# Transportation Management

## Lesson 2

## Passenger Operation

## INTRODUCTION

2.101 The importance of passenger traffic could be easily appreciated from the fact that Indian Railway carried about 7651 million originating passengers during the year 2010-11, which is more than six times the total population of the country. The growth of passenger traffic on the Indian Railways has been phenomenal as can be seen from the table below:-

**Number of Passenger Originating (IN MILLION)***

| Year | Suburban All classsess | Upper Class | Mail/Exp. | Non-suburban Second class Ordinary | Total | Total Non-sub-urban | Grand Total |
|---|---|---|---|---|---|---|---|
| 1950-51 | 412 | 25 | 52 | 795 | 847 | 872 | 1,284 |
| 1960-61 | 680 | 15 | 96 | 803 | 899 | 914 | 1,594 |
| 1970-71 | 1,219 | 16 | 155 | 1,041 | 1,196 | 1,212 | 2,431 |
| 1980-81 | 2,000 | 11 | 260 | 1,342 | 1,602 | 1,613 | 3,613 |
| 1990-91 | 2,259 | 19 | 357 | 1,223 | 1,580 | 1,599 | 3,858 |
| 2000-01 | 2,861 | 40 | 472 | 1,460 | 1,932 | 1,972 | 4,833 |
| 2010-11 | 4,061 | 100 | 1,046 | 2,444 | 3,490 | 3,590 | 7,651 |
| 2013-14 | 4,552 | 126 | 1,306 | 2,413 | 3,719 | 3,845 | 8,397 |
| 2014-15 | 4,505 | 138 | 1,227 | 2,304 | 3,580 | 3,719 | 8,224 |
| 2015-16 | 4,459 | 145 | 1,321 | 2,182 | 3,503 | 3,648 | 8,107 |

**(*Source: Indian Railways Year Book 2015-16)**

2.102 Passenger kms during the same period i.e. from 1950-51 to 2015-2016 increased from 66,517 million to 1,143,039million.

2.103 During the year 2015-16 a total of 13,313 (2014-14 a total of 13098) passenger trains were run which included (5009 EMU 2014-15) 5128 EMU suburban trains. Of the total number of passengers carried in 2015-16, 55% were suburban and 45% non-suburban. Of the total traffic passenger kms for non-suburban passengers, about 22.56 % travelled in ordinary second class and (53.58% in 2014-15) 55.52 % in second class Mail/Express. Only (8.82% in 2014-15) 9.21% of non–suburban passengers travelled in upper classes, while (13.23 % 2014-15) 12.71 % was an account of suburban passenger of all classes.

2.105 It will be seen from the passengers' statistics given above that the Indian Railways are carrying vast volumes of passengers everyday and the goodwill of the Railways depends to a very large extent upon the quality of service rendered to these passengers. The various aspects of passenger operation to be looked after by the Transportation Department, are discussed hereafter.

**Time Tabling of Passengers Carrying Trains**

2.201 Time Tabling of passengers carrying trains is a very intricate process. It has to take into account passengers requirement and preferences as well as other aspects of the railway operation. It is dynamic process and the Time Tables need revision at least once a year for following reasons:-

(a) Increasing demands of passengers due to a developing economy and increasing population Every year a number of additional regular passenger trains are introduced.

(b) Due to technological advancement, the trains are speeded up through dieselization, electrification and signaling improvements.

2.202 Presently revised time table are issued once a year on every Ist July.

**Factors taken into account for Time Tabling**

2.203 These factors could be grouped into two categories viz:-

(i) Requirements of passengers.

(ii) Service requirements by Railways.

**Passengers' Requirements & Preferences**

2.204 (i) Suburban & Suburban like passengers:- Trains should reach the Metropolitan (CBD) and other big towns in the morning hours and leave back after office hours.

(ii) Medium Distance (300 to 500kms) Inter-city passengers:- Superfast day time trains such as Shatabadi Express trains between New Delhi –Kanpur-Lucknow or New Delhi-Chandigarh etc.

(iii) Long Distance passengers:- Overnight Journey without wasting a working day is preferred. That is why Rajdhani Express trains between New Delhi & Bombay and New Delhi and Calcutta are so popular. Very long distances passengers would naturally prefer fast trains with fewer halts.

(iv) Other requirements of passengers would include:-

(a) Convenient arrivals and departures at terminals and important intermediate stations.

(b) Appropriate meal halts.

(c) Proper connections with branch line trains at junction stations.

(d) Adequate halts at intermediate stations for entraining and detraining.

