



PIARC International Seminar

The Best Practices for Earthworks
and Rural Roads



Tunis, Tunisia, 14 - 16 November 2018
Hotel Golden Tulip El Mechtel Tunis

Presentation: The Construction and Maintenance of Rural Roads

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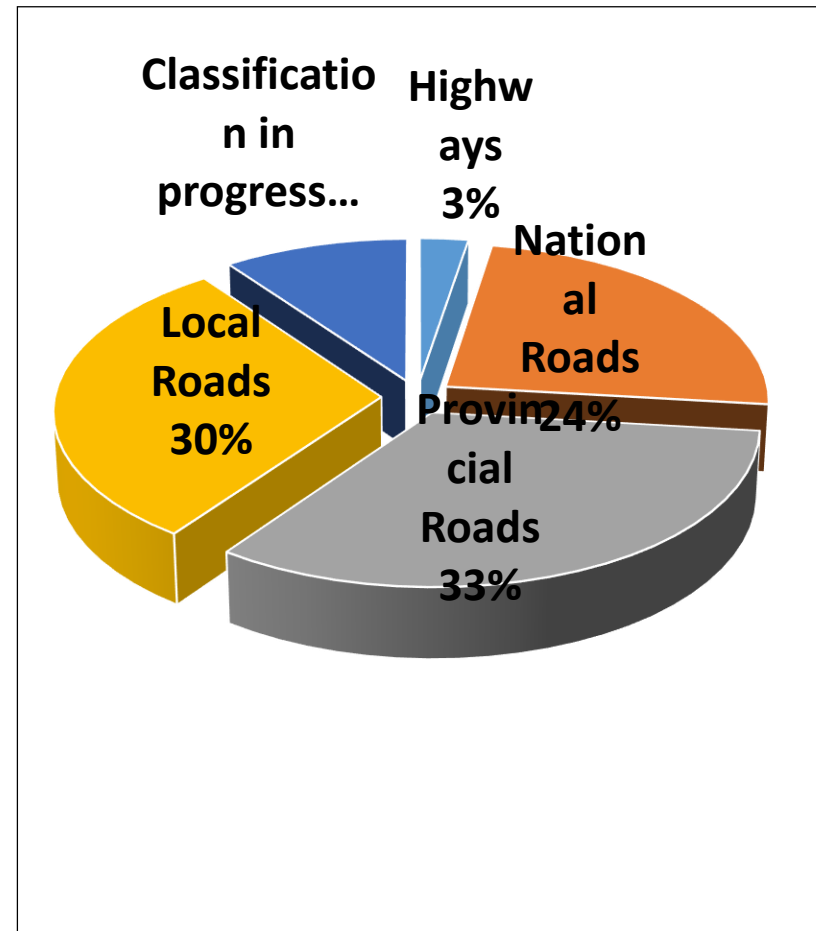
Tunis, 14.11.2018

Outline:

- Tunisia Classified Road Network
- Rural Roads in Tunisia
 - **Importance Of Rural Roads**
 - **Structure In Charge Of The Rural Roads**
 - **Inventory Of The Rural Roads Network**
 - **Funding Of The Rural Roads**
 - **The Construction Of Rural Roads**
 - **The Maintenance Of Rural Roads**

Tunisia Classified Road Network :

	Number	Length (KM)	Length of paved roads	Ratio (%)
Highways	3	622	622	3,1%
National Roads (RN)	30	4746	4440	22,5%
Provincial roads (RR)	149	6507	5869	29,7%
Local roads (RL)	468	5928	3658	18,5%
Classification in progress		1961	1501	7,6%
Total	650	19764	16090	81,4%





