

## List of Indiana Department of Transportation (INDOT) FY 2027 Research Needs (as of June 2, 2026)

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 [snoureldin@indot.in.gov](mailto:snoureldin@indot.in.gov). If expressing an interest in a Research need, attach your CV/resume to your email response.

#	Status	SPR	Focus Group	RNS Title
1	Approval Pending	4844	Pavements, Materials, Geotechnical and Construction, PMGC	Extension & Expansion - Analysis of Down Drag Loads Using the Neutral Plan Method
2	Approval Pending	5016	Traffic Engineering, Safety, Management & Operations, TESMO	Expansion of SPR 5016 Integration of SCRIM and Emerging Data Sources into Network Friction Testing Program for Immediate and Long-Term Needs
3	Approval Pending	5040	District Deputy Commissioners and Workforce, DDC & WF	INDOT R&D Testing Prioritization, Resource Mapping, & Strategic Planning – Phase 2
4	Awarded	5042	Statewide Safety	Performance and Safety Evaluation of Truck Mounted Debris Clearing Systems
5	Proposal Pending	5100	DDC & WF	Synthesis of Best Practices for Attraction and Retention of Land Surveyors
6	Proposal Pending	5101		Strategic Workforce Planning for INDOT Construction Projects
7	Proposal Pending	5103		Rural Workforce Challenges at INDOT: An Investigative and Strategic Approach
8	Proposal Pending	5105	Planning, Multimodal, Finance, Asset Management and Economic Impact, PMFAME	Work zone Analytics Tools and Event Repository
9	Proposal Pending	5107		Travel Demand and Network Impacts of New Interchange Construction
10	Approval Pending	5108	PMFAME	Automated Highway Asset Inventory Using High-Resolution Aerial Imagery and LiDAR Data
11	Proposal Pending	5109	PMGC	Compaction Testing Recalibration & Validation and Recalibration of DCPT for Embankment Construction Acceptance
12	Proposal Pending	5110		Reducing Curing Time and Ensuring Long-Term Performance of Cement-Stabilized Subgrades (CSS)
13	Proposal Pending	5111		AI-Driven Quality Assurance for Tack Coat Construction using Thermal Imaging and Vision-LLMs

14	Proposal Pending	5112	PMGC	Analysis of Options for Modernization of SPT Torque Measurement for Subsurface Characterization	
15	Proposal Pending	5113		Assessment-based Strategies for Determining Milling Depth for Asphalt Overlays	
16	Proposal Pending	5114		Statistical Analysis of Historical Unit Prices for INDOT Change Orders	
17	Proposal Pending	5115		Implementation and Validation of Density Profiling System (DPS) for Asphalt Pavement Compaction Quality Assurance in Indiana	
18	Proposal Pending	5116		Assessment of Highly Modified Asphalt for INDOT Thin and Thick Overlay Applications	
19	Proposal Pending	5117		Detection of Pavement Failures using 3D GPR for Thin Bonded Concrete Overlays on Asphalt	
20	Proposal Pending	5118		Updating and Operationalizing the Developed Soil Resilient Modulus (MR) Prediction Models: Implementation Phase to Deploy an Internal, User-Friendly Interface	
21	Proposal Pending	5119		AI Tool for Automating Material Record Management	
22	Proposal Pending	5120		Pavement Underdrain Requirements for Unsealed Concrete Pavement	
23	Proposal Pending	5121		Construction AI-Driven Knowledge Transfer and Training	
24	Proposal Pending	5122		Integrated Network-Level Pavement Evaluation Using FWD, TSD, and GPR Data for INDOT	
25	Proposal Pending	5123		S	Synthesis Study of Driving Simulation for INDOT: Needs and Implementation Strategies
26	Proposal Pending	5124		Structural, Hydraulics and Environmental, SHE	Comparison of HEC-RAS 2D and SRH-2D for Bridge and Culvert Design in Indiana
27	Proposal Pending	5125			Use of a LiDAR that Collects Bathymetric Data for Scour Monitoring and Stream Degradation
28	Proposal Pending	5126	Making Indiana Historical Aerial Imagery FAIR		
29	Proposal Pending	5127	Design and construction guidelines for widening RC bridge decks with post-installed chemical anchoring systems		
30	Proposal Pending	5128	Development of Specification for T-Wall Application for Bridge Approaches in Indiana		
31	Proposal Pending	5129	Implementation of LiDAR for MSE Wall Asset Management		
32	Awarded	5130	SHE	Computational Tool for Estimating the Service-Life of Concrete Decks and Slabs	
33	Proposal Pending	5131	Traffic Engineering, Safety, Management & Operations, TESMO	Porting Existing CV Data/tools to INDOT Cloud and Integration of New CV Data Sources	
34	Proposal Pending	5132		Implementation of Proven CV Applications on the Local System LRS	
35	Proposal Pending	5133		Evaluation of In-CAB Virtual Sign Network on CMV Sfety	
36	Proposal Pending	5134		Kinetic Energy, Risk, and The Relationship to Traffic Safety	
37	Awarded	5135	TESMO	CARSx Traveler Information Message (J-2735) Module Development	

