



Gateway Upgrade Project



7. Utility Services



7. Utility Services

7.1 Introduction

TOR Requirements:

Describe the existing utility services that may be affected by the project, including electricity, sewerage, water, telecommunications, and airport infrastructure. Owners of the utilities should be provided.

An investigation has been undertaken to identify the existing utility services infrastructure along the existing Motorway and proposed GUP corridor. Potential impacts on existing services as a result of the GUP have been identified, categorised as major or minor and strategies to mitigate these impacts recommended.

7.2 Methodology

Existing utility services along the GUP corridor were identified as a part of the previous Planning Study undertaken by GHD. This information has formed the basis of the services investigations during the EIS, supplemented by additional services searches conducted through Dial Before You Dig (DBYD) and subsequent discussions with relevant service authorities/owners.

7.3 Summary of Existing Utility Services

Existing utility services and their infrastructure owners/managers identified along the GUP corridor are summarised in Table 7.1.

Table 7.1 Summary of Existing Utility Services

Utility Service Type	Owners/Managers
Electrical	Energex and Powerlink
Oil and Gas	Ampol, Fletcher Challenge Fuels, Santos, Energex Gas and Origin Energy
Telecommunications	Telstra, Optus, UEComm and BAC
Sewage	Brisbane Water
Water Supply	Brisbane Water
Stormwater	Brisbane City Council
Railway Services	Queensland Railways
Private Services Infrastructure	Inghams and others

The extent of utility services are shown within the services drawings contained in Volume 3 of the EIS. The identified services and their ownership (where known) are also listed in Appendix F.

7.4 Potential Impacts and Mitigation Measures

TOR Requirements:

This section is to assess the potential impacts of the project on existing utility services. Strategies to minimise potential impacts on existing utility services should be provided.

The GUP, whilst generally confined to the existing Motorway corridor particularly in the southern sections, will impact on a large number of existing utility services both minor and trunk services. This is primarily due to the corridor being located in a highly developed urban environment. In contrast the northern section of the project, north of Pinkenba Rail Line, has a relatively small number of service conflicts but does conflict with major services to the Brisbane Airport.

Based on the detailed concept design for the GUP, conflicts typically occur at the following locations:

- At Motorway crossing of existing road networks;
- At interchanges/intersections adjacent to the Motorway corridor;
- At crossing of services easements or corridors;
- At crossings of rail lines; and
- Where new Motorway ramps are required.

As a result of the investigations there are a large number of minor service conflicts identified along the GUP corridor. These conflicts are shown on the drawings contained in Volume 3 and are presented in Appendix F. The main mitigation strategies to resolve conflicts along the corridor include:

- Leave service in its current position and modify design of the project;
- Relocation of the service;
- Protection of the service during construction and operation; and/or
- Abandonment of the existing infrastructure by reconfiguring the service network.

Numerous minor service conflicts occur as a result of the proposed works and are typical for a road project such as this.

Major conflicts that are likely to have significant impact on the GUP have been outlined in further detail below and discussions with appropriate service authorities have been conducted to provide possible mitigation strategies. Details of each conflict and associated mitigation strategy can be found in Appendix F.

7.4.1 Electrical

275kV Transmission Lines

The existing Motorway alignment passes under high voltage electrical transmission lines (in excess of 275kV) at several locations. Discussions with Powerlink have indicated that adequate clearance will be available between the Motorway and existing overhead lines following the proposed upgrade. In some locations support structures clash with the embankment of the proposed alignment and retaining structures are required along the embankment to provide clearance to the support towers.

Hamilton Lands Sub-Station (Fison Avenue)

The Hamilton Lands electrical substation converts 33kV electricity supply to 11kV for distribution to the local area. The substation is located within Fison Avenue immediately to the west of the existing Gateway Motorway.

The proposed alignment passes over some of the above ground electrical infrastructure (eg busbars) located toward the rear of the property. Relocation of the affected infrastructure and associated underground cable will be required prior to construction works and it is likely that this relocation can occur to one of the neighbouring properties (one of which is owned by Energex and currently in use as an electrical storage yard). It is understood that this substation

is currently being upgraded and there is an opportunity to coordinate the relocation works with the construction of the GUP.

