

AN ILLUSTRATED  
HANDBOOK FOR STANDARD  
OPERATING PROCEDURES  
FOR BENGALURU'S ROADS

# NAMMA RASTE KAIPIDI



VERSION - 1  
FEBRUARY 2025



# **NAMMA RASTE KAIPIDI**

AN ILLUSTRATED HANDBOOK FOR STANDARD  
OPERATING PROCEDURES FOR BENGALURU'S ROADS

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**TITLE**

NAMMA RASTE KAIPIDI

**PUBLISHER**

BRUHAT BENGALURU MAHANAGARA PALIKE (BBMP)  
MOD FOUNDATION

**DESIGN & ILLUSTRATION**

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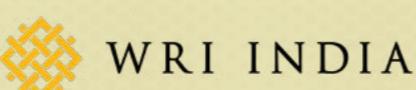
**DATE OF PUBLICATION**

FEBRUARY 2025

ILLUSTRATED, DESIGNED AND PUBLISHED BY



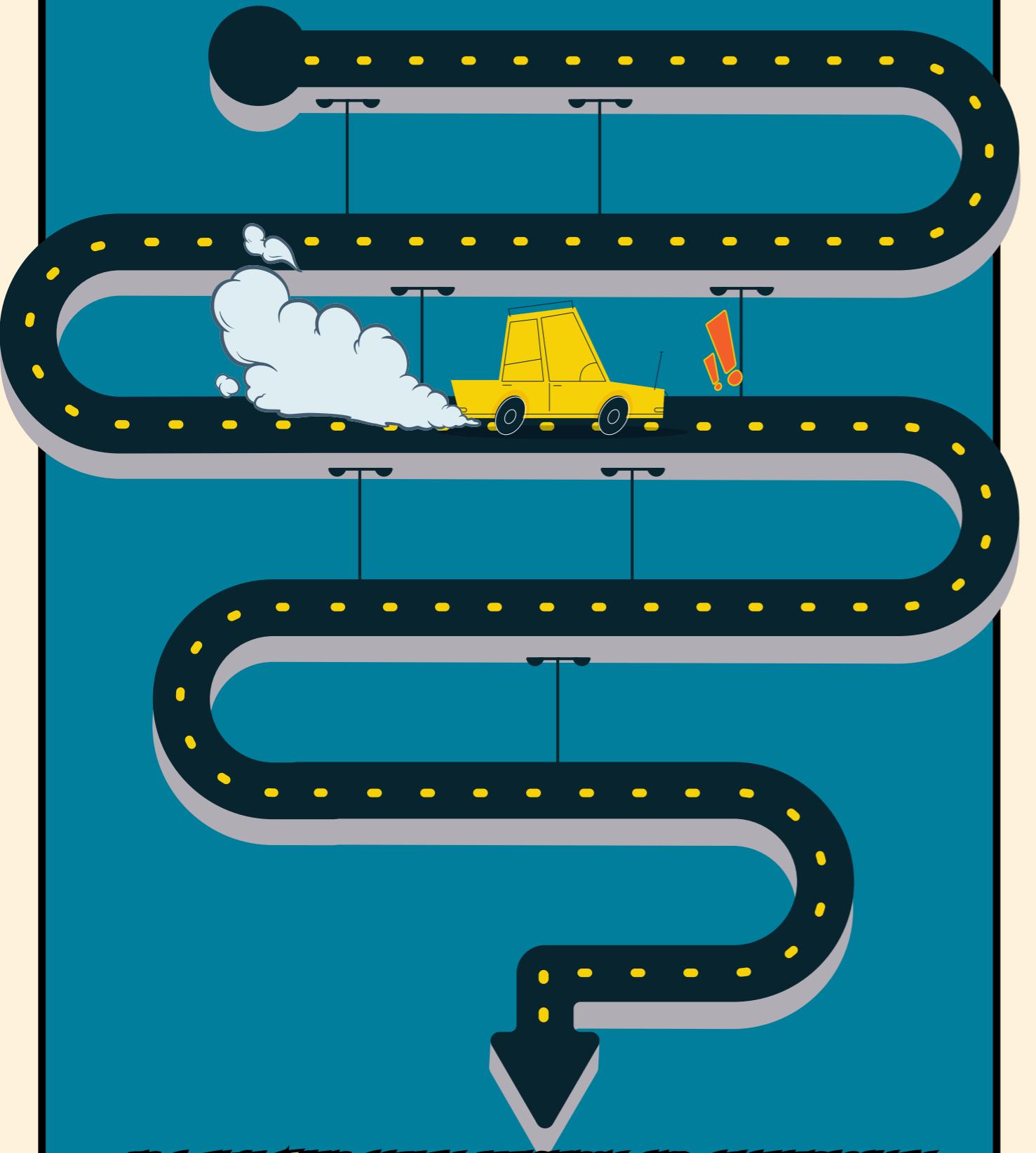
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**DISCLAIMER**

THIS ILLUSTRATED HANDBOOK CONVEYS THE CITY'S ROAD DESIGN THROUGH CLEAR VISUALS, MAKING THEM ACCESSIBLE TO URBAN PLANNERS, ENGINEERS, GOVERNMENT OFFICIALS, AND THE PUBLIC. IT HAS BEEN ADAPTED FROM THE NAMMA RASTE KAIPIDI (MANUAL) PRODUCED BY WRI INDIA AND INCORPORATES RECOMMENDATIONS FROM THE EXPERT COMMITTEE ON THE PREPARATION OF THE MANUAL FOR ROAD DESIGN AND STANDARD OPERATING PROCEDURE.

NO PART OF THIS ILLUSTRATED HANDBOOK MAY BE REPRODUCED, STORED, OR TRANSMITTED IN ANY FORM (ELECTRONIC OR MECHANICAL) WITHOUT PRIOR PERMISSION FROM OR INTIMATION TO BBMP AND MOD FOUNDATION.

# NAMMA RASTE KAIPIDI



**IN A TIME WHEN SAFETY, EFFICIENCY, AND SUSTAINABILITY ARE CRUCIAL, THIS VISUAL GUIDE IS AN ESSENTIAL RESOURCE FOR RESHAPING BENGALURU'S STREETS INTO SAFER, MORE INTELLIGENT, AND EASILY NAVIGABLE SPACES FOR EVERYONE.**

## AN ILLUSTRATED GUIDE FOR STANDARD OPERATING PROCEDURES OF BENGALURU'S ROADS (SOP).

A VISUAL HANDBOOK IS ESSENTIAL FOR EFFECTIVELY COMMUNICATING COMPLEX ROAD DESIGN PRINCIPLES AND STANDARDS TO A DIVERSE AUDIENCE, INCLUDING URBAN PLANNERS, ENGINEERS, GOVERNMENT OFFICIALS, AND THE GENERAL PUBLIC.

ROAD DESIGN STANDARD OPERATING PROCEDURES (SOPs) ARE OFTEN HIGHLY DETAILED AND TECHNICAL, MAKING THEM DIFFICULT FOR NON-EXPERTS TO UNDERSTAND. THIS GUIDE SIMPLIFIES THESE CONCEPTS THROUGH ILLUSTRATIONS, DIAGRAMS, AND VISUAL AIDS, MAKING THEM MORE ACCESSIBLE AND EASIER TO APPLY IN REAL-WORLD SCENARIOS. FOCUSING ON THE UNIQUE CONTEXT OF BENGALURU, THIS ILLUSTRATED GUIDE PROVIDES CLEAR VISUAL REPRESENTATIONS OF THE CITY'S ROAD DESIGN AND UTILITY PLANNING STANDARDS.

IT EMPOWERS STAKEHOLDERS TO CREATE SAFER, MORE EFFICIENT STREETS BY HIGHLIGHTING KEY PRINCIPLES SUCH AS PEDESTRIAN-FRIENDLY INFRASTRUCTURE, ROAD CONSTRUCTION, AND INTEGRATED UTILITY PLANNING. PROPER UTILITY DESIGN—COVERING ELEMENTS LIKE DRAINAGE, STREET LIGHTING, UNDERGROUND UTILITIES, AND SIGNAGE—ENSURES THAT BENGALURU'S ROADS ARE NOT ONLY WELL-CONSTRUCTED BUT ALSO FUNCTIONAL, RESILIENT, AND FUTURE-READY.

THIS HANDBOOK BRIDGES THE GAP BETWEEN TECHNICAL EXPERTISE AND PRACTICAL IMPLEMENTATION, ENSURING THAT ROAD DESIGN IS NOT ONLY EFFECTIVE BUT ALSO INCLUSIVE AND RESPONSIVE TO THE NEEDS OF ALL ROAD USERS.



# MEET THE HEROES!

YOU GIVE ME THE BLUEPRINT, I'LL BUILD THE ROAD – BUT I'VE GOT QUESTIONS ALONG THE WAY!



**CONTRACTOR NAGESH.**  
**CONTRACTOR, BBMP**

GOOD ROADS DON'T JUST HAPPEN – THEY'RE ENGINEERED WITH CARE!



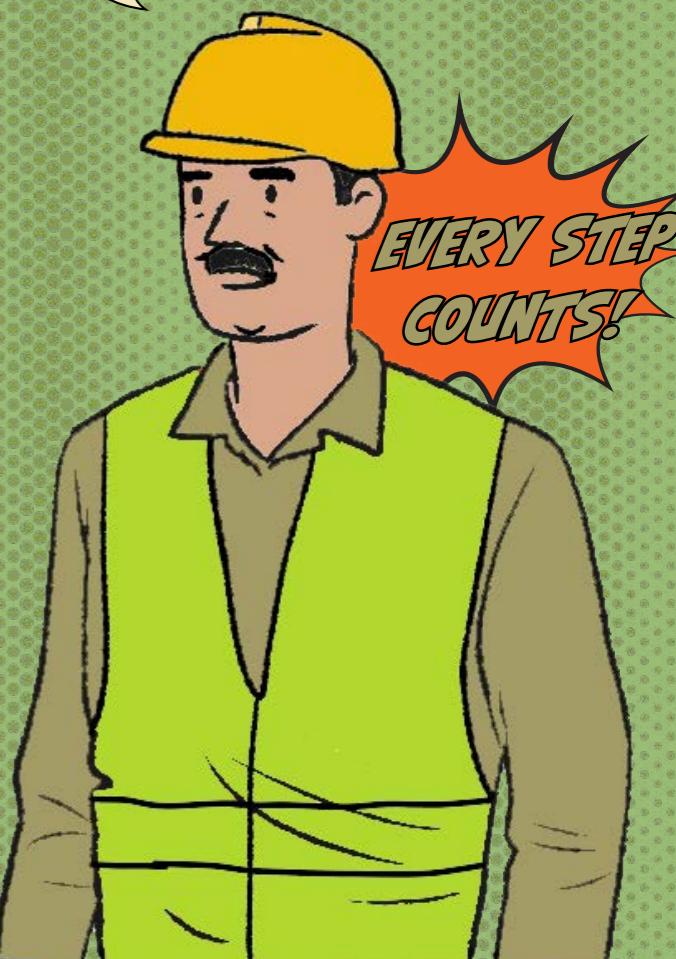
**ENGINEER MANJUNATH.**  
**EXECUTIVE ENGINEER, BBMP**

GOOD ROADS ARE LIKE GOOD DESIGN – FUNCTIONAL, SAFE, AND BUILT TO LAST!



**URBAN DESIGNER GEETA.**  
**SITE ENGINEER, BBMP**

DESIGNS LOOK GREAT ON PAPER, BUT IT'S MY JOB TO MAKE THEM WORK IN THE REAL WORLD!



