

ANNUAL REPORT
Iowa Highway Research Board
Research and Development Activities
FY 2015



DECEMBER 2015

**ANNUAL REPORT
OF
IOWA HIGHWAY RESEARCH BOARD
RESEARCH AND DEVELOPMENT ACTIVITIES**

**FOR THE
FISCAL YEAR ENDING JUNE 30, 2015**

OFFICE OF RESEARCH AND ANALYTICS
(515) 239-1382
www.iowadot.gov/RA

PERFORMANCE AND TECHNOLOGY DIVISION
IOWA DEPARTMENT OF TRANSPORTATION
AMES, IOWA 50010

DECEMBER 2015

TABLE OF CONTENTS

	Page
Research and Development.....	2
Iowa Highway Research Board	2
Table I - Iowa Highway Research Board Members	3
Table II - Iowa Highway Research Board Members	5
Research and Development Projects.....	7
Table III - Financial Summary of Research and Development Project Expenditures	7
Secondary Road Research Fund.....	9
Street Research Fund	10
Primary Road Research Fund	10
Projects Initiated During FY 2015	11
Projects Completed During FY 2015	12

LIST OF ACRONYMS

AASHTO - American Association of State Highway and Transportation Officials
APWA - American Public Works Association
ASCE - American Society of Civil Engineers
DOT - Department of Transportation
FHWA - Federal Highway Administration
GIS - Geographic Information System
HMA - Hot Mix Asphalt
HPC – High Performance Concrete
IHRB - Iowa Highway Research Board
ISU - Iowa State University
LiDAR – Light Detection and Ranging
LRFD - Load and Resistance Factor Design
LTAP - Local Technical Assistance Program
LVR - Low Volume Road
MOVITE - Missouri Valley Section of the Institute of Transportation Engineers
NCHRP - National Cooperative Highway Research Program
SUDAS - Statewide Urban Designs and Specifications
TAC - Technical Advisory Committee
TRB - Transportation Research Board
UHPC - Ultra High Performance Concrete
USGS - United States Geological Survey
WMA – Warm Mix Asphalt
SPR - Statewide Planning and Research
AADT - Annual Average Daily Traffic
RFIDS – Motion Sensing Radio Transponders
CBM – Condition-Based Maintenance
MEMS – Micro Electra Mechanical Sensor
LRFR – Load and Resistance Factor Rating
RCB – Reinforced Concrete Box
QA – Quality Assurance
DNR – Department of Natural Resources
FWD – Falling Weight Deflectometer
DCP – Dynamic Cone Penetrometer
NBIS – National Bridge Inspection Standards
OBS – Office of Bridges and Structures
BEC – Bridge Engineering Center
BBR – Bending Beam Rheometer
LOS – Level of Service
VE – Viscoelastic
FEA – Finite Element Analysis
LRFR – Load and Resistance Factor Rating

RESEARCH AND DEVELOPMENT

The Iowa DOT's Research section is dedicated to *driving a quality research program that delivers targeted solutions for Iowa's transportation future.*

This report, entitled "Iowa Highway Research Board Research and Development Activities FY2015" is submitted in compliance with Sections 310.36 and 312.3A, Code of Iowa, which direct the submission of a report of the Secondary Road Research Fund and the Street Research Fund, respectively. It is a report of the status of research and development projects in progress on June 30, 2015. It is also a report on projects completed during the fiscal year beginning July 1, 2014 and ending June 30, 2015. Detailed information on each of the research and development projects mentioned in this report is available from the Office of Research and Analytics, Performance and Technology Division, Iowa Department of Transportation. All approved final reports are also online for viewing at: www.iowadot.gov/research/reports.html.

THE IOWA HIGHWAY RESEARCH BOARD

In developing a progressive, continuing, and coordinated program of research and development, the Iowa DOT is assisted by the IHRB. This advisory group was established in 1949 by the Iowa State Highway Commission to respond to the research denoted in Sections 310.36 and 312.3A of the Code of Iowa.

