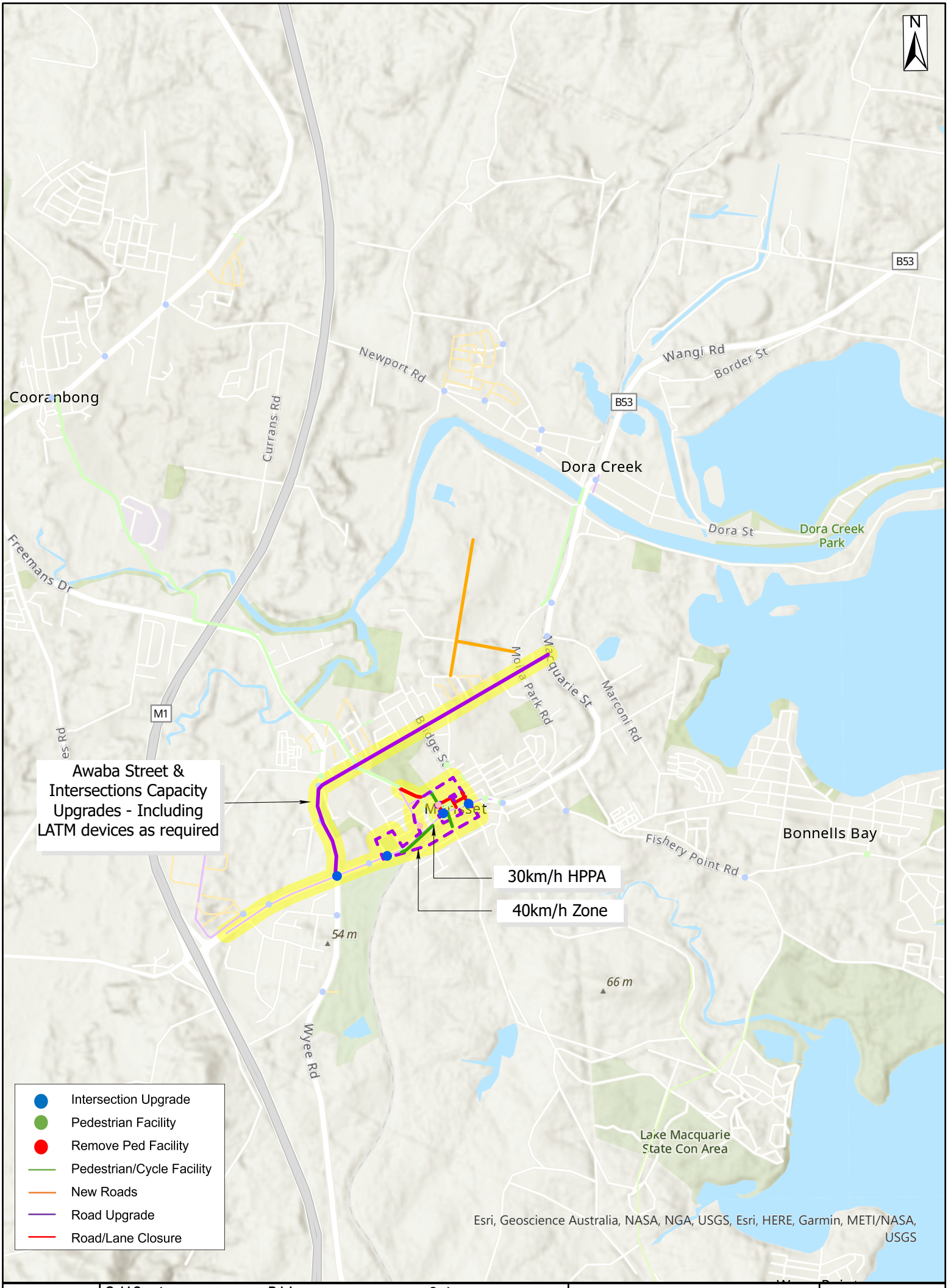
Title:
Morisset Region Map
LOW Growth Scenario Centre

Project Number: P5629
Date: 24/06/2022
Issue: B



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Title:
Morisset Region Map
HIGH Growth Scenario

Project Number:	P5629
Date:	24/06/2022
Issue:	B

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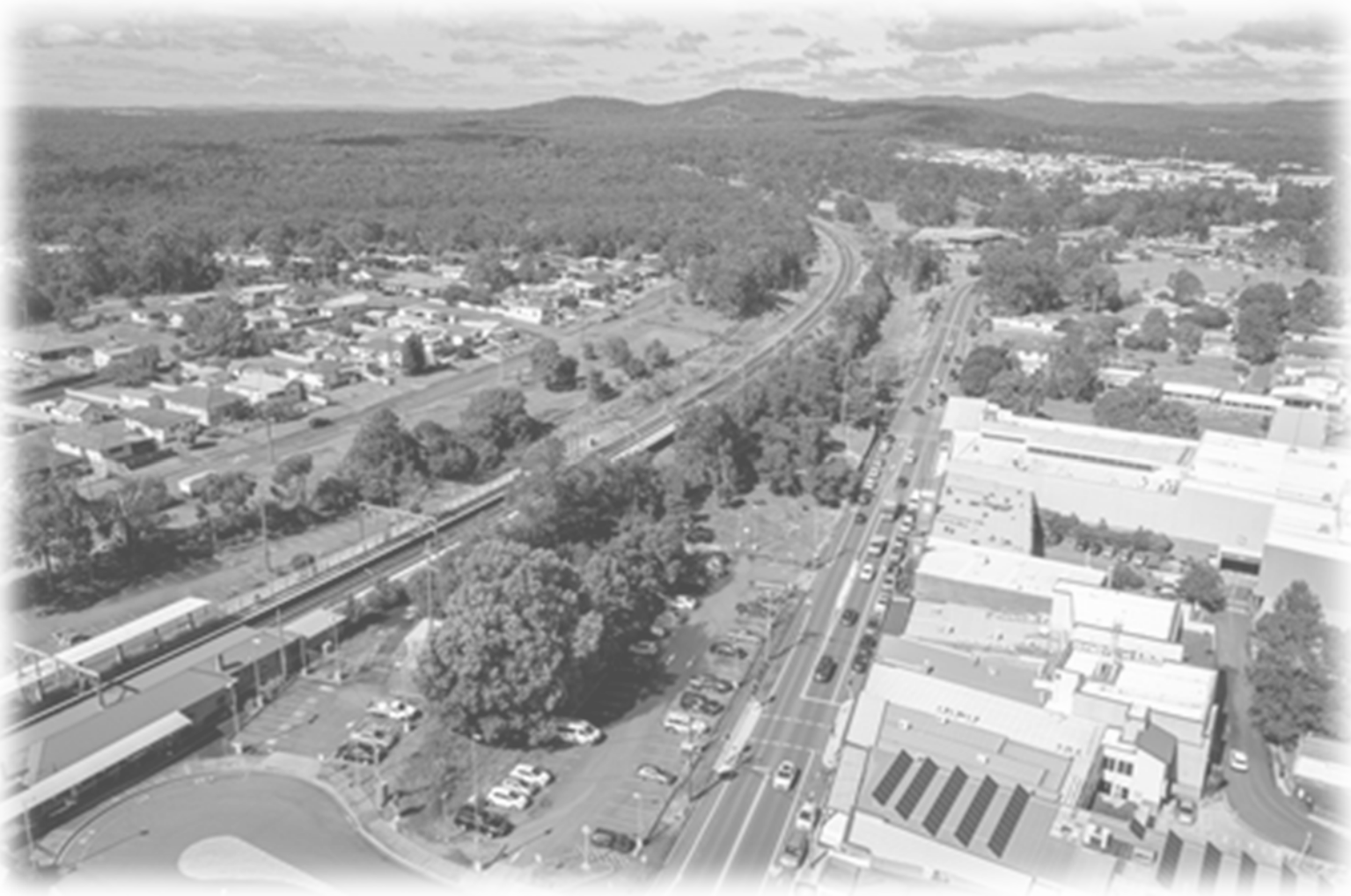
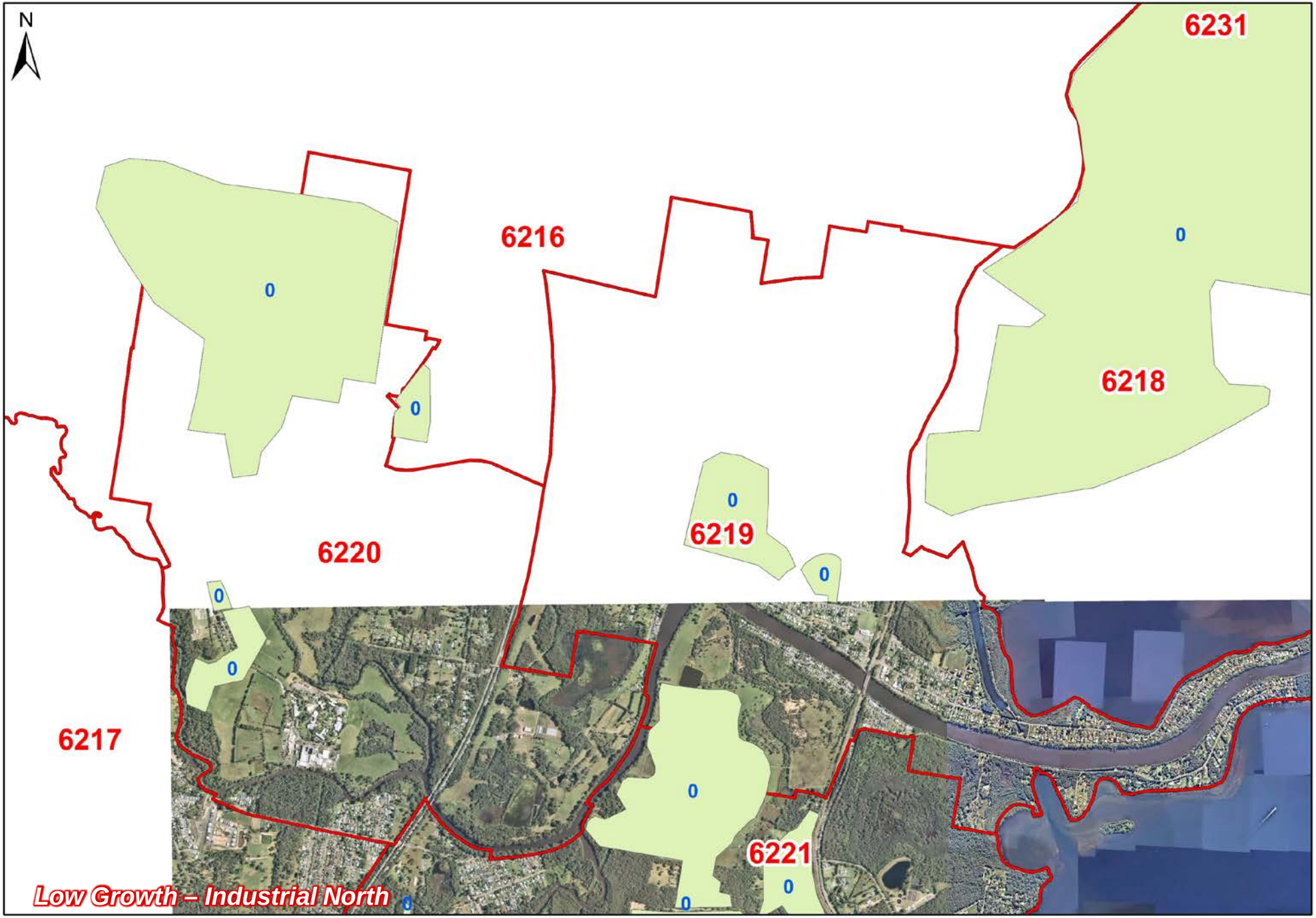
Title:
Morisset Region Map
HIGH Growth Scenario Centre

Project Number: P5629
Date: 24/06/2022
Issue: B

Appendix B: Population & Employment Growth Maps

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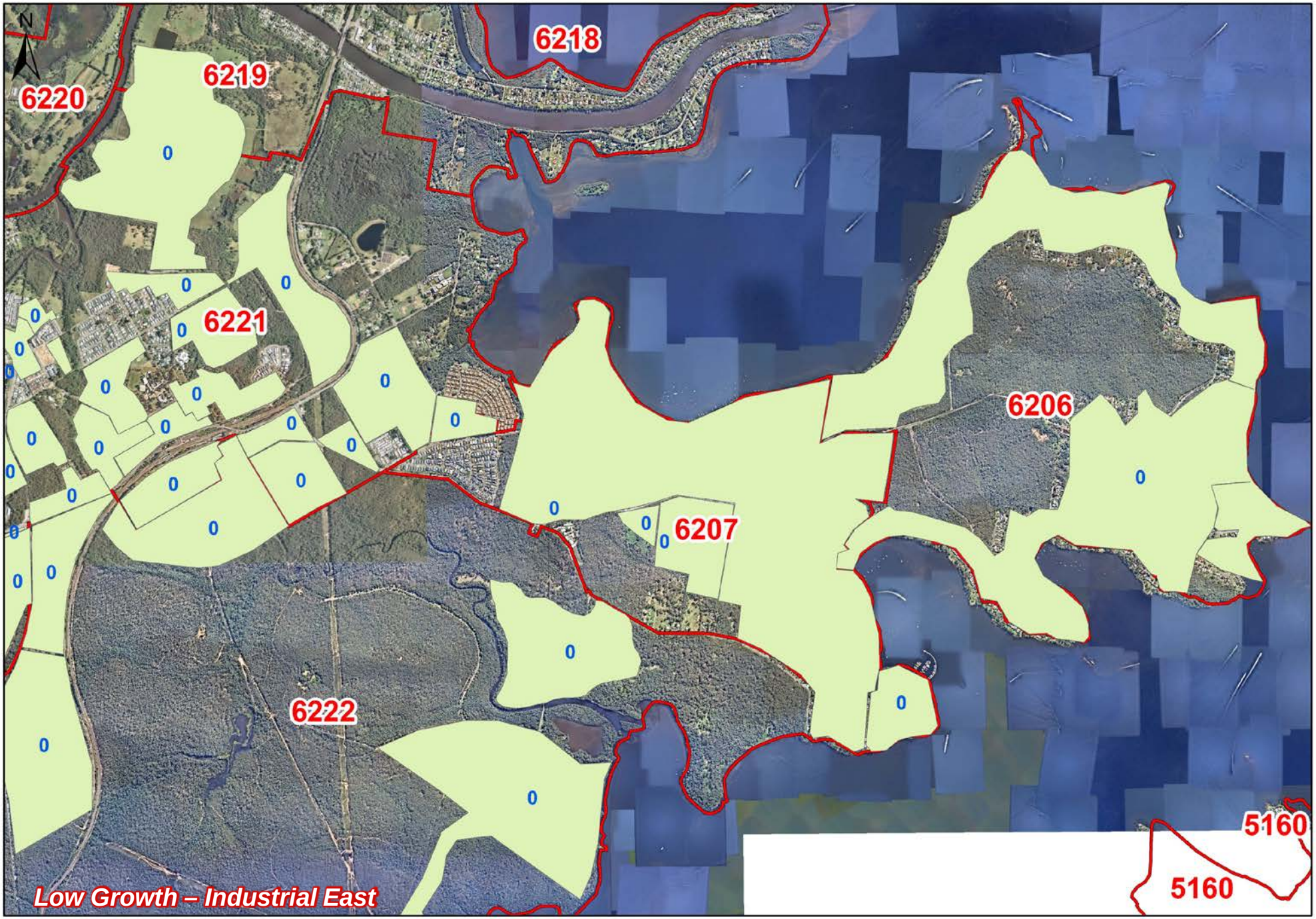
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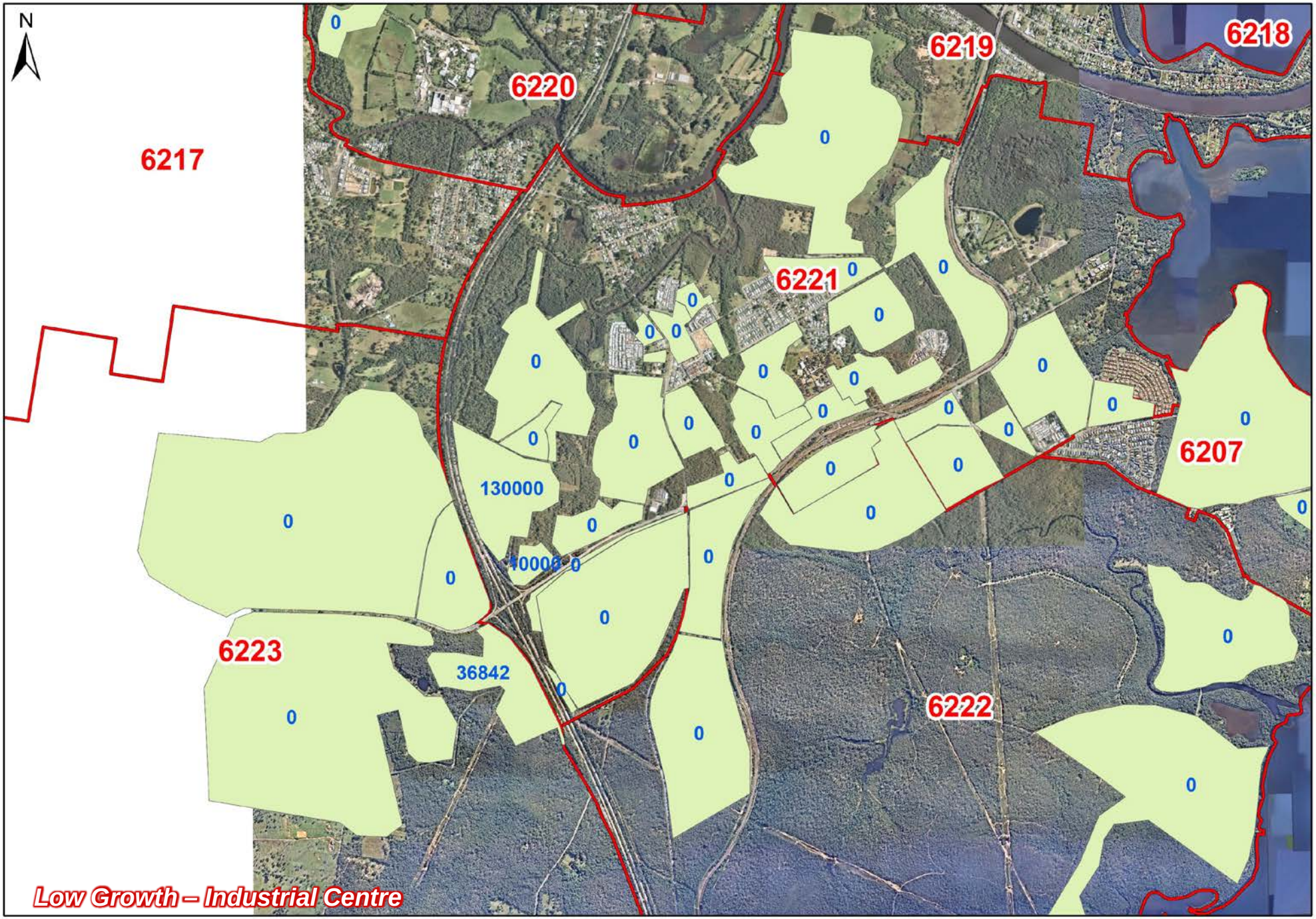
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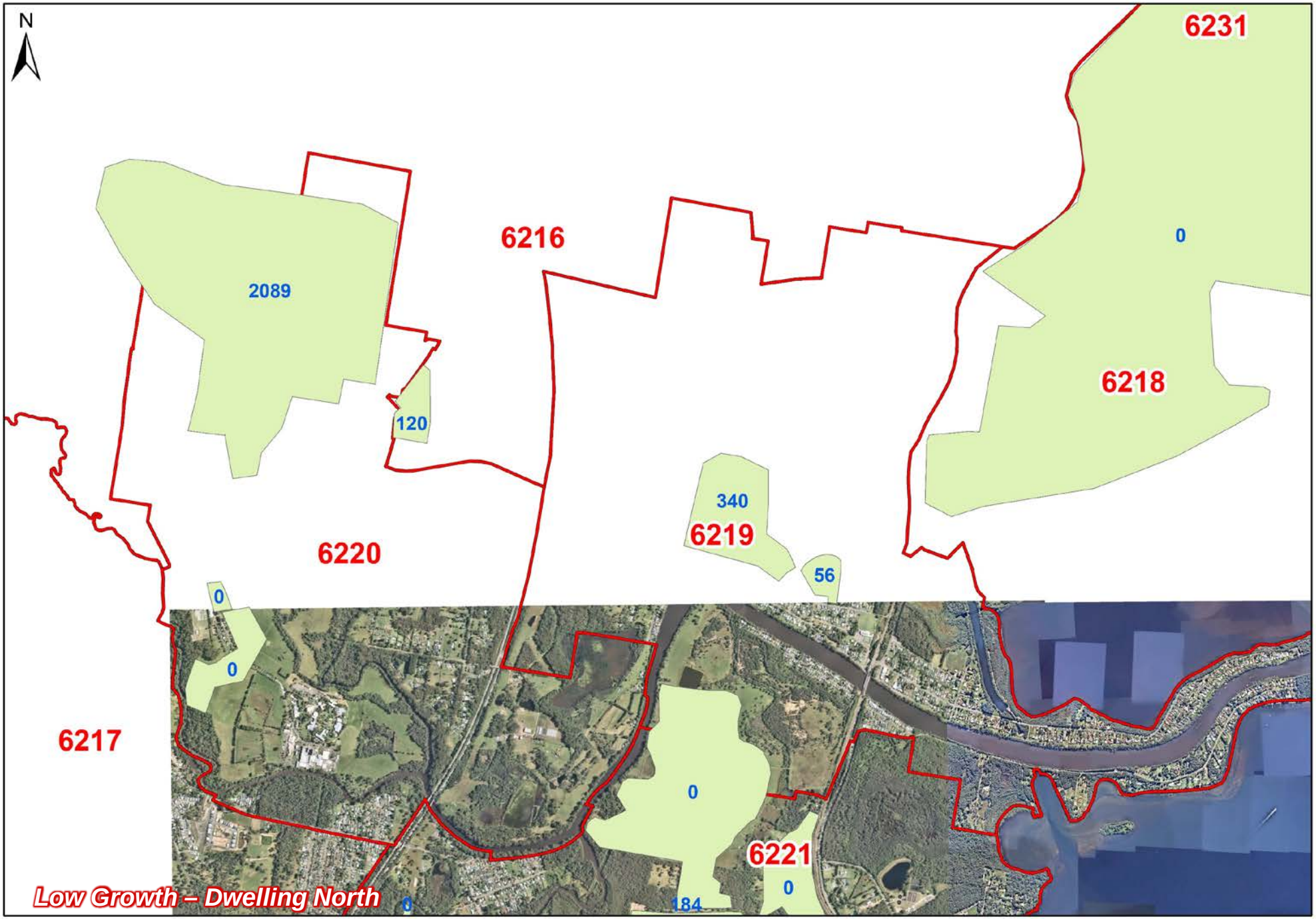
130000
10000
36842
Low Growth – Industrial Centre



