CLOCS-A

Construction Logistics and Community Safety – Australia

Project Rating Tool

Development Process and Rationale

The following notes provide background context to the development of the CLOCS-A Project Rating Tool, which contractors and project managers will use to rate infrastructure projects when participating in the CLOCS-A scheme.

Rationale for CLOCS-A Project Rating Tool

For infrastructure projects that choose to participate in the CLOCS-A scheme, there will be various requirements or standards to meet in terms of the heavy vehicles, drivers, logistics planning and communications. There will not be just a single list of requirements for participation in the scheme – but three different levels of requirements that we have chosen to call Bronze, Silver and Gold.

The specific requirements for each of the three levels (i.e., Bronze, Silver, Gold) for the heavy vehicle specifications, driver training, logistics planning and communications have now been defined. Upon first entering the CLOCS-A scheme, a client's project will be given a rating, and the various participants in that project (such as the transport operators) will nominally require CLOCS-A accreditation at that level or higher. A system or methodology to provide this initial rating for individual infrastructure projects was required to facilitate this process. Thus, there was a need to develop the CLOCS-A Project Rating Tool.

The primary rationale for the development of a tool was to:

- understand the principal relevant variables that exist between infrastructure projects,
- quantify them,
- ascribe a rating system to each so that they may be scored and;
- aggregate or average the "scores" to provide an overall result.

This result could then be used to classify the project as either Bronze, Silver or Gold – depending upon the perceived level of risk exposure for Vulnerable Road Users (VRUs) to heavy vehicle (HV) traffic.

Tool Development Process and Considerations

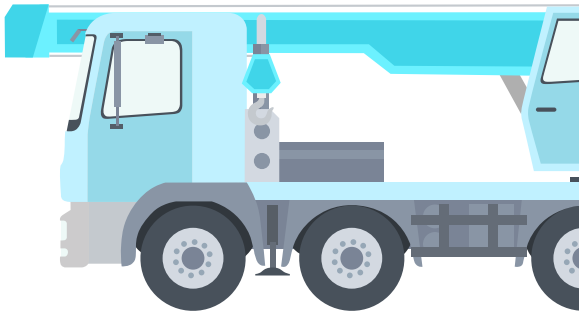
Infrastructure projects can vary significantly, but given the primary purpose of CLOCS-A to reduce the risk of road trauma for VRUs around heavy vehicles, there was a need to focus on the main things that directly create or indicate increased levels of exposure to risk.

In creating the Tool, for practical reasons, we decided to keep the total number of project variables to be quantified to ten or less. It was not possible to arrive at a series of variables that all directly measure VRU exposure for a project, and some of the variables chosen are just "proxies" for probable levels of exposure. After consideration, an initial group of ten variables were developed.

Along with the outlined rationale for the Tool, these ten variables were distributed to managers from around the country currently involved in infrastructure projects (i.e., subject matter experts) to seek their thoughts and suggestions.

Following a process of review of this feedback, a revised list of seven variables was produced, which incorporated the industry feedback received. These seven variables form the basis for the draft CLOCS-A Project Rating Tool.

As noted above, in addition to defining these important variables, they need to be readily quantifiable by either direct measure or having access to a reliable, independent source of information. The proposed variables and measurement ranges for each are shown in Table 1.



Development Process and Rationale

Project Variables	Measures				
	1	2	3	4	5
Total project cost	0 to $5m	$5m to $50m	$50m to $500m	$500m to $1b	> $1b
Usual Resident Population (URP) density (people / km²) in the 1 square km area of land surrounding the project site entrance	< 500	500 to 2,000	2,000 to 5,000	5,000 to 8,000	> 8,000
Average daily number of HV visits into the project site	< 10	10 to 25	25 to 50	50 to 100	> 100
Distance (along the approved route) from the project site entrance to an arterial road or highway	< 0.5kms	0.5 to 1.0 kms	1 to 2 kms	2 to 5 kms	> 5kms
Number of the following items on the last 5km of the approved route(s) to the project site entrance: • School zones • Pre-schools or childcare centres • Pedestrian crossings • Shopping centres • Sporting Fields	0	1 to 3	4 to 6	6 to 10	> 10
Highest (2-way) traffic density (vehicles / day) on any section of road in the last 1km of the approved route to the project site entrance	< 500	500 to 3,000	3,000 to 10,000	10,000 to 50,000	> 50,000
Number of intersections within the last 5kms of the prescribed route into and out of the project site entrance that will require a left turn by a heavy vehicle	0	5 to 10	15 to 20	20 to 25	> 25

Table 1: The variables and measures which comprise the CLOCS-A Project Rating Tool

Each variable will be described in more detail below

1. *Total Project Cost*

Total Project Cost is a proxy measure for the project's size, complexity and duration. Generally, the more expensive the project, the more everything there is likely to be – including the probable exposure of VRUs to HV traffic. The expected cost will be known before the project commences. There may be a need for industry experts with substantial experience in construction project costing to refine further the five cost rating categories outlined in Table 1.

