

Expedited Procurement Procedures for Emergency Construction Services

DETAILS

106 pages | 8.5 x 11 | PAPERBACK

ISBN 978-0-309-22378-2 | DOI 10.17226/22691

BUY THIS BOOK

AUTHORS

Gransberg, Douglas D.; and Loulakis, Michael C.

FIND RELATED TITLES

Visit the National Academies Press at NAP.edu and login or register to get:

- Access to free PDF downloads of thousands of scientific reports
- 10% off the price of print titles
- Email or social media notifications of new titles related to your interests
- Special offers and discounts



Distribution, posting, or copying of this PDF is strictly prohibited without written permission of the National Academies Press. (Request Permission) Unless otherwise indicated, all materials in this PDF are copyrighted by the National Academy of Sciences.

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP SYNTHESIS 438

**Expedited Procurement Procedures for
Emergency Construction Services**

A Synthesis of Highway Practice

CONSULTANTS

DOUGLAS D. GRANSBERG

Iowa State University

Ames, Iowa

and

MICHAEL C. LOULAKIS

Capital Project Strategies, LLC

Reston, Virginia

SUBSCRIBER CATEGORIES

Construction • Highways • Security and Emergencies

Research Sponsored by the American Association of State Highway and Transportation Officials
in Cooperation with the Federal Highway Administration

TRANSPORTATION RESEARCH BOARD

WASHINGTON, D.C.

2012

www.TRB.org

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

In recognition of these needs, the highway administrators of the American Association of State Highway and Transportation Officials initiated in 1962 an objective national highway research program employing modern scientific techniques. This program is supported on a continuing basis by funds from participating member states of the Association and it receives the full cooperation and support of the Federal Highway Administration, United States Department of Transportation.

The Transportation Research Board of the National Research Council was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose as it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communication and cooperation with federal, state, and local governmental agencies, universities, and industry; its relationship to the National Research Council is an insurance of objectivity; it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

The program is developed on the basis of research needs identified by chief administrators of the highway and transportation departments and by committees of AASHTO. Each year, specific areas of research needs to be included in the program are proposed to the National Research Council and the Board by the American Association of State Highway and Transportation Officials. Research projects to fulfill these needs are defined by the Board, and qualified research agencies are selected from those that have submitted proposals. Administration and surveillance of research contracts are the responsibilities of the National Research Council and the Transportation Research Board.

The needs for highway research are many, and the National Cooperative Highway Research Program can make significant contributions to the solution of highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement rather than to substitute for or duplicate other highway research programs.

NOTE: The Transportation Research Board of the National Academies, the National Research Council, the Federal Highway Administration, the American Association of State Highway and Transportation Officials, and the individual states participating in the National Cooperative Highway Research Program do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the object of this report.

NCHRP SYNTHESIS 438

Project 20-05 (Topic 43-11)

ISSN 0547-5570

ISBN 978-0-309-22378-2

Library of Congress Control No. 2012949668

© 2012 National Academy of Sciences. All rights reserved.

COPYRIGHT INFORMATION

Authors herein are responsible for the authenticity of their manuscripts and for obtaining written permissions from publishers or persons who own the copyright to any previously published or copyrighted material used herein.

Cooperative Research Programs (CRP) grants permission to reproduce material in this publication for classroom and not-for-profit purposes. Permission is given with the understanding that none of the material will be used to imply TRB, AASHTO, FAA, FHWA, FMSCA, FTA, or Transit development Corporation endorsement of a particular product, method, or practice. It is expected that those reproducing the material in this document for educational and not-for-profit uses will give appropriate acknowledgment of the source of any development or reproduced material. For other uses of the material, request permission from CRP.

NOTICE

The project that is the subject of this report was a part of the National Cooperative Highway Research Program conducted by the Transportation Research Board with the approval of the Governing Board of the National Research Council. Such approval reflects the Governing Board's judgment that the program concerned is of national importance and appropriate with respect to both the purposes and resources of the National Research Council.

The members of the technical committee selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and, while they have been accepted as appropriate by the technical committee, they are not necessarily those of the Transportation Research Board, the National Research Council, the American Association of State Highway and Transportation Officials, or the Federal Highway Administration of the U.S. Department of Transportation.

Each report is reviewed and accepted for publication by the technical committee according to procedures established and monitored by the Transportation Research Board Executive Committee and the Governing Board of the National Research Council.

Published reports of the

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

are available from:

Transportation Research Board
Business Office
500 Fifth Street, NW
Washington, DC 20001

and can be ordered through the Internet at:
<http://www.national-academies.org/trb/bookstore>

Printed in the United States of America

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

The **National Academy of Sciences** is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. On the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Ralph J. Cicerone is president of the National Academy of Sciences.

The **National Academy of Engineering** was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. Charles M. Vest is president of the National Academy of Engineering.

The **Institute of Medicine** was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, on its own initiative, to identify issues of medical care, research, and education. Dr. Harvey V. Fineberg is president of the Institute of Medicine.

The **National Research Council** was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both Academies and the Institute of Medicine. Dr. Ralph J. Cicerone and Dr. Charles M. Vest are chair and vice chair, respectively, of the National Research Council.

The **Transportation Research Board** is one of six major divisions of the National Research Council. The mission of the Transportation Research Board is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied activities annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. www.TRB.org

www.national-academies.org

NCHRP COMMITTEE FOR PROJECT 20-05

CHAIR

CATHERINE NELSON
Oregon DOT

MEMBERS

KATHLEEN S. AMES
Michael Baker, Jr., Inc.

STUART D. ANDERSON
Texas A&M University

BRIAN A. BLANCHARD
Florida DOT

CYNTHIA J. BURBANK
Parsons Brinckerhoff, Inc.

LISA FREESE
Scott County (MN) Community Services Division

MALCOLM T. KERLEY
Virginia DOT

RICHARD D. LAND
California DOT

JOHN M. MASON, JR.
Auburn University

ROGER C. OLSON
Minnesota DOT

ROBERT L. SACK
New York State DOT

FRANCINE SHAW-WHITSON
Federal Highway Administration

LARRY VELASQUEZ
JAVEL Engineering, Inc.

FHWA LIAISON

JACK JERNIGAN
MARY LYNN TISCHER

TRB LIAISON

STEPHEN F. MAHER

COOPERATIVE RESEARCH PROGRAMS STAFF

CHRISTOPHER W. JENKS, *Director, Cooperative
Research Programs*

CRAWFORD F. JENCKS, *Deputy Director, Cooperative
Research Programs*

NANDA SRINIVASAN, *Senior Program Officer*

EILEEN P. DELANEY, *Director of Publications*

SYNTHESIS STUDIES STAFF

STEPHEN R. GODWIN, *Director for Studies and
Special Programs*

JON M. WILLIAMS, *Program Director, IDEA and
Synthesis Studies*

JO ALLEN GAUSE, *Senior Program Officer*

GAIL R. STABA, *Senior Program Officer*

DONNA L. VLASAK, *Senior Program Officer*

TANYA M. ZWAHLEN, *Consultant*

DON TIPPMAN, *Senior Editor*

CHERYL KEITH, *Senior Program Assistant*

DEMISHA WILLIAMS, *Senior Program Assistant*

DEBBIE IRVIN, *Program Associate*

TOPIC PANEL

STUART D. ANDERSON, *Texas A&M University*

ALAN D. AUTRY, *Florida Department of Transportation*

DEBRA R. BRISK, *Hennipin County, Minneapolis, MN*

JON M. CHIGLO, *Minnesota Department of Transportation*

FEDERICK HEJL, *Transportation Research Board*

KRIS KUHL, *California Department of Transportation*

BRIAN E. SCHMITT, *Oklahoma Department of Transportation*

C. SHANNON SWEITZER, *S&ME, Raleigh, NC*

ED HAMMONTREE, *Federal Highway Administration-
CFLHD, Lakewood, CO (Liaison)*

D. SCOTT WOLF, *Federal Highway Administration (Liaison)*

FOREWORD

Highway administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to highway administrators and engineers. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire highway community, the American Association of State Highway and Transportation Officials—through the mechanism of the National Cooperative Highway Research Program—authorized the Transportation Research Board to undertake a continuing study. This study, NCHRP Project 20-05, “Synthesis of Information Related to Highway Problems,” searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an NCHRP report series, *Synthesis of Highway Practice*.

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

PREFACE

*By Jon M. Williams
Program Director
Transportation
Research Board*

Faced with disasters that close highways to the traveling public, state departments of transportation (DOTs) must undertake emergency procurement procedures to repair and reopen roadways. These procedures provide expedited delivery of contractor services. This study reports and discusses emergency procurement procedures being utilized by state DOTs, in coordination with federal agencies. Information for the study was gathered through a literature review and a survey of state DOTs and Federal Lands Highway Divisions. The study includes legal case studies.

Douglas D. Gransberg, Iowa State University, Ames, Iowa, and Michael C. Loulakis, Capital Projects Strategies LLC, Reston, Virginia, collected and synthesized the information and wrote the report. The members of the topic panel are acknowledged on the preceding page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

CONTENTS

1	SUMMARY
5	CHAPTER ONE INTRODUCTION <ul style="list-style-type: none">Background, 5Synthesis Objective, 5Literature Review, 5Emergency Powers, 6Key Definitions, 8Study Approach, 9
11	CHAPTER TWO EMERGENCY PROCUREMENT PROJECT CASE STUDIES <ul style="list-style-type: none">Introduction, 11Emergency Procurement Project Case Study Project Details, 11Conclusions, Effective Practices, and Future Research Recommendations, 30
33	CHAPTER THREE DEPARTMENT OF TRANSPORTATION EMERGENCY PROCUREMENT POLICIES, PROCEDURES, AND PROGRAMS <ul style="list-style-type: none">Introduction, 33Emergency Definition, 33Emergency Declaration Authority, 34Authorized Scope of Emergency Construction, 36Expedited Procurement Planning Process, 38Emergency Project Plans for Maintenance Projects, 41Conclusions, Effective Practices, and Future Research Recommendations, 42
44	CHAPTER FOUR EMERGENCY PROCUREMENT DESIGNER/CONTRACTOR SELECTION METHODS <ul style="list-style-type: none">Introduction, 44Defining the Appropriate Level of Competition, 44Emergency Project Delivery Methods, 45Emergency Contract Award Procedures, 48Conclusions, Effective Practices, and Future Research Recommendations, 50
51	CHAPTER FIVE EMERGENCY PROCUREMENT CONTRACTS AND POSTAWARD DESIGN/CONTRACT ADMINISTRATION PROCEDURES <ul style="list-style-type: none">Introduction, 51Emergency Project Scope Definition, 51Emergency Contract Types, 52Emergency Project Design and Construction Administration, 53Emergency Contract Special Clauses and Accounting Procedures, 56Conclusions, Effective Practices, and Future Research Recommendations, 60
63	CHAPTER SIX EMERGENCY PROCUREMENT LAW, LEGAL CASE STUDIES, AND RELEVANT CASE LAW <ul style="list-style-type: none">Introduction, 63Emergency Repair Work Defined, 63Procurement and Project Delivery Approaches Governing Emergency Repairs, 64Contracting Approaches, 65Conflicts and Case Law, 65Conclusions, 69

70	CHAPTER SEVEN	CONCLUSIONS, EFFECTIVE PRACTICES, AND RECOMMENDATIONS FOR FUTURE RESEARCH
		Introduction, 70
		Conclusions, 70
		Effective Practices, 71
		Future Research Recommendations, 71
73	REFERENCES	
78	GLOSSARY	
81	APPENDIX A	SURVEY AND SURVEY OUTPUT
102	APPENDIX B	RESEARCH NEEDS STATEMENT
105	APPENDIX C	STATE EMERGENCY PROCUREMENT STATUTES AND DELEGATION OF AUTHORITY

Note: Many of the photographs, figures, and tables in this report have been converted from color to grayscale for printing. The electronic version of the report (posted on the web at www.trb.org) retains the color versions.

EXPEDITED PROCUREMENT PROCEDURES FOR EMERGENCY CONSTRUCTION SERVICES

SUMMARY “In both federal and state law, the use of emergency procurement procedures allows for limited competition in selecting a contractor... however, *this limitation must be carefully utilized and fully documented*” (Perry and Hines 2007, italics added). Herein lies the crux of the source selection issue in expediting procurement procedures during a crisis. Although the law allows state transportation officials to do what it takes to resolve the emergency, they are expected to maintain an extremely careful balancing act between expeditiously resolving the crisis and abusing their authority to circumvent the routine full and open competition process using the emergency as justification. The ability to waive standard procedures comes with the requirement to use that authority both sparingly and wisely. In the words of the New Mexico Department of Transportation (NMDOT) procedures manual (2007), “Lack of planning does not constitute an emergency.” Another author writing on the subject of emergency procurement puts it this way: “Perhaps a good rule of thumb is, ‘when in doubt, bid it out’” (Houston 2011).

The past decade provided a seemingly endless series of natural and man-made catastrophes that resulted in the loss of a major component to the national highway network. From the devastation wreaked by Hurricane Katrina to the Gulf Coast and Interstate 10 to the sudden collapse of the Interstate 35W Bridge over the Mississippi River in Minnesota, state DOTs have had to step into the spotlight and implement expedited procurement procedures to restore vital links in the transportation network, with the media scrutinizing their work every night on the evening news. Although high-profile emergency projects are well known to the traveling public, the more common case is the loss of a culvert on a farm-to-market road as a result of flash flooding or a freeway overpass damaged and closed because of a traffic accident. These mundane local emergencies sometimes go unmentioned in the news, but are every bit as critical to the traveling public in the area and require just as much haste to restore service and remove threats to life and property. The difference between the two is often industry’s willingness to accept a change in routine rules for free and open competition. In major disasters, the publicity brings with it a “do whatever it takes” attitude because of the emotions surrounding the event that are not usually present in the local incidents. Nevertheless, DOTs across the nation have been able to resolve both large and small emergency interruptions to highway network service on an ongoing basis. The purpose of this report is to collect, analyze, synthesize, and publish the collective national experience with expedited procurement procedures to deliver both design and construction services for emergency highway projects.

The synthesis is based on a comprehensive literature review; a survey of the state DOTs that received responses from 42 states and three Federal Lands Highway Divisions (a response rate of 80 percent), and an emergency procedure document content analysis from 42 states plus the FHWA. Structured interviews were conducted with five design consultants and five construction contractors to gain the industry perspective on expedited procurement procedures. Finally, the synthesis furnishes three legal case studies (Minnesota, Pennsylvania, and South Carolina) on cogent emergency procurement legal issues, and

emergency project case studies from California, Florida, Maine, Minnesota, Missouri, Montana, New York, Oklahoma, and Utah that illustrate methods successfully used by transportation agencies on emergency projects.

The major finding of the synthesis is that most agencies use expedited procurement processes with which the agency is familiar and experienced to procure emergency design and construction. In most cases, this will be an accelerated version of traditional design-bid-build project delivery, which helps mitigate risk. Every research instrument supports this conclusion. Additionally, the use of a familiar project delivery method complies with the legal concept of allowing as much competition as time and circumstances permit to reduce the probability of a substantive protest. Put another way, familiarity equals confidence, and confidence permits DOT procurement, design, and construction personnel to accelerate the delivery of an emergency project while making the hard, time-sensitive decisions required with less fear that they may be in violation of procurement laws and regulations.

The other notable conclusions drawn from the review and discussed in the report's body are as follows:

1. Delegating the authority to waive routine contracting constraints from routine central control to the emergency project level is necessary to achieve a quick response and mitigate the overall impact on the public. For instance, a number of states give the DOT senior maintenance engineer the authority to declare an emergency for small-scale, high-frequency accidents whose repair will fall under a specific monetary cost.
2. The fastest way to react to an emergency is to anticipate it and make provisions in advance. The Montana DOT's rockfall remediation project, the Missouri DOT's "nested" design-build contract to repair landslide damage during construction, and the New York State DOT's Statewide Emergency Bridge indefinite delivery/indefinite quantity contract are all examples of developing the capacity to react to an emergency without the need to expedite procurement procedures.
3. Establishing indefinite delivery/indefinite quantity contracts in anticipation of the need for emergency services is the surest contractual means to minimize the impact of an emergency.
4. Investing in a preliminary consultant contract to quantify the scope of emergency design and construction work adds value to the expedited procurement process.
5. Emergency procurements can be executed by using traditional procedures to the greatest extent practical and adjusting them to account for the higher priority owing to the emergency nature of the procurement.
6. A standing list of prequalified designers and contractors, willing to quickly deploy to react to an emergency, is an effective means to expedite procurement procedures. It provides one way for the DOT to manage the increased exposure to risk that accompanies a crisis situation. Additionally, the use of a prequalified list has been shown to be an effective measure to reduce the potential for a formal protest or a lawsuit.
7. Careful review of emergency permits helps ensure that the agency has clearly documented its rationale for shortcutting or bypassing the routine process based on an urgent need to protect life and property.

The most commonly used practice is a standing list of prequalified design consultants and construction contractors. The practice reduces the time needed to identify qualified sources of design and construction services as well as materials and equipment. It also reduces the

risk of executing an emergency contract with a designer or contractor who does not have the technical and financial wherewithal to deliver the needed services. Finally, it acts as a protest avoidance measure by maximizing the amount of competition that can be permitted in a crisis situation to a predetermined level.

Chapter seven contains the remainder of the conclusions, effective practices, and recommendations for future research.

