

Chapter 2

Infrastructure and Planning

Audit examined the adequacy of the existing facilities /infrastructures at selected 15 stations over ten Zonal Railways, studied their utilization and impact of deficiencies in these facilities /infrastructures on the train services. Audit also analysed constraints which are leading to line congestions and action taken by Railways to ease the line congestion. Audit analysis of issues and inter-station comparison of infrastructure/facilities, detentions and execution of works are discussed in the Chapter 2 and 3. Station specific issues have been discussed in Chapter 4.

2.1 Planning for infrastructure on stations for smooth movement of trains

Indian Railways have conceptualized framework for development of stations in order to provide better facilities to passengers on railway stations. Towards this, Railway Board have issued instructions from time to time for development of World Class Stations through Public Private Partnership (PPP). Key objective of the project of World Class Stations is to provide superior services to railway passengers at the stations by converting them into urban icon and standard bearers of the cities. A special purpose company viz., Indian Railway Stations Development Corporation Limited² (IRSDC) has also been incorporated (April 2012) specifically for the purpose of development/redevelopment of stations. The scope of redevelopment of station by IRSDC includes upgradation of level of passenger amenities by new construction/ renovation including redevelopment of station buildings, platform surfaces, circulating areas etc. to better standard so as to serve the need of the passengers. This also include development of real estate of railway land and its commercial utilisation.

Audit observed that the activities for development/ redevelopment of stations include all facilities to be provided to the passengers on the stations including station buildings, station facilities e.g. ticket counters and vending machines, cloak rooms, waiting room, Public Address and information system, lifts, stairs and escalators, sign system, facilities for parking and transportation, shops etc. However, the scope of such projects completely excludes the requirement of various works relating to track, S&T, electrical and railway operations at stations, which has a bearing on quality of services being provided to the passengers in terms of timely arrival and departure of trains and smooth journey to/from stations without any unreasonable and unnecessary delays. As such, important activities such as providing platform with adequate length for facilitating easy boarding/de-boarding of passengers travelling in trains with longer lengths, providing adequate facilities for stabling and maintenance of trains on stations, adequate yard capacity, etc. which significantly contribute in timely arrival and departure of trains on the platforms are not part of any of the stations development/redevelopment plans. These plans mainly address on facilities on and facade of stations only and not on removing constraints and bottlenecks

² A Joint Venture of IRCON International Ltd. and Rail Land Development Authority

for ensuring timely arrival and departure of trains to/from the stations, which should be one of the most important parameter of the quality of service being provided to the passengers. Audit reviewed records in respect of 15 selected stations and found that none of the stations have prepared a Master Plan for providing infrastructure on stations to address the bottlenecks/ constraints, which hamper timely arrival and departure of trains to/from the stations.

During Exit Conference (March 2018), Railway Board agreed that having a specific Master Plan for identifying constraints and addressing them on priority would be helpful in effective execution and monitoring of traffic facility works. They further stated that passenger amenities works and traffic facility works are executed through different Plan Head so that they can be prioritised and executed.

Audit is of the view that the main concern of the passenger is to commence and complete her journey on time and if punctuality is ensured, the passenger would like to spend minimum time in the station area. Thus, there is a need to prepare comprehensive Master Plans for all important stations including number and length of platforms, number of washing pit/stabling lines, yards and other facilities, in order to address the reasons which leads to delay and arrival and departure of trains to/from stations. It is also felt that before taking up modernisation/redevelopment of stations and constructing new buildings, the option of further expansion of the stations by adding more platforms need to be explored.

2.2 Availability and augmentation of infrastructure at stations to handle the passenger trains

Audit reviewed the availability and augmentation of infrastructure at the selected stations as of March 2007, March 2012 and March 2017. While data in respect of 2012 was not available for four stations, data for 2007 was available for seven stations only³. Review of available information showed that

- At 11 stations⁴, where information related to availability of infrastructure as of March 2012 and March 2017 was available, number of trains originated/ terminated per day increased by 13 per cent (94 trains) in March 2017 in comparison to March 2012. However, in these 11 stations, only two pit lines were added during this period taking the number of washing pit lines from 59 to 61 and the number of stabling lines remained the same. This caused increase in waiting time for stabling and maintenance of trains in washing pit lines and subsequently resulted in detention of trains at platforms after termination. Absence of adequate washing pit lines/ stabling lines is also one of the reasons for late start of trains originating from the station.

