Guide to Traffic Impact Assessment

Frequently Asked Questions (December 2017)

This document details a number of frequently asked questions regarding the Guide to Traffic Impact Assessment (GTIA).

Traffic impact assessment – general

Do all developments or projects requiring a traffic impact assessment have to use the GTIA or can they choose to prepare the traffic impact assessment as per current practice under the Guidelines for Assessment of the Road Impacts of Development (GARID)?

The GTIA replaced GARID and is the Department of Transport and Main Roads (TMR) guiding position on traffic impact assessments. While the GTIA took effect from 3 July 2017, TMR acknowledges there will be cases where traffic impact assessments have been prepared to support development applications (or are already underway) using GARID, but the development application was not lodged before 3 July 2017. In such cases TMR will accept traffic impact assessments prepared using GARID, however, proponents may opt to prepare a new traffic impact assessment under the GTIA.

It is acknowledged that there will be a period of transition whereby all practitioners – development proponents, their consultants and TMR officers – are able to confidently and competently apply the new principles and requirements. Accordingly, there is a need for some flexibility with the GTIA's introduction and it is likely there will be some practical issues that may need further consideration. The GTIA is intended to be a 'living document' that will be updated where necessary in a much more regular way than previously the case with GARID.

Will a traffic impact assessment prepared under the GTIA result in less costs for the developer than under GARID?

In some scenarios a traffic impact assessment prepared under the GTIA may result in less costs for the proponent than under GARID, but in other scenarios the GTIA may result in greater costs for the proponent. TMR is unable to provide advice about which method will be of greatest benefit to the proponent in terms of development costs. TMR recommends proponents engage a suitably qualified traffic engineer to provide them with advice about whether a traffic impact assessment prepared under the GTIA would result in less costs than one prepared under GARID.

What input parameters should be used when undertaking a traffic impact assessment?

Appendix A of the GTIA includes a set of standard input parameters for use in traffic impact assessments that will be acceptable to TMR in the majority of situations. If different parameters to those included in Appendix A are used in a traffic impact assessment, these parameters must be fully justified and their source must be referenced.

If a development will result in a relatively small increase in vehicle movements which will not affect the level of service for a road (e.g. 2 – 3 movements on a rural road) but the impact is over the thresholds listed in the GTIA, do the impacts still need to be mitigated?

TMR expects industry to adopt a pragmatic approach to applying the GTIA and does not expect mitigation of minor traffic impacts as described in this scenario, unless the increase will result in an unacceptable safety risk.

If during construction of a development there will be significant traffic impacts, but relatively minor impacts during normal operation (for example, a wind or solar farm), what is the requirement to mitigate impacts?

Most types of development with significant traffic impacts during the construction phase of the development are 'major development projects', for example, coordinated projects under the *State Development and Public Works Organisation Act 1971* or projects subject to environmental impact assessment under the *Planning Act 2016* or *Environmental Protection Act 1994*. These projects will have specific terms of reference guiding the assessment of the impacts of the development which will include transport and road impacts during both construction and operation phases.

Every project is different and therefore mitigation of construction impacts will be assessed on a case by case basis. However, generally in such scenarios TMR will support implementation of non-infrastructure solutions, for example, road use management plans or traffic control measures, to address impacts during the construction phase of the development. However, when construction impacts will result in an unacceptable safety risk, TMR may require implementation of infrastructure solutions such as road works.

If the year of opening is well after the latest available traffic counts at intersections in the impact assessment area, do the counts need to be factored up for background traffic growth?

If traffic counts are available within 3 years of the year of opening, then no background growth factoring would be needed. If the year of opening is beyond 3 years of the available counts or the collected counts, then background growth should be applied to factor the counts to the year of opening.

Background traffic growth rates would ordinarily be nominated by the proponent and either accepted or not accepted by TMR. Background growth rates are less important under the GTIA because the assessment is based on relative delay rather than the threshold-based capacity assessment under GARID.

Should a traffic impact assessment take into account the impact of delay on cyclists and pedestrians?

