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Directions 2031 and Beyond
Outer Metropolitan Perth and Peel Sub-Regional Strategy
Western Australian Planning Commission
469 Wellington Street
Perth WA 6000

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The Project Officer

Outer Metropolitan Perth and Peel Sub-Regional Strategy

The Urban Development Institute of Australia (UDIA WA) is pleased to present this submission on the *Outer Metropolitan Perth and Peel Sub-Regional Strategy*. The strategy provides the detail to implement *Directions 2031 and Beyond* with a particular emphasis on housing and land supply. *Directions 2031* promotes a Connected City model for future growth and sets a target of a 50 per cent increase in the current average residential density from 10 to 15 dwellings per gross urban zoned hectare of land in new development areas.

UDIA welcomes the release of the *Directions 2031* and the sub-regional strategies and supports the key elements and principles upon which the documents are based. The Connected City model will be successfully delivered where there is a balance of infill and greenfield development with quality urban outcomes achieved by both forms of development. From the point of view of the development industry, the key concern is to ensure there is sufficient flexibility in *Directions 2031* and the strategies to accommodate future housing land needs and preferences. Housing land supply is inextricably linked to affordability. An adequate supply of future urban land is necessary to keep housing land prices down, and to ensure affordable land for future generations.

The focus of this submission is the Peel region and the potential for the Mandurah-Pinjarra corridor to accommodate most future urban development opportunities. A major driver of population growth in the Peel sub-region will be employment growth based on local mining projects and growth of industrial and commercial activity. The current high level of employment self-sufficiency will likely improve further with the mining and resource projects in the pipeline which will drive housing demand.

Should you require further comment, please do not hesitate to contact me.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Debra Goostrey', written over a circular stamp. The signature is fluid and cursive.

Debra Goostrey
Chief Executive Officer

The submission provides general comments on the Outer *Metropolitan Perth and Peel Sub-Regional Strategy* followed by commentary focusing on the Peel sub-region.

1. Population Projections are Underestimated

Directions 2031 has adopted population growth projections for Perth to 2031 of 2.2 million based on low estimates of net migration which are below the lowest ABS projection of 2.4 - 2.9 million. The document assumes a population increase of 30,000 per annum compared with the ABS scenarios of 31,000 (low), 41,000 (medium) and 55,000 (high).

Western Australia is growing faster than any other state (ABS 2010, 1367.5) with 65% of the growth attributed to overseas migration. Current population growth is fuelled by a relatively strong state economy underpinned by committed major resource projects in oil and gas developments, iron ore and a range of diverse commodities. WA Treasury has forecast population to grow by 2.6% in 2009-10 and 2.3% in 2010-2011 before stabilising at 2.2% from 2012 – 2014 and is confident of a strong economic and employment outlook.

In the longer term, WA's population is projected to double to 4.6 million by 2056 under the medium growth projection (ABS, 3222.0) with Perth projected to experience the highest percentage growth (116%) of Australia's capital cities, increasing to 3.4 million in 2056. It will attract a higher proportion of the state's population (78% in 2056 compared to 74% in 2007).

UDIA queries why *Directions 2031* is committed to the *WA Tomorrow* (2005) figures when more recent data indicate significantly higher growth rates than *WA Tomorrow* whose data are based on a conventional demographic projection model and do not take into account the economic drivers that are having a resounding impact on the state's growth rates. Underestimation of future growth will have a significant effect on land supply requirements as the targets sets in *Directions 2031* will be reached earlier than anticipated.

2. Gross density yields are overestimated

Directions 2031 assumes a gross density yield of 15 dwelling units per gross urban hectare in greenfield developments which may be overestimated. It is our view that gross urban zoned hectare is not a realistic measure for density targets due to the vast number of non-residential uses that are required with the urban zoned area.

Some increases in densities are supported consistent with *Liveable Neighbourhoods* and to provide variety and choice of housing in the suburbs. The target of 15du/ha, however, is unrealistic for many developments because of the extensive land requirements for shops, schools, employment uses, public open space, conservation areas, wetlands and buffers, drainage channels and buffers to other uses.