³ Records of infrastructure at stations as of March 2012 were not available at Delhi, Kanpur, Allahabad, Mathura stations. Similarly, records of infrastructure at stations as of March 2007 as well as March 2012 were not available at New Delhi, Delhi, Kanpur, Allahabad, Mathura, Bhopal, Itarsi and Ahmedabad stations.

⁴ Patna, Mughalsarai, New Delhi, Howrah, Jaipur, Bhopal, Itarsi, Ahmedabad, Vijayawada, Chennai Central, Nagpur

- In the above 11 stations, number of trains handled in March 2017 (originated/ terminated/ passing through) per day also increased by 176 trains (11 *per cent*), as compared to March 2012. However, only seven⁵ platforms were added during this period (Mughalsarai (two), Itarsi (one), Ahmedabad (three) and Nagpur (one)). Absence of adequate number of platforms was one of the reasons for detention of trains at the preceding station/outer signal.
- Audit also reviewed availability of infrastructure of seven⁶ stations of the above 11 stations, where related information was available for March 2007 as well. In these seven stations, number of trains originated/ terminated trains increased from 383 as of March 2007 to 540 as of March 2017 i.e. by 157 trains per day during the ten years' period. However, the number of washing pit lines and stabling lines in these seven stations remained constant over the period of ten years i.e. since March 2007. Non-availability of adequate number of washing pit lines and stabling lines was one of the reasons for detention of terminated trains at the platforms awaiting shift to stabling/washing pit lines and late start of originated trains from the stations after maintenance.
- In the above seven stations, the number of platforms increased by only seven (10 *per cent*) over the period of ten years (from March 2007 to March 2017) in comparison to the increase of number of total trains handled per day by 272 trains⁷ (34 *per cent*) during the same period.

Adequate number of platforms is necessary to ensure that trains do not wait outside stations for want of platform. Also, adequate number of washing pit lines is necessary for undertaking primary/secondary maintenance of trains originating/terminating on the stations. The time taken for primary maintenance of a train is six hours per train and for secondary maintenance, a time of two hours is required. With increase in number of trains originating/terminating on a station, the number of washing pit lines should increase accordingly. Likewise, adequate number of stabling lines is necessary so as to vacate the platform to free the main line for operation of trains. However, Audit observed that infrastructure such as platforms, washing pit lines and stabling lines at the stations were not augmented according to increase in number of trains handled on these stations over a period of time.

During the analysis of availability of infrastructure of the 15 selected stations, as on 31 March 2017, it was observed that 638 trains were handled on these 15 stations, which had 24 coaches or more. To accommodate these train rakes of longer length, there should be platform of adequate length and adequate facilities of stabling and washing pit lines. One of the effective means to handle more passenger traffic with the existing infrastructure facilities and minimum infrastructure addition, is to run trains with longer lengths and higher coach composition. The details of available infrastructure on these selected stations are given below:

⁵ 117 as of March 2017 as against 110 platforms as of March 2012

⁶ Patna, Mughalsarai, Howrah, Jaipur, Vijayawada, Chennai Central, Nagpur

⁷ from 804 trains in March 2007 to 1076 trains in March 2017

Station	Average number of originating/terminating trains per day	Average number of trains passing through	Total number of platforms	No. of platforms with capacity to handle 24 or more coaches	Total no. of pit lines	No. of pit lines with capacity to handle 24 or more coach trains	Total no. of stabling lines	No. of stabling lines with capacity to handle 24 or more coach trains
Patna	100	59	10	7	2	1	3	2
Mughalsarai	28	112	8	4	0	0	0	0
New Delhi	166	76	16	13	14	9	22	12
Delhi	186	77	16	5	8	1	10	0
Kanpur	25	303	10	5	7	2	0	0
Allahabad	18	172	10	6	2	1	1	1
Mathura	10	180	10	5	2	0	1	0
Howrah	104	3	22	10	0	0	0	0
Jaipur	43	54	5	5	3	3	4	0
Bhopal	26	132	6	4	2	1	0	0
Itarsi	14	146	7	7	2	0	0	0
Ahmedabad	84	58	13	9	11	5	11	4
Vijayawada	72	122	10	8	5	3	0	0
Chennai Central	138	19	12	8	19	7	9	0
Nagpur	20	102	8	5	2	2	1	0
Total	1034	1615	163	101	79	35	62	19

