

KEY CONSTRAINTS AND OPPORTUNITIES	ENVIRONMENTAL AND LAND USE IMPACTS
BELLS LINE OF ROAD – CASTLEREAGH CONNECTION	
<p>Topography, including floodplains associated with the Grose, Nepean and Hawkesbury Rivers</p> <p>Areas of biodiversity including national parks, nature reserves, Cumberland Plain Priority Conservation Lands (PCLs) and Endangered Ecological Communities (EECs) listed under both State and Commonwealth legislation</p> <p>Biodiversity investment opportunities identified for the Cumberland and Hawkesbury areas</p> <p>Commonwealth and State heritage listed sites</p> <p>Land subject to Aboriginal land claims such as Deerubbin Local Aboriginal Land Council lands</p> <p>Special uses such as John Morony Correctional Centre, former Castlereagh Waste Management Centre and former Llandilo International Radio Transmitter Station (Shanes Park)</p> <p>Other land uses such as strategic agricultural land, open space and recreational areas, and social infrastructure</p> <p>Utility infrastructure such as water and sewer mains; and high voltage transmission lines and substations</p> <p>Connection to the M7 Motorway and Sydney motorway network</p> <p>Connection to the Outer Sydney Orbital</p> <p>Utilisation of the existing Castlereagh Freeway corridor reservation presents both opportunities and constraints - opportunities such as connection to the M7 Motorway; and consistent with community expectations given reservation has been in existence for many years; constraints such as good quality vegetation, which has established itself in sections of the existing corridor as a result of limited development since its protection</p> <p>Functional design requirements such as vehicle length, design speed, gradients and design flood levels</p>	<p>Properties directly affected in Penrith LGA: 171 privately owned properties; 40 government owned properties.</p> <p>Properties affected by the recommended corridor which are not within the existing Castlereagh Freeway corridor reservation: 157 privately owned properties and 5 government owned properties.</p> <p>Recommended corridor is proposed along the southern edge of the Cumberland Plain Priority Conservation Lands (PCLs) to avoid remnant bushland and endangered wildlife. This results in increased private property impacts, causing considerable concern to affected landowners.</p> <p><i>Land use, socio-economic and property impacts</i></p> <ul style="list-style-type: none"> • Covers an area of approximately 294 hectares - about 148 hectares of land is already zoned for the Castlereagh Freeway reservation, with the balance of about 146 hectares zoned for other land uses. • Traverses land currently utilised for rural residential development with some small industries and businesses. A total of 23 businesses could be potentially impacted and the land used by 13 existing businesses could be potentially severed. • Covers about 203 hectares of land used for agricultural and/or grazing purposes, including 'Class 2' agricultural land between Castlereagh Road and the Nepean River. Causes some severance of prime agricultural land. • Causes impacts such as: <ul style="list-style-type: none"> ○ disruptions to lifestyle, division of communities and loss of networks and relationships causing anxiety and stress to affected property owners and local business owners and employees ○ diminished property values prior to government acquisition ○ relocation of affected businesses or restrictions on property improvements resulting in reduced economic activity, employment and income, which may affect future viability. • Does not directly impact any social infrastructure, except for the playing fields at St Paul's Grammar School. It is expected that the design of any future motorway could be amended to avoid any impact on the playing fields. Passes within 500 metres of several facilities including Llandilo Primary School, St Paul's Grammar School, Castlereagh Primary School, Castlereagh Community Hall, Castlereagh Anglican Church and Castlereagh Kindergarten