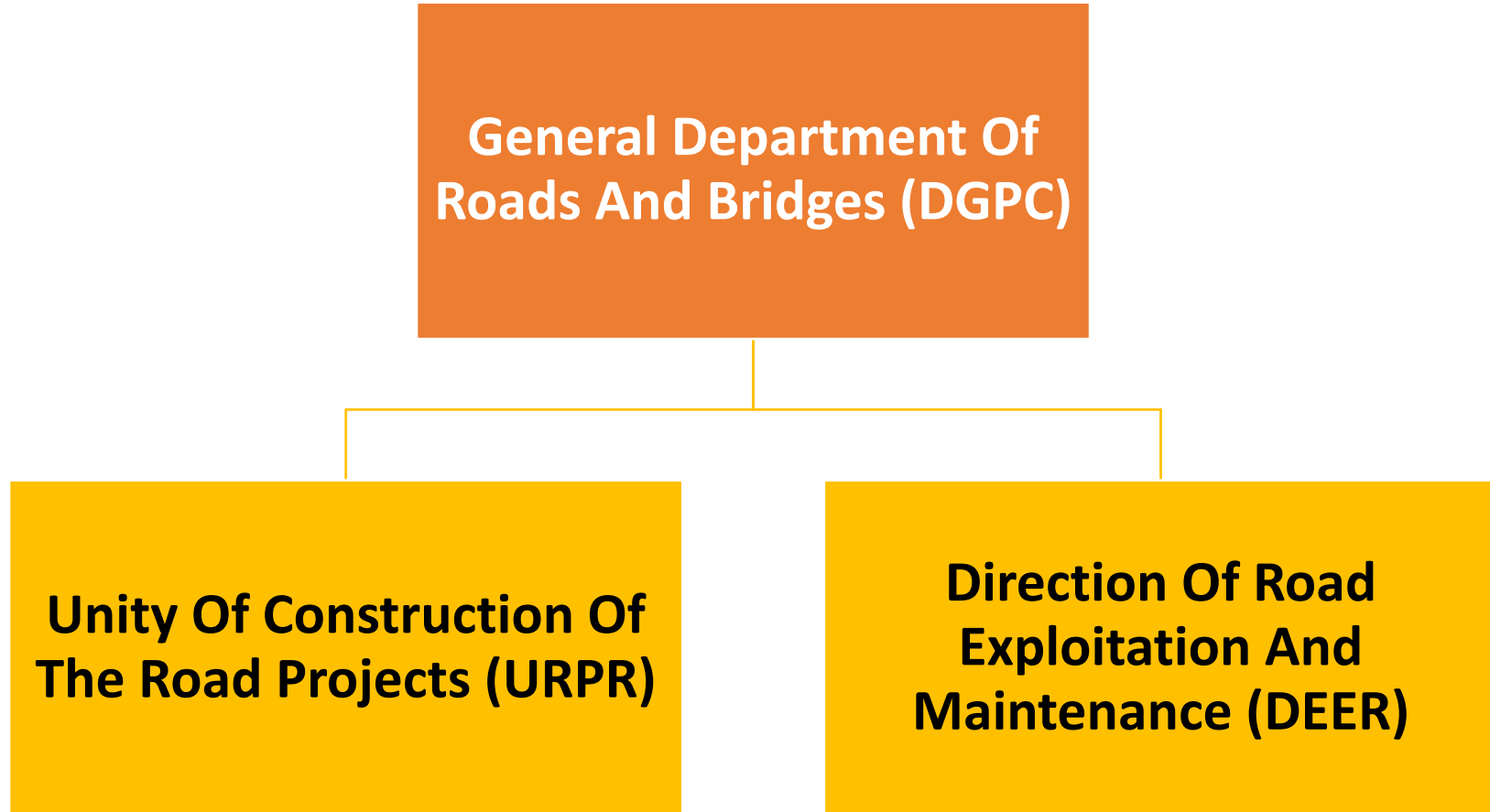
- Highways
- National Roads (RN)
- Provincial Roads (RR)
- Local Roads (RL)

Rural Roads in Tunisia :

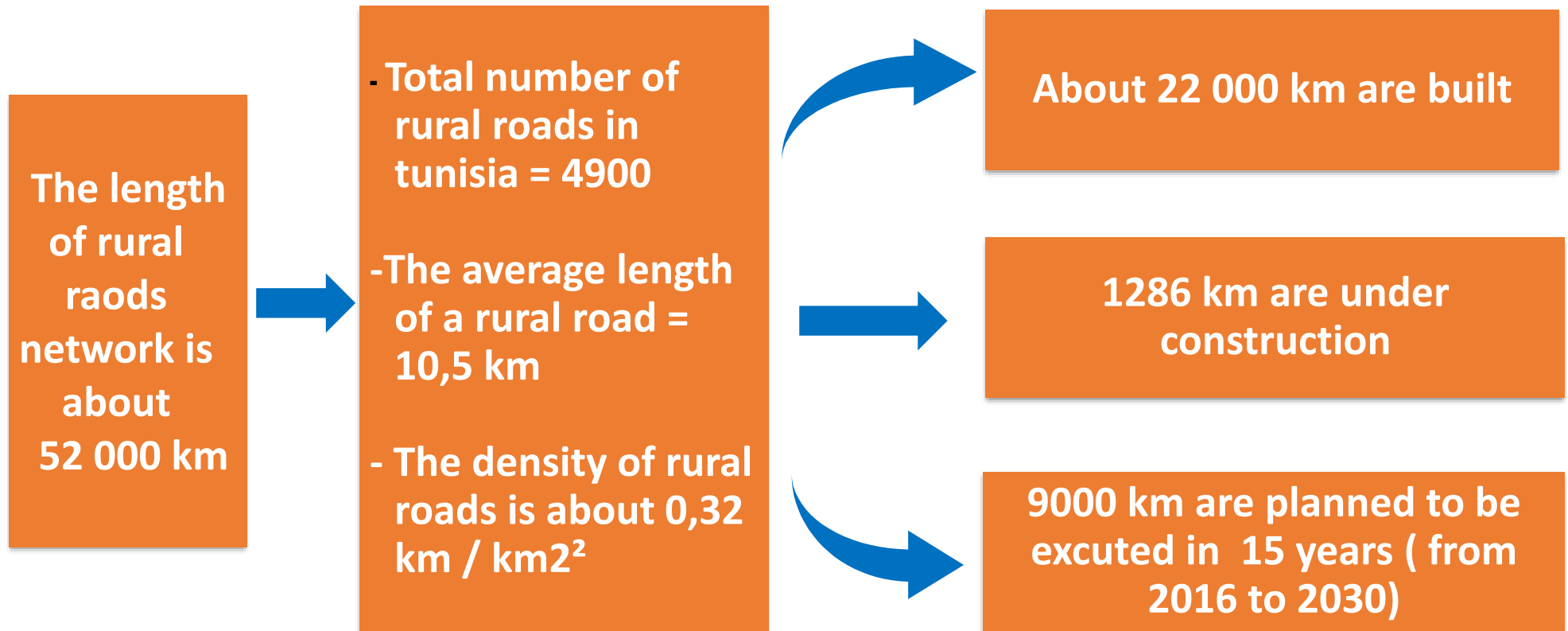
➤ Importance Of Rural Roads :



