

Recommendation Report

Wednesday, August 01, 2007

LOG:h-0555*

Log Number H-0555

Issue Date 12/21/1990

MIAMITOWN OH

5/26/1989

ON MAY 26, 1989, ABOUT 5:25 P.M. EASTERN DAYLIGHT TIME, A 140-FOOT SECTION OF THE 556-FOOT HARRISON ROAD TEMPORARY BRIDGE OVER THE GREAT MIAMI RIVER FELL ABOUT 40 FEET INTO THE RAIN-SWOLLEN RIVER AFTER A PILE BENT COLLAPSED. SEVEN WITNESSES REPORTED THAT A PASSENGER CAR AND A PICKUP TRUCK FELL INTO THE RIVER. HOWEVER, ONLY A PASSENGER CAR AND THE BODIES OF THE CAR'S TWO OCCUPANTS HAVE BEEN RECOVERED FROM THE RIVER. NO OTHER VEHICLES WERE FOUND IN THE RIVER NOR ARE ANY PERSONS REPORTED MISSING IN THE MIAMITOWN AREA. WITNESSES REPORTED AN UNUSUAL AMOUNT OF DEBRIS FLOATING DOWN THE RIVER AND STRIKING THE PILE BENTS OF THE BRIDGE PRIOR TO THE COLLAPSE. ALTHOUGH THE WEATHER WAS CLEAR AND DRY, FLOODING CONDITIONS EXISTED AT THE TIME OF THE COLLAPSE AND THE RIVER HAD OVERFLOWED ITS BANKS ONTO THE FLOOD PLAIN.

Recommendation # H-90-098

**Overall Status
CAA**

**Priority
CLASS II**

THE NTSB RECOMMENDS THAT THE HAMILTON COUNTY ENGINEER'S OFFICE: REQUIRE THAT BRIDGE DESIGN CAPACITIES BE DETERMINED AND ESTABLISH POLICIES AND PROCEDURES FOR MONITORING AND CLOSING PUBLIC HIGHWAY BRIDGES WHEN CONDITIONS EXCEED THE DESIGN CAPACITY OF THE STRUCTURE.

HAMILTON COUNTY ENGINEER

Closed - Acceptable Action

9/11/2003

9/11/2003 NTSB

Safety Recommendation H-90-098 -- classified "Closed-Acceptable Action" by administrative action in NTSB Notation Item 5137C with the following wording: No response has been received from the Hamilton County Engineer since the safety recommendation was issued. The Safety Board also issued a parallel recommendation to the Ohio Department of Transportation (ODOT), H-90-99. In a letter dated November 30, 1994, ODOT outlined changes and clarifications it had made to its Bridge Design Manual. Consequently, Safety Recommendation H-90-99 was classified "Closed-Acceptable Action" on March 6, 1995.

In its response, ODOT also mentioned that while county compliance with the Ohio Revised Code, including the Bridge Design Manual, cannot be mandated by ODOT, there was every indication that the notoriety of the accident had prompted compliance. Staff believes that this includes Hamilton County and that Safety Recommendation H-90-98 should also have been classified "closed" in 1995. Therefore, staff proposes that Safety Recommendation H-90-98 be classified "Closed-Acceptable Action." Staff further believes that sending a letter to the Hamilton County Engineer at this time advising of such action would serve no useful purpose and be of little meaning to the Hamilton County Engineer

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Log Number H-0555A

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MIAMITOWN OH

5/26/1989

ON MAY 26, 1989, ABOUT 5:25 P.M. EASTERN DAYLIGHT TIME, A 140-FOOT SECTION OF THE 556-FOOT HARRISON ROAD TEMPORARY BRIDGE OVER THE GREAT MIAMI RIVER FELL ABOUT 40 FEET INTO THE RAIN-SWOLLEN RIVER AFTER A PILE BENT COLLAPSED. SEVEN WITNESSES REPORTED THAT A PASSENGER CAR AND A PICKUP TRUCK FELL INTO THE RIVER. HOWEVER, ONLY A PASSENGER CAR AND THE BODIES OF THE CAR'S TWO OCCUPANTS HAVE BEEN RECOVERED FROM THE RIVER. NO OTHER VEHICLES WERE FOUND IN THE RIVER NOR ARE ANY PERSONS REPORTED MISSING IN THE MIAMITOWN AREA. WITNESSES REPORTED AN UNUSUAL AMOUNT OF DEBRIS FLOATING DOWN THE RIVER AND STRIKING THE PILE BENTS OF THE BRIDGE PRIOR TO THE COLLAPSE. ALTHOUGH THE WEATHER WAS CLEAR AND DRY, FLOODING CONDITIONS EXISTED AT THE TIME OF THE COLLAPSE AND THE RIVER HAD OVERFLOWED ITS BANKS ONTO THE FLOOD PLAIN.

