Evolution of Data Creation, Management, Publication, and Curation in the Research Process

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EVOLUTION OF DATA CREATION, MANAGEMENT, PUBLICATION, AND CURATION IN THE RESEARCH PROCESS

PAPER 14-0664: A CASE STUDY FROM PURDUE

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#TRBAM
Monday, January 13, 2014
National Institutes of Health (NIH) – 2003
“The NIH expects and supports the timely release and sharing of final research data from NIH-supported studies for use by other researchers.”

National Institutes of Health (NIH) – 2008
“It requires scientists to submit final peer-reviewed journal manuscripts that arise from NIH funds to the digital archive PubMed Central upon acceptance for publication.”

National Science Foundation (NSF) – 2011
“Plans for data management and sharing of the products of research. Proposals must include a supplementary document of no more than two pages labeled ‘Data Management Plan’. This supplement should describe how the proposal will conform to NSF policy on the dissemination and sharing of research results.”

White House Office of Science and Technology Policy (OSTP) – 2013
“The Office of Science and Technology Policy (OSTP) hereby directs each Federal agency with over $100 million in annual conduct of research and development expenditures to develop a plan to support increased public access to the results of research funded by the Federal Government. Further, each agency plan for both scientific publications and digital scientific data…”
TRANSPORTATION RESEARCH

POLICY CHANGES TO FOLLOW?

State Planning and Research (SPR) Funds
  • Approximately $190 Million/year

Federal Highway Administration (FWHA)
  • Reduction of duplicative research activities

U.S. Department of Transportation
  • Response to OSTP Memo
AASHTO Research Committee Awards 2013
Sweet Sixteen High Value Research Projects

The Research Advisory Committee (RAC) to the American Association of State Highway and Transportation Officials’ Standing Committee on Research (SCOR) awarded its 2013 Sweet Sixteen High Value Research Projects at the AASHTO Annual Meeting, held in last month in Denver.

Each year, RAC collects High Value Research highlights from state transportation departments across the nation to showcase projects that are providing transportation excellence through research. This year’s “Research Sweet 16” winners are:

Region 1
- Connecticut Department of Transportation: Use of Streaming Media and Digital Media Technologies at CTDOT
- District Department of Transportation: Innovative Bicycle Facility Research and Analysis
- Maine Department of Transportation: Use of Moisture Induced Stress Testing to Evaluate Stripping Potential of Hot Mix Asphalt (HMA)
- New Jersey Department of Transportation: Elimination of Weight Restriction on Amtrak, NJ Transit, and Conrail Line

Region 2
- Arkansas State Highway and Transportation Department: Design, Construction and Monitoring of Roller Compacted Concrete Pavement in the Fayetteville Shale Play
- Florida Department of Transportation: Aging Driver and Pedestrian Safety: Human Factors Studies
- Georgia Department of Transportation: Recommended Guide for Next Generation of Transportation Design-Build Procurement and Contracting in the State of Georgia
- Louisiana Department of Transportation and Development: Louisiana Legislature Acts on Research to Add Additional Axle to Overloaded Sugar Cane Trucks

Region 3
- Indiana Department of Transportation: Analysis and Methods of Improvements of Safety at High-Speed Rural Intersections
- Iowa Department of Transportation: Evaluation of the RapidAir 457 Air Void Analyzer
- Michigan Department of Transportation: Impact of Non-Freeway Rumble Strips – Phase 1

Region 4
- California Department of Transportation: Accident Risk Analysis Tool
- South Dakota Department of Transportation: Energy Management Program for SDOT
- Utah Department of Transportation: Identifying Characteristics of High-Risk Intersections for Pedestrians and Cyclists
- Wyoming Department of Transportation: Variable Speed Limit System for I-80 Elk Mountain, Wyoming, Corridor
CASE STUDY
PURDUE LIBRARIES &
THE JOINT TRANSPORTATION RESEARCH PROGRAM
Established 1936 as a collaboration between INDOT and Purdue