➤ Structure in charge of The Rural Roads :



➤ Inventory of The Rural Roads Network



- Distribution of Rural Roads :**

Région	Total Length (km)	Average Length (km)	Number of Rural Roads
Great Tunis	2969	4,4	675
Nabeul	1168	6,3	185
Sfax	4172	14,6	286
Tataouine	3477	27,2	128
Tozeur – Kébili	1431	9,9	145
Kairouan – Kasserine	7857	18	437
Gabes – Médenine	6353	15,6	407
Gafsa – Sidi Bouzid	6565	16,7	393
Bizerte – Béja - Jendouba	5142	9,5	541
Kef – Siliana - Zaghouan	10599	11,9	891
Sousse – Monastir - Mahdia	1846	9,5	194
The Entire Territory	51 579	10,5	4912

➤ Funding Of The Rural Roads :

Program	Project	Paved (%)	Unpaved (%)	Total Length	Number of governorates	Funding
11 th plan (2007/2011)	- Construction of 760km	100	0	760	23	BAD
12 th plan (2012/2016)	- Construction of 750km	46	54	750	22	FADES
Exceptional Program Of 2011	- Construction de 1000 km executed in two phases : -Phase 1 : construction of 389km - Phase 2 : Construction of 630km	100	0	389 km	5	BAD
				630 km	10	FADES
13 th plan (2016/ 2020)	- Construction of 300km (In progress)	100	0	300	22	State Budget

➤ **The Construction Of Rural Roads:**

A- Planning



B- Road Selection



C- Design Standards



D- Design Process



E- Construction Works

□ Planning :

- Planning is carried at level of the DGPC: plans are made outlining the general features of a program including information on which areas will be covered by a specific program, annual targets, program budgets, who will carry out the works and the type and amount of resources required,
- The planning process forms the basis for all budgeting and resource scheduling required in civil works projects. Periodic and long-term plans provide estimates for long-term budget projections, while detailed plans are important for the budgeting carried out on an annual and project basis

Road Selection :

As in all infrastructure works, there are essentially three main criteria which needs to be considered when proposing a new rural road development project:

- **Technical Feasibility:**
- **Economic Justification :**
- **Social Considerations:**

□ Design standards :

Design Guidelines

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graph TD; A[Design Guidelines] --> B[General directions on the geometric features of the roads]; B --> C[Appropriate dimensions of the road cross-section and curvature, surfacing options, drainage solutions, road reserves];
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General directions on the geometric features
of the roads

Appropriate dimensions of the road cross-
section and curvature, surfacing options,
drainage solutions, road reserves

The Design standards provide general guidelines relating to the following items:

Alignment Requirements:

- Instructions for setting out vertical and horizontal curves of the road and how this fits with the land.

Technical Characteristics:

- Specifications of minimum horizontal and vertical curvature, geometry of the road , sight distances...

Pavement Solutions:

- Guidelines for design of sub base and base courses and surface treatment depending on road function and traffic volume.

Material Requirements:

- Specifications on the common building materials (such as gravel) and how they are used and tests to be performed

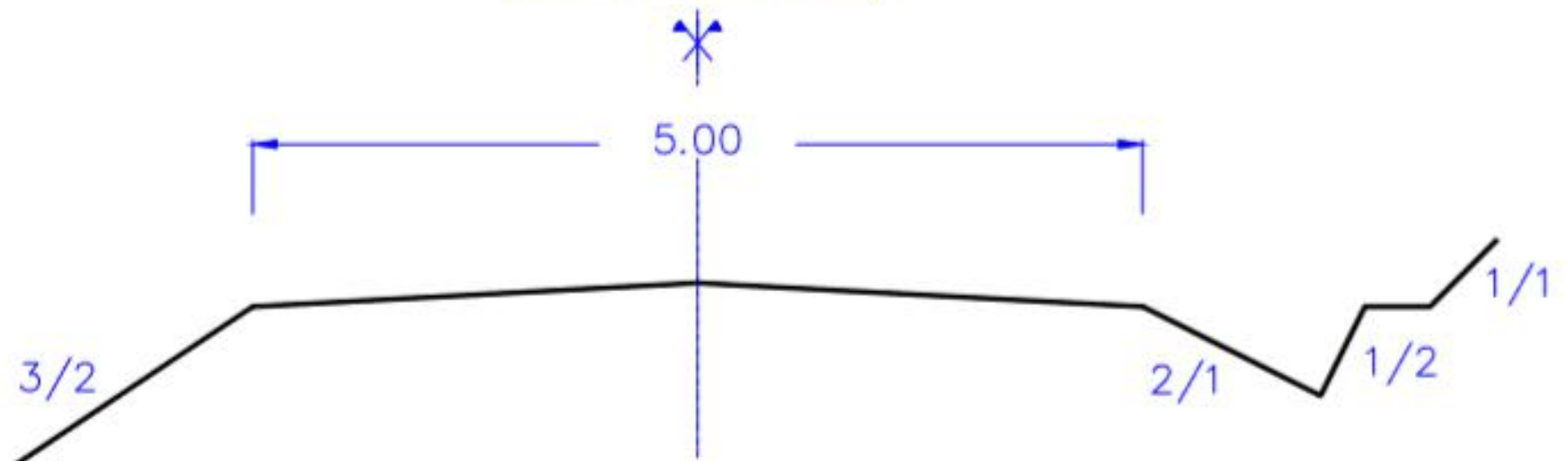
- The Characteristics Of Rural Roads In Tunisia :

