

# Presentation of Awards

## The BEST of 2024

Presented by  
**Pragna Shah**  
*Acting Manager*

Bureau of Research, Innovation and Information Transfer  
New Jersey Department of Transportation



2024

# Outstanding University Student in Transportation Research Award



**Deep Patel**

*Rowan University*



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& INFORMATION TRANSFER

2024

# Research Implementation Award



## Peter Jin

*Rutgers University*

New Brunswick Innovation Hub Smart  
Mobility Testing Ground (Data City SMTG)



NJDOT Contract Number 21-60168, Middlesex County Cost Sharing Resolution: 21-821-R

2024

# Best Poster Award

**Rowan University**  
 CENTER FOR RESEARCH & INNOVATION  
 ENGINEERING SYSTEMS

**Performance Evaluation of Full-Depth Reclamation and Cold In-Place Recycling Asphalt Mixtures at Varying Amounts of Bituminous and Cementitious Additives**  
 Swathi Malluru, Ahmed Said, Ph.D.; Ayman Ali, Ph.D.; Yusuf Menza Ph.D., P.E.;  
 Rowan University CRATES

### Background

- Full-Depth Reclamation (FDR) and Cold In-Place Recycling (CIR) are sustainable methods for rehabilitating deteriorated asphalt pavements, providing economic, environmental and construction benefits.
- FDR involves reclamation of existing pavement and combining into a single layer (depth up to 14 in) through pulverization and stabilization. CIR treats the damaged asphalt pavement (depth up to 4 in) with stabilizers.
- Many state agencies, including NJDOT, lack adequate design and construction specifications for FDR and CIR, necessitating improvements.

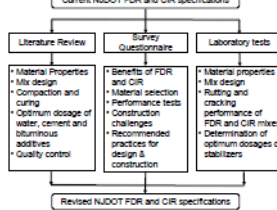
### Goal and Objectives

**Overall Goal:** To improve the current NJDOT design and construction procedures for FDR and CIR.

**Specific Objectives:**

- Conduct thorough literature review on FDR and CIR specifications and best practices as recommended by highway agencies.
- Prepare and distribute survey questionnaires to state agencies across the United States.
- Evaluate the performance of FDR and CIR mixtures prepared with different bituminous additives at constant cement content.

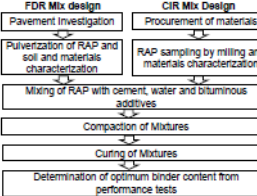
### Methodology



### State of Practice

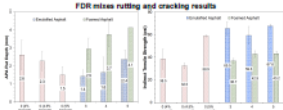


RAP Size (maximum)	1 - 3 in FDR and 1-1.5 in CIR
Chemical additives	Portland cement and lime
Dosage of cement	FDR: 3 - 6% CIR: 0.5 - 1.5%
Optimum Moisture Content	FDR/CIR: 2% - 3%
Bituminous additive	Cationic Slow Setting (CSS-1h) emulsion or foamed bitumen
Dosage of emulsion	FDR: Emulsion - 3%, Foamed Bitumen - 2.5% CIR: Emulsion - 2.5% to 3.0%, Foamed Bitumen - 2% to 2.25%
Compaction	Superpave 30 gyrations or Marshall
Curing	FDR/CIR: 3 days at 140°F
Performance tests	FDR/CIR: Strength and crack tests



### Laboratory Test Results

- FDR mixes with emulsion showed 5% lower air voids than foamed asphalt mixes, while CIR mixes with foamed asphalt showed 2% lower air voids than emulsion mixes.
- Rut depth of FDR mixes with 5% cement or 3% emulsion and 1% cement is approximately 80% lower than that of the 4% cement mix.
- ITD value of FDR mixes with 3% and 5% emulsion is about 15% higher than 5% cement mix, whereas foamed asphalt did not improve the cracking performance of the mix.
- CIR mixes with 1.5% emulsion and 2% foamed bitumen satisfied the NJDOT rutting and cracking criteria of less than 10mm rut depth and minimum 45psi, respectively.



### Significance

This project will serve as a major step towards wider implementation of both FDR and CIR in New Jersey, which will allow NJDOT to become more sustainable and further achieve its goals of being environmentally-friendly.

### Conclusions and Recommendations

- The addition of bituminous additives improved the rutting and fatigue performance of FDR and CIR mixes.
- Recommend to use 3% emulsion with 1% cement and 3% water or 5% cement only for FDR mixes, and 2% emulsion or 1.5% foamed bitumen for CIR mixes.
- The study recommends the use of bituminous additives along with cement, mix design criteria, strength (APA) and crack tests (IOT) and construction practices to update NJDOT specifications for FDR and CIR.

### Acknowledgements

The authors would like to acknowledge NJDOT team for their immense support, and Keshav Paving Systems (APS) for providing the materials for mix preparation.