There are numerous examples of recent developments that are compliant with *Liveable Neighbourhoods* that do not achieve the 15 du/ha target. Current examples include Brighton (12du/ha), Wandi (10.9du/ha) and Austin Cove (10du/ha). The WAPC's own *Swan Urban Growth Corridor Urban Growth Corridor Sub-Regional Plan* only achieves 11.5du/ha and the *Southern River/Forrestdale/Brookdale/Wungong District Structure Plan* only achieves 8.76du/ha. Even the City of Subiaco which is conventionally regarded as being high density has a gross density of only 12du/ha when applied to the municipal area. The examples demonstrate that the

area available to deliver housing is severely reduced by factors which are beyond the control of the proponent.

Industry is experimenting with high density (R60) developments in greenfield locations, for example Cockburn Central and Brighton, however the overall impact on gross densities is marginal. One and two bedroom apartments are not price competitive with standard 4 bedroom 2 bathroom houses in greenfield locations (refer Section 3 Affordability) and market preference for a standard product will likely override the intention of planning policy to limit low density development to provide a more compact urban form.

A more realistic target would be 12du/ha which could be adjusted upwards based on experience rather than adopting a target 15du/ha which is unlikely to be achievable at least in the short term. The concern is that the density targets will be applied as “rules” which will delay and frustrate development and increase costs. Professional development must be provided to all agencies and local authorities to ensure a pragmatic, flexible approach is adopted. Blanket rezoning must be discouraged so intensification can be more responsive.

Unless clearly defined, the gross urban zoned density target could act as a commercial disincentive to the development of constrained sites. This could devalue sites that are not able to achieve the density target, force development outcomes that are not commercially viable to achieve gross targets and impact upon delivery and land supply.

UDIA recommends 15 dwelling units per gross subdivisible hectare as a reasonable density target at a broad structure planning level as opposed to 15 dwelling units per gross urban hectare which in our view is an inequitable measure. The gross subdivisible area should be clearly clarified to exclude land set aside for non-residential land uses and conform to *Liveable Neighbourhoods* with residential site area the measure for density at subdivision level.

The Peel Sub-Region

1. Summary of Key Issues

UDIA has reviewed the *Outer Metropolitan Perth and Peel Sub-Regional Strategy* and has identified a number of inconsistencies with existing WAPC policy and strategies. Further consideration should be given to the following before finalising the OMPPSS:

- Inconsistencies between the *Activity Centres Policy* and the OMPPSS be resolved and any limitations on Pinjarra's capacity to grow as a strong secondary centre be removed so that population driven employment in the centre can be realised
- Inconsistencies with the *Industrial Land Strategy* be resolved such that residential development near identified industrial growth areas is encouraged to promote local employment opportunities to make the target of 80% employment self-sufficiency achievable
- Peel should be viewed as a logical east-west growth corridor in its own right anchored by the Strategic Metropolitan Centre of Mandurah and the Secondary Centre of Pinjarra with policy support for both centres to function to their maximum capacity
- Economic development and employment growth is not adequately addressed in the strategy and needs to be more specific and identify explicit opportunities and target how these are to be actioned

- An upward revision of a sustainable population target should be made following a clearer understanding of the employment potential in Peel
- The development of affordable, suitably located land inland and to the east of Mandurah should occur concurrent with more expensive coastal development. The notion that development in Murray will have to wait until 'the availability of suitable land in coastal areas decreases' should be discarded
- Infrastructure provision can be provided in a logical sequence to meet the development demand with opportunities for water saving practices
- A high frequency transit route between Mandurah and Pinjarra along Pinjarra Road should be the focus for public transport provision in the locality and will reinforce a mixed use spine that supports local employment and service provision
- The planning, commitment and delivery of key public transport, road and utility infrastructure is critical to the developers' ability to deliver infill and greenfield development in line with the targets sets in *Directions 2031*.
- The increasing dependence on developer contributions for infrastructure reduces project viability, investment and affordability.
- The government should commit to investment in urban development through the provision of infrastructure.
- The WAPC and the Infrastructure Coordinating Committee must play a more visible and accountable role in leading and coordinating infrastructure provision to ensure desired outcomes.
- Treasury should undertake a cost-benefit analysis of the sub-regional strategy in order that the State's capital investment program for service infrastructure be set against timeframes and priorities and that these support the framework to deliver the stated targets.