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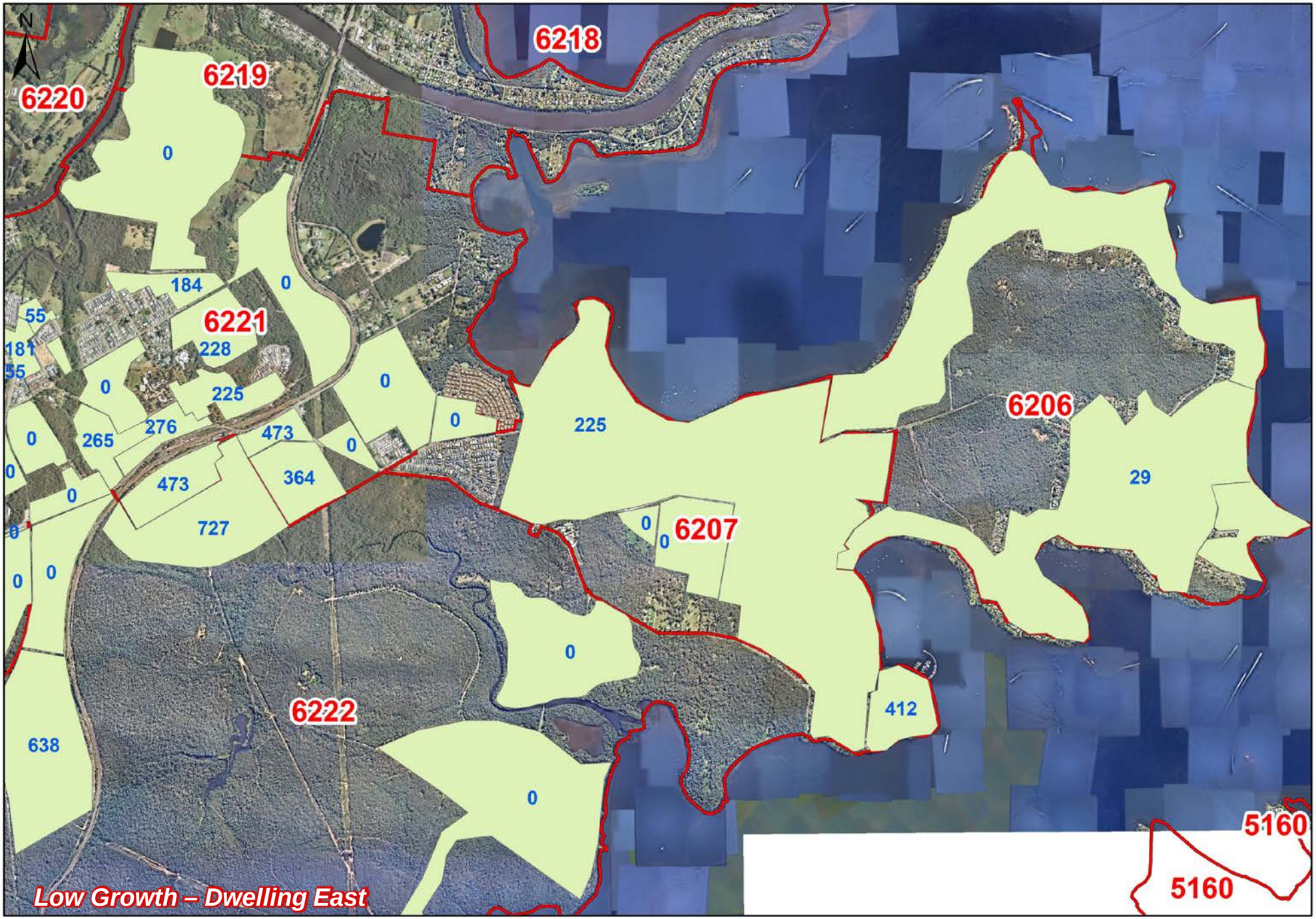
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0
0
473
364
0
727
0
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638
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0
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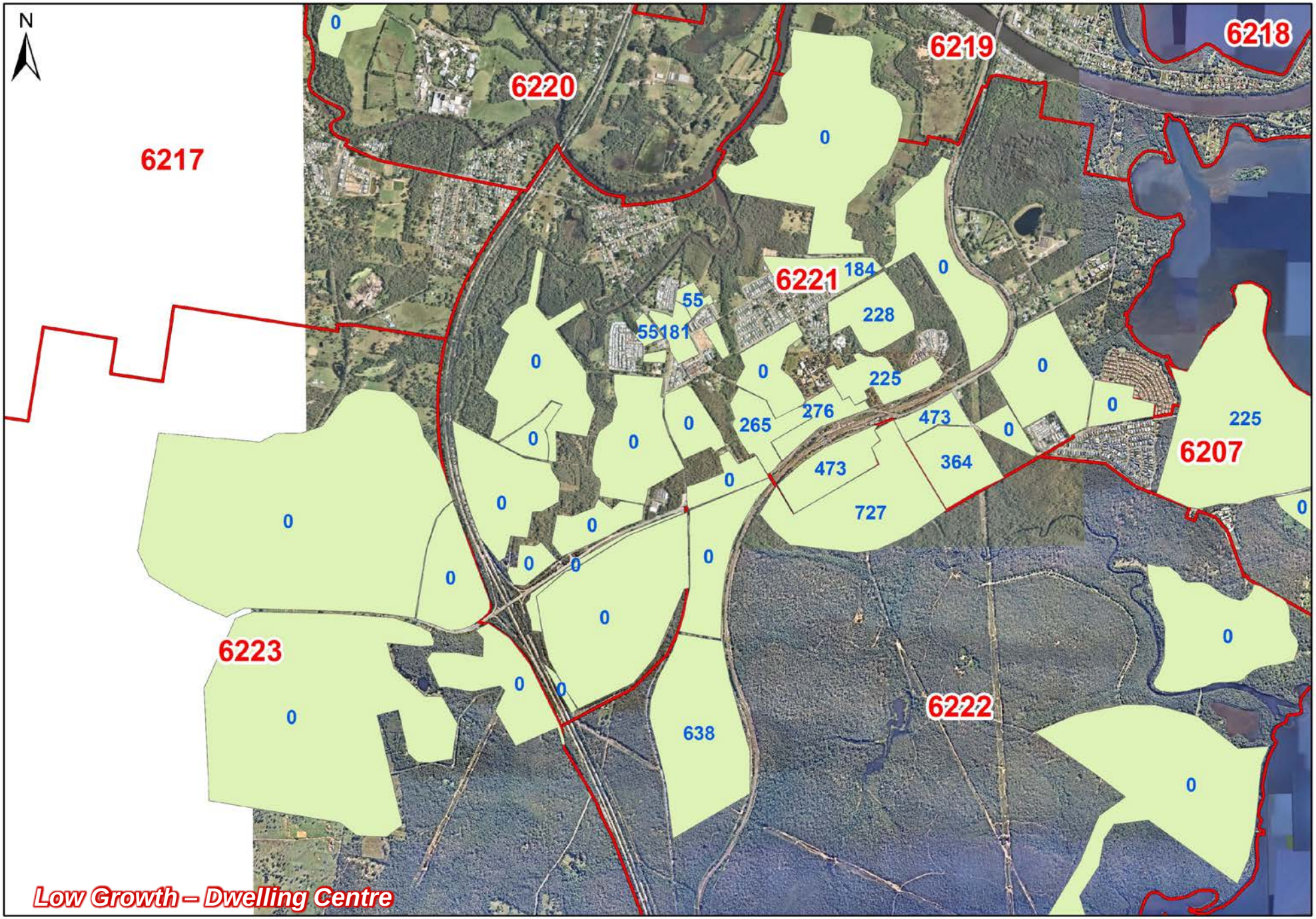
5160
5160
Low Growth – Dwelling East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55
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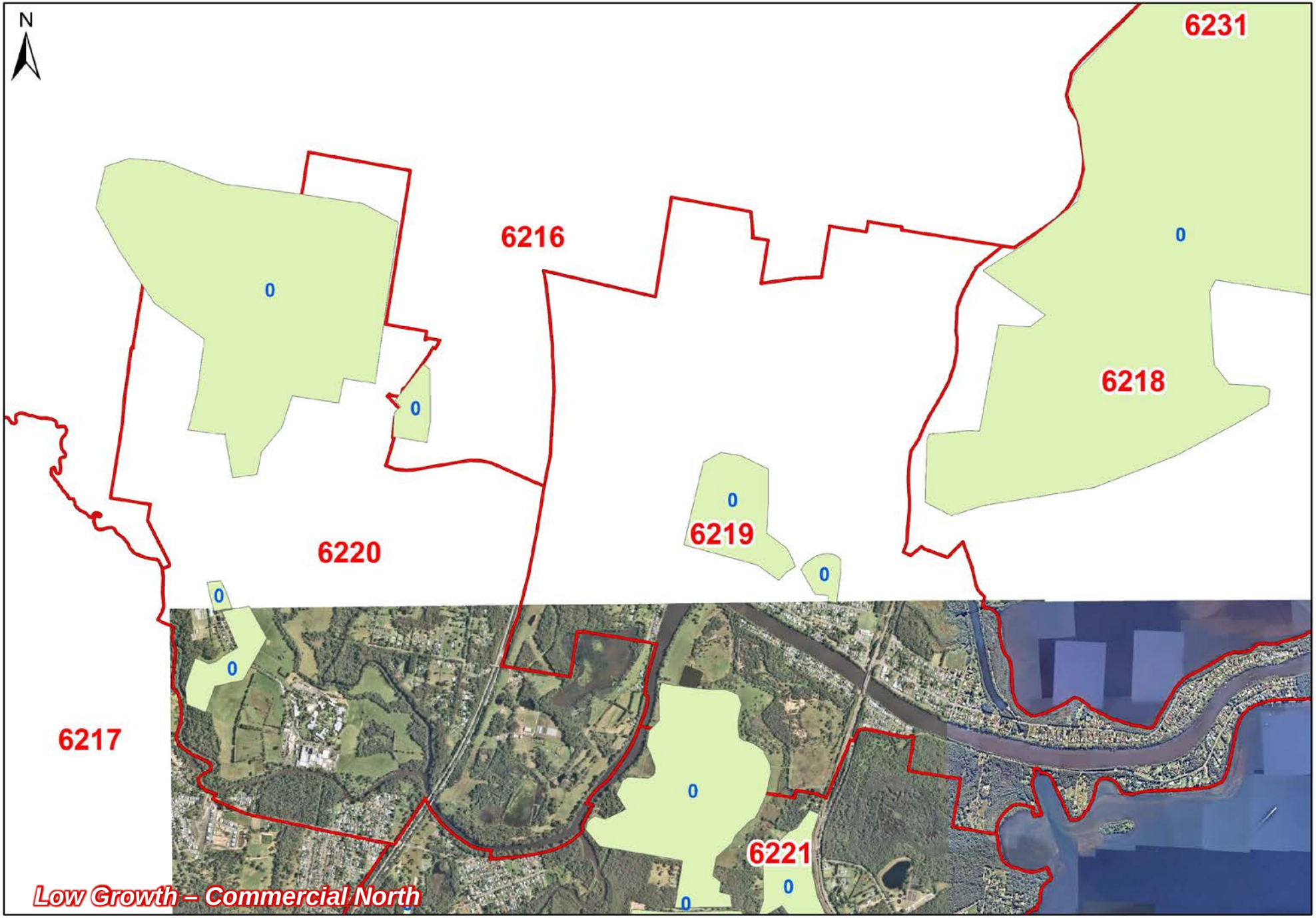
364
727
638
Low Growth – Dwelling Centre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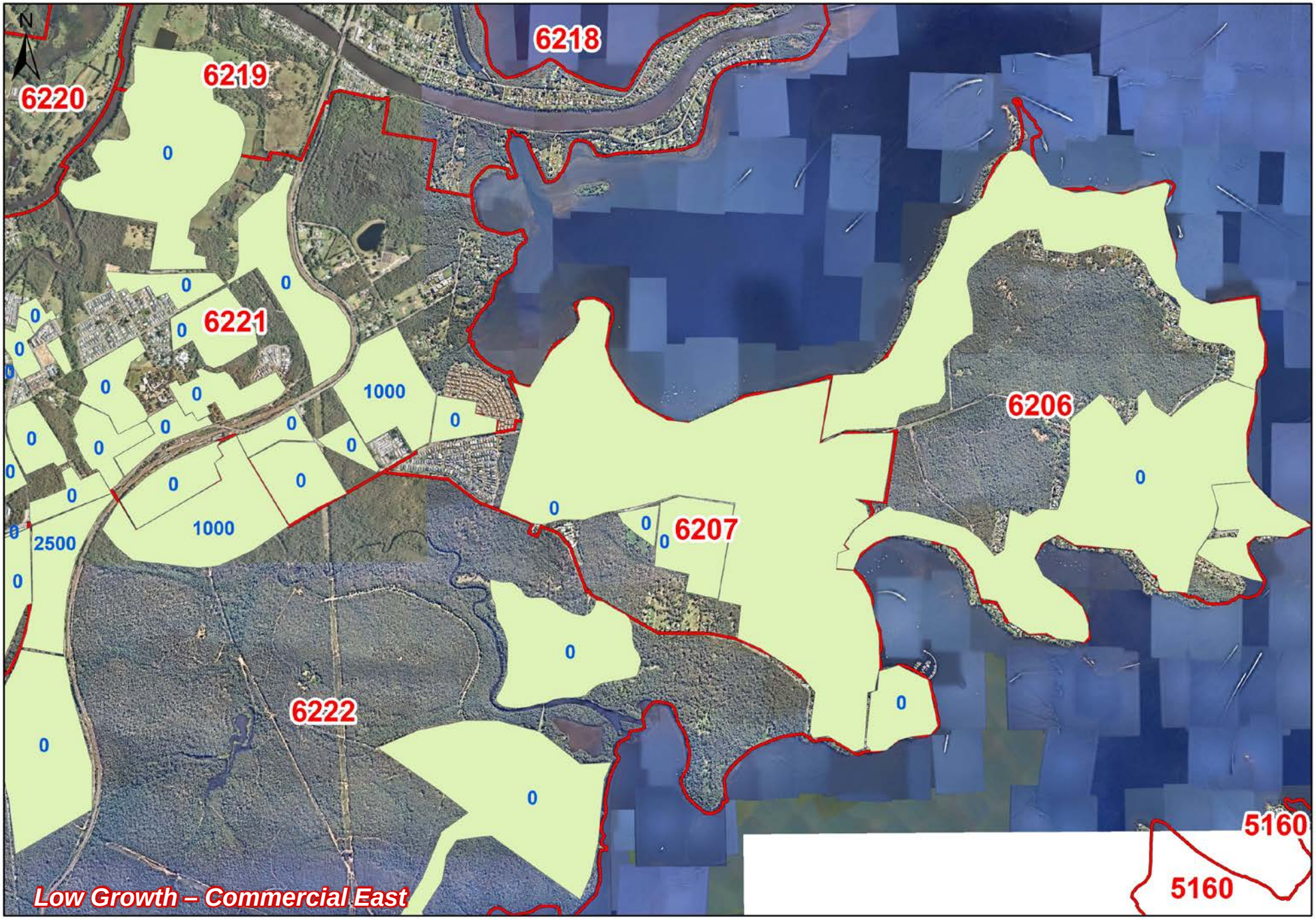
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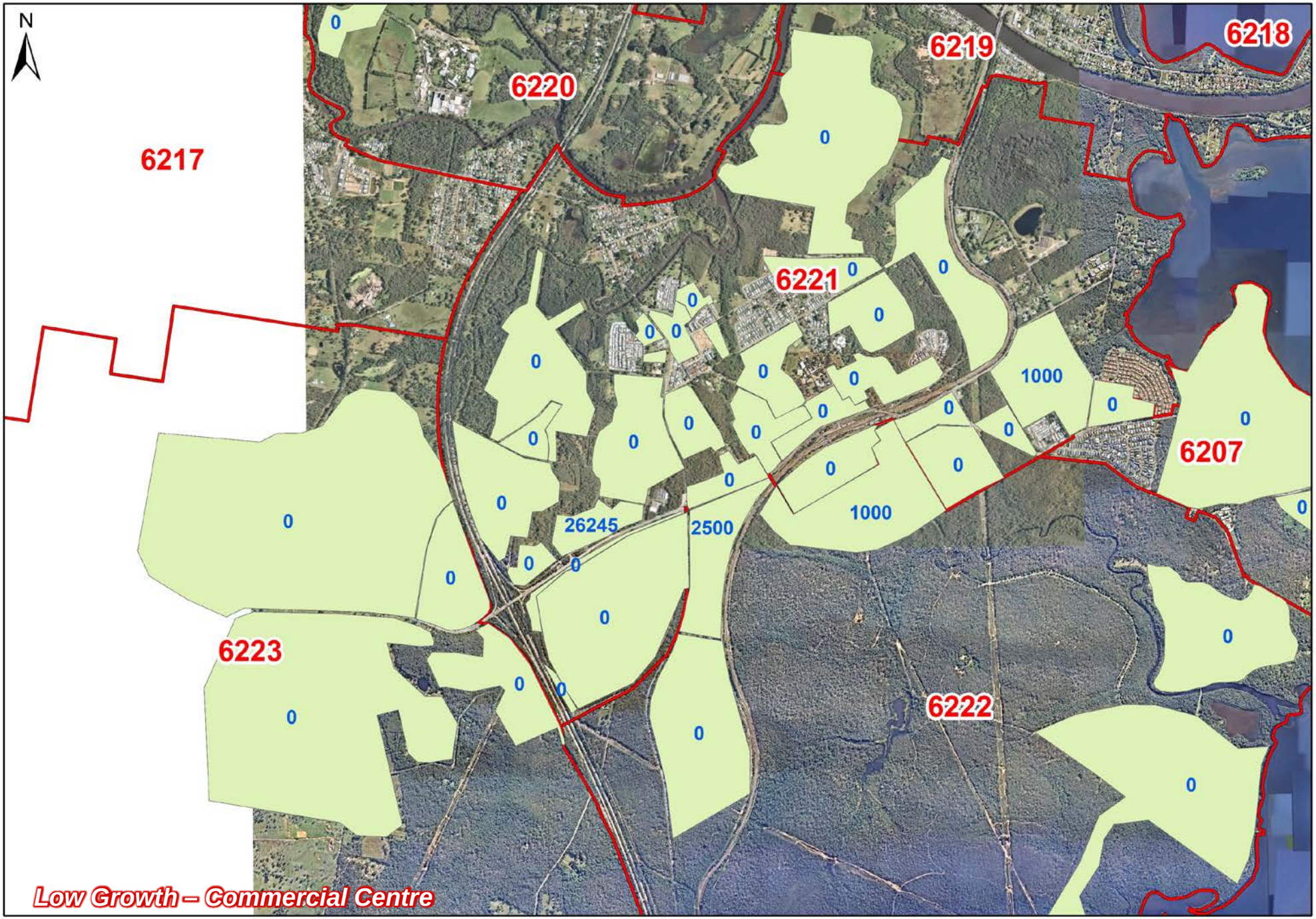
Low Growth – Commercial East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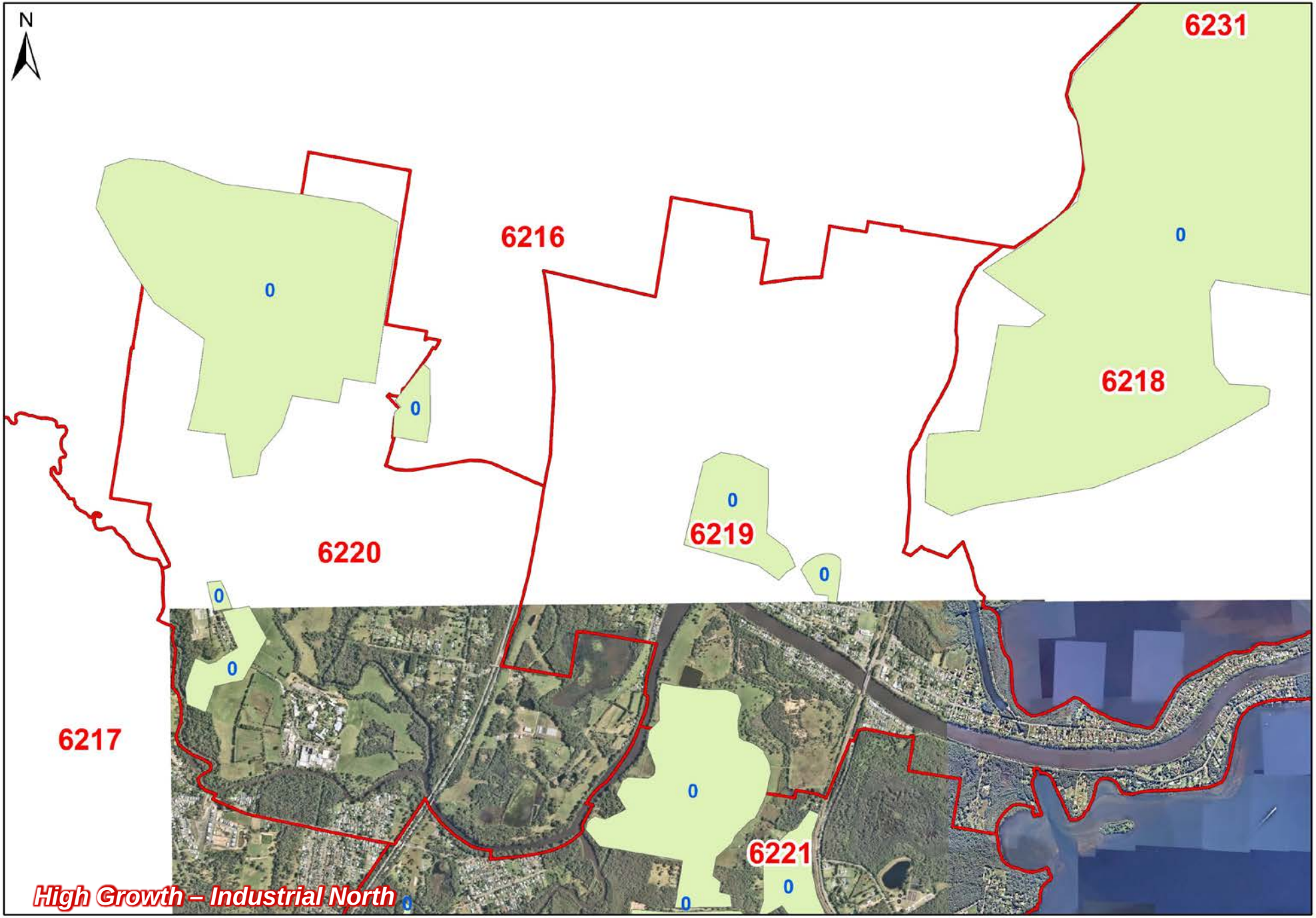
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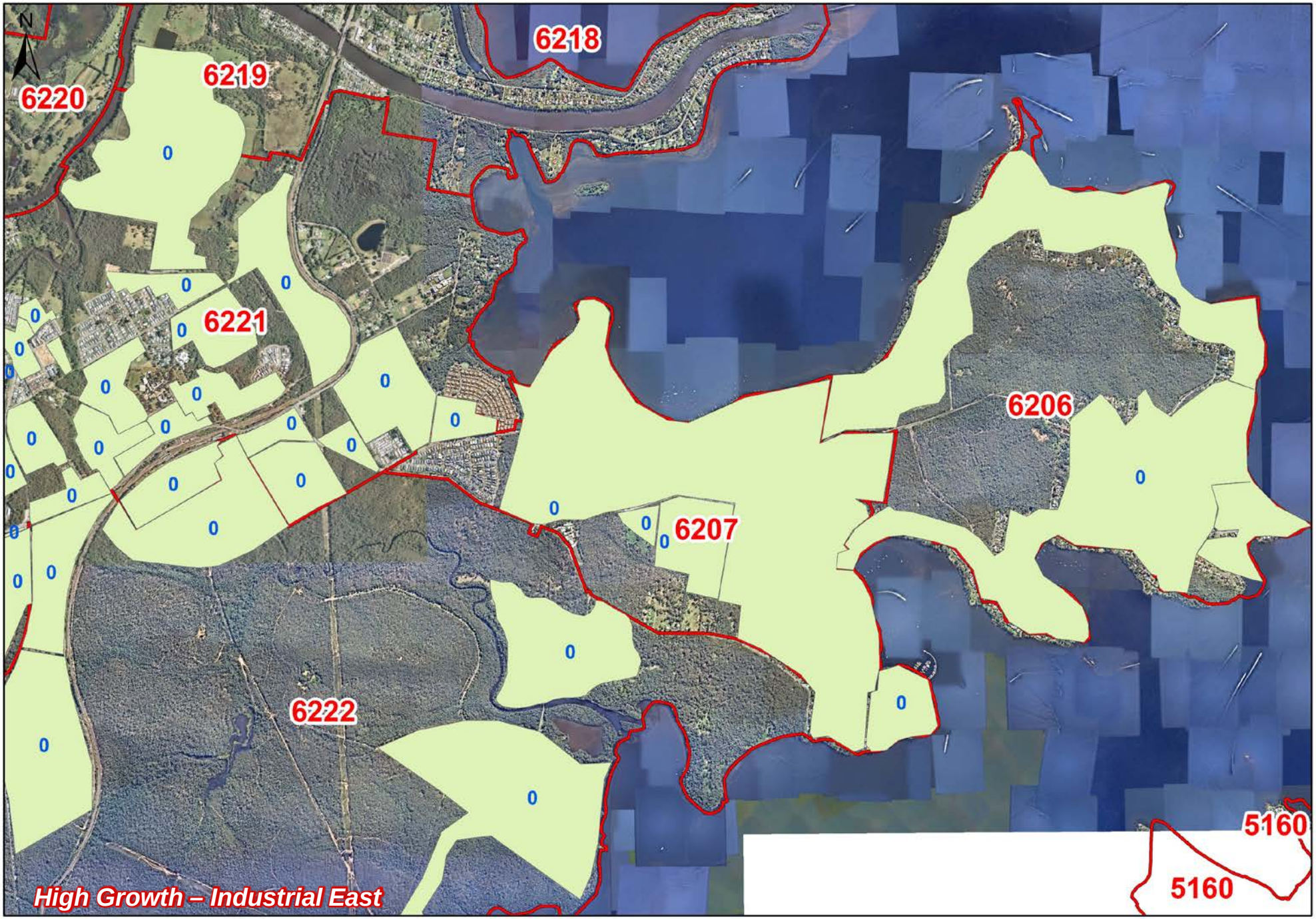
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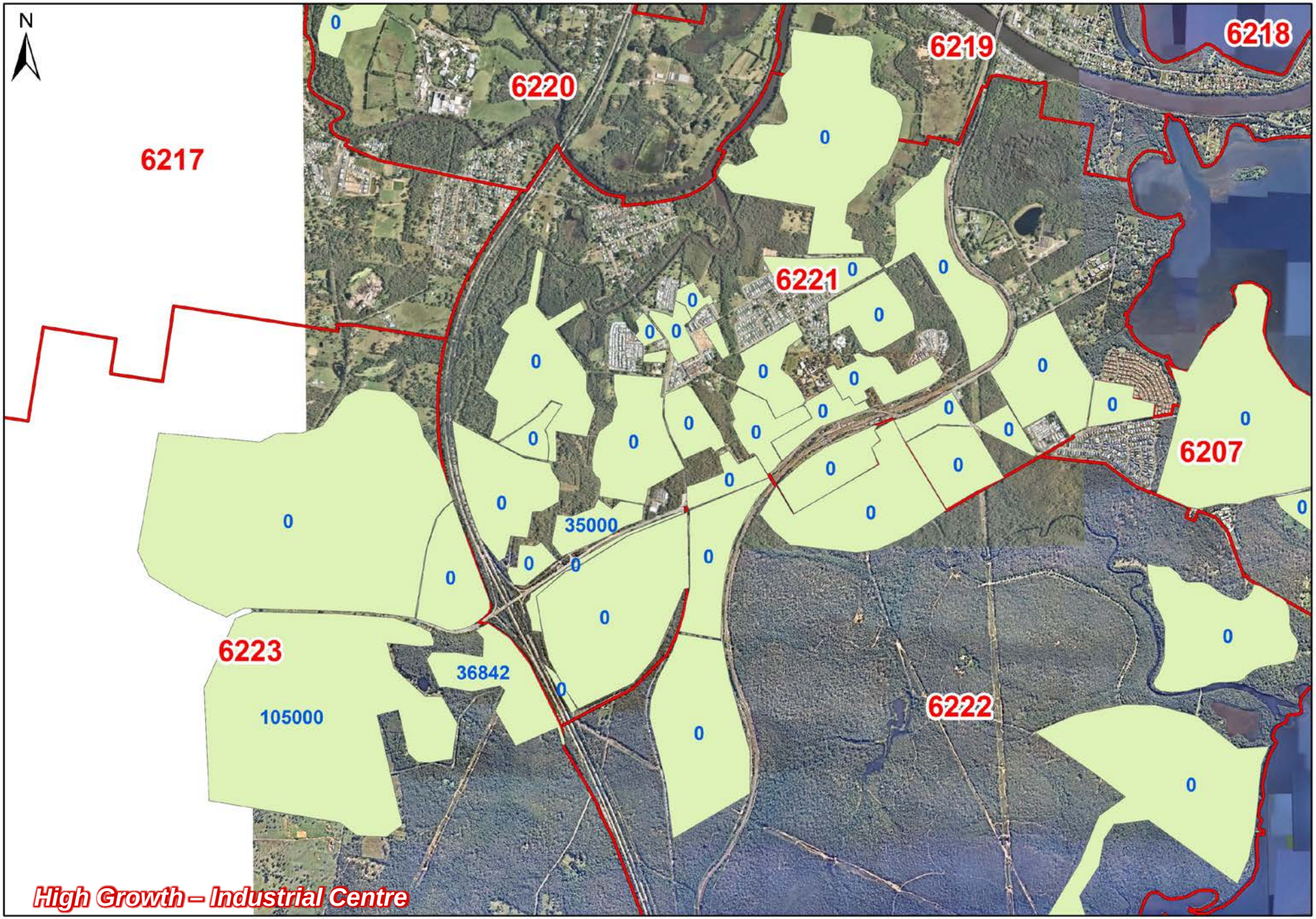
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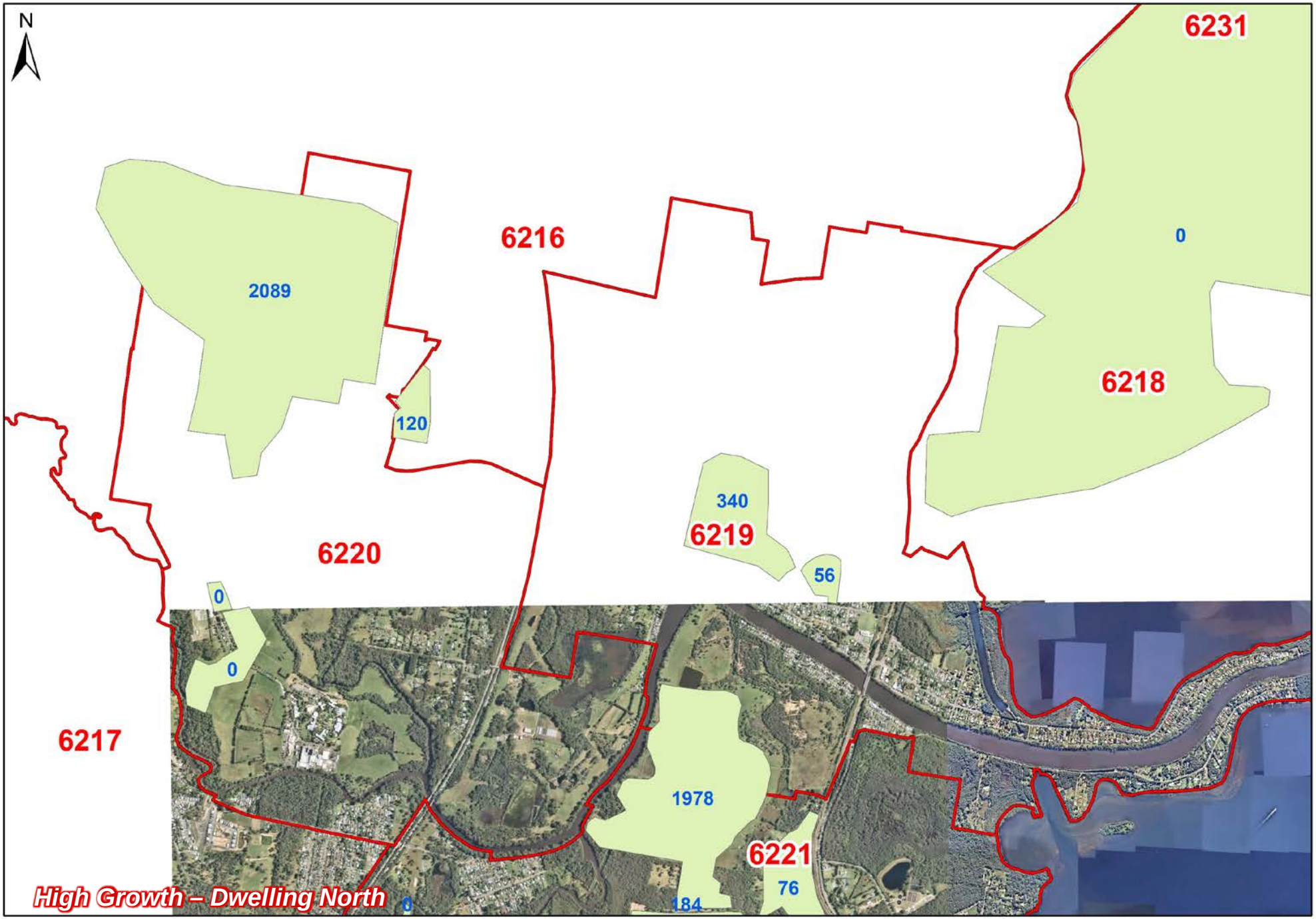
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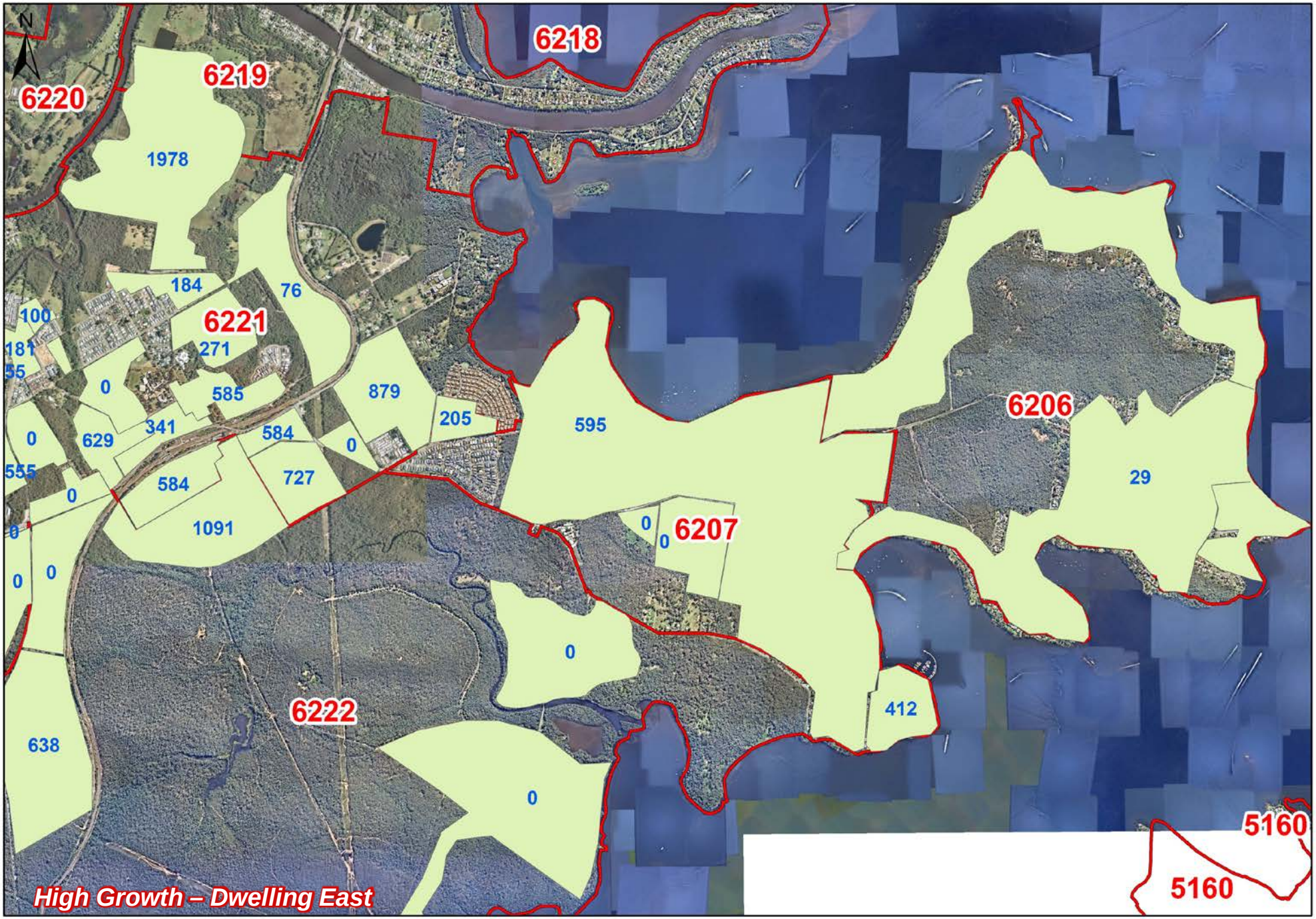
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0
29
555
584
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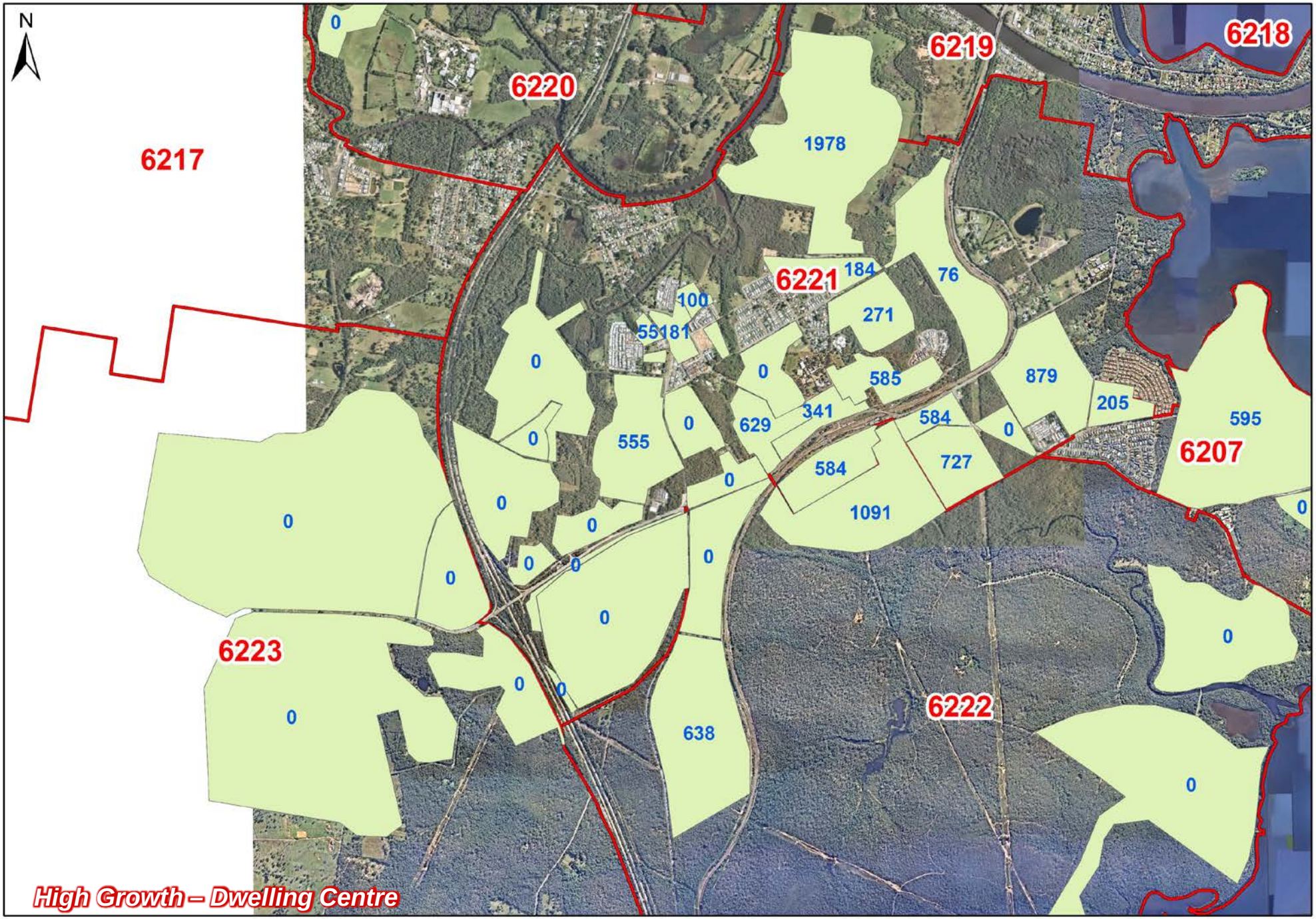
High Growth – Dwelling East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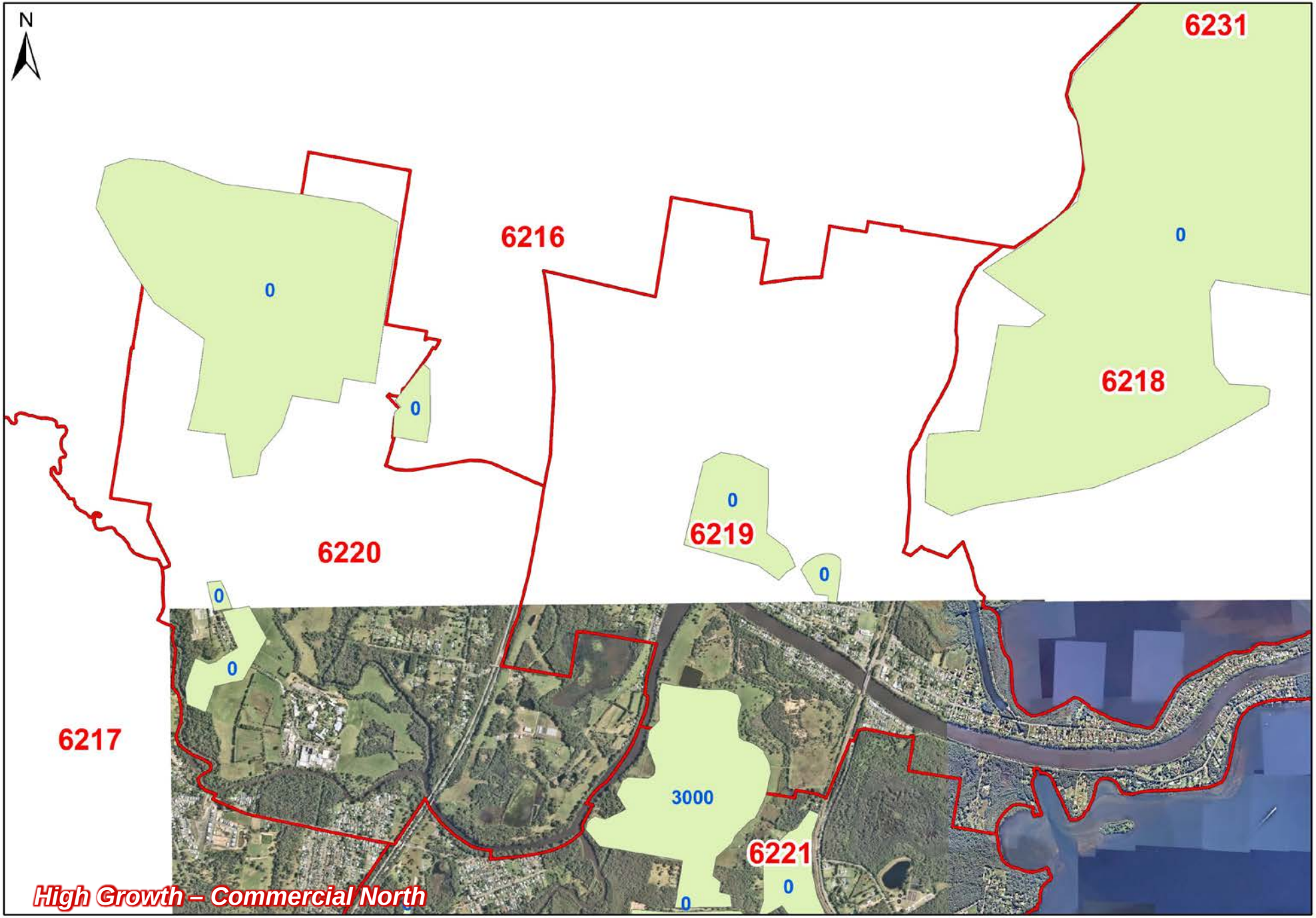
555
727
1091
638
High Growth – Dwelling Centre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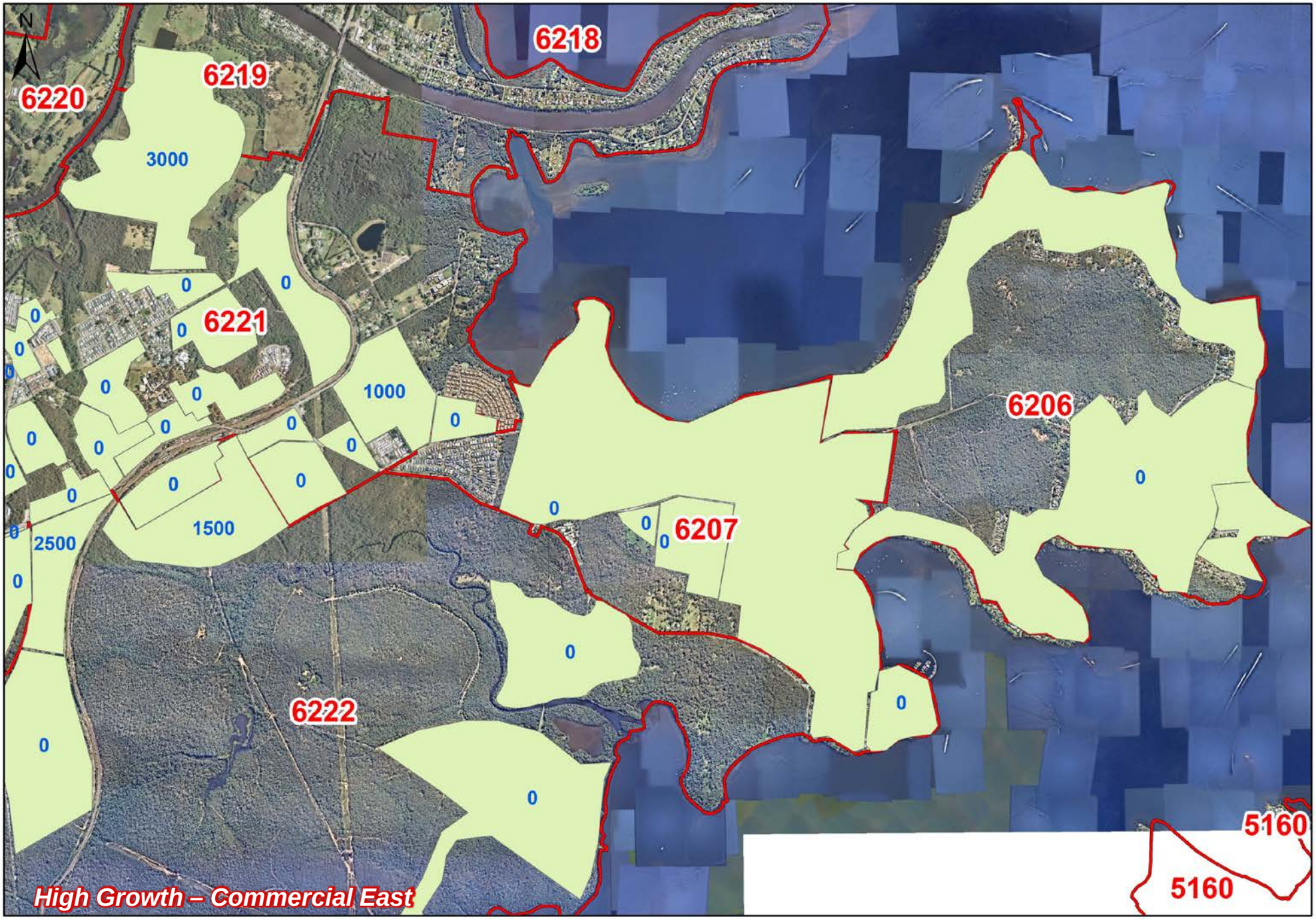
High Growth – Commercial North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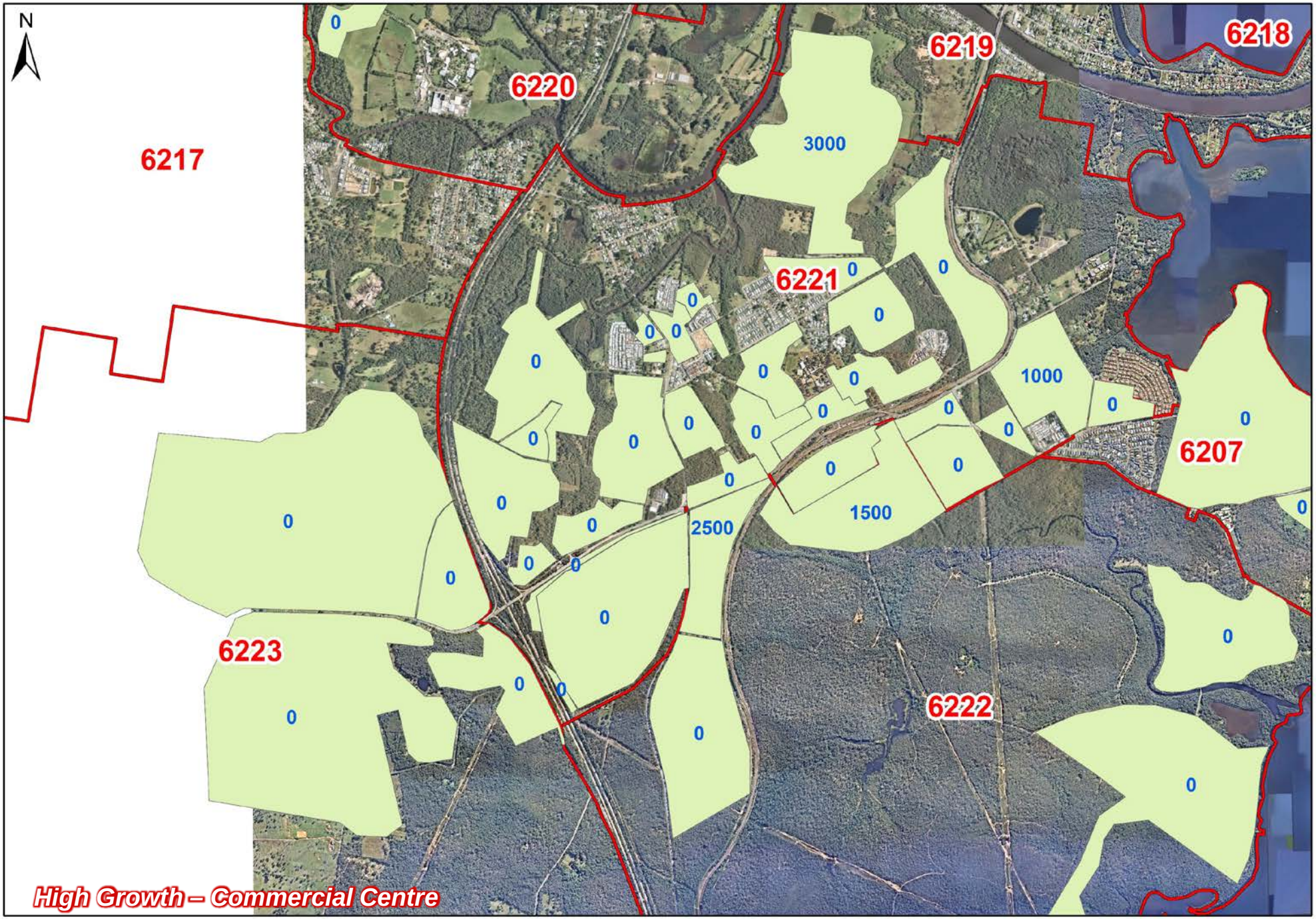
High Growth – Commercial East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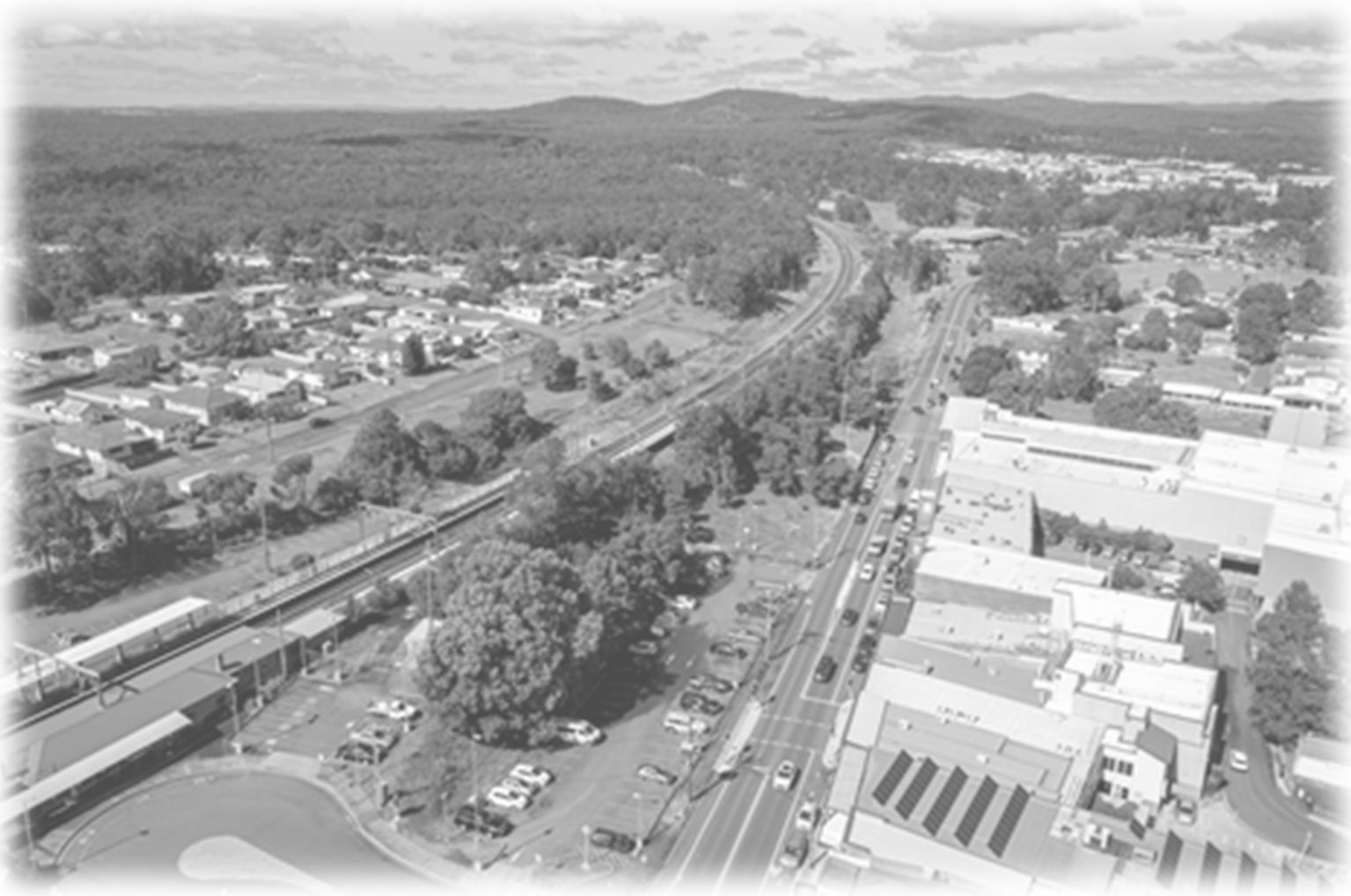
High Growth – Commercial Centre

Appendix C: EMME Modelled Scenario Results



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LOS B (0.35 < V/C <= 0.50)
LOS C (0.50 < V/C <= 0.75)
LOS D (0.75 < V/C <= 0.90)
LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)

Dora Creek
Morisset
Bonnells Bay
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 7-9AM BAU_Zoom Out
V/C Plots

LOS A (V/C <= 0.35)
LOS B (0.35 < V/C <= 0.50)
LOS C (0.50 < V/C <= 0.75)
LOS D (0.75 < V/C <= 0.90)
LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)

Morisset

Pollimedong Creek

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 7-9AM BAU_Zoom In
V/C Plots

LOS A (V/C <= 0.35)
LOS B (0.35 < V/C <= 0.50)
LOS C (0.50 < V/C <= 0.75)
LOS D (0.75 < V/C <= 0.90)
LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)

Dora Creek
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 7-9AM Low Growth_Zoom Out
V/C Plots

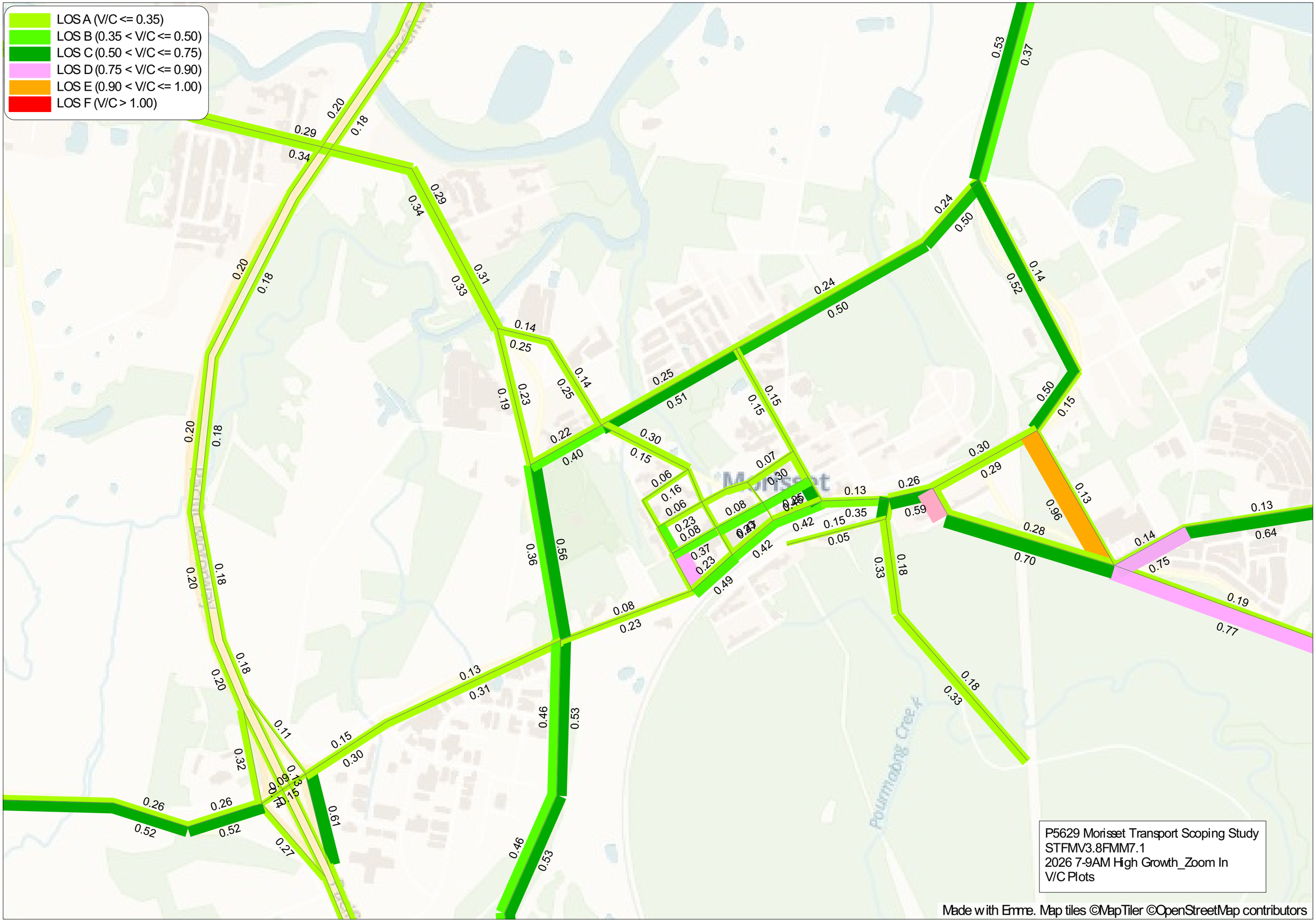
LOS A (V/C <= 0.35)
LOS B (0.35 < V/C <= 0.50)
LOS C (0.50 < V/C <= 0.75)
LOS D (0.75 < V/C <= 0.90)
LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 7-9AM Low Growth_Zoom In
V/C Plots