Brisbane Airport Feeder Cables

Located below the proposed northern airport interchange embankment (CH21300 to CH22600) are a 110kV and 2 x 33kV electrical cables. These cables are currently located in easements within the properties. The proposed Motorway embankments over the top of these cable locations will be up to 4-5m high above existing ground and significant settlements in the area are expected. Discussions with Energex have identified the sensitivity of these cables to settlement and direct loading as a result of the Motorway embankment. In particular the 110kV cable is an oil filled cable which is not tolerable to any differential settlement. It is proposed to either bridge over the existing cables using box culvert sections supported on piles/piers or to provide a bridge structure above the oil filled cable, founded on piles to limit the impact of loading and settlement on the cable. Final details will need to be resolved following additional geotechnical investigations and during detail design of the embankment. The final solution will need to provide maintenance access to the cable at all times and satisfy Energex requirements.

The 2 x 33kV cables will be encased in a large concrete box culvert to allow settlement of the embankment to take place without placing significant load on the cable.

7.4.2 Oil and Gas

The alignment crosses existing gas pipelines at a number of locations. Some crossings require relocation of the existing pipelines while those not requiring relocation will need to have protective slabs constructed beneath the carriageway to limit loading of the service.

Moonie Oil Pipeline

The Moonie Oil Pipeline owned and operated by Santos Ltd passes under the alignment at CH12900. This high pressure oil pipeline requires strict clearance and/or protection measures to be adopted as specified by Santos Ltd. Details will need to be resolved during subsequent project stages.

Ampol Oil Pipeline

The Ampol Oil Pipeline located along the median of Lavarack/Cullen Avenue passes under the alignment at the following locations:

- along the old Cullen Avenue corridor under the Gateway Motorway; and
- under the proposed bridge over Lavarack Avenue at CH18620.

The pipeline crosses the existing Gateway Motorway along the old Cullen Avenue alignment. Placement of embankment above the pipeline due to the widening of the Motorway will require the construction of a protection slab over the pipeline to limit loadings above.

At CH18620 the bridge pier will need to be located on the southern side of the central median with the oil pipeline currently located on the northern side. Adequate clearance to the pipeline will be available by offsetting the piers within the existing median (refer Appendix F for additional information on the Remote Switching Unit – Lavarack Avenue).

7.4.3 Telecommunications

Remote Switching Unit – Lavarack Avenue

The Telstra Remote Switching Unit (RSU) located in the central median along Lavarack Avenue will potentially clash with proposed bridge piers should they be positioned in the centre of the existing median. Telstra requires clearance and access to the RSU with a minimum clearance of 1.0m to the unit being specified.

To avoid relocation of the RSU the proposed bridge piers have been offset to provide the required clearance. There is currently sufficient clearance to the existing median kerb in which the bridge piers may be founded in order maintain clearance to the RSU.

The RSU is also sensitive to vibrational impacts and these will need to be controlled during construction and through the use of bored rather than driven piles (refer Section 15). Relocation of the underground cable into and around the RSU may be required to avoid the pile cap foundations.

7.4.4 Sewerage

A number of sewer mains (gravity and rising mains) are affected by the proposed works and require some form of relocation to resolve clashes with the proposed works.

Port of Brisbane Motorway Interchange

An extensive network of private and BCC owned sewer infrastructure exists in the area of the Port of Brisbane Motorway. The majority of the rising mains under the Motorway alignment have been found to be abandoned or are no longer required to serve properties.

Some relocations of existing infrastructure are required to continue servicing properties in the area. Relocations include a 225/300mm diameter rising main, a 300mm diameter gravity main and a 100mm diameter rising main and associated pump station.

BCC Pumping Station – Bunya Street

The GUP is immediately alongside a major sewage pump station located on the corner of Kingsford Smith Drive and Bunya Street. The existing Motorway is clear of the major infrastructure on the pump station site. A number of rising mains and small gravity mains form part of the underground network associated with the pump station as well as three large gravity mains in excess of 1,400mm diameter coming into the pump station on western side.