38	Proposal Pending	5136	Traffic Engineering, Safety, Management & Operations, TESMO	Maintenance of Traffic in Complex Work Zones with Limited Shoulders
39	Proposal Pending	5137		511-GPT: Leveraging Generative AI and Connected Vehicle Data for Dynamic, Prioritized Traffic Message Dissemination
40	Proposal Pending	5138		Development of Selection Criteria for Residential Driveway Temporary Signals
41	Not approved for funding	Tier 2	District Deputy Commissioners and Workforce, DDC & WF	Enhancing Field Worker Safety at INDOT with Training and Technology (was 5102)
42	Not approved for funding	Tier 2		Strengthening Field Supervisor Development and Knowledge Transfer for INDOT Maintenance and Construction
43	Not approved for funding	Tier 2		Evaluating Interactive Strategies for Employee Training and Retention at INDOT
44	Not approved for funding	Tier 2		Enhancing Project Continuity through a Capable, Technology-enabled, and Retained Transportation Workforce
45	Not approved for funding	Tier 2		Synthesis Study on INDOT Workforce Needs and Development Pathways using Web-Scraped Job Postings
46	Not approved for funding	Tier 2		Synthesis of Best Practices for Regional AI Utilization
47	Not approved for funding	Tier 2	Maintenance Operations, MOP	INDOT Fleet Life Expectancy Model for Non-Vehicle Equipment
48	Not approved for funding	Tier 2		Evaluate the state of science and best management practices pertaining to methods and materials (amendments),
49	Not approved for funding	Tier 2		Evaluate the use of LIDAR and camera imagery to create a work plan for vegetation management.
50	Not approved for funding	Tier 2		What is the appropriate amount of material needed in exterior stockpiles (in reference to aggregate, millings, soils, etc.)? Just in time inventory.
50	Not approved for funding	Tier 2		Deep dive of life cycle costs of noise barriers to improve noise barrier design specifications
51	Not approved for funding	Tier 2		Evaluate current and future guardrail installation locations along INDOT roadsides and evaluate the costs and benefits of utilizing concrete barriers in these areas in greater detail
52	Not approved for funding	Tier 2		Evaluate the state of the science to include return on investment calculations for modifying and incorporating soil slope stabilization methods and materials and updating design standards as well as installation protocols.
53	Not approved for funding	Tier 2		Assessment of the Effectiveness of INDOT External Communication Strategies for the reduction in work requests provided to INDOT maintenance staff.
54	Not	Tier 2	Create a snow fence placement tool	