The Research Board consists of 15 regular members: seven Iowa county engineers, four Iowa DOT engineers, one representative from Iowa State University, one from The University of Iowa, and two engineers employed by Iowa municipalities. Each regular member may have an alternate who will serve at the request of the regular member. The regular members and their alternates are appointed for a three year term. The membership of the Research Board for FY15 is listed in Table I and II.

The Research Board held several regular meetings during the period from July 1, 2014, through June 30, 2015. Suggestions for research and development were reviewed at these meetings and recommendations were made by the Board.



Members of the IHRB are serious about the future of transportation. Understanding that every research project has the potential to strengthen the infrastructure and save lives, time, and precious resources, they work hard to make sure new methods, technologies, and materials are developed efficiently and economically for application in the real world. **The IHRB has received national attention as a leader in transportation research implementation.**

TABLE I: Jan 1 – Dec 31 2014 IOWA HIGHWAY RESEARCH BOARD

<u>Member</u>	<u>Term Expires</u>	<u>Alternate</u>
Ahmad Abu-Hawash Chief Structural Engineer Iowa DOT - Bridges and Structures 800 Lincoln Way Ames, IA 50010 (515) 239-1393 Email: Ahmad.Abu-hawash@dot.iowa.gov	12-31-15	Dave Claman Preliminary Bridge Engineer Iowa DOT - Bridges and Structures 800 Lincoln Way Ames, IA 50010 (515) 239-1487 Email: David.Claman@dot.iowa.gov
Kevin Jones Materials Testing Engineer Iowa DOT 800 Lincoln Way Ames, IA 50010 (515) 239-1237 Email: Kevin.Jones@dot.iowa.gov	12-31-15	Scott Schram Bituminous Materials Engineer Iowa DOT 800 Lincoln Way Ames, IA 50010 (515) 239-1604 Email: Scott.Schram@dot.iowa.gov
Michael Kennerly Director of Design Iowa DOT 800 Lincoln Way Ames, IA 50010 (515) 239-1243 Email: Michael.Kennerly@dot.iowa.gov	12-31-16	David Little Assistant District 2 Engineer Iowa DOT 1420 Fourth St. S.E. Mason City, IA 50401-4438 (641) 422-9464 Email: David.Little@dot.iowa.gov
Robert Younie Director of Maintenance Iowa DOT 800 Lincoln Way Ames, IA 50010 (515) 239-1589 Email: Bob.Younie@dot.iowa.gov	12-31-14	Dan Sprengeler Work Zone Traffic Control Engineer Office of Traffic and Safety 800 Lincoln Way Ames, IA 50010 (515) 239-1823 Email: Dan.Sprengeler@dot.iowa.gov
Sarah Okerlund Civil Engineer II, City of Ankeny 220 W 1 st St Ankeny, IA 50023-1751 (515) 963-3526 Email: sokerlund@ankenyiowa.gov	12-31-14	Matt Cox City Engineer, City of Council Bluffs 209 Pearl Street Council Bluffs, IA 51503-0826 (712) 328-4635 Email: mcox@councilbluffs-ia.gov
Ronald Knoche City Engineer 410 E. Washington Street Iowa City, IA 52240-1825 (319) 356-5138 Email: Ron-Knoche@iowa-city.org	12-31-15	Bruce Braun Street Maintenance Administrator 216 SE 5 th Street Des Moines, IA 50309 (515) 237-1371 Email: BABraun@dmgov.org
Douglas Schnoebelen The University of Iowa – IIHR 323A SHL 300 South Riverside Drive Iowa City, Iowa 52242-1585 (319) 335-6061 Email: Douglas-Schnoebelen@uiowa.edu	-----	

Wade Weiss -----
Greene County Engineer
114 N. Chestnut Street
Jefferson, IA 50129
(515) 386-5650 SS-037
Email: WWeiss@co.greene.ia.us

Robert Kieffer 12-31-14
Boone County Engineers Office District 1
201 State Street
Boone, IA 50036-3988
(515) 433-0530 SS-008
Email: engineer@co.boone.ia.us

Doug Miller 12-31-16
Kossuth Co. Secondary Road Dept. District 2
114 W State Street
Algona, IA, 50511
(515) 295-3320 SS-055
Email: engineer@co.kossuth.ia.us