CHAPTER ONE

INTRODUCTION**BACKGROUND**

The following quotation eloquently describes the tenuous situation a public transportation agency must manage when reacting to an emergency restoration of service severed by either natural or man-made circumstances: “The severe criticism directed at government agencies during their response to, and recovery after, Hurricane Katrina is a testament to the insufficient preparation for executing emergency contracting actions that occurred as a result of this unprecedented event” (Jeffery and Menches 2008). On the one hand, the public expects the agency to react to the emergency as expeditiously as possible; on the other hand, the agency will be exposed to potential criticism from various special-interest groups when it procures the necessary design and construction services in a manner different than its routine procedures. The issue is further complicated by the hypercompressed period for procurement, as shown in recent research that found “a *strong linear correlation* between procurement duration and schedule growth. *Longer procurement duration correlates less with schedule growth*” (Migliaccio et al. 2010, italics added). The first quote also provides a logical solution for the dilemma: sufficient “preparation for executing emergency contracting actions.” This synthesis will look at how state DOTs and other transportation agencies have dealt with a variety of emergencies, and furnish information on commonly used practices for expediting the procurement of an emergency infrastructure repair, restoration, or replacement project.

SYNTHESIS OBJECTIVE

A report of an AASHTO domestic scan team (Blanchard et al. 2009) included a detailed analysis of eight emergency projects in four states and developed a broad set of recommendations for successful emergency procurements. The objective of this report is to build on that work and to identify and synthesize current practices that comprise the state of the practice related to expedited procurement procedures and discuss expedited procurement procedures that have been used successfully on both emergency maintenance and construction projects. This report will help DOTs develop effective procedures for delivering emergency projects and managing the heightened contractual risks that attend those situations.

In addition to a rigorous literature review, the synthesis is based on new data from a survey, a content analysis, three legal case studies, and 10 emergency project case studies. A general survey on expedited procurement practices provided responses from 42 U.S. state departments of transportation (DOTs). The content analysis included emergency policy documents/guidelines from 42 state DOTs and the FHWA. Finally, emergency project case studies from nine different states were conducted to furnish specific information on different approaches to dealing with emergency projects. The case study projects range from a \$315,000 overpass pier replacement to the highly visible replacement of the Interstate Highway 35W Bridge over the Mississippi River that collapsed in Minneapolis. The projects were selected because each demonstrated a specific approach to an emergency contract that allowed an in-depth illustration of important information gleaned from the survey and the DOT policy document content analysis. Only two major high-profile emergencies were selected because it was obvious in the literature review that the typical DOT emergency project is something quite mundane, such as the Oklahoma DOT case where a culvert washed out under an Interstate highway.

LITERATURE REVIEW

Many studies on the deteriorating condition of the nation’s highway network conclude that public transportation agencies must find ways to deliver infrastructure projects “better, faster, cheaper” (Atzei et al. 1999; Avant 1999; Richmond et al. 2006). Once an emergency removes an essential piece of that infrastructure such as a major Interstate highway bridge, the options for optimizing the procurement process narrow to focus on only one of the three previous components: schedule. Although quality and cost are still a concern, they take a backseat until service is restored (Houston 2011). Then, the public attention switches to an analysis of value for money from a retrospective viewpoint that often turns critical of the solution provided by the transportation agency to restore service as fast as possible. As a result of this sometimes career-ending phenomenon (ABC News 2005), public transportation agencies have expended much time and money to develop emergency management plans supported by a suite of expedited procurement procedures (Perry and Hines 2007; Blakemore and Konda 2010; Houston 2011). The requirement to expedite the delivery of an emergency project always arises unexpectedly.

Figure 1 shows the spectrum of emergency response and how emergencies can range from small-scale, high-frequency events to complex low-frequency events. The small localized emergency is typically handled by DOT maintenance forces, whereas the complex emergency requires involvement of agencies at all levels of government.

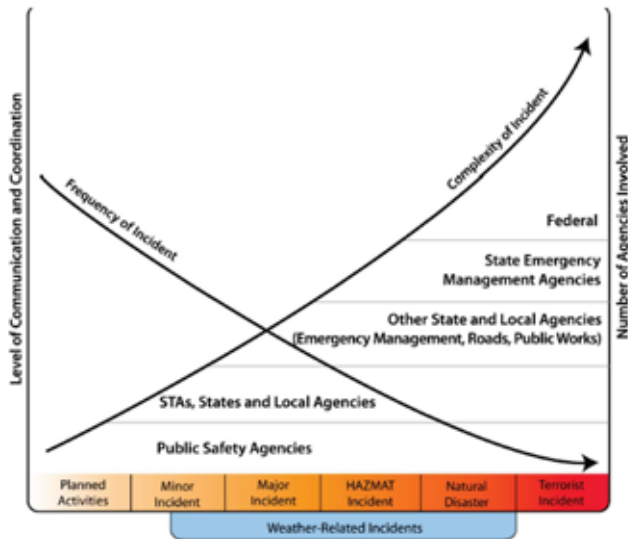


FIGURE 1 Emergency response spectrum (Wallace 2012).

Recent examples are the losses of major Interstate highway bridges in the following states:

- California: SR-60 Freeway overpass damaged by fire from tanker truck accident and explosion (KTLA 2012).
- Florida: I-10 bridge over Escambia Bay destroyed in Hurricane Ivan (Flatiron 2007).
- Minnesota: I-35W Bridge over the Mississippi River lost to catastrophic structural failure (Hietpas 2008).
- Oklahoma: I-40 Bridge over the Arkansas River knocked down by a barge collision (Bai et al. 2006).

In every case, the DOT was able to replace these large structures under heavy traffic in periods that were orders of magnitude less than the routine procurement process would have allowed. The I-35W project was the spark that initiated the FHWA's Every Day Counts program (Mendez 2010), which is an initiative to encourage expedited delivery of critical infrastructure projects on a routine rather than an emergency basis. To achieve the compressed timeline, each of the four cases required a specific authorization to expedite many of the procurement constraints, permitting hurdles, and risk-averse contracting procedures in order to restore the integrity of the national highway network. Additionally, the survey of DOTs found that 41 of 42 respondents delivered at least one emergency project per year, with most indicating that they deal with three to five projects each year (see Figure 2). Thus, it is important for public highway agencies to understand how procurement for emergency projects was successfully expedited.

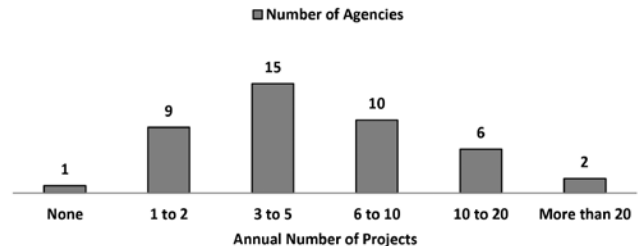


FIGURE 2 Average annual emergency project experiences.

EMERGENCY POWERS

Subject to state law, the powers granted to agencies in an emergency allow whatever action is determined necessary to insure health, safety, and welfare of the community. For example, the Florida State Senate (2010) states the following related to procurement of emergency highway contracts delivered by the Florida DOT:

The political subdivision has the power and authority to waive the procedures and formalities otherwise required of the political subdivision by law pertaining to:

- Performance of public work and taking whatever prudent action is necessary to ensure the health, safety, and welfare of the community.
- Entering into contracts.
- Incurring obligations.
- Employment of permanent and temporary workers.
- Utilization of volunteer workers.
- Rental of equipment.
- Acquisition and distribution, with or without compensation, of supplies, materials, and facilities.
- Appropriation and expenditure of public funds. (Title XVII, 252.38(3)(a)).

This language applies to procurement of emergency highway contracts delivered by the Florida DOT. Most, if not all, state codes contain similar authority to override routine contractual requirements for competition in the event of an emergency where the delay imposed by the routine procurement process could exacerbate the negative impact on the community.

Federal-aid primary, secondary, and special roadway designations are eligible for federal funds administered by FHWA. Title 23 United States Code (USC) §125 (2000) provides for emergency relief (ER) funding for the “repair or reconstruction of highways, roads, and trails, ... that the Secretary finds have suffered serious damage as a result of—(1) natural disaster over a wide area, such as by a flood, hurricane, tidal wave, earthquake, severe storm, or landslide; or (2) catastrophic failure from any external cause.”

Emergency construction work on all other roads is generally reimbursed through the Federal Emergency Management Agency (FEMA) (FDOT 2010).

Under nonemergency conditions, FHWA requires funding recipient consultant contracts to conform to Brooks Act (40 USC 1101-1104) qualifications-based selection (QBS) and contracts for construction to be awarded on the lowest responsive bid meeting the established criteria of responsibility (23 USC 112). However, federal regulations permit temporary suspension of competitive requirements for contracts consummated in emergency conditions. Noncompetitive procurement of engineering and design consultants in an emergency is addressed in title 23 Code of Federal Regulations (CFR) § 172.5(a)(3). The waiver of competitive bidding requirements for construction contracting in an emergency is addressed in 23 CFR 635.204.

Furthermore, an emergency event does not eliminate the need for approval and coordination with other state and federal agencies to meet the requirements of the National Environmental Policy Act (NEPA) (1978). The Council on Environmental Quality (CEQ), which issues the implementation guidance for federal NEPA actions, states,

Where emergency circumstances make it necessary to take an action with significant environmental impact without observing the provisions of these regulations, the Federal agency taking the action should consult with the Council [on Environmental Quality] about alternative arrangements. Agencies and the Council will limit such arrangements to actions necessary to control the immediate impacts of the emergency. Other actions remain subject to NEPA review” (Perry and Hines 2007, p. 9).

Once the emergency conditions have ceased to be an immediate threat and emergency repairs have been accomplished, conventional contracting procedures must be used for the remaining work (UDOT 2011a).

Procurement Regulations and Constraints

Emergency procurement procedures are strictly regulated by state and federal legislation. Nearly all DOTs are subject to a law that requires free and open competition among responsible and responsive bidders in their routine construction procurement process (Perry and Hines 2007). Deviating from that practice is the primary issue that triggers unproductive objections to delivering an expeditious return to service (Bai et al. 2008). The objections can range from merely a public relations problem to litigation and protest of award. The Minnesota DOT (Mn/DOT) has been lauded for its highly successful restoration of the I-35W Bridge after its collapse. Mn/DOT used a best value selection process to procure a design-build (DB) contractor. When it did not select the low bidder, Mn/DOT had to defend itself against an award protest (Hietpas 2008). It did so successfully because the agency had experience with disputed DB awards (Shane et

al. 2006). It also had prepared for expediting procurements when necessary.

A paper reporting a case study of the I-40 bridge at Webber’s Falls in Oklahoma in 2005 (Bai et al. 2006), which was knocked down when it was hit by a barge on the Arkansas River, provides a set of lessons learned that helps frame the following discussion of emergency procurement procedures. It found six lessons:

1. A quick response to the incident was the key to mitigate the losses and ease the inconvenience to the traveling public.
2. Using established contracting methods and procedures sped up the contract negotiation process and avoided future contract disputes.
3. Huge incentive and disincentive clauses in the contracts played a very critical role in motivating design firms, contractors, and material suppliers to finish their work on or ahead of time.
4. The duration of design for the new structure was shortened because the original design drawings and specifications were provided quickly to the design firms and ODOT [Oklahoma Department of Transportation] engineers were on call 24 hours per day.
5. Commitment of the necessary resources such as manpower from all parties, which included ODOT, design firms, contractors, and material suppliers, accelerated the replacement project.
6. Changing the normal DOT operational procedures expedited the reconstruction. For example, ODOT approved the shop drawings the day they were submitted (Bai et al. 2006, p. 342).

Fundamentals of Expedited Procurement

Although every agency will have its own set of emergency procurement laws, rules, regulations, and policies, the literature reveals six fundamental tenets for expediting the procurement of an emergency project. They loosely mirror Bai et al.’s (2006) six lessons learned. The concepts are categorized as follows:

1. Respond rapidly: Compressing the design and construction of an emergency project to its shortest state is the primary objective of the procurement process (Hietpas 2008). To do so, an agency must be prepared with an emergency project delivery plan that describes in detail the steps to obtain the necessary waivers from various regulations in place for routine contracts (Brick 2005; Kirk 2011).
2. Experience counts: The use of procurement procedures with which DOT personnel are not familiar increases the perception of risk and tempts emergency project personnel to violate standard regulations in the name of expedience (Migliaccio et al.

2008; Perry and Hines 2007). Conducting as much of the procurement as possible using the routine system within routine regulatory constraints reduces contract administration risk and the probability of post-event criticism of agency procedures (Christenson and Meeker 2002; Kirk 2011).

3. Incentivize key elements of project success: Strategic Highway Research Program 2 (SHRP2) project number R-10, “Project Management Strategies for Complex Projects,” lists this principle as one of the essential elements of complex project management (Shane et al. 2011). Emergency projects can involve a level of complexity not often encountered that springs from the context in which the project must be delivered. Incentives are one way to make the contractor’s objectives align with project success criteria (Schexnayder and Anderson, 2010; Kirk 2011; Shane et al. 2011).
4. Minimize design review: An agency cannot afford to spend the typical amount of time reviewing and haggling over the details of design in an emergency. Research has shown that most project delays occur during the design phase as designers and owners trade design deliverables back and forth for review and approval (Diekmann and Nelson 1985; West et al. 2012). Hence, the agency must define exactly what must be designed in detail and what can be built without a full set of construction documents (Gonderinger 2001; McMinimee 2010).
5. Control the internal technocracy: Procurement constraints are often immutable, but the agency can mitigate that issue by changing its routine process by implementing a 24-hour operation with senior agency experts and decision makers on call to deal with questions, clarifications, or approvals as they occur (Christenson and Meeker 2002; Migliaccio et al. 2008).
6. Commit to extraordinary effort: A serious emergency requires commitment to project completion regardless of the obstacles (Thorn 2006; Warne 2008). Waiving or reducing competition requirements allows the agency to mitigate the risk of awarding to an incompetent contractor by selecting designers and builders on the basis of qualifications and past performance. This enhances the environment of trust in the procurement as each stakeholder changes its typical procedures to accommodate the needs of the project (Anderson and Damjanovic 2008; Jeffery and Menches 2008; Blanchard et al. 2009).

The remainder of the report will explore these fundamentals in detail, providing examples of the state of the practice in expedited procurement procedures in state DOTs and col-

lecting examples of how public transportation agencies have successfully delivered emergency construction projects.

KEY DEFINITIONS

The report uses a number of procurement terms in a precise sense. It is important for the reader to understand the specific definitions of these terms to gain a full understanding of this study.

Procurement Terms

The definitions for the primary procurement terms are drawn from two sources. With one exception, federal terminology is defined in *Glossary of Federal Acquisition Terms* (Shields 1998), and nonfederal terms are defined in the state of Minnesota’s *Glossary of Common Procurement Terms* (2011), which seemed to be the most complete listing of this type. It must be recognized that each state will have its own definitions for technical terms describing procurement and contract actions.

- Advertise: “To make a public announcement of the intention to purchase goods, services or construction with the intention of increasing the response and enlarging the competition. The announcement must conform to the legal requirements imposed by established laws, rules, policies and procedures to inform the public” (Shields 1998). This term is used in the same sense as the federal definition of full and open competition.
- Emergency: “A threat to public health, welfare, or safety that threatens the functioning of government, the protection of property or the health or safety of people” (State of Minnesota 2011).
- Full and Open Competition: “All responsible sources are permitted to compete for a contract action” (Federal Acquisition Regulation (FAR) 6.003).
- Procurement: “The combined functions of purchasing, inventory control, traffic and transportation, receiving, inspection, store keeping, and salvage and disposal operations” (State of Minnesota 2011). “All stages involved in the process of acquiring supplies or services, beginning with the determination of a need for supplies of services and ending with contract completion or closeout” (Shields 1998).
- Solicitation: “The process used to communicate procurement requirements and to request responses from interested vendors. A solicitation may be, but is not limited to a request for bid and request for proposal” (State of Minnesota 2011). “(1) A document sent to prospective contractors by a Government agency requesting submission of an offer, quote, or information. (2) The process of issuing a document requesting submission of an offer, quote, or information and obtaining responses” (Shields 1998).

In addition to these terms, the DOT survey used the following terms to describe commonly practiced procedures and to differentiate between a routine project and an emergency project:

- **Emergency project:** A project initiated as the result of some unexpected circumstance that affected the capacity/level of service of a given transportation facility (road, bridge, tunnel, etc.) to the point where the respondent believed it to be great enough to warrant special treatment in the procurement phase.
- **Qualifications Based Selection (QBS):** A procurement method where the consultant or contractor is selected on a basis of qualification alone with no price factors. Price is negotiated with the best qualified competitor. This method was codified at the federal level by the Brooks Act, Public Law 92-582 (1972) (40 USC 1101-1104) and regulated by Title 23 USC 112(b)(2)(A) and 23 CFR 172.5(a)(1).
- **Sole source:** A procurement method where the agency is authorized to award directly to the consultant/contractor of its choice without competition.
- **Typical project:** A project delivered using procedures considered by the respondent to be normal.

