



ABSTRACT

Highways Department - Tamil Nadu Road Sector Project – Information and Communication Technology Strategy for the Department – Proposal approved by the Empowered Committee – Orders issued.

Highways (HF. 2) Department

G.O. (Ms) No. 21

Dated : 11.1.2008

Read:-

1. G.O. (Ms) No.62, Highways (HF. 2) Department dated 8.4.2003
2. From the Project Director, Tamil Nadu Road Sector Project, Letter No. 4804/2006/AE-IT, Dated : 06.12.2007.

ORDER:-

1. The Government of Tamil Nadu has received loan assistance from the World Bank for implementation of the Tamil Nadu Road Sector Project in which a provision is made for procurement of IT related equipments for an amount of Rs. 14.11 crore. The Project Director, Tamil Nadu Road Sector Project, has reported that he has proposed to carry out the following development activities in the Highways Department.

- (i) Procurement of Computers and Peripherals, off the shelf Software, Networking and furniture for the staff in the entire state of Tamil Nadu in Highways Department.
- (ii) Consultancy Services to develop and implement Geographic Information System (GIS).
- (iii) Consultancy Services to develop and implement Project, and Finance Management System (P&FMS) and other software development for road and bridges components.

2. To achieve the above the Tamil Nadu Road Sector Project has formulated an “Information and Communication Technology Strategy for Highways Department” with Back ground, Vision, Objectives and methodology etc for approval of Government for successful implementation.

3. The proposal of the Project Director, Tamil Nadu Road Sector Project was placed before the Empowered Committee in its meeting held on 28.8.2007 and the

committee resolved to approve the information and Communication Technology strategy for Highways Department formulated by the Tamil Nadu Road Sector Project.

4. The Government accept the decision of the Empowered Committee and they accordingly approve the information and communication Technology strategy of the Highways Department as in the annexure to this order.

5. This order issues with the concurrence of Finance Department vide U.O. No.83047/PW.I/07. Dated 02.01.2008.

(BY ORDER OF THE GOVERNOR)

**K.ALLAUDIN,
SECRETARY TO GOVERNMENT.
HIGHWAYS DEPARTMENT.**

Annexure to G.O. (Ms) No.21, Highways (HF.2)Department,dated 11-1-2008
Information and Communication Technology Strategy
For Highways Department

Background:

Government of Tamil Nadu have the unique distinction of creating a separate Department as early as in 1946 exclusively to attend works related to "Roads and Bridges" in the State. It was a part of Public Works Department earlier but now a separate and distinct Department with seven Chief Engineers and supporting engineering & administrative staff. The objective of the department is to maintain and improve the roads under the control of the Government, and to provide all weather road connectivity to rural habitations. Tamil Nadu was the forerunner in bringing out a standard specification for the roads and bridges in the year 1954. The Department is also in-charge of improvement and maintenance of those National Highways in the State, which are not under the control of the National Highways authority of India.

The Government of Tamil Nadu through Government of India has received loan assistance from the International Bank for Reconstruction and Development (IBRD) towards the cost of implementation of Tamil Nadu Road Sector Project (TNRSP) and intends to apply a portion of this loan to eligible payments under the following Contracts for the Computerization of Highways Department.

- i. Procurement of Computers and Peripherals, off the shelf software, Networking and Furniture for the staff in the entire State of Tamil Nadu in Highways Department.
- ii. Consultancy Services to Develop and Implement Geographic Information System (GIS).
- iii. Consultancy Services to Develop and Implement Project, Human Resource and Finance Management System (PFMS) and other software development for road and bridge components.

(i) Vision:-

“To provide a safe, efficient and environmental friendly road network that contributes to the sustainable economic development, social well being of the state”.

“To be the customer focused, applying innovation, best practice, appropriate technology and responsible management of internal and external resources.”

(ii) Objective:-

Towards this vision, the Government of Tamil Nadu with loan assistance from the World Bank is all set to upgrade the Highways Department. The computerization of Highways Department is an important component of the Institutional development. The implementation of integrated IT systems across the state for the Highways Department has been planned in the following stages to facilitate prioritization and smooth rollout.

