

4

Infrastructure



Industrial area, Moree
Courtesy of Moree Plains Shire Council

4



This section provides:

- an overview of the precinct enabling infrastructure
- the principles for planning and designing infrastructure for a proposed development.

It applies to infrastructure projects, subdivisions and development.

- 4.1 Precinct enabling infrastructure
- 4.2 Infrastructure design principles

Timely planning and delivery of infrastructure is essential in supporting development and facilitating growth of businesses within the Moree Special Activation Precinct.

Chapter 4 outlines the obligations and considerations for the planning, designing and delivery of infrastructure within the Moree Special Activation Precinct. It identifies the:

4.1 Precinct enabling infrastructure

An overview of the regional infrastructure facilitating development within the Moree Special Activation Precinct. Infrastructure is envisaged to be provided on a staged basis, with some infrastructure constructed on an interim basis with provision for later upgrade as needed.

A high-level overview of the enabling infrastructure is provided based on the concept design. This may change as part of the detailed investigations, development and finalisation of the infrastructure design. For example, the exact location of the infrastructure may vary depending on site characteristics.

4.2 Infrastructure design principles

Principles for planning and designing infrastructure projects, subdivisions and development:

- i) **main roads and utilities infrastructure** for the precinct will be designed and constructed in accordance with the following standards and requirements of the parties (where applicable) MPSC, Transport for NSW (TfNSW), Australian Rail Track Corporation (ARTC), Essential Energy (EE), Transgrid
- ii) **any infrastructure for a subdivision** (connecting to a main road corridor) is to be carried out to MPSC/EE standards and requirements
- iii) **any roads and utilities within a lot** will be to the lot developers requirements, and to MPSC/EE standards and requirements.

This section should also be read in conjunction with other national, state and local regulatory standards and guidelines for a complete picture of the requirements to successfully deliver infrastructure within the precinct.

Aerial of Moree landscape and roads



4.1 Precinct enabling infrastructure



The staging and delivery of infrastructure across the precinct will be flexible and responsive to the timing of growth and land take up. The corporation is delivering infrastructure for the precinct to create opportunities within the northern portion of the Regional Enterprise Zone, with consideration given to future proofing the Moree Special Activation Precinct.

Regional infrastructure typically services the precinct as a whole and extends across all or part of the Moree Special Activation Precinct. It will be planned and coordinated by the corporation, and delivered either by the corporation, utility providers or State agencies, or as a joint venture with private landowners or developers.

→ This form of infrastructure may include:

- upgrades of existing roads and provision of new road infrastructure, including roads, bridges, intersections, street lighting and other civil structures as required (including provision for integrated active and public transport)
- rail intermodal terminal connections for the northern and southern intermodal terminals
- provision of utilities, including gali-water, sewerage, storm water, electrical, and telecommunications networks
- provision within the road reserve utility corridor for additional utility services including emerging technologies.
- connections for energy generation facilities (solar/hydrogen).
- electrical substation upgrades to allow for connections from generation facilities to the main grid
- allowance for behind the meter connections between businesses
- groundwater extraction wells and storage/mixing tanks
- precinct-wide stormwater management basins (to manage stormwater quantity and quality) within the broader catchment network
- multi-purpose riparian corridors associated with Halls Creek for environmental, cultural and surface gali-water flow/wugawa-flood conveyance purposes with associated shared trails.

Asset	Early enabling works (Map 8.3)	Future enabling works (Map 8.4)
Roads and drainage (including main carriageway, local transverse and longitudinal drainage)	<ul style="list-style-type: none"> • Portion of a new east-west main distributor road (MC01) • Connector road running parallel to the Newell Highway to activate lands adjacent to Moree Airport (that connects the distributor road and the Newell Highway (MC02) • North-south road off the new distributor road with adjacent trunk utility corridor (MC04) • East-west road from Bullus Drive (MC07) • North-south road extending southwards from the distributor road (to access Southern Intermodal) (MC08) • Upgrade of Bullus Road to allow for new road connections north-south and east-west 	<ul style="list-style-type: none"> • Remainder of the distributor road to create a connection for the Precinct between the Newell Highway and the Gywdir Highway • Extension of Bullus Drive southwards to connect to the distributor road (MC03) and the southern intermodal • Upgrade of Burrington Road to connect the southern intermodal with Tapscott Road (MC09) • New east-west local road to service areas identified for future solar energy generation (MC11) • Future road upgrades in the southern portion (e.g. in vicinity of the Moree Water Park) • Future expansion of a bypass road along the southern end of the Southern Intermodal Terminal
Road bridges and culverts	<ul style="list-style-type: none"> • Halls Creek culvert (as part of MC08) (45 Culverts 3 x 2.4 m) 	<ul style="list-style-type: none"> • Moree Intermodal Overpass (MIO) over the Newell Highway to complete the Distributor Road connection between the Newell Highway and the Gywdir Highway (MC01)
Rail	<ul style="list-style-type: none"> • Rail works by ARTC as part of the Narrabri to North Star (N2NS) ARTC Inland Rail project. 	<ul style="list-style-type: none"> • New Broadbent siding that connects to existing Inverell spur line that enable to continue the Broadbent facility loading operation without blocking the MC01 road traffic.
Utilities – potable gali-water (existing town gali-water and new groundwater extraction bore from deep source (Great Artesian Basin))	<ul style="list-style-type: none"> • Upgrade of existing trunk gali-water main from Moree Town to service the Precinct, utilisation of existing reservoir at the southwestern corner of the existing industrial estate • Installation of new gali-water distribution lines • New dhawun-ground reservoirs for town gali-water. • New gali-water booster pump stations (to achieve minimum gali-water pressure requirements) 	<ul style="list-style-type: none"> • Great Artesian Basin Extraction Well and Storage/Mixing Facility (South-Eastern Facility) with associated pumps and electrical • Great Artesian Basin Extraction Well and Storage/Mixing Facility (North-Eastern Facility) with associated pumps and electrical • Cooling Towers for groundwater • Mixing Reservoirs for groundwater and town gali-water
Utilities – sewerage	<ul style="list-style-type: none"> • Sewer gravity mains that connect the Precinct to the existing sewerage pipeline system and the MPSC sewerage treatment facility near Greenbah Oval • Sewer pump stations in the vicinity of various road intersections (SPS) • Sewer lift stations at locations where there is limited grade (SLS) • Rising mains within the road corridor or trunk utility corridor to connect to the existing council pump station in Carol Avenue 	<ul style="list-style-type: none"> • Sewer pump stations (SPS) as required • Sewer lift stations (SLS) as required • Rising mains as required
Utilities – gas	<ul style="list-style-type: none"> • Provision for future gas distribution conduits within trunk utility corridor and road corridor 	N/A