2. Policy Framework

Activities Centre Policy

Strategic planning for Peel should promote the east-west development of the Mandurah-Pinjarra corridor as a corridor in its own right with no direct relationship to the Perth CBD. The link between the Strategic Metropolitan Centre of Mandurah and Pinjarra, a Secondary Centre, provides the opportunity for a desirable range of complementary land uses: Mandurah has the highest level of amenity to support urban residential densities and provides the retail and commercial hub while Pinjarra provides the industrial land, opportunities for affordable housing and diversity of dwelling options including larger lots. Mandurah and Pinjarra could potentially be linked by a rapid transit bus service, which would support affordable living options in Peel.

The sub-regional strategy appears to undermine the *Activity Centres Policy* (August 2010) and the future of Pinjarra as a secondary centre in favour of Keralup. We note that in the Peel sub-region only 10.4% of the land under further investigation for residential development is located in the Mandurah - Pinjarra corridor while the majority (78%) is located at Keralup. This will serve to restrict the development potential of Pinjarra as a higher order centre and the full range of retail, commercial, employment and recreational development to meet community needs. It will also impact on the capacity of Peel to reach the employment self-sufficiency target within the timeframe of the strategy as Keralup is a long-term project that is unlikely to deliver sufficiently high employment opportunities to help realise the 80% employment self-sufficiency target within the timeframe of the strategy.

UDIA recommends that the Mandurah-Pinjarra east-west corridor be given greater recognition for the potential of the corridor to deliver complementary land uses to support Mandurah as the Strategic Metropolitan Centre and Pinjarra as the Secondary Centre. It is critical that Pinjarra be given state policy support to develop in line with population and employment growth or it runs the risk of not functioning efficiently as a Secondary Centre. If this were to occur shoppers would travel to Mandurah for services and retail activities that should be available in Pinjarra. Mandurah would develop as the stronger centre and attract the retail and commercial investment that should otherwise go to Pinjarra. Inconsistencies between the sub-regional strategy and the *Activity Centres Policy* should be removed and the function of all centres in the area be given the policy support required to ensure a sustainable future.

Industrial Land Strategy

The Industrial Land Strategy identifies the Greenlands Industrial Area (GIA), which is varyingly referred to as 220 hectares and 295 hectares, as suitable for General Industrial uses providing warehousing, transport and logistics as well as strategic export and knowledge based industries.

The ILS states that the Pinjarra townsite and Mandurah are likely to provide the necessary workforce for the Greenlands industrial area.

Contingent on the nature of the industry that occupies GIA the area could be a major employment hub. The Department of Planning's figures indicate that on average one job is created for every 100 square metres of industrial floor space¹. UDIA has developed the following scenario to demonstrate the implications of this ratio for employment.

If 25% of the GIA is converted to floorspace this would:

- Create 5 000 new direct jobs
- 11 000 indirect jobs (based on a multiplier effect of 2.2 additional jobs for fabricated metal products)
- Provide a total of 16 000 jobs in the area

If 30% of the GIA is converted to floorspace the employment potential increases to a total of 21 300 direct and indirect jobs.

In addition, complementary industrial uses are being considered for both Alcoa sites in the *Industrial Land Strategy* which will further enhance local employment opportunities in the Mandurah - Pinjarra corridor. These jobs would of course be best serviced with local residents to decrease the employment relocation costs. The total labour force in the Shire of Murray² according to the 2006 Census data is 4,947 indicating that the local employment opportunities for the area through the development of industrial land are considerable.

Relationship to the South West Corridor Subregional Strategy

Keralup South is the most significant urban investigation area in the Peel sub-region and accounts for 78% of the land supply stocks in the urban investigation areas. The reliance on

¹ The ILS identifies 16 043 700 sqm of industrial floorspace and 162 000 jobs, p. 12

² Includes full time, part time and unemployed workers

Keralup would appear to be a high risk approach to future land supply given the environmental constraints known to affect the site and skews the housing market into a limited area which reduces competition and choice for the market.

The coastal corridor in the City of Mandurah is largely developed and most future urban development opportunities apart from Keralup will be in the Mandurah-Pinjarra corridor, largely focused on Pinjarra. Pinjarra needs to be recognised as a growth centre and additional land supply is required in the Pinjarra locality to accommodate future population growth and housing demand for the Peel region.