Recommendation # H-90-099

**Overall Status
CAA**

**Priority
CLASS II**

THE NTSB RECOMMENDS THAT THE OHIO DEPARTMENT OF TRANSPORTATION: REQUIRE THAT BRIDGE DESIGN CAPACITIES BE DETERMINED AND ESTABLISH POLICIES AND PROCEDURES TO CLOSE BRIDGE STRUCTURES WHEN CONDITIONS EXCEED THE DESIGN CAPACITY OF THE STRUCTURE.

OHIO, DEPARTMENT OF TRANSPORTATION	Closed - Acceptable Action	11/30/1994
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11/30/1994 Addressee THE PROCEDURES FOR CLOSING TEMPORARY BRIDGE STRUCTURES HAS BEEN CLARIFIED IN THE BRIDGE DESIGN MANUAL, SECTION 5, DATED 1993.

3/6/1995 NTSB

THE BOARD UNDERSTANDS THAT THE PROCEDURES FOR CLOSING TEMPORARY BRIDGE STRUCTURES HAVE BEEN CLARIFIED IN THE 1993 ODTO BRIDGE DESIGN MANUAL. BASED ON THIS INFO H-90-99 HAS BEEN CLASSIFIED "CLOSED--ACCEPTABLE ACTION."

Recommendation # H-90-100

**Overall Status
CAA**

**Priority
CLASS II**

THE NTSB RECOMMENDS THAT THE OHIO DEPARTMENT OF TRANSPORTATION: CLARIFY THE LATERAL LOAD REQUIREMENTS FOR TEMPORARY BRIDGES IN THE OHIO "CONSTRUCTION AND MATERIALS SPECIFICATIONS."

OHIO, DEPARTMENT OF TRANSPORTATION	Closed - Acceptable Action	11/30/1994
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11/30/1994 Addressee THE LATERAL LOAD REQUIREMENTS FOR TEMPORARY BRIDGES HAS BEEN ADDRESSED IN SECTION 5 OF THE BRIDGE DESIGN MANUAL. THE TEMPORARY BRIDGE IS TO BE DESIGNED BY THE DESIGN ENGINEER FOR THE REPLACEMENT STRUCTURE.

3/6/1995 NTSB

THE BOARD NOTES THAT THE LATERAL LOAD REQUIREMENTS FOR TEMPORARY BRIDGES HAVE ALSO BEEN ADDRESSED IN ODOT DESIGN MANUAL. BASED ON THESE REVISIONS TO THE MANUAL H-90-100 HAS BEEN CLASSIFIED "CLOSED--ACCEPTABLE ACTION."

Recommendation # H-90-101

**Overall Status
CAA**

**Priority
CLASS II**

THE NTSB RECOMMENDS THAT THE OHIO DEPARTMENT OF TRANSPORTATION: DISSEMINATE THE FACTS AND CIRCUMSTANCES OF THIS ACCIDENT TO EACH COUNTY AND MUNICIPAL ENGINEER RESPONSIBLE FOR BRIDGE DESIGN AND CONSTRUCTION IN THE STATE OF OHIO.

OHIO, DEPARTMENT OF TRANSPORTATION	Closed - Acceptable Action	11/30/1994
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11/30/1994 Addressee THE FACTS & CIRCUMSTANCES HAVE BEEN DISSEMINATED THROUGH OUR BRIDGE INSPECTION PROGRAMS WHICH ARE CONDUCTED THROUGHOUT THE STATE EVERY YEAR.

3/6/1995 NTSB

THE BOARD IS PLEASED TO LEARN THAT THIS INFO HAS BEEN PROVIDED TO THE ENGINEERS THROUGH THE STATE BRIDGE INSPECTION PROGRAMS CONDUCTED EACH YEAR. BASED ON THIS INFO, H-90-101 HAS BEEN CLASSIFIED "CLOSED--ACCEPTABLE ACTION."

Recommendation Report

Wednesday, August 01, 2007

LOG:h-0555*

Recommendation # H-90-102

Overall Status
CAAA

Priority
CLASS II

THE NTSB RECOMMENDS THAT THE OHIO DEPARTMENT OF TRANSPORTATION: DEVELOP AND IMPLEMENT PROCEDURES TO ENSURE ENFORCEMENT AND MONITORING OF THE OHIO LAW (OHIO REVISED CODE, SECTION 5543) THAT STATES: NO CONTRACT FOR THE CONSTRUCTION OR REPAIR OF A BRIDGE, THE ENTIRE COST OF WHICH CONSTRUCTION OR REPAIR EXCEEDS FIFTY THOUSAND DOLLARS, SHALL BE ENTERED INTO BY THE COUNTY UNLESS THE PLANS ARE FIRST APPROVED BY THE STATE DIRECTOR OF TRANSPORTATION.

