

# Interim Guide to Development in a Transport Environment: Light Rail

March 2017

This interim document will support the *Planning Act 2016* and the State Development Assessment Provisions version 2.0, scheduled to commence in mid-2017. Please note, references to the State Development Assessment Provisions in this document may change.

This interim document may be used to inform planning and development decisions under the *Sustainable Planning Act 2009*.

Comments, suggestions for changes, further inclusions or errors can be provided to [planningpolicyandlegislation@tmr.qld.gov.au](mailto:planningpolicyandlegislation@tmr.qld.gov.au)

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# Part A. Context

## 1. Introduction

The *Guide to Development in a Transport Environment: Light Rail* (the Guide) provides important information for those involved in development, works or activities in the vicinity of light rail in Queensland. It is intended for use as a technical reference document.

The Guide provides specific technical guidance on how to achieve compliance with the assessment benchmarks in the *State Development Assessment Provisions* (SDAP) in relation to managing impacts of development on the safety and operational efficiency of light rail.

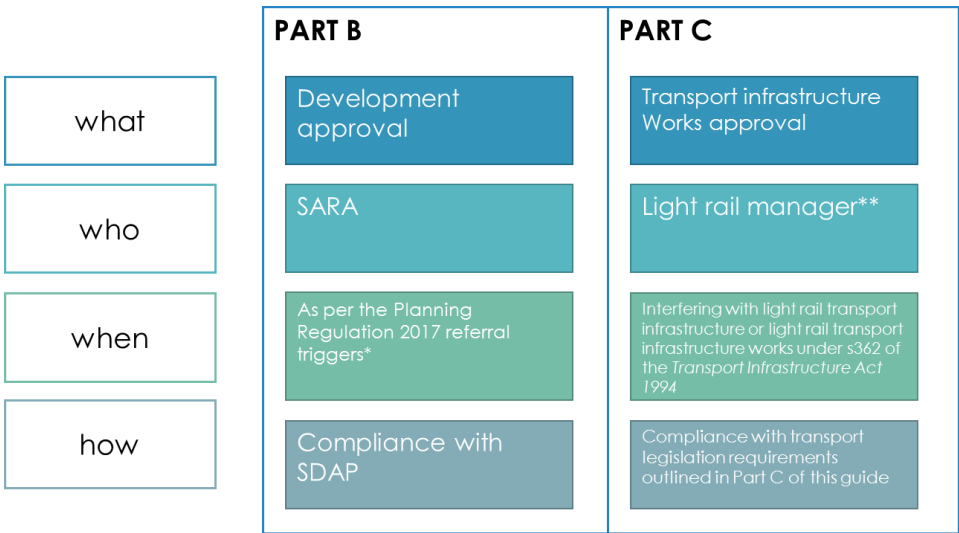
This Guide also provides useful information in relation to the operational constraints and requirements when undertaking works or activities within the light rail environment.

### 1.1. How to use this Guide

This Guide is structured in four parts:

- **A:** provides the context for development in a light rail environment.
- **B:** is relevant to development proposed on land adjacent to a light rail corridor. It provides supporting information about the key issues which need to be addressed if proposing development near a light rail corridor including information to assist in preparing development applications consistent with SDAP.
- **C:** is relevant to development, works or activities proposed in a light rail corridor. It outlines the approvals, processes and technical requirements which must be satisfied to comply with the legislation governing activities, works and public utility plant (PUP) in a light rail corridor.
- **D:** provides supplementary information to support this Guide.

Figure 1 describes the differences between the content found in parts B and C of this Guide.



\* Generally within 25m of light rail corridors or land identified as a future light rail transport corridor. Applicants should consult the Planning Regulation 2017 referral triggers to determine whether their development is triggered for state assessment.

\*\* In some instances, for example, where there is no light rail manager, this approval would be granted by the Director-General of the Department of Transport and Main Roads, or their delegate.

**Figure 1 Explanation of content of parts B and C**

## 1.2. Development process

The *Planning Act 2016* provides the legislative framework for integrated planning and development assessment. Development that may impact on the safe and efficient operation of state transport infrastructure, state transport corridors or future state transport corridors is triggered under the *Planning Regulation 2017* and referred to the State Assessment and Referral Agency (SARA) for assessment. SARA, in consultation with the Department of Transport and Main Roads (TMR), will assess a triggered application against planning legislation and state planning instruments including SDAP.

SDAP contains state codes which applications must meet the purpose of in order for development to be approved by the State. *State code 4: Development in a light rail environment* includes the assessment criteria for applications triggered because of their proximity to a light rail environment. The code seeks to protect light rail, future light rail and other infrastructure in a light rail corridor from the adverse impacts of development. In addition, the state code seeks to protect the safety of people using and living and working near, light rail.

The exact order the development process proceeds in is dependent on the circumstances of the development itself. However, in order to provide basic guidance, the following flow chart outlines typical steps in this process (see Figure 2).

Step 1	Where relevant, pre-lodgement meetings with, or advice from, SARA and technical agencies.
Step 2	Applicant prepares development application having regard to SDAP and the Guide.
Step 3	Applicant submits development application to assessment manager and refers to SARA where triggered by state referral triggers.
Step 4	SARA, in consultation with TMR and the light rail manager, assess the development application. Additional information may be requested from the applicant and/or an applicant may be advised of any identified issues relating to the development proposal.
Step 5	After assessing all information, SARA finalises state responses taking into account TMR and other state agencies' technical advice.
Step 6	The assessment manager (for example, local government) issues the development decision.
Step 7	Where required, applicant submits transport infrastructure works approvals to light rail manager in accordance with requirements outlined in Part C of the Guide.
Step 8	Light rail manager assesses works requirements and provides decision. Any approval provided by the light rail manager may be subject to conditions.
Step 9	TMR, the light rail manager, the applicant or other authorised entity undertakes works.
Step 10	Certification of works undertaken by light rail manager or relevant authority.

**Figure 2** Typical development process flowchart

As noted in section C.4.1, where any works or activity interferes with, or seeks modifications to, light rail transport infrastructure or light rail transport infrastructure works, the light rail manager may seek to enter into an interface agreement with the applicant for these works. In this situation, discussions should occur as early as possible with TMR and the light rail manager. Ideally these matters should be raised during pre-lodgement discussions (Step 1), or during the formulation of a proposal.

### **1.3. Roles and responsibilities**

#### **1.3.1. Department of Transport and Main Roads**

TMR is the Queensland Government department responsible for light rail and light rail transport infrastructure. In this regard, TMR's role is to protect the safety and operational efficiency of light rail.

TMR administers the *Transport Infrastructure Act 1994* (TIA), the governing legislation for the management and operation of state transport infrastructure, including light rail. TMR also administers the *Transport Planning and Coordination Act 1994*, which seeks to achieve transport effectiveness and efficiency through strategic planning and management of transport resources.

#### **1.3.2. Light rail managers**

Light rail managers sub-lease light rail land from the State under section 355, or are granted a licence to light rail land from the State under section 355A, of the TIA. The State will sub-lease or licence land to a light rail manager to manage, maintain and operate light rail transport infrastructure. Light rail managers may contract the management, maintenance and operation of light rail transport infrastructure to a light rail operator.

Light rail managers are responsible for managing works and activities in a light rail corridor. Part C provides additional information in relation to the operational constraints and requirements that must be considered when seeking to undertake works or activities within the light rail corridor.

For the Gold Coast light rail, G:link, GoldLinQ Pty Ltd is the light rail manager and contracts the maintenance and operation of the light rail transport infrastructure and light rail vehicles to KDR Gold Coast Pty Ltd.

#### **1.3.3. Department of Infrastructure, Local Government and Planning**

The Department of Infrastructure, Local Government and Planning (DILGP) is the Queensland Government department responsible for regulating planning and development. The chief executive of DILGP is responsible for administering the Planning Act and for assessing development applications in relation to state interests, as outlined in the Planning Regulation.

#### **1.3.4. State Assessment and Referral Agency**

SARA is an agency within DILGP. It is responsible for coordinating the assessment of development applications for state agencies in relation to matters of state interest. SARA provides a single agency lodgement, assessment and decision point for development applications where the State has a jurisdiction.

SARA assesses relevant development applications by having regard to the SDAP and seeks technical advice from state agencies, such as TMR, for development applications that are of relevance. Typically, where an application involves development in a light rail environment, SARA will consult with TMR in relation to technical matters before finalising the assessment. As part of the process, TMR may also consult with other stakeholders to seek their input, for example light rail managers.

#### **1.3.5. Local government**

Local governments are responsible for land use planning and the built environment in accordance with local government planning schemes. Local governments may also be responsible for roads upon which a light rail may operate as well as public utilities in the vicinity such as water and sewerage. Accordingly, local governments through their planning scheme and associated local laws and policies are responsible for matters that may be relevant in the light rail environment.

### 1.3.6. Economic Development Queensland

Operating under the *Economic Development Act 2012*, Economic Development Queensland (EDQ) is a specialist land use planning and property development agency within DILGP. They are responsible for engaging with state and local government, the development industry and the public to identify, plan, facilitate and deliver property development and infrastructure projects.

EDQ's responsibilities include the assessment of development applications located within priority development areas (PDA). EDQ will assess all development on land within the boundary of the PDA against a supporting PDA development scheme. In addition, EDQ will likely consider the development considerations in Part B of this Guide.

## 1.4. What is the light rail environment?

The light rail environment comprises the following:

- the light rail corridor, including the land on which light rail transport infrastructure or light rail transport infrastructure works are situated, the land below the infrastructure and works, and the airspace above.
- the area adjacent to the light rail corridor, including the zone of influence (see section A.1.4.2), in which development can affect light rail transport infrastructure and light rail transport infrastructure works.

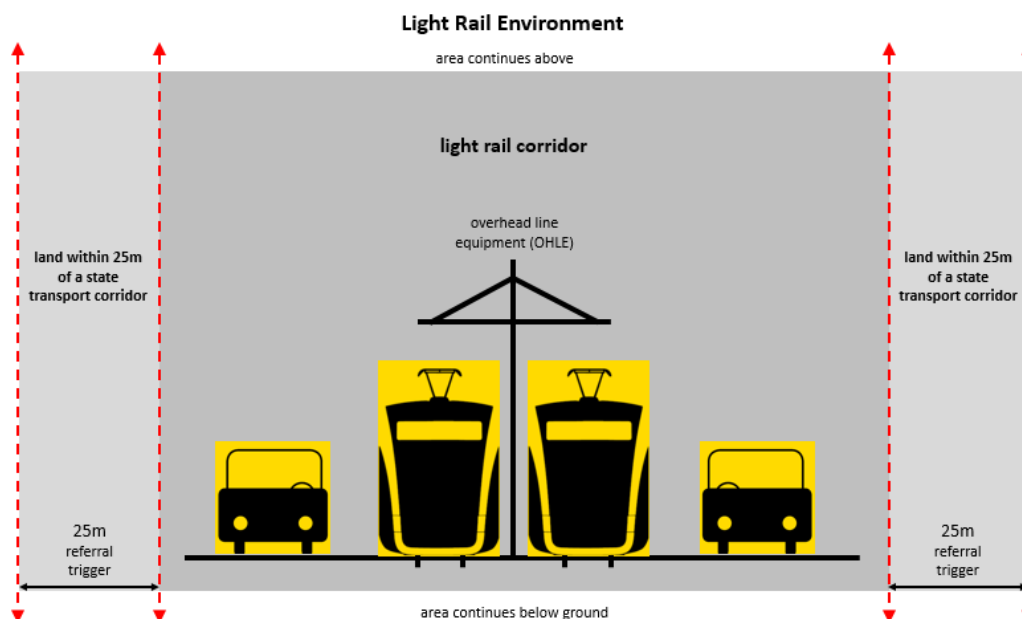
The area adjacent to the light rail corridor should be determined with reference to the relevant state referral triggers as per the Planning Regulation 2017. In the majority of referrals, this area will be land within 25 metres of a state transport corridor. A state transport corridor includes land identified as a light rail corridor.

DILGP provides online mapping that includes layers for light rail corridors, land within 25 metres of a light rail corridor and future light rail corridors. DA mapping is available at:

<http://www.dilgp.qld.gov.au/planning/development-assessment/da-mapping-system.html>

Definitions of light rail corridor, light rail transport infrastructure and light rail transport infrastructure works are contained in the glossary of this Guide.

