PAPER=RISK &DESASTER MANAGEMENT IN CONSTRUCTION

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Question 1. What were the risk involved in BRT during construction associated with technical aspect of the project.?

Ans.Before the start of answer we defined risk.what is risk?

- The concept of risk can be linked to uncertainties associated with events. Within the context of projects, risk is commonly associated with an uncertain event or condition that, if it occurs, has a positive or a negative effect on the objectives of a project.
- Risk originates from the Latin term risicum, which means the challenge presented by a barrier reef to a sailor.
- Oxford Dictionary defines risk as the chance of hazard, bad consequence, loss, and so on, or risk can be defined as the chance of a negative outcome.

Risk involved during BRT construction associated with technical aspect of the project.

In above definitions we define that risk is uncertain events or conditions so echnical means involving the sorts of machines, processes, and materials that are used in industry, transport, and communications.

Extended duration of construction.

In most of the projects it seen that when the duration increase for project, greater chances of hazard can occure because project exposed to evirment for risk occurance.where BRT extedent from 6 month to 2.8 years.

However, in certain circumstances, there are seasonal hazards which occur at specific times of the year and thus require special consideration if the period of construction is to be extended. These hazards include rainfall, temperature changes, flood, storm and wind. To illustrate this point, the example of BRT Peshawar may be cited.it is a project in very cojjusted area which is exposed to every type of accident such as vehicle accident, traffic jom machinery fail, gurder fall and heavy rain, due to BRT Peshawar, traffic every time jom in few areas vehical accidints occure and also due to tim extention budget increase from 10billion to 90billion because of devaluation of Pakistani ropes. Now The contractors attempted to rectify the levels, but in doing so he spent more time.

Technical complexity and innovation in design requiring new methods of construction and/or erection .

When traditional materials or methods are used in construction, the familiarity of those involved with the design or the work itself may permit an occasional ambiguity in the drawings or specifications without them being misinterpreted. It may even provide correction of a mistake. However, in a new design, material or construction method, what is needed is precise and thorough communication between the designer, manufacturer or contractor, as the case may be, and others involved in the construction process. Examples .

BRT Peshawar is a new project na d all technology new for a developing area such as KP where the designer was also a foreigner which was not familiar as required for such backward area project. Where BRT was design as for London BRT design.

Dangerous substances and items during construction and/or commissioning.

The following example from BRT highlights the effect of such substances on construction work. Shortly after commencement, the boring process was carried out in reach lll when boring machine driver toch the electricity wire ,where the whole machine become short and the driver die on time, another dangerouse event that was very common in every place of the BRT sit, that was sanatry pipe/chanel which their was no design present in BRT for it and when drange come in cross, after the event occurance design was change again and again for it.

The ticketing kiosks are also of inferior quality where corrugated steel has been used. “This is not acceptable for the effort and investment made into the Peshawar system; this will generate a very negative view

.of the system both [on a] national [level] and internationally," the lender warned.reference:

[assian development bank finds"deadly flaws in BRT peshawer].

By shahbaz rana,

Published:july 7,2019

Defective design.

After completion of major part of BRT, when buses was brought from china and start testing on road the given design was defective and not suitable to given design of bus so major portion of BRT was redesign for buses and due to this defective design some part of BRT demolish for redesign and thus the whole project late.the project manager was responsible for it because the design of road was just design for buses which it length and width was change then those which PM given design to BUS company and also the design of BRT changed several time because of defective designer.

The ADB has warned in clear words that BRT buses could collide at stations number 10, 12, 15 and 26 during operations because the lane width is less than the minimum requirement of 6.5 metres. "It is disappointing that the directional arrows are entirely missing from the implementation. As a remedy, it will not be acceptable to merely place taped arrows on the surface," the ADB correspondence read. In yet another glaring deviation, the curb interface between the vehicle and the platform does not meet the Kassel curb design mandated in the detailed design of the project. "The lack of an effective curb means that the docking process will be slow, inefficient and potentially damaging to the vehicle tyres," the lender observed. The width of the lane, against the requirement of a at least 6.5 metres, is generally below the minimum threshold at many stations, which the ADB noted "causes concern over the safety and efficiency of the operations". "There is significant concern of corridor lane widths at turns near BS10, BS12, BS15 and BS26. Over the course of operations, the current design may well result in collisions between BRT vehicles," according to the ADB correspondencerefrence.

[Asian Development Bank finds 'deadly flaws' in Peshawar BRT project] By Shahbaz Rana Published: July 7, 2019.

Dangerous substances and items during construction and/or commissioning:

It is stated that poor substances low quality material is used during construction of BRT Peshawar.according to following statement:

the ADB stopped the provincial government from making future payments to contractors because of the poor quality of work. The ADB loan will not be disbursed further until the provincial government introduces changes in the design to address “critical” deficiencies. The inferior quality construction could damage the project’s reputation at the international level, warned the lender that had approved a $335 million (Rs53 billion) loan for the project in mid-2017.reference**.[inferior quality material use inBRT peshawer].**

Asia Last Updated at July 7, 2019 19:40 IST.

Defective workmanship and material.