	approved for funding			
55	Not approved for funding	Tier 2		Roadside Vegetation control with Autonomous Lawnmower
56	Not approved for funding	Tier 2	Maintenance Operations, MOP	Effectiveness of Green Warning Lights on state-owned vehicles used for Winter Maintenance & Other Operations
57	Not approved for funding	Tier 2		Connected Technology for Safer and More Efficient Mowing Operations
58	Not approved for funding	Tier 2		Automated Roadside Vegetation Inspection for Planning Road Maintenance and Rehabilitation
59	Not approved for funding	Tier 2		Implementation of the LiDAR/Image Web Portal developed in SPR 4742
60	Not approved for funding	Tier 2		Assessing Backpack-Mounted LiDAR and Imaging Technologies for Construction and Asset Monitoring
61	Not approved for funding	Tier 2		Forecast-Informed Planning Framework for Winter Operations Capacity, Asset Risk, and Economic Impact under Weather Variability
62	Not approved for funding	Tier 2		Planning, Multimodal, Finance, Asset Management and Economic Impact, PMFAME
63	Not approved for funding	Tier 2	Developing a database of driver licensing requirements for owners of vehicles with advanced driver-assisted system (ADAS) and automated features	
64	Not approved for funding	Tier 2	Developing Guidelines for Adopting INDOT-Approved, Safe, and Trustworthy AI Tools	
65	Not approved for funding	Tier 2	UAS Applications to Improve Multimodal Facilities Operations	
66	Not approved for funding	Tier 2	Spatial and Economic Impacts of Industrial & Logistics Facility Growth on Indiana's Highway Infrastructure	
67	Not approved for funding	Tier 2	EV Charging Station Layout Planning Under Updated Federal Guidance	
68	Not approved for funding	Tier 2	Factors Affecting Public EV Charging Station Utilization to Predict High-Demand Locations	
69	Not approved for funding	Tier 2	Understanding Changes in EV Charging Demand due to Evolving Market, Technology, and Policy Conditions	
70	Not approved for funding	Tier 2	Understanding Barriers to Public EV Charging Station Usage through User Reviews	
71	Not approved	Tier 2	UAV Monitoring Program for Transportation Projects	

	for funding			
72	Not approved for funding	Tier 2		Designing an AI-Based Pavement Management Framework to Optimize Maintenance Prioritization Under Budget Uncertainty
73	Not approved for funding	Tier 2	Planning, Multimodal, Finance, Asset Management and Economic Impact, PMFAME	Validation of Techniques to Reduce Cost, Reduce Maintenance Concerns, and Simplify Construction of DWPT systems with Deep-Seated Coils
74	Not approved for funding	Tier 2		Strategic Review and Safe Demonstration of Artificial Intelligence for INDOT Operations
75	Not approved for funding	Tier 2		From Crowdsourced Images to Ranked Maintenance Candidates: Surface Distress Screening for INDOT
76	Not approved for funding	Tier 2		A framework for prioritizing active transportation projects in Indiana
77	Not approved for funding	Tier 2		Forecasting Indiana’s motor fuel revenues considering the impact of traffic mix and new technologies
78	Not approved for funding	Tier 2		Pavements, Materials, Geotechnical and Construction, PMGC
79	Not approved for funding	Tier 2	Integrated 3D GPR and Mechanical Bond-Strength Evaluation of Thin Bonded Concrete Overlays Using Core and Instron Testing	
80	Not approved for funding	Tier 2	"DCPT Compaction Acceptance Recalibration Using a Decade of INDOT Construction Data"	
81	Not approved for funding	Tier 2	Development of a Simple Seismic Approach for Non-destructive Evaluation of Soil Compaction	
82	Not approved for funding	Tier 2	Enhancing INDOT’s Change-Order Evaluation Through Modernized Statistical Modeling and AI-Driven Unit Price Analysis	
83	Not approved for funding	Tier 2	Predicting In-Service Asphalt Pavement Fatigue Resistance Using Field Back-Calculated Dynamic Modulus Master Curves	
84	Not approved for funding	Tier 2	Research Idea: Viability of Bio-Based Fog Seals for INDOT Chip Seal Programs	
85	Not approved for funding	Tier 2	Development of comprehensive design and construction specifications for T-WALL® systems	
86	Not approved for funding	Tier 2	Expanding INDOT’s Roadway Monitoring Capabilities with AI Powered Edge Devices	
87	Not approved for funding	Tier 2	APT as a Technology Proving Ground: A New Use Case for Sensor and System Validation	
88	Not approved for funding	Tier 2	AI-Ready Construction Guidance: Combining Human Readability with Structured Metadata	

