

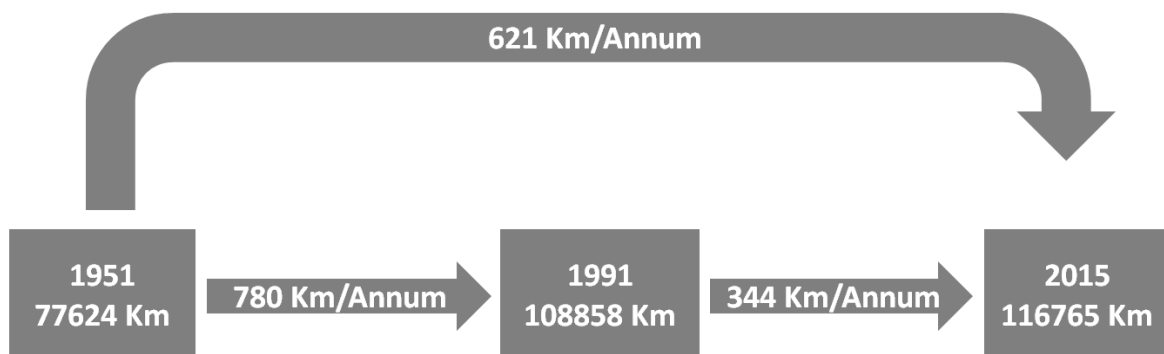
Accelerating Doublings & Triplings – Few needed Improvements

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Synopsis: Doubling, tripling and quadrupling projects for 9400 Km are sanctioned by IR in 2015-16 at an estimated cost of about a lakh crore rupees. Since independence, Indian track km grew at about 620 Km per annum. At this pace, it takes more than 15 years to complete these doublings and triplings. In the last 2 decades, rate of addition of Track Km has retarded considerably. At the retarded pace, it takes about 28 years to complete these sanctioned doublings and triplings. Such long time of completion makes any project management meaningless. It is high time to rework and relook our project delivery systems and re-orient towards faster delivery. A few issues which are going to contribute for faster completion of doublings and triplings are discussed in this article.

1. How IR Network grew since Independence

Growth of track Km (not route Km) in India since independence can be seen as under:



The above figures include BG, MG and also NG. From the above, it can be seen that immediately after independence, the rate of expansion was reasonably good. In the last 2 decades or so, the expansion retarded. This simple statistics call for a serious introspection of all professional Railway men. A few issues of which are likely to contribute for faster completion of the projects are discussed in this article.

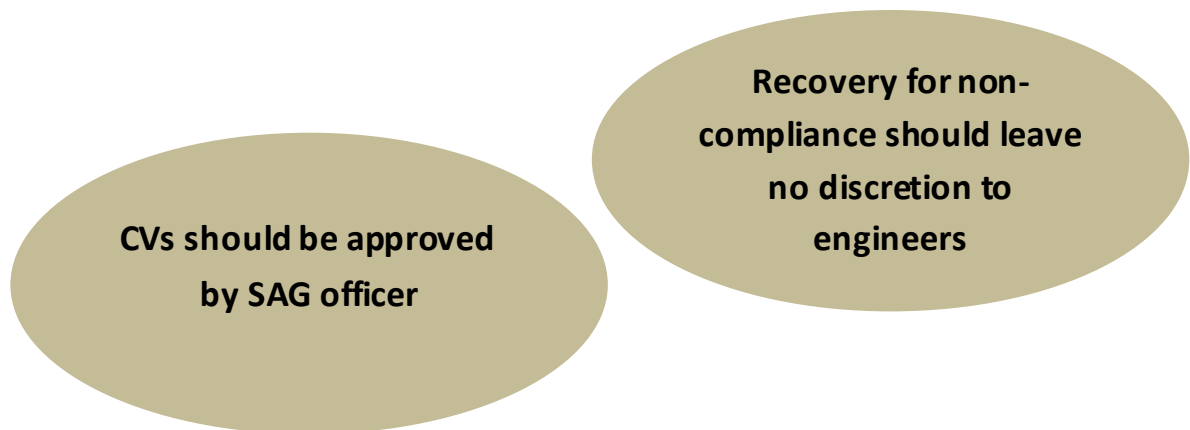
2. Supervisory Engineers shortage problem – A Practical Solution