**CONTRACTOR GOPI.**  
**CONTRACTOR, BBMP**

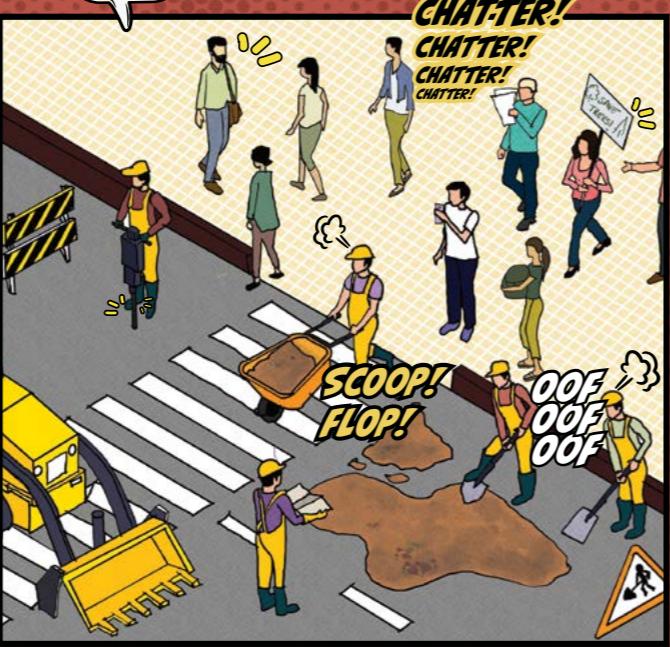
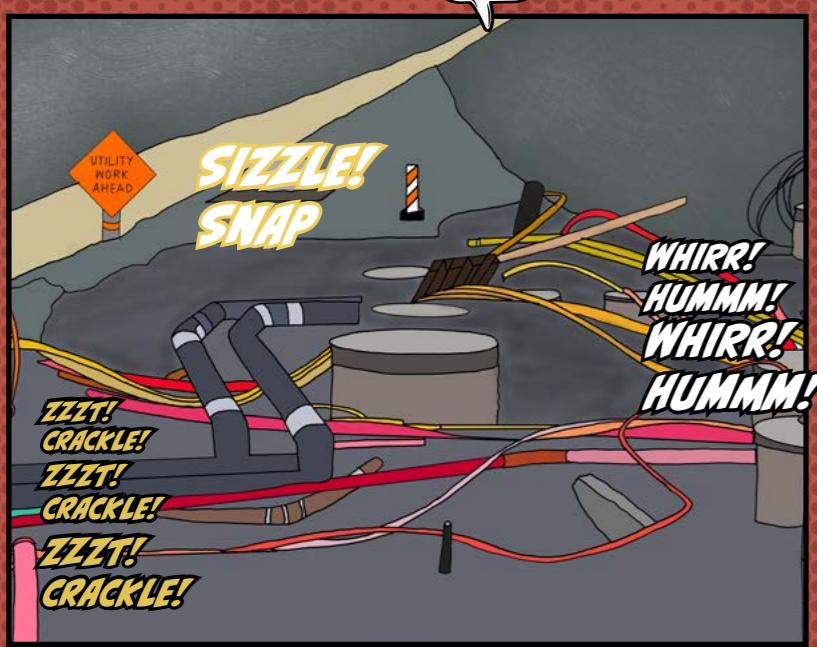
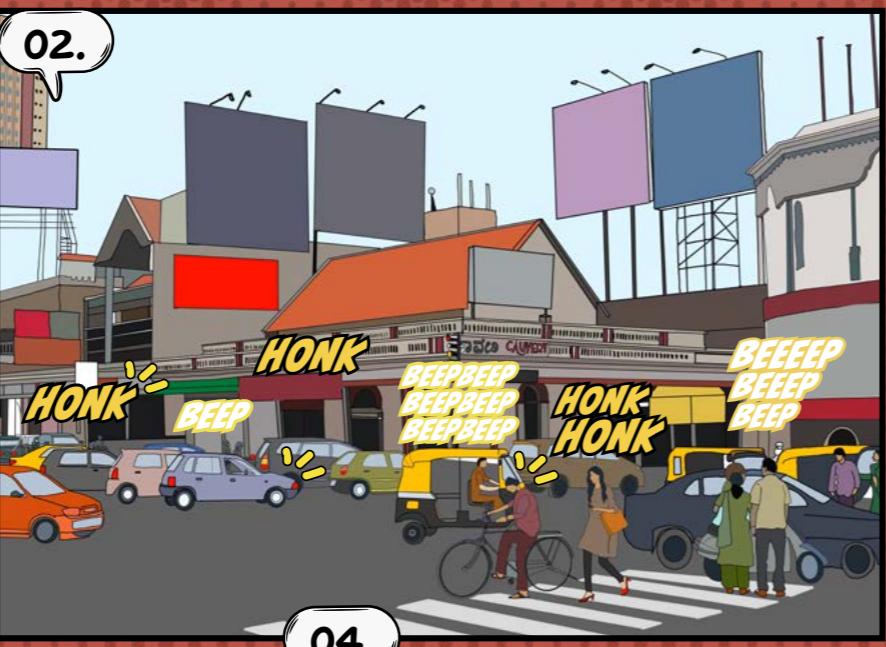
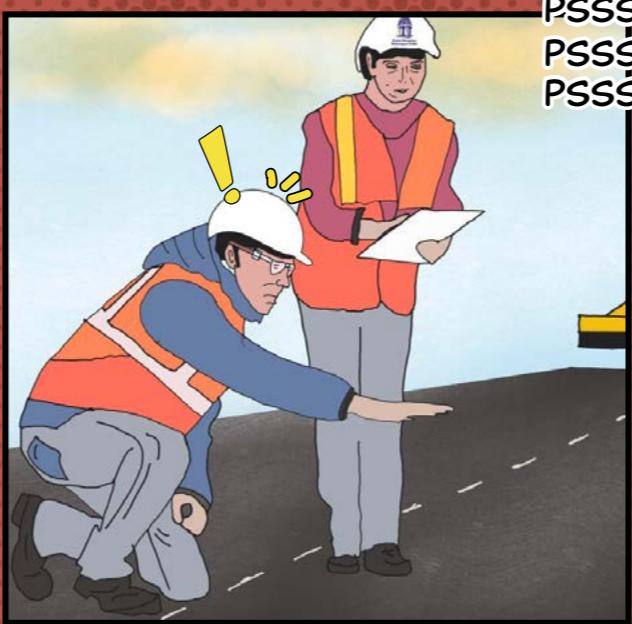
CONTRACTOR NAGESH PLAYS THE ROLE OF A CURIOUS AND EXPERIENCED CONSTRUCTION PROFESSIONAL WHO FREQUENTLY ASKS ENGINEERS QUESTIONS ABOUT THE BEST PRACTICES IN ROAD DESIGN, MATERIALS, SAFETY MEASURES, AND CONSTRUCTION TECHNIQUES. NAGESH'S QUESTIONS FOCUS ON HOW TO IMPLEMENT ENGINEERING CONCEPTS IN THE REAL WORLD, WHERE THINGS DON'T ALWAYS GO AS PLANNED. HIS QUESTIONS HIGHLIGHT THE CHALLENGES OF TRANSLATING THEORY INTO PRACTICE AND CONCERN OF THE GENERAL PUBLIC.

ENGINEER MANJUNATH SERVES AS THE MAIN GUIDE THROUGH THE COMPLEXITIES OF BENGALURU'S ROAD STANDARD OPERATING PRACTICES. HE APPEARS IN VARIOUS SCENARIOS, EXPLAINING CONCEPTS OF ROAD SAFETY, TRAFFIC MANAGEMENT, PEDESTRIAN FACILITIES, AND BEST PRACTICES THROUGH ENGAGING VISUALS AND EASY-TO-UNDERSTAND DIALOGUES. HIS PLAYFUL INTERACTIONS WITH FELLOW ENGINEERS AND CITIZENS ADD A RELATABLE, HUMAN TOUCH TO THE TECHNICAL DETAILS, MAKING COMPLEX ROAD DESIGN TOPICS ACCESSIBLE TO ALL.

DESIGNER GEETA IS THE HEART OF BENGALURU'S BUSTLING ROAD DESIGN EFFORTS, OFFERING A STEADY HAND AS THE CITY TACKLES ITS URBAN MOBILITY CHALLENGES. GEETA IS OFTEN FOUND IN THE THICK OF DESIGNING SAFE, EFFICIENT, AND SUSTAINABLE ROAD SYSTEMS FOR THE CITY. HER ROLE IS CRITICAL IN SHAPING THE ROADS THAT DEFINE THE DAILY COMMUTE OF MILLIONS, AND HER EXPERTISE ENSURES THAT EVERY CURVE, INTERSECTION, AND PEDESTRIAN CROSSING IS CAREFULLY PLANNED TO MEET THE CITY'S GROWING NEEDS.

CONTRACTOR GOPI IS A SHARP-WITTED, HANDS-ON CONSTRUCTION PROFESSIONAL WITH A KNACK FOR TURNING COMPLEX ROAD DESIGN THEORIES INTO PRACTICAL, REAL-WORLD SOLUTIONS. KNOWN FOR HIS RESOURCEFULNESS AND NO-NONSENSE ATTITUDE, HE FREQUENTLY FINDS HIMSELF IN CONVERSATIONS WITH ENGINEERS AND DESIGNERS, CHALLENGING THEM TO THINK OUTSIDE THE BOX. GOPI'S EXPERTISE LIES IN BRIDGING THE GAP BETWEEN METICULOUS PLANNING AND THE UNPREDICTABLE NATURE OF CONSTRUCTION ON THE GROUND.

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- B. UTILITY DESIGN

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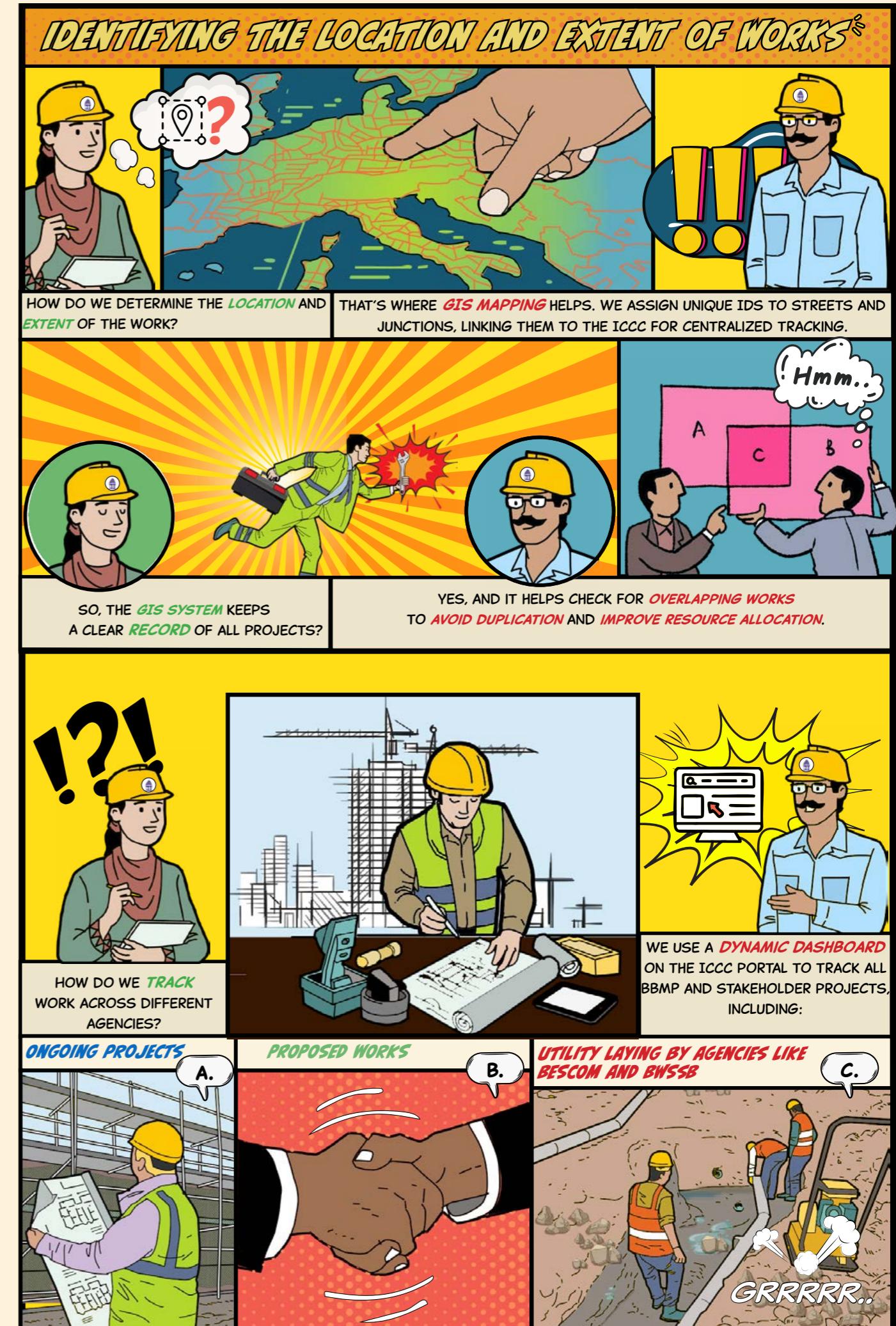
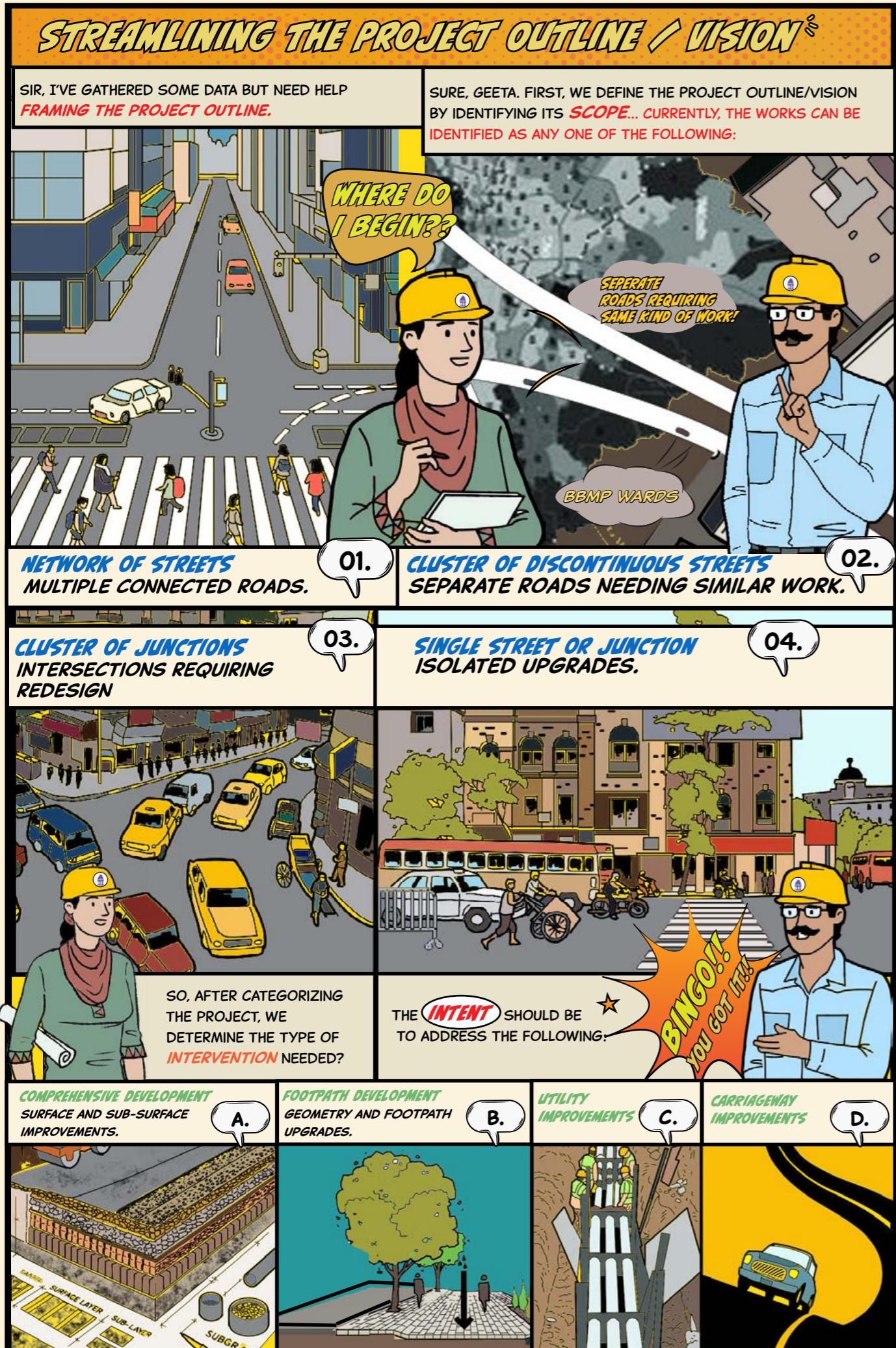
## CHAPTER - 1