Asset	Early enabling works (Map 8.3)	Future enabling works (Map 8.4)
Utilities – hydrogen	<ul style="list-style-type: none"> Provision for future hydrogen distribution conduits within trunk utility corridor and road corridor 	N/A
Utilities – recycled gali-water	<ul style="list-style-type: none"> Provision for future recycled gali-water distribution conduits within trunk utility corridor and road corridor 	N/A
Utilities – electricity	<ul style="list-style-type: none"> Provision of overhead high voltage (22 kV) supply lines from existing Essential Energy substation Upgrade of Essential Energy transformer and new switch room Provision of overhead low voltage supply for street lighting Provision for future electricity conduits in trunk utility corridor and road corridor (for business-to-business services) 	<ul style="list-style-type: none"> Provision of 132 kV north solar connection via dedicated central utility corridor to connect to existing Transgrid Moree zone substation Upgrade of existing Transgrid Moree zone substation Provision of overhead low voltage supply for street lighting
Utilities – optic fibre	<ul style="list-style-type: none"> Provision of conduits in trunk utility corridor and road corridor for telecommunications services Installation of telecommunications within roadside and trunk utility corridor conduits (NBN) 	<ul style="list-style-type: none"> Provision of conduits in trunk utility corridor and road corridor for telecommunications services Installation of telecommunications within roadside and utility corridor conduits (NBN)
Regional stormwater basin	<ul style="list-style-type: none"> Construction of a 20 ha regional stormwater basin (1.5 m depth) for wugawa-flood detention and gali-water quality treatment 	N/A
Riparian corridor	N/A	<ul style="list-style-type: none"> Creek rehabilitation works for Halls Creek (including cut to fill earthworks as required and revegetation with native species)

4.1.1 Early enabling works and envisaged future enabling works

In general, new infrastructure should expand from the existing assets. As such, development across the precinct will stem from the existing industrial estate in the northern portion of the precinct and grow east and south.

The early enabling works (MIO and Stage 1A/1B) are the initial commitment from the corporation with completion targeted for 2025. The envisaged future enabling works provide a logical guiding framework for future stages of development. It is expected that future enabling works will need to respond to new opportunities and evolve in response to government and business investment, and local and global market demand in coming years, as the Moree Special Activation Precinct develops in its entirety.

The corporation will ensure both the early and future enabling works are planned, designed and constructed in accordance with relevant standards from federal, state, and local authorities and service providers.

The corporation (or other entity as relevant and noted in the table) will deliver the infrastructure in stages.

4.1.2 Infrastructure in advance of enabling works

The precinct will respond to emerging needs and demands. Proposals in the precinct not directly benefiting from Early Enabling Works (out of sequence development) will be considered where the infrastructure appropriately contributes to the precincts infrastructure networks.

Variations may be considered where there is demand for a proposal and the delivery is possible in terms of:

- capacity of the network and branch infrastructure
- cost effectiveness of delivering other enabling infrastructure needed to support the out-of-sequence development
- ability and willingness of parties to contribute to the cost of the infrastructure.

4.2 Infrastructure design principles

Precinct design principles will guide planning projects, subdivision and development across the precinct.

Local infrastructure specifically suits a single development, allotment or subdivision and includes:

- **roads** – required to service new development, including new road connections and property access driveways
- **stormwater management** – on site stormwater detention (up to 1% AEP flows) to be provided within a site along with works to connect the outlet to the precinct stormwater systems
- **electricity supply/connections** – including internal and external works to connect the precinct infrastructure to existing substations
- **telecommunications** – including internal and external works to connect to the precinct networks
- **wastewater networks** - including internal and external works to connect to the precinct infrastructure
- **potable water networks** – including internal and external works to connect to the precinct infrastructure
- **gas and/or hydrogen** – pipelines that connect allow for connection into the future precinct network.

The design

Infrastructure within the Moree Special Activation Precinct will be based on the following principles:

- recognition of and site-specific design for local conditions and constraints:
 - existing terrain is extremely flat (0.1% slope)
 - black soils (vertisols – black earths and grey clays) which are high in clay content – these soils:
 - limit stormwater infiltration and avoid sub-surface drainage systems (particularly for pavements)
 - require specific design approaches for all types of earthworks (including trenching, cut and fill)
 - affect the design of foundations, requiring specialist geotechnical and structural advice
 - affect the design of pavements (for example, requiring a cement or lime stabilised portion of the subgrade of at least 300mm and the need for specialist geotechnical advice in this regard)
 - expansive shallow depth stormwater overland flows
 - riverine flooding associated with the Mehi River and local watercourse flooding associated with its tributaries (such as Halls Creek and Clarkes Creek)
- Design life may necessarily be less than commonly adopted for some early infrastructure that will be replaced when upgraded to accommodate growth in the precinct (such as some roads) but otherwise in accordance with utility requirements and/or Australian Standards
- Design for infrastructure that is installed with a regularly adopted design life should be able withstand the projected effects of climate change, including extreme heat, fire, drought and wugawa-flood.