**Service Requirements:**

2.205 These will include:-

(i) Realistic running times between stations: These timings are now generally being determined through computer simulatiaon in the RDSO Lucknow. For departmental use, Minimum and Normal Running times are stipulated for each block section for each train. Minimum Running Time (MRT) is calculated at 'Maximum permissible Speed'. While Normal Running Time (NRT) is calculated at 'Booked Speed' which is generally 90% of the Maximum permissible Speed. Due allowance is made in MRT and NRT for permanent speed restrictions. When a train is running late the driver can make up time equal to (NRT-MRT), except in thick & foggy weather & cautious driving.

(ii) Time Allowances for crossings and precedence : These are calculated by preparing Master Charts which are time distance graphs indicating the paths of all passenger carrying trains & nominated important freight trains.

(iii) Platform facilities at terminals and other important stations.

(iv) Engineering Allowances for maintenance of track.

(v) Time allowances for shunting, if required for attaching/detaching locomotives or slip coaches etc.

(vi) Time required for crew changing.

(vii) Time required for fuelling of locomotives at nominated stations.

(viii) Time required for carriage watering/cleaning.

(ix) Meal halts.

(x) Time required for loading/unloading of parcels/luggage.

(xi) Recovery time: These are provided short of important junction stations and terminals to make up time in case of any unforeseen delays.

**Process of Preparing Time Tables**

2.206 Suggestions received from members of Divisional Railway Users' Consultative Committees (DRUCUs), Passenger Associations and other rial-users, as well as departmental requirements are first examined at Divisional Levels. Suggestions received from the divisions are examined at the zonal headquarters level and are coordinated by the Chief Passenger Traffic Managers (CPTMs).

Inter-Railway Time Table Coordination Meeting is then convened by the Executive Director (Coaching), Railway Board. Suggestions including those for introducing additional trains are considered in depth and the Time tables are finalized by the month

of June. New Time Tables come in force from Ist of July every year.

**Types of Time Tables**

2.207 The following types of time-tables are published:-

(a) Zonal Time Table: - Each zone publishes its detailed time table. These not only give detailed time table of each train but also give detailed information regarding bookings, reservations, refunds, retiring room facilities, catering facilities etc. for use of passengers.

(b) Trains at a Glance :- This is an all-India publication and it gives abstract time-tables for Mail/Express trins.

(c) Sheet time Tables:- These also give abstract timings of trains and are pasted at prominent places at stations.

(d) Working Time Tables :- These are meant for departmental use by railway staff only. These include detailed information for staff including sectional running times, speed restrictions, bread-down and other facilities available at various stations etc.

**Punctuality of Passengers Carrying Trains**

2.301 As has been mentioned earlier more than 10 million passengers travel in over 7500 trains per day on the Indian Railways. Any late running of trains not only results in colossal waste of time of the passengers but also causes great loss of goodwill of the Railways. Punctual running of trains is, therefore, one of the most important aspect of railway operation.

**Factors Affecting Punctuality**

2.302 Timely running of trains can only be ensured by proper performance of an coordination between various departments. The factors which affect punctual running of trains can, therefore, be summarised department wise as discussed below.

**Transportation Department**

2.303 (i) Adequate facilities for berthing of rakes and reception and dispatch of trains at terminals and important intermediate stations : Lack of such facilities result in detention to trains short of terminals and important stations and also late starts.

(ii) Proper time Tabling : Time tables should be realistic making due provision for engineering allowances and recovery times.

(iii) Proper education, training and motivation of operating staff so that they have punctuality consciousness and work efficiently.

Station Masters should grant line clear and set the route and take 'off' signals in time. They should ensure proper maintenance and lighting up of signals and see that shunting

operations, if any, area done efficiently. Warner or Distant signals should be taken 'off' when train is passing through main line, except in case of cautious driving.

Similarly, Guards should appear on duty in time display 'All Right' signal to the Driver to start the train as per rules without delay and make up 'Traffic Time' at stations, when the train is running late, ensures expeditious loading/unloading of parcels/ luggage, and take prompt action in case of any Alarm Chain pulling.

Section Controllers must arrange judicious crossings/precedence having regard to the priority and importance of trains. They should keep in touch with Station Masters to ensure that there are no delays at stations due to various reasons. They may also send messages to the Drivers motivating them to make up time when running late. Stabling of goods trains, if necessary, should be done judiciously.

**Commercial Department**

2.304 (i) Reservation charts should be pasted in time and there should not be any mistakes in the same.

(ii) Meals should be served without causing any detention to train.

(iii) Loading/unloading of parcels/luggage should be completed within allowed time.