LOS A (V/C <= 0.35)
LOS B (0.35 < V/C <= 0.50)
LOS C (0.50 < V/C <= 0.75)
LOS D (0.75 < V/C <= 0.90)
LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)

Dora Creek
Silverwater
Sunshine

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 7-9AM High Growth_Zoom Out
V/C Plots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LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)
Morisset
Powlett Creek
P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 7-9AM High Growth_Zoom In
V/C Plots
Made with Emme. Map tiles ©MapTiler ©OpenStreetMap contributors

LOS A (V/C <= 0.35)
LOS B (0.35 < V/C <= 0.50)
LOS C (0.50 < V/C <= 0.75)
LOS D (0.75 < V/C <= 0.90)
LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)

Dora Creek
Morisset
Bonnells Bay
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 4-6PM BAU_Zoom Out
V/C Plots

LOS A (V/C <= 0.35)
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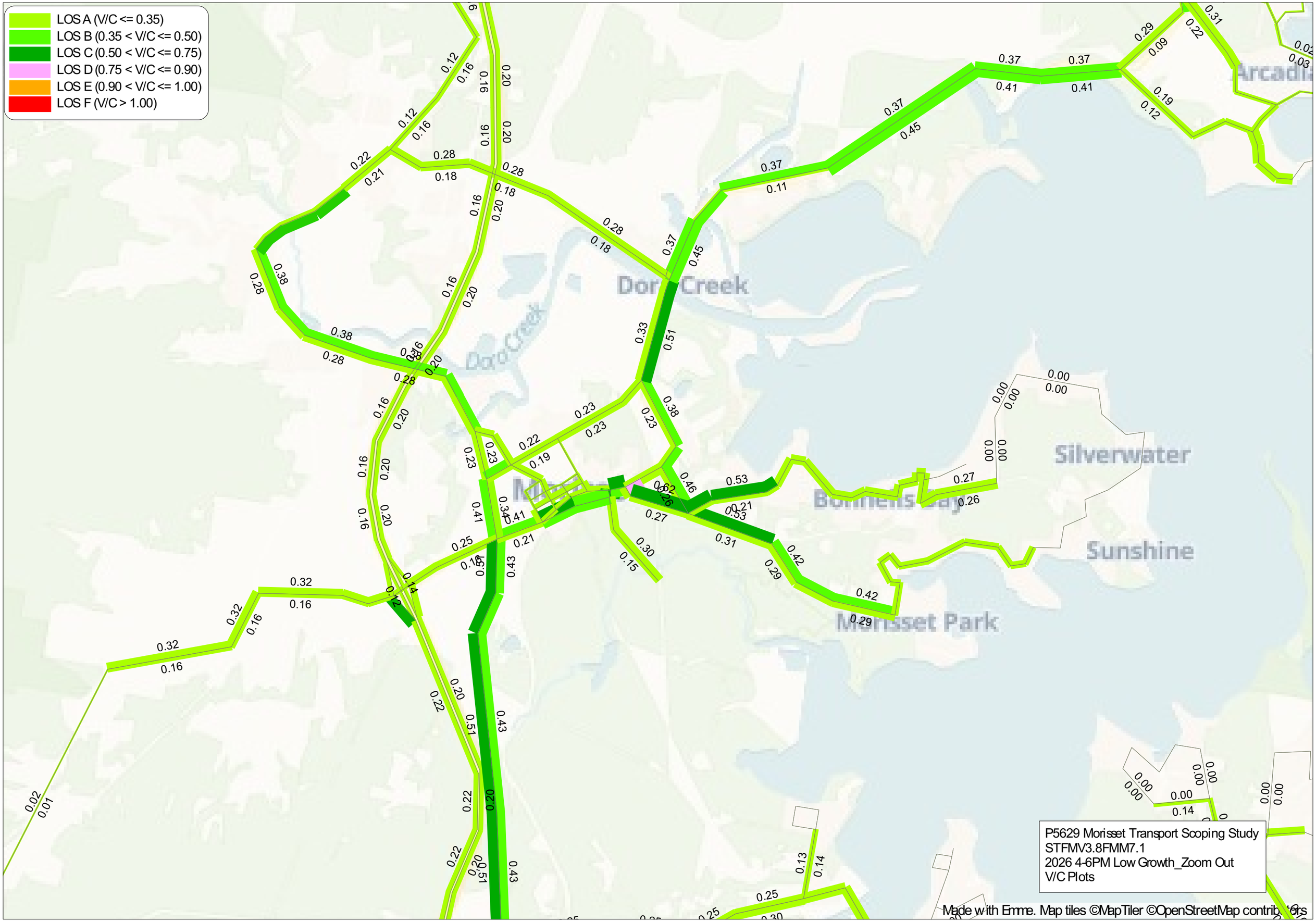
LOS D (0.75 < V/C <= 0.90)
LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)

Morisset

Pourmeadong Creek

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 4-6PM BAU_Zoom In
V/C Plots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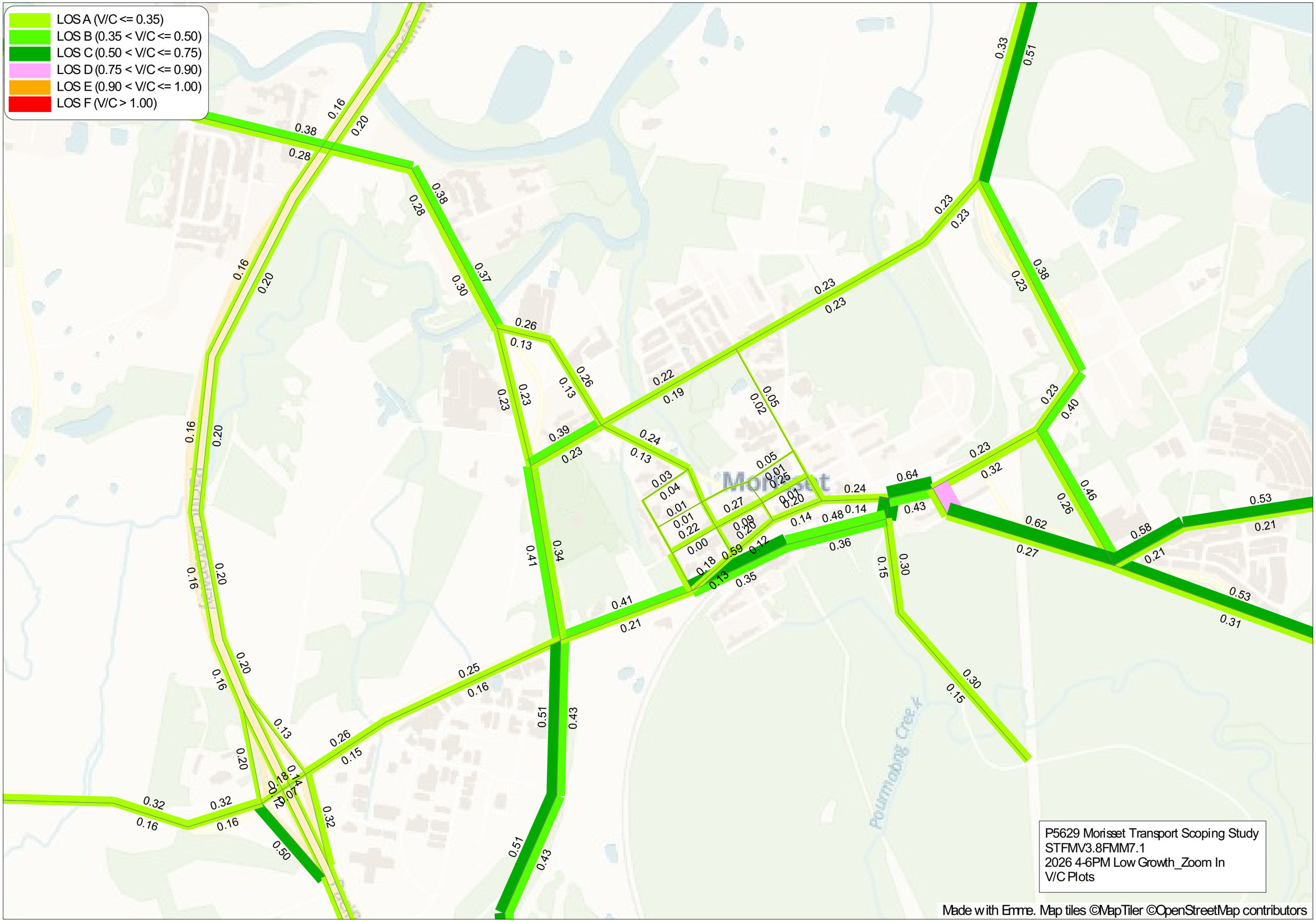
LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)
Dora Creek
Silverwater
Sunshine
Morisset Park
P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 4-6PM Low Growth_Zoom Out
V/C Plots
Made with Emme. Map tiles ©MapTiler ©OpenStreetMap contributors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LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)
P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 4-6PM Low Growth_Zoom In
V/C Plots
Made with Emme. Map tiles ©MapTiler ©OpenStreetMap contributors

LOS A (V/C <= 0.35)
LOS B (0.35 < V/C <= 0.50)
LOS C (0.50 < V/C <= 0.75)
LOS D (0.75 < V/C <= 0.90)
LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)

Dora Creek
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 4-6PM High Growth_Zoom Out
V/C Plots

LOS A (V/C <= 0.35)
LOS B (0.35 < V/C <= 0.50)
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LOS F (V/C > 1.00)

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2026 4-6PM High Growth_Zoom In
V/C Plots

LOS A (V/C <= 0.35)
LOS B (0.35 < V/C <= 0.50)
LOS C (0.50 < V/C <= 0.75)
LOS D (0.75 < V/C <= 0.90)
LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)

Dora Creek
Morisset
Bonnells Bay
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2031 7-9AM BAU_Zoom Out
V/C Plots

LOS A (V/C <= 0.35)
LOS B (0.35 < V/C <= 0.50)
LOS C (0.50 < V/C <= 0.75)
LOS D (0.75 < V/C <= 0.90)
LOS E (0.90 < V/C <= 1.00)
LOS F (V/C > 1.00)

Morisset

Pourmeadong Creek

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2031 7-9AM BAU_Zoom In
V/C Plots

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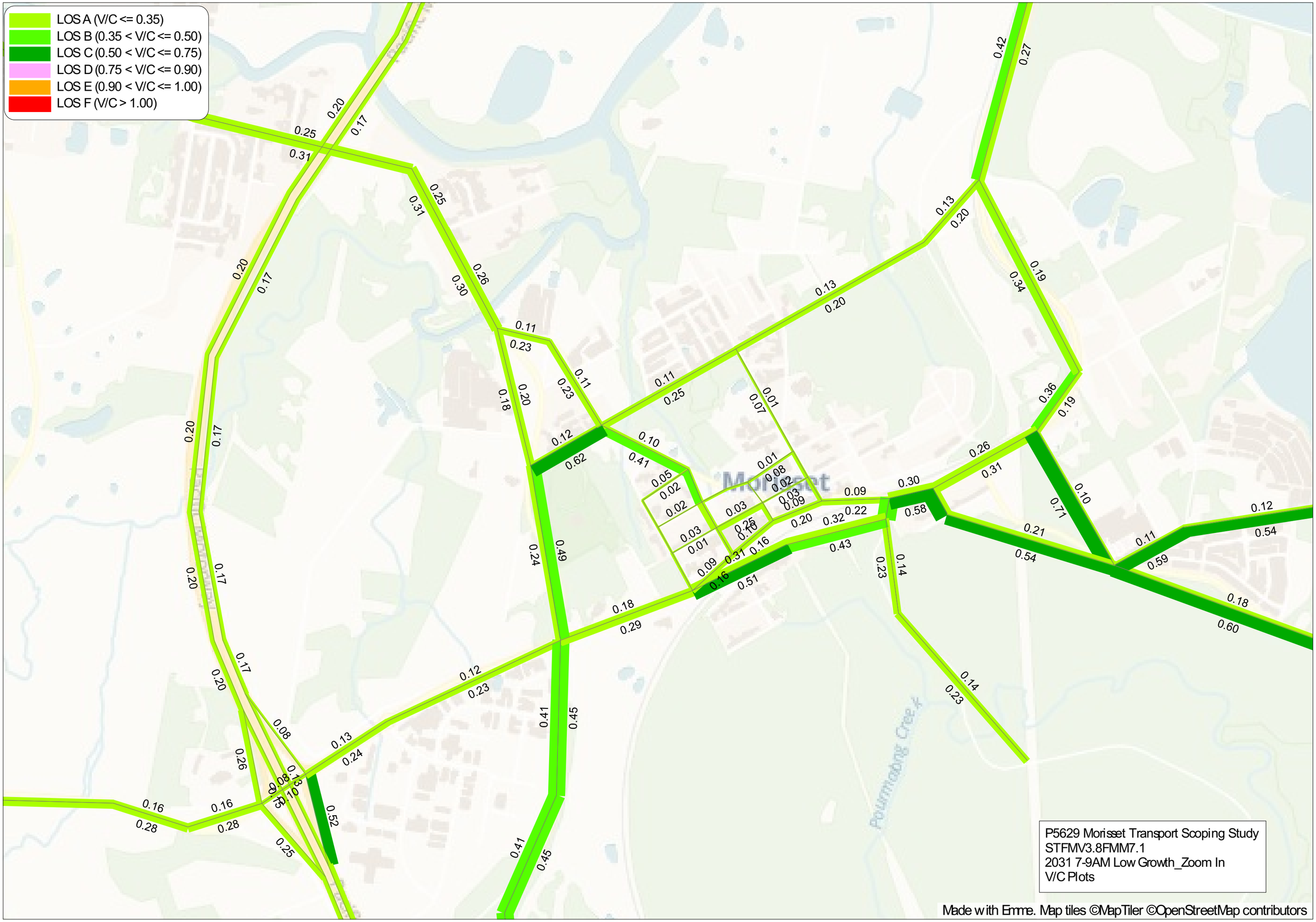
LOS F (V/C > 1.00)

Dora Creek
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2031 7-9AM Low Growth_Zoom Out
V/C Plots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LOS F (V/C > 1.00)
Morisset
Pourmeadow Creek
P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2031 7-9AM Low Growth_Zoom In
V/C Plots
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Dora Creek
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2031 7-9AM High Growth_Zoom Out
V/C Plots

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P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2031 7-9AM High Growth_Zoom In
V/C Plots

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Dora Creek
Morisset
Bonnells Bay
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2031 4-6PM BAU_Zoom Out
V/C Plots

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Morisset

Pourmeadong Creek

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STFMV3.8FMM7.1
2031 4-6PM BAU_Zoom In
V/C Plots

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Dora Creek
Silverwater
Sunshine
Morisset Park

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V/C Plots

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STFMV3.8FMM7.1
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V/C Plots

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Dora Creek
Silverwater
Sunshine
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P5629 Morisset Transport Scoping Study
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2031 4-6PM High Growth_Zoom Out
V/C Plots

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P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2031 4-6PM High Growth_Zoom In
V/C Plots

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Dora Creek
Morisset
Bonnells Bay
Silverwater
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Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2036 7-9AM BAU_Zoom Out
V/C Plots


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Morisset
P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2036 7-9AM BAU_Zoom In
V/C Plots
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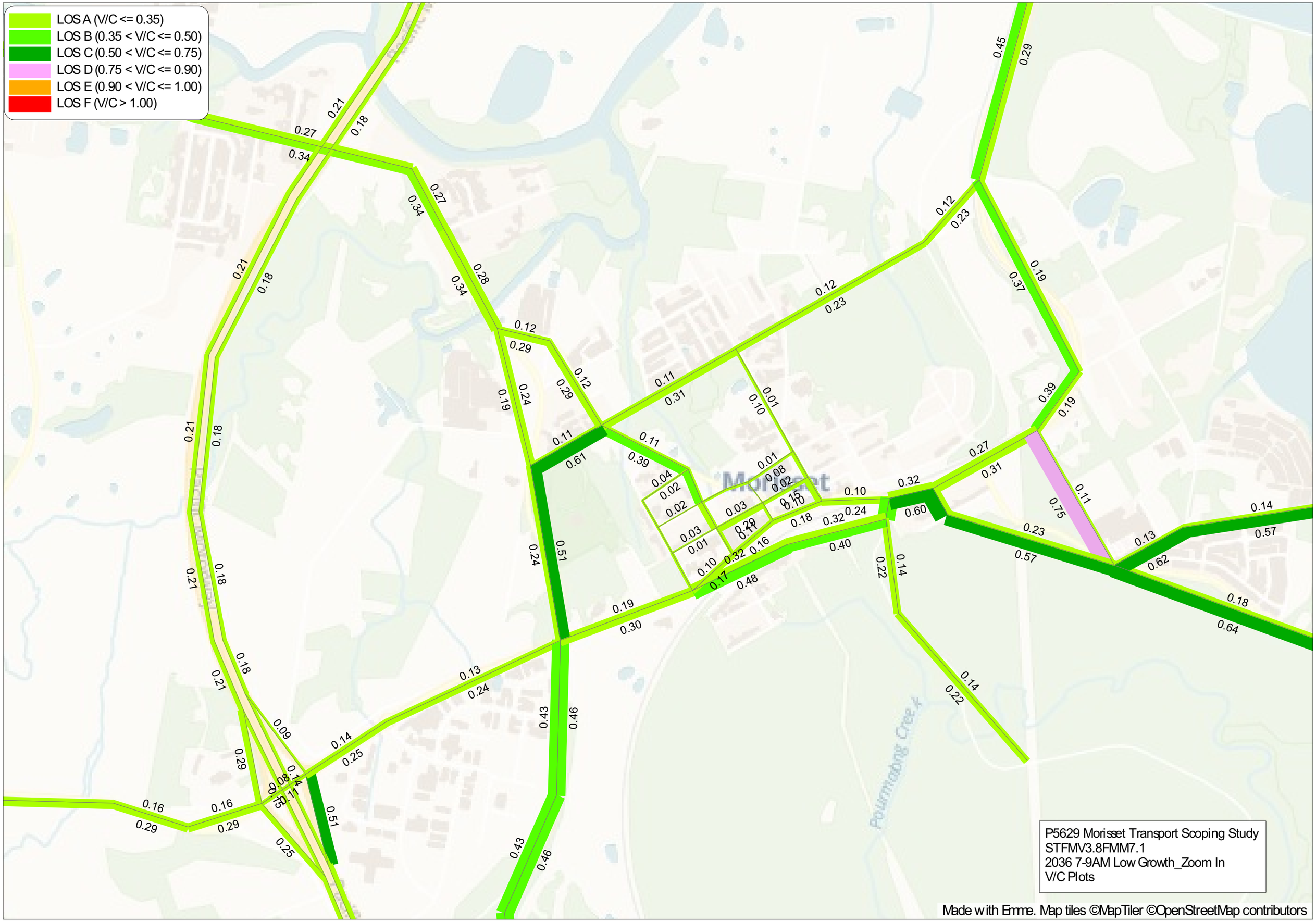
Dora Creek
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2036 7-9AM Low Growth_Zoom Out
V/C Plots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P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2036 7-9AM Low Growth_Zoom In
V/C Plots
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Dora Creek
Silverwater
Sunshine
Morisset Park

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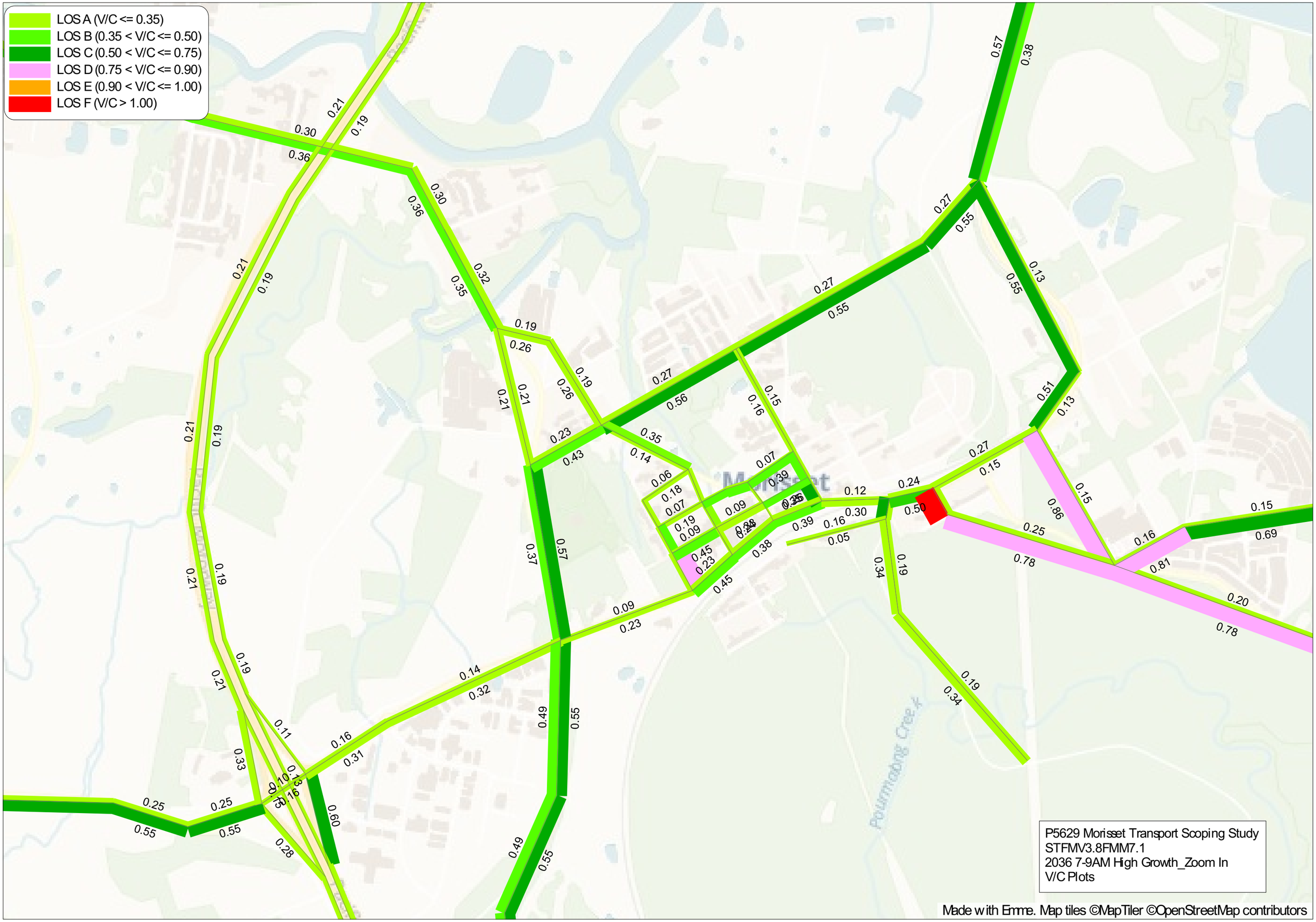
STFMV3.8FMM7.1
2036 7-9AM High Growth_Zoom Out
V/C Plots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Morisset
Pourmadgy Creek
P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2036 7-9AM High Growth_Zoom In
V/C Plots
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Dora Creek
Morisset
Bonnells Bay
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2036 4-6PM BAU_Zoom Out
V/C Plots


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Morisset
Pourmeadong Creek
P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2036 4-6PM BAU_Zoom In
V/C Plots
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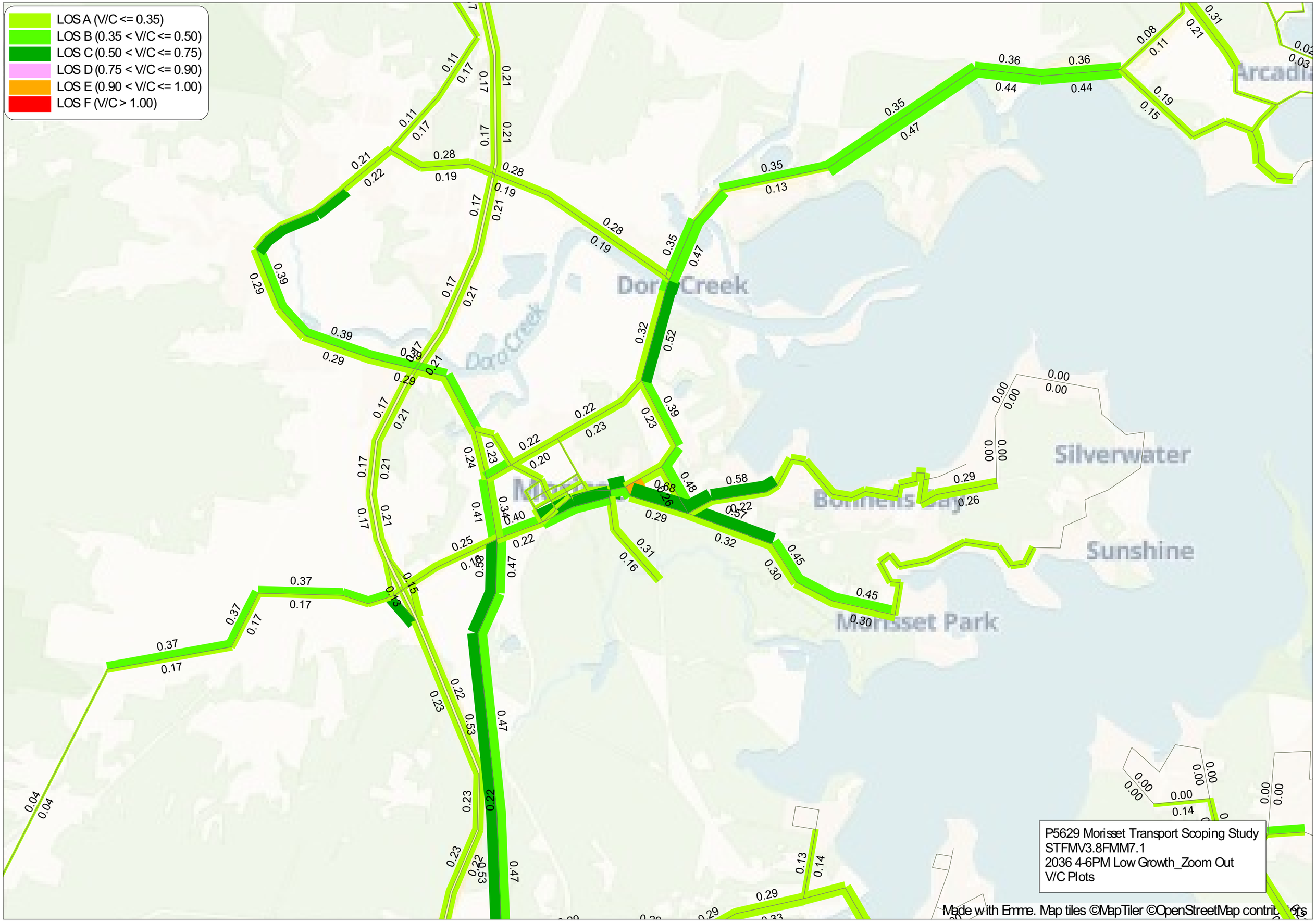
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Dora Creek
Silverwater
Sunshine
Morisset Park
P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2036 4-6PM Low Growth_Zoom Out
V/C Plots
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P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2036 4-6PM Low Growth_Zoom In
V/C Plots

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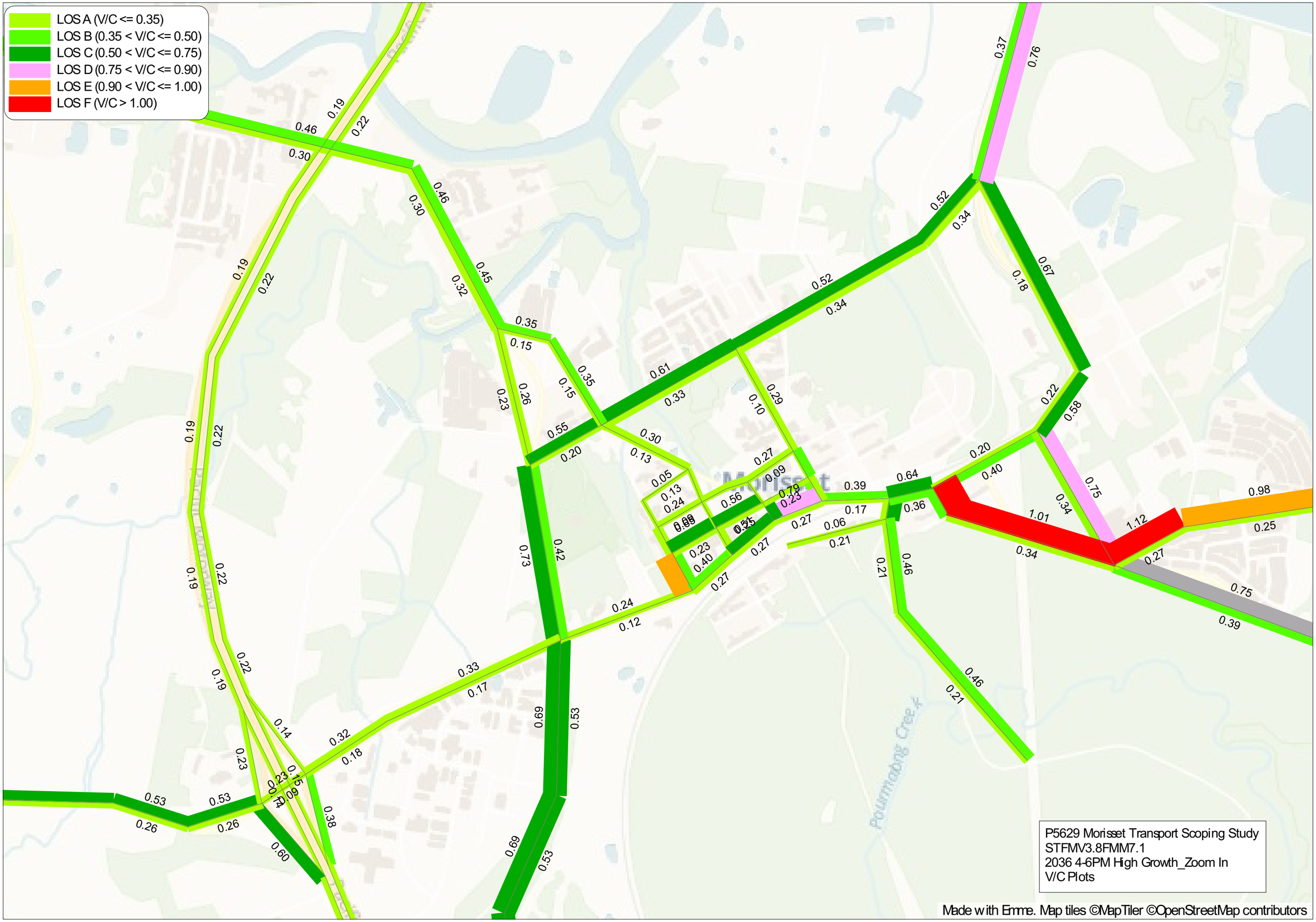
Dora Creek
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2036 4-6PM High Growth_Zoom Out
V/C Plots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Morisset
Pourmeadow Creek
P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2036 4-6PM High Growth_Zoom In
V/C Plots
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Dora Creek
Morisset
Bonnells Bay
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2041 7-9AM BAU_Zoom Out
V/C Plots

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Morisset

Pourmeadong Creek

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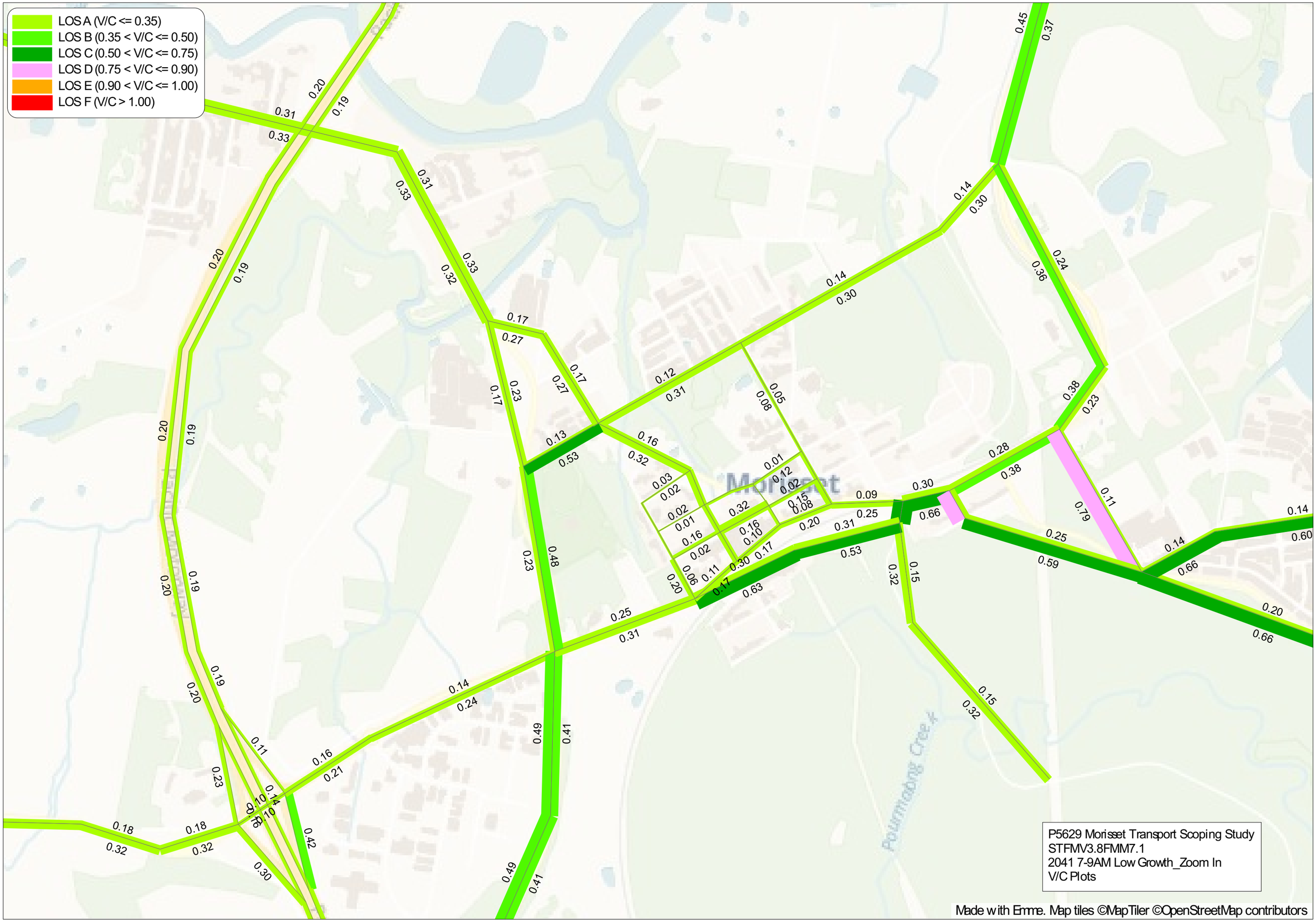
STFMV3.8FMM7.1
2041 7-9AM BAU_Zoom In
V/C Plots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Morisset
Pourmalong Creek
P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2041 7-9AM Low Growth_Zoom In
V/C Plots
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ERARING
Doo Creek
Doro Creek
Yarrawonga Park
Mirrabooka
Sunshine
WYEE POINT

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2041 7-9AM Low Growth_Zoom Out
V/C Plots

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ERARING
Doro Creek
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V/C Plots

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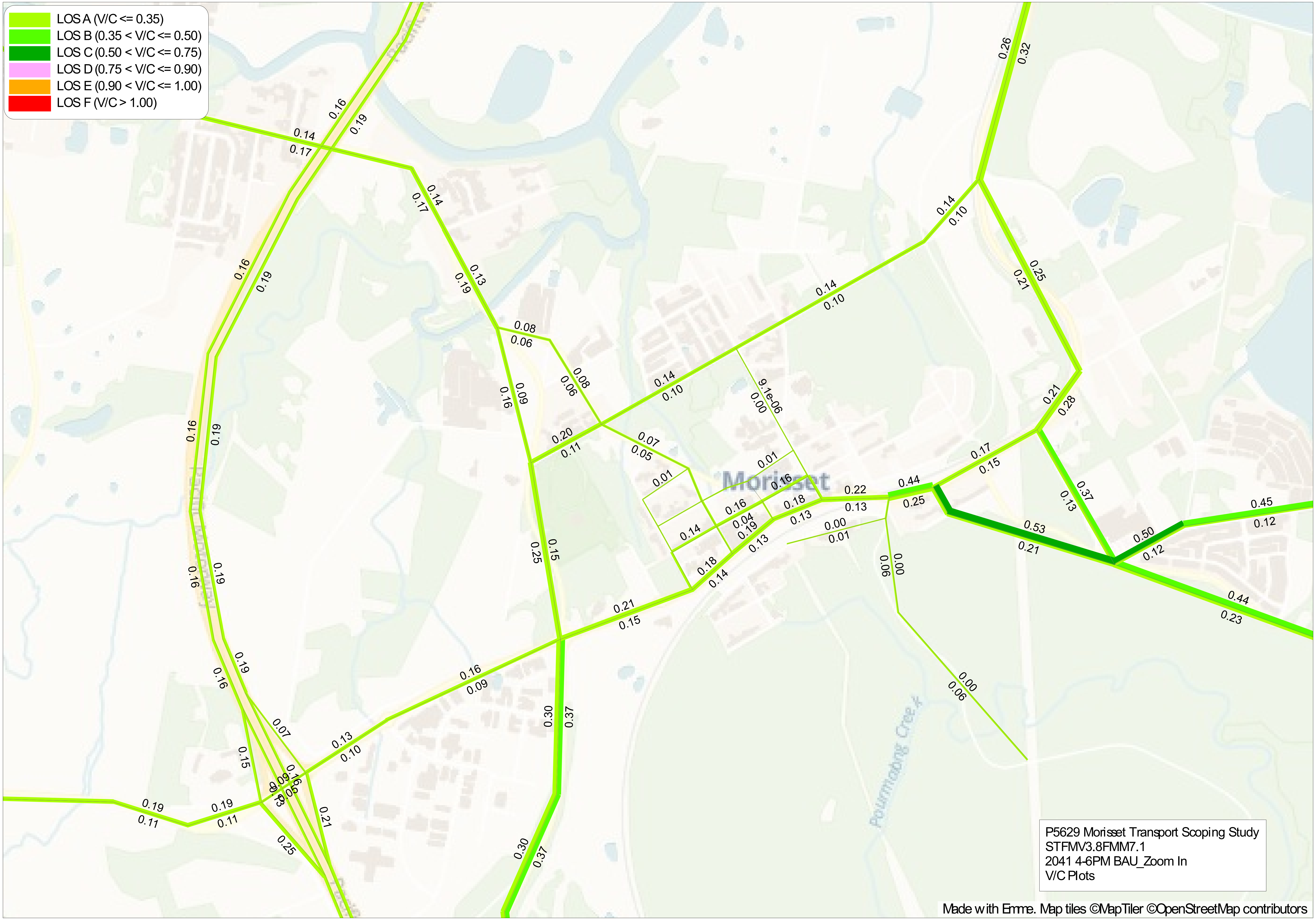
Dora Creek
Morisset
Bonnells Bay
Silverwater
Sunshine
Morisset Park

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2041 4-6PM BAU_Zoom Out
V/C Plots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Morisset
Dora Creek
P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2041 4-6PM BAU_Zoom In
V/C Plots
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ERARING
COORANBONG
Doo Creek
Doro Creek
Morisset
Yarrawonga Park
Silverwater
Mirrabooka
Sunshine
Morisset Park
WYEE POINT
SUMMERLAN

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2041 4-6PM Low Growth_Zoom Out
V/C Plots

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V/C Plots

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ERARING
COORANBONG
Doo Creek
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Silverwater
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WYEE POINT
SUMMERLAN

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STFMV3.8FMM7.1
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ERARING
Doro Creek
Yarrawonga Park
Mirrabooka
Sunshine
WYEE POINT

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2041 7-9AM High Growth Sensitivity Test_Zoom Out
V/C Plots

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Morisset

Pourmadang Creek

P5629 Morisset Transport Scoping Study
STFMV3.8FMM7.1
2041 7-9AM High Growth Sensitivity Test_Zoom In
V/C Plots

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ERARING
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Doyalson Creek
Doyalson Creek
BALCOLYN
Yarrawonga Park
Silverwater
Mirrabooka
Sunshine
Morisset Park
WYEE POINT
SUMMERLAN