One of the most critical issues today is shortage of qualified supervisory manpower. To mitigate this problem to some extent, provisions of graduate engineers by contractor need fine tuning. Clause 26A of GCC and RB's Lr 2012/CE-I/CT/O/20 Dt 10/05/13 provides as under:

- Contractor should employ 1 qualified diploma engineer in case of works costing above Rs 25 lakhs but upto Rs 2 Crores.
- Contractor should employ 1 qualified graduate engineer in case of works costing above Rs 2 Crores.
- In case of non compliance of these stipulations, Contractor is liable to pay Rs 40,000/- per month per graduate engineer and Rs 25,000 per month per diploma engineer.

The present policy as discussed above:

- In-effective because of the wording like "Liable to Pay".
- How many engineers are to be employed in case of a work of about Rs 100 Crores is not clear in the policy. Technically, one engineer is enough.



Therefore, It is required to amend Clause 26A of GCC as under:

Value of the Contract	No of Engineers to be deployed
Above Rs 25 Lakhs – But upto Rs 2 Crores	1
Above Rs 2 Crores - But Upto Rs 10 Crores	1 (Should be a graduate)
Above Rs 10 Crores – But upto Rs 25 Crores	2 (One should be a graduate with at least 5 years experience)

Value of the Contract	No of Engineers to be deployed
Above Rs 25 Crores – But upto Rs 50 Crores	3 (One should be a graduate with 10 years experience and one should be a graduate with 5 years experience)
For every Rs 25 Crores or part thereof beyond Rs 50 Crores	1
<ul style="list-style-type: none"> • Diploma engineer with 3 years experience may be considered as a graduate engineer for the purpose of this clause. • These are the engineers to be deployed on this work full time. • Before deploying any engineer, they should be personally seen, interacted and their CV should be approved by an officer not less than JAG rank (for works upto Rs 25 Crores) and SAG rank (for works above Rs 25 Crores). • Recovery for non compliance: <ul style="list-style-type: none"> ○ Rs 60,000 per month per engineer (for graduates with 10 years experience) ○ Rs 50,000 per month per engineer (for graduates with 5 years experience) ○ Rs 40,000 per month per engineer (for others) 	

3. Is IR really Planning the Work & Working the Plan?

It is needless to emphasize how important it is to follow the doctrine of “Planning the Work and Working the Plan” for faster projects completion. How this parameter is being judged as on now and how it needs to be is typically as under:

Present Criteria to assess an officer	Criteria should be
<ul style="list-style-type: none"> • How fast tender is floated. • How fast tender is finalised. 	<ul style="list-style-type: none"> • How many final bills are drawn? • How many final bills are drawn with: <ul style="list-style-type: none"> ○ Least deviation? ○ Least extension of time?
<p>The moment above criteria is adopted, real planning starts. The moment planning starts, projects go on in fast track.</p>	

Importance attached to issuing a tender notice is not attached to other real activities of work like:

- Making working and detailed drawings, designs etc.
- Realistic assessment of completion time.

With the result, deviations and variations occur. Time becomes non-essence. It consumes lot of time of officials to process deviations. The process

becomes unpleasant due to embarrassing questions posed by finance etc. All this leads to delayed projects execution.

Therefore, **IR needs to strengthen and professionalise its planning process.** The best method to enforce planning process is to periodically review the statistics of how many contracts are closed with least deviations and least time extensions.

