

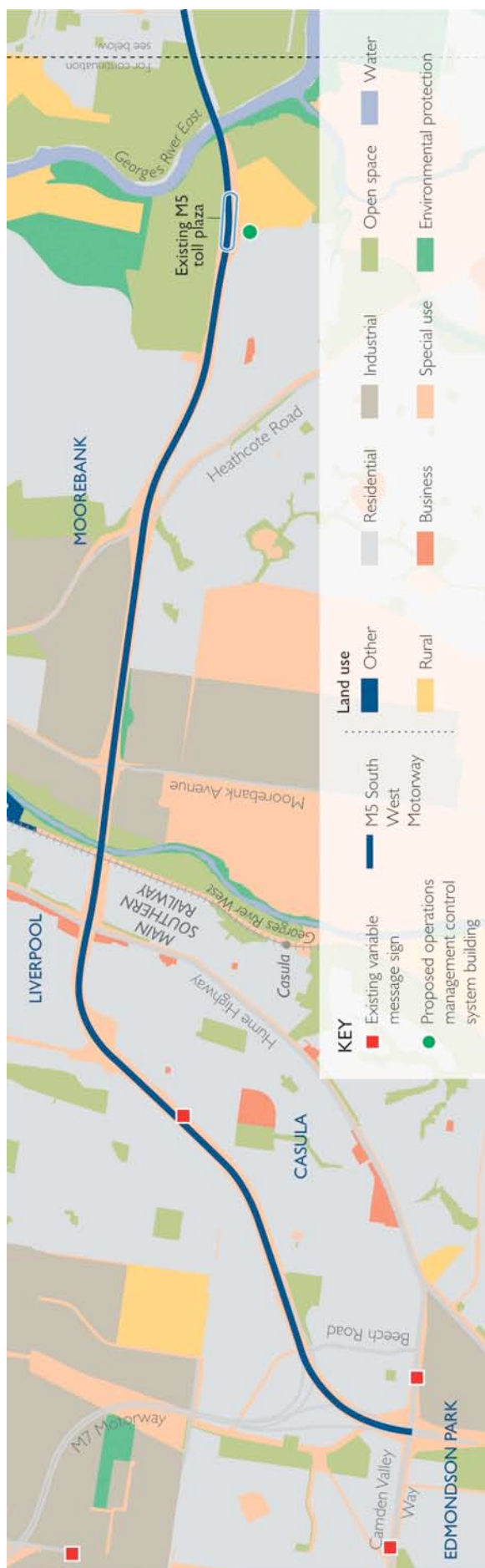


Figure 9.6 Existing land use surrounding the M5 South West Motorway Corridor

Note: Project detail shown is indicative only, subject to detailed design

From Fairford Road to Henry Lawson Drive, the land use on the southern side of the M5 South West Motorway is mainly low-density residential dwellings, and the land use on the northern side is predominantly industrial land. The University of Western Sydney Bankstown campus is also located on the northern side. The former Bankstown rubbish tip comprises a large amount of land on the southern side of the motorway.

From Henry Lawson Drive to Heathcote Road, the land use on either side of the motorway is typically open space, associated with golf courses to the north, and parks and reserves to the south. The Georges River traverses the open space area in a north–south direction. The remainder of this section comprises low-density residential land.

From Heathcote Road to Moorebank Avenue, land use is typically industrial, with low-density residential areas on the southern side.

From Moorebank Avenue to Camden Valley Way, the land use is predominantly low-, medium- and high-density residential on both sides of the existing M5 South West Motorway, interspersed with pockets of open space. The Georges River traverses the area between Moorebank Avenue and the Hume Highway in a north–south direction. There is industrial land use on the eastern side of the Georges River, and residential land on the western side of the Georges River, either side of the motorway.