The extent of the light rail environment is illustrated in Figure 3.



**Figure 3** Light rail environment



### 1.4.1. Light rail hazard zone

The light rail hazard zone is an area within the light rail environment that contains light rail transport infrastructure including overhead line equipment (OHLE), rail lines and the track slab, and light rail vehicles. The light rail hazard zone encompasses both the electrical exclusion zone and the developed kinematic envelope (DKE). Within the hazard zone, construction, works and activities are constrained and closely supervised in order to ensure safety (see Part C for further advice on undertaking works or activities in a light rail hazard zone).

The extent of the light rail hazard zone is illustrated in Figure 4. Below the ground and up to 3 metres above ground, the light rail hazard zone extends 1.75 metres horizontally either side of the outer most rail. At 3 metres or more above ground, the light rail hazard zone extends 3 metres horizontally from the outer most rail.

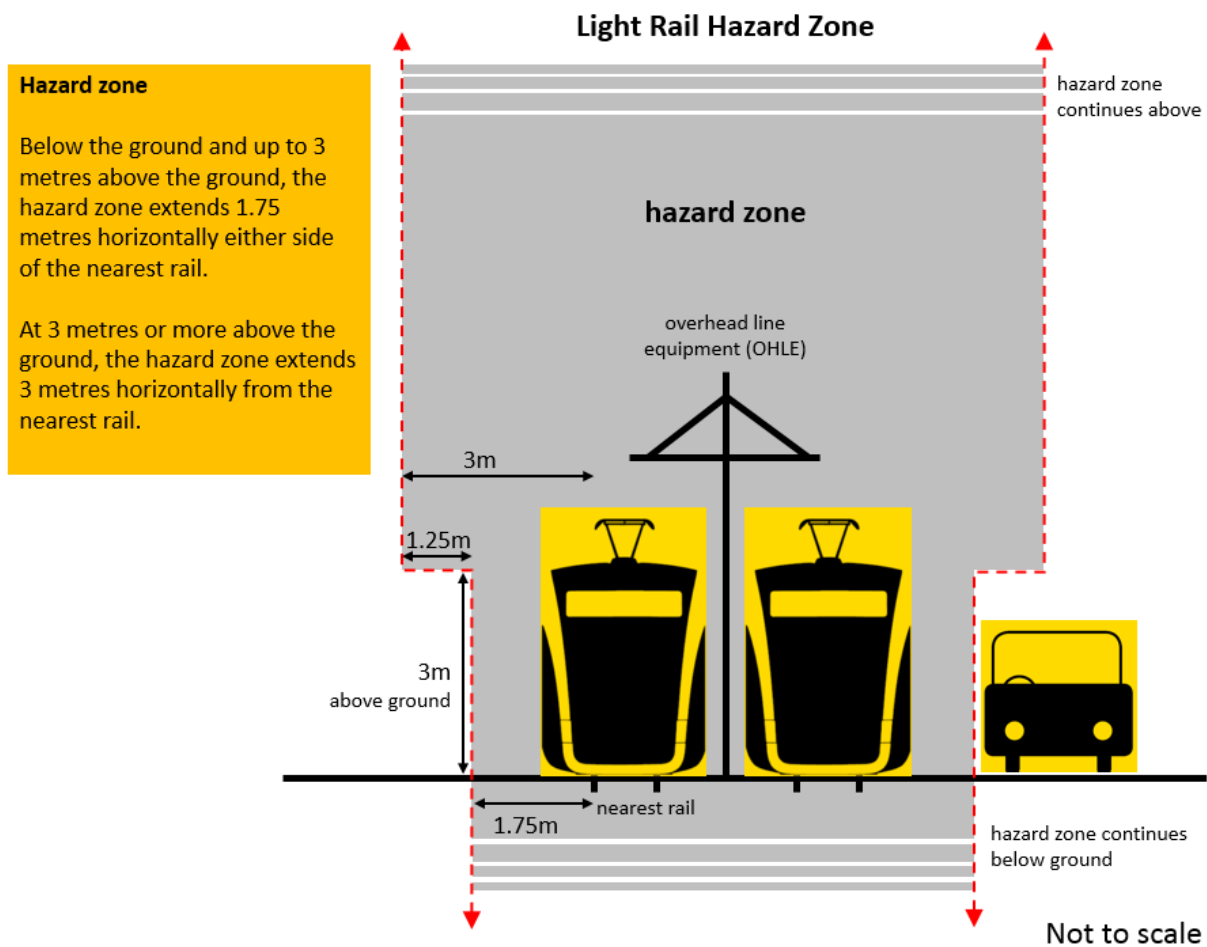
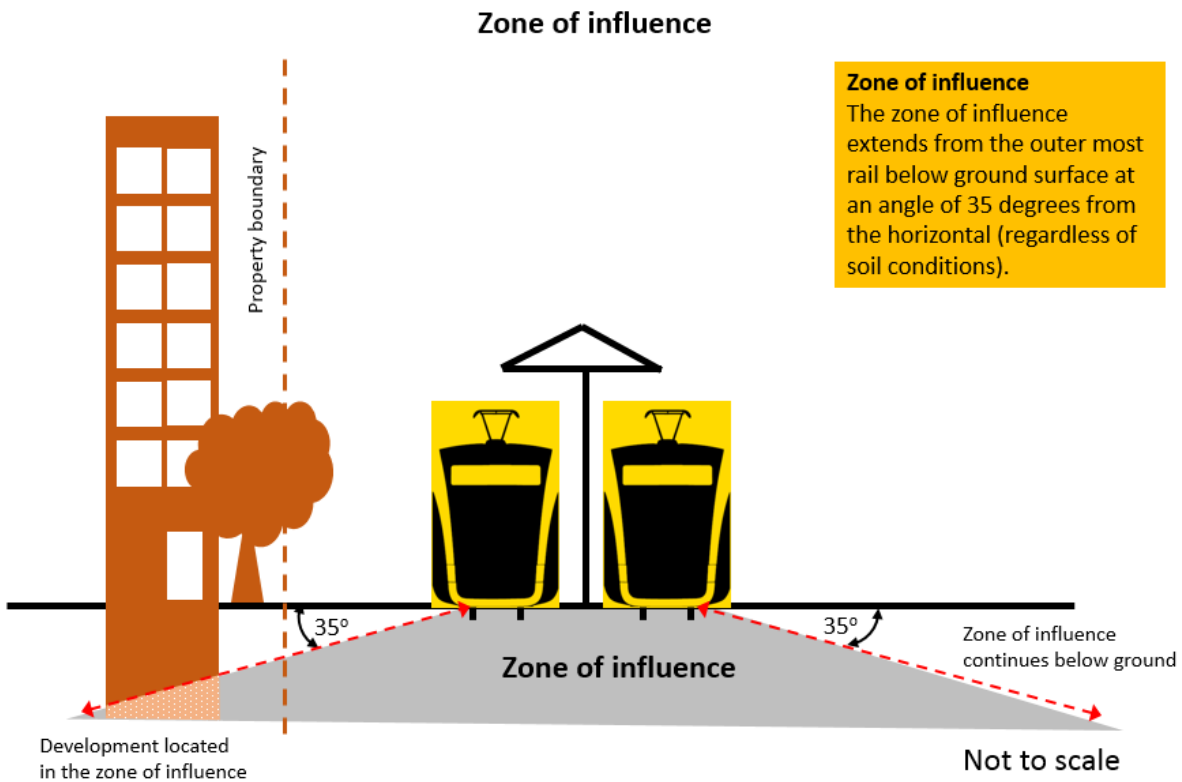


Figure 4 Light rail hazard zone

### 1.4.2. Zone of influence

The zone of influence is an area below ground where works and activities pose an increased risk to the safety and structural integrity of light rail corridors, future light rail corridors and light rail transport infrastructure. The zone of influence extends below ground from the outer most rail at an angle of 35 degrees from the horizontal (regardless of soil conditions). The extent of the zone of influence is illustrated in Figure 5.

Any works and activities in the zone of influence, especially excavation and construction activities, are closely managed in order to ensure the structural integrity and safety of light rail corridors, future light rail corridors and light rail infrastructure.



**Figure 5** Zone of influence

## Part B. Development adjacent to a light rail corridor

The purpose of Part B of the Guide is to provide applicants with important information about the issues which need to be taken into account and addressed in a development application.

Section 2 of this part provides supporting information to assist proponents to achieve the outcomes in SDAP's *State code 4: Development in a light rail environment*. Table 1 below describes how the information in section 2 relates to the provisions of SDAP.

Section 3 of this part provides information about additional matters which may also need to be considered when preparing a development application. These considerations are only relevant in particular circumstances and measures to address these matters can be implemented at the applicant's discretion. They are not required to achieve compliance with the SDAP.

It is recommended this Guide is read in conjunction with the relevant sections of SDAP.

**Table 1 Technical considerations for development in a light rail environment**

SDAP		Relevant sections of the Guide						
		2.1 Buildings and structures	2.2 Filling, excavation and retaining structures	2.3 Stormwater and drainage	2.4 Access – vehicular access	2.5 Access – pedestrian connectivity	2.6 Future light rail corridors and planned upgrades	2.7 Environmental emissions
<i>State code 4: Development in a light rail environment</i>								
<b>Table 4.2.1: Development in a light rail environment</b>								
Building and structures	PO1 - PO5	✓						
Filling, excavation and retaining structures	PO6 - PO11		✓					
Stormwater and drainage	PO12 - PO13			✓				
Access	PO14				✓			
Pedestrian access to public passenger transport infrastructure	PO15					✓		
Planned upgrades	PO16						✓	
<b>Table 4.2.2: Environmental emissions</b>								
Noise	PO17 - PO21							✓
Vibration	PO22							✓

SDAP		Relevant sections of the Guide						
		2.1 Buildings and structures	2.2 Filling, excavation and retaining structures	2.3 Stormwater and drainage	2.4 Access – vehicular access	2.5 Access – pedestrian connectivity	2.6 Future light rail corridors and planned upgrades	2.7 Environmental emissions
<b>Table 4.2.3: Development in a future light rail environment</b>								
Buildings and structures	PO24	✓					✓	
Filling, excavation and retaining structures	PO25 -PO26		✓					
Stormwater and drainage	PO27			✓				

## 2. Technical considerations for assessable development

The content in this section provides supporting information to assist applicants to demonstrate that the performance outcomes in *State code 4: Development in a light rail environment* of the SDAP, are achieved.

### 2.1. Building and structures

The content in this section supports the POs outlined in:

***State code 4: Development in a light rail environment***

- Table 4.2.1: Development in a light rail environment
  - Building and structures (PO1-PO5)
- Table 4.2.3: Development in a future light rail environment
  - Building and structures (PO24).

#### 2.1.1. What is the issue?

Development in a light rail environment, including the siting of buildings, structures, infrastructure and utilities, can compromise the safety and structural integrity of a light rail corridor, future light rail corridor or light rail transport infrastructure. In particular, development in the light rail hazard zone may interfere, or come into contact with, light rail transport infrastructure causing property damage, service disruptions and risk to public safety.

In addition, buildings, structures, infrastructure, services and utilities in a light rail environment can create a safety hazard for users of a light rail or damage light rail transport infrastructure by:

- the addition or removal of vertical surcharge or lateral loading on a light rail corridor
- distracting drivers of light rail vehicles
- providing opportunities for projectiles to be thrown onto a light rail corridor.

