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Transport Planning | Policy & Strategy
Project Management & Delivery

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Dear Taylor,

Gilead Planning Proposal – Strategic Transport Review

This letter provides a high-level review of the strategic transport and urban structure context for Gilead as part of Planning Proposal submittal. The purpose of the letter is to examine the wider emerging land use and transport network context for the Greater Macarthur Growth Area (GMGA) serving the Gilead Priority Precinct. This will inform the identification of the broader area-wide interventions to the transport system already identified in the G*MGA 2040 Plan* serving the Gilead development site and its interface with the surrounding access network.

A more detailed Traffic and Transport Assessment (TTA) for the Gilead Priority Precinct will need to be undertaken to inform the identification of finer local grain interventions to the transport system serving the site and the masterplan layout of key elements of the access network within the Gilead Priority Precinct. As advised during the Technical Assurance Process (TAP), the TTA will need to be undertaken as part of the future masterplanning process, when more detailed existing strategic and operational modelling inputs become available by Transport for NSW.

In this context, several relevant established transport models exist for the OSO Stage 2 (Appin to Illawarra) and *GMGA 2040 Plan* (Public Transport Project Model and Greater Macarthur (Aimsun) Mesoscopic Model respectively) which includes the Gilead Priority Precinct. The timing and release of these established models is still unknown and were not made available to proponent at the time of preparing the Gilead Planning Proposal.

This letter and the high-level transport review has been structured as follows:

- Review the strategic land use and transport context for Gilead focusing on emerging metropolitan transport networks and urban structure
- Review of the preliminary urban structure concept for Gilead Priority Precinct and its alignment with *GMGA 2040 Plan*
- Planning and guidance on the TTA process and transport modelling framework (next steps) to confirm the Gilead TTA scope and methodology approach

Background

Greater Macarthur has been identified as Growth Area by the NSW Government and will provide for 60,000 new homes to the broader south Campbelltown region. Lendlease's landholding at Gilead has been identified as a Priority Precinct, Gilead will make the first

contribution to housing supply in the region of approximately 3,300 new homes, retail centre and education facilities. Importantly, it will secure key conservation outcomes including the establishment of linked fauna corridors between the Georges River and Nepean River.

To facilitate both the housing and conservation outcomes for the site, a Planning Proposal is being prepared to rezone under the State Environmental Planning Policy (Precincts – Western Parkland City) 2021. The Planning Proposal will establish the Urban Development Zone for land capable of development and introduce a C2 Environmental Conservation zone for land containing key fauna habitat to be retained as well as land that native bushland is to be reconstructed. This report specifically addresses the high-level strategic transport review and has been used to shape and inform the Planning Proposal and associated development outcomes.

The Site consists of five properties including Lot 2 in DP 1218887, Lot 2 in DP 249393, Lot 1 DP603675, Lot 2 DP603674 and part of Lot 5 in DP 1240836 that have a combined area of 495ha. Access to the Site is provided by a battle axe handle on the eastern side of Lot 2 in DP 1218887 that connects to Appin Road. Access to the Site is also provided via an easement over land to the east that will be formalised through public roads being delivered by Lendlease as part of their Figtree Hill development. A minor portion of the Site (Lot 2 in DP 249393) has frontage to the Hume Highway and is accessed from Medhurst Road. The preliminary structure plan for the Gilead as part of the Planning Proposal is shown in **Figure 1**.

