TRAFFIC, PLANNING & ENVIRONMENTAL CONSULTING PTY LTD

ELIZABETH HILLS Local Area Traffic Management Scheme

Report Documentation Control

Title	Local Area Traffic Management Scheme for Elizabeth Hills NSW, 2171
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EXECUTIVE SUMMARY

TPE Consulting Pty Ltd was engaged by Liverpool City Council to undertake an in-depth analysis focused on traffic management infrastructure of the Elizabeth Hills precinct. The study encompassed site evaluations, data gathering on traffic patterns, and consultation with Council. The primary aim was to develop a comprehensive Local Area Traffic Management (LATM) scheme designed to improve road safety and efficiently manage the escalating traffic demands within the precinct.

The data-driven assessment surfaced issues specifically high speeds on collector roads and increasing Average Daily Traffic (ADT) values, particularly on Regentville Drive. These findings highlighted possible interventions to divert traffic, regulate speeds, and improve safety across the precinct.

The report proposes a set of targeted LATM measures, detailed in a concept plan in Appendix A, which include:

- Partial road closures at specified intersections to divert southbound Regentville Drive traffic
- Implementation of roundabout controls at critical junctions
- Construction of a raised intersection
- Installation of flat-top road humps
- Application of a give-way treatment at a key intersection

While the proposed interventions are promising, the report also identifies potential drawbacks, such as the possibility of reduced network permeability and longer travel distances associated with the diversion devices. To account for these challenges, the report suggest Council consider a trial run to empirically validate the proposed scheme and gauge community response.

Given the evolving transport dynamics within Elizabeth Hills, including the potential extension of Aviation Road, the report emphasises the need for continuous monitoring and periodic updates to the LATM scheme.

Finally, the report advises a staged implementation of the LATM measures to ensure both financial feasibility and effective performance evaluation. It is recommended diversion devices first be implemented, followed by the additional LATM devices post-monitoring and as funding allows.

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1. INTRODUCTION

1.1. Overview

TPE (Traffic, Planning, and Environmental) Consulting Pty Ltd has been engaged by Liverpool City Council to perform a comprehensive analysis of the Elizabeth Hills precinct, with the aim of identifying the requisite traffic management infrastructure to enable the effective implementation of a Local Area Traffic Management Scheme. Figure 1.1 depicts a map of the study area.

Figure 1.1: Study Area Boundary in Red

1.2. Scope of Study

This report delivers a detailed analysis of current transportation patterns in Elizabeth Hills and develops a robust LATM strategy to enhance road safety in line with best practice. In undertaking the LATM study, TPE Consulting Pty Ltd has:

- Reviewed relevant documentation related to the site;
- Conducted site visits to observe vehicle and pedestrian behaviour, and locations of current infrastructure;
- Considered current and historical 7-day vehicle speed and volume counts at key locations;
- Considered origin-destination (OD) surveys;
- Reviewed locations of crashes and identified measures that can be introduced to reduce crash risks;
- Identified locations that require the implementation of new LATM measures to create a self-enforcing 50 km/h speed limit, and;
- Prepared concept plans of the proposed LATM infrastructure.

1.3. Literature Review

Defining LATM

Local Area Traffic Management (LATM) is defined by Austroads' "*Guide to Traffic Management Part 8*" as a method for planning and managing road space within a local area. It aims to modify streets and networks that no longer meet the needs of residents and users. LATM employs physical devices, streetscaping treatments, and other measures to influence vehicle operation and create safer, more pleasant streets. This approach is consistent with self-explaining streets and context-sensitive urban design.

A local traffic area consists of local access streets and collector roads, typically bounded by arterial roads or other significant transportation routes, or physical barriers such as creeks, railways, reserves, or impassable terrain. LATM adopts a system-based, area-wide approach, addressing neighbourhood traffic problems within the context of the local area or a group of streets. Physical traffic measures should be viewed as a sequence of interrelated devices rather than individual treatments.

The primary objective of LATM is to change driver behaviour through direct physical influence on vehicle operation and indirect influence on drivers' perceptions of appropriate street behaviour. The focus is on reducing traffic volumes and speeds in local streets to enhance amenity, liveability, safety, and access for all road users.

The need for LATM typically arises from the intention to reduce traffic-related problems, ensure orderly traffic planning and management, modify transportation behaviour, improve community spaces and sense of place, and enhance environmental, economic, and social outcomes. LATM may also be necessary for traffic interventions associated with new developments or the implementation of pedestrian and bicycle plans and local policies. Traffic-related problems primarily involve improving traffic safety and security, as well as protecting or improving local amenities. Orderly traffic planning

and management addresses traffic growth, urban life impacts, spill-over from traffic routes, and directing traffic to appropriate routes.

An LATM typically includes 6 stages as follows; (Table 3.1 within Austroads Part 8 - Guide to Traffic Management Part 8: Local Area Traffic Management). This study will address stages 2 and 3.

Stage 1: Initiating an LATM program (Section 3.1)
• Decide that action is needed • Define study area, precincts and functional hierarchy of roads • Develop study plan, including type of treatments and study costs • Develop consultation strategy • Council decision • Prepare brief for consultant, if required
Stage 2: Data collection and problem identification (Section 3.2)
• Define and collect required data • Identify problems • Identify potential solutions • Define and confirm objectives
Stage 3: Development of plans (Section 3.3)
• Clarify suitable strategies (including confirmation of LATM as an appropriate response) • Develop outline schemes and supporting arterial improvements • Consult on draft plans • Assess and refine alternatives • Select, present to council for adoption
Stage 4: Scheme design (Section 3.4)
• Location and design of treatments • Consult with nearby owners/occupiers • Prepare contract documents
Stage 5: Implementation (Section 3.5)
• Confirm timing and staging • Conduct additional 'before' studies as required • Community information • Construct/install • Safety audit
Stage 6: Monitoring and review (Section 3.6)
• 'After' data collection, observation and reports • Identify unanticipated impacts or outcomes • Review technical and community assessment of scheme • Revise as needed and feasible • Record and report process and outcomes

National Road Safety Strategy 2021-30

Australian governments at all levels are working together with our communities to change the road transport system to prevent deaths and serious injuries on our roads. The National Road Safety Strategy represents all governments' commitment to deliver significant reductions in road trauma, putting Australia on a path to achieve 'Vision Zero' or zero deaths and serious injuries on our roads by 2050.

The National Road Safety Strategy 2021-30 sets out Australia's road safety objectives over the next decade, and includes key priorities for action and targets to reduce the annual number of fatalities by at least 50 per cent and serious injuries by at least 30 per cent by 2030. The Strategy continues the commitment to the Safe System approach and strengthening all elements of our road transport system

under three key themes: Safe roads, Safe vehicles and Safe road use. Speed management is embedded within all key themes. The Strategy adopts a social model approach to foster a road safety culture across society and make road safety business-as-usual.

