PUBLIC WORKS DEPARTMENT
Government of Uttar Pradesh, India

UTTAR PRADESH STATE ROADS PROJECT
Under IBRD Loan No. 4684-IN

Technical Assistance for Implementation of
Institutional Reforms in the Road Sector of Uttar Pradesh

REPORT TO IMPLEMENT PWD SPECIFIC HUMAN RESOURCES
PLANNING AND MANAGEMENT PROGRAMME

and

REPORT FOR IMPLEMENTATION OF CIVIL SERVICE REFORMS
LINKED PWD HR PLANNING AND DEVELOPMENT PROGRAMME
(FINAL)

Report Nos. 43 & 49

January 2008

LEA International Ltd., Canada
in joint venture with
LEA Associates South Asia Pvt. Ltd., India
in association with
Ministry of Transportation of Ontario, Canada
# TABLE OF CONTENTS

1. **INTRODUCTION**...................................................................................................................................... 1  
   1.1 THE IDS ACTION PLAN.................................................................................................................... 1  
   1.2 OBJECTIVES OF THIS REPORT .................................................................................................... 2  
   1.3 TERMINOLOGY.................................................................................................................................... 2  
   1.4 WORKFORCE NEEDS FOR THE RESTRUCTURED PWD ORGANISATION................................. 3  
   1.5 ROLE OF THE HRD AND TRAINING CELL .................................................................................. 3  
   1.6 THE STRUCTURE OF THIS REPORT ............................................................................................ 4  

2. **WHY PWD NEEDS WORKFORCE PLANNING**................................................................................. 5  
   2.1 CURRENT WORKFORCE SITUATION IN PWD ........................................................................ 5  
   2.2 HOW WORKFORCE PLANNING CAN HELP PWD...................................................................... 8  
      2.2.1 PWD Will be Geared to Support State Economic Growth Plans................................. 9  
      2.2.2 Impact of Good Workforce Planning ........................................................................... 9  
   2.3 KEY AREAS OF PWD WORKFORCE PLANNING ................................................................... 12  
      2.3.1 The Workforce Forecast .............................................................................................. 12  
      2.3.2 Workforce Action Plans............................................................................................... 12  
      2.3.3 Implementation of Workforce Plans ........................................................................... 13  
      2.3.4 Major Components of Workforce Plans .................................................................... 13  
      2.3.5 Looking towards the future ....................................................................................... 14  

3. **WORKFORCE PLANNING METHODOLOGY**.................................................................................... 15  
   3.1 DEFINITION OF WORKFORCE PLANNING ........................................................................ 15  
   3.2 ORGANIZATIONAL REQUIREMENTS FOR IMPLEMENTING WFP ....................................... 15  
   3.3 REQUIREMENTS FOR A SUCCESSFUL WORKFORCE PLANNING ...................................... 16  
   3.4 FUNCTIONAL CONSIDERATIONS.............................................................................................. 16  
      3.4.1 Planning Time Frame...................................................................................................... 16  
      3.4.2 Planning Levels............................................................................................................... 17  
   3.5 WORKFORCE PLANNING PROCESS....................................................................................... 17  
   3.6 KEY STEPS OF PWD WORK FORCE PLANNING PROCESS .................................................. 18  
      3.6.1 Key Steps .................................................................................................................... 18  
   3.7 STEP ONE – STRATEGIC DIRECTION SETTING ................................................................ 19  
      3.7.1 Identify Parameters ........................................................................................................ 19  
      3.7.2 Organise and Mobilise Strategic Partners ..................................................................... 19  
   3.8 STEP TWO – SUPPLY, DEMAND AND DISCREPANCIES ....................................................... 20  
      3.8.1 Data Collection .............................................................................................................. 20  
      3.8.2 Define Scope of Data and WFP for Organization ......................................................... 20  
      3.8.3 Collect Existing Documents ........................................................................................ 21  
      3.8.4 Examining the Data ..................................................................................................... 21  

January 2008
3.8.5 Assessment by cadres ................................................................. 23
3.8.6 Data Collection Method ............................................................... 23
3.8.7 Steps for Collecting and analysing Data: ................................. 24
3.8.8 Conduct Skills/Competency Analysis .......................................... 24
3.8.9 Projected Workforce Needs .......................................................... 25
3.8.10 Identifying Changes ................................................................. 25
3.8.11 Impact of Changes .................................................................. 26
3.8.12 Documentation of Discrepancies ............................................... 26
3.8.13 Determine Gaps ...................................................................... 26
3.8.14 Gap Calculation ...................................................................... 26
3.8.15 Gap Prioritisation ................................................................... 27
3.9 DESIGNING A WORKFORCE PLAN TO ADDRESS SKILL GAPS ....... 27
  3.9.1 Identify Strategies and Action Items .......................................... 28
  3.9.2 Implement Action Plan ............................................................... 29
3.10 MONITOR, REVISE AND MODIFY .............................................. 30
  3.10.1 Review of Outcomes .............................................................. 30
  3.10.2 Assessing Accomplishment and Effectiveness of Outcomes ....... 30
  3.10.3 Addressing Needs for Adjustments to Strategies and Action Items 31
  3.10.4 Communicate Changes ........................................................... 31
  3.10.5 Dynamic Review of Process Steps .......................................... 31
  3.10.6 Determining Effectiveness of Process Steps ............................ 31
  3.10.7 Communicate Changes ........................................................... 32
3.11 SUMMARY OF KEY ELEMENTS ................................................. 32
4. PWD WORKFORCE PLANNING MODEL ....................................... 35
  4.1 WORKFORCE PLANNING IN CONTEXT OF PWD STRATEGIC PLANNING ....... 35
  4.2 DEVELOPMENT OF PWD WORKFORCE PLANNING MODEL .................... 36
  4.3 CRITICAL STEPS OF WORKFORCE PLANNING ................................ 37
    4.3.1 Supply Analysis .................................................................. 37
    4.3.2 Demand Analysis ............................................................... 38
    4.3.3 Gap analysis ..................................................................... 38
    4.3.4 Solution analysis/ Strategy Development ............................... 38
  4.4 NEED FOR HRMIS FOR HR DATA FOR WORKFORCE PLANNING ........... 38
5. PWD WORKFORCE SUPPLY ANALYSIS ....................................... 40
  5.1 CORE OCCUPATIONAL GROUPS IN PWD SERVICE .................... 41
  5.2 CURRENT WORKFORCE SITUATION .......................................... 42
  5.3 ATTRITION TRENDS .................................................................. 43
    5.3.1 Attrition during last 5 years ................................................. 43
    5.3.2 Expected Attritions during next 5 years ................................. 43
    5.3.3 Expected Attritions due to superannuation during next 5 years .. 43
5.3.4 Attritions due to superannuation (during next 5 years)................................. 47
5.3.5 Anticipated changes in Attrition...................................................................... 48

6. WORKFORCE DEMAND / GAP ANALYSIS ................................................................. 49
   6.1 GAP ANALYSIS........................................................................................................ 49
   6.2 WORKFORCE COMPOSITION IMPLICATIONS....................................................... 50
   6.3 GAPS IN SKILLS AND COMPETENCIES............................................................. 50
      6.3.1 Areas in which very little or no expertise exist......................................... 51
      6.3.2 Areas in which some expertise is there but gaps exist in respect of modern practices and expert knowledge .................................................... 51

7. SOLUTIONS ANALYSIS / STRATEGY DEVELOPMENT.................................................... 52
   7.1 RECRUITMENT AND INDUCTION STRATEGY...................................................... 52
      7.1.1 Need for Recruitment Strategy .................................................................. 52
   7.2 BASIC WORK FORCE INTAKE PRINCIPLES...................................................... 54
   7.3 SUGGESTED INTAKE PLAN................................................................................ 54
   7.4 STRUCTURED INDUCTION TRAINING............................................................... 55
   7.5 CAREER PLANNING, SUCCESSION PLANNING AND CADRE MANAGEMENT..... 55
   7.6 EMPLOYEE KNOWLEDGE, SKILLS AND ABILITIES......................................... 56
      7.6.1 Training and Career Development Opportunities......................................... 56
      7.6.2 Job Description ........................................................................................... 56
      7.6.3 Skills Inventory and Training Needs Assessment......................................... 56
      7.6.4 Specialisation Courses for Civil Engineers................................................ 57
   7.7 CONTRACT APPOINTMENTS............................................................................... 57
      7.7.1 Induction of Specialists on Contract Basis.................................................. 57

8. WAY FORWARD FOR IMPLEMENTATION OF WORKFORCE PLANNING IN PWD...... 59
   8.1 EQUIP HRD AND TRAINING CELL...................................................................... 59
   8.2 ESTABLISH HRMIS............................................................................................ 59
   8.3 TEAM FOR WORKFORCE PLANNING.............................................................. 59
   8.4 INTEGRATE HR PLANNING WITH PWD STRATEGY PLANNING .................... 59
   8.5 CARRY OUT ORGANISATIONAL RESTRUCTURING.......................................... 59
   8.6 INITIATE REGULAR INTAKE OF ENGINEERS................................................ 59
   8.7 APPOINTMENT OF SPECIALIST WORKFORCE .............................................. 59
   8.8 DEVELOP WORKFORCE PLAN............................................................................. 60
   8.9 WORK FORCE PLAN ON ROLLING BASIS....................................................... 60

9. DISCUSSION IN THE FOCUS GROUP........................................................................ 61

10. PRESENTATION TO PROJECT STEERING COMMITTEE............................................. 62
LIST OF TABLES

Table 5.1 : UP PWD Staff Sanctions and in Position (Sep 2007) ............................................................... 42
Table 5.2 : Staff Position as on Sep 2007 .........................................................................................................42
Table 5.3 : Attritions in last five years ............................................................................................................43
Table 5.4 : Expected Superannuation till 2012 ...............................................................................................47
Table 5.5 : Expected Attritions in two core cadres .........................................................................................47
Table 6.1 : Longer-Term (2012) Minimum needs core staff Cadre Strength for UP PWD (with additional 58 non-core Divisions) ........................................................................ 49
Table 6.2 : Demand, Supply and Gap in Workforce in PWD ................................................................. 50
Table 7.1 : Gap in Workforce in 2012 ..............................................................................................................55
Table 7.2 : Suggested Intake Plan: 2008 to 2012 ......................................................................................... 55
Table 7.3 : Requirement of specialists by 2012 ............................................................................................. 57

LIST OF FIGURES

Figure 4.1 : PWD Strategic Planning, HR Planning and Workforce Planning ............................................. 35
Figure 4.2 : Workforce Planning Model ........................................................................................................ 36
Figure 4.3 : Steps of Workforce Planning .................................................................................................... 37

ANNEXURE

Annexure -1 : Development of HRMIS (Human Resource Management Information System) for UPPWD
<table>
<thead>
<tr>
<th>Abbreviation</th>
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<td>Annual Confidential Report</td>
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<td>Asian Development Bank</td>
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<td>Assistant Engineer</td>
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<td>Administrative Staff College of India</td>
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<td>Benaras Hindu University</td>
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<td>Chief Engineer</td>
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<td>Chief Executive Officer</td>
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<td>Central Road Fund</td>
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<td>Central Road Research Institute</td>
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<td>Core Skills Development Programme</td>
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<td>DRM</td>
<td>Divisional Railway Manager</td>
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<tr>
<td>EE</td>
<td>Executive Engineer</td>
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<td>EFC</td>
<td>Eleventh Finance Commission</td>
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<td>E-in-C</td>
<td>Engineer in Chief</td>
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<td>Environmental and Social Development Unit</td>
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<td>Geographic Information System</td>
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<td>Government Order</td>
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<td>GSDP</td>
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<td>Highway Development and Management System</td>
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<td>Head of Department</td>
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<td>International Bank for Reconstruction and Development</td>
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<td>Indian Institute of Technology</td>
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<td>Indian Roads Congress</td>
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<td>Indian Railway Service of Engineers</td>
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<td>Information Technology</td>
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<td>ISAP</td>
<td>Institutional Strengthening Action Plan</td>
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<td>Indian School of Business</td>
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<td>ISO</td>
<td>International Organisation for Standardisation</td>
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<tr>
<td>JE</td>
<td>Junior Engineer</td>
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<td>JE (T)</td>
<td>Junior Engineer (Technical)</td>
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<td>LAN</td>
<td>Local Area Networking</td>
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<td>Major District Roads</td>
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<td>Management Development Institute</td>
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<td>Member of Legislative Assembly</td>
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<td>MLC</td>
<td>Member of Legislative Council</td>
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<tr>
<td>MIS</td>
<td>Management Information System</td>
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<td>MOST</td>
<td>Ministry of Surface Transport</td>
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<td>MoSRTH</td>
<td>Ministry of Shipping, Road Transport &amp; Highways</td>
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<td>MoRTH</td>
<td>Ministry of Road Transport and Highways</td>
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<td>NABARD</td>
<td>National Bank of Agricultural and Rural Development</td>
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<td>Non-Core Roads</td>
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<td>NGO</td>
<td>Non Government Organisation</td>
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<td>NITHE</td>
<td>National Institute for Training of Highway Engineers</td>
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<td>NH</td>
<td>National Highway</td>
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<td>NHAI</td>
<td>National Highways Authority of India</td>
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<td>NICMAR</td>
<td>National Institute of Construction Management and Research</td>
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<tr>
<td>ODR</td>
<td>Other District Road</td>
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<td>PCC</td>
<td>Project Coordinating Consultant</td>
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<td>PCI</td>
<td>Pavement Condition Index</td>
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<td>PCU</td>
<td>Passenger Car Unit</td>
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<td>PMS</td>
<td>Pavement Management System</td>
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<td>PMGSY</td>
<td>Pradhan Mantri Gram Sadak Yojna</td>
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<td>PPP</td>
<td>Public Private Partnership</td>
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<td>PSP</td>
<td>Private Sector Participation</td>
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<td>PPU</td>
<td>Policy and Planning Unit</td>
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<td>PR</td>
<td>Public Relations</td>
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<td>Public Works Department</td>
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<td>Quality Management</td>
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<td>R&amp;B</td>
<td>Road and Buildings Department</td>
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<td>RES</td>
<td>Rural Engineering Services</td>
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<td>RIDF</td>
<td>Rural Infrastructure Development Fund</td>
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<tr>
<td>RMMS</td>
<td>Road Maintenance Management System</td>
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<td>RMIT</td>
<td>Royal Melbourne Institute of Technology</td>
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<tr>
<td>ROI</td>
<td>Return on Investment</td>
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<td>RTI</td>
<td>Right to Information</td>
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<td>SE</td>
<td>Superintending Engineer</td>
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<td>SH</td>
<td>State Highway</td>
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<td>SRF</td>
<td>State Road Fund</td>
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<td>Abbreviation</td>
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<td>STC</td>
<td>Staff Training College</td>
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<td>State Training Policy</td>
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<td>TA</td>
<td>Technical Assistance</td>
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<td>UPAAM</td>
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<td>UPDESCO</td>
<td>Uttar Pradesh Development Systems Corporation</td>
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<td>UPRNN</td>
<td>Uttar Pradesh Rajikiya Nirman Nigam</td>
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<td>UPSBC</td>
<td>Uttar Pradesh State Bridge Corporation</td>
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<td>UPSRP</td>
<td>Uttar Pradesh State Road Project</td>
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<td>Uttar Pradesh State Highway Authority</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>VOC</td>
<td>Vehicle Operating Cost</td>
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<td>VR</td>
<td>Village Roads</td>
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<td>WB</td>
<td>World Bank</td>
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<td>WBM</td>
<td>Water Bound Macadam</td>
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<td>WFP</td>
<td>Workforce Planning</td>
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1. INTRODUCTION

Enhancement of PWD capacity to be capable of taking up bigger challenges in infrastructure development in the State is an integral component of the World Bank supported UPSRP II presently under implementation. It is envisioned that, as the economy of the state grows, the UP PWD should be capable of developing and managing a top quality road network in the State.

The Institutional Development Study (IDS) of the UP road sector carried out by TCE et al made a comprehensive set of recommendations for Institutional Strengthening and Capacity Enhancement of the PWD which were endorsed by the Government of UP in September 2001. The resultant Institutional Development and Strengthening Action Plan (IDSP) is now taken up for implementation with the assistance from the TA Consultants.

The IDS study report stated the following:

“Need to carry out a comprehensive human resource planning and development program as a part of the Institutional strengthening program. Its components should include Manpower need assessment, human resource planning, human resource development policy/guidelines, training policy and objectives and finally performance appraisal and career planning. This study has to be in line with the attempts under the CSR process, underway, for the complete State administration”.

The IDSP involves a wide range of reforms in the organisational structure, systems and processes of the PWD. The implementation strategy for the reforms encompasses diverse catalytic interventions aimed variously at PWD road management, capacity building, legislation, policy and process modernisation, organisational, systems and technological enhancements.

Within the overall organisational capacity building initiative, the ‘Human Resource Management and Development’ is one of the critical areas for reforms and capacity enhancement. The HR and Training enhancements to be implemented in the PWD has a range of initiatives including Staff requirement study through robust work force planning exercise, Training Needs Assessment (TNA) of PWD officers and training for skills development under a Core Skills Development Programme (CSDP), Career Planning and development strategies, staff mobility etc.

1.1 THE IDS ACTION PLAN

The IDS Action Plan (serial 2C) objective states: “Strategic Planning of PWD skill mix, accountability, staffing profiles and levels” The serial 6A of the objective states, “Program to optimise PWD skills mix and quality.”

Action milestones to be achieved in this direction are:

- Implement PWD specific Human Resources Planning and Management Programme
- Implement CSR- linked PWD HR Planning and Development Programme
1.2 OBJECTIVES OF THIS REPORT

This report addresses to two of the TA Consultants’ deliverables:

Report No. 43 : Report to implement PWD specific human resources planning and management programme

Report No. 49 : Report for implementation of civil service reforms linked PWD HR planning and development programme

The two reports described above are combined into one document for the following reasons:

- Both the reports 43 and 49 pertain to HR Planning in PWD. Report No. 43 specifies implementation of a PWD specific human resource planning and management programme while the Report No. 49 is meant for the same outcome, i.e., PWD HR planning and development programme with additional requirement that the programme should be CSR Linked. Both essentially mean the same outcome in the organisation i.e. establishment of a HR Planning system in PWD.

- The additional qualifying condition in the Report No. 49 is that it is to be CSR linked. Two separate reports were suggested in the IDS Action Plan in the area of HR planning, possibly due to reason that during the time the IDS study was made, there were significant activities on the CSR initiative with commissions/ committees working for reforms in the Civil Service at the Central Government and the State Government levels. However the situation on the ground is that, not much progress has been made in the overall State Administration under the civil services reform initiative and there are no concrete orders or guidelines on HR Planning beyond the policy statements in the ‘UP Civil Service Reform Policy 2000’.

- The HR Planning system and process recommended in the report is based on current ‘best practices’ used in the Industry and large Government organisations.

1.3 TERMINOLOGY

It is necessary to clarify various terminology used for staff resource planning. Various terms are used in the HRM literature for ‘Staff Resource Planning’, but essentially referring to the same activity. These are:

- ‘HR planning’
- ‘staff resource planning’
- ‘human resource planning’
- ‘manpower planning’
- ‘personnel planning’ and
- ‘workforce planning’
The term denotes to the systems and processes leading to determining staff requirements for current and anticipated future needs, taking stock of the availability of manpower within the organisation and planning for various actions to make available the right number of staff, with right competencies.

Of all the terms, ‘WORKFORCE PLANNING’ is most widely used term in current literature. We shall adopt this term in our reports.

1.4 WORKFORCE NEEDS FOR THE RESTRUCTURED PWD ORGANISATION

The TA Consultants have submitted a report on “Progressive PWD Restructuring and staffing realignment including internal staff communications on all major aspects” (Report No.11). This is a substantive report with wide-ranging ramifications for the PWD of the future, especially in respect of the Human Resources. The restructuring exercise incorporates modernisation of various ‘functions’ in PWD operations by introducing and strengthening state-of-the-art planning and management functions for effective decision making. The resultant ‘shift’ in the functional workload in PWD at strategic, managerial and operational levels would necessarily involve substantial changes in the staffing needs.

The Report No. 151 and 272 which pertain to PWD longer-term staffing needs and the staffing strategy/plans were developed simultaneously with the Report No.11 with wide-ranging consultations with cross sections of PWD Officers. The minimum staffing needs of PWD in the short term (5 years) based on the key positions required in the PWD for carrying out the various key functions assigned to PWD, as computed in the above reports will be taken into account for the purposes of Workforce Planning.

1.5 ROLE OF THE HRD AND TRAINING CELL

The implementation of reforms in UP PWD will require appropriate staffing i.e. have right people with the right skills and competencies at the key positions. The HR Unit within PWD will have a major role in implementation of the PWD restructuring through staff resource plans drawn up according to the long term staffing strategy.

The need for a dedicated HRD and Training Unit in PWD was accepted as essential for carrying on the HR and training interventions including staffing realignment for the restructured PWD Organisation. A beginning has been made towards the establishment of the HRD and Training Cell by issue of the necessary Government Orders on 05 October 2007. The next task would be to identify suitable officers as per Report No. 43, which has been discussed and accepted by the Project Steering Committee (PSC) meeting on 26 July 2007. The HRD and Training Cell functioning under a Chief Engineer (Human Resources) will be expected to undertake the wide ranging HRD, Organisation Development and Training activities.

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1 Report on submission PWD functional, workload and manpower study to determine longer term ‘minimum needs’ staffing strategy
2 Report on long term Civil Service Reform compatible core staff resources plan with GoUP.
3 Establishment of dedicated training / HRD cell along with enlistment of required / available resources
“Workforce planning” is a complex but essential task and requires a multidisciplinary ‘Workforce Planning Team/Group’ to be headed by the dedicated ‘Strategic HR’ Section established in the HRD and Training Cell. The requirement of resources for workforce planning and its implementation in PWD is described in the concluding section of this report.

1.6 THE STRUCTURE OF THIS REPORT

This report is in sections as described below:

Section 2: Why PWD needs workforce Planning?

Section 3: Discusses the Methodology for Workforce Planning

Section 4: Describes the PWD Workforce Planning Model

Section 5: Analyses the Supply of PWD workforce

Section 6: Analyses the Demand of PWD workforce and the Gaps between supply and demand

Section 7: Analyses the possible solutions

Section 8: Provides a Way Forward for implementation of Workforce Planning in PWD
2. WHY PWD NEEDS WORKFORCE PLANNING

Workforce Planning is a vital process in an organisation to ensure that right people in right numbers are available in right places and working towards fulfilment of organisational objectives. This requirement is more so important for the large organisation like PWD, which is required to function in a dynamic environment of today and tomorrow. Some of the indicators of current manpower situation in PWD are described in Section 2.1.

2.1 CURRENT WORKFORCE SITUATION IN PWD

The overall Human Resource situation in PWD is strained with progressive erosion of staff numbers in core functions without any new intake to make good the erosion. The situation is compounded by the increase in responsibilities and workloads on PWD over the past 5 years. The existing numerical staff strength is already a matter of concern and projections over the next five to ten years may turn alarming if no interventions are made urgently. Listed below are some of the broad indicators of workforce situation over next 10 years.

Demographic Profile of PWD Workforce: Analysis of age profile of the PWD staff during the IDS study in 2000-2001 indicated that the average age of the technical staff was over 47 years. With practically no recruitment and induction of younger staff during the intervening period, the present average age is estimated to be over 50 years. Because of financial stringency and overstaffing in the State administration in general, recruitment of new staff into government employment was either totally banned for years or restricted to reserved categories only. In the last 10 years, there has been virtually no recruitment at the AE level in PWD. There is a need to employ younger professionals especially for field level supervision of works. The age profile trend can be reversed only in the long run.