(v) Special checks should be conducted to eradicate Alarm Chain pulling.

**Mechanical Department**

2.305 (i) Proper maintenance of locos so that there are no detentions due to locomotive failures. In case of steam locomotives, it should be ensured that proper grade of coal is loaded.

(ii) Locomotives should be turned out punctually from the loco-sheds.

(iii) Drivers should be suitably trained, monitored and motivated to ensusre they do not lose time and make up time as per rules when running late.

(iv) Proper maintenance of coaches so that they are not marked sick at the starting station or en-route. Vacuum or Air-brake system, as the case may be, should be maintained efficiently.

(v) Carriage and Wagon examination and carriage watering whereever required, must be done within allowed time.

**Electrical Department**

2.306 (i) proper maintenance of electric locos.

(ii) Proper maintenance of train lighting.

(iii) proper maintenance of air conditioned coaches.

(iv) Proper maintenance of overhead Equipment (OHE) on electrified sections.

(v) Ensuring assured power supply.

**Signal and Telecommunication Department**

2.307 (i) Proper maintenance of points and signals.

(ii) Proper maintenance of telecommunication facilities including Block Instruments.

(iii) Prompt action in case there is any failure of telecommunication or points or signals.

**Civil Engineering Department**

2.308 (i) To ensure minimum speed restrictions and cautions driving. Time loss on this account should not exceed total 'Engineering Allowance' time provided in the time table.

(ii) Whenever 'engineering blocks' are taken for track repair/maintenance, the work should be completed within allotted time.

(iii) Working of dip-lorries in the face of fast mail/express trains should be avoided.

(iv) For speeding up trains, long term measures should be taken to remove permanent speed restrictions as far as possible.

(v) It should be ensured that caution orders are issued to Drivers only when required. It sometimes happens that caution orders continue to be issued even after speed restrictions has been removed due to lack of communication between engineering officials and station staff.

**Action by Administration to Maintain Punctuality**

2.309 A coordinated effort by all departments concerned led by the Divisional Railway Manager (DRM) himself is imperative to maintain punctuality.

2.310 Proper information system

(a) A punctuality register is maintained in the control office wherein particulars of detentions to passenger carrying trains are recorded daily. Departmental Executive officers must make it a point to scrutinise this register in the morning and take up cases of loss of time due to any shortcomings on the part of their department.

(b) In addition each departmental head must set up his own channel of communication to get information in real time for any serious detentions pertaining to his department. Section or Deputy Controllers should also inform telephonically bad cases to the officers concerned even if it happens at odd hours.

(c) DRM generally has a visual indication board in his chamber which indicates how the mail express trains are running. If a train is running late the DRM may order the control to issue message from him to the Driver/Guard and station staff concerned to make up time.

**DRM's Meeting with Departmental Officers**

2.311 Every day the DRM generally holds a meeting attended by all departmental officers concerned to discuss reasons for detention to trains the previous day and remedial action taken. DRM may also hold a monthlymeeting with officers where detailed cause-wise analysis of detentions is done and medium and long term remedial measures are decided upon.

**Control Charts/Drivers & Guards' Journals**

2.312 Transportation& Power officers must scrutinize a few control charts and journals to get better insight into trains running.

**Foot Plate Inspections**

2.313 Foot plates inspections by DRM/ADRM & Transportation, Mechanical, S&T & Engineering officers are very important not only from punctuality but also from safety point of view. It creates punctuality and safety consciousness amongst staff and gives a personal touch for motivating staff. Such inspections also help to pinpoint signals which need improvement in sighting or lighting/focusing.

**Punctuality Awards**

2.314 Good performance by Drivers/Guards, station staff and staff of other departments should not go unnoticed. For good performances in making up time and maintaining punctuality cash awards should be given liberally and the same should be publicized through circulars, fortnightly gazettes etc.

**Punctuality Drives**

2.315 Occasionally punctuality drive may be organized during which all trains should be monitored through footplate inspections and deputing officers round the clock in shift duties in the control office.

**Zonal Headquarters level**

2.316 Chief passenger Traffic Manger (CPTM) Coordinates and monitors passenger operation on the zone. He takes up cases of detentions to trains every day with the Divisional officers concerned.

General Manger or Additional General Manager generally holds meetings everyday with the departmental heads to discuss bad cases and remedial measures taken.

Information about passenger trains operation is collected round the clock by Emergency Cell on each Zonal Hqrs.

**Railway Board's level**

2.317 Executive Director (Coaching) coordinates and monitors passenger train operations at the Railway Board's level. A 'Punctuality Cell' functions in the Railway Board's

office round the clock. Detentions to important trains are scrutinized. Very bad cases may be discussed with Additional Member (Transportation) or Member Traffic himself.