Other Relevant Terms

Since the application of expedited procurement in the context of an emergency contract is the subject of this report, it is also important to have standard terms that relate to project delivery methods:

- **Alternative technical concepts (ATC):** “A procedure where the designers and/or contractors are asked to furnish alternative design solutions for features of work designated by the agency in its DB Request for Proposals (RFP)” (Carpenter 2010).
- **Construction manager/general contractor (CMGC):** “A project delivery method where the contractor is selected during design and furnishes preconstruction services. Also called CM-at-Risk” (DBIA 2009).
- **Design-build (DB):** “The system of contracting under which one entity performs both architecture/engineering and construction under a single contract with the owner” (DBIA 2009).
- **Design-bid-build (DBB):** “The ‘traditional’ project delivery approach where the owner commissions a designer to prepare drawings and specifications under a design services contract, and separately contracts for construction, by engaging a contractor through competitive bidding or negotiation” (DBIA 2009).
- **Indefinite delivery/indefinite quantity (IDIQ):** “A contract that may be used to acquire supplies and/or services when the exact times and/or exact quantities of future deliveries are not known at the time of contract award...within stated limits (minimum and

maximum), of supplies or services to be furnished during a fixed period, with deliveries or performance to be scheduled by placing orders with the contractor” (FAR 16.501-2(a)). These are also called job order contracts, task order contracts, on-call contracts, standby contracts, pushbutton contracts, master contracts, and several other terms.

STUDY APPROACH

The approach used to complete the synthesis relied on five independent sources of information:

- Literature review;
- Survey of DOTs and federal agencies;
- Structured interviews with design consultants and construction contractors;
- Content analysis of DOT emergency management documents; and
- Case studies of emergency projects.

The first source of information was a comprehensive review of the literature. An effort was made to seek not only the most current information but also historical information so that the change, if any, over time in emergency procurement practices could be mapped and related to the current state-of-the-practice. The second was the general survey responses of 42 state DOTs (80 percent response rate), including three Federal Lands Highway Divisions. The survey questionnaire was based on the output of the literature review. Of the survey respondents, five DOTs indicated that they did not have formal procedures to expedite the procurement of emergency projects and seven responses were not complete, leaving 30 complete responses upon which to base the bulk of the synthesis. The third source was structured interviews conducted with design consultants and construction contractors to gain the industry perspective on expedited procurement procedures. The emergency procedure document content analysis using a protocol proposed by Neuendorf (2002) from 42 states plus the FHWA was the fourth source of information. Figure 3 shows the survey response and emergency procedure document content analysis populations as a map.

Subjects where two or more of the five sources intersected were considered notable and used to develop the conclusions and candidates for the list of effective practices. Points where only one source furnishes substantive information on emergency project success were used to identify gaps in the body of knowledge that showed potential for future research.

Since expedited procurement procedures directly affect both the consulting engineering and construction contracting industries, short structured interviews were scheduled with representatives of both stakeholder groups. An effort

was made to sample a population from across the country. The questionnaire was developed from the literature review and assembled in accordance with the protocol established by Oppenheim (1992). The interviews were conducted either face-to-face at a national conference or over the phone according to the General Accounting Office (1991) (now Government Accountability Office) methodology and recorded for analysis. This research instrument was viewed as a validation technique to confirm that the information that seemed to agree from the literature, the survey, and the content analysis was in actuality viewed by industry in the same light. Table 1 contains a description of the industry interviewees, who were promised anonymity in return for their candid input.



FIGURE 3 Survey response and emergency document content analysis map.

TABLE 1
STRUCTURED INTERVIEW POPULATION: CONSULTANTS AND CONTRACTORS

Location	Type	Location	Type
Arizona	Regional general contractor	Florida	National design consultant
California	National general contractor	Massachusetts	International design consultant
Oklahoma	Local paving contractor	Oklahoma	Regional design consultant
Oregon	Regional general contractor	Texas	National construction management consultant
Texas	National general contractor	Washington	Regional design consultant

Protocol to Develop Conclusions, Effective Practices, and Recommendations for Future Research

The major factor in developing a conclusion was the intersection of trends found in two or more research instruments. The intersection of more than two sources of converging information adds authority to the given conclusion. Additionally, greater authority was ascribed to information developed from the general survey of highway agencies. The literature review and emergency document content analysis were considered to be supporting sources of information. Finally, the case studies were used to validate the conclusion as appropriate because they were examples of how U.S. highway agencies have actually implemented expedited procurement procedures to support the delivery of emergency projects.

Effective practices were also identified by multiple instances of the same practice in several different sources of information. Greatest authority was ascribed to practices that were found in the case studies because of the immediate evidence of successful results. Recommendations for future research were developed based on the common practices described in the literature and confirmed as effective by one of the research instruments but not widely used. Gaps in the body of knowledge found in this study were also used to define the areas where more research would be valuable.

Organization of the Report

The next chapter sets the stage for the more thorough analysis contained in subsequent chapters by presenting 10 case studies. The major legal issue in emergency projects is dealing with limiting free and open competition before contract award. Therefore, chapter two demonstrates the methods that agencies used to deal with uncertainty in their emergency projects. The information in this study will be presented as follows:

- Chapter two—Emergency Procurement Project Case Studies
- Chapter three—Department of Transportation Emergency Procurement Policies, Procedures, and Programs
- Chapter four—Emergency Procurement Designer/Contractor Selection Methods
- Chapter five—Emergency Procurement Contracts and Postaward Design/Contract Administration Procedures
- Chapter six—Emergency Procurement Law, Legal Case Studies, and Relevant Case Law
- Chapter seven—Conclusions, Effective Practices, and Recommendations for Future Research

CHAPTER TWO

EMERGENCY PROCUREMENT PROJECT CASE STUDIES**INTRODUCTION**

Case study data collection was based on the results of the literature review. The team proposed to identify and analyze two to five projects from across the spectrum of emergency transportation projects with procurement aspects of specific interest to the synthesis. The cases are separated into emergency procurement project case studies and emergency procurement case law studies. The project case studies each highlight a specific emergency procurement issue that was addressed using expedited procurement procedures for emergency project delivery.

The team was able to identify and gain access to information on 10 emergency procurement projects worth more than \$290 million in six states that represent the cross section of variations on project delivery methods (PDM). Table 2 summarizes the case study projects that were sampled for this report. The projects span from coast to coast and north to south. The case study projects represent the use of four different project delivery methods, including a hybrid DBB with a nested DB provision. The project types range from the replacement of a washed-out culvert to emergency replacement of an eight-lane Interstate highway bridge over the Mississippi River.

EMERGENCY PROCUREMENT PROJECT CASE STUDY DETAILS

The following sections relate the details of each case study project. The objective of this section is to portray the breadth and depth of the case study project population, giving the reader the background to understand how each project's features contributed to the analysis reported in succeeding chapters. The format has been standardized for each project to permit comparison of the projects. All of the details shown in this chapter were obtained through structured interviews (either in person or telephonic) with the agency and then supplemented as required by specifics about each project found in the literature. The values cited for each case are the published cost for the emergency contract and may not include additional costs for incentives, quantity overruns, right-of-way, and so on.

I-580/880 MacArthur Maze Bridge Repair and Replacement Project—California DOT

This project furnishes an example of an extreme use of time-based incentives to clearly communicate the agency's need to complete the emergency project as rapidly as possible. Almost 80 percent of the MacArthur Maze project cost was the result of the contractor earning the maximum possible incentive (Blanchard et al. 2009). It also illustrates a number of tools that the California DOT (Caltrans) used to great effect to expedite the procurement and manage the constraints on this project.

Case 1—Caltrans: I-580/880 Bridge Repair and Replacement

Value: \$5.9 million

Scope: Design and construction of 160 linear feet of I-580 overpass bridge. Replacement of I-880 deck and repair of other damaged features. Figure 4 shows the extent of the damage.



FIGURE 4 I-580/880 accident and fire aftermath (Blanchard et al. 2009).

Right-of-Way: Right-of-way was not an issue in this project.

Permitting: California statutes for the emergency project “allowed for expedited environmental, public involvement, and contracting procedures ... [and were] critical to emergency contract success” (Blanchard et al. 2009).

TABLE 2
SYNTHESIS CASE STUDY PROJECT SUMMARIES

Agency (case no.)	Case Study Project (value)	Construction Type (location)	Expedited Procurement Procedure	Solicitation Type (PDM)	Payment Provision (designer)
California (1)	I-580/880 MacArthur Maze Repair and Replacement (\$5.9 million)	Overpass bridge replacement after truck struck pier and burned (Oakland, CA)	Invitation-only bids from 9 experienced contractors	IFB (DBB)	UP with time incentive (in-house)
Florida (2)	I-10 Escambia Bay Bridge Repair (\$26.4 million)	Repair Interstate bridge damaged in hurricane (Pensacola, FL)	Natural Disaster Emergency Contract— Invitation-only bids from 4 contractors	RFP (DB)	LS with time incentive (outsource)
Maine (3)	Route 27 Emergency Bridge Replacement (\$2.89 million)	Replace two bridges destroyed by flooding (Carrabassett Valley, Eustis, ME)	Use of CMGC with standing contractor prequalification list by a DOT that does not have routine CMGC authority	RFQ/RFP (CMGC)	UP (in-house)
Minnesota DOT (4)	I-35W Bridge Replacement (\$234 million-DB contract only)	Replace collapsed Interstate bridge (Minneapolis, MN)	Abbreviated DB procurement for mega-project. Also included because of protest of award	RFQ/RFP (DB)	LS + time incentive and no-excuse bonus (outsource)
Missouri DOT (5)	I-270—St. Louis County Slide Repair (\$550,000)	Emergency landslide remediation on Interstate highway (St. Louis County, MO)	Use of a “nested” DB contract provision in a DBB contract with known geotechnical issues to respond to a major geotechnical problem	IFB with prequalified geotechnical specialty subcontractor included (DBB w/DB)	Time and materials (outsource)
Montana DOT (6)	US Highway 2 Rockfall Mitigation (\$3.0 million)	Rockfall mitigation features (Flathead County, MT)	Use of a DB unit price provision that allowed construction to begin without geotechnical investigation	RFQ/RFP (DB)	LS with UP items (outsource)
New York State DOT (7)	981G Ramapo River Bridge Replacement (\$1.4 million)	Bridge replacement (Rockland County, NY)	Use of Statewide Emergency Bridge IDIQ Contract	Standing contract (IDIQ)	Time and materials (in-house)
Oklahoma DOT (8)	I-40—Beckham County Bridge Pier Replacement (\$315,000)	Overpass pier replacement after truck struck pier and burned (Elk City, OK)	Sole source cost plus contract to local contractor to install temporary shoring while expedited IFB developed	IFB (DBB)	UP with hourly I/D (in-house)
Oklahoma DOT (9)	I-35 Culvert Repair (\$716,000)	Triple box culvert replacement after wash-out by flood (Logan County, OK)	Expedited procurement in 72 hours after emergency	IFB (DBB)	UP with hourly I/D (in-house)
Utah DOT (10)	SR 14 Landslide Repair (\$15 million)	Repair extensive landslide damage to road and stabilize slide (Cedar City, UT)	Use of CMGC contract to expedite construction through 3 work packages	RFP (CMGC)	GMP (outsource)

I/D = incentive/disincentive; IFB = invitation for bids; GMP = guaranteed maximum price; UP = unit price.; PDM = project delivery method; DBB = design-bid-build; CMGC = construction manager/general contractor IDIQ = indefinite delivery/indefinite quantity.

Rationale: Caltrans considered a force account contract but ruled that out to “drive the best possible bid price and early completion date” (Blanchard et al. 2009). It also considered A+B bidding but discarded that option because the contract was expected to take less than 50 days and the agency did not want to create a situation where there was no incentive for the contractor to finish as fast as possible. It settled on an incentive-based early completion date to “allow the contractor to work as fast as possible and as economically as possible” (Blanchard et al. 2009).

Procurement: Blanchard et al. (2009) describe the procurement as follows:

This project was let as an invitation-only bid. Nine proven and experienced bridge contractors who work in the area were invited to bid. Eventually only seven submitted bids (one declined the invitation and another withdrew before the site visit). There was a mandatory pre-bid conference at the project site on Saturday afternoon and a mandatory small business outreach meeting. Over the next day Caltrans provided immediate responses to bidder inquiries. The project was advertised with a \$200,000 per day incentive/disincentive clause capped at a \$5 million maximum. The contract time was set up for 70 calendar days with an internal milestone of 50 calendar days for opening the bridge to traffic. In addition, the contractor would be fined \$200,000 for every 10 minutes the short-duration lane closures were not reopened to traffic. By creating bonus incentives of up to \$5 million, nearly 100% of the state’s estimated cost for construction of the project, the state clearly conveyed that it placed a high

value on project completion speed. The contract set a construction completion deadline of re-opening I-580 on June 29 (53 calendar days).

Time Line: See Table 3.

TABLE 3
I-880 MACARTHUR MAZE BRIDGE REPAIR AND
REPLACEMENT IN OAKLAND, CALIFORNIA

Date	Event	Remarks
April 29, 2007	Accident occurs	None
April 29, 2007	Emergency demolition contract awarded sole source	Governor issues emergency declaration
April 30, 2007	Contractor installs I-880 temporary shoring; Caltrans locates available steel and begins design	Caltrans generates several feasible options around existing material
May 1, 2007	Consulting engineer survey of damage	Cores and samples taken and shipped to 3 labs around the country for expedited testing and analysis
May 3, 2007	I-580 contract advertised	None
May 5, 2007	I-580 on-site bid conference I-880 deck repairs complete	None
May 6, 2007	I-880 girders heat straightened, bent caps repaired	Addendum #3 to I-580 IFB sent to bidders
May 7, 2007	I-880 reopened I-580 bids opened and contract awarded	Contractor mobilized immediately upon award
May 24, 2007	Construction complete—open to traffic	27 days after incident

Adapted from Blanchard et al. (2009).

Case 1—Summary and Major Tools for Expedited Procurement

Summary: The project was completed in 27 days, with the contractor earning an early completion bonus of \$5 million. This firm had gained experience in emergency bridge repair and construction during the 1994 Northridge earthquake reconstruction on the Santa Monica Freeway and the reconstruction of the Geyserville Highway 128 bridge collapse in 2006. Thus, the agency and the contractor had previously worked together in crisis situations. The contractor further incentivized the steel fabricator, the key logistics constraint, by offering to share 25 percent of the bonus. It also offered a share of the bonus money to its employees to work around the clock and beat the incentive deadline.

The following is a list of the major tools used to expedite the emergency replacement of the I-550/880 MacArthur Maze Bridge:

- Issued sole source contracts to immediately begin demolition and address immediate danger of I-880 bridge collapse with temporary shoring;
- Implemented an aggressive DBB procurement process based on limited competition among a select group of contractors with known experience;
- Arranged bid opening so a contract award could be made immediately after bid opening;
- Incentivized the emergency construction contract to minimize the construction period; and
- Massed agency personnel in three shifts of field engineers and conducted construction submittal review and approval on site.

I-10 Escambia Bay Bridge Repair Project—Florida DOT

This project demonstrates an expedited DB procurement and the procedures and tools that the Florida (FDOT) used to reopen this vital link in the national highway system after Hurricane Ivan wreaked its damage on the Gulf Coast in 2004. The hurricane destroyed a 2.5-mile section of I-10 bridges over Escambia Bay. FDOT invited four contractors to submit DB proposals for the emergency replacement of the westbound bridge using Acrow prefabricated bridging, a third-generation panel bridge system based on the military Bailey bridge (Blanchard et al. 2009). They also bid on a Phase II project to repair the eastbound bridge. The damage included the loss of 3,300 feet of the bridge's superstructure into the bay, 24 destroyed piles bents, and the requirement to reposition numerous superstructure spans that the hurricane had left misaligned.

Case 2—FDOT: I-10 Escambia Bay Bridge Repair

Value: \$26.4 million

Scope: Design and construction of temporary prefabricated metal bridging to restore traffic as well as replacement of bents and installation of precast concrete deck sections (Figure 5). The scope of work is as follows (Maxey 2006):

- Westbound bridge (Phase 1): 12 spans destroyed; 19 spans misaligned; seven bents replaced
- Eastbound bridge (Phase 2): 51 spans destroyed; 33 spans misaligned; 58 Acrow spans installed; 25 bents replaced
- East end approach slab and embankment replaced.

Right-of-Way: Right-of-way was not an issue in this project.

Permitting: Permits were not necessary for the emergency project. Florida statutes allow permitting requirements to be waived or streamlined in an emergency.

Rationale: FDOT has a “Natural Disaster Emergency Contract” form that can be implemented based on the gover-

nor's declaration of an emergency. DB was selected because the urgency of the work demanded a single point of responsibility for design and construction, since design would be ongoing during construction (Maxey 2006).



FIGURE 5 I-10 Escambia Bay Bridge repairs in progress (Courtesy FDOT).

Procurement: FDOT awarded a DB contract based on its expedited procedures for emergency contracting (FDOT 2010). The final awarded contract was on FDOT's standard form with seven pages of handwritten "assumptions and clarifications" (Blanchard et al. 2009). The contract had two phases. Phase 1 involved reestablishing traffic on the westbound bridge and had a contract duration of 24 days. It had an incentive/disincentive (I/D) of \$250,000 per day capped at \$3 million. The contractor completed it in 17 days and earned a \$1.75 million incentive. The Phase 2 contract performance period was set at 90 days with a \$50,000 daily I/D. It was completed in 63 days.

Time Line: See Table 4.

