CASE STUDY:
RIGID PAVEMENTS IRI SPECIFICATION, FIRST EXPERIENCE IN COSTA RICA

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OUTLINE

Costa Rica	• Description
LanammeUCR	• Background
IRI application in Costa Rica	• Specifications • Projects
Case Study	• Project Description • IRI specification • Results • Conclusions

COSTA RICA

- Located in Central America
- Area: 52,000 km^2
- 4,000,000 people
- No army since 1948
- 2.5 million tourists in 2014

UNIVERSIDAD DE COSTA RICA | LanammeUCR LABORATORIO NACIONAL DE MATERIALES Y MODELOS ESTRUCTURALES | PITRA programa de infraestructura del transporte

LanammeUCR

National Laboratory of Materials and Structural Models of the University of Costa Rica

IRI ESPECIFICATION

- CR 2010 National Specificacion Manual
  - Since 2011

Same IRI values for Flexible and Rigid Pavement

Individual values: 3.0 m/km

Data average: 1.85 m/km

Simple moving average (SMA)

% (m/km)	Surface Layer	
	Road type	
	Highways and concessioned roads	Other roads
50	< 1.5	< 1.5
80	< 1.8	< 2.0
100	< 2.0	< 2.5

PROJECTS IN COSTA RICA

Flexible pavements

Route 18	Route 21	Route 23		Route 04	
Max. value 3.0 m/km	Max. value 2.5 m/km	SMA, less than 2.0 m/km	Individual values 3.0 m/km	SMA, less than 1.5 m/km	Individual values 2.0 m/km

CASE STUDY

- 30.4mi (50 km)
- Four lines
- Rigid pavement

CASE STUDY
IRI Specification

Payment factor

Individual values: 2.0 m/km

SMA (5 individual values)

IRI (m/km) ASTM E 70	Fines (%)
1.5 > IRI	0
1.5 ≤ IRI < 1.75	5
1.75 ≤ IRI < 2.0	10
2.0 ≤ IRI < 2.5	20
2.5 ≤ IRI	40

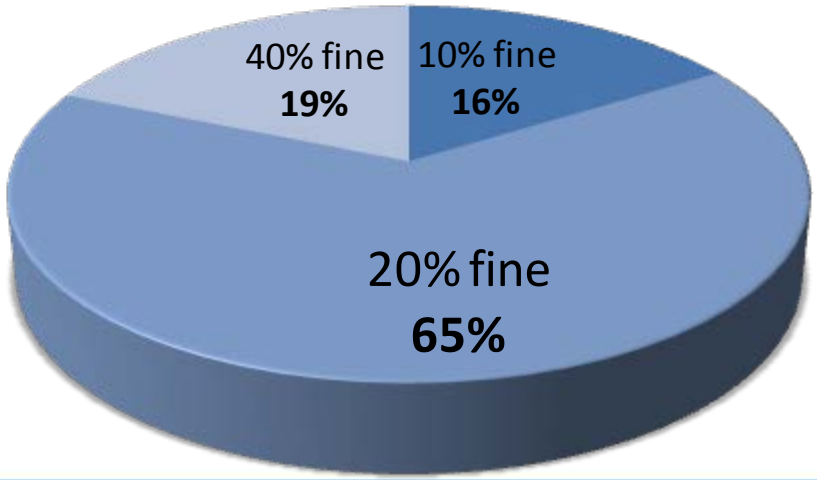
CASE STUDY Results

- **Objective**: Obtain the IRI value and contrast it with the IRI specification for the compliance level and application of fines:
  - Analysis 1: Regular sections
  - Analysis 2: Repaired sections (diamond grinding)

CASE STUDY Analysis 1

- 396 sections of 200 m
- Approximately 79.2 km (39.6% of total project length).

Fine (%)	Sections of 200m	Project section (%)
5	0	0
10	64	16.16
20	258	65.15
40	74	18.69



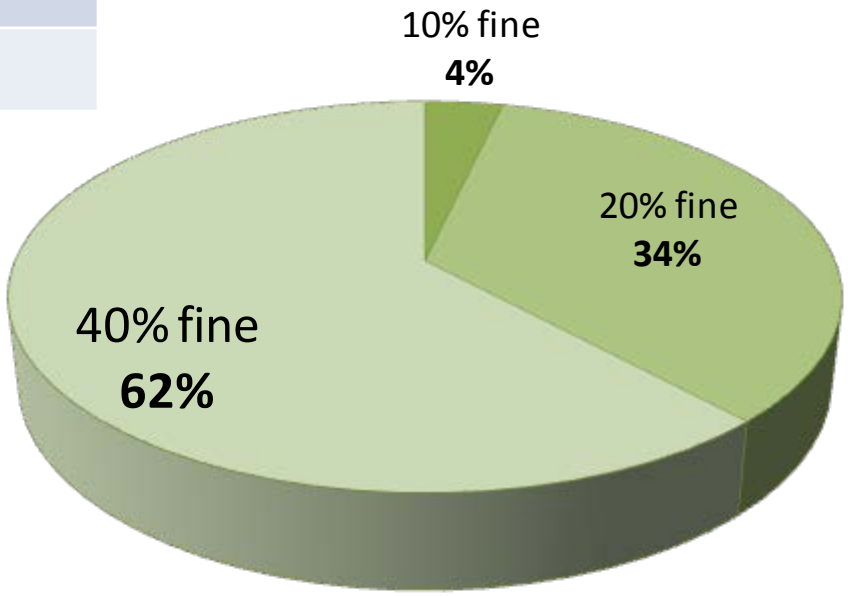
CASE STUDY
Analysis 2

- 55 sections of 200 m, sections with initial high roughness values where a diamond grinding technique was applied
- Approximately 11.0 km (5.5% of total project length)



CASE STUDY Analysis 2

Fine (%)	Sections of 200m	Project section (%)
5	0	0
10	2	3.6
20	19	34.5
40	34	61.8



CASE STUDY Conclusions

- In the analyzed sections of the project, it was obtained high percentages of fines:
  - 27.7% of the sections have a fine of 20% and 10.8% of 40%.

- No decrease were observed in the percentage of fines in sections of the project with initial high roughness values where a diamond grinding technique was applied

FINAL COMMENTS

- Is the IRI specification too strict to be applied in a rigid pavement compared to a flexible pavement?

- Is the IRI value a quality acceptance or a pay parameter?

Thank You

Questions?

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