3. Opportunities and Constraints Mapping

The OMPPSS contains an opportunities and constraints index which has been used to identify the suitability of rural land for urban development however there is no indication of the weighting applied to the criteria. It is suggested that the analysis is based on a broad sustainability framework of environmental, economic, social and cultural factors. UDIA supports the establishment of clear criteria for the WAPC to assess future urban areas however reference to the index (p.35) reveals a strong emphasis on environmental factors and access to employment and services. Some of the environmental constraints are unrealistic and we question why the distance to the Perth Central Business District is considered a significant constraint for the Peel region. Given that the employment self sufficiency target of 80% under *Directions 2031 and Beyond* for Peel is the highest of all the regions except for the Central Metropolitan Sub-Region the constraint of distance from the CBD would seem to be irrelevant.

There is no mention of key factors which impact on housing affordability i.e. land costs, development costs and land tenure (i.e. large scale landholdings suitable for masterplanned developments) which are critical factors in identifying land suitable for development. It is also evident that the draft urban expansion plan has been prepared with input from state agencies and local government but with no reference to major land owners.

Land fragmentation should be regarded as one of the most serious constraints to delivering high quality sustainable outcomes for urban development as fragmented land ownership will add significantly to both the time and cost of project development and runs the risk of less than ideal outcomes. This is not to suggest that fragmented land should be sterilised but the nature of the land ownership should at least be considered as it has been in the *Industrial Land Strategy*. Developers have the capacity to deliver high quality, sustainable master planned developments which is critical given that 66% of conditionally approved lots in Peel do not reach final approval (Urban Growth Monitor, Department of Planning).

It is concerning that a stated constraint is access to existing transport and other infrastructure. Whilst it would be desirable that transport networks such as heavy rail are in place, it would be expected that there would be significant expansion of the bus network based on the predicted population increase. Transport linkages between the Strategic Metropolitan Centre (Mandurah) and the Secondary Centre (Pinjarra) should be seen as the key priority with the potential for a rapid transit bus route linking the two centres.

4. Performance Indicators

In early discussions with the Department of Planning on *Directions 2031* the concept of published criteria for rezoning was to enable consideration of land that was outside the areas identified suitable for urban development. The concept was that if a developer could address all of the critical factors including local employment, transport, infrastructure, housing diversity, educational facilities and so on, then the application for rezoning should be considered. In those discussions it was considered that 10% – 20% of land supply could come from these major developments. This is not apparent in the documents that have since been released and the flexibility in the planning system that this approach would have provided will not be realised.

The performance indicators omit reference to housing diversity. It is essential that we are able to cater affordably for those who require a medium or high density lifestyle as well as those who require a larger private space.

UDIA recommends the following criteria addressing land assembly, supply and economic market factors, be included to provide a triple bottom line approach to the assessment of future proposals and avoid land shortages. Additional criteria to include:

- The capacity to deliver a diverse mix of housing options to achieve the residential density target and deliver affordable housing outcomes.
- The capacity to develop and assemble land in a timely manner to meet housing supply objectives and deliver comprehensively planned communities.
- Provision for diversity in development fronts and price points.

5. Employment

At 71%, the Peel region currently has the highest level of employment self sufficiency of any sub-region with the exception of the Central Perth Metropolitan sub-region. The strategy sets a target of 80% self-sufficiency which means an additional 36,000 – 56,000 jobs will need to be created to achieve the target. The economic base of the Shire of Murray is strongly influenced by alumina refining at Pinjarra, with more than a third of all jobs in the Shire associated with this industry.

Employment growth will come from extension of the West Pinjarra Industrial Area and the development of the Greenlands Road Industrial Area. The proposed extension and connection of Greenlands Road east towards Boddington and beyond will create a vital connection to the Perth-Bunbury Highway and facilitate the expansion of supporting industries in the industrial areas. Pinjarra town centre should also be provided every opportunity to grow and function as a strong Secondary Centre and a priority location for employment generating activities.

Murray is being targeted as a future climate resilient food bowl for Perth with a study under way to identify suitable sites for the development of agri-food precincts in the highly fertile areas south of Pinjarra. The proposal is to irrigate the precincts with recycled water from the Gordon Road Treatment Plant. The area is strategically located between Perth and the South West on a major transport route and the land has the capacity to support diversified agricultural activities. Direct agricultural employment will increase due to the intensification of land use and there will also be a 1.5 multiplier effect for each job created.

The ageing population in Peel will require key workers to support them. The best way to respond to the economic challenge of an ageing population is to support sustainable economic growth by supporting productivity, participation and population. A growing population assists in managing the pressure of an ageing population and provides the skills needs for continued economic growth. The strategy must encourage workforce participation so as to maximise the potential economic growth of the sub-region.

