

Road safety assessment methods: deciding which one to use

Marta, D., Smart, W., Dr Saffron, D., Hamilton, B., Bhatnagar, Y.
NSW Centre for Road Safety, Roads and Traffic Authority of NSW
delilah_marta@rta.nsw.gov.au, wal_smart@rta.nsw.gov.au,
david_saffron@rta.nsw.gov.au, brad_hamilton@rta.nsw.gov.au,
yogen_bhatnagar@rta.nsw.gov.au

Introduction

To enhance road safety of the road network, just assess it from a road safety outlook and apply any follow-on changes. Sounds simple, but in practice it is not that straight forward. Firstly, there are a number of methods offered to assess road safety. Choosing the most suitable one (or more than one) is the key to achieving the desired outcome in road safety.

There is currently limited guidance offered on the different methods to assess road safety and which method to use for a given project or situation. The NSW Centre for Road Safety recognised that by providing practitioners with some direction on these methods it could produce even more road safety benefits overall. Therefore, the NSW Centre for Road Safety has created a simple approach for practitioners in choosing the most appropriate method or methods for assessing road safety for their project or situation. This paper explains this approach.

Types of assessment methods

There are a number of ways to assess the road safety of roads. The methods include:

- road safety strategy
- network risk assessment
- major project safety assessment
- route safety review
- community focused road safety plan
- road safety evaluation
- road safety audit
- road crash investigation
- speed zone review
- road safety check
- safety benefits and impact calculation

A description of each method has been provided in Table 1. As this is a NSW initiative, the method descriptions are based on NSW practices. They take in methods that have been around for years, methods that are relatively new and methods that are still being established.

Table 1 Description of each road safety assessment method	
Method	Description
road safety strategy	<p>It is a plan to guide efforts in reducing fatal and serious injury crashes for all road users across a defined road network. The intention is to establish a desired future direction with actions and targets designed to achieve specific results. It considers professional and community input. It is managed by a qualified team of professionals. A plan is produced.</p> <p>Further information on road safety strategies can be found in Austroads Guide to Road Safety Part 2: Road Safety Strategy and Evaluation.</p>
network risk assessment	<p>It is an assessment of road safety risks across a defined road network. The intention is to identify general areas of risk in road safety for all road users. It considers network operations and road characteristics and may consider crash history. It is managed by a qualified professional. A report is produced.</p> <p>Further information on network risk assessments can be found in Austroads Guide to Road Safety Part 7: Road Network Crash Risk Assessment and Management.</p>
major project safety assessment	<p>It is a formal review of road safety along a proposed road project. The intention is to identify road safety issues and areas of risk that could lead to road crashes or harm to people and establish approaches or actions to enhance road safety benefits. It considers road safety professional inputs. It is managed through a steering committee.</p> <p>Examples where the major project safety assessment was used included duplication works along the Pacific Highway and Hume Highway.</p>

Table 1 Description of each road safety assessment method	
Method	Description
route safety review	<p>Multi-disciplinary safety reviews of key transport routes. These reviews involve extensive investigation and consultation including in-depth analyses of the routes crash history, route inspections, community workshops, reporting and program development. The reviews also place emphasis on further improving the coordination and integration of road improvement projects and ensuring the best safety outcome through an integrated program. Route safety review programs are holistic approaches aimed at reducing the road toll by targeting works at identified road safety problems and effective road safety engineering measures combined with complementary behavioural and enforcement programs. These are undertaken by a multidisciplinary team of road safety engineering, behavioural and enforcement professionals from both within and outside the road authority. A comprehensive report is produced with a comprehensive program of works.</p> <p>Further information on route safety reviews can be found in RTA's Newell Highway safety review and Central West Transport (CENWEST) routes review.</p>
community focused road safety plan	<p>It is a formal process for reviewing the road safety across a defined community area for all road users. The intention is to identify road safety issues and risks and to promote or establish community based strategies and actions to enhance the road safety for that community. It considers all current and proposed strategies, plans and works within the community (for example, pedestrian access and mobility plans). It is led by the community and managed through a steering committee involving road authorities. The plan ensures integration of existing and proposed strategies along with future road upgrades.</p>
road safety evaluation	<p>It is a formal examination of the potential and actual road safety risks for an existing road from the perspective of all road users. The intention is to identify road safety issues and risks that have or could lead to road crashes or harm to people. It includes a road safety audit, crash investigation and request for a speed zone review. It is conducted by independent, qualified professionals. A signed report is produced.</p> <p>Further information on road safety evaluations can be found in RTA's Road Safety Audit Practices Part 2: Road Safety Evaluations.</p>