Flat terrain across the Precinct



View of widespread flooding of Moree from Mehi River in March 2021
Courtesy of Rabbit Hop Films



Black soils (vertisols) are extremely difficult to traverse after rain
Courtesy of Moree Shire Plains Council





4.2.1 Roads and road sections

Roads and road sections in the Moree Special Activation Precinct will be based on the following principles:

- accommodate a B-Triple design vehicle as the largest vehicle servicing within the precinct with the purpose of providing additional connectivity to intermodal terminals, noting future planning for intersection upgrades to BAB-Quad vehicles. Interfaces with the Newell Highway to be designed to accommodate PBS 3A AB-triple vehicles
- roundabouts are to be mountable where required
- cul-de-sacs and temporary turning heads allow continuous turning of AB-Triples without the need for multi-point movements
- road levels set equal to or above the 0.5 per cent Annual Exceedance Probability (AEP) wugawa-flood levels
- pavement design takes into consideration the high centripetal axle loads expected due to large truck turning movements

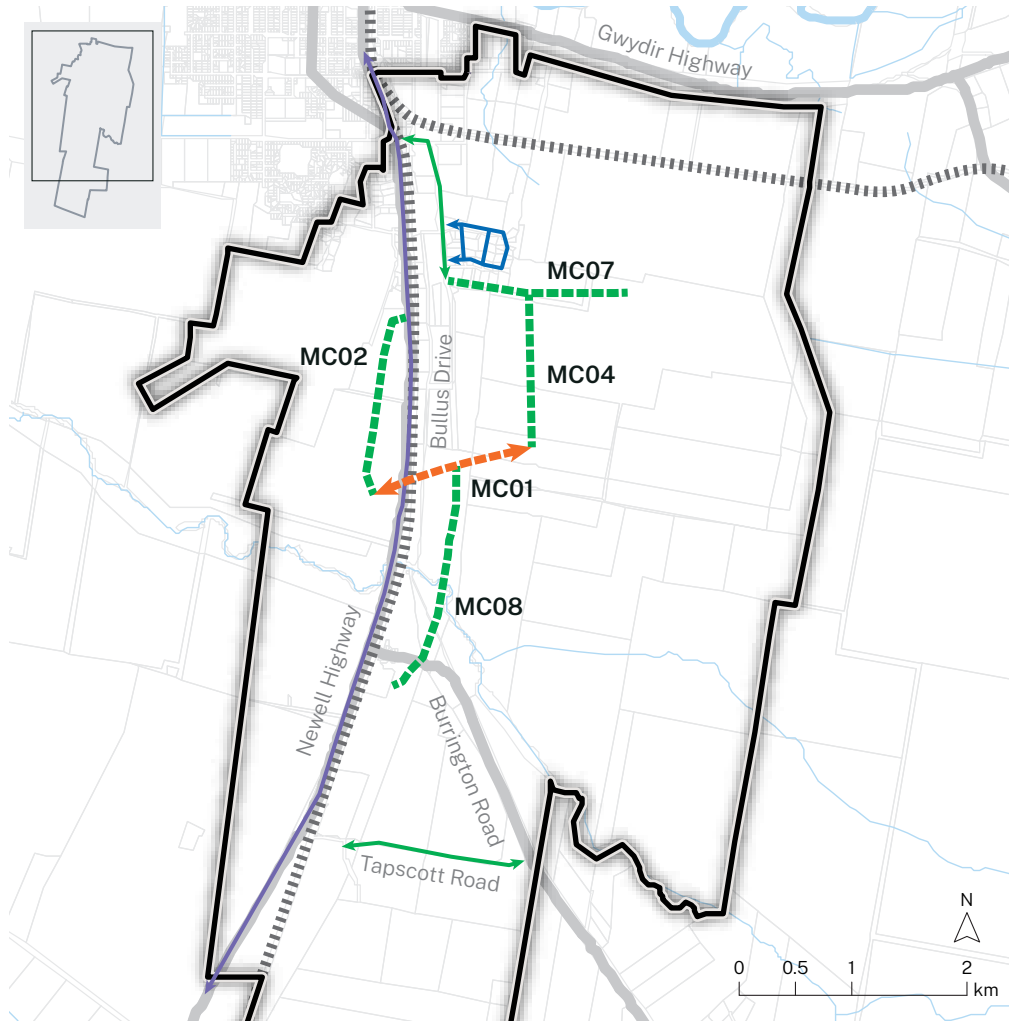
- grade separated crossings across the Newell Highway and Inland Rail line to allow for double-stacking of containers and meet safety requirements as well as those of ARTC
- make use of recycled materials as part of the new pavement profile for road subbase
- works on classified roads are generally limited to intersection upgrades and landscape treatments. These works are to be undertaken in consultation with Transport for NSW
- individual site layouts will provide clear lines of sight for entry points
- public transport stops will be integrated into road verges in appropriate locations including any future commercial nodes, and are to link efficiently with existing network
- intersection design will incorporate the provision of utilities with utilities set back to allow future upgrade of heavy vehicle turning paths.

Figure 8 and 9 respectively show the road hierarchy for the enabling works (early and future works).

