



## Double Floor Railway Platform

Ashish R Gaikwad<sup>1</sup>, Pranav D Chaudhari<sup>2</sup>,  
Sonali B Sharma<sup>3</sup>, Akshada B Shejwal<sup>4</sup>

(Lecturer1 Guru gobindsinghpolytechnic, Nashik MSBTE, Mumbai)

(Student 2 Guru gobindsinghpolytechnic, Nashik MSBTE, Mumbai)

(Student3Guru gobindsinghpolytechnic, Nashik MSBTE, Mumbai)

(Student4 Guru gobindsinghpolytechnic, Nashik MSBTE, Mumbai)

### ABSTRACT:

Railway platform is a place constructed for passengers to enter/exit and to wait for their train. Compared to other pedestrian facilities, railway platforms have different characteristics as they are used simultaneously as walking and waiting areas. These two functions cannot easily be separated in space, as they can alternate with time. For design purposes, this constant change in the space distribution has to be considered. In addition, pedestrians are not evenly distributed along the platform, but have preferred waiting and walking areas. Also, the safety aspect is important for these facilities as passengers should not enter the hazard zone next to the railway tracks. For the design of railway platforms it is therefore important to consider the preferred waiting locations. Otherwise people might tend to wait at locations reserved for walking and thus hinder passenger circulation. In India there are many railway stations which are crowded. Due to this crowd there may be chances of any accidents. People may miss their train. There are many shops on railway platform. They occupy space of people. An accident happened at Elphinstone station in Mumbai due to the crowding of people on the narrow foot bridge. To minimize these accidents, we have got a solution and we are so we have planned a project to add an additional floor to railway station that is adding a floor above railway platform. The shops on platform then will be on that additional floor. Due to this, the place of shop will become free for people. Thus, making the platform big and better than previous platform. A railway platform is a section of pathway, alongside rail tracks at a railway station, metro station or tram stop, at which passengers may board or alight from trains or trams. Almost all rail stations have some form of platform, with larger stations having multiple platforms. The term "railway platform" can also mean any type of freight platform beside a rail siding for loading/unloading freight to/from rail cars.

**Keywords:** Accidents, Double floor Platform, Railway, Passengers

### INTRODUCTION:

Railway platform is a place constructed for passengers to enter/exit and to wait for their train. Compared to other pedestrian facilities, railway platforms have different characteristics as they are used simultaneously as walking and waiting areas. These two functions cannot easily be separated in space, as they can alternate with time. For design purposes, this constant change in the space distribution has to be considered. In addition, pedestrians are not evenly distributed along the platform, but have preferred waiting and walking areas. Also, the safety aspect is important for these facilities as passengers should not enter the hazard zone next to the railway tracks. For the design of railway platforms it is therefore important to consider the preferred waiting locations. Otherwise people might tend to wait at locations reserved for walking and thus hinder passenger circulation. In India there are many railway stations which are crowded. Due to this crowd there may be chances of any accidents. People may miss their train. There are many shops on railway platform. They occupy space of people. An accident happened at Elphinstone station in Mumbai due to the crowding of people on the narrow foot bridge. To minimize these accidents, we have got a solution and we are practicing to make it really applicable. So, we have planned a project to add an additional floor to railway station that is adding a floor above railway platform. The shops on platform then will be on

# International Conference on Science, Technology and Management (ICSTM-2020)



Guru Gobind Singh Polytechnic, Nashik, Maharashtra (India)



15<sup>th</sup> - 16<sup>th</sup> February 2020

[www.conferenceworld.in](http://www.conferenceworld.in)

ISBN : 978-81-944855-1-3

that additional floor. Due to this, the place of shop will become free for people. Thus, making the platform big and better than previous platform. A railway platform is a section of pathway, alongside rail tracks at a railway station, metro station or tram stop, at which passengers may board or alight from trains or trams. Almost all rail stations have some form of platform, with larger stations having multiple platforms. The term “railway platform” can also mean any type of freight platform beside a rail siding for loading/unloading freight to/from rail cars.