- Formation of core IT Team
- Procurement of hardware
- Establishment of network connectivity
- Application software procurement / development
- Data Creation / Conversion
- Go-Live and rollout
- User Training

(iii) The detailed specifications for the modules identified for the computerization are

- Employee Record System
- Finance and Accounting System
- Project Management System
- Office Automation System
- GIS based RIS System
- Road Maintenance and Management System
- Planning requirements

The present Indian governance mechanism is undergoing transformation. The southern states are particularly witnessing high growth following the IT boom.

Road connectivity has been identified as among the key infrastructure critical success factors for attracting FDI. The government departments manages the most important activities in roadways namely

- Creation of new road connectivities
- Up gradation of existing roads

- Maintenance of roads already laid down.

For managing these activities effectively, state departments are considering creation of appropriate IT systems as a solution. Deployment of world class IT systems involves its own set of challenges.

- Develop hardware and network infrastructure.
- Manage & deploy GIS based Road Information System across the state network.
- Deploy Financial and Accounts, HR, Project management, Document Management applications.
- Deploy critical design and research database applications.
- Create and effectively train personnel in IT Applications
- Right of information for the public

Currently several States are undertaking implementation of IT to facilitate better performance and service delivery. Prominent examples are the PWD of Maharashtra, AP and Karnataka.

Now e-Tendering became mandatory to all the departments under Government of Tamil Nadu by initiated e-Tendering publication from 01.07.2007 and e-submission from 01.10.2007 for the procurement of good and service. Highways department with World Bank support is creating an IT roadmap for effective implementation of its objectives.

Intended Benefits:

- Initiating a gradual shift towards paperless office management and e-governance of the department.
- It will allow effective control and easy management of Highways Projects.
- It will create advanced technical know how for better and more cost effective road maintenance and management.
- For better fore-casting of future needs of men, materials and funds for the efficient operation of the road and bridge works, which will take care of planning needs.
- Facilitates getting instant status of the progress of projects, maintenance works etc. for effective control at various levels.
- Reduce the time and travel cost for management to reviewing the works.

- Better utilization of the funds from state, centre and various external agencies.
- Better planning, design and management of Highways project.
- GIS will facilitate on line decision support for highway project like traffic management, bye pass and fly over designs with the traffic data and financial progress of the work etc.
- For better transparency and Right to Information for the public.

3. The proposed objectives will be achieved in the following three stages:-

Stage I

- a) Formation of IT cell under the control of Tamil Nadu Road Sector Project
- b) Procurement of Desktops, Peripherals, Printers & Furniture
- c) Introduction of E-mail communication
- d) Development and implementation of the GIS
- e) Development and implementation of Road Maintenance and Management System (RMMS)
- f) Development and implementation Project and Financial Management System (P& FMS)

Stage II

- a) Interconnection of the system thro TNSWAN and Broad Band connection upto sub- Division level.
- b) Training of the staff on IT implementation on Basic and application software
- c) Mandatory E-mail communication
- d) Installation of the RMMS in the Mini server and Train on RMMS
- e) Expansion of IT cell under the control of Highways Department

Stage III

- a) Procurement of the central server and DR server connecting to TNSWAN and Networking upto sub-Division
- b) Installation of the software in the central server.
- c) Formation of IT cell as a separate IT wing in the Highways Department.
- d) Go-Live.
- e) Consideration of fully automated workflow.

Procurement of Desktops, Peripherals, Printers & Furniture

It is proposed to procure the Desktops, Peripherals and Printers as noted below.