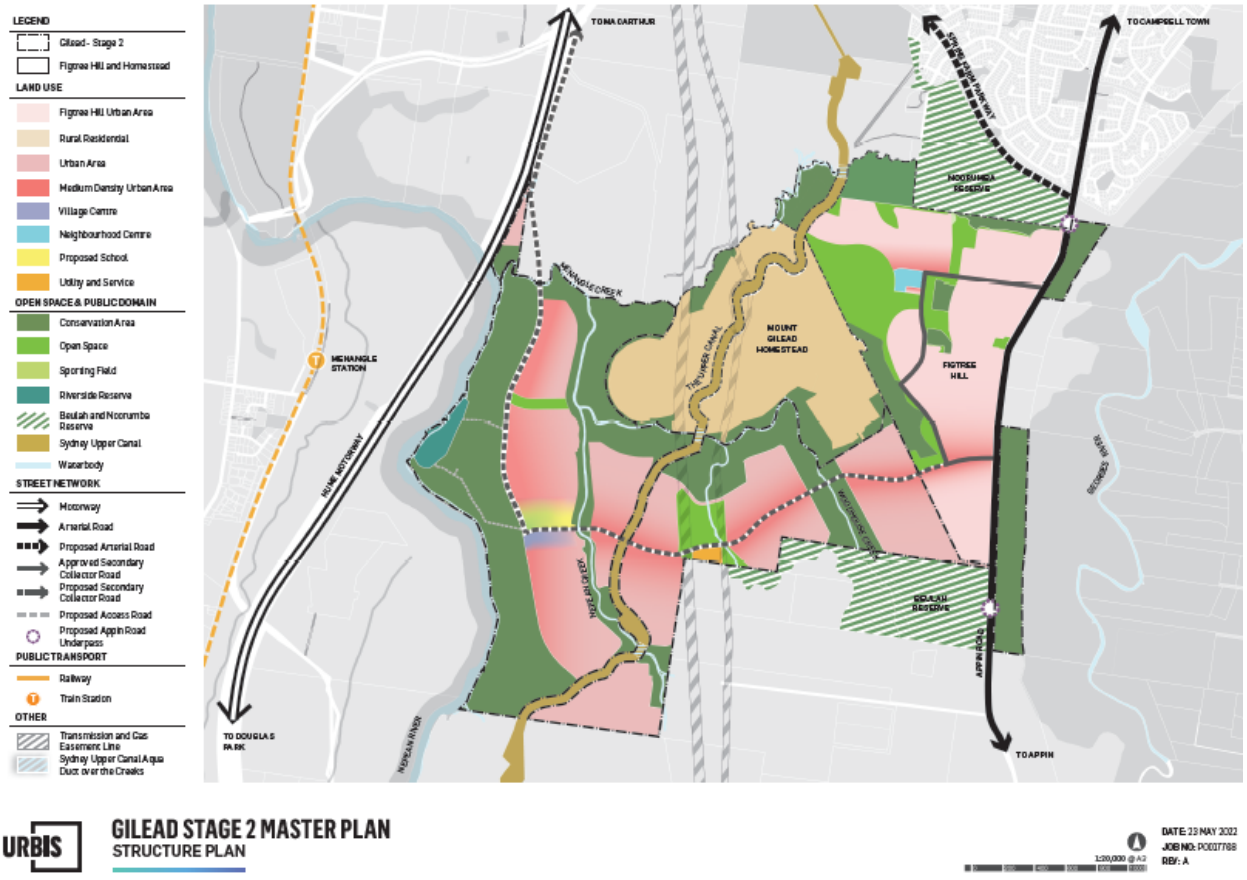

Figure 1 – Gilead Structure Plan (source: Urbis)

GMGA 2040 Plan Strategic Planning – Land Use and Transport Context

Population and growth assumptions

The *Greater Macarthur Growth Area (GMGA) 2040 Plan* and *Greater Macarthur Investigation Area (GMIA) Strategic Transport Infrastructure Study (2018)* developed on behalf of the Department of Planning and Environment (DPE) determined the key transport infrastructure and services required for the successful establishment of over 60,000 new dwellings and 37,000 jobs within the *Greater Macarthur Growth Area* (comprising the sub-precincts of Menangle Park, Mt Gilead, Appin and Wilton). The strategy provided a land use and staging plan for the GMGA to give the NSW government an indication of how development will be staged with infrastructure and services provision over the next 20+ years.