## Problem statement:

Railways Stations are the important component in regional and city’s transport system. India is an developing country, so as there is development population of India is increasing As population is increasing the crowd in some places also increases. Especially on transportation areas like Bus Stand, Railway Station, Air Ports the crowd is more. Hence there are many chances of accidents, stampede, etc. The main problem if this increasing population is seen on the Railway Platform. As there is increase in population the space required by one person on the Railway Platform is reducing. The space is too reduced now - a - days. On the Railway Platform people do number of things like standing, sitting, waiting, sleeping, roaming her and there, etc. Due to these activities the space requirement of one person is reduced. The space required for the free movement of public or passengers is less on the Railway Platform, where there is more crowd. There are many unnecessary structures present on the railway platform like shops, big water tanks, Police Station, CCTV rooms. (Useful in emergency). Due to this the space which is for the passengers is utilized by this shops and tanks. Thus the moving space for passengers is reduced. And if there is over-crowding then stampedes and accidents may happen there are lots of people standing on the platform. Now there is not a small space on platform for single passenger. So the passengers standing or sitting on the end of platform can fall on the track, and thus this will give rise to an accident. In the coming (next) photographs as you can see there are many shops, water tanks, any unwanted structure that takes the place of passengers, thus taking space of passengers. The main problem of this crowd of passengers is on the big cities’ platform like Mumbai, Delhi, Chennai, Madras, etc

## OBJECTIVES:

- To increase the space available for passengers on railway platform.
- To reduce the crowd present on railway platform by providing additional floor.
- To decrease the chances of stampede and accidents.
- To provide more facilities which were not available on old platform.
- To avoid the direct crossing the platforms from the railway tracks.
- To provide easy connections between all platforms
- To provide escalator for easy and safe way to switch the stations for people and specially for elder people.
- To establish solar panels on the top of the roof platform.
- To reduce the distance between the foot



Fig. Crowd of Passengers on Platform

### NECESSITY:

As there is the problem of population in our country, there should be control of it. On platform there are many passengers roaming here and there, some are sleeping, standing, waiting for the train. There is the need of controlling this crowd. Constructing the additional floor on the existing floor will control the crowd on platform. There is necessity of this double floor railway platform to control the crowd, provide the unavailable facilities which were not available on the existing platform. Indian Railways has one of the largest and busiest rail networks across the world, and this fact presses the need for organization the transporter urgently.

1. Indian Railways operates more than 20,000 trains per day.
2. Over 12,500 passengers' trains are operated per day.
3. 7,000+ freight trains are operated per day.
4. The railways network ferries over 23 million passengers every day.
5. The trains ferry across more than 7,000 railways stations daily.
6. Around 3 million tonne of freight is transported by the carrier on a daily basis.
7. The shares of the railways in passenger transportation segment is now just 10 percent, as opposed to 1951 when it was around 74 percent

### LITERATURE SURVEY-

1. **Shashank Tyagi, Rajesh Sukhdev et.al.** (2013) Investigated that most of the deaths belonging to younger age group 21 to 30 yrs. (28%). Males (96.07%) preponderance was observed in our study. Maximum numbers of railway accidents were seen during the evening hours between 1600 to 2000 hrs. The majority of the victims were brought dead 27 (52%). Greatest number of deaths were accidental (98%) in nature. There were less suicidal cases (02%) and no case of homicidal death noted. Most common reason behind railway deaths was hit by train while crossing railway track 48% and 30% had fallen from running train due to overcrowding. Intracranial haemorrhage due to Head injury (47.05 %) was most common cause of death. Railway accidents can be preventable by taking appropriate measures such as attentive surveillance, ambulance availability at stations, safety engineering and awareness among passengers. Most common age group involved in railway deaths was (21-30 years) 14 cases (27.45 %), followed by (41-50 years) 12 cases (23.52 %), (31-40 years) 7 cases (13.72 %) and least in (11-20 years) 5 cases (9.8 %). If we combine age group 21-30 years and 31-40 years then it was observed that almost 34% of deaths occurred in younger age group. Male preponderance was observed in our study contributing almost 98% of the total railway deaths. While only 2% cases belonging to female which are seen in (21-30 years) 1 and (41-50 years)
2. **Vincent Moug, Selby Coxon.** Investigated that the station as public architecture is fundamental to the commuter experience and individual response to build environment (Burns 2000). It provides shelter, amenities, provides directional cues, and is perceived as a local identity or reference point. It is integral to fascinating the movement of passengers between trains and alternate destinations. A negative impact of station design on accessibility for PRM's in observing the DSAPT can be attributed to pre-existing parameters of built station design. It is typical of rail infrastructure and public architecture to be

designed for a functional life of 100 years (VRIOGS 2011). This is in stark contrast to the mean design life of 32.5 years of current Melbourne rolling stock. As a result station infrastructure finds itself misaligned with modern policy requirements. Melbourne's rail network infrastructure like many networks has been subject to periodic capacity growth in line with an increase in population and patronage (PTV 2012). Existing station design (to include heritage stations) therefore requires a rethink to overcome barriers to compliance under the DSAPT. A major component is the platform surface how it can enable accessibility for PRM's.

