



**GOVERNMENT OF INDIA
MINISTRY OF SHIPPING, ROAD TRANSPORT & HIGHWAYS
DEPARTMENT OF ROAD TRANSPORT & HIGHWAYS**

Transport Bhawan,
1, Parliament Street,
New Delhi -110001

No. NH-12037/85/2003/NEC/NH-10

Dated the 30th April, 2008

To

**Shri Otem Dai,
Commissioner, PWD,
Government of Arunachal Pradesh,
Itanagar-791111.**

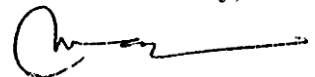
Sub: Capacity building of State Public Works Departments of North Eastern Region

Sir,

The matter regarding capacity building of State Public Works Departments of North Eastern Region was discussed during the meeting taken by Secretary, Road Transport & Highways at Guwahati on 24.4.2008.

2. A discussion paper was circulated by this Ministry in which action points are given under paragraph 12 thereof, According to sub-para 12.1, an in-house exercise should be undertaken by each PWD to reorganize the PWD and its work Divisions consistent with the requirement of present workload. Various issues are brought out in the paper, including areas of improvement, given vide **Annex I** to the paper.
3. It was decided that this in-house exercise would be undertaken and completed by each PWD by end of June, 2008 and proposals will be submitted to the Ministry. It was also felt that specialized cadre of highway engineers in the form of Department of Highways should be created in each PWD by splitting the existing cadre.
4. It is requested that necessary action in the matter may be taken and proposals sent to the Ministry at the earliest. A copy of the discussion paper is enclosed for ready reference.

Yours faithfully,



(Verinder Kaul)

**Superintending Engineer
For Director General (Road Development)**

Discussion paper on Capacity Building of State Public Works Departments of North Eastern Region

1. Background

The road network of North-Eastern Region (NER) is grossly deficient. The density of roads is much lower than the national average. Therefore, thousands of km of new roads have to be constructed in a short span of time. The Central Government and State Governments of the region have prepared definite plans to construct roads and highways in the region in a big way. The Ministry of Shipping, Road Transport & Highways have launched special programmes to construct/upgrade about 11000 km roads constituting primary network at an investment of about Rs. 60,000 crore, These programmes are in addition to the normal plans of the Ministry involving expenditure of over Rs. 500 crore every year on national highways and State roads executed by BRO and PWDs. Rural road connectivity in the region is being provided under PMGSY at a massive investment. Road and bridge works are also being funded under NLCPR and other programmes of the Central Government. In addition to the Central programmes, large amounts are being invested under State plans also. On the whole, investment/expenditure of about Rs. 1,00,000 crore is likely on roads, bridges and highways during 11th and 12th Five Year Plans. The challenge, therefore is to optimally spend this amount and construct durable roads. This cannot be done without proper systems & procedures and capacity building of key players. In this paper, issues have been identified for discussion. Participants may make suggestions as well as send comments in writing.

2. Key Players

2.1 The various activities of road construction & maintenance can be grouped into 7 groups: (i) Planning & programming; (ii) Survey & Investigation and Design; (iii) Making available unencumbered site for construction of road; (iv) efficient procurement; (v) construction; (vi) supervision; and (vii) maintenance. The key players in the area of construction & maintenance of roads, bridges and highways are:-

- (i) Government Agency, such as PWDs who have the onus on planning and executing the works;
- (ii) Contractors;
- (ii) Consultants;
- (iv) Equipment suppliers;
- (v) Miners and materials suppliers;
- (vi) Suppliers of factory made/manufactured materials;
- (vii) Utility Departments (telephone/electrical lines, water supply/sewerage lines);
- (viii) Revenue Department in relation to acquisition of land;
- (ix) Forest Department/MoEF; and
- (x) Security Agencies.

- 2.2 It is imperative, that capacity enhancement takes place of all the above-mentioned key players with PWD being nodal Government Agency taking the lead.