The residential and dwelling projections for 2026, 2036 and 2051 used for the *GMGA 2040 Plan and GMIA Strategic Transport Infrastructure Study* are shown in **Figure 2**. Key findings relevant to Gilead Priority Precinct are:

- The GMGA land use scenario was tested for a combined residential population of 160,000 broadly equivalent to 60,000 dwellings for Mt Gilead, Menangle Park, Appin and Wilton combined (based on average household size of 2.67 persons per new dwelling).
- A projected growth in the Mt Gilead sub-precinct residential population from 12,000 (4,494 new dwellings) in 2026 to 46,000 (17,228 new dwellings) in 2051.
- The potential growth of the Gilead Priority Precinct (circa 3,300 new homes) has already been included in the recent GMIA transport strategy and transport modelling for the *GMGA 2040 Plan* as part of the Mt Gilead sub-precinct.
- Gilead development site comprises only 20% (3,300 new dwellings) of the total planned development for the entire Mt Gilead sub-precinct (17,228 new dwellings) as adopted with the *GMGA 2040 Plan.*

Year	Population Growth	Total Dwellings
Menangle Park		
2026	12,000	5,243
2036	14,000	
2051	14,000	
Mt Gilead		
2026	12,000	17,228
2036	31,000	
2051	46,000	
West Appin		
2026	0	22,471
2036	25,000	
2051	60,000	
Wilton		
2026	17,000	14,981
2036	31,000	
2051	40,000	
Total	**160,000**	**60,000**

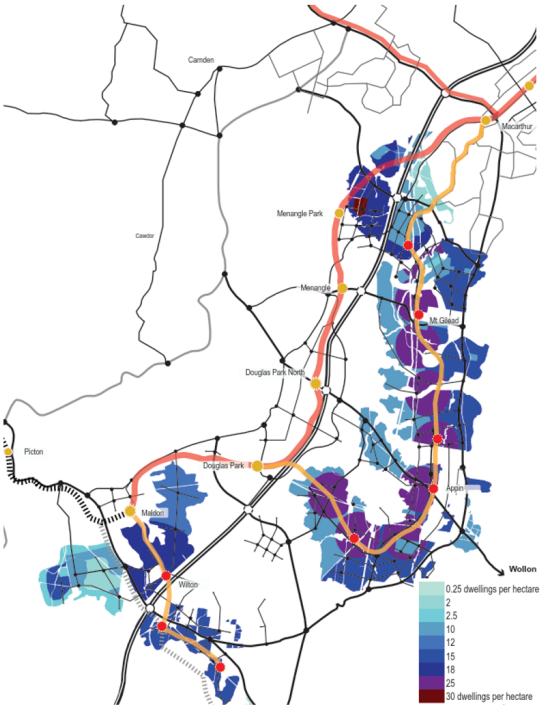

Figure 2 - Population growth assumptions for GMGA (source: GMIA Strategic Transport Study)

Travel demand and trip generation

The *Greater Macarthur Growth Area (GMGA) 2040 Plan* and *Greater Macarthur Investigation Area (GMIA) Strategic Transport Infrastructure Study (2018)* included the growth in travel associated with the increased residential dwellings for Mt Gilead sub-precinct (17,228 dwellings) including the subject Gilead development site comprising 3,300 new dwellings. The total peak hour traffic generation potential adopted for the entire *GMGA Plan 2040* and subsequent modelling for the AM and PM peak for 2026, 2036 and 2051 is shown in **Table 1**.

Table 1 - GMGA total traffic generation potential (source: GMIA Strategic Transport Study)

Area	2026 AM		2036 AM		2051 AM	
	In	Out	In	Out	In	Out
Menangle Park	1,406	2,484	947	2,392	1,157	2,514
Gilead	1,782	3,405	1,981	6,410	2,593	8,119
West Appin	891	383	2,452	5,999	4,676	12,711
Wilton	5,095	6,516	5,832	9,255	7,186	10,850
Total	**9,174**	**12,788**	**11,212**	**24,056**	**15,611**	**34,194**

