



FY2022

RESEARCH AT-A-GLANCE

LEADING THE WAY

From its inception, the Iowa Department of Transportation has been a leader in transportation research. Beginning with the Iowa Highway Research Board in 1949, Iowa DOT has stayed on the leading edge of innovations in materials, processes, and technologies that have brought improvement and longevity to transportation systems around the world.

Our Mission: Driving a quality research program that delivers targeted solutions for Iowa's transportation future.



FOCUS AREAS | We organize our research efforts around four focus areas:



SAFETY

Reducing transportation fatalities and serious injuries through system-wide, multimodal, data-driven, and proactive strategies.



MOBILITY

Improving the accessibility, reliability, time, and costs associated with the movement of people and goods.



SUSTAINABILITY

Considering how transportation supports economic, social, and environmental progress with a long-term perspective.



TECHNOLOGY

Evaluating both current and potential technologies and incorporating them effectively into existing agency functions.

SUPPORTING IOWA DOT'S RESEARCH PROGRAM

Iowa's transportation innovations are possible with oversight and technical and financial support from a variety of sources:

IOWA HIGHWAY RESEARCH BOARD (IHRB) This advisory group is responsible for assisting Iowa's cities and counties and Iowa DOT in the development and continuation of an effective program of research and progress in highway transportation. Funding for IHRB comes from Iowa's Road Use Tax Fund for research.

STATE PLANNING & RESEARCH (SPR) PROGRAM Funding from this Federal Highway Administration (FHWA) program supports statewide planning and research activities at state DOTs. SPR funds are also used for participation in the [Transportation Pooled Fund Program](#).

STATE TRANSPORTATION INNOVATION COUNCIL (STIC) Another FHWA-supported program, the STIC network offers technical assistance and funds to support the costs of standardizing innovative practices in state transportation agencies. STIC members come from federal, state, and local agencies; industry; and academia. IHRB serves as the STIC for Iowa DOT.

ENGAGING & COLLABORATING WITH IOWA DOT RESEARCH

Iowa DOT Research strives to deliver top-quality, targeted solutions for Iowa's transportation future. Whether you're looking to get involved in our research, already have an approved project in the works, or simply want to learn more about our team, we can help.



GET INVOLVED

- **Submit an Idea.** Research ideas can be submitted by anyone (within or beyond the department) at any time through our [Research Ideas site](#).
- **Provide Input.** While ideas are in the open feedback stage, anyone can provide written comments or vote on new proposed ideas.



WORKING WITH US

- **Respond to a Proposal.** Requests for proposals (RFPs) are posted to the [Open Requests for Proposal web page](#) six times per year. Sign up to receive email notices of new RFP postings on our [Requests for Proposal](#) page under Stay Connected.
- **Discover Our Process.** Once a proposal is approved for funding, the work can begin! Learn more about the [steps the research team goes through](#), from contract to final report.



LEARN MORE

- **Follow the Money.** Our research projects are funded through three primary programs: [the Iowa Highway Research Board](#), [State Planning and Research](#), and [State Transportation Innovation Council](#). Find out more about them and how they each contribute to Iowa DOT as a national leader in innovative research.
- **Meet Our Partners.** Iowa DOT works with a variety of [institutions and external agencies](#) to achieve our goals.

PROGRAM OUTREACH

Workshops and peer exchanges are an efficient and cost-effective way for transportation professionals to discuss their programs and best practices. Iowa DOT is frequently invited to participate as a model research program. Here are a few examples of our outreach in Fiscal Year 2022:

AASHTO RAC Annual Summer Meeting, July 2021 – Co-hosted by North Carolina and Mississippi DOTs, this three-day virtual event brought together research offices from all DOTs to discuss topics on upcoming changes to SPR and Pooled Fund policies, innovative state research, knowledge management, agency engagement and technology transfer, communicating research and innovation activities, peer exchange best practices, and research performance measures.

Research Peer Exchange, October 2021 – This four-day virtual event hosted by Minnesota DOT brought together numerous DOTs to discuss topics on equity and research, messaging the value of research, and transportation innovation.

Research Peer Exchange, October 2021 – The three-day virtual event hosted by Washington State DOT brought together five DOTs to discuss topics like performance measures, communication strategies, and resiliency.

University Collaboration

Through formal collaboration agreements with Iowa university partners, Iowa DOT is able to conduct state-of-the-art research and testing to discover new products and materials that will benefit all Iowans.



Iowa State University
since 1997



The University of Iowa
since 2003



University of Northern Iowa
since 2007

Iowa DOT also partners with other universities and private sector firms on the state, national, and international levels.



FOCUSING ON IOWA DOT RESEARCH

Research projects highlighted below and on the following page are a sampling of the nearly 200 research projects that are in process or recently completed grouped by the four focus areas.