### Materials and Methodology for Prototype-

1. Composite fibre: - It is tough material made of compost which we used for base.
2. Wood: -The wood was for the column (wooden strips of length-13cm, breadth-5cm, thick-1cm).
3. Plastic strips: - This was of length-90cm, width-0.5cm, and thickness-0.2cm.
4. Paper: - The paper was used for the structures on the platformVetra bond.

Equipment's used: - 1. Hand saw 2. Cutter 3. Measuring tape 5. Blower 6. Drilling machine 7. Chisel 8. Electric cutter 9. Blade

1. First, we had taken composite fibre, and created the ups and downs as platform and rail tracks.
2. Then we took plastic strips and made the rail tracks and safety rails guards or railings by pasting them together with the help of vetra bond.
3. After this, we took the wooden strip and cut it into pieces for the column purpose. There was proper finish to the wood strips and their ends by using the electric cutter.
4. Then we placed the wooden strips on that ground platform as the columns. After checking that the position of each column is correct, we fixed or pasted the columns tightly with the help of vetra bond.
5. We cut the other composite fibre into shape of platforms as per the ground platform, and made the rectangular holes for the stairs and escalators purpose.
6. Then we checked perfectly if the additional floor is coming exactly over ground ( previous one)and pasted the additional floor on the columns. The bonding of ground platform (i.e. composite fibre), columns(i.e. wood)and the additional floor(i.e. composite fibre)was very strong.
7. After adding the floor, we again pasted the columns on that floor, exactly above the position of columns which were on the ground floor.
8. Then we cut the composite fibre for roofing purpose and made the slanting or sloped roof, on which we fitted the solar panels to generate electricity. We made the escalators with help of wooden strips.
9. After this all work we took the papers and put them on the additional floor as shops, water tanks, hotels, waiting rooms, toilets, etc. To make our model more realistic we added the small components of railway like signal, lights, and train engine. Thus, our model was ready.



FIG:-PROTO TYPE MODEL

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## ADVANTAGES:

- The space available for passengers on railway platform will increase.
- The crowd present on railway platform will become less by providing additional floor.
- Chances of stampede and accidents will be decreased.
- More facilities which were not available on old platform can now be available ( like hospitals, light refreshing centres, small hotels, etc.)
- The direct crossing the platforms from the railway tracks can be avoided.
- There will be an easy connection between all platforms.
- There will be an escalator for easy and safe way to switch the stations for people and specially for elder passengers.
- We will provide solar panels and small wind mills on the top of the roof platform to generate electricity.
- To reduce the distance between the foot bridges.
- Air circulation will increase.

## DISADVANTAGES:

- Cost of constructing this additional floor will be more.
- For making the foundation for columns (to carry extra load of additional floor) on platform, demolition of previous foundation is necessary.
- As all the shops and other services will be on the additional floor the passengers have to go to this 1st floor for their needs.
- There will be some problem for passengers on platform while constructing this structure.
- Energy will be more required as compared to previous platform (Example: - Lights, fans, CCTV camera system, etc).
- As there will be an additional floor on the existing platform there will be less chances of getting the natural light on the ground platform.
- More time will be required to build this double floor railway platform.

## CONCLUSION:

As India is a developing country the development should be made to each and every part of country. The population of India is increasing day by day, hence the number of passengers on the railway platform will increase. Before some decades there were less number of people living on an area, but as population is increasing the space was getting lesser and lesser. So to solve this problem buildings were constructed. So now many people can live on that same area. Hence by keeping this phenomena in mind we can construct double floor railway platform to increase the space required by passengers. ( avoiding horizontal expansion and preferring vertical one). There will be more facilities which were not available on previous one like fixing solar panels on the roofs of the platform to generate electricity which will be useful for the escalator and lighting purpose, establishing small wind mills on the roof to generate electricity. There will be hospitals if there happens an accident or injury. There will be hotels and rooms for having meals and being refresh or to stop at railway station at night. So if there will be this additional floor the chances of accidents will become less as space on platform will increase. So we think this will be a good solution to solve the problem of crowd on the stations where there is more crowd

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