

Executive Summary

Indian Railways is one of the world's largest railway networks in the world comprising 121,407 km of track over a route of 67,368 km and 7,349 stations. In 2016-17, Indian Railways carried 22.24 million passengers per day and ran 13,329 passenger trains every day. With a view to handle the growing demand for Passengers and Goods traffic, the existing level of traffic facilities at Stations/Terminals are subject to continued process of up-gradation and augmentation. Adequate investment and timely completion of works relating to augmentation of station line capacity and efficient management of operations would result in timely running of trains, increase in efficiency of operations and containing loss due detention of train/engines. Decongested line at a station is largely dependent on factors like adequate number and length of platforms and tracks, proper interlinking of tracks, adequate lines for stabling and maintenance of passenger trains and obstacle free movement of trains without any permanent speed restrictions. Line congestion not only results in detention of trains and loss of punctuality, but also results in sub-optimal use of rolling stock. Detention of trains ultimately results in poor quality service to the passengers.

The Audit was conducted with an objective to assess whether the available infrastructure at selected stations is adequate for handling the present and expected traffic load, what is the impact of deficiencies in the existing infrastructure on smooth and efficient running of trains and whether adequate and effective steps have been taken for identifying and addressing the bottlenecks in handling traffic load on these stations. Fifteen stations in ten Zonal Railways falling on the routes with heavy passenger traffic were selected as sample for audit. Audit analysed one month data (March 2017) for detailed study of impact of the deficiencies in infrastructure in terms of detention of trains at adjoining stations/*en route*/platforms, on train services.

Audit findings

- 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. significantly contribute in timely arrival and departure of trains on the platforms. Audit observed that these activities are not part of any of the stations development/redevelopment plans. The station development/redevelopment plans mainly address on facilities for the passengers on the station premises and facade of stations only and not on removing constraints and bottlenecks 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.

(Para 2.1)

- Over a period of time there has been a significant increase in number of trains handled per day in the 15 selected stations. However, the 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. Audit reviewed the data of number of trains handled, platforms, washing pit lines and stabling lines in respect of these station for March 2007, March 2012 and March 2017 and 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.
 - At 11 stations viz. Patna, Mughalsarai, New Delhi, Howrah, Jaipur, Bhopal, Itarsi, Ahmedabad, Vijayawada, Chennai Central, Nagpur, 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 and the number of stabling lines remained the same.
 - In the above 11 stations, number of trains handled in March 2017 (originated/ terminated/ passing through) per day increased by 176 trains (11 *per cent*), as compared to March 2012. However, only seven platforms were added during this period (Mughalsarai (two), Itarsi (one), Ahmedabad (three) and Nagpur (one)).
 - In respect of seven stations viz. Patna, Mughalsarai, Howrah, Jaipur, Vijayawada, Chennai Central, Nagpur of audit reviewed the information for March 2007 in addition to March 2012 and March 2017. 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. 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.
 - In these 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 trains (34 *per cent*) during the same period.
 - 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 originating trains from the stations after maintenance. Absence of adequate number of platforms was one of the important reason for detention of trains at the preceding station/outer signal.
- Of the 2436 trains handled by the selected 15 stations as of March 2017, 638 trains are being run with 24 or more coaches every day. To

accommodate these train rakes of longer length, there should be platform of adequate length and adequate facilities of stabling and washing pit lines.

- On the selected 15 stations, out of 164 platforms, 100 platforms have the capacity to handle trains with 24 or more coaches. Due to absence of adequate capacity of platforms, trains with higher number of coaches had to be handled on platforms of shorter lengths, which led to inconvenience to passengers in boarding and de-boarding trains.
- Out of 79 pit lines and 63 stabling lines, only 35 pit lines and 20 stabling lines have the capacity to handle trains with 24 or more coaches. This increased the time taken for maintenance of trains and impacted punctuality.

(Para 2.2)

- Due to non-availability of path (platform/line), the trains have to wait at outer signal or the adjacent station until the platform is vacated by pre-occupied trains. Audit analysed the data for March 2017, and observed significant detentions to trains at the selected stations.