Where a development is occurring in an area where cyclists and pedestrians constitute a significant proportion of persons transiting along the road or through an intersection then a traffic impact assessment may need to take into account the impact of delay on cyclists and pedestrians. For example, in central business districts, town centres, major activity centres or developments specifically designed to encourage trips using active and public transport, there may be a much higher proportion of pedestrian and cycle traffic.

However, in the majority of circumstances involving high volume pedestrians areas, the impact on pedestrians would expected to be minor as typically they would continue to have right of way at signalised intersections or zebra crossings. The volume of cyclists would also need to be extraordinarily high for increases in signal delay or opposing traffic to noticeably impact total person-hours travelled through the intersection.

Road safety assessment

For the safety risk assessment in the GTIA, can examples be provided of safety risks, and examples provided for the five different likelihood categories?

The GTIA identifies a number of safety risks and assigns a likelihood and consequence rating to these (refer to Figure 9.2.2(b) on page 37).

In addition to these examples, the *Austroads Guide to Road Safety, Part 6* provides a more complete guide to assessing likelihood. For example, rare could mean it may never happen or only happen once a year, whereas almost certain may mean daily. These should provide some possible examples to compare against, although determining the likelihood of a risk is always at the discretion of the person undertaking the road safety audit or

assessment, as it is based on site specific circumstances.

Under the GTIA will a road safety audit or road safety assessment be triggered for all projects?

No. A road safety audit or road safety assessment is only required if any changes to access configurations, nearby intersections, bus stop locations, cycling facilities, footpaths and so on are required for the development, or as mitigation measures for the development. Table 9.3.3(a) and table 9.3.3(b) outline whether a road safety audit or road safety assessment is required based on the safety rating of the road environment the development is accessing.

The GTIA states that a road safety audit must be prepared independently of the design team, however, can the same company undertake the design and the audit?

A company can provide both the road safety audit and design, if any road safety audit is undertaken by a person independent of the person(s) preparing the traffic impact assessment. Suitable independence must be able to be demonstrated.

The wording in Section 9.3.3 of the GTIA does allow for the interpretation that both services are provided by the same company.

If a development is proposed that will impact an unsignalised intersection where safety is a concern, mitigation may include providing signalisation. However, adding signalisation would then create new delay at the intersection. In this instance, would the proponent also need to mitigate the new introduced delay impacts?

Under sections 9.3.5 and 11.3.3 of the GTIA, it is stated that safety must always be prioritised over other outcomes. Accordingly, in this scenario, TMR would accept increased delays because of the overriding principle for maintaining safety. It would be unreasonable to expect a development proponent after addressing safety impacts to then be encumbered with having to mitigate for additional delay introduced because of the safety upgrades. To overcome this, any intersection upgrades required for safety reasons should be considered as part of the 'base case' network for intersection delay assessment.

Under the GTIA a developer may be required to mitigate an existing safety issue. Is this reasonable?

Under the GTIA development must not compromise safety on the SCR network. TMR will not permit any development outcome that worsens an existing excessive safety risk on the SCR network within the impact assessment area of the development.

This matter was considered by a panel of traffic engineers during development of the GTIA. The consensus position was that professionally, traffic engineers cannot 'sign off' on a traffic impact assessment if the development proposed will knowingly increase excessive existing safety risks.

The cost of works required to mitigate existing safety risks should be considered as being able to be offset against the costs of other traffic and transport-related mitigation works required on state-controlled roads for the development.

Under the GTIA will a road safety audit be triggered for local government roads?

The GTIA only applies to development proposing impacts on the safety, efficiency or infrastructure condition of state-controlled roads. It does not apply to impacts on local government roads, although, a local government may choose to adopt the GTIA in part, or in its entirety.

For typical types of development occurring under the Planning Act, a road safety audit is only required when impacting a road with greater than 8000 AADT and a speed environment of greater than 80km/hr. Most local government roads will not meet these criteria.

For major development, a road safety audit is required on roads with less than 8000 AADT and a speed environment of 60km/hr or greater, or roads with greater than 8000 AADT regardless of the speed environment. Some

local government roads will meet these criteria, however, it is up to the local government to decide whether a road safety audit is required in these circumstances or in other circumstance.