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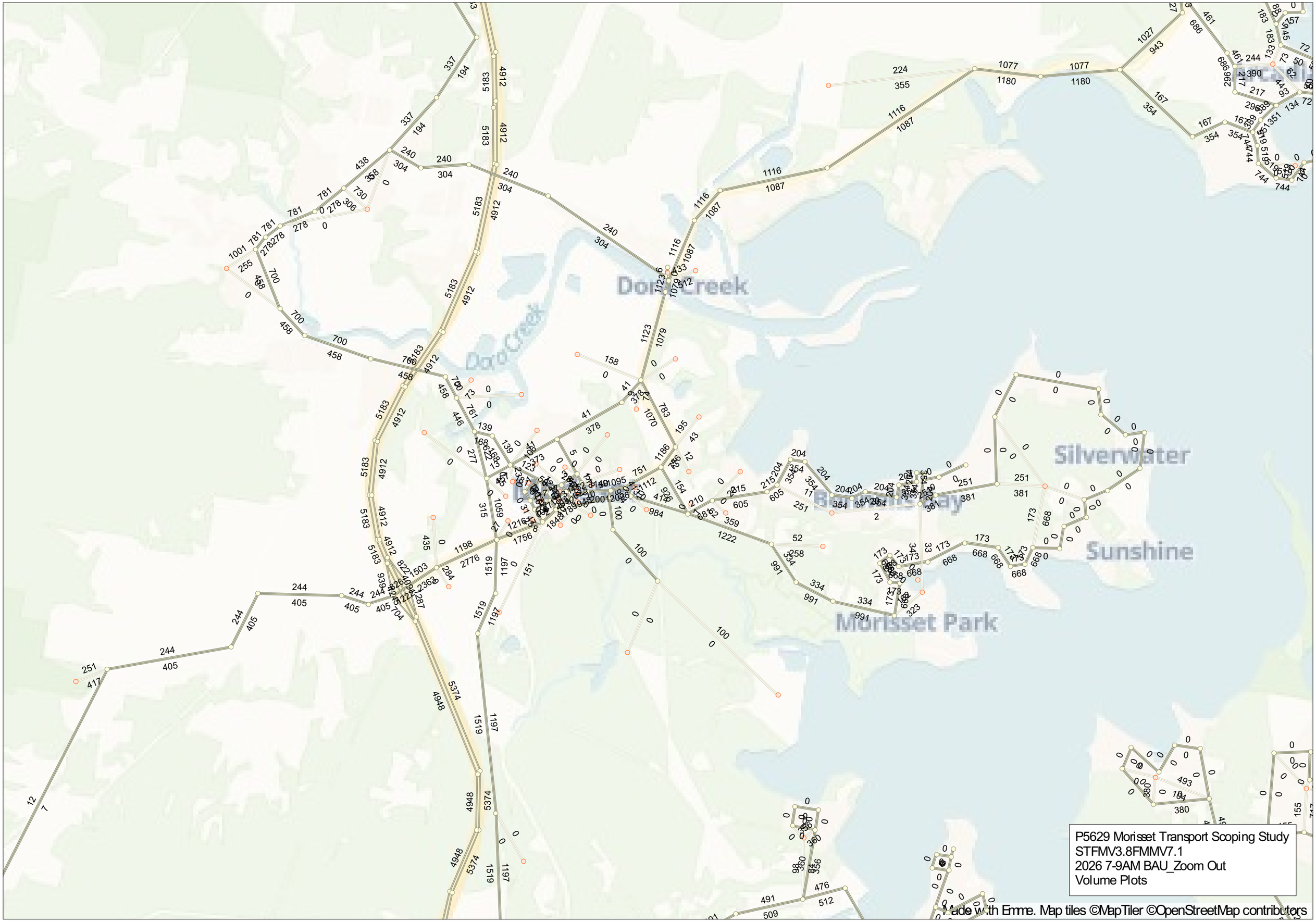
2041 4-6PM High Growth Sensitivity Test_Zoom In
V/C Plots


Dora Creek
Silverwater
Sunshine
Morisset Park
P5629 Morisset Transport Scoping Study
STFMV3.8FMMV7.1
2026 7-9AM BAU_Zoom Out
Volume Plots
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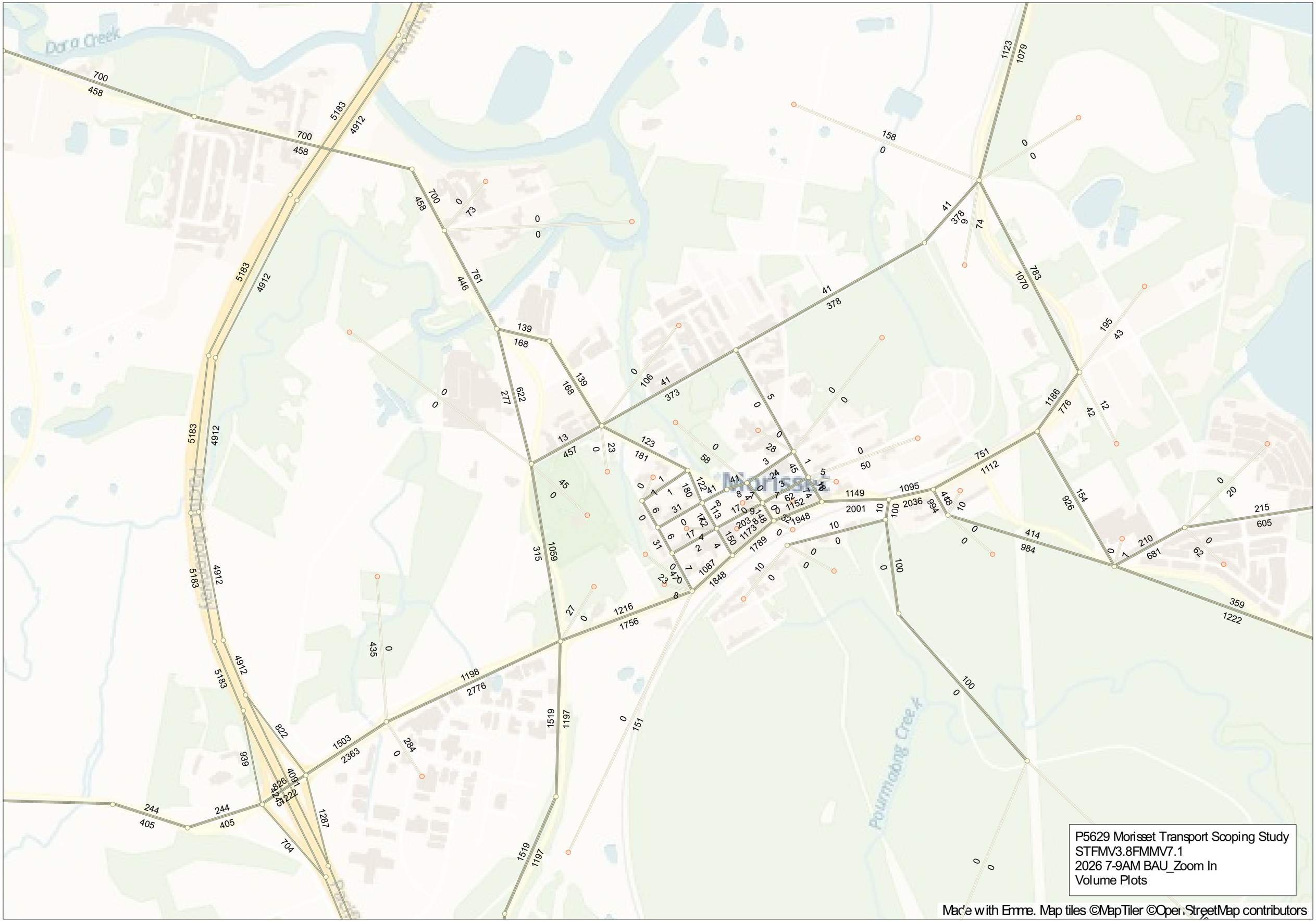

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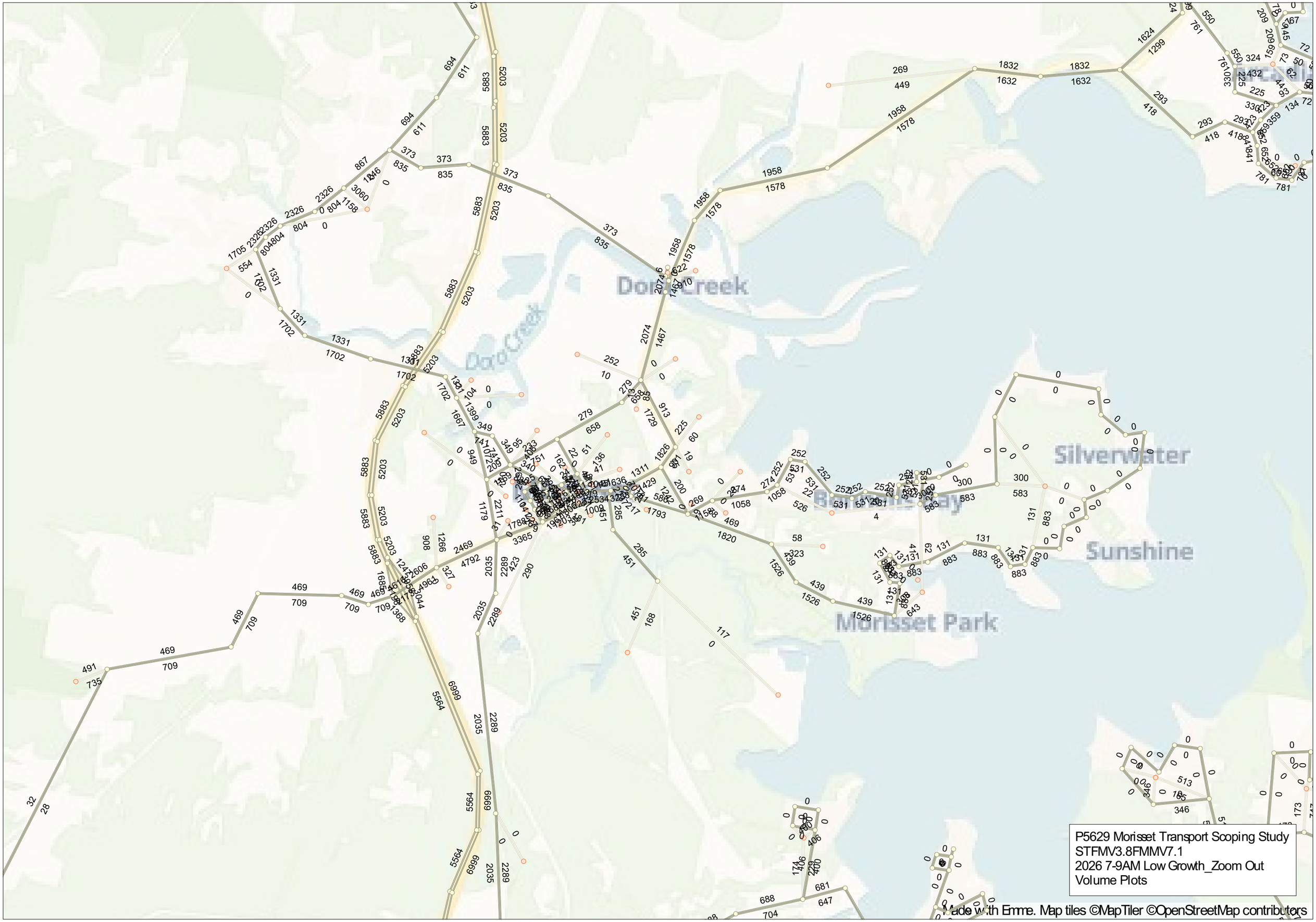
STFMV3.8FMMV7.1
2026 7-9AM BAU_Zoom In
Volume Plots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Morisset Park
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2026 7-9AM Low Growth_Zoom Out
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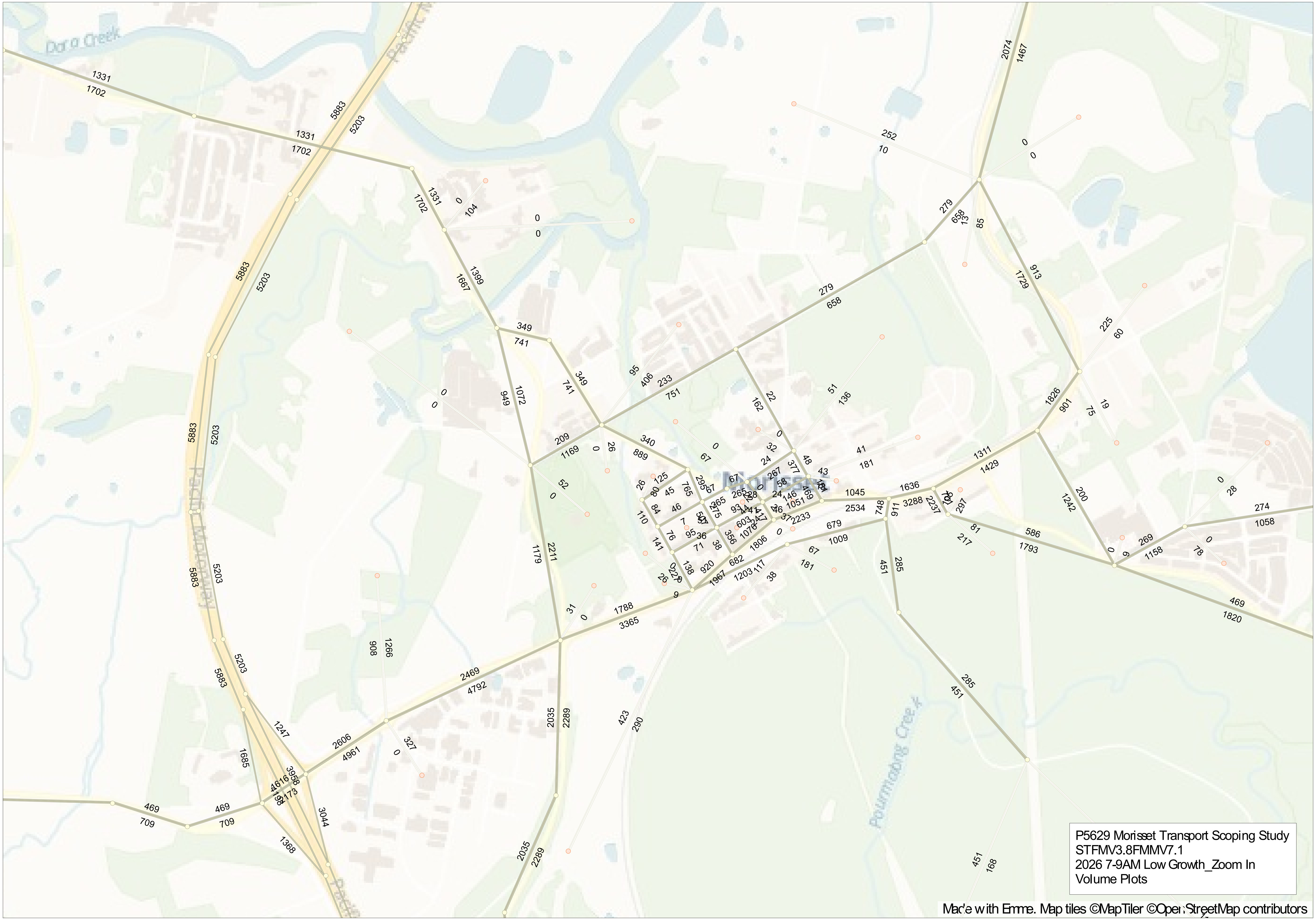
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2026 7-9AM Low Growth_Zoom In
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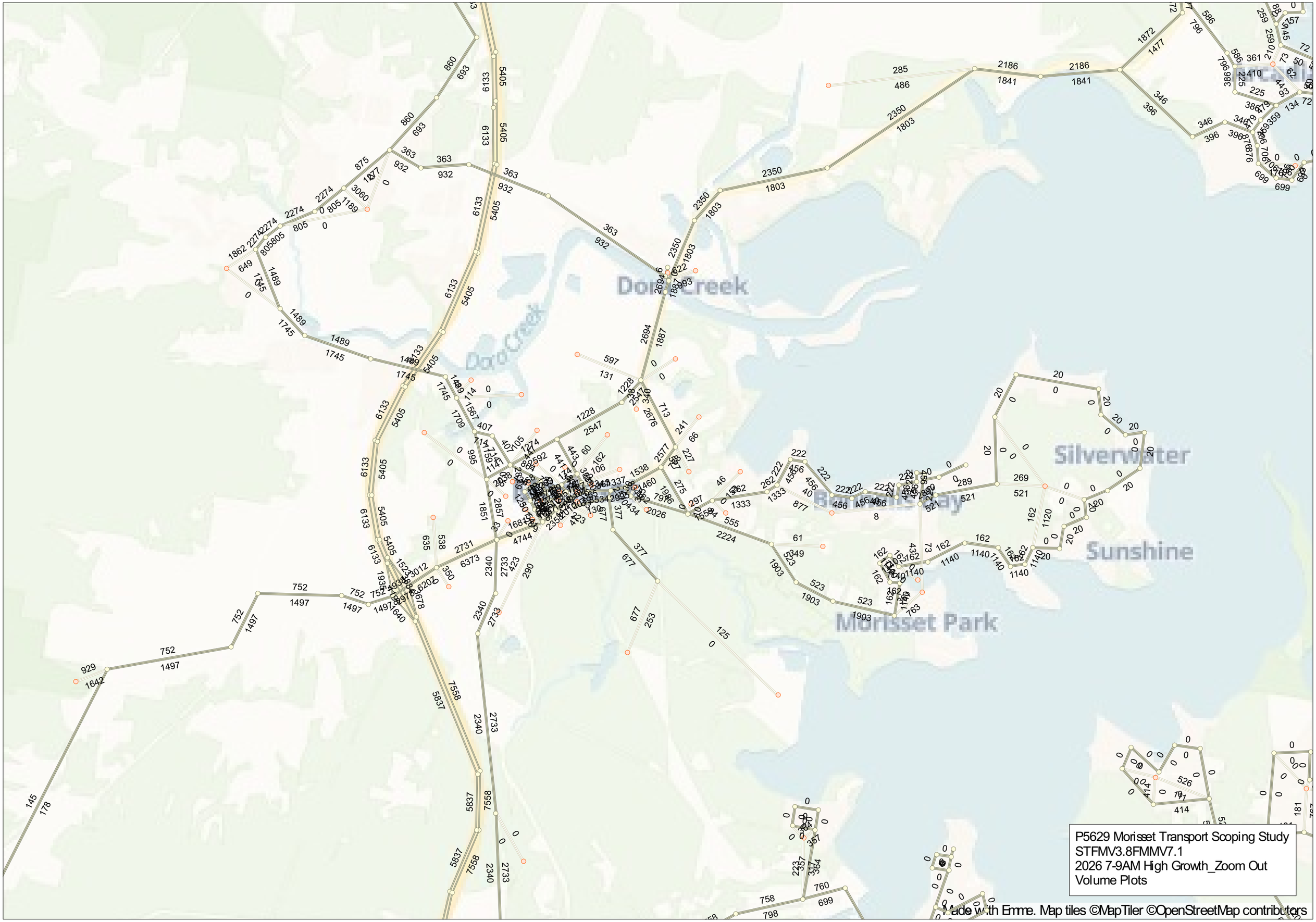
Dora Creek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Silverwater
Sunshine
Morisset Park
P5629 Morisset Transport Scoping Study
STFMV3.8FMMV7.1
2026 7-9AM High Growth_Zoom Out
Volume Plots
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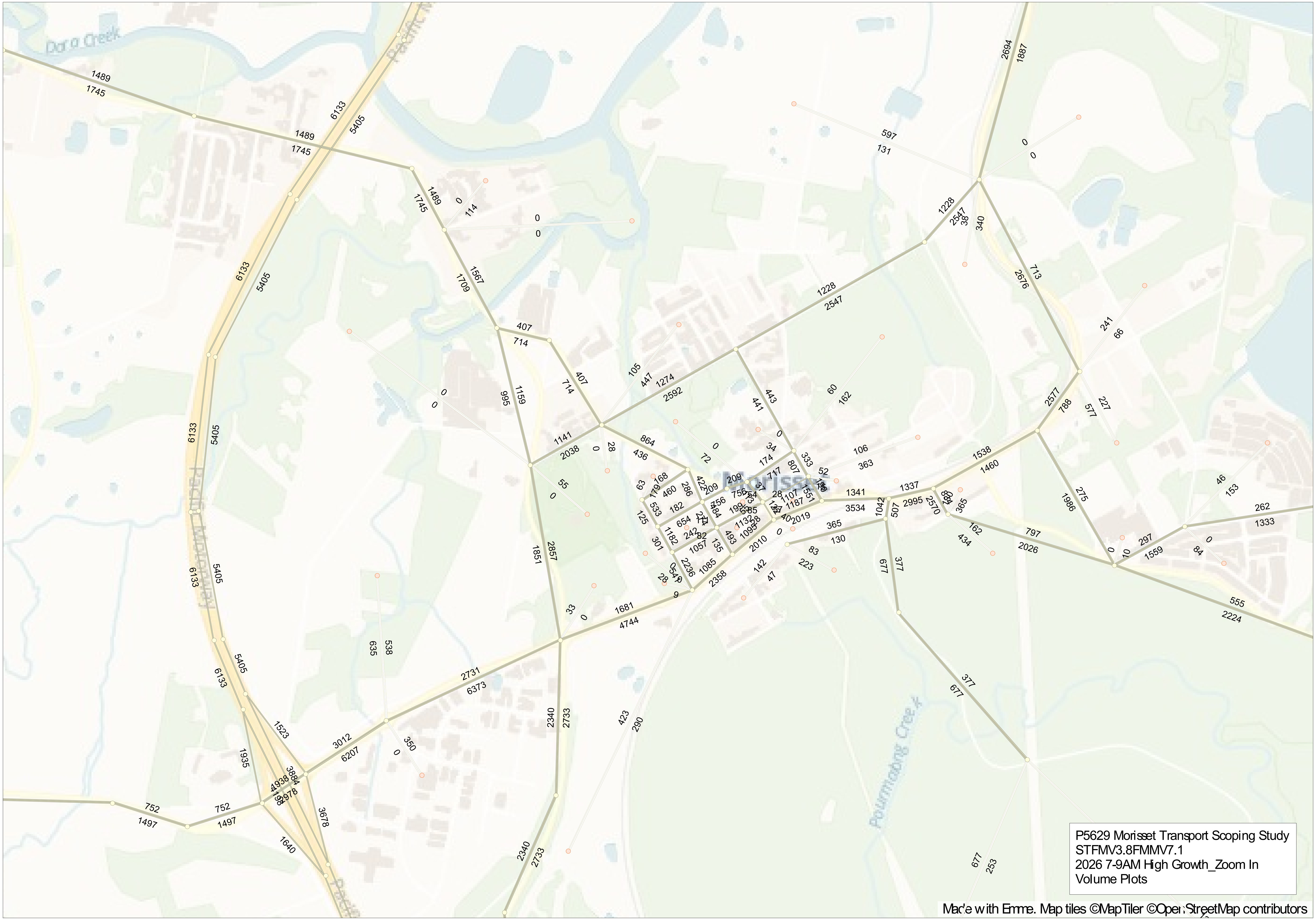
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Pourmalong Creek
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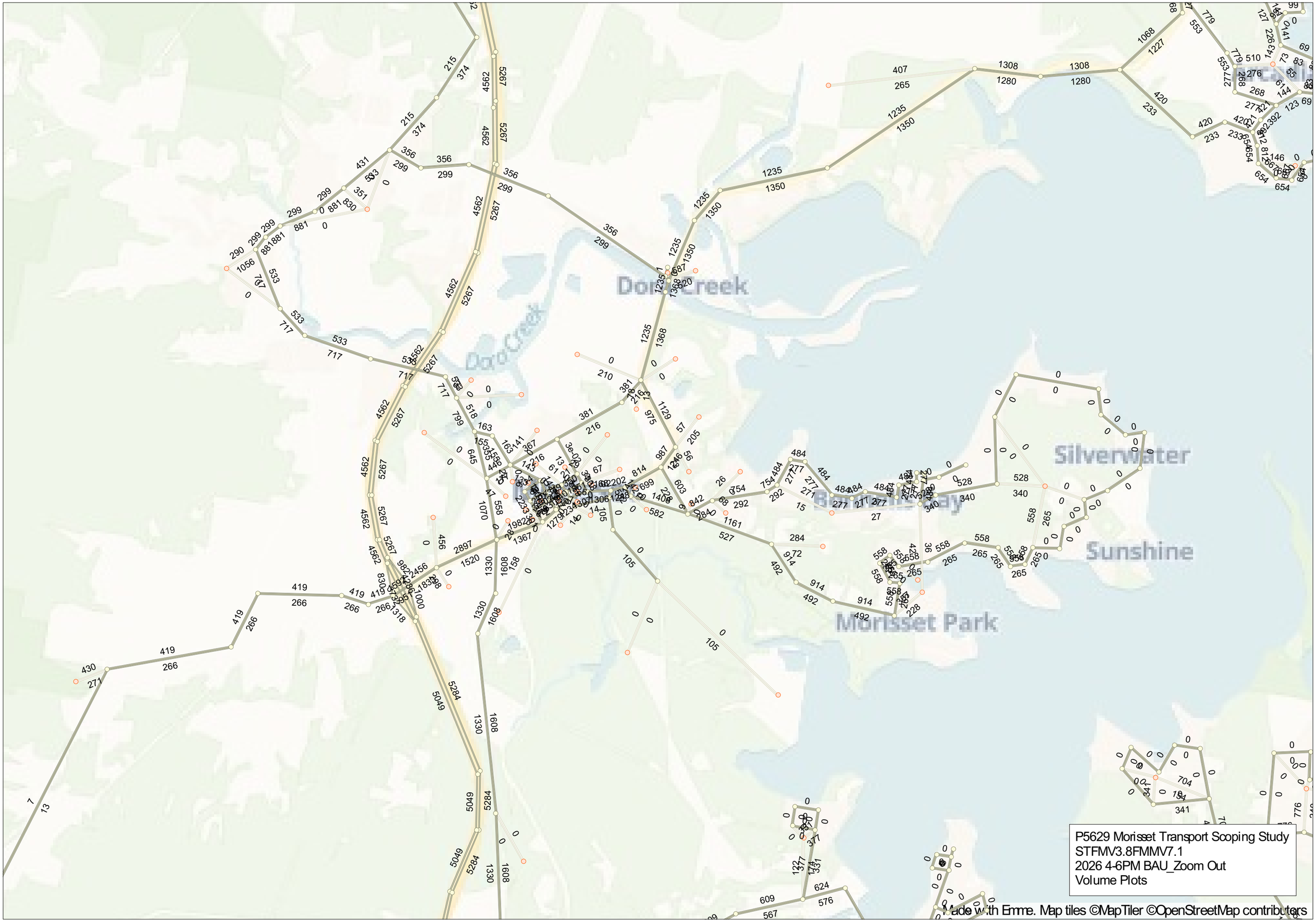
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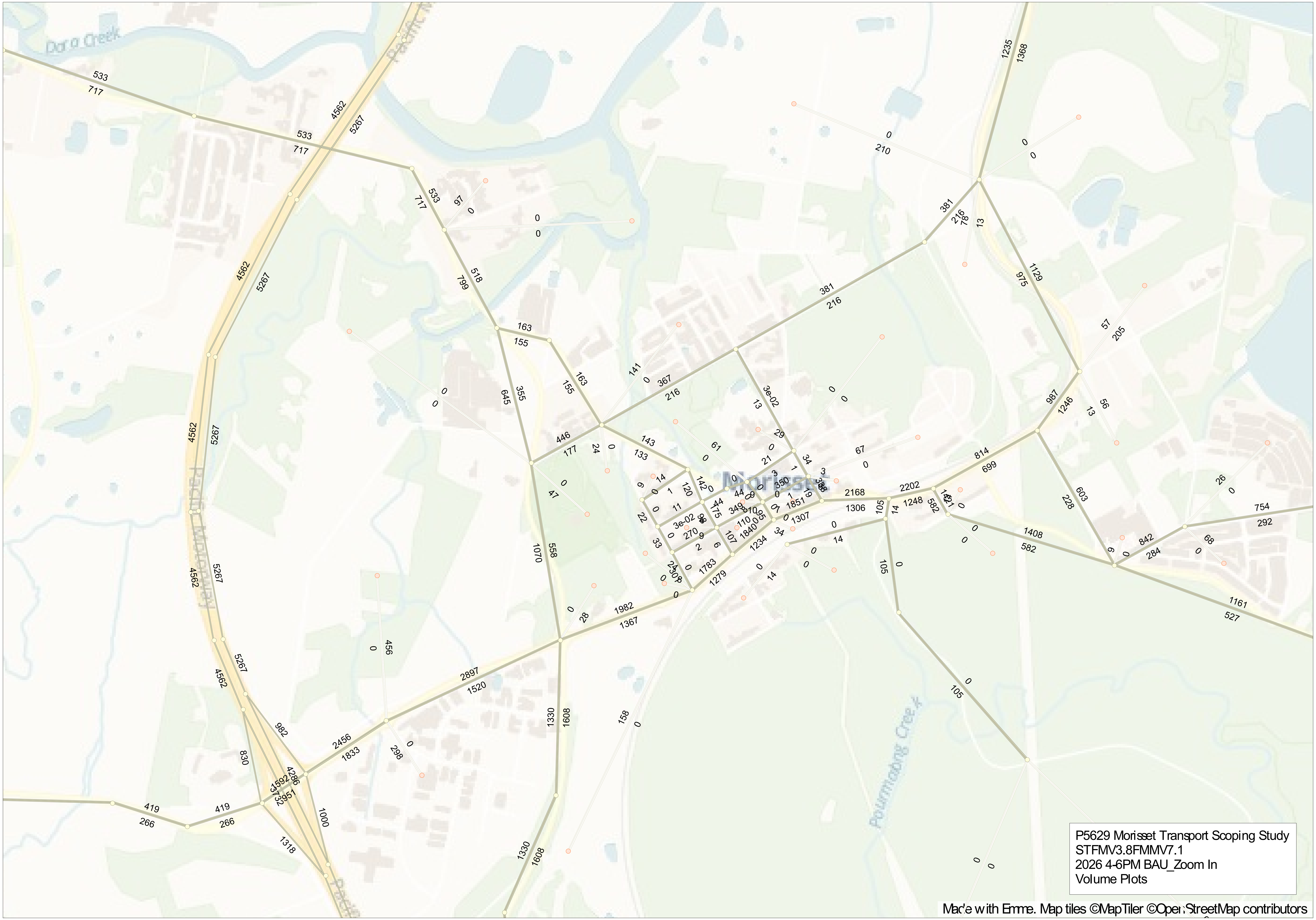
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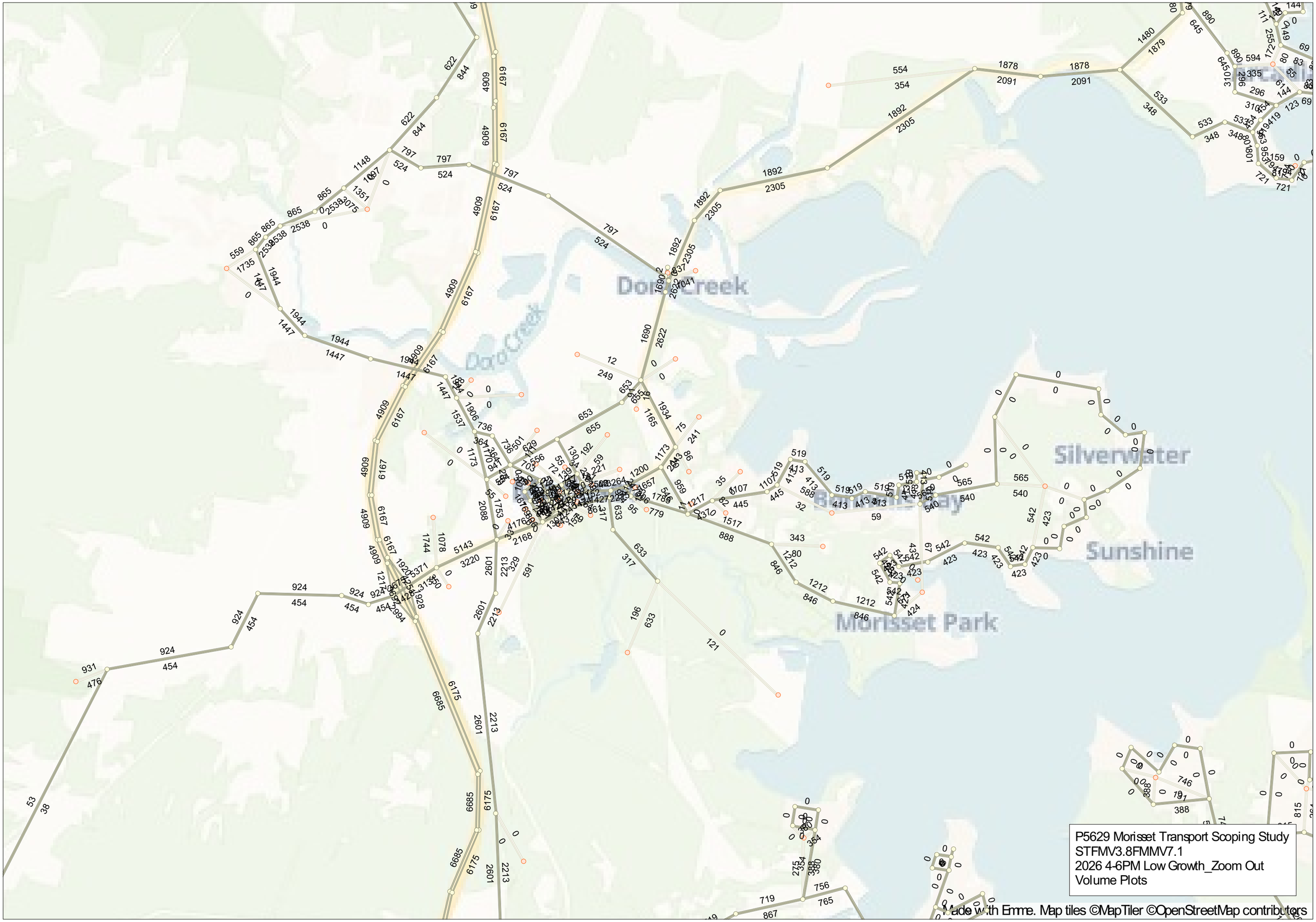
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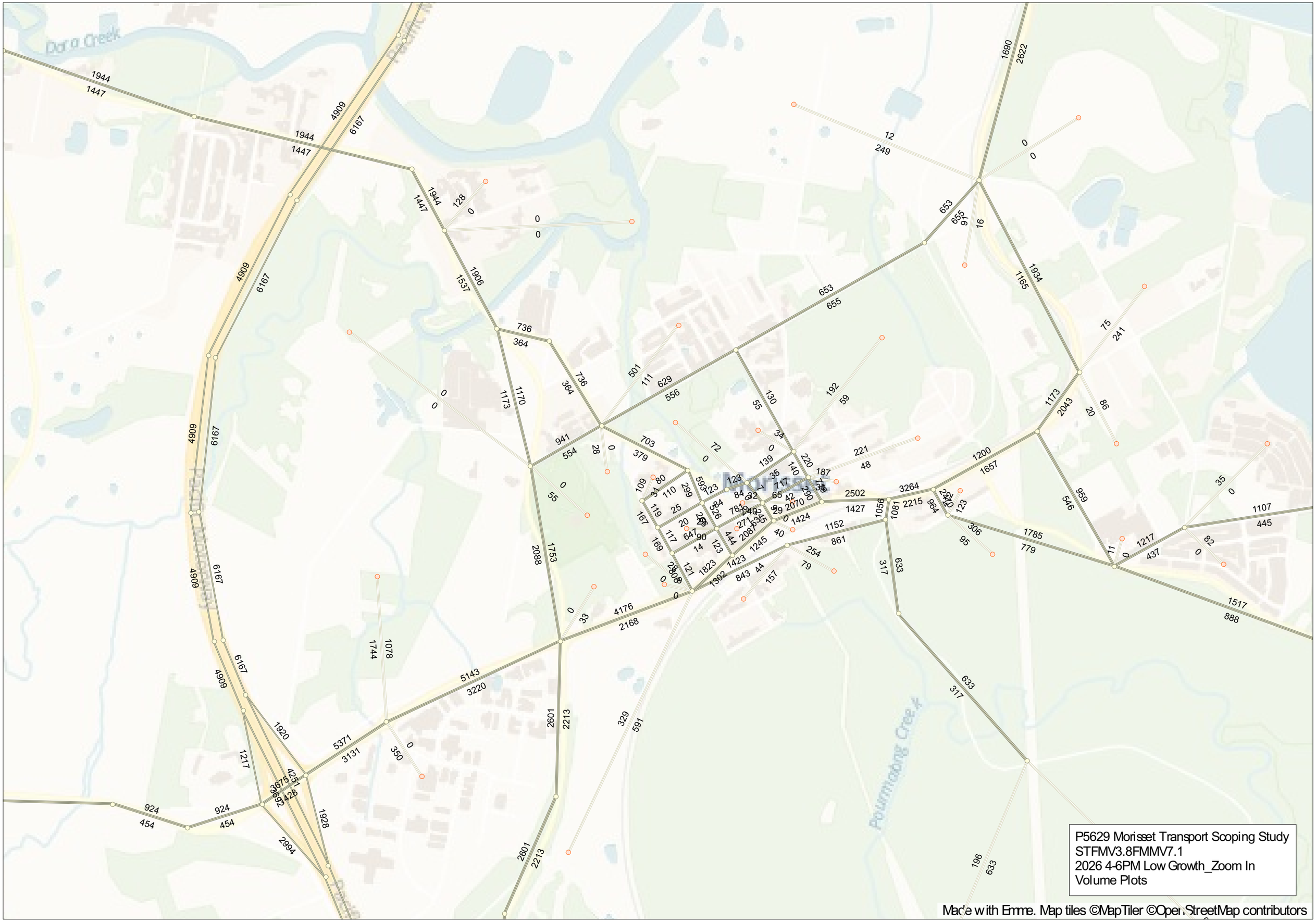

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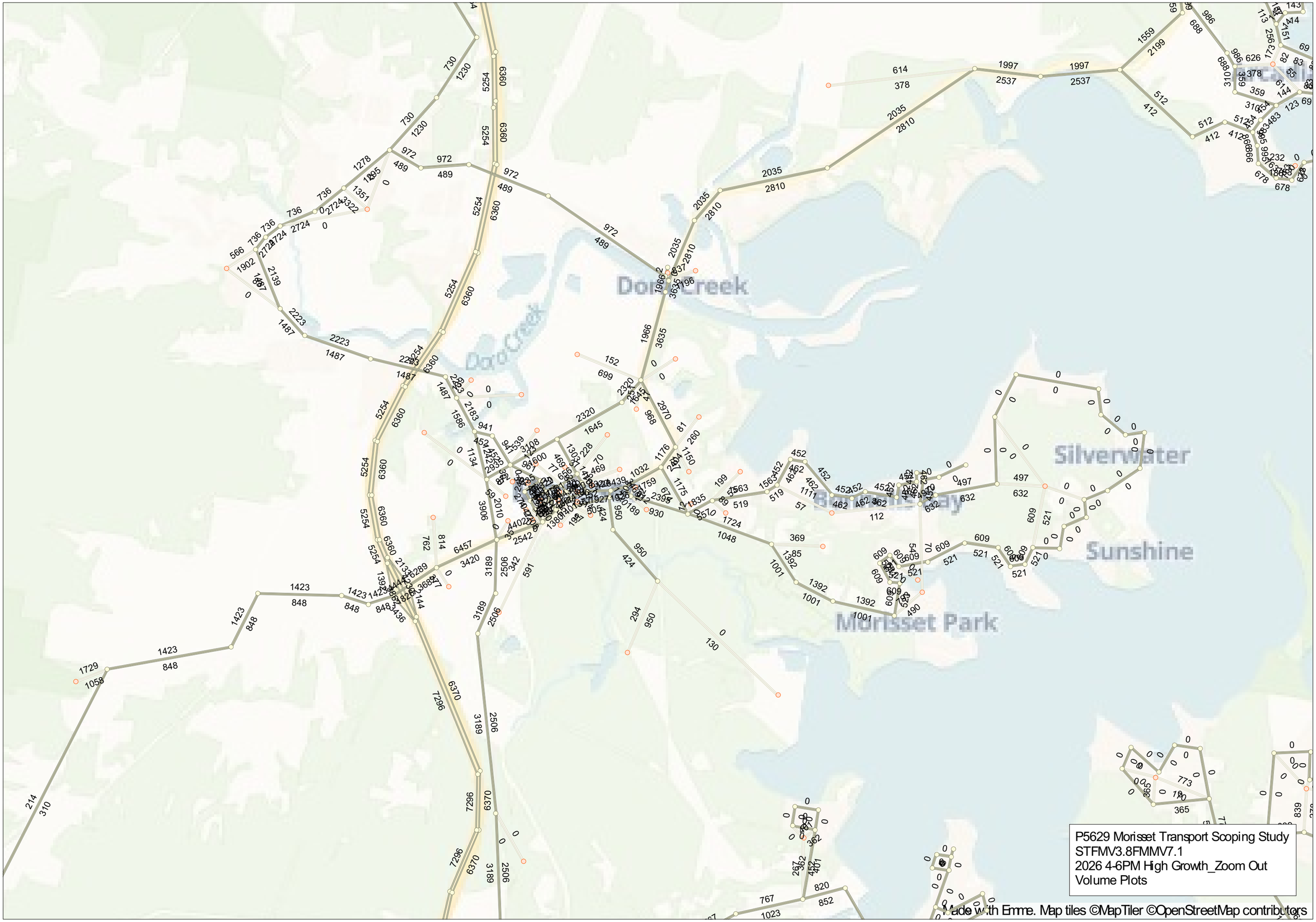
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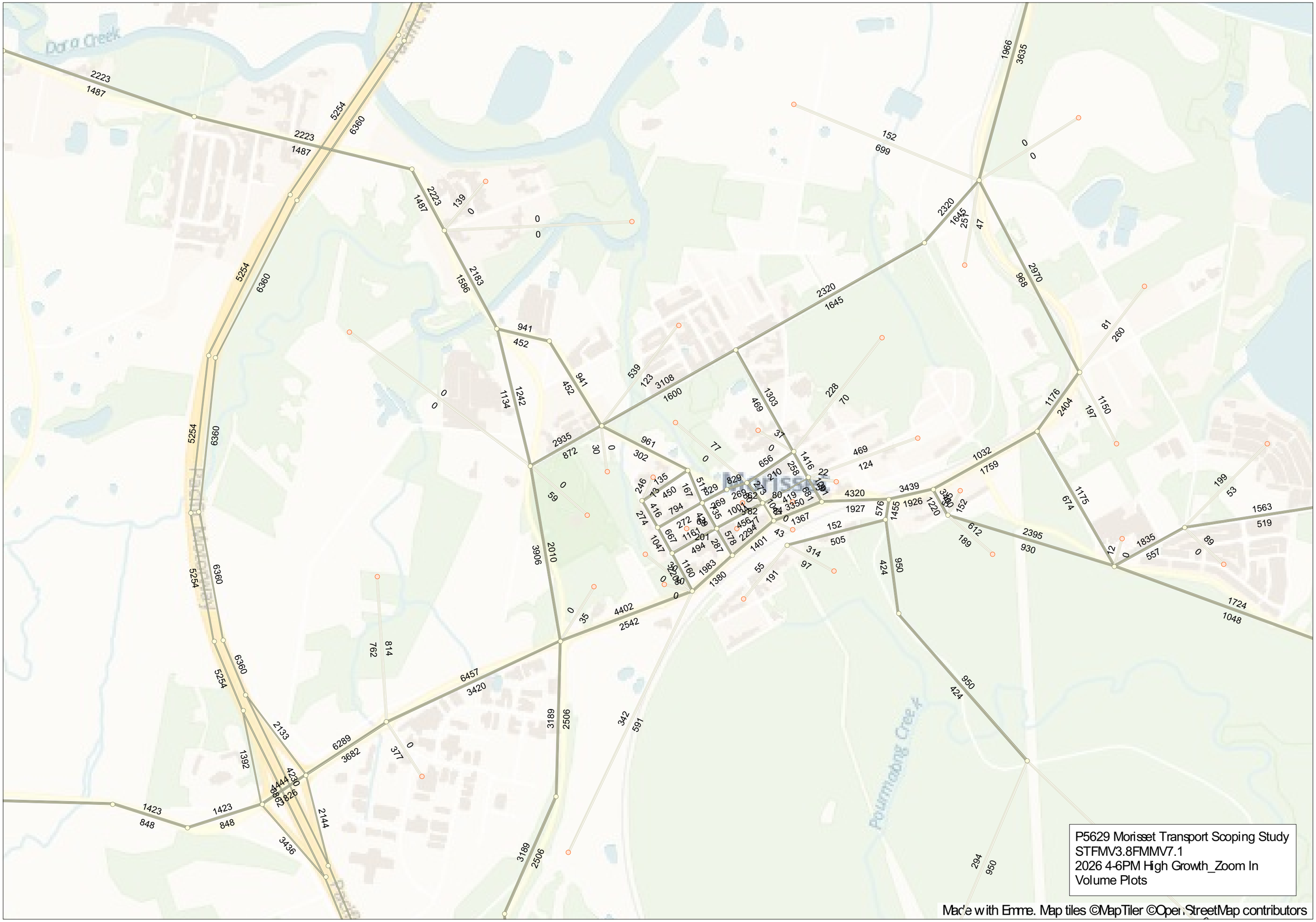

