

(1C) Annual Road Asset Management Plan 1

Presentation for LRN Training

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Module Contents

- ❖ Functions of ARAMP and relationship to DTMP
- ❖ Intervention Definitions
- ❖ ARAMP Principles and its Review for Approval
- ❖ Why update ARAMP V1 procedures?
- ❖ The key ARAMP V2 amendments

INTRODUCTION



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Introduction to ARAMP

- ❖ An annual investment / implementation plan for maintenance, improvements and new construction covering the District Road Core Network (DRCN) only
- ❖ Describes the total fund predicted for the LRN
- ❖ Predicts the outcome / effects of the Year's plan

What does ARAMP do?

- ❖ Details the annual plan from DTMP
- ❖ Follows new Guideline for RAP3 piloting (DG approved) – Version 2 issued for 2014/15.
- ❖ Provides an Excel Template (to assist but not essential) and Report Template
- ❖ Combines maintenance, improvements and new construction in a single Plan
- ❖ Refines maintenance needs, uses; survey (emergency, specific & periodic), averages (routine & recurrent)

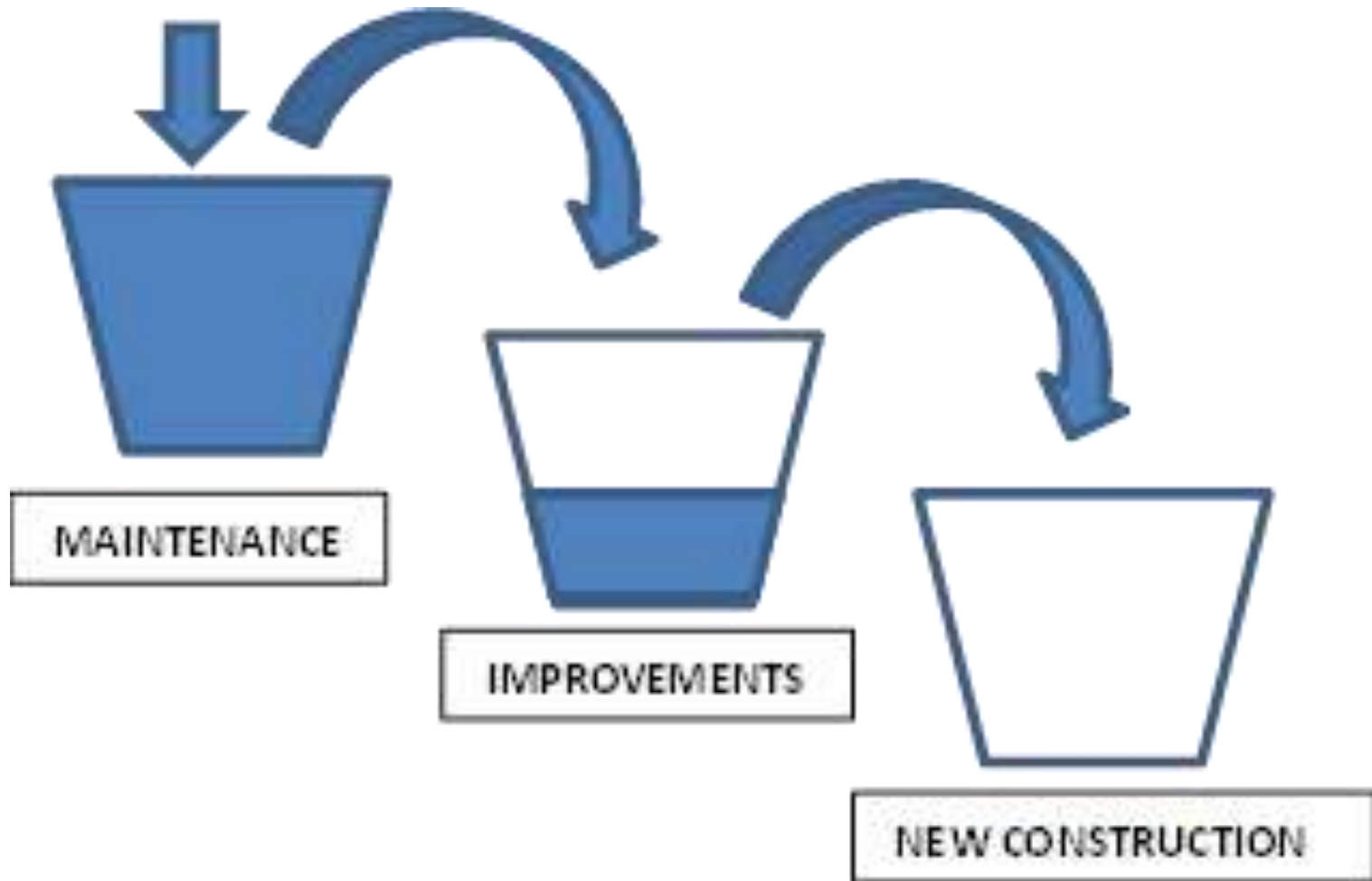
What does ARAMP do? Contd.

