Livingstone Shire Council

Local Government Infrastructure Plan

Transport Network Extrinsic Material Report

06/02/2025 – Version 6

Note: This Transport Network Extrinsic Material Report (Version 6) is endorsed by relevant officers of Council's Growth Management and Engineering Services teams to be submitted to Council's Appointed Reviewer as part of the mandatory Compliance Check Process.

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1.0 Background

Livingstone Shire Council has prepared a Local Government Infrastructure Plan (LGIP) in accordance with the *Planning Act 2016* (PA) and associated rules. The LGIP identifies the type, scale, location and timing of development within the Livingstone Shire Council for the period of fifteen (15) years. It also identifies trunk infrastructure to service that growth at the desired standard of service.

The following trunk infrastructure networks are included within the LGIP:

(a) Water supply network
(b) Sewerage network
(c) Transport network
(d) Public parks and land for community facilities network

The Livingstone Shire Council LGIP is Part 4 and Schedule 3 of the Livingstone Planning Scheme 2018.

2.0 Purpose of report

This extrinsic material report has been prepared to assist in the interpretation of the Livingstone Shire Council LGIP. The report summarises the review methodology and inputs used to prepare the **transport network** component of the LGIP and references all background studies and reports relevant to its preparation. The report should be read in conjunction with the document titled *Livingstone Shire Council Local Government Infrastructure Plan Planning Assumptions Report 2023* and other extrinsic material outlined in this document.

3.0 Review methodology

With regard to the review of the transport infrastructure component of the LGIP, the following is a broad outline of the process undertaken:

(1) Review and confirm the suitability of the desired standards of service for trunk infrastructure.
(2) Review and confirm trunk transport infrastructure types for the purpose of LGIP planning.
(3) Review and confirm transport planning service catchments.
(4) Determine transport network demand within identified transport service catchments.
(5) Review and confirm the need for plans for trunk infrastructure to ensure desired standards of service can be achieved.
(6) Estimate the timing and establishment cost of the plans for trunk infrastructure, and include this in a schedule of work.

4.0 Desired Standards of Service

The current Desired Standards of Service (DSS) for the transport network have been reviewed and it is considered that they are appropriate for retention without changes. The DSS ensure that transport infrastructure provision strikes a balance between traffic volumes and the carrying capacity of the network and delivers an acceptable level of service to the local community.

The DSS for the transport network are outlined below. The DSS are to be achieved through Livingstone Shire Council's Road hierarchy and implementation of the adopted standards identified in the Livingstone Planning Scheme 2018.

The transport network contains three integrated systems being roads, public transport and the pedestrian and cycle network. The Desired Standards of Service (DSS) are below.

1) Roads
    a. The desired standards of service apply to all trunk infrastructure roads within the Livingstone Shire Council area in accordance with Table 1.

b. The desired standards of service for trunk roads are largely dependent on the road hierarchy classification, lanes, traffic loading, traffic pattern, and level of service (LOS) (shown in Tables 2 and 3);

2) Public transport
   a. Bus facilities are to include bus stopping treatments and shelters in accordance with Table 1.

3) Pedestrian and cycle network:
   a. Desired standards of service for cycleways and pedestrian pathways concern geometric design considerations required for the construction of trunk infrastructure as defined by on-road and off-road facilities identified in the Capricorn Municipal Development Guidelines, and summarised in Table 1.

4) It is acknowledged that in some cases, due to local circumstances, the desired standards of service may not be met. In these situations, transport trunk infrastructure aims to meet the standards to the greatest degree practicable.

Table 1: Transport Network Desired Standards of Service

Column 1 **Measure**	**Column 2** **Planning criteria** **(qualitative standards)**	**Column 3** **Design criteria** **(quantitative standards)**
Road network design/ planning standards	The road network provides a functional urban and rural hierarchy that supports settlement patterns, commercial and economic activities and freight movement. Design of the road system aims to meet minimum Level of Service (LOS) D at the Planning Horizon Peak Hour Pattern for the particular site.	• Local government road design and development manual/standards/codes in the planning scheme, planning scheme policies and Capricorn Municipal Development Guidelines • The Queensland Department of Transport and Main Roads Road Planning and Design Manual • Australian Standards • AUSTROADS guides • Maximum acceptable degree of saturation for intersections identified in Table 3 or minimum levels of service (LOS) D in Table 2 below. • Level of service (LOS) – Table 2
Public Transport design/ planning standards	Ensure development accommodates the access to and integration of public transport services. Provide bus stops including bus bays, shelters, seating and bus information systems in accordance with Council's adopted standards identified in the planning scheme.	• Local government road design and development manual/standards/codes in the planning scheme, planning scheme policies and Capricorn Municipal Development Guidelines • Design accords with the performance criteria set by Department of Transport and Main Roads • Queensland Government TRANSLINK Public transport infrastructure manual • AUSTROADS guides for road-based public transport and high-occupancy vehicles

