TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): FHWA HIBT-20

INSTRUCTIONS:
Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

Transportation Pooled Fund Program Project # *(i.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)* TPF-5(202)		**Transportation Pooled Fund Program - Report Period:** ☐ Quarter 1 (January 1 – March 31) ☑ Quarter 2 (April 1 – June 30) ☐ Quarter 3 (July 1 – September 30) ☐ Quarter 4 (October 1 – December 31)
Project Title: HY-8 Culvert Analysis Program – Phase Three of Development Efforts		
Name of Project Manager(s): Brian Beucler	**Phone Number:** 202-366-4598	**E-Mail** brian.beucler@dot.gov
Lead Agency Project ID: TASK T10-B03	**Other Project ID (i.e., contract #):** DTFH61-06-D-00017	**Project Start Date:** September 21,2010
Original Project End Date: December 31, 2012	**Current Project End Date:** December 31, 2012	**Number of Extensions:** 0

Project schedule status:

☐ On schedule ☐ On revised schedule ☐ Ahead of schedule ☑ Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Percentage of Work Completed to Date
$138,134 Planned, $105,130 Funded	Approximately $36,000	Approximately 25%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
Approx $7,200 (= 5.2% planned budget)	Approximately $7,200	Approximately 34%

Project Description:

The objective of this research effort is to continue the phased development of HY-8. The effort would be funded by FHWA and other State DOT contributors (PFP members).

The anticipated scope of work consists of continued development efforts on the HY-8 software (beginning with phase three of the on-going development effort).

The project will consist of the tasks described below. Where possible, the tasks may be developed concurrently. Some tasks will require technical review and approval by PFP members before any programming efforts.

Task 1 - Project Meetings
Task 2 - Enhance Source Code Efficiencies
Task 3 - Hydrograph Routing
Task 4 - Hydraulic Jump Code Implementation
Task 5 - Broken Back Culvert Code Implementation
Task 6 - Allow Modification of the Individual Analysis Discharge Values
Task 7 - Horizontal Culvert Barrels
Task 8 - Adversely Sloped Barrels
Task 9 - Flared End Sections
Task 10 - Concrete Open-bottom Arches
Task 11 - South Dakota's Prefabricated Reinforced Concrete Box Culverts
Task 12 - Generic Culvert Type/Material to add an aquatic organism passage module with up to 4 possible shapes
Task 13 - General Maintenance and Bug Fixes

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

• Completed the following efforts:
o Held teleconference meeting on 6/29/2011 to discuss project status and various bug fixes.
o Task 2 – Enhance Source Code Efficiencies:
Rewrite other recursive functions as needed (to make them non-recursive).
Re-factor the “BALANCE” code to make it simpler and easier to understand.
Re-factor water-surface profile computation codes to simplify the functions and make them easier to understand.
Rewrite several computation subroutines to enhance efficiency.

• Begin work on the following tasks:
o Task 4 – Implement Hydraulic Jump
o Task 7 – Horizontal Culvert Barrels:
Implement slope correction coefficient changes to future HY-8 version 7.3.
o Task 10 – Concrete Open Bottom Arches:
Test Con/Span 2:1 and 4:1 aspect ratios for various culvert aspect ratios and various sizes.
o Task 11 – Implement South Dakota's Prefabricated Reinforced Concrete Box Culvert research into HY-8.
o Task 13 – Maintenance Activities continued:
Bug fixes were completed including the “Save/Save As” bug and the problem with SI units in the report.

o HY-8 Help Files –
Add notes and documentation about Con/Span culverts to the help in HY-8.
Also working on expanding the capabilities of HY-8 help files in parallel with development of a Wiki help site.

Anticipated work next quarter:

Continued work on Tasks 4, 7, 10, 11 and 13 (fixing bug associated with irregular roadway overtopping cross-section data entry).

Anticipate future release of HY-8 version 7.3 including task 10 (Concrete Open-bottom Arches) and task 11 (South Dakota's Prefabricated Reinforced Concrete Box Culverts). FHWA will test a pre-release version of HY-8 7.3 and will seek out help from users to test the version prior to officially posting.

Significant Results:

HY-8 version 7.2.13 (build date 6/28/2011) was posted to the FHWA Hydraulics software website in late June. This version fixes issues users had with 32/64 bit installations and Windows 7.

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).

Acquisition process took much longer than expected. Contractor is now making faster progress as quite a few major tasks have been fully funded.

Potential Implementation:

Progressively improved/enhanced versions of HY-8 will be incorporated into revised NHI Course 135056 on culvert design. The revised course should be completed in Spring of 2012.