IDAMP Manual-MCs

Standard Operating Procedures (SOPs) for Integrated Development and Asset Management Plan (IDAMP)

Metropolitan Corporation (MC)
Lahore, Faisalabad, Rawalpindi, Gujranwala and Multan
Acknowledgements

This document (IDAMP Manual) has been compiled with the efforts of Planning and Development (P&D) Department of Punjab Government and The Urban Unit. We take this opportunity to acknowledge and pay regards to Mr. Mohammad Jahanzeb Khan-Chairman P&DD Board and Mr. Iftikhar Ali Sahoo-Secretary P&DD, for their toiling efforts for the completion of this document.

We would like to laud the guidance provided by the PCGIP team of The World Bank especially Ms. Shahnaz Arshad, Mr. Michael Schaeffer, Mr. Sohaib Athar for the compilation and augmentation of this document. We would also like to extend our gratitude to PCGIP team of The Urban Unit including Dr. Nasir Javed, Ms. Sani-e-Zahra, Mr. Abid Hussainy and Mr. Asif Iqbal.

We also value the inputs and feedback of representatives from MCs in making it a potential document.

Without the special support of the individuals mentioned above and many others, this document would not have been possible. We are grateful for your assistance and acknowledge it in the highest of honor for us.
Foreword

Infrastructure management is the cornerstone of social equity, public health & safety and service delivery for good governance. Infrastructure is essential to achieve the increased levels of economic growth as aspired under Punjab Growth Strategy through job creation and establishment of well serviced areas in urban centers - conducive for economic investment and its enabling environment. In recent years, Government of the Punjab has increasingly focused on the need to balance the delivery of infrastructure in the short term, with the need to strive for sustainability.

Medium Term Budgetary Framework (MTBF), Medium Term Development Framework (MTDF), New Accounting Model (NAM), Project to Improve Financial Reporting and Auditing (PIFRA) are demonstration of Govt. policy and initiatives which is now driving and supporting the cities and their entities through process for asset management by policy guidelines and technical support.

Infrastructure assets and community facilities are complex by nature and require robust management practices. Sound knowledge of the location, characteristics, estimated lives, capacity and utilization, cost characteristics, risk exposure and safety requirements of assets is required to best manage them and make sustainable improvements in service delivery.

We support Local Government in achieving programs that promote sustainable quality of life to all citizens. As part of a broader and ongoing support framework for urban development and sustainable cities, we have developed this document (IDAMP Manual-MC) with inputs from all stakeholders, led by Dr. Nasir Javed CEO The Urban Unit, Mr. Abid Hussainy Sr. Capacity Development Specialist The Urban Unit and Mr. Iftikhar Ali Sahoo, Secretary P&DD.

IDAMP Manual-MC has been compiled to prescribe detailed Standard Operating Procedures (SOPs) for municipal and city asset managers to prepare Integrated Development and Asset Management Plan (IDAMP). In particular, its application will assist in strengthening IDMAP processes and outcomes, the implementation of generally accepted asset management for improved service delivery and matters related to immovable assets, improve infrastructure investment planning efforts and management for improved governance and asset management in cities.

Mohammad Aslam
Secretary, LG&CD
Department
### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADP</td>
<td>Annual Development Plan</td>
</tr>
<tr>
<td>AM</td>
<td>Asset Manager</td>
</tr>
<tr>
<td>AMP</td>
<td>Asset Management Plan</td>
</tr>
<tr>
<td>AMIS</td>
<td>Asset Management Information System</td>
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<tr>
<td>MC</td>
<td>Metropolitan Corporation</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>LG&amp;CD</td>
<td>Local Government &amp; Community Development</td>
</tr>
<tr>
<td>IDAMP</td>
<td>Integrated Development and Asset Management Plan</td>
</tr>
<tr>
<td>MO</td>
<td>Metropolitan Officer</td>
</tr>
<tr>
<td>MOP</td>
<td>Metropolitan Officer Planning</td>
</tr>
<tr>
<td>DMO</td>
<td>Deputy Metropolitan Officer</td>
</tr>
<tr>
<td>P&amp;DD</td>
<td>Planning &amp; Development Department of Punjab Government</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Private Partnership</td>
</tr>
</tbody>
</table>
# Contents

## PART 1: OVERVIEW OF IDAMP

1. Introduction of IDAMP .................................................. 6
   1.1. Introduction ......................................................... 7
1.2. Contextualizing the IDAMP .......................................... 8
1.3. Purpose of the IDAMP Manual ...................................... 9
1.4. Scope of Manual .................................................... 10
1.5. Authority of the Manual ............................................ 11
1.6. Reader Guidance ................................................... 12
1.7. Controller (Homes) of the Manual .............................. 13
2. Overview of MCs ..................................................... 14
   2.1. Establishment of Metropolitan Corporations (MCs) ....... 15
   2.2. Organizational structure of MCs ............................... 15

## PART 2: ASSETS PLANNING

3. Preparation of IDAMP ................................................ 16
   3.1. Annual Planning for IDAMP ................................. 18
   3.2. Development of Project Proposals ............................ 19
   3.3. Preparation of O&M Cost ....................................... 22
   3.4. Development of IDAMP Package ............................. 29
   3.5. Financial Capacity Analysis ..................................... 32
   3.6. Projects Selection and Approval by Technical Team ..... 33
   3.7. Capital Investment Plan ......................................... 34
   3.8. Finalization of IDAMP ........................................... 36
4. Implementation of IDAMP ............................................ 37
   4.1. Integration of IDAMP with ADP ............................... 38
   4.2. Integration of IDAMP with Funding Agencies ............ 39

## PART 3: ASSET MANAGEMENT

5. Management of GIS based Asset Inventory in AMIS .......... 40
   5.1. Addition/Creation of Assets in AMIS ....................... 41
   5.2. Removal of Assets from AMIS ............................... 42
   5.3. Updation of Asset Information in AMIS .................... 43
   6. Asset Management Plan ........................................... 44

## PART 4: MONITORING & EVALUATION

7. Monitoring & Evaluation ............................................ 45
Glossary ................................................................. 46
Part 1: Overview of IDAMP
(Chapter 01 & 02)
1. Introduction of IDAMP Manual

1.1. Introduction

This document may be called as ‘IDAMP Manual - MCs – Standard Operating Procedures for IDAMP’ (hereinafter referred as “IDAMP Manual”). This IDAMP Manual is derived from the principles/ guidelines and policies prescribed in the ‘Integrated Development and Asset Management Framework’ “IDAMP Framework”.

This IDAMP Manual sets out the detailed procedures for planning and investment of resources through effective planning, careful management, accurate recording and reliable reporting of all the assets over the asset life cycle for optimized service delivery to the public. These procedures are based of tested methodology for the development of IDAMPs for Water & Sanitation Agency (WASA) Lahore and Metropolitan Corporation (MC) Lahore.

IDAMP Framework and IDAMP Manual has been based on local as well as global asset planning and management practices and procedures. Following resources were referred for development of IDAMP Framework and IDAMP Manual:

- ‘Project Selection Criteria’ by Michael Schaeffer & Wesal Ashur, World Bank Group
- ‘Managing Project Risk’ by Michael Schaeffer & Wesal Ashur, World Bank Group
- International Infrastructure Asset Management Manual (IIMM)
- ‘City Infrastructure Investment Programming & Prioritization Toolkit’ by Cities Development Initiative for Asia (CDIA)
- ‘Manual for Development Projects’- Planning Commission of Pakistan
1.2. Contextualizing the IDAMP

The concept of "Integrated Development & Asset Management Plan (IDAMP)" revolves around the international best practices of asset management and its enhancement for improving service delivery by the Local Government institutions within the available fiscal space. The processes have been derived from the well-established standards like ISO 55000 and International Infrastructure Asset Management Manual (IIMM). The process is contextualized for Punjab Province based on the intensive discussion with the respective officials overseeing the asset management.

The city entities currently manage public capital assets worth billions of rupees. City entities provide various services and require capital assets that support excellent service delivery outcomes, including facilities, base infrastructure and specialist equipment. The effective management of assets is therefore an essential business process, providing the opportunity for organizational efficiencies, improved asset utilization, reduced operating costs, more effective use of capital.

An IDAMP is a key part of the asset management process. It provides a description of the overall system components, and summarizes key asset and planning information at a single point in time. Its primary purpose is to identify the financial consequences of delivering public services through physical assets, describing:

- The importance of physical assets to delivering service delivery objectives and outcomes;
- The quality of existing physical assets in terms of condition and asset performance;
- The assets needed to meet or sustain current levels of service, and to address current and future shortfalls;
- The feasible asset solutions to address identified shortfalls; and
- The level of commitment and planned improvements.
1.3. Purpose of the IDAMP Manual

The primary purpose of IDAMP Manual is to prescribe the Standard Operating Procedures (SOPs) for evidence based planning, budgeting and management of assets on a medium term horizon of three years.

IDAMP Manual includes procedures for the following asset management activities:

- **Asset planning**
  - Annual preparation of Integrated Development and Asset Management Plan (IDAMP)
  - Implementation of IDAMP

- **Asset Management**
  - Development of Asset Inventory in GIS based AMIS
  - Physical management of assets through Asset Management Plans (AMP)

- **Monitoring and Evaluation**
1.4. Scope of Manual

1.4.1. Initially, this Manual is applicable for integrated development & asset management planning activities within the operation areas of Metropolitan Corporations (MCs) of following cities:

1. Lahore
2. Faisalabad
3. Rawalpindi
4. Gujranwala
5. Multan

1.4.2. Subsequently, the scope of this Manual shall be extended to city boundaries of other cities with the approval of competent authorities.
1.5. Authority of the Manual

1.5.1. Legal Status of Manual

- IDAMP Manual has been prepared under the guidelines of notified IDAMP Framework. IDAMP Framework and IDAMP Manual shall serve as instruments for medium term planning and management of the infrastructure of MCs in five large cities of Punjab.

