

List of Indiana Department of Transportation (INDOT) FY 2026 Research Needs (as of June 5, 2025)

Instructions: This listing is for use by Faculty from accredited Indiana Universities. For additional information or to express an interest in a Research Need listed, please contact the JTRP Program Director at snoueldin@indot.in.gov. If expressing an interest in a Research need, attach your CV/resume to your email response.

#	Status	SPR	Focus Group	Title
1	Approval Pending	4857	Traffic Engineering, Safety, Management & Operations, TESMO	Expansion/Extension: SPR-4857: Statewide Screening of Signalized Intersections for Capacity Improvements
2	Proposal Pending	4900	District Deputy Commissioners and Workforce, DDC & WF	Expansion SPR-4900
3	Proposal Pending	5000		Retention of the Early-Career Highway Technician Workforce: Exploring and Addressing Their Career Trajectories and Challenges
4	Proposal Pending	5001		Recruiting and Retaining Individuals with Limited Mobility in the Transportation Workforce
5	Proposal Pending	5002		Rural Workforce Challenges at INDOT: An Investigative and Strategic Approach
6	Proposal Pending	5005	Planning, Multimodal, Finance, Asset Management and Economic Impact, PMFAME	Evaluation of Asset Identification Technology
7	Proposal Pending	5006		Stakeholder Engagement in Indiana's Electrification Ecosystem and Infrastructure Readiness Assessment
8	Proposal Pending	5007		Performance Evaluation and Development of Cost-Effective DWPT Roadways
9	Proposal Pending	5008	Statewide Safety, S	Strategic Expansion of Driving Simulators in INDOT Driver Training Programs
10	Proposal Pending	5009		Validation of Innovative Work Zone Countermeasures by Field Tests
11	Proposal Pending	5010		Comparative Analysis of Road Zipper Movable Barriers vs. Traditional Permanent and Temporary Barriers for Future Roadway Design, Construction, and Maintenance
12	Proposal Pending	5011	Structural, Hydraulics and Environmental, SHE	Harnessing Real-Time Weather Data for Improved Bridge Inspection after Flood Events
13	Proposal Pending	5012		Investigating FAST Act Legislation Requirements for Bridge Load Rating Considering Emergency Vehicles
14	Proposal Pending	5013		AI-Driven Vision Inspection Analytics to Assist with Quality Control of Bridge Inspection Documentation
15	Proposal Pending	5014		Polymeric Overlays Performance Assessment
16	Proposal Pending	5015		Augmenting INDOT's Remotely Controlled Vehicle with a LiDAR Unit for Culvert Monitoring
17	Awarded	5016	TESMO	Integration of SCRIM and Emerging Data Sources into Network Friction Testing Program for Immediate and Long-Term Needs

18	Proposal Pending	5017	TESMO	Safety Performance of Setting Speed Limits Based on Roadway Alignment
19	Proposal Pending	5018		Connected Freeway and Signalized Corridor Pilot: C-V2X Technologies Deployment for Enhanced Safety & Efficiency
20	Approval Pending	5019	TESMO	Vehicle Moving Pattern Analysis of Road Merge and Split Weaving Areas Involving Highway and Local Streets
21	Proposal Pending	5020	TESMO	Identifying Locations with Abnormally High Wrong Way Driving or Interstate U-Turns
22	Proposal Pending	5021		Traffic Signal Freight Prioritization via Vehicle to Infrastructure (V2I) Communications
23	Approval Pending	5022	TESMO	Development of Diagnostic Analytics Tool for Causal Effect Analysis from 511 Database
24	Proposal Pending	5023	TESMO	Understanding and Shaping Driver Behavior and Public Perception at Reduced Conflict Intersections (RCIs)
25	Awarded	5024	Pavements, Materials, Geotechnical and Construction, PMGC	Evaluation and Optimization of Portland Limestone Cement Concretes: Materials, Mixtures, and Performance
26	Awarded	5026		Evaluating the Effectiveness of Geosynthetics in Controlling the Detrimental Effects of Slow-Moving and Turning Traffic
27	Proposal Pending	5027	PMGC	Evaluation of Recycled Concrete Pavement (RCP) for Base and Subbase Layers
28	Proposal Pending	5028		Investigating Differential Settlement at Bridge Approaches Using 3-D Pavement Condition Survey System and Ground Penetrating Radar
29	Proposal Pending	5029		Sealing vs. Non-Sealing of JPCP Joints: A Comparative Study
30	Proposal Pending	5030		Review of Pavement Preservation Treatments: Use Cases of Treatments in Indiana
31	Proposal Pending	5031		Developing INDOT Road Crack Image Datasets for AI-Integrated Research
32	Proposal Pending	5032		Moisture Damage Control and Mitigation in Pavement Foundations Using Innovative Geosynthetics
33	Awarded	5033	PMGC	Optimizing field compaction of granular materials: Research and guideline development
34	Proposal Pending	5034	PMGC	LiDAR for Near Real-time Measurement of Construction Quality and Accurate 3D As-builts
35	Proposal Pending	5035		Evaluation and classification of temporary traffic paints and adhesives based on their ease-of-removal characteristics, and development of new temporary traffic paint formulations to meet INDOT needs
36	Approval Pending	5036	SHE	Development of Direct CPT-Based Pile Design Method
37	Approval Pending	5037	PMFAME	INDOT Research Program Benefit Cost Analysis – Return on Investment (ROI)