Area	2026 PM		2036 PM		2051 PM	
	In	Out	In	Out	In	Out
Menangle Park	2,592	848	2,758	1,178	2,961	1,476
Gilead	3,634	1,130	6,957	2,257	8,656	2,896
West Appin	533	719	6,764	2,922	13,590	5,334
Wilton	7,329	5,612	11,590	8,956	13,860	11,681
Total	**14,088**	**8,309**	**28,069**	**15,313**	**39,067**	**21,387**

Key findings relevant to Gilead Priority Precinct are:

- The total peak traffic generation potential for the entire Mt Gilead sub-precinct for horizon year 2051 was in the order 10,712 vtph and 11,552 vtph during the AM and PM peak respectively.
- Application of the GMGA traffic generation rates adopted for low density residential dwellings of 0.75 and 0.85 trips per dwelling for the AM and PM peak periods, yields a traffic generation potential of 2,475 vtph (495 In and 1,980 Out) and 2,805 vtph (2,244 In and 561 Out) during the AM and PM peak period respectively for Gilead site.
- The Gilead site comprises only 24% of the total traffic generation potential for the entire Mt Gilead sub-precinct and has already been included in the previous Greater Macarthur (Aimsun) Mesoscopic Model which was used to underpin the *GMGA 2040 Plan*.
- The increase in traffic generated by Gilead site will be modest when compared to the overall Mt Gilead sub-precinct and should not adversely effect the infrastructure and operational performance of the surrounding higher order road network (i.e. Appin Road, Menangle Road, Spring Farm Link Road and M31 Hume Motorway) already determined within the *GMGA 2040 Plan*.

Transport infrastructure and services

The level of access, mobility and transport infrastructure to, from and within Gilead development site has been accounted for in previous Greater Macarthur (Aimsun) Mesoscopic Model for Appin Road, Medhurst Road, Menangle Road, and the M31 Hume Motorway. The key recommended transport infrastructure and services requirements adopted for the northern part of the *GMGA 2040 Plan* (i.e. Mt Gilead and Menangle Park sub-precincts) to accommodate up to 23,000 new dwellings including the Gilead development site is shown in **Figure 3**.

ID	Location	Description
1	Picton Road	Widened to 2 lanes in each direction
2	Hume Motorway	Widened to 3 lanes in each direction
3	Spring Farm Parkway	New arterial road with 2 lanes in each direction
4	Spring Farm Parkway Interchange	Full grade separated interchange with Hume Motorway. North and south facing ramps
5	Appin Road - North	Widened to 2 lanes in each direction
6	Camden Bypass	Widened to 2 lanes in each direction between Old Hume Highway and Macarthur Road
7	Camden Bypass	Widened to 3 lanes in each direction between Spring Farm Parkway and Narellan Road
8	Transit corridor - North	New corridor with segregated transit and 1 traffic lane in each direction

Figure 3 – GMGA key infrastructure requirements (source: GMIA Strategic Transport Study)

Key findings relevant to Gilead Priority Precinct are:

- The emergence of an array of future transport infrastructure projects across GMGA such as Sydney Metro WSA to Campbelltown- Macarthur, Western Sydney Rapid Bus Routes, Spring Farm Link Road, Fast Rail and new interchanges and upgrades on M31 Hume Motorway. These major projects will play a role in enabling the successful operation of metropolitan wide initiatives including future housing supply for the Gilead development site.
- The *GMGA 2040 Plan* provides interconnected and urban scale street pattern to support future connections for the Gilead site particularly along Appin Road, Medhurst Road and Menangle Road.
- The *GMGA 2040 Plan* adopted road hierarchy is clear and logical and has been sized accordingly to support future population growth for Mt Gilead sub precinct including the Gilead development site.
- The key infrastructure requirements on the surrounding road network adopted within the *GMGA 2040 Plan* will be able to accommodate the proposed development traffic for Gilead site and cumulative impacts of surrounding future development.
- The *GMGA 2040 Pla*n identifies larger transport interventions and provides opportunities to change networks and services, enhance the quality and amenity, and change travel behaviours to further support the Gilead development site.