Paul Assman 12-31-15
Crawford County Engineer District 3
1202 Broadway, PO Box 458
Denison, IA 51442
(712) 263-2449 SS-024
Email: passman@crawfordcounty.org

Kevin Mayberry, Chair 12-31-14
Mills County Engineers Office District 4
403 Railroad Avenue
Glenwood, IA, 51534
(712) 527-4873 SS-065
Email: kmayberry@millscoia.us

Larry Roehl 12-31-16
Louisa County Engineer District 5
8313 K. Avenue
Wapello, IA, 52653-9279
(319) 319-523-5272 SS-058
Email: LRoehl.lococoe@louisacomm.net

Robert Fangmann 12-31-15
Cedar County Engineer District 6
400 Cedar Street
Tipton, IA 52772
(563) 886-6102 SS-016
Email: engineer@cedarcountry.org

Terry Wipf, Vice Chair -----
Dept. of CCEE Engineering
Iowa State University
420 Town Engineering Bldg.
Ames, IA 50011
(515) 294-6979
Email: TJWipf@iastate.edu

Russ Stutt
Jasper County Secondary Road
Department
910 N. 11th Ave. E.
Newton, IA, 50208
(641) 792-5862 SS-050
Email: rsjasper@iowatelecom.net

Lee Bjerke
Winneshiek County Engineers Office
201 W Main St
Decorah, IA, 52101-1713
(PH.) 563-382-2951
Email: lbjerke@co.winneshiek.ia.us

Patrick Mouw
Ida County Engineer
1703 W 6th St.
Ida Grove, IA 51445
(712) 364-2920
Email: idaengineer@frontiernet.net

Todd Hagan
Madison County Engineer
1105 E. Court Ave.
Winterset, Iowa 50273
(515) 462-1136 SS-061
Email: THagan@madisoncoia.us

Jacob Thorius
Washington County Engineers Office
210 W Main St., Ste. 2
Washington, IA, 52353-1723
(PH.) 319-653-7731
Email: thorius@co.washington.ia.us

Myron Parizek
Benton County Engineer
1707 W 1st St
PO Box 759
Vinton, IA 52349
(319) 472-2211 SS-006
Email: mparizek@prairieinet.net

TABLE II: Jan 1 – Dec 31 2015 IOWA HIGHWAY RESEARCH BOARD

<u>Member</u>	<u>Term Expires</u>	<u>Alternate</u>
Ahmad Abu-Hawash Chief Structural Engineer Iowa DOT - Bridges and Structures 800 Lincoln Way Ames, IA 50010 (515) 239-1393 Email: Ahmad.Abu-hawash@dot.iowa.gov	12-31-15	Dave Claman Preliminary Bridge Engineer Iowa DOT - Bridges and Structures 800 Lincoln Way Ames, IA 50010 (515) 239-1487 Email: David.Claman@dot.iowa.gov
Kevin Jones Materials Testing Engineer Iowa DOT 800 Lincoln Way Ames, IA 50010 (515) 239-1237 Email: Kevin.Jones@dot.iowa.gov	12-31-15	Scott Schram Bituminous Materials Engineer Iowa DOT 800 Lincoln Way Ames, IA 50010 (515) 239-1604 Email: Scott.Schram@dot.iowa.gov
Michael Kennerly Director of Design Iowa DOT 800 Lincoln Way Ames, IA 50010 (515) 239-1243 Email: Michael.Kennerly@dot.iowa.gov	12-31-16	Chris Poole Safety Programs Engineer Iowa DOT 800 Lincoln Way Ames, IA 50010 (515) 239-1267 Email: Chris.Poole@dot.iowa.gov
Tammy Nicholson Director of Office of Rail Iowa DOT 800 Lincoln Way Ames, IA 50010 (515) 239-1052 Email: Tamara.Nicholson@dot.iowa.gov	12-31-14	Dan Sprengeler Work Zone Traffic Control Engineer Office of Traffic and Safety 800 Lincoln Way Ames, IA 50010 (515) 239-1823 Email: Dan.Sprengeler@dot.iowa.gov
Sarah Okerlund, Vice-Chair Civil Engineer II, City of Ankeny 220 W 1 st St Ankeny, IA 50023-1751 (515) 963-3526 Email: sokerlund@ankenyiowa.gov	12-31-17	Matt Cox City Engineer, City of Council Bluffs 209 Pearl Street Council Bluffs, IA 51503-0826 (712) 328-4635 Email: mcox@councilbluffs-ia.gov
Ronald Knoche City Engineer 410 E. Washington Street Iowa City, IA 52240-1825 (319) 356-5138 Email: Ron-Knoche@iowa-city.org	12-31-15	Bruce Braun Street Maintenance Administrator 216 SE 5 th Street Des Moines, IA 50309 (515) 237-1371 Email: BABraun@dmgov.org
Douglas Schnoebelen The University of Iowa – IIHR 323A SHL 300 South Riverside Drive Iowa City, Iowa 52242-1585 (319) 335-6061 Email: Douglas-Schnoebelen@uiowa.edu	-----	