### 2.1.2. What is the objective?

The objective of these provisions is to ensure that buildings, structures, infrastructure and utilities are located and designed to ensure the safety of:

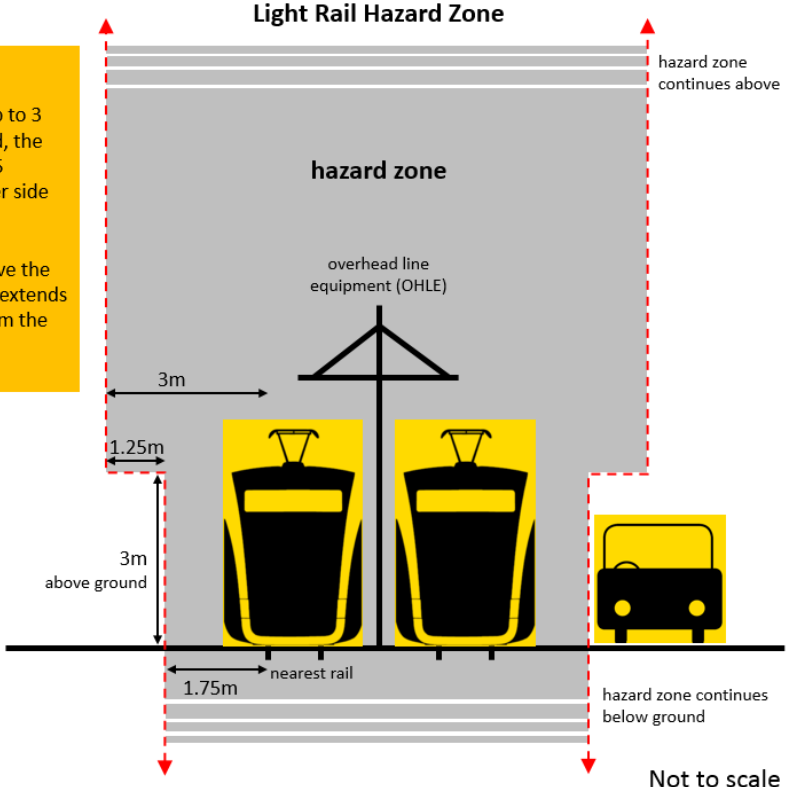
- people
- property
- light rail corridors
- future light rail corridors
- light rail transport infrastructure.

### 2.1.3. How to achieve the performance outcome

The technical considerations in Table 2 provide further guidance and additional information to assist with demonstrating the performance outcomes in SDAP are achieved.

**Table 2 Technical considerations for buildings and structures**

Item	Technical considerations
<b>Buildings and structures</b>	
1	<p>It is recommended all applications provide the following supporting information:</p> <ul style="list-style-type: none"> <li>• a site plan of the development showing the location of any existing or proposed:               <ul style="list-style-type: none"> <li>○ buildings (including building foundations), structures, infrastructure, utilities and landscaping located on the subject site</li> <li>○ light rail corridors, future light rail corridors, light rail transport infrastructure (including OHLE) located on or in proximity to the subject site</li> <li>○ light rail hazard zone</li> <li>○ any road, pedestrian and bikeway bridges over a light rail corridor.</li> </ul> </li> <li>• supporting technical information demonstrating that the siting of buildings and structures in the zone of influence will not compromise the safety and structural integrity of a light rail corridor, future light rail corridor or light rail transport infrastructure.</li> <li>• supporting technical information demonstrating that any construction and maintenance activities will not interfere with a light rail corridor, future light rail corridor or light rail transport infrastructure.</li> </ul>
<b>Light rail hazard zone</b>	
2	<p>Development, including the outermost projection of all development (including buildings, structures, and landscaping), adjacent to a light rail corridor should ensure the minimum clearances from the light rail hazard zone, specified in SDAP, are maintained at all times. Figure 5 demonstrates the requirements as outlined in SDAP. Further information about clearances from OHLE can be found in the <i>Electrical Safety Regulation 2013</i>.</p> <p>Development should be designed to allow for minimum clearances for construction and maintenance activities, including the use of equipment such as cranes, cherry pickers, scaffolding and temporary fences. It is strongly recommended applicants consult the light rail manager when seeking to undertake construction and maintenance activities in proximity to the light rail hazard zone.</p>

Item	Technical considerations
	<div style="text-align: center;">  <p style="text-align: center;"><b>Light Rail Hazard Zone</b></p> <p style="text-align: center;">hazard zone continues above</p> <p style="text-align: center;">hazard zone continues below ground</p> <p style="text-align: right;">Not to scale</p> </div> <p><b>Figure 5 Light rail hazard zone</b></p>
<p><b>Light sources from buildings and structures</b></p>	
<p>3</p>	<p>Where a building or structure emits or reflects a point light source into the face of oncoming light rail vehicles, supporting information should provide detail on how potential impacts will be mitigated. Possible mitigation options include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• landscaped buffers between a light source and the light rail corridor</li> <li>• shields on light sources to prevent direct light being emitted into a light rail corridor</li> <li>• automated dimming in accordance with ambient light conditions/levels.</li> </ul>

## 2.2. Filling, excavation and retaining structures

The content in this section supports the POs outlined in:

### **State code 4: Development in a light rail environment**

- Table 4.2.1: Development in a light rail environment
  - Filling, excavation and retaining structures (PO6-PO11)
- Table 4.2.3: Development in a future light rail environment
  - Filling and excavation (PO25-PO26)

### **2.2.1. What is the issue?**

Filling, excavation and disturbance of land in a light railway environment (including in the zone of influence) can impact on the safety and structural integrity of light rail transport infrastructure and the land in an existing or future light rail corridor.

Specifically, filling and excavation works, retaining structures and other works involving ground disturbance can de-stabilise or undermine light rail infrastructure and the land supporting this infrastructure such as through vibration impacts, ground movement, subsidence and groundwater impacts.

Earthworks can also result in the removal of forces supporting or keeping the infrastructure in place or the addition of forces that the infrastructure is not designed to withstand. In both instances, works may cause damage to light rail transport infrastructure such as movement or cracking of structures, such that services are no longer able to operate.

In terms of future light rail corridors, earthworks can compromise the State's ability to cost effectively construct infrastructure on the land, for example, if considerable works need to be undertaken to re-stabilise land so that it can support light rail infrastructure.

Filling and excavation may be associated with creating a level building pad, excavation for basement car parking, the installation or insertion of temporary and permanent retention systems, constructing footings for fences and building foundation structures, amongst other forms of ground disturbance.

### **2.2.2. What is the objective?**

The objective of the SDAP provisions is to ensure that any filling, excavation and ground disturbance does not adversely impact on the safety and operational integrity of an existing or future light rail corridor or light rail transport infrastructure. In particular, development must ensure that filling, excavation and ground works do not:

- de-stabilise light rail transport infrastructure or an existing or future light rail corridor. In particular, development must not cause or result in any movement or settlement of the light rail infrastructure
- interfere with, or result in damage to, an existing or future light rail corridor or light rail transport infrastructure
- adversely impact on the light rail through the addition or removal of lateral loads or addition of vertical/surcharge loads
- cause, or result in, any change in groundwater level and/or seepage
- compromise the State's ability to construct or upgrade light rail transport infrastructure.

### **2.2.3. How to achieve the performance outcome**

It may be necessary to undertake surveying and geotechnical investigations to ensure that development or works will not adversely impact on a light rail corridor, future light rail corridor, light rail transport infrastructure or light rail transport infrastructure works.

At the material change of use stage of a development, it is important that the referral material provides details of whether rock anchors, soil nails and other retaining structures are required for the development. The provision of temporary rock anchors and soil nails within a light rail corridor is discouraged and requires approval from the light rail manager.

In addition, an applicant may be required to provide a groundwater monitoring and management plan and vibration and movement monitoring plan to demonstrate that the development will not interfere with light rail transport infrastructure or light rail transport infrastructure works.

The technical considerations in Table 3 provide further guidance and additional information to assist with demonstrating that the performance outcomes in SDAP are achieved.

**Table 3 Technical considerations for filling, excavation and retaining structures**

Item	Technical considerations
<b>Geotechnical assessment</b>	
1	<p>Where development proposes filling, excavation, building foundations, retaining structures and other works involving ground disturbance, it is recommended that an applicant provide supporting geotechnical assessment.</p> <p>A geotechnical assessment must be certified by a Registered Professional Engineer of Queensland (RPEQ) and prepared in accordance with the <i>Road Planning and Design Manual</i>. In addition, a geotechnical assessment must include cross sections, elevations, and any required supporting technical details addressing the following:</p> <ul style="list-style-type: none"> <li>• the location and extent of any proposed excavation and filling (earthworks), including likely volumes of cut and fill adjacent to the light rail corridor</li> <li>• the location and extent of any proposed excavation and filling to occur within the zone of influence</li> <li>• the type, spacing, location and depth of building foundation structures (including proposed structures such as footing and bored piles and associated columns)</li> <li>• the maximum depth of any excavation and maximum height of any proposed filling and the gradient and height of any proposed batters adjacent to the light rail corridor</li> <li>• the maximum height and intended form/design of any proposed retaining walls or structures adjacent to the light rail corridor</li> <li>• where proposed excavation, filling/backfilling or retaining walls will be greater than 1 metre in depth or height abutting the light rail corridor, RPEQ (Geotechnical Engineer) certified drawings should be provided demonstrating that the works will not de-stabilise light rail transport infrastructure or the land supporting this infrastructure</li> <li>• demonstrate that the basement retention system is impermeable and has sufficient seepage cut-off, if the groundwater seepage is an issue</li> <li>• demonstrate that the basement retention system is robust and sufficient to prevent any movements on the light rail infrastructure. This may require finite element and seepage modelling to demonstrate that any retaining structures, excavation, and filling/backfilling will be located outside the light rail corridor</li> <li>• provide design assumptions and calculations.</li> <li>• Scaled cross sections and elevations should clearly show the interface with the light rail corridor, including light rail transport infrastructure, as a result of the proposed earthworks. The difference between existing site levels and finished/design levels should be clearly shown.</li> </ul>
<b>Retaining structures</b>	
2	<p>Where development proposes a retaining structure in a light rail environment, it is recommended that an applicant provide a supporting geotechnical assessment. A geotechnical assessment must be certified by a RPEQ and prepared in accordance with the <i>Road Planning and Design Manual</i>.</p>



Item	Technical considerations
	<p>In addition, a geotechnical assessment must include RPEQ certified drawings and any required supporting technical details addressing the following:</p> <ul style="list-style-type: none"> <li>• confirm whether shoring walls, rock anchors and/or soil nails will be used to construct the development, for example, to retain basement excavations, and whether these will be temporary or permanent.</li> <li>• provide preliminary plans, sections and details showing the design, location, length, depth and angle of insertion of any proposed rock anchors and/or soil nails</li> <li>• ensure temporary rock anchors and/or soil nails that are intended to remain in place after construction are de-stressed and released</li> <li>• ensure slope stability requirement of light rail corridor land is consistent with the requirements stipulated in DTMR's <i>Geotechnical Design Standard</i></li> <li>• demonstrate that retaining structures do not adversely impact on the light rail corridor through loading impacts such as the addition or removal of lateral loads or additional vertical surcharge load. This requires demonstration (using finite element modelling) that the basement retention system is impermeable, has sufficient seepage cut-off (if groundwater seepage is an issue), and of robust design sufficient to prevent any movements on the light rail infrastructure.</li> </ul> <p>Note: The provision of temporary rock anchors and soil nails within the light rail environment is strongly discouraged and requires approval from the light rail manager.</p>
<b>Groundwater monitoring and management plan</b>	
3	<p>Where filling and excavation impacts on the ground water in a light rail environment, an applicant will be required to provide a RPEQ certified groundwater monitoring and management plan which investigates excavation and construction work impacts on the light rail including light rail infrastructure. The groundwater monitoring plan should establish a management and monitoring program which ensures that the integrity of the light rail transport infrastructure and the safe and efficient operation of the light rail is not adversely affected by the development.</p> <p>A groundwater monitoring and management plan must include the following:</p> <ul style="list-style-type: none"> <li>• groundwater monitoring (including, but not limited to, groundwater seepage, fluctuations and ground water levels adjacent to light rail infrastructure and field tests to confirm the water tightness of the retaining system) to be undertaken during construction, including identifying any changes that would adversely affect the integrity of the light rail</li> <li>• confirmation that groundwater monitoring will be undertaken and certified by a RPEQ</li> <li>• mitigation measures to be employed during works to manage the identified risks on the light rail and details of the mitigation measures</li> <li>• an alert and response plan which provides the alarm and reporting procedures, required actions, responsibilities and stop work requirements in the event of groundwater issues during excavation and construction works.</li> </ul>
<b>Vibration and movement monitoring plan</b>	
4	<p>Where excavation, boring, piling, blasting or fill compacting during construction results in vibration impacts which may cause damage or nuisance to light rail transport infrastructure or light rail transport infrastructure works, an applicant will be required to provide a supporting vibration and movement monitoring plan.</p> <p>A vibration and movement monitoring plan must be certified by a RPEQ and prepared in accordance with the <i>Transport Noise Management Code of Practice, Volume 2: Construction</i></p>