Some selected and very important trains maybe designated as 'Ministers' Trains' and these have to be especially monitored. Minister for Railways may himself call for action taken in bad cases.

## RAKE COMPOSITIONS, RAKE LINKS AND UTILISATION OF COACHING STOCK

## INTRODUCTION

2.401 Rake composition of passenger carrying trains depends upon the following considerations:-

(a) Passengers' requirements.

(b) Availability of various types of coaches.

(c) Type of train viz. ordinary passenger or Mail/Express, or Superfast or Rajdhani/ Shatabdi Express trains.

(d) Lengths of Platforms.

(e) Rake maintenance facilities.

**Passenger's Requirement**

2.402 The various passenger classes for travel on the Indian Railways could be briefly summarized as follows:-

**Non-Airconditioned**

(a) Second (ordinary)

(b) Second Sleeper.

(c) Second (Sitting).

**Air-Conditioned**

(a) AC Chair Car

(b) AC Sleeper-2 tier

(c) AC 3 tier.

(d) AC Firsts Class.

**Rake Composition**

2.403 Rake composition will include-

(a) Type of coaches on the train.

(b) Total Number of coaches on the train.

-Normal Composition

-Maximum permissible load.

**Types of Coaches to be provided**

2.404 The types of coaches have to be provided keeping in view the passengers requirements and relative importance of trains. Ordinary short distance passenger trains may have only Second (ordinary) coaches with sitting accommodation. Medium and long distance ordinary passenger trains may be provided with II Sleeper coaches and also a First class coach.

Mail/Express trains will normally consist of Second Ordinary, Second Sleeper, Ist Class and Ac two and three tier coaches. More important trains may have AC Ist class in addition. Rajdhani and Shatabdi Express trains area fully air conditioned. Intercity shatabdi Express trains have Air conditioned sitting accommodation while Rajdhani Express trains have AC I class, AC-two tier, Ac-3 tier and AC Chair Cars.

All trains must have a brake van in front and one in rear. Generator car are provide on Air conditioned trains and other specified trains equipped with end-on generation.

In Mail and Express trains area is also provided with postal vans as per requirements of the postal department.

Dinning or pantry cars are also normally provided on long distance trains.

A few important codes used for indicating the types of coaching stock are listed below:

| **Code** | **Stands for** |
|---|---|
| G | Self generating. |
| W | Vestibuled. |
| L | Luggage Compts. |
| R | Brake van |
| Y | (Suffix) Ladies |
| Y | (Prefix) Suburban |
| AC | Airconditioned |
| S | Second Class |
| F | First Class |
| FC | First Class with coupe |
| GSCN | Self Generating Second Class 3 tier (Sleeper) |
| WAC | First ACC |
| WACCN | AC Sleeper (3 tier) |

| | |
|---|---|
| WGACCW | AC Sleeper (2 tier) |
| GSCZAC | Vestibuled second class AC Chair Car. |
| WGFCZAC | Vestibuled First Class AC Chair Car |
| VP | Bogie parcel van |
| PP | Full Postal unit. |
| PPH | Half postal unit |

**Lengths of Trains**

2.405 Trains on Main line/Trunk route are generally overcrowded and still there is often demand for more accommodation. Additional demands for more accommodation are being met by introducing additional passenger trains and also by increasing lengths of the trains. With diesel and electric traction it has been possible to increases the composition of trains to 24 bogies on the B.G. In the long run the Indian railways have plans to run 26 bogies trains on selected trunk routes.

2.406 Maximum length of a train depends on:-

(a) Hauling power of the locomotive

(b) Maximum speed at which the train is required to be run.

(c) Lengths of platforms at terminals and intermediate stopping stations.

(d) Strength of the couplings.

(e) Brake power available.

(f) Signaling system.

**Marshalling of Coaches on a Train**

2.4.07 While marshalling the coaches on a train, the following precautions should be observed:-

(a) Marshalling should conform to Anti-telescopic Marshalling orders.

(b) One brake-van should be provided in the front and one in rear. Passenger carrying coaches should normally not be attached outside brake-vans. However, if it is necessary to do so, it should conform to instructions contained in General and Subsidiary Rules. In any cases not more than two coaches should be attached outside the rear brake-van.

(c) Same class of coaches should normally be grouped together.

(d) Dining Car/Pantry Car should normally be in the middle.