- ❖ Reconfirms intentions for <20% discretionary allocation
- ❖ Predicts the fund balance available for any Improvements & new Construction – allocates as per DTMP
- ❖ Allocates fund sources to different roads
- ❖ Prepare in September; approve before Dasain (target)

ARAMP / DTMP Relationship

| Intervention | Plan | |
|----------------------------|--|-----------------------------------|
| | 1. DTMP | 2. ARAMP |
| Maintenance / Conservation | Lump-sum based on length, composition and average per km costs | Emergency: Rapid Survey |
| | | Routine: Predicted costs |
| | | Recurrent: Predicted costs |
| | | Specific: Survey |
| | | Periodic: Survey |
| Improvements | Site survey and average unit costs | From DTMP (affordability) |
| New Construction | Estimated length + bridges and average costs | From DTMP (affordability) |

ARAMP Fund Flow



DEFINITIONS



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General Definitions

- ❖ **MAINTENANCE:** *'the process of preserving the original condition or function of an asset' (can include 'prevention')*
- ❖ **IMPROVEMENT:** *'addition or change that makes something better than it was before'*
- ❖ **NEW CONSTRUCTION:** *'the work of building'*

Maintenance Categories

| Category | Definition | Example |
|-----------|---|--|
| Emergency | works that are to be carried out due to unexpected and sudden blockage of roads that stop vehicular movement due to natural disasters | e.g. landslide removal (does not include permanent repair which is usually 'specific') |
| Routine | small maintenance works to be carried out in all seasons on all roads on a regular basis | e.g. clearing drains, cutting vegetation etc. |
| Recurrent | small maintenance works not falling under routine maintenance that are carried out a few times a year in all roads to repair minor damage resulting from traffic and rainfall | e.g. repair of potholes, erosion damage etc. |
| Specific* | spot treatments and repairs that do not occur every year or in every road, and which are very specific in nature and location | e.g. new structure at landslide. Typically < NPR 300,000/km on avg. |
| Periodic | maintenance works to be carried out in intervals of years and of large-scale | e.g. regravelling of existing gravel road |

Specific Maintenance - Explanation

- ❖ 'Maintenance' i.e. restoring original access (e.g. permanent restoration at 'emergency' sites),
- ❖ 'Spot treatments' i.e. localised repairs at a critical location (e.g. a stone causeway missed at a soft kholsi)
- ❖ Identify by finding the most critical access points on a road i.e. 'where it blocks first' (talk to the locals)
- ❖ N.B. might be redundant once road comes under full 'improvement' – use sparingly!

Specific Maintenance – Explanation Contd.

- ❖ Limits on size and value – see annex in Guidelines
- ❖ It is Not:
 - ❑ Improving a non-engineered ('bull-dozed') road
 - ❑ Re-grading an over-steep alignment ('new construction' section?)
 - ❑ Lining side drains, etc. etc.