Item	Technical considerations
	<p><i>Noise and Vibration.</i> In addition, a vibration and movement monitoring plan should include the following:</p> <ul style="list-style-type: none"> <li>• an impact assessment of any potential vibration, ground movement and structural movement impacts on light rail transport infrastructure or light rail corridor from the demolition, excavation and construction works associated with the development</li> <li>• vibration monitoring to be undertaken, including the relevant instrumentation to be used for vibration, surface and subsurface ground movement and structural movement monitoring (including monitoring of light rail infrastructure)</li> <li>• confirmation that vibration monitoring will be undertaken by a licensed surveyor specialised in monitoring and experienced in infrastructure projects.</li> <li>• confirmation that the light rail manager will be engaged (at the applicant's expense) to undertake baseline vibration, ground and structural level readings</li> <li>• the identification of vibration, ground movement and structural movement intervention levels and limits (determined in consultation with the light rail manager)</li> <li>• mitigation measures to be employed during works to manage the identified risks on the light rail and details of the mitigation measures</li> <li>• an alert and response plan which provides the alarm and reporting procedures, required actions, responsibilities and stop work requirements.</li> </ul> <p>Note: It is strongly recommended that an applicant engage the light rail manager when developing and implementing monitoring regimes.</p>

## 2.3. Stormwater and drainage

The content in this section supports the POs outlined in:

### ***State code 4: Development in a light rail environment***

- Table 4.2.1: Development in a light rail environment
  - Stormwater and drainage (PO12-PO13)
- Table 4.2.3: Development in a future light rail environment
  - Stormwater and drainage (PO27)

### 2.3.1. What is the issue?

Stormwater, flooding and drainage impacts associated with development, including during construction and on-going operation, have the potential to adversely impact the safety and operational integrity of an existing or future light rail corridor or light rail transport infrastructure. This includes stormwater and drainage:

- resulting in a worsening or actionable nuisance in an existing or future light rail corridor or light rail transport infrastructure. For example, the discharge of stormwater from a subject site causing flooding in a light rail corridor.
- interfering with and/or causing damage to an existing or future light rail corridor or light rail transport infrastructure. For example, run off from a subject site causing siltation of stormwater and drainage infrastructure.

- causing erosion which results in the de-stabilisation of an existing or future light rail corridor or light rail transport infrastructure.

Adverse impacts can be caused by altering peak discharges, flood levels, the frequency/ duration of flooding, flow velocities, water quality, sedimentation and scour effects.

### 2.3.2. What is the objective?

The objective of these provisions is to ensure that any stormwater, flooding and drainage impacts of development are managed to ensure no worsening or actionable nuisance to the light rail corridor, future light rail corridor or light rail transport infrastructure.

### 2.3.3. How to achieve the performance outcome

An applicant can demonstrate compliance with these provisions by ensuring that development does not worsen stormwater, flooding and drainage impacts or cause an actionable nuisance to an existing or future light rail corridor or light rail transport infrastructure. This can be achieved by ensuring development does not:

- create any new discharge points for stormwater runoff onto an existing or future light rail corridor
- interfere with, or cause damage to, existing stormwater drainage on existing or future light rail corridor or light rail transport infrastructure
- cause or result in any settlement of light rail infrastructure
- increase stormwater surcharge to any existing culvert or drain on an existing or future light rail corridor
- reduce the quality of the stormwater discharge onto an existing or future light rail corridor
- result in a reduction in asset life or increase maintenance costs.

The technical considerations in Table 4 provide guidance and additional information to assist with demonstrating the performance outcomes in SDAP are achieved.

**Table 4 Technical considerations for stormwater and drainage**

Item	Technical considerations
<b>Basic stormwater information</b>	
1	<p>It is recommended that all applicants provide basic stormwater information to enable development assessment officers to establish whether the proposed development will result in stormwater and drainage impacts on a light rail corridor, future light rail corridor or light rail transport infrastructure.</p> <p>Basic stormwater information (including a suitable scaled drawing) must include the following:</p> <ul style="list-style-type: none"> <li>• existing site topography/levels (contour information can be sourced from the relevant local government or prepared by a registered surveyor).</li> <li>• proposed finished levels for the proposed development</li> <li>• information verifying whether the subject site is flood prone. Flood searches and mapping can often be obtained from the relevant local government</li> <li>• existing drainage infrastructure on the subject site and in the immediate surrounding area. For example, culverts or kerb and channel in surrounding roads. This should include the location of all natural and constructed drainage features, such as pits, culverts, open channels, drains, detention or retention basins as well as, gullies, wetlands, waterways, and the like. This information is best provided in the form of a site detail and contour survey prepared by a registered surveyor.</li> </ul>

Item	Technical considerations
	<ul style="list-style-type: none"> <li>proposed drainage infrastructure to be provided by the development. This will include any devices such as pipes, downpipes, pits, detention basins, tanks and drains that are proposed to be used to manage stormwater and connect it to the proposed point of discharge. The location where stormwater is proposed to be discharged should be clearly identified, preferably via a RPEQ certified drawing showing the proposed stormwater drainage design for the development with associated hydraulic calculations.</li> <li>proposed increase in impervious area of the subject site as a result of the development. This will include the location and extent of any proposed hardstand or sealed surfaces. This should be clearly illustrated on the architectural drawings showing the proposed development.</li> </ul>
<b>Stormwater management plans</b>	
2	<p>Where development has the potential to have an adverse stormwater, flooding or drainage impact on a light rail corridor, future light rail corridor or light rail transport infrastructure, it is recommended that an applicant provide a stormwater management plan.</p> <p>Stormwater management plans must be certified by a RPEQ and prepared in accordance with the <i>Queensland Urban Drainage Manual</i>.</p> <p>Where a subject site is flood prone, the stormwater management plan should include a flood impact assessment incorporating appropriate hydraulic and hydrological analysis demonstrating:</p> <ul style="list-style-type: none"> <li>design flood peak discharges for the subject site and surrounding area which exist prior to the development for all flood and stormwater events up to a 1% Annual Exceedance Probability (AEP) (equivalent to 1/100 year Average Recurrence Interval (ARI)). This should include at least the following flood and stormwater events: 50%, 20%, 10%, 5%, 2% and 1% AEP (equivalent to 2, 5, 10, 20, 50 and 100 year ARI events respectively)</li> <li>design flood peak discharges for the subject site and surrounding area after the development has occurred for all flood and stormwater events up to a 1% Annual Exceedance Probability (AEP) (equivalent to 1/100 year Average Recurrence Interval (ARI)). This should include at least the following flood and stormwater events: 50%, 20%, 10%, 5%, 2% and 1% AEP (equivalent to 2, 5, 10, 20, 50 and 100 year Average Recurrence Interval (ARI) events respectively).</li> </ul> <p>The stormwater management plan should include details of the mitigation measures proposed to address any potential stormwater impacts (including flooding impacts) of the proposed development. In addition, a stormwater management plan should ensure the following are achieved:</p> <ul style="list-style-type: none"> <li>all relevant legal points of discharge for the subject site are identified</li> <li>the impact of existing or proposed noise barriers on overland flow paths is taken into consideration</li> <li>overland flow paths are identified and hydraulic conveyance is maintained on the subject site as part of the proposed development</li> <li>flood storage capacity and hydraulic conveyance is maintained on the subject site as part of the proposed development</li> <li>adverse impacts from sheet flow on the light rail corridor are prevented</li> <li>retaining structures, filling and excavation, landscaping, construction activities or any other works to the land have been designed to include provision for drainage so as not to adversely impact on light rail transport infrastructure</li> <li>the proposed development does not impede or interfere with any drainage, stormwater or floodwater flows from the light rail corridor</li> </ul>

Item	Technical considerations
	<ul style="list-style-type: none"> <li>• stormwater or floodwater flows have been designed to maintain the structural integrity of the light rail corridor</li> <li>• existing stormwater drainage infrastructure on the light rail corridor is not interfered with or damaged by the proposed development such as through concentrated flows, surcharging, scour or deposition</li> <li>• the quality of stormwater discharging onto the light rail corridor is not reduced through erosion and sedimentation.</li> </ul>

## 2.4. Access – vehicular access

The content in this section supports the POs outlined in:

### ***State code 4: Development in a light rail environment***

- Table 4.2.1: Development in a light rail environment
  - Access (PO14).

### 2.4.1. What is the issue?

Vehicle movement in and around a light rail environment can potentially result in collisions between light rail vehicles and private vehicles causing damage to property and risk to public safety. In addition, vehicles traversing across the light rail corridor can impact on the efficiency of light rail resulting in service disruptions.

### 2.4.2. What is the objective?

The objective of the SDAP provisions is to protect the operational integrity and ensure the safe operation of light rail by ensuring the risks associated with vehicular access are minimised.

### 2.4.3. How to achieve the performance outcome

The safety of people, pedestrians, private vehicles and light rail transport infrastructure can be safeguarded by appropriately managing access to the light rail corridor. In terms of managing access, TMR has adopted a hierarchy of preferred vehicle access configuration:

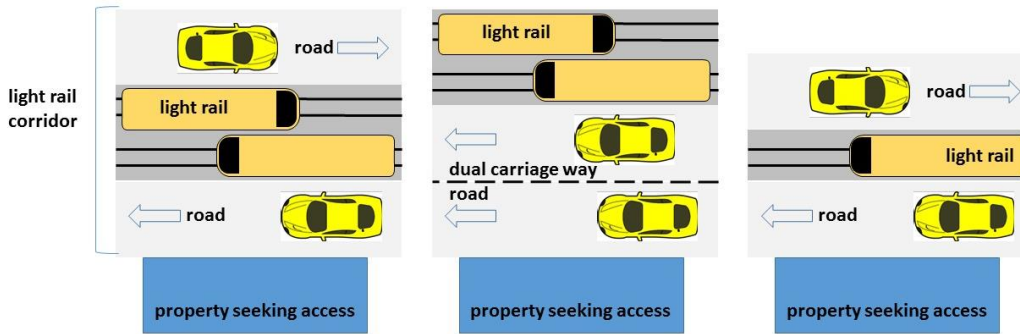
- avoiding access to the light rail corridor where access to an alternative road is available
- where access is required to the light rail corridor, requiring a left-in, left-out turning movement configuration
- where access is required across the light rail corridor, ensuring access (whether signalised or unsignalised) achieves appropriate safety and network efficiency objectives.

The hierarchy is demonstrated in the following two scenarios that categorises access considerations into:

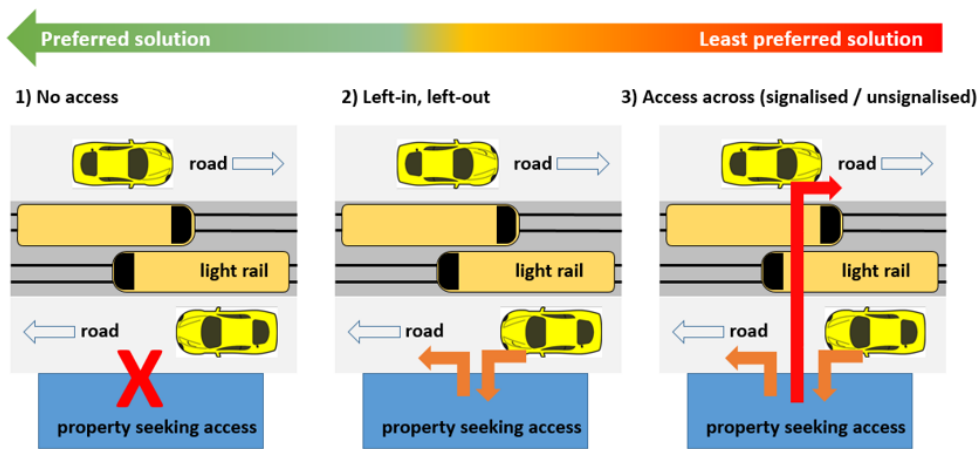
- properties abutting a road that is within a light rail corridor, and
- properties directly abutting light rail infrastructure and the light rail hazard zone (where a property does not abut a road within a light rail corridor).