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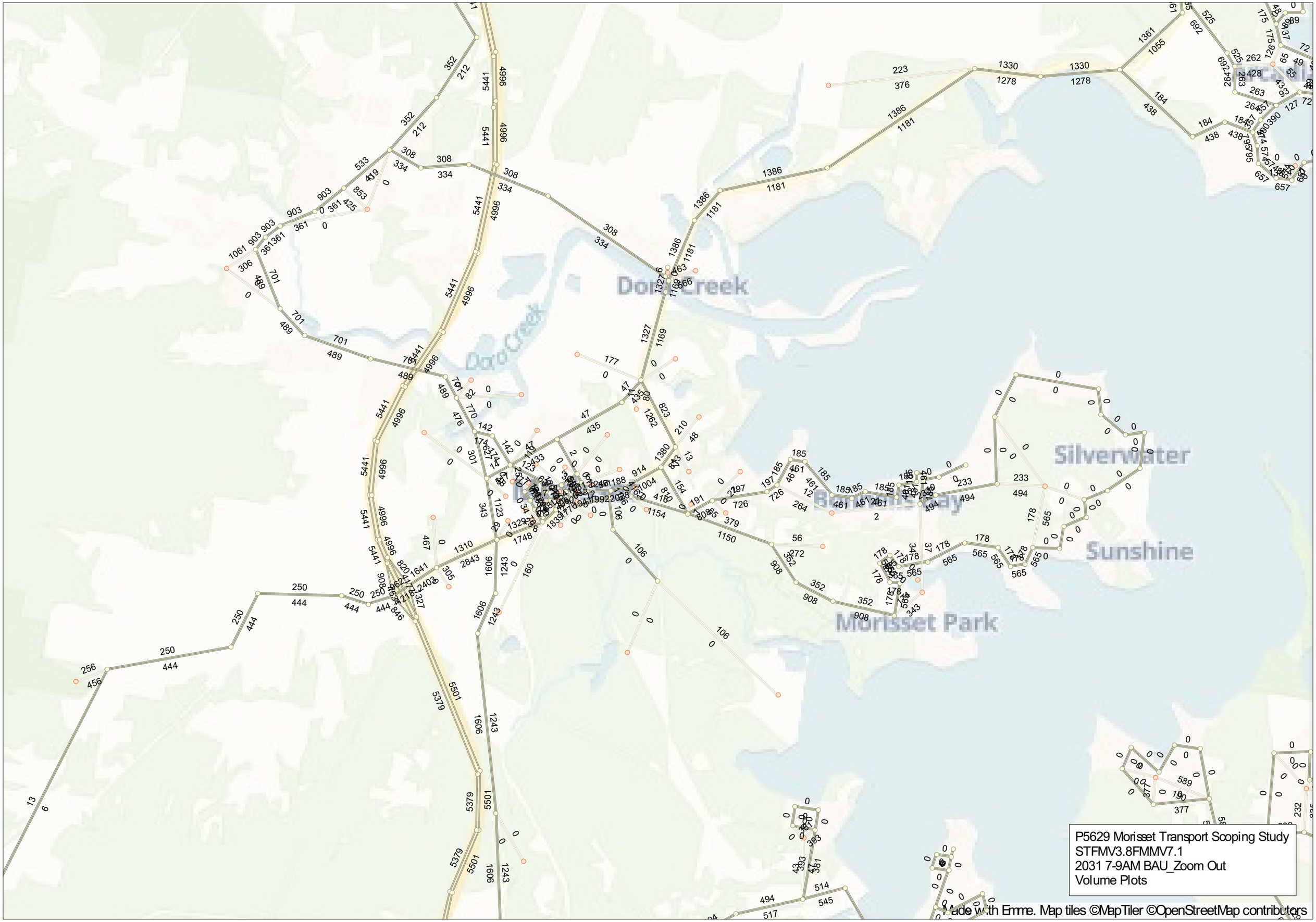
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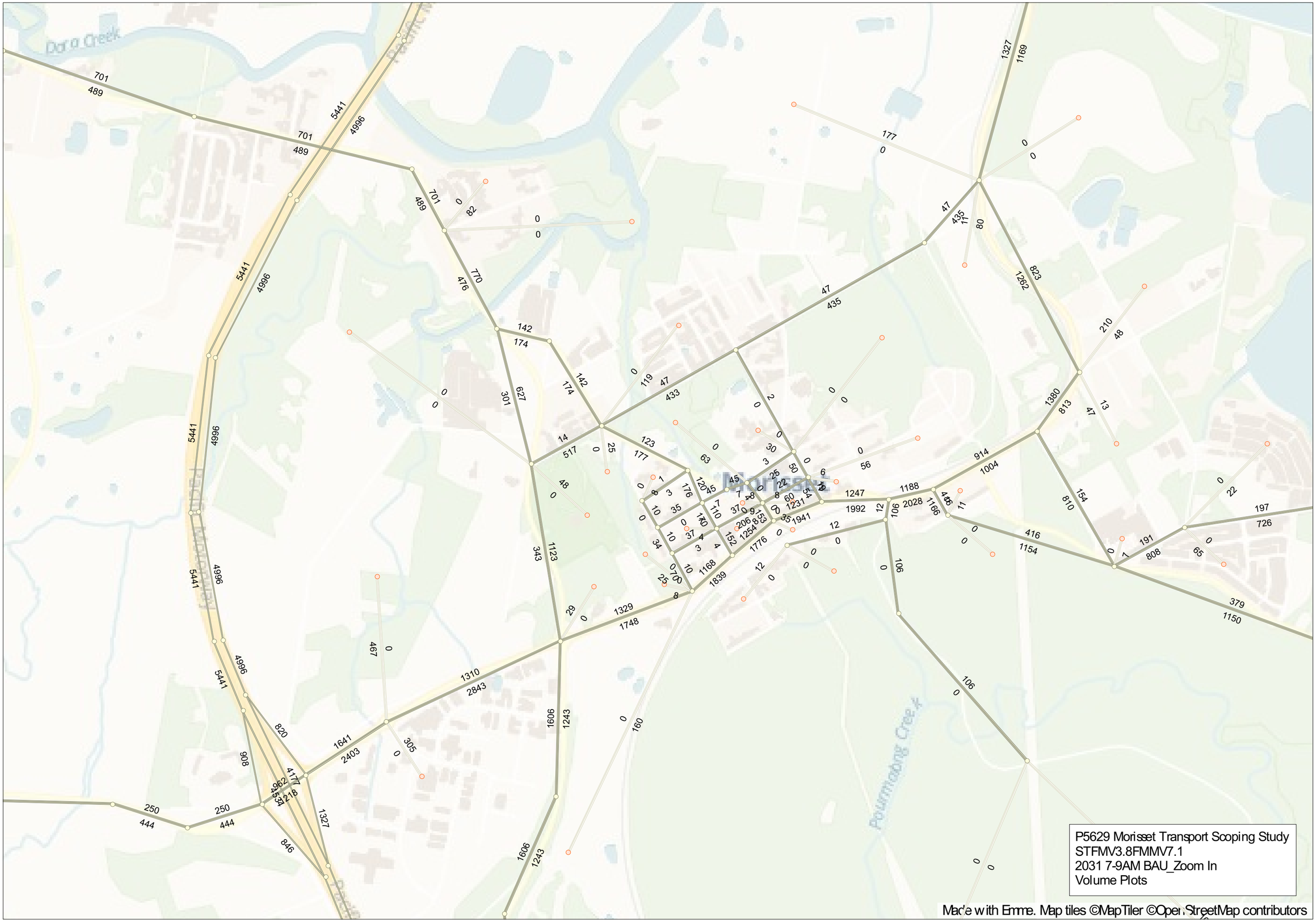

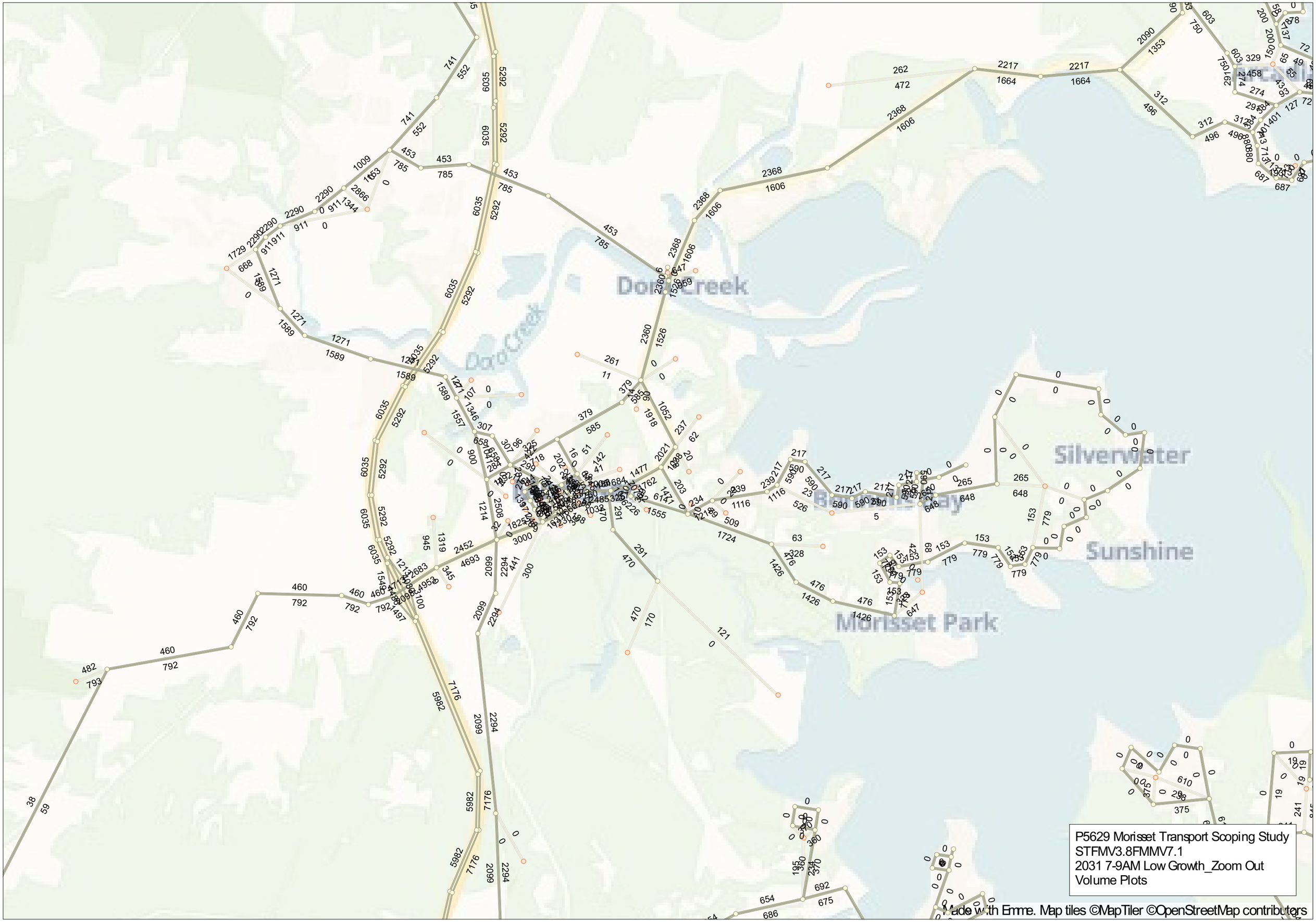
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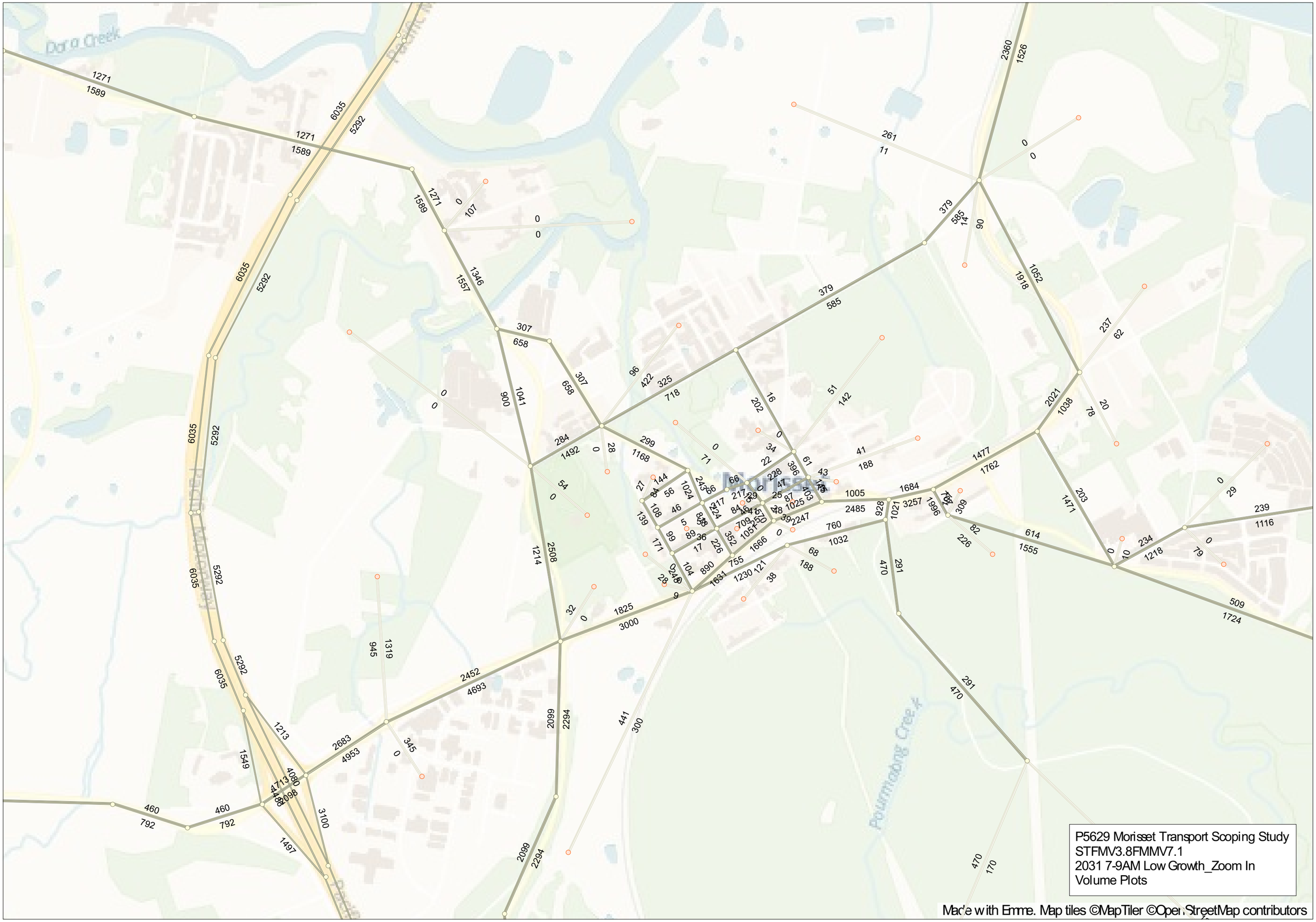

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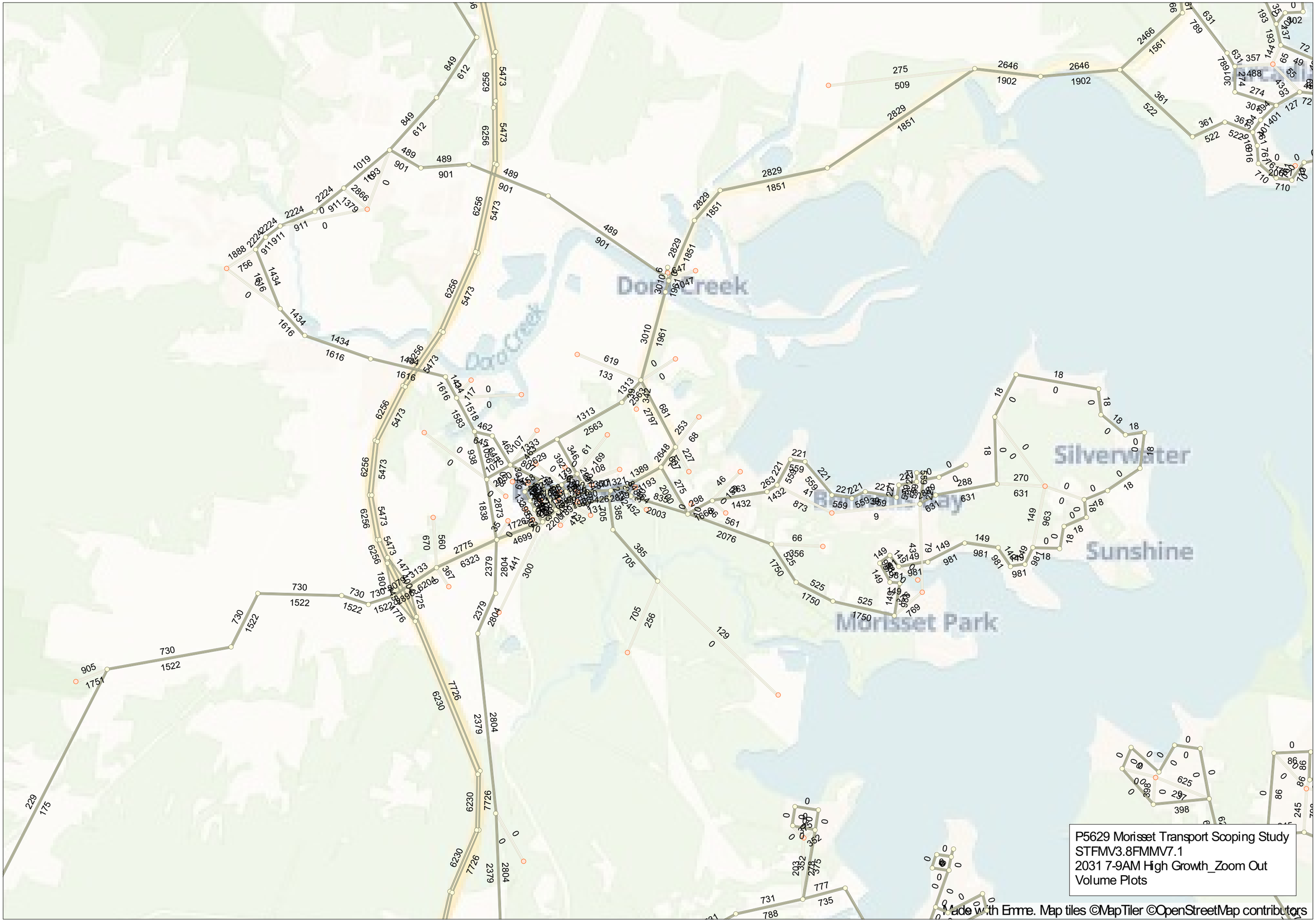
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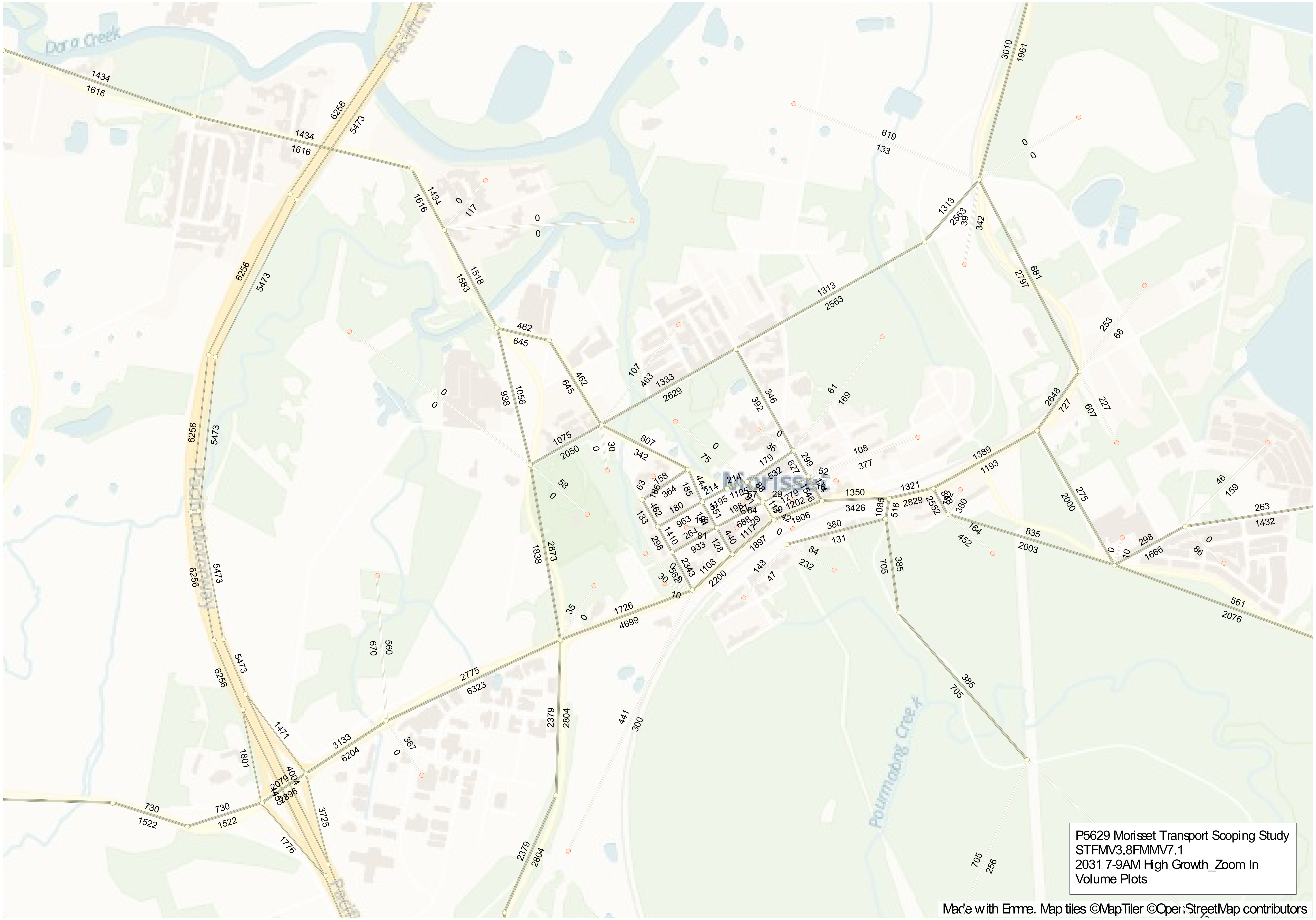

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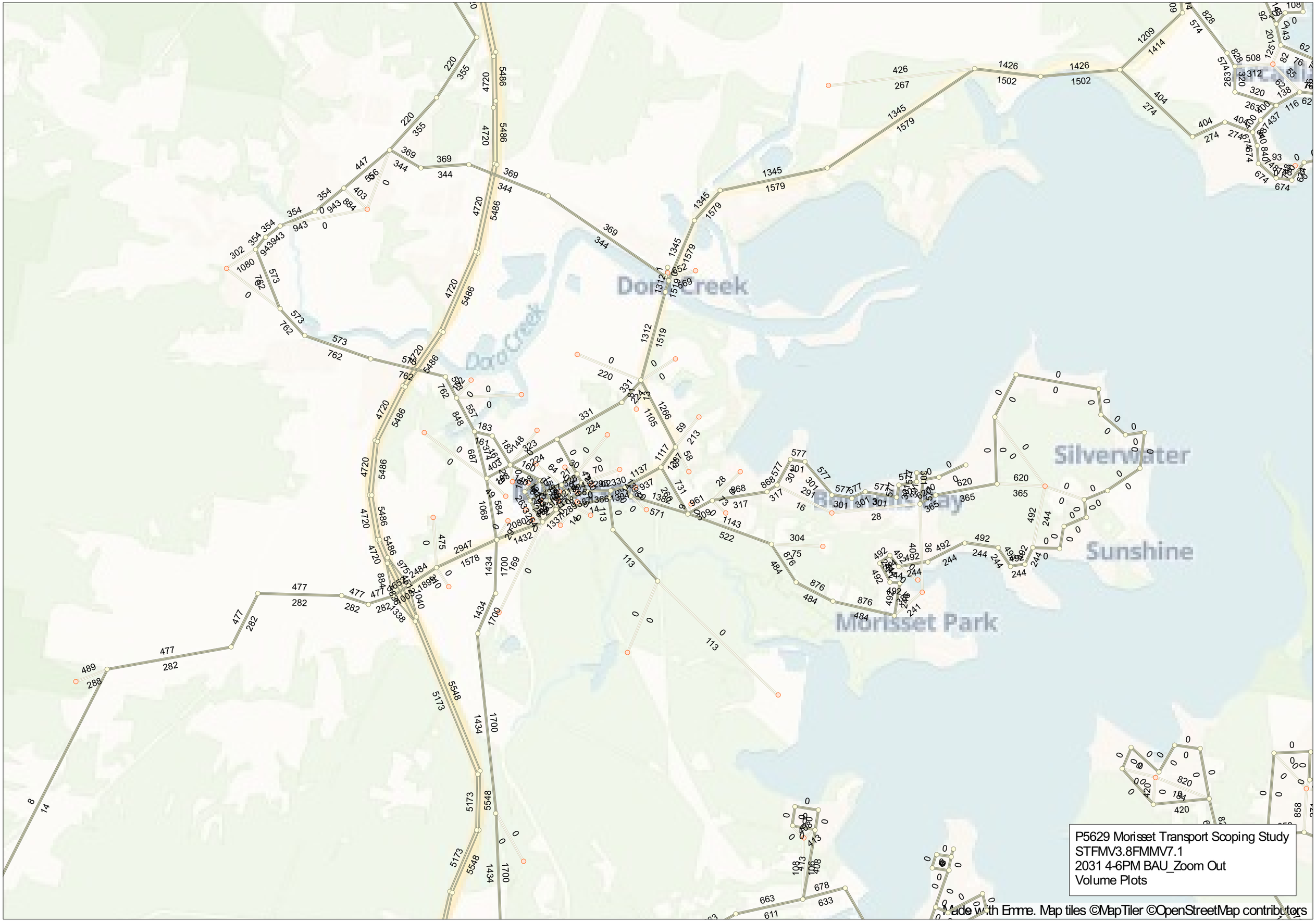
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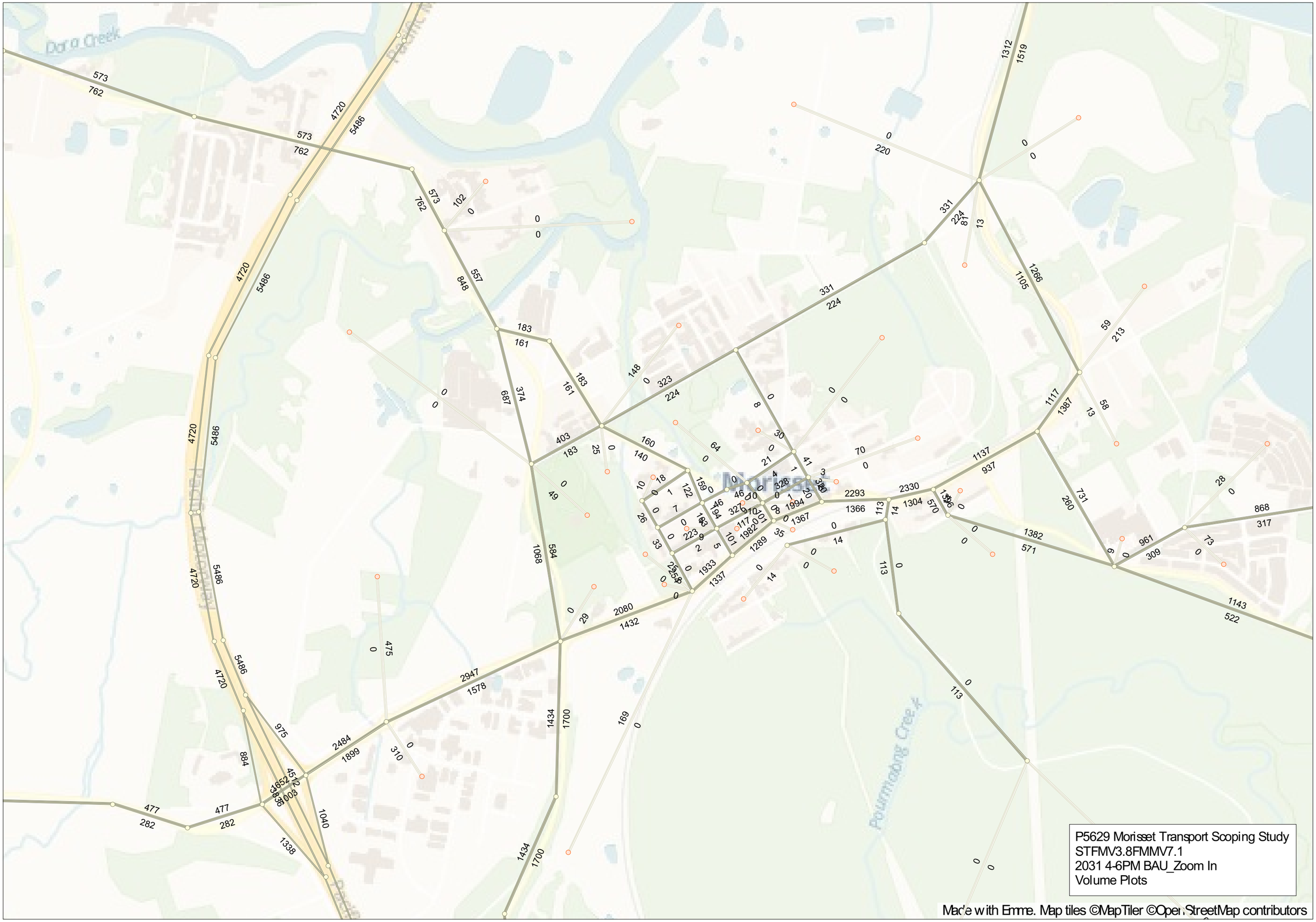

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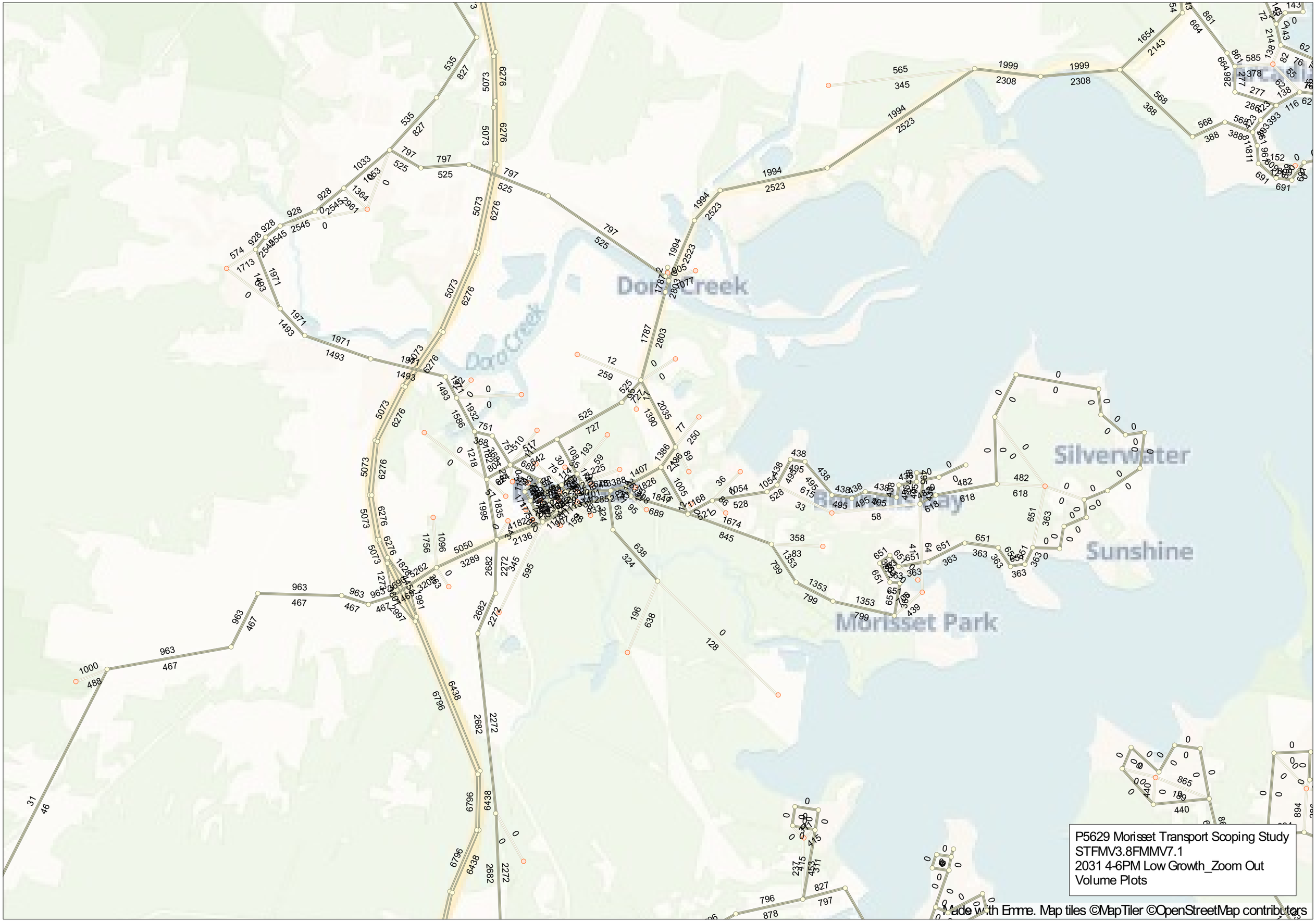
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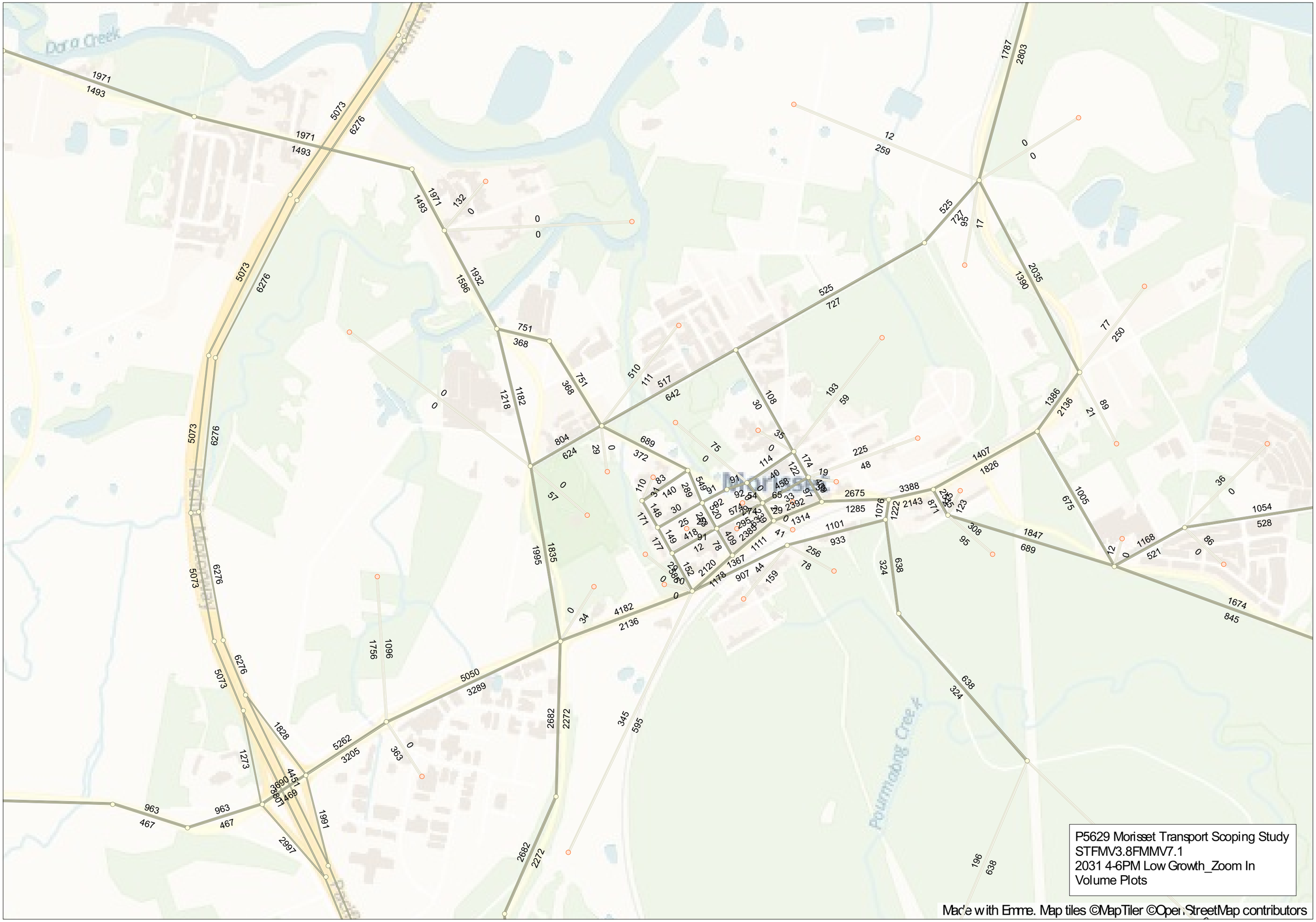