Product Description	QTY
Note book PC	9
Desktops	1770
Servers	10
Printers/Plotters	1136

Following are the distribution pattern for the Desktops, Peripherals and Printers
Chief Engineers Office:

It is proposed to provide one laptop to all the Chief Engineers and his office will be provided with small intranet with one server, desktops and printers upto the A.E level of Technical wing, Superintendent Level of Administrative wing and sufficient number of computer for the general purpose. TNSWAN/ Broadband will be provided for the connection to the state wide area network along with Internet facility and Web camera for the Video conferencing. The Basic office automation software, AutoCAD, Project Management software, etc will also be installed.

Circle Office:

It is proposed to provide one Desktop with printer to all the superintendent Engineers. The Office of the Superintending Engineer will be provided with small networking to share the resource. Each D.S.E, Admin wing and Technical wing of this office will be provided with one Desktop and printer. TNSWAN/ Broadband will be provided for the connection to the statewide area network along with Internet facility and Web camera for the Video conferencing. The Basic office automation software, AutoCAD, Project Management software, etc will also be installed.

Division office:

It is proposed to provide one Desktop with printer to all the Divisional Engineers. The Office of the Divisional engineer will be provided with small networking to share the resource. Each Administration wing, Technical wing will be provided with one Desktop and printer. TNSWAN/ Broadband will be provided for the

connection to state wide network with Internet facility and Web camera for the Video conferencing. The Basic office automation software, AutoCAD, Project Management software, etc will also be installed.

Sub Divisional Office:

Office of the Sub-Divisional Engineer will be provided with two desktops and printers. TNSWAN/ Broadband will be provided for the connection to state wide network with Internet facility and Web camera for the Video conferencing. The Basic office automation software will also be installed.

Development and implementation of the GIS

The present system of archival of road data prevalent in Highways Department is through traditional paper road maps, engineering drawing and Register of roads and Bridges. Voluminous and scattered data, maps in different formats and scales, difficulty in accessing the statistical information of map features etc. are some of the irritants in the prevalent system. A need for GIS is increasingly felt in the Department to have a scientific and systematic approach for the archival of maps and retrieval of statistical information.

The GIS application is designed for whole Highways Department. This project is to develop Road Information and Management system along with Bridge Information by procuring appropriate GIS software.

This project is also to create an up-to date digital database of the roads, bridges, culverts, etc. to increase efficiency and accuracy in monitoring and for aiding Project management in a graphical format using GIS software.

Development and implementation of RMMS

It is proposed to develop a computerized Road Maintenance and Management System for the State Core Road Network (14,500 km of SH & MDR) consisting of

- Road Information System (Web Enabled)
- Road Inventory Information
- Traffic Information System
- Bridge Information System
- Pavement Management System
- Optimization & Prioritization of upgrading & maintenance works including project budget planning

This Information System can be accessed by general public through Internet and the

Data can be updated through Internet by staff of the department from subdivision level.