Column 1 Measure	Column 2 Planning criteria (qualitative standards)	Column 3 Design criteria (quantitative standards)
Cycleway and pathway design/ planning standards	Cycleways and pathways provide a safe and convenient network that encourages walking and cycling as acceptable travel alternatives. Design of the network will comply with Council's adopted standards identified in the planning scheme.	• Local government road design and development manual/standards/codes in the planning scheme, planning scheme policies and Capricorn Municipal Development Guidelines • Australian Standards • AUSTROADS Guides • Complete Streets

Table 2: Level of Service (LOS) for Trunk Roads, Intersections, Pedestrian and Cycle Networks*

Column 1 Level of service	Column 2 Short description	Column 3 Loading
A	Free flow	< 33 %
B	Reasonably free flow	< 50 %
C	Stable flow	< 65 %
D	Approaching unstable flow	< 80 %
E	Unstable flow	100 %
F	Forced or breakdown flow	

* Refer to Department of Main Road Planning and Design Manual

Table 3: Maximum Degree of Saturation for Road Intersections

Column 1 Road network item	Column 2 Maximum degree of saturation
Traffic signals	0.9
Roundabout	0.85
Priority controlled	0.8
Traffic signals (State-controlled)	0.9

5.0 Transport network planning

The types of infrastructure listed in Table 4 may be considered to be trunk transport infrastructure for the purpose of LGIP planning.

Table 4: Trunk transport infrastructure types

Trunk transport infrastructure types
Roads classified as Urban Arterial, Sub-Arterial, Industrial Collector, Major Urban Collector, Rural Arterial, or Rural Major Collector
Intersections, roundabouts, bridges and culverts associated with a Council owned trunk road specified above

Planning for the transport network includes land acquisition where this is an integral part of a project.

6.0 Planning assumptions

6.1 Development projections

Development projections provide a basis for the planning of transport network infrastructure within identified planning catchments for the Livingstone Shire. Development projections for the Livingstone Shire Council local government area were undertaken and they are documented in the report titled Livingstone Shire Council LGIP Planning Assumptions Report 2023.

6.2 Demand assumptions

The projections of residential development (dwellings) and non-residential development (gross floor area) were sourced from the Livingstone Shire Council Planning Assumptions Model 2021 and these were used as key inputs that were considered as part of the review of the Livingstone Shire transport network and determination of plans for trunk infrastructure. Service catchments were determined, and they are identified in Column 1 of Table 5 below and on service catchment maps (refer to service catchment maps TN-01a, TN-02a, TN-03a and TN-04a).

The trip demand generated within each service catchment was determined and then assumptions about trips on the network to meet this demand were made. Demand for the transport network is expressed in vehicle trips per day (vtpd). A summary of the assumed vehicle trip per day for each transport service catchment is provided in Table 5.

Table 5: Existing and projected demand for each transport service catchment

Column 1	**Column 2**				
Service catchment	**Existing and projected demand (vtpd)**				
	2021 (Existing)	**2026**	**2031**	**2036**	**Ultimate development**
Rural North	23,877	25,517	25,517	25,517	29,974
Rural South	17,994	19,234	19,714	20,134	24,755
Rockyview – The Caves	31,598	33,298	34,738	36,138	45,778
Barlows Hill	3,552	3,772	3,852	4,029	4,454
Barmaryee	5,643	5,569	6,326	6,746	9,387
Causeway Lake	851	877	877	877	877
Cooee Bay	6,669	6,990	7,194	7,194	7,236
Hidden Valley	6,428	9,858	14,198	17,798	39,047
Inverness	1,751	2,161	2,161	2,161	2,311
Lammermoor	13,024	14,859	16,679	18,229	19,497
Meikleville Hill	2,408	2,640	2,767	2,777	3,151
Mulambin	4,429	4,635	4,635	4,665	4,665
Pacific Heights	5,658	7,078	7,718	8,668	9,073
Rosslyn	4,164	4,324	4,363	4,443	16,660
Taranganba	14,336	15,453	16,694	17,294	18,303
Taroomball	4,620	7,470	11,802	19,167	41,082
Yeppoon	106,658	109,430	112,235	114,881	244,161
Emu Park	22,372	23,672	25,595	32,142	100,349
Kinka Beach	6,466	5,301	5,438	5,438	5,438
Zilzie	15,764	18,404	20,572	24,869	63,086

The transport service catchments were identified as either 'Urban' or 'Non-Urban.' The 'Urban' catchments were aggregated to calculate the total 'Urban' demand. This total was then incorporated into the Schedule of Works Financial Model, enabling the calculation of 'urban development costs' for

the transport network in accordance with the Minister's Guidelines and Rules. It is noted that some 'Urban' catchments include 'Non-Urban' areas; however, the minimal demand from these areas is considered acceptable for the purpose of calculating 'urban development costs'.