The issue of economic development and employment growth is not adequately addressed in the strategy. As the leading document for assessing employment needs in the sub-region it should be more specific and identify explicit opportunities and target how these are to be actioned. The proposed economic and employment strategy (Section 14.2) should be integrated into the sub-regional strategies to ensure they remain the lead documents in implementing *Directions 2031*. UDIA is aware that major developers operating in Peel have commissioned a review of population and employment forecasts, housing demand and urban land supply requirements in the sub-region and we recommend that close consideration be given to the findings of this work when finalising the OMPPSS.

6. Affordability

Affordability is measured not just by the initial cost of a dwelling; consideration has to be given to affordable living by taking into account transportation and the operational costs of a house. The relatively high level of employment self-sufficiency in the area assists in delivering affordable living options as transport costs to and from work are kept to a minimum. Affordability will be compromised were land supply and residential development in the Pinjarra area limited forcing new residents to locate further from their place of work. Travel requirements are further reduced where Pinjarra functions as a strong Secondary Centre offering a full range of goods and services available to residents.

Medium and high density dwellings in activity centres such as Mandurah fulfil the demand for part of the market but a diversity of product offering more affordable family homes on larger lots will also be required. The OMPPSS states that development in the Shire of Murray is expected "*once the availability of suitable land in coastal areas decreases*" (p.109). This suggests that the strategy will encourage development in Mandurah at the expense of Murray and denies those seeking more affordable residential lots in the Pinjarra area. One of the major challenges for the region is the provision of affordable land for key workers both now and in the future and this issue will be exacerbated if development is constrained and employment growth is strong.

There are a number of large residential developments in the Shire of Murray providing affordable land and housing options compared to coastal developments in Mandurah and Rockingham. They offer a diversity of product on a range of lot sizes that appeal to a broad sector of the community. The strategy proposes little in the way of land under further investigation in Murray which will effectively stifle development, reduce affordability as purchasers compete for limited residential land and force people to other localities.

Pinjarra offers more affordable living options than Mandurah and should continue to do so. According to the ABS (2006) 58% of households with mortgages in Pinjarra pay less than \$1200 per month as opposed to 44.1% in Mandurah. Rental properties are also significantly cheaper in Pinjarra with 93% of households paying less than \$225 per week compared to 79% of households in Mandurah.

Whilst whole of life costs must be taken into consideration when discussing affordability so too must the provision of a diversity of dwelling options. *Directions 2031* has a focus on higher density living which UDIA supports however medium and high density dwellings in greenfield areas struggle to compete with low density product. Table 1 is instructive and shows the impact of multistorey construction on the cost of dwellings. It should be noted that the land value, whilst a factor, does not counter the cost of construction as medium and high density land values tend to be higher due to the proximity to desired levels of amenity such as the coast or entertainment areas. Whilst the land area per dwelling is less the cost per square metre is significantly higher.

Table 1: Comparison of Construction Costs of Single and Multi-Storey Dwellings

Type of Dwelling	Construction Cost	Price per m2	Dwelling size
Single Storey	\$ 250,000	\$ 800	313 m2
Double Storey	\$ 250,000	\$ 1,200	208 m2
3 Storey Walk up	\$ 250,000	\$ 2,600	96 m2
10 Storey Apartments	\$ 250,000	\$ 4,000	63 m2
Over 10 Storey Apartments	\$ 250,000	\$ 6,000	42 m2

Source: UDIA

Housing efficiency in the Peel sub-region requires an adequate supply of residential lots across various price points, locations and housing types as an efficient supply of housing relies on the provision of choice. Mandurah is largely built out with most future opportunities for affordable urban development lying in the Mandurah-Pinjarra corridor supported by rapid public transport.

7. Infrastructure

The provision of infrastructure in Peel has its challenges but these are consistent across the region, are manageable and should not be viewed as barriers to development. The Mandurah-Pinjarra corridor is close to services and also close to existing developments and proposed employment centres. The area can therefore be described as frontal as most of the area is connected to the development front and is clearly not remote in the context of its proximity to existing services.

It is not a critical issue that future development needs new major services and the provision of such services can occur (and be funded) in a logical sequence to suit the development demand. Although most services are available nearby, none has excess capacity to enable any significant development. Wastewater, water supply and power services are each needed to service future growth.