38	Under Consideration	Tier 2	PMGC	ChatGPT-like AI-Bot for vision-based quality assessment
39	Under Consideration	Tier 2		Surface Image Analysis for Quality Control of Unbound Bases
40	Under Consideration	Tier 2		Investigation of Low-temperature Cracking on Asphalt Pavements
41	Under Consideration	Tier 2		Development of a Digital Twin (DT) Model for Simulating APT
42	Under Consideration	Tier 2		Benefits of subgrade soil treatment with calcium oxide vs Lime Kiln Dust
43	Under Consideration	Tier 2		Detection of harmful clays in limestone
44	Under Consideration	Tier 2		Improved Subgrade Resilient Modulus from FWD on PCCP pavements
45	Under Consideration	Tier 2		Re-use and re-treatment of subgrades with sulfates in rehabilitation projects
46	Under Consideration	Tier 2		Coupling LiDAR construction quality features and performance for lifelong monitoring and risk prediction
47	Under Consideration	Tier 2		AI Chatbot for Digital Inspection and Documents Integrity Using Large-Language Models and Retrieval-Augmented Generation
48	Under Consideration	Tier 2		AI-Driven Chatbot for Construction Integrity and Quality Assurance of the Road Infrastructure
49	Under Consideration	Tier 2		Development of Concrete Slab Technology for Use with Dynamic Wireless Power Transfer Systems
50	Under Consideration	Tier 2		Highly modified asphalt (HiMA) for Indiana
51	Under Consideration	Tier 2		Verification of TSR Values on DMF and Modification of TSR Test Method Appropriate for Superpave 5 Mix Design
52	Under Consideration	Tier 2		Tack Coat Application Uniformity
53	Under Consideration	Tier 2		Feasibility Study of AI-Driven Ground Penetrating Radar (GPR) Integration for Real-Time Asphalt Compaction Quality Assessment
54	Under Consideration	Tier 2		AI-Driven Evaluation and Feasibility Assessment of Automating INDOT's Materials and Testing Lab Activities for Enhanced Efficiency, Accuracy, and Modernization
55	Under Consideration	Tier 2		Integrating flooding impacts for INDOT pavement preservation
56	Under Consideration	Tier 2		Deep learning informed GPR method for pavement condition assessment in Indiana
57	Under Consideration	Tier 2		Machine Learning-Driven Optimization of Materials and Mixtures for Enhancing Portland Limestone Cement (PLC) Concrete Quality
58	Under Consideration	Tier 2		Developing In-situ Sensing Methods for Understanding Concrete Fresh Properties
59	Under Consideration	Tier 2		Dielectric Constant of Concrete as a Reliable Durability Indicator for Field Applications
60	Under Consideration	Tier 2		Application of Self-Developed Piezoelectric Sensor for Concrete Sustainability by Conducting Life Cycle Assessment
61	Under Consideration	Tier 2		Reduction in Carbon Footprint of Portland Limestone Cement (PLC) Concrete Construction by Using Piezoelectric Sensor and Life Cycle Assessment (LCA)
62	Under Consideration	Tier 2		Using In-situ Piezoelectric Sensing Technology for Rapid and Reliable Freeze-Thaw Durability Assessment in Aggregates