Table 3 – Average Detention per train on account of various reasons during March 2017 (in minutes)								
Station	Number of originating/terminating trains per day	No. of trains passing through	Detention at adjacent stations/outer stations for Goods trains	Detention at adjacent stations/outer stations for coaching trains	En route detention of coaching trains from outer signal/adjacent station to the selected station	Detention at platforms (excess stoppage than the prescribed period) of coaching trains	Detention at platform (after termination of train) (beyond 30 minutes) of coaching trains	Detention of coaching trains due to late start of trains from stations
Patna	100	59	29	19	11	14	28	46
Mughalsarai	28	112	21	20	18	10	16	30
New Delhi	166	76	0	25	14	15	0	16
Delhi	186	77	0	24	18	13	0	23
Kanpur Central	25	303	100	19	7	10	60	66
Allahabad	18	172	31	23	6	17	102	60
Mathura	10	180	34	15	13	7	26	74
Howrah	104	3	7	9	7	10	33	20
Jaipur	43	54	91	19	7	8	32	39
Bhopal	26	132	33	0	17	8	0	12
Itarsi	14	146	43	8	11	10	21	46
Ahmedabad	84	58	28	0	6	7	56	10
Vijayawada	72	122	75	24	10	11	21	21
Chennai Central	138	19	0	17	4	0	44	6
Nagpur	20	102	59	22	6	12	60	28

- Passenger trains were detained for more than 15 minutes per train in all the selected stations except Howrah, Bhopal, Itarsi and Ahmedabad. At these stations, the trains were detained between 15 to 25 minutes per train.

- The detention of goods trains were significantly higher and was from 21 to 100 minutes per goods train on all the selected stations except Delhi, New Delhi, Howrah and Chennai Central.
- Passenger trains were also detained *en route* for more than 10 minutes from outer signal/adjacent station, before reaching Patna, Mughalsarai, New Delhi, Delhi, Mathura, Bhopal and Itarsi.
- Passenger trains were also stopped beyond their stoppage time at the selected stations for than 10 minutes at Patna, New Delhi, Delhi, Allahabad, Vijayawada and Nagpur.
- Passenger trains were started late form the selected stations by more than 15 minutes and up to 74 minutes at all the selected stations except, Bhopal, Ahmedabad and Chennai Central.

(Paras3.1 to 3.6)

Station-specific audit findings are given below:

- At Allahabad, while Cheeki station has been developed as a terminal station and some of the trains shifted to that station, other alternative stations (Subedarganj and Naini) were yet to be developed. The available washing pit lines and stabling lines were also not adequate to cater to the maintenance of trains originating/ terminating at Allahabad station. During March 2017, between adjacent stations to the Allahabad station, there was *en route* detention of 48506 minutes in respect of 2261 trains. 367 trains were detained on platforms at Allahabad station for 6259 minutes over and above their scheduled stoppage time prescribed in the time table.

(Para 4.1)

- Kanpur Central station handles around 328 trains per day. Only five out of 10 platforms have the capability to handle trains with more than 24 coaches. Due to inadequacy of platform length, trains having more coach capacity had to be stopped at the platforms with lesser coach capacity. During March 2017, between adjacent stations to the Kanpur Central station, there was *en route* detention of 47121 minutes in respect of 2851 trains. During March 2017, there were excess stoppage of 29813 minutes in respect of 2970 trains on platform at Kanpur Central station.

(Para 4.2)

- Mathura Junction station handles around 190 trains per day. Only five of 10 platforms have the capability to handle trains with more than 24 coaches. There are only two washing pit lines and one stabling line in the Mathura station, which cannot handle trains with 24 coaches or more. There were no proposal to construction of new station/terminal nearby Mathura station to decongest the Mathura station. Between adjacent stations to the Mathura station, there was detention of 12059 minutes in respect of 1660 trains during the month of March 2017. 160 trains which originate at Mathura station, started late after being detained for 161 hours during March 2017.