Table 1 Description of each road safety assessment method	
Method	Description
road safety audit	<p>It is a formal examination of road safety risks along a future or existing road from the perspective of all road users. The intention is to identify road safety issues and risks that could lead to road crashes or harm to people. It considers road and traffic characteristics and design plans. It is conducted by an independent, qualified team of professionals. A report signed by each team member is produced.</p> <p>A road safety audit is most effective before the road is built.</p> <p>Further information on road safety audits can be found in Austroads Guide to Road Safety Part 6: Road Safety Audit and RTA's Road Safety Audit Practices Part 2: Road Safety Audits.</p>
crash investigation	<p>It is a detailed analysis of road crashes over a number of years along an existing road. The intention is to identify and analyse crash clusters, fatal and injury crash sites, common crash characteristics and types and develop appropriate treatments. It is conducted by a road safety professional. A signed report is produced.</p> <p>Further information on crash investigations can be found in Austroads Guide to Road Safety Part 8: Treatment of Crash Locations.</p>
speed zone review	<p>It is a formal assessment of speed limits along an existing road to provide an appropriate level of safety while allowing for mobility and amenity on public roads. It considers the road function, roadside development, and road and traffic characteristics. It is conducted by a qualified road safety professional. Formal documents are produced.</p> <p>Further information on speed zone reviews can be found in RTA's NSW Speed Zoning Guidelines.</p>
road safety check	<p>It an assessment of potential road safety risks for a proposed or existing road from the perspective of all road users. It is applied where the overall risks are low (for example design and installation of an indented bus bay along an existing road). The intention is to identify road safety risks . It considers crash history and road and traffic characteristics and is conducted by a road safety professional. As it is a less formal approach a response is produced.</p> <p>Further information on road safety checks can be found in RTA's Road Safety Audit Practices Part 2: Road Safety Checks.</p>

Table 1 Description of each road safety assessment method	
Method	Description
safety benefits and impact calculation	<p>It is an assessment of the impact on road safety of proposed work on an existing road. The intention is to identify treatments for specific works which offer the highest benefit for road safety. Or the intention is to compare the impact on road safety of each proposed work to assist in prioritising a program of works. It considers crash history and treatment options. It is undertaken by project managers. A road safety impact index is produced.</p> <p>Further information on safety benefits and impact calculation can be found in RTA's Road projects safety benefits and impact calculation model user manual.</p>

Each of these methods applies safe system principles to reduce the number of road crashes and harm to people if a crash does occur. Each method has its own unique application, level of detail, inputs, outputs and road safety outcomes. Knowing these subtle differences between each method assists the practitioner in selecting the optimal method for the given project or situation.

Choosing the appropriate method

A simple approach has been created to assist in selecting the most appropriate method or methods for the job. The approach involves:

1. **Establishing the desired effort (input) and level of detail in the output** for the given project or situation. The groups presented are: 'road network' level, 'route / town' level or 'road / site' level. These are described as:
 - The 'road network' level looks at a system of roads across a defined area. This level provides general information.
 - The 'route / town' level looks at highways, or connecting roads linking specific destinations, or roads within a defined town/community area. This level provides focused information.
 - The 'road / site' level looks at individual roads or sites. This level provides detailed information.

2. **Deciding on the form of the road** for the given project or situation. The groups presented are: a 'new' road, an 'existing' road or a combination of both. These are described as:
 - A 'new' road involves creating roads and road related areas on land where road users have not previously travelled, or significantly changing the function and characteristics of roads and road related areas such that it does not resemble what was there before.
 - An 'existing' road involves roads and road related areas currently used by road users.

3. Using Figure 1 to **choose which method or methods to assess road safety** are suitable for the given project or situation. Figure 1 indicates each method to

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assess road safety against the level of detail and the form of the road. It also indicates the order in which methods should be undertaken. For example, if a number of assessments were to be undertaken for a 'new road' project, the order would be:

- a) road safety strategy,
- b) major project safety assessment,
- c) road safety audits, and finally
- d) road safety checks.

This approach has been designed as a starting point and is purposefully made easy for practitioners to use. The full complexities in each method are not presented. For some projects or situations this may need to be further explored before choosing on the optimal method or methods.

Conclusion

There are a number of methods offered to assess road safety on a road network. The NSW Centre for Road Safety recognised that by providing practitioners with direction on the different road safety methods offered and when they should be used, that additional road safety benefits could be achieved.

The NSW Centre for Road Safety has created a simple approach for practitioners in choosing the most appropriate method or methods for assessing road safety for their project or situation. The approach considers the form of the road and the desired effort and output. It offers a starting point for practitioners.