63	Under Consideration	Tier 2	PMGC	Assess Measurement While Drilling (MWD) Techniques for Geotechnical Investigations
64	Under Consideration	Tier 2		Computerized Particle Size Analysis of Soils and Aggregates
65	Under Consideration	Tier 2		Current state of manufactured sand DOT use in concrete, analysis of availability in the Indiana area, and experimental study on its effect on INDOT-compliant concrete mixtures.
66	Under Consideration	Tier 2		Techno-Economic and Environmental Life Cycle Assessment of Pavement Materials in Indiana: Quantifying the Impact of Current and Future Strategies
67	Under Consideration	Tier 2		Developing Guidelines for Adopting INDOT-Approved, Safe, and Trustworthy AI Tools
68	Under Consideration	Tier 2		AI-Enabled Chatbot for Automating Compliance Detection in Construction Projects
69	Under Consideration	Tier 2		Assessment of Subgrade Properties using Machine Learning.
70	Under Consideration	Tier 2		Develop Guidelines for Improving the Engineering Properties of Problematic Soils
71	Under Consideration	Tier 2		MSE Wall Pullout Resistance Factors for Reinforced Backfill Comprising Coarse Aggregates
72	Under Consideration	Tier 2		Determination of Coarse Aggregate Properties for Use in MSE Wall Design
73	Under Consideration	Tier 2		Development of Field-Representative Testing Protocols for Evaluating the Durability of Chemically Treated Subgrades under Freeze-Thaw
74	Under Consideration	Tier 2		Biopolymer-Based Stabilization as a Sustainable Alternative to Lime for Subgrades
75	Under Consideration	Tier 2		Real-time compaction monitoring equipment for use in confined areas
76	Under Consideration	Tier 2		Study of plate load testing to assess foundation capacity and subgrade stiffness
77	Under Consideration	Tier 2		Framework for Predicting Freeze-Thaw Durability in Aggregates: Leveraging Triaxial and Hydraulic Testing with Machine Learning
78	Under Consideration	Tier 2		Optimizing Compaction Parameters for INDOT No. 53 Aggregates to Achieve Maximum Stiffness
79	Under Consideration	Tier 2		Resilient Modulus ML Model Implementation - Streamlining Use and Deployment of Prediction Tools for Maximum Impact
80	Under Consideration	Tier 2		Implementation Phase: Enhancing Usability and Deployment of Resilient Modulus ML Models: Simplifying Access
81	Under Consideration	Tier 2		AI Model for Evaluating Tack Coat Coverage in Road Construction
82	Under Consideration	Tier 2		Innovative Framework for Predicting Freeze-Thaw Durability in Aggregates: Leveraging Triaxial and Hydraulic Testing with ML
83	Under Consideration	Tier 2		Automating Pavement Maintenance through Integrated Data and Machine Learning
84	Under Consideration	Tier 2		Mechanistic Asphalt Overlay Design Framework to Enhance Indiana's Pavement Structural Performance
85	Under Consideration	Tier 2		Estimating Overweight Vehicles-Induced Pavement Damage with Integrated Machine Learning and M-E Analysis Framework
86	Under Consideration	Tier 2		Innovative Solutions for Mitigating Asphalt Cracking
87	Under Consideration	Tier 2		GPR for Accurate Layer Detection Through Autonomous Systems and Strategic Material Integration
88	Under Consideration	Tier 2		Optimizing Crack Sealing Preparation and Operations to Improve Resource Efficiency and Pavement Performance for INDOT