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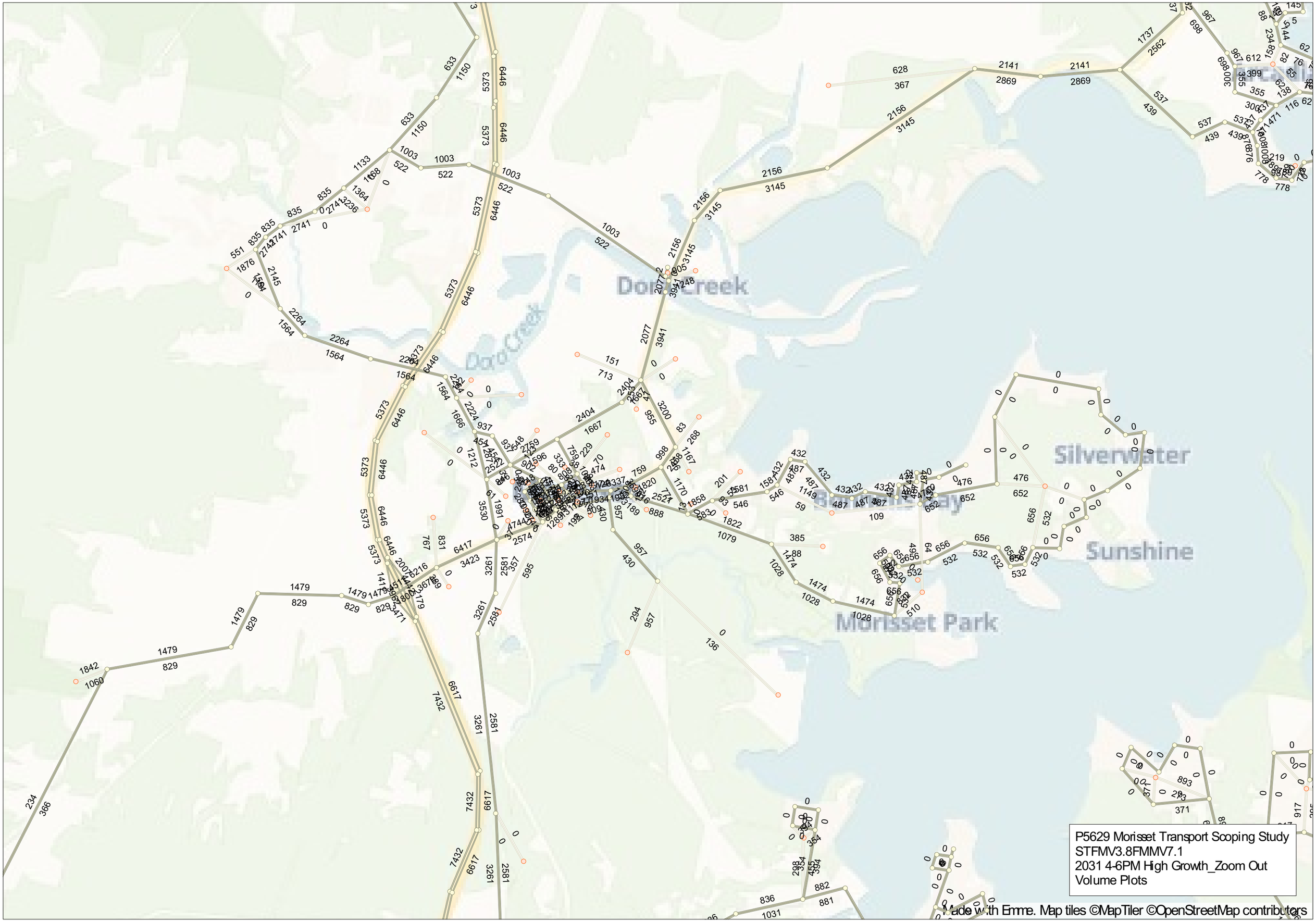

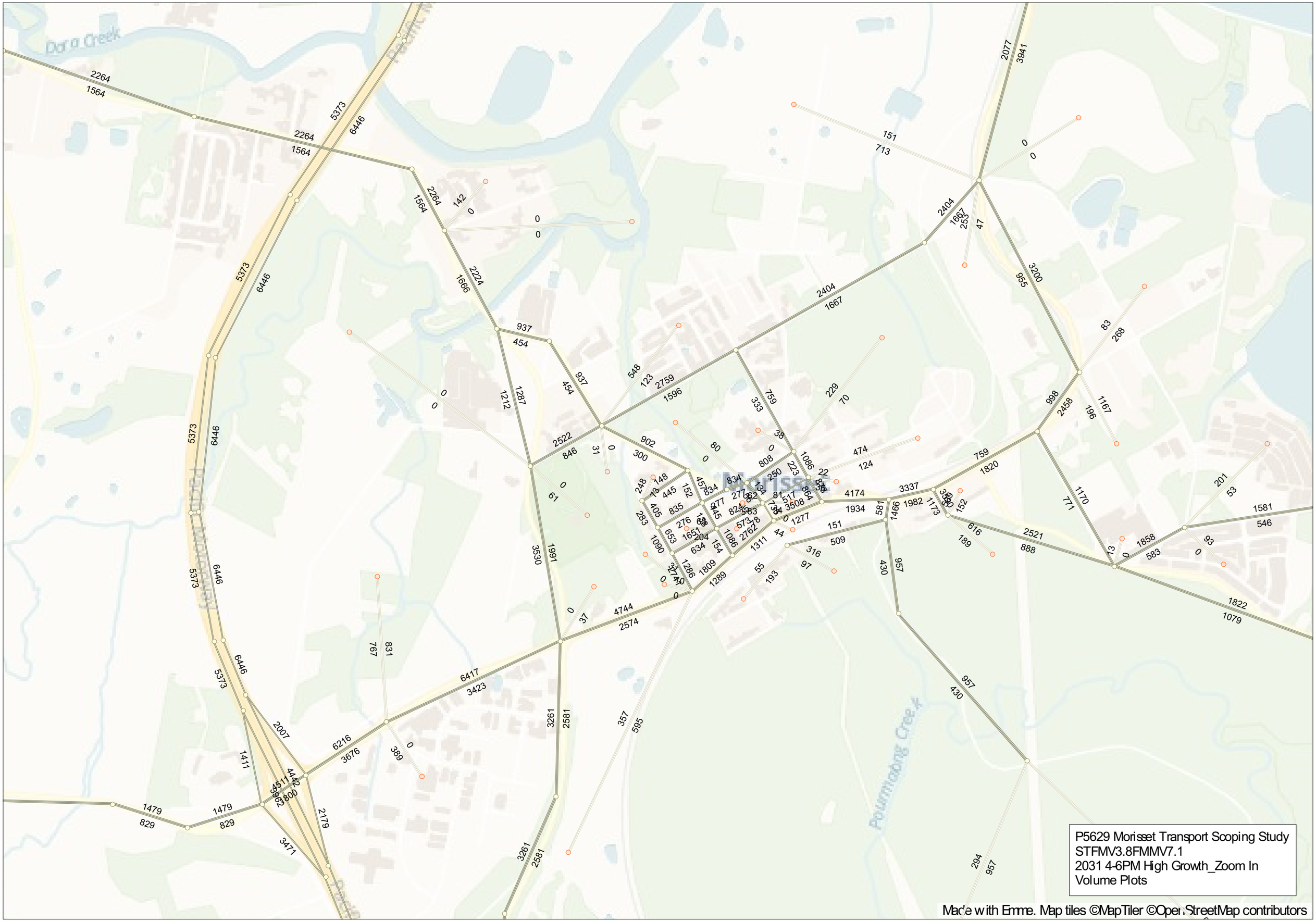

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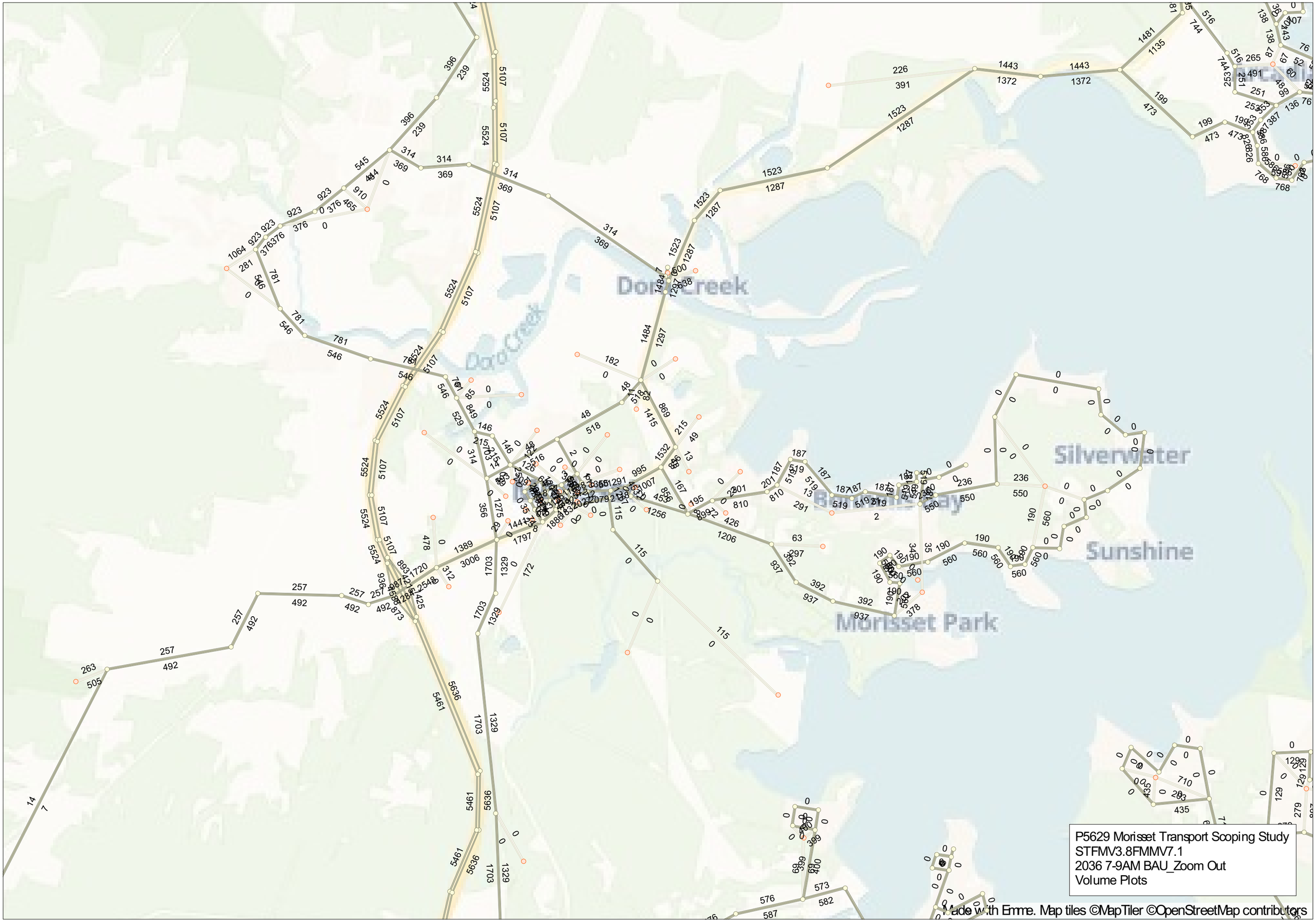
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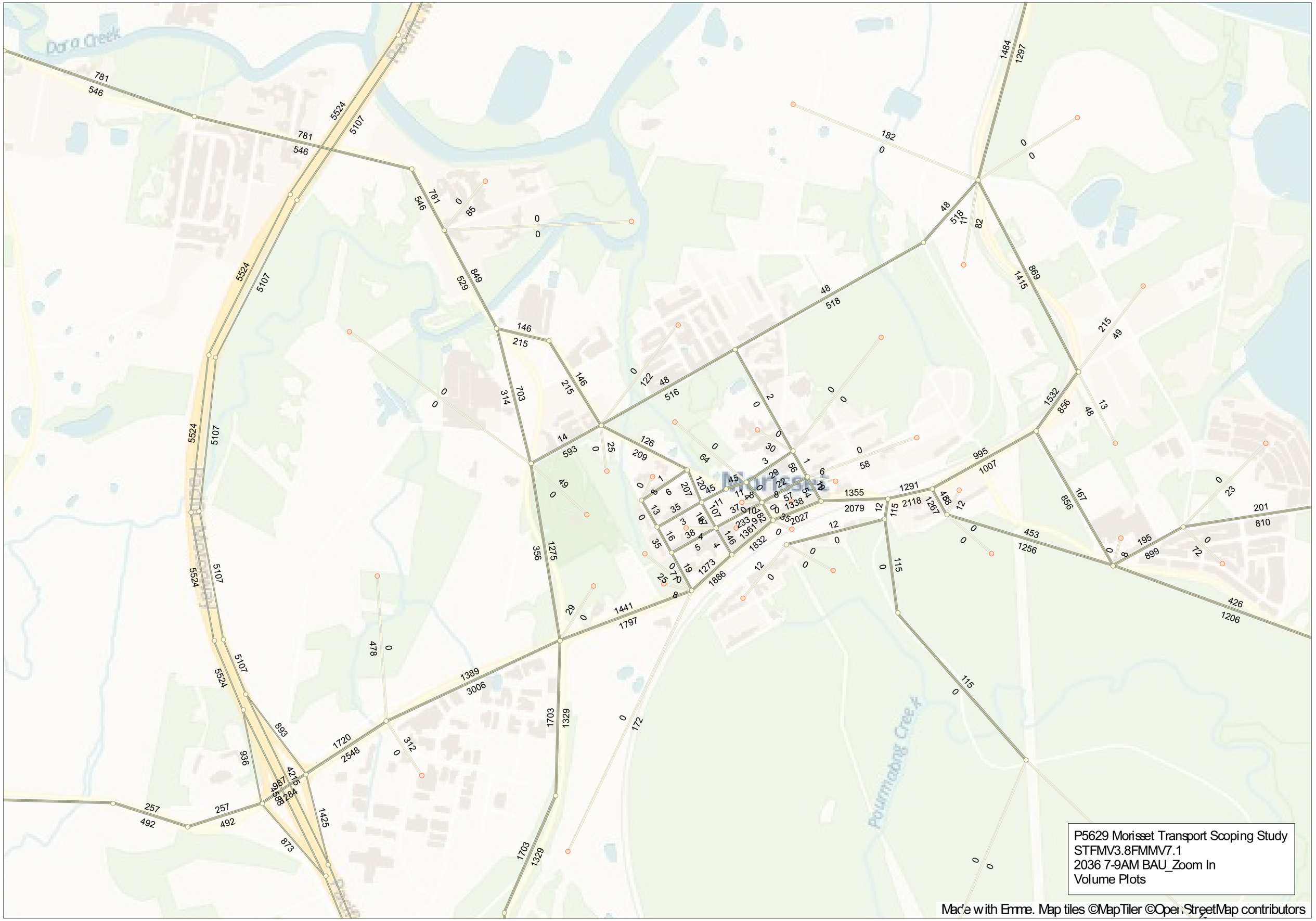

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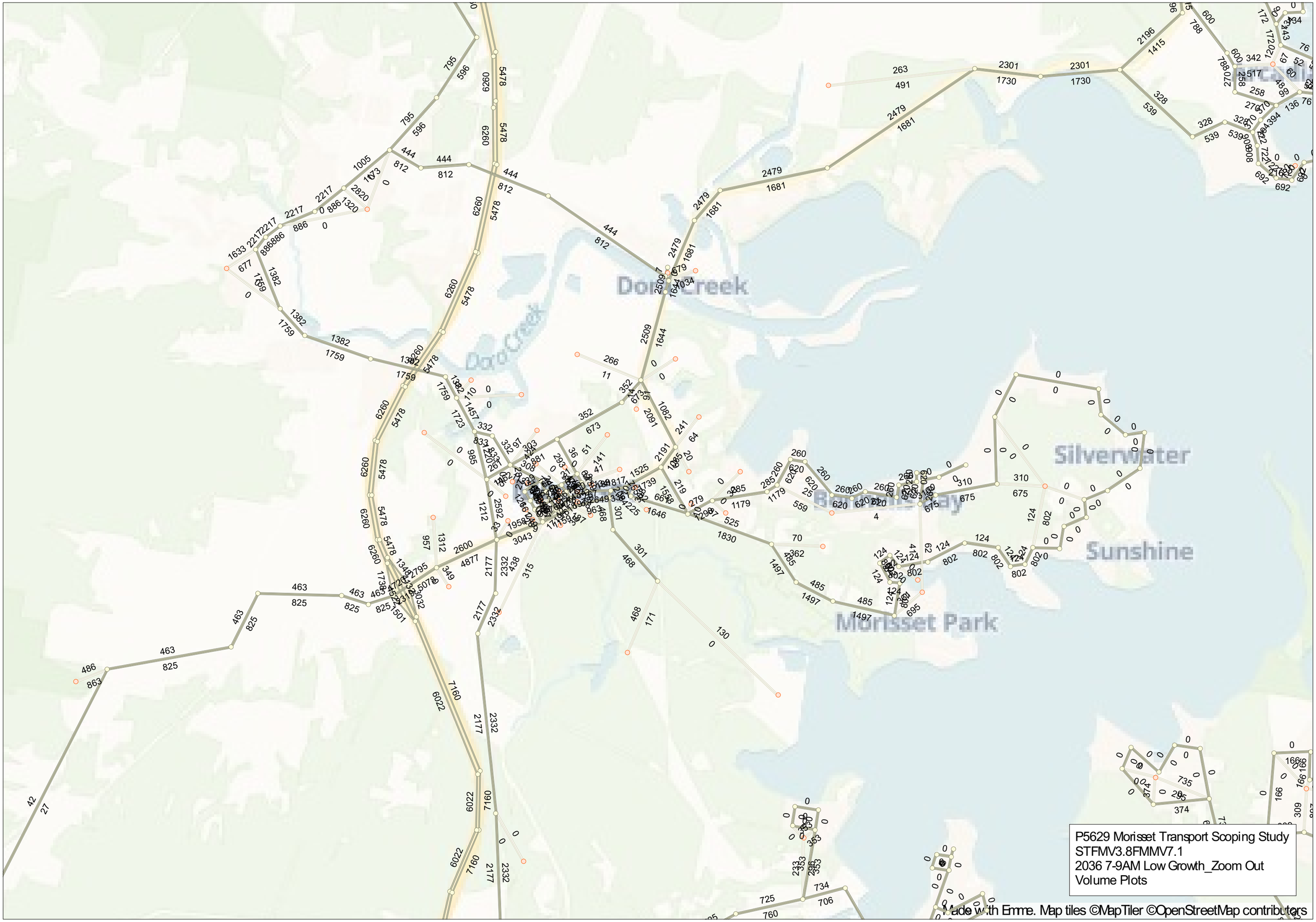
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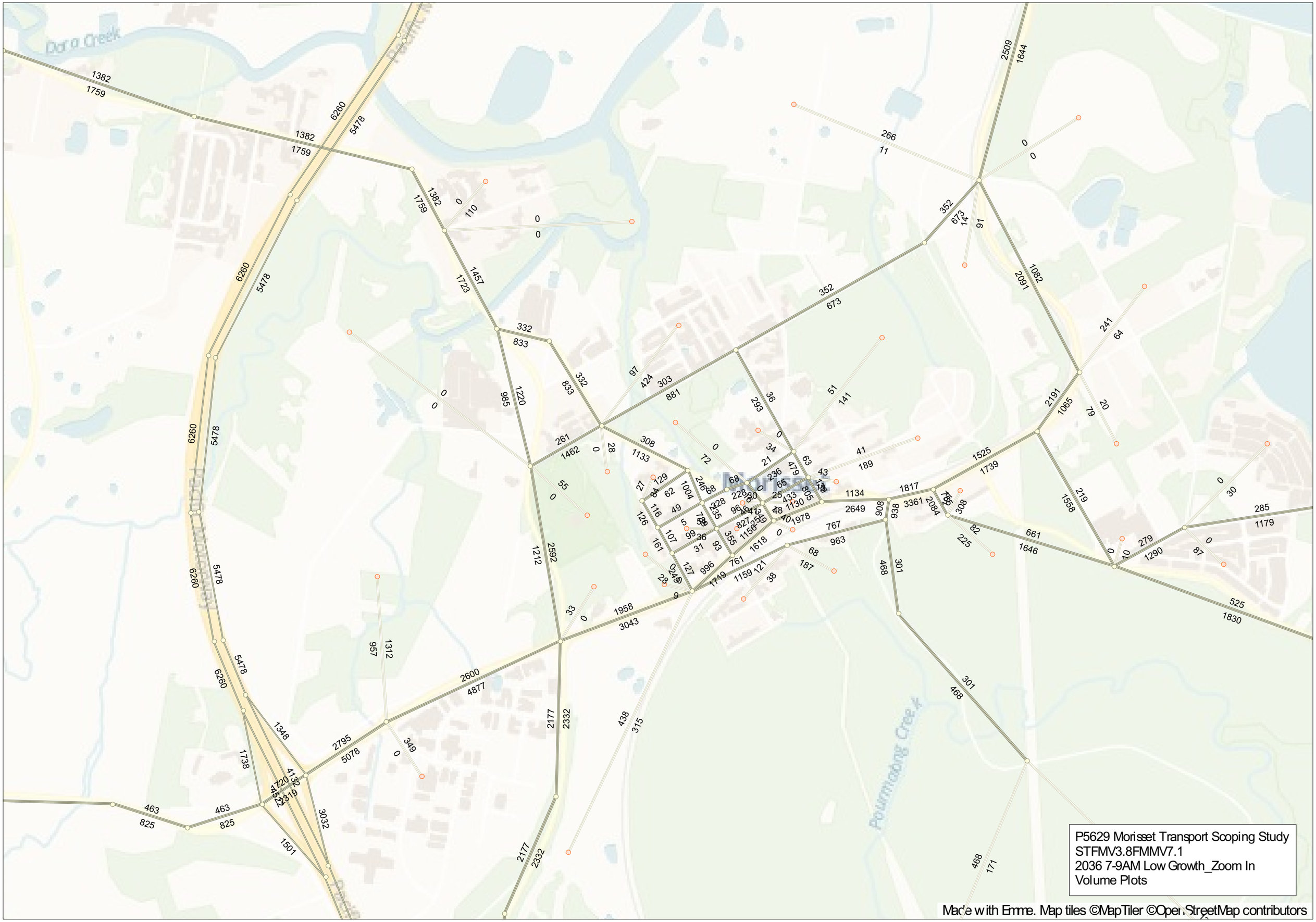

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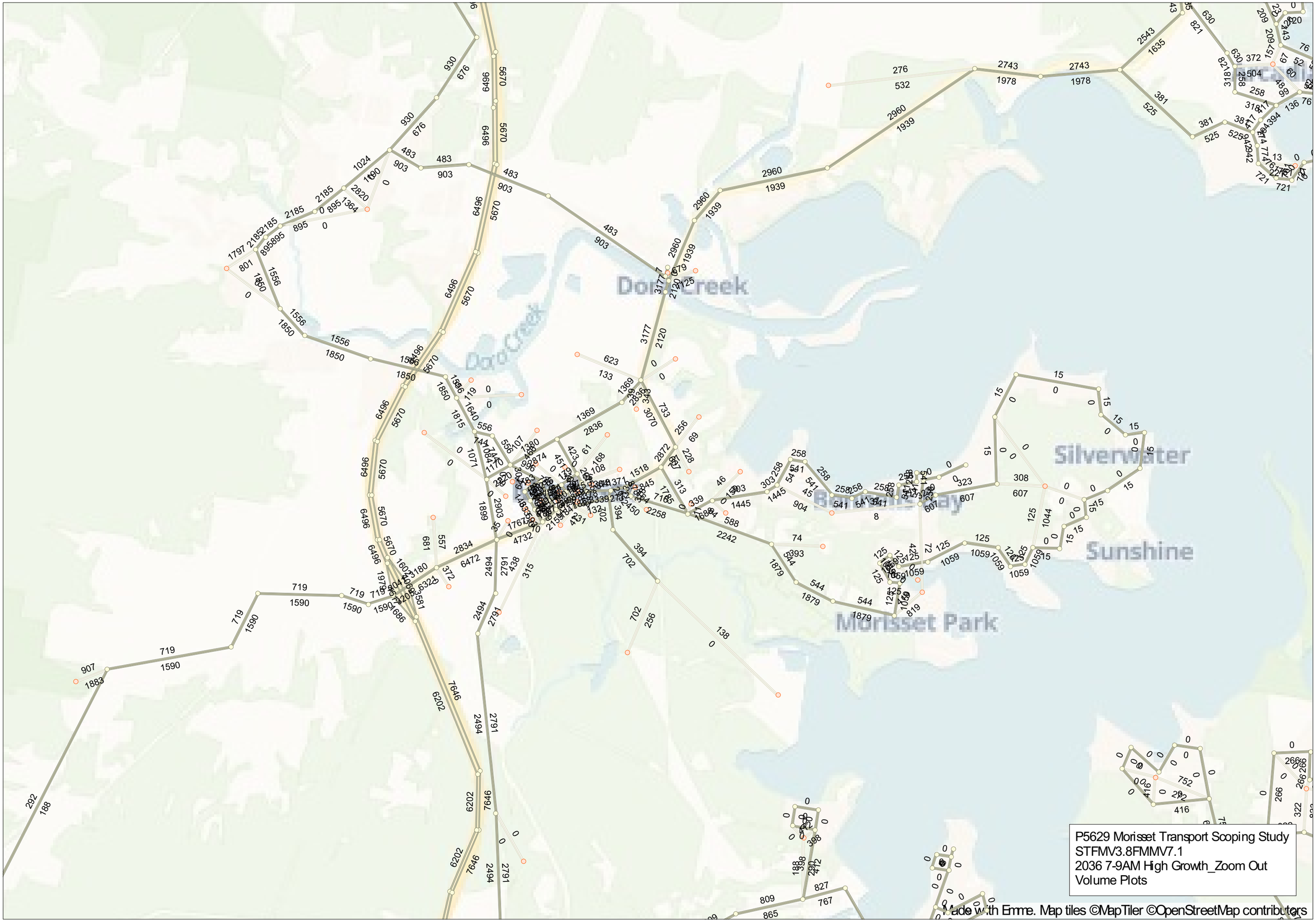
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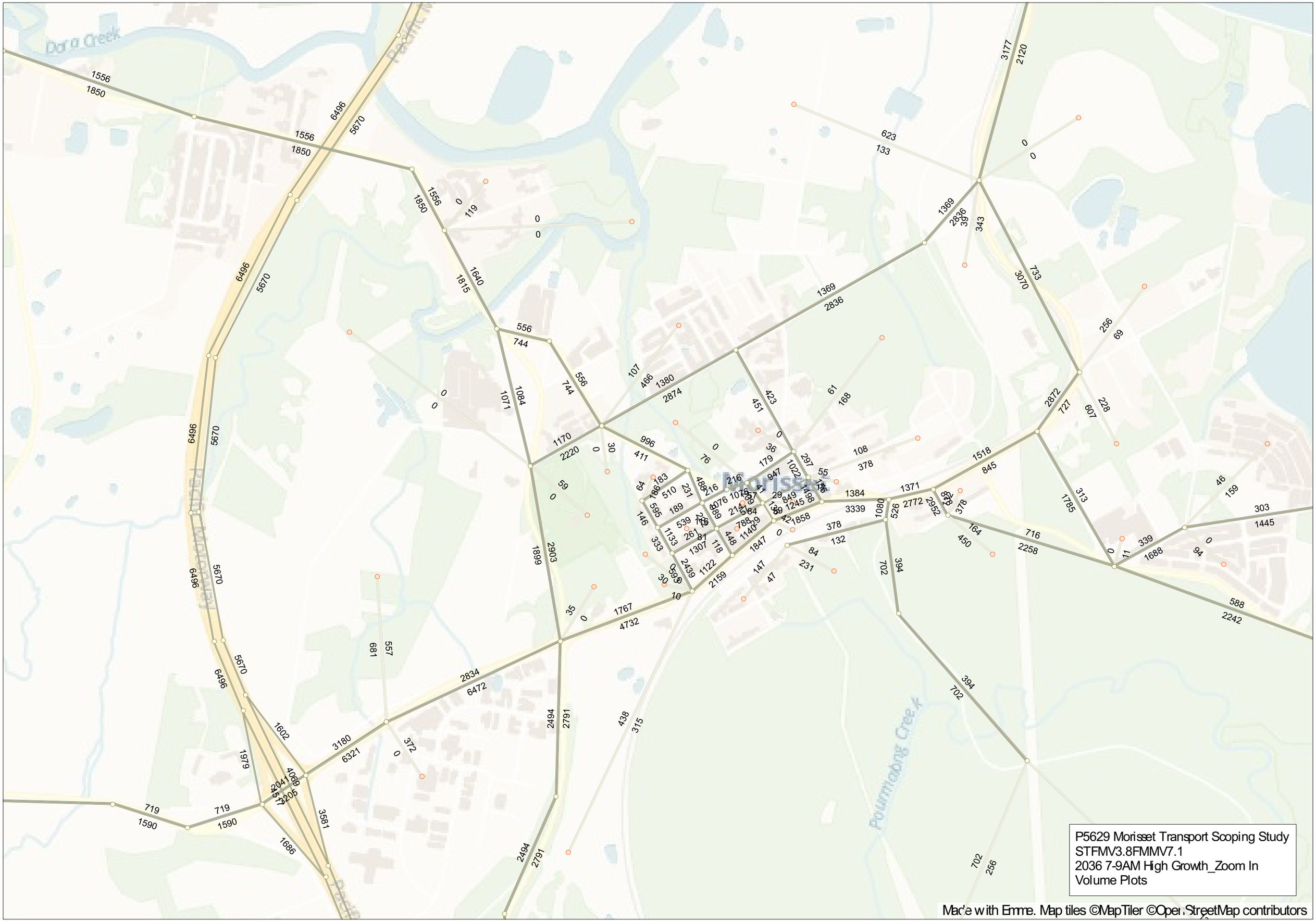

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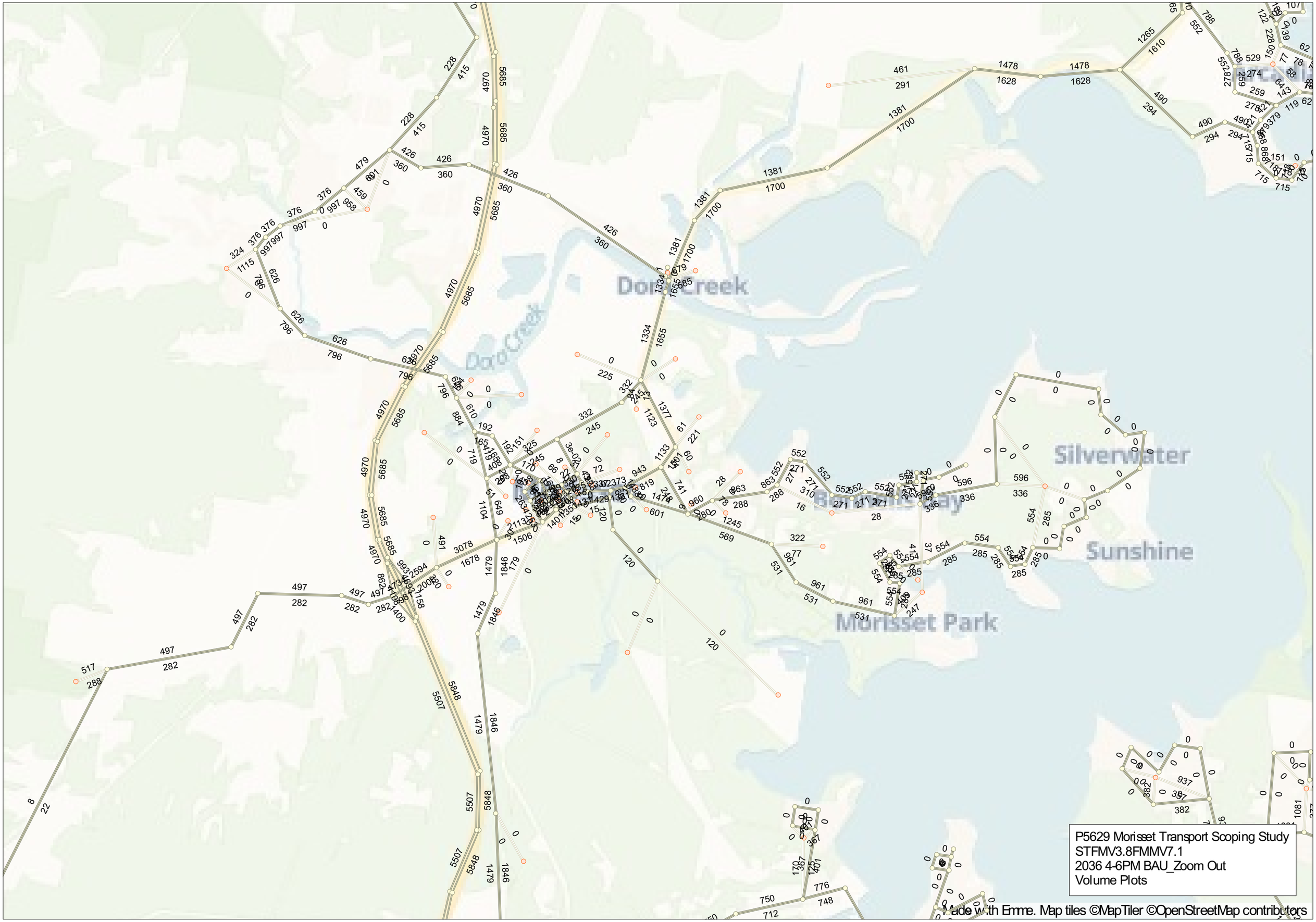
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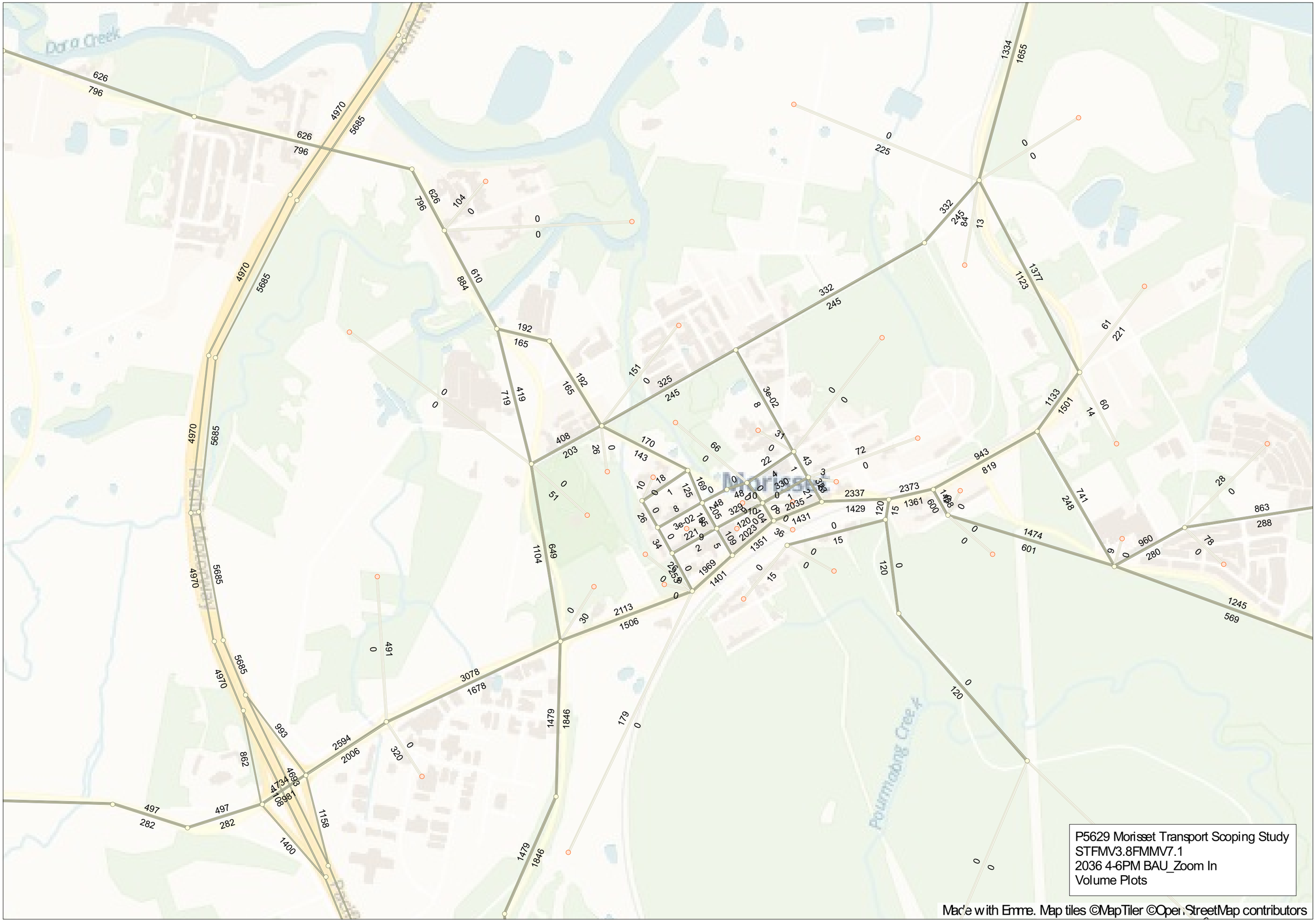

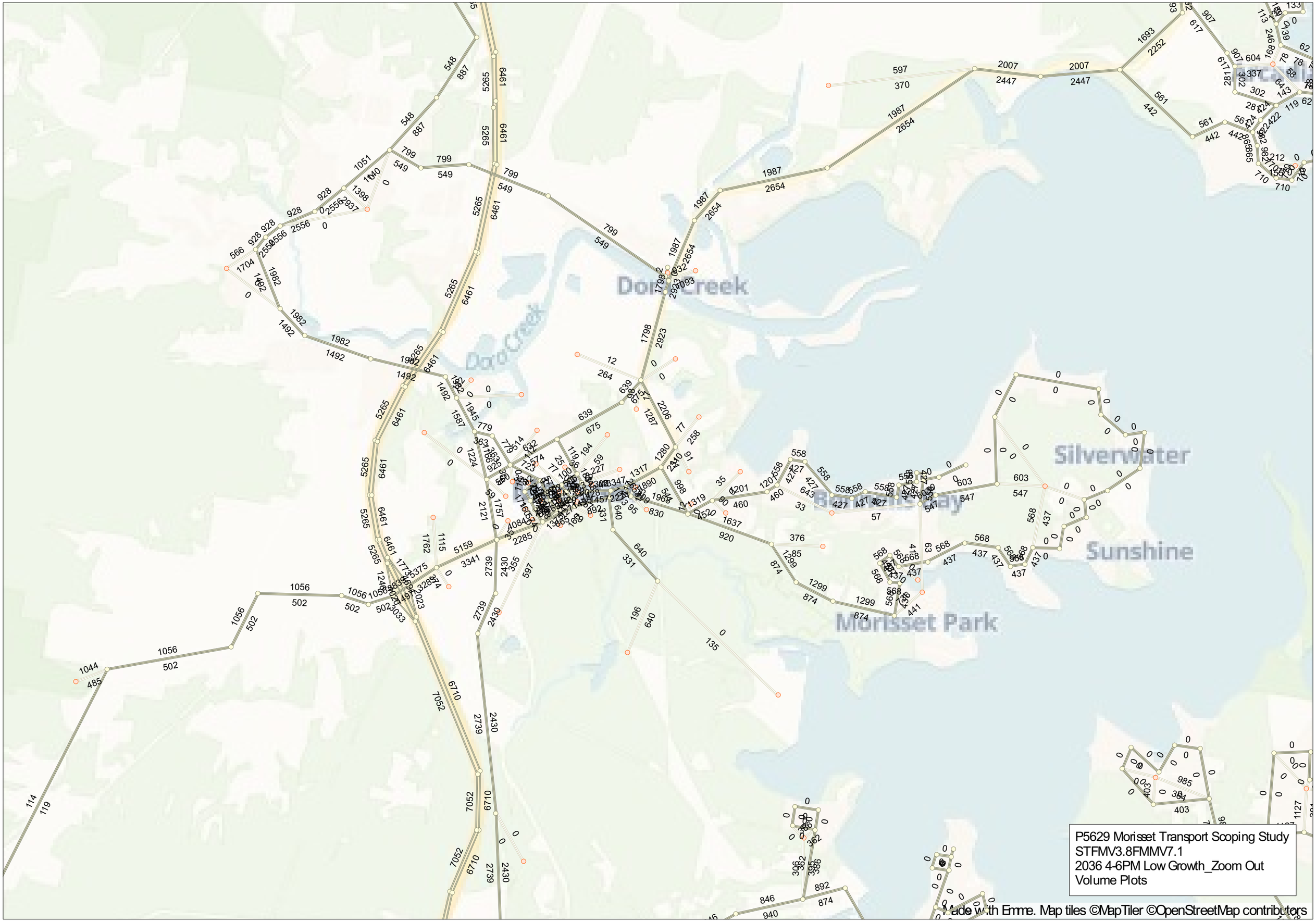
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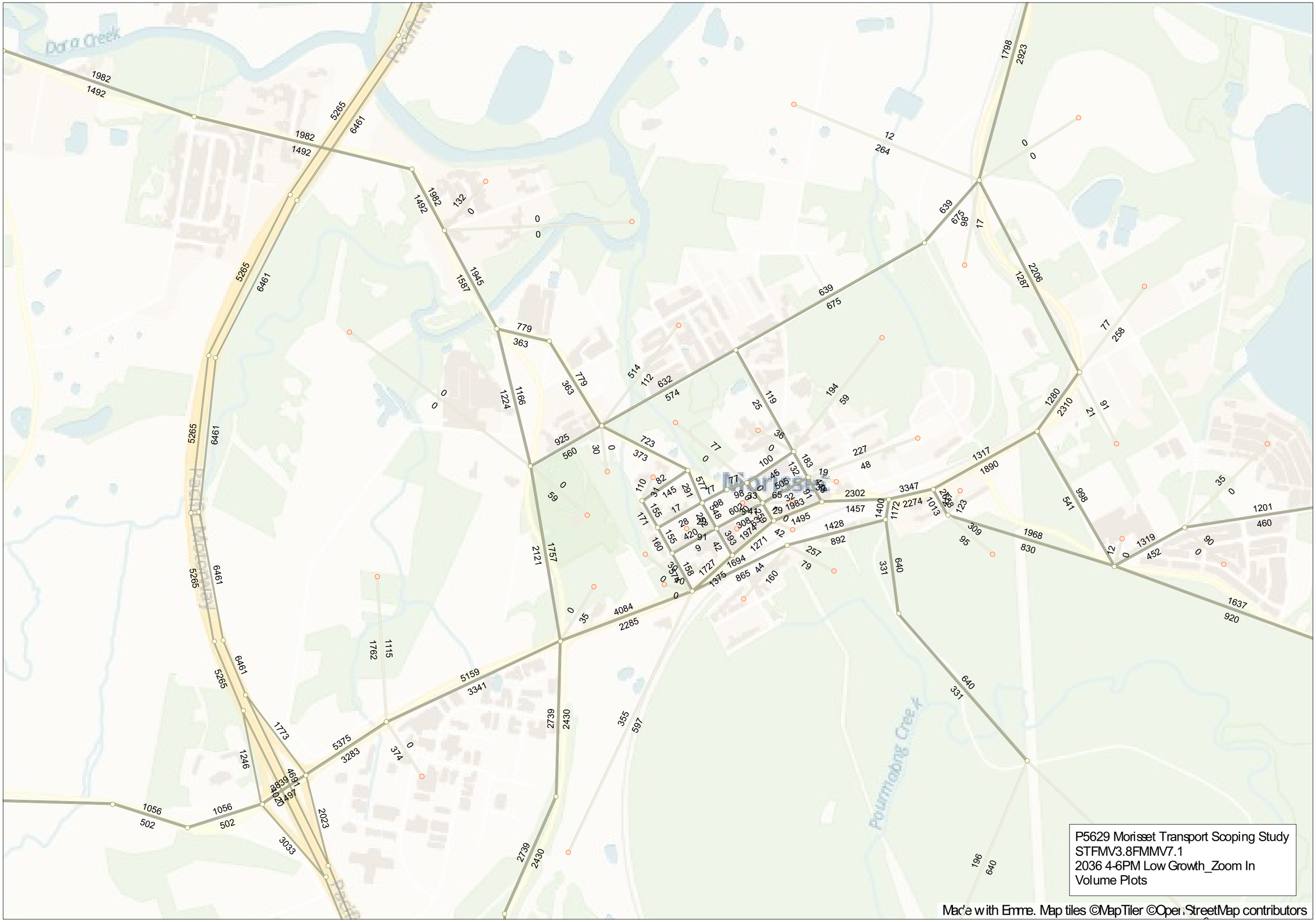

