

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.0 Introduction

The first objective was to study proposed plans of IR for raising maximum permissible speed of passenger trains to 160-200 kmph (semi-high speed) on existing lines. IR has been planning to upgrade speed of trains on the existing network since 1987 when JICA conducted a study for upgradation of speed on Delhi-Kanpur sections. JICA recommended introduction of 160 kmph speed on the existing upgraded route. A Mission was launched for taking the plans further but was finally closed in 2001 as it was found to be expensive one. Thereafter, IR continued working on upgradation of speed and related issues on the existing tracks as documented in the report of the working group on Railways for the XI five year Plan (2007- 12). In Dec 2009, IR presented a Vision Document in the parliament with raising speed of regular passenger trains on major trunk routes as one of its visions for passenger segment. During this period, various railway systems of the world were already having passenger trains with 200 kmph speed on conventional railway lines. IR's vision envisage reducing train journeys between cities like Delhi-Kolkata and Delhi-Mumbai to overnight affairs. Since presentation of this vision in 2009, IR is working aggressively on the issue of semi-high speed. It is being

discussed in almost all successive budget speeches of the Hon'ble Minister of Railways.

IR has identified nine routes (about 4300 km long in total), for upgradation to 160-200 kmph. Out of the nine routes, work on one of the routes i.e. Delhi-Agra (198 km) for upgradation of speed of one train (Bhopal Shatabdi) to 160 kmph is almost completed. Though, complete upgradation of this route for raising speed of regular passenger trains to 160 kmph on the entire stretch of 198 km still seems to be quite far due to non-availability of sufficient number of high power locomotives and high speed coaches, large number of permanent and temporary speed restrictions, excessive level crossings, non-segregation of main line from platform line due to concerns on safety of passengers.

A feasibility study of Delhi-Mumbai route for upgradation of speed of passenger trains to semi-high speed (160-200 kmph) by Ministry of Economy, Trade and Industry, Japan (METI) has been completed in 2013. In this report several deficiencies and suggestions to overcome the same in the existing track, signalling, rolling stock etc. for semi-high speed operation of trains have been brought out.

The second objective of the study was to explore, study and identify issues and challenges in upgrading speed of passenger trains in India to semi-high speed. Based on study of various IR reports, report of METI on Delhi-Mumbai route, papers presented in high speed seminars, articles etc., it emerged that IR is facing several issues and challenges in the process of implementation of its semi-high speed

related plans. These issues are inter-dependent with different driving power and dependence. The issues are existing at all levels i.e. strategic, operational and performance. These issues are barriers in raising speed of trains. The barriers identified are (i) lack of financial resources, (ii) rigid organisational structure, (iii) inadequately defined mission and objectives, (iv) over saturated trunk routes, (v) lack of high speed locomotives, coaches and train sets, (vi) non upgraded track and bridge infrastructure, (vii) lack of ATP based signalling system, (viii) lack of weather monitoring systems, (ix) lack of public awareness on trespassing/ encroachments on railway tracks, (x) non-availability of automatic public announcement system on stations, and (xi) unprotected tracks (large number of level crossings and non-fencing of tracks).

Third objective of the study was to model the inter relationship among the issues in raising speed of trains and to prioritise the same. The ISM technique and MICMAC analysis were used for the modelling and prioritising the barriers.

The analysis indicated that inadequately defined mission and objectives is the most important strategic level barrier and has very low dependence on the other variables. It is the key driver for the realising the vision of semi-high speed. ISM model also identified that 'inadequately defined mission and objectives' is the key barrier at the bottom of the digraph indicating that it is a strategic level barrier addressing which will alleviate all other barriers. Barriers like weather monitoring system, lack of awareness among public on trespassing

/encroachment on tracks, non-availability of high power locomotives, high speed coaches and train sets and over saturated trunk routes are the top level barriers on the ISM hierarchy. These barriers have very few linkages with other variables and can be addressed relatively easily, once strategic barriers are addressed. Lack of public awareness on trespassing/encroachments on railway tracks' is another barrier on the top level of hierarchy. Non-upgraded tracks and bridge infrastructure and lack of ATP based signalling are operational level barriers interdependent on each other. Addressing of strategic barriers will directly help in achieving these two barriers being at next higher level in ISM hierarchy.

The barrier of unprotected tracks requires elimination of level crossings and fencing of tracks. This barrier appears at second top most level in the ISM hierarchy and can be achieved by addressing strategic barriers like inadequately defined mission and objectives and lack of financial resources.

## **5.1 Conclusion**

IR has planned and started upgrading infrastructure on identified routes for raising speed of passenger trains from the present 110-150 kmph to 160-200 kmph. Raising speed of trains on the existing tracks has several issues and challenges related to strategy, operational and performance levels. These barriers need to be addressed in order of priority by dealing first with strategic level barriers like setting a road map for the guidance of all functionaries by clearly spelling out IR's

mission and objectives for semi-high speed. A well laid road map shall also facilitate in arranging financial resources which is the next major barrier. Addressing these two barriers will alleviate operational level barriers such as up-gradation of track, signalling and rolling stock, doubling/quadrupling of over saturated routes, elimination of level crossings and fencing of tracks etc. Following this will help in raising the speed on existing tracks in a time bound, effective and efficient manner. Early realisation of IR's semi-high speed vision will be immensely beneficial to IR as well as to the society at large.

## **5.2 Recommendations**

1. Mission and objectives for the semi-high speed vision should be adequately defined for having a clear road map with well defined milestones with timelines. These should be communicated widely to all concerned i.e. policy makers, design experts and other railway officials working in the divisions at the field level.
2. Financial resources should be arranged through budgetary support and extra budgetary resources.
3. The approach should be to upgrade routes to semi-high speed one by one rather than attempting to undertake upgradation work on several routes at the same time in view of limited financial resources available with IR.
4. Aerodynamically designed higher horse power locomotives and light weight coaches with speed potential upto 200 kmph should be