The Bankstown, Canterbury and Liverpool local environmental plans make provision for the development of the M5 corridor in their land use zoning. The corridor in the Canterbury and Bankstown local environmental plans is zoned '5 – special uses'. In the Liverpool local environmental plan, it is zoned 'SPI – special activities'. Each local environmental plan has objectives relating to development within that land use. The objectives broadly relate to the provision of infrastructure for community use that does not fit into other categories and minimises impacts on surrounding land uses.

9.7.2 Assessment of impacts

The following potential land use and socio-economic issues have been identified for the project:

- Construction stage impacts.
- Property impacts.
- Local amenity.
- Access and connectivity.
- Economic productivity and job creation.
- Planned development.

These potential impacts, and proposed management measures, are described below.

Construction stage impacts

The main socio-economic impacts associated with the project during construction would be from the establishment of construction site compounds and construction traffic. Other impacts would include increased noise and dust levels, access impacts and reduction in visual amenity (including the potential for light spill from night-time construction works). These could have temporary adverse impacts on local residents, businesses and other sensitive land uses.

Construction impacts from the King Georges Road to Fairford Road section are likely to be less than impacts from the Moorebank Avenue to Fairford Road section and the Hume Highway to Camden Valley Way section, as works would be limited to a new concrete safety barrier, pavement resheeting and line marking changes.

Potential construction impacts are described below.

Construction site compounds

The potential locations for construction site compounds are described in section 6.6. The establishment of these facilities would temporarily alter the land use of the sites. Following the completion of construction, site compounds would be decommissioned and removed, and land use restored.

Temporary leases for the use of construction site compounds would be negotiated with the landowners.

Construction traffic

The potential construction traffic impacts arising from the project would be mainly associated with potential disruptions to traffic flow as a result of construction works. These activities would require the motorway speed limit to be reduced to 80 kilometres per hour and vehicles to travel on the hard shoulder, which is likely to result in some traffic delays. There is already congestion on the M5 South West Motorway and this would be increased as a result of slowing traffic speeds.

Lane closures would be required to establish worksites within the median and on the outside of the motorway and a number of other activities including some bridge and concreting works, alteration to static signage (see section 6.5 for details). These would be undertaken at night to minimise traffic impacts. Full road closures of the motorway would be necessary at night-time for asphaltting works and to upgrade the DeMeyrick Avenue underpass. Minimal disruption to the surrounding community is anticipated, as construction work would be undertaken within the existing road corridor and not on any local roads.

There would be minor traffic disruptions around construction compounds and laydown sites for plant and vehicle access. Short-term road management measures would be put in place to ensure safe compound access.

The DeMeyrick Avenue underpass would need to be closed for about six months during bridge reconstruction works. There would also be minor traffic disruption for the installation of variable message signs on arterial access roads surrounding the motorway. Standard traffic management measures would be implemented at each installation site to ensure timely access and minimise lane closures. Construction planning will ensure safe pedestrian access is maintained through DeMeyrick underpass during any construction works undertaken at this location.

A small number of cyclists who use the motorway shoulders would be affected during the construction period by changes to access arrangements, as concrete barriers would be erected to separate traffic from cyclists during the construction period where works are undertaken on the outside of the motorway. Barriers would be erected to provide safe separation distances for cyclists for different travel speeds. The *Austrroads Guide to Traffic Engineering Practice* (Austrroads, 1999) and the RTA's *NSW Bicycle Guidelines* (RTA, 2005) would be considered in siting these barriers.

Property impacts

As discussed above, temporary construction leases would be required for the construction site compounds. The negotiated agreements for the use of these sites would adequately compensate landowners for the use of these lands.

At this stage, no property acquisition has been identified for the project. It is expected that most ancillary works (drainage basins, drainage structures and water quality devices) for the project would be located within the boundary of the existing road reserve and that only limited, if any, acquisition of land would be required.

Any permanent acquisition would be undertaken in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* and RTA policy.

Local amenity

There would be minimal change to the amenity of the surrounding areas as a result of the operation of the project due to the works being undertaken predominately in the existing road reserve.