The proposed foundation arrangement associated with widening the bridge in this area may have implications on these large diameter gravity mains and discussions with Brisbane Water have indicated that final design of the foundation should place no additional loading on these mains during or after construction.

Under the proposed foundation arrangement minimal relocation works are anticipated to accommodate the GUP works. Relocation of a small diameter (150mm) gravity main will be required to avoid conflict with the proposed foundation arrangement.

7.4.5 Stormwater

Stormwater infrastructure along the Motorway corridor exists in the form of naturalised drainage channels, constructed gully pits, manholes and underground pipes. There will be a large number of relocation works required to suit the GUP works, however the impacts of these relocations are minimal relating to erosion and sediment control which can be adequately addressed through the Construction EMP.

7.4.6 Water Supply

Located below the proposed northern airport interchange embankment (CH21300 to 22600) is a 300mm diameter water supply pipeline. The GUP embankments over the top of this pipe is up to 4-5m high above existing ground and significant settlement in the area is expected. It is proposed that the pipeline will be encased in a large concrete box culvert to allow settlement of the embankment to take place without placing significant load on the pipe itself. This culvert crossing will also be used to protect the existing 33kV electrical cables.

7.4.7 Airport Infrastructure

Existing airport infrastructure impacted by the proposed works are limited to the 33kV and 110kV electrical cables discussed in Section 7.4.1 and the OLS beacons 1910 and 1911 discussed in Section 3.

No other airport services infrastructure are affected by the proposed works.

The GUP will provide an interchange to allow a second access to the airport (refer Section 3).

Mitigation measures to address potential utility service conflicts are contained in Appendix F.

7.5 Future Utility Services

In addition to the existing service infrastructure along the GUP corridor consideration has been given to future service provisions in the area of the Motorway that are likely to conflict with the GUP.

While some details of proposed service infrastructure in the area has become available it is likely that additional plans for future provisions have not yet been identified, particularly with respect to the Hamilton Lands substation in Fison Avenue and the potential for a new substation to the east towards Pinkenba.

Further discussions with relevant service authorities should include investigation of future service provision requirements and where possible, design the GUP to enable the future development of likely service infrastructure.

Future service infrastructure currently identified along the GUP alignment include:

- Plans for a BCC sewer pump station and associated main lines to be located along Terminal Drive. Current details of the proposed pump station indicate it to be situated close to the proposed bridge piers for the section of the GUP passing over the Pinkinba Rail Line and Terminal Drive.
- Discussions with Energex and Powerlink have indicated that proposed high voltage infrastructure is to be located in the area of the GUP works to include:
 - Cable from the Hamilton Lands substation proposed to run east and cross under the existing Motorway and future widening/duplication.

- 275kV line (Powerlink) is proposed to cross the alignment at several locations and will need to provide adequate clearance between the Motorway and the line itself and from the boundaries of the motorway to associated support structures. The proposed line is planned to cross the Motorway at the following locations:
 - i) CH6250;
 - ii) CH9200; and
 - iii) CH12800.
- 33kV (Energex) electrical line is proposed to travel beside the Motorway alignment in the Wynnum Road area.
- Proposed upgrade to the existing Hamilton Lands substation may also have a significant impact on the GUP. Currently it is proposed to relocate part of the existing substation to neighbouring land to resolve any clash with the widening of the Motorway in this area. However, Energex has indicated that the upgrade of this substation may require the provision of more infrastructure.
- The commercial development of the BAC land will require considerable service infrastructure to be installed in the area. Given the proposed alignment of the GUP through the Brisbane Airport area potential conflict exists between proposed service infrastructure and the alignment of the Motorway. Details of possible future services to this area are not currently available.

7.6 Conclusions

The GUP requires a number of utility services to be protected and relocated. Further investigation and discussions with relevant service authorities will be undertaken during detail design to ensure that the impact on utility services is managed.