TABLE 4
I-10 ESCAMBIA BAY BRIDGE REPAIR

Date	Event	Remarks
September 15/16, 2004	Hurricane Ivan hits Escambia Bay	None
September 17, 2004	DB procurement initiated and completed	Preproposal meeting at 9:00 a.m. Price proposals received at 4:00 p.m. Contract signed before midnight
September 19, 2004	Contractor mobilization begins	Construction equipment arrives
September 22, 2004	Work begins	None
September 28, 2004	600-ton barge crane arrives	Heavy picks begin
October 4, 2004	Last span in position	At 11:30 p.m. Day 17
October 5, 2004	2-way traffic open on westbound bridge	At 6:00 a.m.
November 20, 2004	Eastbound bridge opened to traffic	Day 63
December 16, 2004	Construction complete	91 days after storm

Adapted from Blanchard et al. (2009).

Case 2—Summary and Major Tools for Expedited Procurement

Summary: The overall project was completed 91 days after the storm damage occurred. The project was successful because FDOT's well-developed emergency plan was in place before the disaster struck. The following is a list of the major tools used to expedite the emergency replacement of the I-10 Escambia Bay Bridge as reported by the scan team:

- "Expedited contract execution—FDOT delegated award to the local office; work was scoped for basic requirements of the needed facility. Obtain an agreement quickly, handwritten if necessary; the formal contract can follow later.
- Mobilization—Marshal people and equipment to the project site as soon as possible. Select a contractor that has the ability to bring people and equipment to an isolated location quickly.
- Design team in place to support the project—Relocate experts to the site and in position to make quick decisions. Develop the design concurrent with the work.
- Flexibility based on material availability—Speed can only be achieved if the DOT is willing to accept available materials for repair" (Blanchard et al. 2009).

Route 27 Carrabassett Valley Emergency Bridge Replacement Project—Maine DOT

This project was selected for inclusion because the Maine DOT does not have the statutory authority to use CMGC

project delivery, but it selected this delivery method as the most appropriate for this emergency project. The Maine DOT also has a prequalified standing list of contractors willing to work in emergencies that it used in rapidly responding to the damage caused by the flooding caused by Hurricane Irene in September 2011.

Case 3—Maine DOT: Route 27 Bridge Replacement

Value: \$2.89 million

Scope: Design and construction of temporary bridging, two permanent concrete bridges, bank restoration, and approaches (Figure 6).

Right-of-Way: Right-of-way was not an issue in this project.

Permitting: Permits were not an issue for this project owing to Maine statutes.

Rationale: The Maine DOT awarded a CMGC contract because it believed that the method furnished the most appropriate mechanism for maximizing constructability and thus minimizing time. It permitted the in-house design team to complete the necessary design expeditiously with contractor input on crane locations, constructability, bridge type based on fabrication availability and cost, as well as input on limits of right-of-way required resulting from equipment location and access to the construction sites. The method also “reduced the level of design and specifications” (Pulver 2012) by not requiring a fully biddable set of construction documents.

Procurement: The DOT had the following three goals for the procurement:

- “[Load] unrestricted temporary bridges
- Temporary bridges open in 2 weeks

- Permanent bridges open by November 15, 2011” (Pulver 2012).

The interviews were 1.5 hours apiece and centered on the following questions:

- “How soon can you mobilize?
- What resources are immediately available?
- Innovative construction techniques?
- Can you meet or beat the schedule goals?
- What do you propose using for temporary bridge?” (Pulver 2012).

The winning contractor was notified at 3:00 p.m. the same day as the interview, and a contract for the temporary bridges and preconstruction services was executed. Five days later the CMGC was given a set of 75 percent plan and asked to furnish a guaranteed maximum price (GMP) the next day. The original bid was 14 percent over the engineer’s estimate. Negotiations ensued, covering each estimate’s assumptions and risk. This brought the two within 5 percent of each other, and the contract for the permanent bridges was awarded.

Time Line: See Table 5.

Case 3—Summary and Major Tools for Expedited Procurement

Summary: The project was completed 82 days after the loss from Hurricane Irene. The Maine DOT achieved all three goals that it set for the procurement immediately after the disaster. The following is a list of the major tools used to expedite the emergency replacement of the Route 27 bridges.

- Created standing list of prequalified emergency contractors, and



FIGURE 6 Damaged Route 27 Brackett Brook and North Branch bridges (Pulver 2012).

TABLE 5
ROUTE 27 BRIDGE REPLACEMENTS

Date	Event	Remarks
August 28, 2011	Hurricane Irene flood occurs.	None
August 29, 2011	Site investigation including boring and surveying mobilize. Internal design team begins work.	Geotechnical investigation to support the design.
August 30, 2011	Governor approves CMGC. Design team on site. Contractor interviews complete; selection made.	5 prequalified contractors, 1.5 hours each; notification at 3:00 p.m.
August 31, 2011	Preconstruction and temporary bridge contract executed; CMGC and design team meet on site; work on temporary detour starts	Detour, alignment, and utility locations determined.
September 5, 2011	75% plans sent to CMGC	Bid opening schedule for next day.
September 6, 2011	GMP negotiated and construction contract awarded. Temporary bridges opened to traffic.	Bid received at 11:00 a.m. and contract executed at 3:00 p.m.
September 9, 2011	Design complete.	None
September 12, 2011	New bridge construction begins.	None
November 18, 2011	Construction complete.	82 days after flood.

Pulver (2012).

- Reduced the level of design by in-house engineers owing to the ability to gain input from the contractor.

I-35W Bridge Replacement—Minnesota DOT

This project illustrates all the aspects of expediting procurement procedures for the emergency delivery of a major Interstate bridge in an urban area. Not only did the I-35W need to be replaced, but the wreckage from the disaster had to be expeditiously removed from the Mississippi River to restore barge traffic on that important route for interstate commerce. Additionally, the Minnesota DOT (Mn/DOT) successfully defended a protest of award on this project. Thus, it provides a tested model for emergency procurement of a major structure.

Case 4—Minnesota DOT: I-35W St. Anthony Falls Bridge Replacement Project

Value: \$234 million (DB contract only; no right-of-way costs, etc.).

Scope: Design and construction of an Interstate bridge over the Mississippi River at St. Anthony Falls in Minneapolis, Minnesota. The new bridge is 189 feet wide with five lanes of traffic running each direction. The central clear span over the river is 504 feet long, and the overall length of the bridge is 1,223 feet from abutment to abutment. The bridge was designed and constructed to be ready for the construction of future light rail features. Figure 7 shows the aftermath of the collapse, and Figure 8 shows the plan and profile of the replacement bridge.

Right-of-Way: The replacement bridge required 13 parcels of land, of which 3 were complete acquisitions and the rest were partial takes. Mn/DOT used the following innovative two-step process to obtain immediate access to the properties and avoid the typical delays associated with the right-of-way process (Warne 2008):

1. An initial “Right of Entry” easement was negotiated with each landowner, each of whom was paid a nominal \$1,000.
2. Owners were then given a guaranteed time line for closing the financial part of each deal.

This procedure guaranteed access to critical pieces of property for both demolition and construction activities. It was also noted that the affected property owners were “generally more cooperative given the nature of the work and the emotional impact on the community of the failure of the 35W Bridge” (Warne 2008).

Permitting: This project required 10 permits as a well as an emergency environmental impact analysis. To expedite the process, MnDOT requested a “Categorical Exclusion” for the project. As a result, MnDOT had to carefully manage the final scope of work to ensure that betterments did not jeopardize the exclusion. For example, proposals to rebuild the undamaged interchanges at either end of the bridge were made that, if included, would have prevented a Categorical Exclusion finding and delayed the project (Warne 2008). The betterments would also have required additional funding, as they would not have been eligible under ER program provisions, further exacerbating the potential delay (MnDOT 2008).

The MnDOT project team approached obtaining permits using the philosophy of: “Build the largest project possible with the smallest environmental process” (MnDOT 2008) and used the following tools to obtain the necessary permits in an expedited fashion:

- Held permitting kickoff meeting with the heads of local, state, and federal permitting authorities to “ensure buy-in from the top down” (MnDOT 2008). The meeting



FIGURE 7 I-35W collapsed bridge section.

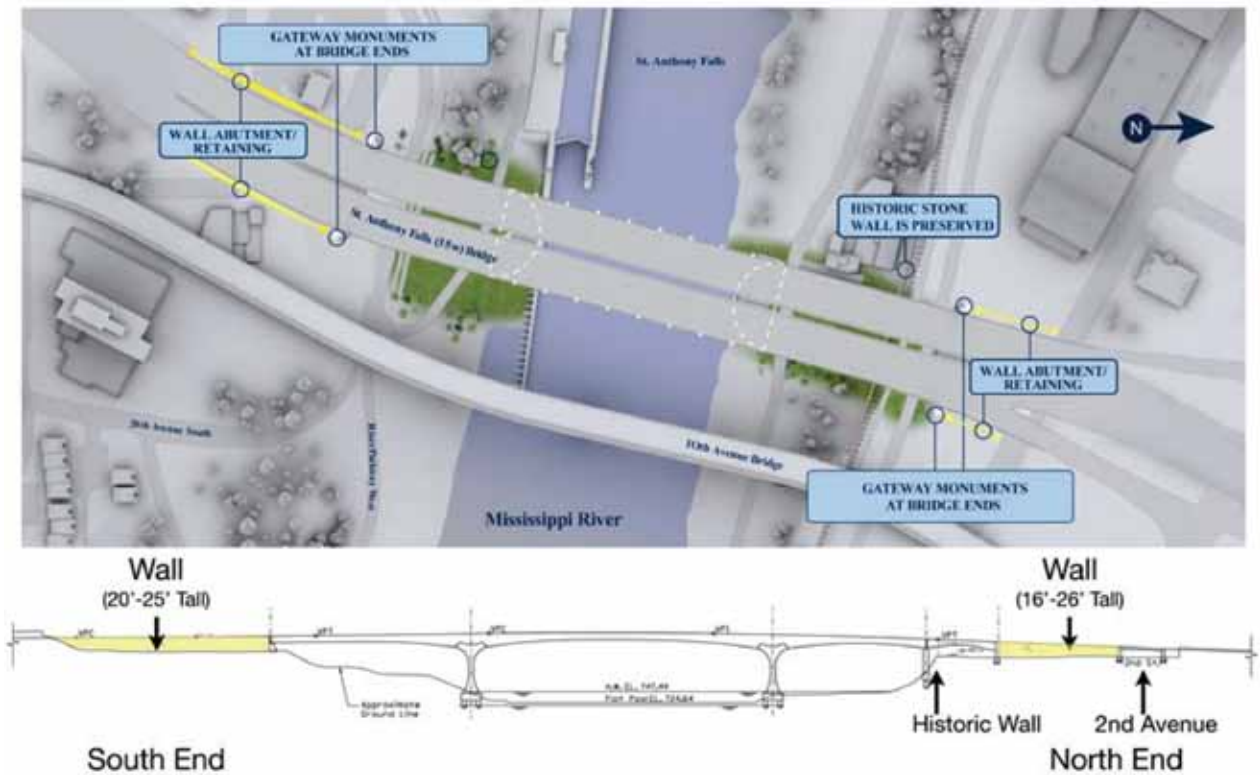


FIGURE 8 I-35W replacement bridge plan.

resulted in agreements or understanding on permitting approvals, mitigation expectations, and submittal requirements, barriers to overcome, and a single point of contact with decision-making authority in each agency.

- Obtained an agreement from the resource agencies to make sure each document received “the priority of the reviewer and it was immediately reviewed and comments returned in a very timely manner” (MnDOT 2008).

- Delegated the authority to make project scope and specific design decisions to the individuals who managed the project and prepared the permit applications.
- Took full advantage of existing programmatic agreements and categorical exclusions, wherever appropriate.
- Ensured that any capacity additions were for less than the mandated 1.0 mile in length to avoid the requirement for an Environmental Assessment triggered at that length.
- Convened a meeting with the competing proposers and the affected utility companies during the procurement phase to furnish firsthand information on potential utility relocations and to provide an opportunity for the industry to ask the utilities direct questions rather than rely on the request for information process.

Procurement Decision Rationale: MnDOT chose to deliver the replacement bridge using DB because it had extensive experience with the method and believed that it could attract highly experienced DB teams to the project both by incentivizing the contract and through the department's reputation from previous successful DB projects. Additionally, DB furnished a mechanism to equitably share the design and performance risk between Mn/DOT and the winning design-builder. For example, Mn/DOT assumed the risk of obtaining all but two of the permits, assigning the risk for the Coast Guard Navigation permit and the National Pollutant Discharge Elimination System permit to the design-builder. Based on the permitting discussion, MnDOT was able to obtain its eight permits within two weeks of the collapse.

Procurement: The procurement process for this major project was completed in "record time" (Warne 2008). The request for qualifications (RFQ) required a "much-abbreviated Statement of Qualifications (SOQ) process.... designed to balance the state's need to have key information about the proposing teams and the desire to reduce the effort required by the teams to enter the proposing process...to not do anything to discourage potential proposers from entering the competition for the project or to distract them from the more important efforts of putting their proposal together" (Warne 2008). Additionally, because of the aggressive time frame to complete procurement, Mn/DOT decided that those potential offerors that "couldn't keep up the pace of the RFP process then they probably would not be able to meet the [design and construction] schedule expectations of the project" (Warne 2008).

The centerpiece of the procurement process was the MnDOT Preapproved Elements (PAE) process. The unique aspect of the procurement process that was particularly important to the design aspects of the project was the use of "private and confidential preproposal meetings," whose purpose was described as follows:

Each Proposer is invited and encouraged to attend a private preproposal meeting at which the Department

will address and respond to the Proposer's concerns and questions regarding details of the project scope, administrative procedures, outstanding issues for the remainder of the bid process, and any other related matters. Each meeting would be private in that only one Proposer would meet with Mn/DOT representatives at a time. Proposers are not required to accept the meeting invitation (Mn/DOT 2010).

Unlike with its previous DB projects, Mn/DOT chose to limit the number of alternative technical concepts (ATCs) that a given proposer could generate to first focus the process on high-value ATCs and to avoid the administrative requirement to review and approve/disapprove numerous ATCs of trivial or no value. Once an ATC had been submitted, a review panel made up of technical experts who were not on the proposal evaluation panel met with the proposer. If the ATC was acceptable, it was approved and incorporated into the proposer's scope of work as a PAE, permitting the proposer to include the ATC-turned-PAE in both its technical package and its price proposal. Flatiron-Manson (FM), the eventual winner, indicated that "MnDOT did an excellent job in managing the procurement process. Of particular value ...the one-on-one meetings [got] answers quickly, [and the] responsiveness saved time and effort in putting their [FM's] proposal together" (Warne 2008). FM relied on the PAEs to include an integral riding surface and an innovative method for removing the existing foundation in its successful proposal.

The clear definition of best value was also cited as important to the success of the selection. The design-builder was particularly pleased with the specificity and transparency of the scoring criteria in the evaluation plan. FM stated that the scoring process "sent a clear message the state valued higher quality and not just price" (Warne 2008). One example was awarding a 15-point bonus for eliminating up to six design exceptions, which clearly portrayed MnDOT's desire to build the project without design exceptions and its willingness to reward creativity and innovation during proposal preparation. Additionally, Mn/DOT scheduled and conducted three 30-minute individual conference calls each week with each of the five competing teams, as well as two weekly 2-hour face-to-face meetings, which meant the agency invested 27.5 hours per week for the 3-week proposal preparation period.

MnDOT also limited the proposal to no more than 20 pages with another 20 pages allowed for appendixes (typical MnDOT DB proposal page limits run 120 to 150 pages). This limitation served to focus the proposers on the elements that were critical to the success of the project. The proposal evaluation panel consisted of four MnDOT engineers and representatives from the city of Minneapolis and from the Associated General Contractors (prescribed by Minnesota law), with two FHWA members providing oversight to ensure that the selection met federal requirements.

Upon completion of the evaluation, Mn/DOT made every effort to award the contact as fast as possible. This created a short-term situation that did not allow time to publish the results of the evaluation before contract award or to debrief unsuccessful offerors. As a result, an award protest was lodged, based primarily on the fact that the winning team also submitted the highest proposed price. Mn/DOT successfully defended the propriety of the award and the integrity of the process used to arrive at the award decision in both state and federal district courts. It relied on the same defense that it had previously used to defend a protest on an earlier nonemergency DB project. This is described in a paper by Shane et al. (2006) as follows:

- “The evaluation plan was completely transparent.
- MnDOT followed it precisely.
- MnDOT could logically defend the final award decision.”

A recent study on managing complex projects (Shane et al. 2011) advocates “incentivizing the key elements of project success.” The St. Anthony Falls Bridge was definitely a complex project, and MnDOT included two incentives for the prime element of project success: timely completion. The project utilized a no-excuse bonus of \$7 million for on-time completion if the contractor waived all future claims (Heitpas 2008). It also contained an early incentive bonus of \$2 million for every 10-day period the project was completed early, up to a maximum of \$20 million. MnDOT justified both incentives based on the \$400,000 per day user cost that was being borne by the traveling public during the bridge outage.

Time Line: Table 6 contains the timeline for the expedited procurement of this case study project. Figure 9 illustrates the design and construction schedule for the project.