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	<p>resulting in a reduction of amenity for users of these facilities.</p> <p><i>Biodiversity impacts</i></p> <ul style="list-style-type: none"> • Minimises major biodiversity impacts compared with other options considered. • Avoids the PCLs at Castlereagh, passing to the south of these high value vegetated areas. The PCLs have been identified as conservation priorities in the Commonwealth and NSW endorsed <i>Cumberland Plain Recovery Plan</i> and are considered to represent “the best remaining opportunities to secure long-term biodiversity benefits in the region at the lowest possible cost”. The existing Castlereagh Freeway reservation through the PCLs covers an area of about 40 hectares and traverses threatened ecological communities (TECs) including: <ul style="list-style-type: none"> ○ Cooks River Castlereagh Ironbark Forest – listed as critically endangered (Commonwealth) and endangered (State) ○ Castlereagh Scribbly Gum Woodland – listed as endangered (Commonwealth) and vulnerable (State) ○ Shale Gravel Transition Forest – listed as critically endangered (Commonwealth) and endangered (State). • Crosses several TECs including those listed above, however, the extent of TECs affected is considerably less than that within the existing reservation. Disruption to wildlife connectivity and removal of habitat will also occur but will be considerably less. Directly impacts on the edges of the PCLs and riparian vegetation along the Nepean River. • A biodiversity offset strategy will need to be developed to manage the process of identifying and securing suitable offset sites and vegetation corridor connectivity. The draft SEA recommends that a regional oversight approach be adopted to ensure a proper assessment of the cumulative impacts on biodiversity. <p><i>Traffic, noise, visual and hydrology impacts</i></p> <ul style="list-style-type: none"> • Improves traffic capacity, reduces existing congestion on key arterial roads such as Richmond Road, improves travel times and increases the efficiency of freight movements. • Provides an additional option for flood evacuation. • Provides local road connectivity for many, but not all local roads. • Generates noise levels that may impact on sensitive receivers such as residential dwellings, schools and child care centres and noise mitigation would need to be

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	<p>considered.</p> <ul style="list-style-type: none"> Has a high visual impact for residents in Llandilo, Cranebrook and Castlereagh as it will be visually exposed when existing vegetation is initially cleared prior to landscape treatment, particularly around the proposed interchanges with Castlereagh Road at Castlereagh and The Northern Road, Cranebrook Road and Londonderry Road at Cranebrook, and where it is elevated across the South Creek floodplain. The proposed bridge over the Hawkesbury-Nepean River also presents a major visible element in the landscape, particularly from neighbouring rural residential properties. <p><i>Aboriginal and non-Aboriginal heritage</i></p> <ul style="list-style-type: none"> Potentially impacts a number of known and potential Aboriginal heritage sites. At this stage, the nature and significance of the sites and likely impacts is not fully understood. Impacts two non-Aboriginal heritage items – item 261: Castlereagh Road Alignment and item 659: 850-856 Castlereagh Road, Agnes Banks – Brick farmhouse, trees and orchard. <p><i>Cumulative impacts</i></p> <ul style="list-style-type: none"> Once constructed, the cumulative impacts of loss of amenity, increased noise, changed traffic and access arrangements and changes in land use are likely to have a negative impact on residents and businesses in some locations. Some decrease in amenity is to be expected with any new infrastructure project and overall would be offset by the benefits derived from the improved regional connectivity between the Blue Mountains, north-western Sydney, and the Sydney motorway network.
OUTER SYDNEY ORBITAL	
<p>Established residential areas and rural villages</p> <p>Special uses such as the former Llandilo International Radio Transmitter Station (Shanes Park), Defence Establishment at Orchard Hills and Western Sydney University at Werrington</p> <p>Areas identified for future residential and/or employment growth such as North West and South West Growth Areas, WSEA and WSAGA including Sydney Science Park</p> <p>National Parks, nature reserves and regional parks such as Castlereagh, Mulgoa and Wianamatta Nature Reserves and Wianamatta Regional Park.</p> <p>Commonwealth listed endangered or critically endangered ecological</p>	<p>Properties directly affected in Penrith LGA: 252 privately owned properties; 105 government owned properties.</p> <p>A significant part of the recommended corridor is located within the South Creek corridor, with significant flooding, biodiversity values and a number of recreational playing fields and other community uses. The South Creek corridor is an important part of the green grid with plans to create a continuous open space corridor along the entirety of South Creek that provides ecological protection and enhancement, improved stormwater treatment and a regionally significant recreation and active transport corridor.</p> <p>Between the North Eastern LGA Boundary and Dunheved</p> <ul style="list-style-type: none"> Traverses and divides Wianamatta Regional Park, recognised for its natural and historical importance, and known to contain threatened vegetation and species, areas of significant