The warranty of incorporating or using only good workmanship and material is implied in construction contracts. Despite that warranty, one finds that as long as quality means perpetual care and high cost, this risk of defective workmanship and material will always exist. Even the smallest defect can sometimes cause a disastrous effect, as happened in the case described below. The stair step height varies “considerably”, which presents a safety problem. “The mild steel flooring material utilised for the ramps and stairs is of an unacceptable quality,” the ADB noted.

At many places, pillars or stairways “do not align properly”. At certain stations, the stairs and escalators have been built in the middle of the stations, obstructing walking space. “The footpaths are blocked by the placement of the public toilets and stairways,” according to the correspondence.reference:[ADB finds 'deadly flaws' in Peshawar BRT project] By Shahbaz Rana Published: July 7, 2019

Defective design, workmanship and quality control.

The critical deficiencies would result in improper docking of buses at the stations and could cause injuries to passengers as well. The tiles are slippery and directional arrow tiles are missing

as well The ADB noted that there were “significant design deviations from the agreed detailed design that impede or degrade system performance. The provincial authorities also used “inferior material” that both harm system functionality as well as deliver an aesthetically inferior product, according to the correspondence. The lender’s third major objection relates to the lack of adequate construction supervision and communication. The ADB seeking modifications to remove the defects might not only slow down the completion of the already much-delayed project, but also further surge its cost.reference:[ADB finds 'deadly flaws' in Peshawar BRT project] By Shahbaz Rana Published: July 7, 2019.

Mechanical and electrical breakdown Inadequate site management.

Considering his position at the BRT as an assistant engineer, Gohar went on to say, "The contractor has not yet submitted any schedule for the completion of BRT project nor progress report has been submitted to any concerned department.

"The contractor of the project has [sublet] the entire project to different nontechnical people who don't even know about construction."

He further claimed that the site inspector did not have any "drawings and specifications of the project" with him to help guide the engineers.

"The engineers were found just to visit the site without any drawing and specifications."reference[Peshawar BRT management dismisses corruption allegations as 'baseless']

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Corrosion.

The corrosion seems to be an all-pervasive phenomenon causing widespread destruction of all types of structures in all countries across the world and has come to be termed as ‘Cancer’ for concrete

The ticketing kiosks are also of inferior quality where corrugated steel has been used. “This is not acceptable for the effort and investment made into the Peshawar system; this will generate a very negative view of the system both [on a] national [level] and internationally,” the lender warned.reference: **[[AsianDevelopment Bank finds 'deadly flaws' in Peshawar BRT project**]

By Shahbaz Rana Published: July 7, 2019

SO these were the risk during construction of BRT associated with technical aspect of the project.

STEP TO COUNTER counter the risk associated with technical aspect IN BRT CONSTRUCTION.

Establish a strong foundation with an excellent BRT conceptual design.

Key project paramaters are established in the preliminary or conceptual design stage. Errors in early stages are often propagated through later stages. A flawed foundation will prevent a project from being successful.

Be aware that half-measures in the form of 'BRT-lite' may be riskier than 'full BRT'

Perhaps counter-intuitively, a lower capacity or BRT-lite approach to BRT may be significantly riskier than a bolder, 'full-BRT' approach. Where the political support or financing is not available, rather than compromising on key features of the BRT system such as median alignment, segregated lanes, pre-board fare collection and high quality stations, it may be preferable not to do BRT at all, and to focus on more modest bus system upgrades instead. It is not possible to generalise, though, because as the cases of Kuala Lumpur, Bangkok, Guiyang and others show, high cost and high quality station construction and even BRT-only elevated roadways do not by themselves guarantee project success, and lower cost systems such as the median bus lanes in Seoul and the BRT system in Istanbul can deliver significant benefits.

multi-year, Use contracts of long duration, preferably for the BRT planning team

There are always multi-month and often longer periods in BRT projects when things are not moving. Delays can take place due to political factors, usually when high level political support is insufficient to overcome the many barriers that emerge during a BRT project. An example is the delays in 2006 and 2007 documented in our Guangzhou BRT overview. Delays also always take place due to procedural factors, such as bidding and procurement, EIA, review and approval steps, and so on. These delays can take several months even where political support is strong. For the BRT planning and design team, these delays are an excellent opportunity to continue with the BRT planning, but can only be taken advantage of if the planning and design team is under contract. Another important reason to have longer term contracts in place is to ensure continuity among the technical team in a situation where counterpart government personnel will often change, noting that a BRT project takes at least three years to IMPLEMENT.

Don't bundle the engineering design and BRT planning into one contract

In most settings it will be preferable for a national rather than international engineering design firm to carry out the engineering design. In all situations it will be essential to have an international expert team providing ongoing input and technical supervision throughout the engineering design and construction stages, noting that much of the BRT work will proceed in parallel. (For example, the final operational design should usually be completed during the period when the BRT is under construction, along with the bulk of the regulatory and institutional inputs.) The best combination is for a strong national engineering design firm under the main engineering design contract, with a separate, smaller contract for BRT planning and technical supervision by a smaller team of international experts. This approach will maximize the chances of getting a strong team in the two distinct areas of engineering design and BRT planning/design.