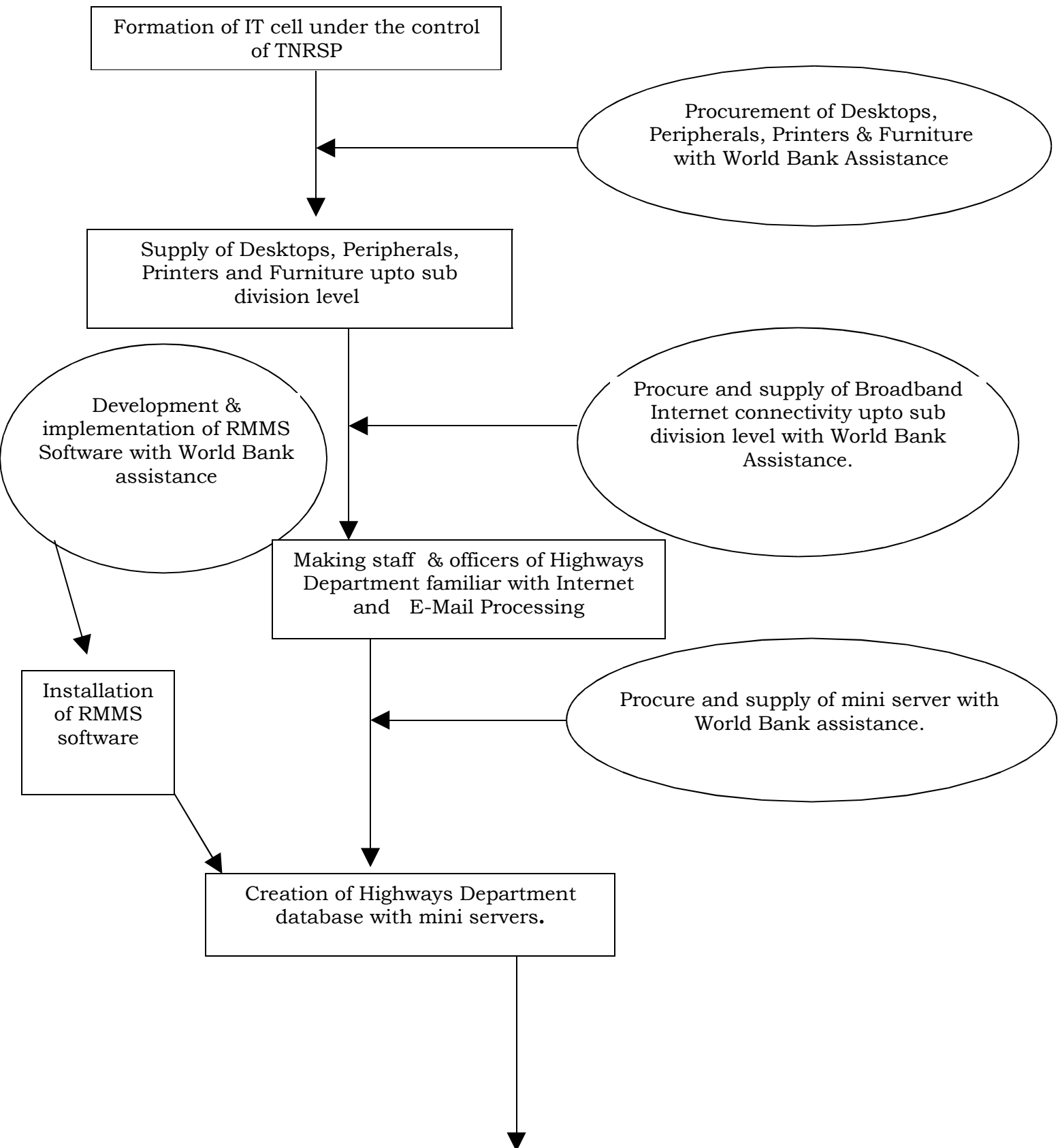
This RMMS will develop an overall condition index of the State core road network. Data collected by the RMMS is based on the detailed condition survey for 20% of core road network which contains pavement condition, inventory, CD, traffic and axle load surveys. Preliminary Data collection done by using ROMDAS Instrument.