Safe Systems

The 2026 Road Safety Action Plan continues to adopt the internationally recognised Safe Systems approach, which is a holistic and proven approach that considers how people, vehicles, speeds, and roads work together to create a safe system. The system acknowledges that:

> *'The human body has physical limits to withstanding the impact of a crash. People sometimes make mistakes – but this shouldn't cost anyone their life. Roads, roadsides, travel speeds and vehicles need to be designed to help avoid a crash or reduce the impact of a crash if it happens. Road safety is a shared responsibility. We all need to make decisions with safety in mind, from the design of our roads and vehicles, investment, laws and education, to each road user acting safely every day.'*

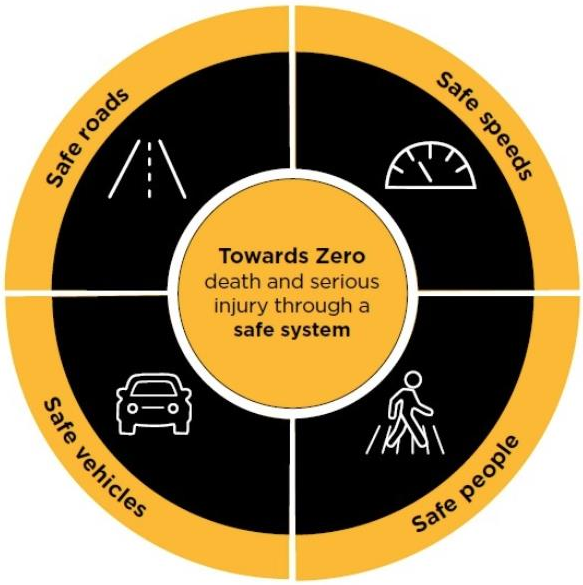


Figure 1.2: Towards Zero Elements (Movement and Place Guidelines December 2022)

In the context of LATM, all four pillars of a Safe System apply and should be central to the design of any LATM scheme.

Movement and Place

Well-designed places encourage interaction among all users, including businesses, visitors, and local community members. These places contribute to healthier, more attractive, resilient, and equitable urban environments, which in turn enhance economic productivity. Roads and streets serve as vital public spaces for communities, fostering socialization and activities that invigorate neighbourhoods. By aligning movement and place in the design of roads and streets, users of all ages and abilities can enjoy safer, healthier travel options while residing in appealing locations.

Movement and Place is an interdisciplinary, place-based approach to the planning, design, delivery, and operation of transport networks. It acknowledges and seeks to optimise the network of public spaces formed by roads and streets, as well as the adjacent and impacted areas. Adopting a Movement and Place approach ensures that the transport network supports effective and efficient movement while maximising social and economic benefits for residents through the consideration of better places. This method provides a cohesive approach to aligning integrated, efficient movement of people and goods with the amenity and quality of places, contributing to the attractiveness, sustainability, and success of cities and towns.

A Movement and Place approach is most applicable in transport programs and projects at stages when network-level decisions are contextualized to local places, following the identification of indicative broad demand patterns for mobility across a city or region. Generally, this occurs at the early stages of a process and at a program level for smaller projects or a project level for larger projects. For instance, it can be used for an individual road or street to workshop the integration of a citywide or regional network within that specific local context.

Understanding movement patterns and functions is crucial for aligning movement and place. These patterns and functions may contribute to better places, as well as creating space (and time) for place. Factors to consider include:

Movement considerations	Examples of movement outcomes
The most efficient, integrated and reliable way to connect people to jobs and key services	A network strategy or integrated transport framework
How to best facilitate the delivery of goods and services essential to economic prosperity and growth	Freight strategy
The degree of access to places required to support vital economic, social and recreational activity	Local access strategy
Trip segmentation by journey purpose to understand which trips could be made by other means	Strategic and switchable trip analysis
The modes by which journeys can be made most efficiently	Desired mode split
Improving safety and encouraging sustainable transport modes to reduce emissions and contribute to public health	Targets for walking, cycling and public transport

2. ASSESSMENT OF EXISTING CONDITIONS

2.1. Context and Existing Traffic Management

Elizabeth Hills is a residential suburb in the local government area of Liverpool. The suburb houses 2,535 people (2016 Census) and is serviced by the 827-bus route (Figure 2.3) to Liverpool via Bonnyrigg Heights, Green Valley and Heckenberg. It also has connections with the M7 Motorway with the nearby Cowpasture Road exit to the south, and the Elizabeth Drive exit to the north. Land use within the study area is almost all residential, with the addition of some parkland area. Industrial land use exists toward the south accessed by Regentville Drive and Aviation Road.

The precinct features a road hierarchy, with Newgate Boulevard, Rosebank Avenue, and Sherrard Avenue forming key local collectors within the suburb. Regentville Drive and Wixstead Avenue provide north-south connectivity between Frederick Road and Cowpasture Road and hold a through-movement function. The typical local road width is 7m and the collector road width is 10-11m.

Certain traffic management features operate in the road network including Watts Profile speed humps and single-lane roundabouts as shown in Figure 2.1. Key active transport routes exist within the precinct and link with the Westlink M7 cycleway as shown in Figure 2.2.