Wade Weiss
Greene County Engineer
114 N. Chestnut Street
Jefferson, IA 50129
(515) 386-5650
Email: WWeiss@co.greene.ia.us

Russ Stutt
Jasper County Engineer
910 N. 11th Ave. E.
Newton, IA, 50208
(641) 792-5862
Email: rsjasper@iowatelecom.n

12-31-14
District 1

Paul Geilenfeldt III
Marshall Co Engineers Office
101 East Church Street
Marshalltown IA, 50158-4915
(PH.) 641-754-6343
Email: pgeilenfeldt@co.marshall.ia.us

Doug Miller
Kossuth Co. Secondary Road Dept.
114 W State Street
Algona, IA, 50511
(515) 295-3320
Email: engineer@co.kossuth.ia.us

12-31-16
District 2

Lee Bjerke
Winneshiek County Engineers Office
201 W Main St
Decorah, IA, 52101-1713
(PH.) 563-382-2951
Email: lbjerke@co.winneshiek.ia.us

Patrick Mouw
Ida County Engineer
1703 W 6th St.
Ida Grove, IA 51445
(712) 364-2920
Email: idaengineer@frontiernet.net

12-31-15
District 3

Paul Assman
Crawford County Engineer
1202 Broadway, PO Box 458
Denison, IA 51442
(712) 263-2449
Email: passman@crawfordcounty.org

Kevin Mayberry
Mills County Engineers Office
403 Railroad Avenue
Glenwood, IA, 51534
(712) 527-4873
Email: kmayberry@millscoia.us

12-31-17
District 4

Todd Hagan
Madison County Engineer
1105 E. Court Ave.
Winterset, Iowa 50273
(515) 462-1136
Email: THagan@madisoncoia.us

Larry Roehl
Louisa County Engineer
8313 K. Avenue
Wapello, IA, 52653-9279
(319) 319-523-5272
Email: LRoehl.lococ@louisacomm.net

12-31-16
District 5

Jacob Thorius
Washington County Engineers Office
210 W Main St., Ste. 2
Washington, IA, 52353-1723
(PH.) 319-653-7731
Email: thorius@co.washington.ia.us

Robert Fangmann
Cedar County Engineer
400 Cedar Street
Tipton, IA 52772
(563) 886-6102
Email: engineer@cedarcountry.org

12-31-15
District 6

Myron Parizek
Benton County Engineer
1707 W 1st St
PO Box 759
Vinton, IA 52349
(319) 472-2211
Email: mparizek@prairieinet.net

Terry Wipf, Chair
Dept. of CCEE Engineering
Iowa State University
420 Town Engineering Bldg.
Ames, IA 50011
(515) 294-6979
Email: TJWipf@iastate.edu

RESEARCH AND DEVELOPMENT PROJECTS

Proposals for research and development are reviewed by the Iowa Highway Research Board. The Board's recommendations are transmitted to the director of the Performance and Technology Division of the Iowa Department of Transportation. Expenditure of research and development funds is then authorized on an individual project basis.