(Para 4.3)

- Patna station handles around 159 trains per day. Out of two washing pit lines available at this station, only one can handle trains with 24 coaches or more. Though the number of trains being handled at Patna station has decreased over the past three years and a number of trains have been shifted to adjacent stations, congestion still exist. During March 2017, detention of average 19 minutes per train was noticed at the adjacent stations to the Patna station. 637 were detained on platforms at Patna station for 9181 minutes over and above their scheduled stoppage time prescribed in the time table. Platform no. 8 has the capacity for handling 24 coach trains when received up/down directions from/to Patna-Gaya line, but for the main line trains, it has the capacity to handle only 17 coaches. The work for addressing this constraint was yet to be proposed by ECR Administration.

(Para 4.4)

- At Mughalsarai station, only four out of eight platforms have the capacity to handle trains with 24 or more coaches. Due to inadequacy of platform length, trains having more coach capacity had to be stopped at the platforms with lesser coach capacity, which caused inconvenience to passengers in boarding and de-boarding the trains. The work 'All platform 24 coaches at Mughalsarai' was awarded in May 2012, which is yet to be completed. During March 2017, 168 trains started late from Mughalsarai station, after being detained for 84 hours.

(Para 4.5)

- All the platforms (seven) of Itarsi station have the capacity to handle trains with 24 or more coaches. To ease the congestion, no proposal was made to construct new station/terminal nearby the Itarsi station. During March 2017, 1343 trains were detained on platforms at Itarsi station for 12877 minutes over and above their scheduled stoppage time prescribed in the time table. 76 trains which originate from Itarsi station, started late from the station, after being detained for 59 hours.

(Para 4.6)

- Through Bhopal station, a significant number of trains i.e. on an average 132 trains passing per day, there are only six platforms on this station. During March 2017, between adjacent stations to the Bhopal station, there was *en route* detention of 12771 minutes in respect of 752 trains. Excess stoppage of 6593 minutes in respect of 823 trains was noticed on platforms. 104 trains which originated at Bhopal station, started late after being detained for 20 hours. There are no stabling lines at Bhopal station due to which five Mail/Express trains which terminate at Bhopal station are returned without primary maintenance.

(Para 4.7)

- Ahmedabad station handles around 142 trains per day and there are 13 platforms to handle these trains. There are 11 washing pit line and 11 stabling lines at this station. No detention was noticed of passenger trains at adjacent stations/outer signals of Ahmedabad station. However, 512

trains were detained on platforms at Ahmedabad station for 3375 minutes over and above their scheduled stoppage time prescribed in the time table in March 2017. 497 trains which originate at Ahmedabad station, started late from Ahmedabad station, after being detained for 83 hours. To decongest Ahmedabad station, in 2013-14, Railways planned development of second coaching terminal at Sabarmati (6 kms away), which was yet to be completed.

(Para 4.8)

- Chennai Central (MAS), a terminal station, on an average handles around 157 trains per day and Suburban terminal (MASS) on an average handles around 215 to and fro trains per day. Although MAS and MASS handles train services from different corridors, exclusive tracks were not available for each direction of traffic from Chennai Central, as all these lines physically converge at Basin Bridge Junction located 2.2 kms away from Chennai Central, forming a bottleneck. There was *en route* detention of 988 minutes in respect of 256 trains between adjacent stations to the Chennai Central station during the month of March 2017. 3605 trains which originate from Chennai Central station, started late from the station, after being detained for 370 hours.

(Para 4.9)

- At Howrah station, out of the total 22 platforms, only 10 platforms have the capacity to handle trains with 24 or more coaches. Trains with higher coach capacity had to be stopped at platforms with lesser coach capacity which resulted in inconvenience to passengers. During March 2017, 54 trains were detained on platforms at Howrah station for 524 minutes over and above their scheduled stoppage time prescribed in the time table. 118 trains which originate at Howrah station, started late from Howrah station, after being detained for 39 hours. A work, 'New Platform no. 24 at Howrah' was sanctioned in the year 2015-16, but detailed estimate was yet to be finalized.

(Para 4.10)

- Jaipur station handle 97 trains, but has only six platforms, which caused detention of inward trains. Between adjacent stations to the Jaipur station, there was *en route* detention of 2161 minutes in respect of 304 trains. During the month of March 2017, there were excess stoppage of 10349 minutes in respect of 1270 trains on platforms at Jaipur station. 335 trains which originate at Jaipur station, started late from Jaipur station, after being detained for 219 hours. In order to eliminate congestion at Jaipur, a proposal was made in October 2015 to construct a large passenger terminal with modern facilities at Khatipura, an adjacent station to Jaipur, for which detailed estimates were yet to be prepared.