OHIO, DEPARTMENT OF TRANSPORTATION	Closed - Acceptable Alternate Action	11/30/1994
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11/30/1994 Addressee THE STATE OF OHIO IS A HOME RULE STATE & AS SUCH THE DEPARTMENT CANNOT MANDATE THAT THE COUNTIES OBEY OHIO REVISED CODE, SECTION 5543.02. THE NOTORIETY OF THE DISASTER HAVE PROMPTED THE VARIOUS COUNTIES TO COMPLY WITH THE LAW AS EVIDENCED BY THE GREATLY INCREASED VOLUME OF COUNTY CONTRACTED BRIDGES OVER 50,000.

3/6/1995 NTSB THE BOARD NOTES THE SUBSTANTIAL INCREASE IN THE VOLUME OF ODOT-ARRPROVED, COUNTY-CONTRACTED BRIDGES OVER 50,000 THAT INDICATES COUNTIES ARE COMPLYING WITH OHIO CODE SECTION 5543. BASED ON THIS INFO, H-90-102 HAS BEEN CLASSIFIED "CLOSED--ACCEPTABLE ALTERNATE ACTION."

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Recommendation # H-90-103

**Overall Status
CAA**

**Priority
CLASS II**

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: UNDERTAKE A RESEARCH PROGRAM IN COOPERATION WITH THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND THE U.S. GEOLOGICAL SURVEY TO DEVELOP METHODS FOR ESTIMATING MAXIMUM DEBRIS LOADS FOR BRIDGE DESIGN PURPOSES.

FHWA	Closed - Acceptable Action	10/7/1997
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- 4/22/1991 Addressee PRELIMINARY DISCUSSIONS HAVE BEEN HELD WITH REPRESENTATIVES OF THE USCG, AASHTO, AND THE TRANSPORTATION RESEARCH BOARD TO INITIATE THE NEEDED RESEARCH REPRESENTATIVES OF THE USCG ARE PREPARING A RESEARCH PLAN FOR FHWA CONSIDERATION. AS CURRENTLY ENVISIONED, THE PROPOSED RESEARCH WILL PROVIDE A PROBABILISTIC BASIS FOR ESTIMATING MAXIMUM DEBRIS LOADS ON BRIDGES FOR DESIGN PURPOSES. THE FHWA WILL SUPPORT THIS PROJECT AND COOPERATE WITH ALL PARTIES TO EXPEDITE THE WORK.
- 12/2/1991 NTSB
- 3/19/1993 Addressee A STATUS UPDATE AS OF FEB. 19 INDICATES THAT RESEARCH PROJECT IS UNDERWAY WITH THE USCG FOR DEBRIS PRODUCTION STUDY. RESULTS OF THIS RESEARCH WILL BE USED FOR A JOINT PROJECT WITH NCHRP FOR A DEBRIS LOAD STUDY.
- 6/21/1993 NTSB THE BOARD UNDERSTANDS THAT THE FHWA IS COOPERATING WITH OTHER AGENCIES IN STUDYING DEBRIS. THE BOARD WOULD APPRECIATE RECEIVING THE RESULTS OF THE STUDY. IN THE MEANTIME, RECOMMENDATION H-90-103 WILL MAIN "OPEN--ACCEPTABLE RESPONSE."
- 3/27/1997 Addressee An FHWA research project, Debris Loading [Hazards] to Highway Bridges, is underway in cooperation with the USGS. The project will provide regional estimates of the quantity, size, mass, and character of debris and ice for various discharges and watersheds used as input to NCHRP Project 12-39. The draft final report is under review. The FHWA contract manager is Dr. Steven B. Chase, (703) 285-2442.
- 10/7/1997 NTSB The Safety Board understands that the draft final report for the research project, "Debris Loading [Hazards] to Highway Bridges," is under review, likely to be adopted, and includes regional estimates of the quantity, size, mass, and character of debris and ice for various discharges and watersheds used as input to NCHRP Project 12-39, "Design Specifications for Debris Forces on Highway Bridges." Therefore, Safety Recommendation H-90- 103 has been classified "Closed-Acceptable Action."