Truck on weigh bridge

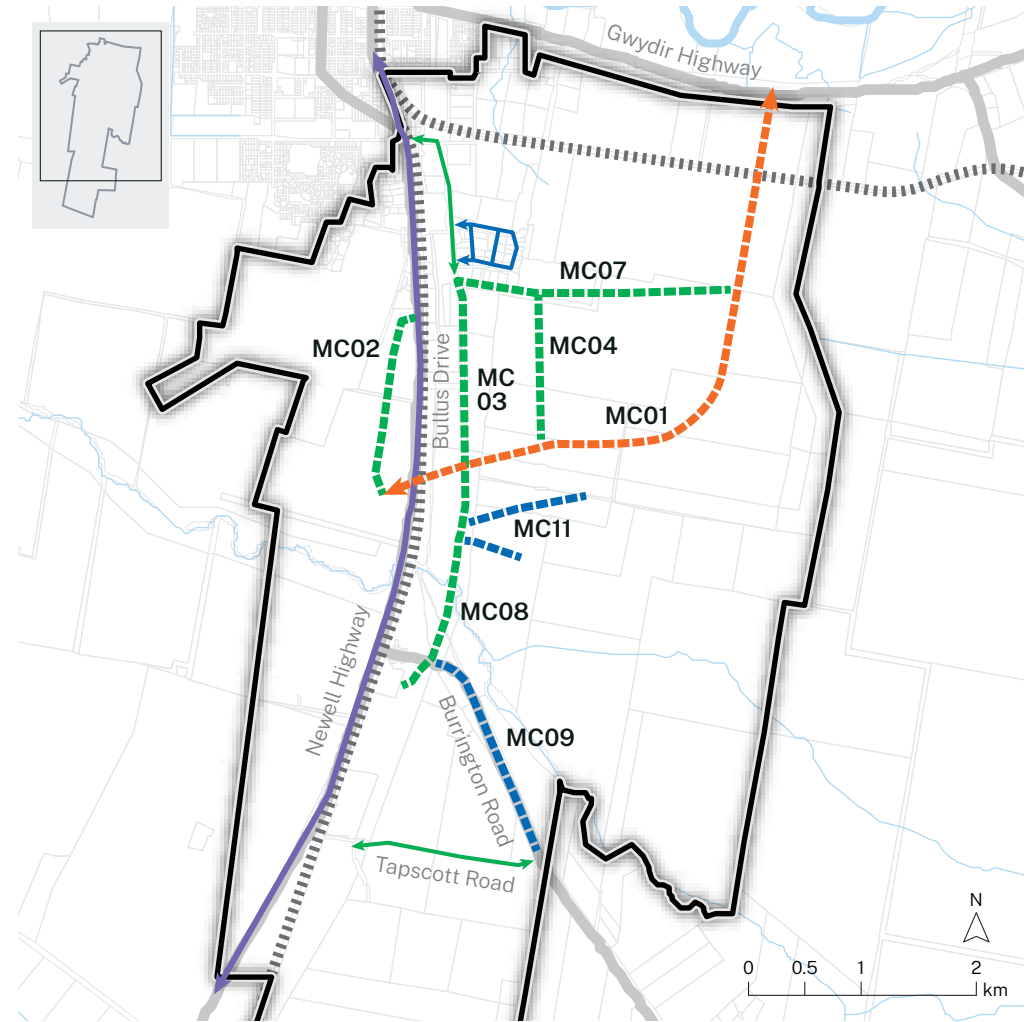


Figure 8: Road hierarchy for early works



- | | | |
|--------------------------------------|-----------------------|-----------------------|
| Special Activation Precinct boundary | Proposed roads | Existing roads |
| Rail | Collector/HPV road | Local road |
| Major roads | Distributor | Collector/HPV road |
| Rivers and creeks | | Newell Highway |

Figure 9: Future road hierarchy



- | | | |
|--------------------------------------|-----------------------|-----------------------|
| Special Activation Precinct boundary | Proposed roads | Existing roads |
| Rail | Rural road | Local road |
| Major roads | Collector/HPV road | Collector/HPV road |
| Rivers and creeks | Distributor | Newell Highway |

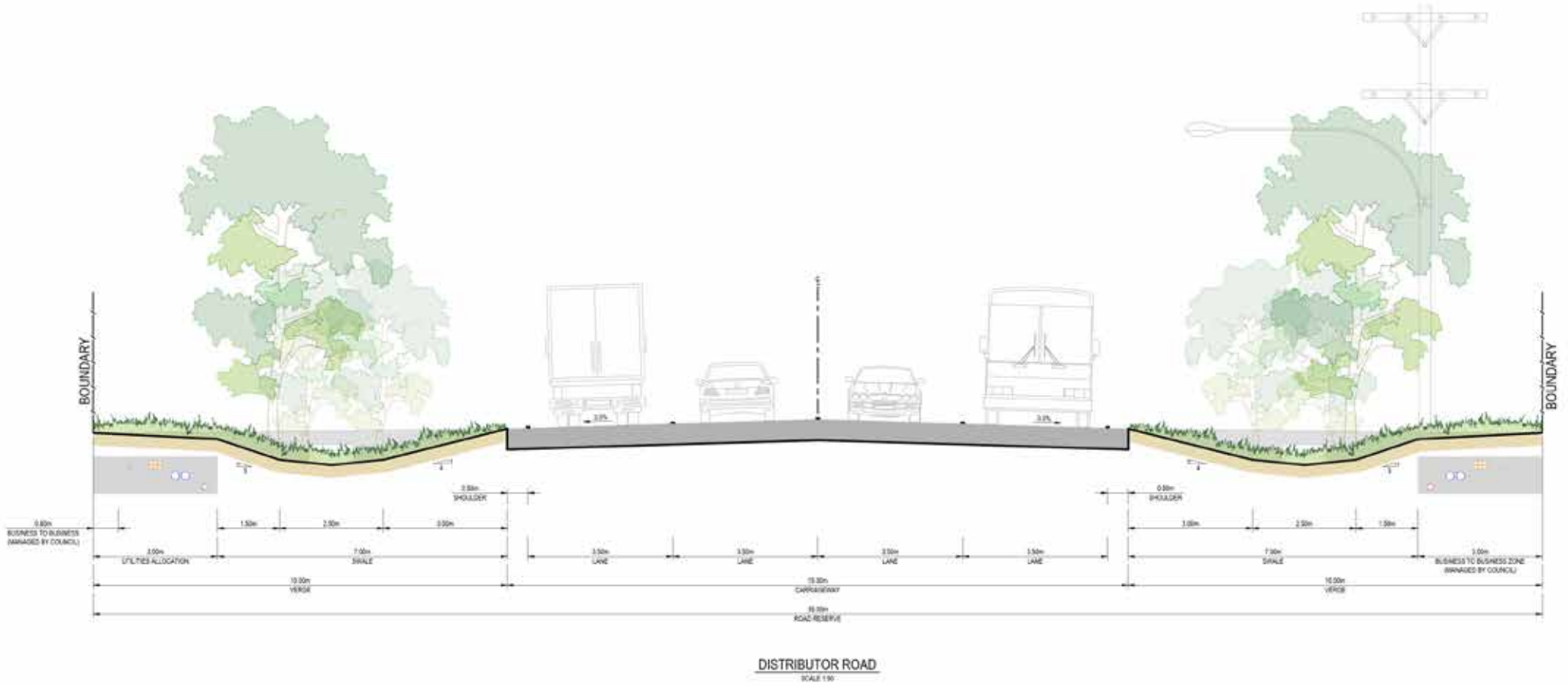
Table 4.1: Road standards of existing road network

Road name	Road classification	Target design speed (km/h)	Number of lanes	Widths			Kerb type
				Road reserve	Carriageway	Verge	
Bullus Drive	Local road	50	2	50 m	8m	10m, 6m	Table drain
Industrial Drive	Local road	50	2	20m	10m	5 m	Existing kerb and gutter
Burrington Road (west of MC08)	Road	50	2	100 m	7m	10m, 6m	Table drain
Tapscott Road	Collector	50	2	50m	9m	6m	Table drain

Table 4.2: Road standards for the new roads as part of the enabling road infrastructure.

