Economic analysis for the construction of Railway Over Bridge – (A Case Study of Dakoha Rail Crossing, Jalandhar)

A PROJECT REPORT

in partial fulfilment for the award of the degree of

MASTER OF TECHNOLOGY

IN

CIVIL ENGINEERING

Submitted by

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SUPERVISOR

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School of civil Engineering

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TOPIC APPROVAL PERFORMA

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PROPOSED TOPIC : Economic Evaluation of Rail Over Bridge at Dakwa Rail Level Crossing

Qualitative Assessment of Proposed Topic by PAC		
Sr.No.	**Parameter**	**Rating (out of 10)**
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2	Project Feasibility: Project can be timely carried out in-house with low-cost and available resources in the University by the students.	7.00
3	Project Academic Inputs: Project topic is relevant and makes extensive use of academic inputs in UG program and serves as a culminating effort for core study area of the degree program.	7.00
4	Project Supervision: Project supervisor's is technically competent to guide students, resolve any issues, and impart necessary skills.	6.00
5	Social Applicability: Project work intends to solve a practical problem.	6.00
6	Future Scope: Project has potential to become basis of future research work, publication or patent.	7.00

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Overall Remarks: Approved (with minor changes)

PAC CHAIRPERSON Name: 20207::Dr. V. Rajesh Kumar **Approval Date:** 11 Mar 2017

CERTIFICATE

This is to certify that **Adarsh Pandey** under Reg. no. 11304908 has prepared the Pre-Dissertation Report Titled "**Economic analysis for the construction of Railway Over Bridge – (A Case Study of Dakoha Rail Crossing, Jalandhar)**" under any direction. This is a bonafide work of the above competitor and has been submitted to me in fractional satisfaction of the prerequisite for the honour of MASTER OF TECHONOLOGY in CIVIL ENGINEERING.

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ABSTRACT

Facility investments decision represent the major commitments of the corporate resources and has a serious consequence at the profitability and economic stability of an employer. In public region, the decisions also affect the viability of facility funding programs and the credibility of the organisation in rate of programs.

It is important to evaluate the facilities rationally with the regard to both Monetary feasibility of person initiatives and relative net advantages to opportunity and at the same time specific projects.

Modern day production prefers prestressed girders over traditional RCC for lengthy span bridge construction. This paper offers with the layout of railway over bridge at DAKOHA CROSSING, JALANDHAR, PUNJAB.

The essential goal right here is to validate and advocate info of design of durable and constructible info to acquire the structural continuity between widespread precast, prestressed concrete girders for this proposed bridge. This paper will deal with the layout of pier.

In this paper, a case takes a look at of Dakoha Rail Crossing considers for determining the financial evaluation a goal to look at the locating whether rail bridge is monetary viable or no longer by different strategies of financial evaluation.

People of Dakoha village face acute visitor's problem on the railway crossing avenue. The most important purpose to this problem is the passage of more numbers of trains, which leads to closure of the railway gate for longer time. People have to wait several mins to pass thru the crossing.

To solve the traffic trouble, making plans and building a Flyover Bridge over railway crossing should be a possible choice.

For planning of bridge, the web page visit and site visitors survey at railway crossing needed to be completed. Also for planning the fly over bridge for railway crossing, primary guidelines and requirements in bridge layout as consistent with Indian requirements code must be considered.

Keeping the above points in view, a survey should be performed throughout this take a look at to explore the possibility of planning and building fly-over bridge at Dakoha railway crossing.

ACKNOWLEDGEMENT

I wish to express our sincere gratitude to our esteemed guide **Asst. Prof. Mr. AKASH VERMA** for his guidance during the course of this project. We also thank him for the timely advices and suggestions throughout the course work.

I am highly obliged to **Mrs. Geeta Mehta,** Research Coordinator of Civil Engineering for her continuous encouragement and providing all the facilities required for the completion of this project.

I would also like to thank our teaching staff, non-teaching staff and all others involved in this project.

Signature of student

ADARSH PANDEY

DECLERATION

I **ADARSH PANDEY** (11304908), hereby declare that this submission is my own work and that to the best of my insight and conviction, its content no material beforehand distributed or composed by other individual or office. No material which has been acknowledged for reward of some other degree or certificate of the college or other organisation of higher learning with the exception of where due affinitions have been made in the content. It was arranged and displayed under the direction and supervision of **Mr. Akash verma** (Assistant Professor)

Date: -

Place: -

ADARSH PANDEY

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CHAPTER: - 1 INTRODUCTION

In spite the development achieved in software program development, designing complex system at same time as respecting its safety, requirements, remain very difficult. During the time of vital software program development technique, protection and the safety necessities have to trace from the casual specification to code generation. So, we want to get trace them inside the distinct fashions: casual, semi-formal/formal ones. We present new methods here to convert a semi-formal modelling to formal modelling specification which allows them to trace. This approach might be implemented to railways case study, in which safety necessities are very strict.

Transportation may be a motion of fellows and things is as vintage as civilization Roads or highways are one form of the approach of transporting men and materials from one space to the other. Transportation may be a crucial underpinning upon that the business and technological advanced of the state relies.

Transportation is that the existence-line of a rustic, as a result of all walk of lifestyles while not transportation development or development of a rustic is not possible. Transportation performs a very essential operate in money and also the social development of country. mounted centres of physical part of machine that's constant in house and represent the community of hyperlinks (e.g., road segments, railway song, and pipes) and nodes (e.g., intersections, interchanges, transit terminals, harbours, and airport) of the transportation device.

Vehicular site visitors on road has grown at unmanageable rate through years making journey chaotic, tiring, and the time ingesting and dangerous. It is within nature of incidence that once two roads intersect each other, junctions seem and that is due to fact both the intersecting roads are inside the identical horizontal aircraft. It is at those junctions wherein visitors from one of a kind directions converge and reason traffic congestion and additionally accidents. The motive for this visitor’s congestion is overcrowding at junctions due to the increasing density of visitors from all directions. To avoid junctions and subsequent congestion, flyover or street over bridge were designed which have partly solved the trouble of congestion and injuries. Traffic isn't simplest trouble of big mega towns however additionally of small growing cities. Big mega cities are properly planned and its delivery machine is also well - equipped whilst developing cities are not so well planned. That’s the cause that if planning of small town is taken in to consideration it will create massive problem.

For example, if a growing city have residential vicinity divided in exclusive small element and if a few part of town is generating employment, imparting enterprise and educational centres for people of about half population of city than it can create site visitors problem due ride era from extraordinary area of city in the direction of that area. Jalandhar being a small metropolis faces the equal type scenario defined above. People of Dakoha village face traffic draw back at the railway crossing road. the primary cause for this hassle is that the passage of extra no. of trains that cause closure of gates for extended amount of your time. people got to look several minutes on railway crossing.