• The Width And The Pavement Surface Of The Rural Road :

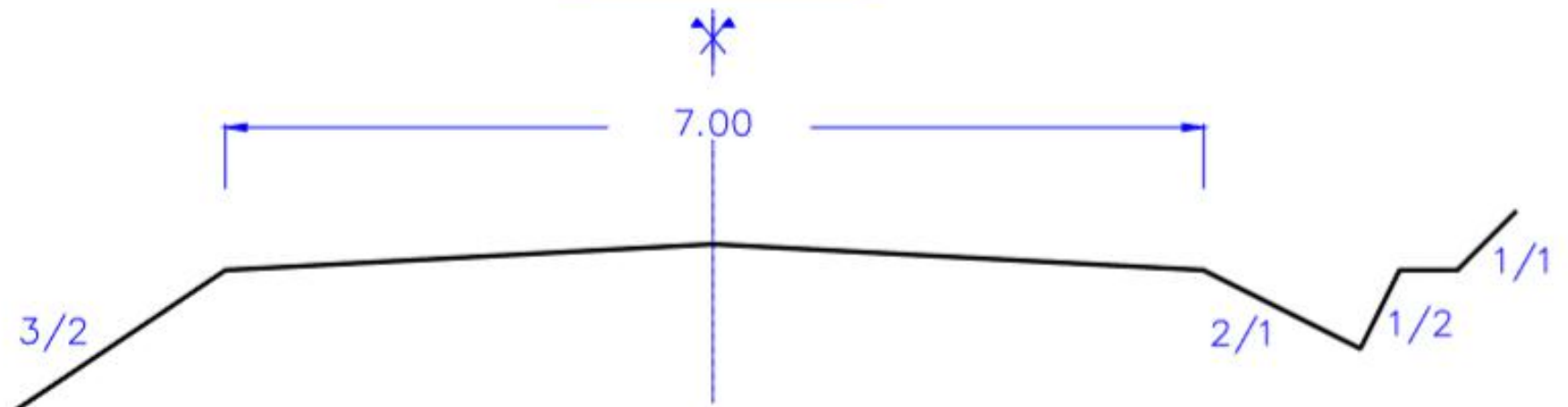
Traffic (AADT)	Level of development	Roadway (m)	Shoulders (m)	Total Width of the platform(m)	Pavement surface
$0 < T_1 \leq 30$	N1	5	0	5	No
$30 < T_2 \leq 80$	N2	7	0	7	No
$80 < T_3 \leq 200$	N3	9	0	9	No
$T_4 > 200$	N4	5	2x2		yes
	N5	6	2x2,5	11	yes

ADT : is the Annual average daily traffic

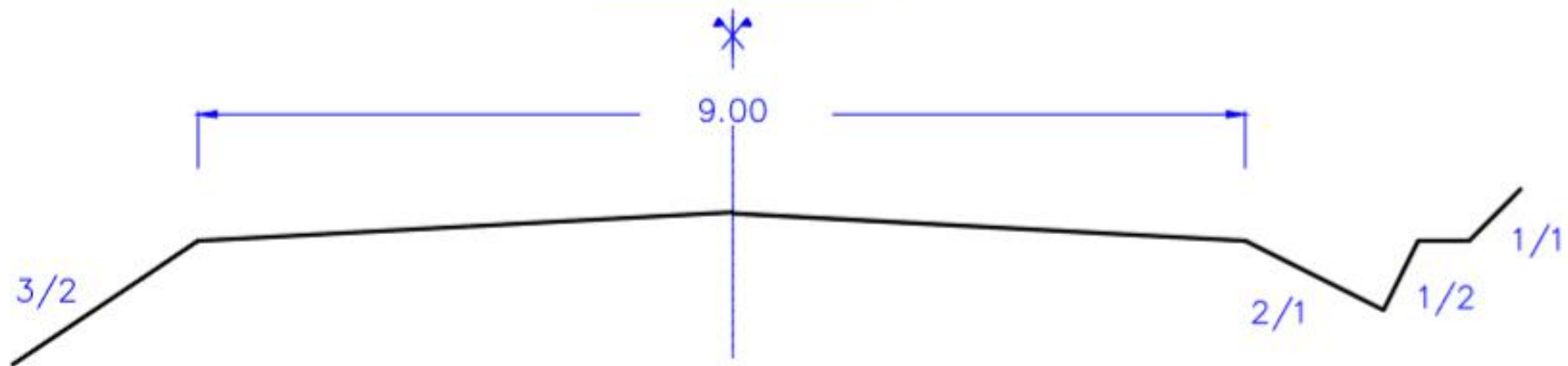
Niveau N1:

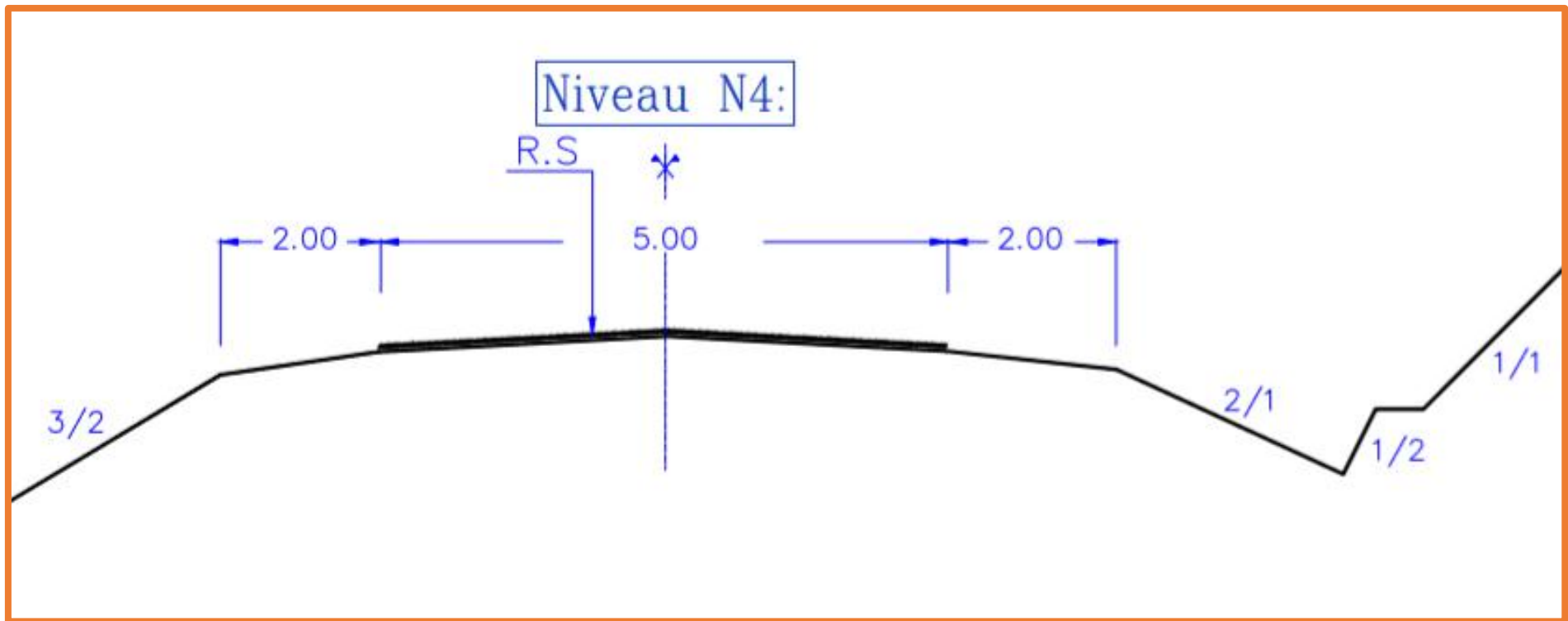


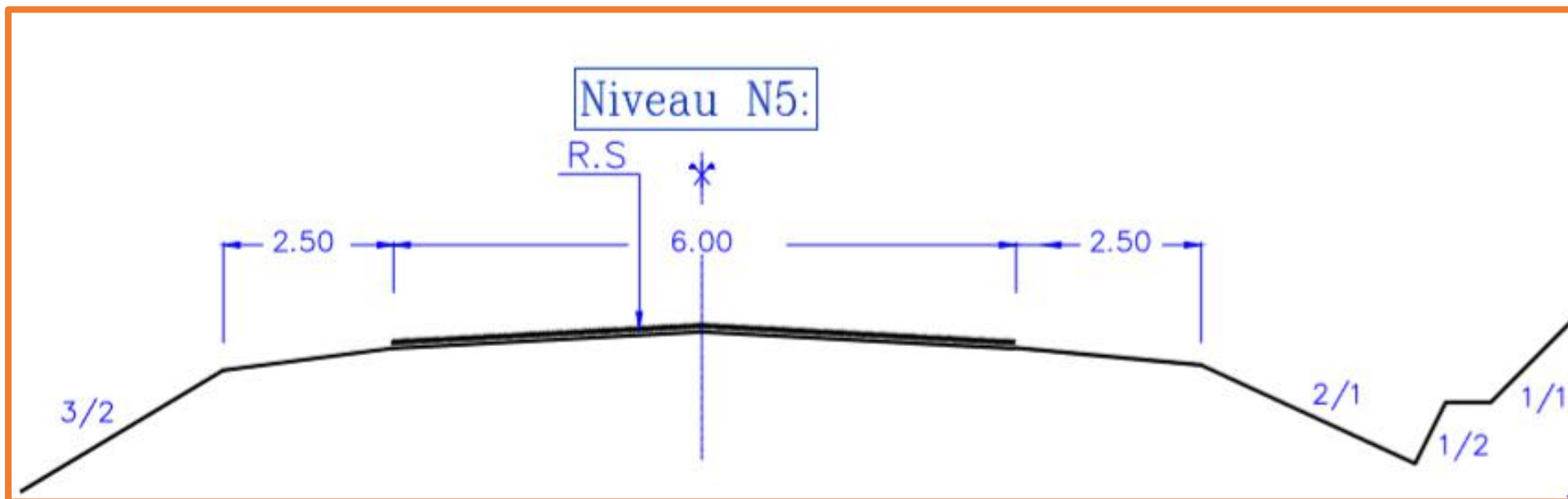
Niveau N2:



Niveau N3:







- Reference speed in rural

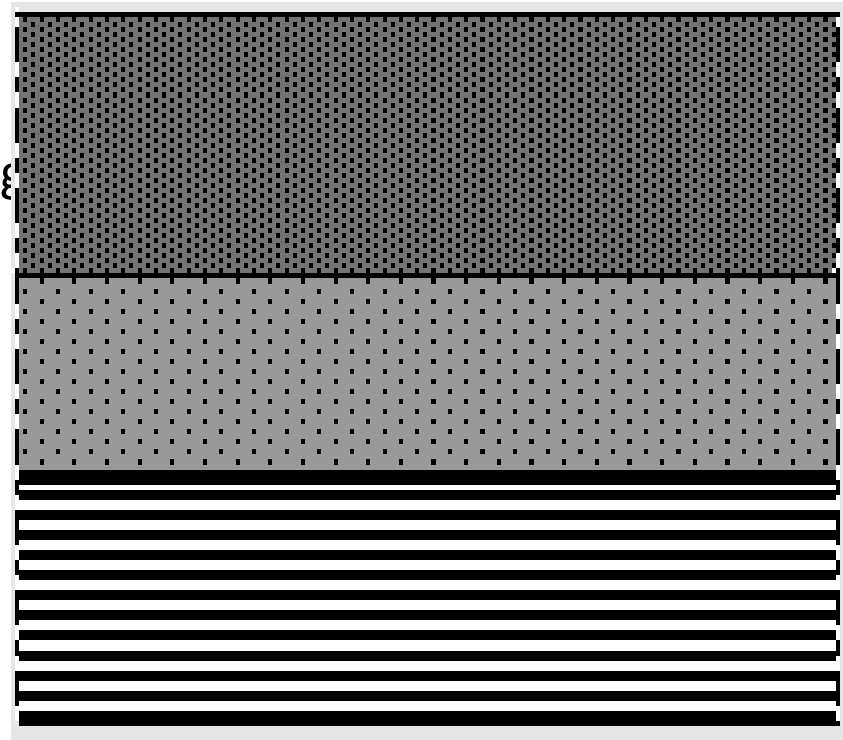
Roads:



Landform	Level Of Development			
	N1	N2	N3	N4 et N5
Flat	Minimal	40 km/h	60 km/h	60 km/h
Hills			40 km/h	
Mountains			40 km/h	