Community concerns may include increased traffic, noise and vibration from additional vehicles on the motorway and increased emissions and fumes from additional vehicles. These concerns and management measures to address potential impacts are addressed in sections 8.1, 8.2 and 9.4 respectively.

Visual impacts associated with the project, including the appearance of the new variable message signs and the potential for light spill from these signs, are assessed in section 8.4.

Access and connectivity

The project greatest effect on access and connectivity would be to improve the connectivity between Sydney's South West region and Port Botany, Sydney Airport and further on to Sydney's central business district.

There are a number of interchanges along the length of the motorway (see Chapter 6). A number of roads also pass under and over the motorway at various and regular locations. There are two pedestrian overpasses at Bell Street, Riverwood and Box Road, Prestons/Casula. Pedestrians are able to cross over and under the motorway at a number of points, generally at the road overpasses and underpasses and at the two pedestrian overpasses.

Locally, there would be negligible adverse impacts on access during construction or operation of the project:

- Pedestrian access to the motorway is currently prohibited for safety reasons and this would remain the case. As indicated above, pedestrian access via the De Meyrick Avenue underpass would be retained during the construction phase.
- Access for cyclists would be maintained during construction and operation. The road shoulder would continue to be available for use by cyclists during operation of the project.
- No severance would occur as a result of the project, as the motorway entry and exit points would retain their current function. With the exception of the temporary closure of the De Meyrick Avenue underpass, there would be no changes to local road access.

Economic productivity and job creation

The project is expected to have positive economic impacts. Economic analysis (discussed in more detail in Chapter 3) found that the proposed widening of the M5 South West Motorway would deliver benefits, realised by the general community, that outweigh the initial upfront construction cost and ongoing operational costs.

These benefits would include:

- Increased economic activity and employment opportunities during construction and operation. During construction, there is likely to be a short-term boost to the local and regional economy from employment and spending in the region. Construction supplies and construction workers would be sourced locally, where possible. It is expected that around 300 to 500 people would be employed to construct the project.
- Wider economic benefits, which are expected to include the facilitation of expanding residential and employment areas through enhanced capacity and connectivity. The project would increase the accessibility of the South West Growth Centre, Liverpool City and the Western Sydney Employment Hub, in addition to employment land in and around Sydney Airport and Port Botany, and south west to Canberra and Melbourne.

- Benefits for businesses from reduced traffic congestion, travel times and transport costs. Businesses that use the motorway to access either south-western Sydney or the city would benefit from improved accessibility and travel times.

Planned development

The project would provide enabling infrastructure that would support other government initiatives, such as the South West Growth Centre and Western Sydney Employment Hub, to drive land use change and support future local and regional economic development.

Land use change in the vicinity of the project is influenced by strategic planning initiatives and the statutory controls of local and State government. The project has been developed in consideration of the existing strategic planning documents:

- *Sydney Urban Corridor Strategy* (DOTARS, 2007b).
- *South West Subregion – Draft Subregional Strategy* (DoP, 2007a).
- *South Subregion – Draft Subregional Strategy* (DoP, 2007b).
- *West Central Subregion – Draft Subregional Strategy* (DoP, 2007c).

Planned development includes significant new development and planned intensification of residential and employment uses, with a large proportion of this in the existing urban areas of south-western Sydney. These developments include:

- The South West Growth Centre, which includes Liverpool, Camden and Campbelltown local government areas and covers an area of about 170 square kilometres. This area is planned to accommodate around 110,000 new homes in the next 30 years. Land is progressively being released at Edmondson Park.
- The Western Sydney Employment Hub, which is located at the intersection of the M4 and M7 motorways, and is expected to eventually accommodate around 40,000 workers. It comprises 1500 hectares of land for industrial use, with the potential to generate more than 1000 net hectares of additional employment land.