Gilead Structure Plan

Optimising connections to the broader land use and transport system

The Gilead Structure Plan (refer to **Figure 4**) has ensured that land use and transport have been integrated at every stage and in every aspect of the masterplan. The spatial arrangement and urban design of the Gilead proposed Village Centre on the transit network via the proposed secondary collector road, aligns with the *GMGA 2040 Plan* transit spine linking Gilead to Macarthur providing a critical element of sound integration of transportation and land use.

The Structure Plan has been developed based on a strong commitment to bring transit services into the Village Centre rather than relegating them to the Appin Road edge of the development site. Public transport will activate and be activated by development within the Village Centre. Importantly, transit will be visible and a key element of the Gilead Village Centre's function. This integration will be significantly strengthened by the extension of this on-road transit corridor via Medhurst Road and Menangle Road to Macarthur Station.

Street network integrated into the urban environment

The Gilead Structure Plan is based on an interconnected, legible, urban-scale grid street pattern that will provide a pedestrian-friendly environment and provide optimal opportunities for bus servicing and access.

The internal street network has been planned and dimensioned integrally with the land use planning. This has ensured that the design of each street and its position in the movement and place hierarchy is appropriate to its role and the traffic demands placed upon it. Future traffic modelling as part of the Gilead Traffic and Transport Assessment (TTA) will be undertaken to confirm that all streets and local intersections will operate satisfactorily under the critical peak hour flows.

The above elements have been integrated with a firm view of the broader aims of the masterplan to ensure the following transport outcomes:

- An interconnected, legible, urban-scale grid street pattern that will provide a pedestrian-cycling friendly environment and optimal opportunities for bus servicing and access.
- The Village Centre is developed based on promoting local access rather than regional traffic.
- The street hierarchy is compatible with the land use and range of roles that each street serves. This incorporates collector roads to distribute traffic within the Village Centre and to provide access into parking areas.
- The alignment of roads and intersections support the urban structure and form (e.g. the extension of the new secondary collector road connecting to Appin Road to the east and Medhurst Road to the west)
- The surrounding access network and masterplan aligns with planned future infrastructure upgrades adopted with the *GMGA 2040 Plan*. These include:
    - Appin Road widening to a four-lane carriageway with signalised intersections
    - Medhust Road widening to a four-lane carriageway with signalised intersection at Menangle Road
    - New Spring Farm Link Road four lane carriageway connection between M31 Hume Motorway (north and south facing ramps) and Appin Road

- Restructured local bus routes focussing on Gilead Priority Precinct and interchanging with new transit corridor connecting Gilead to Macarthur.

- Carriageways have been dimensioned to support the aims of the masterplan:
  - main secondary collector roads are proposed to each have a width capable of providing either four travel lanes, two travel lanes and two bus lanes or two travel lanes and two parking lanes.
  - some of the lesser local streets are proposed to have carriageways which would be capable of providing two travel lanes plus a parking lane on one side.

Promotion of sustainable transport modes

The Gilead Structure Plan is based on the provision of high-quality facilities for pedestrians and cyclists. There will be a safe, amenable, and attractive pedestrian and cycling environment in all streets. Cycling will be promoted through a network comprising dedicated bicycle facilities and streets that are made safe for cycling through traffic planning, carriageway design and streetscape treatments.