## Scenario 1 – property abutting a road within light rail corridor

Example layouts



Not to scale



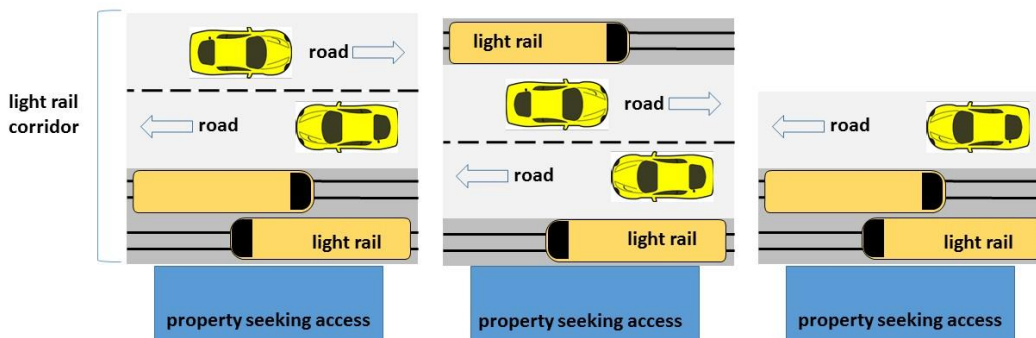
### Note

Vehicle movements across the light rail tracks from an adjacent property facing light rail tracks will generally not be permitted

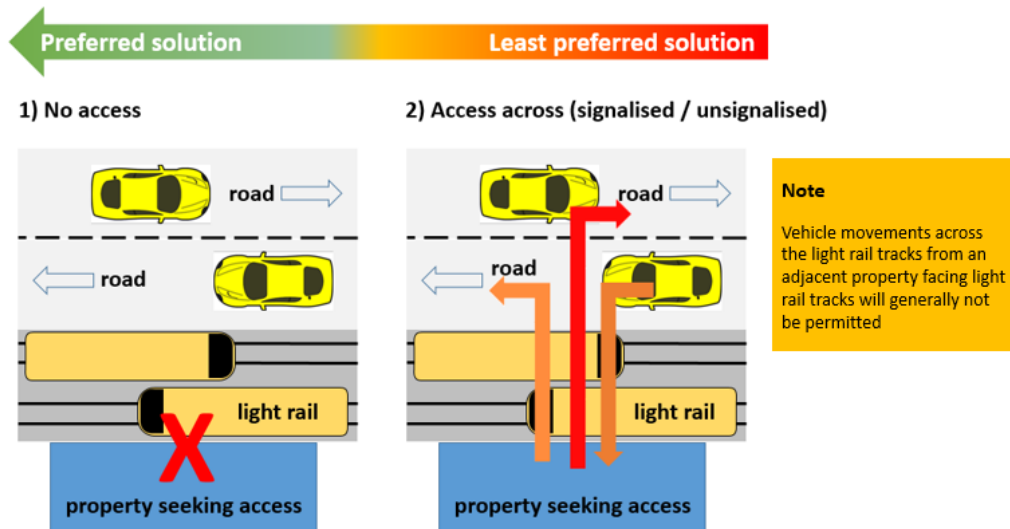
Not to scale

## Scenario 2 – property abutting light rail tracks

Example layouts



Not to scale



Not to scale

The technical considerations in Table 5 provide further guidance and additional information to assist with demonstrating the performance outcomes in SDAP are achieved.

**Table 5 Technical considerations for vehicle access to the light rail corridor**

Item	Technical considerations
<b>Access to the light rail corridor</b>	
1	<p>Vehicular access to properties bordering a light rail corridor can lead to adverse impacts on safety, efficiency and service reliability. Increased vehicle access across the light rail corridor can also negatively impact on light rail operating times and service level performance targets.</p> <p>To manage vehicular access, properties with access to alternative roads will generally not be permitted access to the light rail corridor. Where vehicular access is necessary to the light rail corridor, left-in left-out only vehicle movements are preferred.</p> <p>Vehicle movements across the light rail tracks from an adjacent property facing light rail tracks will not be permitted, apart from where exceptional circumstances exist. An example of an exceptional circumstance may be that a subject site cannot be accessed without crossing the light rail tracks.</p> <p>It is recommended that a Public Transport Impact Assessment be prepared in accordance with Appendix 1 of the <i>State Development Assessment Provisions Supporting Information – Public Passenger Transport</i>.</p>
<b>Design of on-site vehicle movement</b>	
2	<p>On-site circulation should be designed to allow vehicles to enter and exit the property in a forward direction so as to avoid service vehicles, buses and other vehicles reversing on to the light rail corridor and potentially into the path of a light rail vehicle or light rail transport infrastructure.</p> <p>On-site vehicular manoeuvring should also be designed to prevent queuing of vehicles seeking to enter the property from roads within the light rail corridor.</p>



## 2.5. Access – public passenger transport infrastructure

The content in this section supports the POs outlined in:

### **State code 4: Development in a light rail environment**

- Table 4.2.1: Development in a light rail environment
  - access to public passenger transport infrastructure (PO15).

### 2.5.1. What is the issue?

Development can impede, obstruct and delay cyclists and pedestrians' ability to access public passenger transport infrastructure such as light rail stations.

### 2.5.2. What is the objective?

The objective of these provisions is to ensure safe, efficient and legible access for pedestrians and cyclists to light rail stations and other public transport infrastructure.

### 2.5.3. How to achieve the performance outcome

Developments should maintain pedestrian and cycle access pathways or consider appropriate alternative pedestrian access pathways to light rail stations where impacted by development.

The technical considerations in Table 6 provide further guidance and additional information to assist with demonstrating the performance outcomes in SDAP are achieved.

**Table 6 Technical considerations for pedestrian connectivity**

Item	Technical considerations
<b>Existing pedestrian and cycle access to light rail stations</b>	
1	Existing pedestrian and cycle access to light rail stations should be maintained after completion of the development. Any disruption to pedestrian access to light rail stations should be appropriately mitigated.
<b>Enhancing pedestrian access to and from light rail stations</b>	
2	<p>Development in the vicinity of light rail stations should consider the possibility of enhancing pedestrian access to and from light rail stations. Pathways for pedestrian access including pedestrian desire lines should be considered with reference to:</p> <ul style="list-style-type: none"> <li>• Disability access in accordance with the <i>Disability Standards for Accessible Public Transport 2002</i> – subsection 31(1) of the <i>Disability Discrimination Act 1992</i></li> <li>• Crime prevention through environmental design principles as set out in the <i>Crime Prevention through Environmental Design Guidelines for Queensland</i></li> <li>• Design requirements in Austroads <i>Guide to Road Design – Part 6A: Pedestrian and Cyclist Paths</i>.</li> </ul>



## 2.6. Future light rail corridors and planned upgrades

The content in this section supports the POs outlined in:

**State code 4: Development in a light rail environment**

- Table 4.2.1: Development in a light rail environment
  - Planned upgrades (PO16)
- Table 4.2.3 Development in a future light rail environment
  - Buildings and structures (PO24)

### 2.6.1. What is the issue?

Development can affect the State’s ability to deliver future light rail transport infrastructure and planned upgrades to existing light rail transport infrastructure. In particular, buildings, structures and operational works can impact on the form, cost and delivery of light rail transport infrastructure.

A planned upgrade can include any extension, upgrade or duplication of light rail transport infrastructure for which affected land has been identified in a publicly available government document, or in written advice to affected land owners.

### 2.6.2. What is the objective?

The objective of these provisions is to ensure that development does not compromise the State’s ability to deliver new light rail transport infrastructure, planned upgrades of light rail transport infrastructure or significantly increase the cost to maintain and operate light rail.

### 2.6.3. How to achieve the performance outcome

The technical considerations in Table 7 provide further guidance and additional information to assist with demonstrating the performance outcomes in SDAP are achieved.

**Table 7 Technical considerations for future light rail corridors and planned upgrades**

Item	Technical considerations
<b>All applications</b>	
1	<p>It is recommended that all applicants provide:</p> <ul style="list-style-type: none"> <li>• a site plan of the subject site detailing land identified as future light rail corridor or for any planned upgrades to light rail transport infrastructure</li> <li>• supporting information demonstrating how TMR’s future infrastructure is considered in the site layout of the development.</li> </ul> <p>Land required for future light rail or the planned upgrade of a light rail is identified in the SARA DA Mapping System.</p>

## 2.7. Environmental emissions

### 2.7.1. Noise

The content in this section supports the POs outlined in:

**State code 4: Development in a light rail environment**

- Table 4.2.2: Environmental emissions
  - Noise (PO17-PO21)

#### 2.7.1.1. What is the issue?

Light rail transport infrastructure and light rail vehicles generate noise. Noise can have an adverse impact on the health, wellbeing and quality of life of communities located in the vicinity of a light rail corridor if development is not located, designed and constructed to reduce the occupants of the affected building's exposure to noise from transport operations and infrastructure.

#### 2.7.1.2. What is the objective?

The objective of these provisions is to ensure that development affected by noise from light rail transport infrastructure is developed in a way that reduces the community's exposure to adverse noise impacts.

#### 2.7.1.3. How to achieve the performance outcome

Applicants proposing new sensitive uses are responsible for ensuring significant noise impacts on the proposed development are mitigated to appropriate levels. Sensitive uses are:

- accommodation activities
- educational establishments
- child care centres
- hospitals.

For further details regarding sensitive developments, please refer to the TMR's *Policy for Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure*, (the Environmental Emissions Policy).

Specific information about the proposed development and surrounding acoustical environment must be provided with a development application in order for the State to determine whether the development can mitigate noise to acceptable levels for residents, visitors, workers and patrons.

The type of information that needs to be provided with a development application depends on the extent to which the proposed development is likely to be affected by noise generated by transport operations and infrastructure. The State has sought to minimise the costs of demonstrating compliance with noise criteria by only requiring detailed noise assessment reports to be prepared when there is a medium to high probability of the development being impacted by noise from transport operations and infrastructure.

Table 8 identifies the likelihood of a development being adversely impacted by noise (based on the type and location of the proposed development) and the corresponding level of information which must be provided with a development application.

The technical considerations in Table 9 provide further guidance and additional information to assist with demonstrating the performance outcomes in SDAP are achieved.

Part D provides requirements for noise assessment reports.

**Table 8 Information required as part of a development application**

Probability of Impact	Development Proposed	Information Required
Low	Development not involving a sensitive use.	Standard information
	Development involving a sensitive use located on land that is greater than 100 metres* from a light rail corridor.	
Medium	Development involving a sensitive use impacted by noise generated from light rail transport infrastructure but the level of impact does not exceed the relevant criteria for the development listed in the <i>Environmental Emissions Policy</i> .	Noise Assessment Report - Part A
High	Development involving a sensitive use that is located within 100 metres* of a light rail corridor and the level of impact will exceed the relevant noise criteria for the development listed in the <i>Environmental Emissions Policy</i> .	Noise Assessment Report - Part A and Part B
* Measured from the edge of the outer most track.		

**Table 9 Technical considerations for Noise**

Item	Technical considerations
<b>Low impact applications</b>	
1	<p>Low impact proposals must provide information so that a development assessment officer can confirm noise from transport operations and infrastructure will not have a significant impact on the development.</p> <p>It is recommended that all applicants provide the following supporting information:</p> <ul style="list-style-type: none"> <li>the type of development proposed (i.e. whether the development is a sensitive use)</li> <li>the intensity of development proposed (e.g. maximum floor area, maximum building height)</li> <li>the location of development on the subject site</li> <li>building layouts showing sensitive areas and uses and their distance from a light rail corridor</li> <li>contours for the subject site and transport corridor showing any physical embankments/buildings/existing noise barriers located between the light rail corridor and the proposed buildings</li> <li>the volume of traffic using the light rail corridor daily.</li> </ul>
<b>Medium impact applications</b>	
2	<p>To be assessed as a medium impact proposal, an applicant must provide a Noise Assessment Report - Part A demonstrating that the relevant noise criteria will not be exceeded and therefore no attenuation measures are required.</p> <p>A Noise Assessment Report - Part A must address the requirements outlined in Part D and be prepared by an appropriately qualified acoustic consultant and certified by a RPEQ.</p>

Item	Technical considerations
<b>High impact applications</b>	
3	<p>A high impact application must demonstrate that noise attenuation treatments can be included in the development to ensure that noise levels are reduced to an acceptable level.</p> <p>The Noise Assessment Report for high impact proposals must contain both Parts A and B. The Noise Assessment Report must address the requirements outlined in Part D and be prepared by an appropriately qualified acoustic consultant and certified by a RPEQ.</p>

## 2.7.2. Vibration

The content in this section supports the POs outlined in:

### ***State code 4: Development in a light rail environment***

- Table 4.2.2: Environmental emissions
  - Vibration (PO22)

### 2.7.3. What is the issue?

The operation of light rail has the potential to generate vibration which can have an adverse impact on the health, wellbeing and quality of life of nearby communities. This is particularly an issue for hospitals which should be located, designed and constructed to reduce or mitigate the community's exposure to vibration from light rail operations and infrastructure.