SAFETY

Updating Statewide Guidance with Complete Streets Considerations

Complete streets designs take into account the safety and accessibility of all road users. To ensure the needs of pedestrians, bicyclists, and motorists are all considered, this project updated and aligned Iowa DOT's statewide design manuals with agency goals and policies. [STIC Project ST-011](#)



Partnership for the Transformation of Traffic Safety Culture

This pooled fund project seeks to reduce the risky behaviors found in many communities and jurisdictions by identifying, measuring, and analyzing cultural influences. The project also implemented a limited number of demonstration projects of specific traffic safety culture transformation studies. [SPR Project TPF-5\(309\)](#)

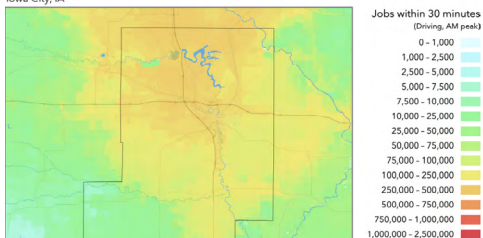
MOBILITY

Alternative Funding Approaches for Iowa Roads

The purchasing power of Iowa's primary transportation revenue source, the fuel tax, has decreased over time due to annual fuel tax revenues not keeping pace with the growth in costs. This study evaluated Iowa's existing transportation funding sources and identified practices other states use to increase transportation revenues. [IHRB Project TR-790](#)



Iowa City
Iowa City, IA



National Accessibility Evaluation

This pooled fund project calculated the number of jobs that can be reached by auto, transit, biking, or walking, within various travel time thresholds. The results can help Iowa DOT and agencies across the country evaluate the effectiveness of their transportation networks, the equitable distribution of transportation costs and benefits, and prioritize future investments.

[SPR Project TPF-5\(315\)](#)

SUSTAINABILITY

Use of Waste Quarry Fines as a Binding Material on Unpaved Roads

Extreme temperature changes and heavy equipment can damage and erode the unbound aggregates on Iowa's unpaved roads, leading to potholes, ruts, and other problems. Combining the aggregates with quarry fines—the small particles that remain after the usable stones from a quarry have been extracted—can improve the roads' performance and reduce the need for routine maintenance. [IHRB Project TR-747](#)



Evaluation of Sediment Basin Performance Using Large-Scale Testing Techniques

The Iowa DOT is required to develop stormwater pollution prevention plans to minimize the risk of downstream pollution caused by highway construction. This research indicates that in-channel sediment basins are effective with proper design, installation, and maintenance. A new in-channel sediment basin design may minimize land easement and use of existing infrastructure to decrease costs. [SPR Project 20-SPR2-001](#)

TECHNOLOGY

Incorporating Digital As-Built Information into I-380/I-80 Interchange BIM

As part of the I-80/I-380 interchange reconstruction project in Johnson County, Iowa, a 3D Building Information Model was used for the construction of the Ramp B Bridge. This study pushed the boundaries of the software and investigated the benefits and shortcomings of its use during construction. [STIC Project ST-012](#)



Implementation of Low Temperature Cracking Criteria in Iowa

This study evaluated the current performance of field-produced asphalt mixtures using various low-temperature cracking methods and recommends necessary adjustments to the limiting criteria for laboratory-produced mixes to enable asphalt pavements to perform better and last longer under low-temperature cracking. [SPR Project 18-SPR0-016](#)

Get Involved! Iowa DOT staff and partners from local public agencies and industry can be part of the research process by becoming a member of a research group or committee, [submitting an idea](#), or providing feedback on other ideas. Staff can also represent Iowa at the national level by serving on research and technical committees convened by the [Transportation Research Board](#) and [AASHTO](#).

LEVERAGING FUNDING WITH PARTNERSHIPS

Getting the Most From Our Research Dollars

By leveraging partnerships, efforts led by Iowa DOT get **57% more funding for the same investment.**

Transportation Pooled Fund Program

By joining forces, two or more DOTs with a shared research goal can get all the benefits of the research results at a fraction of what it would cost individually. Iowa DOT is a nationally recognized leader in transportation research, participating in 56 active **Transportation Pooled Fund (TPF)** studies and serving as the lead agency for 20 of these. Project results help Iowa DOT make better-informed decisions, conserve resources, and remain on the cutting edge of technological advancements.

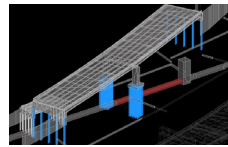
TPF-5(368): Performance Engineered Concrete Paving Mixtures



As concrete paving mixtures have become increasingly complex, the need for specification changes is apparent. Iowa DOT serves as the lead state for this **pooled fund project**,

which aims to advance the best approaches to accelerating the implementation and benefits associated with durability-based specifications.