- The premise of the IDAMP in planning horizon of MCs shall be as follow:

<table>
<thead>
<tr>
<th>Planning Horizon</th>
<th>MCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Term</td>
<td>Punjab Growth Strategies</td>
</tr>
<tr>
<td>Medium Term</td>
<td>Integrated Development And Asset Management Plan (IDAMP) (Three Years)</td>
</tr>
<tr>
<td>Short Term</td>
<td>Annual Development Plan (ADP) (One Year)</td>
</tr>
</tbody>
</table>

1.5.2. Approval Authorities

- IDAMP Manual-MC shall be approved and notified in the official gazette by the Chairman P&D Board. Further, IDAMP Manual-MC shall be endorsed by the Local Government & Community Development Department for implementation in the five MCs and other city boundaries.

- After respective approval and endorsement, MCs shall adopt and implement the IDAMP Manual.
1.6. **Reader Guidance**

1.6.1. There are five levels of heading in the Manual:

- level 1 - Part
- level 2 - section
- level 3 - sub-section
- level 4 - bullet point

1.6.2. The organization of the part, sections and sub-sections are shown in the Table of Contents at the front of this document.

1.6.3. The layout of each page within this Manual is standardized. The title of the Manual is displayed in the top right corner of each page respectively. The footer for each page contains the page number and custodian of the document.

1.6.4. A list of abbreviations and Glossary commonly used in this Manual is included for reference purposes.

1.6.5. The Annexure includes forms to be used in the application of this Manual.
1.7. **Controller (Homes) of the Manual**

1.7.1. **Homes of IDAMP Manual**

The IDAMP Manual is housed at three levels as illustrated in the Figure below.

1) The Secretary of LG&CD, as the controller, will be the Policy Home for the Manual to ensure safe custody, and management of legal requirements for notification, maintenance, distribution, implementation and revision.

2) The Secretary of Planning and Development (P&D), through the Urban Sector Planning and Management Services Unit (Private) Limited (Urban Unit, UU), shall be the Implementation Home of the Manual providing the resource support to individual MCs for all aspects of IDAMP activities in accordance with the IDAMP Framework and Manual requirements.

3) Individual MCs/ local governing bodies will be the Operational Home of the Manual and responsible for actually preparing, implementing and managing the process.
1.7.2. **Distribution of IDAMP Manual**

i. Secretary LG & CD shall also ensure that the IDAMP Manual is not distributed without business intent. Further, Secretary LG & CD shall be responsible for ensuring that any person, party or group who receives IDAMP Manual is informed of the confidentiality requirement.

ii. All copies of the IDAMP Manual, revisions and changes shall be controlled by Secretary LG & CD and a due record of such revisions and changes shall be maintained in the Document Control Page. *(Refer to sub section 1.7.4 for Document Control Page)*

iii. Secretary LG & CD shall distribute the IDAMP Manual to the MCs.

iv. Mayor / Chief Officers shall be responsible for intra departmental distribution within the respective MCs.
2. Overview of MCs

Introduction
This section provides information about the MCs, its establishment, functions, composition and organizational structure.

2.1. Establishment of Metropolitan Corporations (MCs)

The Metropolitan Corporation comprises the Metropolitan offices, including sub-offices of the Provincial Departments of the Provincial Government decentralized to the Metropolitan Corporation and other offices set up by the Provincial Government and grouped under the Metropolitan Officers and coordinated by the Chief Officer.

The Metropolitan Group of Offices is headed by the Mayor / Chief Officer. A group of offices, other than the Mayor Group of Offices, is headed by a Metropolitan Officer. The Metropolitan Officers heads the Metropolitan offices. The Provincial Government may setup sub-offices of the offices decentralized to Metropolitan in every tehsil or town in a metropolitan depending upon the needs of such tehsil or, as the case may be, town for such sub-office. Where any sub-office exists or is set up in a tehsil or town in a metropolitan. It will be headed by the Metropolitan Officers/TMAs.

The authority of the Metropolitan Corporation comprises the operation, management and control of offices of the departments which are decentralized to it and the Metropolitan Corporation shall exercise authority within the district in accordance with the general policy of the Provincial Government.

2.2. Organizational structure of MCs

- Finance Department
- Planning Department
- Regulation Department
- Infrastructure Department
- Services Department
Part 2: Assets Planning
(Chapter 03 & 04)
**Introduction**

This part contains information about the planning phase of the Asset. Planning of asset involves activities and decisions for analysis of existing assets and need assessment for replacement/rehabilitation of existing assets or procurement of new assets in order to achieve the service delivery objectives. Asset Planning involve the following activities:

- Preparation of IDAMP
- Implementation of IDAMP
3. Preparation of IDAMP

Introduction

This section contains procedures for evidence based planning of assets. For this purpose, an Integrated Development & Asset Management Plan (IDAMP) shall be prepared for upcoming three years on a rolling basis approach. IDAMP shall include identification of projects for replacements/rehabilitation of existing assets and creation/purchase of new assets for upcoming three years. Rolling basis means that for the initial three years, a roll-on plan is prepared for 'a', 'b', 'c' years. Next year, the 'a' year is ousted and 'd' year entered, so that the plan still remains for the three years. For the 'b' and 'c' years, adjustments are made according to the implementation of 'a' year. This process continues for good.

Preparation of IDAMP involves following activities:

1) Development of GIS based inventory
2) Notification of level of services (LOS)
3) Development of Project Proposals along with estimated rough costs
4) Preparation of O&M Costs
5) Development of Project Packages
6) Financial Capacity Analysis
7) Projects Selection and Approval by Technical Team
8) Capital Investment Plan
9) Finalization of IDAMP
3.1. Annual Planning for IDAMP

Introduction
This section contains procedures to initiate the process for preparation of IDAMP. On annual basis, an IDAMP planning & review meeting shall be convened to review the progress of preceding year and plan for the upcoming three years. Following the meeting, process for the preparation of IDAMP shall be initiated by the Finance Department-MC

3.1.1. Annual Planning & Review Meeting of IDAMP

i. In the first week of October, District Officer Planning- MC shall circulate an official letter to convene the Annual Planning & Review Meeting on IDAMP. MOP shall attach the following documents with the letter:
   - Annual IDAMP Progress Report
   - LOS Report

ii. Annual Planning & Review Meeting of IDAMP shall be attended by the following personnel:
   - Representatives of Implementation Home
     - P&D Department
     - The Urban Unit
   - Representative of Operational Home
     - Mayor / Chief Officer (Chair)
     - MO Finance (convener & secretary)
     - All MOs
     - DMO Planning
     - DMO Infrastructure
     - DMO Finance & Budget

iii. Agenda of the Annual Planning & Review Meeting shall include the following activities and decisions:
   - MO Planning shall present the Annual IDAMP Progress Report and Annual LOS Report to the participants. Annual IDAMP Progress Report shall contain the information about status of procurement/ construction, operationalization and recordation in AMIS of projects approved for the preceding year. Whereas Annual LOS Report shall contain the information about LOS achieved during the preceding year.
   - Participants of meeting shall discuss and give their recommendation for setting the Target LOS for the upcoming three years.
   - Chairperson of the meeting shall approve the Reports and authorize the same for circulation to the relevant directorates. Further, Chairperson shall authorize MO Planning to finalize the Target LOS and initiate the process for preparation of IDAMP.
3.1.2. Preparation and Notification of target Level of Service (LOS)

i. MO Planning, on the recommendations of Annual IDAMP Progress Meeting, prepare LOS Statement for the upcoming three years.

ii. MO Planning shall coordinate with relevant departments and obtain the required information for establishment of following LOS indicators:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Indicator</th>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Solid Waste Management Efficiency</td>
<td>%</td>
<td>Total amount of solid waste collected expressed as a percentage of total solid waste produced</td>
</tr>
<tr>
<td>1.1</td>
<td>Collection efficiency</td>
<td>%</td>
<td>Total amount of solid waste disposed off expressed as a percentage of total solid waste collected</td>
</tr>
<tr>
<td>1.2</td>
<td>Disposal efficiency</td>
<td>%</td>
<td>Total amount of solid waste disposed off expressed as a percentage of total solid waste collected</td>
</tr>
<tr>
<td>2</td>
<td>Roads Efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Roads with condition &quot;A&quot; (Excellent)</td>
<td>%</td>
<td>Total number of roads with condition “A” expressed as a percentage of total roads</td>
</tr>
<tr>
<td>2.2</td>
<td>Roads with condition &quot;B&quot; (Good)</td>
<td>%</td>
<td>Total number of roads with condition “B” expressed as a percentage of total roads</td>
</tr>
<tr>
<td>2.3</td>
<td>Roads with condition &quot;C&quot; (Fair)</td>
<td>%</td>
<td>Total number of roads with condition “C” expressed as a percentage of total roads</td>
</tr>
<tr>
<td>2.4</td>
<td>Roads with condition &quot;D&quot; (Poor)</td>
<td>%</td>
<td>Total number of roads with condition “D” expressed as a percentage of total roads</td>
</tr>
<tr>
<td>2.5</td>
<td>Roads with condition &quot;F&quot; (Failing)</td>
<td>%</td>
<td>Total number of roads with condition “F” expressed as a percentage of total roads</td>
</tr>
<tr>
<td>3</td>
<td>Traffic system efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Functioning traffic signals</td>
<td>%</td>
<td>Total number of functioning traffic signals expressed as a percentage of total number of traffic signals</td>
</tr>
<tr>
<td>3.2</td>
<td>Road signage</td>
<td>%</td>
<td>Percentage of signage on roads</td>
</tr>
<tr>
<td>3.3</td>
<td>Working Street Light</td>
<td>%</td>
<td>Percentage of working street lights as of total street lights</td>
</tr>
<tr>
<td>4</td>
<td>Citizens satisfaction for service delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Complaints resolved to total complaints</td>
<td>%</td>
<td>Total number of complaints resolved expressed as a percentage of total number of complaints</td>
</tr>
<tr>
<td>4.2</td>
<td>Complainants showing satisfaction</td>
<td>%</td>
<td>Percentage of complaints satisfied in relation to complaints dissatisfied</td>
</tr>
</tbody>
</table>
### Standard Operating Procedures (SOPs) for IDAMP

#### Sr. No. | Indicator | Unit | Description
--- | --- | --- | ---
5 | Asset Management System implementation | | |
5.1 | Number of logins issued to Personnel | Number | Total number of logins issued to Personnel
5.2 | No of Assets entered in the system | No. of assets | Total number of Assets entered in the system

### 6. Pollution in city

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Indicator</th>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>No of days air pollution was at acceptable levels</td>
<td>No. of Days</td>
<td>Total number of days air pollution was at acceptable levels</td>
</tr>
</tbody>
</table>

iii. After compilation of LOS Statement, MO Planning shall forward the same to Mayor / Chief Officer for approval.

iv. After approval by the Mayor / Chief Officer, MO Planning shall forward the LOS Statement to Secretaty LG & CD Department for notification.

v. After notification, MO Planning shall publish the LOS statement on official website of Metropolitan Corporation and Punjab Portal.