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<p>communities including Cumberland Plain Woodland and Shale Sandstone Transition Forest</p> <p>State listed endangered ecological communities including Shale Sandstone Transition Forest and River Flat Eucalyptus Forest</p> <p>Areas containing habitat identified for conservation and vegetation retention as part of the bio-certification order for SEPP (Sydney Region Growth Centres) 2006</p> <p>Areas identified as a priority for conservation as part of the Cumberland Plain Recovery Plan</p> <p>Biobanking sites or offset sites not within OEHL land ownership</p> <p>Aboriginal heritage landscapes and Native Title registered areas</p> <p>Commonwealth and State Heritage listed sites such as Llandilo International Radio Transmitter Station and Orchard Hills Cumberland Plain Woodland</p> <p>Views to the Greater Blue Mountains</p> <p>Topography</p> <p>Watercourses and associated low-lying floodplain areas primarily associated with South Creek, the Nepean River and their tributaries - crossings of watercourses and floodplain areas with elevated structures can be technically challenging and costly, and impact flood storage, riparian vegetation and visual character along the watercourse</p> <p>OSO interchanges with the M4 Motorway and Great Western Highway</p> <p>Freight rail connectivity such as providing a four way grade separated junction between OSO and Main West Rail Line in the Werrington/St Marys area; a connection between OSO corridor and WSFL corridor; and co-location of NSRL with OSO</p> <p>Functional design requirements such as train length, design speed, track alignment/geometry, horizontal and vertical clearances, and design flood levels</p> <p>Utility infrastructure such as Warragamba to Prospect Water Supply Pipeline and Sydney Water sewer trunk mains; high voltage transmission lines and substations; and telecommunications infrastructure</p>	<p>archaeological potential and Aboriginal cultural heritage.</p> <ul style="list-style-type: none"> • Mitigates impacts on Regional Park by avoiding impacts to the main access and minimising impacts on associated facilities, which will allow continued community use of the Regional Park. Also avoids South Creek riparian corridor through the centre of the Regional Park to minimise impacts to significant biodiversity values and areas of Aboriginal cultural sensitivity. This work has been determined in consultation with OEHL. • Avoids existing residential communities of Ropes Crossing and Jordan Springs. <p>Between Dunheved Precinct and Main West Rail Line</p> <ul style="list-style-type: none"> • Traverses the Dunheved Precinct in the St Marys ADI Site to avoid the St Marys Sewage Treatment Plant and Maintenance Depot, which are important assets that would be difficult to relocate. • Passes along southern edge of the existing Dunheved Business Park and through eastern portion of Dunheved Golf Course site, impacting on the existing club house and facilities. • Rail loop incorporated in this section of the corridor to encircle the existing Dunheved Business Park, north of Christie Street. • Partially uses disused rail corridor formerly serving the St Marys ADI site and retains a large majority of the industrial area. • Uses existing industrial zoned land on the former St Marys ADI site that has not yet been developed; therefore no significant loss of existing development in this locality. • Avoids impacts to key through roads in this area such as Forrester Road or Christie Street • Avoids existing residential communities of Werrington and North St Marys • Removes need for the rail junction to impact both the northern and southern sides of the Main West Rail Line, which compromises St Marys town centre and important community infrastructure such as St Marys High School and other key sporting and recreational facilities in the vicinity. <p>Between Main West Rail Line and M4 Motorway</p> <ul style="list-style-type: none"> • Avoids existing communities and severing existing or proposed housing, in particular Claremont Meadows and Orchard Hills to the west of the corridor and St Marys to the east • Avoids impacting a number of educational and community facilities, including WSU land at Werrington east of corridor, Kurrambee School and Penrith Valley Learning Centre

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	<ul style="list-style-type: none"> • Avoids impacting some recreational areas such as Cook Park and Lang Park • Significantly impacts Blair Oval, home to Nepean Athletics Club, BMX Track, St Marys Tennis Courts, and parts of The Kingsway Playing Fields and South Creek Park. <p>Between M4 Motorway and Southern LGA Boundary</p> <ul style="list-style-type: none"> • Significantly impacts Samuel Marsden Reserve which includes Colyton St Clair Chiefs Baseball Club. • Traverses rural land, passing over the Warragamba to Prospect Water Supply Pipeline and various local roads. • Enables proposed M12 Motorway and OSO to function as a higher order interchange to allow for direct access to Western Sydney Airport, and consolidate these motorways to minimise land take in Western Sydney Airport Growth Area • Enables connection of OSO with proposed Western Sydney Freight Line • Avoids impacts to Defence Establishment Orchard Hills and associated heritage and biodiversity values • Avoids rural village of Luddenham.
NORTH SOUTH RAIL LINE / SOUTH WEST RAIL LINK EXTENSION	
<p>Topography, geology and soils</p> <p>Hydrology including Werrington, Byrnes, Claremont, Blaxland, Cosgroves and Badgerys Creeks and groundwater aquifers</p> <p>Land uses including:</p> <ul style="list-style-type: none"> • St Marys Town Centre • The Quarter (Penrith Health and Education Precinct) • Primary and secondary schools - Wollemi College, Penrith Valley Learning Centre, Kurrambee School • Cobham Juvenile Detention Centre • Western Sydney Records Centre • Caddens and Claremont Meadows residential areas • Orchard Hills – existing and proposed residential • Twin Creeks, Luddenham, Badgerys Creek and Kemp's Creek rural areas and villages • Defence Establishment Orchard Hills 	<p>Properties directly affected in LGA:</p> <p>Rail at surface: 23 privately owned properties; 7 government owned properties</p> <p>Rail in tunnel: will be under 1613 privately owned properties; 99 government owned properties</p> <p><i>Land use and property impacts</i></p> <ul style="list-style-type: none"> • Where tunnelled, avoids substantial urban development, transport infrastructure or social infrastructure at the surface. • Maximises flexibility in design and function of future precincts identified for growth in State Government strategic plans. • Co-located with OSO through Orchard Hills, Luddenham and Badgerys Creek to minimise land take and reduce potential for severance of properties. Co-location also concentrates potential noise, air quality and visual impacts to reduce number of potentially impacted sensitive receivers.