The cost to extend, as well as the constraints on both water and wastewater facilities, provides an opportunity to reduce potable water demand by recycling treated wastewater which in turn addresses the main constraint on expansion of the existing wastewater treatment plant (i.e. disposal of its treated water). Recycling the water has the positive benefits of reducing demand on the water supply system and providing a logical solution for disposal of treated wastewater from the future West Murray wastewater treatment facility.

Proposed industrial/commercial development to the north and south of the area not only assist with significant employment opportunities to help sustain the development, but also they also offer more opportunities for the reuse of water.

Infrastructure Analysis

Following is a more detailed analysis of the infrastructure requirements in the Mandurah-Pinjarra corridor.

Water supply

It is likely that Peel will be connected to the existing infrastructure fed from the North Dandalup and Pinjarra Water Schemes by means of pressure reducing valves and a network of trunk and distribution mains. The Water Corporation has indicated that they are about to commence a study of water supply options for the land in this district. A Value Management Study is to be followed by a Planning Study that will determine the source of the water for the area and outline how it is distributed.

It is expected that the Planning Study would identify the need to install new trunk and distribution mains connected to the existing water schemes. Staged development of the area could proceed (as it has elsewhere) by means of a network of new distribution mains. Existing water distribution mains supplying Mandurah already cross Murray and they will probably be duplicated to supply future residential development.

Wastewater Disposal

The Water Corporation has completed conceptual wastewater planning for the area. They have plans to construct the new West Murray Wastewater Scheme, to serve the larger district of Nambeelup, North Ravenswood east across to South Dandalup. This waste water treatment plant (WWTP) will be the third plant in addition to the existing plant in Gordon Road Mandurah and one other near Pinjarra. The Corporation has said that re-use of treated water from the new plant will be an integral and critically important aspect of the design of the new facility. The water would be planned to be made available to developments in the district amongst other purposes.

Staged development of the land is possible by directing wastewater from a series of wastewater pumping stations to either the Gordon Road WWTP on a temporary basis, or to the new West Murray WWTP or the existing Pinjarra WWTP on a permanent basis to suit the catchment areas of each treatment plant. The rate of development of the land and other possible sites (such as the industrial areas to the north and south) will dictate to some extent for how long any temporary connections can act as outlets before their capacity is exceeded and the new WWTP will be required.

The development of the land under the auspices of meeting targets for very low scheme water use provides a perfect opportunity to reuse wastewater (treated to an A+ standard) as a sustainable non-potable or secondary water supply for irrigation of garden and open spaces areas and flushing of toilets.

Power Supply

Western Power has undertaken little planning in this district and has advised that the capacity of the existing overhead systems are limited. It is likely that upgrading of their network will be required as development beyond the first few years occurs in the district. The upgrading will logically follow the staging of the development. Western Power will need to install new feeders

throughout the district to suit demand and they will probably be extended from the Pinjarra zone substation.

Future development of the area will need to be supplied from new zone substations. The location of these new substations will depend on the load demand and layout of the proposed development. Sites for these new substation sites (typically about 1.5 hectares) will need to be provided.

The timing and type of upgrading and new works will be dependent on the load-uptake and development staging in the region. However, if development were to proceed logically to suit the demand and logical layout of the other services, it is apparent that the area can be readily served with a power supply.

Communication Services

Telstra advises that the area could be serviced by a connection to existing fibre-optic equipment in the area and the exchanges in the area are already broadband enabled. There is relatively little existing infrastructure and in order to provide a network to service future development, fibre-optic cables will be installed from the development back to the exchange. The recent announcement of the NBN Co operations indicates that NBN Co will fund the provision of fibre and backhaul to new housing estates, with developers funding the provision of 'pit and pipe' when built to NBN Co specifications. NBN Co intends new developments across Australia will be among some of the first to connect to the National Broadband Network.

Gas Services

West Net Gas (formerly Alinta) has advised that natural gas reticulation is not currently available in the area. A gas service could be provided by means of a pipeline along Pinjarra Road from Mandurah connecting to the existing supply in Pinjarra. As a supporting and alternative energy source provider, there is an argument to justify gas being provided under community service obligation (CSO) process by Government in a manner similar to the CSO's paid to the Water Corporation. Gas should be supplied to the new developments and the cost for gas extensions should not have to be funded by developers with no hope of future reimbursement, as is the case now.