### 2.7.4. What is the objective?

The objective of these provisions is to ensure that hospitals adjacent to light rail transport infrastructure are developed in a way that reduces the hospital's patients, staff and visitor's exposure to adverse vibration impacts.

### 2.7.5. How to achieve the performance outcome

Applicants proposing a hospital are responsible for ensuring significant vibration impacts on the proposed development are mitigated to appropriate levels.

The technical considerations in Table 10 provide further guidance and additional information to assist with demonstrating the performance outcomes in SDAP are achieved.

**Table 10 Technical considerations for Environmental Emissions (vibration)**

Item	Technical considerations
<b>Vibration assessment report</b>	
1	Where development proposes a hospital in proximity to a light rail corridor, it is recommended that an applicant provide a vibration assessment report. A vibration assessment report must be certified by a RPEQ.

### 3. Other technical considerations

The content in this section provides information about additional considerations for development in a light rail environment. These issues may be addressed in a development proposal at the applicant’s discretion and are not required to achieve compliance with the SDAP.

#### 3.1. Stray current

DC traction power systems such as those employed by light rail systems can be a source of stray current. Stray current is current used to operate a light rail vehicle that would normally return to a light rail traction power station via the light rail tracks. In some cases this current leaves the tracks and travels through the ground or through other metal assets running parallel to the tracks.

Where stray current leaves a metal asset it has the potential to cause electrolysis corrosion to the metal on that asset. In some circumstances damage to metal assets may represent a safety concern for people (for example, where a hole may develop in a pipe which then fails). The impacts of stray current may be relevant for structures such as underground car parks, retaining walls, bridges, electricity and telecommunication cables, and pipelines such as gas, oil and water pipelines.

In addition, development should avoid generating new sources of stray current which may impact on light rail transport infrastructure and light rail transport infrastructure works.

The objective of these provisions is to ensure that any stray current from light rail transport infrastructure is managed to ensure no damage to property or infrastructure.

The technical considerations in Table 11 provide further guidance and additional information in this regard.

**Table 11 Technical considerations for stray current**

Item	Technical considerations
1	<p>It is recommended that a stray current report certified by a chartered professional engineer be prepared for any high risk assets including metallic structures in excess of 75 metres in length adjacent to a light rail corridor.</p> <p>A stray current report should include:</p> <ul style="list-style-type: none"> <li>• an assessment of the risk to the development from existing or likely levels of stray current</li> <li>• where such a risk exists, propose mitigation measures to be provided by the development. Mitigation measures may include (but are not limited to) selection of suitable building materials such as non-metal finishes for infrastructure in the vicinity of a light rail corridor, as well as use of monitoring points, drainage bonds or cathodic protection systems.</li> </ul> <p>It is strongly recommended that applicants consult with the light rail manager in assessing the stray current risk and in formulating mitigation measures.</p>

## **Part C. Advice for works and activities in the light rail environment**

The purpose of Part C of the Guide is to provide information in relation to the operational constraints and requirements when undertaking works or activities within the light rail environment.

The safety of light rail operations and workplace health and safety in the light rail environment are paramount. Light rail managers have safety policies, which extend to all works undertaken by third parties in the light rail environment. It is recommended that applicants liaise with the light rail manager to ascertain construction, safety and access requirements, well in advance to works commencing.

Requirements in Part B of this Guide may also have relevance for works or activities within the light rail environment which will, or have the potential to, impact on the safety of people, property and light rail transport infrastructure.

This part provides guidance only. The appropriate procedures and processes should be confirmed with the relevant light rail manager prior to undertaking the proposed works.

### **4. Works and activities interfering with light rail transport infrastructure**

The following section provides guidance regarding undertaking works and activities which can potentially interfere with a light rail corridor or light rail transport infrastructure.

#### **4.1. Approval to undertake works or activities in the light rail environment**

Section 362 of the Transport Infrastructure Act establishes that a person must not interfere with light rail transport infrastructure or light rail transport infrastructure works unless they have obtained the written approval of the light rail manager (for example, carrying out works or undertaking activities).

Examples of works and activities that may interfere with light rail transport infrastructure or light rail transport infrastructure works include:

- construction or maintenance works, including overhead crane operations
- bore works or excavations beneath light rail tracks
- erecting or dismantling scaffolding
- carrying out roof inspections
- maintenance or extensions to awnings and other overhead structures including advertising signs
- landscaping and maintenance of vegetation
- activities such as outdoor dining and other pedestrian activity
- traffic signal phasing and network operations
- development within the zone of influence, see section A.1.4.2.

In addition, authorisation may be required by the light rail manager for various activities on a light rail corridor, including:

- any work or activity where any part of the subject site, or any tools, material, machine, suspended load, or any person, is within the light rail hazard zone as outlined in section A.1.4.1. This could include, for example crane operations, tipping bodies or skip loaders
- any work or activity which will force pedestrians to be diverted into the light rail hazard zone

- any work or activity which may obscure light rail vehicle sight lines, for example signage or structures
- piling, using a crane, excavation over 2 metres deep, or erecting or dismantling scaffolding, within 6 metres of the edge of the light rail hazard zone
- excavation within 3 metres of any pole supporting OHLE.

In addition, a light rail manager may require an applicant provide a construction management plan demonstrating that there will be no disruption to the light rail during the course of the construction.

Written authorisation can be obtained by directly contacting the relevant light rail manager or, where no light rail manager exists, TMR. Typically, information required to be provided to support approval for works or activities includes the:

- location of works
- timeframe for works
- scope of works and equipment to be used
- company name, contact name and contact details including phone number
- construction management plan
- work method statement
- other information deemed necessary when undertaking a worksite safety assessment.

## **4.2. Interface agreements**

Where any works require modification to, or interference with, light rail transport infrastructure or light rail transport infrastructure works, the written approval of the light rail manager must first be obtained, in accordance with section C.4.1. In providing such approval, the light rail manager may impose conditions including a requirement that the applicant enter into an interface agreement. An applicant given an approval must comply with the conditions of the approval.

An interface agreement may require the light rail manager to design, certify and undertake the works itself. An interface agreement may also seek to pass on the light rail manager's costs associated with modifying or interfering with the light rail transport infrastructure or light rail transport infrastructure works. In addition to design and construction costs, these costs may also include additional project specific insurance, design and technical assessments, and documentation update costs.

## **4.3. Safety requirements**

The light rail manager has a duty of care to advise on, and approve certain safety issues in the light rail environment. A breach of safety requirements may result in severe penalties, including large fines and custodial sentences.

Approval for work within the light rail corridor, may require:

- submission of a safety management plan
- submission of work method statements (see section C.4.5)
- supervision as agreed with the light rail manager, including the use of specialist safety personnel, such as protection officers, lookouts and electrical supervisory staff
- appropriate insurances and indemnities
- the applicant meeting all reasonable costs incurred by the light rail manager in managing safety issues
- a quality assurance system and a quality plan approved by the light rail manager
- a dilapidation survey of any light rail transport infrastructure before construction commences.

The safety of the public is to be maintained at all times during construction. Any temporary arrangements, such as temporary access, must meet the light rail manager's safety and operational requirements.

Depending on the light rail manager's specific requirements, a contractor's safety liaison representative may need to be appointed with responsibility for:

- safety of the contractor's employees, plant and equipment during the execution of work in the light rail corridor
- coordinating and programming the contractor's work in the corridor
- receiving directions from the light rail manager's superintendent, the site protection supervisor or protection officers on matters relating to the safety of the operating light rail
- ensuring that all plant and equipment is operated and all employees of the contractor act in accordance with such directions.

If required, the safety liaison representative is to be present on subject site at all times while works are being undertaken in the light rail corridor. If the safety liaison representative leaves the site at any time while works are being undertaken, a competent relief representative must be appointed.

#### **4.4. Safety in design**

A design risk assessment (which incorporates a safe design and risk management approach) should be undertaken to examine the works to ensure 'so far as reasonably practicable' that the works are designed to be without risks to the health and safety of persons who:

- construct the works
- operate and maintain the works
- use the light rail transport infrastructure including adjoining development
- demolish and dismantle the works.

This is a legislative requirement in accordance with:

- *Work Health and Safety Act 2011*
- *Safe design of Structures Code of Practice 2013.*

#### **4.5. Construction management plan and work method statements**

Where development or works will, or have the potential to, interfere with light rail transport infrastructure or light rail transport infrastructure works, an applicant must provide a construction management plan. A construction management plan must detail the construction procedure and safety management plan, inclusive of the construction safety risk register, both of which refer to the interfaces with light rail operations. For each package of work within the light rail corridor, a detailed work method statement should be prepared and submitted to the light rail manager for review. These will include detailed methodologies for excavations, installation of retaining systems, erection of supporting elements near the track, and construction over the tracks and OHLE.

A program for construction of the development, with details of any required OHLE isolations, must be submitted with the construction management plan. It is strongly recommended that the construction methodology is planned collaboratively with the light rail manager to avoid rework due to safety issues. It is unlikely that OHLE isolations will be conducted during light rail operating hours.

Specifically, a construction management plan should provide the following:

- a detailed and complete description of the works
- details regarding the estimated duration and timing of construction (including start and finish dates and times)



- identification of the equipment/machinery required to undertake the works and the proximity of the works, equipment and machinery (including crane/s) to a light rail corridor
- identification of the road/s or sections of road/s that will be closed and the closure period/s
- details on any roads that will require a change to traffic conditions (if any) – for example, closure of one lane, and the period of time required for the change to traffic conditions
- a schedule of when material or goods will be removed or delivered to the site in quantities that may disrupt traffic or the light rail (through traffic volumes or oversized vehicles)
- identify any disruptions to the operation of the light rail including any impacts on light rail transport infrastructure or light rail transport infrastructure works or other public transport services or stops
- identification of access and egress locations
- identification of any disruption to pedestrian, cyclist or public passenger transport services or infrastructure
- identification of how groundwater, surface and subsurface ground movement and structural movement will be monitored and managed
- details of how waste and other materials will be managed to ensure no encroachment, dust or debris within the light rail
- confirmation that an application to undertake works or activities on a light rail corridor is to be submitted to, and authorisation obtained from, the light rail manager if any of the following is proposed:
  - works or activities where any part of the site, tools, material, machinery, suspended load or personnel could come within the light rail hazard zone
  - works or activities which may result in pedestrians or vehicles being diverted into the light rail hazard zone
  - using a crane and/or erecting and dismantling scaffolding or other structures within six metres of the edge of the light rail hazard zone
  - any excavation or piling within the zone of influence of the light rail infrastructure
  - any work or activity which may obscure light rail sight lines (including signage or structures)
  - any other works with the potential to impact the integrity of the light rail infrastructure or the safe and efficient operation of the light rail system, including overhead line equipment.

Construction must not commence until the light rail manager has considered the construction management plan and individual work method statements, in accordance with section 362 of the Transport Infrastructure Act.

#### **4.6. Site supervision requirements**

Where works or activities are being carried out in the light rail corridor, it may be necessary for the works to be carried out under the direction of the light rail manager to ensure the safety of the operating light rail. The officer assigned by the light rail manager will be entitled to stop or direct the movement of construction workers and the location of plant and equipment in accordance with the safe working procedures.

#### **4.7. Works in the vicinity of overhead line equipment (OHLE)**

A light rail manager is an electrical entity under the *Electrical Safety Act 2002* and must be contacted before any work within the light rail hazard zone commences. Any instructions given by the light rail manager on how to perform the work around the OHLE must be complied with in full.

In some circumstances, the light rail manager may undertake all work on the OHLE required to facilitate the development, and charge the costs to the proponent.

As none of the components of the OHLE have protective covering, they are potentially dangerous, and people should not encroach the defined light rail hazard zone (see section A.1.3.1) either directly or indirectly with any item of material or equipment without appropriate approval.

All OHLE must always be regarded as energised with 750V DC of electricity unless an isolation has been carried out and a permit to work has been issued to the trained authorised person.