High Attrition Rate: With the majority of technical staff being of a higher age bracket, the expected natural attrition rate due to retirements is 4-5% per year. This is likely to lead to rapid depletion of the staff strength in addition to the loss of valuable work experience and expertise within PWD. Among the present technical staff, over 20% would retire in the next five years. This would have an impact on the staffing needs of the organisation in the next few years.

Inadequate HR Management: Systematic HR management mechanisms are non-existent. The present HR activities are mostly limited to routine and operational personnel administration functions. The distribution of the personnel related work is distributed amongst 4 Establishment Sections. Most of the procedures, rules and regulations are those that are uniformly applicable to all State Government Departments.

Seniority Based Compensation and Promotions: Compensation is strictly based on rank and seniority, derived from the Civil Services system. Though the guiding principle for Promotions is that they need to be based on a combination of seniority and merit, in the absence of a non-controvertible system of measuring merit, promotions are made strictly on the basis of seniority provided that there is nothing seriously adverse so as to attract inquiries and legal proceedings. Under the system, there is little scope of rewarding merit or outstanding performance.
Limited Career Advancement Opportunities: During their careers, most JEs can only attain an AE level position. Most graduate engineers, who join as AE, retire as EE. Transfers are decided on a yearly basis, which proves to be dysfunctional at times. There is no formal training policy in PWD. Training needs are neither captured at the time of annual appraisal nor otherwise assessed. Most of the officials undertake two to three training programmes in their entire career. Training is mostly limited to the engineering/technical aspects, even for officers holding positions with large managerial content. The IDS Report stated as follows:

“The Department needs to draw out greater professionalism and initiatives on the part of its employees. If has to meet effectively the targets and objectives in the future Employees at various levels are voicing their realization of the limitations of the present personnel and human resource policies. Further, the Department's project management capabilities and capacities are under severe strain considering the number of large projects under initiation or in progress”

Inflexible HR Policies: PWD human resource policies and personnel systems are a subset of the overall GoUP staff policies applicable to employees of all State Government departments. They cannot be changed in isolation and need to follow the ‘Civil Services Reforms’.

Lack of Specialist Manpower: Present technical staff comprises of generalist civil engineers. There are a smaller no. of mechanical and electrical engineers. Specialists like transport planners, economists, social scientists and environmental engineers are not available with the Department. There is still a need for training/employing skeletal staff in these areas for effective co-ordination with the consultants

Inappropriate Staffing Norms: The staffing norms in terms of Technical: Ministerial (clerks etc.) support staff (chowkidar etc.) for divisions is at 4:4:1 and for circles at 4:21:7 respectively. These staffing norms are based on the predominant tasks of execution at Division level and coordination at the Circle level. Further, it assumes limited data processing and documentation capabilities and manual systems and processes. It is also based on an assumption of in-house execution of works. There is a need to review the staffing norms (type and numbers) to factor in the revised roles and positions emerging out of the proposed redesign of the field officer and HQ. The review should also take into account the changes in the manpower requirements due to changes in the organisational systems and procedures that would be increasingly based on greater data gathering and employing of Information Technology tools. Emerging out of the revised manpower norms will be positions that are no longer required in that number and also new positions requiring personnel with different skill mix. To the extent possible, the staffs have to be retrained and redeployed in new positions.

Absence of Updated HR Database: There is no centralised database regarding the socio-economic and demographic profile of the workforce in PWD. Recruitment was stopped for a long period. Recruitment is only at the entry level and not at the middle levels. Recruitment is based on qualification at the Graduation level. The human resource planning and redeployment exercise shall indicate the number and kind of personnel that have to be inducted in the Department to enable PWD achieve its objectives. There is a need to recruit specialists and experienced professionals at the middle level for infusing fresh ideas, initiatives, experience sharing and to overcome the skill deficiencies like in the case of socio-environmental analysis and road safety management.
The responsibility for recruitment and selection is likely to continue with the State Public Service Commission, but the Department can play a more effective role by clearly elucidating the specific skills required and desirable educational strengths, which should be part of the assessment exercise.

**Uncertain Tenures:** There is no consistency in the tenures of the officers. Government guidelines with regard to transfers are not consistent and are announced every year. The inconsistency in the policy guidelines and increasing number of exceptions have lead to a situation of Uncertainty among the officers in the executive positions and consequent day-to-day orientation towards the tasks, at the cost of activities with long-term but important significance. The frequent exceptions have affected faith in the whole process of postings and transfers.

While the Government shall retain the prerogative of transferring personnel in the greater public interest, the continuity of personnel in some positions is warranted for greater accountability and proper execution of Works. Accordingly, certain senior positions should have a minimum tenure. The systems should be made transparent to the extent possible, through communication of transfer policy across the organisation and also communicating the reasons for deviation.

**Low Levels of Motivation:** There is a noticeable low level of motivation among the officers in the Department especially at the JE and AE levels, where promotion avenues are highly constrained. Promotions are mainly based on seniority, with perceived merit given some consideration. There are very few positive aspects encouraging commitment and initiative, whereas there is widespread sensitivity towards possibility of disciplinary action for any non-adherence to the rule (deliberate or circumstantial). There is a need to enrich the jobs (responsibilities) at the junior level and with specific accountability. This should be accompanied by greater powers at junior levels. There is need to creatively bring in respectability and professionalism to the Division level officers to boost the low motivation as prevailing today. There have to be conscious efforts to encourage initiatives to break the prevalent culture of restraint and fear psychosis.

**Ineffective Appraisal System:** The current performance appraisal system is a closed system wherein the contents of the appraisal are not discussed with the concerned employee. The format for confidential reports has very few guidelines and hence is open to discretion of the reviewer. The appraisal process should be redesigned so that the process is objective and transparent. The scope of the Performance Appraisal form can be enhanced to include information related to capability improvement.

**Inadequate Training:** There seems to be no regular arrangement for providing training and reorientation to the officers of the Department. The State does not have a training institute dedicated to the roads sector. No training policy or guidelines have been laid down. Training programs receive ad-hoc allocations. Annual budget for training is just Rs. 25 lakh and most of that goes unused. Training is limited mostly to technical areas. On the average, PWD officers attend two to three training programs in their entire career. Training budget as per the proposed Government norms plus the training support as part of the “Institutional Development Strengthening Programme” shall provide sufficient funds for a “Comprehensive Management Development and Competence Enhancement” program for the PWD Officers. However, there is
a need to define training policy and objectives. The training contents should be designed specifically keeping the nature of responsibilities handled by the officers at different levels. Training should be mandatory before taking a particular assignment especially involving roles with high managerial contents. There is dire need to improve the capability of engineering staff and to reform the human resource management policy. The Engineers in the PWD are competent but they are demoralised and it is not possible to expect good results without increased training.

Absence of Conducive Career Development and Cadre Management Systems: Cadre management has not received due attention in PWD. Promotion prospects have remained generally poor in comparison to other departments. Bulk of and the majority of professional staff remains at lower levels for long periods. Discussions with PWD officers indicate that most Junior Engineers remain at the same level throughout their career. Graduate Engineers who joined as Assistant Engineers through the State Public Service Commission, continued to remain at the entry level as Asst. Engineers for over 25 years before being considered for promoted to the next higher level.

2.2 HOW WORKFORCE PLANNING CAN HELP PWD

Adequate Workforce planning will help PWD manage talent shortages and surpluses in a planned manner. By understanding the likely demands on the department and tending to "talent pipelines" and current talent inventories, the top management of PWD can act well in time, instead of just react at the time of crisis. The HRD and Training Cell, under creation in PWD, will take up the Workforce planning activities as one of the most important agenda and focus on meticulous implementation of the approved workforce plans which is a challenging task.

The following descriptions demystify what workforce planning is, and discusses the reasons why PWD should implement such an effort.

Being prepared is better than being surprised. Organisations that just wait and then attempt to react to current events will not thrive for very long. The new standard is to provide managers with warnings and action plans to combat full-blown problems before they become more than a blip on their radar. Workforce planning is a systematic, fully integrated organizational process that involves proactively planning ahead to avoid talent surpluses or shortages. It is based on the premise that an organisation can be staffed more efficiently if it forecasts its talent needs as well as the actual supply of talent that is or will be available.

By planning ahead, HR can provide the PWD managers with the right number of people, with the right skills, in the right place, and at the right time. Workforce planning might be more accurately called talent planning because it integrates the forecasting elements of each of the HR functions that relate to talent -- recruiting, retention, redeployment, and leadership and employee development.

The rate of change in the talent market is dramatic. We now know how important talent is to the success of an organisation. It's time to make the talent pipeline (a defined recruiting channel where the Department can find qualified talent to meet its specific needs) more efficient. It's also time to manage PWD's talent inventory (PWD's current employee base) so that there is neither shortage nor surplus.
2.2.1 PWD Will be Geared to Support State Economic Growth Plans

The State is embarked on an economic growth path and will need to accelerate the development of which will put a great demand for connectivity and quick transportation of facilities. The Road sector needs to be well equipped to meet these demands. PWD is required to operate in unison with the other economic engines of growth and should not be allowed to fall into the naïve trap of operating independently of the economic cycle. Organisations which work in a short-term orientation with no independent planning and forecasting function; reacting to events and lacking a long-term, big-picture view of the larger scenario can be found wanting when the demand comes. This should not be the case with PWD.

To further aggravate the problem, many HR departments have no formal strategy of any kind. When you stop HR people in the same department and independently ask them to name their department's strategy, more often than not you get a blank look. Rather than seeing the big picture, HR departments tend to develop programs only when a "crisis" occurs. It is infrequent that you find a systematic strategy, a forecast, and a plan to integrate HR.

PWD has distinct reasons for planning ahead. The first reason is to lessen the impact of the boom-and-bust cycle on the management and operation of the PWD. The second--and perhaps more important--reason for planning ahead is that PWD needs to manage the talent pipeline for the organization for easy transition of talent to key positions as soon as they fall vacant due to large scale retirements. It's crucial to maintain both the talent pipeline and the talent "inventory" at the right levels.

Unfortunately, Government organisations are notorious for first "over hiring" and then not having the capacity to reduce the workforce to necessary levels without inflicting major damage on employee morale. In contrast, during the boom phases, HR processes, which were designed for the average load, can't handle the overload requirements of high-volume hiring and retention issues. Fortunately, there is a common answer to both dilemmas: workforce planning.

2.2.2 Impact of Good Workforce Planning

Good workforce planning has multiple impacts on an organisation. Most significant ones include:

- **Strategic basis for human resource decisions:** WFP helps the organization as a whole forecast future conditions and develops objectives for the human resource programs to meet the PWD needs. It allows managers to anticipate change as well as provide strategic methods for addressing present and anticipated workforce issues. Changes in skills, competencies, and key positions can be anticipated as a result of retirements and natural attrition.

- **Links expenditures to organization’s long-term goals and objectives:** Human resources are expensive. The higher the percentage of the budget comprised of human resources-related costs, the more important is the need to plan. The cost of employee turnover, replacement, retraining, and retention further increases these costs. WFP can reduce these costs by ensuring more efficient and effective recruitment, training, and retention. It also provides other benefits such as background information for position management and succession planning; better identification of training and development needs for the long-term; linkage of training with performance goals and more cost effective programs.
• **Links recruitment, development and training decisions to organizational goals:** WFP provides a clear rationale for linking expenditures for recruitment, training, employment development, retention, and other human resource programs. The PWD's performance need to match the outcomes and results it is expected to accomplish as stated in the strategic plans and the annual business plans.

• Improvements in skills, personnel, and procedures will assist organizations in achieving GPRA goals. "Only when the right workers (employees or contingency workers) are on board and are provided the training, tools, structures, incentives, and accountability to work effectively is organizational success possible."

• **Address changes in program direction:** that impacts the type of work being performed and/or how the work is being performed. WFP will help to identify work that can be contracted to the private sector (outsourcing) and opportunities to delayer management. Lastly WFP allows managers to identify ways in which technology and other business changes impact the skills required in the workforce.

• **Eliminating Surprises:** HR should limit the stressful "trauma" related to being surprised. HR should have the time to prepare processes and answers.

• **Rapid Talent Replacement:** Having the capability to rapidly figure out positions that are vacant due to sudden (or unavoidable) turnover so that the works or services don't miss a beat.

• **No Delays:** Ensuring that the organisation can meet the goals by employing the right number of people.

• **The right skills:** Ultimately increasing product-development speed because the organisation has the brightest people with the right skills to take products through to their launch--on time.

• **Employee development:** The ability to ramp up rapidly on new projects because the organisation has prepared and trained internal talent to meet the project needs.

• **Identifying problems early:** If you have a smoke-detector system in place to notify managers before a talent fire gets out of hand, it will be much easier to minimize the potential damage. HR should develop a system of "alerts" to warn managers of minor problems (that they can rectify with little effort) before they turn into major problems.

• **Preventing problems:** Having to fix problems is expensive and painful. A superior approach is to prevent problems from ever occurring.

• **Lower turnover rates:** Employees are continually groomed for new opportunities that fit their career interests and capabilities. They transition easily and rapidly to them.

• **Lower salary cost:** The capability is developed to rapidly reduce salary costs without the need for large-scale layoffs of permanent employees.

• **No layoffs:** Avoiding the need for layoffs by managing head count ensures that the organisation won't have a "surplus" of talent.
• **Taking advantage of opportunities:** Given sufficient lead-time, you can gather resources and the talent necessary to take advantage of positive opportunities. When you’re constantly fighting fires, you generally miss even seeing the opportunities, and there is

• **Improving Department’s image:** Looking like you’re constantly in a frantic state does nothing to inspire confidence or improve your department's image. By being well prepared for any eventuality, you build your image, your brand, and your credibility, so the decision makers are more likely to invest in you.

• **Encourage Automation:** Automation of HR information being a prerequisite for the workforce planning process, it would encourage the computerisation of PWD work systems and this in turn will have a profound impact on the way PWD functions. Advances in computer hardware and software will allow PWD to extensively use interactive and intelligent systems. Major changes to the personnel data system, office processes, and training methods can be expected.

*Workforce planning is an important Human Resource and Organization Development activity that will enable us to:*

• Determine the workforce needed for tomorrow's success;
• Bridge knowledge gaps due to attrition;
• Have the right people at the right place at the right time.
• Provide a foundation to actively train, recruit or restructure resources.
• Take all of the separate initiatives out of the stovepipes and put them in an integrated whole as part of an overall plan.
• Allow for a more effective and efficient use of workforce when faced with a situation to take up more programmes with fewer staff members.
• Ensure that replacements are available to fill important vacancies.
• Provide realistic staffing projections for budget purposes; very helpful when justifying budget requests to the Legislature.
• Provide clear rationale for linking expenditures for training and retraining, development, career counselling, and recruiting efforts.
• Prepare for restructuring, reducing, or expanding its workforce.
2.3 KEY AREAS OF PWD WORKFORCE PLANNING

PWD Workforce planning system will consist of three basic areas of focus:

2.3.1 The Workforce Forecast

Workforce forecasting is a process for predicting upcoming changes in the demand for workforce and the supply of workforce. Forecasts are generally broken down into four areas:

- Estimated increases in organisation growth, output, and budget.
- Estimates of the corresponding changes in workforce needs that come from that growth. Estimates can include the number and type of employees as well as where and when they will be needed.
- Projections of future vacancies.
- Estimates of the internal and external availability of the workforce needed to meet forecasts.

The predictions that result from the forecast have two basic purposes:

- To educate or provide a heads-up to managers and HR about what they should expect on the workforce front.
- To provide specific information on the supply of and demand for workforce across industries. In this way, specific action plans can be developed in the next part of the workforce-planning process (workforce action plans) to provide the organisation with an advantage over its competitors. Action plans are generally developed in each of the different forecasted areas, including recruitment, retention, redeployment, contractual workforce, outsourcing, leadership development, and succession planning.

2.3.2 Workforce Action Plans

Workforce action plans outline what specific actions managers will have to take in terms of workforce management. Action plans are designed to attract, retain, redeploy, and develop the workforce an organisation needs in order to meet the forecasted quantity and quality of employees in the future. The action plans designate responsibility and outline the specific steps that should be taken in order to fill the workforce pipeline and maintain the workforce inventory at the levels required for the firm’s projected growth rate.

Each action plan has a set of goals, an individual who is responsible for making sure the plan objectives are met, a budget, a timetable, and a measurable result. Action plans can be broken down into three general activities:

a. Sourcing and recruiting an adequate supply of workforce: maintaining an external recruiting capability to identify and court a supply of future workforce to ensure that the organisation's needs are not hampered by an inability to find and hire the right employees.
b. Internal development and supply of qualified leaders and key workforce: identifying and grooming internal workforce and providing learning opportunities to increase the internal supply of future leaders (and top workforce in key positions) to ensure that the organisation's efficiencies are not restricted by a lack of leadership workforce.

c. Forecasting the gaps between workforce needs and its availability: required workforce and leadership supply and needs forecasts to management so that they are aware of, and are considering solutions for, the gap between the organisation's overall workforce needs and the identifiable supply of workforce.

2.3.3 Implementation of Workforce Plans

Action plans must be fully implemented if an organisation is going to meet its forecasted workforce needs. Unfortunately, most workforce plans fail or drop off when they come to the implementation phase. Written plans can sit on shelves, whereas action plans can be independent of normal, day-to-day operations. For action plans to be effective, workforce planning and the process of being “future-focused” must be fully integrated into every aspect of workforce management.

In addition to being seamlessly integrated into every aspect of HR, workforce planning must become a way of thinking for managers as well. The integration plan has many aspects, including communication and identification of potential supporters and resisters. Metrics would be used to monitor progress of implementation plan and appropriate rewards are to be used to encourage action and overcome resistance.

2.3.4 Major Components of Workforce Plans

Several formats of workforce plan have been developed and are in use in organisations. Some workforce plans contain many components, while others contain just a succession plan for senior managers. There is no one-size-fits-all model. While there are some basic components that all plans should include, there are some supplementary components that can and will work better for some organisations than others. The following is a list of the most common components of a workforce plan:

- Forecasting and assessment. Estimates of the internal/external supply and demand; labour costs; organisation growth rates; and organisation revenue.
- Succession planning. Designating the progression plan for key positions.
- Leadership development. Designating high-potential employees; coaching; mentoring; rotating people into different projects.
- Recruiting. Estimating needs for head count, positions, location, timing, and more.
- Retention. Forecasting turnover rates; identifying who is at risk and how to keep them.
- Redeployment. Deciding who is eligible for redeployment, and from where to where.
- Contingent workforce. Designating the percentage of employees who will be contingent, and in what positions.
• Potential retirements. Figuring out who is due for retirement, when they are eligible, who will replace them, and what alternative work arrangements are available.

• Performance management. Instituting "forced ranking" or identifying who should be "managed out."

• Career path. Career counselling for employees to help them move up.

• Backfills. Designating key-position backups.

• Internal placement. Developing job-posting systems for internal employees to get a leg up on new openings.

• Environmental forecast. Forecasts of industry and environmental trends, as well as competitor assessment.

• Identifying job and competency needs. Establishing skills-and-interest inventory for key positions.

• Metrics. Identifying metrics to determine the effectiveness of workforce planning.

2.3.5 Looking towards the future

The primary reason for PWD workforce planning is economics. If done well, workforce planning will increase productivity, cut manpower costs in the long term, and dramatically cut time-to-implement projects because PWD will have the right number of people, with the right skills, in the right places, at the right time.

Workforce planning works because it forces everyone to begin looking toward the future, and prevents surprises. It requires managers to plan ahead and to consider all eventualities. Effective workforce planning is an integrated workforce management system that has the potential to enhance PWD’s efficiency and effectiveness to deliver better works to the society.
3. WORKFORCE PLANNING METHODOLOGY

3.1 DEFINITION OF WORKFORCE PLANNING

Workforce Planning (WFP) ensures that “the right people with the right skills are in the right place at the right time.”

This definition covers a methodical process that provides managers with a framework for making human resource decisions based on the organization’s mission, strategic plan, budgetary resources, and a set of desired workforce competencies.

Planning for human resource needs is one of the greatest challenges facing managers and leaders. In order to meet this challenge, a uniform process that provides a disciplined approach for matching human resources with the anticipated needs of the PWD is essential. Workforce planning is a fundamental planning tool, critical to quality performance that will contribute to the achievement of program objectives by providing a basis for justifying budget allocation and workload staffing levels. As PWD develops strategies to support the achievement of both long-term and annual performance goals in the strategic plans, workforce planning should be included as a key management activity. WFP must be directly linked to broad-based management strategies that encompass several processes.

WFP should be a dynamic process that facilitates planning for different scenarios. It can be as complex or as simple as the organizational needs dictate. Initially, PWD may decide to take up workforce planning for the ‘core staff’. Core staff (as defined in the Report No. 15) consists of Civil Engineering staff from JE to E-in-C and their performance is critical to success of PWD mission in the Road Sector. Staff reductions or increases should be directly linked to the organization’s mission through proper workforce planning as any mismatch between the targets and resources would hamper achievement of organisational goals.

3.2 ORGANIZATIONAL REQUIREMENTS FOR IMPLEMENTING WFP

In order to achieve the optimum WFP product, the following have been identified as being essential organizational elements that need to be in place in PWD for effectively carrying out WFP activities:

- Multi-disciplinary team of HR, Strategic Planning, Operations, Finance and Field level professionals.
- Integration of the Organisation’s planning processes (strategic plans, and annual business plans) with WFP
- Top management support
- Accountability at all levels
- A simple, systematic and well-documented process
3.3 REQUIREMENTS FOR A SUCCESSFUL WORKFORCE PLANNING

A review of several models has shown that, although WFP will vary depending upon the needs of an organization, the general processes have some common elements. A typical WFP would need to meet the following criteria:

- **Integration with other planning processes**: In particular, strategic planning, budget, and human resources are key players in workforce planning. The strategic plan formulated by the organisation identifies the organizational direction and articulates measurable program goals and objectives. The budget process provides information on the allocated funding to achieve objectives. Human resources provides tools for identifying skills/competencies needed in the workforce, recruiting, career development, training, retraining, outsourcing, etc. in order to build the workforce of the future.

- **Workforce Supply**: Analysis of projected workforce supply based on the inventory of present workforce and the projected retirements and expected other attritions over the time span for which the WFP is to be developed. An updated HR database of all staff, popularly known as the Human Resource Management Information System (HRMIS), is essential for the workforce supply data required for the WFP.

- **Forecast Workforce Need**: Identification of skills/competencies needed in the future;

- **Gap Analysis**: Comparison of the present workforce skills/competencies to future needs to identify skill/competency gaps and surpluses.

- **Strategies**: Development of strategies and action items to address needed or surplus skills

- **Evaluation**: A dynamic evaluation process that ensures the workforce model remains valid and that objectives are being met in support of the organization's performance goals.

3.4 FUNCTIONAL CONSIDERATIONS

Workforce planning requires two important functional considerations:

3.4.1 Planning Time Frame

PWD need to consider how far into the future to project when carrying out workforce planning. Managers need to balance the certainty of short-range planning against the need to plan for longer-range objectives. Longer time frames may provide more flexibility in planning workforce transitions but also will require regular validation of the analysis of future workforce needs. Shorter time frames run the risks of requiring more drastic workforce transition management and of missing coming changes by not looking far enough into the future. **The Consultants recommend a five-year time frame.**
3.4.2 Planning Levels

What is an appropriate organizational level for developing a workforce plan? There is no single answer to the issue of appropriate planning levels. The most useful guideline in determining planning levels is to make sure that the outputs of workforce planning will relate to organizational or programmatic strategic objectives.

A workforce planning model should provide flexibility to PWD to adapt the model to the organization. This includes the flexibility to determine planning levels that make managerial sense and support strategic plans objectives. The size of PWD, how it is organized, how programs are managed, and budgeted, all will impact on workforce-planning levels.