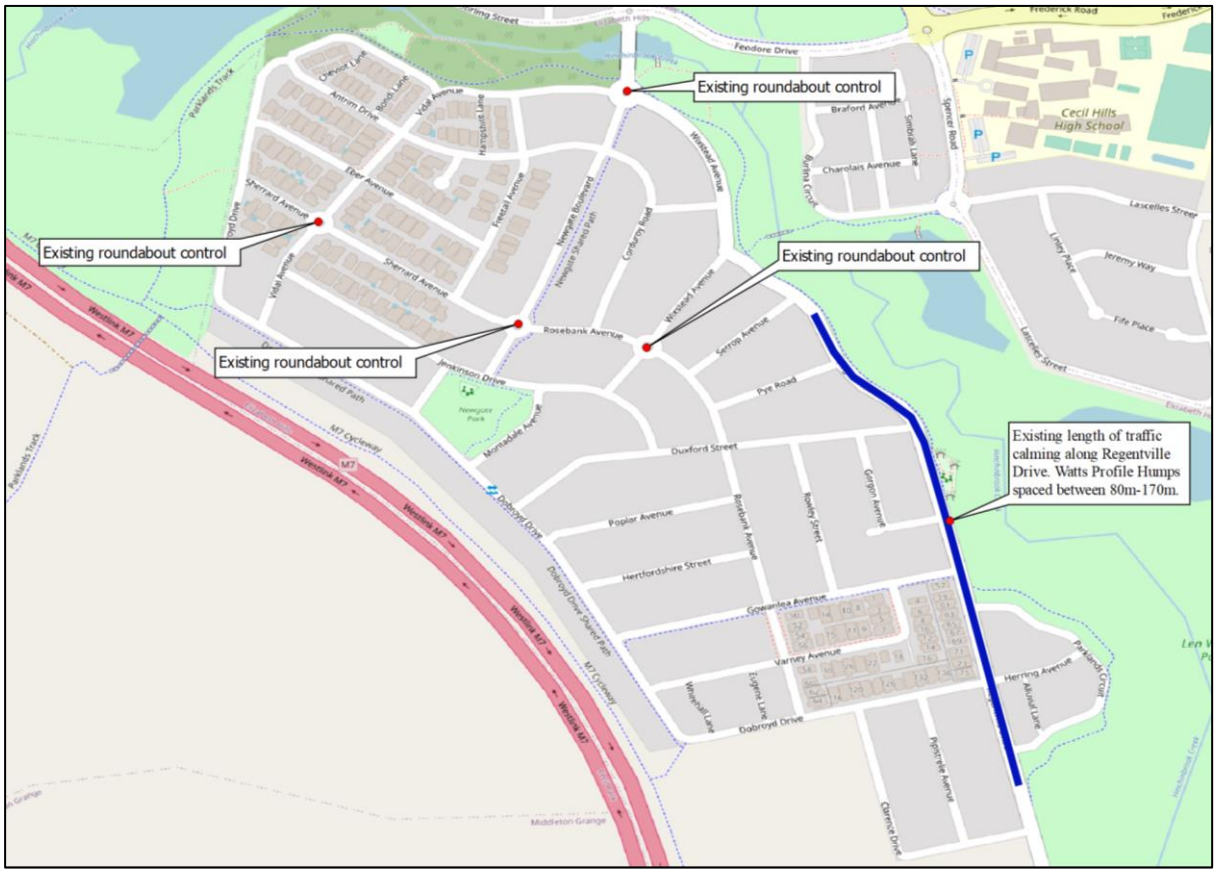


Figure 2.1: Current Traffic Management Facilities

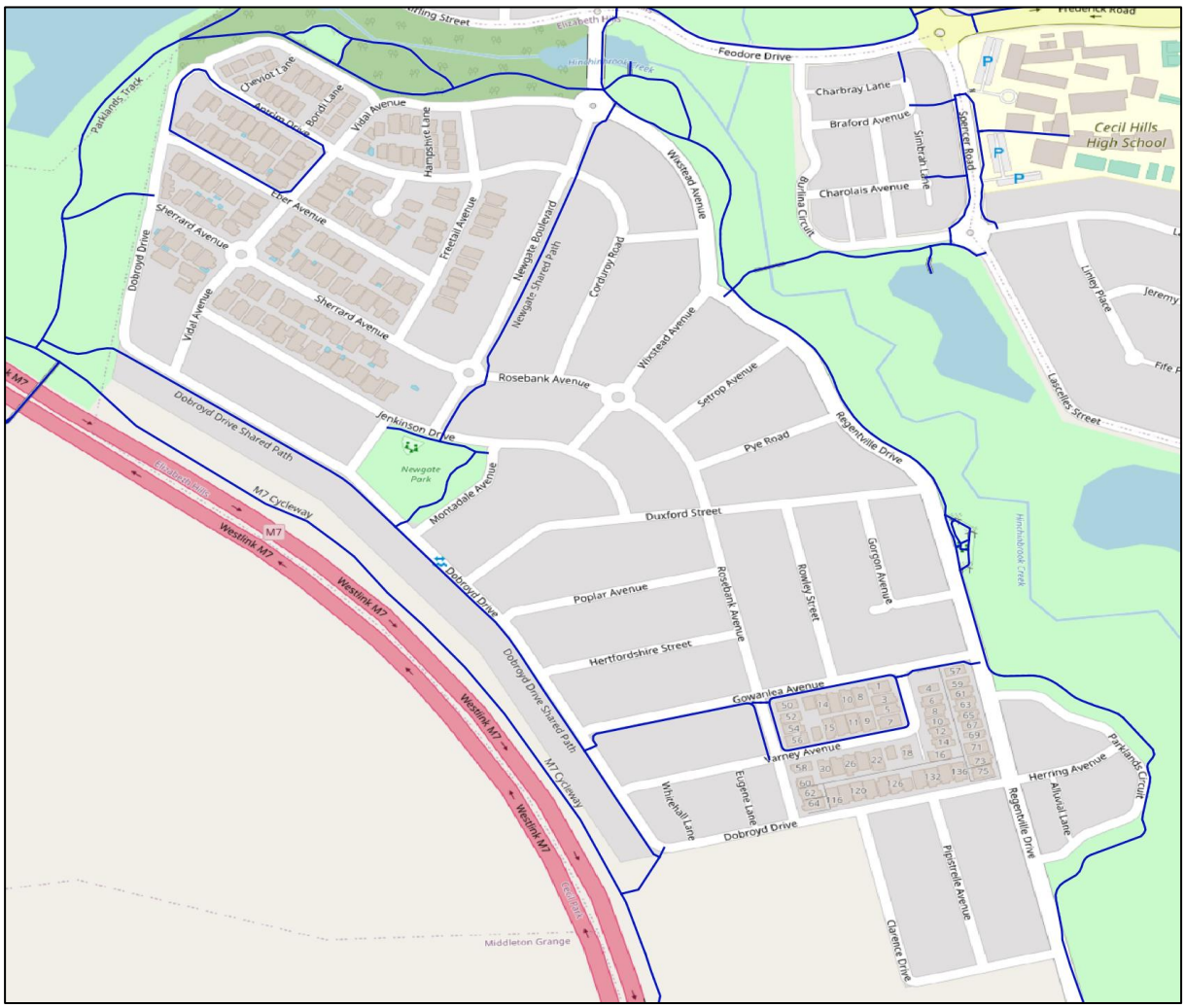


Figure 2.2: Key Active Transport Links in Blue

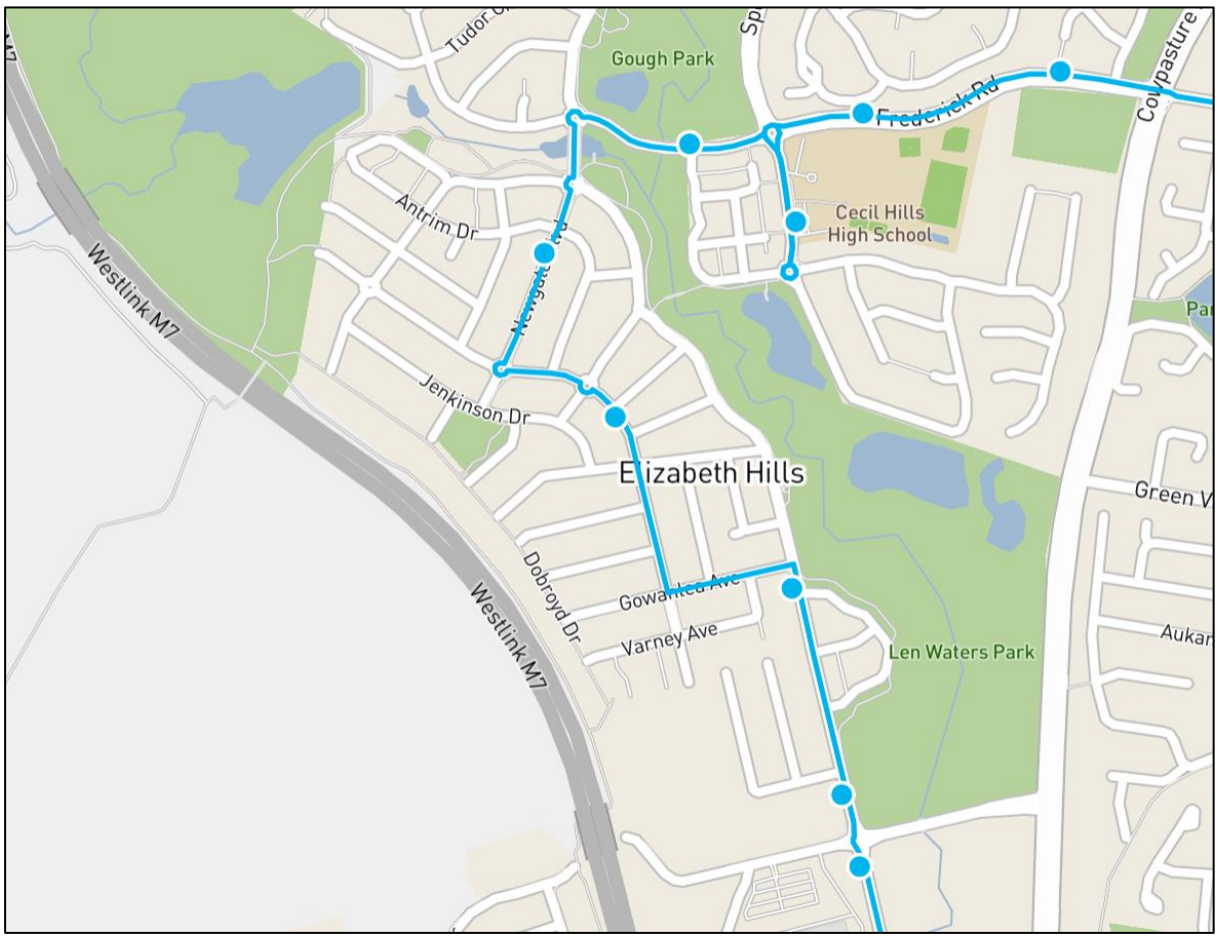


Figure 2.3: 827-bus route in Blue

2.2. Speed, Volume, and OD Data

The study included 7-day tube traffic surveys at 12 locations carried out between 28 March and 3 April 2023. The results are summarised in Table 2.1 and Figure 2.4.

Table 2.1: Surveyed Traffic Speeds and Volumes

Count Number / Location	85th Percentile Speed (km/h)			ADT (5 day)
	South / East	North / West	Combined	Combined
Dobroyd Drive: House No. 116	51	48	49	1781
Dobroyd Drive: House No. 37	48	48	48	303
Dobroyd Drive: House No. 75	54	56	55	486
Duxford Street: Between Jenkinson And Rosebank	40	43	42	189
Wixstead Avenue: House No. 21	54	49	51	5018
Jenkinson Drive: House No. 25	38	39	38	392

Count Number / Location	85th Percentile Speed (km/h)			ADT (5 day)
	South / East	North / West	Combined	Combined
Regentville Drive: Between Clarence And Aviation	57	57	57	6404
Newgate Boulevarde: House No. 20	63	59	60	1443
Clarence Drive: House No. 18	54	53	53	438
Vidal Avenue: House No. 22	46	45	45	697
Dobroyd Drive: Between Sherrard And Eber	49	51	50	83
Rosebank Avenue: House No. 38	64	60	62	1611

Figure 2.4: 85th Percentile Speed and 5-day ADT

The results indicate prevalent speeding trends on collector roadways within Elizabeth Hills, with the 85th percentile speed surpassing the posted speed limit. These roadways also experience higher Average Daily Traffic (ADT) values, ranging between 1,000 and 6,500. The elevated speeds can be primarily attributed to the broader roadway width, in contrast to local roads that generally have self-enforcing characteristics.

Historical data collected on Regentville Drive is summarised in Table 2.2 and Figure 2.5.

Table 2.2: Historical Traffic Speeds and Volumes

Count Number / Location	85th Percentile Speed (km/h)			ADT (5 day)	Start Date (7-day duration)
	South	North	Combined	Combined	
17 Regentville Drive	54	54	54	3715	August 2018
53 Regentville Drive	55	58	57	3516	August 2018
97 Regentville Drive	60	59	60	4489	August 2018
23 Regentville Drive	53	50	51	3347	January 2019

Figure 2.5: 85th Percentile Speed and 5-day ADT for Historical Data