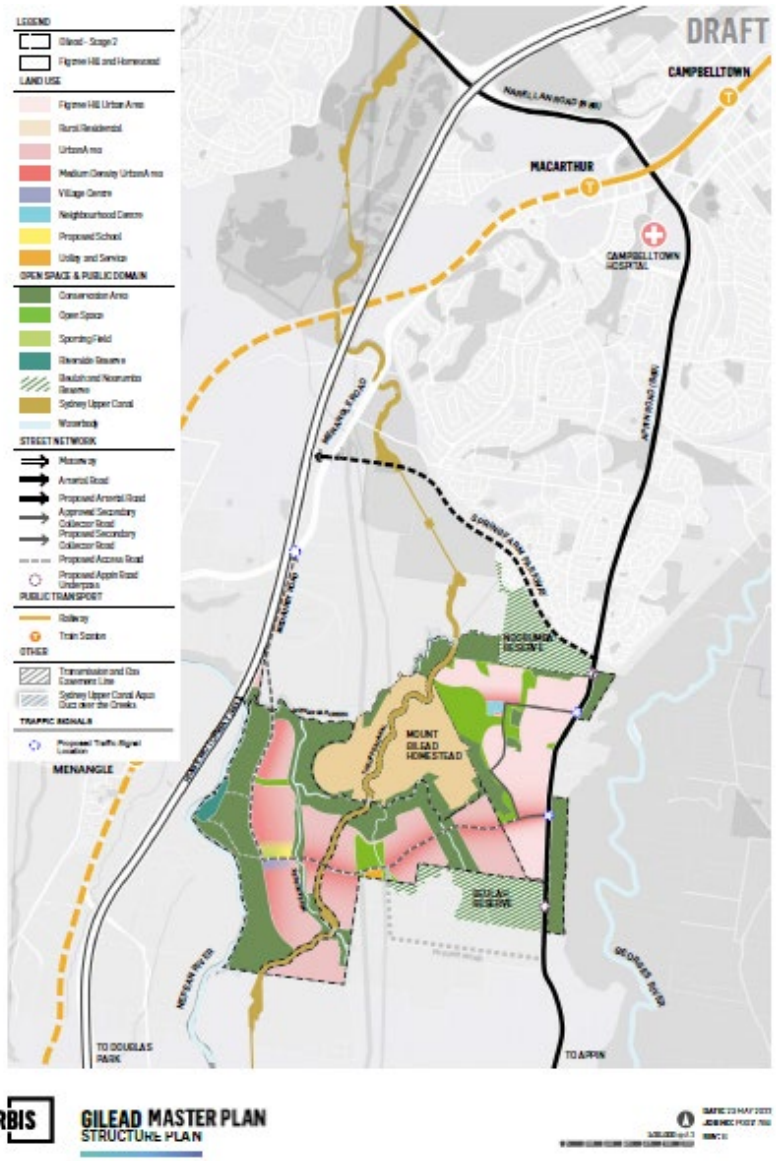

Figure 4 - Gilead Structure Plan – Broader Context (source: Urbis)

Gilead – Traffic and Transport Assessment (TTA) Process

The Gilead Traffic and Transport Assessment (TTA) will provide a robust, defensible traffic and transport evidence base to support the Planning Proposal. This work can commence once access is provided to the range of established transport models (and modelling packages) developed for the *GMGA 2040 Plan*.

The Gilead TTA and established transport models will support the robustness of the overall Planning Proposal process by considering the interfaces between the Gilead development site and the surrounding area. This will require a higher level of detail for the transport system serving the Gilead site, while a broader, concept-level resolution will likely be appropriate for the surrounding area.

The Gilead TTA will be structure on a multiple-staged process, with Phase A understanding the broader transport context at the macro level serving the Gilead site, and Phase B will be of a sufficient detail to inform to provide clear directions at the local level to inform the masterplan and the traffic and transport assessment process.

The structure of the Gilead TTA process is broadly outlined below:

- **Phase A** of the process will seek to understand the transport and land use context affecting the Gilead Priority Precinct and includes applying appropriate analysis / strategic modelling for a broad assessment of the overall transport network serving the Precinct. This will inform the identification of larger scale interventions to the transport system serving the precinct and its interface with the surrounding access network. Phase A will require the use of strategic modelling such as Sydney Strategic Travel Model (STM), Public Transport Project Model (PTPM) and Sydney Traffic Forecasting Model (STFM) to be provided by Transport for NSW.
- **Phase B** of the process will incorporate a more detailed Traffic and Transport Assessment for the Gilead Priority Precinct. This will inform the identification of finer grained interventions to the transport system serving the Precinct and the master plan layout of key elements of the access network within the development site. Local and area-wide modelling will be required to identify and develop localised street network augmentations and external road interfaces for the Gilead precinct. Phase B will require access to the Greater Macarthur (Aimsun) Mesoscopic Model (GMMM) developed as part of the *GMGA 2040 Plan*.