89	Under Consideration	Tier 2	DDC & WFD	Improving Civil Engineering Student Readiness: A Focus on Industry-Relevant Software
90	Under Consideration	Tier 2		SPR 4806 Expansion: Workforce Development for INDOT Construction Workers and Highway Engineers
91	Under Consideration	Tier 2		Retention and Advancement of Women with Different Job Classifications in the Engineering and Transportation Workforce
92	Under Consideration	Tier 2		Impact of New Technologies on Workforce
93	Under Consideration	Tier 2	S	Phase II of SPR-4628: Evaluation and Validation of Innovative Work Zone Countermeasures based on Human Information Processing
94	Not approved for funding	Tier 3	DDC & WFD	Remote/Hybrid Work Impact Assessment for Technical Roles in INDOT
95	Not approved for funding	Tier 3	Maintenance Operations, MOP	Expansion of SPR 4808 (Development of Indiana's First De-Icing Operations Manual and Decision-Support Monograms)
96	Not approved for funding	Tier 3		AI-Driven Video Analysis Framework for Dynamic Resource Optimization, Adaptive Planning, and Enhanced Operational Efficiency in INDOT's In-House Chip Seal Operations.
97	Not approved for funding	Tier 3		Predictive Maintenance and Warranty Management for Fleet Vehicles Using Digital Twins and IoT Sensor
98	Not approved for funding	Tier 3		Optimizing Vehicle Parts Inventory Management (my apologies. please use this updated version)
99	Not approved for funding	Tier 3		Enhancing INDOT Operations Through Lean Six Sigma Implementation
100	Not approved for funding	Tier 3		Optimizing Vegetation Management: Enhancing Precision and Efficiency in Herbicide Application for Indiana's Roadways
101	Not approved for funding	Tier 3		Synthesis Study on Best Practices for INDOT Maintenance Worker Training
102	Not approved for funding	Tier 3		Environment-Aware Smart Infrastructure and Asset Management via a State-Scale Digital Twin
103	Not approved for funding	Tier 3		Autonomous Robotic Assisted System for Pavement Crack Detection using Deep Learning
104	Not approved for funding	Tier 3		Vision AI Model-guided Autonomous Pavement Crack Repairing System
105	Not approved for funding	Tier 3		Smart Automated Roadway Defect Detection Using AI and Community Imaging Networks
106	Not approved for funding	Tier 3		Smart Automated Roadway Defect Detection Using AI and Community Imaging Networks
107	Not approved for funding	Tier 3		Best Practices of Using Renewable Energy for Highway Lighting Systems and Beyond.
108	Not approved for funding	Tier 3		Improving Roadway Safety: Innovative Strategies for Road Debris Real-time Detection, Prevention, and Response
109	Not approved for funding	Tier 3	PMFAME	Multimodal Hazardous Materials Transportation Safety and Emergency Plan
110	Not approved for funding	Tier 3		Evaluation Tools of Selecting Highway-Railroad Grade Crossing for Grade Separation in Indiana
111	Not approved for funding	Tier 3		Road Infrastructure Analysis Using Advanced Scanning Technologies
112	Not approved for funding	Tier 3		Developing a Methodology to Quantify User Costs of Pavement Maintenance Types
113	Not approved for funding	Tier 3		Investigation into the Usage of Automotive-grade Accelerometer Readings for Evaluating Road Surface Conditions

114	Not approved for funding	Tier 3	PMFAME	Dynamic Wireless Power Transfer Electric Road Inspection and Maintenance Using Drone Thermal Imagery
115	Not approved for funding	Tier 3		Economic Impacts of Electric Vehicle Charging Stations on Local Businesses
116	Not approved for funding	Tier 3		Fleet Operator's Charging Preferences and Business Models for Electric Truck Charging Technologies
117	Not approved for funding	Tier 3		Identifying the Factors Affecting Utilization of Indiana Public EV Charging Stations
118	Not approved for funding	Tier 3		Workforce Development for Electric Vehicle Charging Infrastructure: Preparing INDOT for Sustainable Transportation
119	Not approved for funding	Tier 3		Estimating Emissions Reduction from Electric Vehicles Using Simulation Models
120	Not approved for funding	Tier 3		Towards a Comprehensive Regional Screening Tool for Transportation Investment Planning
121	Not approved for funding	Tier 3		Freight Mobility Trends using Connected Vehicle Data
122	Not approved for funding	Tier 3		Synthesis of Transportation Cybersecurity Threats, Vulnerabilities, and Mitigation Strategies
123	Not approved for funding	Tier 3		Evaluating the feasibility of using generative AI to support opinion data collection
124	Not approved for funding	Tier 3		Assessing the potential travel demand and road usage change due to freight truck electrification
125	Not approved for funding	Tier 3		Impact Assessment of Electric and Automated Delivery Vehicles (ADV) in Rural Areas for Identifying Road Infrastructure Needs
126	Not approved for funding	Tier 3		Advancing Electric Vehicle Charging Infrastructure: A Comprehensive Review of Charging Provision Technologies and Strategies
127	Not approved for funding	Tier 3	S	Work Boot Study to Reduce the Injuries for INDOT Field Employees
128	Not approved for funding	Tier 3		Leveraging Machine Learning and Augmented Reality to Improve Mental Health for Construction Workers
129	Not approved for funding	Tier 3	SHE	Speed Bridge: Feasibility of Innovations in Accelerated Bridge Construction
130	Not approved for funding	Tier 3		Steel-Concrete Composite Piles: Feasibility of Implementing Latest in R&D in Indiana
131	Not approved for funding	Tier 3		Predicting Camber of Prestressed Concrete Girder Bridges
132	Not approved for funding	Tier 3		Near Real-time Evaluation of Rebar Cover Thickness during the Pour of a Concrete Bridge Deck
133	Not approved for funding	Tier 3		Waterway opening lost after channel clearing
134	Not approved for funding	Tier 3		Flexural, Bond and Shear Strength of reinforced concrete members with corrosion related damage.
135	Not approved for funding	Tier 3		Automated UAV-UGV Hybrid System for Challenging Highway Culvert Inspection
136	Not approved for funding	Tier 3		Cost-Efficient Approach for Non-Destructive Testing of Unknown Foundations using AI-Driven Electrical Resistivity Imaging
137	Not approved for funding	Tier 3		Enhancing HY-8 Culvert Analysis Software Functionality
138	Not approved for funding	Tier 3		Immersive Virtual Reality Modules for Enhanced Bridge Inspection Training
139	Not approved for funding	Tier 3		Integrating smart sensors with non-destructive testing (NDT) methods presents a promising approach for efficient bridge inspection.