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<p>Areas identified for future growth such as WSAGA including Sydney Science Park</p> <p>Road infrastructure such as M4 Motorway and Great Western Highway</p> <p>Rail infrastructure such as Main Western Line, St Marys, Werrington and Kingswood Stations</p> <p>Major utilities such as electricity transmission lines and Warragamba to Prospect Water Supply Pipeline</p> <p>Areas identified as a priority for conservation as part of the Cumberland Plain Recovery Plan including along Claremont Creek in Claremont Meadows; areas within Defence Establishment Orchard Hills; and between Pennard Crescent and South Creek, Twins Creek Estate</p> <p>Commonwealth and State listed endangered or critically endangered ecological communities including Cumberland Plain Woodland</p> <p>Aboriginal and Non-Aboriginal Heritage</p> <p>Landscape values</p> <p>Functional design requirements such as train length, design speed, track alignment/geometry and gradients</p>	<p><i>Traffic and transport impacts</i></p> <ul style="list-style-type: none"> • Where tunnelled, avoids several State roads including Great Western Highway and M4 Motorway. • TfNSW to liaise with DPE, Council and landowners during precinct planning and rezoning processes to ensure corridor is properly accommodated in land use structure plans. <p><i>Noise and vibration impacts</i></p> <ul style="list-style-type: none"> • Where tunnelled, avoids airborne noise impacts to sensitive receivers. Potential for ground borne noise and vibration from tunnel to be determined at the next stage of planning. Mitigation strategies can be implemented to ensure surface impacts are avoided and noise and vibration criteria achieved. • Sensitive receivers near corridor include dwellings on eastern edge of The Vines subdivision and dwellings on rural properties. • If corridor is zoned SP2 Infrastructure, clause 102 of State Environmental Planning Policy (Infrastructure) 2007 (or similar controls) would apply, defining internal noise goals for residential buildings. Further, development controls should be introduced in future precinct plans to ensure new residential areas contain appropriate noise mitigations, and buildings located near the corridor include noise attenuation measures. <p><i>Visual and air quality impacts</i></p> <ul style="list-style-type: none"> • Where tunnelled, avoids visual impacts to sensitive receivers. The tunnel requires access and air circulation outlets to be provided above it. The location of these outlets to be determined during detailed design and documented in environmental impact statement prior to delivery of infrastructure. • At surface, introduces a new dominant feature to the rural landscape. If design includes viaducts and other elevated structures (particularly in the vicinity of flood prone land such as at the crossings of Blaxland Creek, Cosgroves Creeks and other smaller tributaries of South Creek), visual impacts potentially high. However, visual impacts will be reduced as land use changes with development of WSAGA. • Contributes to significant reduction in air quality and greenhouse gas emissions compared to increased car travel that would otherwise be expected in its absence. <p><i>Soil and water impacts</i></p> <ul style="list-style-type: none"> • Aligns to generally avoid flood prone land and mostly located above the 1 in 100-year flood levels. However, traverses watercourses and parts of South Creek flood plain.

