

# Infrastructure in Poor Condition:

## Reconstruction and Maintenance of Potholes at the Corner of Francia Street and Rio Negro Street in Paraná City

National Technological University

Paraná Regional School

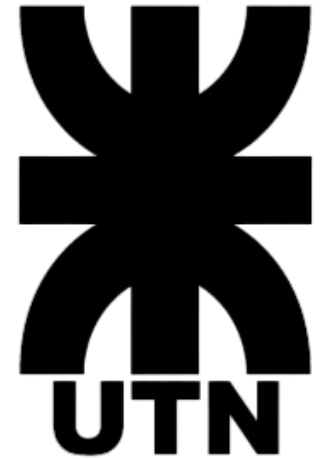
Civil Engineering Department

Inglés I

Academic Year: 2023

Members:

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# Introduction

- Road infrastructure in poor condition in the city of Paraná due to inadequate construction and maintenance



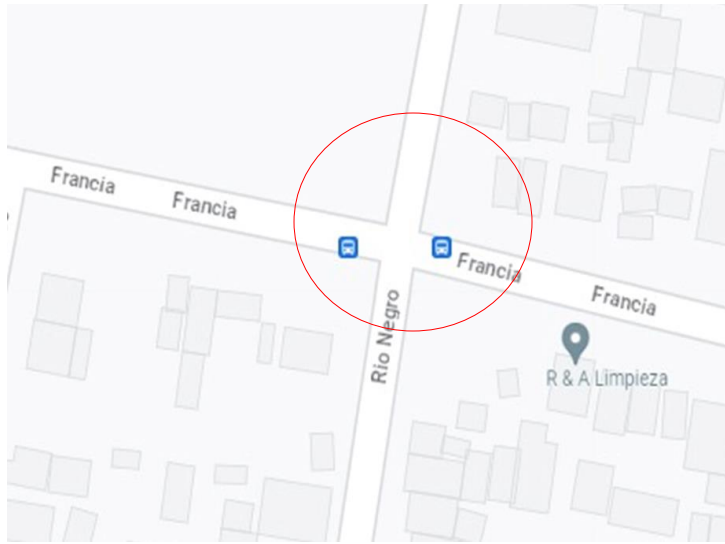
Potholes in poor condition in the city of Paraná

# INTRODUCTION

# Purpose and Solution

## Introduction

- » The purpose of the presentation is to address the problem of potholes at the intersection of Francia Street and Río Negro Street in Paraná.



Intersection of Francia Street and Río Negro Street

Río Negro Street



Francia Street

- » To fulfill this aim, a solution that involves the repair and maintenance of potholes in the affected area will be described.



Pothole maintenance

## Map of the Presentation

- » Location of the problem area in Universitario neighborhood, between Francia Street and Rio Negro Street
- » Description of pictures that show the area where the problem is located
- » Statement of the problem, analyzing its causes and consequences
- » Possible solution
- » Positive and negative aspects of the proposal

## Introduction



## Work Impact

» The impact that this project seeks to generate is to contribute to society in the field of engineering, prioritizing the environment, people's well-being and their safety.

## Introduction



# PROBLEM DEFINITION AND ANALYSIS

# Problem Definition and Analysis

## Description of the Context

### Paraná

- Capital city of the province of Entre Ríos
- 1,426,426 inhabitants
- Five areas



View of Paraná city



Paraná department in Entre Ríos



Areas of Paraná



# Problem Definition and Analysis

## Description of the Context

### Problem location

- » Universitario neighborhood
- » Located between Francia Street and Rio Negro Street
- » 50 meters away from Universitario Club
- » 200 meters away from UTN FRP