9.7.3 Mitigation measures

The following mitigation measures are proposed to address socio-economic and land use impacts associated with the project during construction:

- Any permanent property acquisition will be undertaken in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*.
- The community will be kept informed of the project by website updates, letterbox drops, existing variable message signs, and targeted consultation with affected individuals and/or groups. Information provided would include the timing of the project, progress of the construction works, and changes to traffic conditions.
- Access for cyclists will be maintained during construction and future operation of the motorway.
- Construction planning will ensure safe pedestrian access is maintained through DeMeyrick underpass during any construction works undertaken at this location.
- Property access will be maintained during construction. Should temporary access restrictions be required, these would be arranged in consultation with the affected landowner(s).

9.8 Resources and waste management

9.8.1 Existing environment

There are three main legislative instruments to manage waste in NSW:

- *Waste Avoidance and Resource Recovery Act 2001*.
- *Protection of the Environment Operations Act 1997* (POEO Act).
- Protection of the Environment Operations (Waste) Regulation 2005.

The *Waste Avoidance and Resource Recovery Act 2001* is the primary legislation for managing waste. It aims to achieve a reduction in waste generation and the conversion of waste into a recoverable resource. Resource and waste management is prioritised according to the principles of the resource management hierarchy as defined in that Act.

This hierarchy is (in order of preference):

- Avoidance of unnecessary resource consumption.
- Resource recovery (including reuse, reprocessing, recycling and energy recovery).
- Disposal.

Various waste streams would be generated during the construction of the project including construction and excavation waste, vegetation waste, packaging materials and liquid wastes. Waste generated during operation would be limited.

The POEO Act defines 'waste' for regulatory purposes and establishes management and licensing requirements for the transport, storage, disposal and re-use of waste.

The Protection of the Environment Operations (Waste) Regulation 2005 provides a mechanism for recognising genuine resource recovery through resource recovery exemptions. Exemptions allowing land application of waste-derived materials are permitted under section 51 of the Regulation. Resource recovery exemptions are relevant to a range of materials that are commonly used in road construction activities.

9.8.2 Assessment of impacts

Construction resource use

Construction of the project would require the following resources:

- Energy – construction plant and equipment would use about 2,600,000 litres of fuel and the transportation of materials would use about 500,000 litres. The construction site compounds would use a total of about 270,000 kilowatt hours of electricity.
- Water – about 15 to 20 megalitres of water would be required for the construction of the project. Typically, water would be used for concrete mixing, dust suppression, compaction of road construction materials, wash-down of vehicles and equipment, landscape establishment and site amenities (toilets, taps, showers). Water would be sourced from the sedimentation ponds along the motorway, where such water is available and is of suitable quality for its intended construction purpose. About five megalitres would be sourced from the eight filling points along the motorway (this would be potable water requiring metered standpipes).
- Materials – construction of the project would require a variety of materials including:
 - 86,000 tonnes of concrete.
 - 2000 tonnes of cement.

- 550 tonnes of steel.
- 30,000 tonnes of sand.
- 150,000 tonnes of asphalt.
- Less than 500 litres of sealant.
- 750 tonnes of precast concrete (for bridge works).
- 1000 tonnes of concrete pipes and drainage products.
- 120,000 tonnes of heavily bound base material.
- 150,000 metres of 100-millimetre diameter conduits.
- 25,000 litres of curing compounds.
- 120,000 tonnes of select material would be required for pavement construction.
- 25,000 tonnes of drainage backfill materials.

The above quantities are preliminary estimates only. Detailed estimates would be made during the detailed design and construction planning stage of the project.

Construction waste

Construction waste would comprise excavated material, old paving, and general waste, as outlined below.

About 250,000 tonnes of material would be excavated from the corridor, mainly from the central median, drainage works, drainage basins and operational management control system works. Where possible this material would be reused in the project for visual screening, noise mounds and stabilising batters. It is estimated that up to about 80 per cent of the excavated material from the construction works would be re-used on site. This would result in a significant reduction in waste generated by the project, and would avoid the environmental and economic costs associated with the transport and disposal of all of the excavated material off-site.