TPF-5(372): Building Information Modeling (BIM) for Bridges and Structures



Data standardization, governance, and stewardship can provide benefits throughout a transportation structure's life cycle. Iowa DOT leads this **pooled fund project**, which aims to establish a

variety of materials to encourage and accelerate the adoption of BIM for Bridges and Structures nationwide.

Iowa Highway Research Board

As the first organization of its kind in the United States to investigate road construction problems at the local level, the work of the **Iowa Highway Research Board (IHRB)** over the past 70 years has contributed to Iowa's reputation as a leader in transportation solutions. The IHRB consists of 15 regular members and represents a variety of stakeholders. The group oversees approximately 20 research projects each year and has overseen over 800 projects since it was established.

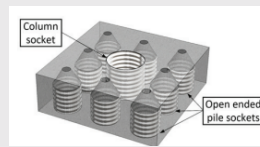


TR-803: Accelerated Bridge Construction (ABC) Methodology for Integral Abutments



Building on a previous bridge substructure project, the **proposed research** will advance the accelerated bridge construction method for integral bridge abutments supported on steel piles and constructed using prefabricated and in-situ concrete along with other advanced construction techniques and materials.

TR-802: Accelerated Bridge Construction (ABC) Methods for Pile-Footing Column Systems Using Lightweight Precast Members



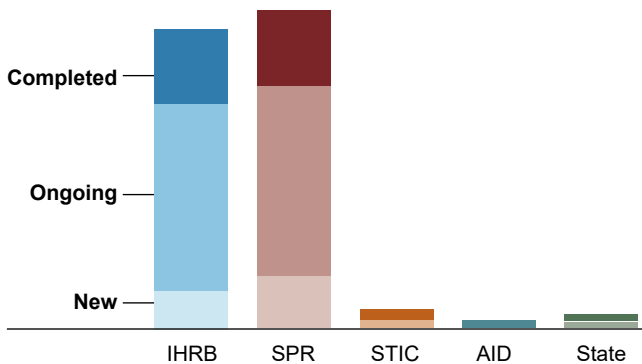
Using the combination of analytical and experimental observations and findings from the previous phase of **this project**, appropriate design

recommendations will be developed to improve bridge construction.

IOWA DOT'S RESEARCH PROGRAM BY THE NUMBERS

Research Program Activity

Iowa DOT Research staff oversaw 217 projects in FY2022.

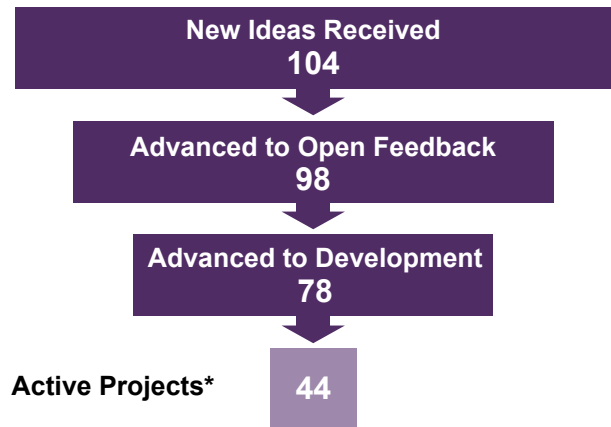


Project Type	IHRB	SPR	STIC	AID	State	Total
New	17	23	2	0	2	44
Ongoing	65	65	2	3	7	142
Completed	14	14	1	1	1	31

Research Idea Submissions

Research ideas can be submitted by anyone at any time through the [Research Ideas site](#). While ideas are in the open feedback stage, anyone can provide written comments or vote on a new idea.

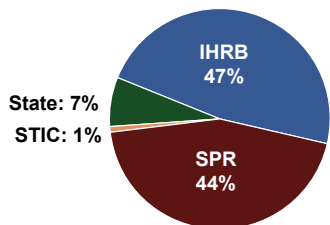
Almost all of the FY2022 research ideas progressed to the open feedback stage; more than three-fourths advanced to development.



*Includes projects developed in previous fiscal years.