2. *Usual Resident Population*

Usual Resident Population (or URP) for the one square km area surrounding the project site is utilised as a proxy for the likely volume of VRU traffic and shops etc., that heavy vehicles accessing the site might encounter— the more VRU traffic the greater the risk level. URP information is available from the Australian Bureau of Statistics (based on 2011 Census data). Categories used by the ABS are:

- less than 500,
- 500 to 2,000,
- 2,000 to 5,000,
- 5,000 to 8,0000 and
- greater than 8,000 people per square km.

These are the five measurement categories chosen for use here.

3. *Average daily HV visits to site*

Average daily HV visits to the project site is the other side of the same coin. A heavy vehicle that both enters and exits the site is counted as one visit and may be either to deliver or remove material, goods or equipment. The average daily number of HV visits should be calculated based on the days that the project is open.. The more HV movements there are, the more interactions between trucks and VRUs. Project managers should be able to calculate or predict this with some accuracy, and will most likely have already been done in the project approval stage.

It's worth noting that this tool has nothing to do with determining the preferred or approved HV routes in and out of project sites. That should have been done by others beforehand

Development Process and Rationale

4. *Distance from the project site entrance to an arterial road or highway*

Distance along the approved route between an arterial road/highway and the site entrance is relevant here as (amongst other things):

- minor roads are typically narrower,
- intersections are tighter,
- there are fewer traffic lights to control movements,
- cars may be parked on the sides,
- there may be children playing and
- pedestrians may be less vigilant than on higher speed roads.

Once again, the five measurement bands set out in the table may need further refinement.

5. *Number of listed items on the last 5km of the approved route(s) to the project site entrance*

There are a range of factors that the CLOCS-A team determined as likely to create increased levels of VRU risk associated with HV traffic. These include:

- school zones,
- pre-schools or childcare centres,
- pedestrian crossings,
- shopping centres and
- sporting fields.

While there are additional factors to consider, this was deemed sufficient for the purpose of variable measurement. It has been suggested that we count the number of these in the last 5 km of the approved HV route as a measure for this variable.

6. *Highest (2-way) traffic density*

The highest 2-way traffic density for the last km into the site is also a proxy for the likely level of interaction between VRU and vehicles—the more traffic – the more likely the number of interactions and, therefore risk of an incident.

Austroads and some State Governments like South Australia have extremely good data on average daily traffic densities by road. This is available on-line, or may be known from information collected in the project approval stage. If not available from an existing source, it may have to be measured directly.

7. *Number of intersections within the last 5kms*

Lastly, we have included the number of intersections in the last 5 km (travelling in and out of the site) that will require a left turn by an HV. Left turns would appear to be where a significant percentage of the problems between HV and VRUs occur, so we believe it is worth looking at this directly.

Rating Process

Once the relevant measure for each of the seven variables is determined for a particular project, a rating will be ascribed to them (risk band 1 to 5) for each variable, which will be averaged to obtain a project average risk band (Table 2).

EXAMPLE RATINGS	
Variable	**Risk Band**
Project cost	3
Population density	3
Average daily HV visits	4
Distance to arterial road	2
Schools etc on route	3
Highest Traffic Density	4
Left Turns Required	4
Average	3.3

Table 2: Example variable and average risk band ratings using the CLOCS-A Project Rating Tool

We have suggested a nominal ranking of:

- Bronze: 0 – 3 Risk Band
- Silver: 3 – 4 Risk Band
- Gold: 4+

The results may be presented graphically in a spider diagram, as for the example in Figure 1.

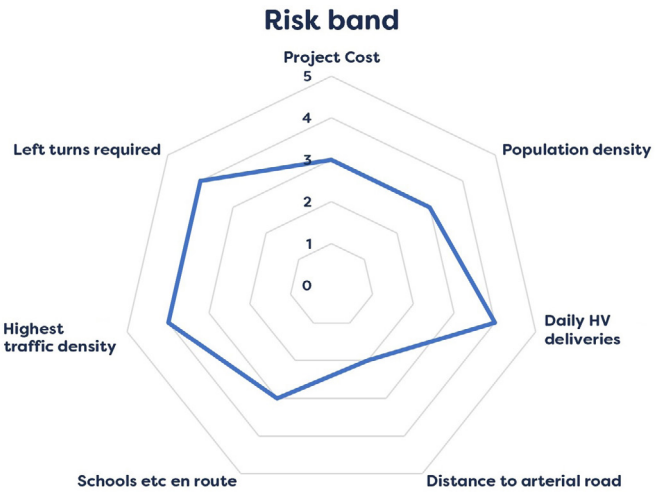


Figure 1: Example spider diagram illustrating project risk bands

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