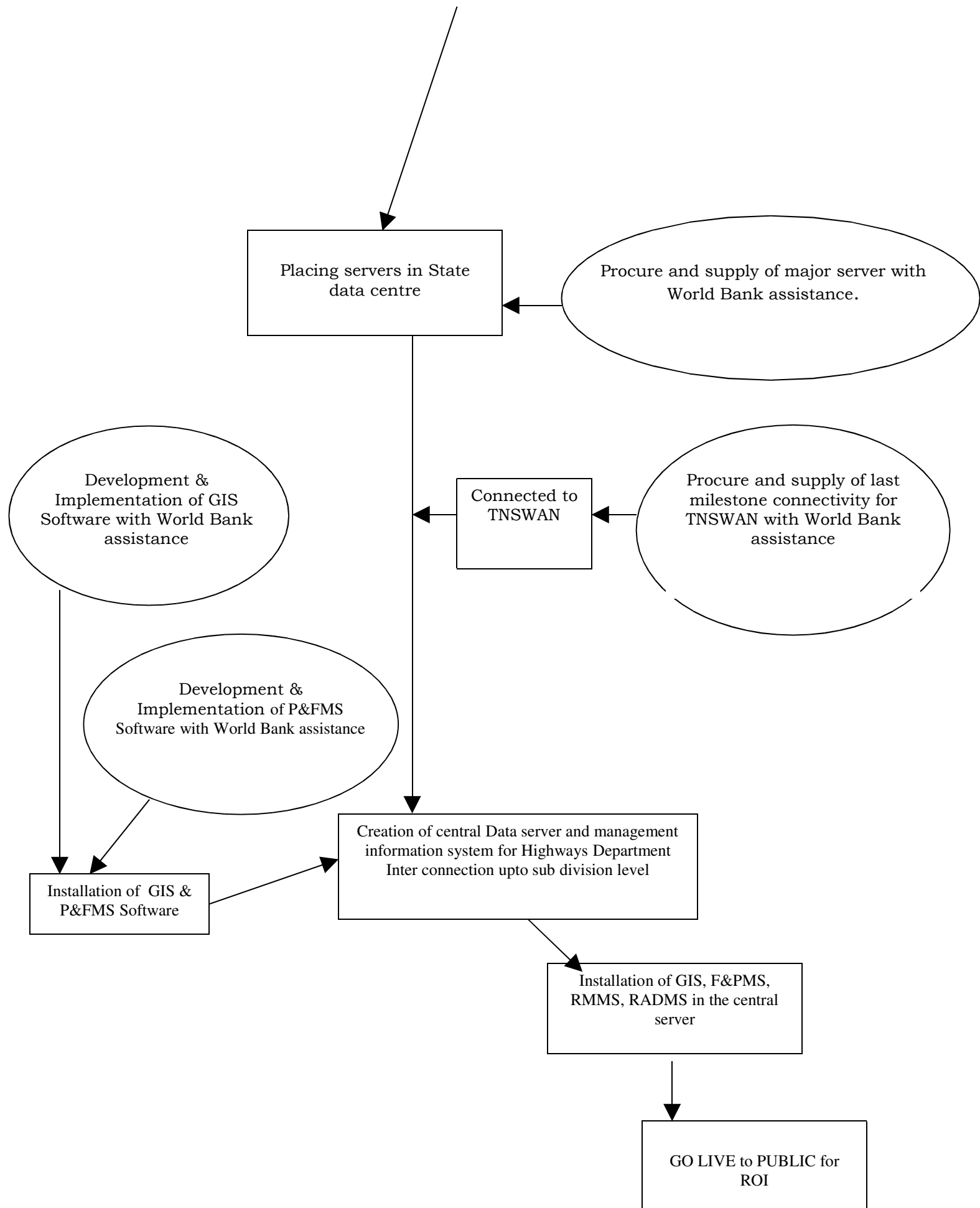
Development and implementation of P& FMS

This component has the following objectives:-

- To ensure the statewide computerization to automate the existing manual procedures and process followed for Project Management, Financial Management, Employee Record system etc. for improved project monitoring, Communication, information and office management through P&FMS.
- To create up-to date digital database for the project management, financials, etc. to induce efficiency and accuracy in monitoring using P&FMS software.
- To co-ordinate and integrate the P&FMS with GIS by adding the information of the roads, bridges, culverts, etc from the GIS consultant for the successful implementation of this developed software throughout the selected circles of Tamil Nadu Highways Department via TNSWAN.

Process Chart





Financial Mechanism:

The computerization of the Highways Department is an important sub component of the Institutional Strengthening and Policy Development component of the Tamil Nadu Road Sector Project.

IT Improvement plan consists of the following provisions as per G.O.(MS.) No..62, Highways (HF2) Department dated 8-4-2003.

Sl. No.	Description	Amount in Millions of US\$	Amount in Crores of Rs.
1	IT need analysis	0.02	0.09
2	IT Related Equipment	2.94	14.11
3	IT Development and implementation Consultant	0.94	4.51
4	Road management Systems Development consultant	1.55	7.44

Institutional Mechanism:

Central IT cell will be established for IT development and maintenance program for Highways Department.