These expenditures may be charged to the Primary Road Research Fund, Secondary Road Research Fund or the Street Research Fund, or a combination and the costs are shared.

Table III is a record of expenditures for IHRB Projects made during the fiscal year ending June 30, 2015. Total expenditure was \$1,572,911.49.

Table III
FINANCIAL SUMMARY OF RESEARCH AND DEVELOPMENT PROJECT EXPENDITURES

July 1, 2013 to June 30, 2014

(Active projects with no current fiscal year expenditures are not included)

Project #	Project Title	Primary Road Research Fund Expenditures	Secondary Road Research Fund Expenditures	Street Research Fund Expenditures	Total Expenditures
HR140	Collection & Analysis of Streamflow Data		195,255.00	65,085.00	260,340.00
HR296	ISU Local Technical Assistance Program (LTAP)	19,391.06	135,074.57	27,068.14	181,533.77
HR375	Transportation Research Board Education for County Engineers		4,795.73		4,795.73
HR1027	Secondary Road Research Coordinator (Annual Funds)		42,560.82		42,560.82
TR519	Developing Flood-Frequency Discharge Estimation Methods for Small Drainage Basins in Iowa	12,720.00			12,720.00
TR603	Part II - Updating Portions of H-Standard Three Span Prestressed Beam Bridges, T-Pier and Pile Bent Pier Update to LRFD		11,528.60		11,528.60
TR613	Study of the Impacts of Implements of Husbandry on Iowa Bridges	24.09			24.09
TR620	Update of RCB Culvert Standards to LRFD Specifications		64,546.97	6,504.00	71,050.97
TR626	Optimization of Snow Drifting Mitigation & Control Methods for Iowa Conditions		20,964.56		20,964.56
TR628	Alkali Content in Fly Ash Measuring & Testing Strategies for Evaluating Compliance	26,518.02			26,518.02
TR631	Automation of DEM Cutting for Hydrologic/Hydraulic Modeling	1,236.56			1,236.56
TR635	Warm Mix Asphalt Phase II: Evaluation of WMA Quality Assurance Testing Protocols	(80.11)			(80.11)
TR637	Development of a Wireless MEMS Multifunction Sensor System and Field Demonstration of Embedded Sensors for Monitoring Concrete Pavements	26,010.71			26,010.71

TR640	Optimizing Pavement Base, Subbase, and Subgrade Layers for Cost and Performance on Local Roads		25,697.59		25,697.59
TR641	Reflective Crack Mitigation Guide for Flexible Pavements	24,412.22			24,412.22
TR642	Pilot Project for a Hybrid Road-Flooding Forecasting System on Squaw Creek	69,088.00	86,361.00	17,272.00	172,721.00
TR655	Updating the Iowa Culvert Hydraulics and Iowa Bridge Backwater Software		4,981.50		4,981.50
TR657	Evaluation of Low-Cost Signalized Intersection Red Light Running Countermeasures in Medium to Large Communities in Iowa		5,096.31		5,096.31
TR658	Development of Quality Standards for Inclusion of High Recycled Asphalt Pavement Content in Asphalt Mixtures - Phase 2		42,272.54		42,272.54
TR659	Development of Asphalt Dynamic Modulus Master Curve Using Falling Weight Deflectometer (FWD) Measurements		11,820.52		11,820.52
TR660	Investigation of Negative Moment Reinforcing in Bridge Decks		43,908.53		43,908.53
TR661	Evaluate the Need for Longitudinal Median Joints in Bridge Decks on Dual Structures		41,179.62		41,179.62
TR662	Evaluating Roadway Subsurface Drainage Practices - Phase II		42,789.19		42,789.19
TR663	Short Span County Bridge Standards		2,269.80		2,269.80
TR664	Low Cost Rural Surface Alternatives: Demonstration Project	23,253.75	44,418.24		67,671.99
TR669	Statistical Summary of Selected Iowa Streamflow Data		21,742.30		21,742.30
TR670	Iowa DOT Library Services, Collection, & Technology Assessment		4,383.57		4,383.57
TR673	Design and Performance Verification of a Bridge Column/Footing/Pile System for Accelerated Bridge Construction (ABC)		23,146.21	150.99	23,297.20
TR675	Assessment of PCC Concrete Setting Time and Joint Sawing		28,252.36	10,045.82	38,298.18
TR676	Impacts of Internally Cured Concrete Paving on Contraction Joint Spacing		19,257.90	15,821.94	35,079.84
TR677	Embankment Quality and Assessment of Moisture Control Implementation		109,694.09	18,835.68	128,529.77
TR678	Flood-Estimation Comparisons for Small Drainage Basins in Iowa		21,075.00	4,733.00	25,808.00
TR679	Upgrading Bridge Rails on Low Volume Roads in Iowa		28,253.06		28,253.06
TR682	Standard for Single Span Prefabricated Bridges-Phase III		89,994.16	11,522.67	101,516.83
TR684	Laboratory and Field Evaluation of an Alternative UHPC Mix and an Associated UHPC Bridge	912.78			912.78
TR685	Feasibility of Gravel Road and Shoulder Recycling	9,433.05			9,433.05
TR686	Guidance on Traffic Sign Effectiveness, Installation, and removal	11,632.38			11,632.38
Project Total		224,552.51	1,171,319.74	177,039.24	1,572,911.49