#### 3.1.3. Circulation of letter for preparation of IDAMP

After notification of LOS Statement, MO Planning shall circulate an official letter to to all the Departments of MC with the intimation to prepare project proposals for IDAMP. MO Planning shall also annex the Project Proposal Form (refer to Annexures for specimen of Project Proposal Form 2) and LOS statement with the letter.
3.2. Development of Project Proposals

Introduction
This section contains procedures for initial planning of assets for incorporation in IDAMP. Initial planning involves identification of assets for replacement, rehabilitation or new creation of assets over three years in order to meet the target service delivery program. For this purpose, respective Asset Managers shall develop the detailed proposals for replacement/rehabilitation or new acquisition of assets. **Asset Manager includes MC Officials who are controlling or using the asset for service delivery to the public. In the context of IDAMP Manual, Asset Manager includes District Metropolitan Officers (DMO) for the respective departmental assets.** Where MOs are not in place, MO of the department shall be deemed as the Asset Manager. Project Proposal shall be based on evidence based identification and criteria based screening and phasing in respect of all the identified projects.

Development of project proposals involve the following activities:

- Project Identification
- Project preparation
- Projects Appraisal
- Projects Screening and Phasing

3.2.1. Project Identification

i. AM shall, in consultation with the supporting staff, identify the infrastructure required to meet the service delivery program/ target LOS in designated service area/boundaries. For this purpose, AM shall use the following tools/techniques:

A. **Asset Management Information System (AMIS)**

AMIS, the software used for the recording and maintenance of assets inventory along with the attributes such as condition, failure risk and replacement year shall be used for analysis of existing assets.

B. **Punjab Government Goals and Growth Strategies**

Any compulsory recommendations/requirements of Punjab Government shall be considered and used for projects identification. E.g. Chief Minister’s School Reform Road Map, Punjab Health Sector Plan 2018, Building a Healthier Punjab.

C. **Community Consultation Survey**

Asset Manager shall conduct the surveys on sample basis for obtaining the feedback of public regarding the quality of MC services and the deficiencies in services in area. The sample size for determining the number of people to be interviewed/households to be surveyed shall be calculated by using the link https://www.mccallum-layton.co.uk/tools/statistic-calculators/sample-size-calculator/.

D. **Complaint Data**
Asset Manager shall collect and analyze the data from MC Complaint Cell. AM shall identify the areas and assets that need immediate attention for trouble in service delivery to the complainants.

ii. Depending on the infrastructure requirements identified through aforementioned tools/techniques, AM shall identify the assets/work required over three years. Asset/work requirement include the following categories:

- Rehabilitation/replacement of existing assets
- Creation of new assets

iii. AM shall consider the following factors while identification of assets/work:

A. **Rehabilitation/replacement of existing assets**:

Rehabilitation/replacement of existing assets means that assets are already been in operation but the roads, buildings, or any other machinery needs to be replaced due to any of the following factors:

- Assets have reached to its replacement year (Source: Asset Management System)
- Assets have condition rating D (poor) & F (failing) Condition of asset (Source: Asset Management System)
- Assets have High risk of failure (Source: Asset Management System)
- Recommendations of Government Strategies
- There are regulatory/statutory directions to replace the asset

B. **Creation of new assets**

Creation of new assets means the construction of buildings and roads or any other machinery for reaching to unserved serviceable area by increasing the service delivery coverage. The need for enhancement in service delivery will be based on the growing needs of population, development intervention and extension of services in extended boundary of city that requires planning of new assets to be integrated with the existing network of assets.

iv. After due consideration to above factors, AM shall identify the list of assets/work required for rehabilitation of existing assets and acquisition of new assets.

### 3.2.2. Preparation of Projects

i. After identification of the assets, AM shall prepare the detailed projects on the [Project Proposal Form](Refer to Annexures for “Form 2 - Project Proposal” for specimen of Project Proposal Form). AM may group different assets under a single project if the improvement in the service delivery is based on the integrated operation of different assets.

ii. AM shall perform the following activities in respect of identified project:

A. **Preparation of technical design or technical specifications**
AM shall prepare the technical design/ specification of the projects. Technical design/ specification shall be based on the category of respective asset. Few components of technical design/ specification are as follow:

- Identification of project area
- Capacity and specific manufacturer of machinery and equipment
- Sq. Ft. of required demolition/ construction work.
- In case of roads, proper specification related to its rehabilitation / construction.

Having identified the technical specification/ design, AM shall develop separate GIS maps for the projects involving Services highlighting the area and identified projects on maps where service needs to be improved. Moreover existing and proposed projects should also be identified on respective maps.

B. **Rough cost estimation of the projects**

AM shall estimate the rough cost of the project in the light of technical design/ specifications. Rough cost shall be based on the following rates:

a) Latest Market Rate System (MRS) rates
b) The cost of non-MRS items shall be based on:
   - Latest procurement cost with 10% annual increase or
   - An open market quotation

C. **Operation and maintenance (O&M) costing of proposed projects**

- In addition to the estimated rough cost, AM shall identify the Annual Operational and Maintenace (O&M) cost for the proposed project.

- O&M Cost includes the operational cost for the operation of the asset and maintenance cost required to keep the asset in operational form.

For computation of **Operational Cost**, AM shall consider the following components:

- Staff cost
- Electricity cost
- POL cost

For computation of **Maintenance Cost**, AM shall consult the Asset Management Plan (AMP).

3.2.3. **Projects Appraisal**

i. After preparation of project, AM shall perform the project appraisal for the new assets/projects. The results of appraisal shall play an important role in screening and phasing of identified projects.

ii. AM shall use the following appraisal techniques for the appraisal of the identified projects:
- **Project Payback period**: The payback period is the length of time required to recover the cost of an investment. The payback period of a given investment or project is an important determinant of whether to undertake the position or project, as longer payback periods are typically not desirable for investment positions.

- **Net Present Value (NPV)**: NPV is the difference between the present value of cash inflows and the present value of cash outflows.

- **Internal Rate of return (IRR)**: IRR is a metric used in capital budgeting, measuring the profitability of potential investments. Internal rate of return is a discount rate that makes the net present value of all cash flows from a particular project equal to zero.

iii. For the appraisal of any identified project, Asset manager shall use the following assumptions:

**Costs**:

a) Costs should be taken at Constant prices (without inflation)

b) Costs should include the Capital Costs and O&M costs.

**Benefits**

a) Benefits should be taken at Constant prices (without inflation)

b) Benefits shall include the following:

- Enhancement of revenue streams
- Enhanced recovery management
- Economic and Social benefits of projects

c) Residual value shall be taken as nil.

**Estimated Asset Life**

The life estimates of assets is compiled after review of asset technical attributes, international best practices and taxation rules of Pakistan. The Life Estimates for assets are as follow:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Type</th>
<th>Design life (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Roads</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Bridges</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Underpasses</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>Buildings</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>Parking Stands</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Land</td>
<td>-</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Type</td>
<td>Design life (Years)</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>7</td>
<td>Machinery &amp; Equipment</td>
<td>As per OEM</td>
</tr>
<tr>
<td>8</td>
<td>Vehicles</td>
<td>As per OEM</td>
</tr>
</tbody>
</table>

**Discount Rate**

Discount rate shall be used as per prescribed by the P&D Department of Punjab Government.

**3.2.4. Projects Screening and Phasing**

i. Finally, AM shall, in consultation with the relevant staff, evaluate and prioritize the identified projects against Screening & Phasing Criteria. For this purpose, AM shall, in consultation with relevant staff (Planning Staff etc.) assign the scores to each project against the following criteria:

<table>
<thead>
<tr>
<th>Criteria No</th>
<th>Criteria description</th>
<th>Lowest score</th>
<th>Highest score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Project Purpose</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Whether the Project is linked to the Governments Master Planning?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Whether the project will contribute to city master plan/ regional development goals?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Does the project contribute to the target Level of Service (LOS) and fill a gap in a wider system of service delivery?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Whether the deference/ delay of the project is going to affect citizens’ health, safety, property, prosperity etc.?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><strong>Public Response &amp; Service Delivery Improvement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Is the project likely to get support from municipal leadership?</td>
<td>01</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>• Will the project get approval from higher levels of entity?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Does the project have a local 'champion' or where did the project idea originate from?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Is there support or opposition from residents, NGO's and community groups in the immediate vicinity of the proposed facility/ project?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><strong>Environmental Impact</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Does the project provide any benefits to the quality of public spaces in the city e.g. parks, green infrastructure, water bodies, boulevards, open spaces, etc.?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Does the project confer direct benefits to the quality of public spaces in the city e.g. parks, green infrastructure, water bodies, boulevards, open spaces, etc.?</td>
<td>01</td>
<td>20</td>
</tr>
</tbody>
</table>
Criteria No | Criteria description | Lowest score | Highest score
--- | --- | --- | ---
4 | the local environment e.g. air quality, water pollution, waste reduction, etc.? | 01 | 20 |
  | Does the project fulfills the prescribed requirements of environmental and social screening and impacts identification as per Pakistan Environmental Protection Act 1997.? |  |  |
4 | Socio-Economic Impact |  |  |
  | Does the project bring improvements to low income neighborhoods? |  |  |
  | Does the project contribute to a more harmonious society? |  |  |
  | Will the project bring in direct revenue? |  |  |
  | Does the project has acceptable economic appraisal/cost effectiveness? |  |  |
  | Are there indirect economic benefits from this project in the long term, e.g. employment creation, investment generation, increase in land/property prices, reduction in citizens’ expenditures, etc.? |  |  |
5 | Project Feasibility of Implementation | 01 | 20 |
  | Ease of implementation of project in respect of technical design? |  |  |
  | Has an institutional needs assessment been carried out with regard to planning, implementing and managing the proposed infrastructure? |  |  |
  | Will the external factors negatively impact the outcome of the proposed project? |  |  |
  | Is there a capable system in place to implement and operate this project or is external support needed? |  |  |
  | Is the project feasible as per IEE/EIA studies? |  |  |

ii. AM shall compute the total score of each project. Further, AM shall screen out and prioritize the project in any of the three years against the following scheme:

<table>
<thead>
<tr>
<th>Cumulative Average Score</th>
<th>Phasing Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 ------71</td>
<td>Year 1</td>
</tr>
<tr>
<td>70 ------ 51</td>
<td>Year 2</td>
</tr>
<tr>
<td>50 ------ 21</td>
<td>Year 3</td>
</tr>
<tr>
<td>20-------- 0</td>
<td>Screened Out</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Feasibility of Implementation score is less than 10</td>
<td></td>
</tr>
</tbody>
</table>

iii. After screening and phasing, AM shall finalize the **Project Proposal Form** in respect of each project and submit the same to the respective Director.
3.3. Preparation of O&M Cost

Introduction

This section contains procedures for computation of Operational & Maintenance costs. O&M costs shall be incorporated in the IDAMP for allocation of funds to keep the assets in intended operational form.

3.3.1. AM shall compute asset wise annual operational and maintenance cost in respect for all the assets managed by the AM. For this purpose Asset Manager shall use the O&M Cost Forms for asset category wise calculation of O&M Costs. (Refer to Annexure- 3 for the specimen of O&M Costs Form)

3.3.2. Annual Operational cost/ unit (for each asset) shall be calculated as following:

A. Roads

a) Maintenance Activities

- These shall be carried out as per Asset Management Plan;

<table>
<thead>
<tr>
<th>Work Activity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patch Work</td>
<td>233,546</td>
</tr>
<tr>
<td>Sub Base Course</td>
<td>120,393</td>
</tr>
<tr>
<td>Base Course</td>
<td>165,624</td>
</tr>
<tr>
<td>Paint For Traffic Lane</td>
<td>44,280</td>
</tr>
<tr>
<td>Kerb Stone</td>
<td>82,000</td>
</tr>
<tr>
<td>Paint for Kerb stone</td>
<td>78,720</td>
</tr>
<tr>
<td>Reflectorized Pavement  Studs</td>
<td>196,800</td>
</tr>
<tr>
<td>Cost Per Km for Two side Lane</td>
<td>921,363</td>
</tr>
<tr>
<td>Cost per km for One side lane</td>
<td>460,682</td>
</tr>
</tbody>
</table>

b) Operational Costs

- No Operational Costs shall be assumed

B. Buildings

a) Annual Electricity Cost

- For Residential Areas, average consumption varies according to area of land:

<table>
<thead>
<tr>
<th>Plot Size (Marla)</th>
<th>Load (KW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>
- For Commercial Areas, average load/consumption approximates to 0.014 Kilowatt/Hour per square feet of covered area for building
- On Average, electricity consumed for 12 hours in a day, 30 days in a month and 12 months in a year
- Electricity rate is assumed at Rs. 15/unit.

**b) Annual Staff Cost**
- Staff cost includes cost of Sweeper and watchmen for each building.
- No. of sweepers and watchmen is based on type and land area of building:

<table>
<thead>
<tr>
<th>Land Area (Kanal)</th>
<th>No. of Sweepers</th>
<th>No. of Watchmen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2 and above</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

- Sweeper and watchman salary per month is Rs. 16,000 each.

**c) Annual Repair & maintenance Cost**
- As per Asset Management Plan.
- Repair & Maintenance Cost is based on MRS rates
- R&M cost for different types of building is as follow:

<table>
<thead>
<tr>
<th>Type of Building</th>
<th>R&amp;M cost/ sq. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Buildings</td>
<td>41</td>
</tr>
<tr>
<td>Separately Constructed Garages, shops etc.</td>
<td>28</td>
</tr>
<tr>
<td>Furnished Residence</td>
<td>49</td>
</tr>
<tr>
<td>Residence (G-17)</td>
<td>44</td>
</tr>
<tr>
<td>Staff Residence</td>
<td>40</td>
</tr>
<tr>
<td>Hospital, Schools</td>
<td>37</td>
</tr>
</tbody>
</table>

**C. Vehicles**

**a) Annual Fuel Cost**
- Average daily fuel consumption is based on type of vehicles as follow:
<table>
<thead>
<tr>
<th>Type of vehicle</th>
<th>Average fuel consumption/day (lits.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two (2) wheel</td>
<td>2</td>
</tr>
<tr>
<td>Four (4) Wheel (LTV)</td>
<td>7</td>
</tr>
<tr>
<td>Four (4) wheel (HTV)</td>
<td>10</td>
</tr>
</tbody>
</table>

- Month consist of 30 Days and a year contains 12 months
- Cost per liter of fuel is assumed to remain at Rs. 75 for whole

b) **Annual Repair & maintenance Cost**

- Cost of repair and maintenance contains the engine oil and air & oil filters replacement
3.4. Development of IDAMP Package

Introduction

This section contains procedures for the consolidation of project proposals and annual O&M requirements at directorate/town/zone level.

3.4.1. After development of project proposals and O&M cost, Asset Managers shall submit the following documents to their respective MO of the department.

- Project Proposals
- GIS based Project Maps (if applicable)
- O&M Costs
- AMIS report of Existing asset inventory
- Community Consultation Survey Forms

3.4.2. MO shall consolidate all the projects to produce an IDAMP Package at the departmental level. IDAMP Package shall include following documents, at minimum;

- Summary of Proposed Projects (Asset manager wise, asset wise, year wise summary of projects)
- Detail of Proposed Projects (Asset manager wise, asset wise, year wise)
  - Project ID
  - Description of project
  - Screening & Phasing Scores
  - Proposed year
  - Rough Capital costs
  - Annual Operation & Maintenance Costs
- GIS based project maps
- Total O&M costs for existing assets
- AMIS report of Existing asset inventory (Asset manager wise)
- Results of community consultation surveys conducted

3.4.3. Relevant MOs shall submit their IDAMP Package to the MO Planning for consideration.
3.5. Financial Capacity Analysis

**Introduction**

This section contains procedures for assessment of potential financial resources over the three years. Availability of financial resources determines the prioritization for investment in the most eligible projects. Results of financial capacity analysis shall assist the planning authorities in prioritization of projects or to arrange additional resources from external sources.

3.5.1. After receipt of IDAMP packages from all the departments, MO Planning shall coordinate with MO Finance and DMO Budgets and assess the estimated figures of the own source revenue, subsidies, government grants and donations for the next three years.

3.5.2. MO Finance shall analyze the following potential financial sources that would be available for financing the projects.

- **Local capital revenues**: These include revenues generated only once, e.g. from selling a property that is owned by the MCs, and not needed for public use. Also, included here are incomes generated from renting of own properties or assets for use to public interest.

- **Planned operating surplus (balance)**: This is the net operating surplus calculated as the balance (difference) between MCs operating revenues and operating expenditures.

- **Using the capital reserve fund**: Although MCs have not yet started to set up a capital reserve fund for the replacement of capital equipment or capital investments, this represents one of the potential source for funding in the future.

- **Central Government transfers**: This foresees the transfer from central/provincial Government coming either in the form of conditional grant for investments or unconditional grant, which can be used for capital investments.

- **Donor Grants**: This comprises all incomes for which the MCs are assured they will be raised from donors, by clearly identifying the donor, fund, their requests and the year.

- **Any Other Revenue Source**

3.5.3. After receiving the financial estimations, MO Planning shall finalize the figures that would guide the Technical Team for final decision regarding selection and phasing of projects.
3.6. Projects Selection and Approval by Technical Team

Introduction

This section contains procedures for evaluation, selection and approval of projects for incorporation in the IDAMP.

3.6.1. After receipt of financial projections for three years, MOP shall prepare a “TT Selection and Approval Form” (refer to Annexure-4 for the specimen) and present the same to Technical Team for evaluation and selection.

3.6.2. MO Finance shall convene the meeting of MC Technical Team in the second week of December. Technical Team shall comprise of following personnel:

- Mayor / Chief Officer (Chair)
- MO Finance (convener & secretary)
- All MOs
- MO Planning
- DMO Buildings
- DMO Finance & Budget
- DMO Environment
- Concerned Asset Manager (MOs, DMOs) shall attend the meetings of Technical Team for justification of their proposed projects.

3.6.3. Technical Team shall evaluate the proposed projects against following criteria and assign a score to each project:

<table>
<thead>
<tr>
<th>Criteria No</th>
<th>Criteria description</th>
<th>Lowest score</th>
<th>Highest score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Relevance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Whether the project design is fundamentally suited for achieving the goals associated with the project?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Whether the proposed project complied with the applicable legal regulations?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Short Term Assumptions Performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Has funding been secured/allocated within the Local Government budget for this project?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ If required then whether the external sources of funding have been secured?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Whether the proposed project is financially and/or economical viable?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Whether the proposed project would be able to attain time &amp; cost efficiency?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Will the proposed project going to improve the overall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criteria No</td>
<td>Criteria description</td>
<td>Lowest score</td>
<td>Highest score</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td>4</td>
<td>Efficiency of the service delivery?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Effectiveness</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Does the project contribute towards long term sustainable development, e.g. renewable energy, clean water supply, waste treatment, recycling, etc.?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Does the project improve the social status and access to social services for women and children?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Whether the project will be able in achieving the associated <strong>wide objectives</strong>?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Sustainability</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• If there is risk, does the project design include a risk mitigation strategy?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Whether the proposed project would be able to sustain if external financial or technical support has been withdrawn after completion?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.6.4. MOP shall compute the final score achieved by each project. Final project score shall be derived on basis of scores allocated by Technical Team and Asset Manager to the individual project. Score given by Technical Team and Asset Manager shall be clubbed by 70% and 30% respectively.