Following the survey in August 2018, two additional Watts profile humps were installed in December 2018, one to the south fronting 95 Regentville Drive and another to the north fronting 13 Regentville Drive. More recently, another Watts profile was installed fronting 53 Regentville Drive in late 2021. A comparison of current and historical data indicates a minor speed reduction on Regentville Drive after the installation of additional traffic calming measures, with the 85th percentile speeds reduced by approximately 3 km/h at comparable count locations. This reduction is more pronounced closer to the Watts profile devices.

Notably, the ADT on Regentville Drive has increased by 40% to 50% since the 2018/2019 counts, despite minimal development within the Elizabeth Hills catchment. This increase may be attributed to several factors, such as the heightened use of the industrial area to the south and/or the utilization of Regentville Drive as a "rat run" to avoid Cowpasture Road congestion. In this context, Regentville Drive serves as a north-south alternative route to access Elizabeth Drive and the Westlink M7 interchange.

Origin-Destination (OD) surveys were conducted on 9 May 2023. Two scenarios were tested including Route 1 and Route 2. A summary of the results can be found in Table 3.3. Route 1 represents the basic through movement in which vehicles stick to Regentville Drive only. Route 2 is also a through movement but can consist of a variety of routes deviating from Regentville Drive into the estate. The three station locations and likely route choices are illustrated in Figure 2.6. A 7-minute time threshold was adopted between repeat observations of license plates.

Table 2.3: OD survey result summary during peak periods

		AM (7am - 9am)					PM (2:30pm - 5:30pm)				
Route	Criteria	Northbound	Southbound	Total	Total Observations	% Through	Northbound	Southbound	Total	Total Observations	% Through
Route 1	Pass stations 1, 2 and 3	77	130	207	865	23.93%	210	318	528	2024	26.09%
Route 2	Pass stations 1 and 3 but not 2	66	36	102	865	11.79%	70	120	190	2024	9.39%

Table 2.3 shows that approximately 25% of the total volume is a basic through movement along Regentville Drive (Route 1), and approximately 10% of the total volume is a through movement but passes into the estate and avoids the Station 2 location (Route 2). This indicates that the Watts profile humps on Regentville Drive may have displaced a percentage of through movements to local roads within the Elizabeth Hills estate. A total through movement value of 35% is recorded between Stations 1 and 3 (Route 1 and Route 2), indicating a north-south "rat run" to avoid Cowpasture Road congestion.