3.5 WORKFORCE PLANNING PROCESS

Planning for human resources needs (competencies and capabilities) is essentially a process for matching human resources with the anticipated needs of the PWD. Program goals will not be achieved without having “the right people with the right skills in the right place at the right time.” Workforce planning is a fundamental tool, critical to quality performance that will contribute to the achievement of program objectives. As PWD formulates strategies that support the achievement of its long-term and annual performance goals in the strategic and annual business (works) plans, workforce planning should be included as an essential component of the broad-based management strategy.

The following are common reasons to conduct workforce planning:

- Helps meet the organization’s competency/skill needs
- Provides focus for workforce demographics, retirement projections, and succession planning.
- Provides a clear rationale for linking expenditures for recruitment, training, employee development, retention, and other human resource programs to the organization’s long-term goals and objectives.
- Provides managers with tools to address changes in program direction that impacts that type of work being performed.
- Assists managers in creating a high quality workforce capable of continually growing and changing.
- Assist managers in identifying partnering, outsourcing, de-layering, and reorganizing opportunities.
- Provides critical information for inclusion in budget requests and Annual Reports.
3.6 KEY STEPS OF PWD WORK FORCE PLANNING PROCESS

3.6.1 Key Steps

The following are the steps that lead to a full workforce analysis:

- Prepare for workforce planning
- Organize and mobilize strategic partners
- Collect data
- Examine data
- Envision the future
- Project needs
- Determine the gaps
- Develop action plans
- Implement plans
- Review effectiveness and fine tune.
3.7 STEP ONE – STRATEGIC DIRECTION SETTING

PWD should identify a multidisciplinary team to conduct workforce planning. The HRD Cell should be tasked with this responsibility and the head of the Strategic HR Unit within the HRD Cell would lead the workforce planning team. The team should have members from Policy and Planning unit, HRMIS in-charge, IT specialist and a few representatives from the field units.

The Workforce Planning Team and the HRD and Training Cell will do the following:

3.7.1 Identify Parameters

Workforce planning will require input from a variety of functional areas and levels such as strategic planning, executing agencies, administrative units, program units, human resources, budget and finance, staff associations etc. Before beginning to conduct analysis, the team should begin with the following parameters:

- Clearly understand why you are doing PWD workforce planning.
- Identify resources available.
- Adapt models, strategies, tools, and processes to your organizational environment and needs. Concentrate on planning outputs that are organizationally meaningful and which support program objectives, budget requests, staffing requests, and strategic plans. Training, coaching, technical assistance and other support will be required as offices prepare to use models, strategies, and tools.
- Begin with a set of assumptions that set the scope of workforce planning within an organization.
- The capacity to do effective workforce planning will only be developed over time. The time needed to conduct workforce planning will vary depending on the scope of the WFP plan. It is critical to begin carefully and to validate the analysis at each step. It may be helpful for an office to begin with a subset of the workforce and extend planning through the remainder of the organization. After you have either adopted these parameters or developed your own based on your organization, you should discuss them with top management to ensure their support. In this report, the analysis is made in respect of the ‘Core Staff’ of Civil Engineers (JE to E-in-C).

3.7.2 Organise and Mobilise Strategic Partners

Now that you have established the parameters for the workforce-planning project, you should begin assembling the team of professionals to participate in the workforce study. At the very least, you will need specialists from strategic planning, financial management, budget, human resources, program areas, and a management analyst to assist you. Strategic planning sets organizational direction and articulates measurable program goals and objectives, the budget process plans for the funding to achieve these objectives, and human resources provides tools for identifying competencies needed in the workforce and for recruiting, developing, training, retaining, retraining, or placing employees to build the workforce of the future.
The HRM Cell should notify subject-matter officials of this task and request their assistance when needed. Leadership should appoint specific offices and individuals to serve as key players, including employees from any targeted occupational groups that the plan is examining. This is also the time to discuss the roles, responsibilities, and commitment of each team member. The following information should be addressed for each team member:

- Name of each member
- Occupational group represented
- Specific role
- Responsibility
- Time committed to projected

You are now ready to begin workforce planning according to the following steps that are outlined in the remainder of this report.

3.8 **STEP TWO – SUPPLY, DEMAND AND DISCREPANCIES**

3.8.1 **Data Collection**

Workforce planners must gather a variety of information and data in order to conduct comprehensive workforce planning to determine future needs as well as the projected workforce supply. In order to paint the picture of the future, you should begin by:

1. Examining planning documents (strategic plans, performance plans, etc.)
2. Reviewing current and projected financial/budget information
3. Determining major planning issues (external influences, trends, and anticipated changes in budgets)
4. Developing assumptions and setting objectives accordingly.

The following sections will guide you in collecting all the data you will need to proceed with the other steps in conducting a workforce plan analysis.

3.8.2 **Define Scope of Data and WFP for Organization**

Understand the scope of your study and exactly what information will help you develop a full workforce plan. It is recommended that you begin by identifying the Scope of Data and Scope of the Organization as outlined below:

- Will the workforce plan focus on the entire organization, sub-unit, specific occupation, or functional area?
- Determine the number of years for which the workforce planning process will make projections (5 year time horizon is recommended)
Determine whether the "workforce" includes permanent, temporary, part-time, contractual employees. This includes reviewing positions, organizations, and functions for possible outsourcing. It also involves looking for organizational delayering opportunities.

Examine diversity and/or cultural issues (ensure that the approach does not raise barriers for segments of the labour force)

Identify baseline human resource and financial data, such as annual and projected budgets that will be used for the analysis.

Dealing with each of these issues will help you define the scope of your workforce analysis. This is a critical step in the beginning stages of understanding your workforce dynamics. While no formal protocol exists for capturing this information, it is recommended that these answers be documented as a section of the plan for future reference.

3.8.3 Collect Existing Documents

You will need to collect as many of the following documents/reports to assist you with understanding your organization’s vision, outlook, and overall workforce dynamics:

- Strategic Plan(s) including Mission Statement(s)
- Organizational Performance Plan(s)
- Financial Report(s)
- Budget Reports
- Vision Statement(s)
- Organizational Long/Short Term Goals
- Organizational Objectives
- Affirmative Action Reports
- Workload Reports
- All Organizational Studies
- Organizational Charts
- Staffing Plans

Once you have collected these documents, follow the instructions below to analyze each document. This information will be referred to throughout the processes and will be the driving force behind each step and strategy hereafter.

3.8.4 Examining the Data

You will need to examine and analyze the data to determine future needs, changes, and direction within your organization. To assist in analyzing the data you have collected, answer the following questions using the information you have collected.
QUESTIONS THAT WILL IMPACT THE ANALYSIS

1. What changes are anticipated over the next 5-10 years in respect of PWD’s
   - Mission, core functions, strategic goals and objectives, operational goals, etc.
   - Budget, trends and patterns. Do projected funding levels support the objectives? Are there any changes to your philosophy or approach to budgeting?
   - Impacts of internal and external environment (legislative changes, departmental initiatives, social and economic trends.)
   - Labour force trends
   - Shifting skills/competencies
   - New technology innovations
   - Changes in organizational structures (including reorganizing/restructuring)
   - Outsourcing of works, services (contracting out)
   - Partnering with other agencies
   - Privatizing elements of the works
   - Duration of the projects and programs

2. How will these changes affect:
   - The volume, type and location of works to be performed
   - Organizational structure and design
   - Outsourcing decisions
   - Mix of skills
   - Supervisory/manager employee ratios
   - Increasing/decreasing workforce staffing levels

3. What is the planned organizational outlook for the future and how do you plan to meet those goals? Examine the workforce by analyzing:
   - The numbers of work units (Divisions, Circles and Zones etc) are needed in the organization and with what skills and competencies and by when?
   - Number and kinds of skills/competencies needed at each level of expertise
   - Number of supervisors/non-supervisors
   - Number of types of teams (teaming cultures and strategies)
   - Developmental needs
   - Positive education requirements

This information will be needed when you determine your gap and analyze strategies and action items to address those gaps.
This section will focus on gathering information to analyze how the projected workforce supply will look by applying projected retirements and turnover to the current workforce. It will be based on workforce demographics and employment trends. Demographics include occupations, grade levels, organizational structure, gender, age, length of service, retirements etc. The above data will provide the necessary baselines for analysis. Trend analysis provides both descriptive and forecasting models which describes how turnover will affect the workforce in the absence of management action. Analysis can provide powerful predictors of how many employees will actually retire, resign or transfer. Workforce demographics data will provide a snapshot of your organization by organizing workforce data from the HRMIS data warehouse.

3.8.5 Assessment by cadres

In order to analyze your current workforce and obtain a snapshot of your organization, you should collect data, as applicable, for each cadre for significant occupational series/grouping to determine the following:

1. How many employees at each organizational level?
2. What is the grade structure for these series?
3. What is the average education level/grade/step/time in position for employees in this field?
4. What is the turnover rate? Are employees leaving PWD to transfer to other Government agencies or private organizations?
5. Are employees in this field moving around within PWD?
6. Are employees retiring earlier than their superannuation?
7. What is the predicted retirement count for the next five year?
8. What is the average year of service at retirement?
9. What are the gender/racial/age/disabilities statistics for this field?
10. Can any of the work be outsourced?

3.8.6 Data Collection Method

Information needed to analyze the workforce and answer all the questions cited above will have to be collected from various files and documents held in the establishment sections and the Zonal/ Circle/ Division Offices. A centralised HRMIS established in the department with the specific objective of using it for workforce planning (among other uses) would be an essential first step towards modernisation of HR Planning and Management systems in PWD. Until such a system is in place the Workforce planning team may have to depend on the data that may be collected from the above sources. Using the information above, it would be possible to compute broad turnover rates, analyze retirement trends, anticipate future retirements, analyze the current total workforce, determine recruitment practices, and provide a snapshot of the entire series.
3.8.7 Steps for Collecting and analysing Data:

Obtain electronic human resources information from payroll and other reports that includes the following data elements:

- **Title:** The title of each position within a career field.

- **Specialisation /cadre:** Information for the entire occupational series will be available, allowing you to analyze each occupation within the series separately or together.

- **Grade:** This field allows you to analyze the current grade structure, percentages of higher grades versus lower grades, average length of service in a grade and the average grade of retirees.

- **Date of Birth (DOB):** The DOB is needed to analyze retirement dates, average age of different ranks, age of new hires, retirees, etc.

- **Gender:** This information is useful in determining the gender structure of the career field, the typical hiring trends of males and females, and the career paths of both.

- **Type of Appointment:** The type of appointment under which an employee is serving (permanent, temporary, on probation, on contract, on extension, etc.)

- **Date of Retirement:** Gives the date employees will be due for retirement.

3.8.8 Conduct Skills/Competency Analysis

In order to understand whether the organization will have the skills needed in the future, it is needed to determine the skills/competencies of the current workforce. It is recommended that competency analysis is taken up only in the second iteration of PWD workforce planning. The first time the WFP exercise is carried out, it is recommended that PWD limits the study to the most important occupational series i.e. the Civil Engineering cadres and to the numerical headcount. This will build a base-line from which PWD can later refine the requirements using a skills/competency analysis.

Two key elements in identifying skills/competencies are:

- **Workforce skill analysis,** a process that described the skills/competencies required for today’s work.

- **Conducting workforce skill/competency analysis** requires the leaders of an organization to anticipate how the nature of the organization’s work will change, and then to identify future human resource requirements. The process spans the supply analysis and demand analysis aspect of workforce planning.

- **Job analysis,** which collects information describing successful job performance.

- **Job analysis** focuses on tasks, responsibilities, knowledge and skill requirements as well as other criteria that contribute to successful job performance. Information obtained from employees in this process is used to identify skills/competencies.
Follow the steps outlined below to conduct a skills/competencies analysis:

1. Identify the job skills/competencies that will be required for future positions in your organization. A matrix can be used as a tool for identifying the skills/competencies that are or will be required for specific positions. This step will likely have been done at some point in the strategic planning, prior to the gap analysis.

2. Determine whether current employees possess the skills/competencies that will be required by the identified positions. This is the data likely to be missing other than in anecdotal ways or based on assumptions related to current grade and series. A skills assessment/competencies tool can be used to measure individual employee competencies.

3. Analyze the difference (if any) between current employee skills/competencies and future organizational needs.

The results of the skills analysis will help to identify potential retraining needs that employees in certain "excess" or "surplus" positions may require in order to transition into other positions within the organization. It will also help establish the focus of recruiting and training efforts.

3.8.9 Projected Workforce Needs

The information collected will be used in this step to determine PWD's future needs in terms of specific skills/competencies needed. The mission, vision, goals, and objectives of the organization, which are already identified in the previous steps, help define the workforce needed in the future.

An important part of the future needs forecasting process is the examination of the needed anticipated occupations, work the organization will do in the future, and how that work will be performed. In particular, computer systems and Internet technology will continue to impact how individuals and organizations perform in the future. To determine the organization’s future needs, list needed skills based on the strategic plan, technology innovations, etc, based on the information collected in Step1. Coordinate with a human resources management specialist who can identify the relevant series.

Also, agencies must incorporate the impact of any Civil Service Reforms guidelines on the future workforce.

3.8.10 Identifying Changes

The following questions will assist in identifying anticipated changes:

1. What changes are expected over the planned time period in mission, functions, strategic goals, and objectives? Will the program or organization’s method of PWD change?

2. What are the budget trends and patterns?

3. Do projected funding levels support positions and objectives?

4. Are there any changes expected in the number of work units?
5. What factors in the internal and external environment will impact decisions (legislative changes, departmental initiatives, social/economic trends, etc.)

6. What is the nature of the work to be done, in terms of volume, location and duration?

7. Can these services be contracted (outsourcing)?

8. Will the use of retention allowances decrease critical turnover and help retain important skills?

9. Can volunteers be utilized to a greater extent?

10. Can the organization be restructured by using E-Governance? Can the organization be de-layered? Can employees be moved closer to customers?

3.8.11 Impact of Changes

Once you have identified the anticipated changes, ascertain how these changes will affect:

- The amount, type, duration and location of work to be completed.
- Organizational structure and design
- The mix of skills/competencies
- The supervisors/manager to non-supervisory employee ratio
- Diversity initiatives
- Increasing/decreasing workforce demands
- Moving work to contingency workers and contracts

3.8.12 Documentation of Discrepancies

Document your projected need (Demand) by category, title, series, grade, competency, and location etc.

3.8.13 Determine Gaps

The gaps are identified as result of an analysis of the differences between the forecasted human resources needs and future human resource supply. This analysis reveals human resources surpluses and deficits in raw numbers, and will assist you with further planning for addressing these gaps.

3.8.14 Gap Calculation

Calculating the gap is important for identifying personnel and/or skills/competencies in the current workforce that will not meet future needs (need exceeds supply). It will determine whether the current workforce exceeds the needs of the future – supply exceeds need. There are also situations where the supply will meet the future needs, thus resulting in no gap or a difference between supply and need of zero. Depending upon how the supply and needs were determined and the level of specificity, the gap can be identified by specific title, series, grades, competencies, locations, etc. or any variation needed. The comparison requires that the skills/competencies sets developed in the supply analysis and demand analysis phase be comparable – not independently developed.
3.8.15 Gap Prioritisation

Once you have identified the gaps between future needs and projected workforce supply, you must consult with management to prioritise the significant gaps that have the most impact on organizational goals. Be aware that management may decide that having large "gaps" in particular series or skills may not be as important as planning for the anticipated retirement of a specialist.

3.9 DESIGNING A WORKFORCE PLAN TO ADDRESS SKILL GAPS

You can now begin developing strategies and action items for addressing those gaps. When developing strategies, these are examples of some issues to consider:

- The cost associated with the strategies for addressing competency or skill gaps
- How to keep corporate knowledge from being lost?
- What skills are currently vital to the accomplishment of the agency's goals and objectives?
- How is the agency addressing skill imbalances due to attrition, including retirement over the next 5 years?
- Are there ways to maximize recruitment in order to minimize training needs of new employees?
- Explore training, retraining, relocation, or recruiting options for filling competency gaps.
- What retention strategies are necessary and most feasible?
- What are the costs of these retention strategies?
- Are there alternative training mechanisms (training, education)?
- Can needed skills be obtained through sharing of resources?
- Cost-effectiveness of contracting, outsourcing or using volunteers.
- Implementation of career development programs.
- Are there ways to restructure by using E-Governance, delayering, moving employees closer to customers etc.?
3.9.1 Identify Strategies and Action Items

Determine strategies and specific action items to address gaps. Strategies are broad categorical statements whereas action items identify the specific person(s) responsible for implementing the strategy and when it will be accomplished. Examples of types of strategies to consider for addressing gaps include:

**Strategy: Addressing Gaps with Surplus employees**

- Review the list of surplus positions available as outlined on your gap analysis worksheet. Then, review the skills of each of those positions. Once you have completed the analysis, determine which positions can transition into the gaps to be filled. To do this, consider: (1) Are these skills transferable to the positions/work requirements to be filled? (2) Can any of the positions to be filled by retaining employees (career development)?

- After you have identified positions to be filled and surplus positions, identify and document: (1) positions that can be converted into trainee positions (2) positions with the same skills needed; (3) positions that can be easily reclassified to the positions needed.

**Strategy: Partnership with academic institutions for Intern Programmes**

- Establish a memorandum of understanding with Colleges and Universities to develop a pool of potential candidates.

- Encourage an intern system for civil engineering students to work in PWD units for their practical projects. These people would later be potential candidates for recruitment.

**Strategy: Use a variety of incentives/mechanisms to recruit and retain staff**

A. Development of a formal mentoring program for trainees and junior employees
B. Use of volunteers
C. Other agency agreement (contractual)
D. Recruitment and relocation bonus
E. Creative compensation packages (special salary rates)
F. Expanded outreach efforts (e.g. job fairs, advertising, internet posting, employee referrals)
G. Special hiring authorities (on the spot hiring)
H. Augmentation of work/family programs (e.g. flexible and varying work schedules; telecommuting as appropriate; student loan repayment)
I. Automated hiring systems
3.9.2 Implement Action Plan

Once the strategic direction has been established (Step 1 of the Workforce Planning Model), the workforce supply and demand realities have been identified (step), and the action plan developed (Step 3), the finalized plan can be implemented.

Management, Leadership, and Support: Successful workforce planning requires the commitment and leadership of top management. Senior-level managers must lead the planning process, must assure that workforce plans are aligned with strategic direction, and must hold subordinate managers accountable for carrying out workforce planning and for using its products.

Workforce planning offers a means of systematically aligning organizational and program priorities with budgetary and human resources needs. By beginning the planning process with identified strategic objectives, managers and their organizations can develop workforce plans that will help them accomplish those objectives. At the same time, workforce plans provide a sound basis for justifying budget and staffing requests, since there is a clear connection between objectives, the budget, and the human resources needed to accomplish them.

Need for External Assistance: Using a consultant to assist in carrying out workforce planning is optional, but may be desirable in some cases. An experienced consultant may provide a level of expertise in workforce planning that does not exist in the organization. In addition, the consultant may have a more detached view of issues than organization's employees and managers can provide.

The combination of experience and an outside viewpoint can provide legitimacy for workforce planning that is not available to a strictly internal effort. However, care should be exercised on the recommendations from an outsider who may not understand the organizational culture and governmental requirements and realities. In addition to the cost of hiring a consultant, organizations should factor in the time it will take to provide the consultant with necessary background information on the organization.

Departments may also consider partnering with other departments or agencies to achieve their workforce planning goal. Partnering allows departments to share resources including budgetary, personnel, knowledge, experience, lessons learned, etc. This may reduce the department’s cost.

Conduct Recruitment, Hiring, and Placement: Given the increasing mobility that defines today’s workforce, it is essential that organizations design, develop, and implement recruitment, hiring, and placement programs that are continuous, innovative, and targeted. These programs should be aligned with and supportive of the organization’s strategic direction and provide a reflection of the organizational culture. The plan should outline the actions, steps, and timeline that:

- Identify and "brand" the organization
- Create marketing materials reflecting the "brand"
- Determine timing, where, how, and when the marketing is conducted
- Identify competencies that will be targeted in the process
- Ensure candidate assessment tools are in place and "just-in-time" training regarding those tools is available.
Implement Retention Strategies. Research has demonstrated that today’s average employee stays on a particular job for an average of 36 months. To avoid critical retention/succession situations created by this cycle, supervisors, managers, and organizational leaders must know and understand what valued employees want and need to become long-term assets, applying accumulated knowledge to the accomplishment of the agency’s goals. A progressive retention plan should:

- Determine those employees who are critical to accomplishment of organizational goals.
- Develop an infrastructure to provide constant feedback between these critical employees and supervisors/managers to determine what they want and need to become long-term assets to the organization.
- Develop a means of providing incentives and/or working conditions designed to retain valued employees. This system must provide an accurate measurement of the actual return on invest concerning the retention of valued employees.

The Government guidelines require that each department prepare annual performance plans that set measurable goals defining what will be accomplished during a fiscal year. The PWD goals and performance measures focus on the outcomes and results the PWD units, offices and partners work to achieve through their many programs.

Workforce planning provides the means for achieving overarching program goals. Program goals will not be achieved "without the right number of people with the right competencies in the right place at the right time." Workforce planning is a fundamental tool, critical to quality performance, which will contribute to the achievement of program objectives. As PWD develops strategies that support the achievement of both long-term and annual program performance goals in the strategic and performance plans, they need to include management activities (such as workforce planning) as essential components of a broad-based management strategy.

**3.10 MONITOR, REVISE AND MODIFY**

**3.10.1 Review of Outcomes**

The WFP plan, especially the strategies and action items, should serve as a roadmap for managers to ensure the right people are in the right locations at the right time in order to achieve the organization’s long-term and short-term goals. The outcomes should be continuously evaluated to determine progress in addressing the gaps and, specifically, where adjustments to the strategies and action items are needed.

**3.10.2 Assessing Accomplishment and Effectiveness of Outcomes**

There are many different methods to obtain feedback concerning the achievement of accomplishments and the effectiveness of outcomes. This information can be obtained via meetings, surveys, focus groups, review of accomplishment reports, etc. Regardless of the method, examples of questions to ask in order to determine whether the strategies and action items are effective include:
Were the actions and strategies completed and do they fulfil the goals?

Did the action plan accomplish what was needed?

If not, have the organization’s strategies upon which the plan is based changed? Were there other factors preventing the obtainment of the goal?

Are the assumptions of the need and supply models still valid?

Have the conditions changed such that the strategies need to be revisited?

Is there a need to modify the action items?

### 3.10.3 Addressing Needs for Adjustments to Strategies and Action Items

After the above analysis has been conducted, steps should be taken to remedy problems in implementing action items. Examples include:

- Timeframe for implementation of action items may need to be changed
- Content of action items may need to be adjusted
- Deletion of action items because they may no longer be valid and/or feasible, e.g. budget, reorganization, etc.
- Persons responsible for action item may need to be changed

### 3.10.4 Communicate Changes

Changes to the action items must be communicated to responsible individuals in a timely manner to allow for questions and clarification. Similarly, achievement of action items should be reflected in the organization’s annual accomplishments and ultimately the fulfilment of strategic goals.

### 3.10.5 Dynamic Review of Process Steps

The WFP process is a continuous process of forecasting, clarifying, and identifying organizational workforce needs, assessing competencies, and implementing appropriate interventions. The process should be continuously evaluated to determine how well each of its component parts are functioning and where adjustments are needed.

### 3.10.6 Determining Effectiveness of Process Steps

Feedback should be obtained from participants and customers, including managers and top-level officials to determine the effectiveness of the WFP process in producing a useful product. This information can be obtain via a variety of information gathering methods such as interviews, focus groups, surveys, review of the quality of the workforce plan, etc. When ascertaining the effectiveness of the WFP process, examples of questions to ask include:

- What was expected from this process?
- Did this process produce a plan that is useful to managers in support of the organization’s strategic goals?
• What worked and why?
• Did the process work well as a team effort?
• If some of the steps did not work, how did you proceed?
• What didn’t work and how could it be improved?
• Was there enough time to conduct WFP?
• Were the appropriate offices involved?
• Were adequate resources provided?
• Were the costs and saving estimates accurate?

