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Economical Feasibility of High Speed Railway Corridor

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Abstract*—India begins the largest country which has one of the most important rail networks within the world but doesn't have any high-speed rail (HSR) line capable supporting speed of 200 kmph or more. High-speed corridors are proposed but not yet implemented. The ministry of the railway had first proposed HSR in 2007-08 and have made pre-feasibility studies on various routes in the country. For building a high-speed railway line project besides its acquisition, operation and maintenance ones are very high which makes the project an expensive option of transportation. The implementation of an HSR project must be evaluated, which determines its costs and revenues, in order to justify its viability. This research proposes a model to gain the feasibility of an HSR line*.

Keywords—High speed rail (HSR), feasibility, Indian railway, rail network, bullet train.

I. INTRODUCTION

For Investing in HSR line require a very huge budget, and this budget to build rail route of a bullet train is substantially higher than the budget require for a conventional rail line. Despite its very high costs, this mode of transportation has not only been expanded but also been considered by countries which have not already implemented it considering the present condition of the Indian railways, it becomes important to evaluate as to whether it could be a better choice for the modernization of the existing plight of the railways rather than go for bigger investments such as the bullet trains. Indian railways by way of rail-networks modernization, renovation of coaches that are in bad condition, similar to the steps followed by countries like Japan and China, there could be a considerable amount of saving rather than investment in a bullet train eliminating this as a wasteful expenditure. The present study brings about the various pros and cons of the choice of making such investment vice versa the modernization of the current bad state of Indian railways. Therefore this becomes extremely vital to study for making comparative cost benefit analysis as regard to the incremental gain that could be generated or otherwise.

II. OBJECTIVE

1. To understand Economical calculations behind the project
2. To study the various economical factors affecting the feasibility of project.
3. To check economic feasibility of HSR between Mumbai and Ahmedabad.

Bullet train calculation:-

- No of trips = 72
- Let say 1000 passengers will travel
- Ticket fair per passenger = 3000rs
- Therefore one day revenue = 72*1000*3000 = 216000000 (216 cr.)
- For a yr. of about 250 days = 250*216000000 = 5400 cr.

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TABLE 1
CALCULATION OF PROFIT PERYEARS

Years	Loan amount in cr.	Interest in per	Interest amount in cr.	Principal amount in cr.	Maintenance in cr.	Profit in cr.
1	89000	0.1	89	4000	412	899
2	85000	0.1	85	4000	412	903
3	81000	0.1	81	4000	412	907
4	77000	0.1	77	4000	412	911
5	73000	0.1	73	4000	412	915
6	69000	0.1	69	4000	412	919
7	65000	0.1	65	4000	412	923
8	61000	0.1	61	4000	412	927
9	57000	0.1	57	4000	412	931
10	53000	0.1	53	4000	412	935
11	49000	0.1	49	4000	412	939
12	45000	0.1	45	4000	412	943
13	41000	0.1	41	4000	412	947
14	37000	0.1	37	4000	412	9515

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TABLE 2

Calculation of number of train per week (from Mumbai to Ahmedabad Existing)

DAYS	NO. OF TRAINS
MONDAY	28
TUESDAY	19
WEDNESDAY	21
THURSDAY	18
FRIDAY	30
SATURDAY	32
SUNDAY	25
TOTAL NO OF TRAINS IN A WEEK	173

Calculation of amount gain by government per yr. (from Mumbai to Ahmedabad railway corridor)

- 173 trains travels in 1 week
- 1 year consist of 52 week
- Therefore number of trains travels in a yr.
  i.e. (173*52 = 8996 No.)
- Number of seats in a train = 1944

Therefore total number of seat in 8996 trains.
i.e. (8996*1944 = 17488224 No.)

- Ticket price = 400rs
- Amount in a year. i.e. {17488224*400 = 6995289600 (699 cr.)}
- Maintenance cost = 100 Cr.
- Amount left per yr. = 5995289600 (599 cr.)
- Amount in 23 yrs. i.e. {23*5995289600 = 137891660800 (13789 cr.)}

TABLE 3

Mumbai to Ahmedabad railway corridor comparison

Mumbai to Ahmedabad railway corridor	Existing trains	Bullet train
Income (per year)	699 cr.	5400 cr.
Maintenance cost (per year)	100 cr.	412 cr.
Remaining amount (per year)	599 cr.	4988 cr.
0.1 percent Interest (per year)	-	89 cr.
Loan paid (per year)	-	4000 cr.
Final remaining (per year)	599 cr.	899 cr.

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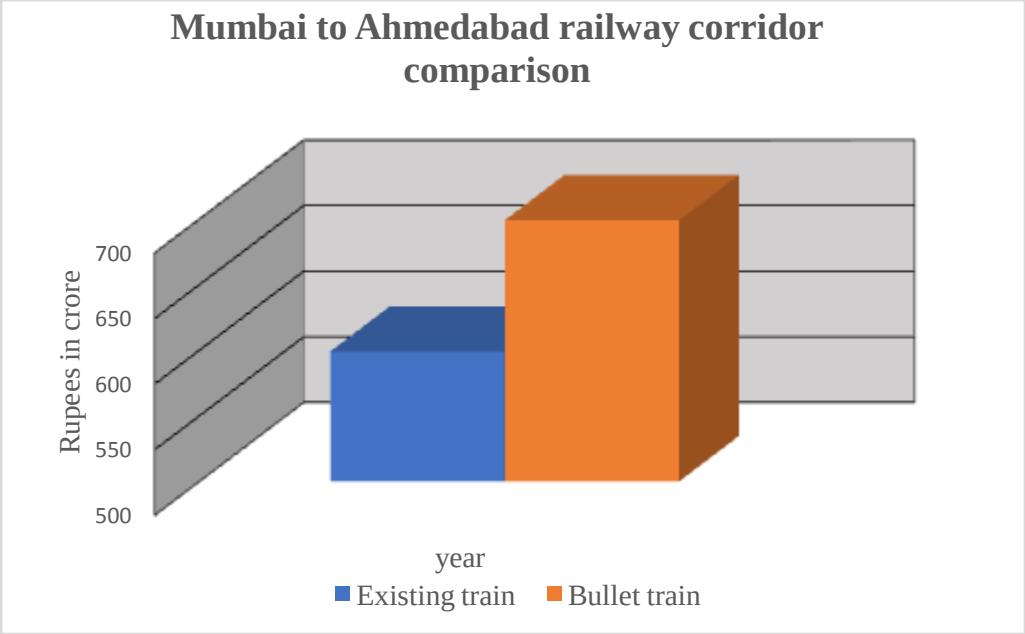

FIGURE 1: Mumbai to Ahmedabad railway corridor comparison

III. CONCLUSION

The Indian rail government have 20,000cr rupees for updating the railway line but according to Suresh Prabhu (pervious rail ministry) 1, 20,000crrupees will be require for updating the Indian railways networks. If India manages to brings 1 lakh crore rupees than the concept of bullet train will be not require at present

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