3.6.5. MOP shall prepare Final Approved and Phased List of Projects against the following scores schedule:

<table>
<thead>
<tr>
<th>Cumulative Average Score</th>
<th>Phasing Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 ------------------ 71</td>
<td>Year 1</td>
</tr>
<tr>
<td>70 ------------------ 51</td>
<td>Year 2</td>
</tr>
<tr>
<td>50 ------------------ 21</td>
<td>Year 3</td>
</tr>
<tr>
<td>20 ------------------ 0</td>
<td>Rejected</td>
</tr>
</tbody>
</table>
3.7. Capital Investment Plan

Introduction

This section contains the procedures for preparation of Capital Investment Plan. Capital Investment Plan is used to match the funds required for investment in the approved projects with the funds available from various sources.

3.7.1. After Technical Team meeting, Metropolitan Officer Planning shall identify total funds required for investment in the approved projects. For this purpose, MOP shall accumulate:

- Capital Costs of the approved projects over three years
- Operation and Maintenance costs of the existing asset and approved projects in the relevant proposed year

3.7.2. After identification of total annual fund requirements, MOP shall match the total funds required with the total funds available for investment in projects over three years.

3.7.3. MO Planning in consultation with MO Finance, shall allocate following source of finance to each project:

- Local capital revenues
- Planned operating surplus (balance)
- Capital Reserve Funds
- Central Government transfers
- Donor Grants
- Any Other Revenue Source
3.8. Finalization of IDAMP

Introduction

This section contains the procedures for finalization of IDAMP. After finalization of capital Investment Plan, IDAMP shall be finalized and approved by the competent authorities.

3.8.1. After finalization of Capital Investment Plan, Integrated Development and Asset Management Plan (IDAMP) for MC shall be compiled in the form of a single book. (refer to Annexure 5 for the template of IDAMP)

3.8.2. MO Planning shall forward the IDAMP MC to MO Finance (MO Finance) and Mayor / Chief Officer for review and comments.

3.8.3. After review and revisions (if any), Mayor / Chief Officer shall forward IDAMP MC to secretary LG&CD department for approval and notification.

3.8.4. After notification, MO Planning shall circulate the IDAMP to all the Departments of MC. Further, MO Planning shall publish the IDAMP in AMIS and official website of MC.
4. Implementation of IDAMP

Introduction

This section contains procedures for implementation of notified IDAMP. IDAMP is a medium term plan and it contains potential projects for upcoming three years. Thus these potential projects may be implemented through government regulated Annual Development Program (ADP) and/or nongovernment programs with the aid of Funding Agencies.

MCs are currently under statutory obligation to comply with the requirements of Annual Development Planning process. Annual Development Program represents a key policy instrument for implementing development vision of the government through strategic resource allocation with a medium term perspective.

In addition to ADP, MCs also execute development works with the aid of certain funding agencies. For this purpose, funding agencies support MCs through funds transfer or aid in kind for potential development projects.

As IDAMP-MC is a medium term planning instrument, it includes the maximum projects that are objectively beneficial, technically sound and practically feasible for implementation in the next three years. Thus, IDAMP shall provide potential investment projects that could be adopted through ADP or funding agencies.

4.1. Integration of IDAMP with ADP

4.1.1. Currently, on Annual basis, MO Planning receives a letter from LG&CD department for preparation of ADP for MC. MO Planning receives development schemes from MC officials and elected members of national/provincial assemblies. MO Planning finalizes the schemes in consultation with executive management of MC and submits the same to LG&CD for approval.

4.1.2. Once IDAMP process has been operationalized, MO Planning shall prepare the ADP in line with the notified IDAMP.

4.1.3. While preparation of Annual ADP, MO Planning shall incorporate the pre notified projects from IDAMP in the ADP. MOP shall annex the Project Proposal of approved projects in the IDAMP to the PC I and incorporate the project in ADP.

4.1.4. In case of change in circumstances or MCs requirements, Non IDAMP projects could also be incorporated in the ADP of upcoming year. However, Non IDAMP projects must be routed through the process of IDAMP.

4.2. Integration of IDAMP with Funding Agencies

4.2.1. Certain IDAMP projects which could not be adopted in ADP shall be implemented through funding agencies or through other source.
4.2.2. Whenever, a funding agency wants to plan and invest for the up gradation and rehabilitation of MC, MOP shall present the projects of IDAMP to the interested agency.
Part 3: Asset Management

(Chapter 05 & 06)
5. Management of GIS based Asset Inventory in AMIS

Introduction

This section contains the procedures for development and management of asset inventory in Geographic Information System (GIS) based Asset Management Information System (AMIS). 

Asset inventory is the group of assets held by the public body to achieve its service delivery program. GIS based AMIS is the software in which a centralized record of assets shall be maintained for planning and management of the assets. Please refer to "Appendix A for 'AMIS User's Manual'" to operate various functions of AMIS.
5.1. **Addition/Creation of Assets in AMIS**

5.1.1. Asset Manager shall be responsible to maintain a complete and updated record of all the assets under his/her control.

5.1.2. Assets shall be created in AMIS at two stages:

   Stage 1: Creation of existing assets
   Stage 2: Creation of new assets

5.1.3. Asset Manager shall update the Asset inventory by creating the existing assets in AMIS.

5.1.4. Asset Manager shall complete the ‘AMIS Asset Creation Form’ for each asset of following asset categories:

1. Tube wells
2. Disposal Stations
3. Waste Water Treatment Plants
4. Overhead Reservoirs
5. Machinery & Equipment
6. Vehicles
7. Land
8. Buildings
9. Pipelines

5.1.5. After completion of Form, Asset Manager shall log in to the AMIS (IP address: **192.168.80.130:99** and allocated Log in and Password).

5.1.6. AM shall enter the asset information in the Asset Creation Module in AMIS.

5.1.7. After recording asset information, AM shall archive the record.
Stage 2: Creation of New Assets

5.1.8. New Assets shall be created in the AMIS after the procurement has been made.

5.1.9. AM shall receive the procurement documents from the procuring department/ directorate/ authority within seven (7) days of procurement.

5.1.10. Asset Manager shall complete the ‘AMIS Asset Creation Form’ for newly procured asset of respective category as mentioned in Table 01: Asset Categories.

5.1.11. After completion of Form, Asset Manager shall log in to access the AMIS (IP address: 192.168.80.130:99 and allocated Log in and Password).

5.1.12. AM shall enter the asset information in the Asset Creation Module in AMIS.

5.1.13. After recording asset information, AM shall archive the record.

5.2. Removal of Assets from AMIS

5.2.1. AM shall remove the asset form active assets in AMIS on following grounds:
- Replacement of an asset with new asset
- Permanent discontinuance of the use of asset for service delivery program

5.2.2. Incase of replacement of an asset with new asset, asset shall be removed form AMIS ONLY after the new asset has been purchased.

5.2.3. Incase of permanent discontinuance of the use of asset, asset shall be removed form AMIS ONLY after the approval from the competent authority.

5.2.4. In either case, AM shall complete the ‘AMIS Asset Removal Form’ for removal of respective asset.

5.2.5. After completion of Form, Asset Manager shall log in to the AMIS (IP address: 192.168.80.130:99 and allocated Log in and Password).

5.2.6. AM shall enter the asset information in the Asset Removal Module in AMIS.

5.2.7. After recording asset information, AM shall archive the record.

5.3. Updation of Asset Information in AMIS

5.3.1. Asset information shall be updated in AMIS on periodic intervals or on happening of a specific event, whichever is earlier.

5.3.2. AM shall fill the AMIS Asset Information Form for any change in the asset attributes.

5.3.3. After completion of Form, Asset Manager shall log in to the AMIS (IP address: 192.168.80.130:99 and allocated Log in and Password).

5.3.4. AM shall update the asset information in AMIS.

5.3.5. After recording asset information, AM shall archive the record.
6. Asset Management Plan

Introduction

This section contains information about operational and maintenance activities to keep the assets operational and for the intended use. The assets are subjected to wear, tear, erosion and corrosion due to their nature of functioning and use and therefore these are vulnerable for failures. In order to keep the assets up and available for use, assets should be properly operated and maintained. In the following sub sections, various activities/schedules are detailed in respect of all the assets for effective operation and timely maintenance.
Asset Management Plan- MC

**Roads**

On any road network there are two environments through which a road will pass – Urban and Rural. They have different characteristics in terms of the density of roads, the extent of their adjacent development and the nature of their travel patterns.

Urban and Rural road types can be defined as follows:

**Urban roads** – lie adjacent to areas which contain, or are zoned for built land use development

**Rural roads** – lie adjacent to areas which are predominantly natural, with little or minor adjacent built land use development

<table>
<thead>
<tr>
<th>Asset Management System</th>
<th>What’s There?</th>
<th>What’s the condition?</th>
<th>What are you going to do?</th>
<th>How are you managing it?</th>
<th>What’s going on?</th>
<th>How do you anticipate what’s going on?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Asset Register</td>
<td>Condition</td>
<td>Inspections</td>
<td>Priorities and package works</td>
<td>Reliability</td>
<td>Local Analytics</td>
</tr>
<tr>
<td></td>
<td>Hierarchy</td>
<td>Current</td>
<td>Planned maintenance</td>
<td>budget management</td>
<td>Availability</td>
<td>Risk based</td>
</tr>
<tr>
<td></td>
<td>Data</td>
<td>Historical</td>
<td>Reactive maintenance</td>
<td>Workflow/ approvals</td>
<td>Performance</td>
<td>maintenance</td>
</tr>
<tr>
<td></td>
<td>Parts/ Material Stock Control</td>
<td>Work Order history</td>
<td>Incident response</td>
<td>Manageumannent</td>
<td>KPIs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Capital replacement</td>
<td></td>
<td>Dashboards</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reporting</td>
<td></td>
</tr>
</tbody>
</table>

**Network Inspection**

The inspection regime should provide the basic information for addressing the key objectives of highway maintenance strategy, these are:

Network safety

Network serviceability

Network sustainability

It will also provide the basic condition data for the development of programs for maintenance as part of the Asset Management Plan (AMP). All elements of the inspection and assessment regime should be applied systematically and consistently, in accordance with the principles of Quality Assurance.
Inspections should be carried out by trained, qualified or experienced personnel. To promote inspection consistency and quality, authorities are recommended to carry out regular in-house inspection meetings to assess the competence of inspectors including those provided by external contractors.