SECONDARY ROAD RESEARCH FUND

Section 310.34 of the Iowa Code authorizes the Iowa Department of Transportation to set aside each year an amount not to exceed 1½% of the receipts to the Farm-to-Market Fund in a fund to be known as the Secondary Road Research Fund. This authorization was first made in 1949; it was repealed in 1963, and reinstated in 1965. When the fund was reinstated, the fund was designated to finance engineering studies and research projects. The Iowa Department of Transportation accounting procedure for the Secondary Road Research Fund is based on obligations for expenditures on research projects and not the actual expenditures.

The fiscal year 2015 financial summary is:

Beginning Balance 7-1-14		\$ 1,567,198.94
Receipts		
State Road Use Tax Fund		
(1½% of receipts)	\$1,333,275.38	
Federal Aid Secondary		
(1½% of receipts)	0.00	
Research Income	<u>\$ 0.00</u>	
Sub-Total		<u>\$1,333,275.38</u>
Total Funds Available		\$2,900,474.32
Obligation for Expenditures		
Obligated for		
Contract Research	\$1,114,111.41	
Non-Contract		
Engineering Studies	<u>\$ 0.00</u>	
Total Expenditures		<u>\$1,114,111.41</u>
Ending Balance 6-30-15		\$1,786,362.91

STREET RESEARCH FUND

The Street Research Fund was established in 1989 under Section 312.3A of the Iowa Code. Each year \$200,000 is set aside from the street construction fund for the sole purpose of financing engineering studies and research projects. The objective of these projects is more efficient use of funds and materials available for construction and maintenance of city streets. The Iowa Department of Transportation accounting procedure for the Street Research Fund is based on obligations for expenditures on research projects and not the actual expenditures. The fiscal year 2015 financial summary is:

Beginning Balance (7-1-14)	\$118,699
FY15 Street Research Funding	<u>\$200,000</u>
Total Funds Available for Street Research	\$318,699
Total Obligated for Expenditure FY15	<u>(\$196,297)</u>
Ending Unobligated Balance 6-30-15	\$122,402

PRIMARY ROAD RESEARCH FUND

The Primary Road Research Fund is sourced from non-obligated funds of the Primary Road Fund. These funds can only be expended on Iowa DOT projects for which the funds were reserved, such as contracted research and project-specific research supplies or equipment. An estimate of Primary Road Research Fund expenditures is made prior to the beginning of each fiscal year. The amount expended for contract research from the Primary Road Research Fund for FY15 was \$392,065.93 and the estimate for obligations for FY16 is \$750,000.

PROJECTS INITIATED DURING FY 2015

The following projects were initiated in FY 15.