Now a $5.3M annual investment in around 270 Purdue University students, faculty, and staff

Goal is to improve the efficiency of the Indiana transportation system and infrastructure
ALL HANDS MEETINGS

PUL AND JTRP

Meetings (March-June 2013):
• Purdue University Libraries (PUL)
• JTRP-PUL Meeting

Shared goals:
• Compliance with funder requirements
• Expose data
• Create an integrated publishing workflow linking tech reports and data

Actions:
• Identify use case
• Stage datasets in PURR
• Format and stage tech report
• Linking the data
PUBLICATION IMPACT

JTRP Technical Report Downloads by Month
October 2006 - December 2013

- Old reports digitized and published April – June 2011
- First born digital report published – October 2006

- 2007: 21,943
- 2008: 28,679
- 2009: 36,775
- 2010: 60,455
- 2011: 108,170
- 2012: 190,215
- 2013: 254,898
Download Summary for JTRP Materials in the e-Pubs Repository

Archiving of Conference Proceedings is an emerging opportunity.

[Bar chart showing download trends from 2006 to 2013 for different categories: Technical Reports, Data Papers, Road School, Other Publications, Mobility Report, Affiliated Reports.]
From... To...
e-Pubs
REPOSITORIES
A SERVICE MODEL OF COLLABORATION

Purdue e-Pubs and the Purdue University Research Repository (PURR)

Publications

Purdue e-Pubs is a service of the Purdue University Libraries, providing online publishing support for original publications as well as hosting for Purdue-affiliated articles, reports, conference proceedings, student scholarship, and more. Contact the Libraries to discuss opportunities to bring additional Purdue-affiliated scholarship online.

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At a Glance

Top 10 Downloads
All time
Recent Additions
50 most recent additions

Paper of the Day

Absolute measurement of iodine branching fractions of the Dr(+) resonance.
J. P. Alexander, R. Berkowitz, et al.

Data

What is PURR?
The Purdue University Research Repository (PURR) provides an online, collaborative working space and data-sharing platform to support the data management needs of Purdue researchers and their collaborators.

Start Your Research Project

- Create a Data Management Plan
- Upload Research Data to Your Project
- Publish your Dataset

Featured Dataset

Linking Pressure and Temperature through Interthalon Antarctic in Greenland Glaciers
By V. Nisius, B. Helgason, L. Pythipolla, O. Botstein Purdue University, University of Umeå

 PURR
Purdue University Research Repository
http://purpurdue.edu

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EVOLVING WORKFLOWS
PURDUE LIBRARIES/PURR/JTRP
From... To...

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If difficulties persist, please contact the System Administrator of this site.

S-1 Span Damage - Supplementary Materials for the Report: Effects of Realistic Heat Straightening Repair on the Properties and Serviceability of Damaged Steel Beam Bridges

By Amit H. Varna, Youngsoo Soh
Purdue University

Abstract: Guidelines for conducting heat straightening repair have been developed by FHWA and many DOTs. The guidelines establish limits for (a) the maximum damage that can be repaired, (b) the minimum reheating force, and (c) the maximum reheating temperature to prevent the side effects of heat straightening repair process.

However, the heat straightening guidelines are in the field due to time and economic issues. These guidelines include, but are not limited to (a) reheating above 1050°F (b) reheating above 1050°F (c) over straining above remaining force limit (6.5 Mpsi) (d) multiple heat straightening of the same beam more than two times.

Currently, there is a lack of knowledge of the effects of these modifications in the heat straightening repair process on the condition and serviceability of the damaged/repair beams. This knowledge is needed to develop more realistic guidelines for evaluating and replacing bridge members subjected to damage followed by repaired heat straightening repair.

The overall goal of this research is to develop recommendations and guidelines for evaluating steel beam bridges in Illinois subjected to damage followed by heat straightening repair with imperfections (overheating, overstraining, or multiple heat straightening).