Recommendation Report

Wednesday, August 01, 2007

LOG:h-0555*

Recommendation # H-90-104

**Overall Status
CAA**

**Priority
CLASS II**

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: ESTABLISH, IN COOPERATION WITH THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, STANDARD ANALYTICAL METHODS TO DETERMINE LOADS IMPOSED BY DEBRIS IMPACT AND BY DEBRIS ACCUMULATION ON BRIDGE SUBSTRUCTURES.

FHWA	Closed - Acceptable Action	6/2/2004
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- 4/22/1991 Addressee PRELIMINARY DISCUSSIONS HAVE BEEN HELD WITH REPRESENTATIVES OF THE USCG, AASHTO, AND THE TRANSPORTATION RESEARCH BOARD TO INITIATE THE NEEDED RESEARCH. PRESENTATIVES OF THE USCG ARE PREPARING A RESEARCH PLAN FOR FHWA CONSIDERATION. AS CURRENTLY ENVISIONED, THE PROPOSED RESEARCH WILL PROVIDE A PROBABILISTIC BASIC FOR ESTIMATING MAXIMUM DEBRIS LOADS ON BRIDGES FOR DESIGN PURPOSES. THE FHWA WILL SUPPORT THIS PROJECT AND COOPERATE WITH ALL PARTIES TO EXPEDITE THE WORK.
- 12/2/1991 NTSB
- 3/19/1993 Addressee A STATUS UPDATE AS OF FEB. 19 INDICATES THAT THE AASHTO SUBCOMMITTEE ON BRIDGES AND STRUCTURES AT ITS MAY 1992 MEETING AND SUBSEQUENT BALLOT, ADOPTED A REVISED ARTICLE 3.18 TO INCLUDE DRIFT CONDITION IN THE STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES. FHWA WILL CONTINUE TO WORK WITH AASHTO TO IMPROVE THIS SPECIFICATION.
- 6/21/1993 NTSB THE BOARD IS PLEASED TO LEARN THAT THE CHAIRMAN OF AASHTO'S SUBCOMMITTEE ON BRIDGES AND STRUCTURES HAS WRITTEN TO THE TRANSPORTATION RESEARCH BOARD (TRB) REQUESTING THAT THIS RECOMMENDATION RECEIVE HIGHT PRIORITY FOR FUNDING UNDER THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM. A PROBLEM STATEMENT WAS PREPARED BY THE TRB, AND FUNDS WERE AWARDED IN FISCAL YEAR 1992. RECOMMENATION H-90-104 WILL BE CLASSIFIED "OPEN--ACCEPTABLE RESPONSE" PENDING THE COMPLETION OF FHWA'S OFFORTS TO IMPROVE THE METHODS OF DETERMINING LOADS IMPOSED BY DEBRIS ACCUMULATION ON BRIDGE STRUCTURES.
- 1/3/1996 Addressee
- 3/27/1997 Addressee The Chairman of the AASHTO Subcommittee on Bridges and Structures has written to the Transportation Research Board (TRB) and requested that this work be a high priorit. for finding under the National Cooperative Highway Research Program (NCHRP). A problem statement was prepared by TRB staff engineers and the project was awarded in fiscal year 1992. The FHWA will support this project and will continue to coordinate and collaborate with all parties to integrate this work with that being carried out in response to NTSB Recommendation H-90-103. AASHTO Subcommittee on Bridges and Structures at their May 1992 meeting and subsequent ballot adopted a revised article 3.18 to include drift condition in the Standard Specifications for Highway Bridges. The 1996 Sixteenth Edition of the Standard Specifications contains the revised article 3.18. As noted above, FHWA will continue to work with AASHTO to improve this specification.
- 10/7/1997 NTSB The Safety Board notes that in 1992 the Subcommittee on Bridges and Structures revised article 3.18 to include drift condition and that the 1996 AASHTO Stmtdard Specifications for Highway Bridges contains the revisions. The Safety Board also notes that the FHWA will continue to coordinate the efforts of NCHRP Project 12-39. Therefore, pending completion of NCHRP Project 12-39 and improvement to the methods of determining loads imposed by debris impact and accumulation on bridge structures, Safety Recommendation H-90- 104 remains classified "Open--Acceptable Response."
- 8/13/1998 NTSB 7/30/98, followup meeting on recommendation status
- 12/17/2003 NTSB In a 12/17/2003 SWAT meeting, FHWA provided the Board with a copy of National Cooperative Highway Research Program (NCHRP) 445. Safety Board staff will evaluate the report and determine if the recommendation can be closed.
- 6/2/2004 NTSB The Safety Board has reviewed the National Cooperative Highway Research Program (NCHRP) Report 445 entitled "Debris Forces on Highway Bridges," coordinated by the FHWA, and concludes that this report satisfies the recommendation. As a result, Safety Recommendation H-90-104 is classified "Closed--Acceptable Action."