In order to remedy this visitors trouble, making plans and constructing a ROB may be viable alternative.

Therefore, a feasibility observation for planning a ROB at railway crossing changed into carried out preserving in view of the subsequent vast targets: whether a fly-over can be built that is fee-powerful, minimum demolition and secure and rapid movement of vehicle in order that of visitor's trouble at railway crossing of Dakoha street may be solved.

Fig 1.1: - View of DAKOHA RAILWAY CROSSING.

Fig 1.2: - View of Dakoha Railway Crossing.

Dakoha is a village within the Jalandhar Cantonment of the country of Punjab, northwest India. This railway line is of very extremely good importance as it connects maximum of passenger and items educate of various part of India to Jalandhar or Punjab together with the foremost and a minor ancient , business places at rail line.

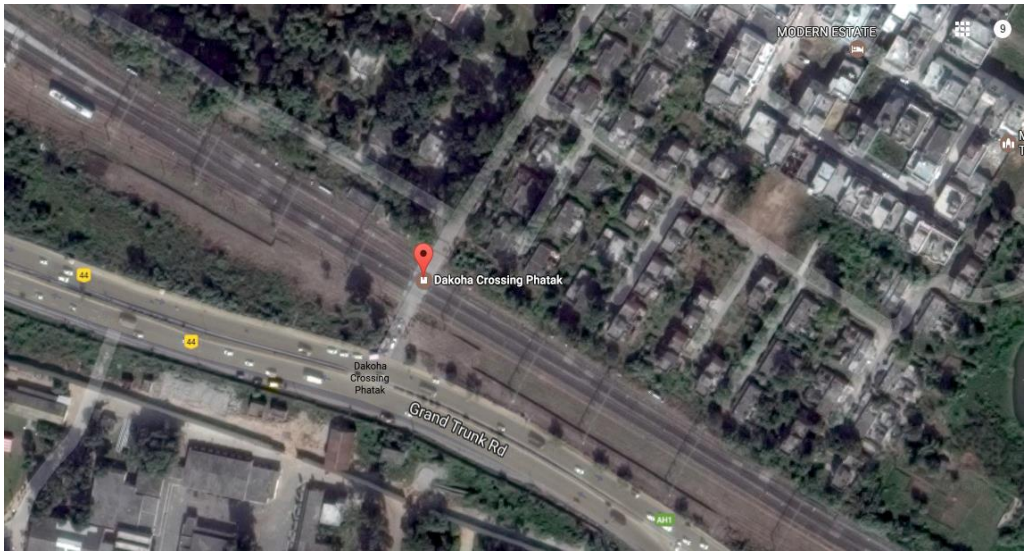


Fig 2: - Over view of area on Google Earth map.

CHAPTER: - 2 Problem Background

The study might be executed from point of view - company (Gram panchayet or personal operator), Regulate and also the person the final public delivery gadget). The studies represented because the volume that the land folks or merchandise to realize sports or destination by suggests that of shipping model. to get the start of the journey generate to connect New Hampshire forty four infrastructure primarily based centers measures like journey time, congestion and operative speed on the road network, plays associate impairment role in shipping polices related to accessibility. Utility and activity primarily based entirely facilities measures square measure accustomed examine the blessings character land use delivery gismo and land use pattern. Its uses in money sports. To propose exceptional alternatives likewise tunnel, over bridge or diversion for the to decrease the traffic or different coincident parameters at Dakoha railway crossing.

Fig 3: - Traffic Jam caused due on crossing.

a. Accidents in Indian Railways- Review of last 6 years: -

In the 6-12 months' period among year 2009-10 and year 2014-15, there square measure a whole of 803 injuries in Indian Railways that killed 620 groups of people and disjointed 1855 people. And forty seventh of these injuries were thanks to the mischance of the trains. whenever there's Associate in Nursing educate coincidence, the matter of protection in Indian Railways involves the fore. The recent teach accident in UP has all over again precipitated a dialogue on protection.

Between year 2009-10 and year 2014-15, there square measure a whole of 803 injuries in Indian Railways.

- **Number & Type of Accidents**

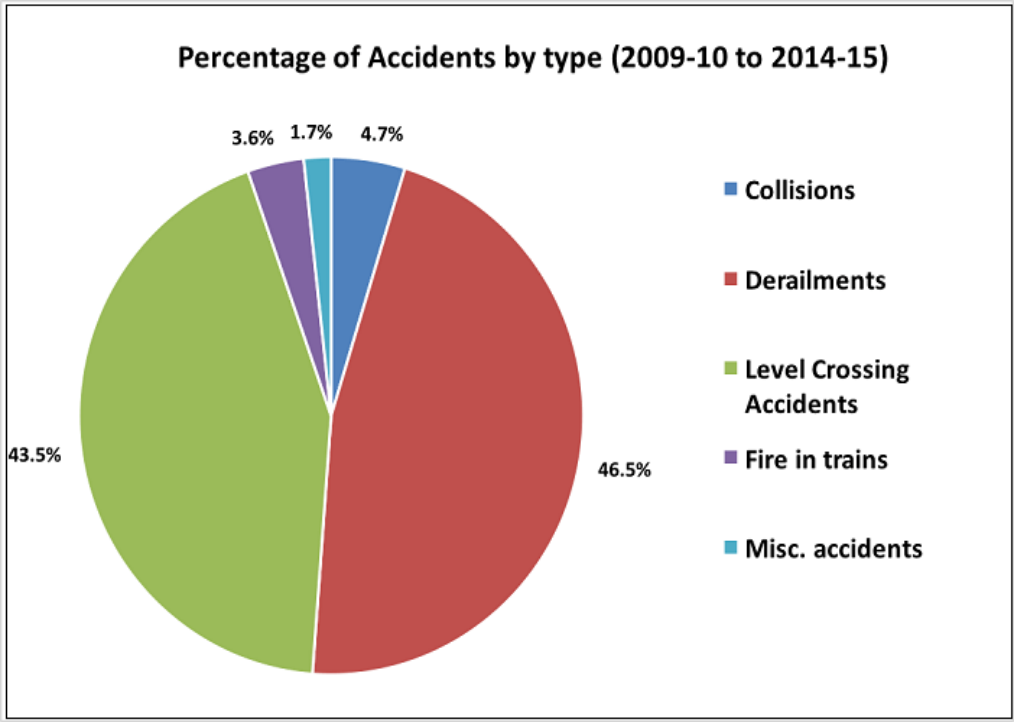


Fig 4: - Percentage of accident by type.

By a long way, the best range of accident are because of the derailment & accident at degree crossings. 9/10 railway accidents in the course of 2009-10 and 2014-15 were because of derailments and injuries at the level crossings. The different type of injuries consists of collisions, and so on. But their wide variety is particularly a great deal decrease.