In addition, about 50,000 tonnes of asphaltic concrete pavement would be milled from the existing carriageways as part of the pavement re-surfacing works. All of this material would be reclaimed by the asphalt supplier company or companies engaged for the construction. The reclaimed millings would be re-used in the manufacture of new pavement materials and used in the pavement construction works of the project, if appropriate, as well as other concurrent construction projects.

Construction of the project would also generate a number of other waste streams, including:

- Vegetation from the removal of landscaped grass and trees (about 4500 tonnes).
- Packaging materials such as cardboard, paper, plastic and glass associated with items delivered to the site.
- Demolition waste from noise walls and drainage basins.
- Waste oils, liquids and chemicals from the operation and maintenance of machinery and vehicles.
- Sewage from the compound sites.
- General rubbish from the compound sites including paper, cardboard, beverage containers and food waste.

Operational resource use

Table 9.12 provides estimates of the existing and proposed annual operational resource requirements for the project.

Table 9.12 Resource requirements for operation of the M5 South West Motorway (existing and future)

Resource	Units	Existing (2009)	With the project (2013)	Change
Electricity				
Total electricity	Gigawatt hours	1.23	1.8	+0.57
Maintenance vehicles				
Petrol	Kilolitres	24	20	-4
Diesel	Kilolitres	6	6	0
LPG	Kilolitres	23	20	-3
Maintenance materials				
Asphalt	Tonnes	5000	7000	+2000
Concrete	Tonnes	50	50	0

Operational waste

Operational waste would be relatively limited, with the main waste streams likely to be:

- Oils, liquids and chemicals used for maintenance of plant and equipment used in road maintenance activities.
- Sewage and other liquid wastes generated in the new and existing control rooms. This waste would be disposed of to sewer.
- General solid wastes from the operation of the new control building and existing control room. Where possible recyclable wastes such as paper, cardboard and packaging would be recycled and the remainder sent to a licensed waste facility.
- General litter along the motorway.
- Landscape and vegetation waste.
- Waste grit and soil from road sweepers.
- General office waste.

9.8.3 Mitigation measures

Construction resource use

As described above, excavated material will be used for fill requirements, where practicable, to reduce the demand for fill. Where reasonable and feasible recycled and recovered material will be utilised in the construction of the project. Materials used will be sourced locally where practicable.

Given the restrictions on Sydney's water supply and the need to conserve this resource, the use of water for the construction of the project will be carefully managed. Wherever practicable, water will be sourced from the drainage basins instead of the potable water supply.

Construction waste

Construction waste will be managed as follows:

- Standard waste management measures will be implemented, including:
 - The application of the waste minimisation hierarchy principles of avoid/reduce/re-use/recycle/dispose.
 - Appropriate waste handling, storage and disposal.

- Any waste material that is unable to be re-used, reprocessed or recycled would be disposed at a facility approved to receive that type of waste.
- Construction waste will be minimised by providing realistic predictions for the quantities of resources such as construction materials.
- Excavated material will be reused on site to the greatest extent possible.
- Trees and plant material will be mulched or chipped on-site and used in landscaping where practicable.
- Waste will be segregated and recycling facilities would be provided to separate paper, plastic, glass, aluminium cans and other recyclable materials from general waste, where practicable.
- Waste disposal will only occur where there are no other options for waste avoidance, re-use and recycling.
- All waste generated during construction will be classified, managed, treated and disposed in accordance with the Waste Classification Guidelines (DECCW, 2008). A waste management register would be maintained during construction.
- Construction contractors will be required to report on the extent of recycling and reuse, and quantities of waste generated.

Operation

Resources used and waste generated during operation will be addressed within the operator's environmental management system.