The proposed **IT cell** will be headed by one appropriately qualified Engineer and comprise of IT savvy persons to absorb the new systems and then transfer and train the other Highways Department officers to use these system on a sustainable basis.

The Highways Department is making a concredited effort to provide access to all its staff from the headquarters to the sub-division level through a reliable computer network to all wing and section level of the maintenance wing.

The Final report on "Need Analysis" prepared by M/s. Price Water House Coopers and approved by the Steering Committee of TNRSP proposed to establish an IT team to implement IT program. The proposed IT team will co-ordinate the procurement activities like Hardware and software connected through TNSWAN, procurement of off-the-shelf software, procurement and installation of furniture including partitions & furnishing, etc. and other infrastructure facilities, and also to deal with the Consultancy services for software, database development and training

of core Highways officers who in-turn transfer and train other Highways Department officers. This IT team will play the key role in the maintenance and updation of the core data base.

The existing wings of Highways Department consists of 7 Chief Engineers, 27 Superintending Engineers, 124 Divisional Engineers, 474 Assistant Divisional Engineers spreaded over the entire State. It is proposed to be provided with Computers, peripherals and other infrastructure facilities to all the officers upto sub-division level in all wings and section level to the maintenance wing. The Institutional strengthening action plan has proposed a new Organizational structure for the Highways Department with Planning Unit, Centralized office accommodation at Region levels, Corporate office etc. However, the preliminary IT works are in progress with the available Chief Officer (Information Technology) and Information Officer. As the IT project implementation works involves about Rs 20 crore, a team of Engineers are to be formed in addition to the CO and IO for proper handling of the implementation, upgradation and maintenance process. Hence the additional staff proposed in two units. (1) IT Working group, (2) IT Cell.

IT Working Group :

The IT working group consists of senior engineers of the department working in the various wings and experts in the department who have IT knowledge. This working group will have the following composition:-

(i) IT Implementation Team

This team consists of Project Director (Tamil Nadu Road Sector Project), C.E (TNRSP), C.E (General), Director (HRS), S.E(TNRSP), Chief Officer(IT), Deputy Director (HW), NIC.

The IT implementation team will decide and review the procedures and methodologies of the various stages of IT implementations in the department and also review the project consultants and update the IT implementation in the future.

(ii) GIS Implementation Team

GIS Implementation team consist of CO(IT), IO, D.E(TNRSP), D.D(HRS), A.P.D(TNRSP), A.D(HRS) having qualification with knowledge in GIS.

(iii) P&FMS Implementation Team

P&FMS Implementation Team is the working group unit, which initiates paperless e-governance in the department by implementing proper procedures followed by Government of Tamil Nadu and Government of India. This group consist of C.E(TNRSP), C.E(General), C.E(Design), C.E(Projects), Director(HRS), C.E(NH), C.E(RR), Chief Officer (IT), CHD(General or TNRSP), AO(G), FAO(TNRSP), FM(TNRSP), IO.

I. IT Cell :

IT Cell is the IT implementation Unit of Highways Department.

It will consist of the following staffing for the various areas of Highways department. This staffing arrangement is organized in the following manner exclusively for IT implementation.

1. Head Office (IT Wing) @ Chennai
2. IT Wing in field level.
3. IT Wing in data centre and disaster recovery centre.

1. Head Office (IT Wing) @ Chennai

Head Office IT wing consist of the following officer and staffs in various position in the organization. This head office will be initially working under the control of Project Director, Tamil Nadu Road Sector Project and later on it will be transferred under the control of Chief Engineer (GI) or Director General (Highways) depending upon the reorganization. This IT wing will be headed by the Chief Officer(IT) in the rank of superintending Engineer(Highways). Suitable number of staff like Information Officer , Engineers for software development , Hardware supply with other support staff including Data entry operators and technicians will also be in position.