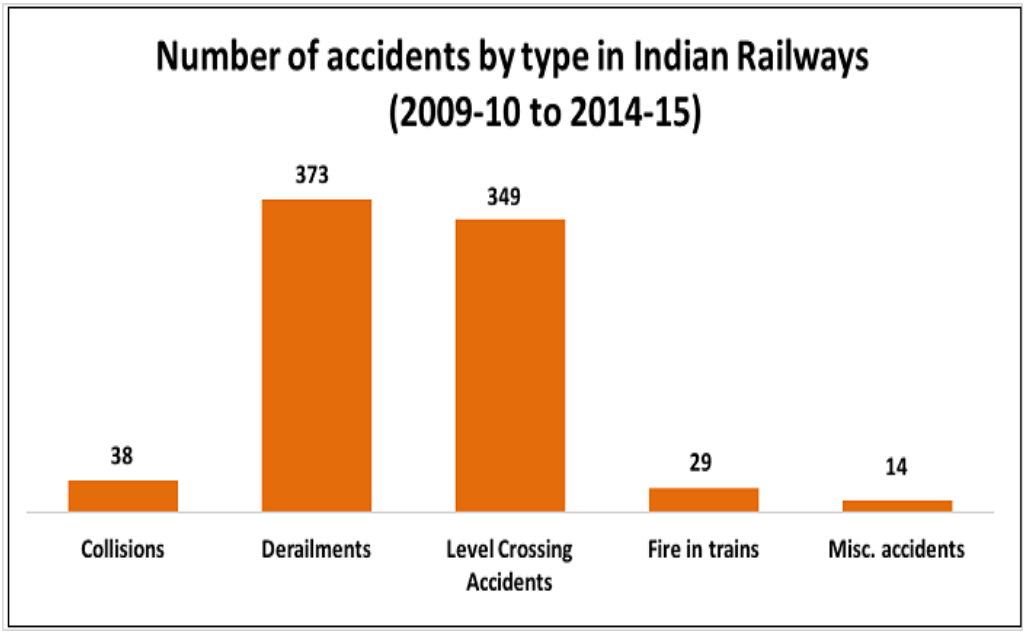


Fig 5: -Number of accidents by type in Indian railway.

- **Cause of Accidents**

There were diverse reasons for train injuries starting from Human Failure to breakdown to Sabotage etc. within the 6-yr amount among 2009-10 and 2014-15, human failure has caused larger than eighty six of the total accidents. during this forty first accidents had been precipitated owing to the failure of the railway team of employees and rest area unit because of failure of others. breakdown brought on two.2% of the injuries.

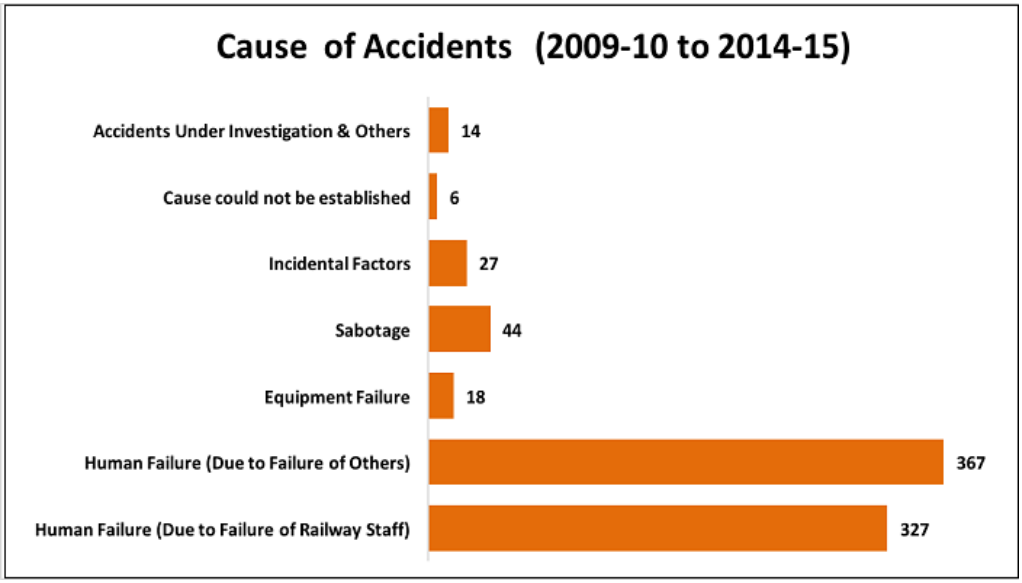


Fig 6: - Cause of accidents.

CHAPTER: - 3 Literature Review

RONAK N. MODI, MS. POOJA PODAR

In this analysis, the assumption was that when learning the all the statistics and taking regarding all of the specified survey of the important to my cross-check section. To resolve the traffic downside at the Chhapi Railway Crossing Under-Bridge and Flyover area unit the now not a lot of helpful to the folks that suggest. however technical purpose of read and Economic side through the fee of the event under-bridge and flyover thus high and therefore the construction time is a lot of so as per have cross-check space scenario that's not possible to the near station house and residential section etc. So, take each alternative various is Diversion of the route that's already to be had however the shortage of the folks attention and not correct maintain direction now not used as needed. If, folks used that route thus there's a lot of clear up Traffic issues at the Chhapi Railway Crossing. And when Analysis of the data distinction among to achieve the SH-41 not further. encompassing space of this 2 villages area unit used this route they've decrease the road person fee and automobile running fee. when analysis of the data time distinction 8min to 10min and therefore the kilometer distinction 3km-4km. For the providing humans focus and supply right diversion signal to use this rote learning. So, if folks utilize the diversion of the trail this can be the useful to the humans like clever Infrastructure Development and Economic issue of read is that the most helpful.

Prof. Ancy Joseph, Elsa Babu, Karthika Babu, Lakshmi G, Meera R Krishna

The design of superstructure of ROB proposed at Kumaranellur, Kerala, India became finished and all drawings (the usage of AutoCAD 2010) and specifications have been organized. The design of superstructure turned into finished manually the use of relevant codes. In this paper, the different masses and forces which are probably to act on the shape are considered. The evaluation and subsequent design has shown that the shape is able to managing the outside load and forces competently. On crowning glory, this task will reduce the site visitor’s congestion of Kumaranellur-Kudamaloor road.

Ankit M Patel

NPV values is 27.46 crore, this is positive. Hence, project is even

- B/C quantitative relation is 2.80 that is bigger than one. Hence, task is even
- IRR is 42% that should be more than 15% . Hence, task is even
- Rate of return is 36.31% that is quite prevailing marketplace fee. Hence, project is even.
- Saving in period of time price is Rs. 4, 99, 76,117.6/ yr.
- Saving in gas saving is Rs. 83, 03,253.6 / yr.
- Increase inside the velocity of the various vehicles.