TR-681, “Context Sensitive Designs: Testing of Multi-Performance Level Box Beam Standards”

TR-682, “Standard for Single Span Prefabricated Bridges – Phase III”

TR-684, “Laboratory and Field Evaluation of an Alternative UHPC Mix and an Associated UHPC Bridge”

TR-685, “Feasibility of Gravel Road and Shoulder Recycling”

TR-686, “Guidance on Traffic Sign Effectiveness, Installation, and Removal”

TR-687, “Effect of Wind Induced Unsteady Vortex Shedding, Diurnal Temperature Changes and Transit Conditions on Truss Structures Supporting Large Highway Signs”

TR-690, “Investigation into Shrinkage of High Performance Concrete Used for Iowa Bridge Decks and Overlays – Phase II Shrinkage Control and Field Investigation”

TR-691, “Cost-Competitive Timber Bridge Designs for Long-Term Performance”

TR-692, “Investigation of Stream-Channel and Watershed Delineations and Basin-Characteristic Measurements Using LiDAR Data for Small Drainage Basins in Iowa Located Within the Des Moines Lobe Landform Region”

TR-693, “Development of Quality Standards for Inclusion of High Recycled Asphalt Pavement Content in Asphalt Mixtures – Phase III”

TR-694, “Temporary Traffic Control Handbook for Local Agencies”

TR-695, “Evaluation of Rural Intersection Treatments”

TR-696, “Installation Guidance for Centerline and Edgeline Rumble Strips in Narrow Pavements”

15 Projects Initiated

PROJECTS COMPLETED DURING FY 2015

The following projects were completed during FY 2015 and project Final Reports were approved by the Iowa Highway Research Board. Links to the final reports are provided.

- TR-614, “Structural Characterization of UHPC Waffle Bridge Deck and Connections”
<http://publications.iowa.gov/17917/>
- TR-617, “An Adaptive Field Detection Method for Bridge Scour Monitoring Using Motion-Sensing Radio Transponders (RFIDs)” <http://publications.iowa.gov/18156/>
- TR-626, “Optimization of Snow Drifting Mitigation and Control Methods for Iowa Conditions Part II”
<http://publications.iowa.gov/19046/>
- TR-628, “Alkali Content of Fly Ash: Measuring and Testing Strategies for Compliance”
<http://publications.iowa.gov/19046/>
- TR-631, “Automation of DEM Cutting for Hydrologic/Hydraulic Modeling”
<http://publications.iowa.gov/18940/>
- TR-640, “Guidance for Improving Foundation Layers to Increase Pavement Performance on Local Roads”
<http://publications.iowa.gov/id/eprint/18413>
- TR-642, “Pilot for a Hybrid Road-Flooding Forecasting System on Squaw Creek”
<http://publications.iowa.gov/id/eprint/18240>
- TR-647, “Methods for Removing Concrete Decks from Bridge Girders” <http://publications.iowa.gov/17908/>
- TR-653, “Assessment of Non-Destructive Testing Technologies for Quality Control/Quality Assurance of Asphalt Mixtures” <http://publications.iowa.gov/20082/>
- TR-657, “Evaluation of the Confirmation Light System at Signalized Intersections in Medium to Large Iowa Communities to Reduce Red Light Running Violations” *Final Report pending edits.
- TR-658, “Development of Quality Standards For Inclusion of High Recycled Asphalt Pavement Content in Asphalt Mixtures – Phase II” <http://publications.iowa.gov/19151/>
- TR-659, “Development of Asphalt Dynamic Modulus Master Curve Using Falling Weight Deflectometer (FWD) Measurements” <http://publications.iowa.gov/17832/>
- TR-662, “Evaluating Roadway Subsurface Drainage Practices – Phase II” <http://publications.iowa.gov/19446/>
- TR-663, “Standard for Single Span Prefabricated Bridges- Phase 1-Concept Development”
<http://publications.iowa.gov/18226/>
- TR-664, “Low-Cost Rural Surface Alternatives: Demonstration Project” <http://publications.iowa.gov/20128/>
- TR-666, “Investigation of Field Corrosion Performance and Bond/Development Length of Galvanized Reinforcing Steel” <http://publications.iowa.gov/18412/>

TR-670, “Iowa DOT Library Services, Collection, & Technology Assessment”
<http://publications.iowa.gov/18227/>

17 Projects Completed and Approved