3. Public Works Departments

Public Works Departments (PWDs) being drivers, the speed of road construction and quality of works has direct relationship with their capacity and capability. PWDs are very old and established organizations in the country, with rich experience and talent. These organizations are engaged in Planning, Design, Investment Decisions; Budgeting. Construction and Maintenance of Public Works, particularly roads, bridges and highways. However, some of the Public Works Departments, particularly the PWDs of NER could not keep pace with society's needs of speedy delivery of quality roads, in tune with the demand. Notwithstanding this, the Public Works Departments, who are familiar with the people, topography, climate, availability of materials and construction & maintenance practices of the region are best suited for construction & maintenance of the roads. But, these organizations are tuned to execute small works. Enhancing their capacity is, therefore critical for development & maintenance of roads in the region. The main objective is to prepare a strategy to enhance the capacity of all Public Works Departments or the North-Eastern States of India to construct, manage & maintain roads, bridges and highways with speed and quality. This would essentially be achieved by quantum jump in the volume of work to be handled by various existing units of these organizations as there is tremendous shortage of trained and experienced manpower in highway sector. Further, there is a need of overhauling of the road engineering practices, business procedures, and core functions of PWDs to improve their performance. Capacity building is also required to execute big highway projects by using sound engineering designs and modern construction & contract management practices ensuring adequate quality and avoiding cost and time overruns as well as disputes.

4. Main shortcomings of PWDs

- (i) Exposure of PWD staff to the international best practices and modern road engineering practices is limited;
- (ii) Policies, plans and programmes are not being implemented effectively and long term focus is missing;
- (iii) Maintenance of roads is neglected and the concept of asset management is missing;
- (iv) The functions relating to Planning, Surveys & Investigations, Designs, Quality Assurance are not being performed efficiently and the concept of modern contract management is completely missing;
- (v) Modern designs, material specifications, quality assurance systems and modern equipments are generally not being used;
- (vi) Low productivity of PWD staff and posting / deployment of key functionaries is arbitrary;
- (vii) Inadequate delegation;
- (viii) Complex working systems / procedures;
- (ix) Lack or non-provision of even most essential working facilities, and
- (x) Lack of Training.

5. There is, therefore a need to in-house review of the existing working systems and procedures of each State PWD of NER, covering the following tasks:

- (i) Review the existing planning process of each PWD, identify the shortcomings/gaps and make suggestions and improvement.
- (ii) Review the existing system and procedures to undertake surveys, investigations and project preparation, identify the deficiencies and suggest measures to improve the quality of project preparation, and optimization of cost.
- (iii) Review the readiness of each State PWD to handle pre-construction activities, such as ensuring availability of land, shining or utilities, tree cutting etc and make recommendations for speedy completion of these activities and simplification of procedures.
- (iv) Review the preparedness of each State PWD to adapt modern designs and specifications, use of modern equipment and quality assurance systems, review the functioning of existing research and testing laboratories and improve their working, keeping in view the activities/areas of outsourcing. Strengthen the existing laboratories to make them more efficient/effective.
- (v) Review the procurement procedures, contract formats/conditions and ensure rationality and transparency. Enhance the skill and capacity of PWD staff to handle the procurement more efficiently and to minimize/avoid litigations/claims.
- (vi) Review the existing procedure of supervision. Identify the shortcomings and make the supervision more effective. Measures to make PWD staff accountable with focused responsibilities and updation of working facilities to the supervision staff may also be suggested;
- (vii) Review the monitoring and controls systems and make them objective and result oriented;
- (viii) Review the organisation and management of each PWD and make recommendations for their reorganization, to ensure efficiency, proper distribution of work and deployment of resources, including transfer/posting of the staff.
- (ix) Review the job description and accountability or stall of various categories, examine whether they are properly defined. Update PWD manual.
- (x) Review the process of investment decision. Review the delegation between Chief Engineers' Office and Government and suggest simplification.