Prashantha.B. Y, Harisha.S

The complete paintings passed off in this paper heading towards seeking to keep away from accidents and decrease the number of fatalities inside the discipline of railway transportation machine. Thus, basically paper concept thru a stone to avoid two obstacles, the ones of firstly, changing manned kind by using adopting unmanned kind i.e. Completely automated microcontroller primarily based system, this enables in preventing the dying brought on close to level crossing, additionally decline the time for which the people wait close to the level crossing and completely save you errors that has achieved by using gate keeper. Secondly, to help human beings those who are bodily unwell and aged because they are not having sufficient stamina to climb and Cross the song with the resource of flyover, to understand that use of automated plat shape bridge is foremost and did the identical on this painting. This is the step toward help them and also powerful technique for people who don't use flyover and go the tune along music itself.

Kuldip.B. Patel, Anand D. Sapariya and Pradeep P. Lodha

This study has led to the following conclusions: -

- To solve the traffic problems at vijalpore railway crossing, construction of a fly -over bridge was thought appropriate.
- A survey of the site was conducted for making a design of the proposed fly-over. After this, the design of bridge was made using the data collected and obtained from various other sources.
- The proposed design is cost effective, to cause minimum demolition and safe for fast movement of vehicles.

Tessa H. Volley

Conclusions based on development of 1999 and 2000 PPC deck plank bridges are follows:

1. Deck planks with cracks have been issue to preliminary rejection if cracks had been visible from arm's duration and more than three' (75 mm) alongside plank. This requirement led to a big quantity of rejected PPC deck planks. Once the load test primarily based on American Concrete Institute 318, Chapter 20 modified into observed, several of the rejected PPC deck planks have been every day and used in the initiatives.

2. A few adjustments within the bridge deck reinforcement have been essential because of the PPC deck planks. Some of the modifications important at Jersey-Greene county bridge consists of reducing the splice bars 3' to 4 inch shorter, and reducing the vertical bars at the parapet wall. The one modification critical on Logan County bridges emerge as the trade from L-fashioned stirrup design for girders to loop stirrup layout.

3. The polystyrene strips used as office work underneath the rims of PPC deck planks regularly did now not preserve up nicely in the route of the concrete pours. Several blow-outs took place at some stage in the Stage 1 pour on Jersey-Greene county bridge and sooner or later of the Stage 1 and multiple pours on the Logan county bridges. The only grade of polystyrene that seemed sturdy sufficient to maintain up in opposition to the concrete modified into the ASTM C 578 Type IV extruded polystyrene.

4. The resident engineers and contractors claimed that PPC deck planks saved little in time & value in evaluation to traditional stable-in-region bridge decks.

5. Four cast-in-area bridges have been surveyed for evaluation. All 1999 and 2000 PPC deck plank bridge consist of more transverse cracks in keeping with foot than comparable solid-in-region bridges which have been surveyed.

6.One of the stable-in-region bridges includes longitudinal cracks, at identical time as all of the three PPC deck plank bridges include longitudinal cracks. However, three PPC deck plank bridge include much less longitudinal cracks steady with foot than the handiest solid-in-location bridge that has longitudinal cracks.

Tony Matutis

Working with the Archer Western and HNTB group in the direction of a not unusual goal, Canam-Bridges became capable of meet the diverse necessities of this undertaking and in doing so, created a higher patron experience by using contributing added-cost in its capacity as a professional bridge fabricator. The knowhow received inside the scope of the Memorial Bridge undertaking has due to fact that been implemented to other layout-construct contracts in Canam-Bridges' task portfolio.

CHAPTER: - 4 Proposed Research Objective

- To become aware of journey time, delays, congestion, outstanding alternatives.
- To control web page traffic congestion and their manipulate.
- To Check the extent of accessibility from certainly one of a type elements of localities or neighbourhoods for all the sections of society to acquire their spot (artwork area, education and buying).
- To find out the what are the mitigate diploma for fulfillment and failure of the one of a kind transport infrastructure facilities in town?
- To find out distance human beings will to journey based at the modes used to access.
- To endorse correct facilities in transportation infrastructure (long time/ financially sustainable/ meet needs of locals) in town.

- **The primary goal of BRIDGE undertaking is to facilitate rescue and healing operations through:**

- Methods and equipment that support run-time intra- and inter-corporation collaboration;
- Access to a vast range of incident-applicable statistics;
- Simple and easy exploration of splendid information;
- Careful attention of organizational workflows and communication processes.

- **Technical Aims**

BRIDGE intends to expand a platform so one can:

- Integrate current emergency reaction structures and structures;
- Integrate laboratory tools into normal running practice;
- Represent and model's organizational workflows and verbal exchange techniques;
- Comprise a middleware allowing records, gadget and network interoperability;
- Advance human-computer interaction techniques.

- **Bridge monitoring**

There are several strategies used to monitor the pressure on huge systems like bridges. The maximum common technique is the usage of an accelerometer, that's included into the bridge whilst it's far being constructed. This generation is used as long-term surveillance of bridges.

Another options for structural-integrity tracking is "non-touch tracking", which use Doppler effect. A laser beam from Laser Doppler Vibrometer is directed at point of interest, and vibration amplitude and frequency get extracted from Doppler shift of laser beam frequency because of the movement of the floor.

The benefit of this method is that the setup time for the gadget is quicker and, in contrast to an accelerometer, this makes measurements feasible on more than one structures in as brief a time as feasible. Additionally, this method measures a particular factor on a bridge that is probably difficult to get entry to.

- **Classification of Level Crossings**

(1) The type of level crossings should be settled in session with the Road authorities concerned retaining in view the magnificence of the street, visibility conditions, the volume of the street site visitors and the wide variety of trains passing over the extent crossing.

(2) Level crossings at colliery, manufacturing unit and different comparable sidings where railway visitors are mild may additionally but be handled according to neighbourhood situations, concern to the approval of the Commissioner of Railway Safety involved being received in each case to measures adopted for the secure operating of trains at the crossing.

CHAPTER: - 5 Proposed Research Methodology

The methodology used here should be in proper steps as shown below in the following figure to get the best and accurate result: -

1. Existing site condition: -

This is the very first step done in any construction work. In this process, the site verification is done to ensure that the site fulfils the minimum standards required for the over bridge construction.

2. Existing Problem Identification: -

Now the second step is to identify the existing problems of the site. And we also identify the causes of problems. Data collection is also a part of this in which we collect all the data required.

3. Solution: -

In this step we analyse the data which has been collected earlier and examine that to give proper solution for the construction.

- Here the solutions can be: -

a) Flyovers.

b) Underpass/Subways.

c) Route Diversions.