Improvements Definition

- ❖ Upgrading a road by pavement category (earthen to gravel or gravel to blacktop)
- ❖ Bringing up to appropriate engineering standard (NRRS)
- ❖ Construction of new bridges on an existing road
- ❖ Rehabilitating an existing road that has become extensively destroyed by returning to a maintainable condition

Maintenance vs. Improvements (Annex 1)

Guideline Annex 1 provides more guidance on differentiation by type and magnitude, generally:

- ❖ **Specific Maintenance:** treats short critical sections in order to reduce damage and ensure continued access in the future
- ❖ **Periodic Maintenance:** treats extended road lengths to bring them back to their original standard
- ❖ **Improvements:** treats large areas and extended road lengths to bring them to a higher standard

ARAMP PRINCIPLES



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Prioritisation - Maintenance

- ❖ Cost per vehicle (daily traffic / intervention cost for the road) – based on interview
- ❖ Each Category of maintenance prioritised separately
- ❖ Assigns priority to roads with demand and connectivity

Prioritisation – Improvement / New (from DTMP)

❖ Cost per population served (least highest)



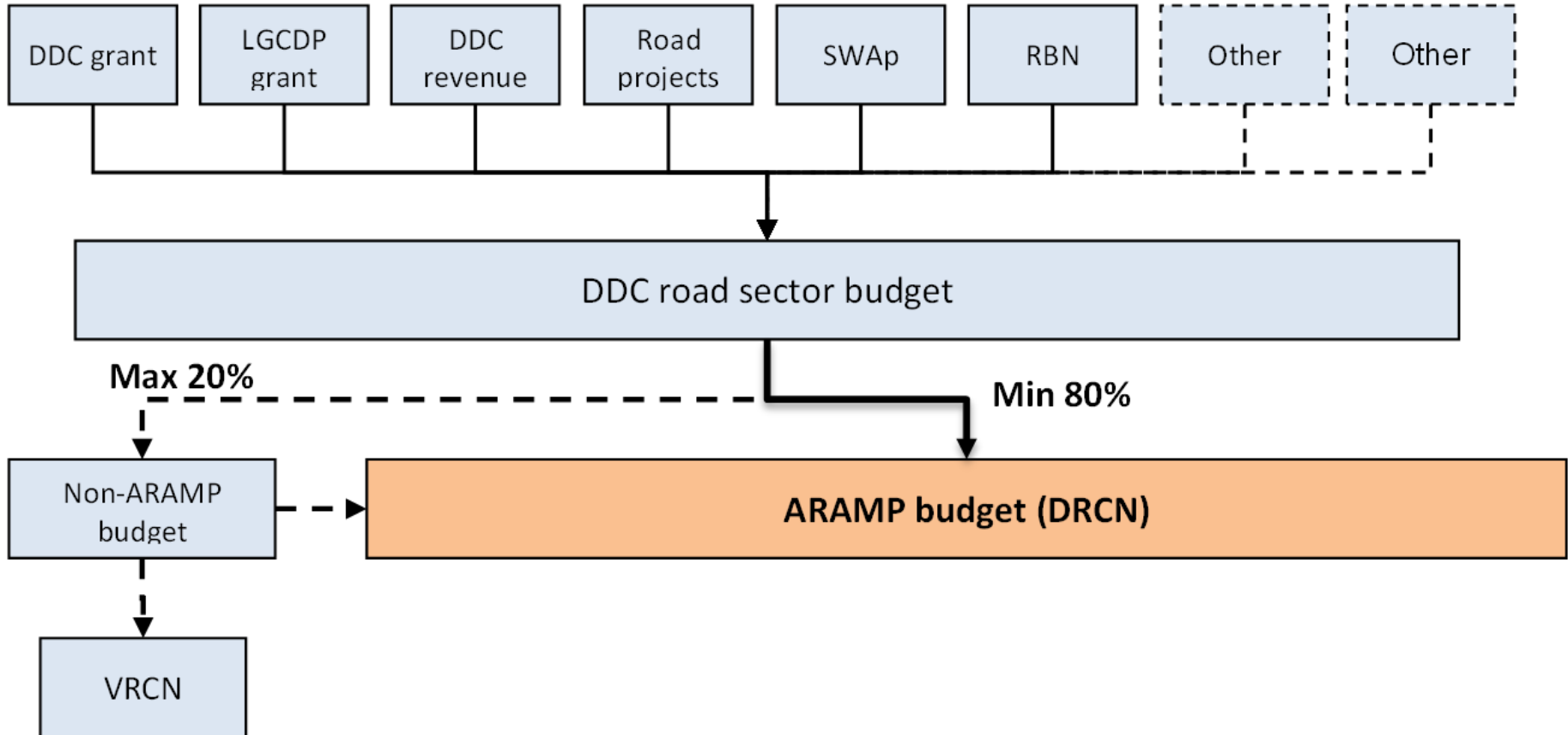
❑ DR 001: cost — , population ●●●●

❑ DR 002: cost — , population ●

Basis for Planning Requirements

- ❖ Emergency – Rapid Condition Survey
- ❖ Routine – average annual demands
- ❖ Recurrent – average annual demands
- ❖ Specific – Rapid Condition Survey
- ❖ Periodic – Rapid Condition Survey
- ❖ Improvements – DTMP
- ❖ New Construction - DTMP

LRN District Budget



Typical ARAMP Investment Plan

| | Emergency maintenance (NPR '000) | | | Routine/Recurrent maintenance (NPR '000) | | | Specific maintenance (NPR '000) | | | Periodic maintenance (NPR '000) | | | Improvement (NPR '000) | | | New construction (NPR '000) | | |
|----|----------------------------------|----------------|---------------|--|----------------|---------------|---------------------------------|----------------|---------------|---------------------------------|----------------|---------------|------------------------|----------------|----------------|-----------------------------|----------------|---------------|
| | Available | 200,230 | | Available | 199,607 | | Available | 191,004 | | Available | 185,212 | | Available | 185,212 | | Available | | |
| # | Road code | Estimated cost | Approved cost | Road code | Estimated cost | Approved cost | Road code | Estimated cost | Approved cost | Road code | Estimated cost | Approved cost | Road code | Estimated cost | Approved cost | Road code | Estimated cost | Approved cost |