In addition there may be external and internal forces that precipitate changes to the process. Examples of these include reorganizations, redistribution of resources, new and/or changes to information data systems, budgetary and strategic planning cycle changes, etc.

3.10.7 Communicate Changes

• Appropriate actions should be taken to address process inefficiencies.
• Any changes to the processes and subsequent impacts should be fully discussed and analyzed with the multi-disciplinary team to ensure the changes do not create unforeseen roadblocks.
• Modifications to the processes should be communicated to everyone as soon as possible to ensure sufficient time for training and/or questions.

3.11 SUMMARY OF KEY ELEMENTS

The following is a checklist summarizes key elements of effective workforce planning.

1. Vision. Identify the organization’s direction. Project the organizational configuration 5 years from now. Review and analyze the following:

A. Program Plans for the future.
   – Anticipated program/mission changes
   – Anticipated volume, type and location of work to be done
   – Changes in organization/position structures
   – Past patterns/trends
   – Anticipated supervisory/managerial strengths
   – Skill mix of workers
   – Increasing/decreasing workforce demands

B. Budget Situation.
   – Anticipated ceiling, budget philosophy, or goals
   – Funding levels
   – Trends/Patterns
C. Anticipated Environment (Internal/External) Factors
   - Legislative changes
   - Technological changes
   - Social changes

2. Current Resources. Determine the future availability of current workforce by organizing following tasks:

A. Conduct work force analyses.
   - Potential losses of current employees
   - Turnover data, retirement rates, retirement projections, promotion and award rates, etc.
   - Organization/position structures
   - Vacancies created by internal movements
   - Supervisory/non-supervisory ratio data
   - Competitive sourcing

3. Needed Resources. Identify anticipated shortfalls that need to be addressed.

A. Forecast specific needs in light of mission needs and vision. Forecast overall numbers by occupations
   - By grades
   - By location of positions if applicable

B. Compare current available resources with needed resources for the future.
   - Net human resource needs
   - Increase/decrease in productivity levels
   - Skills/grade levels
   - Position management
   - Under-staffing or over-staffing
   - Career progressions
   - Supervisory/managerial replacements

4. Action Plan. Determine how your needs will be met by:

A. Addressing serious shortfalls and critical issues. Establish human resource objectives

B. Develop an action plan.
- Internal sources of workers
- Recruitment for external sources of workers
- Job redesign
- Training, retraining, career development
- Succession planning
- Competitive sourcing
- Delayering
- Volunteers
- Productivity improvement
- Restructuring (organization/positions)
- Position management plan

C. Develop a plan for handling Staff Management Issues

- Legal and contractual requirements
- Employee involvement
- Negotiations
- Potential for adverse outcomes
- Union-Management relations climate

5. **Cost Implications.** Identify items with cost implications. Project an annual budget by:

A. Costing out the items requiring monetary support.

- Grade distribution
- Recruiting
- Training, retraining, career management
- Succession planning, delayering cost
- Relocation costs, reorganizing cost
- Increased or decreased staffing
4. PWD WORKFORCE PLANNING MODEL

4.1 WORKFORCE PLANNING IN CONTEXT OF PWD STRATEGIC PLANNING

The Workforce Planning is a subset of HR Planning which itself is a subset of overall PWD strategic planning process as described in Figure below (from Report No. 27: Fig no. 5.2, PWD Strategic HR Planning).

Figure 4.1: PWD Strategic Planning, HR Planning and Workforce Planning
4.2 DEVELOPMENT OF PWD WORKFORCE PLANNING MODEL

“Workforce planning is putting the right people, in the right place, at the right time to accomplish the mission of the organisation.”

Many organizations, both public and private, have developed models for workforce planning. Putting aside variations in terminology, the processes are alike. All rely on an analysis of present workforce competencies; an identification of competencies needed in the future; a comparison of the present workforce to future needs to identify competency gaps and surpluses; preparation of plans for building the workforce needed in the future; and an evaluation process to assure that the workforce competency model remains valid and that objectives are being met. This process is simple in outline but depends on rigorous and comprehensive analysis of the organization’s work, workforce, and strategic direction.

We have used a FOUR PHASE workforce planning model adapted from a number of models of workforce planning. The model relies on analyzing the present workforce, identifying organizational objectives and the workforce competencies needed to achieve them, comparing present workforce competencies to those needed in the future, then developing plans to transition from the present workforce to the future workforce.

**Figure 4.2 : Workforce Planning Model**

<table>
<thead>
<tr>
<th>Phase - I</th>
<th>Phase - II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Strategic Direction</td>
<td>Workforce Analysis/Strategies</td>
</tr>
<tr>
<td>Determine future functional requirements through VISION and strategic planning and budgeting process.</td>
<td>Step 1: Supply Analysis- present workforce profile.</td>
</tr>
<tr>
<td></td>
<td>Step 2: Demand Projection – future workforce profile needed.</td>
</tr>
<tr>
<td></td>
<td>Step 3: Gap Analysis - discrepancy between demand and supply.</td>
</tr>
<tr>
<td></td>
<td>Step 4: Solution Analysis and Strategy Development - solutions to close gaps</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase - IV</th>
<th>Phase - III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor, Evaluate, Revise</td>
<td>Implement Workforce Plan</td>
</tr>
<tr>
<td>• Assess what's working and not.</td>
<td>• Communicate Workforce Plan</td>
</tr>
<tr>
<td>• Make adjustments to plan.</td>
<td>• Implement strategies to close gaps.</td>
</tr>
<tr>
<td>• Address new workforce and organizational issues</td>
<td>Examples include: succession planning, target recruitment, training programs, restructuring, retention strategies etc.</td>
</tr>
</tbody>
</table>
4.3 CRITICAL STEPS OF WORKFORCE PLANNING

The model consists of four planning steps: supply analysis, demand analysis, gap analysis and solution analysis; plus ongoing implementation and evaluation steps.

**Figure 4.3 : Steps of Workforce Planning**

- **Step 1 – Supply Analysis**
  - Consider:
    - Staffing levels
    - Workforce skills
    - Workforce demographics
    - Employment trends

- **Step 2 – Demand Analysis**
  - Identify:
    - Workforce skills to meet projected needs
    - Staffing patterns
    - Anticipated program and workload changes

- **Step 3 – Gap Analysis**
  - Compare supply analysis with demand analysis to determine future gaps (shortages and surpluses) in the number of staff and needed skills.
  - Identify future changes in workforce demographics.
  - Identify areas in which management action will be needed to reach workforce objectives.

- **Step 4 – Strategy Development**
  - Plan:
    - Recruiting
    - Succession
    - Employee development and retraining
    - Work/organization change

4.3.1 Supply Analysis

*Assess the Current Workforce.* Determine what our current workforce resources are and how they will evolve over time through turnover etc. Identify organizational competencies, analyse staff demographics and employment trends. Competency analysis provides baseline data on the existing organization and present staff. Trend analysis provides both descriptive and forecasting models describing how turnover will affect the workforce in the absence of management action. Trend analysis is essential to the solution analysis phase.
4.3.2 Demand Analysis

Analyze the Future Workforce. Developing specifications for the kinds, numbers and location of workers and managers we will need to accomplish the mission, goals and objectives. This information is developed in conjunction with the organization’s strategic plans and budget documents and deals with measures of future activities and workloads, and describing the competency set needed by the workforce of the future. Demand analysis takes into account not only workforce changes driven by changing workload, but also changing work processes. Technology will continue to have an impact on how work is performed and must be considered in the demand analysis process.

4.3.3 Gap analysis

Is the process of comparing information from the supply analysis and demand analysis to identify the differences, (the "gaps") between the current organizational competencies and the competency set needed in the future work force. The comparison requires the competency sets developed in the supply analysis and demand analysis phases to be comparable. Gap analysis identifies situations in which the no. of personnel or competencies in the current workforce will not meet future needs (demand exceeds supply) and situations in which current workforce personnel or competencies exceed the needs of the future (supply exceeds demand).

4.3.4 Solution analysis/ Strategy Development

Is the process of developing strategies for closing gaps in competencies and reducing surplus competencies. A variety of strategies are available in solution analysis including planned recruiting, training, re-training, restructuring organizations, contracting out, competency-based assessments, leadership development, succession planning, technological enhancements and placing employees. Solution analysis must take into account employment trends which may work either in favour of or counter to the direction of planned workforce change.

Implementation strategies would include action plans that are clear, concise, and measurable, including achievable milestones developed with stakeholder input. Periodic and systematic review of the mission and objectives and the workforce plan would be done to make adjustments as required by changes in mission, objectives, and workforce competencies.

4.4 NEED FOR HRMIS FOR HR DATA FOR WORKFORCE PLANNING

The various workforce planning processes require accurate and updated data of the Human resources in the department. A computerised Human Resource Management Information System (HRMIS) is an essential prerequisite for carrying out the above analysis and arrive at precise conclusions. The HRMIS development is the first step towards implementing a scientific HR Management and Development process in PWD including for the Work force planning process.

A comprehensive paper on establishment of the HRMIS in PWD has been detailed out in the Annexure 1 to this report.
Pending initiation of the HRMIS project, the subsequent sections of this report will describe the Workforce planning process for PWD using the broad workforce data compiled by the TA Consultants from various Establishment sections in PWD. The analysis of the workforce situation and the plans developed in the next sections are indicative of the strategic options which need to be explored and agreed to. The action plans will be fine tuned and refined with the help of authentic data from the HRMIS when established.
5. PWD WORKFORCE SUPPLY ANALYSIS

“One of the key constraints—and arguably the most challenging one—facing road agencies in India is staffing. With the exception of NHAI and a small number of Road Development Corporations, Indian road agencies are significant employers, frequently overstaffed by international standards especially at the lower levels. There has been a freeze on new hiring for over a decade and as a result, the average age of staff in PWD is over 50 and there are big age gaps in staff hierarchies that cannot be addressed in short time span. Hiring at the entry levels would reduce the average age but would result in large scale discontinuities in the supply pipeline.

PWD workforce lacks diversity in skills, with an overwhelming preponderance of traditionally educated engineers who have limited exposure to emerging issues such as contract and environmental management. The situation is exacerbated by the high transfer rate that precludes specialization in technical areas and consistent leadership. This in turn inhibits high levels of technical expertise and effective leadership. Salaries are below market rates, though numerous perks and job security are often cited as offsetting benefits. Career advancement is invariably slow, with performance playing second fiddle to seniority in promotion decisions. Individual staff members frequently do not work to a clear job specification and are not held accountable for poor performance or rewarded for good performance.

Human resource issues are not managed by professionally qualified, full-time senior officers, but treated as an adjunct to senior management, absorbing much of their precious time and energy. Investment in training as well as professional and managerial development appears very limited—certainly well below the 2-3 percent of administrative costs that many modern organizations invest in their staff.

These HR problems are endemic throughout the State Government services, and it would be very difficult for PWD to tackle these problems in isolation from broader civil service reform. Yet these issues are, arguably, among the most important constraints faced by the PWD in improving performance. NHAI is currently setting the standard for India with a lean workforce that is reasonably diversified in age and skills. One of the five members of the Authority is responsible for HR, and a Training Officer is hired to take forward the implementation of a comprehensive professional development program for staff. At the state level, some reforms have been implemented. For example, in Andhra Pradesh, actions are being taken to improve the transparency of postings and transfers, and the Engineer-in-Chief has instituted a performance appraisal system that clearly identifies the targets for various types of works expected from the Superintending Engineers. In Karnataka, the cabinet is considering a proposal that an Engineering Board make decisions on postings rather than the Minister. Various Road agencies have been established more flexible HR arrangements which allow hiring from a broader array of professions to meet specific emerging needs—in financial, social and environmental management for instance.
5.1 CORE OCCUPATIONAL GROUPS IN PWD SERVICE

The PWD considers the following occupational groups to represent its core workforce. These groupings were chosen for several reasons. They represent most of the State’s workforce. More than 90% of the workforce falls into these categories. They perform work that is most directly related to the achievement of the State’s PWD goals. The categorization is done based on their distinct education and skill requirements and nature of duties. Similar groups are clubbed together for the sake of analysis.

1. Civil Engineers (Class I): Such officers are occupying the ranks of EE’s, SE’s, CE’s and E-in-C’s.

2. Civil Engineers (Class II): occupying positions as AE’s.

In UP PWD all graduate engineers join service as AE in class II (unlike in some other states like Gujarat who also have direct Class I entry into the Engineering services in addition to class II entry). As all class I posts in UP PWD are filled by promotions from within, that is AE getting promoted to EE and above, we may consider all Class II and class I civil engineers belonging to one cadre for the purposes of Recruitment Planning component of the Work Force Planning as all of them have a common entry profile as AE through the State Public Service Commission. The differentiation of ranks would be necessary for promotion planning and succession planning exercises which are advanced applications of workforce planning.

3. Diploma Civil Engineers: JE’s and JE (T): There are a number of Graduate/ post graduate degree holders in the JE cadre but essentially they entered the cadre based on minimum qualifications of Diploma only.

PWD’s non engineering staff and gang labour etc. ay not be included in the current Work force planning study.

Thus the present report will analyse the PWD workforce focused on two cadres of Civil Engineering staff as defined below:

a) Graduate Engineers (Civil) cadre /Gazetted Cadre (Groups A and B) ; AEs and above

b) JE (Civil) Cadre / Diploma Engineers
5.2 CURRENT WORKFORCE SITUATION

The workforce available in PWD as on September 2007 is given below:

Table 5.1: UP PWD Staff Sanctions and in Position (Sep 2007)

<table>
<thead>
<tr>
<th>Designation / Position</th>
<th>Sanctioned Post (Total Number of Officers)</th>
<th>In-position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sanctioned in Deputation General Deputation General Deputation General Deputation</td>
<td></td>
</tr>
<tr>
<td>Engineer-in-Chief (ENC)</td>
<td>3 Nil 2 Nil</td>
<td></td>
</tr>
<tr>
<td>Chief Engineer (CE) Civil – Level I</td>
<td>3 Nil 2 Nil</td>
<td></td>
</tr>
<tr>
<td>Chief Engineer (CE) Civil – Level II</td>
<td>29 7 (out of 29) 18 4 (out of 18)</td>
<td></td>
</tr>
<tr>
<td>Chief Engineer (CE) Electrical/Mechanical</td>
<td>1 Nil - Nil</td>
<td></td>
</tr>
<tr>
<td>Superintending Engineer (SE) Civil</td>
<td>85 14 (out of 85) 73 12 (out of 73)</td>
<td></td>
</tr>
<tr>
<td>Superintending Engineer (SE) Electrical/Mechanical</td>
<td>4 Nil 4 Nil</td>
<td></td>
</tr>
<tr>
<td>Executive Engineer (EE) Civil</td>
<td>366 40 (out of 366) 349 18 (out of 349)</td>
<td></td>
</tr>
<tr>
<td>Executive Engineer (EE) Electrical/Mechanical</td>
<td>28 1 (out of 28) 27 Nil</td>
<td></td>
</tr>
<tr>
<td>Assistant Engineer (AE) Civil</td>
<td>1225 Nil 676 14 (out of 676) 16 (out of 113)</td>
<td></td>
</tr>
<tr>
<td>Assistant Engineer (AE) Electrical/Mechanical</td>
<td>124 Nil 113 16 (out of 113)</td>
<td></td>
</tr>
<tr>
<td>Junior Engineer (JE) Civil</td>
<td>4176 Nil 3087 Nil</td>
<td></td>
</tr>
<tr>
<td>Junior Engineer (JE) Electrical/Mechanical</td>
<td>322+385 Nil 267+289 Nil</td>
<td></td>
</tr>
<tr>
<td>Junior Engineer (JE) T</td>
<td>467 Nil 325 Nil</td>
<td></td>
</tr>
<tr>
<td>Draftsman</td>
<td>319 Nil 344 Nil</td>
<td></td>
</tr>
<tr>
<td>Tracer</td>
<td>208 Nil 61 Nil</td>
<td></td>
</tr>
</tbody>
</table>

In respect of the two cadres of our interest, the position is as given in table below.

Table 5.2: Staff Position as on Sep 2007

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Category</th>
<th>Sanction</th>
<th>In Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Graduate Engineers (Civil)</td>
<td>1661</td>
<td>1120</td>
</tr>
<tr>
<td>2.</td>
<td>JE’s (Civil)</td>
<td>4643</td>
<td>3412</td>
</tr>
</tbody>
</table>
5.3 ATTRITION TRENDS

Attrition is due to superannuation as well as resignations, death, voluntary separations etc. The last 5 years’ data of attrition can be a good indicator of likely attritions during the next 5 years provided the employment market remains more or less stable. The attritions during last 5 years, and the projected retirements in next 5 years are as below.

5.3.1 Attrition during last 5 years

The data in respect of attritions due to superannuation and due to other reasons are to be computed from the HRMIS data bank in the following manner

Table 5.3 : Attritions in last five years

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Category</th>
<th>Retired on Superannuation</th>
<th>Resignation/Voluntary Retirement</th>
<th>Annual Superannuation %</th>
<th>Annual Resignation/Voluntary Retirement %</th>
<th>Total Annual Attrition %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Graduate Engineers (Civil)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>JE’s (Civil)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.3.2 Expected Attritions during next 5 years

The exact attritions will need to be computed from the HRMIS data bank in respect of both the superannuation and other separations. The superannuation data will be readily available from the HRMIS and for other separations it has to be estimated based on last 5 years' trends.

5.3.3 Expected Attritions due to superannuation during next 5 years

The superannuation data is computed from the available data (as on December 2006) in respect of CEs, SEs, EEs and AEs respectively are shown in the following tables and graphs.
Technical Assistance for Implementation of Institutional Reforms in Road Sector of Uttar Pradesh

Staff Strength and Retirement for Superintending Engineers

<table>
<thead>
<tr>
<th>Year</th>
<th>Staff Strength</th>
<th>No of Persons to be retired</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>87</td>
<td>2</td>
</tr>
<tr>
<td>2007</td>
<td>85</td>
<td>14</td>
</tr>
<tr>
<td>2008</td>
<td>71</td>
<td>19</td>
</tr>
<tr>
<td>2009</td>
<td>52</td>
<td>13</td>
</tr>
<tr>
<td>2010</td>
<td>39</td>
<td>8</td>
</tr>
<tr>
<td>2011</td>
<td>31</td>
<td>10</td>
</tr>
<tr>
<td>2012</td>
<td>21</td>
<td>3</td>
</tr>
<tr>
<td>2013</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>2014</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>2015</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>2016</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>2017</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>2018</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>2019</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2020</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Staff Strength and Retirement for Chief Engineers

<table>
<thead>
<tr>
<th>Year</th>
<th>Staff Strength</th>
<th>No of Persons to be retired</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>2007</td>
<td>30</td>
<td>18</td>
</tr>
<tr>
<td>2008</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>2009</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>2010</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2006</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>2007</td>
<td>30</td>
<td>18</td>
</tr>
<tr>
<td>2008</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>2009</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>2010</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Report No. 43 and 49

January 2008
## Staff Strength and Retirement for Executive Engineers

<table>
<thead>
<tr>
<th>Year</th>
<th>Staff Strength</th>
<th>No of Persons to be retired</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>385</td>
<td>4</td>
</tr>
<tr>
<td>2007</td>
<td>381</td>
<td>50</td>
</tr>
<tr>
<td>2008</td>
<td>331</td>
<td>57</td>
</tr>
<tr>
<td>2009</td>
<td>274</td>
<td>41</td>
</tr>
<tr>
<td>2010</td>
<td>233</td>
<td>52</td>
</tr>
<tr>
<td>2011</td>
<td>181</td>
<td>28</td>
</tr>
<tr>
<td>2012</td>
<td>153</td>
<td>17</td>
</tr>
<tr>
<td>2013</td>
<td>136</td>
<td>8</td>
</tr>
<tr>
<td>2014</td>
<td>128</td>
<td>19</td>
</tr>
<tr>
<td>2015</td>
<td>109</td>
<td>14</td>
</tr>
<tr>
<td>2016</td>
<td>95</td>
<td>8</td>
</tr>
<tr>
<td>2017</td>
<td>87</td>
<td>15</td>
</tr>
<tr>
<td>2018</td>
<td>72</td>
<td>21</td>
</tr>
<tr>
<td>2019</td>
<td>51</td>
<td>17</td>
</tr>
<tr>
<td>2020</td>
<td>34</td>
<td>6</td>
</tr>
<tr>
<td>2021</td>
<td>28</td>
<td>15</td>
</tr>
<tr>
<td>2022</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>2023</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>2024</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2025</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2026</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2027</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Technical Assistance for Implementation of Institutional Reforms in Road Sector of Uttar Pradesh

Report No. 43 and 49

January 2008

46

Staff Strength and Retirement for Assistant Engineers

<table>
<thead>
<tr>
<th>Year</th>
<th>Staff Strength</th>
<th>No of Persons to be retired</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>971</td>
<td>23</td>
</tr>
<tr>
<td>2007</td>
<td>948</td>
<td>38</td>
</tr>
<tr>
<td>2008</td>
<td>910</td>
<td>40</td>
</tr>
<tr>
<td>2009</td>
<td>870</td>
<td>31</td>
</tr>
<tr>
<td>2010</td>
<td>839</td>
<td>39</td>
</tr>
<tr>
<td>2011</td>
<td>800</td>
<td>35</td>
</tr>
<tr>
<td>2012</td>
<td>765</td>
<td>34</td>
</tr>
<tr>
<td>2013</td>
<td>731</td>
<td>18</td>
</tr>
<tr>
<td>2014</td>
<td>713</td>
<td>37</td>
</tr>
<tr>
<td>2015</td>
<td>676</td>
<td>28</td>
</tr>
<tr>
<td>2016</td>
<td>648</td>
<td>31</td>
</tr>
<tr>
<td>2017</td>
<td>617</td>
<td>52</td>
</tr>
<tr>
<td>2018</td>
<td>565</td>
<td>49</td>
</tr>
<tr>
<td>2019</td>
<td>516</td>
<td>42</td>
</tr>
<tr>
<td>2020</td>
<td>474</td>
<td>44</td>
</tr>
<tr>
<td>2021</td>
<td>430</td>
<td>46</td>
</tr>
<tr>
<td>2022</td>
<td>384</td>
<td>55</td>
</tr>
<tr>
<td>2023</td>
<td>329</td>
<td>52</td>
</tr>
<tr>
<td>2024</td>
<td>277</td>
<td>49</td>
</tr>
<tr>
<td>2025</td>
<td>228</td>
<td>22</td>
</tr>
<tr>
<td>2026</td>
<td>206</td>
<td>31</td>
</tr>
<tr>
<td>2027</td>
<td>175</td>
<td>34</td>
</tr>
<tr>
<td>2028</td>
<td>141</td>
<td>26</td>
</tr>
<tr>
<td>2029</td>
<td>115</td>
<td>29</td>
</tr>
<tr>
<td>2030</td>
<td>86</td>
<td>16</td>
</tr>
<tr>
<td>2031</td>
<td>70</td>
<td>16</td>
</tr>
<tr>
<td>2032</td>
<td>54</td>
<td>21</td>
</tr>
<tr>
<td>2033</td>
<td>33</td>
<td>15</td>
</tr>
<tr>
<td>2034</td>
<td>18</td>
<td>9</td>
</tr>
<tr>
<td>2035</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>2036</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

The data available in respect of JE’s is not comprehensive for computing similar superannuation profiles.
5.3.4 Attritions due to superannuation (during next 5 years)

Table 5.4: Expected Superannuation till 2012

<table>
<thead>
<tr>
<th>Designation</th>
<th>Strength in Sep 07</th>
<th>Number due for superannuation during</th>
<th>Total superannuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE</td>
<td>-</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>SE</td>
<td>-</td>
<td>19</td>
<td>13</td>
</tr>
<tr>
<td>EE</td>
<td>-</td>
<td>57</td>
<td>41</td>
</tr>
<tr>
<td>AE</td>
<td>-</td>
<td>40</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>1120</td>
<td>40</td>
<td>123</td>
</tr>
</tbody>
</table>

Note: The above superannuation data is computed from secondary data of list of PWD officers as on December 2006.