Road name	Road classification	Target design speed (km/h)	Number of lanes	Widths			Kerb type
				Road reserve	Carriageway	Verge	
MC01	Distributor	80-100	4	35m	15m	10m,10m	Table drain
MC02	Collector/HPV	50	2	35m	15m	10m,10m	Table drain
MC03	Collector/HPV	50	2	35m	15m	10m,10m	Table drain
MC04	Local	50	2	35m	15m	10m,10m	Table drain
MC07	Local	50	2	35m	15m	10m,10m	Table drain
MC08	Collector/HPV	60	2	35m	15m	10m,10m	Table drain
MC09	Rural	80	2	29m	9m	10m, 10m	-
MC11	Rural	80	2	29m	9m	10m, 10m	-
Ski Park Access Road	Rural	80	2	29m	9m	10m, 10m	-

Figure 10: Distributor road typical section





4.2.2 Rail and intermodals

Rail and intermodal facilities in the Moree Special Activation Precinct will be based on the following principles:

- rail infrastructure within the precinct is designed and installed in accordance with Specifications, Standards and Procedures listed in the ARTC Track and Civil Code of Practice
- ensure all design, materials, equipment and installations relating to rail infrastructure complies with the latest revision of the ARTC Engineering Standards and Australian Standards as relevant
- rail sidings and spurs to incorporate appropriate horizontal and vertical clearances for double-stacked freight trains along the alignment
- ensure for orderly and coordinated provision of rail infrastructure and associated facilities within the precinct.



4.2.3 Stormwater

The management of stormwater in the Moree Special Activation Precinct will be based on the following principles:

Stormwater quantity

- the stormwater quantity strategy is shown conceptually in Figure 11
- stormwater infrastructure includes on-site management measures, along with precinct wide measures that form part of the broader stormwater and wugawa-flood management strategy for the precinct
- on site detention includes the provision of lot scale detention to maintain pre-development flowrates for all events up to and including the 1 per cent AEP event and regional detention basins that will account for the differential between the 1 per cent AEP and the 0.5 per cent AEP runoff
Note: Where development is subsequent to and consistent with an approved subdivision which provides subregional stormwater detention infrastructure up to and including the 1 per cent AEP, site specific detention is not required
- no increase to peak discharges from overland flows or local stormwater runoff from the pre to post development case scenario

- longitudinal drainage swales (bioswales) are provided for the conveyance of stormwater along road alignments. Diversion swales are provided to direct runoff from the local catchments to the regional treatment and detention facility
- cross drainage culverts sized to provide a 0.5 per cent AEP wugawa-flood immunity at waterway crossings to minimise road access disruption within the precinct.

Stormwater quality

- the stormwater quality strategy is shown conceptually in Figure 12
- regional measures include the use of roadside drainage swales (bioswales), the provision of a large gross pollutant trap on the inlet to the regional basin (as a means of primary treatment) with a bioretention filter at the base of the regional detention basin to target finer sediment and nutrients
- proposed lot scale treatment includes rainwater tanks to capture roof runoff for landscape irrigation and internal re-use
- site runoff from certain industrial uses may need additional on-site treatment to achieve precinct water quality objectives

- impacts to groundwater resources will be managed by treating runoff from the developed catchments and, where relevant, site runoff from certain industrial sites may need additional on-site treatment to achieve precinct water quality objectives. The volume of runoff that will ultimately infiltrate to groundwater is intended to be maintained as it is directed to the riparian corridors
- during construction, erosion and sediment controls will be required in accordance with guidelines such as Managing Urban Stormwater Soils and Construction - Volume 1 (Urban Development, Landcom, 2004), or 2A (Installation of Services, DECC, 2008a) or 2D (Main Roads, DECC, 2008b).