2. IT Wing in field level

Field level Office of IT wing consist of following officer and staffs in various position in the organization. This field level office will be initially working under the control of Project Director, Tamil Nadu Road Sector Project and later it will be shifted to the control of Regular wing of Highways. It is proposed to have one Assistant Divisional Engineer for each regular circle to take care of the all the activities like procurement and maintenance of HW, SW related to all the wings of Highways covering approximately ten various division. Suitable number of staff like Engineers

for software maintenance , Hardware maintenance and for training with other support staff including Data entry operators and technicians will also be in position.

3. IT Wing in data centre and disaster recovery centre

A separate Data centre and disaster recovery centre was proposed for the Highways department. Based on the policy decision of the Government, it is proposed to place the servers of the Highways Department in the State Data Centre at Chennai and State disaster recovery centre at Madurai. The maintenance of the above data centre will be done by the IT department of Govt. of Tamil Nadu (here the maintenance stands for physical maintenance like A.C, Power supply etc). The day today operation, maintenance and updation of the Highways department server should be done by the departmental staff. Hence it is proposed for the following staffs like Information Officer, Data entry operators and technicians will also be in position.

Apart form the above IT cell, RMS unit with the following staffing is proposed under the IDS implementation. Hence for the successful sustainability of RMS effective RMS unit is to be formed with the under mentioned tasks

- System Administration
- Overall RMS implementation co ordination
- Verification of the updating process by the respective circle.
- Running the pavement management system.
- Strategy budget study & Maintenance budget planning.
- Preparing and updating the rolling maintenance plan.
- Conducting of ROMDAS survey, BBD survey, CBR test, etc.
- CD co ordination survey, Traffic survey and Inventory data collection updating for overall co ordination of RMS.

Tentatively the following numbers are proposed:

Suitable Engineer from Superintending Engineer to Assistant Engineer level and other support staff like Research assistant, Field Assistant, Lab Assistant, Data entry Operators etc.

Necessary Training Plan to all Officers:

to derive the maximum out of strategy is proposed in the following areas:

1. Basic and Advance training on system operation and operating system.

A basic training to all the users of the department of about 2700 users for 5 working days in handling the basic operations has to be organized by the Hardware Bidder on performing the following tasks:

Basic OS operation, Basic Office suite operation, Virus Scans, Using of network facilities, Sharing of data, Sending and receiving mails, Accessing software packages in the networks, etc.

2. Introduction and Awareness of one day training for top level officers

This training includes introduction of the various available software and techniques to use the software for the better management and review of the work.

3. Application of 15 days training for the middle level officers

Training to the department staff (about 10 persons) should be given on the each Specialized Software per license, which has been include in the software cost.

The Supplier shall indicate the course syllabus, course duration, CV of the trainer and course schedule. It is preferred to have the training at a professional training institute on the basics and advanced areas initially and to provide practical training at a place identified by the department. The Basic training should be given to 2700 users in all 31 Districts.

4. Basic and Advanced training on GIS software operations.

An objective of the GIS software development project is that the staff should become self sufficient in the use and administration, and elements of support and maintenance of the system, documentation and other deliverables.

Training to core team members on the capability of the package for about 10 persons and to end users on the solution in batches at respective locations for about 300 persons. The training course shall cover:

- System administration
- Software administration

- Package software/custom software engineering principles and overview
- Use job specific training
- Include course assessment methods
- Training manuals

5. Basic and advance Training P&FMS software operations.

Training to core team members on the capability of the package and to end users on the solution in batches at respective locations for 500 Nos.

For custom application, training will be imparted to end users on the solution. The training courses shall cover:

- Use of system and complimentary procedures for each functional areas.
- System administration
- Software administration
- Package software/custom software engineering principles and overview
- Use job specific training
- Include course assessment methods
- Training manuals

The ICT strategy will be revised and updated in a regular interval since it is fast changing in nature.

**K. ALLAUDIN,
SECRETARY TO GOVERNMENT,
HIGHWAYS DEPARTMENT.**