- **Road Structure :**

- **Unpaved Rural road :**



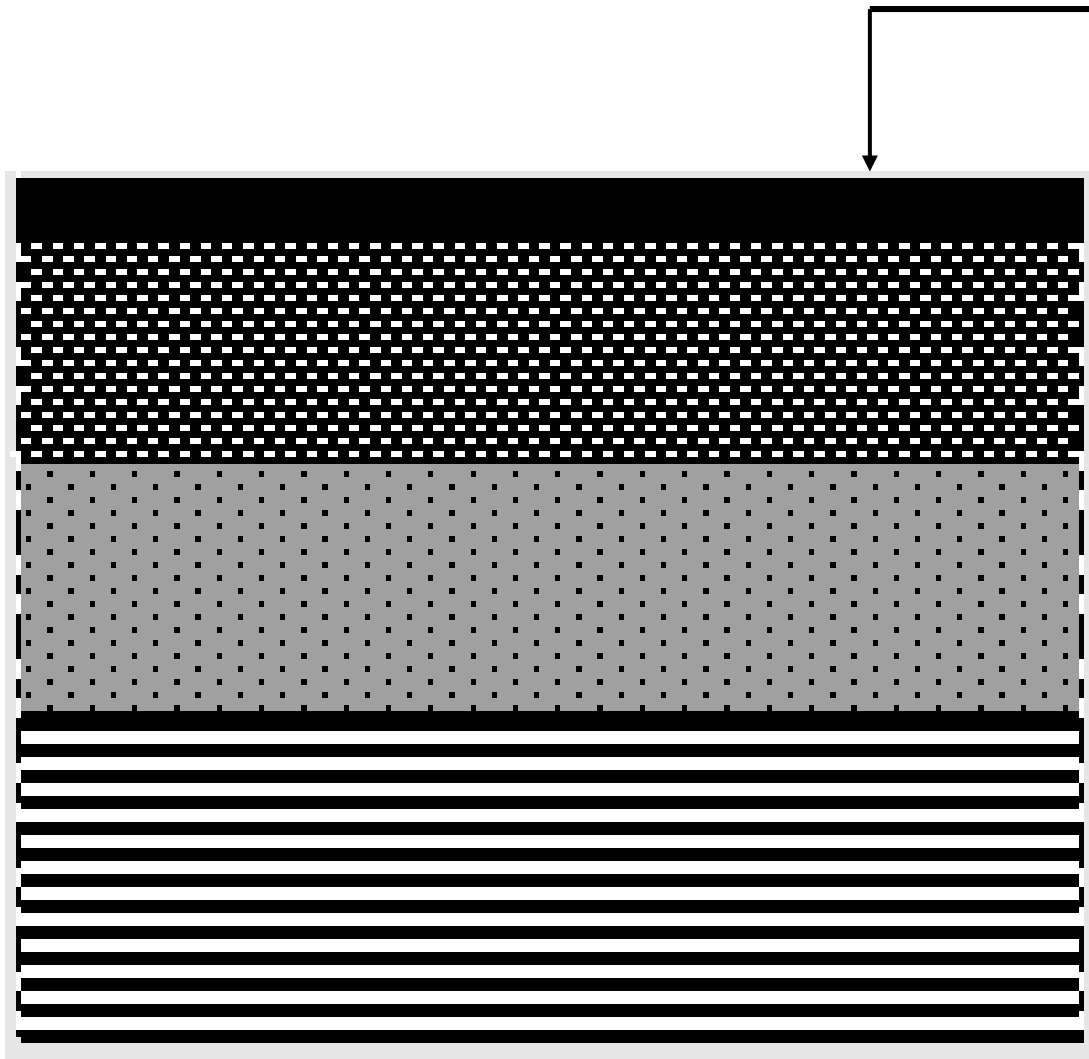
Base course : natural selected

Sub base : Natural gravel

Subgrade soil ,

- Paved Rural road :

Surface course : pavement



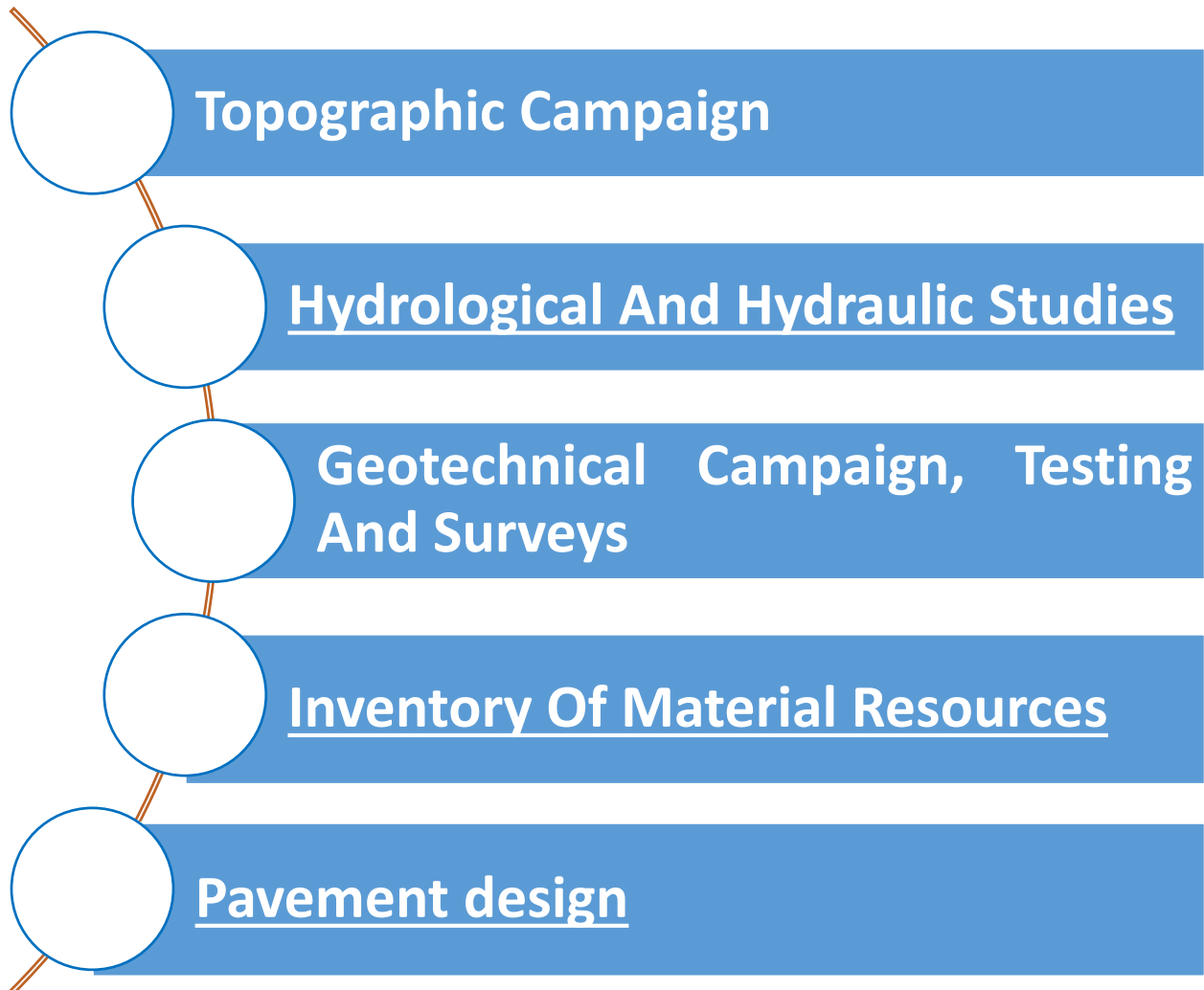
Base course : Crushed stone

Sub base : Natural gravel

Subgrade soil

□ Design Process :

the design process deals with the following main steps:



❑ Construction Works :

Clearing
The Site



Earthworks



Road
Structure



Drainage



➤ **The Maintenance Of Rural Roads:**

The purpose of road maintenance is :

- Extending the life of the road by reducing the rate of deterioration thereby safeguarding previous investments in construction and rehabilitation;
- Lowering the cost of operating vehicles on the road by providing a smooth running surface;
- Keeping the road open on a continuous basis by preventing it from becoming impassable.

