

Iqra National University
Department of Civil Engineering
ASSIGNMENT

Discipline: MS Civil Engineering

Course Title: Risk and Disaster
Management in Construction

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Question 1.

Considering the **Bus Rapid Transit (BRT) Peshawar**, what were the risks involved during construction associated with the **technical aspects** of the project? Support your answer with logical and factual arguments along with references. State how we could counter the risks associated with the technical aspects.

Project Overview

✓ The proposed project consists of the development of a bus rapid transit (BRT) corridor with a total length of 30.8 km to be constructed on a phase wise basis in Peshawar city, Pakistan. The first phase will involve construction of 25.8 km of the BRT corridor while 5 km will be constructed in the second phase. The BRT corridor will consist of a total of 31 stations and will run from Chamkani to Hayatabad.

✓ In 2013, the provincial government of Khyber Pakhtunkhwa (GoKP) requested the City Development Initiative for Asia (CDIA) to help improve Peshawar's urban transport system and provide technical and financial support to implement mass transit solutions and strengthen institutions and organizations managing the urban transport sector.

In response to this request, CDIA undertook an Urban Transport Pre-Feasibility Study (PFS). Completed in May 2014, this technical assistance developed a 20-year urban transport strategy with a 10-year action plan. The PFS also conducted a basic travel demand survey, identifying the east-west and north-south priority axis to be developed as mass-transit corridors and analyzed cost-efficiency of different mass transit modes on those corridors. Based on available data and generic estimates, the PFS finally recommended the development of Bus Rapid Transit (BRT) on corridor 2 (GT Road from Chamkani to Karkhano) as the most viable option and priority investment under the action plan.

What were the risks involved during construction?

All construction projects carry some level of risk. Being able to identify and manage risks requires skill, careful planning, and being able to make good decisions quickly. When risks become reality, they can be detrimental to the successful completion of your project. Properly managed risks can lead to higher profits, stronger relationships with clients and the ability to grow and expand your business.

✓ Here are the main risks were in BRT project:

1- Labor availability & Productivity problems

Not having enough workers available to complete the project or hit productivity goals was a huge risk when taking on new projects. Without the manpower to perform the work, the project can suffer from longer construction schedules and potential delays in delivering the project on time to the owner.

Issues with labor shortages have been delayed the construction of BRT since recovery from the last recession began. Many of the skilled workers that were let go or left the industry during the

project either retired or found other careers. In general Construction companies have been struggling to fill positions to keep up with the growing demand for their services.

2- Health and Safety Hazards

Keeping workers safe should be the top priority on every jobsite. During BRT progress site conditions are change rapidly, and unexpected hazards can crop up at any time. Major accidents can result in serious injuries or fatalities to the employees. The goal on every project should be to be accident-free and ensure every worker goes home safe to their family.

In addition to the potential harm to workers, a serious accident was cause work to be stopped or delayed and leads to a decrease in productivity due to low morale among the workers. This can put the project in huge financial risk due to all the costs associated with dealing with an accident.

The sites of BRT were different and safety materials should be available to increase the speed and save money

3- Subcontractor Issues

Dealing with a subcontractor that fails to perform on a project is a major risk factor for general contractors. A defaulting subcontractor that isn't meeting its contractual obligations can completely wreck your project schedule and destroy your profit margin. Schedule delays are also impact other subcontractors and can result in costly rework.

No subcontractor starts a job with the intention of defaulting on the work. Subcontractors must front a substantial portion of the costs on a project before they start getting paid. This can quickly lead to cash flow problems if they overextend themselves by taking on too much work or payments on other projects are being delayed.

Replacing a terminated subcontractor or supplementing their uncompleted work can kill a project and hurt contractor's reputation. It might be better off working with them to solve any issues to complete the project rather than letting them go.

4- Change Orders

Change orders are an inevitable part of construction and can be a major risk factor when not managed properly. A change order is simply an addendum or amendment to the original construction contract or the scope of work. They can be initiated by the owner, general contractor, or subcontractors. They typically require performing additional work for reasons such as omissions or errors in the original scope of work or ambiguous construction drawings.

Increased project costs, delays in hitting contract milestones, interruptions of workflow, and not completing a project on time are some of the issues caused by poorly handled change orders. Managing change orders takes preparation, understanding, and lots of communication with all parties involved with the project.

This was clearly when they change the road way, implement bridges, change in design.

- ✓ There was some other risk such as:
 - Choice of plant or cranes is found to be unsuitable during construction.
 - Construction staging (storage) areas are not large enough.
 - Contractual disputes between government and contractor or contractor and subcontractor.
 - Deep excavations needed in bad ground leading to risk of collapse, falling materials etc.
 - Designs for temporary excavation and shoring system were not correct.
 - Errors in method statements lead to delays also in the quantity surveys.
 - Road closures or partial street closures are delayed because of inadequate coordination and planning. For example not informing the community or not given sufficient notice of works.
 - Poor inaccurate or over optimistic contract time estimates.
 - Overhead power lines not identified and found obstruct construction work.
 - New or innovative technology is used in the construction which may lead to unforeseen complications and delays.
 - Multiple change requests are needed due to unexpected site conditions.

Question 2.

You are going to initiate a construction project. During the project, annual probability of occurrence of a hazardous event is (ID/6585200). If the event occurs, then the cost of the loss will be 45,275,000 US\$ (consequence). By referring to Table 2.1 & Table 2.2, identify the risk level in the risk matrix shown in Figure 2.1.

Solution:

My id 14364

Annual probability of occurrence of a hazardous event is $14364/6585200 = 0.0021$

0.0021 is in category C it is Very unlikely.

Table 2.1

The cost of the loss will be 45,275,000 US\$.

This is $\geq 10,000,000$ but $< 100,000,000$ and this is in category IV (Significant loss) table 2.2

Now from schedule 2.3 or Consequence category map said the risk is low (L)

Probability category	A	L	M	M	H	H	H
	B	L	L	M	M	H	H
	C	L	L	L	M	M	H
	D	L	L	L	L	M	M
	E	L	L	L	L	L	M
	F	L	L	L	L	L	L
		VI	V	IV	III	II	I
	Consequence category						

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