4. Synchronize the procedures and powers

- Present scenario of procedures and powers on IR typically is as under:

Existing Procedures	Existing Powers
<ul style="list-style-type: none"> • Adopt 2 packet system for works of above Rs 10 Crores. • Permit JVs for works of value more than Rs 5 Crores. • Tenders with 2 packet system and where JVs are allowed take considerably longer time for finalisation. 	<ul style="list-style-type: none"> • JAG tender committee powers are upto: Rs 20 Crores • SAG tender committee powers are upto: Rs 100 Crores
<p>Synchronise JAG powers, limit for 2 packet system & limit for permitting JV so that JAG officers are left with more time for real technical work</p>	

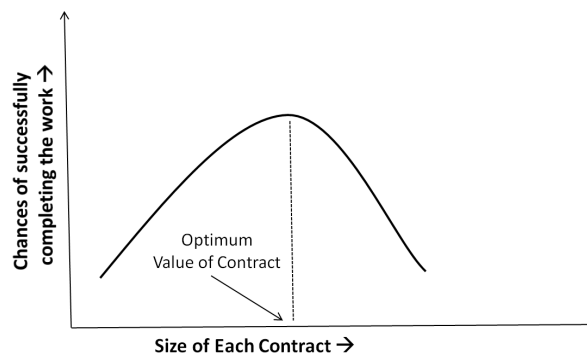
- These limits are very low compared to the practice prevalent on other professional organizations (or even Railway PSUs).
- Today, tender committee need to mechanically check the bidder whether he meets single similar work criterion and turnover criterion. No great subjective judgement is warranted from tender committee members. Therefore, single packet system can be allowed for more values also.

Suggested change in policy on IR to expedite tenders finalisation
➤ If work costs above Rs 20 Crores: Permit JVs & adopt 2 packet system.
➤ If work costs upto Rs 20 Crores: Permit No JVs & adopt 1 packet system
As and when JAG powers are revised, this policy also can be revised

- SAG officers can spend more time (compared to JAG officers) for evaluating bids with 2 packets and with JVs.
- Therefore, above suggested changes expedite the tender finalisation process substantially.
- Also, JVs are going to really serve the purpose they are meant for.

5. How big should be contract value?

- With enhancement of powers of acceptance of tenders to Zonal railways, there is a tendency to float bigger and bigger tenders.
- There is a concept among executives that lesser the number of contracts, lesser the problems and more is the success.
- But, the fact is depicted as under:



Smaller the Contract	Bigger the contract
<ul style="list-style-type: none"> • Un-professional agencies come. • Agencies with lesser resources come. • More time is lost in contract and tenders management 	<ul style="list-style-type: none"> • Sub-contractors mushroom. Sub-contractors are normally not very successful. • Mostly, big corporates bag the contracts. They may not be as responsive as small agencies. • Local contractors get demoralised and that may pose some problems. • Many officials have to manage a single contract. No full control for any official.
<p align="center">At present, optimum value of a contract needs to be about Rs 30 to 50 Cr This can be enhanced progressively year after year</p>	

6. Avoid Composite Tenders

As powers of tender acceptance are more, there is also a tendency of clubbing works of different nature. There may be cases of clubbing engineering, S&T and electrical works also. This tendency may be more specially in case of PSUs.

- On date, success of composite tenders is far from satisfactory.
- Contractors depend on different agencies. This pose different problems.
- Officials managing the contracts become many. Officials of different departments need to manage the same contract. This poses lot of co-ordination problems. No single official shall have full control on the contract.

Composite tenders should be avoided. Even clubbing different engineering works like earth work and PSC bridges also may need to be avoided.

7. Control Arbitrary low rates and unworkable rates by Additional Performance Guarantee

Quoting arbitrary or unworkable rates by bidders is also not uncommon. Such low rates have serious bearing on completion of projects. Tendency of such arbitrary rates can be checked by insisting Additional Performance Guarantee.

**Additional Performance Guarantee to be insisted:
(90% of Estimated Cost) – (Quoted & Awarded Value)**

This should be a part of GCC

This effectively:

- Checks quoting arbitrary low rates and unworkable rates.
- Forces executives to spend more time on planning and adopting more realistic rates.

8. Refining eligibility criteria for Works Tenders

Present practice on IR specifies basically 2 eligibility criteria:

- Completion of similar single work for a value of at least 35% of the present tender within the qualifying period of 3 years.

- Turnover of not less than 150% of present tender value in the last 3 financial years.

In this criteria, two important issues are missing:

- Experience in physical terms i.e completion of key activities (like: specified quantity of earth work or concrete or so).
- Bid Capacity of Bidder: i.e Work on hand for the bidder and Capacity of the bidder to take up further works.