Audit observed that

- New terminals/stations were developed to decongest the existing stations for example, Anand Vihar Terminal for decongestion of New Delhi/ Delhi station, Rajendranagar Terminal and Patliputra station for decongestion of Patna Junction, Prayag and Cheeki stations for decongestion of Allahabad station. To further decongest Allahabad and Delhi stations, works of development of Subedarganj and Sakurbasti stations respectively were taken up, which are in progress. Similar works taken up to decongest Jaipur, Ahmedabad and Nagpur stations, to develop Khatipura, Sabarmati and Ajni stations respectively were in initial stages.
- Out of total 163 platforms in the selected 15 stations, 101 platforms have the capacity to handle trains with 24 or more coaches. Only Itarsi Junction has all its platform lines capacity to handle 24 and more coach trains. At Delhi Jn., out of total 16 platforms, only five have the handling capacity of 24 or more coach trains. Audit noticed a number of instances during joint inspection conducted, wherein due to absence of adequate capacity of platforms, trains with higher number of coaches had to be handled in less capacity platforms leading to inconvenience to passengers in boarding and de-boarding trains.
- Out of the available 79 pit lines and 62 stabling lines in the selected 15 stations, 35 pit lines and 20 stabling lines respectively could handle trains with 24 or more coaches. Due to inadequate facility of washing pits and non-availability of slots in existing washing pit

lines, the terminated trains have to be shifted for maintenance/washing to the washing pit attached to other stations.

- Audit reviewed the works undertaken by the selected 10 Zonal Railways, relating to extension of platforms, construction of new platforms, construction of washing/stabling lines and other traffic facilities works such as route relay interlocking, yard remodelling etc., which were taken up to ease the congestion at stations. Audit observed that works taken up to address the constraints faced by the Railways in decongestion of the stations were not completed on time thereby not achieving the objective of decongestion. In a number of places, works were not taken up to address the constraints.
- Works related to Panel Interlocking (PI) and Route Relay Interlocking (RRI) in Danapur station (preceding station of Patna Junction) of East Central Railway were sanctioned five to 17 years back, but yet to be completed. This impacted the smooth movement of inward trains coming to Patna Junction. Yard remodelling works in Mughalsarai, Mathura Junction, Jaipur and Bhopal stations were going on and yet to be completed after one to ten years of sanction.

During Exit Conference (March 2018), Railway Board agreed with the audit observations and stated that there is need to expeditiously execute the already sanctioned worked at the stations. As regards, recording of reasons for exclusion of works from the Plan, they stated that the same could be due to fixing of priorities among the works by Railway Board. They added that while there constraints of funds in earlier years, the same are not a constraint any more.

These deficiencies in the available infrastructure on the selected stations were the main reason for detention of trains at or before stations. Due to absence of adequate capacity of platforms, trains with higher number of coaches had to be handled at less capacity platforms, leading to inconvenience to passengers in boarding and de-boarding trains. Works taken up were not completed timely so as to derive the intended benefits from the same. These deficiencies in infrastructure and delays in completion of works had a cascading impact on the running and punctuality of the inbound and outbound trains on these stations, as the trains were detained at adjacent stations, outer signals, enroute or on stations due to want of further path as discussed in the following chapter.

Thus, there is a need to prepare comprehensive Master Plans by all Zonal Railways for stations with heavy passenger traffic, identify constraints of station line capacity and devise measures to be taken to address these constraints on priority. There is also a need to develop a suitable methodology for assessing the requirements of infrastructure on various stations such as number of platforms, length of platforms, availability of pit lines, stabling lines and yard etc. with reference to the pattern of the traffic being handled at these stations. The milestones for execution of the works identified to address these constraints are required to be clearly laid down and followed and the infrastructure augmented keeping pace with the increase in traffic.