The overall target is to reduce road crashes and trauma if a crash does occur on our road networks. By assessing roads from a road safety perspective and applying appropriate countermeasures, we are well on the way to ensuring that road safety is further enhanced for all road users.

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	NEW ROADS	EXISTING ROADS	
Road network level	<p style="text-align: center;">ROAD SAFETY STRATEGY</p> <p>Process involves:</p> <ul style="list-style-type: none"> ▪ reviewing current strategies & plans ▪ consulting stakeholders <p>Outputs are:</p> <ul style="list-style-type: none"> ▪ identifies future direction across the network ▪ identifies actions and targets at a high level 		
		<p style="text-align: center;">NETWORK RISK ASSESSMENT</p> <p>Process involves:</p> <ul style="list-style-type: none"> ▪ assessing information ▪ checking data in the field <p>Outputs are:</p> <ul style="list-style-type: none"> ▪ identifies major road safety risk areas across the network 	
Route / town level	<p style="text-align: center;">MAJOR PROJECT SAFETY ASSESSMENT</p> <p>Process involves:</p> <ul style="list-style-type: none"> ▪ detailed analysis of crash data and issues ▪ consulting road safety professionals ▪ managing through a steering committee <p>Outputs are:</p> <ul style="list-style-type: none"> ▪ identifies road safety issues and risks for a project ▪ identifies treatment strategies 	<p style="text-align: center;">ROUTE SAFETY REVIEW</p> <p>Process involves:</p> <ul style="list-style-type: none"> ▪ analysing crash data ▪ consulting stakeholders ▪ assessing field data <p>Outputs are:</p> <ul style="list-style-type: none"> ▪ identifies road safety issues along route ▪ identifies mass action treatment strategies ▪ identifies some site specific strategies 	<p style="text-align: center;">COMMUNITY FOCUSED ROAD SAFETY PLAN</p> <p>Process involves:</p> <ul style="list-style-type: none"> ▪ reviewing current strategies, plans & works ▪ consulting stakeholders ▪ community led steering committee <p>Outputs are:</p> <ul style="list-style-type: none"> ▪ identifies road safety issues and risk across the local network ▪ identifies strategies & actions at a local level
Road / site level		<p style="text-align: center;">ROAD SAFETY EVALUATION</p> <p>Process involves:</p> <ul style="list-style-type: none"> ▪ minimum of 2 independent professionals ▪ conducting a road safety audit ▪ conducting a road crash investigation ▪ requesting a speed zone review <p>Outputs are:</p> <ul style="list-style-type: none"> ▪ identifies specific road safety issues and risk for the site ▪ produces a corrective action program 	
		<p style="text-align: center;">ROAD SAFETY AUDIT</p> <p>Process involves:</p> <ul style="list-style-type: none"> ▪ minimum of 2 independent certified road safety auditors ▪ examining design plans ▪ inspecting the site <p>Outputs are:</p> <ul style="list-style-type: none"> ▪ identifies road safety issues and risks at the site ▪ produces a corrective action program 	
		<p style="text-align: center;">ROAD CRASH INVESTIGATION</p> <p>Process involves:</p> <ul style="list-style-type: none"> ▪ a qualified professional ▪ detailed analysis of crash data ▪ inspecting the site <p>Outputs are:</p> <ul style="list-style-type: none"> ▪ identifies road safety issues and risks at the site ▪ identifies countermeasures / treatment options 	<p style="text-align: center;">SPEED ZONE REVIEW</p> <p>Process involves:</p> <ul style="list-style-type: none"> ▪ a qualified professional ▪ collecting traffic & site data ▪ assessing data <p>Outputs are:</p> <ul style="list-style-type: none"> ▪ identifies speed limit issues for the site ▪ identifies speed limit / zone options ▪ determines the speed limit / zone
		<p style="text-align: center;">ROAD SAFETY CHECK</p> <p>Process involves:</p> <ul style="list-style-type: none"> ▪ a road safety professional ▪ checking design plans ▪ checking / inspecting the site <p>Outputs are:</p> <ul style="list-style-type: none"> ▪ identifies potential road safety risks at the site ▪ identifies corrective action options 	
			<p style="text-align: center;">SAFETY BENEFITS & IMPACT CALCULATION</p> <p>Process involves:</p> <ul style="list-style-type: none"> ▪ reviewing crash data ▪ assessing different treatment options <p>Outputs are:</p> <ul style="list-style-type: none"> ▪ produces an index for the impact on road safety

Figure 1. Road safety assessment method next to the detail level and road form.

References

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