# PROJECT PLANNING



### WELCOME TO CHAPTER 1!

CHAPTER 1 FOCUSES ON CLEAR PROJECT OUTLINE ENSURES EFFICIENT PLANNING, COORDINATION, AND EXECUTION. THIS CHAPTER COVERS PROJECT CATEGORIZATION, INTERVENTION TYPES, GIS-BASED TRACKING, STAKEHOLDER ROLES, BUDGET ALLOCATION, AND PAYMENT MODELS. BY STREAMLINING THESE PROCESSES, IT ENHANCES EFFICIENCY, PREVENTS DUPLICATION, AND ENSURES WELL-COORDINATED ROAD PROJECTS IN BENGALURU.



## SCOPE OF WORK<sup>®</sup>

ONCE THE PROJECT OUTLINE AND LOCATION ARE IDENTIFIED, HOW DO WE DIVIDE THE SCOPE OF WORK?

THE SCOPE OF WORK SHOULD BE DIVIDED INTO **THREE** PARTS:

**SCOPE FOR THE DPR CONSULTANT - DEFINING THE PROJECT DESIGN AND PLANNING.**

1. A man giving a presentation to a group of people. One person says "ZAP!!".

HOW DO WE CALCULATE THE BUDGET FOR THE PROJECT?

**SCOPE FOR THE PMC (PROJECT MANAGEMENT CONSULTANT) - OVERSEEING PROJECT EXECUTION**

2. A team working on a large blueprint of a building complex.

**LET'S TALK BUDGET!**

WE CALCULATE COSTS USING RATES PER KILOMETER FOR CORRIDORS AND PER SQUARE METER FOR JUNCTIONS.

AHA!

3. Construction workers carrying materials. One says "POINNNNT!" and another says "WHEEEEEE!"

**SCOPE FOR IMPLEMENTATION - EXECUTING THE WORK ON GROUND**

WAS THIS HELPFUL? WHAM!

THE BUDGET IS BASED ON THE FOLLOWING!!

A. SCRIBBLE SCRIBBLE SCRIBBLE

B. UGHHHHHH!

C. PROJECT OUTLINE EXTENT OF WORKS SCOPE OF WORK

## PAYMENT MODEL<sup>®</sup>

HOW DO WE DECIDE THE PAYMENT MODEL FOR DIFFERENT PROJECT SIZES?

PAYMENT REVIEW DEPENDS ON PROJECT SCALE:

**SMALL TO MEDIUM SCALE PROJECTS ARE REVIEWED BY EXECUTIVE ENGINEERS.**

A. LARGE SCALE PROJECTS ARE REVIEWED BY CHIEF ENGINEERS.

B.

LARGE TO MEGA SCALE PROJECTS ARE REVIEWED BY CHIEF ENGINEERS, SPECIAL COMMISSIONERS, OR THE COMMISSIONER.

C.

WHO DEFINES THE PROJECT SCALE?

BBMP, GOK, AND OTHER RELEVANT STAKEHOLDERS NEED TO DEFINE THE CRITERIA FOR **SMALL, MEDIUM, LARGE, AND MEGA** PROJECTS.

DOES THIS **SCALE** AFFECT THE **PROJECT STAGES?**

YES

THE DEFINED SCALE SHOULD GUIDE THE PROJECT AT **ALL STAGES**: FROM RFP TO DPR, IMPLEMENTATION, AND MONITORING, ETC.

# CHAPTER - 2

## DESIGN

### PART A - INTRODUCTION

#### WELCOME TO CHAPTER 2A!

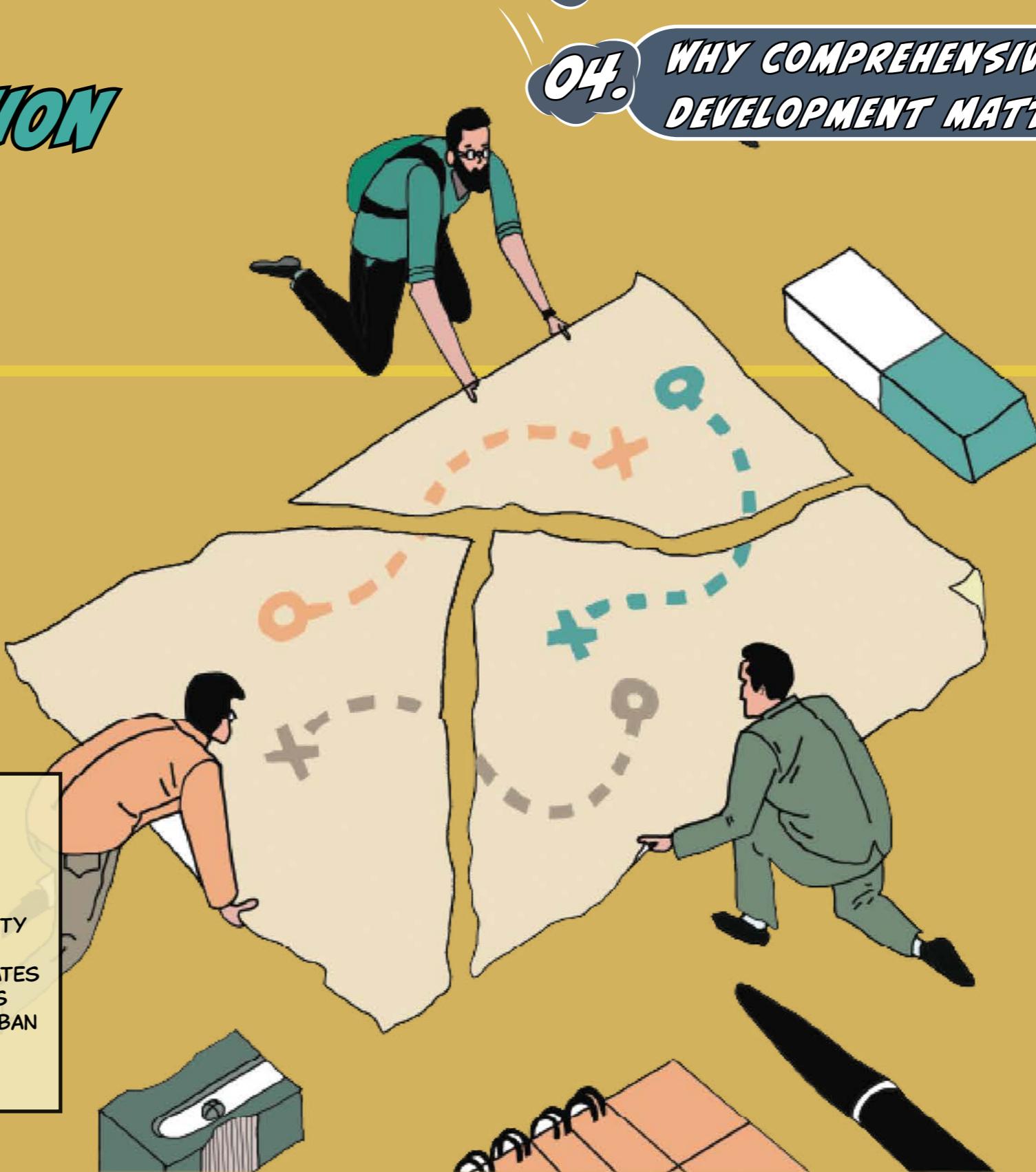
IN THIS CHAPTER, WE LOOK AT COMPREHENSIVE DEVELOPMENT, UPGRADING ROADS, FOOTPATHS, DRAINAGE, LIGHTING, AND UNDERGROUND UTILITIES IN A COORDINATED WAY, ENSURING DURABILITY AND REDUCING MAINTENANCE. BY INTEGRATING GEOMETRIC ROAD DESIGN, STORMWATER MANAGEMENT, AND UTILITY PLANNING, IT CREATES SAFER, MORE ACCESSIBLE, AND PEDESTRIAN-FRIENDLY STREETS. THIS CHAPTER EXPLORES HOW A HOLISTIC APPROACH CAN TRANSFORM URBAN INFRASTRUCTURE FOR LONG-TERM EFFICIENCY AND LIVABILITY.