89	Not approved for funding	Tier 2		Optimization of Type 1L INDOT Concrete Mix design and update of performance specifications
90	Not approved for funding	Tier 2	Pavements, Materials, Geotechnical and Construction, PMGC	Developing Standard Data Acquisition and Preprocessing Methods for Traffic Speed Deflectometer in Network Level Pavement Structure Assessment
91	Not approved for funding	Tier 2		Investigating Functional Performance and Curing Properties of Bio-Based Fog Seals for Indiana Preservation Applications
92	Not approved for funding	Tier 2		Mechanistic Asphalt Overlay Design Framework to Enhance Indiana's Pavement Structural Performance
93	Not approved for funding	Tier 2		Design Recommendations for Drilled Shafts in Shale
94	Not approved for funding	Tier 2		Recommendations for Optimum Application and Installation of Light-Weight Materials
95	Not approved for funding	Tier 2		Trenchless installation of pipelines and utilities in cohesionless soils
96	Not approved for funding	Tier 2		Formatting Construction Guidance Documents for Effective Use with AI/LLM Chatbots
97	Not approved for funding	Tier 2		From PDFs to Instant Answers: Converting Manuals into Machine-Readable, Citable Field QA/Inspection Guidance
98	Not approved for funding	Tier 2		Indiana-Specific CPT-SPT Mapping and Uncertainty-Aware CPT-from-SPT Prediction
99	Not approved for funding	Tier 2		Alternative Subgrade Stabilizers for High-Moisture Conditions in Indiana
100	Not approved for funding	Tier 2		Long-Term Freeze-Thaw Resilient Modulus Degradation in Cement-Stabilized High-Plasticity Subgrades
101	Not approved for funding	Tier 2		Accelerated Curing Technologies for Cement-Stabilized Subgrades: Comparative
102	Not approved for funding	Tier 2		This research idea on customized LLM addresses the Construction problem on Statistical analysis of unit price history.
103	Not approved for funding	Tier 2		Compaction Testing Recalibration for Updated Guidelines of DCPT-based Quality Control of Soil Compaction
104	Not approved for funding	Tier 2		Evaluation of Reduced Curing Durations for Cement-Stabilized Soils Using Plasticizers and Moisture Control
105	Not approved for funding	Tier 2	Optimizing Curing Requirements for Cement-Stabilized Soils	

106	Not approved for funding	Tier 2		Toward Performance-Based Evaluation of Pavement Subgrades Beyond Density Control
107	Not approved for funding	Tier 2		Expanded Resilient Modulus Modeling for Cement-Stabilized Soils Incorporating Index Properties
108	Not approved for funding	Tier 2	Statewide Safety	Reducing Psychological Distance for Safer Speeds in Work Zones.
109	Not approved for funding	Tier 2		Assessing safety when approaching work zones while using advanced driver-assisted system (ADAS) features
110	Not approved for funding	Tier 2		Practical Technologies And Best Practices To Reduce Thermal Stress On Workers
111	Not approved for funding	Tier 2		REDUCING SLIP, TRIP, AND FALL INCIDENTS AMONG INDOT EMPLOYEES
112	Not approved for funding	Tier 2		V2: Enhancing Field Worker Safety at INDOT with Training and Technology
113	Not approved for funding	Tier 2		Structural, Hydraulics and Environmental, SHE
114	Not approved for funding	Tier 2	Scalable Mapping System for Generating Dynamic As-Is models of Indiana's Bridges	
115	Not approved for funding	Tier 2	Quantitatively Assessing the Impact of Adopting New Technologies on Bridge Lifecycle Performance and Costs Using Physics-based Models	
116	Not approved for funding	Tier 2	FRP bars for the extension of reinforced concrete bridge slabs as post-installed chemical anchoring systems	
117	Not approved for funding	Tier 2	Investigating FAST Act Legislation Requirements for Bridge Load Rating Considering Emergency Vehicles	
118	Not approved for funding	Tier 2	Evaluating Shear Strength of Older Concrete Girders with Noncompliant Shear Details for Accurate Load Rating	
119	Not approved for funding	Tier 2	Expansion of SPR-4927: Bridge Data Virtual Validator (Scale Up with LLMs)	
120	Not approved for funding	Tier 2	Vibration-based Bridge Condition Assessment	
121	Not approved for funding	Tier 2	Immersive Virtual Reality Modules for Enhanced Bridge Inspection Training	
122	Not approved for funding	Tier 2	Integrated UAV-UGV AI-enabled Inspection and Automated Fault Identification and Classification	
123	Not approved for funding	Tier 2	Selection, Application, and Validation of Advanced NDT Instruments for Concrete Strength Estimation in Historic Concrete Bridges	