Table 5.5: Expected Attritions in two core cadres

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Category</th>
<th>Strength in Sep 07</th>
<th>Superannuation by 2012</th>
<th>Superannuation rate Per annum</th>
<th>Attrition per annum including resignations etc.</th>
<th>Strength in end 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Graduate Engineers (Civil)</td>
<td>1120</td>
<td>479</td>
<td>8.2%</td>
<td>9%</td>
<td>585</td>
</tr>
<tr>
<td>2.</td>
<td>JE’s</td>
<td>3412</td>
<td>1482</td>
<td>8.2% (assumed)</td>
<td>9%</td>
<td>1784</td>
</tr>
</tbody>
</table>

The expected superannuation rate for Graduate Engineer category works out to 8.2% on an annual basis.

There is no comprehensive data in respect of JE’s superannuation. Therefore the same rate as the Graduate Engineers has been applied to arrive at above figures.

The attrition due to reasons other than superannuation has been estimated at 0.8% and the total attrition is 9% per annum.

For the purpose of planning for manpower the projected annual attrition rate is therefore taken as 9% for all categories over the next 5 years.
5.3.5 Anticipated changes in Attrition

There is a risk of attrition of skilled workforce in some critical categories of work force: Civil Engineers trained and groomed by Govt. PWD service are quite prone to moving on to more lucrative private sector employment in India or abroad. For example, huge demand of trained engineers in the Construction Industry in India during the recent decade has led to a severe shortage of experienced engineers in this sector. Though the data in respect of the current PWD workforce does not show this trend (as most of the staff is of average 50 years of age) this trend may be significant in the new staff who would be inducted into PWD in the coming years. Adverse effect of this in the future can not be ruled out.
6. WORKFORCE DEMAND / GAP ANALYSIS

Workforce requirement of PWD by 2012 has been estimated in Report No. 27 (given at Table 4.10). This estimate was developed based on the current thinking on possible organisation restructuring presented at Report No. 11. We have adopted the same figures for our Workforce Demand analysis in this report.

Table 6.1: Longer-Term (2012) Minimum needs core staff Cadre Strength for UP PWD (with additional 58 non-core Divisions)

<table>
<thead>
<tr>
<th>Cadre</th>
<th>Duty posts in 2007</th>
<th>Addl. duty posts in 2012</th>
<th>Total duty posts in 2012</th>
<th>Reserve @ 20% of duty posts</th>
<th>Cadre strength in 2012</th>
<th>Existing sanction (2007)</th>
<th>Surplus/Deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE and above</td>
<td>43</td>
<td>-</td>
<td>43</td>
<td>-</td>
<td>35</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SE</td>
<td>138</td>
<td>-</td>
<td>138</td>
<td>-</td>
<td>85</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>EE</td>
<td>524</td>
<td>58</td>
<td>582</td>
<td>-</td>
<td>366</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total Class I</td>
<td>705</td>
<td>58</td>
<td>763</td>
<td>153</td>
<td>916</td>
<td>486</td>
<td>(-) 430</td>
</tr>
<tr>
<td>AE</td>
<td>1547</td>
<td>232</td>
<td>1779</td>
<td>356</td>
<td>2135</td>
<td>1225</td>
<td>(-) 910</td>
</tr>
<tr>
<td>JE (Civil)</td>
<td>4354</td>
<td>928</td>
<td>5282</td>
<td>1056</td>
<td>6338</td>
<td>4176</td>
<td>(-) 2162</td>
</tr>
<tr>
<td>JE (T)</td>
<td>491</td>
<td>58</td>
<td>549</td>
<td>110</td>
<td>659</td>
<td>467</td>
<td>(-) 192</td>
</tr>
<tr>
<td>Total Class I</td>
<td>705</td>
<td>58</td>
<td>763</td>
<td>153</td>
<td>916</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

The total demand of Workforce at the end of 2012 in respect of the two cadres of interest are:

- Graduate Engineers: 3015
- JE’s: 6997

6.1 GAP ANALYSIS

The demand of workforce in the year 2012, as computed above needs to be compared with the Supply of Workforce expected in 2012 computed in the Table 5.5 to arrive at surpluses/deficits that can be expected. The following table (Table 6.2) calculates the gaps between demand and supply in respect of the two core cadres of PWD.
Table 6.2: Demand, Supply and Gap in Workforce in PWD

<table>
<thead>
<tr>
<th>Category</th>
<th>Strength in Sep 2007</th>
<th>Sanction In 2007</th>
<th>Existing gap</th>
<th>Demand as in 2012</th>
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</thead>
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<td>1784</td>
<td>5213</td>
</tr>
</tbody>
</table>

The projections for the year 2012 as shown in above table indicate that additional 2430 Graduate Engineers and 5213 Diploma Engineers will be needed in PWD. The additional requirements are almost four times the workforce that will be remaining from out of the existing strength of Graduate Engineers and three times in case of Diploma Engineers.

It would be absolutely essential to fill in the gaps by induction of new entrants through fresh recruitments.

6.2 WORKFORCE COMPOSITION IMPLICATIONS

The Civil Engineers’ cadre may be considered as a pipeline of talent. Graduate Engineers join the State service at the entry of the pipeline. This inflow feeds to the need of higher management and leadership positions. The requirements of supply to these outflows are essential and occur regularly and almost at every now and then for filling management positions. The CE HR, as the cadre manager, can meet all these requirements only if the pipeline has a regular flow at appropriate points. For this regular intake of fresh engineers at least once batch in a year is required to maintain this flow. The past intake pattern between 1993 and 2007 has large gaps in the intake pattern. Severe shortages of Civil Engineers of appropriate experience band for mid level positions would continue to exist for quite some time. What is more alarming is that if regular recruitments are not done for a few more years, a severe imbalance in the cadre will occur.

6.3 GAPS IN SKILLS AND COMPETENCIES

A detailed analysis of existing skills and competencies amongst PWD officers was carried out through a Training Needs Assessment (TNA) during 2006. The TNA has led to a structural training plan, (Report No. 36) which needs to be put in place to address these skill gaps.

The gaps in competencies amongst PWD workforce are of two kinds:

a. Gaps in knowledge and skills in specialist areas which are outside the current PWD work processes.

b. Gaps in engineering related disciplines which can be addressed through proper training.
The areas of skill gaps are listed below:

6.3.1 **Areas in which very little or no expertise exist**
1. Environmental Planning
2. Transport Planning
3. Transport Economics
4. Social Science
5. Human Resource Development
6. Training
7. Legal
8. IT and e-Governance

6.3.2 **Areas in which some expertise is there but gaps exist in respect of modern practices and expert knowledge**
1. Design of Roads
2. Design of Bridges and Structures
3. Quality Management
4. Asset Management
7. SOLUTIONS ANALYSIS / STRATEGY DEVELOPMENT

7.1 RECRUITMENT AND INDUCTION STRATEGY

For a large cadre of PWD workforce who are required to man a widely dispersed network of essential services, regular recruitment is essential for replenishing the workforce from attritions and for meeting additional requirements. Recruitment Strategy should take into account the following:

a) **No scope for lateral induction.** Recruitments are to be at the entry level and the personnel are to be groomed with requisite skills and experience for middle and senior levels requirements.

b) **Long Gestation Periods.** The lead times for induction of fresh talent after the long procedure of the PSC need to be taken care of. Timely induction of workforce calls for well planned and timely initiation of actions. Recruitment process is governed by various prescribed rules and procedures. There are possibilities of policy shifts, often with changes in the Govt. and legal interventions like long periods of stay on the recruitment process brought about by litigations. Such developments have tremendous adverse effect on the planned induction process. Such eventualities can not be avoided; they can be minimized through sound policies and transparent procedures.

c) **Cadre Management.** Specialized cadre management services are required to provide for specialists and managers for various Administrative and Specialist positions. This calls for career planning, succession planning and in-service training programmes drawn up on annual basis and implemented to ensure that Civil Engineers of appropriate experience band are available and ready for appointment to higher positions.

Purely from the cadre management viewpoint, **a certain no. of regular entry is essential every year. This no. has to be at least equal to or more than the estimated annual requirements of appointments.** Thus the option for Civil Engineers’ intake is either all regular appointment or a mix of Regular appointment and some contract appointments.

7.1.1 Need for Recruitment Strategy

For a large cadre of PWD core workforce who are required to man a widely dispersed network of essential services, regular recruitment is essential for replenishing the workforce from attritions and for meeting additional requirements. Recruitments into the PWD are characterized by the following:

i. **No scope for lateral induction.** Almost all recruitments are at the entry level. There is very little scope for sourcing skilled and experienced personnel for middle and senior levels through lateral induction. Though a good talent pool would be available at these levels in the industry there is a great demand for this category of professionals and experienced Civil Engineering professionals in the private sector are unlikely to be attracted to Govt. Service.
ii. For intake of fresher’s there has been substantial expansion of the educational institutions mostly in private sector, leading to increase in supply of young qualified Engineers. But the demand for qualified people in the Industry is continuing to grow very rapidly leading to shortages and hence a premium on talent.

iii. The onus of growing own specialists and managers for various Administrative and Specialist positions rests solely on the Govt. This calls for a specialized cadre management services, career planning, succession planning and whole range of in-service training institutions and programmes. In other words, timely planning and actions are required to groom the selected people to take up these specialist /managerial assignments when needed.

iv. Govt.’s recruitment process is governed by various prescribed rules and procedures. Recruitment of Civil Engineers is done by the State Public Service Commission and other cadres by Staff Selection Commission. There are prescribed methods for requisition for recruitment, notifications of the vacancies and recruitment schedules, screening of applicants, tests, and interviews etc. which are elaborate and often time taking. Timely induction of workforce therefore calls for well planned and timely initiation of actions.

v. There are possibilities of policy shifts, often with changes in the Govt. and legal interventions like long periods of stay on the recruitment process brought about by litigations. Such developments have tremendous adverse effect on the planned induction process. While these eventualities can not be avoided, they can be minimized through sound policies and transparent procedures.

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ix. There are possibilities of policy shifts, often with changes in the Govt. and legal interventions like long periods of stay on the recruitment process brought about by litigations. Such developments have tremendous adverse effect on the planned induction process. While these eventualities can not be avoided, they can be minimized through sound policies and transparent procedures.
Recruitments in the past have been made on as required basis and not as per any annual plan. Further, regular appointments of Civil Engineers were virtually stopped after 1993. This has led to the present situation of shortages in almost all categories of staff. The manpower situation is in need of immediate corrective actions through a planned strategy.

7.2 BASIC WORK FORCE INTAKE PRINCIPLES

- **Lean manning is better than over manning.** From the experience of many Public as well as Private sector organizations, it is proven that a slight shortage of manpower is more effective than a slight surplus. Surplus manpower leads to negative productivity and a drain on the scarce resources as well. Many sick organizations have been able to turn the corner by getting rid of surplus manpower. More over, once manpower is acquired, it is extremely difficult to get rid of them, particularly so in a Govt. setting. **While planning for the manpower, we have chosen a conservative estimate of the requirements so that at any point in time, we never have a surplus; but a slight shortage.** This is also a more cost effective strategy.

- **Recruitment in regular well spaced batches** is more effective than piece meal of lumped recruitments. A regular batch of recruitment provides economy of effort and is more conducive to meritocracy. The Induction training for regular batches is more effective. It also helps the training institutions to plan the courses well in advance and arrange the best of training. Regular batches of intake are also necessary for effective career planning and cadre management. The frequency of recruitment can be once a year and synchronized with the academic cycle. We strongly advocate regular yearly intakes as per pre-fixed time frame.

The yearly intakes should be normalized rather than large variations. For example, if we have a back log vacancy of say 500 Civil Engineers and our new requirement is 200 per year for next 5 years, we need to recruit 1500 Civil Engineers in next 5 years. One approach could be to recruit 500 + 200 in year 1 and thereafter 200 each in next 4 years. Another would be: intake of 300 each year. Third approach is a graduated intake plan, say for example: 400, 400, 300, 200 and 200. The second and third options are better for meritocracy as well as for cadre management.

7.3 SUGGESTED INTAKE PLAN

The third option of graduated intake is more appropriate for PWD, as currently PWD has a huge backlog of vacancies due to stoppage of recruitment during last several years. The need for professional manpower in PWD is very urgent as PWD is embarked on an institutional strengthening plan which requires dedicated manpower for various enhanced functions.

**On the above considerations we recommend an intake plan of 30%, 25%, 15%, 15% and 15% of the projected requirements over the next 5 years.**
Table 7.1: Gap in Workforce in 2012

<table>
<thead>
<tr>
<th>Category</th>
<th>Strength in Sep 2007</th>
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</tr>
</tbody>
</table>

Table 7.2: Suggested Intake Plan: 2008 to 2012

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</tr>
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<tbody>
<tr>
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<td>3015</td>
<td>585</td>
<td>2430</td>
<td>2430</td>
<td>730</td>
<td>610</td>
<td>360</td>
<td>360</td>
<td>370</td>
</tr>
<tr>
<td>JEs</td>
<td>6997</td>
<td>1784</td>
<td>5213</td>
<td>5213</td>
<td>1570</td>
<td>1300</td>
<td>780</td>
<td>780</td>
<td>780</td>
</tr>
</tbody>
</table>

Note:
1. Intake plan figures start from 2008. Figures for 2009 may be adjusted for any variation of intake during 2008.
2. Intake required till 2012 have been computed by adding the estimated gaps by 2012.
3. In order to make good the existing vacancies, higher level of intake during 2008 and 2009 is suggested. The distribution suggested is 30%, 25%, 15%, 15% and 15% in the years 2008, 2009, 2010, 2011 and 2012 respectively. Even with this recruitment plan, there will be gaps in the Workforce from year to year and at no time PWD would have surplus staff.

7.4 STRUCTURED INDUCTION TRAINING

Along with planned intake of different category of personnel, a comprehensive induction training programme needs to be designed and implemented.

7.5 CAREER PLANNING, SUCCESSION PLANNING AND CADRE MANAGEMENT

The Civil Engineers' cadre may be considered as a pipeline of talent. Graduate Engineers join the State service at the entry of the pipeline. This inflow feeds to the need of higher management and leadership positions. The requirements of supply to these outflows are essential and occur regularly and almost at every now and then for filling management positions. The CE HR, as the cadre manager, can meet all these requirements only if the pipeline has a regular flow at appropriate points. Regular intake (at least once in a year) is required to maintain this flow. But the past intake pattern between 1993 and 2007 has left a vacuum in the beginning of the pipeline. The impact of this would be felt a few years hence when severe shortages of Civil
Engineers of appropriate experience band would be felt. What is more alarming is that if the regular recruitments are not done for a few more years, a severe imbalance in the cadre will occur.

For effective cadre management of the cadres of Civil Engineers, where it is necessary to grow our own leaders (lateral induction being ruled out) it is necessary to maintain a steady flow in the pipeline with intake at regular intervals. This would call for a well thought out recruitment policy, planned intake of workforce every year and an appropriate training policy. This would be discussed further in subsequent sections.

7.6 EMPLOYEE KNOWLEDGE, SKILLS AND ABILITIES

7.6.1 Training and Career Development Opportunities

Training the next generation of PWD engineers is an integral component of the State PWD mission. Govt. is committed to provide its staff ample opportunities for furthering their knowledge and skills. Continuous Training and skill up-gradation is essential for a PWD engineer on two counts: skill enhancement for performing a higher level role as one progresses in the career, and second for keeping abreast with the developments in the field. From a personal growth perspective, nothing is more motivating for a professional than the opportunity of learning the latest technologies and having an opportunity to practice them.

The State has formulated a comprehensive Training Policy to address this requirement. This needs to be operationalised through sound training plans. Some of the initiatives in this regard are listed below.

7.6.2 Job Description

Job descriptions of various positions in the department would need to be developed. This document is expected to serve as a guide to perform one’s task to the best possible manner.

7.6.3 Skills Inventory and Training Needs Assessment

From the prospective of career planning, the job description provides a list of competencies (knowledge and skills) required of a position against which the competencies existing in a position holder can be mapped and the gaps identified as individual training needs. For the purpose, it would be required to do a targeted skill assessment of each employee individually. Skill and competency assessment is done either as an independent exercise or as a part of annual performance appraisal. The skill/competency gaps constitute the training needs of the individual. Similar training needs of a group of people are clubbed together and a training programme is designed to bridge the gaps. Training plans must ensure that each employee is provided with the requisite knowledge and skills so that he/ she is able to perform well on the jobs assigned.
7.6.4 Specialisation Courses for Civil Engineers

Opportunity to specialize is a major career incentive for a. Government PWD service provides this opportunity of attending a specialization course to a good number of Civil Engineers. The requirement of specialists is going to grow in the future. The State cadre should have adequate bench strength to nominate Civil Engineers for specialist courses.

The number of PWD engineers to be developed as experts in different areas are:

1. Design Roads 30
2. Design of Structures / Bridges 20
3. Quality Management 50
4. Asset Management Specialist 50

7.7 CONTRACT APPOINTMENTS

Contractual appointments, if decided due to financial considerations or operational necessities, should be resorted to in a manner that it meets short term needs without jeopardising long term cadre management needs. Generally positions that are filled by contract appointments are:

i. Short term / seasonal assignments
ii. Project based assignments
iii. Posts in difficult areas if can be filled by local talent
iv. Vacancies on account of Leave, deputations, courses etc.
v. Highly specialized positions at fixed locations.

7.7.1 Induction of Specialists on Contract Basis

The areas of specialisation listed are 6.3.1 should be addressed to by lateral induction of qualified persons on contractual basis. The number of staff for specialist positions are estimated at Table 7.3.

Table 7.3 : Requirement of specialists by 2012

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Specialist Workforce on Contract Basis</th>
<th>Number requires by 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Environment Planner</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>Transport Planner</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Transport Economist</td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>Social Specialist</td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>Human Resource Specialist</td>
<td>6</td>
</tr>
<tr>
<td>6.</td>
<td>Training Specialist</td>
<td>10</td>
</tr>
<tr>
<td>7.</td>
<td>Legal Specialist</td>
<td>5</td>
</tr>
<tr>
<td>8.</td>
<td>IT and e-Governance</td>
<td>10</td>
</tr>
<tr>
<td>9.</td>
<td>Finance</td>
<td>10</td>
</tr>
</tbody>
</table>
The appointment of these specialist positions will not in any way reduce the requirement of induction of fresher Graduate and Diploma Engineers as mentioned in the intake plan at Table 7.2.
8. WAY FORWARD FOR IMPLEMENTATION OF WORKFORCE PLANNING IN PWD

Workforce Planning is a complex but essential planning exercise for a large organisation like UP PWD. The implementation of WFP in UP PWD is all the more pressing as the HR situation in PWD is not at its best. The present situation of HR in UP PWD is rather attributable to lack of a systematic Workforce Planning process in the past.

The following action steps are suggested for implementation of WFP:

8.1 EQUIP HRD AND TRAINING CELL

Establish and fully equip the HRD and Training Cell (which has been created through a Government Order). The critical area of “Strategic HR” needs to be developed by possibly filling in at least two HR Specialists either laterally or on contract basis.

8.2 ESTABLISH HRMIS

Establish a computerised HRMIS. The detailed guidelines for this is given at Annexure 1.

8.3 TEAM FOR WORKFORCE PLANNING

Form a team for Workforce Planning consisting of HR specialist, Strategic HR Manager, IT Expert, members for planning unit, budget, finance and selected field units.

8.4 INTEGRATE HR PLANNING WITH PWD STRATEGY PLANNING

Include the HR Workforce Planning team in the PWD Strategic Planning process and Annual Business Planning process.

8.5 CARRY OUT ORGANISATIONAL RESTRUCTURING

Simultaneously, carry out the organisational restructuring exercise to obtain a clear mandate on the future organisation and the workforce needs in terms of Government sanctions.

8.6 INITIATE REGULAR INTAKE OF ENGINEERS

Develop an initial workforce plan and validate the requirements of intake for PWD at the earliest. Initiate the process of regular induction of Graduate and Diploma Engineers through State PSC and Staff Selection Commission respectively. The action needs to commence urgently in view of the long lead times for the recruitment process and the urgency of the need for additional manpower for PWD.

8.7 APPOINTMENT OF SPECIALIST WORKFORCE

Appointment of specialist workforce on contract basis as recommended at 7.7.1.
8.8 DEVELOP WORKFORCE PLAN

Develop a full fledged Workforce Plan for PWD for all cadres of staff on an annual basis.

The following annual plans will be required:

a. Intake Plan / Recruitment Plan
b. Development Plan for Specialist cadres
c. Training and Development Plan
d. Staff Promotion Plan
e. Succession Plan for Key Positions

8.9 WORK FORCE PLAN ON ROLLING BASIS

Carry out WFP on a rolling basis annually by adjusting to the changes and anticipated requirements.
9. DISCUSSION IN THE FOCUS GROUP

The Report (43 and 49) was discussed in detail by the Focus Group ‘E’ on HR and Training in a meeting held on 24 January 2008.

Suggestions and comments during the discussion have been incorporated in this Final Report.
10. PRESENTATION TO PROJECT STEERING COMMITTEE
Report No. 43 : Report to implement PWD specific Human Resources Planning and Management Programme

and

Report No. 49 : Report for implementation of civil service reforms linked PWD HR Planning and Development Programme

<table>
<thead>
<tr>
<th>PWD Focus Group - E</th>
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<tbody>
<tr>
<td>Sri Afsar Husain</td>
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<td>Sri Sushil Kumar</td>
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LEA International Ltd. and LEA Associates South Asia Pvt. Ltd.

Cdr. Narayan Mishra | Human Resource Management Specialist
UPSRP IDS

Report No. 43  :  Report to implement PWD specific Human Resources Planning and Management Programme

and

Report No. 49  :  Report for implementation of civil service reforms linked PWD HR Planning and Development Programme

BACKGROUND

TCE Study (2000 – 2002) recommended:

“Need to carry out a comprehensive human resource planning and development program as a part of the Institutional strengthening program. Its components should include Manpower need assessment, human resource planning, human resource development policy/guidelines, training policy and objectives and finally performance appraisal and career planning. This study has to be in line with the attempts under the CSR process, underway, for the complete State administration”

The IDS Action Plan (serial 2C) objective states: “Strategic Planning of PWD skill mix, accountability, staffing profiles and levels” The serial 6A of the objective states, “Program to optimise PWD skills mix and quality.”

Action milestones to be achieved in this direction are:

• Implement PWD specific Human Resources Planning and Management Programme
• Implement CSR- linked PWD HR Planning and Development Programme
Report No. 43 : Report to implement PWD specific Human Resources Planning and Management Programme

Report No. 49 : Report for implementation of civil service reforms linked PWD HR Planning and Development Programme

BACKGROUND (contd…)

Translated into the following action for T. A. input:

Report No. 43 : Report to implement PWD specific human resources planning and management programme

Report No. 49 : Report for implementation of civil service reforms linked PWD HR planning and development programme
Two Reports are combined for following reasons:

- Report No. 43: PWD specific human resource planning and management programme; Report No. 49: (CSR Linked) PWD HR planning and development programme
  
- Both essentially mean “Establishment of an HR Planning and Management System in PWD”
  
- Since the IDS study during 1999-01, no significant CSR initiatives on HR Planning have been made at the Central and State Government levels
  
- The HR Planning system and process recommended in this report are based on current ‘best practices’ in the Industry / large Government organisations
WHAT IS STAFF RESOURCE PLANNING

“Systems and processes leading to determining staff requirements for current and anticipated future needs, taking stock of the availability of manpower within the organisation and planning for various actions to make available the right number of staff, with right competencies, at the right time.”