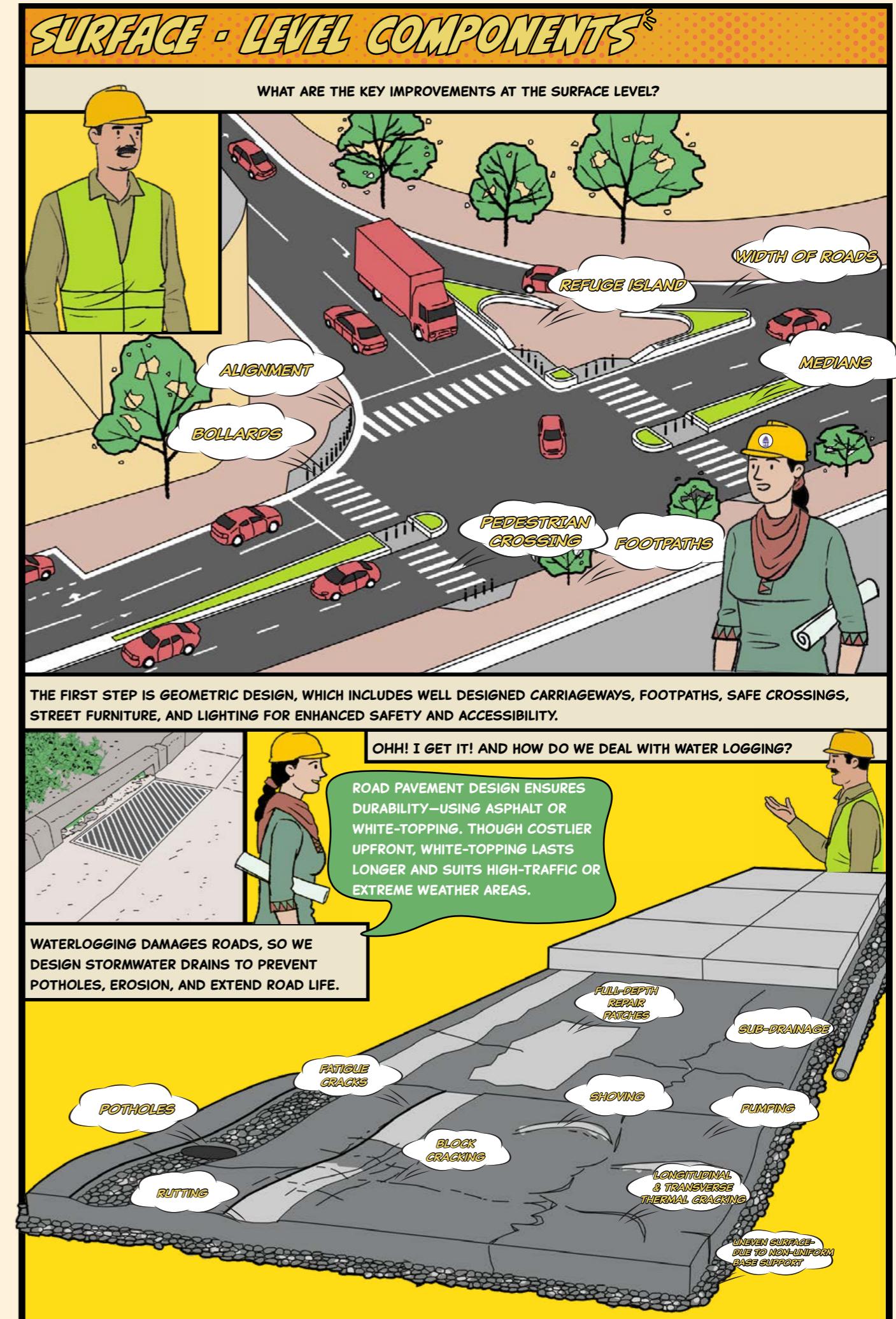
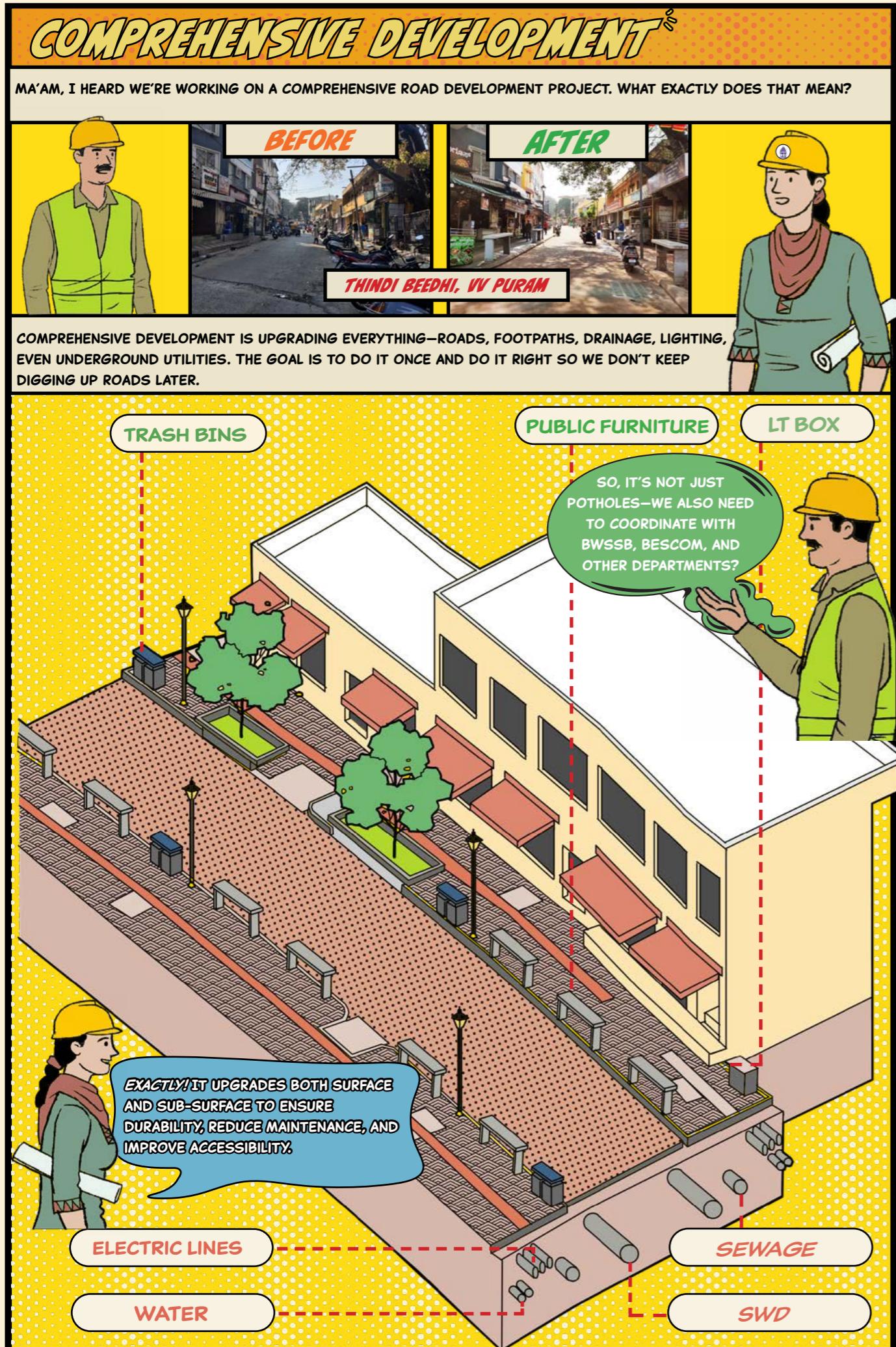
01. COMPREHENSIVE DEVELOPMENT

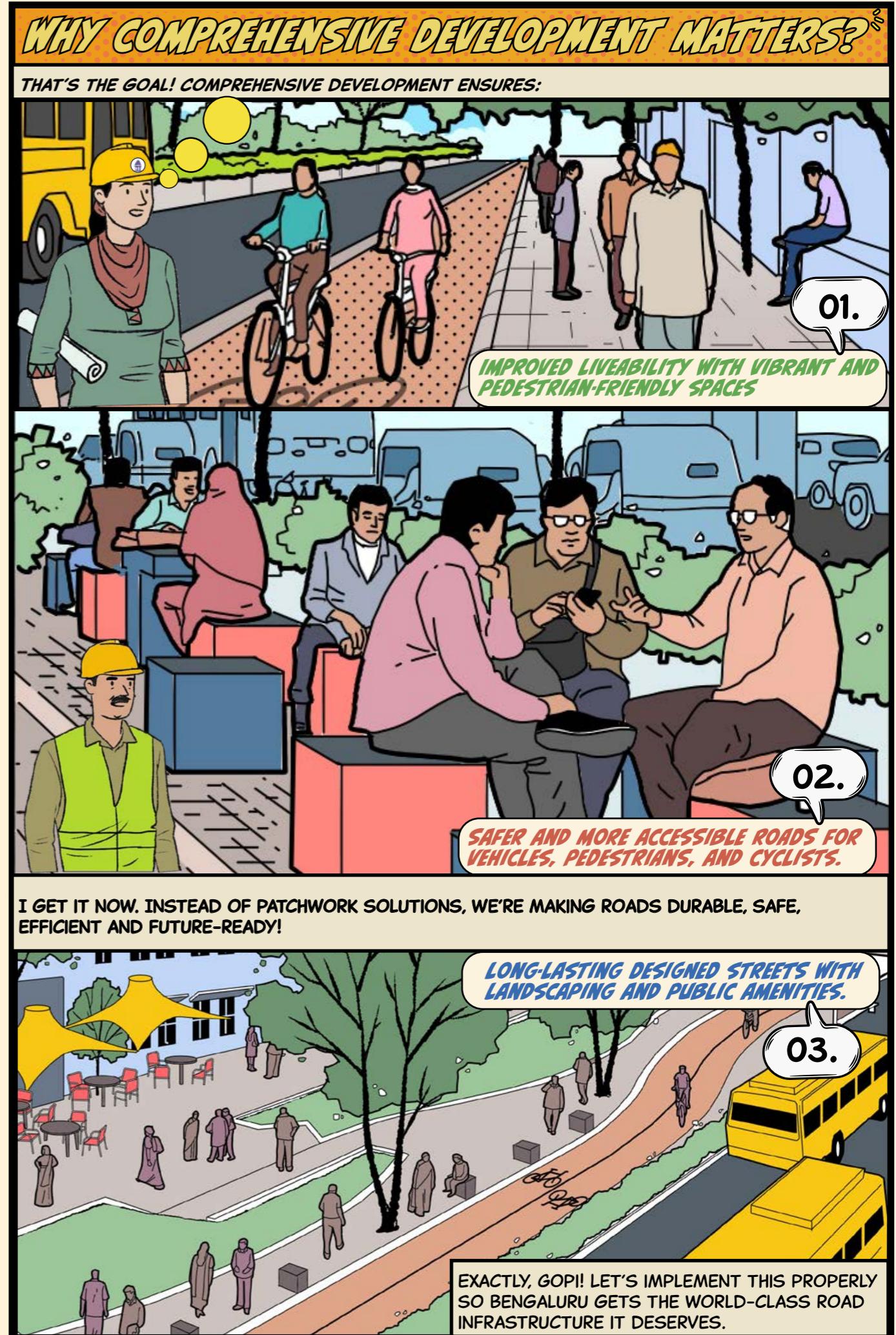
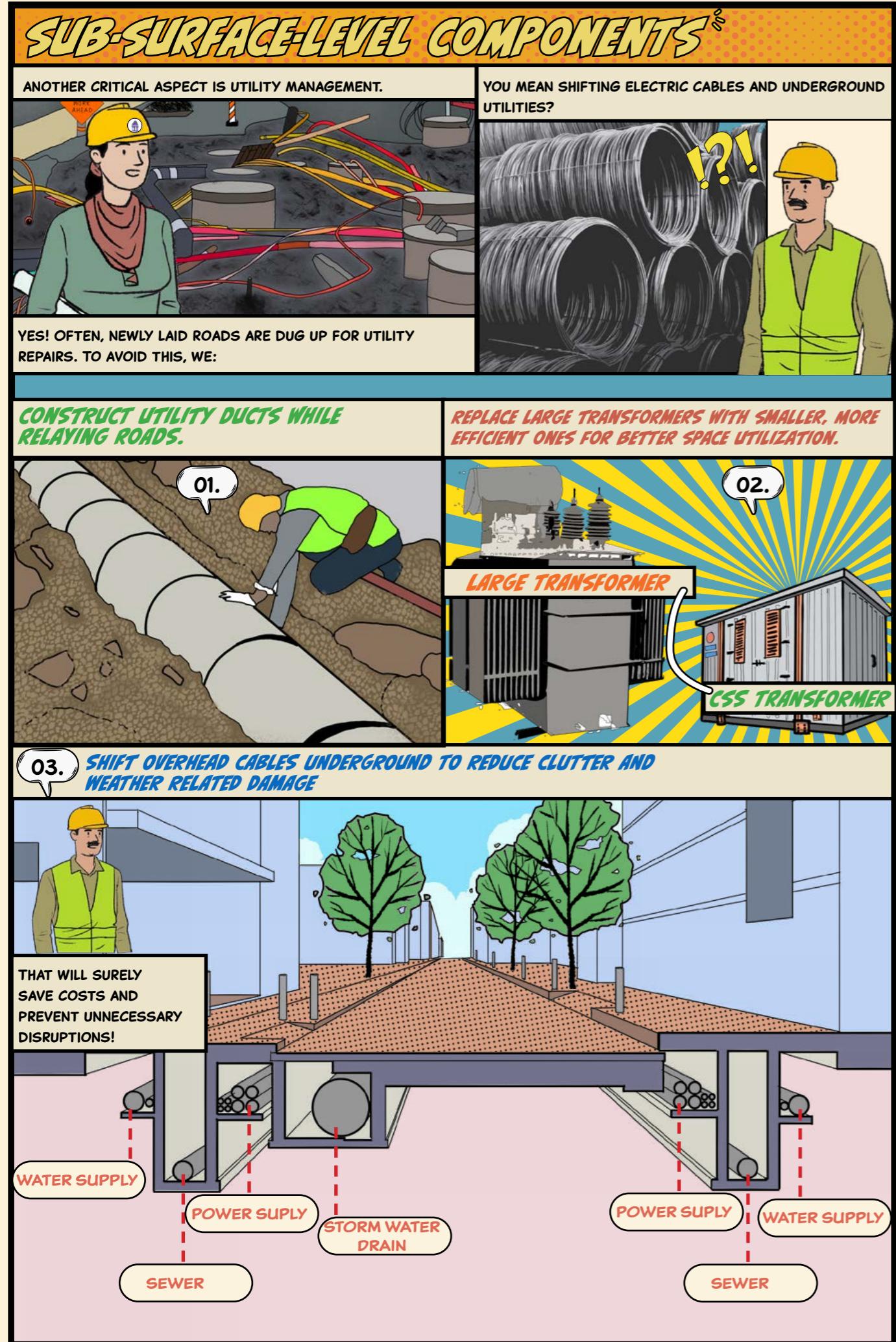
02. SURFACE-LVL COMPONENTS