These 2 criteria are already prevalent in the construction industry including many Railway PSUs. These criteria go a long way in selecting more competent agencies and faster completion of projects.

9. Is the Time really Essence of Contract?

Clause 17 of GCC says “Time is Essence of Contract”. But in practice, spirit of this clause is not respected due to various reasons. With the result, contractors also take the clause very casually. The result is delays and slippage of targets. This clause is to be honoured in true spirit to ensure delivery dead lines. Only for very valid and firm reasons, extension of time (EOT) is to be granted. To enable this, hindrance register is to be maintained as is the practice with many professional organizations.

Sl No	Item which could not be executed	Dt of Start of Hindrance	Dt of removal of Hindrance	Overlapping Period	Weight age	Net Effective days of hindrance	Sign of Site Engineer	Sign of Agency's Rep

The format is a part of GCC and construction hand books of many organizations. In Railway GCC, this format does not exist explicitly. But, the format is exactly in terms of clause 17 of Railway GCC. Therefore, it can be used for Railway projects as well. If required, the same can be specified in special conditions also.

Hindrance register is found very successful in really making the time the essence of contract

Hindrance register be updated every day. Such updation is easier if it is made online

Extension of time of contract to be strictly as per Hindrance Register

More the importance to hindrance register, better the planning on IR

Daily updating hindrance register should be insisted. Such daily updating can be ensured if the hindrance register is made online. With hindrance register, contractor gets automatically reminded every day about where he stands in meeting the dead line.

10. Time is Essence even for Officials

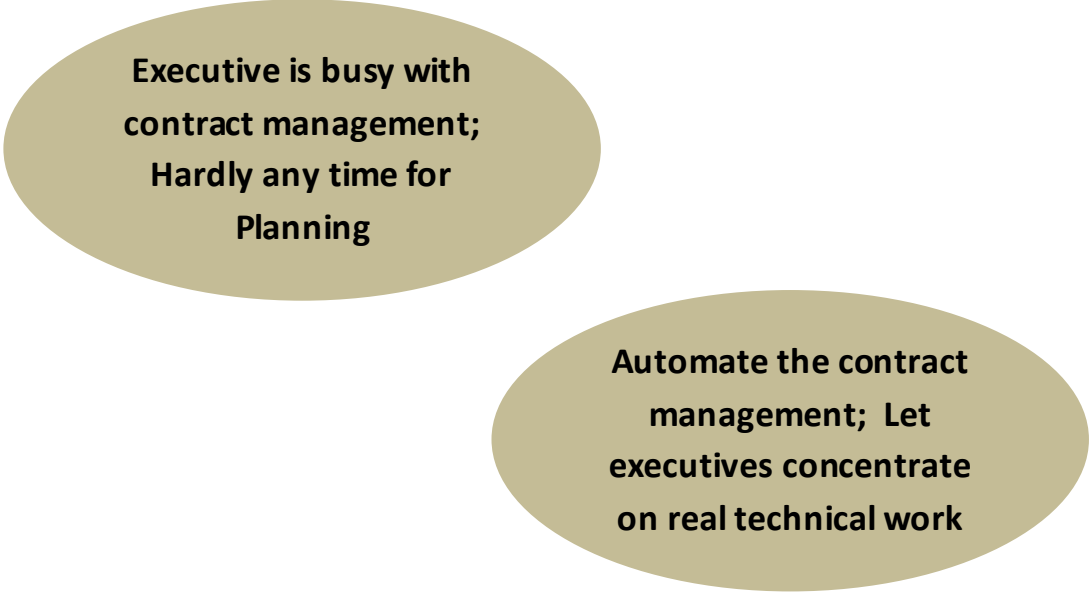
Maintaining hindrance registers as discussed above needs great deal of planning on the part of executives also. It not only puts pressure on contractor, but also on executives. Defective planning, delayed decisions and other in-action of executives shall be reflected in hindrance register. Therefore, executives need to be extra vigilant and extra careful in planning the work. Some of the issues which the executives are to be careful about are listed here under.