Intersection delay assessment and no net worsening

Why has the GARID requirement to design for intersection performance of ten years been removed from the GTIA?

GARID required assessment of intersection impacts to allow for ten years of growth post development. Under GTIA, this requirement has not been retained as it is considered inequitable and unreasonable for a development to mitigate impacts beyond its direct impacts at the time that they are first generated or to assess the impacts under an uncertain worsening future base case condition.

If there is a development proposed where its access creates a new intersection or adds to an existing intersection and its impacts are felt through traffic delays on the fronting road, should these delays be considered as part of the total intersection delay impact?

There is no single response to this situation as there are multiple scenarios in which this may apply however the following principles are put forward for consideration. If the access upgrade is required for safety reasons and it provides additional safety benefits to the intersection, then the upgrade's effect should not be considered in the summation of intersection delay impacts.

If the access upgrade is primarily provided for access to the development, without any appreciable benefits to the broader community, then the upgrade's effect should be included in the summation of intersection delay impacts.

Under the GTIA, can an applicant propose multiple intersections to 'spread the impact' of introduced delay on the state-controlled road network? For example, where a development will significantly increase the delay of an access point can the proponent include nearby intersections with spare capacity to offset the development's impact?

The GTIA provides the flexibility to offset delay impacts in the most efficient way possible across the impact assessment area (subject to TMR being agreeable to the works proposed aligning with its policy goals and current planning).

Under the GTIA's intersection delay assessment procedures, the total delay impacts would be the sum of the vehicle-hours of delays across the impact assessment area. How this vehicle-hours of delay is recovered could be at one or at multiple intersections and an objective would be to minimise construction costs to achieve this outcome.

An example of 'spreading the impact' is where TMR agrees to the provision of two or three priority intersection accesses instead of one signalised access. In this scenario, the vehicle minutes of imposed delay may be less with several priority intersections than with a single signalised intersection because development traffic will mostly have to give way to non-development traffic. However, TMR may not agree to such an option if it does not align with the access management strategy for the road.

How should local government intersections be considered in the traffic impact assessment?

While TMR is primarily concerned with the safety and efficiency of its network, a "one network" approach should be the basis for consideration of intersection delay impacts. That is, regardless of whether the local government has requested assessment of its intersections, TMR will need to know the full extent of the impact assessment area across both its network and the local government network. In terms of achieving no net worsening of intersection delay, it is probable that the

highest value for money works would be at state-controlled intersections, where the greatest vehicle delay-savings will be generated.

Can development proponents propose signal phasing changes as a management strategy?

While changing signal phasing can lead to improved efficiency for some traffic, it will sometimes result in negative effects on other traffic or pedestrians. For the calculation of intersection delay offsets, changing signal phasing should not be used as a strategy as this is something that could be undertaken by TMR independent of any development, or there may be specific reasons why timings are set the way they are (such as for coordination, for affecting downstream intersections, for gap creation downstream etc.). Also, savings from more efficient phasing should be seen as a community benefit that is not yet realised rather than a new benefit introduced by the development simply because it is identified.

While not included in the GTIA as an example of a management strategy, it may, however, be a useful strategy in some instances where TMR agrees with its use given that large developments may require timing adjustments to optimise the system anyway.

What analysis software should be used for calculating intersection delays?

Ideally, and in most situations, the Signalised and Un-signalised Intersection Design and Research Aid (SIDRA) should be used. In some cases, SIDRA network may be appropriate although care should be taken when reviewing results from SIDRA network to ensure that the models have been suitably calibrated as a network model.

For larger developments in complex traffic networks, suitably calibrated/validated microsimulation models may be used. For even larger areas (e.g. master planned communities) strategic or mesoscopic models may be used for broad network analysis and SIDRA for more localised analysis typically on a stage-by-stage basis.

Pavement impact assessment

What are 'marginal costs' under the GTIA?

The GTIA provides advice on determination of marginal costs for estimating the cost impact that a development's traffic has on state-controlled road pavements. In simple terms, a marginal cost is an estimation of the increase in the annual cost (or Equivalent Annual Uniform Cost (EAUC)) that corresponds to the increase in pavement deterioration (measured by Standard Axle Repetitions (SAR)).