| 1 | 60DR003 | - | - | 60DR018 | 120 | 120 | 60DR011 | - | - | 60DR001 | - | - | 60DR002 | 16,725 | 16,725 | 60DR012 | 8,000 | 8,000 |
| 2 | 60DR009 | - | - | 60DR007 | 800 | 800 | 60DR016 | - | - | 60DR002 | - | - | 60DR011 | 35,200 | 35,200 | 60DR020 | 12,000 | - |
| 3 | 60DR011 | - | - | 60DR013 | 784 | 784 | 60DR013 | 3 | 3 | 60DR003 | - | - | 60DR012 | 17,545 | 17,545 | 60DR009 | 24,000 | - |
| 4 | 60DR015 | - | - | 60DR005 | 514 | 514 | 60DR005 | 20 | 20 | 60DR004 | - | - | 60DR008 | 241,850 | 115,742 | 60DR024 | 20,000 | 14,248 |
| 5 | 60DR018 | - | - | 60DR006 | 343 | 343 | 60DR004 | 30 | 30 | 60DR005 | - | - | 60DR003 | 46,200 | - | 60DR008 | 144,400 | - |
| 6 | 60DR004 | 8 | 8 | 60DR004 | 750 | 750 | 60DR006 | 48 | 48 | 60DR006 | - | - | 60DR018 | 9,160 | - | 60DR001 | 100,000 | - |
| 7 | 60DR007 | 23 | 23 | 60DR015 | 500 | 500 | 60DR009 | 16 | 16 | 60DR007 | - | - | 60DR005 | 33,635 | - | 60DR019 | 60,000 | - |
| 8 | 60DR013 | 16 | 16 | 60DR014 | 183 | 183 | 60DR008 | 70 | 70 | 60DR008 | - | - | 60DR009 | 118,362 | - | 60DR005 | 92,000 | - |
| 9 | 60DR005 | 16 | 16 | 60DR016 | 550 | 550 | 60DR007 | 404 | 404 | 60DR009 | - | - | 60DR010 | 13,853 | - | 60DR022 | 132,000 | - |
| 10 | 60DR006 | 12 | 12 | 60DR003 | 840 | 840 | 60DR002 | 23 | 23 | 60DR010 | - | - | 60DR013 | 157,489 | - | 60DR021 | 100,000 | - |
| 11 | 60DR010 | 4 | 4 | 60DR017 | 514 | 514 | 60DR015 | 141 | 141 | 60DR011 | - | - | 60DR017 | 33,710 | - | 60DR003 | 120,000 | - |
| 12 | 60DR001 | 15 | 15 | 60DR008 | 720 | 720 | 60DR018 | 240 | 240 | 60DR012 | - | - | 60DR007 | 163,418 | - | 60DR023 | 52,000 | - |
| 13 | 60DR008 | 63 | 63 | 60DR009 | 188 | 188 | 60DR014 | 141 | 141 | 60DR013 | - | - | - | - | - | - | - | - |
| 14 | 60DR016 | 64 | 64 | 60DR010 | 200 | 200 | 60DR001 | 250 | 250 | 60DR014 | - | - | - | - | - | - | - | - |
| 15 | 60DR017 | 102 | 102 | 60DR001 | 450 | 450 | 60DR003 | 1,410 | 1,410 | 60DR015 | - | - | - | - | - | - | - | - |
| 16 | 60DR012 | 35 | 35 | 60DR012 | 240 | 240 | 60DR010 | 365 | 365 | 60DR016 | - | - | - | - | - | - | - | - |
| 17 | 60DR014 | 170 | 170 | 60DR002 | 267 | 267 | 60DR017 | 1,750 | 1,750 | 60DR017 | - | - | - | - | - | - | - | - |
| 18 | 60DR002 | 96 | 96 | 60DR011 | 640 | 640 | 60DR012 | 882 | 882 | 60DR018 | - | - | - | - | - | - | - | - |
| 19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Total | 623 | 623 | Total | 8,603 | 8,603 | Total | 5,792 | 5,792 | Total | - | - | Total | 887,146 | 185,212 | Total | 864,400 | - |
| | Remaining | | 199,607 | Remaining | | 191,004 | Remaining | | 185,212 | Remaining | | 185,212 | Remaining | | - | Remaining | | - |