# Swathi Malluru

Rowan University

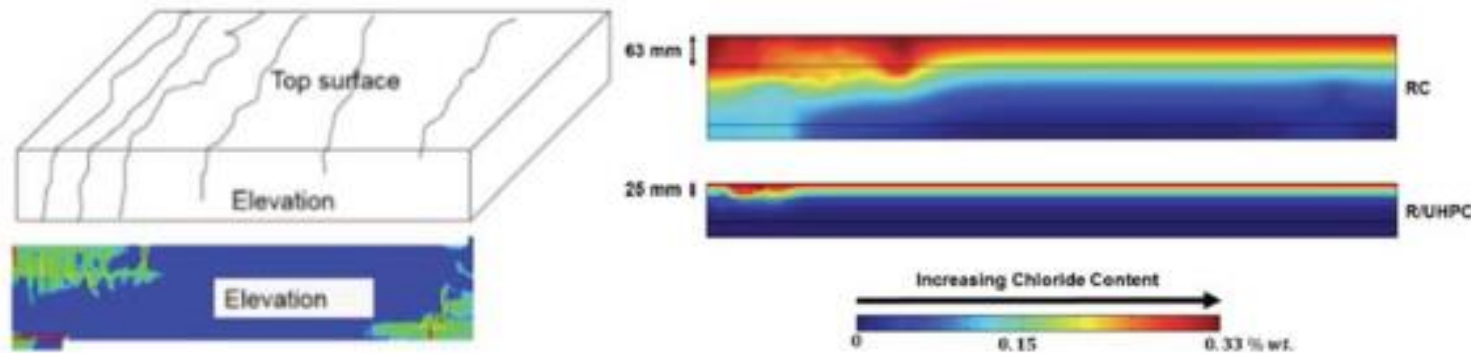
# Performance Evaluation of Full-Depth Reclamation and Cold In-Place Recycling Asphalt Mixtures at Varying Amounts of Bituminous and Cementitious Additives

2024

# Research Champion Excellence Award

## Yong Zeng and Emmanuel Basse

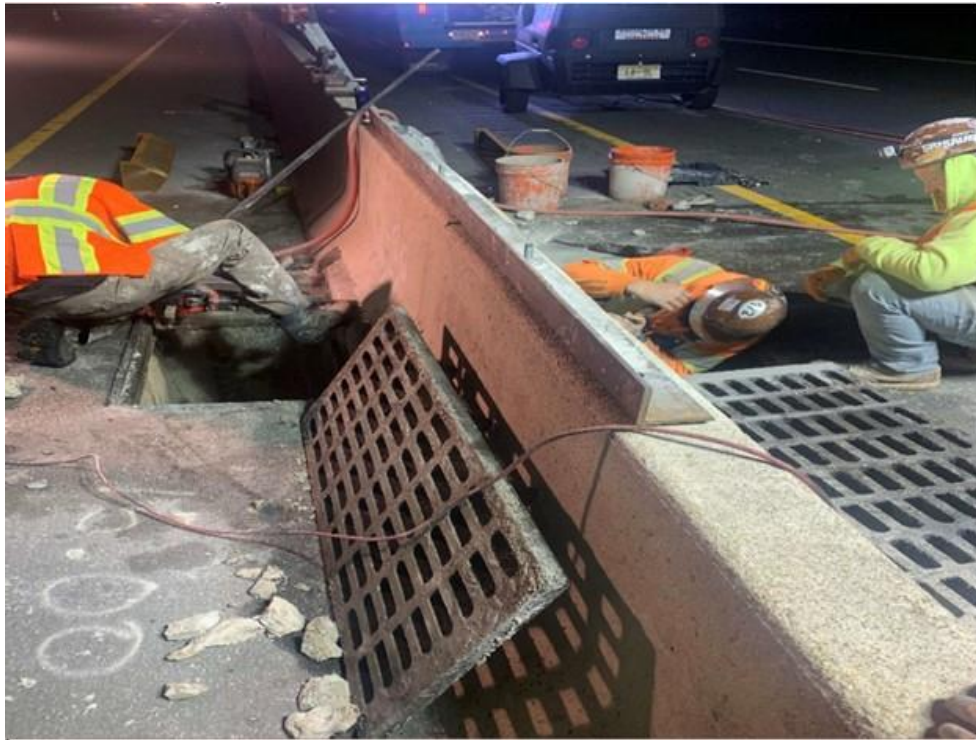
*New Jersey Department of Transportation*



In recognition of your partnership and dedication while acting as Technical Advisory Panel members on the **Advanced Reinforced Concrete Materials for Transportation Infrastructure** research project. Your commitment has greatly contributed to the success and implementation of this research project.

2024

# Build a Better Mousetrap Award



## Bishoy Y. Abdallah

New Jersey BABM Winner

*New Jersey Department of Transportation  
Division of Highway and Traffic Design*

Innovation Solution:

Replacing Inlet Curb Pieces in  
Existing Concrete Barrier Curb



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# National High Value Research Award

## AASHTO High Value Research Awards

Principal Investigator	Research Project Manager	Technical Advisory Panel (TAP)
Matthew Bandelt	Giri Venkiteela	Emmanuel Bassey
Matthew P Adams		Nehemie Jasmin
		Yong Zeng

**Advanced Reinforced Concrete Materials for Transportation Infrastructure**

*New Jersey Department of Transportation*



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2024

# National High Value Research Award

## AASHTO Supplemental High Value Research Awards

Principal Investigator	Research Project Manager	Technical Advisory Panel (TAP)	
Hao Wang	Giri Venkiteela	Sadime Absolam	Jeff Evanylo
Husam Najm		Emmanuel Basse	Kenrick Layne
		Nicholas Colangelo	Anupkumar Patel
		Roger Estivalletti	Yong Zeng

### Innovative Pothole Repair Materials and Techniques

*New Jersey Department of Transportation*