Allow time for refinement of the BRT design

There are many variables and approaches that can be taken to corridors, services, stations, intersections, vehicles, modal integration and other BRT system features, and the BRT design and planning team is never going to arrive at the best solution upon the first attempt. In addition, feedback from stakeholders will often require the design and planning team to revise and reconsider key aspects of the project. Risk can be greatly reduced by providing sufficient time and budget for the BRT planning team to reconsider and revise aspects of the project as needed. Thus while a BRT concept design can in some cases be completed in as little as four to six months, a time frame of six to eight months is preferable if the time is available. Note that

time spent on a more detailed concept and preliminary design is not wasted, because this work will save time at later stages.

Recognize the importance of the first BRT corridor

While the replication of BRT corridors is unpredictable (some very successful BRT corridors have no progeny, while some mediocre corridors are rapidly expanded citywide), in virtually all cases the DNA of the first 'parent' corridor finds expression in later 'offspring' corridors. The risks discussed in this article, often flowing from a poorly conceived or vague preliminary BRT plan, unfortunately do not stop with the first corridor and on the contrary are often replicated in later corridors.

Select the right BRT planning team

The selection of consultants trumps all of the above considerations. The wrong team will in the best case and most common scenario result in wasted time and money, but at least nothing will be actually implemented. This is very common. Many cities around the region have BRT plans and designs that were vague, unviable, poorly conceived, and fortunately never implemented. Some cities have multiple such studies. People who are deeply involved in the project, especially local officials and stakeholders who have been promoting BRT, are understandably disappointed when a project is not implemented, but having no project at all is ultimately far preferable to having a failed BRT project.

Question 2.

Given data ;annual probability of occurrence of HAZARDIOUS event is

=id/6585200

Cost of loss=45275000uss.

Required; identify the risk level in risk matrix

Salution; ; find out the annual probability rang/value from the statement given in question.

Annual probability range=15056/6585200=0.002286.

<u>Step#2;</u> now we have to select likelywood catogry for risk matrix

From table 2.1

Our annuL PROBABILITY range 0.002286>0.001 but less then 0.01

Therefore our risk occure have catogry "c" (very unlikely)

Step#3;

Now to select the catogry in table 2.2 for consequences

Catogry for a risk matrix in monetary amount(uss)

Now compare the cost with table 2.2.

Cost of loss =45275000>10,000,000

But 45275000<100,000,000.

So consequence catogery of our risk are ,4(significant loss).

Step#4;

To find out the risk level in risk mAtrix frome figure 2.1 are

	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
		6	5	4	3	2	1

IN FIGURE 2.1 THE HORIZENTAL SHOW CONSEQUENCE CATOGERY

WHILE VERTICAL SHOW PRBIBILITY CATEGORY AND H,M,L FOR HIGH, LOW AND MEDIUM SO OURE PROBABILITY CATEGORY IS "C" AND CONSEQUENCE CATEGORY IS"4" BY JOINING THEM WE WILL GIVE THAT

THE RISK IS LOW CATEGORY.

Step #02

Now we have To select likelywood catagr for Risk matrix frome Table.

Table 2.1

Our Annual probibility Rang i.e 0.002286 > 0.001 but less Then 0.01

So Our Risk occure have catasry 'C' (very unlikely).

Step #03

Now To select The catosry in Table 2.2 for Consequences catogries for a Risk matrix in Monetory amount (usd)

Step #02

Now we have To select likelywood catagr for Risk matrix frome Table.

Table 2.1

Our Annual probibility Rang i.e 0.002286 > 0.001 but less Then 0.01

So Our Risk occure have catasry 'C' (very unlikely).

Step #03

Now To select The catosry in Table 2.2 for Consequences catogries for a Risk matrix in Monetory amount (usd)

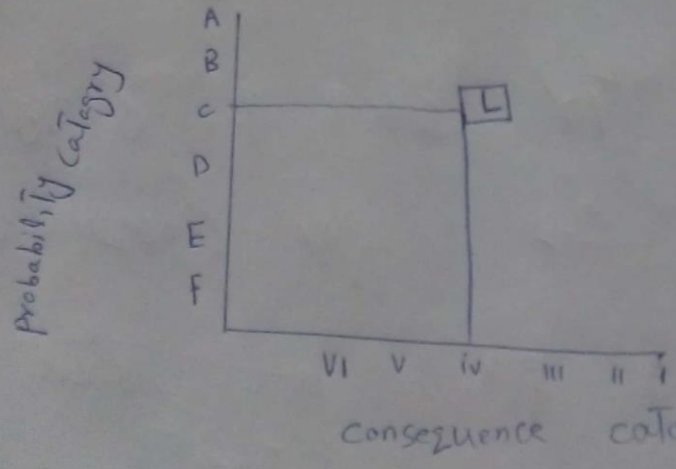
Now compare The cost with Table 2.2

Cost of loss = 4527500 > 10,000,000

but 4527500 < 100,000,000

So Consequences catagries of our risk are (IV), Significant loss.

Step #(4) To find out The Risk level in Risk matrics fig 2.1 are



The Risk is Low catogy.