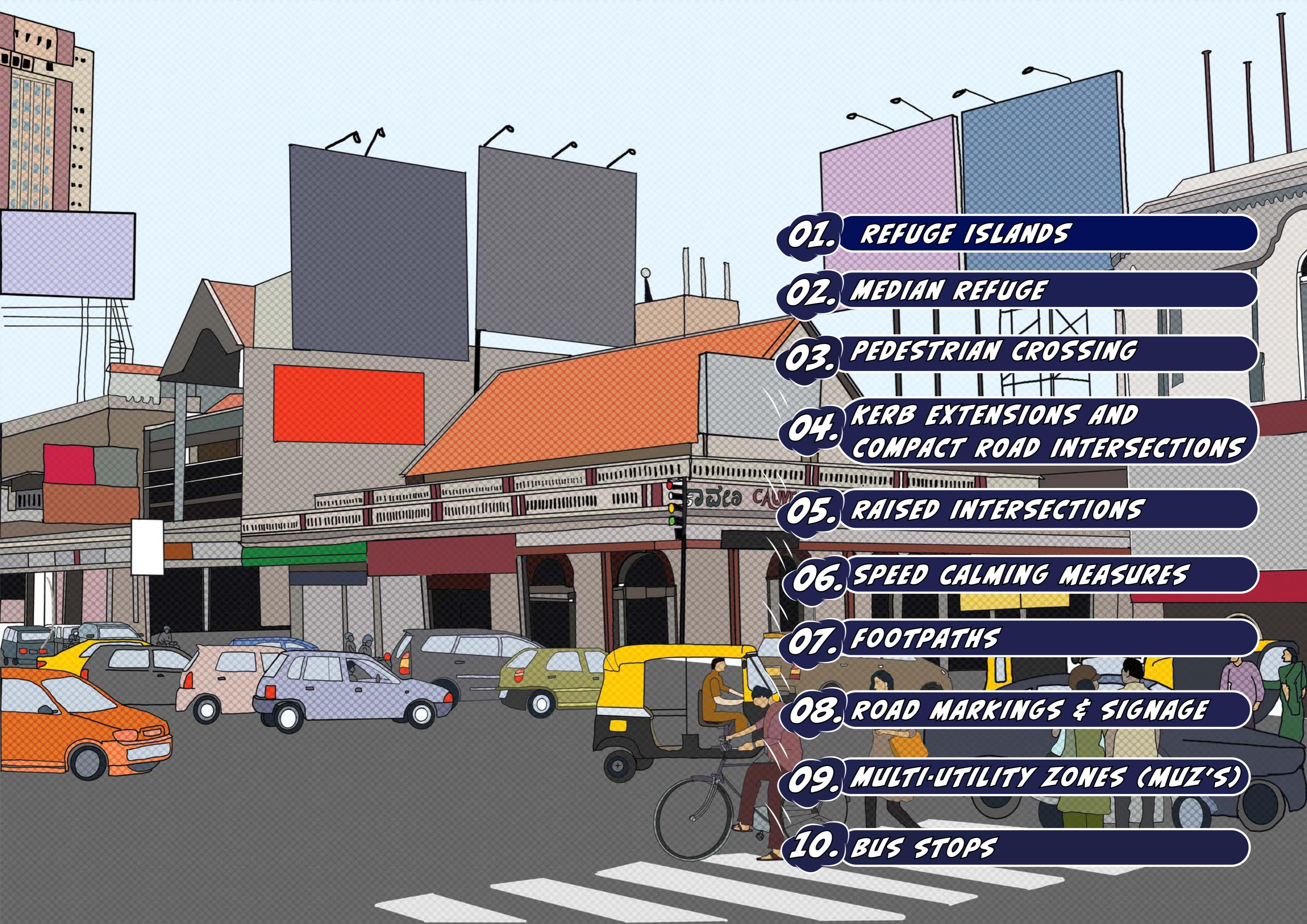
03. SUB-SURFACE LVL COMPONENTS

04. WHY COMPREHENSIVE DEVELOPMENT MATTERS?









**01. REFUGE ISLANDS**

**02. MEDIAN REFUGE**

**03. PEDESTRIAN CROSSING**

**04. KERB EXTENSIONS AND  
COMPACT ROAD INTERSECTIONS**

**05. RAISED INTERSECTIONS**

**06. SPEED CALMING MEASURES**

**07. FOOTPATHS**

**08. ROAD MARKINGS & SIGNAGE**

**09. MULTI-UTILITY ZONES (MUZ'S)**

**10. BUS STOPS**

# DESIGN OF ROADS & SPECIAL AREAS<sup>®</sup>

HEY EVERYONE! THIS IS OUR PLAN TO IMPROVE THE BUSY STREETS AND INTERSECTIONS IN BENGALURU. LET'S MAKE OUR ROADS **SAFER** AND **MORE EFFICIENT!!**

**BEFORE**                                    **AFTER**

**CHURCH STREET**

THESE ARE PROVEN DESIGNS THAT WORK AROUND THE WORLD! **SIMPLE** AND **COST EFFECTIVE** MEASURES WITH A LARGE IMPACT. LET'S EXAMINE EACH ONE IN TURN!

## 1. REFUGE ISLAND

**REFUGE ISLAND**

**CROSSING**

**REFUGE ISLAND**

**MEDIAN REFUGE**

WHY ARE THESE **REFUGE ISLANDS** SO BIG? DON'T THEY JUST WASTE SPACE, MONEY AND CAUSE CONGESTION?

NOT AT ALL! THEY **GUIDE TRAFFIC**, **SHORTEN CROSSING DISTANCES** AND, **IMPROVE VISIBILITY** WITHOUT CAUSING DELAYS.

## 2. MEDIAN REFUGE

**STOP LINE**

**C.**

**0.3 M SPACING**

**MIN. WIDTH- 3M, MIN. DEPTH- 12M FOR RAMP**

**MAX. MEDIAN HEIGHT- 0.6 M (AS PER IRC 1999 GUIDELINES FOR INTERSECTION)**

**A.**

## 3. PEDESTRIAN CROSSING

WON'T VEHICLES ENTER IF WE PUT **BOLLARDS** FAR APART? WON'T EXTENDING THE MEDIAN **REDUCE THE CARRIAGeway SPACE?**

**BOLLARD SPACING**

**0.6 M**

**12 M BOLLARD SPACING**

NO!! WE ENSURE UNIFORM ROAD AND FOOTPATH WIDTHS, WITH ANY EXTRA SPACE USED FOR THE MEDIAN.

## 4. KERB EXTENSIONS & COMPACT ROAD INTERSECTIONS

WON'T A SMALL TURNING RADIUS MAKE IT HARD FOR VEHICLES TO TURN?

ACTUALLY, IT HELPS SLOW DOWN VEHICLES, MAKING IT **SAFER** FOR BOTH VEHICLES AND PEDESTRIANS.

## 5. RAISED INTERSECTIONS

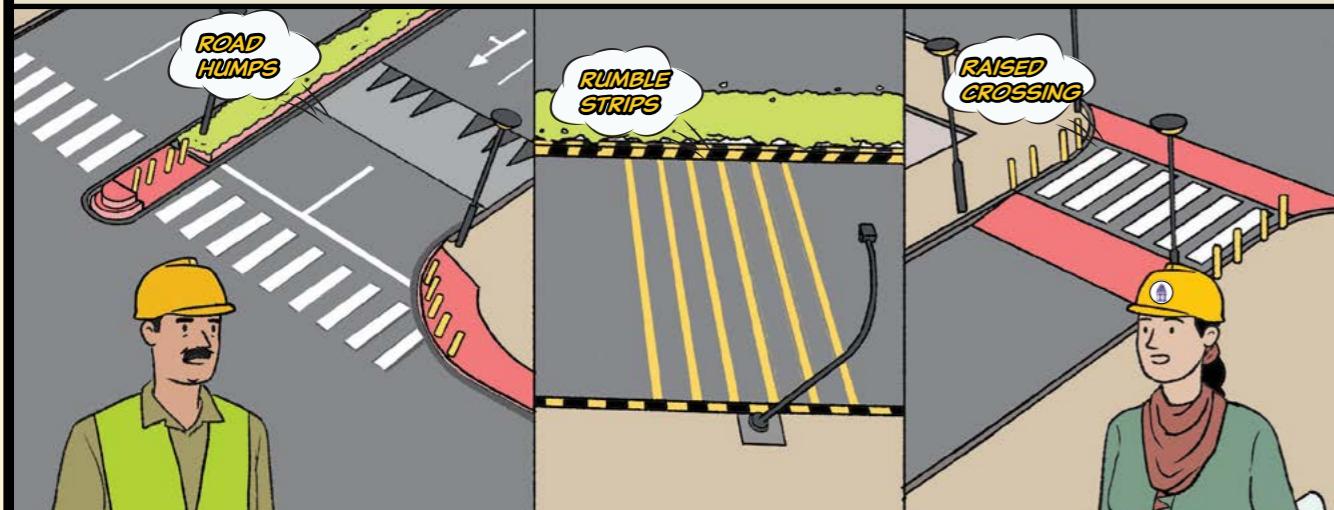
WHY DO WE NEED **RAISED INTERSECTIONS** NEAR IMPORTANT PUBLIC SPACES LIKE SCHOOLS?

ACTUALLY, IT HELPS INCREASE VISIBILITY OF PEDESTRIANS AND PRIORITIZES PEDESTRIANS, MAKING IT **SAFER** FOR BOTH **VEHICLES AND PEDESTRIANS**.

# *DESIGN OF ROADS & SPECIAL AREAS*



## **6. SPEED CALMING MEASURES -HRPC/SPEED HUMPS/RUMBLE STRIPS**

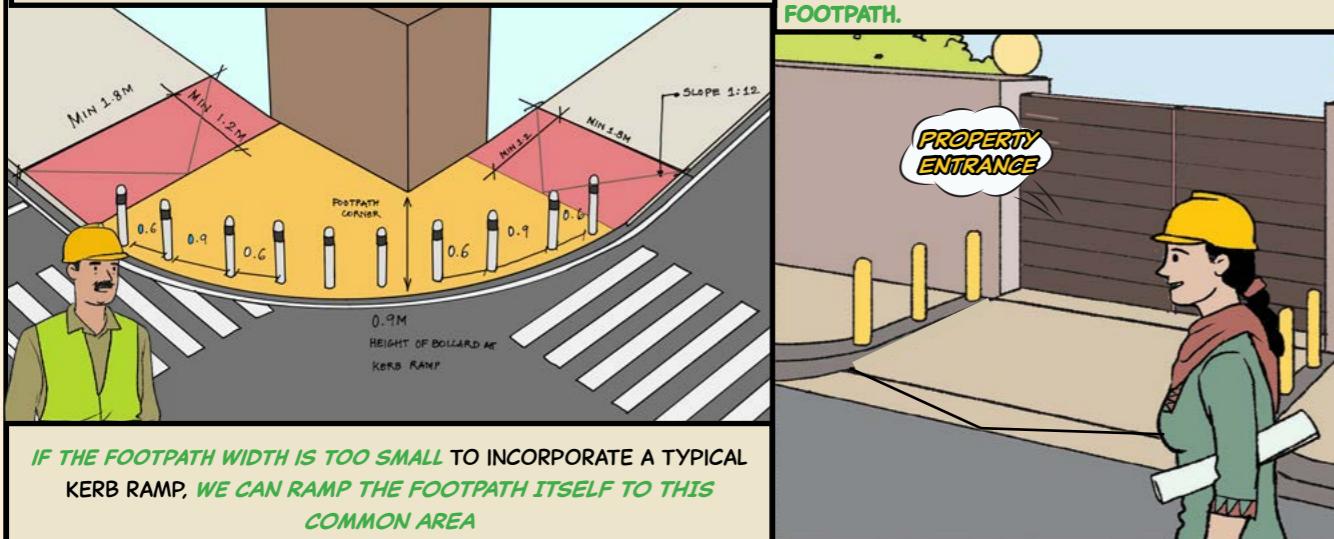


## HOW DO WE DECIDE THE SIZE OF THE SPEED HUMP?

AS PER IRC, SPEED HUMPS SHOULD HAVE A 17M RADIUS, 3.7M WIDTH, AND 0.1M HEIGHT, DESIGNED FOR A 25 KM/H ADVISORY SPEED.