The service catchment demand projections identified in Table 5 have been prepared by applying the assumed trip generation rates stated in Table 6, to the development assumptions contained within the Livingstone Shire Council Planning Assumptions Model 2021. The trip generation rates were determined following on a review of historic locally adopted trip generation benchmarks for a range of development types.

Table 6: Transport network trip generation rates for a LGIP development type

Column 1 **LGIP development type and other local planning assumption model categories**	**Column 2** **Trip generation rate (vtpd)**
Residential Development	
Dwelling House	10 per dwelling
Multiple Dwelling	6.5 per dwelling
Other Dwelling	6.5 per dwelling
Non-Residential Development	
Major Centre	60 per 100 m^2 GFA
Minor Centre	60 per 100 m^2 GFA
Commercial	10 per 100 m^2 GFA
Retail	60 per 100 m^2 GFA
Industrial	5 per 100 m^2 GFA
Community	30 per 100 m^2 GFA
Other – Car wash	30 per 100 m^2 GFA
Other – Transport Depot	5 per 100 m^2 GFA
Other – Other specialised uses and minor uses	Given the highly diverse range of uses and the unique and highly variable trip generation characteristics, transport demand for specialised uses and minor uses are assessed on a case by case basis.

7.0 Plans for trunk infrastructure

Where it has been assumed that the Desired Standards of Service are unlikely to be achieved, a plan for trunk infrastructure has been identified to rectify the situation. All plans for trunk infrastructure have been identified and mapped (refer to maps TN-01a, TN-02a, TN-03a and TN-04a), and they are included in a schedule of work along with estimates of timing and cost (refer Section 9 of this document).

8.0 Infrastructure costs

The *Planning Act 2016* defines establishment cost of trunk infrastructure to be -

(a) For existing infrastructure –
- *i. The current replacement cost of the infrastructure as reflected in the relevant local government asset register; and*
- *ii. The current value of the land acquired for the infrastructure*

(b) For future infrastructure – all the costs of land acquisition, financing, and design and construction, for the infrastructure

The establishment cost of trunk transport infrastructure has been estimated as per Section 8.1 – Section 8.4 below.

8.1 Cost of land

The establishment cost of existing land used for trunk transport infrastructure was obtained from the Livingstone Shire Council asset register as at 2021.

Where land is required for future trunk transport infrastructure, the establishment cost has been calculated using empirical rates of previous land acquisitions by Council. However, the actual pricing is subject to market variability, reflecting changes in the real estate market conditions and property values.

8.2 Cost of works

The establishment cost of existing trunk transport infrastructure (works) was obtained from the Livingstone Shire Council asset register as at 2021.

The establishment cost of future trunk transport infrastructure (works) was calculated in June 2022 dollars using Council's design estimation template which utilises current established costs and unit rates.

The use of a design estimation template is a common practice in project management. Such templates typically include predefined unit rates, cost factors, and other variables to assist in calculating the total project cost based on the design specifications. By utilising current established costs, the Council ensures that the estimation reflects the most up-to-date pricing for materials, labour, and other resources.

Using these unit rates, the establishment cost of future trunk transport infrastructure was calculated and 3% indexation applied.

8.3 On-cost allowance

On-costs represent the owner's project costs and may include master planning, survey, geotechnical investigations, design, project management, contract administration and environmental investigations. An on-cost allowance of 20% as been applied to future projects within trunk the transport network. This on-cost is consistent with the allowance specified in the Minister's Guidelines and Rules.

No on-cost allowance was applied to land costs within the trunk transport network.

8.4 Contingency allowance

A contingency allowance is included in the establishment cost of future trunk infrastructure to deal with known risks. A contingency allowance of 30% has been applied to future projects within the trunk transport network. This contingency is consistent with the allowance specified in the Minister's Guidelines and Rules.

No contingency allowance was applied to land costs within the trunk transport network.

9.0 Transport network schedule of works

Table 7 provides a list of trunk infrastructure planned for the trunk transport network and included in the LGIP. Trunk infrastructure items that are identified as being delivered as a Potential State Funded Project related to State Controlled roads have been included in Table 7. A Potential State Funded Project related to State Controlled roads may potentially be delivered through a Transport Infrastructure Development Scheme. Potential State Funded Projects do not include an establishment cost.