Watchman Role

The Watchman Role is central to a network management approach and will encompass wide-ranging and varied functions. It dictates the way an organization responds to the changing needs of itself, stakeholders and customers, encouraging value and innovation and a constantly improving level of service.

An important element of the Watchman Role is the requirement to improve quality, efficiency and effectiveness of operations, thus improving outcomes for customers and overall asset value and involves:

- monitoring customers’ perceptions and addressing their complaints
- monitoring the operation, and influences on the network
- monitoring network trends
- identifying needs and risks
- maintaining and improving asset value
- aligning with the corporate strategies and objectives
- Proposing solutions or enhancements to operations or network asset

Cyclic Maintenance

For those activities where the cyclic works will completely rectify any defects found e.g. cutting grassed areas or sweeping and cleaning, no formal Detailed Inspection regime is needed, although it is recognized that if an inspector finds defective items under these Asset types, he may recommend bringing forward the date of the next schedule inspection to rectify them.

**Table 1: Non-Specialist Inspection Frequencies**

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Detailed Inspection Interval/Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 1</td>
</tr>
<tr>
<td>Non Specialist</td>
<td></td>
</tr>
<tr>
<td>Specialist Inspections</td>
<td>X</td>
</tr>
<tr>
<td>Major Roads</td>
<td>X</td>
</tr>
</tbody>
</table>
### Table 2: Specialist Inspection Frequencies

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Detailed Inspection Interval/Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Specialist/Specialist Inspections</td>
<td>Year 1</td>
</tr>
<tr>
<td>Minor Roads</td>
<td>X</td>
</tr>
<tr>
<td>Local Roads</td>
<td>X</td>
</tr>
<tr>
<td>Foot Paths</td>
<td>X</td>
</tr>
<tr>
<td>Kerb/Channel – Primary – Urban</td>
<td>X</td>
</tr>
<tr>
<td>Kerb Stone Major Road</td>
<td>X</td>
</tr>
<tr>
<td>Kerb Stone Minor Road</td>
<td>X</td>
</tr>
<tr>
<td>Culverts and side Drains and their grating</td>
<td>X</td>
</tr>
<tr>
<td>Road Markings/ Kerb Stone Paint</td>
<td>X</td>
</tr>
<tr>
<td>Steet light Poles</td>
<td>X</td>
</tr>
<tr>
<td>Reflective/Non Reflective Road Stud</td>
<td>5 years after installation and then every 2 years thereafter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Detailed Inspection Interval/Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist Inspections</td>
<td>Year 1</td>
</tr>
<tr>
<td>Tension of Safety Fences</td>
<td></td>
</tr>
<tr>
<td>Vegetation/Trees - Soundness</td>
<td></td>
</tr>
<tr>
<td>Road Markings – Retro Reflectivity</td>
<td>X</td>
</tr>
<tr>
<td>Lit Signs/Bollards – Electrical Testing</td>
<td>X</td>
</tr>
<tr>
<td>Signs – Night-time Visual Performance and Retro Reflectivity</td>
<td>5 years after installation and then every 2 years thereafter</td>
</tr>
</tbody>
</table>
Emergency

An emergency is defined as an incident or defect that requires an immediate response because it represents a danger that may cause injury, loss of life or damage to property and that requires immediate attention and remedial action.

Examples of incidents/defects or scenarios that could be deemed an emergency would be where there is a significant risk of:

- injury to any part using or repairing the network
- major disruption to the normal flow of traffic through the network
- structural deterioration of part of the network
- damage to third party property or equipment

### Table 3: Emergencies defects and mitigation measures

<table>
<thead>
<tr>
<th>Emergency Defect</th>
<th>Hazard Mitigation</th>
<th>Permanent Repair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large sink holes, depressions or potholes that will cause damage to vehicles in carriageway</td>
<td>Make safe by installing appropriate traffic management</td>
<td>Undertake full repair of affected area</td>
</tr>
<tr>
<td>Large pieces of debris in live lanes</td>
<td>Install appropriate traffic management to enable safe recovery of debris, including requesting police assistance</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Road Traffic Collision where damaged vehicles are blocking live lanes</td>
<td>Install appropriate traffic management to allow emergency services and recovery crews to work</td>
<td>Remove traffic management</td>
</tr>
<tr>
<td>Significant damage to infrastructure assets resulting from a Road Traffic Collision</td>
<td>Make safe by removing damaged asset and installing appropriate traffic Management</td>
<td>Undertake full repair of damaged asset</td>
</tr>
<tr>
<td>Emergency Defect</td>
<td>Hazard Mitigation</td>
<td>Permanent Repair</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>Live lanes blocked by significant sand build up</td>
<td>Install appropriate traffic management to isolate blocked lanes and arrange to remove sand from Carriageway</td>
<td>Scheme to ensure no future re-occurrence</td>
</tr>
<tr>
<td>Significant flooding</td>
<td>Install appropriate traffic management to isolate blocked lanes or close roads and arrange appropriate plant to remove water from Carriageway</td>
<td>Investigate reason for cause of flood and repair, clean or install positive drainage system</td>
</tr>
<tr>
<td>Sinkholes, depressions or missing paving blocks in footway</td>
<td>Make safe by coning off</td>
<td>Undertake repair of damaged asset</td>
</tr>
<tr>
<td>Unprotected excavations in or adjacent to footways</td>
<td>Make safe by coning off</td>
<td>Undertake full repair of affected area</td>
</tr>
<tr>
<td>Footways blocked by illegal obstructions causing</td>
<td>Erect warning signs to warn vehicular and pedestrian traffic</td>
<td>Install appropriate pedestrian traffic arrangements or remove obstructions</td>
</tr>
<tr>
<td>Missing manhole covers or gully gratings in live lanes</td>
<td>Install lane closure and cone off hazard</td>
<td>Replace cover or grating</td>
</tr>
<tr>
<td>Emergency Defect</td>
<td>Hazard Mitigation</td>
<td>Permanent Repair</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Exposed wiring</td>
<td>Isolate electricity supply and make safe</td>
<td>Undertake repair of asset</td>
</tr>
<tr>
<td>Structural integrity of lighting column or sign compromised</td>
<td>Remove lighting column or sign</td>
<td>Replace lighting column or sign or erect temporary unit</td>
</tr>
<tr>
<td>Loose or hanging parts of a damaged/defective overhead sign</td>
<td>Remove overhanging sign parts</td>
<td>Replace sign or damaged parts</td>
</tr>
<tr>
<td>Bridge strikes where damage has occurred to the structure</td>
<td>Call out Structural Engineer to assess damage and if necessary install appropriate traffic management to mitigate hazard</td>
<td></td>
</tr>
<tr>
<td>Loss of power at Traffic Signal Intersections</td>
<td>Inform police and erect appropriate Traffic Signals not in use signs</td>
<td>Undertake repair</td>
</tr>
</tbody>
</table>

**Table 4: Emergencies defects and mitigation measures**

<table>
<thead>
<tr>
<th>Survey Frequency</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Condition Survey (Rutting/Cracking etc.)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Maintenance

Pavements

The requirements relate to minor repairs to the carriageway in order to ensure that all pavements provide a safe, even and comfortable surface for all users, including pedestrians, and cyclists. It is assumed that repairs relate to the following paved area assets;

- Trafficked areas
- Hard shoulders
- Paved medians
- Paved traffic islands
- Median cross-overs

**Inspection Requirements**

Detailed Inspections shall be carried out at intervals of 6 months on Urban Expressways and Urban Primary Roads, at intervals of 1 year on Rural Expressways, Rural Primary and all Secondary and Tertiary Roads. They shall be coordinated as fully as possible with the detailed inspection of other items in the highway as a whole.

Footways and Cycle Tracks

The requirements relate to minor repairs to footways and cycle tracks. The requirements do not relate to larger scale work which would normally be classed as, or linked to, structural maintenance jobs.
A footway is a paved facility for pedestrians, usually within the highway boundary and usually consists of hand laid pre-cast concrete paving blocks. Footways include the walking surfaces of subways, under bridges, over bridges and pedestrian rights of way. They may occasionally fall outside the highway boundary.

**Inspection Requirements**

Detailed Inspections shall be carried out at intervals of 6 months in urban areas and at intervals of 1 year in rural areas, Rural Primary and all Secondary and Tertiary Roads. They shall be coordinated as fully as possible with the detailed inspection of other items in the highway as a whole.

**Covers, Gratings, Frames and Boxes (Ironwork)**

The majority of covers are situated in carriageways and footways but those in verges, particularly those verges that are likely to be traversed by pedestrians, should not be ignored. It may often be difficult to decide whether a cracked or broken item is in real danger of collapse. If in doubt, it should be replaced, irrespective of its position.

**Inspection Requirements**

Detailed Inspections shall be carried out at intervals of 6 months on Urban Expressways and Urban Primary Roads, at intervals of 1 year on Rural Expressways, Rural Primary and all Secondary and Tertiary Roads. They shall be coordinated as fully as possible with the detailed inspection of other items in the highway as a whole.

**Kerbs, Edgings and Pre-formed Channels**

The requirements relate to minor repairs to Kerbs, edgings and pre-formed channels of all types. The requirements do not relate to larger scale works that would be classed as or linked to structural maintenance jobs.

Although these items tend to be stable by their nature and construction specification, hazardous conditions can develop quickly when either individual Kerbs, or short lengths, are damaged or put out of alignment by vehicle overrun, or when local subsidence occurs. Frequent damage by vehicles may suggest the need for local re-alignment or a more robust specification.

**Inspection Requirements**

Detailed Inspections shall be carried out at intervals of 6 months on Urban Expressways and Urban Primary Roads, at intervals of 1 year on Rural Expressways, Rural Primary and all Secondary and Tertiary Roads. They shall be coordinated as fully as possible with the detailed inspection of other items in the highway as a whole.