TERMINOLOGY: Terms used in the HRM literature:

- ‘HR planning’
- ‘staff resource planning’
- ‘human resource planning’
- ‘manpower planning’
- ‘personnel planning’
- ‘cadre planning’
- ‘workforce planning’

‘WORKFORCE PLANNING’ is term most widely used in current literature
WHAT IS WORK FORCE PLANNING?

Systems and processes leading to:

- determining staff requirements for current and anticipated future needs,
- taking stock of the availability of manpower within the organisation and
- planning for various actions to make available the right number of staff, with right competencies, at the right places at the right time.

“RIGHT PERSON FOR THE RIGHT JOB AT THE RIGHT TIME”
This Report Covers:

- Why PWD needs workforce Planning?
- Methodology for Workforce Planning
- PWD Workforce Planning Model
- PWD Workforce Supply (availability) Analysis
- Analysis of the Demand of PWD workforce
- Gaps between supply and demand
- Analysis of possible solutions
- Implementation of Workforce Planning in PWD
WHY PWD NEEDS WORKFORCE PLANNING?

Current Workforce Situation in PWD

- Aging demographic profile of PWD Workforce
- High Attrition Rate
- Inadequate HR Management
- Seniority Based Compensation and Promotions
- Limited Career Advancement Opportunities
- Inflexible HR Policies
- Lack of Specialist Manpower
- Inappropriate Staffing Norms
- Absence of Updated HR Database
- Uncertain Tenures
- Low Levels of Motivation
- Ineffective Appraisal System
- Inadequate Training
- Absence of conducive Career Development and Cadre Management Systems
How Workforce Planning can help PWD

- Determine the workforce needed for tomorrow's success
- Bridge knowledge gaps due to attrition
- Have the right people at the right place at the right time
- Provide a foundation to actively train, recruit or restructure resources
- Take all of the separate initiatives out of the stovepipes and put them in an integrated whole as part of an overall plan
- Allow for a more effective and efficient use of workforce when faced with a situation to take up more programmes with fewer staff members
- Ensure that replacements are available to fill important vacancies
- Provide realistic staffing projections for budget purposes; very helpful when justifying budget requests to the Legislature
- Provide clear rationale for linking expenditures for training, retraining, career development and recruiting efforts
- Prepare for restructuring, reducing, or expanding the workforce
Key Steps of PWD Workforce Planning Process

1. Strategic Direction Setting
2. Supply, Demand, Discrepancies
3. Develop Action Plan
4. Implement Action Plan
5. Monitor, Evaluate, Revise

Workforce Planning Model
METHODOLOGY FOR WORKFORCE PLANNING (contd…)

Key Steps of PWD Workforce Planning Process

The following are the steps that lead to a full workforce planning:

• Prepare for workforce planning
• Organize and mobilize strategic partners
• Collect data
• Examine data
• Envision the future
• Project needs
• Determine the gaps
• Develop action plans
• Implement plans
• Review effectiveness and fine tune.
METHODOLOGY FOR WORKFORCE PLANNING (contd…)

Checklist of Key Elements

1. Vision. Identify the organization’s direction. Project the organizational configuration 5 years from now. Review and analyze the following:
   A. Program Plans for the future
      – Anticipated program/mission changes
      – Anticipated volume, type and location of work to be done
      – Changes in organization/position structures
      – Past patterns/trends
      – Anticipated supervisory/managerial strengths
      – Skill mix of workers
      – Increasing/decreasing workforce demand
   B. Budget Situation.
      – Anticipated ceiling, budget philosophy, or goals
      – Funding levels
      – Trends/Patterns
   C. Anticipated Environment (Internal/External) Factors
      – Legislative changes
      – Technological changes
      – Social changes
Report No. 43 : Report to implement PWD specific Human Resources Planning and Management Programme and
Report No. 49 : Report for implementation of civil service reforms linked PWD HR Planning and Development Programme

METHODOLOGY FOR WORKFORCE PLANNING (contd…)

Checklist of Key Elements …

2. Current Resources : Determine the future availability of current workforce by organising following tasks:

A. Conduct work force analysis
   – Potential losses of current employees
   – Turnover data, retirement rates, retirement projections, promotions .
   – Organization/position structures
   – Vacancies created by internal movements
   – Supervisory/non-supervisory ratio data
   – Competitive sourcing
METHODOLOGY FOR WORKFORCE PLANNING (contd…)

Checklist of Key Elements …..

3. Needed Resources. Identify anticipated shortfalls that need to be addressed.
   
   A. Forecast specific needs in light of mission needs and vision. Forecast overall numbers
      - By occupations
      - By grades
      - By location of positions if applicable
   
   B. Compare current available resources with needed resources for the future.
      - Net human resource needs
      - Increase/decrease in productivity levels
      - Skills/grade levels
      - Position management
      - Under-staffing or over-staffing
      - Career progressions
      - Supervisory/managerial replacements

Report No. 43 : Report to implement PWD specific Human Resources Planning and Management Programme

Report No. 49 : Report for implementation of civil service reforms linked PWD HR Planning and Development Programme
4. Action Plan. Determine how your needs will be met by:
   A. Addressing serious shortfalls and critical issues. Establish human resource objectives
   B. Develop an action plan.
      – Internal sources of workers
      – Recruitment for external sources of workers
      – Job redesign
      – Training, retraining, career development
      – Succession planning
      – Competitive sourcing
      – De-layering
      – Productivity improvements
      – Restructuring (organization/positions)
      – Position management plan
   C. Develop a plan for handling Staff Management Issues
      – Legal and contractual requirements
      – Employee involvement
      – Negotiations
METHODOLOGY FOR WORKFORCE PLANNING (contd…)

Checklist of Key Elements …..

5. Cost Implications. Identify items with cost implications. Project an annual budget by:

A. Costing out the items requiring monetary support.
   – Grade distribution
   – Recruiting
   – Training, retraining, career management
   – Succession planning, de-layering cost
   – Relocation costs, reorganizing cost
   – Increased or decreased staffing
PWD WORKFORCE PLANNING MODEL

Workforce Planning in the context of PWD Strategic Planning

GoI Level Strategic Goals
- Policies & Plans
- Transport Sector Plans
- Five Year Plans

PWD Vision & Mission
- Strategic Plans, Policies

PWD Annual Business Plans
- Works Programs

HR (Staffing) Strategy

HR (Staffing) Plans

Estimated Staffing Needs

Existing Staffing

Attrition of Existing Staff

Gap Analysis

Staffing Plan

Annual Recruitment Plan

Organisation Level Plans

Staff Recruitment Plan

Staff Training and Development Plan

Staff Promotion Plan

Staff Succession Plan

HR Policies

Recruitment Policy

Training Policy

Promotion Policy

Transfer Policy

Career Development Policy

Individual Level Plans

Performance Planning & Management

Training Needs Identification

Individual Training & Development Plan

Career Development Plan

Numbers & Levels

Skill set requirements

Induction Plan
### PWD Workforce Planning Model

#### Phase - I
**Set Strategic Direction**
Determine future functional requirements through VISION and strategic planning and budgeting process.

#### Phase - II
**Workforce Analysis/Strategies**
- **Step 1:** Supply Analysis - present workforce profile.
- **Step 2:** Demand Projection – future workforce profile needed.
- **Step 3:** Gap Analysis - discrepancy between demand and supply.
- **Step 4:** Solution Analysis and Strategy Development - solutions to close gaps.

#### Phase - III
**Implement Workforce Plan**
- **Communicate Workforce Plan**
- **Implement strategies to close gaps.** Examples include: succession planning, target recruitment, training programs, restructuring, retention strategies etc.

#### Phase - IV
**Monitor, Evaluate, Revise**
- **1.** Assess what’s working and not.
- **2.** Make adjustments to plan.
- **3.** Address new workforce and organizational issues.
Critical Steps of PWD Workforce Planning

Step 1 – Supply Analysis
Consider:
- Staffing levels
- Workforce skills
- Workforce demographics
- Employment trends

Step 2 – Demand Analysis
Identify:
- Workforce skills to meet projected needs
- Staffing patterns
- Anticipated program and workload changes

Step 3 – Gap Analysis
- Compare supply analysis with demand analysis to determine future gaps (shortages) and surpluses (excesses) in the number of staff and needed skills
- Identify future changes in workforce demographics
- Identify areas in which management action will be needed to reach workforce objectives

Step 4 – Strategy Development
Plan:
- Recruiting
- Succession
- Employee development and retraining
- Work/organization change
Need for HRMIS for HR data for workforce planning

Establishment of a computerised HR database is essential for carrying out a comprehensive Work Force Planning

HRMIS needs to be developed to provide various workforce data/reports for the Work force planning exercise

A comprehensive working paper for establishment of the HRMIS in PWD is included in the Report

Broad HR data obtained from PWD during the TA consultancy have been used to illustrate various planning processes in this report
## PWD WORKFORCE SUPPLY ANALYSIS

### Current Workforce Situation

<table>
<thead>
<tr>
<th>Designation / Position</th>
<th>(Total Number of Officers)</th>
<th>Sanctioned Post</th>
<th>In-position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>General</td>
<td>Deputation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General</td>
<td>Deputation</td>
</tr>
<tr>
<td>Engineer-in-Chief (ENC)</td>
<td>3</td>
<td>2</td>
<td>Nil</td>
</tr>
<tr>
<td>Chief Engineer (CE) Civil – Level I</td>
<td>3</td>
<td>2</td>
<td>Nil</td>
</tr>
<tr>
<td>Chief Engineer (CE) Civil – Level II</td>
<td>29</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>Chief Engineer (CE) Electrical/Mechanical</td>
<td>1</td>
<td>-</td>
<td>Nil</td>
</tr>
<tr>
<td>Superintending Engineer (SE) Civil</td>
<td>85</td>
<td>73</td>
<td>12</td>
</tr>
<tr>
<td>Superintending Engineer (SE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Executive Engineer (EE) Civil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Executive Engineer (EE) Electrical/Mechanical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assistant Engineer (AE) Civil</td>
<td>1225</td>
<td>676</td>
<td>14</td>
</tr>
<tr>
<td>Assistant Engineer (AE) Electrical/Mechanical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior Engineer (JE) Civil</td>
<td>4176</td>
<td>3087</td>
<td>Nil</td>
</tr>
<tr>
<td>Junior Engineer (JE) Electrical/Mechanical</td>
<td>322+385</td>
<td>267+289</td>
<td>Nil</td>
</tr>
<tr>
<td>Junior Engineer (JE) T</td>
<td>467</td>
<td>325</td>
<td>Nil</td>
</tr>
<tr>
<td>Draftsman</td>
<td>319</td>
<td>344</td>
<td>Nil</td>
</tr>
<tr>
<td>Tracer</td>
<td>208</td>
<td>61</td>
<td>Nil</td>
</tr>
</tbody>
</table>
**Report No. 43**: Report to implement PWD specific Human Resources Planning and Management Programme

**Report No. 49**: Report for implementation of civil service reforms linked PWD HR Planning and Development Programme

**PWD WORKFORCE SUPPLY ANALYSIS : EXPECTED ATTRITIONS**

**Table 5.4 : Expected Superannuation till 2012**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Strength in Sep 07</th>
<th>Number due for superannuation during 2007 Sep-Dec</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>Total Superannuations</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE</td>
<td>-</td>
<td>-</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>SE</td>
<td>-</td>
<td>-</td>
<td>19</td>
<td>13</td>
<td>8</td>
<td>10</td>
<td>3</td>
<td>53</td>
</tr>
<tr>
<td>EE</td>
<td>-</td>
<td>-</td>
<td>57</td>
<td>41</td>
<td>52</td>
<td>28</td>
<td>17</td>
<td>195</td>
</tr>
<tr>
<td>AE</td>
<td>-</td>
<td>-</td>
<td>40</td>
<td>31</td>
<td>39</td>
<td>35</td>
<td>34</td>
<td>179</td>
</tr>
<tr>
<td>Total</td>
<td>1120</td>
<td>40</td>
<td>123</td>
<td>88</td>
<td>101</td>
<td>73</td>
<td>54</td>
<td>479</td>
</tr>
</tbody>
</table>

Note: The above superannuation data is computed from secondary data of list of PWD officers as on December 2006
**PWD WORKFORCE SUPPLY ANALYSIS : EXPECTED ATTRITIONS**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Category</th>
<th>Strength In Sep 2007</th>
<th>Superannuation by 2012</th>
<th>Superannuation rate per annum</th>
<th>Attrition per annum including resignations etc.</th>
<th>Strength in end 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Graduate Engineers (Civil)</td>
<td>1120</td>
<td>479</td>
<td>8.2%</td>
<td>9%</td>
<td>585</td>
</tr>
<tr>
<td>2.</td>
<td>JE’s</td>
<td>3412</td>
<td>1482</td>
<td>8.2% (assumed)</td>
<td>9%</td>
<td>1784</td>
</tr>
</tbody>
</table>
WORKFORCE DEMAND ANALYSIS (from Report No. 27)

Table 6.1: Longer-Term (2012) Minimum needs core staff Cadre Strength for UP PWD (with additional 58 non-core Divisions)

<table>
<thead>
<tr>
<th>Cadre</th>
<th>Duty posts in 2007</th>
<th>Addl. duty posts in 2012</th>
<th>Total duty posts in 2012</th>
<th>Reserve @ 20% of duty posts</th>
<th>Cadre strength in 2012</th>
<th>Existing sanction (2007)</th>
<th>Surplus/Deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE &amp; above</td>
<td>43</td>
<td>-</td>
<td>43</td>
<td>-</td>
<td>35</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SE</td>
<td>138</td>
<td>-</td>
<td>138</td>
<td>-</td>
<td>85</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>EE</td>
<td>524</td>
<td>58</td>
<td>582</td>
<td>-</td>
<td>366</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total Class I</td>
<td>705</td>
<td>58</td>
<td>763</td>
<td>153</td>
<td>916</td>
<td>486</td>
<td>(-) 430</td>
</tr>
<tr>
<td>AE</td>
<td>1547</td>
<td>232</td>
<td>1779</td>
<td>356</td>
<td>2135</td>
<td>1225</td>
<td>(-) 910</td>
</tr>
<tr>
<td>JE (Civil)</td>
<td>4354</td>
<td>928</td>
<td>5282</td>
<td>1056</td>
<td>6338</td>
<td>4176</td>
<td>(-) 2162</td>
</tr>
<tr>
<td>JE (T)</td>
<td>491</td>
<td>58</td>
<td>549</td>
<td>110</td>
<td>659</td>
<td>467</td>
<td>(-) 192</td>
</tr>
</tbody>
</table>

DEMAND OF ENGINEERS in 2012
Graduate Engineers: 3015
JE’s: 6997
Report No. 43 : Report to implement PWD specific Human Resources Planning and Management Programme

and

Report No. 49 : Report for implementation of civil service reforms linked PWD HR Planning and Development Programme

**WORKFORCE GAP IN PWD (2012)**

Table 6.2 : Demand, Supply and Gap in Workforce in PWD

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Engineers</td>
<td>1120</td>
<td>1661</td>
<td>541</td>
<td>3015</td>
<td>585</td>
<td>2430</td>
</tr>
<tr>
<td>JEs</td>
<td>3412</td>
<td>4643</td>
<td>1231</td>
<td>6997</td>
<td>1784</td>
<td>5213</td>
</tr>
</tbody>
</table>
UPSRP

Report No. 43 : Report to implement PWD specific Human Resources Planning and Management Programme and
Report No. 49 : Report for implementation of civil service reforms linked PWD HR Planning and Development Programme

SOLUTION ANALYSIS / STRATEGY DEVELOPMENT

Recruitment and Induction Strategy
Basic Workforce Intake principles
Suggested Intake plan
Structured Induction training
Career Planning, Succession Planning and Cadre Management
Employee knowledge and skill abilities
Contract Appointments
Report No. 43 : Report to implement PWD specific Human Resources Planning and Management Programme
and
Report No. 49 : Report for implementation of civil service reforms linked PWD HR Planning and Development Programme

SOLUTION ANALYSIS : SUGGESTED INTAKE PLAN 2008 - 2012

Table 7.2 : Suggested Intake Plan: 2008 to 2012

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Graduate Engineers</td>
<td>3015</td>
<td>585</td>
<td>2430</td>
<td>2430</td>
<td>730</td>
<td>610</td>
<td>360</td>
<td>360</td>
<td>370</td>
</tr>
<tr>
<td>JEs</td>
<td>6997</td>
<td>1784</td>
<td>5213</td>
<td>5213</td>
<td>1570</td>
<td>1300</td>
<td>780</td>
<td>780</td>
<td>780</td>
</tr>
</tbody>
</table>
WAY FORWARD FOR IMPLEMENTATION OF WORKFORCE PLANNING IN PWD

Equip HRD and Training Cell
Establish HRMIS
Constitute Workforce Planning Team
Integrate HR Planning with PWD Strategy Planning
Carry out organizational restructuring
Initiate regular intake of engineers (Very Urgent)
Appointment of Specialist Workforce
Develop Workforce Plans

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Report No. 49 : Report for implementation of civil service reforms linked PWD HR Planning and Development Programme
WAY FORWARD FOR IMPLEMENTATION OF WORKFORCE PLANNING IN PWD

Develop and Implement Workforce Plans:

- Intake Plan / Recruitment Plan
- Development Plan for Specialist cadres
- Training and Development Plan
- Staff Promotion Plan
- Succession Plan for Key Positions

REPEAT ANNUAL WORKFORCE PLANNING ON A ROLLING BASIS
ANNEXURE - 1 : DEVELOPMENT OF HRMIS (HUMAN RESOURCE MANAGEMENT INFORMATION SYSTEM) FOR UP PWD

1. HRMIS FOR UP PWD

Various Human Resource and Training enhancements being implemented in UP PWD IDS Action Plan require accurate and updated data on the Human resources in the department. A Computerised Human Resource Management Information System (HRMIS) needs to be established and the data base of Human Resources in PWD developed for the purpose.

2. OBJECTIVES OF HRMIS

To provide data support for various HR interventions in the following areas:

Manpower Planning

1. To provide updated data on manpower planning, career progression and other HR decisions
2. HR related policies, guidelines, regulations etc
3. Making available personnel widely to all users. Personal data of individuals such as leave records should be available to individuals on the web
4. Review and revise the job descriptions of different positions to bring them on line with present day requirements
5. Carry out manpower need studies to project the manpower needed rank-wise and skill set-wise, and provide the data for manpower planning exercise
6. Conduct manpower planning to determine Recruitment needs and promotions to be effected on an annual basis

Recruitment

7. Initiate the process of Recruitments with UP PSC and Staff Selection Commission for timely selection and induction of personnel

Performance Management and Career Management

8. Review the existing Performance Appraisal System and revise it to make it more objective and transparent in line with the Civil Service Reforms and to include identification of individual career progression and Training and Development needs
9. Organise training programmes for Appraisers and Appraisees on the Performance Management System and monitor its timely and proper implementation
10. Manage the (Confidential) Performance Management Data
11. Provide data inputs for promotions and transfers etc from the HRMIS and the confidential Performance Management data
12. Plan and conduct Professional Examinations
Communications and Change Management

13. Develop and issue PWD wide communications of important information through newsletters and bulletins and e-bulletins

2.1 Training and Development Functions

Policy Formulation

1. Developing Training Vision 2015 for the UP PWD
2. Developing Training Policy for UP PWD including annual training Plans

Training Needs Identification

3. Carry out Training Needs Assessment for PWD staff once in 3 years to identify core skills required to be developed in the Staff at different level
4. Based on TNA report, develop PWD Core Skills Development Plan (CSDP)

Training Database

5. Develop and maintain a comprehensive HRMIS (Database/Inventory of Human Assets) of all officers in PWD including the training data. The database will include details like name, designation, place of posting, address and e-mail, telephone numbers (mobile/landline), date of joining PWD, date of birth, date of retirement, qualifications, area of specialisation, details of training programmes attended
6. Maintain the details of Annual Confidential Reports
7. Establish an individualized Training and development needs inventory of all officers. Individual’s training needs to be identified in the Annual Performance Appraisal Form. Performance Appraisal process to be revamped to include training and development needs identified by each officer and his supervisor

Organising Training Programmes

8. Induction training programme for the newly joined AEs and updating programmes for newly promoted officers based on their immediate work needs
9. Support an annual recruitment plan and annual promotion plan based on HR data
10. Develop a database of outsourced Training Providers (Training Institutions like CRRI, NITHE, IRC, etc) and the standard and specialised training programmes offered by each of them
11. Manage Training Programmes through the Consultants as mandated in various Works/Consultancy contracts
12. System of nomination of officers for the scheduled courses based on matching of the TNA, individual Training Need and PWD’s requirements
13. Maintain a database of persons trained for initiate follow up actions
14. Maintain particulars of local/ regional/national Resource persons/experts/faculty available in the subject areas of interest of PWD, and who are willing to provide training services

2.2 \textit{Planning and Establishment of PWD Training Centre}

15. Prepare a list of local/ regional/national Resource persons/experts/faculty available in the subject areas of interest of PWD and who are willing to provide training services

16. Develop a Resource Base of Training Material in print as well as electronic media

17. Develop a system of evaluation of Training Programmes during the course, at end of course as well as impact evaluation after 3-6 months of the programme

18. Organise with the help of IT implementation agencies, IT Skills courses for PWD officers

19. Organisation-wide communications and information sharing through proactive disclosure and electronic bulletin boards accessible by members

2.3 \textit{HRMIS Development}

HRMIS is a systematic procedure for collecting, storing, maintaining, retrieving, and validating data needed by an organization about its human resources, personnel activities, and organization unit characteristics.

It is planned to develop an integrated, user friendly HRMIS System in respect of Engineering staff of Class I, II and III (from Chief Engineers to Junior Engineers) containing information about the personal details, qualifications, career progression and trainings undergone etc. The HRMIS will facilitate the Workforce planning process and also in planning individualized Training and career development for each officer. Later, the system would also be linked to the Performance Management System. This one time effort will, in addition to providing accurate manpower data for the Human Resource Planning exercise, shall meet the requirements of the ‘Right to Information Act’ and in future, save a lot of time and efforts in HR Planning process. Part of the HRMIS would be access controlled. The HRMIS, in due course be extended to cover the Administrative and Accounts staff in the PWD.

A computerized human resource database of the UP PWD will support long range planning, with information on Work force planning, and supply and demand forecasts; staffing, separations, applicant qualifications; and development with information on training program costs and trainee work performance. HRMIS can also support payroll management with information on pay increases, salary forecasts, and pay budgets; and employee assistance needs. In every case the purpose is to provide information that is either required by the human resource stakeholders or supports human resource decisions. Computerized HRMIS is to be designed to produce the required information faster or at a lower cost. Administrative tasks will be faster and managed with less paper work and with fewer people handling the establishment sections.
2.4 Use of HRMIS

Automation can cut administrative costs. Such applications are based on the basic assumption that the administrative activity should be continued. Many organizations are finding that the most fundamental value of technology is its ability to encourage new thinking that removes the need for layers of administration. This kind of fundamental change is called reengineering. Many organizations are utilizing the HRMIS to disseminate information to employees using internet and intranet. The technology enables processing of large amounts of data rapidly and accurately with fewer people.

The second and the important use of HRMIS is in decision support applications; that assist managers and employees to make better decisions. The key is to focus on making better decisions, not just producing data faster.