6. Maintenance

With a view to better utilize the limited funds for maintenance of road review the existing practices of maintenance planning, programming, budgeting, execution of works and monitoring and make recommendations for major overhaul to ensure optimum utilization of maintenance funds. The task shall inter-alia, cover :

- (i) Review of current road maintenance practices & policies;
- (ii) Modification of the current road maintenance policy and action plan;
- (iii) Examine need of developing a Data Collection and Road Information System and make recommendations to develop such a system in each State PWD of NER, if any;
- (iv) Examine whether preparation of road condition reports and annual maintenance plans are necessary and make recommendation accordingly;
- (v) Briefly review the norms for road maintenance and make recommendations on sources of funding of maintenance;
- (vi) Review the existing systems of procurement/execution or maintenance works and make recommendations for efficient implementation of maintenance task, including necessity of performance based contract system,

7. Contractor's capacity

7.1 Contractor's capacity mainly depends on:

- (i) Deployment of construction plant & equipment;
- (ii) Management; and
- (iii) Working capital

7.2 Experience shows that that induction of construction plant & equipment has resulted into manifold increase in delivery of roads. BRO's case is the befitting example to cite. During 2007-08, BRO's turnover in NER increased 50% over its turnover of 2006-07, mainly due to induction of plant & equipment. Assam PWD also executed an additional work of about Rs. 130 crore during 2007-08 mainly due to the deployment of plant & machinery by Contractors.

7.3 Providing opportunity to Contractors appears to be the best way of building their capacity. Rest of the thing follow. Therefore, the selection criteria should be tailored to provide opportunity to local Contractors.

7.4 Simultaneously, there is a need to also regulate and train the Contractors. Most of the Contractors, who have plant & equipment are unable to make efficient utilisation merely because of lack of management. The plant & equipment remain idle due to matching supplies. Many of the workmen of Contractors are not properly trained in operation of plant & equipment. There is a need to set up an institute to train the workmen in various aspects of road construction & maintenance. It is suggested that 0.25% of total bill amount of the Contractors may be set aside to meet the expenses of such training institute. Modalities can be worked out.

7.5 The Contractors should be encouraged to standardize their working and getting ISO certification. After sometime, ISO certification of Contractors could be made mandatory.

8. Reorganization of PWD Divisions

- 8.1 PWD Divisions, at present, generally have large number of technical and non-technical staff. There are usually 3-4 Assistant Engineers/Assistant Executive Engineers assisted by 12-16 junior engineer level officers. This structure may be justified for the maintenance works. However, for the project execution, such a Division is highly over-staffed. There is a need to segregate supervision of project execution and routine maintenance. In Assam, there are 9 NH Divisions working on national highways. The average turnover of these 9 Divisions was Rs. 30 crore during 2007-08 against the usual turnover of 8-10 crore per Division in other places. Even in Assam, there is further scope for improvement to increase the turnover to Rs 50-60 crore per Division. It is, therefore felt that for the purpose of execution of project, the Division should be lean and thin in the form of a Project Implementation Unit, as per the following composition:-

Composition:- Departmental Staff

Sl. No.	Designation	Number
1.	Executive Engineer	1
2.	Assistant Engineer/ Junior Engineer	3
3.	Account	1

Staff on Outsourcing basis:

Sl. No.	Designation	Number
1.	Quality	1
2.	Quality Control Staff	2
3.	Private Assistant	1
4.	Peon	1

- 8.2 For the purpose of maintenance however, the Divisions may have more number of junior Engineers. Here again, the numbers should also be reduced to half from the present level. This is justified in view of the fact that for major maintenance items, Contractors are now deployed, as against the Departmental execution undertaken in the past.
- 8.3 The exercise to reorganize the regular work Divisions should be undertaken by each PWD in such a manner that the Division should cover about 400-500 km length of road for the purpose of maintenance and normal development works such as marginal widening, improvement of riding quality, etc. with the help of two Assistant Engineers and 4-6 junior Engineers along with the subordinate staff. For the purpose of project execution the approach of PIU having lean and thin structure as suggested above may be considered.