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LOG:h-0555*

Recommendation # H-90-105

Overall Status
CAA

Priority
CLASS II

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: ENCOURAGE THE STATES TO DETERMINE BRIDGE DESIGN CAPACITIES AND TO ESTABLISH POLICIES AND PROCEDURES TO CLOSE BRIDGES WHEN CONDITIONS EXCEED THE DESIGN CAPACITY.

FHWA	Closed - Acceptable Action	4/22/1991
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4/22/1991 Addressee THE FHWA HEADQUARTERS OFFICE IS DEVELOPING A MEMORANDUM TO ALL FHWA REGIONAL ADMINISTRATORS DIRECTING THEM TO INFORM THE STATES THAT THE FHWA ENCOURAGES ALL BRIDGE OWNERS TO (1) DETERMINE THE SAFE LOAD CAPACITIES OF ALL BRIDGES CARRYING PUBLIC ROADS, AND (2) WHENEVER LOAD CAPACITIES EXCEED WHICH EXCEED THAT SAFE LOAD CAPACITY OF A BRIDGE TO A POINT WHERE THE BRIDGE IS IN DANGER OF FAILURE, THE STATES SHOULD HAVE POSITIVE PROCEDURES IN PLACE TO CLOSE THE BRIDGE.

12/2/1991 NTSB

Recommendation # H-90-106

Overall Status
CAA

Priority
CLASS II

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: ENCOURAGE ALL STATES TO REQUIRE THE AMERICAN ASSOCIATION OF HIGHWAY AND TRANSPORTATION OFFICIALS LOADING SPECIFICATIONS AS MINIMUM DESIGN CRITERIA FOR ALL BRIDGES OPEN TO THE PUBLIC.

FHWA	Closed - Acceptable Action	4/22/1991
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4/22/1991 Addressee THE FHWA HEADQUARTERS OFFICE IS DEVELOPING A MEMORANDUM TO BE SENT TO ALL FHWA REGIONAL OFFICES DIRECTING THAT ALL STATES BE INFORMED THAT THE FHWA ENCOURAGES THE USE OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES AS MINIMUM DESIGN CRITERIA FOR ALL BRIDGES (TEMPORARY AS WELL AS PERMANENT) CARRYING PUBLIC ROADS.

12/2/1991 NTSB

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MIAMITOWN OH

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Recommendation # H-90-107

**Overall Status
CAA**

**Priority
CLASS II**

THE NTSB RECOMMENDS THAT THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS: COOPERATE WITH THE FEDERAL HIGHWAY ADMINISTRATION AND THE U.S. GEOLOGICAL SURVEY IN A RESEARCH PROGRAM TO DEVELOP METHODS TO ESTIMATE MAXIMUM DEBRIS LOADS FOR BRIDGE DESIGN PURPOSES.

AMERICAN ASSOCIATION OF STATE HIGHWAY Closed - Acceptable Action

7/20/2004

1/2/1992 Addressee RECOMMENDATIONS H-90-107 THRU -109 ARE BEING SPECIFICALLY ADDRESSED IN RESEARCH UNDERWAY BY FHWA AND THROUGH THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) OF THE TRANSPORTATION RESEARCH BOARD (TRB). THE RECOMMENDATIONS WERE REFERRED TO OUR HIGHWAY SUBCOMMITTEE ON BRIDGES AND STRUCTURES WHICH IN TURN REQUESTED A 3000,000 NCHRP RESEARCH EFFORT, THROUGH OUR STANDING COMMITTEE ON RESEARCH, TO DEVELOP DESIGN METHODOLOGIES AND SPECIFICATION CRITERIA FOR DEBRIS LOAD FORCES.

5/12/1992 NTSB

12/8/1994 Addressee

6/20/1995 NTSB AS STATED IN ITS 5/12/92, LETTER, THE BOARD UNDERSTANDS THAT H-90-107 THROUGH -109 ARE BEING ADDRESSED IN RESEARCH PROJECT NCHRP 12-39. AASHTO'S HIGHWAY SUBCOMMITTEE ON BRIDGES & STRUCTURES WAS SCHEDULED TO MEET IN MAY 1995 TO EVALUATE DESIGN METHODOLOGIES & SPECIFICATION CRITERIA FOR DEBRIS LOAD FORCES. PENDING RECEIPT OF MATERIAL ON DEBRIS LOADING DESIGN, FROM THE SUBCOMMITTEE. RECOMMENDATIONS H-90-107 THROUGH-109 WILL REMAIN CLASSIFIED "OPEN--ACCEPTABLE RESPONSE.