2.5 MIS Reports from HRMIS Database

The HRMIS of UP PWD will be designed as comprehensive HR database system to take care of various anticipated information requirements for HR and Training decisions. The HRMIS will provide the following information and reports to the decision makers at the click of a button:

2.5.1 Personnel Statistics

1. Strength and list of staff on any given day, category wise
2. Seniority lists, cadre wise
3. Lists by dates of birth, cadre wise
4. Lists of officers due for retirement in a given month and year
5. List of officers retired during a month / year
6. Lists of officers joining date wise and during a particular year
7. Lists of officers present at a station on any date
8. Lists of officers in the present post for 1 yr, 2 yrs, 3 yrs, 4 years, 5 yrs etc
9. Lists of officers at the present station for 1 yr, 2 yrs, 3 yrs, 4 years, 5 yrs etc
10. Lists of officers promoted during a particular year, promotion percentages out of total eligible, category wise
11. Lists of officers eligible for higher scale / promotion based on defined criteria of qualifications / age / experience / performance record / years of residual service etc. and combinations thereof
12. Lists of officers who meet any defined set of criteria of age, experience, qualifications, specializations etc
13. List of officers under transfer orders with details, joined their assignments, yet to join during a month / year
14. List of officers on deputation to outside Rand BD, tenures of appointments, due dates of return to cadre
15. Lists of officers deputed to UP PWD and their due dates for return to parent cadre
16. Lists of officers on probation, dates of removal from probation, the status of reports for each for removal from promotion
17. List of officers in temporary, permanent, regular, contract categories
18. Lists of officers qualification wise (Degree / Diploma / PG), specialization wise
19. Full details of an individual; individual file updated regularly. Non confidential information accessible to individual. Confidential information accessible to authorized persons with graded security

2.5.2 Organisational Reports

20. Organizational structure, sanctioned positions, filled / vacant positions; overall / Circle / Division / Subdivision wise; district / zone wise
21. Details of posts sanctioned as on a specified date; circle/division/subdivision wise
22. Details of temporary sanctions, project posts and their dates of expiry of sanctions
23. Details of positions vacant, since when
24. Details of posts filled by charge holders; in addition to their primary / original charges; since when
25. Details of officers holding the charge of a higher post as primary duty
26. Details of Individuals holding additional charges; since when
27. Details of new posts created with dates and details of tenure etc. during last ten years
28. Details of posts abolished during last ten years with dates
29. Lists of officers promoted year wise during last ten years
30. List of officers superannuated, voluntary retired, resigned, suspended / dismissed in last 10 years, year wise
31. Professional exams data - individual wise; including details of attempts, results of each attempt etc. exam wise
32. Lists of persons who are required to pass to pass Professional exam
33. List of persons who are not passed professional Examination
34. List of officers who are required to pass the Computer proficiency exam ; who have passed, who are yet to pass the exam

2.5.3 Training Reports

35. Individual wise qualifications at the time of joining the service
36. Additional qualifications acquired after joining service
37. Individual wise training programmes attended with details of dates, Institution, performance in the course etc
38. List of personnel who have done a particular training program
39. Individual’s training needs identified with priorities
40. Program wise lists of participants
41. Performance record of trainees
42. Master list of trainers topic wise
43. Levels of trainers by position / qualifications / experience
44. Record of rating of each trainer by trainees
45. Effectiveness of a specific training programme - Participants feedback
46. Effectiveness of a specific training programme - evaluation by dept
47. Induction training details cadre wise
48. Tracking of induction training and evaluation at the end of induction training
49. Monitoring of State training policy implementation – 3 days training to each Class I / II officer in a 2 years cycle
50. Training curriculum of various standard courses
51. Training resources like power point presentations of various courses
52. Lists of Course material available for a particular course
53. Lists of Reference material / web resources for a particular topic
54. Annual training calendar and details of any additional courses planned
55. Training calendars of outside Institutions to which UP PWD officers are to be deputed for courses
56. Records of officers deputed for a particular course outside the State / overseas
57. Notifications to participants through e-mails / confirmations from participants

2.5.4 Decision Support Reports

58. List of persons with specified qualification, experience and training
59. Lists of persons eligible/ recommended for a particular training course
60. Lists of potential trainers for a particular course

(The HRMIS can also be used for salary administration in a very effective manner with additional enhancements to the database)

2.6 Components of an HRMIS

It is convenient to consider these three major functional components in any HRMIS:

Input -> Data Maintenance -> Output
The input function: It enters personnel information into the HRMIS. In the past, data entry was often the only way. Today, scanning technology allows computers to scan and store the actual image of an original document, including signatures and handwritten notes.

Data Maintenance: After the data is entered into the information system, the data maintenance function updates and adds the new data to the database. In non-computerized systems, clerks do this by hand; they file paper documents and make the appropriate entries in the files. Computerized systems accomplish this function accurately and rapidly, often making the new data available only seconds after being input. This area is growing rapidly to allow for electronic data storage and workflow management.

Output: The most visible function of a HRMIS is the output generated. To generate useful output for the users, the HRMIS must process that output, make the necessary calculations, and then format the presentation in a way that the user can understand. No matter how compelling the technology, the information presented is still the heart of a system's value. So, it is important to consider the users, and how they employ the information system. In many of today's organizations, employees, line managers, and a variety of human resource staff use the information in the HRMIS directly through their PCs, telephones, or in written form. This trend is likely to continue with users demanding a more active role in the input, maintenance, and output functions of the HRMIS.

The use of expert systems in programming the questions, logic, and decision rules are an additional feature of a HRMIS that is gaining popularity. Such systems can be applied to the decision of whether to reprimand an employee, what pay level to assign to a job, which skills to look for in a new team member, or which benefit choices are best for an employee. Computer programs can capture some of the experts' question patterns and decision rules. The user of an expert system gives honest answers to the questions, receives and carefully considers the system's recommendations, and can sometimes use a summary of the system's logic to learn how to be more expert. It is this type of logic that is rapidly utilizing the interactive voice response (IVR) technology to become the next link in HRMIS. The use of (IVR) allows fewer employees to provide information to a larger audience faster and at a much lower cost.

2.7 HRMIS Design Process

Specifying the system requirements: The first and most important step in the design process is specifying the system requirements, especially the target users and the decisions the system is designed to support. These specifications include decisions about the type of data to collect, the amount of data to collect, and how and when to collect the data.

Business System Design: The next step is business system design. This step involves answering questions about who will use the system, how they will access it, how it will be updated, and more.
Technical system design: This includes software system development and programming. The system is then tested at selected locations and evaluated. Once in operation, the system is evaluated, improvements are determined, and the process begins again. Clearly, the aforementioned principles of information value should be used to guide the choice of information to include in an HRMIS. In addition to the choice of what information to include, the design of the HRMIS must also account for organizational and user characteristics. These organizational and user characteristics include the structure and composition of the HRMIS staff, the link between the HRMIS technology strategy and that of the larger organization, and the impact of the HRMIS staff's efforts on personnel and the culture of the larger organization.

The Future: It would have been impossible 10 years ago to accomplish many of the tasks previously described without the recent advances in computer networks and user-friendly software. PCs have definitely arrived in HR management. Hundreds of software programs are helping HR managers be more effective, and more are on the way. Many organizations can store their entire HR databases on today's more powerful PCs. When PCs can access mainframe computers, or can be linked together to form networks that share information and tools, the possibilities are virtually limitless. PCs are good at graphic presentations of information, interactive data analysis, and providing a high degree of individual control. PCs make it possible to use technology such as touch-screens, interactive video, voice-activated responses, scanning technology, and sophisticated multi-media or graphics. Many experts forecast that the PC will become the central tool for all HR professionals. This has already become the case in the organizations cited herein.

While the benefits of ready access to computerized HR information are compelling, this technology creates new obligations and responsibilities for the managers. The data stored on computerized systems is often confidential and private and should be accessible only to approved individuals under controlled conditions. To maintain control and security of data, organizations should address to the following issues:

1. Management considerations, such as who is authorized to use PCs, user training, inventories of equipment, and procedures for special events like power outages.
2. Physical security, such as access to PC areas, diskette handling, and secure housekeeping.
3. Information security, such as locking diskettes and hard drives, documenting PC applications, backup procedures, and network safety precautions.

Most important elements of an HRMIS are not the computers, but the information. The focus of any comprehensive HRMIS should be on information validity, reliability and utility first and on automation of the process second. Many organizations have gone through years of expensive software development only to find that the process for accomplishing the work should have been changed, or added little or no value to the end result.
2.8 18 Steps to Developing HRMIS

HRMIS Project is a complex process, more complex than we originally estimate and one with long-term consequences for an organization. It requires a careful and thoughtful approach to fully address the issues and impacts related to your decisions. There are 18 steps that need to be gone through though some steps may be combined or performed concurrently, but the Project Manager will optimize the effort by following the process.

Step 1 - Teamwork

Congratulations. You've been selected to head the HRMIS Project. We strongly recommend that you form a 3 to 7 persons team to oversee your selection. There are a myriad of issues to consider and software selection is definitely one area where the quality of the decision is improved by having several people involved in the evaluation and decision making process. Include on the team the key users and stakeholders of the new application. Include a knowledgeable member of your Information Technology staff from the very beginning and make sure that you have appropriate management representation so that as costs are developed, you will not find yourself in a situation of delivering "surprising" news at the end of the evaluation process. Larger organizations may also have a "Steering Committee" typically consisting of the decisions makers - management who will sign off on the costs, participate in contract negotiations, support the project team and provide visible top level support.

Step 2 - Goals

At your initial team meeting(s) begin by identifying and agreeing on the goals for the project. Without a set of fully developed goals at the beginning of your search, you will either waste significant time evaluating the wrong products, or, even worse, select the wrong software.

Ask the team to fully answer the following questions:

- What is your overall HR information technology strategy?
- What do you need and why do you need it, what system functionality do you need?
- What results do you wish to accomplish with this effort?
- What work processes do you wish to change through this selection and what should the new processes look like?
- What are the business drivers for the new system, how does this system support the overall needs of the business?

Identifying goals may include interviewing senior management, others in HR and clients to identify the "right" needs for your organization.
Step 3 - Big Picture

Once your goals are developed, take a step back and ask how they fit into the bigger picture of your overall human resource information system. Make sure that you consider how it will need to integrate with other applications such as your main MIS. If you’re selecting a new HRMIS, does it cover all of specialized needs you have such as training records management? How does this application fit with your HR IT strategy?

Step 4 - Future Needs

Ask what your information system needs will be in the next few years. What other applications will be needed? When will you need them? Will they share the same information needs as this application, i.e. employee id, employee no. date of birth, name, address, etc? If so, how will you prevent having to enter the same data into different applications in future years? Are you planning to move to web based applications and if so, is this the time to begin moving in that direction? Are any major business processes going to change either as a result of this selection or in the near future? Where do issues like employee self-service and manager self service fit into your overall strategy?

Step 5 - Technical Environment

It is absolutely critical that you define the base technical environment for the new application before you begin to look at any specific products. This is an area where your IT representative plays a key role. The questions that need to be answered include: what type of application are you looking for, stand alone PC, networked client/server, or mainframe. What operating system does it need to run on -- Windows NT, Unix, etc.? If it’s a database application, what database does your company support, SQL, Oracle, DB2? How will it connect to remote offices? Does it need to be web deployable? Does it make a difference what language the application is programmed in such as C++ or Visual Basic? Is your IT department planning a major change in technology platforms in the next year?

Step 6 - Budget

Budgets can be hard to define before you speak with any vendors but you need to at least define some ballpark estimate of what your organization is willing to pay before you start talking to vendors. A key item to keep in mind during budget definition is to separate your costs into three areas: Software, hardware and implementation. Software includes the actual software licensing fee and other software development / customization costs and for items such as database licenses and annual maintenance costs. Hardware is what you will need to spend for servers, PCs, and network upgrades. Finally, implementation costs encompass the money you will spend for configuring the software, training, and data conversion including the possible need to hire consulting services from the vendor or third party consulting firm to help in implementation.
Step 7 – Specifications

Now that you’ve completed the first 6 steps, you’re ready to develop a written specification document for your new software package. The specification should begin with your overall HR IT strategy, list your project goal, define the base system functionality that you require, specify how it needs to integrate with other systems, and list the technical requirements developed in step 5. This is a key deliverable for the overall project. If your specification is clear, specific and well defined; your selection process will be relatively painless. However, if you remain unclear on goals, functionality or the technical environment, then you’re not ready to move forward.

Step 8 - Build vs. Buy

At some point during the process, most organizations address the issue of whether they want to develop the application internally or purchase commercially available software. This issue may be considered as early as step 2 or 3 and as late as step 15 or 16. We don’t think it should come any later than step 8 because it is typically both an emotional and confusing debate and one that can sidetrack your process indefinitely. Many organizations have successfully developed their own human resource software. Many more have been less than successful in such efforts. When the issue arises in your process, ask the following questions:

• Are the necessary IT resources available internally for this project?
• Does the human resource staff have the time and expertise to develop detailed system specifications, screen designs, system edits and reporting requirements?
• What priority will it be given by IT management compared to other business systems?
• What is so specialized about your needs that you can’t get 80% of your requirements with commercially available software?

Finally, if your Information Technology staff develops any preliminary budgets or schedules for doing the job internally, experience says that you should double both and you will have a more realistic estimate to compare against the commercial products.

Step 9 - Research

Now you’re ready to start identifying vendors and products that could meet your needs. How do you locate information on vendors and products? The obvious starting point is to talk to your colleagues in other companies for recommendations on products they have used that fit your general needs. Another source is the internet.

Step 10 - Literature

Hopefully, your research has generated a good list of potential vendors. The next step is to contact each and get some product literature. Vendors supply different levels of information in their brochures, some are very high level without much detail, and other pieces are more informative. Make sure that you specifically ask for literature containing the level of detail you need. This is a key step in the process and should not be skipped because it should reduce your potential vendor list to a manageable number. Some vendors will drop out when you call
for literature and you find out their product isn't available to fit your technical platform, or it really doesn't meet your needs. You will eliminate some after reviewing their literature and determining that the product is not as close a match with your technical specifications as others. One note of caution about this step, many vendors will want to schedule meetings when you contact them for literature. Don't meet with vendors yet, you're not ready. Limit them to sending you as much information as they can, and let them know that you'll contact them if you have further interest.

Step 11 - RFP

Now you're ready to develop and send a request for proposal (RFP) to your smaller list of target vendors. RFP's can be one page in length or ten or more. You will need to decide how much detail you want prior to seeing product demonstrations. Smaller companies may want to use a simplified 1 or 2 page requests for information (RFI) that requests less information and has more flexible response guidelines in order to expedite this stage. Larger companies and those in the public sector most typically will use a formal RFP process. The most common elements in an HRMIS request for proposal include:

- An overview that describes your company
- A description of your software need and the employee population it will support
- Desired system functionality
- Required technical environment / specifications
- A request for pricing (licensing fees, maintenance charges, training and implementation support, annual maintenance fees and telephone hotline support)
- A request for customer references
- Details on customer service / support available from the vendor
- A request for sample contract terms

Once you have assembled your RFP, send it to your vendor contacts and give them a reasonable period of time to respond, typically 3 to 5 weeks. Some vendors will supply you with a "sample" RFP if you request one, which you can then modify for your specific system needs. The RFP needs to contain guidelines for the vendor response such as:

- Are each of the required features currently in their system?
- Are certain features proposed in a future version of the system?
- Will any of your required features require system customizations and if so what are the costs and problems associated with the customizations?

Always be aware of your "special needs" and the extra money and effort it will cost for implementation and future support. Work hard to modify your internal processes to match the software before embarking on customization.
Step 12 - Evaluate

As the RFP's are returned, you will want to have a common basis for evaluating all of the proposals. A typical approach is to create a spreadsheet with all of the items in the RFP as your column headings and the vendors listed on the rows. Then you would assign a value to each RFP item (yes/no, a dollar value, or a numerical ranking of some type) for each vendor. Once you have received all of the proposals and entered the data on your spreadsheet, then the team can meet, review the evaluations and select the vendors they want to schedule for product demonstrations.

Step 13 - Demos

Software product demonstrations, by their very nature, are designed to showcase the best attributes of the product and downplay the limitations. You can and should control product demonstrations to try and get as accurate and unbiased information as you can from what is clearly a major sales event for the vendor. How do you control the product demonstration? You control the demonstration by modifying the vendor's agenda. All software vendors have standard product demonstrations - don't accept the standard demonstration. By this point in the process, you should have a strong grasp of your needs and issues. Create a list of specific questions/trends for the demonstration that focus on your issues and concerns and provide it to the vendor in advance of the meeting. In this way the vendor can include your issues as part of their overall demonstration and you should get a more unbiased look at the product. All of your team members should be involved in the demonstration and the team should agree in advance on specific issues that each member will ensure are addressed during the demonstration.

Step 14 - Evaluate Again

After you have completed your initial product demonstrations, it’s time for the team to meet and evaluate the products based on all of the information you have at that point. Have each team member list the likes, dislikes, concerns, and unresolved questions that they have concerning each product. You may need to have one or more vendors provide some additional information before you move forward. You also need to be concerned about pricing differences at this point in the process. However, do not assume that you have the “final” price from each vendor. As the vendors learn more about your specific needs, they may be in a position to refine the pricing submitted with their RFP. Finally, narrow your vendor list to 2 or no more than 3 vendors. Invite those remaining vendors back for a second product demonstration.

Step 15 - Decision Points

You've seen all the products once and have the preliminary pricing proposals. It's time for the team to start discussing the items that will drive your final decision. In most software selections price is one of, but not the only, selection criteria. Other obvious decision points may include differences in functionality and compatibility with existing systems. For many companies, implementation costs and timeframes are critical decision points. One word of caution is certain that your management team representative is heavily involved during this discussion as the team needs to be very sensitive to the items that will influence the eventual Approval or disapproval of their recommendation.
Step 16 - Check References

Now it's time to start checking references on your finalists. Your team should develop a list of questions that they would like answered by each reference. Questions should cover any areas of concern that you have with the product, product functionality, implementation, problems the reference has encountered and ongoing support. Make sure that you understand the technical environment of each reference, i.e. Windows NT, Unix, AS / 400, etc so that you can identify issues that may or may not apply to your situation. Listen carefully to what is said and not said by the reference. If you can get references in the same geographic area in which you work, try and visit the reference's business to see the product in action and talk to the actual users. It is best to check all of the references before the second demonstration so that issues that come up during this process can be addressed at the time of the next demonstration.

Step 17 - Demo Again

As with the first demonstration, set the agenda. The team will have specific items that they want to see again or need to have clarified. These items should form the basis of your second demonstration. Make sure that your management team representative is present at this demo. Your IT representative should ensure that all technical issues are resolved at this time. Review core functionality, reporting, processing time, implementation schedule and costs, customer support, issues raised in the reference checking process and any specific concerns of the team. You should also review each item in the pricing of the product with the vendor's sales representative. If you have any concerns about the pricing portion of vendor's proposal, now is the time to express them so that the vendor has a chance to clarify this critical issue before you make your decision. If you do not get everything resolved to your satisfaction during the second round of demonstrations, do not be afraid to bring one or more of the vendors back for a third demonstration.

Step 18 - Evaluate Again and Select

The demonstrations are finished; all the questions have been answered, it's time to make a selection. Before everyone decides to vote, take a step back and evaluate the information you learned in the second round of product demonstrations. Compare what you've learned to your initial goals and product specifications. Create a matrix of how each product evaluates against your decision points. If you've done a thorough job of learning the strengths and weaknesses of each product, established clear goals and product specifications and you've been aligned as team from goal setting through final demonstrations, then you should have an easy time reaching consensus on a product recommendation. In some situations, you will have two systems that meet your needs. In that situation, begin contract negotiations with both companies and work on negotiating the best package for your company - software price, training credits, implementation assistance, etc. Remember that making the right selection is only phase one of your project. A successful implementation that achieves your goals is the real challenge.
A MODEL OF SUCCESSFUL and FUNCTIONAL HRMIS- THE PERSONNEL INFORMATION MANAGEMENT SYSTEM (PIMS) IN PWD (DELHI)/CPWD

(Reference: Sharma Anil K.; Making e-Governance Happen in Government-Personnel Information and Management System; New Building Materials and Construction World (NBMandCW); Aug 2005 page 72-79.)

1. e-Governance enables the executives including those at top positions in taking an objective and unbiased decision but with a ‘reliable database’ using I.T. as an accurate data analytical tool. The quality of decision is assured by the speed and accuracy of data analysis in different scenarios, whatsoever could be conceived, for better governance. The reliability of database becomes the backbone of e-Governance in an organisation. e-Governance in Personnel Administration has been successfully implemented and is in operation in Delhi PWD since 15th Oct 2004. While it is being continuously upgraded with new features, it has brought about transparency in personnel management in PWD. It has empowered the citizen, employees as well as management. Dependence on paper files and support staff is largely substituted with a convenient web-based information retrieval system.

2. Important Features of PIMS: The web-based software is capable to integrate any department/ministry of the central/state government. To start operations for any department/ministry, the starting data needed is
   i. The general hierarchical structure defining each level from highest to lowest administrative unit
   ii. List of various Heads of Offices in possession of Service Records
   iii. Delegated powers of transfer for various categories of staff
   iv. List of service cadres and nature of duties performed by them

The employees’ data addition can commence immediately after receipt of above data and addition thereto in PIMS database. The employees’ database of any department/ministry can be conveniently completed within 30 to 90 days depending upon the commitment of the top executive. Due to versatility of the package, it has also been laterally extended in Central Govt. to CPWD on their request. It has at present over 30,000 employees on its database. For the sake of convenience, the salient features of PIMS are summarized as under:

2.1 Capable of handling employees with different rules of man-management: It is capable of handling any department/ministry with its employees drawn from different cadres with different rules laid down for man-management by different Cadre Controlling Authorities. There is flexibility of adoption of designation wise and cadre wise different criteria for transfer/posting based on tenures of ‘nature of job’, ‘station of posting’, ‘posting in region, zone, circle and/or division’, etc. This star feature of the software enables each of the Cadre Controlling Authority to fix transfer/posting criteria centrally and its uniform adoption in the Government by various subordinate authorities
delegated powers to issue Orders of Transfer of employees of that cadre. Following are the Service Cadres already covered in PIMS. PWD/CPWD provide its services taking help of following Service Cadres and respective Cadre Controlling Authorities:

a) Central Engineering Service (Gr-A)-Ministry of Urban Development
b) Central Elect and Mech Engg Service (Gr-A)-Ministry of Urban Development
c) Central Engineering Service (Gr-B) –DGW, CPWD
d) Central Electrical and Mechanical Engineering Service (Gr-B)- DGW, CPWD
e) Central Secretariat Service-Home Ministry
f) Central Official Language Service-Home Ministry
g) CPWD Junior Engineers (Civil) (Gr-C)-DGW, CPWD
h) CPWD Junior Engineers (Elect) (Gr-C) -DGW, CPWD
i) Central Secretariat Clerical Service -Home Ministry
j) CPWD Clerical Service-DGW, CPWD
k) Central Secretariat Stenographers Service-Home Ministry
l) CPWD Stenographers Service-DGW, CPWD
m) Group-D Staff-Ministry of UD Cadre
n) CPWD Group-D Staff Service-DGW, CPWD
o) Central Government Accounts Service-CAG
p) Delhi Administration Accounts Service (DAAS)-Finance (Accts), Delhi Govt
q) Delhi Administration Secretariat Service (DASS)-GAD, Delhi Govt

2.2 Integration of Any other Department/Ministry Possible: The modular character of the software allows other departments to be integrated to a common database just by adding in the database various office Ids and the list of designations, related posts and cadres in those departments/ministries. It is due to such character that the software originally designed for Delhi PWD could easily be extended to CPWD. And it is further extendable to any other department / ministry of Central and State Government(s). It would give lot of advantages due to common database for all Govt employees.

