



Technology Institute

## Tech Brief

### DEVELOPMENT OF AN IMPLEMENTATION PLAN FOR SUSTAINABLE TRANSPORTATION INFRASTRUCTURE SYSTEMS IN IOWA

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#### RESEARCH PROJECT TITLE:

Development of an Implementation Plan for Sustainable Transportation Infrastructure Systems in Iowa

#### SPONSORS:

Iowa DOT (21-SPR1-006)  
Federal Highway

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## Background

The need to incorporate sustainability principles and practices is increasing due to both environmental and economic reasons. It is critical to identify and operationalize sustainability strategies into core administrative, planning, design, construction, operational, and maintenance activities for the transportation infrastructure systems using a comprehensive systems approach and the integration of sustainability in decision-making processes.

## Problem Statement

Because Iowa DOT and local public agencies are building, operating, and maintaining their transportation infrastructure systems with constrained budgets, there are critical needs to: 1) maximize service and performance quality while controlling costs and environmental impact, 2) integrate sustainability in decision-making processes for planning, designing, building and managing transportation infrastructure systems, and 3) incorporate sustainability principles and practices in their everyday operations.

## Objectives

The primary goal of this study is to develop an implementation plan for achieving more sustainable transportation infrastructure systems for Iowa DOT and local road agencies. The specific objective of this research is to develop a systemic methodology for identifying the best sustainable practices for implementation in transportation infrastructure practices in Iowa by developing shelf-ready ideas based on identified target areas to be put into practice through small-scale pilot projects.

## Research

To achieve the main objectives, the following five tasks have been performed: 1) surveying other states and leading European highway agencies, 2) identifying existing sustainability attributes, 3) evaluating sustainability assessment tools, 4) developing detailed goals and work tasks and making recommendations to implement sustainability practices and 5) preparing at least two shelf-ready ideas based on identified target areas to be put into practice through small scale pilot projects.

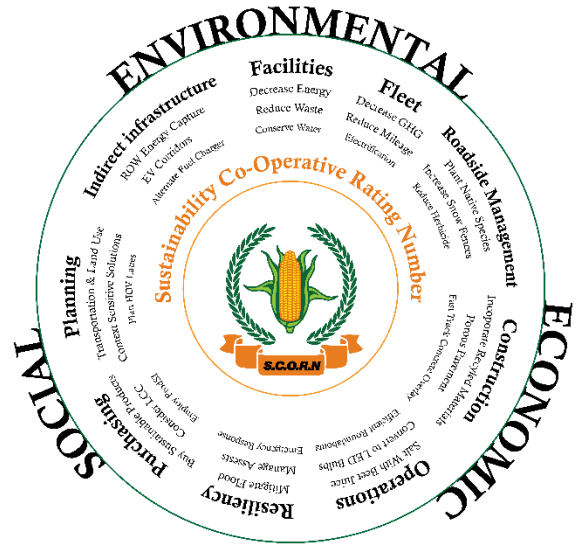
## Benefits

The main benefit of this research is to develop goals and practices of sustainability for Iowa DOT by identifying sustainability goals and practices. The sustainability tools (SCORN and DOSPIR) developed from this study will provide a roadmap for Iowa DOT to effectively implement sustainable practices.

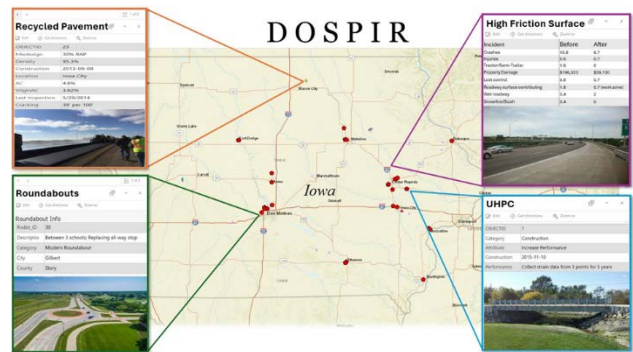
# Key Findings

The following conclusions are derived:

1. Sustainable transportation practices can yield cost savings, increased resource efficiency, reduced environmental impacts, and increased service life.
2. Core strategies and approaches that significantly contribute to the development of more sustainable transportation infrastructures were identified.
3. An implementation plan was developed for Iowa DOT to achieve more sustainable transportation infrastructure systems.
4. Database of sustainable practices with implementation records (DOSPIR) was developed to help transportation engineers access past performance data and identify the most successfully implemented sustainable practices.
5. Sustainability co-operative rating number (SCORN) was developed to help transportation engineers identify the most appropriate sustainable practices by measuring the benefits of each sustainable practice.
6. This study provided a roadmap for Iowa DOT and local public agencies to effectively implement sustainable practices ensuring that it contributes positively to our environment and society.



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# Future Studies

1. Prototype SCORN on a small scale should be expanded to include and refine rating criteria after adjusting their relative weights based on normalized performance metrics so that the effect of meeting or not meeting sustainability targets could be appropriately quantifiable.
2. Prototype DOSPIR with a limited scope should be expanded to incorporate more sustainable practices with historical data and their GIS locations.
3. Both SCORN and DOSPIR should be made available for all employees and stakeholders of Iowa DOT and local public agencies where they can give feedback for further improvements.
4. The future study should include interviewing the top management of Iowa DOT and local public agencies to assess their perception and support for sustainability efforts with potential incentives for sustainable practices and possibly creating a separate sustainability office that can coordinate and oversee sustainability efforts within the agency.



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