**Rake Links**

2.408 Rake links are chalked out for time tabling the movement of rakes of passenger carrying trains on a regular schedule. While making these schedules the requirements of

maintenance of rakes are duly taken into account. This will include 'Primary' and 'Secondary' maintenance of rakes.

**Primary Maintenance**

2.409 Primary maintenance is carried out by the Zonal railway to which the rake belongs. All scheduled repairs such as repacking of axle-boxes, cylinder overhauling, clappet valve testing, water tank wash out are carried out during primary maintenance in addition to washing, cleaning and safe-to-run examination. Normally six hours are provided for such maintenance at the homing depot of the rake.

**Secondary Maintenance**

2.410 Only cleaning and safe to-run examination as well as minor repairs are carried out during Secondary maintenance. For this also six hours are normally provided.

**Booklet showing rake links, composition etc. of Passenger Carrying Trains :-**

2.411 Each Zonal railway publishes such a book for guidance of staff. This booklet gives the following information for all passenger carrying trains:-

(i) Rake Links.

(ii) Normal Composition of rakes.

(iii) Marshalling order of each rake.

(iv) Permissible loads.

(v) Maintenance stations.

2.412 A typical example of a rake link covering 2403/2404 and 2413/2414 Super Fast Express trains on the Northern Railway is given below:-

| Composition/Marshalling Order | |
|---|---|
| Sl | 1 |
| GS | 2 |
| WGSCN | 3 |
| WGACCW | 4 |
| GS | 5 |
| WGSCN | 6 |
| SLR | 7 |
| Total | 8 |

**RAKE LINK-NO.25**

| | | | | |
|---|---|---|---|---|
| JAT | | DLI | | |
| DEP: | 18.25 | 2404 | ARRL : 04.35 | |
| JP | | | | |
| ARRL : 10.35 | | 2413 | DEP | 05.30 |
| | | | DLI | |
| DEP: | 16.45 | 2414 | ARRL: | 21.50 |
| JAT | | | | |
| ARRL : 08.50 | | 2403 | DEP | 22.30 |
| DEP | 18.35 | | | |

**LOAD POSITION**

| SECTION | MAX | NORMAL | POWER |
|---|---|---|---|
| All sections | 17 | 17 | WDM-2 |

It will be seen from above that two daily Superfast trains, one between JAT and DLI and other between Delhi and Jaipur, are covered by this rake link. It will also be seen that the number of rakes required is equal to the total turn round time in days. In this case it is two days and two rakes.

**Utilisation of Pasenger Coaches**

2.413 As on 31.3.2016, Indian Railways had 8805 EMU coaches and 54,506 conventional passenger coaches. Efficient management and utilization of this large number of coaches is an important aspect of passenger operation.

**Information system for controlling usage of Passenger Coaches**

2.414 Control of coaching stock is exercised at Zonal HQs level. Earlier 'Cardex' system was used wherein there was a distinctive card for each vehicle in the Coaching Cabinet section of the COM's office. Now railways have installed computers for this purpose.

2.415 Every day all interchange points convey the out-reports of trains interchanged to the Zonal HQs. In addition Divisional Control conveys 18.00hrs. daily coaching stock position which gives the details of spare coaches, programmed bogies, coaches attached and detached etc. Zonal HQs feeds the information in the HQs computers and obtains requisite outputs for exercising proper control on the movements of coaching stock.

2.416 Important aspects to be looked after by the HQs office include the following:-

(a) Rake compositions of trains as per prescribed marshalling and trains are not running under load.

(b) Coaches are sent for POH to workshops as per schedule.

(c) Percentage of ineffective coaches is within prescribed limit. Coaches marked sick out of course are repaired expeditiously.

(d) Spare coaches are not held in excess of the target.

(e) Foreign railways' coaches are returned to the owning railways expeditiously. Also chasing the foreign railways to return own railways coaches expeditiously.

(f) Steps are taken to accept maximum movement of programmed bogies and seasonal traffic within existing resources.

**Improving Utilistion of Coaching Stock**

2.417 The following steps help to improve utilisation of coaching stock:-

(a) Having an efficient information system for control of coaching stock:-

(b) Careful planning of Rake Links with mini mum required lie-over periods at terminals. For example in the rake link no 25 of the N.Rly given in para 2,412, the coaching stock utilsation is only 598 Kms per day. while for 2419/2420 Lucknow- New delhi stock Gomti Express trains the utilisatiion is as high as

1014 Kms per day. standardisation of rake compositions can help us to prepare Rake Links combining several trains minimising lie over periods at terminals and improving utilisation of stock.

(c) Reducing ineffective percentage of coaches by better maintenance.

(d) Not holding stock in excess of necessary requirements.