3/30/2004 Addressee NCHRP Project 12-39, "Design Specifications for Debris Forces on Highway Bridges" developed practical methods for determining drag and hydrostatic forces on bridge piers and on superstructures due to waterborne debris. This information has been incorporated into the 17th Edition of the Standard Specifications for Highway Bridges.

7/20/2004 NTSB The Safety Board has reviewed the National Cooperative Highway Research Program (NCHRP) Report 445, titled "Debris Forces on Highway Bridges," which was completed in 2000, and concludes that this report developed practical methods for determining drag and hydrostatic forces on bridge piers and superstructures due to waterborne debris. The report also includes recommended specifications for assessing these forces and this information has been incorporated into the 17th edition of the "Standard Specifications for Highway Bridges." This action satisfies the recommendations; accordingly, Safety Recommendations H-90-107 through -109 are classified "Closed--Acceptable Action."

Recommendation Report

Wednesday, August 01, 2007

LOG:h-0555*

Recommendation # H-90-108

Overall Status
CAA

Priority
CLASS II

THE NTSB RECOMMENDS THAT THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS: COOPERATE WITH THE FEDERAL HIGHWAY ADMINISTRATION IN ESTABLISHING STANDARD ANALYTICAL METHODS TO DETERMINE LOADS IMPOSED BY DEBRIS IMPACT AND BY DEBRIS ACCUMULATION ON BRIDGE SUBSTRUCTURES.

AMERICAN ASSOCIATION OF STATE HIGHWAY	Closed - Acceptable Action	7/20/2004
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1/2/1992 Addressee RECOMMENDATIONS H-90-107 THRU -109 ARE BEING SPECIFICALLY ADDRESSED IN RESEARCH UNDERWAY BY FHWA AND THROUGH THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) OF THE TRANSPORTATION RESEARCH BOARD (TRB). THE RECOMMENDATIONS WERE REFERRED TO OUR HIGHWAY SUBCOMMITTEE ON BRIDGES AND STRUCTURES WHICH IN TURN REQUESTED A 3000,000 NCHRP RESEARCH EFFORT, THROUGH OUR STANDING COMMITTEE ON RESEARCH, TO DEVELOP DESIGN METHODOLOGIES AND SPECIFICATION CRITERIA FOR DEBRIS LOAD FORCES.

5/12/1992 NTSB

12/8/1994 Addressee H-90-107 THROUGH -109 DEAL WITH LATERAL LOADS ON SUBSTRUCTURE UNITS IMPOSED BY DEBRIS IN A SWOLLEN STREAM. THIS SUBJECT HAS BEEN TAKEN UP BY NCHRP PROJECT 12-39, FUNDED AT 300,000 WHICH IS NOW ONGOING. A REPORT OF THE FINDING OF THIS RESEARCH PROJECT IS SCHEDULED FOR THE TECHNICAL COMMITTEE MEETING TO BE HELD IN CONJUNCTION WITH THE FULL SUBCOMMITTEE ON BRIDGES AND STRUCTURES MEETING SCHEDULED FOR MAY, 1995.

6/20/1995 NTSB

AS STATED IN ITS 5/12/92, LETTER, THE BOARD UNDERSTANDS THAT H-90-107 THROUGH -109 ARE BEING ADDRESSED IN RESEARCH PROJECT NCHRP 12-39. AASHTO'S HIGHWAY SUBCOMMITTEE ON BRIDGES & STRUCTURES WAS SCHEDULED TO MEET IN MAY 1995 TO EVALUATE DESIGN METHODOLOGIES & SPECIFICATION CRITERIA FOR DEBRIS LOAD FORCES. PENDING RECEIPT OF MATERIAL ON DEBRIS LOADING DESIGN, FROM THE SUBCOMMITTEE. RECOMMENDATIONS H-90-107 THROUGH-109 WILL REMAIN CLASSIFIED "OPEN--ACCEPTABLE RESPONSE.

3/30/2004 Addressee

NCHRP Project 12-39, "Design Specifications for Debris Forces on Highway Bridges" developed practical methods for determining drag and hydrostatic forces on bridge piers and on superstructures due to waterborne debris. This information has been incorporated into the 17th Edition of the Standard Specifications for Highway Bridges.

7/20/2004 NTSB

The Safety Board has reviewed the National Cooperative Highway Research Program (NCHRP) Report 445, titled "Debris Forces on Highway Bridges," which was completed in 2000, and concludes that this report developed practical methods for determining drag and hydrostatic forces on bridge piers and superstructures due to waterborne debris. The report also includes recommended specifications for assessing these forces and this information has been incorporated into the 17th edition of the "Standard Specifications for Highway Bridges." This action satisfies the recommendations; accordingly, Safety Recommendations H-90-107 through -109 are classified "Closed--Acceptable Action."