4. Efficiency: -

Here we check the performance of the solutions given, and try to fix the errors. This is basically a trail mode of the given solutions. In this we also calculate the Benefit cost ratio (B/c) which should be greater than 1. Then only construction can take place.

5. Implementation: -

After everything goes as per the plan we apply the solutions on the real location.

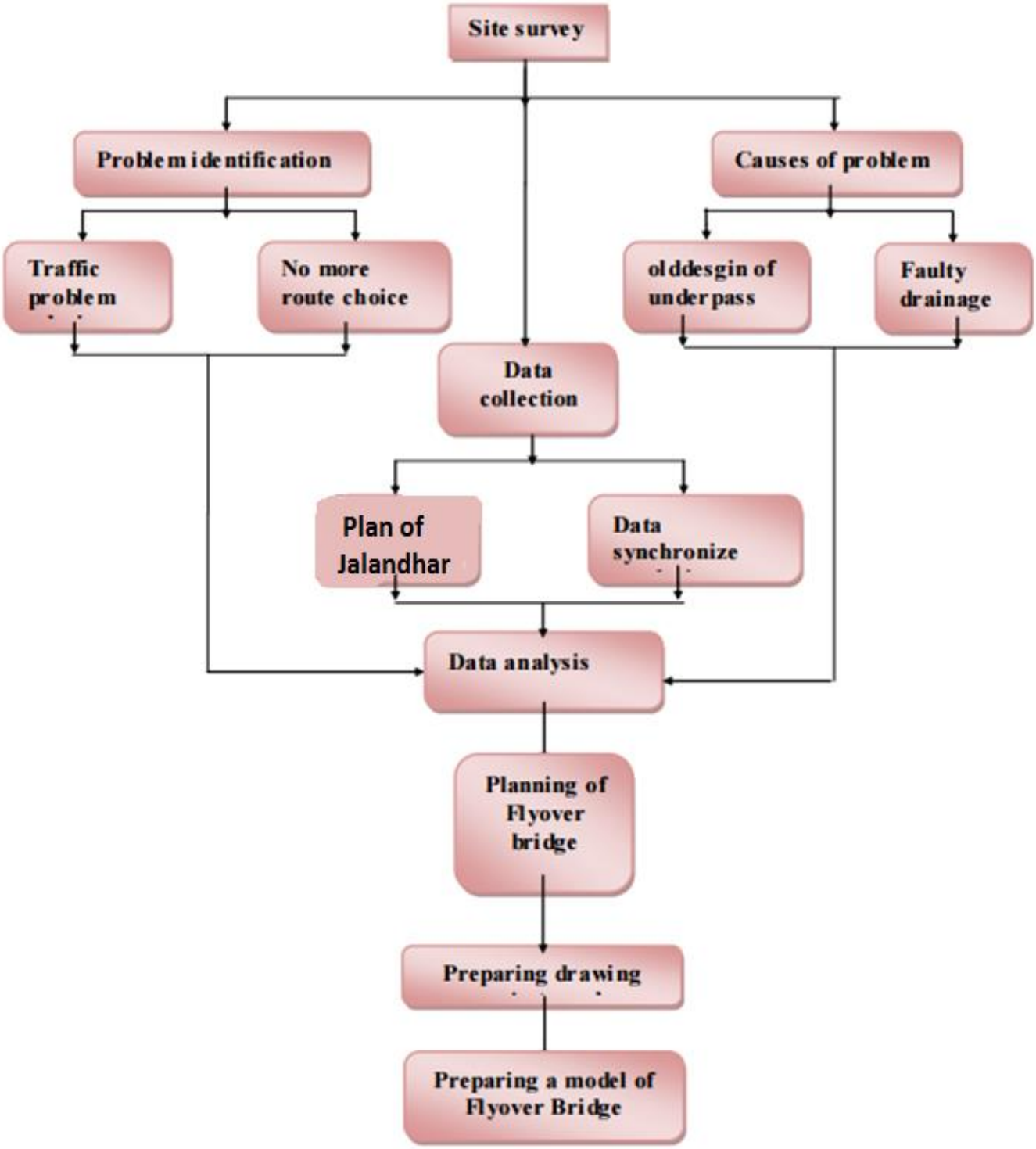


Fig 7: - The methodology used here to get the best and accurate result.

➢ Data collection

Fig 8: -TIME TABLE OF Trains AT Dakoha Railway crossing

- **UP TRAINS – WEF (WITH EFFECT FROM) 01/09/2014**

Train No.	Train Name	Arrival	Departure
14609	Haridwar	00:05	00:10
14645	Shalimar	01:00	01:05
14603	Jan Shdharan	01:00	01:11
12425	RAJDHANI	01:00	01:50
12445	S.KRANTI	02:30	02:35
13151	SEALDAH	02:55	03:00
12265	DURONTO	03:40	03:45
14033	JAMMU MAIL	03:06	03:08
12903	G.TEMPLE	03:59	04:01
12413	POOJA	04:15	04:20
11077	JHELAM	04:45	04:50
18103	JALIAWALA B.	04:45	04:58
14001	ATTARI	04:45	04:58
14631	DEHRADUN	05:21	05:23
14035	DHOLADHAR	06:00	06:05
12207	GARIB RATH	05:35	05:40
18237	CHATTIS GARH	05:45	05:47
18101	TATA MOORI	06:16	06:18
12355	ARCHANA	06:28	06:33
13005	HOWRAH M.	06:47	06:49
54601	HISSAR. ASR	07:12	07:13
12237	BSB - JAPSF FAST	07:25	07:28
12459	KANPUR-JAT	07:40	07:45
12491	SHOPUR	07:40	07:45
16031	ANDMAN	08:05	08:10
16687	NAVYUG	08:05	08:10
11449	JABBALPUR	08:05	08:10
16317	HIMSAGAR	08:05	08:10
13049	HOWRAH	08:15	08:17
12331	HIMGIRI	08:30	08:35
12587	AMAR NATH	08:30	08:35
15097	AMAR NATH	08:30	08:35
15651	LOHIT	08:30	08:35