TABLE 6
I-35W BRIDGE REPLACEMENT TIMELINE

Date	Event	Remarks
August 1, 2007	Bridge collapses	None
August 2, 2007	MnDOT decides to use DB project delivery	None
August 4, 2007	RFQ issued	None
August 8, 2007	Statement of qualifications received from competitors	None
August 8, 2007	Short list published	Same day as receipt
August 23, 2007	RFP released	None
September 15, 2007	Proposals submitted	None
September 19, 2007	Design-builder selected	49 days to select contractor
October 8, 2007	Notice to proceed	None
September 19, 2008	Project opened to traffic	339 days after start of construction

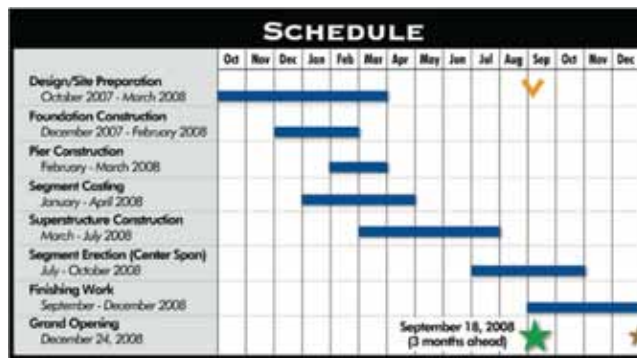


FIGURE 9 I-35W design and construction schedule.

Case 4—Summary and Major Tools for Expedited Procurement

Summary: The project was completed 339 days after the start of construction and represents a notable achievement by both the agency and the design-builder. Figure 10 shows the completed bridge and underscores the magnitude of the undertaking.

The following is a list of the major tools used to expedite the emergency replacement of the I-35W St. Anthony Falls Bridge:

- Used two-step right-of-way acquisition with right of entry easements to provide immediate access to the construction site followed by a guaranteed timeline for financial closure on each parcel;
- Obtained single points of contact within each resource agency for all permit communication and a commitment to expedite the issuance of project permits;
- Kept tight control of project scope to avoid unintentional delays as the result of exceeding permit constraints;
- Encouraged a highly interactive preproposal period, including regularly scheduled one-on-one meetings with each competitor, whose contents were kept confidential;
- Accepted confidential ATC/PAEs prior to proposal submission for review and decision;
- Created a completely transparent evaluation plan and award algorithm that withstood a protest; and
- Developed incentives that were directly related to the preeminent project success factor, timely completion.

I-270 Slide Repair Project—Missouri DOT

This project was selected for inclusion because it not only illustrates an innovative approach to including a DB provision inside of a DBB contract but also provides an example of an emergency that occurred during an active construction contract, rather than a construction contract resulting from an emergency. Additionally, the case was successful in that it generated an innovative geotechnical design that permitted construction without lane closures on an urban freeway (McLain and Shane 2009). The case is an emergency repair



FIGURE 10 Completed I-35W St. Anthony Falls Bridge.

and stabilization project that resulted from a landslide that damaged a triple box culvert and threatened to close the eastbound lanes of I-270 in St. Louis County, Missouri.

Case 4—Missouri DOT: I-270 Slide Repair Project, St. Louis County

Value: \$552,148

Scope: Design and construction of temporary shoring needed to protect the Interstate traffic as well as to allow quick repair of the box culvert after a landslide (see Figure 11). The temporary shoring also allowed the slope to be restored with shot rock. The repair project ultimately required the design and construction of a temporary soil nail wall that had more than a hundred and fifty 40-foot soil nails spaced at 5' horizontal and 5' vertical and was 45 feet high. The DB subcontractor developed this innovative solution to replace MoDOT's conventional slide plane removal-and-replace technique (McLain 2008).



FIGURE 11 I-270 slide aftermath.

Right-of-Way: Right-of-way was not an issue in this project.

Permitting: Permits were already in place for the DBB project and not necessary for the emergency project.

Rationale: The Missouri Department of Transportation (MoDOT) awarded a DBB contract on a conventional project in this location that contained a “nested” DB provision for emergency repair of slides during construction by a prequalified geotechnical specialty DB subcontractor as required during the contract period. The primary rationale for selecting this form of DB was to shorten the time the roadway was out of operation by having the same entity begin preliminary construction tasks while the design of the repair was under way. It also encouraged the use of innovative means and methods to reduce the cost of the slope repair projects. Finally, it mitigated design risk during construction by consolidating it with one entity, the nested DB specialty subcontractor.

Procurement: The MoDOT policy for a DBB project with significant geotechnical risk includes a 10- to 14-week design review period to validate the design within the constraints of the geotechnical design report before a construction contract can be advertised if the project costs more than \$1 million. This is followed by another 3-week period to award the construction contract. Thus, MoDOT's ability to react to a geotechnical emergency is hampered by its design risk mitigation policy. By adding the “nested DB provision” for landslide repairs inside the DBB contract, it avoids the delays inherent in developing a new project or the need to get waivers to speed the reaction to an emergency requirement. The nested DB provision required the prime contractor to subcontract this work with a prequalified geotechnical specialty contractor that had experience in successfully completing MoDOT slide repair projects.

The geotechnical DB specialty subcontractor was selected prior to advertising the DBB contract on a basis of qualifications and past performance. MoDOT understood the potential for a landslide disrupting both construction and traffic and completed a preliminary geotechnical risk analysis,

identifying the use of a soil nail wall as a response measure to a slide as the best technical option for restoring traffic. The wall was “a key design element that allowed the slope to be safely excavated top down so that a rock slope could be rebuilt with rock... [and] the nested design-build allowed the design [of the soil nail wall] to be completed quickly” (McLain 2008). The final design for the slide repair itself was completed by the MoDOT geotechnical design section and relied on the soil nail wall as the means around which the area could be stabilized with a rock surcharge.

That MoDOT anticipated the landslide and took contractual measures to be prepared to react expeditiously allowed the administrative portions of the procurement to essentially be prenegotiated. The nested DB subcontract was treated as an allowance, and all the bidders on the prime DBB contract used the same number for that lump sum pay item. Once the need to invoke that contract arose, the most time-consuming element was the geotechnical investigation, testing, and geotechnical design report preparation necessary to quantify the actual scope of emergency design and construction involved in the change order required to repair the landslide damage. Two previous emergency projects (Route 59 and Route 5) took 50 days from the submittal of the landslide repair project design to the authorization of the repair (McLain 2008). These designs were completed by consultants and required the procurement period necessary to consummate a consultant design contract. By comparison, the nested DB subcontract allowed construction to proceed only 5 days after the design was submitted, because the design-builder acted as a single point of responsibility for both design and construction. During the design period, MoDOT conducted over-the-shoulder reviews of the design-builder’s design work, further expediting the approval of the soil nail wall design and permitting an information-rich communication environment to develop so that when the MoDOT designers took over from the DB subcontractor to complete the final slide repair design, they were completely knowledgeable of the rationale used for the soil nail wall and could easily incorporate it into their calculations.

Time Line: Table 7 shows the sequence of events and dates.

Case 3—Summary and Major Tools for Expedited Procurement

Summary: The project was completed 120 days after the slide damage occurred. The design took 5 days. These periods compare to an average of 205 days from slide to construction completion and 50 days for design for two similar projects that were procured using DBB (McLain and Shane 2009). The use of the soil nail wall permitted the construction to be completed without the need to close any lanes on I-270. If a conventional slide plane removal-and-replacement method had been used, MoDOT would have needed to close at least one lane of traffic throughout construction.

TABLE 7
I-270 SLIDE REPAIR IN ST. LOUIS COUNTY

Date	Event	Remarks
August 25, 1997	Slide occurs	None
August 27, 1997	MoDOT drilling operations begin	Geotechnical investigation to support the change to the DBB prime contract to invoke the DB subcontract
September 30, 1997	Change to contract awarded	Time required to complete the geotechnical design report and quantify the scope of the DB subcontract
October 29, 1997	Design for soil nail wall drawings submitted	None
October 30, 1997	Design for soil nail wall drawings approved	None
November 1, 1997	Construction begins	None
December 5, 1997	Construction complete	120 days after slide

McLain (2008).

The following is a list of the major tools used to expedite procurement in this project:

- Recognized the risk of an emergency during construction and mitigated that risk by building a fast-response solution into the DBB construction contract;
- Developed the necessary contractual mechanism to add a “nested DB” contract with a preselected specialty design-builder;
- Recognized that in-house designers lacked the technical expertise to design soil nail walls and made provisions to expedite obtaining that expertise by means of the nested DB contract; and
- Integrated the efforts of in-house designers with the specialty contractor’s designers to jointly arrive at an overall emergency design solution.

US-2 Rockfall Mitigation Project—Montana DOT

U.S. Highway 2 passes through the mountainous area that leads to Glacier National Park in northern Montana (Figure 12). The passes on this road are highly susceptible to rockslides and historically have been blocked because of rockslides after heavy rainstorms. The Rockfall Mitigation project, though not an emergency project in itself, was procured by the Montana DOT (MDT) using expedited procurement means owing to the urgent need to get the work started so that an actual rockslide would not close the park during tourist season. This project was selected for inclusion for three reasons. First, the primary technical problem that had to be solved was how to quantify a scope of geotechnical work when the agency did not know the minimum angle of repose for an unstable rock slope and it could not be found

until construction commenced. Therefore, this represents the high end of geotechnical uncertainty, and the fact that MDT chose DB project delivery represents an interesting and valuable rationale for emergency projects with high geotechnical uncertainty. The second reason was the mechanism that MDT chose to allocate risk, unit price pay items for the uncertain features of the scope. Finally, MDT developed an innovative approach to getting as much rockfall mitigation completed as possible for the available funding, recognizing that once it had reached the end of the budget, the project was over regardless of how many linear feet of slope remained to be stabilized.



FIGURE 12 US Highway 2 project map.

Case 6—Montana DOT: US-2 Rockfall Mitigation Project, Flathead County

Value: \$3.0 million

Scope: Design and construction of rockfall mitigation measures and slope stabilization along 14 miles of U.S. Highway 2 east of West Glacier. The project identified six reaches that had to be mitigated and two more that were to be fixed if the contract funding was available. Traffic control was a major issue on this job since the road provides access to Glacier National Park. The project included scaling, draped rockfall protection, trim blasting, and other techniques as may be determined by the design-builder.

Right-of-Way: Right-of-way was not an issue in this project.

Permitting: Permits were obtained using the routine process and were assigned to the design-builder, since the permits would be specific to the means and methods selected by the winning design-builder.

Rationale: MDT chose DB project delivery because it appeared to be the best method for sharing the risk of geotechnical uncertainty on this urgently needed project. The preferred rockfall mitigation method was to scale back the rock faces to a safe angle of repose (see Figure 13). However, there is no economical method for determining that angle other than by field trial. As a result, completing the design before letting the construction contract carried an unacceptable risk because of the high potential for differing site conditions changes/claims. The project had a fixed budget of \$3 million with no contingency. Therefore, MDT originally looked at using a fixed price-best proposal best value award algorithm (Gransberg and Molenaar 2004). In

this manner, the contract price would have been fixed at \$3 million and each competing proposal would have stated how many of the eight reaches in the 14-mile zone it could do for that amount. Unfortunately, MDT's enabling legislation requires it to use an adjusted score award algorithm, which requires the price to be divided by the technical score, with the lowest adjusted score becoming the best value (MDT 2011). The final alternative was to develop a unit price approach for those pay items that were expected to vary in quantities and bundle the remaining items into a single lump sum price.



FIGURE 13 Scaling operations on US-2.

Procurement: The partial unit price method shown in Figure 14 allowed the technical proposal to be scored and did not constrain the competitors to a stipulated price. The RFP used the following clause to articulate this approach:

Bid Price Proposals will be submitted on the blank Bid Price Proposal Requirements Form included as an attachment to this RFP. The Bid Price Proposal form will include unit prices for the items indicated, a lump sum price for the remainder of the project scope and the completion date proposed by the Firm. The unit prices will include all costs associated with the construction of the items indicated. Each unit price will be multiplied by the quantity provided by MDT to determine the total amount for each of the unit price items. *The Total Lump Sum for the project will be calculated by adding the extended sum of the unit price items with the lump sum amount for the remainder of the project scope.* This total lump sum will be the final contract amount. The lump sum price will include costs for all design, surveying, geotechnical work, engineering services, Quality Management Plan, construction of the project (all items except the unit price items) and all other work necessary to fully and timely complete the project in accordance with the Contract Documents. The lump sum price will also include all job site and home office overhead and profit. It is understood payment of the lump sum amount for the project will be full, complete and final compensation for all work required to complete the project. *If project [unit priced quantities] overruns or under runs occur at sites, the unit prices will be utilized to extend or reduce the work at other sites to maximize the amount of work accomplished for three million dollars* (MDT 2011, italics added).

STATE OF MONTANA DEPARTMENT OF TRANSPORTATION BID PRICE PROPOSAL REQUIREMENTS				
PROJECT NO.: SFCN 1-2(169)154		CONTROL NO.: 7586		
PROJECT/LOCATION/DESCRIPTION: US-2 ROCKFALL MITIGATION				
Item Description	Unit	Unit Price	Quantity	Price
Scaling	MH	\$	2600	
Draped Rockfall Protection	SF	\$	145,000	
Rock Bolting	LF	\$	3700	
Trim Blasting	CU YD	\$	--	
* Design-Build	LS	\$	1	
** Contingency	UNIT	\$1	100,000	\$100,000.00
TOTAL LUMP SUM BID PRICE PLUS CONTINGENCY FUND				

MH = manhour; SF = square feet; LF = linear feet; CU YD = cubic yards; LS = lump sum

FIGURE 14 Design-build bid price proposal form with unit price items.

The clause made it clear that MDT intended to spend the entire budget for this project and get as much work done as possible. This clause was followed by a second clause that described what MDT would do if all price proposals exceeded the \$3 million budget. Essentially, the procedure was to ask each responsive competitor to submit a “Best and Final Offer” that detailed the scope of work that each competitor could complete for the specified budget. MDT would then repeat technical scoring and compute the best value based on the adjusted score.

The RFP also explicitly encouraged including ATCs in the proposal. “Credit will be given for innovation in design and construction methods that minimize public impacts, minimize traffic delays, mitigate the risk of quantity overruns, and accelerate project delivery by reducing the total project duration. Credit will also be given for design proposals that improve functionality and safety of the project” (MDT 2011). It contained a “Design and Construction Criteria Package (DCCP)” to furnish technical guidance to the design-builders during proposal preparation. The RFP described the ATC proposal process as follows:

The Firm will *identify separately all innovative aspects* as such in the Technical Proposal and each must be *explained in detail with any estimated cost increase or decrease*. The Technical Proposal must clearly state whether any cost increase or cost decrease resulting from innovation is included in the base Bid Price Proposal Amount. An innovative aspect does not include changes to specifications or established MDT policies and must conform to the RFP and DCCP requirements. *Innovation should be limited to the Firm's means and methods, approach to the project, rockfall mitigation techniques, use of new products and new uses for established products*. Proposed changes to the RFP, DCCP, Design Concept, specifications or established MDT policies should be identified as **Alternatives or Options** in the Technical Proposal and explained in detail with any estimated cost increase or decrease to be considered together with innovative aspects, as the basis for scoring Technical Proposals. *The estimated cost increase or cost decrease associated with any Alternative or Option that proposes changes to the RFP, DCCP, specifications or established MDT policies must not be included in the base Bid Price Proposal Amount* (MDT 2011, italics added).

The clause is an excellent example of a way for the owner to express its desires as well as its requirements. The phrase “an innovative aspect *does not include changes* to specifications or established MDT policies,” clearly indicates that MDT specifications and policies must be used, although, on the other hand, innovation is encouraged in “means and methods, approach to the project, rockfall mitigation techniques, use of new products and new uses for established products.”

Time Line: Table 8 contains the timeline for the expedited procurement of this case study project.

TABLE 8
US-2 ROCKFALL MITIGATION PROJECT

Date	Event	Remarks
February 28, 2011	RFQ advertisement date	None
March 18, 2011	SOQ response due date	10 days to prepare SOQ
March 25, 2011	Short list date	None
March 25, 2011	RFP issue date	None
April 5, 2011	Written question deadline	None
April 6, 2011	Preproposal meeting	None
May 4, 2011	Technical proposal due date	40 days to prepare technical proposal
May 24, 2011	Bid price proposal due date	60 days to prepare price proposal
May 26, 2011	Final selection date	None
May 26, 2011	Anticipated award date	87 days from RFQ
June 1, 2011	Anticipated notice to proceed date	None
November 4, 2011	Complete no later than date	Design-builders proposed their own schedule in their proposal and MDT evaluated it as part of the evaluation plan.

MDT (2011).

Case 6—Summary and Major Tools for Expedited Procurement

Summary: MDT’s procurement approach on this project illustrates an alternative for sharing the risk of geotechnical uncertainty on a DB project. “Unit price contracts are used for work where it is not possible to calculate the exact quantity of materials that will be required” (Schexnayder and Mayo 2004). In a lump sum contract, the design-builder bears the entire quantity risk. Unit pricing for specific features of work inside a lump sum DB contract allows the agency to share the risk of the final quantities of work with the contractor and reduce the price. This happens because the contractor does not have to bid the worst possible case if the quantities of work are not finite, as it would be driven to do in a lump sum award (Gransberg and Riemer 2009). Thus, it makes sense to use the DB contract payment provisions as a means to manage geotechnical uncertainty through unit pricing. This case intersected with facts found

in two Virginia RFPs and one Delaware RFP, which qualifies selective unit pricing as an effective practice. It also leads to a recommendation for future research to examine potential costs and benefits of employing selective unit pricing as a geotechnical risk management technique.

The following is a list of the major tools used to expedite procurement in this project:

- Developed a compressed timeline for short listing and award;
- Enabled risk sharing through the use of selective unit pricing internal to a lump sum contract;
- Encouraged ATCs through the scoring system in the DB evaluation plan;
- Permitted proposers to set their own schedule and incentivized early completion through the evaluation plan weighting; and
- Used Best and Final Offers after initial proposal evaluation to synchronize the proposed scope of the unit priced work items with the available budget.