Figure 11:
Stormwater quantity strategy

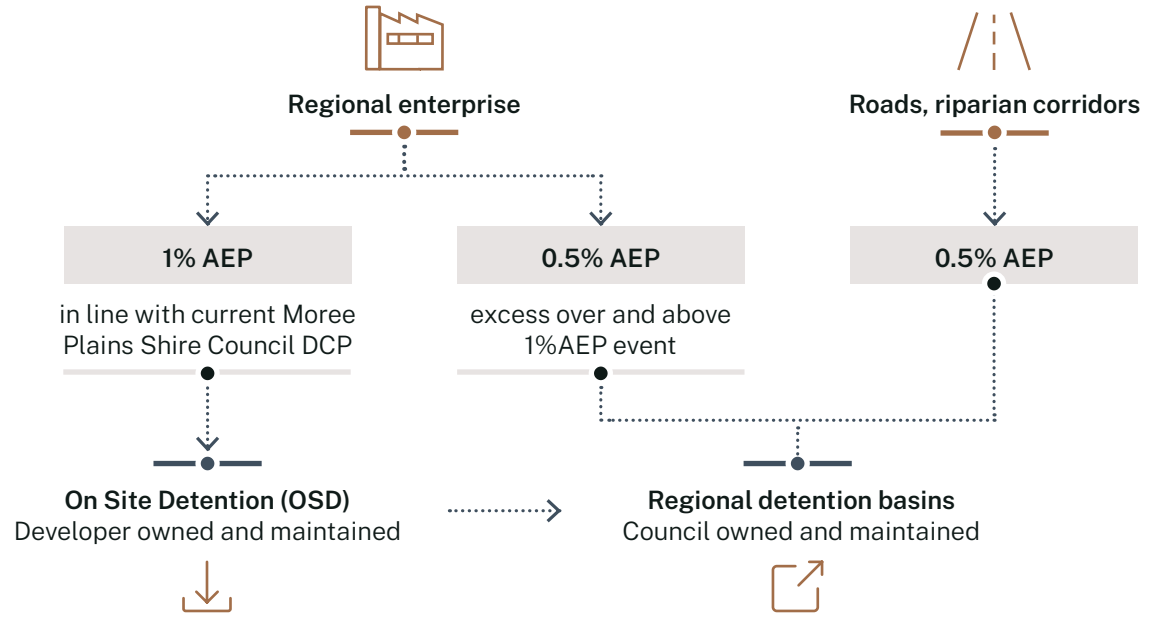
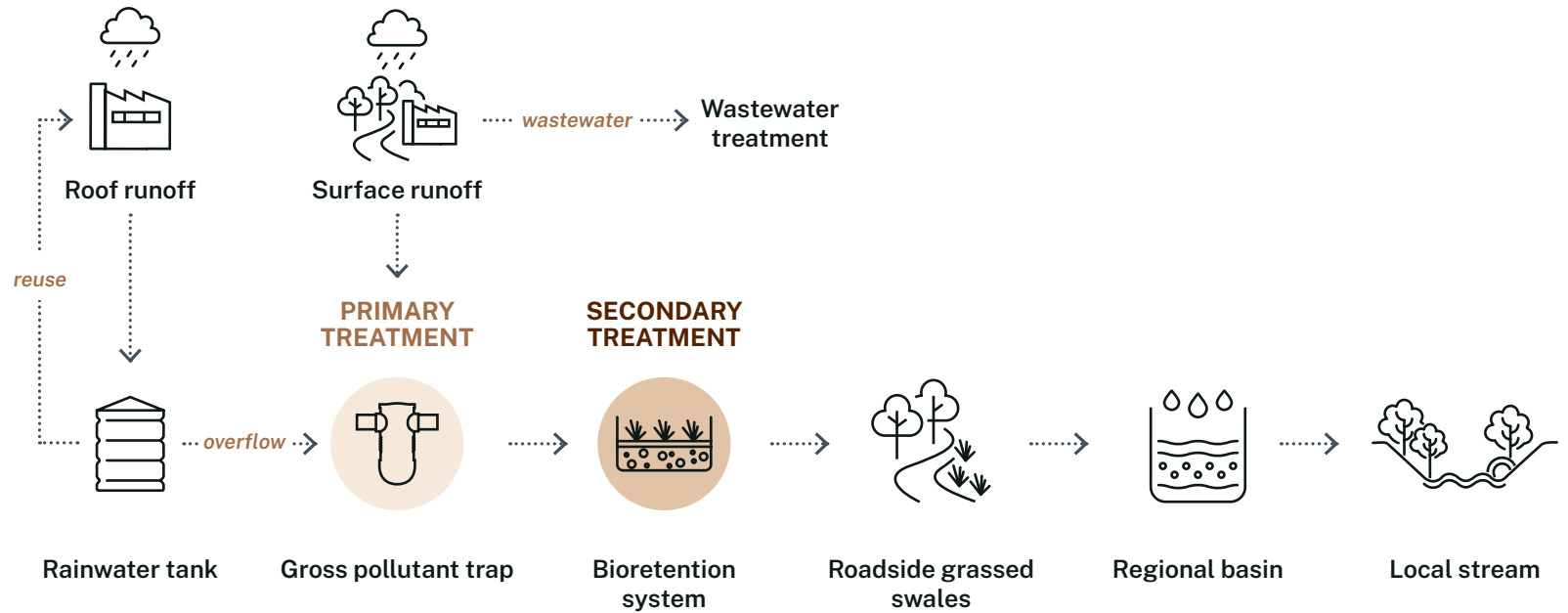


Figure 12:
Stormwater volume and quality strategy



4.2.4 Electrical

Electrical services in the Moree Special Activation Precinct will be based on the following principles:

- supply will be provided from an existing Essential Energy 66/22 kV zone substation to the precinct. This substation is supplied from two 66 kV sub-transmission lines from the TransGrid Moree bulk supply substation (feeder numbers 721 and 722), each rated at 64MVA
- electrical transmission and distribution infrastructure to connect to these existing facilities will be provided by the corporation across the precinct to cater for the additional loads, which are estimated to be over 300 per cent of the existing load. The distribution service will be provided as either high voltage or low voltage services (e.g for street lighting)
- high voltage/low voltage utilities are to be designed in accordance with Australian and prevailing utility standards, noting that specific requirements for designs will be defined within information work packs issued by each utility prior to the commencement of detailed design

- services will be designed in accordance with the following Australian Standards (AS) relating to substation and overhead line design:
 - AS2067: Substations and High Voltage Installations
 - AS3000: Wiring Rules
 - AS/NZS7000: Overhead Line Design.

Existing overhead electricity network in the southern areas of the precinct
Courtesy of Rhelm



Existing overhead electricity network in the northern areas of the precinct
Courtesy of Rhelm





4.2.5 Lighting

Lighting in the Moree Special Activation Precinct will be based on the following principles:

- street lighting will be provided along the distributor road and local roads, along with all intersections
- street lighting will be provided to all shared use paths where standalone lighting is required
- smart lighting/sustainable lighting should be encouraged.