**Highway Drainage**
The requirements for drainage relate to all elements of the drainage system from the point at which water drains from the paved or other areas, structures and subsoil, to the outfall. The requirements for drainage also relate to the prevention and mitigation of the effects of flooding.

The purpose of drainage is to remove water from hardened surfaces, where it may represent a hazard and disrupt the free flow of traffic, cycles and pedestrians and from sub-layers of the pavement and adjoining earthworks, where its presence may damage the pavement or other structures. In removing the water, the drainage system must be maintained to its design performance or similar to prevent pollution of ground and surface water, and flooding of adjoining property or services. This requirement includes drainage systems that interface with parts of the public drainage system.

**Inspection Requirements**

Detailed inspections of piped drainage systems shall normally be carried out once every 10 years unless the need for a greater frequency has been agreed, or there is evidence of blockage or some other fault noted on safety inspections, or reports and complaints received from other sources.

Methods of inspection which may be suitable include;

- **Pulling a mandrel through the pipe line:** This may indicate if a pipe is broken, distorted, silted up or contains roots, but it will not distinguish between these defects.

- **Flushing:** Flushing pipelines is less informative than using a mandrel but will provide the best method of inspection in areas of subsidence and where the use of a mandrel is not appropriate.

Inspection at catch pits, soakaway and interceptors during or immediately following a period of prolonged rainfall: Measurement of the depth of water within the entries of pipes, in successive catch pits, soakaway or interceptors along a drain-run will give an indication of whether there is any blockage or fault.

**Culverts**

Larger culverts shall be inspected and maintained as highway structures, and are outside the scope of this section and should be maintained. It should be noted that many culverts can tolerate some silting and vegetation growth before efficiency is impaired to the point where the culvert should be cleared. Grilles fitted across the ends of some culverts are however particularly prone to blockage, restricting free flow of water through the culvert and may need to be inspected more frequently.

**Inspection Requirements**

Detailed inspections of culverts shall be carried out at intervals of 1 year on all roads and should be timed to happen before the rainy season. All debris that prevents the free flow of water should be cleared immediately. Clearance work should also be programmed to be undertaken before the onset of the rainy season.
Vehicle Restraint Systems and Barriers

The requirements relate to maintenance and repairs to all types of vehicle restraint systems (steel, wire rope and Vertical Concrete Barrier- VCB), parapets and associated installations such as end terminals, crash cushions, pedestrian guard rails and pedestrian fences (including those designed to prevent pedestrians crossing highways).

**Inspection Requirements**

Detailed Inspections of all vehicle restraint systems and associated installations shall be carried out at intervals of 2 years in respect of mounting height, surface protective treatment and structural condition.

Detailed Inspections of pedestrian guard rail and pedestrian fences shall be carried out at intervals of 2 years in respect of surface protective treatment and structural condition.

Detailed Inspections of VCB shall be carried out at intervals of 2 years in respect of height and structural condition.

Damage sections of vehicle restraint systems, end terminals and crash cushions where the integrity of the system is compromised shall be treated as Urgent defects unless damage is clearly superficial with no loss of integrity of the system. Permanent repairs shall be carried out as soon as possible and in any case within 14 days.

Fences, Walls, Screens and Environmental Barriers

The requirements relate to repairs to all types of fences (excluding vehicle restraint systems) which are;

- Animal (camel) fencing
- Sand fencing
- Boundary fencing
- Pedestrian fences
- Walls and retaining walls <1.5m
- Anti-glare screen fences
- Environmental barriers

Detailed Inspections shall be carried out in respect of integrity, and their intended purpose, at intervals of 6 months and as far as possible during inspections of other highway items.
Detailed Inspections shall be carried out at intervals of 2 years in respect of structural condition.

Road Markings

The requirements relate to inspection regimes for the inspection and routine maintenance of machine and hand laid road markings in the following materials;

- sprayed and screeded thermoplastic
- water-borne traffic paint
- solvent based Kerb paint
- cold plastic
- colored pavement markings e.g. red colored surfacing at school Gateways

**Inspection Requirements**

Detailed Inspections in respect of wear, luminance factor, skid resistance and retro-reflectivity shall be undertaken at intervals of 1 year for painted markings and 2 years for thermoplastic markings.

Road Traffic Signs

The requirements relate to routine inspection and cyclic maintenance of permanent road traffic sign installations including Prohibitory, Warning Signs, Direction Signs, Street Name Plates, Delineators and Overhead Gantry Signs. It includes all associated sign posts, brackets, fixings and electric.

Signs shall be inspected for the following;

- visual performance
- electrical safety and operation
- Structural integrity

Road Lighting

The requirements relate to the routine maintenance of road lighting installations.

**Inspection Requirements**
The condition of road lighting, including electrical, mechanical and structural elements, shall be inspected for the performance and integrity of the system. The safe and effective maintenance of road lighting is dependent on trained, competent, and well equipped personnel.

Typical Road Maintenance

The goal of maintenance is to preserve the asset, not to upgrade it. Unlike major road works, maintenance must be done regularly. Road maintenance comprises “activities to keep pavement, shoulders, slopes, drainage facilities and all other structures and property within the road margins as near as possible to their as-constructed or renewed condition”. It includes minor repairs and improvements to eliminate the cause of defects and to avoid excessive repetition of maintenance efforts. For management and operational convenience, road maintenance is categorized as routine, periodic, and urgent.

Routine maintenance

Routine maintenance comprises small-scale works conducted regularly, aims “to ensure the daily possibility and safety of existing roads in the short-run and to prevent premature deterioration of the roads”. Frequency of activities varies but is generally once or more a week or month. Typical activities include roadside verge clearing and grass cutting, cleaning of silted ditches and culverts, patching, and pothole repair.

Periodic maintenance

Periodic maintenance covers activities on a section of road at regular and relatively long intervals, aims “to preserve the structural integrity of the road”. These operations tend to be large scale, requiring specialized equipment and skilled personnel. They cost more than routine maintenance works and require specific identification and planning for implementation and often even design. Activities can be classified as preventive, resurfacing, overlay, and pavement reconstruction. Resealing and overlay works are generally undertaken in response to measured deterioration in road conditions. For a paved road repaving is needed about every eight years; for a gravel road re-graveling is needed about every three years.

Urgent maintenance

Urgent maintenance is undertaken for repairs that cannot be foreseen but require immediate attention, such as collapsed culverts or landslides that block a road. Maintenance does not include rehabilitation, building shoulders, or widening roads. If the sections to be rebuilt constitute more than 25 percent of the road’s length, the work is rehabilitation, not maintenance.
### Maintenance costs for two-lane roads, (per kilometer)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Work Activity</th>
<th>Description</th>
<th>Cost for activity (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patch Work</td>
<td>Providing and laying plant premixed bituminous carpet 2 inch thick, including compaction and finishing to required camber, grade and density.</td>
<td>233,546</td>
</tr>
<tr>
<td></td>
<td>Sub Base Course</td>
<td>Providing and laying sub-base course of stone product of approved quality and grade including, placing, mixing, spreading and compaction of sub base material to required depth</td>
<td>120,393</td>
</tr>
<tr>
<td></td>
<td>Base Course</td>
<td>Providing and laying base course of crushed stone of approved quality and grade including, placing, mixing, spreading and compaction of base course material to required depth</td>
<td>165,624</td>
</tr>
<tr>
<td></td>
<td>Paint For Traffic Lanes</td>
<td>Painting traffic lane 5&quot; (125 mm) wide, with road marking enamel.</td>
<td>44,280</td>
</tr>
<tr>
<td></td>
<td>Kerb Stone</td>
<td>Providing and laying Precast Kerb stone complete in all respect as per specifications</td>
<td>82,000</td>
</tr>
<tr>
<td></td>
<td>Paint for Kerb Stone</td>
<td>Providing and applying enamel paint on Kerb stone of approved shade</td>
<td>78,720</td>
</tr>
<tr>
<td></td>
<td>Reflectorized Pavement Studs</td>
<td>Providing and laying reflectorized pavement studs (cat eyes, flush surface type) complete in all respect as per specifications.</td>
<td>196,800</td>
</tr>
</tbody>
</table>

### Buildings

Building maintenance is work undertaken to keep, restore or improve every facility i.e. every part of a building, its services including Horticulture operations to a currently acceptable standard and to sustain the utility and value of the facility.

The objective of maintenance is:

To preserve machinery, building and services, in good operating condition.
To restore it back to its original standards, and
to improve the facilities depending upon the development that is taking place in the building engineering.

**Maintenance Services**

These include primarily operations undertaken for maintaining proper condition of buildings, its services and works in ordinary use. The use for which buildings are designed is a prime factor in determining the requisite standard of care.

Excessive maintenance should be avoided. At the same time, maintenance should ensure safety to occupant or the public at large and should comply with the statutory requirements. The need also depends upon intensity of usage. The repair works are classified in under mentioned categories:

**Day to day repairs/ service facilities**

Day to day repairs should be carried out in all the buildings under its maintenance. The works which are to be attended on day to day basis such as removing chokage of drainage pipes, man holes, restoration of water supply, replacement of blown fuses, repairs to faulty switches, watering of plants, lawn mowing, hedge cutting, sweeping of leaf falls etc. are attended under day to day service facilities. The purpose of this facility is to ensure satisfactory continuous functioning of various services in the buildings. These services are provided after receipt of complaint from the users at the respective Service Centers.

**Annual repairs**

The works of periodical nature like White washing, colour washing, distempering, painting etc. are called Annual Repair works and these are generally undertaken through system of contracts.

**Special repairs**

As the building ages, there is deterioration to the various parts of the building and services. Major repairs and replacement of elements become inevitable. It becomes necessary to prevent the structure from deterioration and undue wear and tear as well as to restore it back to its original conditions to the extent possible. The following types of works in general are undertaken under special repairs.
White Washing, Color washing, distempering etc., after completely scrapping the existing finish and preparing the surface afresh.

Painting after removing the existing old paint from various members.

Repairs of internal roads and pavements.

Repairs/replacement of flooring, skirting, dado and plaster.

Replacement of doors, window frames and shutters. Replacement of door and window fittings.