981G Ramapo River Bridge Replacement—New York State DOT

This project illustrates the use of an IDIQ contract for emergency bridge repair. It also demonstrates a single project that is part of a much larger overall disaster response that was necessitated by the flooding that resulted from Hurricane Irene/Tropical Storm Lee in August and September 2011. Finally, the case shows how early contractor involvement in the design process permits a highly constructable design to be completed in a short time.

Case 7—981G Ramapo River Bridge Replacement, Rockland County, New York

Value: \$1.4 million

Scope: Design and construction of two-lane bridge over the Ramapo River and demolition of existing concrete arch

bridge damaged by flooding from Hurricane Irene/Tropical Storm Lee. Both abutments were undermined, and the superstructure failed as the foundation settled (see Figure 15). The approach to the bridge was then washed out, making it impassable. The replacement bridge was designed by the New York State DOT (NYSDOT) Main Office Structures Design Bureau. The design was purposely constrained around the use of available structural steel members. The same was true for the design of the precast deck and approach slab panels. Information on the availability of construction materials was furnished by the Statewide Emergency Bridge Contractor (Sechrist et al. 2011).

Right-of-Way: Right-of-way was not an issue in this project.

Permitting: Executive order declaring emergency temporarily suspended the routine permitting process, which eliminated most permitting issues.

Rationale: NYSDOT was faced with massive infrastructure damage in the wake of the two storms. The scope of the recovery operation provides a suitable context within which to understand this particular emergency project. In a nutshell, NYSDOT accomplished the following work as part of the recovery effort:

- Repaired 1,300 miles of roadway, repaired 37 bridges and more than 250 culverts using internal maintenance crews.
- Emplaced 12 temporary bridges, 11 owned by NYSDOT and one owned by a contractor.
- Awarded 14 emergency restoration contracts in 4 weeks.

NYSDOT had instituted an IDIQ contract (called a standby contract in the DOT's terminology) for emergency bridge repair and replacement services in 2007 (NYSDOT 2007). The contract "allows the Department to replace collapsed or otherwise unusable bridges on an emergency basis... [and] to perform other emergency bridge work such as structural repairs, erecting shoring to stabilize a damaged bridge, or demolition, removal, and disposal of a damaged superstructure or bridge components" (NYSDOT 2007).



FIGURE 15 Ramapo River Bridge damage.

This contract is one of a number of tools available to the department for use as determined by the NYSDOT emergency response system, shown in Figure 16.

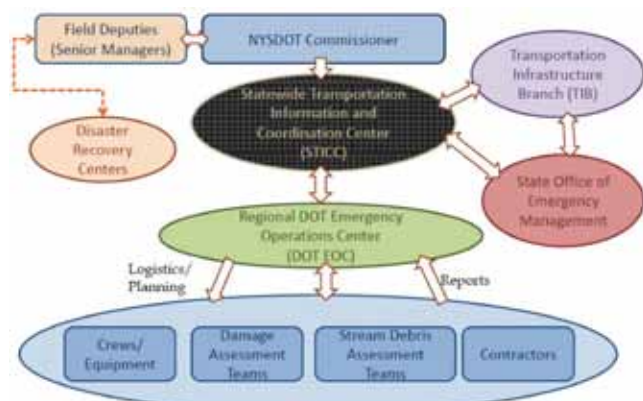


FIGURE 16 NYSDOT emergency response framework (Sechrist et al. 2001).

Procurement: The actual procurement procedure for an emergency project flows out of the Figure 16 framework. In the Ramapo Bridge Replacement Project, the IDIQ for emergency bridge construction was linked with in-house design teams in a delivery method that mirrors CMGC project delivery, which allows the construction contractor to have substantial input to the design process through reviewing constructability, furnishing pricing information on available construction materials, and synchronizing the design with the construction means and methods (West et al. 2012). In this case, the statewide Emergency Bridge contractor furnished information to the in-house design team regarding accelerated bridge construction methods (ABCs), which led to the decision to utilize off-the-shelf precast bridge deck and approach slab panels as well as to design around readily available steel sections. Because the IDIQ contract was in place, no time was wasted on the procurement process.

Time Line: Table 9 is the timeline that was followed to replace the Ramapo River Bridge. Figure 17 is a picture of the completed bridge.

Case 7—Summary and Major Tools for Expedited Procurement

Summary: The NYSDOT response to the massive amount of damage caused by Hurricane Irene and Tropical Storm Lee in the Hudson River Valley furnishes a model for wide-scale infrastructure repair and restoration. The 981G Ramapo River Bridge Replacement Projects responded to only one among many disruptions of vital transportation service that needed to be restored. Because NYSDOT had the prescience to put the necessary emergency construction capacity in place years before the disaster through its Statewide Emergency Bridge IDIQ contract, it was able to restore service in less than 2 months.

TABLE 9
981G RAMAPO RIVER BRIDGE REPLACEMENT PROJECT
TIMELINE

Date	Event	Remarks
August 25, 2011	Executive Order (EO) 17 declaration of emergency	None
August 31, 2011	Inspection of damaged bridge completed	This is merely 1 of more than 500 bridges inspected in the aftermath of the event.
September 1, 2011	EO 19 temporary suspension of contracting competition provisions	Provides NYSDOT flexibility to address critical needs
September 11, 2011	Construction begins	10 days from inspection completion
September 19, 2011	Design of replacement bridge complete	20 days from inspection completion
October 26, 2011	Permanent bridge completed	57 days from inspection completion; 5 days ahead of schedule

Sechrist et al. (2011).



FIGURE 17 Finished 981G Ramapo River Bridge (Courtesy NYSDOT).

The following is a list of the major tools used to expedite procurement in this project:

- Established IDIQ contract for emergency bridge repair on a statewide basis. The contract also contains provisions to erect temporary bridges that are stockpiled at a bridge park on Long Island (Sechrist et al. 2011);
- Integrated in-house design with Statewide Emergency Bridge Contractor input, using a process similar to CMGC;
- Constrained the design team to using available steel sections; and
- Employed accelerated bridge construction techniques, including standard precast bridge deck and approach slab panels.

I-40—Beckham County Bridge Pier Replacement—Oklahoma DOT

This project demonstrates the use of an expedited DBB project delivery. It also contains an I/D provision that shows how such a feature can be used to expedite an emergency procurement. Finally, it shows how the agency split the procurement into an immediate need sole source award and an expedited IFB to restore the damaged bridge.

Case 8—I-40 Bridge Pier Replacement Beckham County, Oklahoma

Value: \$315,930

Scope: A fuel truck hit the south shoulder pier of the State Highway 6 (SH-6) overpass over I-40 in Beckham County in extreme western Oklahoma and caught fire. The emergency scope of work included temporary shoring immediately after the accident that damaged the south shoulder pier. Design and construction of the replacement pier including footings, columns, and pier cap as well as repair of the parapet wall damage and smoke damage.

Right-of-Way: Right-of-way was not an issue in this project.

Permitting: No permits were required for this project.

Rationale: The Oklahoma Department of Transportation (ODOT) had to move fast to avoid the potential of having both SH-6 and I-40 closed because of the accident and subsequent fire. This bridge is located in extreme western Oklahoma and is quite isolated. Thus, ODOT split the emergency replacement into two phases. The first addressed the immediate threat of collapse and involved mobilizing contractors in the immediate area to build a temporary shoring system. The second was the demolition and replacement of the damaged pier.

Procurement: The temporary shoring system was procured using sole source contracts for H-piling, concrete, and installation (labor and equipment). The permanent replacement was completed using a highly expedited form of DBB. ODOT bridge division designers completed the construction documents. Time was saved by ensuring that all the required signatory authorities were physically present at the bid opening; thus, the bids were opened, reviewed, and an award decision was made in the same afternoon.

The contract contained the following I/D clause:

The incentive/disincentive rate for this project is \$1,000 per hour. The Contractor will be paid the incentive rate for each hour less than 360 hours that substantial completion is achieved. The maximum number of hours for which the incentive will be paid is 120 hours. The disincentive rate will be assessed for every hour that exceeds the time allowed for substantial completion. Hourly time charges will be assessed against the Contractor from

the time notice to proceed is issued or 5 p.m. on 9-07-07 whichever is later, and continue until the bridge is reopened to normal traffic. One half of the incentive will be placed on the first progressive estimate following the period in which it is earned. The second half will be paid on the final estimate. Disincentive will be applied to the progressive estimate following the period in which it was earned (ODOT 2007).

The project's IFB provided a 15 calendar day (360-hour) completion period. The contractor completed work in 12 calendar days, 3 days (72 hours) early, earning an incentive payment of approximately \$72,000.

Time Line: Table 10 details the timeline for this case study project.

TABLE 10
I-40 PIER REPLACEMENT PROJECT

Date	Event	Remarks
August 30, 2007	Bridge pier hit and burned	None
August 31, 2007	Declaration of emergency by ODOT director	Director has emergency declaration authority for projects that cost less than \$500,000.
August 31, 2007	H-piling deliver to site	None
September 1, 2007	Concrete pouring begins	2:00 a.m.
September 3, 2007	Erection of temporary shoring complete	4 days after incident
September 4, 2007	Construction documents complete	None
September 4, 2007	Mandatory prebid meeting held on site	1:00 p.m.
September 5, 2007	IFB issued	None
September 6, 2007	Bids received, opened, and contract awarded	1:30 p.m.
September 7, 2007	Executed contract with bonds received from contractor	1:00 p.m.
September 7, 2007	Notice to proceed issued	5:00 p.m.
September 19, 2007	Bridge open to traffic	21 days after accident and 3 days early

ODOT (2007).

Case 8— Summary and Major Tools for Expedited Procurement

Summary: ODOT clearly demonstrated that the traditional DBB project delivery method can be successfully applied to an emergency procurement. The key to success on this project was that it fell within the ODOT director's authority to declare an emergency (>\$500,000). This permitted the agency to immediately address the emergency without losing time to receive a waiver of procurement constraints. The hour-based incentive spoke directly to the importance of the

loss of service; for example, every hour counted. Previous research (Anderson and Damnjanovic 2008) has shown that incentives are effective in highway construction, and this case study project was no exception, saving 20 percent of the scheduled time.

The following is a list of the major tools used to expedite procurement in this project:

- Mobilized immediately available construction contractors and local material suppliers with sole source contracts to address immediate danger of bridge collapse with temporary shoring;
- Implemented an aggressive DBB procurement process, which included assembling all required authorities to be present at bid opening so an award could be made immediately after bid opening; and
- Incentivized the emergency construction contract to minimize the construction period.

I-35 Culvert Repair—Oklahoma DOT

This project was the result of a localized flash flood that damaged a box culvert on an Interstate highway. It demonstrates an expedited DBB process for a project that threatened to close a major Interstate highway. It also demonstrates limited competition procurement where only selected contractors with previously proven experience in the type of work needed were invited to bid.

Case 9—I-35 Culvert Repair Logan County, Oklahoma

Value: \$715,505

Scope: Design and construction of a 12'-14'-12' by 78' long reinforced concrete triple box culvert. The scope included in the IFB is as follows:

- Remove the existing guardrail adjacent to the inside northbound lane.
- Construct a [temporary widening] adjacent to the inside northbound lane.
- Place and maintain barrier wall.
- Remove a portion of the existing pavement.
- Drive sheet piling adjacent to the existing structure.
- Excavate and remove the existing reinforced concrete box culvert section.
- Construct the new reinforced concrete box culvert section.
- Backfill the new structure.
- Replace pavement.
- Replace guardrail (ODOT 2010).

Right-of-Way: Right-of-way was not an issue in this project.

Permitting: Permits were not an issue in this project.

Rationale: ODOT decided to use an abbreviated DBB project delivery rather than seek an emergency waiver of competition rules. The process was authorized by the ODOT director citing a rule that allows expedited procedures to accept bids.

Procurement: The procurement followed the routine process except that the IFB was issued to 12 contractors in the area of the incident whose past performance indicated that they would be well qualified to prosecute the work as fast as possible. Although this did not preclude other contractors from bidding, the 12 contractors on the short list were the only ones that were individually notified. The pre-bid meeting was held 31 hours after the failure was noticed. Plans were received the next morning. Bids were opened, award was made, and notice to proceed was issued on the same day.

Time Line: Table 11 shows the timeline for this emergency project.

TABLE 11
I-35 CULVERT REPAIR LOGAN COUNTY

Date	Event	Remarks
June 14, 2010	Heavy rain causes flooding that washes out the triple box culvert.	Begins at 10:00 p.m.
June 15, 2010	Shoulder settlement observed; ODOT closes lane of traffic.	10:00 a.m.
June 16, 2010	Notice sent to 12 short-listed contractors with preliminary plan sheets.	10:00 a.m.
June 17, 2010	Mandatory prebid meeting on site.	5:00 p.m.
June 18, 2010	Final plans complete.	7:30 a.m.
June 18, 2010	IFB issued with plans.	10:00 a.m.
June 18, 2010	Bids opened and award made.	1:00 p.m.
June 18, 2010	Executed contract received from contractor.	5:00 p.m.
June 18, 2010	Notice to proceed issued.	8:00 p.m.
June 29, 2010	Contract complete.	15 days after incident

ODOT (2012).

Case 9—Summary and Major Tools for Expedited Procurement

Summary: This case clearly demonstrates that the traditional DBB project delivery process can be successfully applied to an expedited procurement with minor modifications. In this case, one modification was the decision to individually notify a list of area contractors with previous similar experi-

ence. The second modification was the compressing of the contract award administrative process by assembling all the individuals who had a role in approving a contract award at the bid opening.

The following is a list of the major tools used to expedite procurement in this project:

- Issued invitations to bid to a short list of qualified contractors (this might be called an informal prequalification process)
- Implemented an aggressive DBB procurement process that included assembling all required authorities to be present at bid opening so an award could be made immediately after bid opening; and
- Incentivized the emergency construction contract to minimize the construction period.

SR-14 Landslide Repair—Utah DOT

This project demonstrates the use of CMGC to expedite the procurement of a construction contractor and to leverage that capability to mitigate the risk of cost overruns resulting from compressing the project's delivery period to its shortest state. It was also selected because both right-of-way and permitting posed significant potential issues on this project. Utah DOT (UDOT) is using CMGC delivery as a means of mitigating the delay risk resulting from third party stakeholders. The project is currently under way.

Case 10—State Route 14 Landslide Repair, Cedar City, Utah

Value: \$15,000,000

Scope: This case study project has been named the “Restore 14 Project.” It is in response to an October 2011 landslide that destroyed more than a one-third mile section of State Route 14 (SR-14) in Cedar Canyon, dumping debris more than 100 feet deep in some areas (see Figure 18). The landslide material contains boulders that are as large as houses. The work includes stabilizing slopes, moving earth and debris, and constructing a new road. Limited betterments are included to reduce the potential for future landslides and erosion of the base. The project will address five areas along SR-14:

- Build a temporary roadway to carry limited traffic during the construction.
- In the main slide area, move 400,000 cubic yards of material to completely restore more than a one-third mile stretch of SR-14.
- Rebuild end of a tunnel located under SR-14 and restore shoulder.
- Perform slide mitigation.
- Install soil nail wall to repair active slide.



FIGURE 18 Aftermath of landslide on SR-14 (UDOT 2012).

Right-of-Way: The schedule for the repair of the landslide damage is constrained by UDOT right-of-way procurement. The design for the right-of-way that is necessary for the acquisition process started in early January 2012, and sufficient data were assembled to permit the UDOT right-of-way specialists to begin negotiating with landowners by the end of the month. The negotiations are under way and UDOT had secured the necessary permissions to begin preliminary construction operations on March 15 to rough out an access road through the slide areas.

Permitting: Permitting is also an issue on this project. A Stream Alteration Permit is required to restore the bed and banks of the creek that is located below the road. Permits from the county, the Fish and Wildlife Services, and the Utah Department of Wildlife Resources are also required. Finally, Section 106 coordination may be required with the local Native American tribe. To quantify the risk of delay because of permitting, UDOT developed two schedules and named them the “Fast Track” and “Slow Track” permitting packages. These planning packages included right-of-way, environmental documents, and the site-grading package, which is dependent on both. The Slow Track schedule is 60 days and the Fast Track schedule is 25 days. Permits were received in time to allow preliminary construction to start on March 15, 2012, to remove excess material and to build a temporary access road.

Rationale: UDOT expressed its rationale for selecting CMGC project delivery in its CMGC RFP as follows:

The focus of Streamlined CMGC is to use the contractor's experience in small projects while still maintaining a fair price through open bidding. The selected contractor will partner with UDOT the owner and the designer working for UDOT. The focus is on a partnership in which we minimize risk, improve construction schedule, try new innovations, and stay within budget. An important role of the Contractor is to help acquire the information to reduce risk. Your involvement will help reduce errors in design,

improve constructability and meet budget goals... The CMGC team relies on the expertise of the Contractor to deliver a better product in less time and at a lower cost than design-bid-build construction processes.... Because this approach encourages innovations and minimizes risk, the construction cost is expected to be less than a conventional design-bid-build project. The role of the contractor will be to construct the project within the cost proposed, help manage the budget, and propose solutions that will achieve the goal of staying within budget (UDOT 2011).