In some circumstances, light rail managers may not permit lifting / crane operations over operational tracks or live OHLE without isolation or the erection of protective structures in the corridor that will withstand the impact of a failure in lifting operations.

Approval may be provided by the light rail manager for the weather vaning of cranes over the corridor in some circumstances.

#### **4.8. Overhead line equipment (OHLE) isolations**

If the light rail manager is not satisfied that work near the OHLE can be safely performed, arrangements will be made to isolate the OHLE. Light rail managers have access protocols which must be followed and are available upon request.

An OHLE isolation may be required in the following circumstances:

- there is a risk that any part of the operation will encroach within 3 metres of the OHLE
- there is a risk that light rail continuity or any bonding cables will be broken
- plant and or machinery is to be used beneath the OHLE.

Approval to interrupt light rail services and occupy track areas is limited and only permitted with written approval from the light rail manager. A proposed development needs to take account of the practicalities of accessing the light rail environment and any potential interruptions to services.

As isolations interfere with normal light rail operations, they must be kept to a minimum and may be scheduled at night when light rail vehicles are not running.

The risk of cancellation due to inclement weather means that contingency periods for isolations should also be booked.

The applicant will incur the costs of isolations and cancellations. There may be additional associated costs, for example for alternative transport arrangements for passengers such as buses.

Detailed planning and efficient use of construction windows is vital, as a late finish to work will cause isolations to over-run and may attract penalties.

#### **4.9. Rectification of works**

In accordance with section 363 of the Transport Infrastructure Act, a light rail manager may inspect any works that interfere with light rail transport infrastructure or light rail transport infrastructure works and may issue a list of defects with written notice requiring rectification works to be undertaken within a stated time period.

In addition, TMR may require an applicant to provide a dilapidation survey where a development will interfere with light rail transport infrastructure or light rail transport infrastructure works. A dilapidation survey will be undertaken by the light rail manager, at the applicant's expense, and will record the pre and post construction condition of the light rail transport infrastructure and determine if any rectifications works are necessary.

Where rectification works are identified by a light rail manager, the applicant is required to engage the light rail manager to undertake all necessary rectification works at the applicant's expense. Should

rectification works not be complied with, the light rail manager may undertake the works itself and recover the cost of rectification works.

#### **4.10. Operational impacts (delay of service)**

A light rail manager may have contractual obligations to meet in relation to performance measures relating to the operation of the light rail service. Consequently, any unscheduled delays or interruptions to light rail vehicles or a net worsening of service performance (including longer journey times), which are attributed to the works, may result in penalties and, in severe cases, termination of their respective contracts. As a result, the light rail manager and light rail operator may impose conditions on any development approval seeking to mitigate or avoid such risks, including appropriate insurances and indemnities.

#### **4.11. Emergency procedures and contacts**

The applicant's safety management plan must align and comply with the light rail manager's operational safety plans for any event that occurs in the light rail corridor. This includes, but is not restricted to, notification of incidents, command and control of the incident site, and restoration of services.

Where works obstruct the track unexpectedly, if anyone or anything comes into contact with the OHLE, or if light rail transport infrastructure is damaged, the light rail manager's control room must be immediately informed. The control room can be contacted at any time, by for example, using emergency help points at light rail stations, or asking a member of staff or emergency services personnel.

#### **4.12. Trespassing on light rail**

In accordance with section 377 of the Transport Infrastructure Act, a person must not be on light rail land, light rail transport infrastructure or a site where light rail transport infrastructure works are situated unless the person has relevant permission to do so from the light rail manager or a delegated officer from TMR.

### **5. Public utility provider agreements**

To ensure regular access and maintenance of existing and future PUPs, TMR may establish interface agreements with a public utility provider, for land on which light rail transport infrastructure is situated.

Where an interface agreement exists between a public utility provider and TMR or a light rail manager, the interface agreement should take precedence over this Guide.

#### **5.1. Permissible PUP works**

Section 366 of the Transport Infrastructure Act provides for a public utility provider to undertake works to a PUP where written agreement has been received by the light rail manager and a delegated officer of TMR.

In accordance with section 366(4) of the Transport Infrastructure Act, a public utility provider may carry out urgent maintenance of its PUP on light rail land without written agreement where reasonable steps have been taken to obtain agreement.

#### **5.2. Public utility provider consultation with light rail authority**

In the interests of coordination of mutually benefit works arrangements for government agencies and public utility providers, section 368 of the Transport Infrastructure Act provides for public utility providers to consult with light rail managers and TMR when proposing replacement of the whole or a substantial proportion of a PUP on light rail land.

### **5.3. Compliance and remedy actions for PUPs**

In accordance with section 369 of the Transport Infrastructure Act where a public utility provider undertakes works to their PUP without seeking the required written agreement or where works are inconsistent with an existing interface agreement, the light rail manager and TMR may require the public utility provider, at its cost, to take action to remedy the relevant action within a stated time period.

Should rectification works not be complied with, the light rail manager may arrange to undertake necessary action to remedy the relevant action and request recovery for the cost of these actions from the public utility provider.

### **5.4. Requirement for PUPs to alter public utility plant**

In accordance with section 370 of the Transport Infrastructure Act, the Director-General, TMR or their delegate may require a public utility provider to alter the position of a PUP on light rail land if it is deemed to interfere with the exercise of the Director-General's powers for the light rail land.

### **5.5. Liability for damage**

Sections 372 to 374 of the Transport Infrastructure Act provide protection for TMR and light rail managers, where damage is caused to a PUP on light rail land. In certain circumstances, TMR and the light rail manager are not liable for damage where a public utility provider has not complied with legislative requirements.

As per section 375 of the Transport Infrastructure Act a public utility provider may be liable to pay TMR and the light rail manager the additional expense incurred in carrying out light rail transport infrastructure works.

## Part D. Supporting information to support this Guide

### Requirements for noise assessment reports

Where development includes a sensitive land use and is likely to be impacted by noise from a light rail, an applicant should provide a noise assessment report demonstrating that:

- relevant noise criteria will not be exceeded and therefore no attenuation measures are required, or
- noise attenuation treatments can be included in a development to ensure that noise levels are reduced to an acceptable level.

A noise assessment report seeks to ensure that any sensitive development achieves acceptable noise levels for residents and visitors by ensuring development mitigates the adverse impacts from noise generated by a light rail.

A noise assessment report should adequately document and present all the data inputs, assumptions and assessment results, and noise attenuation strategies/options considered as part of the assessment. In order to limit the expense of preparing reports, a Noise Assessment Report has been split into two parts:

- 1) Noise Assessment Report - Part A is to present the noise assessment findings. The findings and conclusion of Part A will determine whether noise attenuation measures will be required for the development
- 2) Noise Assessment Report - Part B is to detail the noise attenuation measures required as per the results of Part A and will only need to be provided when measured noise levels exceed the relevant noise criteria for the development in *State code 4: Development in a light rail environment*.

Where it is obvious that a development will require noise attenuation measures, it is suggested a full Noise Assessment Report (i.e. Part A and Part B) be prepared at the same time. Matters that the Noise Assessment Report should consider are outlined as follows:

### Noise assessment report Part A – review of noise impacts

#### Development details

The following information is to be provided:

- description of the subject site including real property description/s and a locality plan
- description of the proposed development including building and open space layout plans, noise sensitive areas and uses, the setback distances for building facades (noise sensitive locations), proposed lot numbers (if applicable)
- drawings showing site contours and earthworks (cut and fill) information to clarify the existing topography and proposed finished levels
- drawings showing cross-sections through the light rail corridor (showing levels of transport infrastructure, any embankments or physical obstructions), any existing noise attenuation measures, the proposed development including ground level and levels for each storey.

## Noise measurement

The following information is to be provided:

- a summary of the noise measurement results including a layout plan depicting the site locations and positions of the noise measurements conducted for the assessment, the time of day and weekday the measurements took place
- measurement data sheets and site attendance records/site notes taken by the consultant measuring noise at each measurement site:
  - all results of measurements, calculations and predictions are to be presented in a tabular format
- tabulation of calculated noise levels for all noise sensitive receptors (without noise attenuation treatments)
- noise contours or plans showing specific areas where noise criteria are exceeded:
  - the noise level exposures can be produced as noise level contours or presented in a format depicting areas where the specified noise criteria are exceeded or where the noise levels of noise sensitive receptors fall within a certain noise level range. Which format to adopt will depend on the number of factors/options/ criteria considered in the noise assessment and the type of development proposal being assessed
  - when presenting noise contours, the figure should make clear whether the noise levels are facade corrected or free field based on a grid assessment. This assessment will determine the relative accuracy of the contours compared with the facade calculations and the receptor height assumed. The maximum grid spacing shall be a 10 metre by 10 metre square depending on the accuracy required. Reference to grid spacing assessment is to be noted in the title block for each figure.

## Acoustic assessment

For acoustic assessment, the following information should be provided:

- description of the investigation process in determining the noise exceedance:
  - careful interrogation of noise level contours needs to be undertaken in conjunction with the tabulated noise levels in order to clearly identify whether any of the criteria levels are exceeded
- documentation of all noise model input data and assessment criteria adopted. The source and date of collection of all data used should be clearly documented. Data more than 12 months old cannot be used in the acoustical assessment
- all acoustical assessments undertaken as part of the Noise Assessment Report must take the following into account:
  - for reconfiguration proposals for a material change of use affecting a local planning instrument, the assumed location of residential building facades is to be the minimum setback distance required by the relevant local government planning scheme for detached and duplex housing. For other noise sensitive developments, the assumed facade location is to be as per the relevant planning scheme. In these situations, a 'facade correction' of 2.5dB(A) should be added to the free field measurement of 1 metre from the assumed facade to determine the facade corrected noise level
  - the receptor height used in the acoustical assessment should be 1.5 metres above the finished floor level/s. In the case of multi-level buildings, all floor levels are to be assessed. For residential reconfigurations, where the finished floor level is not known,

the receptor heights should be assumed at 1.8 metres and 4.6 metres above an assumed building pad level, for the ground and first floors (first and second storey) respectively. It is essential that both low and high-set residential buildings be considered in the assessment.

## **Recommendation**

The Noise Assessment Report Part A must clearly articulate whether noise generated from the transport corridor exceeds the relevant noise criteria. If levels are exceeded, the Report must recommend that attenuation measures are to be provided by the development.

## **Certification**

The Noise Assessment Report Part A is to be prepared by a qualified acoustic consultant and certified by a RPEQ.

## **Attachments**

Attachments to include where applicable are:

- all field measurement results
- all input and output data and analysis including modelling data files in electronic format
- supplementary reports and references
- any other explanatory and general notes.

## **Noise assessment report Part B – noise attenuation measures**

If the Noise Assessment Report Part A recommends that noise attenuation measures are necessary, these measures should be presented as per the requirements of Part B.

### **Attenuation**

Part B should provide full details of the preferred noise attenuation strategies and clearly demonstrate that the proposed measures will reduce noise to acceptable levels including:

- description of the investigation process in determining the preferred noise attenuation strategies/options
- description and layout plans of all existing and recommended noise attenuation treatment/options, including the length, height and location of proposed noise barriers
- layout plans showing the length, height and location of all existing and recommended noise attenuation treatment options. These should include:
  - the maximum height above proposed finished ground levels in Reduced Levels (RLs) on AHD of any proposed noise attenuation structures, which are required to meet the TMR's noise criteria
  - the maximum height above proposed finished ground levels in RLs on AHD of any proposed noise attenuation structures, which are required to meet the TMR's noise criteria for the ground level (first storey) of any noise sensitive receiver (if different from above)
  - the maximum height above proposed finished ground levels in RLs on AHD of any proposed noise attenuation structures which are required to meet the TMR's noise criteria for the first floor level (second storey) of any noise sensitive receiver
  - if the proposed noise attenuating structure(s) include/s an earth mound/s, the footprint extent of any earth mound/s

- the layout of the proposed development.
- supporting analysis, calculations and model outputs substantiating the ability of the proposed treatments to attenuate noise to acceptable levels.

### **Recommendations and conclusions**

The Noise Assessment Report Part B must clearly demonstrate and subsequently recommend that the development provide noise attenuation measures to ensure noise generated from the transport corridor meets acceptable noise criteria.

### **Certification**

The Noise Assessment Report Part B is to be prepared by a qualified acoustic consultant and certified by a RPEQ.