Recommendation # H-90-109

Overall Status
CAA

Priority
CLASS II

THE NTSB RECOMMENDS THAT THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS: FOLLOWING THE DEVELOPMENT OF DEBRIS LOADING DESIGN METHODOLOGIES, INCLUDE DETAILED CRITERIA FOR CALCULATING THE MAXIMUM EXPECTED DEBRIS LOADS AND STRESSES IN THE "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES."

AMERICAN ASSOCIATION OF STATE HIGHWAY	Closed - Acceptable Action	7/20/2004
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1/2/1992 Addressee RECOMMENDATIONS H-90-107 THRU -109 ARE BEING SPECIFICALLY ADDRESSED IN RESEARCH UNDERWAY BY FHWA AND THROUGH THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) OF THE TRANSPORTATION RESEARCH BOARD (TRB). THE RECOMMENDATIONS WERE REFERRED TO OUR HIGHWAY SUBCOMMITTEE ON BRIDGES AND STRUCTURES WHICH IN TURN REQUESTED A 3000,000 NCHRP RESEARCH EFFORT, THROUGH OUR STANDING COMMITTEE ON RESEARCH, TO DEVELOP DESIGN METHODOLOGIES AND SPECIFICATION CRITERIA FOR DEBRIS LOAD FORCES.

5/12/1992 NTSB

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- 12/8/1994 Addressee H-90-107 THROUGH -109 DEAL WITH LATERAL LOADS ON SUBSTRUCTURE UNITS IMPOSED BY DEBRIS IN A SWOLLEN STREAM. THIS SUBJECT HAS BEEN TAKEN UP BY NCHRP PROJECT 12-39, FUNDED AT 300,000 WHICH IS NOW ONGOING. A REPORT OF THE FINDING OF THIS RESEARCH PROJECT IS SCHEDULED FOR THE TECHNICAL COMMITTEE MEETING TO BE HELD IN CONJUNCTION WITH THE FULL SUBCOMMITTEE ON BRIDGES AND STRUCTURES MEETING SCHEDULED FOR MAY, 1995.
- 6/20/1995 NTSB AS STATED IN ITS 5/12/92, LETTER, THE BOARD UNDERSTANDS THAT H-90-107 THROUGH -109 ARE BEING ADDRESSED IN RESEARCH PROJECT NCHRP 12-39. AASHTO'S HIGHWAY SUBCOMMITTEE ON BRIDGES & STRUCTURES WAS SCHEDULED TO MEET IN MAY 1995 TO EVALUATE DESIGN METHODOLOGIES & SPECIFICATION CRITERIA FOR DEBRIS LOAD FORCES. PENDING RECEIPT OF MATERIAL ON DEBRIS LOADING DESIGN, FROM THE SUBCOMMITTEE. RECOMMENDATIONS H-90-107 THROUGH-109 WILL REMAIN CLASSIFIED "OPEN--ACCEPTABLE RESPONSE.
- 3/30/2004 Addressee NCHRP Project 12-39, "Design Specifications for Debris Forces on Highway Bridges" developed practical methods for determining drag and hydrostatic forces on bridge piers and on superstructures due to waterborne debris. This information has been incorporated into the 17th Edition of the Standard Specifications for Highway Bridges.
- 7/20/2004 NTSB The Safety Board has reviewed the National Cooperative Highway Research Program (NCHRP) Report 445, titled "Debris Forces on Highway Bridges," which was completed in 2000, and concludes that this report developed practical methods for determining drag and hydrostatic forces on bridge piers and superstructures due to waterborne debris. The report also includes recommended specifications for assessing these forces and this information has been incorporated into the 17th edition of the "Standard Specifications for Highway Bridges." This action satisfies the recommendations; accordingly, Safety Recommendations H-90-107 through -109 are classified "Closed--Acceptable Action."