4.2.6 Gali-Water

Gali-Water supply in the Moree Special Activation Precinct will be based on the following principles:

- provision of gali-water to the precinct will initially be via an upgrade of the existing trunk gali-water main from Moree township (operated by Moree Plains Shire Council) and the existing reservoir at the southwestern corner of the existing industrial estate. From this upgraded line a series of new gali-water distribution lines will be installed in the road reserve and within the trunk utility corridor
- town gali-water is to be supplied to ANZECC drinking gali-water quality standards
- due to the flat topography of the precinct (and the region in general), town gali-water will be stored in new and upgraded dhawun-ground reservoirs
- new reservoirs proposed to be provided with associated booster pump stations, which will be sized to meet peak day demand (PDD) volumes and level of service pressure heads
- when demand increases, additional gali-water will be sourced from new deep wells extracting gali-water from the Great Artesian Basin (GAB) groundwater source. GAB

gali-water is not deemed to be at drinking gali-water standard due to a high total dissolved solids (TDS) and high hardness content, resulting in the need for mixing with other gali-water sources. GAB is also hotter and requires cooling towers to reduce the temperature before it is distributed for use. GAB will be chlorinated and disinfected and mixed with town gali-water at appropriately located dhawun-ground reservoirs

- no new groundwater extraction from the Lower Gwydir Alluvium groundwater source is to occur for any purpose. This source is already fully allocated
- potable gali-water storage and reticulation is to be designed in accordance with national standard specifications defined by the Water Services Association (WSA) of Australia. When further details are required the following standards and guidelines should be used:
 - WSA 03-2011-3.1 Water Supply Code of Australia (Sydney Water Edition 2014)
 - WSA 02-2002-2.2 Sewage Code of Australia (Sydney Water Edition 1 version4)
 - WSA-04-2005-2.1 Sewage Pumping Stations

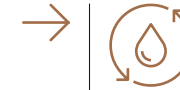
- PVC-M PN18 (for town) and DICL PN35 (for GAB sources) pipes to be provided for potable gali-water reticulation for all types of gali-water demand (potable, industrial, horticultural)
- fire flow requirements for a number of industries are significant and therefore these demands are proposed to be managed by each site owner/operator as required via fire tanks. Onsite tanks are to be filled from the potable supply and the onsite fire tanks to be sized to meet Australian Standards and Rural Fire Services (RFS) requirements.



4.2.7 Wastewater

Wastewater in the Moree Special Activation Precinct will be based on the following principles:

- use of a gravity trunk network and maximise the areas serviced by gravity connections. Sewer pumping stations (submersible with wet well) are to be in the vicinity of new road intersections wherever possible and shall be wugawa-flood-proofed to the 0.2%AEP wugawa-flood level
- wastewater system will connect to the existing wastewater treatment plant (WWTP) in Moree (operated by Moree Plains Shire Council)
- alternately, a pressure sewer system may be delivered by the Corporation/ Council given the very low grades in the precinct
- key standards of design are:
 - gravity Mains no deeper than 10 metres
 - pump stations no deeper than 15 metres
 - allowance for septicity management as required using proposed sewer pumping station infrastructure i.e. chemical dosing, pump run times
- the Corporation will provide further trunk sewerage infrastructure developed in stages as growth occurs
- Sewer systems are to be designed in accordance with national standard specifications defined by the Water Services Association (WSA) of Australia. Where further details are required the following standards and guidelines should be used:
 - WSA 02-2002-2.2 Sewage Code of Australia (Sydney Water Edition 1 version 4)
 - WSA-04-2005-2.1 Sewage Pumping Stations
- discharge to the wastewater network will require a trade waste agreement with Moree Plains Shire Council
- onsite treatment is proposed for areas that are beyond the centralised sewer system collection zones and where the Equivalent Population (EP) on this site is expected to be low (less than 25). Specific design will be required and discharge will need to be limited given local soil conditions and facilities will require approval by Council.



4.2.8 Recycled gali-water

Recycled gali-water in the Moree Special Activation Precinct will be based on the following principles:

- where recycled gali-water is produced, it should meet the required quality for the intended end use
- where relevant, recycled customers will be responsible for building their recycled infrastructure connecting to the proposed trunk network
- recycled gali-water reticulation to be designed in accordance with WASA (Water Services Association of Australia) standards.

A centralised recycled gali-water plant is not currently anticipated for the precinct.



4.2.9 Biogas

Biogas in the Moree Special Activation Precinct will be based on the following principles:

- a space allocation has been provided within standard services allocations along all new roads for a future gas service if required. This allocation could support a potential biogas system if one was to be constructed. A future biogas facility could potentially be located near an electrical substation and would allow ready access to the Newell Highway via the proposed MIO as well as close proximity to the southern intermodal.
- any future gas network to be designed.



4.2.10 Telecommunications

Telecommunications in the Moree Special Activation Precinct will be based on the following principles:

- conduits are to be installed within the trunk utility corridor and the road corridor to enable optic fibre installations (NBN)
- where appropriate, all infrastructure should be provided with digital connectivity access to allow for ease of performance monitoring and communication between networks to improve operational efficiency, enabling secure and high-speed digital connectivity.