UTN - FRP

Universitario Club



Map showing the problem location

Corner of France Street and Rio Negro Street

# Problem Definition and Analysis



Universitario Club

# Description of the Context



UTN - FRP



Corner of France Street and Rio Negro Street

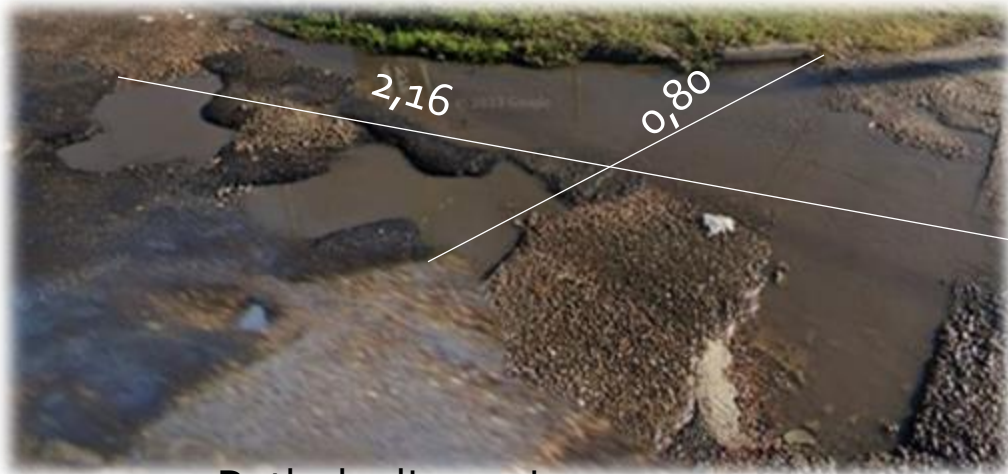


Cotapa factory

# Problem Definition and Analysis



Pothole at the intersection of Rio Negro Street and Francia Street



Pothole dimensions

## Problem Statement

- » Pothole filled with water located in the University neighborhood
- » 2.16 x 0.80 meter pothole dimension
- » Lack of maintenance
- » Significant flooding at the intersection of Rio Negro Street and Francia Street
- » Garbage accumulation

## Problem Definition and Analysis

## Description of Scenes that Help Picture the Problematic Situation



People waiting for the bus delayed by the flooding of the pothole



Pothole filled with water on Francia Street

# Problem Definition and Analysis

## Causes of the Problem

- » Extreme weather
- » Heavy traffic and wear
- » Lack of maintenance



Impact of extremely low temperature on pavement quality



Impact of extremely high temperature on pavement quality



A bus as an example of a heavy-load commercial vehicle



Pavement maintenance

# Problem Definition and Analysis

## Consequences of the Problem`

- » Road safety concerns
- » Repair costs
- » Damage to vehicles



Poor signage



Budget agreement

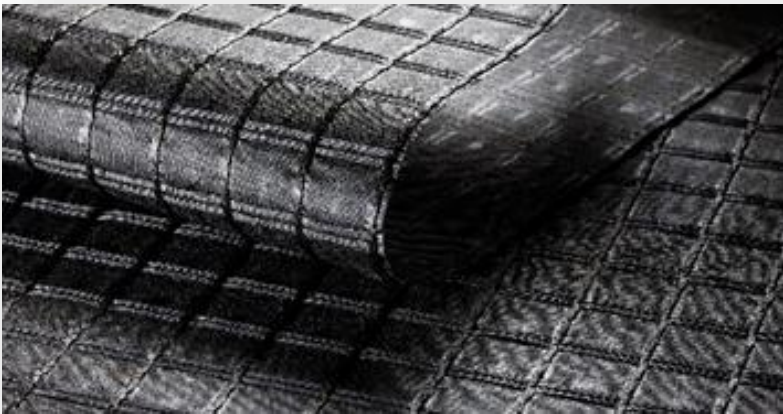


Vehicle's safety hazard because of this pothole

# PROBLEM APPROACH

# Problem Approach

- » The proposed solution will consist of the use of polymeric materials for the resurfacing of the street.



Geogrid for resurfacing [1]

- » Definition of Geogrids

Geogrids can only be applied on flexible pavements

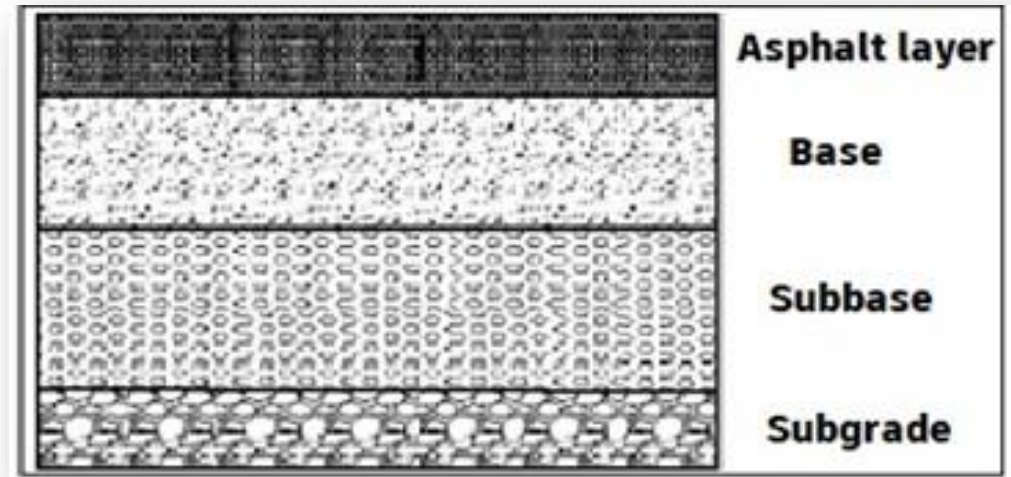
- » Geogrids are increasingly used in the country since they have multiple benefits:
  - Extension of maintenance intervals
  - Extension of useful life of pavements
  - Reduction of maintenance costs
  - Duration of more than 40 years.