- Assessment of DDC should be very realistic. Fixing arbitrary DDC defeats the purpose of hindrance register. In rate analysis, justification is given for every rate. Similarly, working out time required for completion should be based on a justification duly quoting past completed projects rather than fixing arbitrarily.
- Once an hindrance is reflected in the register, immediate action is required to remove the hindrance.

- Efforts should be put on concentrating on pre-tender activity like finalisation of designs, schemes, keeping the site ready for handing over to contractor etc. Practice of initiating design and planning process after tender is approved should be viewed very seriously.
- Contract conditions should be carefully drafted to avoid ambiguity to make variations etc minimum.

Such planning needs the executive to spend good amount of time and energy. But, on date, the typical Railway executive is more busy with contract management (like processing tenders, variations, deviations, bills, estimates, revised estimates, rate analysis, rate comparisons etc) and can hardly spend any time on planning.

Contract management is mostly a repetitive and clerical activity and needs very less application of mind. That means, it can be easily automated and lot



**Executive is busy with
contract management;
Hardly any time for
Planning**

**Automate the contract
management; Let
executives concentrate
on real technical work**

of time can be saved for executives. Then, executives shall be able to concentrate on planning work.

11. Construction Manual in the lines of IRPWM or IRBM or IRWM

It is high time for Indian Railways to draft a Construction Manual indicating:

- Formalities of declaring a project manager and building project team.

- Norms for building project team in terms of expertise and numbers. Project team includes departmental officials as well as consultants and contractors.
- How frequently a project manager can be changed?
- Laying down responsibilities of Assistant IOW, IOW, AEN/XEN, Dy CE and CE.
- Laying down schedules of inspections of construction activities for various officials. Contractor engineer, consultant etc
- Procedures for engagement and management of Project Management Consultant.
- Laying down scales of T & P like vehicles, total stations, lab equipment etc (either to be provided by contractor or department).
- Certain norms and procedures to workout number of proclains, tippers, dozers, rollers, site laboratory equipment, manpower requirement (both contractor and departmental etc).
- Typical Method Statements for a few major items.
- Procedure and authority to approve time of completion for each contract. There should be an established and objective assessment of time of completion. On date, it is more like an arbitrary.
- Procedures and guide lines for drawing Quality Assurance Plan and implementing the Quality Assurance Plan.
- Introduction to some heavy construction machines like tunnel boring machines, concrete batching plants etc.
- Cross reference to relevant provisions of engineering code, Indian Railways Unified Specifications and other Indian standard codes etc.

12. PMS in the lines of TMS : Automate Project and Contract Management

To automate Project and contract management, develop a system as in case of TMS. Main objectives shall be:

- Registers like hindrance register, site order book, and all other registers to be maintained at filed shall be online. Executives of all levels shall have access to this on real time basis.

- Field executives key-in every day issues, problems, progress etc into the system and all concerned have all this information on real time basis.
- Making deviations, bills, etc shall be just a few mouse clicks away.
- Recommending or granting EOT should be a mechanical activity. No discretion or application of mind be envisaged while granting EOT.
- Vetted rates, USSOR rates, previously accepted rates etc shall be easily available in no time.

Until PMS is put in place, low cost (or free) Project Management systems available on line be used

google docs & google sites is a good beginning to make project managements online

Until a full fledged PMS is put in place, ready made low cost (or even free) project management systems available on line can be made use of. Even free google account can be a good beginning to make the projects online.

