NCHRP Bridge Research

Report to

AASHTO Highway Subcommittee on Bridges and Structures

National Cooperative Highway Research Program
Transportation Research Board
June 2005
Overview

- NCHRP Products
- Program Description
- FY 2006 Program
- Active Projects
- Recent Reports
Application of NCHRP Bridge Products

2005 Agenda

4 Ballot Items reference 3 NCHRP Projects or Reports

NCHRP Projects 12-63, 10-38 (Report 469), & 24-17 (Report 507)
Coming NCHRP Bridge Products

**NCHRP 12-52**

LRFD specifications for the design and construction of horizontally curved steel girder bridges.
Coming NCHRP Bridge Products

**NCHRP 12-58 (Report 543)**
Recommended effective slab width of composite steel bridge members.

**NCHRP 12-61**
Simplified shear design procedures for concrete members.
Coming NCHRP Bridge Products

**NCHRP 12-62**
Recommended LRFD live-load distribution-factor design equations

**NCHRP 12-63**
Recommend revisions to the legal loads for posting
Coming NCHRP Bridge Products

**NCHRP 12-56**
Extension of LRFD Specifications to 18 ksi for shear

**NCHRP 12-60**
Extension of LRFD Specifications to 18 ksi for transfer, development, and splice length

**NCHRP 12-64**
Extension of LRFD Specifications to 18 ksi for flexure and compression
The National Academies

- National Academy of Sciences
- National Academy of Engineering
- Institute of Medicine
- National Research Council

NCHRP

The Transportation Research Board of The National Academies
Overview of NCHRP Process

- Program Selection - AASHTO
- Program Funding - FHWA/States
- Program Administration - NCHRP
Program Selection
AASHTO

- Problem Statements
- Standing Committee on Research
- States Ballot - 2/3 must approve project

Project Panel Members
Program Funding
FHWA

- States Voluntary Contributions
  - AASHTO negotiated agreement with States
  - 5-1/2% of SPR funds
  - FHWA administers funds
Program Administration
NCHRP

- Set Up Project Panels
- Develop Project Statements (RFP)
- Contract with Research Agency
- Project Surveillance
FY 2006 Program

FY 2004    $25,311,000
(+ $ 4,600,000 Unfunded Contingencies)
FY 2005    $27,525,000
(All Contingencies were funded)
FY 2006    $27,615,000
(+ $ 4,900,000 Unfunded Contingencies)
FY 2006 Program

● Continuation Projects
  – 21 Projects $ 10,275,000
  – 0 Bridge Related

● New Projects
  – 38 Total $17,340,000
  – 8 Bridge Interest $ 4,800,000
FY 2006 Program
New Projects

• 10-70 Fatigue Testing for Cantilever Traffic Signal and Sign Structure Connection Details $800,000 (Your #1 Priority)

• 10-71 Evaluation of CIP Reinforced Joints for Full-Depth Precast Concrete Bridge Decks $750,000 (#4 Priority of Evaluation Panel)
FY 2006 Program
New Projects

- 10-72 Bridge Deck Testing Specification $500,000 (Your #3 Priority)

- 12-75 Behavior and Design of Concrete Girders Strengthened in Shear with CFRP Laminates $500,000 (Your #6 Priority)
FY 2006 Program
New Projects

• **12-76**  Assessment of Truck Traffic on Highway Bridges $400,000 (Medium Priority)

• **24-30**  Improving the Lateral Capacity of Highway Bridge Foundations in Weak Soils $500,000 (Your #4Priority)
FY 2006 Program
New Projects

- Your #2 Priority Guidelines and Details for Converting Jointed to Jointless Bridges

- Your #5 Priority was a 2005 Contingency initiated as 12-74 Development of a Precast Bent Cap System for Seismic Regions
FY 2006 Program
New Projects

- 24-28 Reliability of Metal Loss & Service-Life Estimates for Metal-Tensioned Systems in Geotechnical Applications $600,000

- 24-29 Effects of Fractured or Degradable Rock on Pier Scour at Bridges $750,000
20-07 Research for the
AASHTO Standing Committee
on Highways

- $1,000,000 FY 2006 Funding
- AASHTO Highway Committee or Subcommittees of SCOH can request Task funding
- 20-07 panel selects tasks biannually
- Informally appointed Task panels

NCHRP

The Transportation Research Board
of The National Academies
20-05 Synthesis

- Managed Within TRB, but outside NCHRP
- $1,200,000 FY 2006 Funds
- Topics selected by 20-05 panel
- Informally appointed topic panels
Grand Challenges

1. EXTENDING SERVICE LIFE
2. OPTIMIZING STRUCTURAL SYSTEMS
3. ACCELERATING BRIDGE CONSTRUCTION
4. ADVANCING THE AASHTO SPECIFICATIONS
5. MONITORING BRIDGE CONDITION
6. CONTRIBUTING TO NATIONAL POLICY
7. MANAGING KNOWLEDGE
The Riemann Hypothesis

The German mathematician G.F.B. Riemann (1826-1866) observed that the frequency of prime numbers is related to the behavior of the function

$$\zeta(s) = 1 + \frac{1}{2}s + \frac{1}{3}s + \frac{1}{4}s + \ldots$$
called the Riemann Zeta function.

The Riemann hypothesis asserts that all nontrivial solutions of the equation

$$\zeta(s) = 0$$

have real part equal to ½.
Active Projects

- 46 Projects of Interest
- >$21,900,000
Recent Reports

- 534 Guidelines for Inspection and Strength Evaluations of Suspension Bridge Parallel-Wire Cables
- 543 Effective Slab Width for Composite Steel Bridge Members
Web Sites

NCHRP
WWW4.nas.edu/trb/crp.nsf
TRB
trb.org