The Gilead TTA would be undertaken in a way that is integrated and iterative, incorporating initial feedback during the post rezoning masterplanning phase addressing issues from Transport for NSW, Department of Planning and Environment and Campbelltown Council etc. The overall approach is outlined below:

- Compile and document information relating to the multi-modal transport network (existing and planned) relevant to the Gilead Priority Precinct. This will draw on strategic-level information provided by Transport for NSW (e.g. recent strategic modelling work for OSO Stage 2 Appin to Illawarra and Sydney Metro WSA to Campbelltown-Macarthur etc) and will require consultation with Transport for NSW
- Estimation of projected future background traffic volumes generated by population and employment land uses within the development area using PTPM/STFM forecast demand growth for 2026 and 2036 used for the OSO Stage 2 Appin to Illawarra project.
- Estimation of trip generation potential for Gilead development site based on TfNSW guidelines/technical directions, previous rates adopted for GMGA 2040 Plan and/or estimated using first principles.

- Update the Greater Macarthur (Aimsun) Mesoscopic Model assessing the operational impacts of the proposed Gilead site on the surrounding road network including the cumulative development impacts surrounding the site for 2026 and 2036 (AM and PM peak periods). The Aimsun model will be based on the already calibrated base model to be supplied by Transport for NSW.
- Assessment and analysis of the operating conditions of the Gilead development's street network considering the horizon year generated traffic volumes using both the GMMM Mesoscopic Model and SIDRA software (version 9.0) for 2026 and 2036 (AM and PM peak periods).
- Evaluation of the Gilead development's overall transport network performance based on the levels of service thresholds defined for intersections, roadway segments, bus stop capacity and the spatial requirements for pedestrians walking and cycling within the development site.
- Evaluation of the recommended public transport network envisaged for the Gilead development site in terms of the bus capacity and service coverage proposed to ensure performant services within the development site.
- Evaluation and detail arrangements regarding access within the Gilead site for people walking and cycling, service and delivery access, access for people travelling to the site by bus etc within the development site.
- Develop a staging plan for the provision of agreed key transport interventions (infrastructure, services, supporting initiatives etc.) for the Gilead development site.
- Evaluation of the adequacy of the proposed parking supply for Gilead particularly the Village Centre, as well as developing recommendations to help ensure a balanced approach to the supply of parking as a part of an effective travel demand management strategy.
- Prepare Traffic and Transport Assessment Report documenting the entire traffic and transport planning development process to support the Planning Proposal.

Strategic and operational modelling process

The modelling framework for Gilead TTA leverages the existing strategic and operational modelling tools to assess the traffic and transport impact of the development site (circa 3,300 new dwellings) and the surrounding access network. Figure 5 shows the modelling flowchart and the interaction between the existing strategic and operational models from Transport for NSW for the GMGA.

The land use projections together with road and public transport infrastructure assumptions will need to be updated and fed into the four-step multimodal Sydney Strategic Travel Model (STM). The STM produces mechanised travel demand forecasts which are fed into the Public Transport Project Model (PTPM) to perform mode choice which was recently used by Transport for NSW for OSO Stage 2 Appin to Illawarra.

The demand response to land use in STM and mode choice response in PTPM will need to be applied to the Sydney Traffic Forecasting Model (STFM) matrix. The STFM matrix represents the road user behaviour and is a strategic traffic model for the assessment of road infrastructure. The adjusted STFM matrix will be fed into the existing Greater Macarthur (Aimsun) Mesoscopic Model (GMMM) for operational road network assessment. The intersection turning volumes from the GMMM can then be extracted for input into SIDRA

Intersection (SIDRA) modelling for isolated key intersection performance assessment within the Gilead development site.