13. Planning Track Maintenance Teams for newly created Double/Triple Lines

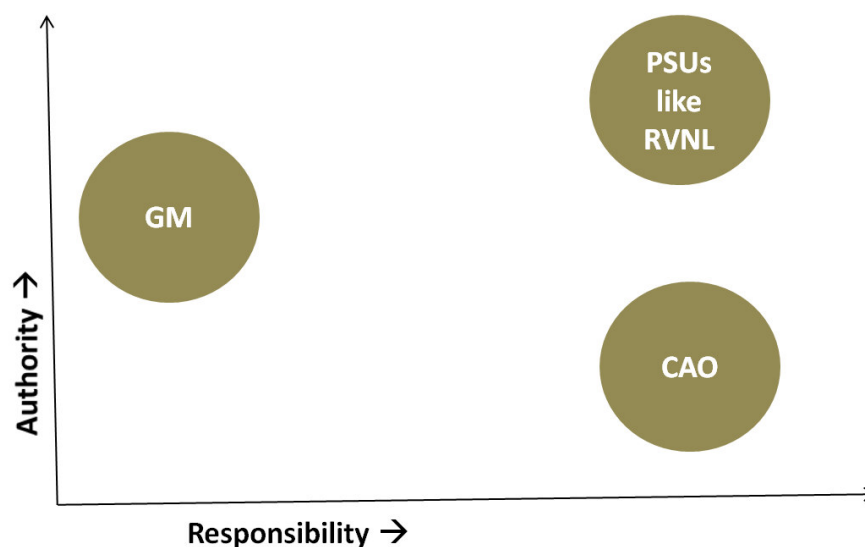
Evolving strategies for expeditious completion of the doublings and triplings is only one side of the story. Other side is creating necessary additional infrastructure and additional organisation to maintain the newly created double / triple lines. Assuming that the sanctioned 9400 Km of doublings / triplings are completed by about 2020, additional manpower needed to be created by 2020 shall be:

- Additional Trackmen needed: 15000 (9400 Km * 1.6 approx)
- PWIs of different grades: 350 (One for every 30 Km approx)
- IOWs of different grades: 100 (One for every 100 Km or so)

As recruitment is a very long lead item, planning need to be started now itself for recruitment of additional manpower for maintaining the newly created assets.

14. Make Power, Authority & Responsibility Commensurate with each other

One of the basic and foremost requirements of any professionally managed entities is that the authority and powers of its managers should commensurate with responsibilities. Responsibility without authority makes the management very weak in-effective. Authority without responsibility results in lack of accountability. Typical scenario of power, authority and responsibilities on IR in the context of projects implementation are depicted here under:



In the context of Indian Railways, anomalies that should be resolved for better power responsibility correlation are:

- Presently, CAO has no authority on his team members of other departments i.e FA&CAO/C, CSTE/C and CEE/E. In the absence of such authority, how can a CAO organization deliver the projects? This is a **very serious structural defect of Railway organization**. Unless all department heads are under CAO, projects execution on Indian Railways will continue to suffer.
- Responsibility of CAO towards construction projects is much more than the GM. Powers of CAO are less than that of GM. Unless GMs are equally made responsible for project deliveries (or unless, CAOs are equally empowered), projects will continue to sluggish.
- CAO organization powers should be made at par with RVNL or RITES or any Railway PSU to ensure faster delivery of projects. One typical issue:

- Estimates Sanction should be within Zonal Railway's powers irrespective of the value as long as the estimate is within certain percentage of sanctioned cost.
- Like the above, CAO organization need to be empowered in a number of other issues.
- Presently, same powers are delegated to O/L and Construction officers. O/L deals with less value works and construction deals with more value tenders. The present Rs 20 Crores tender committee powers for a JAG officer of O/L is very high. Hardly there will be any tender of this value in divisions. Such anomalies need to be resolved.

15. Empower Project Manager almost at par with CEO of a PSU

In case instating a real empowered project manager (CAO) is not possible in the present Indian Railways frame work, it is better and worth to instate real project manager by restructuring construction team of Railways or corporatizing the whole construction activity of Indian Railways. For corporatization, wheel in-fact need not be invented. Some alternatives available:

- a) All CAO units can be upgraded to GM/Con as in case of N F Railway.
- b) GM/Con may be created region wise (one GM/Con for a few Railways together).
- c) All CAO units can be made a part of an already invented wheel, the RVNL.

Whatever way the real project manager is instated, he should be delegated powers almost at par with powers to CEO of a PSU for real and effective delivery of projects.

16. Conclusions

- Measures suggested in this articles are mostly within the powers of the Railways or RB in some cases so that their implementation is easier.
- These measures are certainly going to set a platform for accelerated completion of doublings, triplings and all other projects on IR.