Recommendation Report

Wednesday, August 01, 2007

LOG:h-0555*

Log Number H-0555

Issue Date 12/21/1990

MIAMITOWN OH

5/26/1989

ON MAY 26, 1989, ABOUT 5:25 P.M. EASTERN DAYLIGHT TIME, A 140-FOOT SECTION OF THE 556-FOOT HARRISON ROAD TEMPORARY BRIDGE OVER THE GREAT MIAMI RIVER FELL ABOUT 40 FEET INTO THE RAIN-SWOLLEN RIVER AFTER A PILE BENT COLLAPSED. SEVEN WITNESSES REPORTED THAT A PASSENGER CAR AND A PICKUP TRUCK FELL INTO THE RIVER. HOWEVER, ONLY A PASSENGER CAR AND THE BODIES OF THE CAR'S TWO OCCUPANTS HAVE BEEN RECOVERED FROM THE RIVER. NO OTHER VEHICLES WERE FOUND IN THE RIVER NOR ARE ANY PERSONS REPORTED MISSING IN THE MIAMITOWN AREA. WITNESSES REPORTED AN UNUSUAL AMOUNT OF DEBRIS FLOATING DOWN THE RIVER AND STRIKING THE PILE BENTS OF THE BRIDGE PRIOR TO THE COLLAPSE. ALTHOUGH THE WEATHER WAS CLEAR AND DRY, FLOODING CONDITIONS EXISTED AT THE TIME OF THE COLLAPSE AND THE RIVER HAD OVERFLOWED ITS BANKS ONTO THE FLOOD PLAIN.

Recommendation # H-90-110

**Overall Status
CAA**

**Priority
CLASS II**

THE NTSB RECOMMENDS THAT THE U.S. GEOLOGICAL SURVEY: COOPERATE WITH THE FEDERAL HIGHWAY ADMINISTRATION AND THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS IN A RESEARCH PROGRAM TO DEVELOP METHODS TO ESTIMATE MAXIMUM DEBRIS LOADS FOR BRIDGE DESIGN PURPOSES.

U.S. GEOLOGICAL SURVEY (DOI)	Closed - Acceptable Action	6/21/2004
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2/6/1991 Addressee

5/8/1991 NTSB

6/27/1991 Addressee THE USGS AND THE FHWA MET IN FEBRUARY 1991 TO DISCUSS A COOPERATIVE PROJECT TO INVESTIGATE THE MAGNITUDE AND FREQUENCY OF DEBRIS LOADS FOR BRIDGE-DESIGN PURPOSES. AS A RESULT OF THIS MEETING, USGS AND FHWA HAVE DEVELOPED A RESEARCH PROPOSAL TO JOINTLY INVESTIGATE THE SOURCE AND TRANSPORT OF DEBRIS FLOWS AND THEIR EFFECTS ON BRIDGE STRUCTURES. THE STUDY WILL PROVIDE INFORMATION FOR THE DEVELOPMENT OF DESIGN FLOWS AND COUNTERMEASURES THAT MAY BE SUBSEQUENTLY RECOMMENDED BY THE AASHTO.

10/9/1991 NTSB

11/13/1991 Addressee AS DISCUSSED IN OUR LETTER OF JUNE 27, 1991, THE USCG AND THE FHWA HAVE DEVELOPED A RESEARCH PROPOSAL TO JOINTLY INVESTIGATE THE SOURCE AND TRANSPORT OF DEBRIS FLOWS AND THEIR EFFECTS ON BRIDGE STRUCTURES. DR. ROY E. TRENT, FHWA HAS INFORMED US THAT FHWA DOES HAVE FUNDING FOR THIS PROJECT FOR THE 1992 FISCAL YEAR AND THAT THE PROJECT SHOULD BE INITIATED LATER THIS FISCAL YEAR. THE OBJECTIVE OF OUR COOPERATIVE STUDY, WHICH WILL SUPPORT FHWA NEEDS, IS TO INVESTIGATE THE RELATION BETWEEN THE SOURCE AND AMOUNT OF WOODY DEBRIS WATERSHED AND THE MAGNITUDE AND FREQUENCY OF DEBRIS ACCUMULATES ON BRIDGE STRUCTURES.

12/26/1991 NTSB

6/21/2004 NTSB A companion recommendation to the FHWA (H-90-104) was discussed between the Safety Board and FHWA in a SWAT (Safety With A Team) meeting on December 17, 2003. The Board subsequently reviewed the National Cooperative Highway Research Program Report 445, titled "Debris Forces on Highway Bridges," which was coordinated by the FHWA and included information from an FHWA- and USGS-sponsored study, "Potential Drift Accumulation at Bridges," Federal Highway Administration Report No. FHWA-RD-97-28. Our review determined that the report satisfied the recommendation, and a letter to the FHWA closing Safety Recommendation H-90-104 and two other recommendations is currently in circulation. Because the USGS provided information that led to the closing of H-90-104, Safety Recommendation H-90-110 to the USGS is classified "Closed-Acceptable Action."

The Board believes that sending a letter to the USGS at this time advising of such action would serve no useful purpose and be of little meaning to them.

Recommendation Report

Wednesday, August 01, 2007

LOG:h-0555*

Total Number of Recommendations for Recommendation Report: 13

Selection for Report:

LOG:h-0555*