Review/Approval Process

- ❖ Draft ARAMP: prepared by Consultant; support from DTA; inputs and ownership from DDC
- ❖ Present to DDC Body for approval (target before Dasain)
- ❖ Use maps, road inventory, prioritisation system, cross-ref to approved DTMP, focus on Investment Plan (overheads / PowerPoint)

Review/Approval Process Contd.

- ❖ Review and agree any Discretionary funding (VRCN / DRCN); how much (<20%); from what source; for what?
- ❖ Leniency – ‘logic check’ (see next slide)
- ❖ Endorse – by DDC Council (typically in January)

'Leniency' – ARAMP Rules

- ❖ Refer to ARAMP Guidelines (para 96, V2):
- ❖ ' ... any comments are taken into consideration and may result in the amendment of the ARAMP if they are found to be justified and in line with the ARAMP process. The important thing is that the ARAMP is accepted and will be followed by the DDC. To a large extent the ARAMP should follow the procedures and prioritization criteria in these Guidelines, but a certain degree of leniency is allowed to incorporate particular priorities of the district. However, this leniency is only permitted with regards to the ranking and prioritization of interventions, and should be explained in the ARAMP Report. **Interventions that do not pertain to the DRCN or are not included in the DTMP cannot be included in the ARAMP!**'

REVIEW OF 2013/14 ARAMPS



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Issues from 2013/14 ARAMPs

A review of RAP3 ARAMPs in May 2014 revealed:

- ❖ Deviations from ARAMP / DTMP principles not properly explained
- ❖ Performing maintenance on 'un-trafficable roads'
- ❖ Not rationalising multiple inputs (e.g. Improvements + Recurrent)
- ❖ Changes made to DRCN from the DTMP

Issues from 2013/14 ARAMPs Contd.

- ❖ Confusion – existing vs planned DRCN
- ❖ ‘Emergency Works’ including heavy maintenance (e.g. creation of new drains + stone soling)
- ❖ Routine & Recurrent – the entire trafficable DRCN should be under maintenance
- ❖ Too much ‘Specific Maintenance’ – limit to ensure budget for Improvements (< NRs 300,000 / km)

Issues from 2013/14 ARAMPs Contd.