Table 7: Planned trunk transport infrastructure included in the LGIP

Column 1 Map reference	Column 2 Trunk infrastructure	Column 3 Estimated timing	Column 4 Establishment cost[1]
T-11	Clayton Road (Mulambin Road to Starfish Drive)	2031 - 2032	$3,735,748
T-12	Condon Drive (Rockhampton Road to Adelaide Park Road)	2036 - 2037	$14,189,814
T-27	Taranganba Road (Carige Boulevard - Nara Street)	2031 - 2032	$2,481,718
T-28	Taranganba Road Floodway Upgrade	2031 - 2032	$8,940,507
T-29	Taranganba Road Upgrade (Carige Boulevard - Tanby Road)	2031 - 2032	$7,309,060
T-33	Intersection (Scenic Highway - Mulambin Road)	2036 - 2037	$2,213,464
T-37	Chandler Road (Bottlebrush Drive - Tanby Road)	2031 - 2033	$28,112,345
T-39	Limestone Creek Road (Adelaide Park Road - Neils Road)	2031 - 2032	$5,193,146
T-44	Barmaryee Road (Rockhampton Road - Rail Trail)	2036 - 2037	$4,358,878
T-45	Barmaryee Road (Rail Trail - Neils Road)	2036 - 2037	$13,436,604
T-65	Intersection (Queen Street - Anzac Parade)	2036 - 2037	$2,792,999
T-70	East-West Trunk Road (Rockhampton Road to Tanby Road) - Delivery dependent on grant being received from State Government or Federal Government	2036 - 2042	$197,000,000
T-71	Henry Street Extended (Scenic Highway to Emu Park Road)	2036 - 2037	$6,361,284
T-78	Mulambin Road (Clayton Road - Tanby Road)	2036 - 2038	$18,260,942
T-79	Intersection (James Street - Arthur Street)	2031 - 2032	$1,723,848
T-95	Rail Trail Stage 2 4416 - 5600 - 4416 - **Potential State Funded Project**	2031 - 2032	-
T-96	Malrose Place (Frangipani Drive to Taranganba Road)	2036 - 2037	$5,400,967
T-99	Intersection Adelaide Park - Condon Drive)	2036 - 2037	$2,034,281
T-101	Intersection Chandler - Clayton - **Potential State Funded Project**	2031 - 2032	-
T-114	Intersection (Mulambin Road - Clayton Road)	2036 - 2037	$2,253,192
T-118	Homemaker Drive (Yeppoon Road - Cordingley Street)	2031 - 2032	$5,951,997
T-119	Intersection (Yeppoon Road - Homemaker Drive)	2031 - 2032	$3,142,487
T-120	Underpass (Yeppoon Road - Rail Trail) - **Potential State Funded Project**	2031 - 2032	-

[1] The establishment cost is expressed in cost terms as at June 2022 dollars.

Column 1 Map reference	Column 2 Trunk infrastructure	Column 3 Estimated timing	Column 4 Establishment cost[1]
T-121	Intersection Condon Drive - Bridge & Rail Trail Underpass - **Potential State Funded Project**	2036 - 2037	-
T-122	Intersection (Scenic Highway - Clayton Road)	2036 - 2037	$2,792,999
T-123	Mulambin Road Relocation	2036 - 2037	$5,330,825
T-127	Rail Trail 5600 - 10930 Stg 3 - **Potential State Funded Project**	2036 - 2037	-
T-131	McLaughlin Road (Ramsay Creek to Dawson Road)	2036 - 2039	$32,728,696
T-132	Intersection (Dawson Road - McLaughlin Road)	2036 - 2037	$2,253,192
T-133	McLaughlin Road - Ramsay Creek bridge (LSC 50%)	2036 - 2037	$5,275,264
T-135	Vin E Drive, New, 500m	2036 - 2037	$4,499,487
T-137	Carige Boulevard (Havenwood Drive - Chandler Road)	2026 - 2027	$3,862,249
T-201	The Pines Boulevard (Yeppoon Road - Darambal Road)	2026 - 2027	$4,121,284
T-205	Intersection The Pines Boulevard - Darambal Road	2026 - 2027	$1,513,696
T-210	Intersection (Mulambin Road - Discovery Crescent)	2036 - 2037	$2,034,281
T-213	Intersection (Carige Boulevard - Chandler Road)	2026 - 2027	$1,513,696
T-216	Darambal Road (Part)	2026 - 2027	$5,777,015
TOTAL			**$406,595,965**

10.0 Supporting information

Various information sources assisted with the Transport Network Trunk Infrastructure Review. The key information sources are identified in Table 8 – Transport Network Information Sources.

Table 8 – Transport Network Information Sources

Location	Background/Review Information Sources
Livingstone Shire	The Capricorn Municipal Development Guidelines
	Austroads Guidelines
	Queensland Government TRANSLINK Public transport infrastructure manual
	Road Planning and Design Manual (Queensland Department of Transport and Main Roads)
	Queensland Manual of Uniform Traffic Control Devices (Queensland Department of Transport and Main Roads)
	Australian Standards