7. FOOTPATHS

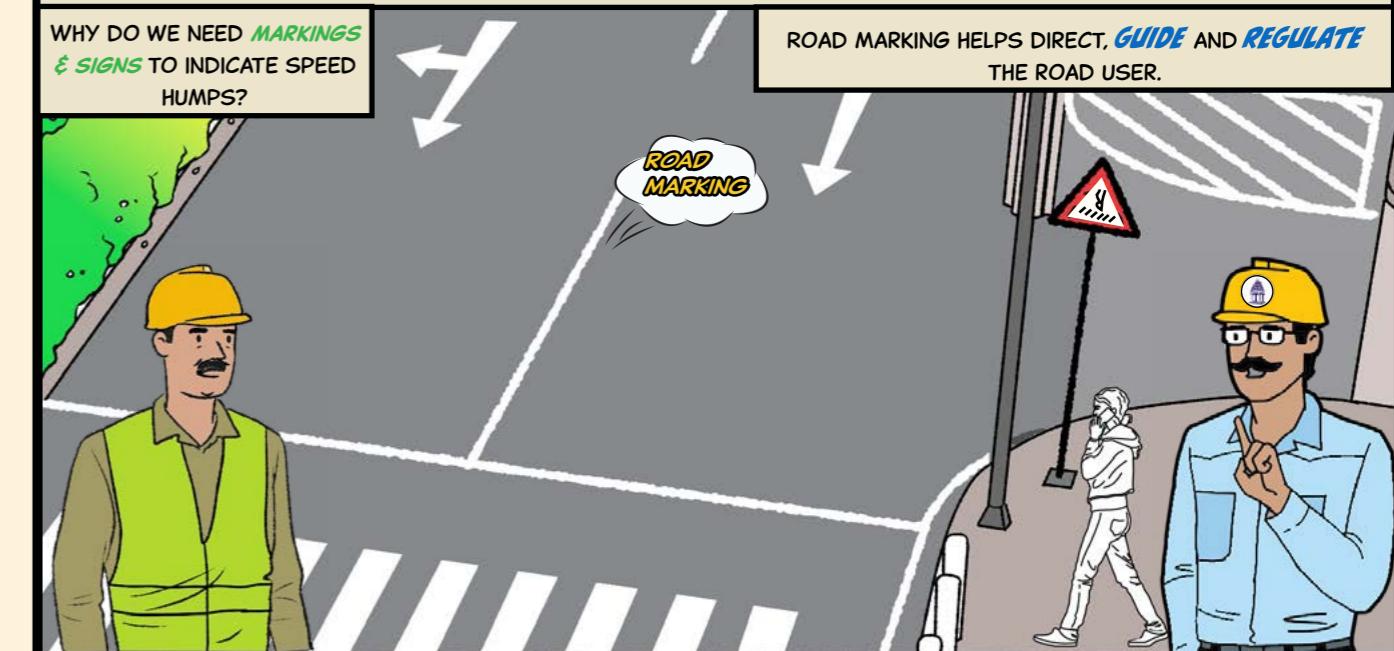
**WHAT IF THE FOOTPATHS ARE TOO SMALL?  
WHERE DO WE PUT THE RAMP?**



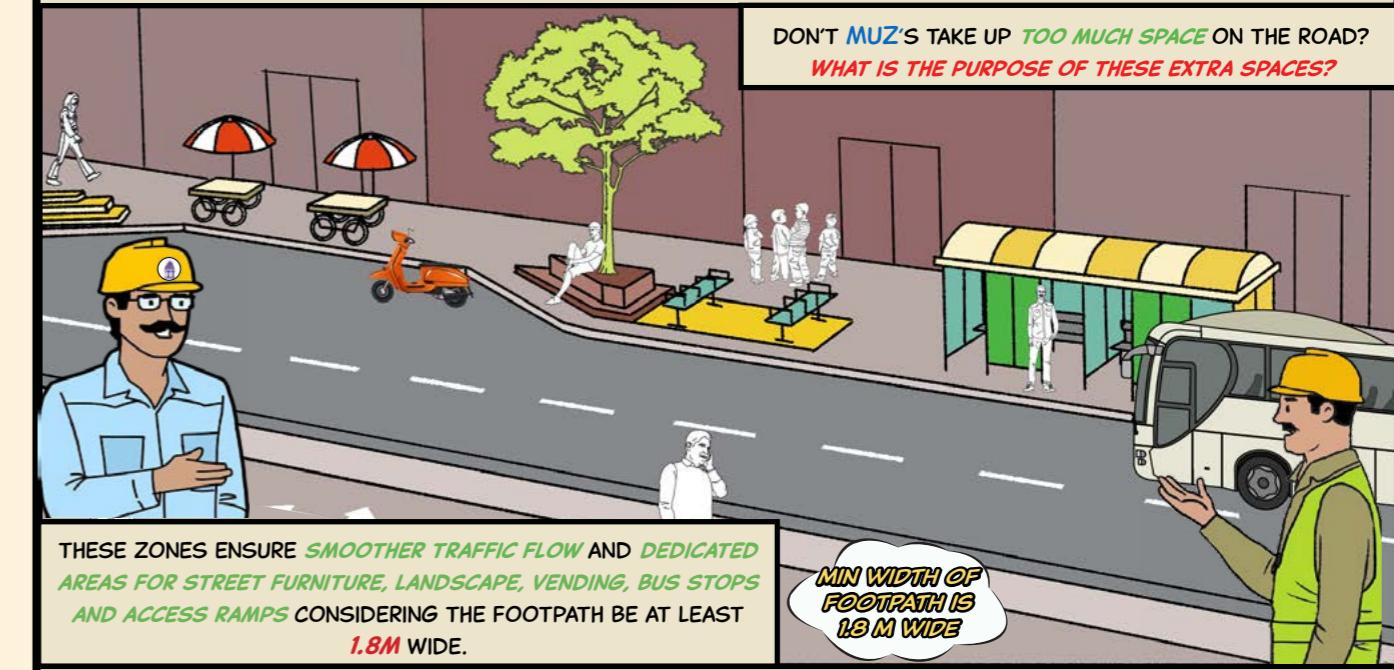
## **8. ROAD MARKING & SIGNAGE**

## WHY DO WE NEED **MARKINGS** **& SIGNS** TO INDICATE SPEED HUMPS?

ROAD MARKING HELPS DIRECT, **GUIDE** AND **REGULATE**  
THE ROAD USER.



## **9. MULTI-UTILITY ZONES (MUZ'S)**



## **10. BUS STOPS**

**BUS STOPS ARE PAUSE POINTS. WILL THEY OBSTRUCT MOVING TRAFFIC? HOW DO WE DESIGN SPACES FOR BUS STOPS?**



## CHAPTER - 3

### ENGINEERING

#### PART A - ASPHALTING & WHITE-TOPPING

##### WELCOME TO CHAPTER 3A!

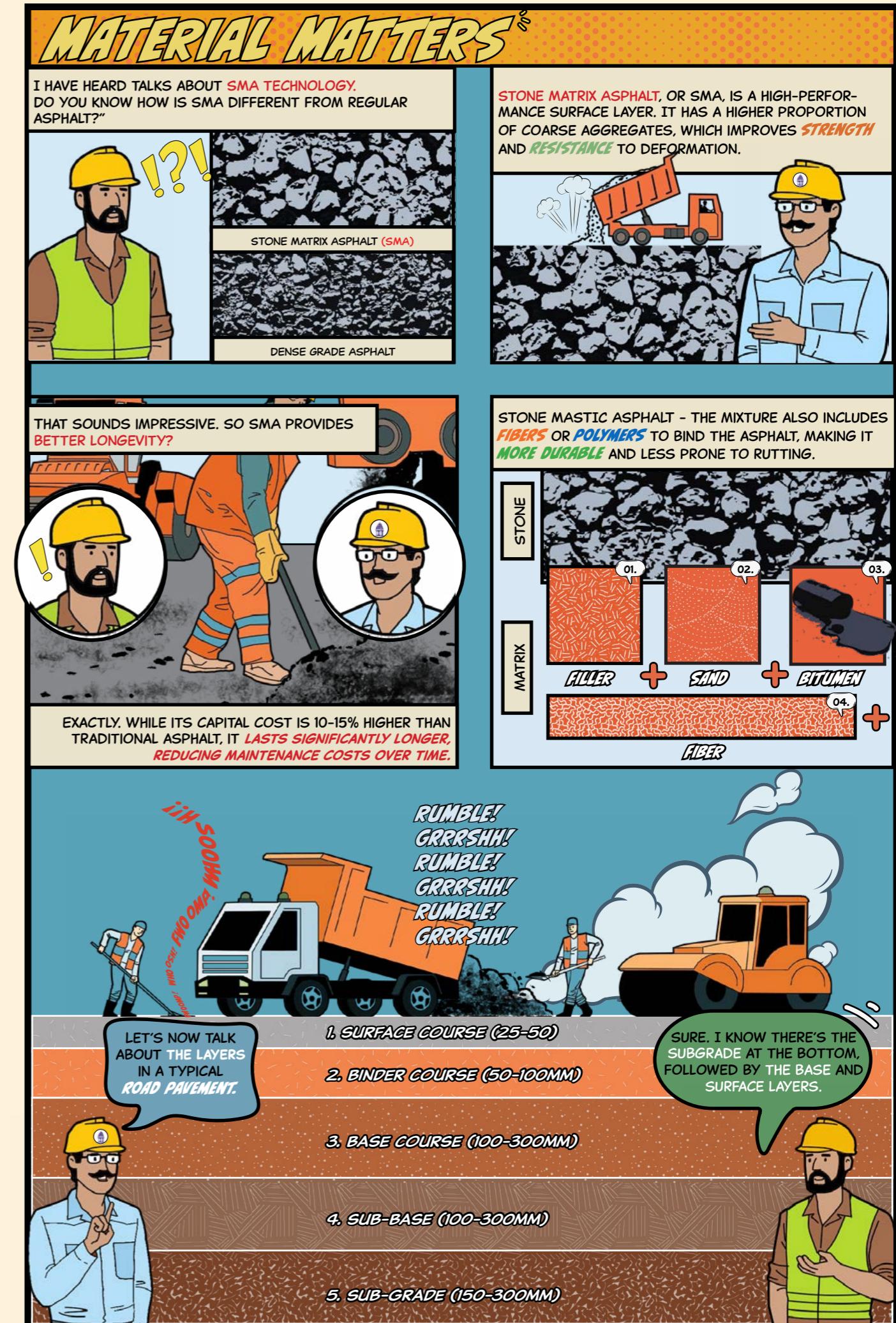
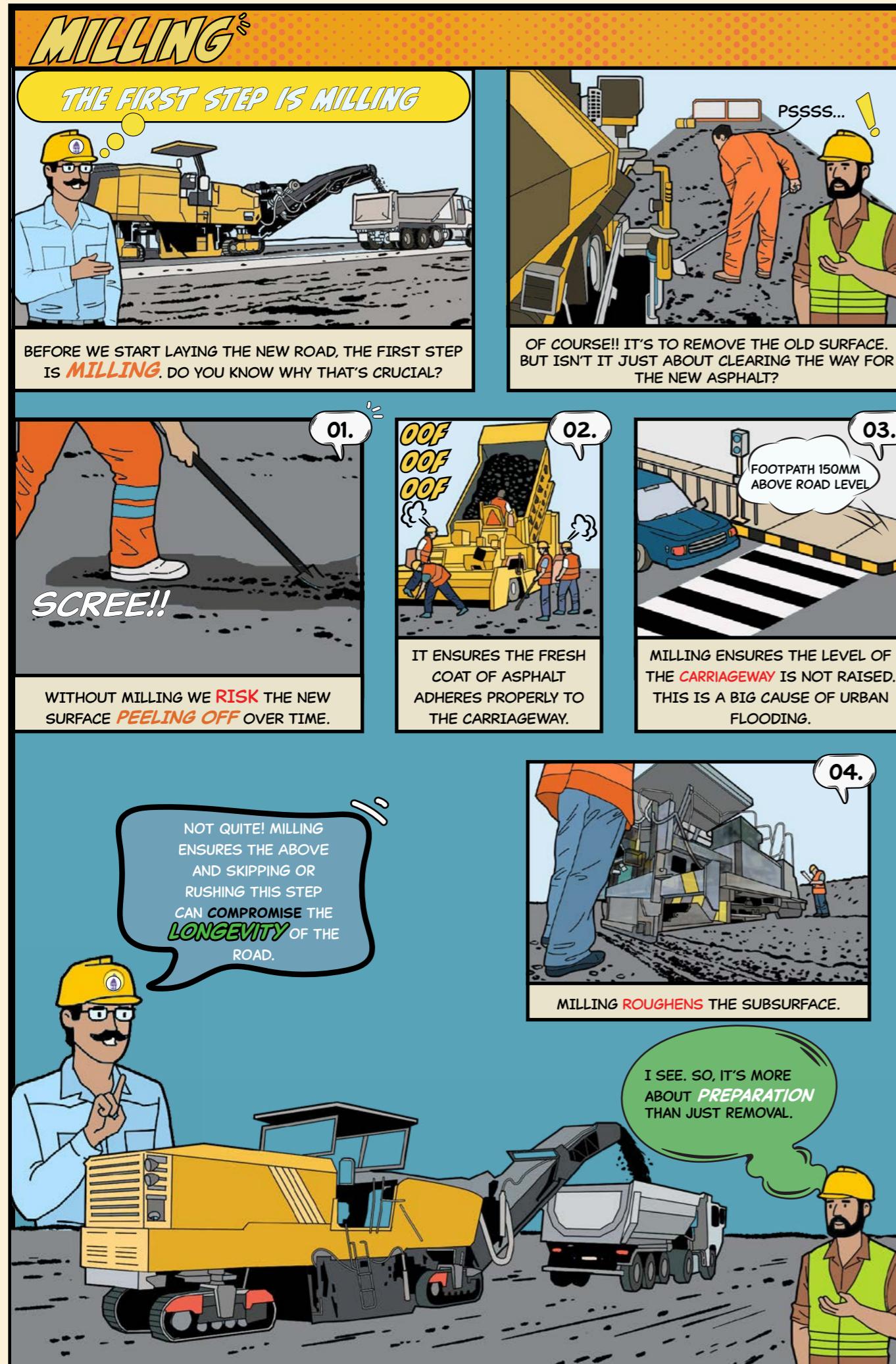
IN THIS CHAPTER, WE FOCUS ON THE CRITICAL PROCESS OF ASPHALTING—A KEY METHOD IN ROAD CONSTRUCTION THAT ENSURES SMOOTH, LONG-LASTING SURFACES FOR ALL TYPES OF TRAFFIC. WHETHER YOU'RE LAYING DOWN FRESH ASPHALT FOR A BRAND-NEW ROAD OR RESURFACING AN EXISTING ONE, UNDERSTANDING THE STEPS AND TECHNIQUES INVOLVED IS ESSENTIAL. THROUGH THIS CHAPTER, WE'LL WALK YOU THROUGH EACH PHASE, SHARE BEST PRACTICES, AND PROVIDE EXPERT TIPS TO ENSURE YOUR PROJECT STANDS THE TEST OF TIME. LET'S GET STARTED!