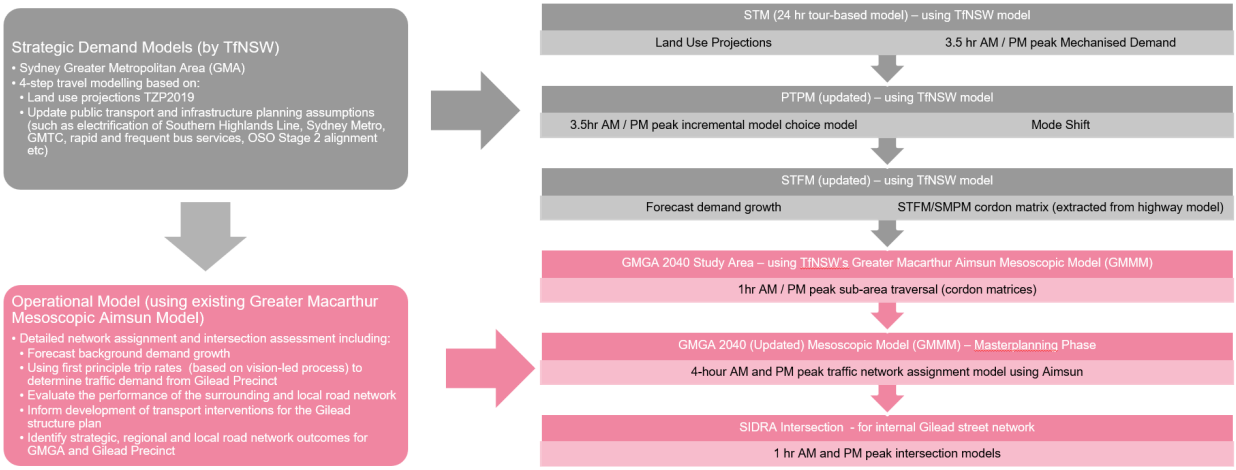

Figure 5 - Gilead TTA modelling process as part of the masterplanning

Conclusion

The key conclusions drawn from the strategic transport review for the Gilead Planning Proposal are as follows:

- A more detailed Traffic and Transport Assessment (TTA) for the Gilead Priority Precinct will need to be undertaken to inform the identification of finer local grain interventions to the transport system serving the site and the masterplan layout of key elements of the access network within the Precinct. This work can be completed as part of the masterplanning phase once access is provided to the range of established transport models (and modelling packages) developed for the *GMGA 2040 Plan* are provided to the proponent.
- The Gilead development site has been included in the *GMGA 2040 Plan* in terms of the land use projections together with the surrounding road and transport infrastructure assumptions which fed into the Greater Macarthur (Aimsun) Mesoscopic Model.
- The key transport and road infrastructure requirements adopted within the *GMGA 2040 Plan*, would provide sufficient capacity to accommodate the Gilead development site (circa 3,300 new dwellings) on the surrounding access network at M31 Hume Motorway, Menangle Road, Spring Farm Link Road and Appin Road.
- The increase in traffic generated by the Gilead development comprises only 24% of the total traffic generation potential of the entire Mt Gilead sub-precinct as adopted within the *GMGA 2040 Plan*. This will not result in adverse effects on the operational performance of the surrounding higher order road network already determined by the previous operational modelling using the Greater Macarthur (Aimsun) Mesoscopic Model.
- The Gilead Structure Plan has been developed to minimise the impact on the surrounding higher order road network by optimising the viability of public transport services through the provision of a bus stop/interchange within the Village Centre, and maximisation of land use potential (schools and residential) within bus stop catchments, and creation of a linear east-west transit spine connecting the Village Centre to Campbelltown-Macarthur via Appin Road and Menangle Road.

- The Gilead Structure Plan is based on the formation of an accessible street grid to optimise internal distribution of movement, while fostering the creation of street environment and public realm capable of accommodating a wide range of sustainable travel modes.
- The Gilead Structure Plan provides a strong emphasis on connectivity between the development site and local residential neighbourhoods, surrounding precincts and major centres such as Campbelltown-Macarthur through the provision of integrated major road, street, public transport, principal bike pedestrian and green space networks.

Yours sincerely

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