15653	LOHIT	08:30	08:35
19613	JAIPUR	08:30	08:35
64551	UMB-ASR	09:25	09:26
15707	AMARPALI	09:25	10:14
12471	SWARAJ	10:50	10:55
12473	SARVODHAYA	10:50	10:55
12475	HAPPA	10:50	10:55
12477	JAM NAGAR	10:50	10:55
12919	MALWA	12:00	12:05
12029	SHATABDI	12:00	12:16
12031	SHATABDI	12:00	12:16
12497	SHAN-E-PUNJAB	12:00	12:53
12196	SJP – ASR	12:00	12:29
14037	PATHANKOT	12:00	13:51
11057	DADAR	14:43	14:45
12549	DURG – JAT	16:10	16:15
18215	TS – JAT	20:45	20:50
12317	SEALDAH	15:00	15:30
12357	DURONTO	15:00	15:30
15209	JANSEWA	15:00	15:09
12925	PASCHIM	17:37	17:39
12483	KCVL-ASR	17:40	17:57
12379	S.KRANTI	17:40	17:57
74645	UMB-ASR	18:32	18:33
12715	SUCH KHAND	18:30	18:43
12203	GARIB RATH	19:00	19:13
19325	INDORE-ASR	19:00	19:13
15933	DIBRUGARH	18:00	18:08
12459	ASR-S.FAST	20:00	20:13
12053	JAN SHATABDI	20:00	20:25
14673	SHAHEED	20:01	20:03
14649	SARYU JAMUNA	20:01	20:03
18507	HIRAKUND	21:30	21:37
12013	SHATABDI	21:20	21:26
74647	LDH	21:57	21:58
14681	NDLS-JUC	23:20	23:29

15211	JAN NAYAK	23:51	23:53
12421	NAD-ASR	20:15	20:25
12241	CDG-ASR	20:20	20:35
74911	HSX JRC DMU	05:03	05:08
74923	HSX ASR DMU	06:01	06:10
74925	HSX FZRDEMU	07:30	07:32
74913	HSX JRC DMU	08:53	08:55
54637	HSX JUC PASSENGER	13:01	13:03
74915	HSX JUC DEMU	15:45	15:47
74917	HSX JRC DMU	18:21	18:22
54071	HSX JRC PASSENGER	21:01	21:03
74919	HSX JRC DMU	21:43	21:48
54625	JJJ JUC PASSENGER	07:52	07:56
74951	JJJ JUC DMU	13:16	13:18
74953	JJJ JUC DMU	19:29	19:30

Table 2: - UP TRAINS – WEF (WITH EFFECT FROM) 01/09/2014

- **DOWN TRAINS – WEF (WITH EFFECT FROM) 01/09/2014**

Train No.	Train Name	Arrival	Departure
12446	S.KARANTI	00:33	00:38
14036	DHOLADHAR	01:25	01:30
13152	SEALDAH	01:05	00:15
18508	ASR-VXP	01:00	01:06
14646	SHALIMAR	01:00	01:15
11078	JHELAM	01:45	01:50
15652	LOHIT	02:15	02:20
12588	JAT-GKP	02:15	02:20
12332	HIMGIRI	02:15	02:20
15654	JAT-GHY	02:15	02:20
15098	JAT-BARAUNI	02:15	02:20
12208	GARIBRATH	02:55	03:00
16318	HIMSAGAR	03:40	03:45
11450	JABBALPUR	03:40	03:45

16688	NAVYUG	03:40	03:45
16032	NANDMAN	03:40	03:45
14682	NDLS-JUC	04:00	04:18
74646	ASR-UMB	05:20	05:21
12204	GARIBRATH	05:35	05:41
19326	ASR-INDORE	05:35	05:41
12014	SHATABDI	06:00	06:12
12716	SUCH KHAND	06:45	06:51
12316	AKAL TAKHAT	07:00	07:16
12484	ASR-KCVL	07:00	07:16
12357	KOLKATA-ASR	07:00	07:16
12460	ASR-NDLS	07:35	07:37
15211	JANSEINA	07:50	07:54
12054	SHATABDI	08:00	08:11
15708	AMARPALI	08:48	09:30
12926	PASCHIM	09:28	10:15
11058	DADAR	10:13	10:51
14038	PLI-PTR	10:45	12:16
12380	S.KRANTI	12:10	12:43
12920	MALWA	12:38	12:25
14650	S.YAMUNA	13:23	13:25
14674	SHAHEED	13:23	14:07
18104	JALIAWALA B.	14:00	14:07
14604	JAN SADHARN	14:28	14:31
12472	SWARAJ	14:50	14:55
12474	SARVODHYA	14:50	14:55
12476	HAPPA	14:50	14:55
12478	JAMNAGAR	14:50	14:55
19772	JAIPUR	15:40	15:46
12498	SHAN-E-PUNJAB	16:20	16:26
64552	ASR-UMB	16:07	16:34
15934	ASR-DIBRUGARH	17:00	17:09
12238	JAT-SSB S.FAST	17:30	17:35
18238	CHHATISGARH EXPRESS	17:46	17:48
12550	JAT DURG SF EXP	08:30	08:35
19028	VIVEK EXPRESS	13:05	13:10

12030	SHATABDI	18:00	18:03
12032	SHATABDI	18:00	18:03
54602	ASR-HISSAR	18:43	18:45
19614	ASR-JAIPUR	19:10	19:16
13050	HOWRAH	19:38	19:40
13006	HOWRAH	20:05	20:07
15212	JAN NAYAK	20:20	20:26
18102	TATA MOORI	21:06	21:08
14002	ATTARI	21:50	21:56
12414	POOJA	22:00	22:05
14034	JAT MAIL	22:18	22:20
12266	DURONTO	22:30	22:32
12904	G. TEMPLE	22:48	22:50
14610	HIMKUND	22:56	23:01
12426	RAJDHANI	23:07	23:12
12356	ARCHANA	23:32	23:35
12470	JAT-CNB	23:32	23:35
12492	SHONPUR	23:32	23:35
14632	DDN	00:01	00:03
12242	ASR-GOA	06:20	06:25
14012	HSX-DLI	23:20	23:50
12422	ASR-NAD	15:40	15:46
74912	JUC HSX DMU	03:37	03:39
54072	JUC HSX PASSENGER	05:02	05:08
74914	JUC HSX DMU	06:42	06:44
54638	JUC HSX PASSENGER	10:27	10:29
74924	ASR HSX DMU	13:40	13:41
74926	FZR HSX DEMU	14:42	14:44
74916	JUC HSX DMU	16:37	16:39
74918	JUC HSX DMU	19:07	19:09
74920	JUC HSX DMU	21:47	21:49
74952	JUC JJJ DEMU	07:02	07:03
74954	JUC JJJ DEMU	13:52	13:54
54626	JUC JJJ PASSENGER	17:22	17:23

Table 3: - DOWN TRAINS – WEF (WITH EFFECT FROM) 01/09/2014

Time Table Jalandhar cantt. – Hoshiarpur

• UP Trains WEF (With Effect from) 01/10/2016

Train No.	Train Name	From	To	Arrival	Departure	Days
74911	PASSENGER	HOSHIARPUR	JALANDHAR CITY	05:03	05:05	Daily
74923	PASSENGER	HOSHIARPUR	AMRITSAR	05:47	05:49	Daily
74925	PASSENGER	HOSHIARPUR	FEROZPUR	06:32	06:34	Daily
74913	PASSENGER	HOSHIARPUR	JALANDHAR CITY	08:50	08:52	Daily
54637	PASSENGER	HOSHIARPUR	JALANDHAR CITY	13:01	13:03	Daily
74915	PASSENGER	HOSHIARPUR	JALANDHAR CITY	15:45	15:47	Daily
74917	PASSENGER	HOSHIARPUR	JALANDHAR CITY	18:28	18:30	Daily
74919	PASSENGER	HOSHIARPUR	JALANDHAR CITY	21:15	21:17	Daily