- ❖ Unit Rates / Costs – update & use District-specific data
- ❖ ‘Sprinkling’ – sharing inadequate funds over multiple roads rather than ‘prioritising’
- ❖ ARAMP Procedures and Templates – some weaknesses and glitches exposed

ARAMP VERSION 2 (2014/15)



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Key Changes

- ❖ **Maintenance Fund** (basket allocation for the year's maintenance): *'...to allow the funding allocations to maintenance on the one side and improvement/construction on the other side, to be determined as soon as the annual road sector budget is known, thus making it possible to start the preparations for improvement/construction works earlier (even before the Rapid Condition Survey is carried out), giving more time during the dry season for implementation'* (Table 5.1.3)

Key Changes Contd.

- ❖ **RED highlight ‘warnings’ in Excel:** data missing or not in line with Procedures – either adjust or explain fully in Report (Excel suggests likely causes)
- ❖ **Extra Data Columns added:** to ease comparison of ‘ARAMP-suggested’ with actual data used + reporting

Key Changes Contd.

- ❖ **DRCN & ‘Planned DRCN’**: clear differentiation
- ❖ **Investment Plan / Discretionary Funding**: separate columns now shown
- ❖ **Numerous minor ‘tweaks’**: e.g. facility for pipe culverts added to Specific

Preparation Pack

New 'ARAMP Preparation Pack' comprising:

- ❖ ARAMP Guideline for RAP3 Piloting (Version 2): procedures and 'how-to?' guide
- ❖ ARAMP Excel Templates (Version 2): assists in data processing and generation of Report tables (also an 'amendments list')
- ❖ ARAMP Rapid Condition Survey Form (Version 2)
- ❖ ARAMP – Report Preparation Template (Version 2)

Stepwise Procedure - Overview

- ❖ DTMP – review and familiarise
- ❖ Data Collection – traffic, population unit costs, etc. (update as necessary)
- ❖ Rapid Condition Survey – Emergency, Specific & Periodic requirements
- ❖ Budgets (funds)?

Stepwise Procedure – Overview

Contd.

- ❖ Populate Excel Templates, enter:
 - ❑ DRCN data + traffic (Sheet A.1)
 - ❑ Planned interventions for Emer (3.1), Spec (3.3) & Per (3.4) from RCS + sort (cost/veh)
 - ❑ Copy Improvements Data in prioritised order from DTMP (update unit costs / any works already done)
 - ❑ Ditto for New Construction
 - ❑ Enter funding amounts / data (sheet 5.1)
 - ❑ Investment Plan (Sheet 5.2) – auto-generates
 - ❑ Review & Interrogate