9.9 Cumulative impacts and interactions

9.9.1 Nature of cumulative impacts

Cumulative impacts result from a number of projects being constructed or operated at the same time. They typically relate to amenity impacts such as noise, visual, or traffic impacts, or resource impacts such as biodiversity and water quality. When considered in isolation, a particular impact from one project may be considered minor, but when the impact of multiple projects on the same receivers is considered, the impacts may be much more substantial.

Another type of cumulative impact is known as construction fatigue. This concept relates to sensitive receivers that experience construction impacts from a variety of projects, over a long period of time, with little or no breaks between construction periods. Construction fatigue typically relates to amenity impacts from projects that are constructed consecutively or 'back to back'.

The impacts associated with the construction and operation of the M5 West widening project and other relevant projects are the subject of this cumulative impact assessment. Prediction and evaluation of cumulative impacts is not a straightforward process. The following sections provide an assessment based on the most up to date and publicly available information.

9.9.2 Assessment methodology

This assessment of cumulative impacts focuses on the key environmental issues that are assessed in detail in Chapter 8, namely:

- Traffic and transport.
- Noise and vibration.
- Biodiversity.

- Visual impacts, urban design and landscaping.

Potential construction phase interfaces with other significant projects were also reviewed. The identification of projects for consideration was based on the following criteria:

- The project size – given the extent of development within Sydney, only major projects (as determined by the Department of Planning) were considered.
- The project boundary – only projects located within suburbs intersected by or adjacent to the M5 South West Motorway were considered. The suburbs considered within the catchment of the assessment therefore included Kingsgrove, Beverley Hills, Roselands, Narwee, Riverwood, Punchbowl, Bankstown, Condell Park, Padstow, Revesby, Panania, Milperra, Voyager Point, Hammondville, Holsworthy, Moorebank, Wattle Grove, Liverpool, Lurnea, Casula, Glenfield, Prestons and Edmondson Park.
- The project timeframe – only projects likely to be undertaken at some point during the construction period of the M5 West widening project were considered. However, one project was identified that had already been constructed (Aldi warehouse and distribution centre development). The potential for 'back to back' cumulative impacts as a result of consecutive construction timeframes was assessed for this project.

The operational relationship of the project with existing and planned transport infrastructure is considered in Chapter 3.

9.9.3 Existing environment

Based on the criteria explained in section 9.9.2, seven major projects were identified within suburbs intersected by or adjacent to the M5 South West Motorway. These projects are illustrated in Figure 9.7 and a summary of these projects and their relevant impacts is provided below.

Kingsgrove to Revesby quadruplication project

This project is about 400 metres from the M5 South West Motorway at its closest point.

It involves the construction of a second pair of railway tracks on the East Hills Line between Kingsgrove and Revesby (refer Figure 9.7) and an associated bridge and station. The works allow for a physical separation of local and express services. Construction commenced in early 2009 and is due for completion in about 2013.

Information on impacts was obtained from the *Kingsgrove to Revesby Quadruplication Project Environmental Assessment* (Sinclair Knight Merz, 2007), and is summarised below.

Noise and vibration

Bridge and station works are predicted to exceed the construction noise goals. These works are being undertaken at 11 locations, all of which are between about 400 and 1200 metres from the M5 South West Motorway. The predictions show that off-site truck noise levels would comply with the relevant road traffic noise criteria at offset distances greater than 20 metres.

Once operational, the number of locations exceeding the overall noise trigger levels compared to existing conditions is predicted to increase from 46 to 57 on the southern side of the corridor and from 46 to 56 on the northern side of the corridor (which is the side closest to the M5 South West Motorway).

Traffic and transport

Construction vehicles generally use major roads, including the M5 South West Motorway, King Georges Road, Belmore Road, Davies Road, The River Road and Canterbury Road. The number of trucks per day at each access point will range between one and forty over a period of 6 to 17 months. Some of the works require full or partial road closures including King Georges Road, Belmore Road, and Davies Road.

Once operational, the project will have no impact on the regional or local road network.