9. The capacity to build the road is also severely constrained at times due to the shortage of aggregates and other construction materials such as sand, quarry dust etc. Not only the works are delayed, but the plant & equipment also remain underutilized due to short supply of boulders from quarries. No amount of efforts done to build the roads can succeed unless the quarries for road construction materials are properly identified and explored in economical manner. Since the North East is blessed with hills, mountains and rivers there should not be any reason for the short supply of road construction materials, which are found in abundance in rivers and hills. There is, therefore a need to identify more quarries and explore them.
10. The acquisition of land is often cited as the major hurdle in timely execution of road and highway works. Devoted capacity has to be built in each Public Works Department to liaise with the Revenue Officers effectively to get land promptly at reasonable cost. Simultaneously, the various supporting Departments such as Revenue Department, Forest Department, Mines Department have also to change their mind set and respond to the requirement of Road Agencies more professionally, effectively and timely to provide necessary support by speedy performance of the activities relating to them. One way to achieve this, perhaps, by setting up a high level coordination mechanism in the with representation from the concerned Departments to sort out the issues. The Public Works Department should then have the capacity to take follow up actions at the working level.
11. There are also shortage of factory made/manufactured items, such as cement, steel, Bitumen, hume pipes etc. In many States, the cost of these materials are almost 2 times of the cost in mainland due to high transportation cost and cost incurred on overcoming other difficulties en route. Regional Depots from where the Contractors can purchase such items from within the State may perhaps reduce costs, hassles and ensure timely supply.

12. **Action points**

- 12.1 An in-house exercise should be undertaken by each PWD to reorganize the organisation and its work Divisions, consistent with the requirement or present workload and methodology of execution. Areas of improvement of PWDs have been identified and given vide **Annex I** for guidance. It is felt that these areas may specifically be considered, while carrying out the in-house exercise.
- 12.2 After completing the exercise, the PWD could be assisted and advised by 2-3 experts, who may be retired senior engineers to prepare the re-organizational plan of PWD. To ensure wider participation, work shops could also be held. The Ministry will be able to bear the expenditure on engagement of experts and holding of workshops, etc.
- 12.3 After preparation of the report, the State Government will take follow up action on the items relating to it. The various Departments of the Central Government would also take action on the items relating to them. The Ministry will coordinate the follow up action with the State Government as well as other Departments of the Central Government.

Areas of improvement of PWDs

- Policies & programmes of roads should imbibe vision and long term approach. There should be an exclusive Cell under Engineer- in-Chief/ Secretary PWD for this purpose;
- Inclusive maintenance, with focus on asset management, serviceability. The design of roads and highways should be prepared keeping maintenance in view. A proper system to maintain the roads should be put in place with assured funds;
- Improve quality of project preparation. This is most important requirement, as durability, economy and successful execution of road will depend on the accuracy with which Survey & Investigations have been carried out and designs have been prepared, The Department should have in-house capacity & capability to supervise & monitor the Consultants as well as to carry out project preparation itself without the help of Consultants. Further, interaction with Consultants at senior level for speedy decisions needs to be ensured. At present, unfortunately, the estimates are generally prepared by JE and senior level inputs are missing.
- Create capacity to effectively handle the pre-construction activities. This is another area in which expertise has to be created to professionally deal with the matters of land acquisition, shifting of utilities, MoEF clearance, tree cutting, other statutory clearances etc. Special multi-disciplinary cells should be established for the project duration, while normal works could be done by the regular staff;

There is a need to upgrade the knowledge and expertise of the engineers and improve work practices with focus on: adaptability & adoptability of latest designs, new material, specifications, & equipment. Research & Development in real sense; exposure to international best practices and road engineering, training of staff; effective utilisation and modernization of the existing research and testing laboratories, as additionally to Contractor's facilities; set up bench mark standards for Contractors, Consultants and Departments;

- Review or procurement procedures and contract formats to bring about rationality, transparency, equity and speedy award & execution:
- Make the supervision more effective and accountable. Rationalize the role of supervision Consultant;
- Make monitoring & controls objective and result oriented, with credible threats;
- Increase productivity of staff and Work Divisions. Quantum jump in volume by productivity increase is need of the hour;

- Overhauling of road engineering practices, business procedures and core functions is required;
- Change the mind set from doing the Foreman's job to Engineer's job. Planners, Designers, Researchers be given importance and recognition;
- Ensure provision of required working facilities to the staff;
- Simplify & rationalize the complex practices & procedures;
- Have an effective policy on transfer & posting of the staff to eliminate exterior influence and arbitrariness;
- Update the PWD manual;
- Review the delegation between Chief Engineer's Office and Government to get more powers to the PWD;
- Document the procedures and rules to minimize external interference.

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