Replacement of water supply and sanitary installation like water tanks, WC cistern, Wash basins, kitchen sinks, pipes etc...

Re-grassing of lawns/grass plots within 5-10 years.

Operations and Maintenance

Operations

Operations activities are activities that consume resources to ensure the infrastructure asset levels of service are met. For example “running costs” and consumables.

Typical operational activities include:

Utility costs, e.g. electricity, rates;

Cleaning

Security including patrols; and

Asset management data collection and condition assessment.

Maintenance

Maintenance is the regular on-going work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again.

Maintenance includes reactive, planned and cyclic work activities

Reactive maintenance is unplanned repair work carried out in response to service requests and management/supervisory directions.
Planned maintenance is repair work that is identified and managed through a maintenance management system (MMS). Under the AMP it would be proposed that MMS activities include inspection, assessing asset condition against failure/breakdown, prioritizing, scheduling, actioning the work and reporting what was done to develop a maintenance history to improve maintenance and service delivery performance.

Cyclic maintenance is replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting street furniture e.g. seating and shelters and pump component replacement. These works generally fall below the capital works threshold. This work generally falls below the capital/maintenance threshold.

Inspection of buildings and services

Periodical inspections

The starting point of maintenance to building is the regular inspection of buildings. It should be carried out periodically with a view to keep down the restoration cost to the minimum and to attend to essential repairs at the opportune moment. The inspection varies from building to building and the resulting deterioration varies with reference to the climatic conditions, pollution, fungi, the insect attack, subsidence, flooding, intensity of usage, careless usage and the like.

It is necessary to know when should the building be inspected, what should be inspected, at what level of deterioration a component should be replaced or repaired and whether any preventive maintenance is called for.

Preventive maintenance

As mentioned above, for carrying out preventive maintenance, inspection of building has to be carried out. The building is to be inspected during moon soon season.

Monsoon rains, winds and cyclone cause considerable damage to buildings, tall structure, uproot trees and lamp posts, cause floods, roof leakage into building, blow water through broken window panels, blow off thatched roofs, hutments and bus shelters, came disruptions in power supply, water supply and sewerage systems resulting in untold sufferings to people besides causing huge financial losses.
<table>
<thead>
<tr>
<th>Description</th>
<th>Yes</th>
<th>No</th>
<th>Any Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BUILDING EXTERIOR - WALLS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does exterior masonry show the following signs of deterioration</td>
<td>Yes</td>
<td>No</td>
<td>Any Comments</td>
</tr>
<tr>
<td>Cracks in walls?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cracks over doors or windows?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loose bricks?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cracked bricks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing bricks?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White or gray stains</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BUILDING EXTERIOR - ROOF, ALL TYPES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspect all roots for evidence of deterioration, weather damage, and water penetration. If roof is not accessible, use binoculars. Check interior of building for evidence of water damage.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there gaps or holes around any roof penetrations, chimneys, or vents</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are flashings (Metal Strip to stop the water) rusted</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do metal components need painting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there evidence of water seepage through roof</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Does roof have proper ventilation</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BUILDING INTERIOR - WALLS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there cracks?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are surfaces peeling or dirty?</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is wall, finish buckled or loose?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BUILDING INTERIOR - CEILINGS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there cracks?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are surfaces peeling or dirty?</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is ceiling structure separating?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there damaged ceiling tiles?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are light fixtures secure?</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td><strong>PLUMBING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bathroom fixtures?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piping?</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do flush valves, faucets work properly?</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Are any drains or traps clogged?</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part 4: Monitoring & Evaluation

(Chapter 07)
7. Monitoring & Evaluation

Introduction

This section contains procedures for monitoring and evaluation of IDAMP system. Monitoring & Evaluation include processes for the measurement, monitoring, analysis and evaluation of the MC assets, asset management system and asset management activities.

7.1. Establishment of M&E Unit

7.1.1. A Monitoring and Evaluation (M&E) Unit shall be established for continuous monitoring of implementation and compliance of the IDAMP.

7.1.2. Mayor / Chief Officer shall nominate the MO Finance and MO Infrastructure to lead the M&E Unit. Further, Mayor / Chief Officer shall also designate following personnel as part of M&E unit for support to the M&E Lead:

1. GIS Officer
2. MO / DMO
3. Technical Officer

7.1.3. M&E unit shall use the M&E tools/techniques to perform its M&E functions and retain appropriate documented information as evidence of the results of monitoring, measurement, analysis and evaluation.

7.2. Term of References for M&E Unit

The M&E Unit shall have the following terms of references:

- Ensure that Asset Management System (AMIS) is updated in all aspects
- Review and evaluation of performance of IDAMP Team (Technical Team & Asset Managers)
- M&E Unit shall monitor;
  - Levels of services
  - performance of an asset, including financial and non-financial performance
  - the effectiveness of the asset management system
- M&E Unit shall receive and evaluate the following reports from the entity and Asset Managers:
  - Report on Key Performance Indicators (Target vs Achieved)
  - Report on projects implementation status
  - Report on any hindrance observed while implementing the project
- Evaluation of projects implemented during the year and its status with respect to IDAM Plan developed
- Conduct Internal Audit at planned intervals to identify and address potential gaps in system and identify opportunities for performance improvement
• Review the entity’s asset management policies, procedures and systems, at planned intervals, to ensure its continuous improvement, adequacy, suitability and effectiveness
• Provide recommendation and guidelines to IDAMP Team

7.3. **Function of M&E Unit**

7.3.1. **Maintenance of Asset Inventory in GIS based AMIS**

- M&E Unit shall obtain Category wise Asset Reports from all the Asset Managers on **quarterly** basis.
- M&E shall review the asset reports and reconcile the asset information with the information in AMIS.
- In case of inconsistencies, M&E unit shall coordinate with the respective AM and update the record in AMIS.

7.3.2. **Progress report on IDAMP**

- M&E unit shall obtain Quarterly Progress Reports on IDAMP from all the Asset Managers. Progress Reports shall contain the information of completed projects along with the completion certificates and ongoing projects.
- M&E shall review the reports and take appropriate action as required.

7.3.3. **Performance Management**

- M&E Unit shall monitor the performance of MC and Asset Manager and prepare the following reports:
  - LOS Report
    
    (This report contains the target LOS for the year and actual LOS achieved during the year.
  - Community Surveys Report
    
    This report contains the town wise results of community surveys conducted to assess the services provided by the MC.
- M&E Unit shall present the reports to Mayor / Chief Officer for review and further proceedings.
Glossary

Asset A resource with economic value that an individual, organization or country owns or controls with the expectation that it will provide future benefits.

Asset Life Period from asset creation to asset end-of-life

Asset Management Plan Documented information that specifies how organizational objectives are to be converted into asset management objectives, the approach for developing asset management plans, and the role of the asset management system in supporting achievement of the asset management objectives

Asset Management System Management system for asset management whose function is to establish the asset management policy and asset management objectives

Asset portfolio Assets that are within the scope of the asset management system

Asset system Set of assets that interact or are interrelated

Asset type Grouping of assets having common characteristics that distinguish those assets as a group or class

Audit Systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled

Capability Asset management measure of capacity and the ability of an entity system, person or organization to achieve its objectives

Competence Ability to apply knowledge and skills to achieve intended results

Conformity Fulfilment of a requirement

Continual improvement Recurring activity to enhance performance

Critical asset Asset having potential to significantly impact on the achievement of the organization's objectives

Depreciable Asset A non-current asset having a limited useful life
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depreciation</td>
<td>An amount representing the reduction of the service potential during an accounting period</td>
</tr>
<tr>
<td>Documented Information</td>
<td>Information required to be controlled and maintained by an organization and the medium on which it is contained</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Extent to which planned activities are realized and planned results achieved</td>
</tr>
<tr>
<td>Level of service</td>
<td>Parameters, or combination of parameters, which reflect social, political, environmental and economic outcomes that the organization delivers</td>
</tr>
<tr>
<td>Maintenance</td>
<td>The actions required for an asset to achieve its expected useful life. Maintenance can be planned or unplanned. Planned Maintenance includes measures to prevent known failure modes and can be time or condition-based. Repairs are a form of unplanned maintenance to restore an asset to its previous condition after failure or damage. Expenses on maintenance are considered operational expenditure.</td>
</tr>
<tr>
<td>Monitoring Objective</td>
<td>Determining the status of a system, a process or an activity result to be achieved</td>
</tr>
<tr>
<td>Organization</td>
<td>Person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives</td>
</tr>
<tr>
<td>Organizational Objective</td>
<td>Overarching objective that sets the context and direction for an organization’s activities</td>
</tr>
<tr>
<td>Organizational Plan</td>
<td>Documented information that specifies the programs to achieve the organizational objectives</td>
</tr>
<tr>
<td>Performance Policy</td>
<td>Measureable result Intenions and direction of an organization as formally expressed by its top management</td>
</tr>
<tr>
<td>Predictive action</td>
<td>Actions to monitor the condition of an asset and predict the need for preventive action or corrective action</td>
</tr>
<tr>
<td>Process</td>
<td>Set of interrelated or interacting activities which transforms inputs into outputs</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>Works to rebuild or replace parts of an asset to enable it to the original</td>
</tr>
</tbody>
</table>
capacity and performance, and materially extend its useful life (which may be a full or partial extension of life - i.e. less than its original expected useful life).

**Remaining Useful Life**

The time remaining until an asset ceases to provide the required standard of performance or economic usefulness.

**Replacement**

The complete replacement or reconstruction of an asset with one that performs to a similar standard of performance, as a result of which the asset life can be considered to have re-commenced.

**Risk Management**

The application of a formal process that identifies the exposure of a municipality to service performance risk and determines appropriate responses.

**Stakeholder**

Person or organization that can affect, be affected by, or perceive themselves to be affected by a decision or activity.

**Asset Management Plan**

Documented information that specifies how organizational objectives are to be converted into asset management objectives), the approach for developing asset management plans, and the role of the asset management system in supporting achievement of the asset management objectives.

**Upgrading**

The augmentation or alteration of an asset that results in a material improvement to capacity or performance. Expenses on upgrading works are considered capital expenditure.