(e) Quick repairs and retrievals of coaches marked sick out of course.

## 2.5 Passenger Stations

### Categories of Passenger Stations

2.501 Passaesnger stations could be broadly divided into the following categories:-

(a) 'D' class non-block stations.

(b) Roadside small and medium size block stations.

(c) Major stations including Junction stations.

(d) Passenger terminals.

(e) 'D' Class Non-block Stations

2.502 In the General Rules, 'D' class non-block stations have been defined as places which area situated between two consecutive block stations and do not from the boundary of any block station.

2.503 A 'D' class station which serves an outlying siding is called 'DK' station. The siding takes off through a cross over at such a station and the cross-over can be operated only with the help of a key released by inserting the line clear Token in a box provided for the purpose. The Token gets locked in the box and can be released only when the points are set and locked in the normal position for the main line. The key also gets locked back in the box.

2.504 A 'D' class station which serves no siding is called a 'Halt' or 'Flag' station. A halt has normally a rail-level platform and no railway staff is posted to man the station. Passengers at such stations area booked by the Travelling Ticket Examiners or the Guard of the train. Halt may also be operated for booking of passengers etc. through a contractor. It is known as 'Contractor operated Halt'.

2.505 A 'Flag' station has a station building including booking office and waiting hall. Commercial staff area posted there for booking of passengers and parcels.

2.506 Normally only slow moving passenger trains are booked to stop at 'Halt' or 'Flag' stations.

### (b) Roadside block stations

2.507 Roadside block stations are small intermediate stations where only slow moving passenger trains are booked to stop. As the small booking of goods traffic has been

discontinued since Dec. 94 and piecemeal wagonload goods traffic is not begin generally accepted, most of the roadside stations have been closed for goods booking. Such stations now deal with passenger and parcel traffic only. Main operating work at such stations includes arranging of trains passing, crossings, precedence and dealing with stopping passenger trains.

2.508 For operation of points and signals at such stations, there may be either a central abin or there may be two cabins, one at either end of the station. Block instruments may be provided either in the cabins or in the Station Master's office. When the Block working is done from cabins, the cabins are manned by Cabin ASMs or Switchmen. However, Station Master controls the operation of reception and dispatch signals through 'slides control' provided in his office. Reception and dispatch of trains and shunting movements, if any, are done strictly according to the instructions laid done in the 'Station Working Orders'.

2.509 When a train runs through, the Station Master in proper uniform should stand opposite his office and exchange 'all right' signals with the Driver and Guard of the train. He should carefully watch the running train and, if there are any unusual conditions, such as hot-box etc. he should advise station in advance through the block instrument to stop and examine the train and/or take such action as prescribed in the General and Subsidiary Rules.

**Layouts of Roadside Satiations**

2.510 Some of the typical track layouts of roadside stations are illustrated in the diagrams below (without showing signals):-

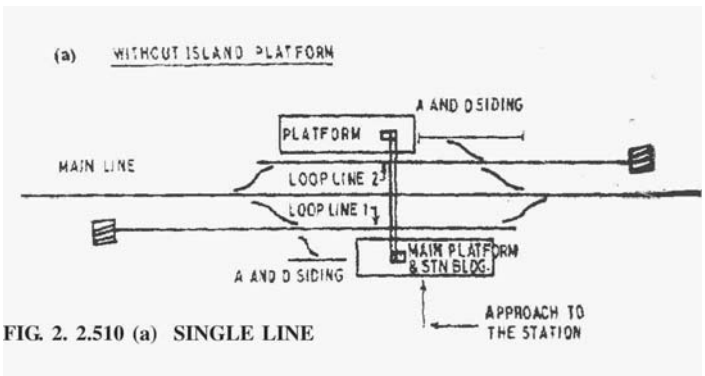



FIG. 2. 2.510 (a) SINGLE LINE

2.511 Notes (1) On an Island platform two stopping trains can be dealt with simultaneously. Also, if a goods train has to be stabled at such a station, it can be accommodated on the loop line of the Island platform, thus keeping the main line free for run through trains. (2) It is desirable to provide 'Attaching and Detaching Sidings' at

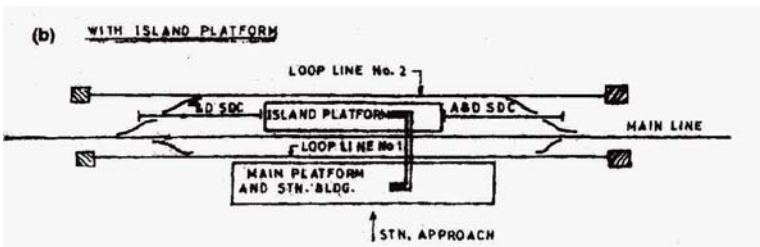



FIG. 2.510 (b)

either end to accommodate Vehicles/wagons, such as marked sick from running trains.