2.3 Decentralised Data Entry and its Accuracy: There is no necessity of employee data collection and its entry before it can be implemented in the department. Here data furnished by the employee after verification from service records is entered in a decentralised manner by HOOs who are in possession of service records. After the data entry in database, the copies of printed data as entered is handed over to employee and also kept in official personal file of the individual employee. Thus, employee as well as head of office, both are made responsible for accuracy of data entered in a decentralised manner.
2.4 **Uniqueness of Employee Id:** The employee Id is generated independently based on the employee’s name, date of birth, date of initial joining the service and the initial designation at which service started. While the employee Id becomes unique, it is easy to memorise by the employee himself. With no chance of any duplicate employee Id, the database can have data of all employees in the Government on a uniform pattern.

2.5 **Online Administrative Functions:** This has online administrative features of

- **Online Transfer/posting** of officials based on
  - Tenure at a station of posting
  - Tenure in a particular type of duty and/or
  - Tenure in the same office
- **Online relieving and joining** of the transferred employees
- **Online salary bills:** In Delhi PWD, it is compulsory for all Heads of Offices/DDOs to pay salary to its entire staff based on bills prepared through this software.
- **Online leave application/sanction** and simultaneous updating leave account of each employee. The online view facility available to employees of balance leaves at his credit is convenient to employees.
- **Promotion module:** With seniority lists of all categories of employees available on display to employees, it brings transparency in personal administration.
- **Online Directory of Employees:** With each HOO as well as employee on login is required to update official and residential contact details. Thus, the online accurate telephone directory is available to citizens, employees and HODs.
- **An Instant and Sure Communication System:** For issue of circulars, administrative orders and communication through PIMS Mail with appropriate filters applied as per requirement to be communicated to Offices, Officers and/or Staff.

2.6 **Compulsive Monitoring of Transfer Orders and their Implementation:** The system displays at every login the employees posted-in or transferred-out from an office till they finally join respective ordered office of posting. This compulsive monitoring enables any Head of Office to bring about and enforce administrative discipline conveniently by locating the absconding transferred employees, who after getting relieved from an office disappear on other lucrative assignments and join back in the new office later.

2.7 **Can Enforce Administrative Discipline:** The compulsive linkage of payment of salary of each employee through this software can enforce administrative discipline in the Government in ensuring strict implementation of its policies including transfer/posting orders.
2.8 Human Resource Development: It covers all aspects of human resource management and its development. It can be used with advantage in skill up-gradation of employees with training needs appropriately addressed. Online nomination for seminars/training courses based on specializations allocated to each of the officers is an important tool for proper human resource development.

2.9 Other Facilitation to Citizen and Employees: The availability of an online database has permitted to have many additional features

- Online viewing of Seniority Lists
- Online Leave application by employee(s)
- Online viewing by employees of leaves at their credit
- Search an employee based on one or more of the available criteria
- Locate contact address of office(s) and view employees posted therein
- Get online Income Tax Return based on salary data with additional inputs, if any.

2.10 Advantages of Unified Database: The composite unified data base of all Government employees would be immensely advantageous to the Government, employees as well the citizen at large. Few of such advantages are as under:

- **Reduction of uncalled for paper work**
  - Seeking information from different subordinate formations relating to employees
  - **Instant Communication System**: The server based PIMS Mail can be utilised for instant communication between management and employees and employee to employee located anywhere in the world is a star feature of this application software. Stationary consumed in issuing orders and circulars to be communicated to employees can be largely saved using PIMS Mail.

- **Introducing uniform e-Governance practices** throughout the Government(s) in the state / country.

- **Long and short term realistic policies** can be gainfully formulated and their strict compliance can be ensured due to availability of online reliable data and its analysis.

- **Accurate database of salary components** could be a great utility in realistic analysis and future projections in a variety of scenarios due to online availability the staff strength in each cadre/ designation/ category and availability of database of salary components (payments and deductions)
Simultaneous Accounting of Recoveries from Salary and updating of relevant record is possible as salary package can be linked to other departments as under:

- GPF and CGEIS account
- License Fees of Govt Houses allotted
- Income Tax recoveries
- CGHS/DGHS Recoveries

2.11 Password Protected Functions: While it addresses day to day personnel administration with user friendly web-based software, the data security mechanism has been ingrained into the system with password protected operations and designation based graded responsibilities of administrative functions for employees under their administrative jurisdiction.

3. PIMS is Informative and Friendly: The system has to be key source of information to Administrators and the employees. It is designed to provide information to:-

Each Head of Office: Online forced availability of information at every login relating to Staff Status for his own office and subordinate offices as under:

- Sanctioned Strength
- Vacancies position.
- Staff transferred out yet to be relieved
- Staff transferred In yet to Report
- Data deficiency of staff in the data base are displayed, if any
- Online Administrative Functions:
  - Transfer of staff based on laid down Criteria or otherwise
  - Relieving staff transferred
  - Joining of Staff relieved by previous office.
  - Salary Bill preparation
  - Online Change of Contact details of his office
- An Instant and Sure Communication System:
  - Issue of circulars, administrative orders and communication through PIMS Mail with appropriate filters applied as per requirement to be communicated to Offices, Officers, Staff.
For Common Employee

- Obtain direct from the Web
  - Monthly Salary Slip
  - Annual Salary Statement
  - Income Tax Return based on his further inputs
- Get Instantly informed of
  - Transfer Orders, if any
  - Nomination to a Training Course or Seminar
  - Edit his own Contact Details
  - Information Source
- View own as well other’s personal data relating to
  - Transfer, Training, Seminar, Personal details (excluding salary), etc
- Locate any of the office or employee with all relevant contact details
- Communicate instantly using
  - PIMS Mailing System
  - PIMS Chat Room

For General Public: General public is allowed to have an access to PIMS with User ID and Password taken as ‘guest’ for searching any employee or locate any office, contact address and other details

4. Challenges and their Resolution: While e-Governance can be applied at all places but the continued online and accurate updating of data always remains a challenge before the management. This necessitates an in-depth study of the system to incorporate certain features in the system to have compulsion for every one to update the data regularly. The reasons for its success and failure largely depend on this factor alone. The most important challenges, which have been resolved in implementation of this e-Governance Project are as under:

4.1 Commitment of Top Management is foremost and essential for the success of any e-Governance Project. Top management is equipped with financial as well as administrative powers, both of which are important. Financial powers are needed for facilitating with the required hardware and software, whereas administrative powers are needed for enforcement of its policy. Even the basic information for generation of the minimal database, which is essential for e-Governance, does not come forth voluntarily from the majority of employees of a large organisation. This is because majority of them perform only their assigned routine duties unless forced with administrative powers for implementation of its e-Governance policy. If the top management itself is not committed to e-Governance, it will never be able to get implemented.
4.2 **Computer Phobia:** Due to advancement of information technology at an unexpected fast pace, a common employee or an administrator belonging to yester years is hesitant to even touch a computer. This is because he had never been trained in his schooling or professional training before joining the service. This phobia acts as a big deterrent and it has to be dispelled properly by allowing them to feel homely with computers. They are to be made confident that the computers are not going to be damaged even if they use it as a novice user in getting accustomed to its basic operations e.g. putting the computer on, turning it off, mouse operations, etc.

It is therefore necessary to give a compulsory exposure to each of them in training sessions with the hands-on exposure on use of computer by allowing them to use it independently. The minimal topics needed to be covered are:

- Basics of Computer
- Hardware
- Operating System

It would definitely remove the Computer phobia from the minds of the officials.

4.3 **Computer as a Utility Tool:** Since most of the employees do not appreciate the utility of computers in day-to-day personal and official life, computers are to be informed in aforesaid training sessions as an important utility tool by exposing them with MS Office and its components. Besides being informed of the basic hardware of computer, its operating system, they have to be made comfortable with other user friendly common day today application software e.g. MS Word, Excel, Power Point, Outlook, Outlook Express, surfing the internet and sending/receiving E-mails etc. This would make them feel homely with computer usage and would consider computer as an important tool for their day today use.

4.4 **Training in PIMS:** In order to exploit full potential of the PIMS and develop confidence amongst its users, it is essential to inform them about its operations, capabilities and other finer issues during training sessions in class-room environment with hands-on exposure to the software use. They should be encouraged to ask further probing questions during these sessions for acquainting themselves by about use of software and its potential.

In order to ensure implementation of e-Governance thru PIMS, each of the offices of Delhi UP PWD (more than 60), which mattered in its implementation, was exposed to five day hands-on-training sessions with three days devoted for Head of Office and his deputy and two days for Establishment In-charge and Clerk responsible for salary bills. With sixteen desktops in a Class Room interconnected with LAN, 6 to 8 offices per week were given hands-on training and were exposed to the web-based application software besides computers introduced as utility tool with its basics made known.
4.5 Responsibility of Data-entry and its Accuracy: It is a common practice to create data base by making data entry centrally, which could work only in small organisations. But in large organisations, data entry and responsibility for its accuracy has to be distributed. Otherwise, it is certain that e-Governance would be fairly difficult to implement. Persons with vested interest would attempt for its failure by criticizing the errors, if made, by data-entry operators.

In the present case of PIMS, each employee and the Head of Office (i.e. custodian of service record) were made jointly responsible for the data entry and its accuracy. The employee was asked to fill up a data-sheet based on his information and his Head of Office was to verify the same from service record before making entry in the data base through Web-based application. PIMS printout of entered employee data is required to be delivered to the employee and a copy of the same was to be kept in his personal record. Each Head of Office was required to certify the same with data entered of his employees to be accurate as per Service Record and submit to next higher authority.

4.6 Formatted Data Entry to avoid Un-intentional Errors: The database has to be generated such that correct data is entered in the first instance itself. The scope of unintentional incorrect data entry should be eliminated by the programmer / software designer. The logical verification of data at data entry stage should be a part of the software architecture. The data entry formats have been designed to ensure unintentional incorrect data is not entered. Wherever the data length and its type are known, fixed data entry fields are to be given. To the extent possible, keying in of data has been avoided to ensure that the data entered goes to the database in the correct format. Introduce drop down menus for selecting the desired data from limited options.

4.7 Employees’ Resistance against Change: Even if new system might be far better than the traditional one, if the benefits are not immediately visible, majority in big organisations would not like to switch over, due to familiarity and confidence in the old systems, unless there is compulsion to change. Given a laxity, they would revert back to old system.

It is therefore essential that implementation of e-Governance has to be compulsive for certain key functions of the organisation. The old system has to be dispensed with altogether from a cut off date. If the two systems are allowed to continue together, it is certain that implementation of e-Governance would be rather impossible. In the present case of PIMS, salary bill, transfer/ relieving/ joining orders for all employees was forced on the offices to make it mandatory through the Web-based application and the traditional methods were disbanded altogether. This is how, database and its accuracy with online database updating has been ensured.
4.8 **Generation of Interest amongst Employee(s):** The successful implementation largely depends upon the motivation of the employees at large, which can be generated by making the project attractive in their day today working. It should reduce their work and is not to be taken as an extra work rather it should reduce physical efforts and provide convenience in day-to-day working. It has to be made further attractive by giving them access to the information, which matters to them personally.

4.9 **Technology Related Challenges:** These are largely the internet connectivity in remote locations in the country. These have been addressed largely by allowing broadband cable connections to offices located in big cities and dial up connections in small cities and also permitting use of Cyber Café for data entry. Non-availability of Computer Hardware could be addressed largely by making computers available in most of the offices.

4.10 **Transfer Criteria and Transfer Authorities:** Transfer/posting or Placement on Deputation is a normal administrative practice effecting rotation between

- Intra-Ministries,
- Intra-Departments
- Ministry-Department and vice versa
- State-Central Government and vice versa

When employees are transferred very frequently with varieties of:-

- Employees coming from different govts, ministries, departments.
- Different cadre controlling authorities responsible for their transfer.
- Transferring authorities based on the designation and the cadre to which the employee belongs.
- Different transfer criteria based on their
  - Designation,
  - Cadre,
  - Station of posting,
  - Tenure in an office and
  - The nature of duties.

All above are the challenges to be addressed. It is necessary to provide convenience to every transferring authority to be able to exercise effective control on employees under his jurisdiction as per laid down policy. To be able to issue transfer orders based on standard criteria to be centrally controlled as per policy fixed by each Cadre Controlling Authority for each designation, station, etc. It is possible to get a list of officials due for transfer through this web-based software. Also, in exceptional cases, individual employee(s) could also be transferred as per administrative requirements.
Confidential remarks to keep all such record of pressures for retention or getting desired posting for each employee, could be maintained. It could be seen as and when required by the competent authority in future to do away with future pressures.

4.11 Flexible Data Retrieval Tool: In the present day environment, when there is a generation gap in day to day use of computers with a very few of the literate young population exposed, it is absolutely essential that any software developed has to be user friendly with flexibility for getting the desired information. It is therefore essential to always provide a tool for the user to be able to extract relevant data from the database in the desired format as may be needed by him.

In the web-based software, which is developed as above, provides for information extraction with the button named ‘Customised Report’ and lets the user to have all the information of relevance, which he can selectively download in the Excel format for further processing as may be needed.

5. The Web-based Software Used: The front end software is Asp.net and SQL Server database is the back-end software.

6. Conclusions: PIMS can be used with advantage to bring in a uniform e-Governance practice in Personnel Administration in Government. It is capable of substantially reducing paper flow and energy of the Government as bulk of it is wasted in Personnel Administration. It is citizen-centric. It empowers the citizen, employees, the administration and the Government as a whole. It would make the Government more efficient by bringing in a transparency to reduce large number of disputes in Personnel Administration as at present due to non-transparent system.
Employee Information Form
(The form used by CPWD, to be modified for use in UPPWD)
(ALL ENTRIES IN THE FORM BE MADE IN CAPITAL LETTERS ONLY)

Circle ………… Division ………………………………

A. OFFICE ADDRESS
Office Address d. Circle : ………………………………
e. Division : ……………………………

B. Staff Category
Tick (✓) the option

C. Personal Data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Accounts</td>
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<tr>
<td>2</td>
<td>Architectural</td>
</tr>
<tr>
<td>3</td>
<td>Drawing Staff</td>
</tr>
<tr>
<td>4</td>
<td>Engineering</td>
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<td>5</td>
<td>Group D</td>
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<td>6</td>
<td>Horticulture</td>
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<td>7</td>
<td>Ministerial</td>
</tr>
<tr>
<td>8</td>
<td>Stenographer</td>
</tr>
<tr>
<td>9</td>
<td>Work Charged</td>
</tr>
</tbody>
</table>

1. Name:
First Name……………………Middle Name………………………Last name…………………………

4. Date of Birth (dd/mm/yy) ………/…………/…………

5. Father/Husband Name Shri ……………………………

6. Gender [Tick (✓) the option] a. MALE b. FEMALE

7. Marital Status [Tick (✓) the option] a. Unmarried b Married

8. Date of Marriage (dd/mm/yy) ………/…………/…………
### D. Details of Initial Appointment

9. Initially Appointed as/ equivalent to ..............................................

[For the example, AE, JE]

10. Initial Joining Date .................................................................

### E. CURRENT POSTING DETAILS

(If holding more than one post, give details of the Primary post here)

11. Present Designation ...............................................................  

12. Present Pay Scale ...............................................................  

13. Post Held at present .............................................................  

14. Status of present appointment  

   a. Regular  

   [Tick (√) the option]  

   b. Ad-hoc  

   c. Temporary  

15. Nature of Job  

   Engineering Staff  

   a) Field  

   b) Planning  

   Ministerial Staff  

   a) Accts Br  

   b) Corresp. Br.  

   [Tick (√) the option]  

16. Cadre  

   a) PWD  

   [Tick (√) the option]  

   b) WS  

   c) U.P. State Admin service  

   d) Any other (specify)  

17. Station of Posting: ...............................................................  

18. Date of Joining the Current Office (dd/mm/yyyy)  

19. Name of Subdivision, if any ..................................................  

   *(For field Divisions only)*  

20. Reference to the Orders of Posting .......................................  


F. RESIDENTIAL ADDRESS DETAILS:

21. Present Address
   Street Address ..............................................
   City/Town ....................................................
   State .........................................................
   PIN ..............................................................

22. Permanent Address
   Street Address ..............................................
   City ...........................................................
   State .........................................................
   PIN ..............................................................

G. OTHER CONTACT DETAILS:

23. Telephone No. (Office): STD Code:........Tel No ..............

(Res): STD Code:........Tel No ..............
(Mobile): Tel No ..................................................

24. E-mail
   (Official) ....................................................@.............................................

   (Personal) .................................................@...............................................}

H. CLASSIFICATION DETAILS FOR RESERVATION IN SERVICE

25. Category (Tick (✓) the category Gen /SC /ST /OBC

   which applies to you)

26. Ex-Service man (Tick (✓) the ......... YES / NO

   appropriate option)

27. Physical Disability ......... Ortho / Blind / Mute or Deaf......

   (To be filled by candidate

   …Percentage Disability…….%

   (For appointed under handicapped quota only)
I. Academic Qualifications:

28. Essential Minimum Qualification  
   a. Graduate  
   (Tick (✓) the appropriate category)  
   b. Under Graduate  
   c. Under Matric

29. Essential Qualification Details at the time of joining service. Give the degree, college/ university, % of marks/CGPA etc. ………………………………………………….

   (e.g. B.E..(Civil Engg), B.Com (Hons), Dip in Civil Engg, etc)

Additional Qualifications acquired after joining service

   (only recognized qualifications, degrees, diplomas and certificates )

<table>
<thead>
<tr>
<th>Additional Qualifications (e.g. Doctorate, Above Post Graduate, Post Graduate Graduate, Under Graduate, Under Matric)</th>
<th>Qualification Details (e.g. B.E.(Civil Engg), B.Com (Hons), Dip in Civil Engg, etc)</th>
<th>Year of qualifying</th>
<th>Institute/ University</th>
<th>Remarks Regular course/correspondence; sponsored by dept/ self sponsored</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

30. Specialisation.(For Class I/II officers only) Maximum three fields to be selected only based on their past experience and/or qualification in order of priority)

<table>
<thead>
<tr>
<th>Specialisation</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
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<td>3.</td>
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</tbody>
</table>

Note: Only following categories of specialization shall be given. If not available in the following list, ‘Others’ shall be selected with details to be given mandatorily:-
<table>
<thead>
<tr>
<th>CIVIL</th>
<th>ELECTRICAL</th>
<th>ARCHITECTURAL</th>
<th>HORTICULTURE</th>
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</thead>
<tbody>
<tr>
<td>Geo-Technical Engg.</td>
<td>Air conditioning</td>
<td>Information Technology</td>
<td>Building Maintenance</td>
</tr>
<tr>
<td>New Materials and Technologies</td>
<td>Building Maintenance</td>
<td>Interior Design</td>
<td>Floral Design</td>
</tr>
<tr>
<td>Shuttering and Scaffolding</td>
<td>Bulk Services</td>
<td>Landscaping</td>
<td>Landscaping</td>
</tr>
<tr>
<td>Cement and Concrete Technology</td>
<td>Construction Machinery</td>
<td>Low-rise Buildings</td>
<td>Lawn Development</td>
</tr>
<tr>
<td>Low-rise Buildings</td>
<td>Information Technology</td>
<td>Multi-storeyed Buildings</td>
<td>Road Maintenance</td>
</tr>
<tr>
<td>Multi-storeyed Buildings</td>
<td>Lift and Escalators etc.</td>
<td>New Materials and Technologies</td>
<td>Others</td>
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<tr>
<td>Construction Machinery</td>
<td>Lighting</td>
<td>Personnel/Human Resource Management</td>
<td></td>
</tr>
<tr>
<td>Information Technology</td>
<td>Multi-storeyed Buildings</td>
<td>Public Buildings(Infrastructure)</td>
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<tr>
<td>Bulk Services</td>
<td>New Materials and Technologies</td>
<td>Structural Repairs, Renovation and Retrofitting</td>
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<tr>
<td>Techno-Legal</td>
<td>Personnel/Human Resource Management</td>
<td>others</td>
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<tr>
<td>Monumental Buildings</td>
<td>Quality Assurance</td>
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<tr>
<td>Quality Assurance</td>
<td>Road Maintenance</td>
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<tr>
<td>Structural Repairs, Renovation and Retrofitting</td>
<td>Shuttering and Scaffolding</td>
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<tr>
<td>Road Construction</td>
<td>Techno-Legal</td>
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<tr>
<td>Road Maintenance</td>
<td>Others</td>
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<tr>
<td>Building Maintenance</td>
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<tr>
<td>Construction Safety, Health and Environment</td>
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<tr>
<td>Human Resource Development/Management</td>
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<tr>
<td>Others</td>
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</table>
Technical Assistance for Implementation of Institutional Reforms in Road Sector of Uttar Pradesh

Report No. 43 and 49

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<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of raining Course</th>
<th>Training Institute and Place</th>
<th>From (dd/mm/yy)</th>
<th>To (dd/mm/yy)</th>
<th>Remarks</th>
<th>If abroad, name of country</th>
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Note: Add additional rows or sheets as may be necessary to complete the details.

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J. SEMINAR DETAILS

31. Seminars Attended (Start from the latest Seminar attended and backwards)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Seminar</th>
<th>Training Place</th>
<th>From (dd/mm/yy)</th>
<th>To (dd/mm/yy)</th>
<th>Remarks</th>
<th>Whether Inland or abroad</th>
<th>If abroad, name of country</th>
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Note: Add additional rows or sheets as may be necessary to complete the details.

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K. SALARY DETAILS

(This section may be omitted if the Pay Roll process is not to be implemented)

32. Salary Details :

PAYMENTS:

A. Present Pay Scale ..........................................................
B. Present Basic ..........................................................
C. Increment Date ..........................................................
D. GPF A/c No ..........................................................
E. Govt. Vehicle Facility .......................................................... Yes / No
F. Govt. House Allotted .......................................................... Yes / No
G. Gazetted .......................................................... Yes / No
Technical Assistance for Implementation of Institutional Reforms in Road Sector of Uttar Pradesh

Report No. 43 and 49

H. Special Pay (If any) .................................................................
I. Personal Pay, if any .................................................................
J. Washing Allowance, if any ......................................................
K. Medical Allowance, if any .......................................................  
L. Additional Allowance, if any ....................................................  Rs  Details ..............
M. Additional Allowance, if any ....................................................  Rs  Details ..............

DEDUCTIONS:

N. GPF Deduction .......................................................... Rs.
O. CGEIS Deduction .......................................................... Rs
P. CGHS Subscription .......................................................... Rs
Q. DGHS Subscription .......................................................... Rs.
R. PM's Relief Fund .......................................................... Rs
S. Income Tax Deduction ......................................................... Rs.
T. Miscellaneous education...................................................... Rs  Details..............

LICENSE FEE:

Govt. House No ........................................................................
Address ..................................................................................
Allotment Date .......................................................................  
License Fee ..............................................................................
Water Charges..........................................................................  
Electric Charges.....................................................................

ADVANCES (LOANS) WITHOUT INTEREST

Loan Description ...........................................................................  
Loan Date .................................................................................
Date from Deductions effected .................................................
Sanctioned Loan Amount..........................................................  
Total Number of Instalments.....................................................  
EMI .............................................................................................
Current Instalment Number.......................................................  

ADVANCES (LOANS) WITH INTEREST:

**Loan Particulars:**

- Loan Description: 
- Loan Date: 
- Sanctioned Amount: 
- Total Number of Instalments: 

**Principal Amount Recovery:**

- EMI (Principal): 
- Total Number of Instalments: 
- Date from Deductions effected: 
- Current Instalment Number: 

**Interest Amount Recovery:**

- Total Interest Amount: 
- EMI (Interest): 
- Total Number of Instalments: 
- Date from Deductions effected: 
- Current Instalment Number: 

I certify that the foregoing information is correct to the best of my knowledge and belief.

Signature of the Employee: 
Name of the Employee: 
Date: 

Crosschecked from Service Records.

Signature of Office In-charge: 
Name of Office Incharge with Designation: 
Date: (With SEAL)