Council has also advised that Aviation Road may connect in the future with Middleton Drive under the Westlink M7, which may create additional through-demand on Regentville Drive, such as from the Middleton Grange catchment traffic wishing to access the Elizabeth Drive interchange or Cecil Hills High School. This will need to be considered through network modelling at the time of this proposal.

Figure 2.6: OD survey station locations and routes highlighted

2.3. Crash Data

A review of the most recent TfNSW crash data (Q1 2012 to Q3 2022) reveals two crashes in the Elizabeth Hills precinct. As shown in Figure 2.7, these crashes occurred at the intersection of Dobroyd Drive and Regentville Avenue with details provided in Table 2.4. It should be noted that TfNSW crash data is obtained from crashes reported to Police with a minimum severity of a personal injury. It is expected that there may have been unreported or minor crashes in the study area.

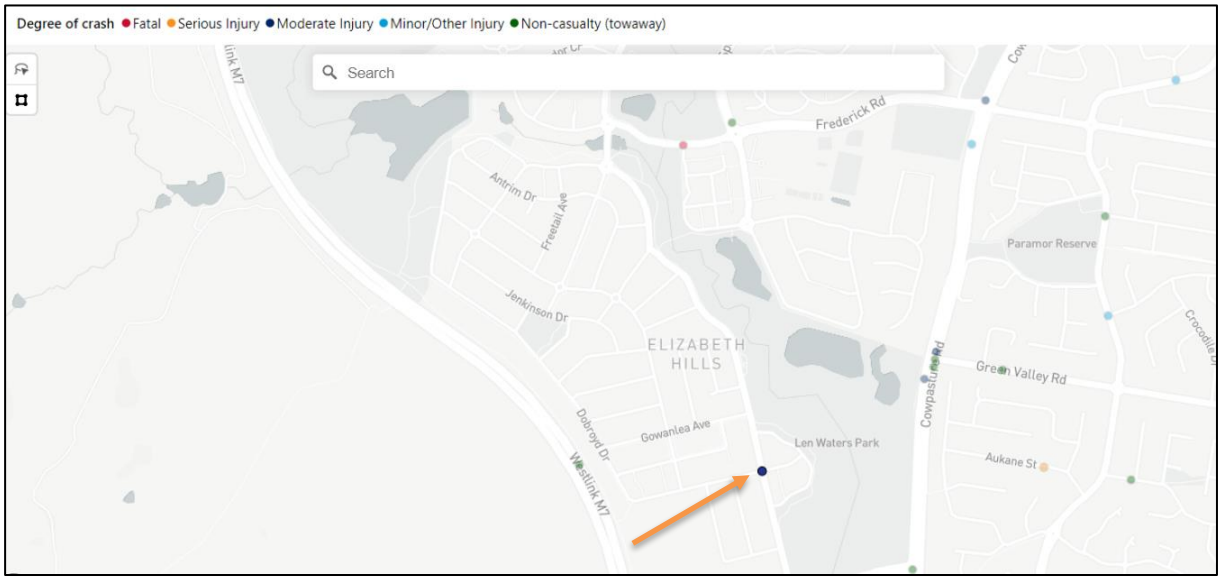


Figure 2.7: Crash Locations within Study Area (Source: TfNSW SSA)

Table 2.4: Crash Details

Crash ID	Degree	Year	Lighting	RUM
1186716	Moderate Injury	2018	Darkness	21 – Right through
1195718	Minor Injury	2019	Daylight	10 – Cross traffic

2.4. Site Observations

Images taken during site inspections are provided in Table 2.5 with locations shown in Figure 2.8.

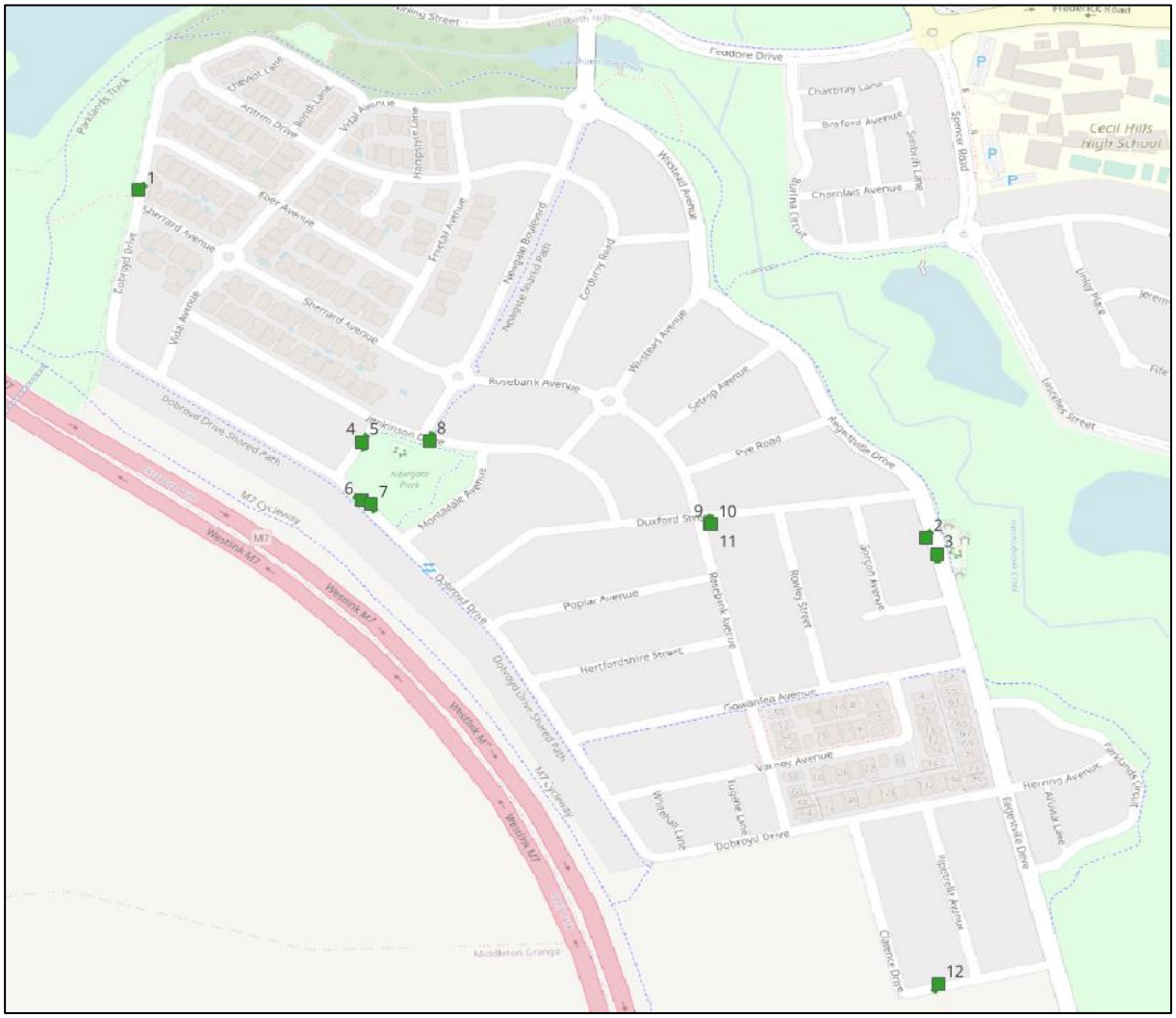


Figure 2.8: Image Locations in Green and ID Numbers

Table 2.5: Site Images and Observations

Image ID	Image	Note / Observation
1.		