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	<ul style="list-style-type: none"> • Avoids many of the existing small dams and water storage areas in Orchard Hills, Luddenham and Badgerys Creek, but traverses some small dams located on agricultural land as well as Cosgroves Creek and South Creek. • Soil conditions subject to erosion and potential contamination, which can be mitigated through appropriate remediation and erosion and sediment controls. <p><i>Biodiversity impacts</i></p> <ul style="list-style-type: none"> • Where tunnelled, avoids areas of established vegetation, including riparian vegetation along South Creek and Claremont Creek and PCL at Claremont Meadows. • Avoids PCLs within Defence Establishment Orchard Hills • Largely traverses land that has been cleared, however, requires removal of about 8.31 hectares of native vegetation including: <ul style="list-style-type: none"> ○ Shale Plains Woodland – listed as critically endangered (Commonwealth and State as associated with Cumberland Plain Woodland) ○ Alluvial Woodland – listed endangered (State). <p>Minimal impact expected given existing records of biota activity in the area as well as potential design of infrastructure.</p> <ul style="list-style-type: none"> • Crosses a number of watercourses, including Blaxland Creek, Cosgroves Creek and other smaller tributaries of South Creek. Riparian and aquatic habitat unlikely to be significantly affected as linear nature of the corridor only affects small widths of waterways and associated vegetation. • The draft SEA recommends detailed flora and fauna surveys to determine offsets in accordance with the relevant biodiversity legislation. • The draft SEA recommends that a regional oversight approach be adopted to ensure a proper assessment of the cumulative impacts of all large infrastructure works in Western Sydney on biodiversity. <p><i>Heritage impacts</i></p> <ul style="list-style-type: none"> • Where tunnelled, avoids impacts to heritage items. • At surface, traverses heritage item 843 - Luddenham Road Alignment and heritage item 857 - McGarvie-Smith Farm, which was the first farm to be acquired by University of Sydney in 1936 to support the teaching and research of veterinary science and agriculture. Design and construction measures to be identified to minimise impacts on local heritage

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	<p>items.</p> <ul style="list-style-type: none"> • While the landscape is acknowledged to be of cultural and social significance to Aboriginal people, there are no identified areas of particular cultural or social significance within corridor. <p><i>Economic and social impacts</i></p> <ul style="list-style-type: none"> • Where tunnelled, minimises disruption to existing communities. • Acts as a catalyst for the new Western Economic Corridor. • Makes a direct economic contribution to Western Sydney and broader Sydney Metropolitan Area in terms of economic growth, employment and savings to the economy. • Provides opportunities to support existing and future housing and employment centres in Western Sydney. Creating more and higher-value employment opportunities in Western Sydney will help to manage travel demand and facilitate 30-minute city. • If not protected, there will be higher future costs associated with land acquisition and relocating local infrastructure, utilities and services. If incompatible development occurs within and around corridor, then these costs could rise to a point where building rail infrastructure in the future becomes unviable.
WESTERN SYDNEY FREIGHT LINE	
<p>Residential and community land uses</p> <p>Opportunities to service existing and future employment land</p> <p>Infrastructure such as Warragamba to Prospect Water Supply Pipeline, M7 Motorway and proposed Outer Sydney Orbital</p> <p>Existing freight network</p> <p>Functional design requirements</p> <p>Biodiversity – scattered areas of vegetation with high ecological value</p> <p>Aboriginal and non-Aboriginal heritage items</p> <p>Topography – design requirements include maximum grade of 1% to ensure efficient operations and avoid unnecessary emissions and increased noise</p> <p>Flooding and hydrology - including South Creek and Ropes Creek</p>	<p>Properties directly affected in LGA: 16 privately owned properties; 7 government owned properties</p> <ul style="list-style-type: none"> • Achieves best balance between engineering and constructability while minimising impacts on the community and environment. • Has least impact on existing dwellings by maximising separation to residential communities, such as Twin Creeks residential community. • Avoids direct impact on several sensitive receivers including the Emmaus Retirement Village, Trinity Primary School and recreational land uses. • Has least impact on critical infrastructure including Warragamba pipeline, Outer Sydney Orbital corridor and M7 Motorway. For example, corridor runs alongside Warragamba pipeline to eliminate need for future infrastructure to cross pipeline and corridor crosses M7 at a location that allows a grade-separated crossing. • Delivers best operational freight outcomes including an alignment that avoids major

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	<p>undulations in landform.</p> <ul style="list-style-type: none">• Avoids major impact to biodiversity, flooding or heritage. OEH has been consulted. Further consideration required during design development.• Facilitates development of freight and logistics industries in Western Sydney.• Has less significant impact than other potential alignments given its co-location with existing Warragamba Pipeline.