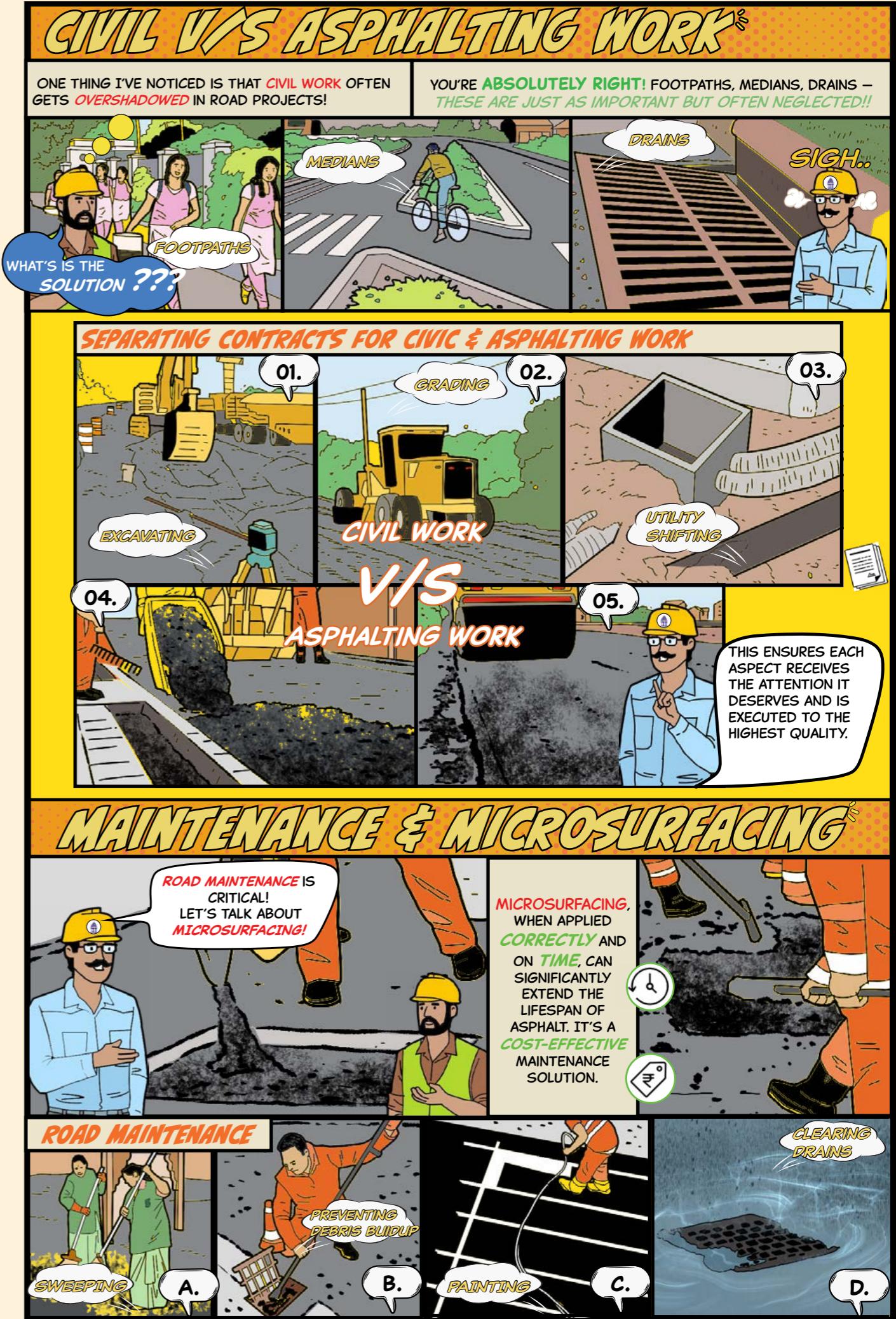
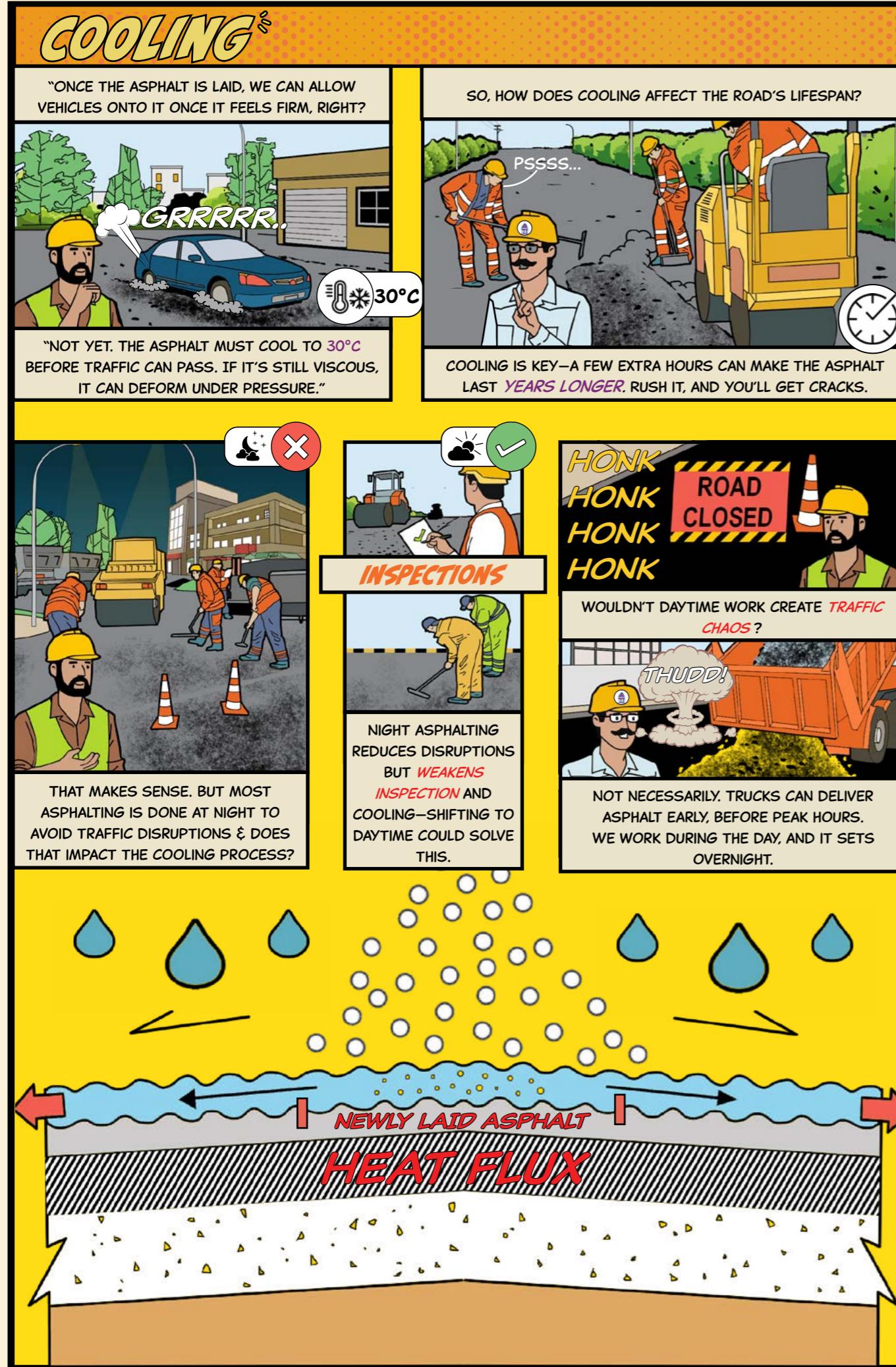
01. MILLING

02. MATERIAL MATTERS

03. COOLING

04. CIVIL V/S ASPHALTING





## CHAPTER - 3B

# UTILITY DESIGN

UTILITY  
WORK  
AHEAD

01. UTILITY DESIGN

02. COMPONENTS OF  
UTILITY DESIGN

### WELCOME TO CHAPTER 3B!

EFFECTIVE UTILITY DESIGN INTEGRATES DRAINAGE, SEWAGE, WATER, OFC, AND ELECTRICITY TO PREVENT FREQUENT ROAD EXCAVATION AND ENSURE DURABILITY. SMART PLANNING REDUCES MAINTENANCE, PREVENTS FLOODING, AND SUPPORTS GROUNDWATER RECHARGE. THIS CHAPTER EXAMINES STORMWATER MANAGEMENT, STRUCTURED UTILITY PLACEMENT, AND DIGITAL TRACKING FOR EFFICIENT, RESILIENT URBAN INFRASTRUCTURE.