Drainage

Based on many similar developments in this location and district, land with a shallow water table is capable of development however, specific strategies for the management of drainage are needed. Shallow ground water is a major engineering issue affecting the land from a development perspective in this district. This does not mean that the land is not capable of development or that it should be sterilised for the life of the sub-regional strategy but simply that the costs of developing the land will be higher than the costs of development of land that does not have a similar shallow groundwater level.

Stormwater management

An integrated district water management strategy, a local water management strategy and an urban water management plan would each be required as part of any development in this district. The concepts for the stormwater and local water management would be based on the requirements of *Better Urban Water Management* (Department of Water, 2008) as well as *Decision Process for Stormwater Management for WA* (Department of Environment and Conservation, 2009). These documents set out the process for how stormwater management

issues need to be addressed during the development process. They stipulate water quality management targets via statutory documents such as the Statement of Planning Policy No 2.1 The Peel – Harvey Coastal Plain Catchment (WAPC, February 1992).

The Department of Water has recently published the draft *Murray Drainage and Water Management Plan* (DWMP) (October 2010) for the district listing criteria for development. The Murray DWMP encourages innovative solutions to the drainage and water management challenges associated with development in Peel. The DWMP cites a series of key principles and strategies that are to be met with development works. A critical strategy is the need to reclaim and reuse water.

The major considerations revolve around the relatively flat nature of the area, the high groundwater level and the large areas that are inundated in winter. Based on other developments in the district, some storage within selected areas of open space areas with top water levels higher than that occurring in the Murray River will be required.

The Murray River Floodplain Strategy identifies some areas of the land being defined as floodplains. To facilitate land development, it is desirable to install subsoil drainage at a level at or slightly below the Average Annual Maximum Groundwater Level (AAMGL) within the zone of seasonal groundwater variation to minimise imported fill requirements.

It is important that the Controlled Groundwater Level (CGL) does not adversely impact on wetlands on the lands that are to be retained. The draft *Murray Drainage and Water Management Plan* (DWMP) uses the new term “hydrological zones” around wetlands, being the land nearby where changes to groundwater level may have an impact on the wetland. The Murray DWMP suggests that if development within 200 to 300 metres of a wetland is contemplated, then it is within the hydrological zone and special modelling and analysis is needed to demonstrate that development will have no negative impacts on the wetland. This is not to say that development cannot be located closer to the wetland, but that more sophisticated and specialised studies are warranted if the controlling of groundwater levels is contemplated.

Acid Sulphate Soils and Dewatering

The area is affected to varying degrees by acid sulphate soils (ASS) and a condition for approval of a subdivision would require ASS investigations to be undertaken and for the DEC to be satisfied that an ASS Management Plan (ASSMP) is prepared. The ASS issues in Peel are managed easily albeit with some increase in development costs. Subsurface investigations along proposed sewer routes need to be completed prior to construction to assist in the preparation of specific ASSMP's for the excavation and dewatering for the sewer installation before a dewatering permit would be granted.

Most of the area has a shallow groundwater level and is relatively flat and dewatering will be required for most of the sewer installation. This is manageable and not a constraint to development in the area.

8. Public Transport

The Peel sub-region has the potential to realize a robust urban fabric supported by an integrated, multi-modal transport network. Based on the urban development already underway in the sub-region improvements to the public transport and road network are important, but can be

managed in a staged manner as development proceeds and many of which can be contained to existing reservations.

Given the potential high level of employment self sufficiency trips will be largely self contained, rather than commuter travel outside of the sub-region.

The OMPPSS Peel sub-regional framework plan shows an integrated north south and east west road network supporting urban development and reducing reliance on Forrest Highway and Pinjarra Road. This road network is strongly supported and should be expanded and enhanced as development progresses.

Extensions to existing bus routes will be able to serve initial stages of development with additional services provided as demand warrants. A high frequency transit route between Mandurah and Pinjarra along Pinjarra Road, as the focus for public transport provision in the locality, will reinforce a mixed use spine that supports local employment and service provision. An initial bus service with local feeder bus routes could be upgraded in the long term to light rail. We understand the Pinjarra Road median width is sufficient to accommodate future light rail.

While not fundamental to the growth of the area, the provision of high priority and high speed public transport services along the Forrest Highway could also be provided in the longer term for regional trips, with transit stations spaced evenly at North Ravenswood and South Yunderup / West Pinjarra. Like Pinjarra Road, an initial stage bus service could be upgraded to light rail.