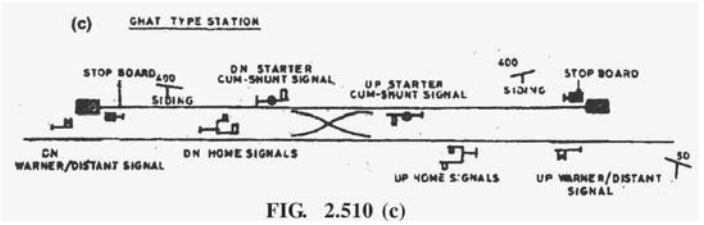


FIG. 2.510 (c)

(3) Foot over bridges should be provided at stations with high level platforms.

(4) On less important routes only one loop line may be provided in addition to the main line.

(5) In case of Ghat type stations, while arranging crossing of trains, the train negotiating the up gradient (up train in this case) should not be stopped at the Home signal and must be received directly on the lie by Siding, detaining the other direction train at the Home signal, if necessary.

2.512 Note: In the above layout the following aspects are worth noting:-

(a) Attaching/ Detaching sidings are provided in each direction

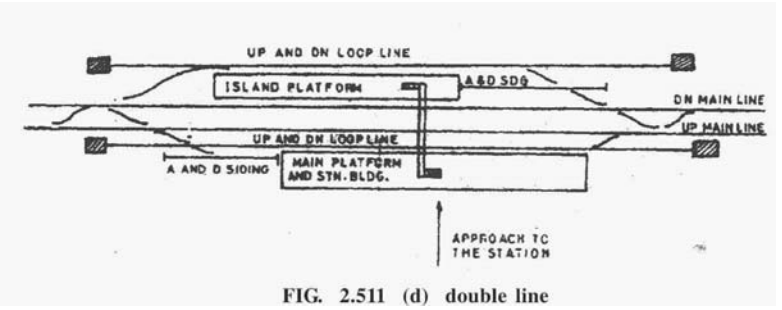


FIG. 2.511 (d) double line

(b) Island platform helps in dealing with more than one train in each direction. Also if necessary,

a goods train can be stabled on the loop line of the Island platform keeping main line free for stopping passenger trains and all run through trains.

(c) Main station building has direct approach for passengers. Apart from convenience to passengers, this facilitates provision of a nice front elevation for the station building.

(d) Main platform loop line has facility for reception of both Up and Dn trains. Hence more important stopping trains can be received on the main platform line.

(e) Facing and trailing cross-overs are provided in either direction. In case of accidents etc. if temporary signal line working has to be adopted, there will be no need of backing a train from one line to the other in such layout.

**Junction Stations**

2.513 A station where lines meet from more than two directions is called a Junction station. A few examples are Itarsi, Moghalsarai, Lucknow, Ghaziabad, Kazipet, Muri, and Bangalore.

The following aspects may be kept in view while designing layouts of junction stations:-

(i) It should be possible to receive trains simultaneously from various directions.

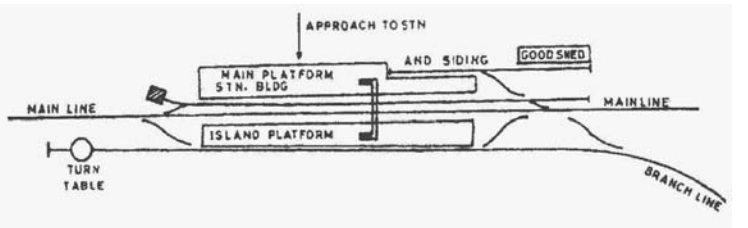
(ii) Adequate number of platform lines should be provided so that trains are not detained for reception at the station.

(iii) In case connection is to be provided with a branch line train, an Island platform maybe so designed that the passengers may transship from one train to another using the same platform.

Typical layout of a junction station maybe as given in the diagram below:

**Passenger Terminal Stations**

2.514 A few examples of such terminals are, Mumbai CST, Mumbai Central, Churchgate, Howrah, Sealdah, Dehradun,




and Kalka. A few important aspects in the layouts of such stations are given below:-

(a) Reception and dispatch of trains should be easy. Adequate number of Platforms should be provided keeping in view the requirements of reception, despatach and berthing of trains. Major Stations should have route relay interlocking and all Points and Signals should be centrally operated from a Route Relay Cabin.