# UTILITY DESIGN

**DESIGNING, ENGINEERING AND IMPLEMENTATION OF SUB-SURFACE UTILITIES INCLUDING STORM WATER DRAINS, SEWAGE, WATER, OFC, ELECTRIC.**

UTILITY DESIGN ISN'T JUST ABOUT LAYING PIPES! IT'S ABOUT SMART PLANNING SO WE DON'T KEEP DIGGING UP ROADS!

SIGH... !?!

EXACTLY! BY COORDINATING WITH BWSSB, BESCOM, AND OTHERS, WE FUTURE PROOF THE SYSTEM AND KEEP THINGS ACCESSIBLE.

YOU GOT IT!

OH, SO IF WE DO IT RIGHT, WE AVOID THE CONSTANT MESS OF REPAIRS?

AND THAT INCLUDES DRAINAGE TOO?

STORM WATER DRAINS!

PREVENTS WATER LOGGING

ROAD CAMBERING

YEP! STORM WATER DRAINS, ROAD CAMBERING—EVERYTHING WORKS TOGETHER TO PREVENT WATER-LOGGING AND MAKE ROADS LAST LONGER!

**UTILITIES**

SO, UTILITIES JUST GET PLACED WHEREVER THERE'S SPACE?

BUT WHAT IF SOMEONE NEEDS TO DIG LATER?

HOW DO WE KEEP TRACK OF NEW UTILITY LINES?

MARCS APPLICATION

CENTRAL DYNAMIC DASHBOARD UNDER ICCC

WHEN SHOULD UTILITIES BE SHIFTED?

DURING COMPREHENSIVE ROAD DEVELOPMENT—TO AVOID FUTURE DIGGING AND DAMAGE TO PAVEMENTS.

THAT SHOULD BE RARE! MARCS APPLICATIONS FOR DIGGING SHOULD BE HIGHLY RESTRICTED AND ONLY FOR EMERGENCIES.

# COMPONENTS OF UTILITY DESIGNS

## PIPES

THERE ARE THREE KEY PARTS—UNDERGROUND PIPES, GROUNDWATER RECHARGE PITS, PROPERLY DESIGNED STREET DRAINS AND ROAD CAMBERING.

OH!! SO, IT'S NOT JUST ABOUT PIPES?

WHY USE PIPES INSTEAD OF BOX DRAINS?

V/S

PIPES

BOX DRAINS

UNDERGROUND PIPES

HOW DOES GROUNDWATER RECHARGE WORK?

**GROUNDWATER RECHARGE**

PERCOLATION PITS

PIPES REDUCE SILTING AND NEED LESS MAINTENANCE. PLUS, ACCESS POINTS MAKE DESILTING EASIER.

**DRAINS**

WHAT ABOUT STREET DRAINS?

SILT FILTRATION CHAMBER

A.

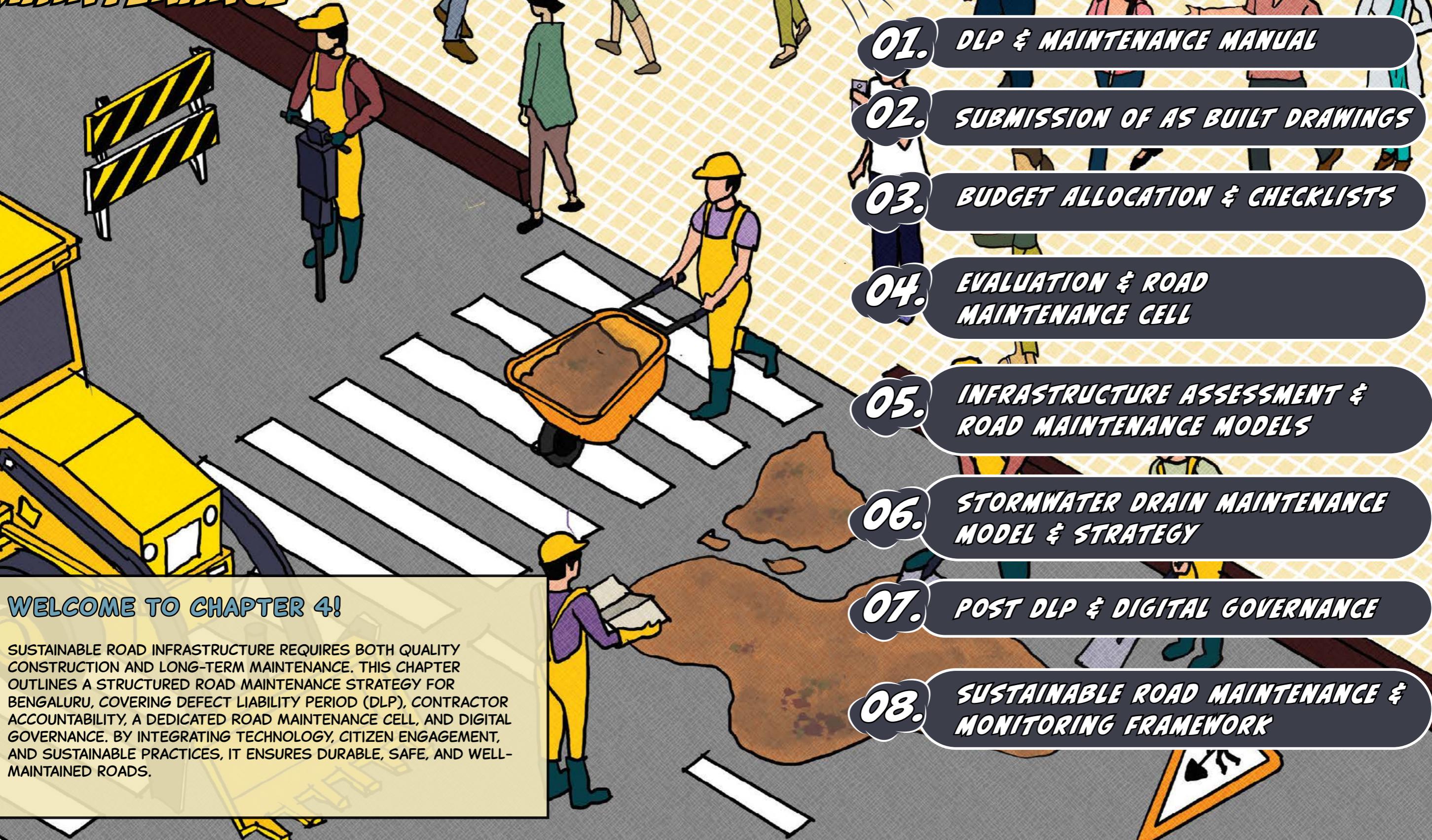
GREEN BUFFERS ALONG FOOTPATHS ALSO HELP ABSORB EXCESS WATER.

B.

REDUCED PRESSURE ON DRAINS & LAKES

## CHAPTER - 4

# OPERATIONS & MAINTENANCE



## DEFECT LIABILITY PERIOD (DLP)

**WHY IS D.L.P. IMPORTANT?**

**THE DEFECT LIABILITY PERIOD (DLP) IS CRUCIAL FOR HOLDING CONTRACTORS ACCOUNTABLE.** WE NEED TO ENSURE THE RFP CLEARLY DEFINES THEIR RESPONSIBILITIES. THE SCOPE SHOULD OUTLINE:

**DLP DURATION:** CONTRACTOR IS LIABLE FOR REPAIRS AND DEFECTS FOR A SET PERIOD.

**COVERED DEFECTS:** INCLUDES POTHOLES, SINKHOLES, STRUCTURAL FAILURES, PAVEMENT DAMAGE, AND DRAINAGE ISSUES.

**01.**   
SCRAPE! SHNK!  
SCRAPE! SHNK!  
SCRAPE! SHNK!

**02.** 

**MAINTENANCE DUTIES:** ROUTINE CHECKS, EMERGENCY FIXES, AND DEFECT RECTIFICATION.

**REPORTING:** MUST SUBMIT AS-BUILT DRAWINGS AND POST-IMPLEMENTATION REPORTS.

**PENALTIES:** STRICT CONSEQUENCES FOR NON-COMPLIANCE.

**03.** 

**04.** 

**05.** 

## SUBMISSION OF AS-BUILT DRAWINGS & MAINTENANCE MANUAL

AT PROJECT COMPLETION, CONTRACTORS MUST SUBMIT PROPER DOCUMENTATION.

**AS-BUILT DRAWINGS:** FINAL CONSTRUCTION PLANS WITH MODIFICATIONS.

**POST-IMPLEMENTATION REPORT:** MATERIALS, QUALITY CERTIFICATIONS, ROAD HEALTH, AND MAINTENANCE STRATEGY.

**Maintenance Manual:** PROTOCOLS, INSPECTION FREQUENCY, AND PREVENTIVE UPKEEP GUIDELINES

WHAT EXACTLY DO THEY NEED TO PROVIDE?

## BUDGET ALLOCATION FOR DOCUMENTATION

WE NEED TO ALLOCATE A BUDGET FOR PROPER DOCUMENTATION. WITHOUT IT, TRACKING ROAD QUALITY AND MAINTENANCE BECOMES A CHALLENGE.

SIMPLE FAILURE WILL LEAD TO AN OFFICIAL NON-COMPLIANCE NOTICE, WHICH GOES ON RECORD.

NO DOCUMENTATION, NO CLEAN HANDOVER!

AGREED, BUT WHAT IF CONTRACTORS DON'T COMPLY?

## NON-COMPLIANCE & CONTRACTOR PERFORMANCE EVALUATION

WE SHOULD INTRODUCE A CONTRACTOR PERFORMANCE EVALUATION SYSTEM TO BOOST ACCOUNTABILITY.

YES!! IF CONTRACTORS MISS REQUIRED DOCS—LIKE AS-BUILTS, REPORTS, OR MANUALS—they lose points for future BBMP BIDS.

THAT'LL DEFINITELY KEEP THEM ON TRACK!

## STANDARDIZED PROJECT COMPLETION CHECKLIST

WE NEED A STANDARDIZED PROJECT COMPLETION CHECKLIST TO ENSURE PROPER PROJECT CLOSURE.

THIS IS THE LAST STEP BEFORE SIGN-OFF AND FINANCIAL CLOSURE. WHAT SHOULD IT COVER?

**VERIFY COMPLETED WORK AS PER DESIGN.**

**ENSURE MATERIAL QUALITY COMPLIANCE.**

**CHECK DRAINAGE AND STORMWATER CHANNELS.**

**CONFIRM PEDESTRIAN AND VEHICULAR SAFETY MEASURES.**

**SUBMIT ALL REQUIRED DOCUMENTS**

WE SHOULD ALSO SET UP A MEMO SYSTEM FOR REPEAT VIOLATORS.

DEFINITELY, THESE MEASURES WILL ENSURE ONLY RELIABLE CONTRACTORS ARE ENGAGED IN FUTURE PROJECTS, IMPROVING ROAD QUALITY AND SUSTAINABILITY!

1ST MEMO: OFFICIAL WARNING FOR NON-COMPLIANCE.

2ND MEMO: DEDUCTION OF QUALIFICATION POINTS FOR FUTURE TENDERS.

3RD MEMO: BLACKLISTING OF THE CONTRACTOR FROM BBMP PROJECT

WE NEED A DEDICATED ROAD MAINTENANCE CELL WITHIN BBMP TO KEEP BENGALURU'S ROADS IN CHECK.

AGREED! IT SHOULD INCLUDE MEMBERS FROM BBMP ENGINEERING AND MAINTENANCE, BTP, BWSSB, BESCOM, TELECOM PROVIDERS, URBAN DEVELOPMENT AUTHORITIES, AND EVEN CITIZEN GROUPS LIKE RWAS AND NGOs.

## ESTABLISHMENT OF A DEDICATED ROAD MAINTENANCE CELL

### PRIMARY FUNCTION OF ROAD MAINTENANCE CELL

**ROUTINE INSPECTIONS** A.

MONTHLY AND QUARTERLY AUDITS TO SPOT EARLY DEFECTS LIKE POTHOLES AND CRACKS.

**EMERGENCY RESPONSE** B.

DEDICATED HELPLINE AND DIGITAL SYSTEM FOR PUBLIC COMPLAINTS AND TIMELY FIXES.

**MAINTENANCE COORDINATION** C.

SMOOTH COORDINATION BETWEEN BBMP, TRAFFIC POLICE, UTILITY AGENCIES, AND CONTRACTORS.

**STAKEHOLDER ENGAGEMENT** D.

REGULAR MEETINGS WITH CITIZENS, LOCAL LEADERS, AND URBAN EXPERTS FOR FEEDBACK ON MAINTENANCE.