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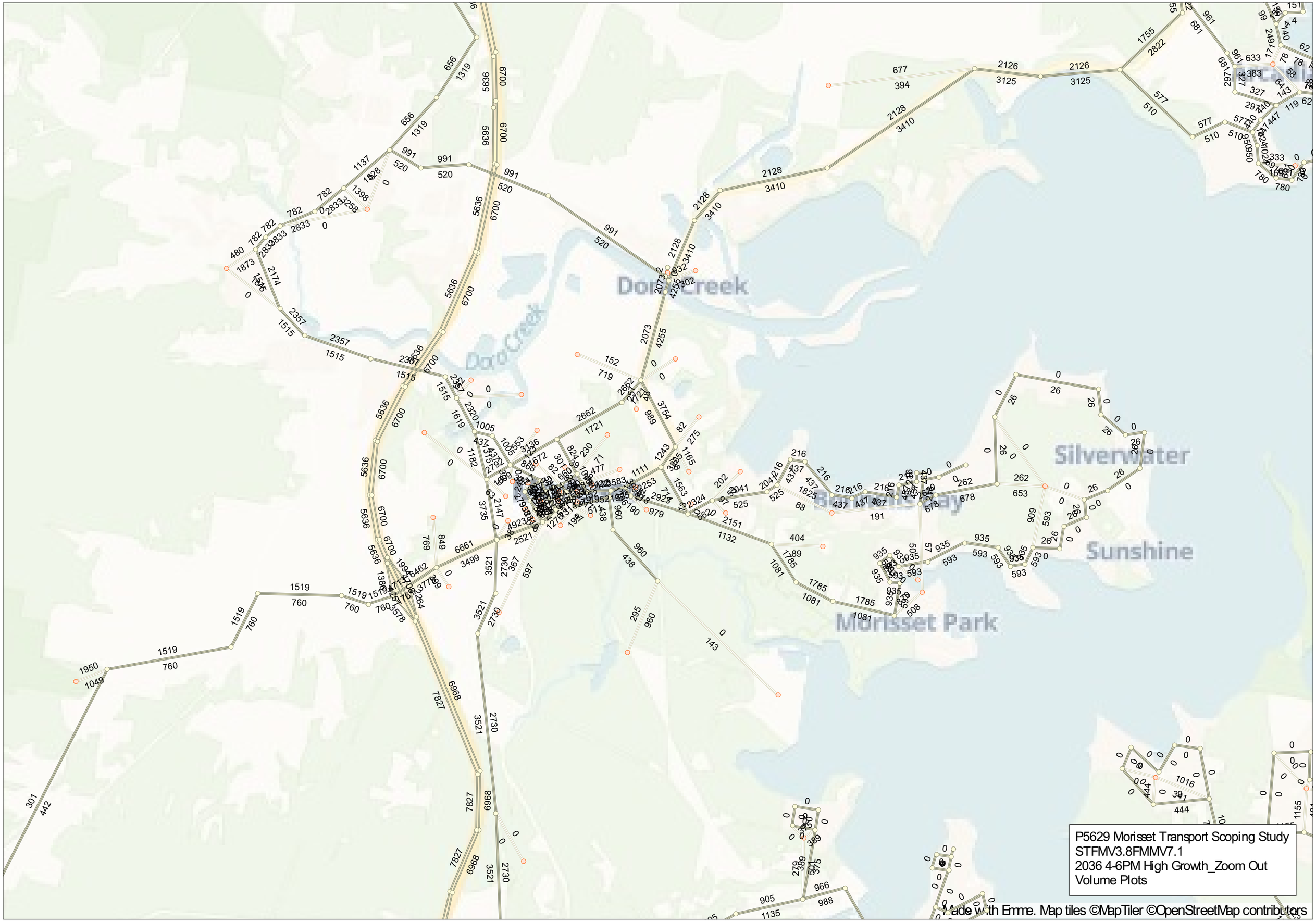
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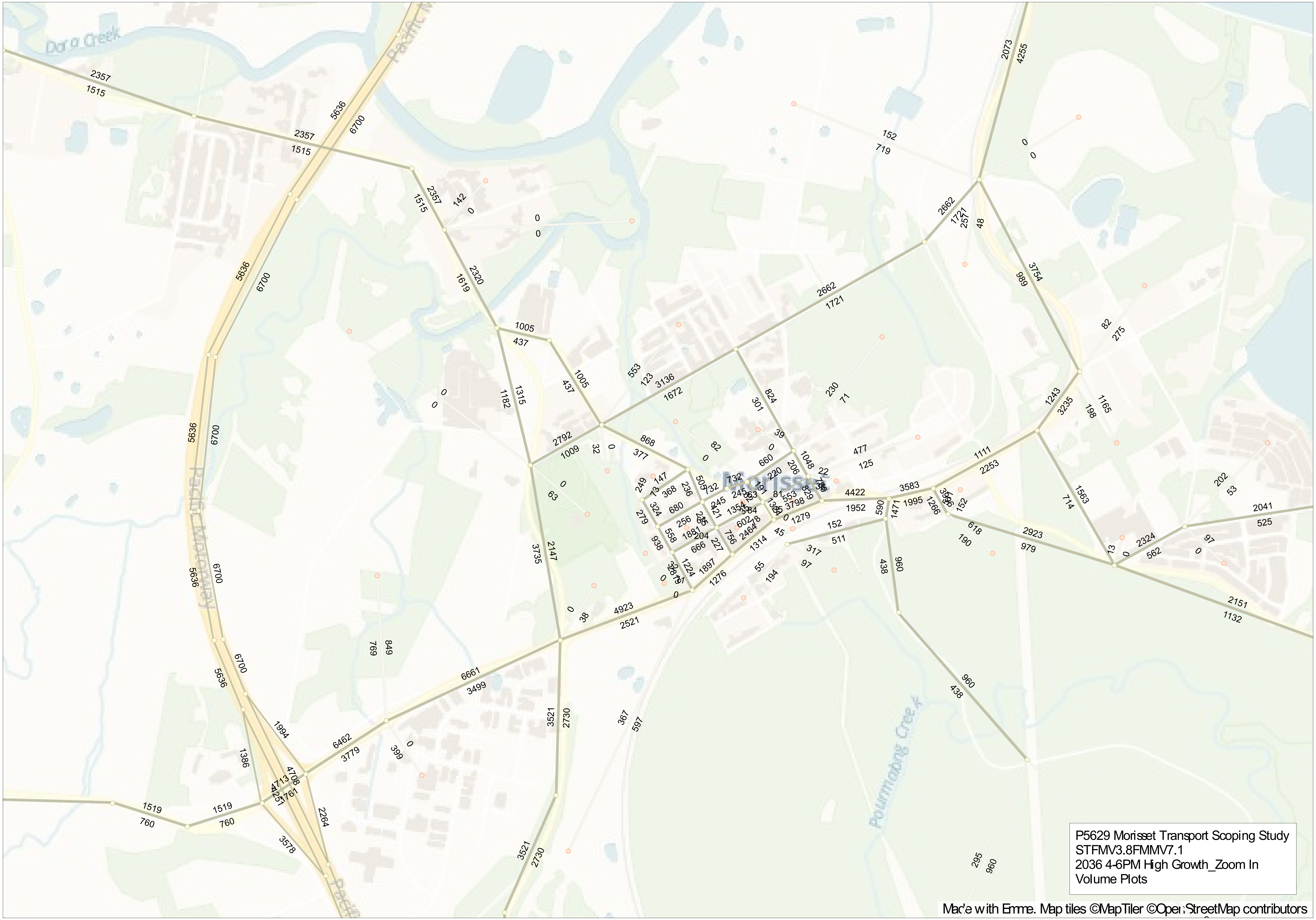
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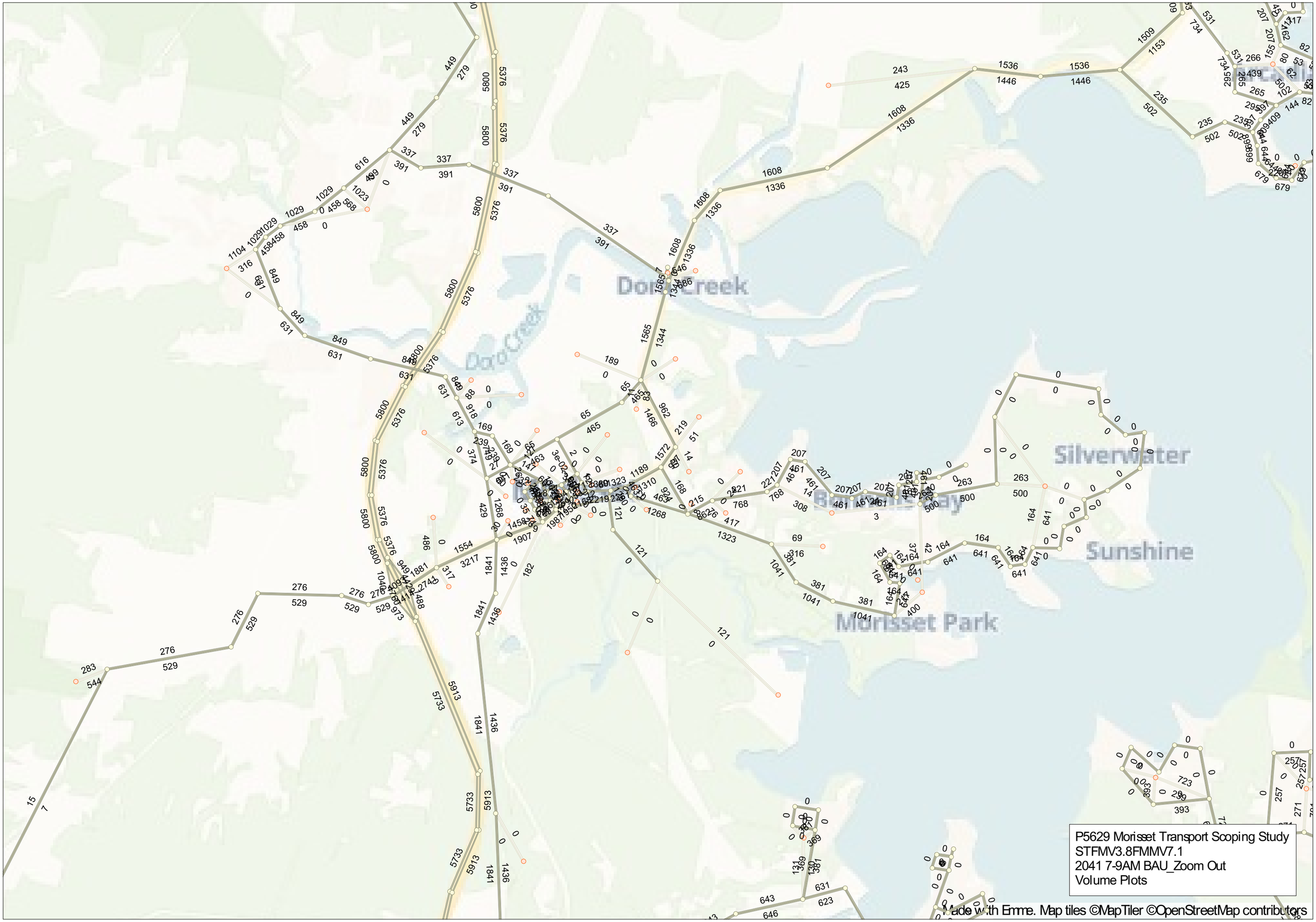
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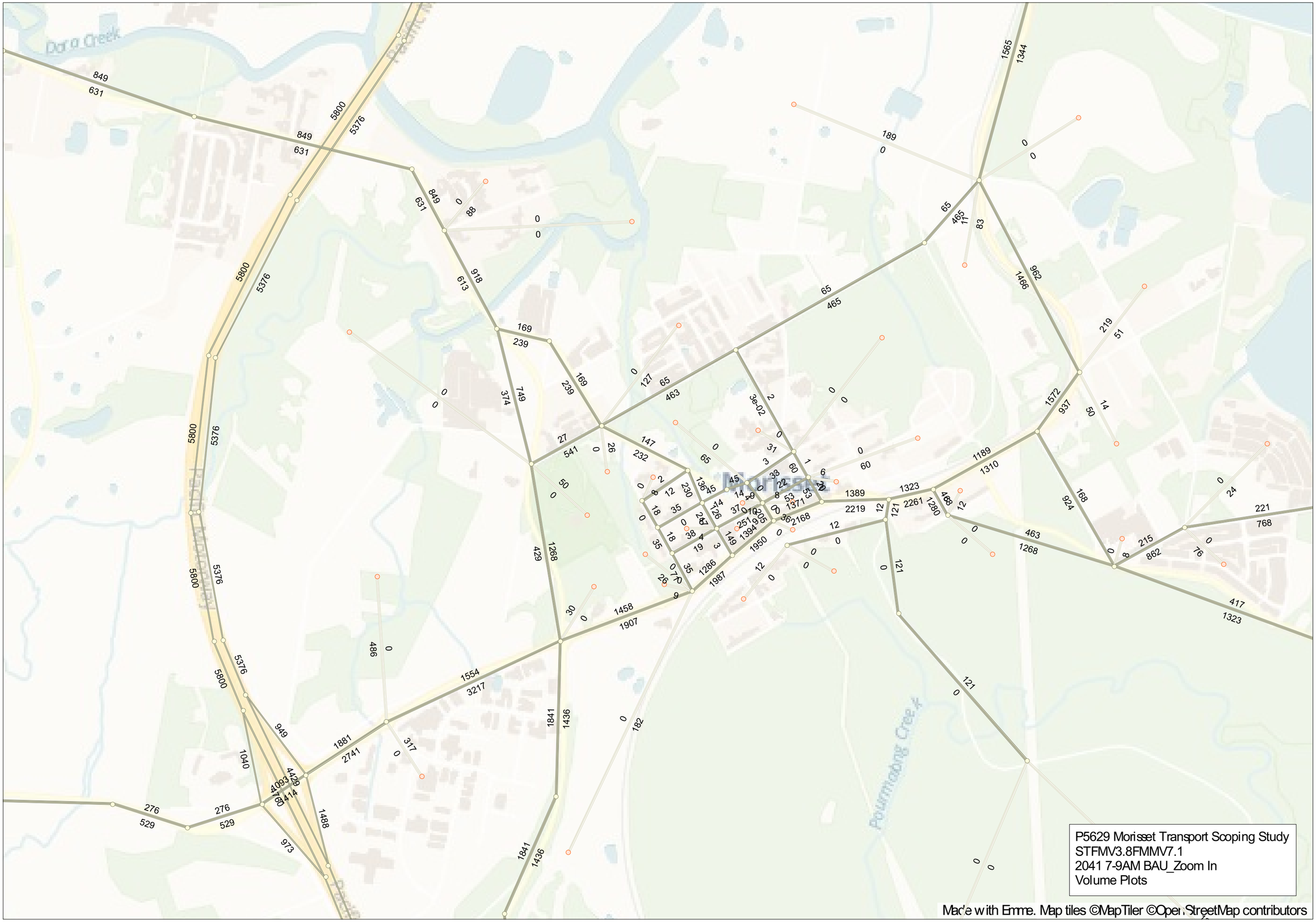

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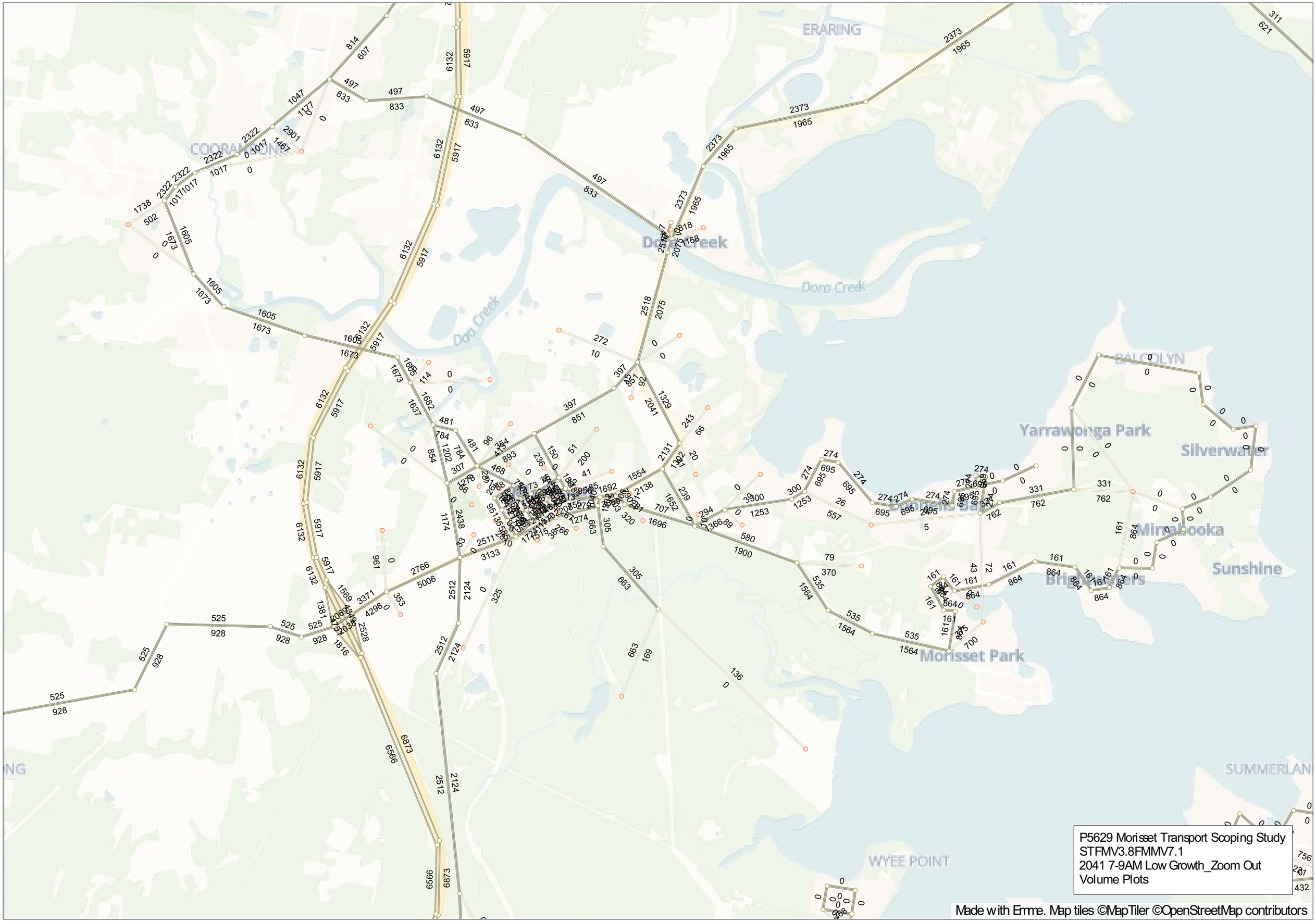
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Morisset Park
WYEE POINT
SUMMERLAN
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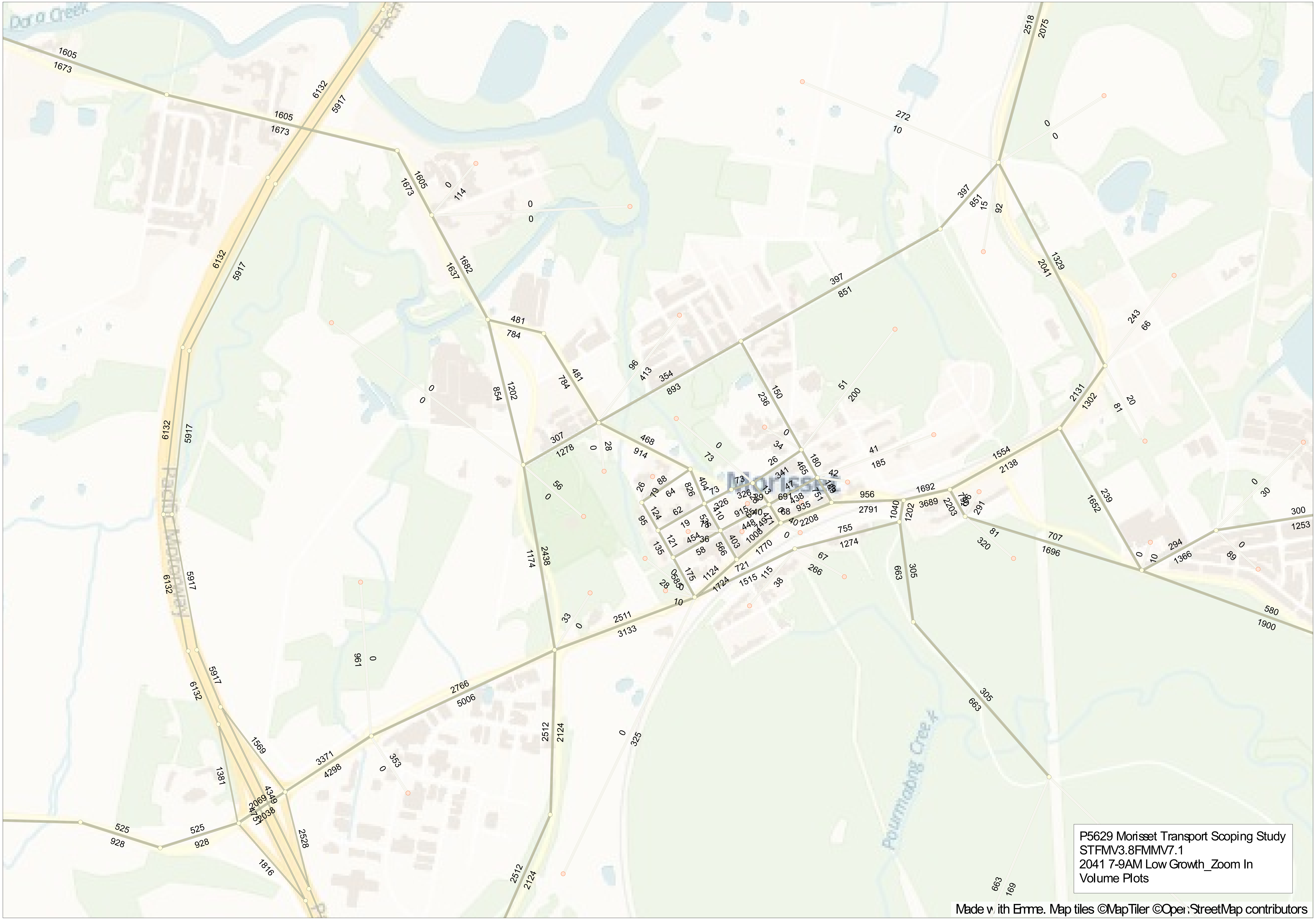
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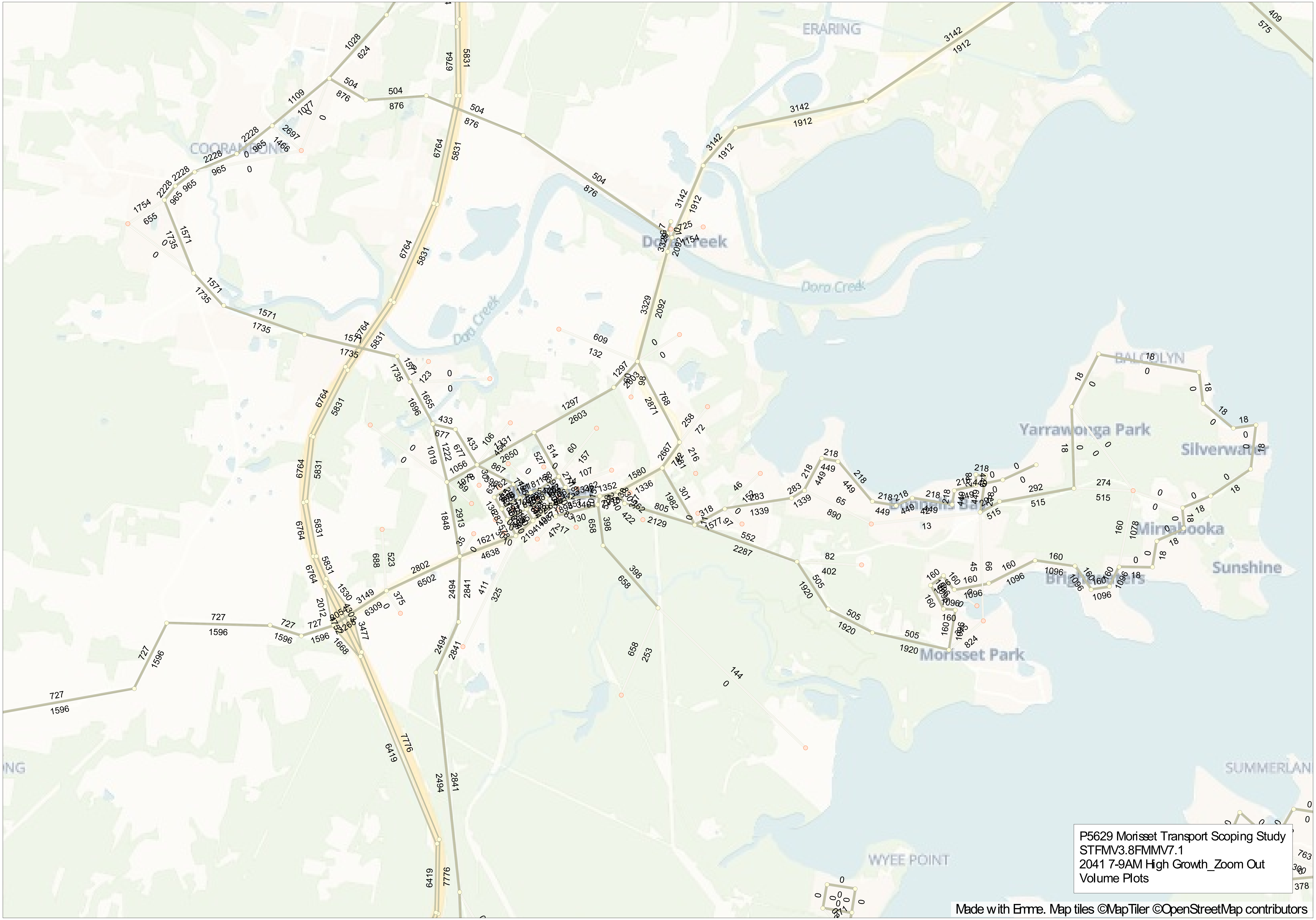

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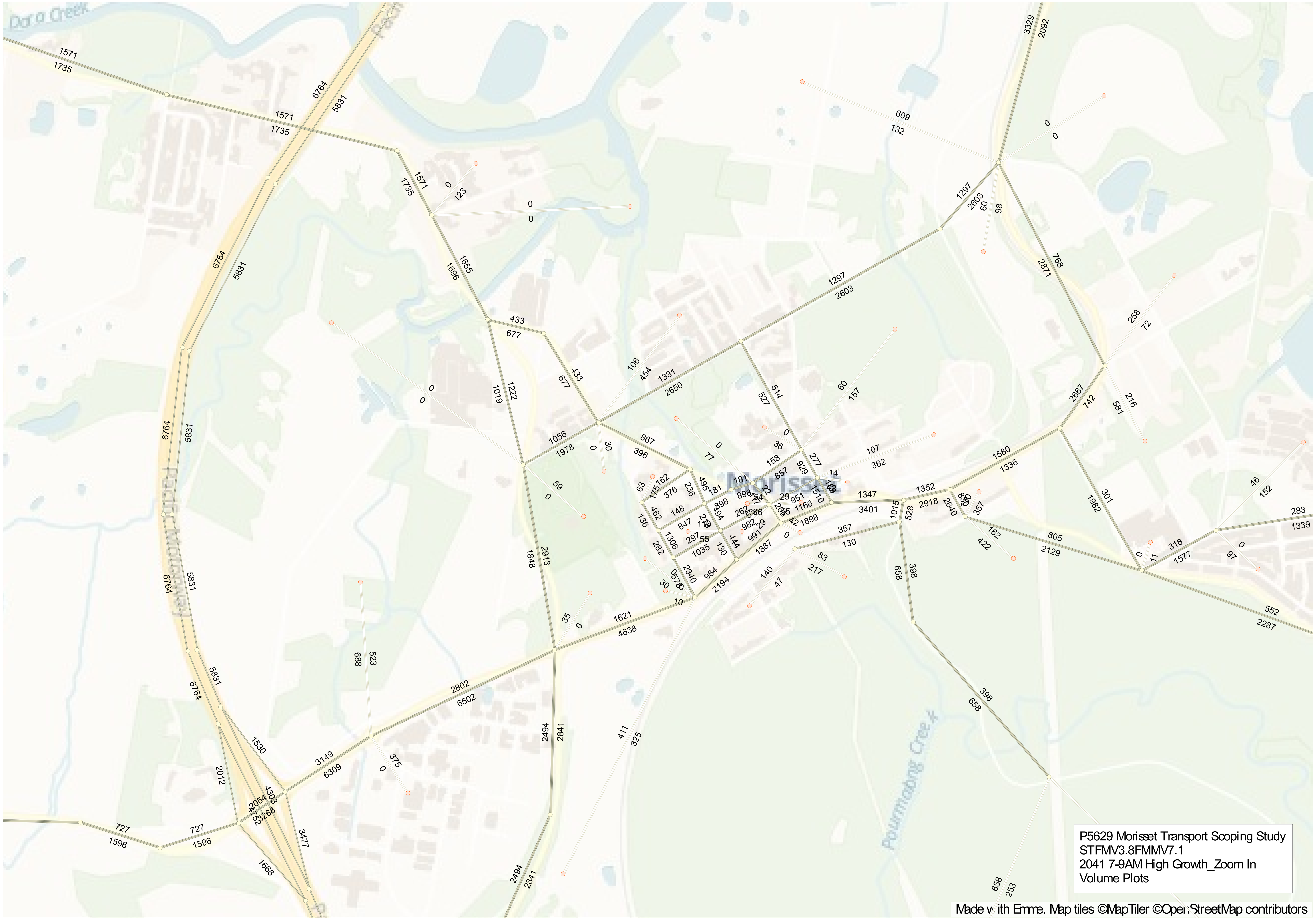
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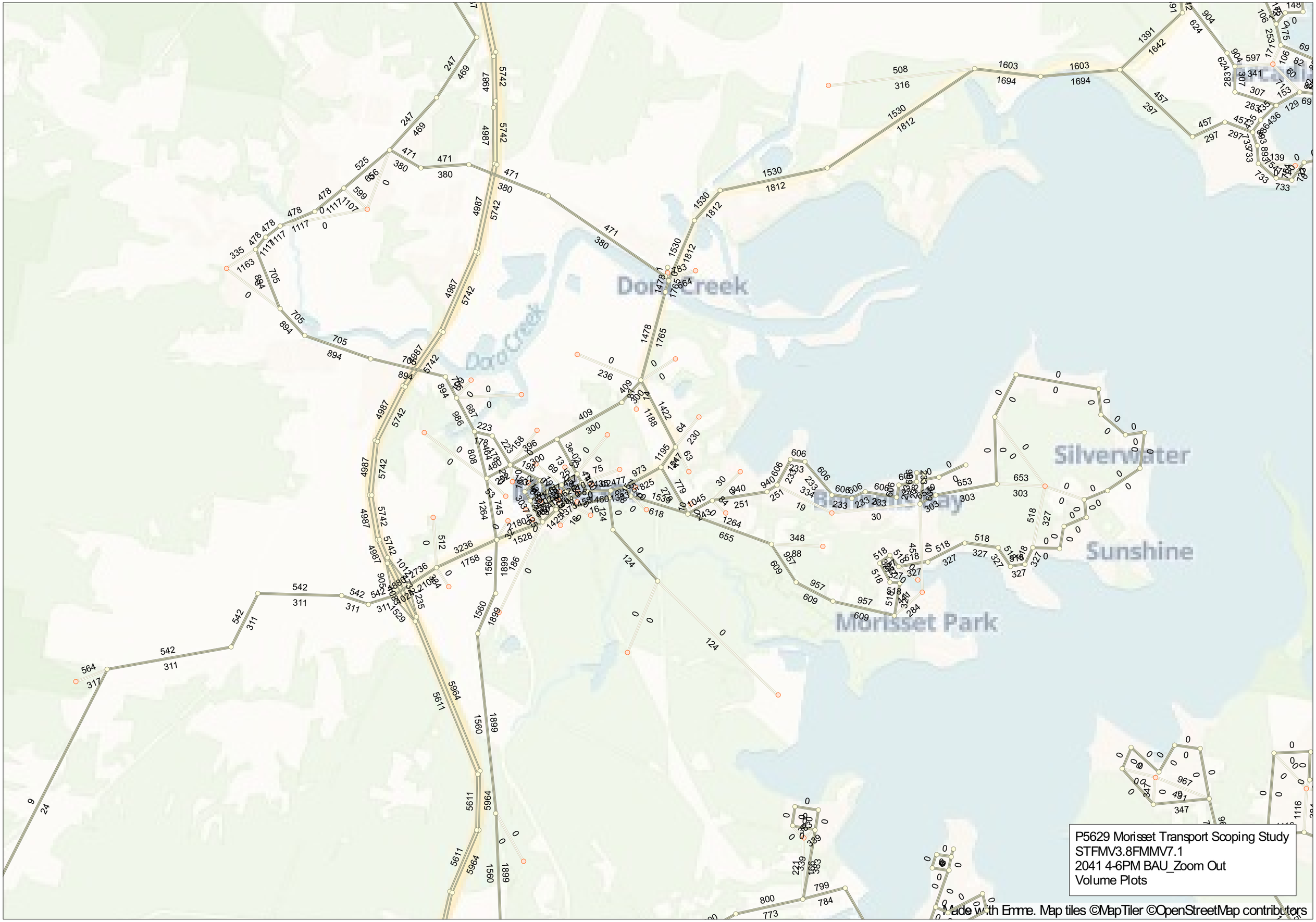
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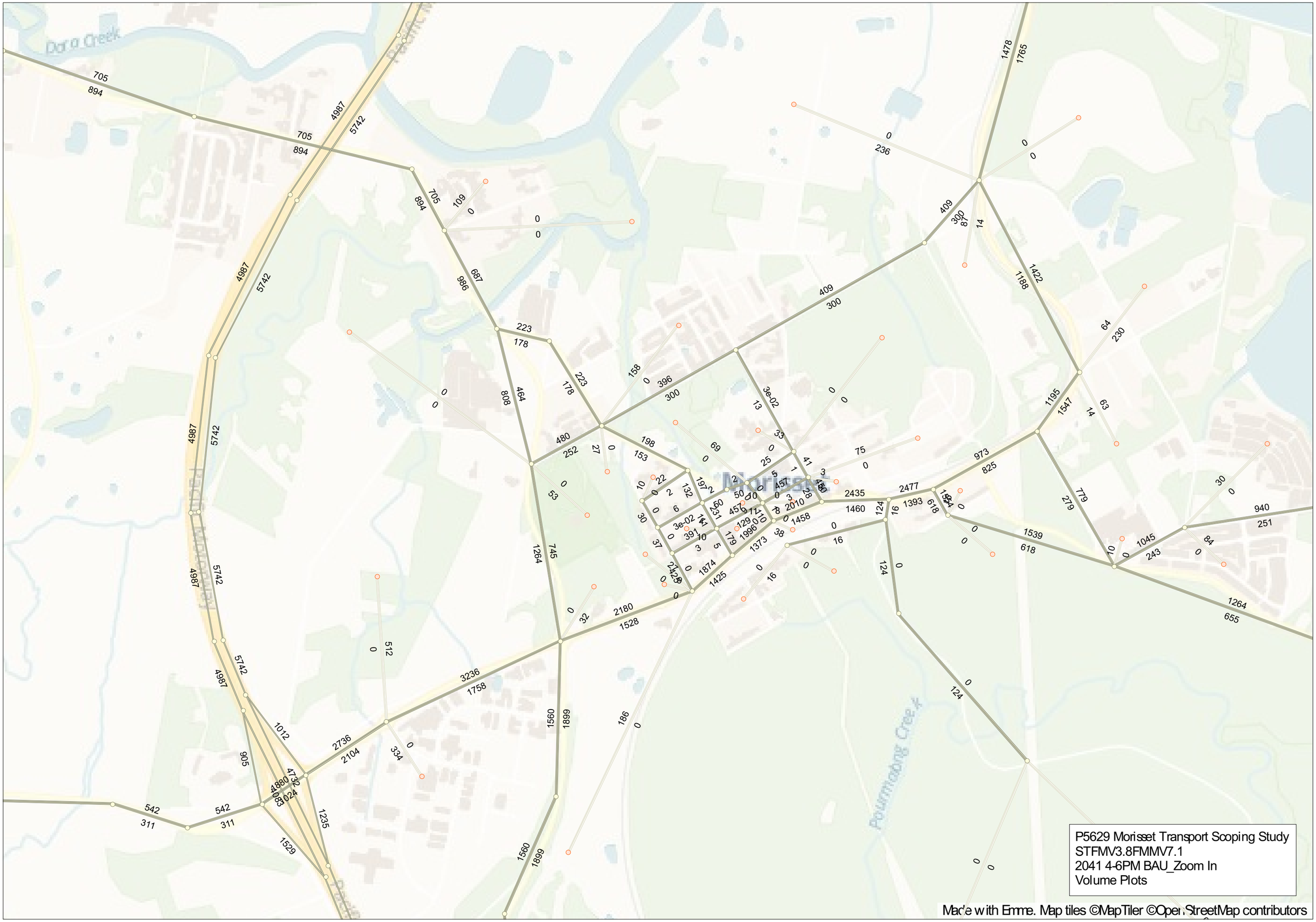

