



CAREC Road Safety Engineering Manuals

I. Road Safety Audit

Case Study 3

Central Asia Regional Economic Cooperation Program



Case Study 3

Case Study Three

A roadworks stage audit of the upgrading of two sections of an international highway.

Title

The complete technical title of the audit including its location and aims

Audit Team

The name and the role of each audit team member

Project Background

This project involves upgrading the two most westerly sections of this international highway. The first is an existing divided highway that is to be improved to Class I, four-lane divided highway. It extends between the border crossing (Km 256.700) and the outskirts of the border township at Km 252.100. The work in this section involves rehabilitating both carriageways, replacing four damaged culverts, constructing kerb and channel at three key intersections, and replacing two old bridges. The second section is between Km 252.100 and the bridge over the river at Km 240.900. The work involves widening and upgrading this 11.2km section of highway to a Class II, two-lane highway according to the Trans Asian Highway design standard.

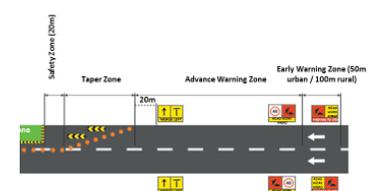
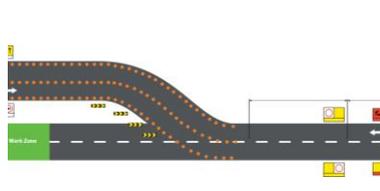
The project has a total length of 15.8 km. The highway is in undulating area for most of this length but the first three kilometres (from the bridge westwards) are in hilly terrain with sharp horizontal curves, and steep grades. The highway is used by many trucks and buses, some cars, motorcycles, pedestrians and some animal drawn vehicles.

The construction work commenced in the first week of May. A roadworks stage audit has been undertaken as a condition of the Contract. It has involved a desktop audit of the Traffic Management Plans (TMP's) submitted by the Contractor as well as an audit of the initial TMP when set up. This report details the key findings from the roadworks audit.

Audit Details

The road safety audit included a desktop audit of the Traffic Management Plans between 10-11th April. A site inspection took place on Monday 11th April (day and night) in order for the audit team to become familiar with the highway at this location. The weather during this inspection was overcast and warm. A further site inspection took place on Tuesday 10th May the first day on which the TMP's were in place and just as the construction work commenced. This site inspection took place during the afternoon and into the late evening. The weather was fine and warm/hot.

Audit Findings

KM.	SAFETY CONCERN	RISK	PHOTO	RECOMMENDATION	CLIENT RESPONSE
SAFETY CONCERNS IDENTIFIED IN THE DESKTOP AUDIT OF THE TMP'S FOR THE INTERNATIONAL HIGHWAY					
GENERAL	There are inadequate numbers of reflective warning signs shown in the TMP. The existing highway has speeds up to 80km/h in parts and it is possible that some drivers could miss seeing an advanced warning sign if only on the left side of the highway. All warning signs should be duplicated (both sides of the road) in the advance warning zone.	HIGH	 <p>Source: CAREC Manual 2</p>	<ul style="list-style-type: none"> - Duplicate all road work signs used in this project by ensuring that a matching sign is placed on the right side of the carrieway to match the sign(s) installed on the left side. 	
GENERAL	There are no speed restriction or repeater speed restriction signs shown in the TMP. Consistent application of a 40km/h speed limit through each work zone is recommended for the safety of the road users as well as the road workers.	HIGH	 <p>Source: CAREC Manual 2</p>	<ul style="list-style-type: none"> - A uniform 40km/h speed restriction is recommended through the work site. - Ensure that reflective size "A" 40km/h speed restriction signs are installed in the Advance Warning Zone and then continue to remind drivers of this limit by installing pairs of repeater 40km/h speed limit signs every 1km. 	
From Km 252.100 to Km 256.700	The TMP shows inadequate transition lengths at locations where two lanes were being reduced to one (typically in advance of sections where traffic is to be diverted onto the other carrieway). The TMP is unclear what devices are to be used to provide guidance in the transition zones. It must be ensured that highly visible, forgiving devices (such as traffic cones) are the only acceptable device to use for this.	HIGH	 <p>Source: CAREC Manual 2</p>	<ul style="list-style-type: none"> - Use the CAREC "Road Safety at Road Works" manual to determine the necessary length of the transition zones for these locations. Traffic will be travelling at about 60km/h and have to merge (2 lanes into 1 lane) and thus a zone length of some 100m will be required 	

KM.	SAFETY CONCERN	RISK	PHOTO	RECOMMENDATION	CLIENT RESPONSE
From Km 252.100 to Km 256.700	No "Two Way Traffic" warning signs are shown in the TMP to warn/inform drivers in both directions when contra-flow arrangements exist. One "Go Slow" sign is in place but it is too general and it gives no warning of the risk of head on collisions. Allowing drivers to forget they are on a two-way road sets up a high risk of head-on collisions.	HIGH		<ul style="list-style-type: none"> - Redesign the TMP to show the installation of duplicated, reflective "Two Way Traffic" warning signs at spacings not exceeding 500m through the contraflow section of the duplicated highway. - Ensure the warning signs face both directions of traffic. 	
GENERAL	No workers were sighted wearing reflective or high visibility clothing on-site during the site inspections. This is a requirement in the Contract and is an essential matter for personal safety.	MED		<ul style="list-style-type: none"> - Ensure the Contractor provides reflective high visibility clothing for all workers. - Ensure all workers wear this clothing. - Monitor the situation periodically and check that all workers wear the high visibility clothing at all times while working. 	
Km 256+200	Concrete filled barrels are being used as delineators and to hold some "Diversion" signs at this work site. These are roadside hazards and are highly dangerous if struck by a small vehicle or a motorcyclist.	MED		<ul style="list-style-type: none"> - Direct the Contractor to remove these concrete filled drums and replace them with conspicuous but forgiving traffic control devices (such as plastic traffic cones, bollards) and reflective metal signs. 	

The Audit Team has carried out this roadwork stage road safety audit according to the CAREC Road Safety Audit Manual.

SIGNED:

{INSERT NAME HERE} Team Leader on behalf of the RSA Team {DATE}