(b) Interlocking should permit maximum simultaneous movements both for reception and dispatch of trains as well as shunting. Diesel shunting engines should be provided as per requirements.

(c) Approach and dispersal of passengers should be easy. At a suburban terminal platforms may be provided at either end of a track as has been done at Churchgate station of the Western Railway.

(d) Adequate facilities such as washing lines and sick lines should be provided for cleaning and maintenance of rakes of passenger trains.

(e) If possible, an approach road may be provided between two important platforms where passengers may get their cars, as is the case at Howrah station.

(f) The front elevation of the station may be designed beautifully.

(g) The drainage should be designed carefully so that there is no stagnation of water. Washable aprons should be provided so that cleaning of tracks is easy. Examples of two different types of layouts of terminal stations are given below (only reception

lines and passenger concourse are shown):

**Passenger Terminal Stations**

(Ancillary facilities such as washing lines, sick lines, stabling lines, loco shed other sidings etc. not shown for simplicity)

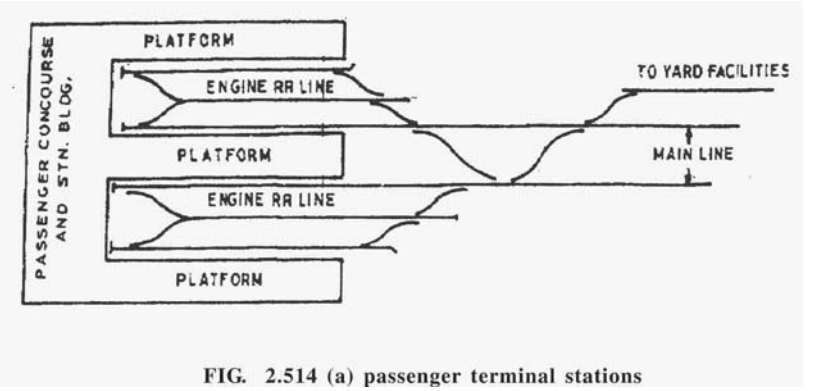



FIG. 2.514 (a) passenger terminal stations

Note : *(1) In the above layout locomotive of an incoming train can be released immediataely on the arrival of the train through the engine run-round (ERR) line. However, it involves lot of additional space and expenditure for this purpose.*

*(2) Hydraulic buffers are provided at the dead ends of Reception lines*

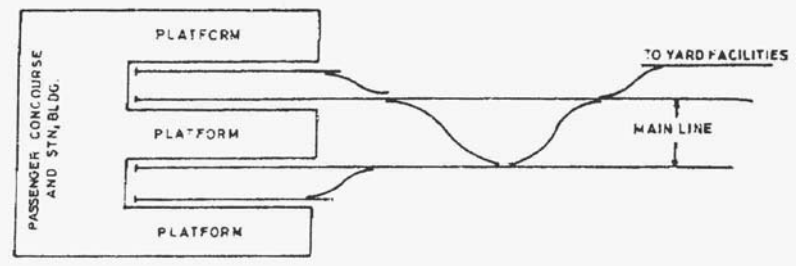



FIG. 2.514 (b)

*Note: In this type of layout the locomotive of an incoming train gets locked up till the rake is released and backed. A rake should normally be released in 15mts to ½ hour sand as such it is not a serious constraint, but it saves previous space of the terminal station.*

**Facilities At Major Stations**

2.515 Facilities at major stations should include the following:-

(a) Adequate number of platform lines.

(b) Adequate number of washing and sick repair lines.

(c) Extra lines to accommodate spare coaches.

(d) Engine movement and run round lines.

(e) Special platform facilities for tourist and programmed bogies.

(f) Saloon sidling with platforms for Inspection Carriages.

(g) Layout should permit easy shunting movements and simultaneous reception and dispatch facilities.

(h) Sufficiently wide foot over bridges or sub-ways.

(i) Offices for the officials of various departments.

(j) Running Room facilities for train crews as well as TTEs

(k) Proper shelter and basic facilities for licensed porters.

**Commercial facilities will include**

2.516 (i) Proper enquiry, reservation and booking offices.

(ii) Sufficiently large parcel office and facilities for stacking and movement of parcels and luggage.

(iii) Proper approach, including adequate area for parking of road vehicles.

(iv) Waiting Rooms, Waiting Halls, Retiring Rooms.

(v) Adequate and convenient drinking water and catering facilities, including refreshment rooms and stalls.

(vi) Public address and announcements system.

(vii) Public Telephone booth.

(viii) Public conveniences (Toilets etc.)

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