For management and operational convenience, road maintenance is categorized as either routine, periodic, and emergency/urgent.

- Routine maintenance :

Operations required to be carried out once or more per year on a section of road.

- Inspect and remove obstacles from roadway and drains On/Off-carriageway
- Clean culverts and other cross drainage Off-carriageway
- Clean side drains
- Repair drainage structures Off-carriageway
- Repair road shoulders and surface/carriageway edges On/Off-carriageway

-Periodic maintenance :

Operations that are occasionally required on a section of road after a period of a number of years. They are normally large scale and require specialist equipment and skilled resources. These operations are costly and require specific identification and planning

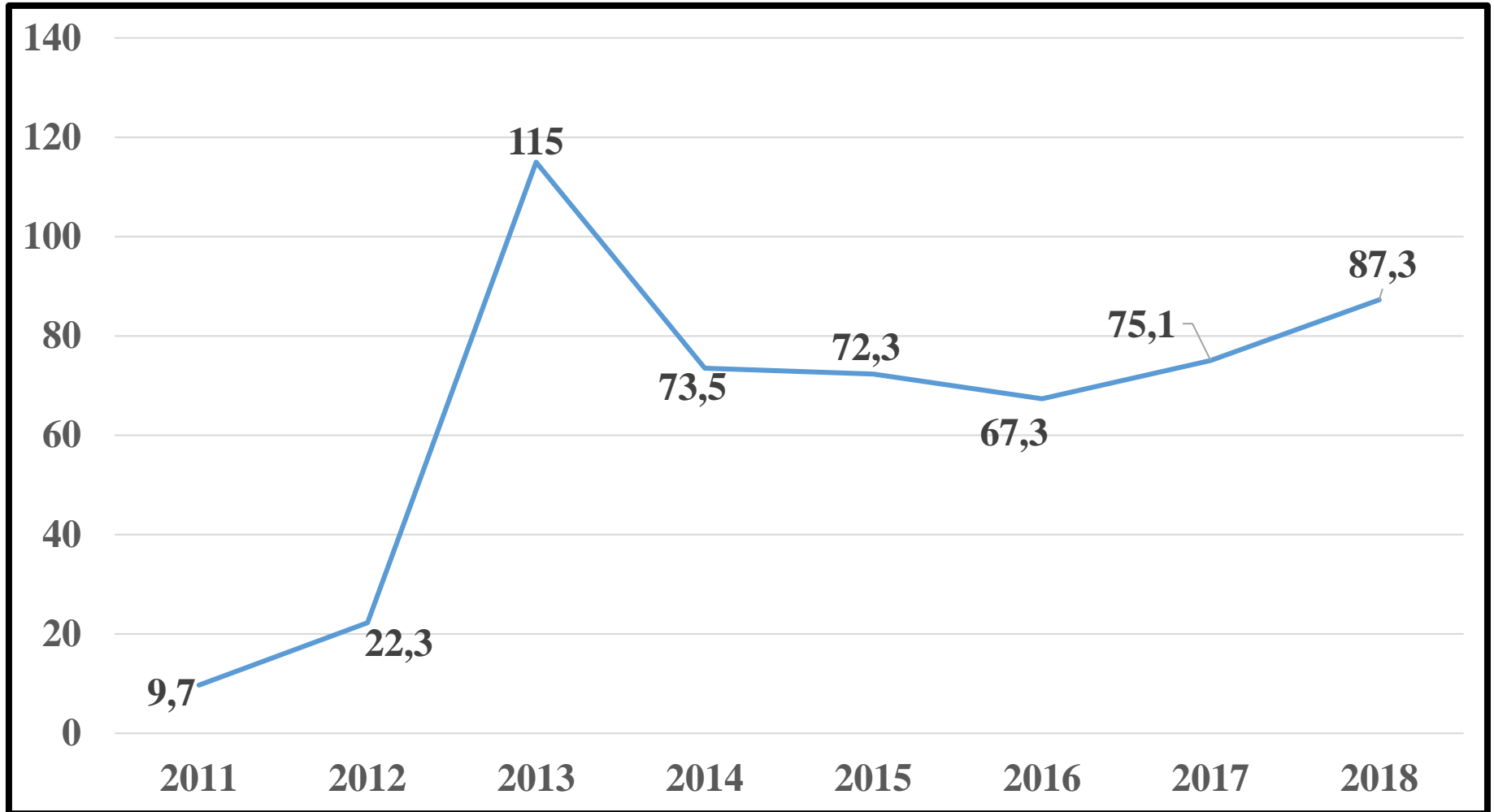
- Drain clearing, grading and shape correction are typical works categories for unpaved roads, while pothole patching, shoulder repair and resealing are examples of additional tasks for paved roads.

EVALUATION OF RURAL ROADS MAINTENANCE

BUDGET

from 2011 to 2018

In Million TDN



Thank you for your
attention