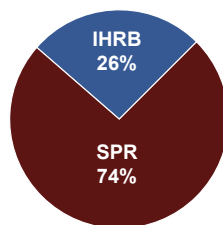
FY2022 FUNDING BY PROGRAM:

New FY2022 Funding



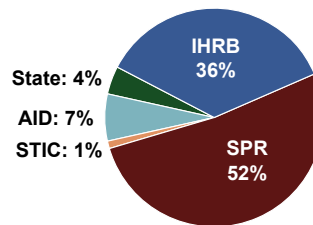
IHRB	\$3,287,275
SPR	\$3,067,419
STIC	\$100,000
AID	—
State	\$500,000
Total	\$6,954,694

New Leveraged Funding for FY2022



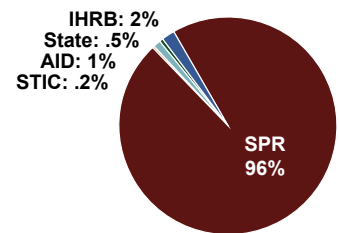
IHRB	\$1,029,622
SPR	\$2,921,908
STIC	—
AID	—
State	—
Total	\$3,951,530

Total Iowa Funding for All Active Projects



IHRB	\$8,822,026
SPR	\$12,878,922
STIC	\$257,997
AID	\$1,800,000
State	\$879,977
Total	\$24,638,922

Total Funding from All Sources for All Active Projects

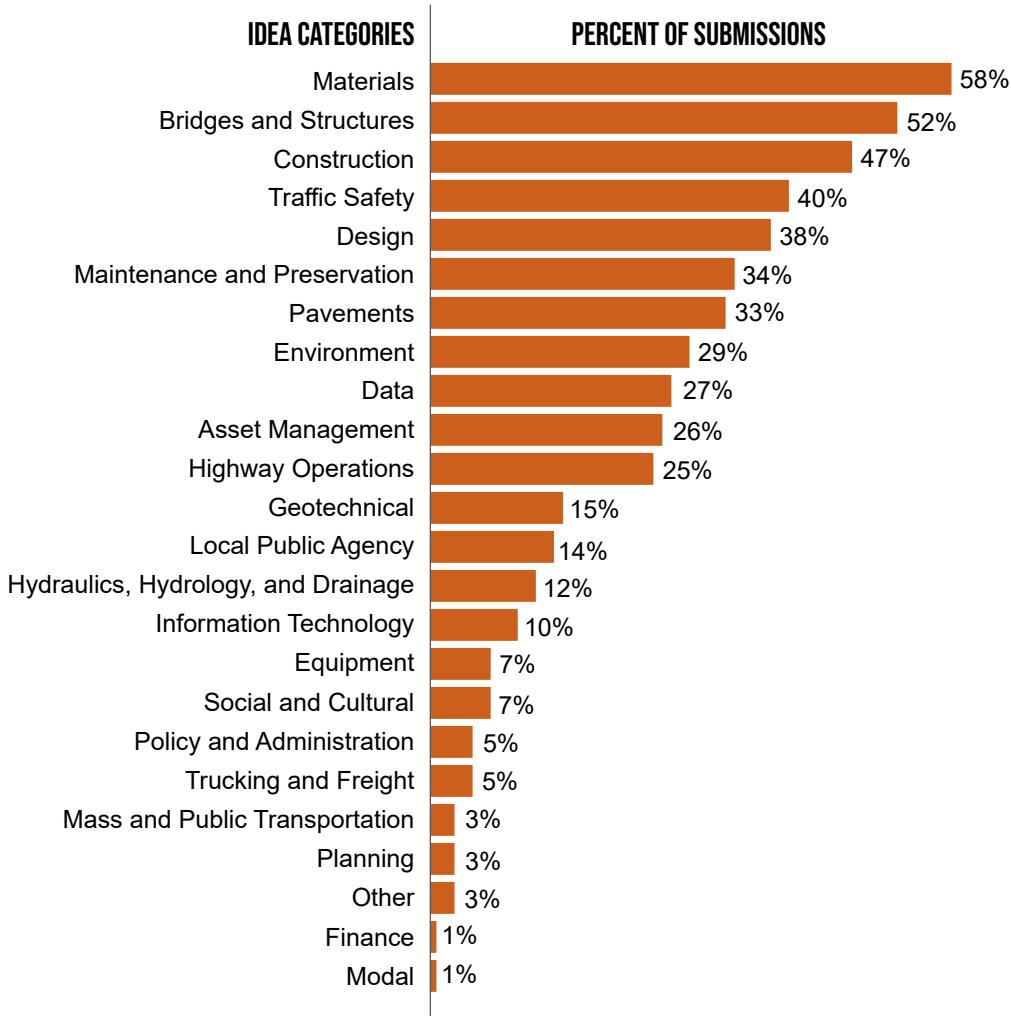


IHRB	\$3,871,080
SPR	\$150,907,749
STIC	\$255,997
AID	\$1,800,000
State	\$879,977
Total	\$157,714,803

IOWA DOT'S RESEARCH PROGRAM BY THE NUMBERS

Categorizing Research Ideas

The categories assigned to all research ideas submitted provide an early indication of what future projects will focus on. More than one category can be assigned to an idea.



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