Table 4: - UP Passenger Trains WEF (With Effect from) 01/10/2016

• Down Trains WEF (With effect from) 01/10/2016

Train No.	Train Name	From	To	Arrival	Departure	Days
74912	PASSENGER	JALANDHAR CITY	HOSHIARPUR	03:27	03:29	DAILY
14011	PASSENGER	DELHI	HOSHIARPUR	04:03	04:05	DAILY
74914	PASSENGER	JALANDHAR CITY	HOSHIARPUR	06:42	06:44	DAILY
54638	PASSENGER	JALANDHAR CITY	HOSHIARPUR	10:27	10:29	DAILY
74924	PASSENGER	JALANDHAR CITY	HOSHIARPUR	13:40	13:41	DAILY
74926	PASSENGER	FEROZPUR	HOSHIARPUR	14:42	14:44	DAILY
74916	PASSENGER	JALANDHAR CITY	HOSHIARPUR	16:37	16:39	DAILY
74918	PASSENGER	JALANDHAR CITY	HOSHIARPUR	19:02	19:04	DAILY
74920	PASSENGER	JALANDHAR CITY	HOSHIARPUR	21:27	21:29	DAILY

Table 5: - DOWN Passenger Trains WEF (With Effect from) 01/10/2016

Calculation: -

- Not much of data was collected so the calculation part is small here and after the complete data collection there will be complete calculation and complete result.
- Jalandhar cantt. Railway station network is one of busiest train networks in India as of the transportation of goods and the intersection of north side to the east, west and south side area.
- As the Dakoha railway crossing is situated near the Jalandhar cantt. Railway station each and every train passing through Jalandhar cantt. Railway station also passes through the Dakoha railway crossing.
- The total no. of trains passing at the Jalandhar cantt. station is around 17 passenger trains per day.
- Out of which 9 trains are DOWN Passenger train which pass through DAKOHA railway crossing.
- And Other all trains passing through Jalandhar cantt. Station are 168 all other trains per day.
- In this the DOWN Trains are 84 per day.
- Which means a total is (other + passenger => 84 + 9 =93) 93 trains pass per day from DAKOHA RAILWAY CROSSING.
- If we calculate the average waiting time on crossing per day, it will be: -

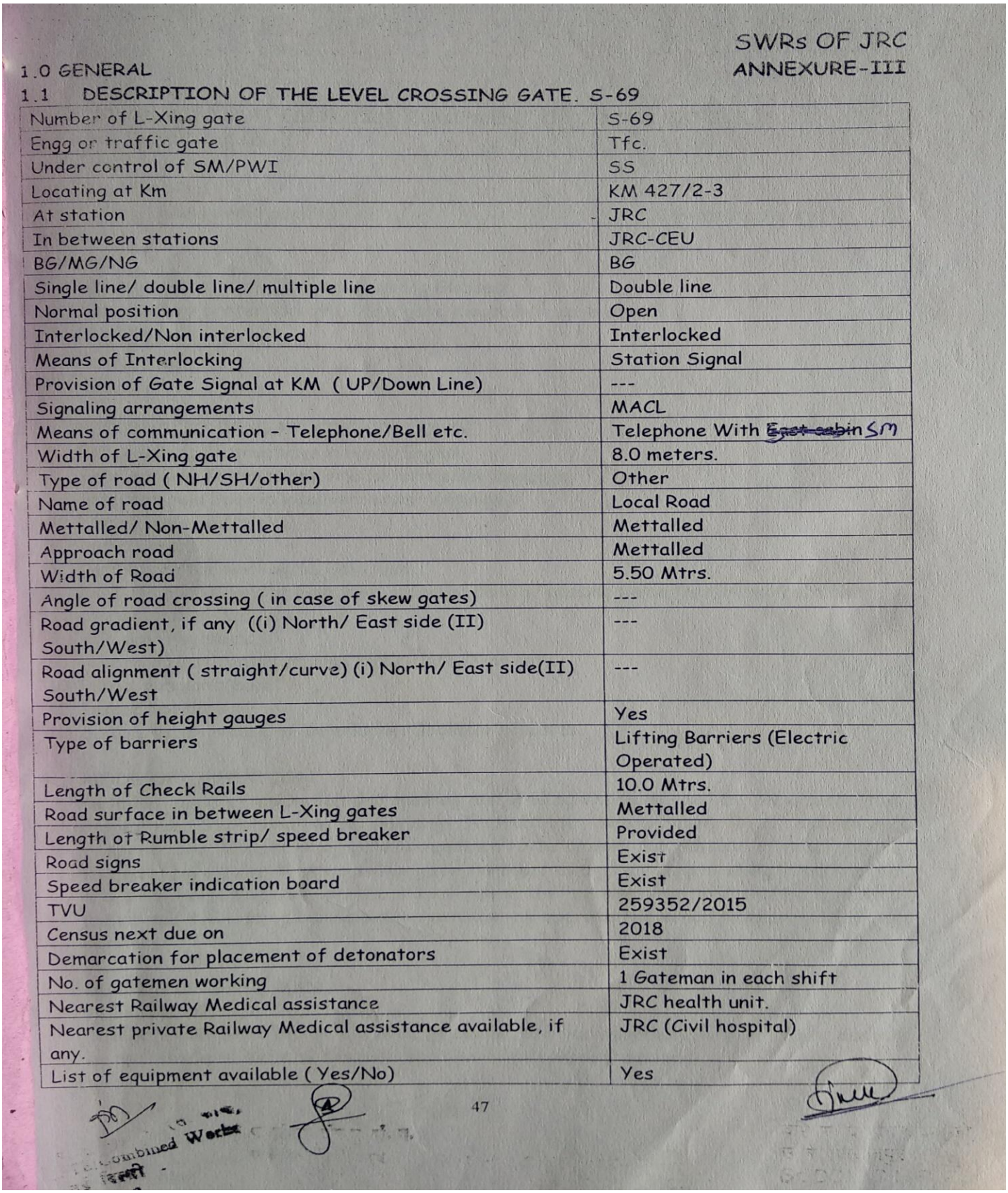
Avg. waiting time per train = 10min

Trains per day= 93

Total waiting time per day = 93* 10 =930 mins => 15.5 hours/day

These numbers are very high and due to this much number of trains passing through the crossing there is much wastage of time on the crossings for the travellers as the gates are closed for longer time every day.