| | Emergency maintenance | | ARAMP Prioritised Budget Discretionary Budget | | Routine/Recurrent | | ARAMP Prioritised Budget Discretionary Budget | | Specific maintenance | | ARAMP Prioritised Budget Discretionary Budget | | Periodic maintenance | | ARAMP Prioritised Budget Discretionary Budget | | Improvement | | ARAMP Prioritised Budget Discretionary Budget | | New construction | | ARAMP Prioritised Budget Discretionary Budget | |
|----|-----------------------|----------------|---|------------|----------------------|----------------|---|------------|----------------------|----------------|---|------------|----------------------|----------------|---|------------|----------------------|----------------|---|------------|----------------------|----------------|---|------------|
| | Road code | Estimated cost | Allocation | Allocation | Road code | Estimated cost | Allocation | Allocation | Road code | Estimated cost | Allocation | Allocation | Road code | Estimated cost | Allocation | Allocation | Road code | Estimated cost | Allocation | Allocation | Road code | Estimated cost | Allocation | Allocation |
| | Available (NPR '000) | | 129,763 | 27,896 | Available (NPR '000) | | 125,386 | 27,896 | Available (NPR '000) | | 103,808 | 27,896 | Available (NPR '000) | | 74,074 | 27,896 | Available (NPR '000) | | 32,976 | 27,896 | Available (NPR '000) | | - | 17,896 |
| 1 | 04DR005 | - | - | - | 04DR005 | - | - | - | 04DR001 | 3,465 | 3,465 | - | 04DR004 | - | - | - | 04DR003 | 4,700 | 4,700 | - | - | - | - | - |
| 2 | 04DR007 | - | - | - | 04DR017 | - | - | - | 04DR002 | 1,878 | 1,878 | - | 04DR008 | 2,100 | 2,100 | - | 04DR005 | - | - | - | - | - | - | - |
| 3 | 04DR008 | - | - | - | 04DR008 | 1,040 | 1,040 | - | 04DR003 | 2,220 | 2,220 | - | 04DR015 | 2,340 | 2,340 | - | 04DR010 | - | - | - | - | - | - | - |
| 4 | 04DR013 | - | - | - | 04DR011 | 768 | 768 | - | 04DR004 | - | - | - | 04DR002 | 3,500 | 3,500 | - | 04DR006 | - | - | - | - | - | - | - |
| 5 | 04DR014 | - | - | - | 04DR016 | 645 | 645 | - | 04DR005 | 90 | 90 | - | 04DR017 | 2,800 | 2,800 | - | 04DR011 | 6,250 | 6,250 | - | - | - | - | - |
| 6 | 04DR017 | - | - | - | 04DR004 | 1,035 | 1,035 | - | 04DR006 | 1,750 | 1,750 | - | 04DR003 | 1,680 | 1,680 | - | 04DR007 | - | - | - | - | - | - | - |
| 7 | 04DR011 | 5 | 5 | - | 04DR002 | 1,215 | 1,215 | - | 04DR007 | 2,350 | 2,350 | - | 04DR011 | 4,112 | 4,112 | - | 04DR016 | 11,250 | - | - | - | - | - | - |
| 8 | 04DR016 | 126 | 126 | - | 04DR009 | 1,198 | 1,198 | - | 04DR008 | 2,925 | 2,925 | - | 04DR014 | 3,500 | 3,500 | - | 04DR004 | 67,325 | - | - | - | - | - | - |
| 9 | 04DR002 | 237 | 200 | - | 04DR010 | 885 | 885 | - | 04DR009 | 1,308 | 1,308 | - | 04DR001 | 2,940 | 2,940 | - | 04DR001 | - | - | - | - | - | - | - |
| 10 | 04DR015 | 279 | 279 | - | 04DR015 | 1,868 | 1,868 | - | 04DR010 | 632 | 632 | - | 04DR009 | 5,400 | 5,400 | - | 04DR017 | 3,750 | - | - | - | - | - | - |
| 11 | 04DR009 | 225 | 225 | - | 04DR003 | 1,053 | 1,053 | - | 04DR011 | 116 | 116 | - | 04DR007 | 5,300 | 5,300 | - | 04DR002 | 1,695 | - | - | - | - | - | - |
| 12 | 04DR004 | 289 | 289 | - | 04DR014 | 1,682 | 5,000 | - | 04DR012 | 3,572 | 3,572 | - | 04DR013 | 4,520 | 4,520 | - | 04DR008 | 16,250 | 16,250 | - | - | - | - | - |
| 13 | 04DR012 | 463 | 463 | - | 04DR007 | 1,743 | 1,743 | - | 04DR013 | 971 | 971 | - | 04DR005 | 2,000 | 80,000 | - | 04DR009 | 19,803 | 5,776 | 10,000 | - | - | - | - |
| 14 | 04DR003 | 197 | 197 | - | 04DR013 | 1,478 | 1,478 | - | 04DR014 | 814 | 814 | - | 04DR016 | 6,138 | - | - | 04DR015 | 3,250 | - | - | - | - | - | - |
| 15 | 04DR001 | 268 | 268 | - | 04DR001 | 1,686 | 1,686 | - | 04DR015 | 3,754 | 3,754 | - | 04DR010 | 5,472 | - | - | 04DR012 | 15,240 | 5,000 | - | - | - | - | - |
| 16 | 04DR010 | 2,325 | 2,325 | - | 04DR012 | 1,446 | 1,446 | - | 04DR016 | 2,218 | 2,218 | - | 04DR006 | 1,225 | - | - | 04DR013 | 13,000 | - | - | - | - | - | - |
| 17 | 04DR006 | - | - | - | 04DR006 | 520 | 520 | - | 04DR017 | 1,673 | 1,673 | - | 04DR012 | 5,300 | - | - | 04DR014 | 6,500 | - | - | - | - | - | - |
| 18 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

END