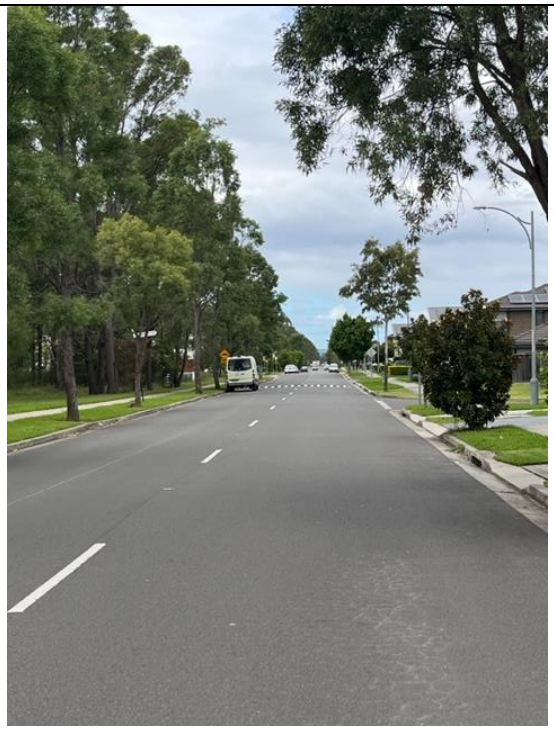
Image ID	Image	Note / Observation
2.		Existing Watts Profile humps along Regentville Drive. No landscaping buffer or fencing barrier exists to prevent use as pedestrian crossings to the adjacent park.
3.		

Image ID	Image	Note / Observation
4.		
5.		
6.		

Image ID	Image	Note / Observation
7.		
8.		Key pedestrian crossing location at Jenkinson Drive north-east of Newgate Park. Poor kerb ramp alignment exists at this location.

Image ID	Image	Note / Observation
9.		Four-way intersection between Rosebank Avenue and Duxford Street. Whilst onsite, a nearby resident expressed safety concerns with this intersection, including vehicle speeds, adjacent parking, and poor sight distance.
10.		
11.		

Image ID	Image	Note / Observation
12.		Use of existing yellow C3 kerbside line marking within the suburb to indicate No Stopping restrictions. No vehicles were observed breaching these restrictions.

3. PROPOSED MEASURES

3.1. LATM Scheme Suitability

There is no standard practice or prescriptive warrants defined in the Austroads Guide to Traffic Management Part 8 for scoring a LATM proposal. However, certain factors are salient in scoping and justifying a LATM scheme. These include:

- Traffic speed – usually in terms of 85th percentile and mean speed;
- Traffic volume – both in terms of vehicles per day and highest hourly volume;
- Crashes – over the most recent period that gives useable data (say, two-to-five years), taking separate account of fatalities, serious injuries and other related crashes; it may be appropriate to include unreported crashes where information is reliable, and;
- Presence of activity generators, buildings with a high sense of place, and/or sensitive land uses – specifically in terms of likely pedestrian and bicycle generation, impact on street amenity, and the requirements for people with disabilities.

As discussed in Section 2, Elizabeth Hills does satisfy many of the above factors, noting the following:

- The 85th percentile speeds were recorded to be around 10 km/hr above the posted speed limit on collector roads, while local roadways were generally self-enforcing due to their narrow width and prevalence of parking.
- High traffic volumes and "rat running" behaviour largely concentrated on Regentville Drive.
- Injury crashes have occurred at the intersection of Dobroyd Drive and Regentville Avenue. The incidence is likely to increase within the estate as traffic volumes rise.
- The estate features residential land use with some parkland areas. Although high activity generators are not present, the provision of LATM will need to consider urban amenity and safety, particularly in areas with potential pedestrian movements.

As such, it is recommended to proceed with an LATM proposal, with careful consideration given to the type and locations of devices.

Collector roads and "rat run" movements

As discussed in Section 2, Regentville Drive serves a through-movement function, with approximately 25% of its total volume not accessing the Elizabeth Hills estate. Council has attempted to combat this behaviour using traffic calming in the form of Watt profile humps. Nevertheless, volumes have increased by 40% to 50% since the 2018/2019 counts, despite minimal development within the Elizabeth Hills catchment. This may be a result of several factors, such as the heightened use of the industrial area to the south and/or the utilization of Regentville Drive as a "rat run" to avoid Cowpasture Road congestion.

With increasing demand, Council and the community have expressed concerns regarding the function of Regentville Drive.

The OD surveys suggest the Watts profile humps on Regentville Drive may have displaced through movements to internal roadways. Represented as Route 2 in Figure 2.6, approximately 10% of traffic demand on Regentville Drive (at stations 1 and 3) uses Rosebank Avenue and Newgate Boulevard as an alternate route. Whilst this does internalise movements, it eases the burden on Regentville Drive.

This trend may increase, noting the growth on Regentville Drive and the potential Aviation Road and Middleton Drive link. As such, it is important to consider traffic calming devices that support both speeding and "rut running" trends.

3.2. LATM Considerations

Figure 3.1 is an extract from Austroads Guide to Traffic Management Part 8 and includes a list of LATM devices in common use by local government authorities in Australia, ranging from the most commonly used device and descending to the least commonly used device. This information provides a good indication of the popularity and breadth of application of different LATM devices, and may be useful as a measure of the amount of experience within the industry in their design and construction.

