Executive Summary

This study highlights the factors affecting the "throughput" and "line capacity" on the Indian Railways (IR). Study also examines the extent & scope of higher freight speeds as a factor to augment the line capacity. In this context the study examines the role of "motive power to trailing load ratio" (HP/TL) in improving speeds of freight trains in IR & how higher HP/TL ratio can be implemented.

Projected future target of freight traffic has posed a significant challenge to the Indian Railways. Railway is already facing resource crunch & saturation of capacity. It is also grappling with problems of reliability, safety & aging infrastructure. To achieve the target Indian Railways will have to either invest heavily in infrastructure or improve its operational efficiency and asset utilization.

Indian Railways is much behind other similar Asian countries in terms of & speeds and throughput. Average speed of freight trains is only 25 KMPH in India and is one of the major contributors to poor line capacity. This study finds that various demographic, infrastructural & operational bottlenecks adversely affect freight speeds. Wide variety of train mix, high speed differentials & poor HP/TL ratio are the major reasons for lower speeds of the freight trains. In this context it is observed that on the existing network, mere infrastructural augmentation alone will not yield desired result unless speeds of the freight trains are increased and speed variance is minimized.

The study also observed that HP/TL ratio controls important parameters like speed, acceleration, distance & time to achieve desired speeds etc. HP/TL ratio is of the order of 1 for most of the freight trains in IR & desired acceleration/speeds of 75 KMPH or more on all terrain can not be achieved with prevalent HP/TL. Therefore it needs to be improved to 1.5 and beyond to enhance speeds and reduce the running time. This can bring an increase in line capacity upto 30%. Study shows that higher average speeds of freight trains will also improve wagon turn-around time by 20% or more and provide host of other benefits like reduced requirement of crew, reliability improvement etc. culminating in synergy of train operation.

The study finds that increasing HP/TL ratio to at least 1.5 in short term & beyond 2 in long term & running freight trains ahead of passenger trains, can be an economically viable option for IR. To implement this strategy, higher HP locomotives & "multiple locomotive banks" have to be deployed by inducting additional fleet of locomotives. As IR is already facing shortage of locomotives, there is an urgent need to increase the production capacity of locomotives. PSUs & private companies can also play a vital role in bridging the gap in the supply through PPP route.

Therefore increasing HP/TL by augmenting locomotives holds the key to enhance the much needed freight speeds on Indian Railways and subsequently bring down the speed differentials. The study comes out with the recommendations & short term/long term action plan in this regard. This strategy can prove to be a viable option to increase line capacity to meet the future freight demands.