(Para 4.11)

- Nagpur station handles around 122 trains per day with eight platforms. During the last three years one platform has been added to this station. During March 2017, there was *en route* detention of 3634 minutes in

respect of 569 trains between adjacent stations to the Nagpur. 522 trains were detained on platforms at Nagpur station for 6275 minutes over and above their scheduled stoppage time prescribed. To decongest the Nagpur station, development of Ajni station, was sanctioned during the year 2016-17, but detailed estimate was yet to be sanctioned (November 2017). The work of extension of platforms No. 4, 5 and 7 for 24 coaches was proposed by Divisional authority of Nagpur Division in the year 2013-14, the same was not included in the Final Works Programme.

(Para 4.12)

- New Delhi stations handles around 242 trains and Delhi station handles 263 trains per day. During the last three years, the number of trains handled has increased by 14 on each of these two stations. At Delhi station, out of 16 platforms, only five can handle trains with 24 or more coaches. To ease the congestion of New Delhi and Delhi stations, Anand Vihar Terminal was developed (Phase I – three platforms in 2009 and Phase II – four platforms in 2015). During the month of March 2017, 289 and 474 trains were detained on platforms at New Delhi and Delhi stations respectively for 4301 minutes and 6110 minutes respectively over and above their scheduled stoppage time. 154 trains, which originate at New Delhi station, started late from New Delhi station, after being detained for 46 hours. At Delhi station, 707 trains originated with late, after being detained for 269 hours.

(Para 4.13)

- Vijayawada station handles around 194 trains per day. Around 72 trains originated/terminated at this station daily. However, this station have only five washing pit lines, of which only three can handle trains with 24 coaches or more. This station has no stabling line. There was no proposal for construction of new terminal station to decongest station at Vijayawada station during 2014-17. During March 2017, between adjacent stations to the Vijayawada station, there was *en route* detention of 11575 minutes in respect of 1162 trains. 518 trains which originate at Vijayawada station, started late from the station, after being detained for 178 hours. The work of extension of these two platforms (no.2 and 3) to handle 24 coaches was taken up in September 2015 and scheduled for completion in December 2016, which is still in progress as of March 2017.

(Para 4.14)

Recommendations

1. ***All Zonal Railways need to prepare comprehensive Master Plans for stations with heavy passenger traffic, identify constraints of station line capacity and devise measures to be taken to address these constraints on priority. They may 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 may be clearly laid down and followed. The infrastructure should be augmented keeping pace with the increase in traffic.

- 2. Before taking up modernization/redevelopment of stations and constructing new buildings, the possibility of further expansion of the stations by adding more platforms need to be considered. The modernization/ redevelopment of stations should also address infrastructural constraints and works such as construction of additional platforms, stabling and washing pit lines, remodelling of yards etc., should be included in the scope of modernization/redevelopment of stations.*
- 3. It may be desirable to increase the length of all the platforms at major stations so as to accommodate trains of 24 or more coaches.*
- 4. Railways need to create additional platforms/ pit lines of adequate length where the number of platforms is not adequate for handling the trains originating/ terminating/ passing by the station. Where creation of additional platforms/pit lines is not possible due to space constraints, Railways need to explore alternatives places to develop new stations/terminals to decongest the existing stations and/or increasing length of platforms so as to accommodate two trains simultaneously at a platform.*
- 5. The works already planned/ ongoing to augment the station line capacity (platform/lines, yard remodeling, RRI etc.) need to be expedited to achieve the stated objectives of the works.*
- 6. To avoid the detention of trains at outer signals/adjacent stations/en route besides augmenting station line capacity, Railway need to address the other constraints causing detentions such as route relay interlocking, yard remodelling, etc. Traffic facility works for removal of these constraints need to be taken up and completed on priority basis.*
- 7. Time norms for removal of empty rakes of the terminated trains from the platforms may be prescribed for optimum utilization of platforms.*