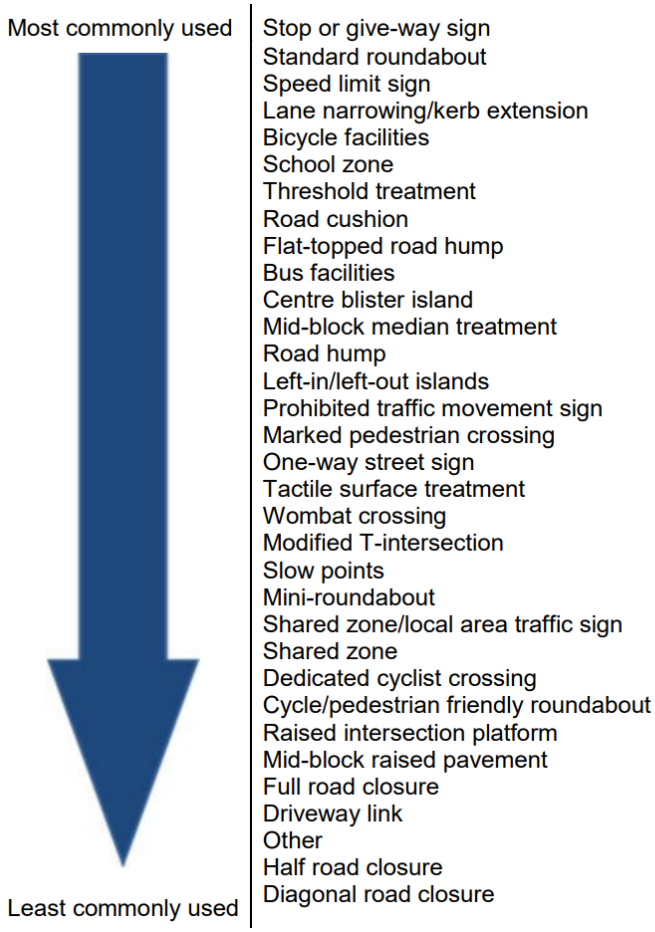


Figure 3.1: LATM devices commonly used by local governments

Table 3.1 lists each device in the LATM toolkit and outlines their relative uses based on previous research and current Australian practice. Adopted devices are outlined in red. The reminder of this section will discuss considerations pertaining road humps, diversion devices, and construction costs.

Road Humps

Vertical deflection devices are the most common physical device, and force vertical changes in the ride alignment or travel path of a vehicle introduced as the result of a physical feature of a roadway. This deflection generally achieves a reduction in vehicle speeds as drivers attempt to avoid discomfort when travelling over the LATM measure. Most popular of which is the road hump. This speed reduction device in the form of a raised curved profile extending across the roadway. Road humps are typically 70 to 120 mm high with a total length of 3 to 4 m. On bus routes and cycle routes a hump height of 75 mm or less and a hump length of at least 3.7 m is recommended.

Careful consideration should be given to the location and design of road humps before committing to their implementation as they are the most often complained about device currently used in Australasia. Vehicle speeds can be significantly reduced when they are correctly placed and designed. They should be installed at right angles to the direction of travel and should extend as close to the kerb as possible allowing sufficient opening for drainage. Road humps should be clearly visible to approaching drivers, illuminated by adequate street lighting, and enhanced by the use of signs, pavement markings, and other delineation. Road humps are a whole-of-street treatment and more than one road hump may be needed where speed reduction is required over the entire length of the street. The spacing of further road humps should be as uniform as possible allowing for side roads and vehicle crossings. Consideration also needs to be given to maintaining drainage paths and providing bypasses for bicycles.

LATM devices should not generally be used as isolated treatments, but rather should ideally be installed as a consistent area-wide traffic management scheme in a local area. A typical LATM scheme includes devices placed at regular and frequent intervals, generally 80 m to 120 m apart on any one street. Isolated devices particularly raise concerns about safety. A traffic-calmed neighbourhood relies partly on the presence of constant reminders about the need to drive slowly. Under these conditions, quite severe traffic control devices and streetscaping innovations can be acceptable, but wider spacings may create isolated obstacles which drivers confront at inappropriate speeds.

Note that Austroads Guide to Traffic Management Part 8 recommends the spacing of road hump devices should not be less than 80 m and generally not more than 120 to 150 m.

Diversion Devices

Diversion devices are used to redirect traffic, typically using physical obstructions in the roadway supplemented by regulatory signs. These measures obstruct specific vehicle movements typically at intersections or mid-block locations to discourage short cutting or through traffic, which may reduce conflicts and vehicle speeds.

This may be achieved with full or half-road closures. A full road closure is the closure of a street to two-way traffic. It serves as a means of eliminating through traffic from a street or simplifying an intersection layout to reduce the possible number of conflict points and the consequent crash risk. The closure can be located at either an intersection or placed mid-block. While half road closures restrict entry or exit to local areas by kerb arrangement and regulatory control to one direction only. Half road closures are used where traffic control

without full restriction to traffic movements is required. Half road closures rely on closing one lane to traffic and may be located either at intersections or mid-block. Their effectiveness relies on drivers obeying regulatory signs prohibiting access through the device.

Table 3.1: Description and use of LATM devices - Adopted devices are outlined in red.

Measure		Reduce speeds	Reduce traffic volume	Reduce crash risk	Increase pedestrian safety	Increase bicycle safety
Vertical deflection devices (Section 7.2)	Road humps	✓	✓	✓	–	–
	Road cushions	✓	✓	✓	–	✓
	Flat-top road humps	✓	✓	✓	–	✓
	Wombat crossings	✓	✓	✓	✓	✓
	Raised pavements	✓	✓	✓	–	✓
Horizontal deflection devices (Section 7.3)	Lane narrowings/kerb extensions	✓	–	–	✓	–
	Slow points	✓	✓	–	–	–
	Centre blister islands	✓	✓	–	✓	–
	Driveway links	✓	✓	–	✓	✓
	Mid-block median treatments	✓	–	✓	✓	✓
	Roundabouts	✓	✓	✓	–	–
Diversion devices (Section 7.4)	Full road closure	–	✓	✓	✓	✓
	Half road closure	–	✓	✓	✓	✓
	Diagonal road closure	–	✓	✓	✓	✓
	Modified T-intersection	✓	✓	✓	✓	✓
	Left-in/left-out islands	–	✓	✓	✓	–
Signs, linemarking and other treatments (Section 7.5)	Speed limit signs	✓	–	✓	✓	✓
	Prohibited traffic movement signs	–	✓	✓	–	✓
	One-way (street) signs	–	✓	✓	✓	–
	Give-way signs	✓	✓	✓	✓	✓
	Stop signs	✓	✓	✓	✓	✓
	Shared zones	✓	✓	–	✓	✓
	School zones	✓	–	✓	✓	✓
	Threshold treatments	✓	✓	✓	–	✓
	Tactile surface treatments	✓	–	–	–	–
	Bicycle facilities	–	–	✓	–	✓
	Bus facilities	–	✓	–	–	–

Another consideration is cost. An example developed by ARRB is provided in Figure 3.5 showing the spread of actual costs reported for various treatments and the relativities between them, escalated to 2015 equivalent numbers using CPI for the construction costs. Road humps are generally an economical efficient option as a traffic calming device, verses road closures and roundabouts which are typically more expensive.