### **Attachments**

Attachments to include where applicable:

- all input and output data and analysis including modelling data files in electronic format
- supplementary reports and references
- any other explanatory and general notes.



## Glossary of terms

Term	Definition
Activities	See 'works'.
Development	Refer to Planning Act 2016.  Means— <ul style="list-style-type: none"> <li>• carrying out—               <ul style="list-style-type: none"> <li>– building work; or</li> <li>– plumbing or drainage work; or</li> <li>– operational work; or</li> </ul> </li> <li>• reconfiguring a lot; or</li> <li>• making a material change of use of premises.</li> </ul>
Dilapidation survey	A survey that is usually undertaken immediately before a contractor commences site work. The purpose of the survey is to record the pre-construction condition of properties adjoining the contractor's site and/or which may be influenced by the contractor's work. The survey encompasses the external elements of these properties and may extend to the internal condition if deemed appropriate.
Developed kinematic envelope (DKE)	The maximum width of a light rail vehicle in motion at a particular point.
Future light rail corridor	Refer to Planning Regulation 2016.  Means land identified in a guideline made under the Transport Planning Coordination Act, section 8E for— <ul style="list-style-type: none"> <li>• light rail transport infrastructure; or</li> <li>• light rail transport infrastructure works.</li> </ul>
Interfere with light rail transport infrastructure	Refer to Transport Infrastructure Act 1994, schedule 6.  For light rail transport infrastructure, for chapter 10, part 4, division 2, see section 361A of the Transport Infrastructure Act.
Light rail	Refer to Transport Infrastructure Act 1994, schedule 6.  Means— <ul style="list-style-type: none"> <li>• a route wholly or partly dedicated to the priority movement of light rail vehicles for passenger transport purposes, whether or not the route was designed and constructed for those purposes as well as other purposes</li> <li>• places for the taking on and letting off of light rail vehicle passengers using the route.</li> </ul>
Light rail corridor	Refer to Planning Regulation 2016.  Means—

Term	Definition
	<ul style="list-style-type: none"> <li>• land on which light rail transport infrastructure is situated; or</li> <li>• land on which light rail transport infrastructure works are carried out; or</li> <li>• land on which services for the maintenance or operation of light rail transport infrastructure are situated.</li> </ul>
Light rail environment	<p>Comprises the following:</p> <ul style="list-style-type: none"> <li>• The light rail corridor. This includes the land on which light rail transport infrastructure or light rail transport infrastructure works are situated, the land below the infrastructure and works</li> <li>• the area adjacent to the light rail corridor and the airspace above, including the zone of influence</li> </ul>
Light rail hazard zone	<p>Means—</p> <ul style="list-style-type: none"> <li>• the area extending: <ul style="list-style-type: none"> <li>– 1.75 metres horizontally either side of the nearest rail below ground and up to 3 metres above ground, and</li> <li>– 3 metres horizontally either side of the nearest rail at 3 metres or more above ground.</li> </ul> </li> </ul>
Light rail land	<p>Refer to Transport Infrastructure Act 1994, schedule 6.</p> <p>Means—</p> <ul style="list-style-type: none"> <li>• Light rail land means land declared to be light rail land under chapter 10 [of Transport Infrastructure Act].</li> <li>• Additionally, the following apply- <ul style="list-style-type: none"> <li>a) for chapter 10, part 4, division 3, see section 364 of the Transport Infrastructure Act; <p>[s364(1) of the Transport Infrastructure Act includes land that is state land, or private agreement land, on which light rail transport infrastructure is, or is proposed to be, situated]</p> </li> <li>b) for chapter 10, part 4, division 5, see section 378 of the Transport Infrastructure Act. <p>[s378 of the Transport Infrastructure Act, light rail land means light rail land that, when declared under this chapter to be light rail land, was-</p> <ul style="list-style-type: none"> <li>(a) a road or part of a road; or</li> <li>(b) busway land].</li> </ul> </li> </ul> </li> </ul>
Light rail manager	<p>Refer to Transport Infrastructure Act 1994, schedule 6.</p> <p>Means a person who is an accredited rail infrastructure manager in relation to railway operations, under the <i>Transport (Rail Safety) Act 2010</i>, for the light rail.</p>
Light rail operator	<p>Refer to Transport Infrastructure Act 1994, schedule 6.</p> <p>Means a person who is accredited, as a rail transport operator in relation to railway operations for light rail, under the <i>Transport (Rail Safety) Act</i>.</p>

Term	Definition
Light rail transport infrastructure	<p data-bbox="544 248 1129 275">Refer to Transport Infrastructure Act 1994, schedule 6.</p> <p data-bbox="544 304 852 331">Means each of the following-</p> <ul style="list-style-type: none"> <li data-bbox="544 353 1310 416">• the rails on which light rail vehicles run for a light rail and pavement incorporating the rails;</li> <li data-bbox="544 439 975 465">• the stations for operating a light rail;</li> <li data-bbox="544 488 1406 551">• other facilities necessary for managing or operating a light rail, including, for example- <ul style="list-style-type: none"> <li data-bbox="592 573 1374 636">– works built for the light rail, including the following- cuttings; drainage works; excavations; land fill; track support earthworks; and</li> <li data-bbox="592 658 1150 685">– light rail vehicles that operate on a light rail; and</li> <li data-bbox="592 707 1422 1070">– the following things if they are associated with the light rail’s operation- access or service lanes; bridges, including bridges over water; communication systems; light rail operation control facilities; machinery and other equipment; maintenance depots; marshalling yards; monitoring and security systems; noise barriers; notice boards, notice markers and signs; office buildings; overhead wiring; over-track structures; passenger interchange facilities between light rail and other modes of transport; platforms; positioning systems; power and communication cables; power supply substations and equipment; signalling facilities and equipment; survey stations, pegs and marks; ticketing equipment and systems; timetabling systems; tunnels; under-track structures; workshops;</li> </ul> </li> <li data-bbox="544 1093 1406 1120">• vehicle parking and set down facilities for intending passengers for a light rail</li> <li data-bbox="544 1142 1262 1169">• pedestrian facilities, including paving of footpaths, for a light rail</li> <li data-bbox="544 1191 1422 1317">• other facilities, of commercial or retail outlets or works, for the convenience of passengers and others who may use a light rail, including, for example, automatic teller machines, lockers or showers for cyclists and others, newsagents and wheelchair hire or exchange centres;</li> <li data-bbox="544 1339 1086 1366">• landscaping or associated works for a light rail.</li> </ul>
Light rail transport infrastructure works	<p data-bbox="544 1384 1070 1411">Refer to Transport Infrastructure Act, schedule 6.</p> <p data-bbox="544 1440 794 1467">Means works done for-</p> <ul style="list-style-type: none"> <li data-bbox="544 1489 1422 1552">• constructing light rail transport infrastructure or things associated with light rail transport infrastructure; or</li> <li data-bbox="544 1574 1390 1637">• the maintenance of light rail transport infrastructure or of things associated with light rail transport infrastructure; or</li> <li data-bbox="544 1659 1310 1722">• facilitating the operation of light rail transport infrastructure or things associated with light rail transport infrastructure; or</li> <li data-bbox="544 1744 1390 1807">• establishing, constructing or maintaining transport infrastructure, other than light rail transport infrastructure, if the works are- <ul style="list-style-type: none"> <li data-bbox="592 1830 1406 1856">– directly related to an activity mentioned in paragraph (a), (b), or (c); and</li> <li data-bbox="592 1879 1406 1942">– necessary for the safety, efficiency and operational integrity of transport infrastructure; or</li> </ul> </li> <li data-bbox="544 1964 1422 2027">• other works declared under a regulation to be light rail transport infrastructure works.</li> </ul>

Term	Definition
Light rail vehicle	<p>Refer to Transport Infrastructure Act 1994, schedule 6.</p> <p>Means a type of transport that–</p> <ul style="list-style-type: none"> <li>• is intended wholly or mainly for the carriage of passengers or for track maintenance; and</li> <li>• travels on flanged wheels on parallel rails; and</li> <li>• is designed to operate in line of sight on road-like areas.</li> </ul>
Overhead line equipment (OHLE)	<p>Overhead lines, cabling and associated structures used to provide power to electrical trains or light rail vehicles.</p>
Public passenger transport Infrastructure	<p>Refer to Transport Planning and Coordination Act 1994, section 3.</p> <p>Means -</p> <ul style="list-style-type: none"> <li>• infrastructure for, or associated with, the provision of public passenger transport, including, but not limited to:</li> <li>• a transit terminal for public passengers services (for example, an airport terminal, a coach terminal, a cruise ship terminal)</li> <li>• a ferry terminal, jetty, pontoon or landing for ferry services</li> <li>• a bus stop, bus shelter, bus station or bus lay-by</li> <li>• a busway station</li> <li>• a light rail station</li> <li>• a taxi rank, limousine rank or limousine standing area</li> <li>• a railway station</li> <li>• vehicle parking and set-down facilities</li> <li>• pedestrian and bicycle paths and bicycle facilities</li> <li>• a road on which a public passenger transport service operates.</li> </ul>
Registered Professional Engineer of Queensland (RPEQ)	<p>Registered Professional Engineer of Queensland, under the <i>Professional Engineers Act 2002</i>.</p>
Rock anchor	<p>A steel rod or cable placed in a hole drilled in rock, held in position by grout, mechanical means or both.</p>
State transport corridors	<p>Refer to Planning Regulation.</p> <p>Means–</p> <ul style="list-style-type: none"> <li>• a busway corridor; or</li> <li>• a light rail corridor; or</li> <li>• a railway corridor; or</li> <li>• a State-controlled road.</li> </ul>

Term	Definition
Stormwater management plan	A stormwater management plan demonstrates the likely stormwater and drainage impacts of a proposed development on a public passenger transport corridor, including light rail transport infrastructure.  It must be certified by a RPEQ and demonstrate mitigation strategies to achieve no worsening impacts on the pre-development condition.
Works	Refer to Transport Infrastructure Act 1994, schedule 6.  Works includes activities.
Zone of influence	The zone of influence is an area below ground where works and activities pose an increased risk to the safety and integrity of light rail infrastructure and light rail infrastructure works.

## Reference list

- Austrroads (2009). *Guide to Road Design – Part 6A: Pedestrian and Cyclist Paths*
- Department of Energy and Water Supply (2013). *Queensland Urban Drainage Manual*
- Department of Justice and Attorney-General (2013). *Safe Design of Structures: Code of Practice 2013*
- Queensland Police Service (2007). *Crime Prevention through Environmental Design – Guidelines for Queensland*
- TMR (2013). *Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure Version 2*
- TMR (2014). *State Development Assessment Provisions Supporting Information – Public Passenger Transport*
- TMR (2014). *Transport Noise Management Code of Practice, volume 2: Construction Noise and Vibration*
- TMR (2015). *Geotechnical Design Standard*
- TMR (2016). *Road Planning and Design Manual 2nd Edition: Volume 3*
- Worksafe (2013). *Safe Design of Structures Code of Practice 2013*

## Links

- DA Mapping System, <http://www.dilgp.qld.gov.au>
- Disability Discrimination Act, <https://www.legislation.gov.au>
- Disability Standards for Accessible Public Transport, <https://www.legislation.gov.au>
- Economic Development Act, <https://www.legislation.qld.gov.au>
- Electrical Safety Act, <https://www.legislation.qld.gov.au>
- Electrical Safety Regulation, <https://www.legislation.qld.gov.au>
- SARA, <http://www.dilgp.qld.gov.au/planning/development-assessment/state-assessment-and-referral-agency.html>

SDAP, <http://www.dilgp.qld.gov.au/planning/development-assessment/state-development-assessment-provisions.html>

State Planning Policy, <http://www.dilgp.qld.gov.au/planning/state-planning-instruments/state-planning-policy.html>

Planning Act, <https://www.legislation.qld.gov.au>

Planning Regulation, <https://www.legislation.qld.gov.au>

Professional Engineers Act, <https://www.legislation.qld.gov.au>

Transport Infrastructure Act, <https://www.legislation.qld.gov.au>

Transport Planning and Coordination Act, <https://www.legislation.qld.gov.au>

Transport (Rail Safety) Act, <https://www.legislation.qld.gov.au>

Work Health and Safety Act, <https://www.legislation.qld.gov.au>

## Contact details

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