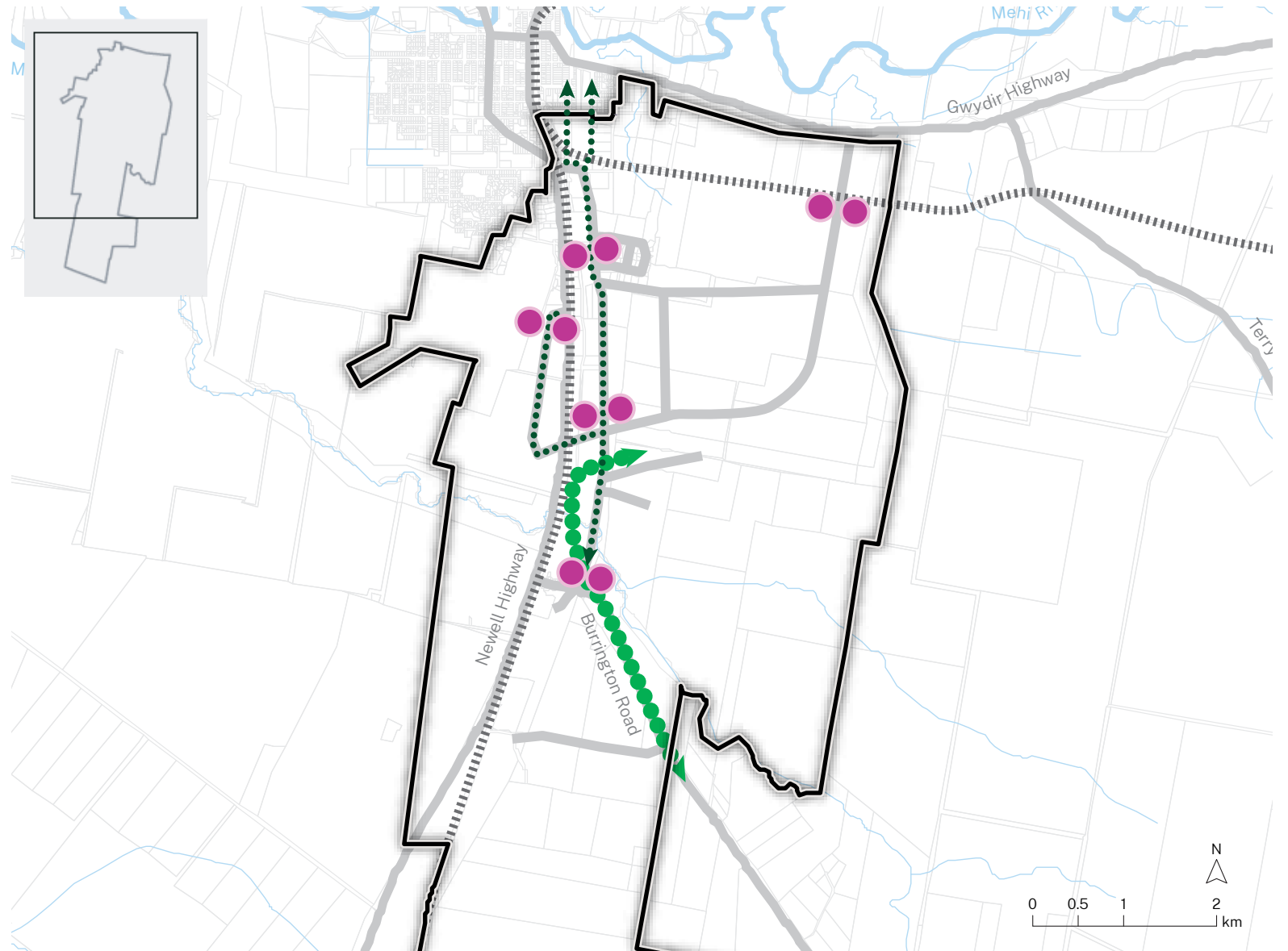
4.2.11 Active and public transport

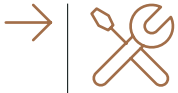
Active and public transport in the Moree Special Activation Precinct will be based on the following principles:

- individual site layouts will provide clear lines of sight for entry points and public shared use paths
- roads designed to incorporate provision in the shoulder for shared user paths
- public transport stops will be integrated into road verges in appropriate locations to support the on-demand bus services
- active transport should be encouraged within the precinct and where this occurs in the future there is to be provision of end of trip facilities
- future commercial nodes are to provide bus route connections, which link efficiently with existing network and bus on demand services
- taxi zones/ride share are to be located at each future commercial node. A specific pick up and drop off zone should be easily visible and accessible for all users with appropriate signage and lighting provided
- future preservation of a 'off road green corridor' for recreational purposes such as off-road cycling, walking and bridle trails.

Figure 13: Active and public transport network

- Special Activation Precinct boundary
- ▬▬▬▬ Rail
- Roads
- Rivers and creeks
- ⋯⋯⋯ Future shared user path
- Off road green corridor
- Bus stops





4.2.12 Utilities and services trunk corridor

The utilities and services trunk corridor in the Moree Special Activation Precinct will be based on the following principles:

- a north-south services corridor will be provided adjacent to the north south road off the distributor road to support new underground services required to activate the precinct including:
 - gali-water main
 - telecommunications
 - future services such as
 - recycled gali-water main
 - gas pipeline
 - hydrogen
 - unknown future pipes/ conduits
- the new underground services will be organised inside the services corridor in accordance with the NSW Streets Opening Coordination Council Guide 2018
- the services corridor will be approximately 10 metres in width and is to be accommodated adjacent to the road reserve
- the services corridor to be grassed or covered with low level plantings that can easily and cost effectively be removed and replaced if required
- no dhulu-tree should be planted above the services corridor but may be in the vicinity, providing the appropriate authority's protection measurements for the assets that are implemented. If dhulu-trees are in the vicinity of services, root barriers are required to protect the asset as well as any extra protection deemed by the asset authority
- the design, operation, maintenance and protection of new utilities will be in accordance with the specifications of the different asset owners for the entire precinct
- every asset will have the required space as per the asset owner specifications and enough clearance from other services to protect and allow maintenance activities, as well as easy access for replacement, if required
- the sequencing and staging of the services will be as per the specification of the various asset owners, and in coordination with the overall construction program.

4.2.13 Other considerations

Other considerations should include:

Cost effectiveness

- the costs and standards for infrastructure design and construction should address the appropriate lifespan. Designs should achieve efficiencies in maintenance without over scoping and unnecessarily increasing development costs within the precinct.

Future proofing

- infrastructure planning should accommodate the anticipated demand for each stage, without compromising future development potential, or significant capital investment costs for upgrading or replacing infrastructure ahead of its planned lifespan.

Infrastructure should be fit-for-purpose and provide value for money

infrastructure design should embrace innovation and future change, without introducing onerous construction and operation costs.

4.2.14 A collaborative approach

One of the primary functions of the corporation is to facilitate and deliver infrastructure. This is in the context of the broader network management framework of regulated utility providers, state agencies and Moree Plains Shire Council.

The corporation recommends that proponents collaborate in planning and designing of infrastructure with the ultimate asset owners. This will ensure consistency with both the precinct objectives and individual utility and authority objectives and requirements.

The corporation will coordinate consultation for works it will undertake. Each proponent will be responsible for consultation work related to their own individual developments.