TVU (Traffic volume unit) for Dakoha Railway crossing



SWRs OF JRC
ANNEXURE-III

1.0 GENERAL

1.1 DESCRIPTION OF THE LEVEL CROSSING GATE. S-69

Number of L-Xing gate	S-69
Engg or traffic gate	Tfc.
Under control of SM/PWI	SS
Locating at Km	KM 427/2-3
At station	JRC
In between stations	JRC-CEU
BG/MG/NG	BG
Single line/ double line/ multiple line	Double line
Normal position	Open
Interlocked/Non interlocked	Interlocked
Means of Interlocking	Station Signal
Provision of Gate Signal at KM (UP/Down Line)	---
Signaling arrangements	MACL
Means of communication - Telephone/Bell etc.	Telephone With ~~East cabin~~ SM
Width of L-Xing gate	8.0 meters.
Type of road (NH/SH/other)	Other
Name of road	Local Road
Mettalled/ Non-Mettalled	Mettalled
Approach road	Mettalled
Width of Road	5.50 Mtrs.
Angle of road crossing (in case of skew gates)	---
Road gradient, if any ((i) North/ East side (II) South/West)	---
Road alignment (straight/curve) (i) North/ East side(II) South/West	---
Provision of height gauges	Yes
Type of barriers	Lifting Barriers (Electric Operated)
Length of Check Rails	10.0 Mtrs.
Road surface in between L-Xing gates	Mettalled
Length of Rumble strip/ speed breaker	Provided
Road signs	Exist
Speed breaker indication board	Exist
TVU	259352/2015
Census next due on	2018
Demarcation for placement of detonators	Exist
No. of gatemen working	1 Gateman in each shift
Nearest Railway Medical assistance	JRC health unit.
Nearest private Railway Medical assistance available, if any.	JRC (Civil hospital)
List of equipment available (Yes/No)	Yes

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Fig 9: - Description of the Dakoha level Crossing gate.

CHAPTER: - 6 Expected Research Outcome

With assist of located facts economic evaluation of rail over bridge at decided on study place can be accomplished by using numerous technique of it and get an end result of various approach.

In this study, the realization became that once analysing the all of the information and taking approximately all the required survey of the essential to my study place. To treatment the site visitors hassle on the Jalandhar Railway Crossing Under-Bridge and Flyover are the not extra useful to the humans which advise. But technical point of view and Economic aspect via the price of production under-bridge and flyover so immoderate and the development time is extra so as consistent with take look at area situation that isn't feasible to the nearby police station and residential location and so forth. So, take some other opportunity is Diversion of the direction that is already to be had however the lack of the human's attention and no longer proper hold course not used as required. If, humans used that route so there is a great deal resolve Traffic Problem at Dakoha Railway Crossing.

The whole work came about is heading closer to looking to avoid accidents and decrease the quantity of fatalities within the discipline of railway transportation machine. Thus, basically paper idea thru a stone to avoid boundaries, the ones of first of all, replacing manned type with the aid of adopting unmanned kind i.e. Completely automated microcontroller based totally system, this allows in preventing the death prompted near stage crossing, also decline the time for which the humans wait near the extent crossing and absolutely prevent blunders that has done by means of gate keeper. Secondly, to assist human being's folks that are physically sick and aged because they are not having enough stamina to climb and Cross the tune with the resource of flyover, to remember the fact that use of automatic plat shape bridge is primary and did the equal in this painting. This is the step closer to help them and also effective method for those who don't use flyover and cross the track alongside song itself. It can have concluded that the street is economically feasible for the proposed-up gradation & upgrades.

Type/Class of Road	TUV Required
Special	for roads - TVUs > 50,000
'A' Class	for roads - TVUs > 30,000 but < 50,000
'B' Class	for roads - TVUs > 20,000
'C' Class	for roads - All Other L-xings for road not covered above
'D' Class	for cattle crossings

Table 6: - classification of the level crossings

Sr. no.	Daily traffic density	Level Crossing Type
1	TVU < 6000	Unmanned Level crossing
2	6000 ≤ TVU < 10000	All unmanned level crossings to be manned
3	10000 ≤ TVU < 100000	Manned level crossing
4	TVU ≥ 100000	Road over/under bridge

Table 7: - TVU criteria adopted in India

- Such as if the TVU < 50,000, then no construction should be there.
- If the TVU is more than 50000 <1,00,000 then an underpass should be constructed.
- And if the TVU is more than 1,00,000, then there ROB should be constructed.

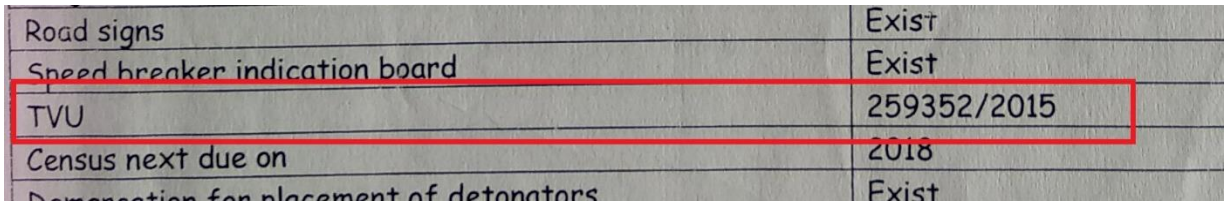

Fig 10: - TVU at Dakoha rail crossing

- The total TVU here at Dakoha Level crossing is 2,59,352 vehicles/week.
- This data was collected from the Dakoha level crossing itself.
- As the TVU is greater than 1,00,000 and is 2,59,352 there an over-bridge should be constructed as per the above table.

- The final outcome does not only depend upon the TVU value there are many more data collections and observations remained to be done, which will be done in future.
- Some of the data collections remains to be done are – Accident data at crossing, Types of vehicles passing Dakoha crossing, Average waiting time per train, etc.

The expected result or outcome can be analysed by if there is requirement for overbridge construction after the analysis then there should be construction but if according to the data analysed there should be no need for the construction or no benefit of constructing the overbridge then the overbridge shouldn't be made. If the Benefit Cost Ratio of Project is more than 1, the project should be accepted.

Construction of overbridge here will improve safety for drivers, ensure higher traffic go with the flow and meld nicely with the beauty of the city.

- Some of the data collections remains to be done in future are: –

1. Accident data at Dakoha crossing.
2. Types of vehicles passing Dakoha crossing.
3. Average waiting time on Dakoha crossing per train, etc.

Only after we collect all the data given above then only the final result can be calculated. So for the expected result as of now can only be said that "the Trains passing through the Dakoha crossing are much in number and these are creating traffic jam, which can cause much harms to environment and public. And the second thing is that the TVU of the DAKOHA railway crossing is much high and if compared to the TVU table, there should a Railway Over Bridge (ROB) constructed".

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