Marginal costs have been determined for each kilometre segment of the state-controlled road network, based upon traffic speed deflectometer (TSD) analysis of 100 metre segments for around 18,000 kilometres of the state-controlled road network. From this data, representative segments were used to determine marginal costs for the remaining segments that were not analysed using TSD.

Can the FAMLIT tool deal with scenarios where there is a significant increase in the number of heavy vehicle movements on a state-controlled road?

The FAMLIT methodology calculates the relationship between SAR and the EAUC and was derived by accounting for variances in annual Equivalent Standard Axles (ESA) of between -40% and +40% for each road segment.

There may be proposed developments that may fall outside these limits and accordingly, in these instances further analysis of the impact may be necessary.

Is there any way of calculating damage for something like a quarry where the customers may be unknown?

Traffic impact assessments for quarries, concrete batching plants, building material supplies etc. need to estimate where their haul routes are, however, it is acknowledged that this is largely market driven and may change when the development is constructed.

This has always been an issue under GARID and will continue to be an issue under the GTIA. Typically, the proponent will nominate its

haul routes, and TMR will review these for reasonableness. This process is likely to be retained and once the haul routes are identified (to the extent of the pavement impact assessment area), then the pavement damage calculations can be undertaken.

In addition, for development applications under the Planning Act, a development application may be conditioned to require the applicant to apply for a variation of approval condition if new haul routes arise, or if haul routes change to those originally permitted. Under the Planning Act, this is referred to as a minor change application, and is given effect under sections 78 to 81.

Monetary contributions and mitigation outcomes

If no mitigation works can be identified or agreed between TMR and a proponent, what is the process under GTIA to calculate a monetary contribution?

The GTIA provides basic advice about calculating contributions as it will be difficult to provide comprehensive advice to meet all development scenarios.

In practice, the proponent should define the theoretical works required to mitigate the impacts and the contribution should be based on the construction costs for these works (excluding land costs). The theoretical works should be the most likely works that could reasonably be constructed in the impact assessment area. The works should be based on typical rates for similar works and be provided by the local TMR office (e.g. per sqm of lane). For intersection control type upgrades involving major works, an estimate of the project value would need to be estimated on a case by case basis.

Who determines the mitigation works to be completed under the GTIA? For example, where there are multiple mitigation options, what is the process for determining the mitigation option to be progressed?

The development proponent should put forward reasonable mitigation strategies from which TMR would agree and condition (or recommend to the State Assessment and Referral Agency (SARA)) accordingly. Ultimately TMR and the Department of Infrastructure, Local Government and Planning (DILGP) have the responsibility to condition for development, so TMR needs to be satisfied that the mitigation works are reasonable, relevant, final and certain, and aligned with TMR's policies and planning intentions for the area under consideration.

The underlying principle under the GTIA is to provide the lowest cost works option to minimise the whole of life costs to the community, as long as the mitigation works meet TMR's road planning objectives,

Other matters

Does the GTIA address other impacts from development, including noise and environmental impacts, and stormwater and drainage impacts?

The GTIA does not provide guidance about how development must address other impacts of development outlined in the State Development Assessment Provisions (SDAP) such as stormwater and drainage, earthworks, noise, dust or protected vegetation. The guide intentionally focuses on providing guidance to industry on how to assess and mitigate traffic impacts of development on the state-controlled road network.

Guidance for other development impacts is provided in guidelines supporting the SDAP available on TMR's website:

https://www.tmr.qld.gov.au/Community-and-environment/Planning-and-development/Planning-and-development-assessment-under-SPA/Assessable-development

On the matter of protected vegetation in the road reserve, TMR has no authority to provide approvals or advice in relation to the clearing of protected vegetation in the road reserve. It is the applicant's responsibility to obtain all necessary approvals from the Department of Environment and Heritage Protection, the Department of Natural Resources and Mines or other responsible Commonwealth or state agencies if clearing of protected vegetation in a road reserve is required when undertaking road works.

Further questions

If you have further questions about GTIA please contact TMR by emailing planningpolicy@tmr.qld.gov.au.

This document will be updated periodically to include further questions and answers.