Procurement: The project was procured using an expedited version of the typical UDOT CMGC RFP procurement process that was designated “a Request for Streamlined Proposal.” Figure 19 illustrates the typical CMGC procurement process with typical time frames in the major events. As Figure 19 shows, an ordinary CMGC procurement could take from 23 to 26 weeks to get both the design consultant and the contractor on board. Additionally, the contractor must furnish pricing information for specified unit price pay items and its fees.

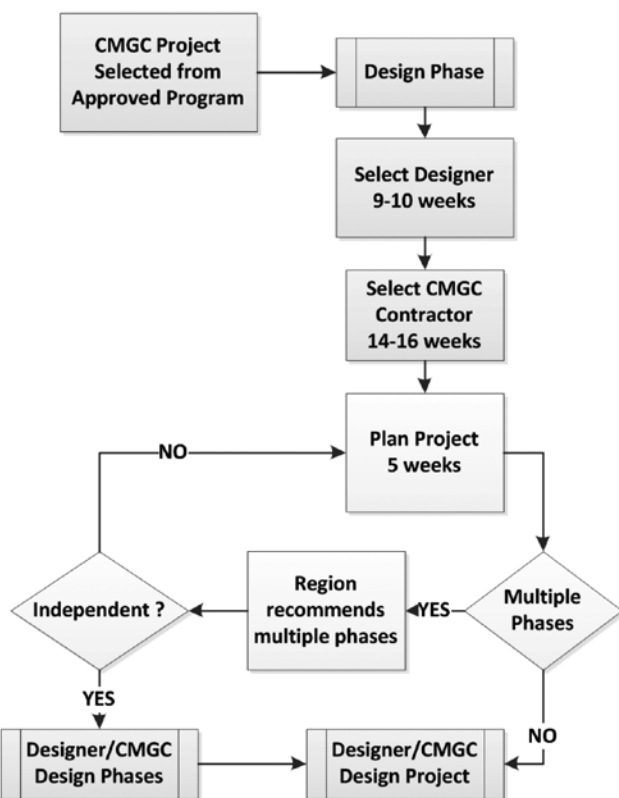


FIGURE 19 Typical Utah DOT CMGC procurement process timeline (Alder 2007).

The streamlined process compressed the design and construction source selection process to roughly 5 weeks not only by reducing the amount of information required of the competing consultants and contractors but also by mandating an aggressive set of deadlines for the agency to review proposals and award the contracts. Figure 20 is a copy of the streamlined price form used in the project. The unit prices in this submittal are intended to be carried forward into GMP

negotiations as the design is advanced. The proposal evaluation plan allocated 50 percent of the weight to the technical proposal, which included information on the contractor’s project team qualifications, its approach to completing the project, the proposed schedule, and its design support plan. The remaining 50 percent was allocated to the price submittal shown in Figure 19, as articulated by a narrative “approach to price proposal.” This narrative explains the contractor’s assumptions for means, methods, and materials; its perceived risks and the way they are priced; its proposed cost and/or time savings innovations; its thoughts on the impacts the current marketplace will have on work in such a remote location; and its plan to achieve a “favorable cost at or below traditional projects” (UDOT 2011).

Item No.	UDOT Specification	Item Description	Units	Estimated Quantity	Unit Price (includes profit & overhead)	Total Amount
1	02316M	Roadway Excavation (Total Est. Quantity) See note 1	Cubic Yard	1,100,000		
2	02741	HMA 1/2"	Ton	4,400		
3	02721	Untreated Base Course (Plan Quantity)	Cubic Yard	3,300		
4	02056	Granular Borrow (Plan Quantity)	Cubic Yard	72,000		
8	03310	Structural Concrete (Est. Lump QTY: 110 cu yd)	Lump	1		
9	03211	Reinforcing Steel Coated	Pound	27,500		
10		Pre-stressed Concrete Member (56'-10" UBT 42) (Specialty Item)	Each	2		
11		Drilled Shaft 36"	Ft	54		
12	02373	Riprap (realign stream channel)- See note 2	Cubic Yard	19,400		
13		Soldier Piles / Lagging Wall	Square Feet	6,000		
Total Cost						

FIGURE 20 State Route 14 landslide repair project CMGC price submittal (UDOT 2011).

After award of both the design contract and CMGC pre-construction services contract, the project team agreed to divide the work into three design/construction packages:

- Package 1: Primarily grading and building a road base for limited access through the main slide. Issues involved in this package include gaining right of entry permits from private landowners to conduct construction and stabilizing the slide area in a manner that does not create an unsafe work environment. The work is labor-intensive and provides the basis for keeping all other work and associated costs in check and on schedule.
- Package 2: Completion of construction elements on both the roadway and adjacent slopes to stabilize the main landslide area.
- Package 3: Structural work to stabilize and repair other slides. The results of geotechnical investigations will define the scope of work for this package.

Time Line: Table 12 shows the timeline of events completed as of this writing and the projected milestones for major events yet to be completed.

Case 10—Summary and Major Tools for Expedited Procurement

Summary: The project is currently under way and on schedule (UDOT website 2012). The use of CMGC project

delivery furnished UDOT with a procurement method that brought the construction contractor on the team as an active participant during the design process. This has permitted UDOT to control both cost and time.

TABLE 12
STATE ROUTE 14 LANDSLIDE REPAIR PROJECT

Date	Event	Remarks
October 8, 2011	Landslide closes Cedar Canyon	None
October 9, 2011	Project set up and initial funding identified	None
October 15, 2011	Aerial survey	None
October 15, 2011	RFQ for design services issued	None
October 31, 2011	CMGC RFP advertised	23 days after event
November 1, 2011	Design consultant selected	24 days after event
November 3, 2011	Mandatory preproposal meeting held	None
November 19, 2011	Geotechnical investigation started	None
November 23, 2011	CMGC proposals received	None
December 1, 2011	CMGC selected	38 days after event
December 5, 2011	CMGC preconstruction contract negotiated	None
December 20, 2011	Risk analysis started	None
January 17, 2012	Environmental document complete	101 days after event
January 21, 2012	Initial funding approved by commission	None
January 31, 2012	ROW ready for offers	115 days after event
February 1, 2012	Geotechnical analysis complete	None
February 3, 2012	Commission approved final funding	None
March 15, 2012	Construction begins on Package 1	None
May 31, 2012	Construction begins on Package 2	Projected date
June 1, 2012	Temporary road open to public	Projected date
July 31, 2012	Main slide area paving complete	Projected date
September 2012	Project complete	Projected date < 1 year after event

UDOT (2011).

The following is a list of the major tools used to expedite procurement in this project:

- Streamlined CMGC RFP procedure;
- Used the CMGC proposal evaluation to prequalify the CMGC by assigning a high weight to the contractor's proposed team and past experience;

- Used work packaging that supported permitting and right-of-way requirements; and
- Managed the risk of permit delays by developing two possible permitting schedules and then coordinating the design and construction work in a manner that could be accelerated if the permits were received earlier than expected by the longer of the two schedules.

CONCLUSIONS, EFFECTIVE PRACTICES, AND FUTURE RESEARCH RECOMMENDATIONS

The analyses discussed in this chapter resulted in the following conclusions and effective practices.

Conclusions

The following conclusions were drawn from the case studies:

- The fastest way to react to an emergency is to anticipate it and make provisions in advance of the event. The Montana DOT rockfall remediation project, MoDOT "nested" DB contract, and NYSDOT Statewide Emergency Bridge IDIQ contract are all examples of developing the capacity to react to an emergency without the need to expedite procurement procedures.
- Streamlined procedures for DBB, DB, and CMGC delivery of emergency projects can be developed to accelerate the procurement of design and construction assets in response to a major emergency. The Oklahoma, Minnesota, and Utah DOTs furnished examples of how each project delivery method can be abbreviated to award an emergency contract in much less time than it routinely takes.

Effective Practices

The following effective practices were identified in this chapter:

California DOT I-550/880 MacArthur Maze Bridge

- Issued sole source contracts to immediately begin demolition and address immediate danger of I-880 bridge collapse with temporary shoring.
- Implemented an aggressive DBB procurement process based on limited competition among a select group of contractors with known experience.
- Arranged bid opening so a contract award could be made immediately after bid opening.
- Incentivized the emergency construction contract to minimize the construction period.
- Massed agency personnel in three shifts of field engineers and conducted construction submittal review and approval on site.

Florida DOT I-10 Escambia Bay Bridge as Reported by the Scan Team

- “Expedited contract execution—FDOT delegated award to the local office; work was scoped for basic requirements of the needed facility. Obtain an agreement quickly, hand-written if necessary; the formal contract can follow later.
- Mobilization—Marshal people and equipment to the project site as soon as possible. Select a contractor that has the ability to bring people and equipment to an isolated location quickly.
- Design team in place to support the project—Relocate experts to the site and in position to make quick decisions. Develop the design concurrent with the work.
- Flexibility based on material availability—Speed can only be achieved if the DOT is willing to accept available materials for repair” (Blanchard et al. 2009).

Maine DOT Route 27 Bridges

- Maintained a standing list of prequalified emergency contractors.
- Reduced the level of design by in-house engineers because of the ability to gain input from the contractor.

Minnesota DOT I-35W St. Anthony Falls Bridge

- Used two-step right-of-way acquisition using Right of Entry easements to provide immediate access to the construction site followed by a guaranteed timeline for financial closure on each parcel.
- Obtained single points of contact within each resource agency for all permit communication and a commitment to expedite the issuance of project permits.
- Maintained tight control of project scope to avoid unintentional delays owing to exceeding permit constraints.
- A highly interactive preproposal period included regularly scheduled one-on-one meetings with each competitor, whose contents were kept confidential.
- Accepted confidential ATC/PAEs before proposal submission for review and decision.
- A completely transparent evaluation plan and award algorithm withstood a protest.
- Incentives were directly related to the preeminent project success factor, timely completion.

Montana DOT: US-2 Rockfall Mitigation Project

- Compressed timeline for short listing and award.
- Risk sharing through the use of selective unit pricing internal to a lump sum contract.
- Encouraging ATCs through the scoring system in the DB evaluation plan.
- Permitting proposers to set their own schedule and incentivizing early completion by means of the evaluation plan weighting.

- Use of Best and Final Offers after initial proposal evaluation to synchronize the proposed scope of the unit priced work items with the available budget.

Missouri DOT I-270 Slide Repair Project

- Recognized the risk of an emergency during construction and mitigated that risk by building a fast response solution into the DBB construction contract.
- Developed the necessary contractual mechanism to add a “nested DB” contract with a preselected specialty design-builder.
- Recognized that in-house designers lacked the technical expertise to design soil nail walls and made provisions to expedite obtaining that expertise by means of the nested DB contract.
- Integrated the efforts of in-house designers with the specialty contractor’s designers to jointly arrive at an overall emergency design solution.

New York State DOT 931G Bridge Replacement

- IDIQ contract for emergency bridge repair on a statewide basis. The contract also contains provisions to erect temporary bridges that are stockpiled at a bridge park on Long Island (Sechrist et al. 2011).
- Integrated in-house design with Statewide Emergency Bridge Contractor input, using a process similar to CMGC.
- Constrained the design team to using available steel sections.
- Employed accelerated bridge construction techniques including standard precast bridge deck and approach slab panels.

Oklahoma DOT I-40 Bridge Pier Replacement

- Mobilized immediately available construction contractors and local material suppliers with sole source contracts to address immediate danger of bridge collapse with temporary shoring.
- Implemented an aggressive DBB procurement process that included assembling all required authorities to be present at bid opening so an award could be made immediately after bid opening.
- Incentivized the emergency construction contract to minimize the construction period.

Oklahoma DOT I-35 Culvert Repair

- Issued invitations to bid to a short list of qualified contractors (this might be called an informal prequalification process).
- Implemented an aggressive DBB procurement process that included assembling all required authorities to be present at bid opening so an award could be made immediately after bid opening.

- Incentivized the emergency construction contract to minimize the construction period.

Utah DOT Cedar Canyon Landslide Repair

- Streamlined CMGC RFP procedure.
- Used the CMGC proposal evaluation to prequalify the CMGC by assigning a high weight to the contractor's proposed team and past experience.
- Used work packaging that supported permitting and right-of-way requirements.

- Managed the risk of permit delays by developing two possible permitting schedules and then coordinating the design and construction work in a manner that could be accelerated if the permits were received earlier than expected by the longer of the two schedules.

Future Research

No recommendations for future research are made.

CHAPTER THREE

DEPARTMENT OF TRANSPORTATION EMERGENCY PROCUREMENT POLICIES, PROCEDURES, AND PROGRAMS

INTRODUCTION

The speed with which a DOT can respond to an emergency can greatly influence the effect of the crisis on the public. To effectively respond to an emergency, the DOT must act decisively to mitigate the impact and ongoing nature of a crisis. The continuation of an emergency may directly threaten life and can cause continuous destruction of property, in addition to the subsequent effect on the local economy until service has been restored, so it is important to understand the conditions that legally constitute an emergency and who has the authority to declare an emergency. A solid understanding of the regulations and laws that constrain a DOT's procurement options to respond to emergency conditions allows an agency to develop emergency response plans and synchronize them with other state and federal agencies.

The Stafford Disaster Relief and Emergency Assistance Act (USC 2007) requires all states to have an Emergency Management Plan (EMP). The act sets the constraints for the receipt of federal ER that funds the DOT procedures on procurement of construction services following an emergency. The literature review shows that the depth of content of the EMPs ranges from a several-page memorandum to a full-scale policy manual. The more robust plans are typically found in states that experience frequent disasters, such as Florida with its hurricanes/tropical storms and California with its earthquakes and wildfires. The operating principle for emergency procurement is preparation prior to the emergency, and an EMP forms the foundation upon which a DOT will begin its relief efforts (Thorn 2006). The theme of the EMP is risk allocation within the constraints of existing legislation and regulations. One contractor indicated that “the principle behind good risk allocation is that the *risk should go to the group that can best manage that particular risk*” (Christenson and Meeker 2007). This chapter discusses the emergency project planning process and synthesizes the programs in use by DOTs to respond to emergencies and how risk should be allocated to address emergency construction. It starts with a discussion of what constitutes an emergency.

EMERGENCY DEFINITION

The definitions of an emergency or a state of emergency act as triggers to make special sources of funds available

from federal and state government agencies. Because an emergency declaration is often the condition precedent to waiving routine consultant and construction procurement constraints, understanding each agency's definition is important to address the true nature and meaning of an emergency. When a potential emergency occurs, the facts surrounding the incident and its impact on the affected community determine whether the situation conforms to a specific definition of an emergency and hence qualifies for a waiver of routine procurement constraints as well as emergency funding. The survey asked the respondents to rate the importance of a clear definition of an emergency on the success for an emergency project. Two-thirds believed that it is essential, and six more indicated that it was important.

FHWA and U.S. federal law define an emergency per the United States Code, Title 23 (USC 2000). To receive federal funding, an emergency project must meet the requirements listed in the Stafford Act definition of emergency. The content analysis found three DOTs that specifically align their definition with the FHWA criteria (see Table 13). In presidentially declared emergencies, the event must meet the criteria of the Stafford Act, and 15 DOTs reference the act in their emergency planning documents.

Table 13 shows the output of the content analysis regarding the criteria used to define an emergency. Four different types of criteria are used to define the circumstances that constitute an emergency: event, loss, time, and location. In the event criteria, the majority of DOTs cite a naturally occurring disaster, catastrophe, or *force majeure* in their definition of an emergency circumstance. They also include man-made incidents such as a bridge-barge collision in the definition. The incident's potential to cause loss of life or impair the health, property, and welfare of the public is a loss-based emergency definition criterion. The other two emergency criteria types are time and location. Time criteria refer to an urgent or immediate need to react to the incident, and location criteria typically require that some government official declare a specific geographic area a disaster area. The definition of emergency from each department may not be fully inclusive. Figure 21 shows the results of the survey for declaration required to trigger expedited procurement procedures.

TABLE 13
EMERGENCY DEFINITION CRITERIA

Emergency Criterion Type	Event Type Criteria			Loss Type Criteria			Time Criterion	Location Criterion
Source	Stanford Act defn.	Man-made catastrophe	Natural disaster	Loss of life, impairment of health, property, and welfare	Loss or impairment of public services	Economic loss	Need for immediate action/time dependent	Disaster area designation
U.S. Code	Y	Y	Y	Y	N	Y	N	Y
FHWA	Y	Y	Y	Y	N	Y	N	Y
Alaska DOT	Y	Y	Y	Y		Y	N	Y
California DOT		Y	Y	Y	Y	N	Y	N
Colorado DOT	Y	N	N	Y	Y	N	Y	N
Delaware DOT	Y	N	N	Y	N	N	N	Y
Florida DOT	N	Y	Y	Y	N	N	Y	N
Hawaii DOT	N	N	N	N	N	Y	Y	Y
Idaho DOT	N	Y	Y	Y	N	N	Y	N
Illinois DOT	Y	Y	Y	Y	N	Y	N	Y
Iowa DOT	Y	Y	Y	Y	N	Y	N	Y
Kansas DOT	N	Y	Y	Y	Y	N	Y	Y
Maine DOT	N	Y	Y	Y	Y	N	Y	N
Maryland DOT	Y	N	N	Y	N	N	Y	N
Massachusetts DOT	Y	N	N	Y	Y	N	Y	Y
Minnesota DOT	N	Y	Y	Y	Y	N	Y	N
Mississippi DOT	N	Y	Y	Y	Y	Y	Y	N
Missouri DOT	N	Y	Y	N	Y	N	Y	N
Montana DOT	N	Y	Y	Y	N	N	N	N
Nebraska DOT	N	Y	Y	Y	N	N	Y	N
Nevada DOT	N	Y	Y	N	N	N	N	Y
North Carolina DOT	Y	N	N	Y	N	N	Y	N
Ohio DOT	N	Y	Y	Y	N	Y	Y	Y
Oklahoma DOT	N	Y	Y	Y	Y	N	Y	N
Oregon DOT	Y	Y	Y	Y	N	N	Y	N
Tennessee DOT	Y	N	N	Y	Y	N	Y	N
Utah DOT	Y	N	N	Y	N	N	N	N
Vermont DOT	N	N	Y	Y	N	N	Y	N
Virginia DOT	N	N	N	N	N	N	N	N
Washington DOT	Y	Y	Y	Y	N	N	N	N
Wisconsin DOT	Y	Y	Y	N	N	N	N	Y
Wyoming DOT	N	Y	Y	Y	Y	N	Y	N
Totals	32	15	22	23	11	8	20	12

Y= yes; N = no.