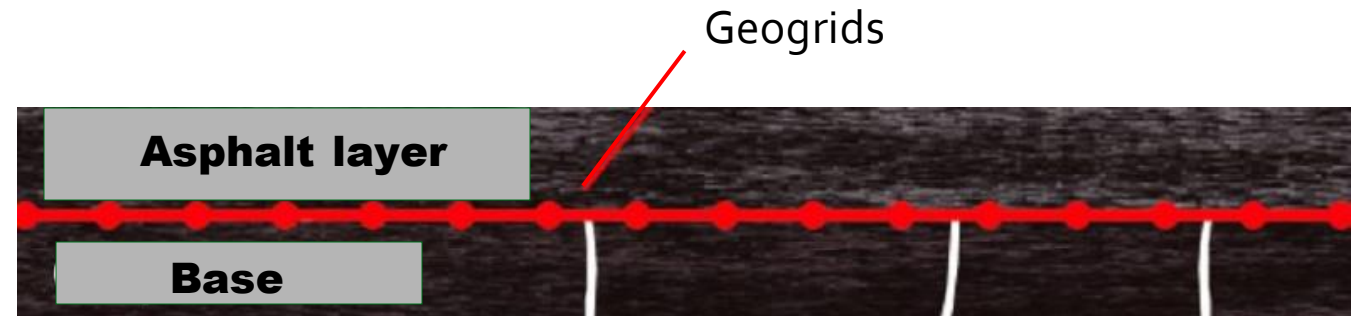
# Problem Approach

The structural package of flexible pavement is the set of structural layers that form a pavement, composed of four layers:

- » Asphalt layer
- » Base
- » Subbase
- » Subgrade



- » Geogrids are applied above the base.



# Problem Approach

Steps for geogrid cloths installation:

1. Milling
2. Surface treatment
3. Geogrid installation
4. Joint securing
5. Surface cleaning
6. Asphalt layer
7. Final asphalt installation
8. Thickness verification
9. Final compaction



Pavement milling



Garter irrigation



Geogrid collation



Asphalt venting



Asphalt installation

# POSITIVE AND NEGATIVE ASPECTS OF USING GEOGRIDS FOR RESURFACING

## **Positive aspects of geogrids**

- » A long useful life
- » Heavy traffic support
- » Waterproofing of the asphalt layer
- » Crack prevention

## **Negative aspects of geogrids**

- » Environmental impact
- » High expense

# CONCLUSION

## Conclusion

The proposed approach shows a solution that not only addresses the road-related challenges, but also extends into the social field; offering a promising avenue approach to address this widespread problem in the city.



## References

- [1] "Refuerzo Asfáltico," Coripa. <https://coripa.com.ar/refuerzo-asfaltico/> (accessed Oct. 13th, 2023).
- [2] "HaTelit® C - Cirtex," Aug. 11, 2021. <https://cirtexcivil.co.nz/products/pavement-surface-reinforcement/hatelit> (accessed Oct. 12th, 2023).

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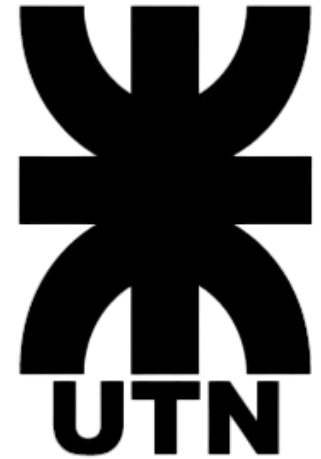
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