140	Not approved for funding	Tier 3	SHE	Assessing Hurricane Remnant Risks Under Shared Socioeconomic Pathways for Resilient Transportation Infrastructure in Indiana
141	Not approved for funding	Tier 3		Development of Design Methods for Piles in Gravelly Soils
142	Not approved for funding	Tier 3		Development of Pile Driving Analysis and Static Design Method for Open-Ended Pipe Piles
143	Not approved for funding	Tier 3		Direct CPT Interpretation Method for Pile Design using Artificial Intelligence Engine
144	Not approved for funding	Tier 3		Non-destructive Methods to Determine the Geometry of Unknown Foundations
145	Not approved for funding	Tier 3		Leveraging Qualitative Inspection Data for Performance Assessment
146	Not approved for funding	Tier 3		Physics-based Models for Predicting the Impact of New Technologies on Bridge Lifecycle Performance and Costs
147	Not approved for funding	Tier 3		use of ordinary reinforced concrete and ultra-high-performance concrete in bridges with focus on cost and time-performance
148	Not approved for funding	Tier 3		Monitoring of Concrete Bridge Extensions: Piezoelectric Sensor Arrays and AI-guided EMI Techniques for Durability Assessment
149	Not approved for funding	Tier 3		Monitoring of Concrete Bridge Extensions: Piezoelectric Sensor Arrays and AI-guided EMI Techniques for Interface Assessment
150	Not approved for funding	Tier 3	TESMO	Leveraging 3D Technology and Artificial Intelligence for Phantom Braking Risk Assessment in Autonomous Driving in Indiana
151	Not approved for funding	Tier 3		Interstate View Screens
152	Not approved for funding	Tier 3		Real-Time Anomaly Detection of Equipment Operators with Privacy-Enhanced Intelligent Monitoring
153	Not approved for funding	Tier 3		Reducing MOT Investment
154	Not approved for funding	Tier 3		Temporary traffic paints and adhesives based on their ease-of-removal characteristics
155	Not approved for funding	Tier 3		Automated Characterization of Lane Markings and Road Surface Condition using Mobile LiDAR Data
156	Not approved for funding	Tier 3		Investigation into the Potential Usage of Automotive-grade LiDAR for Lane Marking Evaluation
157	Not approved for funding	Tier 3		Leveraging CAVs crowdsourcing data in evaluating highway marking retro reflectivity
158	Not approved for funding	Tier 3		Change Detection of Highway Signs, Pavement Marking, and related Traffic Control Devices
159	Not approved for funding	Tier 3		Systematic Identification and Documentation of Secondary Crash Incident Impacts on Indiana Interstates
160	Not approved for funding	Tier 3		Leveraging CV Data to Develop Truck Parking Metrics to Assess the Impact of New Facilities and Prioritize Future Investments
161	Not approved for funding	Tier 3		Porting Heatmaps to INDOT Cloud and Integration of New OEM Data sources
162	Not approved for funding	Tier 3		Using Artificial Intelligence (AI) for Quality Control Screening of Crash Reports
163	Not approved for funding	Tier 3		Separating official construction detours for heavy vehicles and passenger cars and work zone crash analysis.
164	Not approved for funding	Tier 3		Pilot Program for Low-Cost, Fully Automated, Zero-Distracted In-Vehicle Driver Check-In Systems
165	Not approved for funding	Tier 3		Enhancing User Safety at Roundabout Interchanges (RBIs): A Study on Merging Dynamics and Design Improvements