124	Not approved for funding	Tier 2		Irregular Area QTO Automation for Roadway and Bridge Projects
125	Not approved for funding	Tier 2		Feasibility Assessment of Wall-Climbing Robots Integrated with Ground Penetrating Radar (GPR) for Non-Destructive Inspection of Concrete Bridges
126	Not approved for funding	Tier 2	Structural, Hydraulics and Environmental, SHE	UHPC Bridge Deck Overlays for Indiana: Laboratory Verification, Field Pilot, and Cost-Benefit Implementation Framework
127	Not approved for funding	Tier 2		Performance of Textured Epoxy-Coated reinforcement in concrete bridges
128	Not approved for funding	Tier 2		Impact of corrosion of the reinforcement on the shear strength of reinforced concrete bridges.
129	Not approved for funding	Tier 2		digital billboards in the era of advanced technology: balancing innovation, compliance, and privacy
130	Not approved for funding	Tier 2	Traffic Engineering, Safety, Management & Operations, TESMO	Evaluating LiDAR Performance at Road Intersections Under Adverse Weather Conditions
131	Not approved for funding	Tier 2		Power Management Control Device that can be used as a wrong way detector, vehicle counter and speed indicator for highway offramps.
132	Not approved for funding	Tier 2		Implementation of the Data to Science platform for secure, scalable, and accessible drone data for sustainable INDOT drone operation
133	Not approved for funding	Tier 2		Automated Traffic Incident Detection using Multiple Roadside Sensors (Cameras / Radars / Lidars) for Improved Accuracy and Reliability
134	Not approved for funding	Tier 2		Roadway Curve and Intersection Risk Detection for Statewide Safety
135	Not approved for funding	Tier 2		Implementation of Digital Alerting on INDOT Crew Cabs
136	Not approved for funding	Tier 2		DRIVER RESPONSE TO DYNAMIC MESSAGE AND SPEED SIGNS
137	Not approved for funding	Tier 2		AI Distracted Driving Alerts
138	Not approved for funding	Tier 2		Network-level work zone Planning Considering Project Bundling
139	Not approved for funding	Tier 2		Stop taking data from cell phones, Paul Mitchell.
140	Not approved for funding	Tier 2		AI-enabled Pre-site Investigation Support Tool. This research proposes developing an AI-driven tool to support pre-site roadway safety investigation activities
141	Not approved for funding	Tier 2		Mapping Digital Twin into Traffic Simulation: A Metadata-driven Gap Analysis and Comparison Study

142	Not approved for funding	Tier 2		a non-intrusive, privacy-by-design solution that leverages the physical properties of millimeter waves to operate reliably under adverse weather conditions.
143	Not approved for funding	Tier 2		Automated Traffic Incident Detection using Multiple Roadside Sensors (Cameras with optional Radars or Lidars) for Improved Accuracy and Reliability
144	Not approved for funding	Tier 2	Traffic Engineering, Safety, Management & Operations, TESMO	Statewide Spatiotemporal Hotspot Analytics and Alert Effectiveness Optimization Using Safety Cloud Digital Alerts
145	Not approved for funding	Tier 2		Leveraging Emerging AI Tools to Identify Inconsistencies in Crash Reports
146	Not approved for funding	Tier 2		Onshoring Connected Vehicle Data to reside within INDOT Google Cloud Computing (GCP) environment
147	Not approved for funding	Tier 2		Roadside Safety Recommendations for Sound Barrier Walls
148	Not approved for funding	Tier 2		Localized Traffic Jam Containment Using Existing Signal and Ramp Controls on Indiana Corridors
149	Not approved for funding	Tier 2		Effectiveness of Traffic-Control Devices (TCDs) in Reducing Speed in Highway Construction Work Zones
150	Not approved for funding	Tier 2		Review the potential for reducing grain truck traffic in the city of Lafayette via the use of current rail infrastructure.