Local Area Traffic Management Device	Construction Cost (2015 AUD$)
Road humps (round profile)	1,000 - 12,000
Flat-topped road humps	3,600 - 24,000
Wombat crossing	3,600 - 36,000
Road cushions	1,200 - 12,000
Raised intersection pavements	9,600 - 60,000
Kerbside lane narrowings / kerb extensions - per 100 m	3,000 - 60,000
Slow points (angled or straight)	2,400 - 48,000
Blister islands	1,200 - 36,000
Driveway links - per 100 m	3,600 - 72,000
Median treatments - per 100 m	600 - 60,000
Roundabouts	6,000 - 480,000
Full road closure	600 - 60,000
Half / part / diagonal road closure	1,800 - 60,000
Modified "T" intersection	6,000 - 300,000
Pedestrian crossings	600 - 60,000
Perimeter threshold treatments	1,200 - 54,000
Tactile surface treatments - per 100 m	1,200 - 30,000
Bicycle lanes / bypasses - per 100 m	600 - 30,000
bus only links / bus bypasses - per 100 m	1,200 - 120,000
Shared zones - per 100 m	1,200 - 180,000

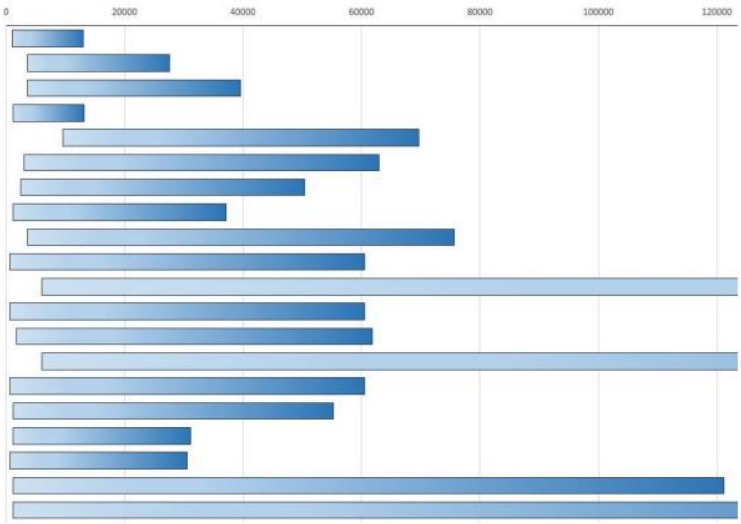


Figure 3.5: Relative LATM device construction costs

3.3. Proposal

The proposed LATM treatments are provided in Appendix A as a strategic concept plan. This plan was formed following multiple iterations and discussions with Council. The plan has also been endorsed by Council's Local Traffic Committee (LTC).

The following treatments are proposed:

- Partial road closures at the Newgate Boulevard and Wixstead Avenue, and Bentwing Avenue and Wixstead Avenue intersections. This will divert southbound Regentville Drive traffic to the Newgate Boulevard, Rosebank Avenue, and Dobroyd Drive collector roadways.
- Roundabout controls at the Rosebank Avenue and Duxford Street, and Dobroyd Drive and Regentville Drive intersections.
- Raised intersection at Rosebank Avenue and Gowanlea Avenue.
- A series of flat-top road humps located around the estate.
- A give way treatment at the Newgate Boulevard and Corduroy Road intersection.

Per Table 3.1, the treatments offer numerous advantages in terms of reducing travel speeds, traffic volumes, and safety. The proposed partial closure devices act to divert traffic from Regentville Drive to estate collector roadways, with expected diversion volumes indicated in Sheet 1 of Appendix A based on 2023 survey data. The primary closure is at the Newgate Boulevard and Wixstead Avenue roundabout, with the secondary closure at Bentwing Avenue and Wixstead Avenue to prevent immediate re-routing back onto Regentville Drive.

Large increases in southbound demand in the order of 400% along Newgate Boulevard and Rosebank Avenue are expected. Traffic will filter back onto Regentville Drive toward the south via side streets, with the majority using Dobroyd Drive. Newgate Boulevard, Rosebank Avenue, and Dobroyd Drive will still operate within their collector road limits.

To supplement the diversion devices, roundabout devices and raised intersections are proposed at critical intersections to support the added volumes. Note a raised intersection was proposed at Rosebank Avenue and Gowanlea Avenue over a roundabout given its use as a bus route and limited turn space provision. Calming in the form of flat-top road humps is proposed to both reduce travel speeds and prevent through traffic using local roadways within the estate. These have been positioned to minimise residential disturbance. Note that Austroads suggests that road humps produce an 85th percentile speed reduction of 45% at the treatment and 21% at the midpoint between treatments. For roundabouts, an 85th percentile speed reduction of 46% at the treatment and 15% at the midpoint between treatments is expected.

Whilst the proposed diversion devices serve Council's objective of reducing Regentville Drive burden, consideration should be given to likely dis-benefits of the scheme. These include reduced network permeability, increased vehicle travel distances, and disturbance to residents located on affected roadways. Council may wish to consider a trial run with temporary closures in this regard.

It is also recommended that the deficiencies sighted in Table 2.5 are addressed, particularly landscaping existing watts profile devices to prevent pedestrian crossing movement complacency.

3.4. Staging

Progression of the LATM scheme follows Step 4 of Table 3.1 of Austroads Part 8 (Discussed in Section 1.3 of this report). After draft scheme approval, the focus turns to detailed design, cost estimates, defining priorities, and establishing timelines. Stakeholder consultation is crucial and involves engaging adjacent residents, service companies, bus companies, and emergency services.

Council has indicated they wish to stage the delivery, thus suggested staging is indicated in Appendix A and includes:

- **Stage 1**: Install partial closure devices and give way treatment at Newgate Boulevard and Corduroy Road.
- **Stage 2**: Delivery of flat-top hump devices.
- **Stage 3**: Delivery of intersection devices including roundabout in raised platform treatments.

Stage 3 imposes the greatest financial burden and thus may be delivered last as funding is sourced. Funding streams, such as the NSW Safer Roads and Federal Blackspot programme may be considered for both proactive and reactive proposals.

4. CONCLUSION

TPE Consulting Pty Ltd was engaged to deliver a comprehensive analysis of the Elizabeth Hills precinct's traffic management infrastructure needs. After evaluation through site visits, data collection, and consultation with the Liverpool City Council, a Local Area Traffic Management (LATM) scheme was proposed to improve road safety and manage increasing traffic demands.

The assessment highlighted key issues such as elevated speeds on collector roads and increasing Average Daily Traffic (ADT) values, notably on Regentville Drive. The proposed LATM measures aim to strategically divert traffic flows, reduce speeds, and enhance safety across the Elizabeth Hills precinct.

The proposed LATM measures are provided in Appendix A and include:

- Partial road closures at Newgate Boulevard and Wixstead Avenue, and Bentwing Avenue and Wixstead Avenue intersections.
- Roundabout controls at Rosebank Avenue and Duxford Street, and Dobroyd Drive and Regentville Drive intersections.
- Raised intersection at Rosebank Avenue and Gowanlea Avenue.
- Flat-top road humps throughout the estate.
- A give way treatment at the Newgate Boulevard and Corduroy Road intersection.

While the proposed measures are promising in their efficacy, careful consideration of potential dis-benefits, such as reduced network permeability and increased travel distances. A pilot trial run of the scheme is recommended for real-time validation.

The LATM scheme comes at a time of evolving transport dynamics within the Elizabeth Hills catchment area, including the potential extension of Aviation Road to Middleton Drive. These changes necessitate continuous monitoring and potentially periodic adjustments to the LATM measures in place.

The execution of the LATM measures may proceed in a staged manner, as indicated in Appendix A, to facilitate both financial feasibility and performance evaluation.

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APPENDIX A

Concept Design of Proposed Traffic Control Devices