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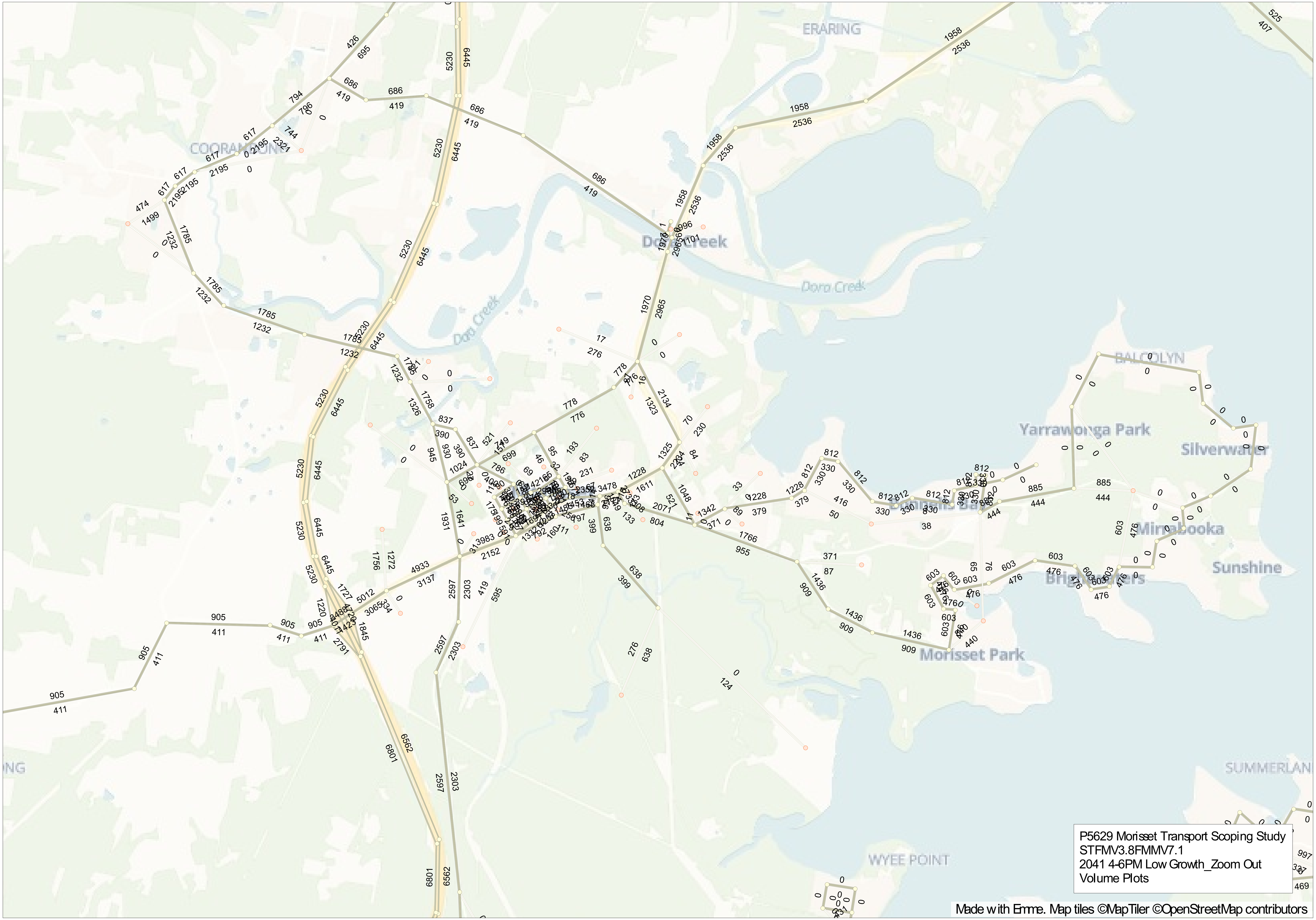
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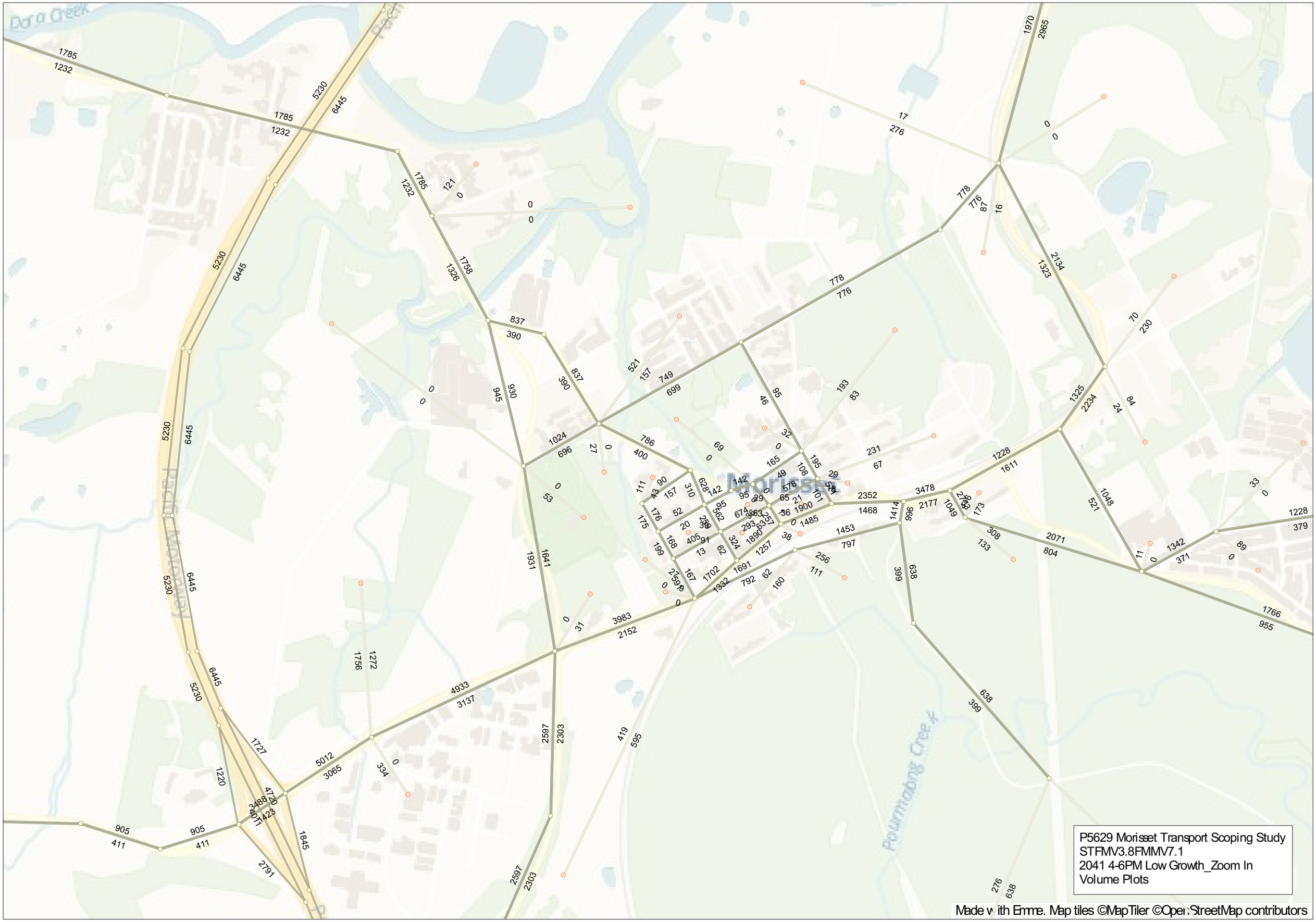

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2041 4-6PM Low Growth_Zoom In
Volume Plots

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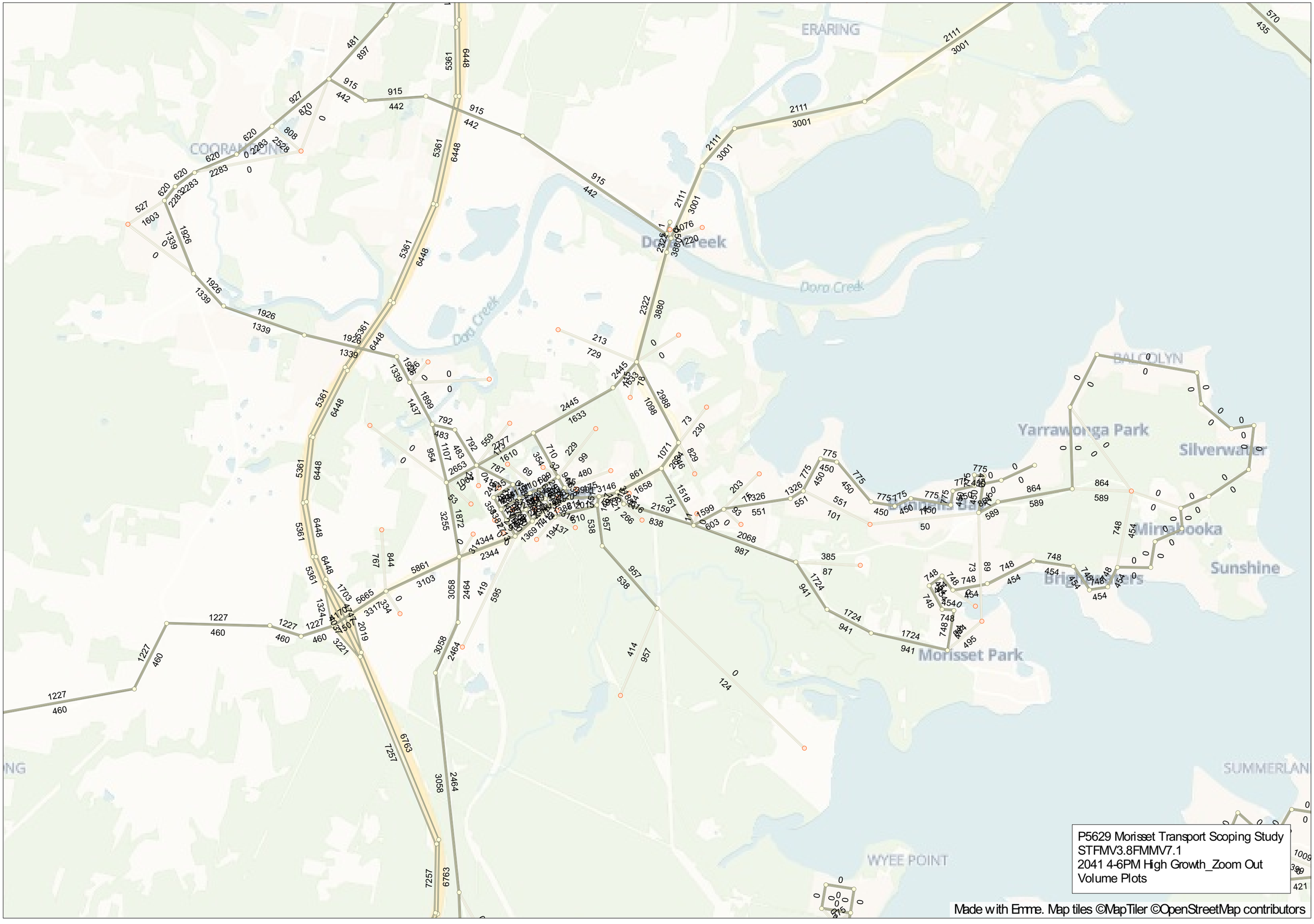
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Doro Creek
Yarrawonga Park
Silverwater
Mirrabooka
Sunshine
Morisset Park
WYEE POINT
BALCOLYN
P5629 Morisset Transport Scoping Study
STFMV3.8FMMV7.1
2041 4-6PM High Growth_Zoom Out
Volume Plots
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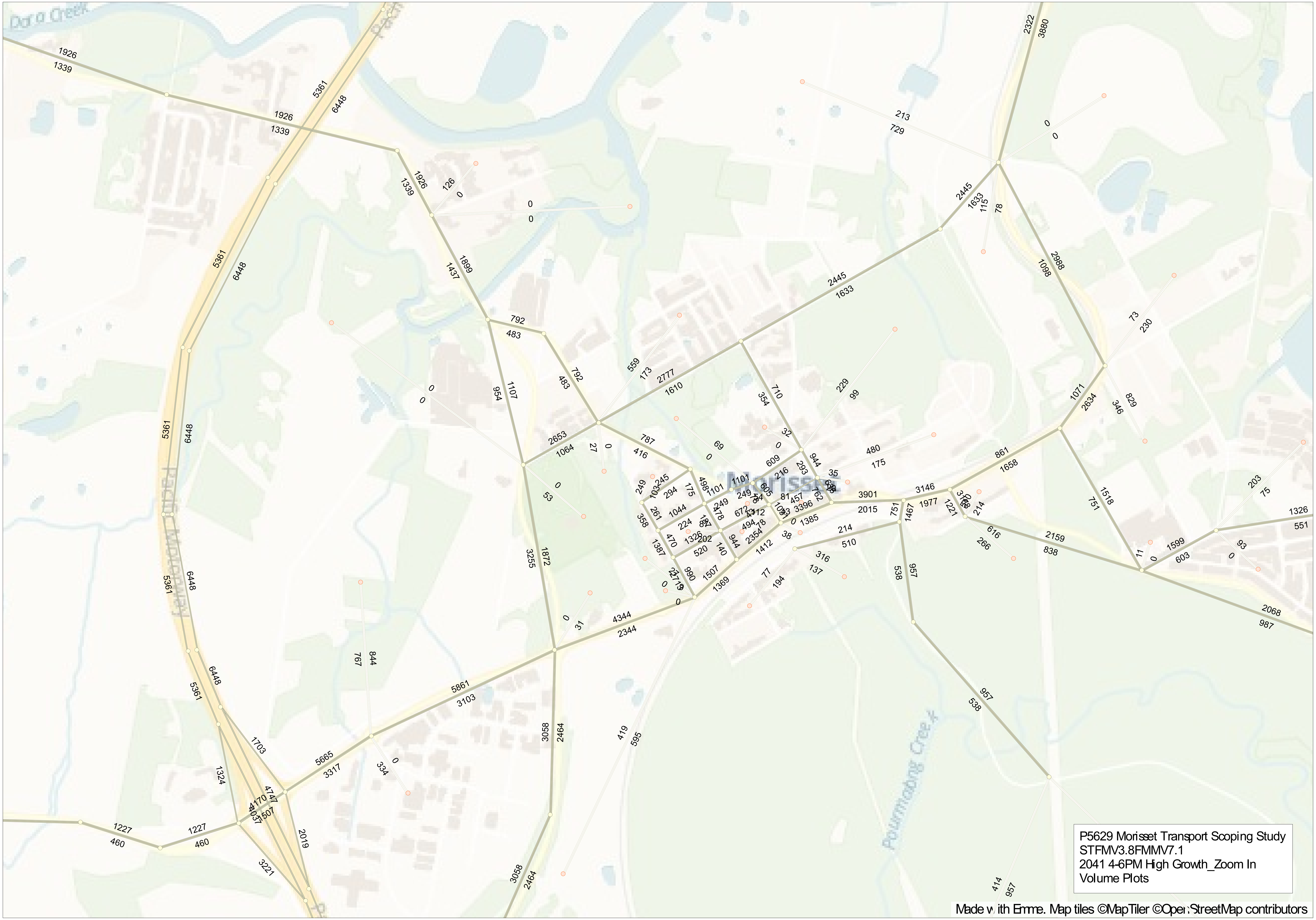

Dora Creek
Pacific Motorway
Morisset
Pourmalong Creek
P5629 Morisset Transport Scoping Study
STFMV3.8FMMV7.1
2041 4-6PM High Growth_Zoom In
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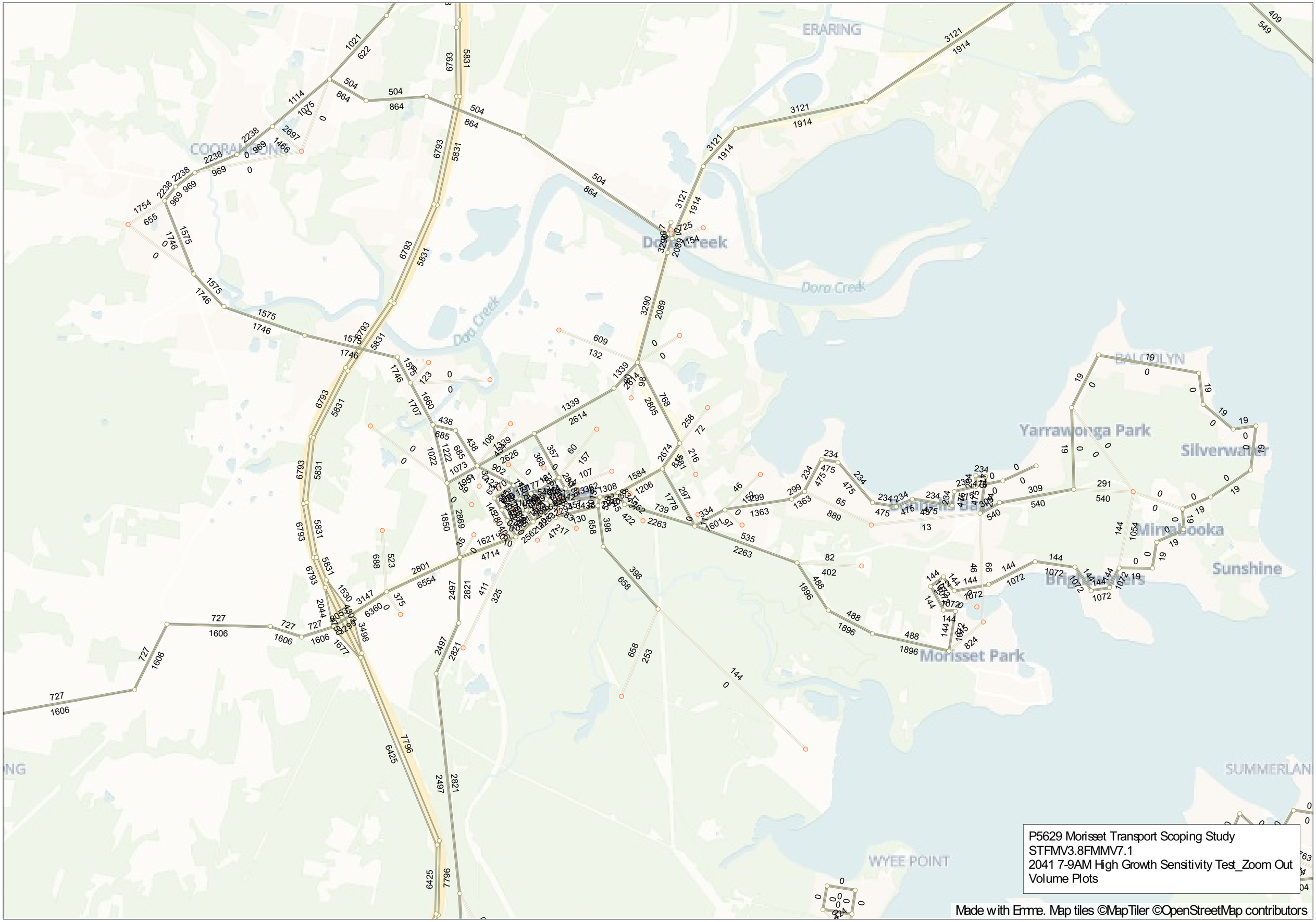
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Doro Creek
Doro Creek
Doro Creek
BALCOLYN
Yarrawonga Park
Silverwater
Mirrabooka
Sunshine
Bridgers
Morisset Park
WYEE POINT
SUMMERLAN
P5629 Morisset Transport Scoping Study
STFMV3.8FMMV7.1
2041 7-9AM High Growth Sensitivity Test_Zoom Out
Volume Plots
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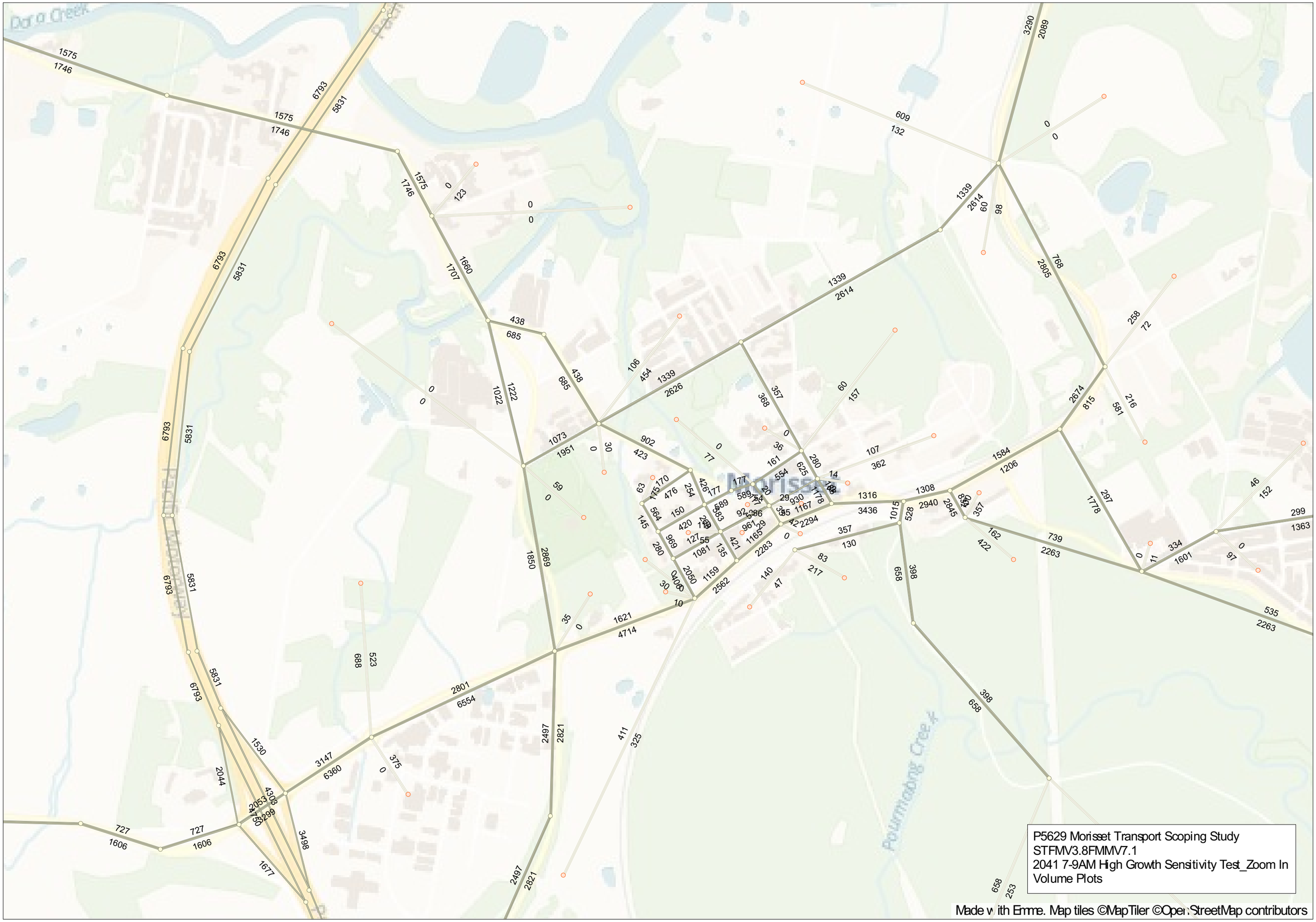

P5629 Morisset Transport Scoping Study
STFMV3.8FMMV7.1
2041 7-9AM High Growth Sensitivity Test_Zoom In
Volume Plots

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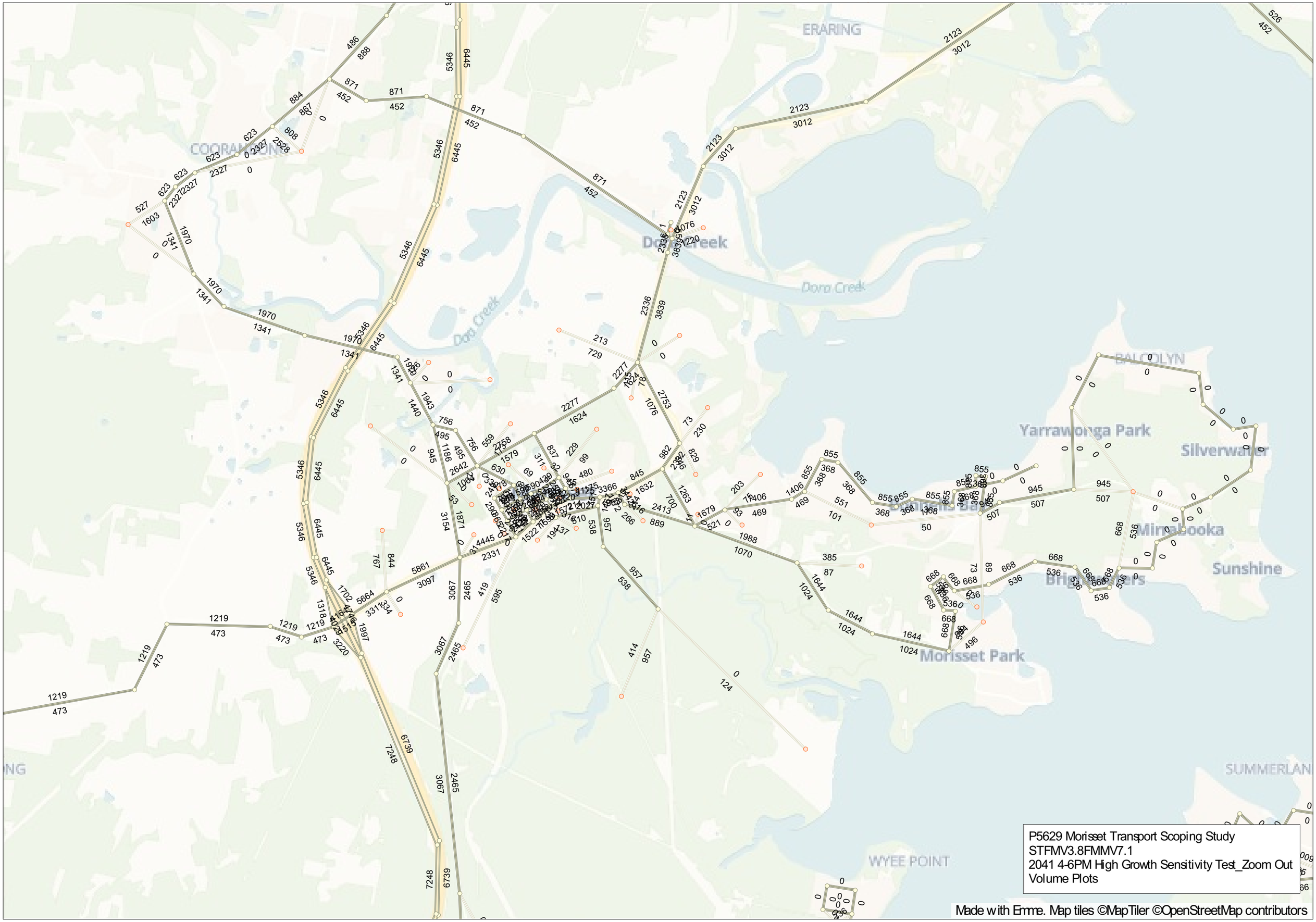
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COORAMBONG
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Silverwater
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Sunshine
Bridgewaters
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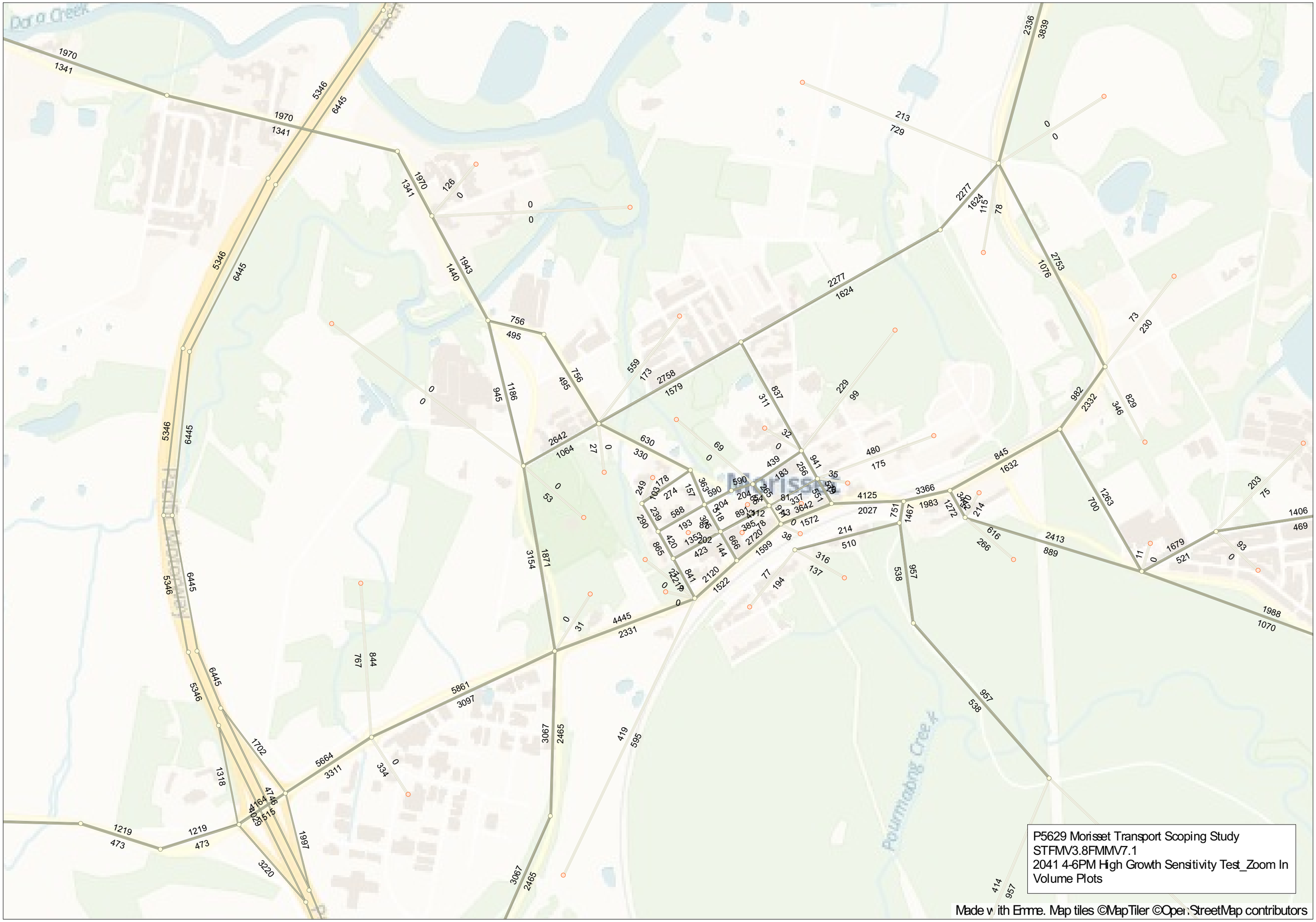
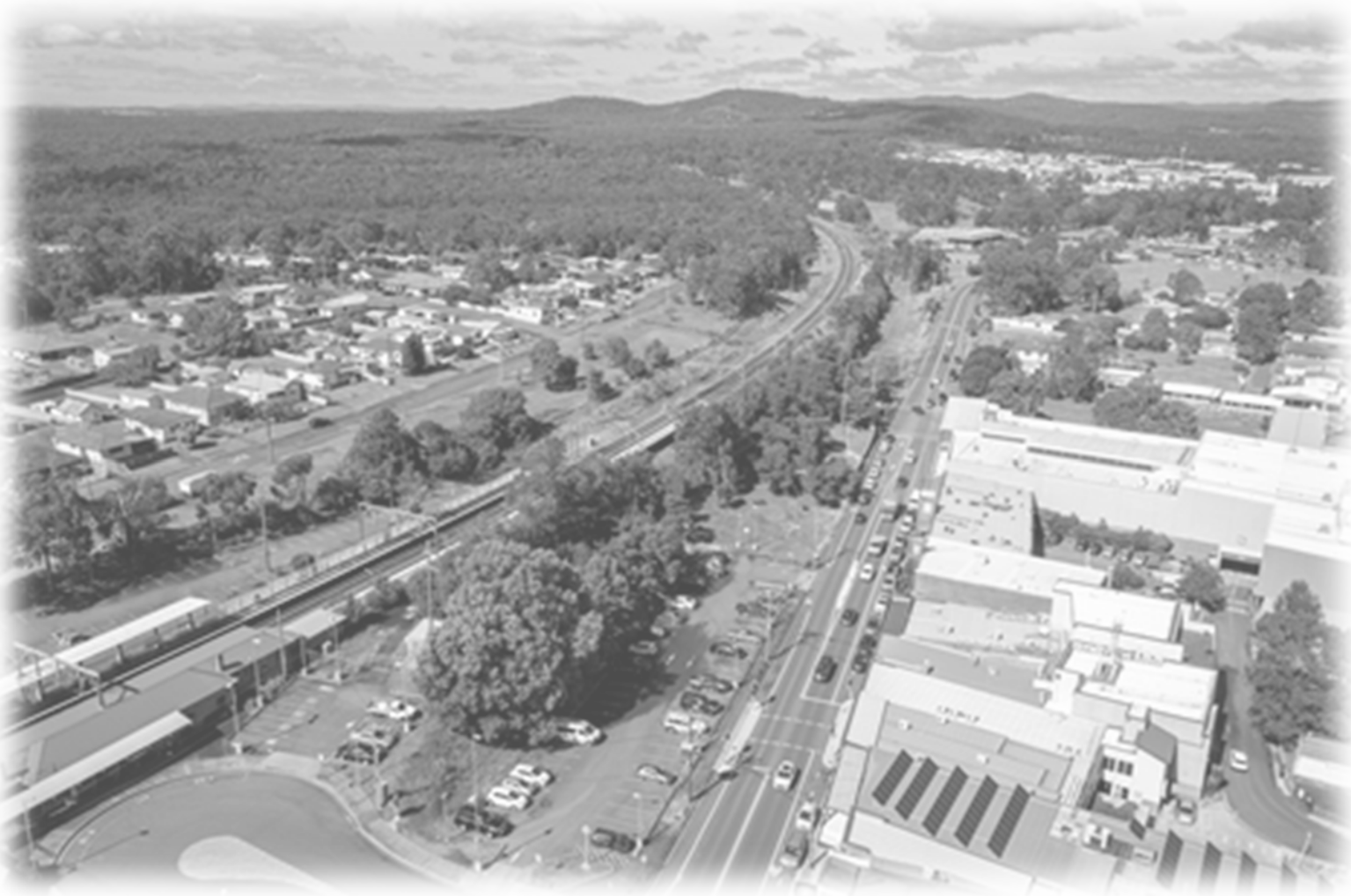


Appendix D: Potential Projects Works Schedule



P5629.001S - Preliminary Project Works

Note that this list does not include all proposed porjects within Council or TfNSW planning, only those considered relevent (or that required review) as part of the Morisset Scoping Study

#	Project Name	Description	Scenario	Type	Cost (if available)	Estimated Delivery Year
1	Town Centre Alternate Route (Awaba Street)	Upgrade Awaba Street to improve capacity (including 60km/h limit), similar cross section suggested to residential sections of Freemans Drive. Upgrades to intersections with Main Road and Freemans Drive also need to be investigated. Aims to assist in resolving movement delays on Dora Street for Morisset Economic Centre by providing alternate route for northbound traffic	High	Bypass	$45,000,000	2041
2	Dual Lanes - Mandalong Road and Dora Street	Upgrade to 2 lanes in each direction of travel between Town Centre and M1 Highway (does not extend to within centre)	BAU	Road upgrade	$730,000	2026
3	Intersection Upgrade - Dora Street / Freemans Drive	Upgrade to Signalised Intersection (Dora Street / Freemans Drive)	BAU	Traffic signals	$15,000,000	2026
4	Investigate - Awaba Street / Moira Park Road	Investigate intersection upgrade and potential staged realignment in collaboration with Project 1	Low/High	Investigation	$5,000,000	2036
5	Pedestrian Bridge Upgrade - Dora Street to Macquarie Street	Improve pedestrian bridge across rail from Dora Street to Macquarie Street	High	Streetscaping	$5,000,000	2041
6	Reduce to One Way - Short Street	Reduce Short Street to one-way westbound from Station Street to Short Street	High	Lane reduction	$15,000,000	2041
7	Reduce to One Way - Station Street	Reduce Station Street to one-way southbound from Yambo Street to Dora Street	High	Lane reduction		2041
8	Reduce to One Way - Yambo Street	Reduce Yamba Street to one-way southbound from Station Street to Short Street	High	Lane reduction		2041
9	Road and cycle upgrade - Dora Street	Construct new lanes and widen bridge for cyclists parallel to road over Dora Street railway bridge bypass	BAU	Bicycle ramp or bypass	$3,000,000	2036
10	Speed Reduction - Morisset Town	Lower speeds around Morisset Town to 40km/h	Low/High	Speed reduction	$100,000	2026
11	Speed Reduction - Morisset Town Centre	Lower speeds around Morisset Town Centre to 30km/h	High	Speed reduction	$80,000	2031
12	Pedestrian / Cycle Upgrade - Dora Street	Improve Pedestrian/Cycle Corridor on south side of Dora Street	BAU	Streetscaping	$250,000	2026
13	Road Upgrade - Fishery Point Road	Upgrade road capacity of Fishery Point Road and upgrade to signalised intersection with Main Road, dual lanes on approach suggested	Low	Capacity upgrade	$3,000,000	2036
14	Centre Streetscaping Investigations	Investigate kerb build outs, narrow street lanes and create parking lanes in Town Centre	Low/High	Streetscaping	$500,000	2036
15	Intersection Upgrade - Mandalong Road / Gateway Boulevard	Upgrade to Signalised Intersection (Mandalong Road / Gateway Boulevard). Completed in conjunction with Item 2	Low	Traffic signals	Within Project 2	2036/2026
16	Alternative route - Macquarie Street Upgrade*	Local town bypass to reduce traffic volume on Dora Street. Would involve two intersection upgrades with Dora Street and a new rail bridge. It is understood that this potential project is currently be reviewed by TfNSW.	Low	Bypass	$43,000,000	2041
17	Investigate - Expanded Morisset M1 Interchange	Investigate futher	High	Investigation		2041
18	Reduce to One Way - Mullard Street	Reduce Mullard Street to one-way westbound	High	Lane reduction		2031
19	Intersection Modification - Coorumbung Road / Gradwells Road	Intesection Realignment and Modification (Coorumbung Road / Gradwells Road)	BAU	Other	$458,000	2026
20	Intersection Modification - Dora Street / Station Street	Remove right turn in/out of Station Street	High	Other modification		2031
21	Intersection Modification - Gradwells Road / Newport Road	Intersection Modification (Gradwells Raod/ Newport Road)	BAU	Other	$829,000	2026
22	Intersection Modification - Optional New Entrance to Showground	Intersection Modification refer to Councils *Showground Master Plan*	BAU	Roundabout		2026
23	Intersection Upgrade - Awaba Street / Kahibah Street	Invesetigate upgrade to intersection (Awaba Street / Kahibah Street)	High	Traffic signals	$5,000,000	2026
24	Intersection Upgrade - Dora Street / Ourimbah Street	Upgrade to Signalised Intersection (Ourimbah Street / Dora Street) include pedestrian crossings	High	Traffic signals		2026
25	Intersection Upgrade - Freemans Drive / Awaba Street	Upgrade to Roundabout Intersection (Freemans Drive / Awaba Street)	Low	Roundabout		2031
26	Intersection Upgrade - Freemans Drive / Jamerin Way Intersection	Investigate Intersection Upgrade (Freemans Drive / Jamerin Way) with possible showground access	BAU	Traffic signals		2026
27	Intersection Upgrade - Macquarie Street / Fishery Point Road	Investigate upgrade to Signalised Intersection (Macquarie Street / Fishery Point Road)	Low	Traffic signals		2041
28	Intersection Upgrade - Main Road / Dora Street (Dora Creek)	Investigate Intersection form and upgrade (Main Road / Dora Street (Dora Creek))	BAU	Traffic signals		2031
29	Intersection Upgrade - Newcastle Street / Doyalson Street	Investigate upgrade to Roundabout Intersection (Newcastle Street / Doyalson Street)	High	Roundabout		2041
30	Intersection Upgrade - Newcastle Street / Station Street	Investigate upgrade to Intersection (Newcastle Street / Station Street)	High	Traffic signals		2026
31	Intersection Upgrade - Station Street / Dora Street	Investigate upgrade to Signalised Intersection (Station Street / Dora Street)	Low	Traffic signals	$400,000	2026
32	Intersection Upgrade - Stockton Street / Freemans Drive	Investigate upgrade to intersection (Stockton Street / Freemans Drive)	High	Roundabout		2036
33	Intersection Upgrade - Yambo Street / Station Street	Investigate upgrade to Roundabout Intersection (Yambo Street / Station Street)	High	Roundabout		2036
34	Intesection Upgrade - Wyee Road / Alliance Avenue	Investigate upgrade to Roundabout Inteserction (Wyee Road / Alliance Road)	High	Roundabout		2036
35	Road Upgrade - Wharf Street	Investigate upgrading capacity on Wharf Street	High	Capacity upgrade		2041
36	Kerb Buildout Extension - Terrigal Street	Extend kerb bulidouts on Terrigal Street	BAU	Extensions		2026
37	Kerb Ramp - Awaba Street	Kerb ramp required on Awaba Street when triggered by Awaba Road cycleway connection to Stockton Street	BAU	Ramps		2026
38	Kerb Ramp - Station Street	Kerb ramp on Station Street where private driveway is being currently used	BAU	Ramps		2026
39	Pedestrian Refuge - Bridge Street / Terrigal Street Intersection	Pedestrian refuge crossing (Bridge Street / Terrigal Street)	BAU	With kerb alterations		2026
40	Pedestrian Refuge - Dora Street	Pedestrian refuge on Dora Street	BAU	With no kerb alerations		2026
41	Pedestrian Refuge - Fishery Point Road / Pearson Street Intersection	Pedestrian refuge cossing (Fishery Point Road / Pearson Street)	BAU	With kerb alterations		2026
42	Pedestrian Refuge - Freemans Drive	Pedestrian refuge crossing across Freemans Drive from MHE	BAU	With kerb alterations	$50,000	2026
43	Pedestrian Refuge - Yambo Street / Station Street Intersection	Pedestrian refuge crossing (Yambo Street / Station Street)	BAU	Raised (wombat)		2026
44	Removal of Dora Street On-street Parking	Investigate removal of parking along Dora Street between Short Street and Bridge Street to extend kerb space	Low	Removal		2031
45	Remove Pedestrian Crossing - Doyalson Street	Remove Pedestrian Crossing (On Doyalson Street), suggest shifting to intersection to better aling with pedestrian desire lines and avoid commercial 'back-of-house' areas	BAU	Removal	$50,000	2026
46	Road Upgrade - Doyalson Street	Include linemarking and kerb buildouts on Doyalson Street	BAU	Streetscaping		2036
47	Path Upgrade - Doyalson Street	Extend footpath on Doyalson Street to traffic signals at Dora Street intersection	Low	Extensions		2031
48	Road Upgrade - Yambo Street and Short Street	Include kerb buildouts and idnented parking along Yambo Street and Short Street	Low	Streetscaping		2036
49	Investigate - Deaves Road / Mandalong Road	Investigate to include access to development investigation precinct	BAU	Investigation		2036
50	Investigate - Main Road / Stingaree Point Drive, service road upgrade Russell Road and subdivision to Baker Street	Investigate to include access to development investigation precinct	BAU	Investigation		2026
51	Investigate - Mandalong Road / Old Maitland Road	Investigate to include access to development investigation precinct	BAU	Investigation		2031
52	Investigate - Russell Road / Ettalong Road / Wamberal Street	Investigate to include access to development investigation precinct	BAU	Investigation		2031
53	Investigate - Rutley Road / Governemnt Road	Subject to economic study analysis	BAU	Investigation		2031
54	Investigate - Terrigal Street / Awaba Street	Investigate to include access to development investigation precinct	BAU	Investigation		2031
55	Investigate - Wyree Road / Hue Hue Road	Investigate intersection access, subject to economic study analysis	BAU	Investigation		2031
56	Investigate South Morisset Release Area Access	Access for South Morisset release area on Macqauarie Street at Bridge Street, or Fishery Point Road at power easement, or Marconi Road	Low	Investigation		2026
57	Investigation - Dora Street / Bridge Street	Investigate capacity of Dora Street / Bridge Street	Low	Investigation		2026
58	Permeability - Centre Lots	Multi-faceted upgrades with physical and planning elements to gain additional pedestrian links	Low	Streetscaping		2026
59	Road Modification - Wamsley Street / Dora Street (Dora Creek)	Redesign Wamsley Street and intersection with Dora Street (Dora Creek)	BAU	Other modification		2041
60	Intersection Upgrades - Freemans Drive at Cooranbong	Three intersection upgrades noted in Councils planning at Cooranbong (Avondale Road, Alton Road and Patrick Drive)	BAU	Other	$15,000,000	2026