Tags: Steel Beam Bridges, Heat straightening repair, FHWA, Multiple Heat Straightening, TFRP
RESEARCH SUPPORT
WORK FLOW MODELS
TRADITIONAL SCHOLARLY PUBLICATIONS
PURDUE UNIVERSITY PRESS/PURDUE E-PUBS/JTRP

1. PI drafts proposal
2. Data Management Plan Created
3. PI submits proposal to funding agency
4. Proposal accepted by funding agency
5. PI submits draft report
6. SAC review of report
7. PI revises draft report
8. PA/PI & SAC confer
9. Final report production process

q) Post Production:
- Data/Tech Report Link
- Tech Summary
- DOIs
- Persistent URL
- Indexing
- Archiving
- Print on Demand

r) Measurements of Impact:
- Altmetrics
- Citations
- Downloads
- Access

PI = principal investigator
SAC = study advisory committee
PA = project administrator
PURR WORKFLOW

DATA MANAGEMENT PLANNING, COLLABORATION, PUBLISHING, & PRESERVATION

a) PI drafts proposal

b) Data Management Plan Created

j) PI creates project in PURR

k) Project group collaborates in PURR

l) PI submits data set

m) SSL verifies data set

n) Data set published/ archived with DOI

PI = principal investigator
PURR = Purdue University Research Repository
SSL = Subject Specialist Liaison

r) Measurements of Impact:
- Citations
- Downloads
- Access
LINKING TECHNICAL REPORTS AND DATA
1. **DMP**
2. **DOI**
3. **Metadata**

**COHESIVE PUBLICATION WORKFLOW**

- **1. DMP**
  - a) PI drafts proposal
  - b) Data Management Plan Created
  - j) PI creates project in PURR

- **2. DOI**
  - c) PI submits proposal to funding agency
  - d) Proposal accepted by funding agency
  - k) Project group collaborates in PURR
  - l) PI submits data set
  - m) SSL verifies data set
  - n) Data set published / archived with DOI
  - o) Data DOI submitted to publishing
  - p) PURR and e-Pubs links established (metadata)

- **3. Metadata**
  - g) PI revises draft report
  - h) PA/PI & SAC confer
  - i) Final report production process

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**Post Production:**
- Data/Tech Report Link
- Tech Summary
- DOIs
- Persistent URL
- Indexing
- Archiving
- Print on Demand

**r) Measurements of Impact:**
- Altmetrics
- Citations
- Downloads
- Access

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- PURR = Purdue University Research Repository
- SSL = Subject Specialist Liaison
JTRP LINKED PUBLICATIONS

TECHNICAL REPORT


DATA

Effects of Realistic Heat Straightening Repair on the Properties and Serviceability of Damaged Steel Beam Bridges

Amit H. Varma, Purdue University
Youngmoo Sohn, Purdue University

DOI
10.5703/1288284315184

Recommended Citation

Citations
Affiliated authors
Effects of Realistic Heat Straightening Repair on the Properties and Serviceability of Damaged Steel Beam Bridges

Amit H. Varma
Youngmoo Sohn

Publication: N2 Span Damage - Supplementary Materials for the Report: Effects of Realistic Heat Straightening Repair on the Properties and Serviceability of Damaged Steel Beam Bridges

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MEASURING IMPACT
MOVING FORWARD

BEST PRACTICES

• Linked work flows
  • Coordinate resources
  • Anticipate needs

• Early interaction with the data repository
  • Employ good data management principles and practices
  • Ease citation management
  • Increase impact

• Traditional publication attributes
  • Increase visibility and discoverability
  • Meet funder requirements
  • Measure and assess impact

• Usage and access metrics
  • Monitor and evaluate through quantitative and qualitative measurements
  • Communicate impact
Thank You

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RESOURCES

- Joint Transportation Research Program. https://engineering.purdue.edu/JTRP
- Purdue e-Pubs. http://docs.lib.purdue.edu/
- Purdue University Research Repository (PURR). https://purr.purdue.edu/