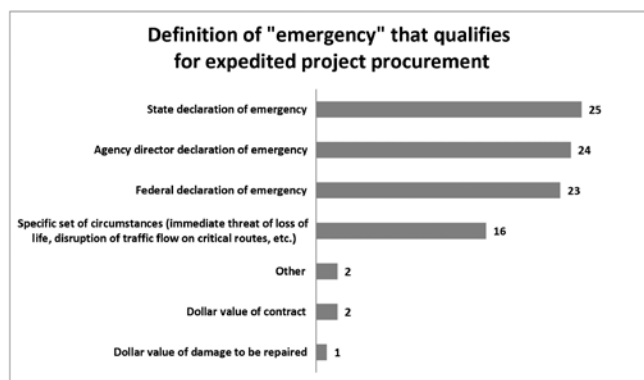


FIGURE 21 Emergency definition survey results.

EMERGENCY DECLARATION AUTHORITY

The authority to declare an emergency is provided for in the law, as well as in agency regulations and policies. The declaration is typically the key step to implementing expedited emergency procurement procedures. Many DOTs permit their officials to declare an emergency at their discretion (Maine DOT 2011). Table 14 is a summary of the content analysis augmented by the survey results for this specific question. The states that did not specifically include the governor in their emergency procedures document must be presumed to have incorporated that authority by reference to state code. The level of authority to declare an emergency

determines the means available to control the situation. The content analysis revealed that once an emergency is declared, certain procurement, purchases, and construction obligations are dismissed compared with nonemergency conditions. This analysis infers two prime categorizes of an emergency: a localized emergency declared by a DOT official, and a state-level emergency declared by the governor. An example of how an emergency declaration operates is found in the Alaska emergency regulation, which states that whoever has the authority to hold the governor's office has

the power to declare a state-level emergency (Gilson 1997). The effect of such a state-level declaration is to activate the response and recovery aspects of all applicable local or interjurisdictional emergency services and to authorize the furnishing of aid and assistance under those plans (Gilson 1997). In California, a director's order documents the use of special authority, delegated by the state law, to set aside normal contracting procedures, and often includes funding allocation, scope of work, and duration (Caltrans 2006; Trauner 2007).

TABLE 14
EMERGENCY DECLARATION AUTHORITY FOUND IN DOT EMERGENCY DOCUMENTS

State (total = 38)	Governor	Secretary/ Commissioner	DOT Director	Prmt./ Contr. Office	Dist./Div. Engr./Other	DOT Authority Level
Alabama	Y	N	N	N	Y	<\$50K
Alaska	Y	Y	Y	N	Y	<\$100K
Arizona	N	N	N	Y	N	<\$50K
California	Y	N	Y	N	N	No \$ limitation
Colorado	Y	N	Y	N	Y	No \$ limitation
Connecticut	N	Y	N	N	N	NA
Florida	Y	N	N	Y	N	No \$ limitation
Hawaii	Y	N	N	N	Y	NA
Idaho	Y	N	N	N	N	NA
Illinois	N	N	N	Y	N	No \$ limitation
Iowa	Y	N	Y	Y	N	<\$100K
Kansas	N	Y	Y	N	N	NA
Louisiana	Y	N	N	N	N	<\$50K
Maine	Y	N	Y	N	N	NA
Massachusetts	N	N	Y	N	N	NA
Michigan	N	N	N	Y	N	NA
Minnesota	Y	Y	N	N	N	NA
Mississippi	N	Y	N	N	Y	NA
Montana	N	Y	N	N	N	NA
Nebraska	N	N	Y	Y	Y	NA
Nevada	Y	N	N	N	N	NA
New Hampshire	Y	N	N	N	Y	NA
New Mexico	Y	N	Y	Y	Y	NA
New York State	N	N	Y	N	N	NA
North Carolina	Y	N	Y	N	N	No \$ limitation
North Dakota	Y	N	Y	N	N	<\$150K
Ohio	Y	N	Y	N	N	NA
Oklahoma	Y	N	Y	N	N	<\$500K
Oregon	Y	N	Y	Y	Y	<\$250K
Pennsylvania	N	N	Y	Y	Y	NA
Rhode Island	N	N	Y	N	Y	NA
South Carolina	N	N	Y	N	Y	NA
Texas	Y	Y	N	N	Y	No \$ limitation
Utah	Y	N	Y	Y	N	<\$25K
Vermont	Y	Y	Y	N	N	No \$ limitation
Washington	Y	Y	Y	N	N	<\$100K
West Virginia	Y	Y	N	N	Y	NA
Wisconsin	Y	N	N	N	Y	NA
Wyoming	Y	N	Y	N	N	NA

Y = yes; N = no; NA = not available.

The Florida DOT Emergency Plan states that “(f) Nothing contained in this Order shall prevent local jurisdictions from taking prompt and necessary action to save lives and protect property of their citizens, including the authority to compel and direct timely evacuation when necessary in the absence of the Governor’s directive” (Florida 2010). The Florida clause is intended to delegate the authority to declare a localized emergency to officials of the DOT, who include the deputy director, chief engineer, and chief structural engineer (Florida 2010). Its intent is to facilitate a speedy response to an emergency situation at the lowest level and not hinder the necessary steps to save lives and property and restore transportation service by forcing local officials to wait for permission at a higher level. The survey asked the importance of delegating decision-making authority to the project level, and 21 of 30 responses indicated that it was either important or essential. This leads to the conclusion that delegating the authority to waive routine contracting constraints is necessary to achieve a quick response (Expedited Procurement Fundamental #1; chapter one) and mitigate the overall impact to the public.

Figure 22 shows the integration process between local and state agencies for declaring an emergency. The diagram separates the action taken and the point of responsibility. The local agencies on the ground assess the damage and notify the DOT. The DOT determines the scope of the emergency and asks the governor to declare an emergency. The governor reviews the damage and decides if it is indeed an emergency. If the governor declares an emergency, directors’ orders will be produced. This triggers a collaborative state-level emergency response from state and local agencies.

Some states’ emergency management plans, such as Alabama’s (2009), are specific in the chain of authority and contain a defined succession of delegated authority. If the governor or any other delegate in charge of declaring an emergency is absent from their post, then the second-in-command can assume authority and declare an emergency.

The U.S. President can declare an emergency under the Stafford Act. If the President does not declare an emergency under this act, the governor or the state’s chief executive office must ask the President to declare an emergency as a prerequisite to federal ER funding (Gilson 1997).

Types of Emergency

The literature review and content analysis found that DOTs distinguish between two forms of emergency: a catastrophic disaster and a routine incident (Loosemore and Hughes 1998; Schexnayder and Anderson 2010; Houston 2011). The area affected will depend upon the type of emergency; a catastrophic disaster will affect an entire state, but may be isolated to a localized area. A routine emergency will affect only a localized area. A catastrophic emergency can be caused by a natural disaster or unexpected structural failures. State agencies have internally established levels to categorize crisis situations to determine whether emergency procurement procedures are required. The level of action required by a state is dependent on the type of incident that has occurred. Table 15 lists the typical causes of emergencies and categorizes them into either potentially catastrophic emergency or day-to-day incidents.

AUTHORIZED SCOPE OF EMERGENCY CONSTRUCTION

Since normal rules of competitive bidding are suspended during the procurement of emergency construction, the laws that regulate the emergency procedures also regulate the scope of work that will be authorized to be construction under emergency powers. Title 23 USC is explicit on the scope limitations:

In no event shall funds be used pursuant to this section for the repair or reconstruction of bridges that have been permanently closed to all vehicular traffic by the State or responsible local official because of imminent danger

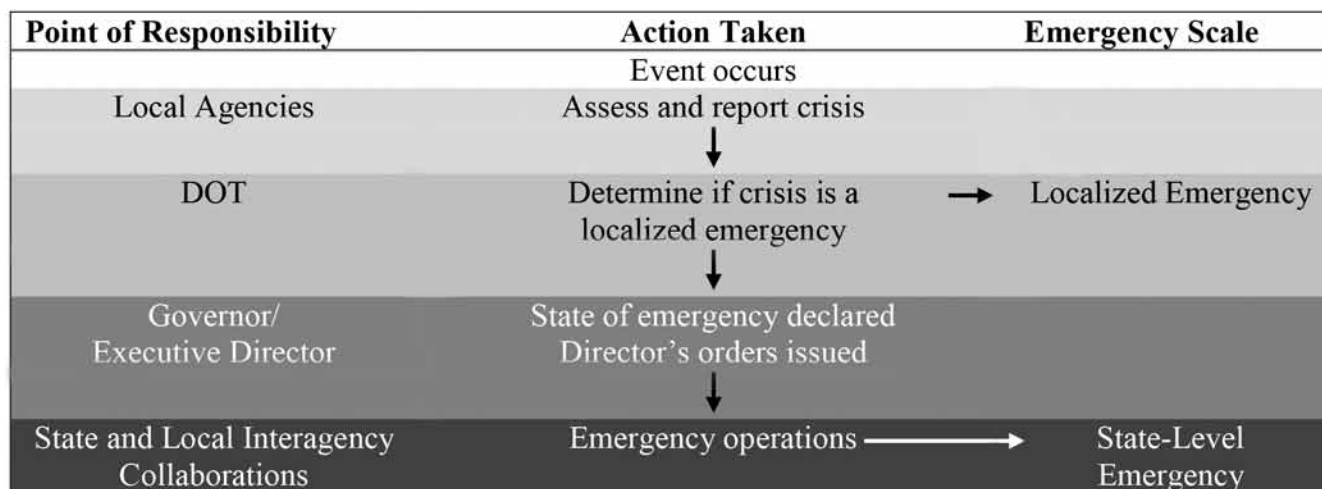


FIGURE 22 State and local emergency collaboration process.

of collapse due to a structural deficiency or physical deterioration (USC 2000).

TABLE 15
EMERGENCY CLASSIFICATIONS

Catastrophic Emergency		Routine Emergency
Natural Disaster	Structural/Technical Failure	
Flooding	Energy crisis	Traffic accident
Tornado/windstorm	Transportation network interruption Bridge collapse	Minor infrastructure failure
Hurricane	Terrorism	Severe weather
Winter/ice storm	Radiological crisis	Temporary road closure due to fallen trees or downed power lines
Lightning	Dam failure	
Extreme temperatures	Hazmat	
Wildfire	Civil disturbance	Rural culvert washout
Urban fire	Cyber crisis	
Earthquake		
Landslide		

Lo (1997); AEMA (2009); FDOT (2010).

The operating notion here is that a state agency is not allowed to “get well” using emergency federal funding just because a qualifying disaster happened to occur in the area where a structure that was deficient before the crisis is located. The same policy applies to replacing a damaged road or bridge with a new facility that is better than the old one that failed or was destroyed. This is termed a “betterment” in the regulations (Kirk 2011). Although it might be perfectly logical to increase the capacity of a transportation facility that is being rebuilt after a disaster, to do so violates the spirit of the Title 23 authorization for ER funding. The law was enacted to help states restore damaged highways to predisaster capacity, not to supplement standard federal-aid highway funding. Hence, betterments constitute a highly restricted special case requiring careful coordination with the FHWA if federal ER funding is needed to pay for them.

Betterments

In some situations it may appear appropriate to upgrade a damaged road or bridge. Betterments are defined by the Wisconsin Department of Transportation (WSDOT) (2012) as “any additional feature, upgrading or change in capacity, or character of the facility from its predisaster condition.” Betterments can be incorporated into ER projects only if they can be justified to show an economical savings in costs to the current or future ER program (Kirk 2011). Betterments typically associated with ER work are—

- “Relocating a facility to a higher elevation or raising roadway grades;

- Providing additional hydraulic capacity by lengthening or raising bridges, adding additional culverts, replacing culverts with bridges, and/or deepening channels; or
- Providing additional protection by installing riprap, scour protection at bridges, spur dikes, and stabilization of slopes/slide areas” (Ziegler 2011).

DOTs, however, are able to incorporate betterments that are paid for with nonfederal funds as well as eligible non-ER federal funding. The federal underlying principle of “only that which is necessary to remove the emergency condition” (plus allowances for achieving future capacity and to meet current FHWA standards) is further reinforced by state code and DOT operating policies. The Alaska DOT (Alaska Department of Transportation and Public Facilities 2005) permits emergency procurement procedures to be used only to purchase the goods and services necessary to “relieve the emergency situation.” Finally, according to Perry and Hines (2007), the Kansas DOT policy limits the emergency contracts to “immediate corrective actions including steps for necessary emergency procurements shall be taken to stabilize the situation until a permanent solution can be obtained through conventional channels.” When the previous discussion is considered in the light of the fact that 80 percent of the survey responses indicated that a “clear definition of allowable betterments” was either important or essential to the success of an emergency project, the conclusion is that including betterments in an emergency project violates the fundamental purpose of the procedures—to restore essential services and eliminate hazards (Kirk 2011)—even if the inclusion is perfectly logical. This is because the use of expedited procurement procedures where competition requirements have been waived is limited to the design and construction tasks necessary to resolve the emergency and restore predisaster service, which leads to a definition of emergency restoration.

Emergency Restoration

Speedy system restoration is critical to effective recovery from an emergency. Therefore, the DOT’s prime responsibility is expeditiously initiating the procurement processes necessary to achieve permanent system restoration. Depending on the scale of damage, restoration of service is typically achieved through two repair phases (Perry and Hines 2007):

- Emergency repairs: “Emergency repairs are meant to permit work to start immediately to restore essential traffic in the disaster area that cannot wait for a finding of eligibility and programming of a project. This part of the program is especially designed for speed” (Kirk 2011).
- Permanent repairs: “Permanent repairs go beyond the restoration of essential traffic and are intended to restore the damaged bridges and roads to pre-disaster conditions and capabilities. Where the damaged parts of the road can be repaired to pre-disaster conditions,

without replacement or reconstruction, this is done” (Kirk 2011).

The average DOT has two forms of emergency contracts: a maintenance contract and a reconstruction contract. The contract for emergency repairs allows access for emergency services, damage assessment, and repairs to minor infrastructure reconstruction. UDOT (2011) defines emergency repairs as a “public works project undertaken to eliminate an imminent risk of damages to or loss of public or private property.” Expedited procurement procedures are normally authorized for emergency repairs. The North Dakota DOT lists the following types of emergency repairs expected after a major disaster:

- “Regrading of roadway surfaces, roadway fills, and embankments
- Temporary grade raises to restore essential traffic
- Debris removal within shoulders of roadway or to prevent future damage
- Erection and removal of barricades and detour signs, flagging and pilot cars during the emergency period, and placement of riprap around piers and bridge abutments to relieve severe on-going scour action
- Placement of riprap on the downstream slopes of approach fills to prevent scour during overtopping of the fill
- Removal of slides if affecting traffic
- Construction of temporary roadway connections (detours)
- Erection of temporary detour bridges
- Replacement of approach fills
- Wave action damage within the clear zone” (Ziegler 2011).

If key infrastructure must be reconstructed as a result of the emergency, a permanent repair contract is used. Permanent restoration is typically not eligible for federal ER funding. For example, “[w]here a road needs to be replaced, ER funding is limited to the costs of building a roadway designed to current standards and of comparable capacity” (Kirk 2011). Additionally, depending on the situation, infrastructure reconstruction projects, while still of high priority until service has been completely restored, are normally subject to the nonemergency procurement rules for competition (Perry and Hines 2007; Kirk 2011).

EXPEDITED PROCUREMENT PLANNING PROCESS

The old cliché warns that “proper prior planning prevents pitifully poor performance” (Brick 2005). In emergency design and construction, procurement planning must begin before the disaster occurs. The survey asked two questions specific to emergency project planning. The first asked if the DOT had a document that “specifically describes the procedures to be used with emergency procurements.” Fewer than half

(13 of 30) the respondents answered “yes.” The second asked the agency had a “contract document that was specifically developed for emergency projects.” Only 5 of the 30 answered “yes.” This response indicates the need for research on the appropriate content of DOT emergency project delivery plans as well as the form and content of tailored emergency contracts and their efficacy for agencies that have used them. Contracting agencies are required to prepare written policies and procedures for each method of procurement used for engineering and design-related services funded with federal-aid highway program funds and submit them to FHWA for approval, as specified in 23 CFR 172.9(a).

The literature finds that the first step in the emergency plan is a decision-making sequence that differentiates between emergency repairs and nonemergency repairs (Perry and Hines 2007; Thorn 2006; Kirk 2011;). The Virginia DOT’s (VDOT) *Emergency Contract Manual* (2012) furnishes an example of how this decision is made (see Figure 23).

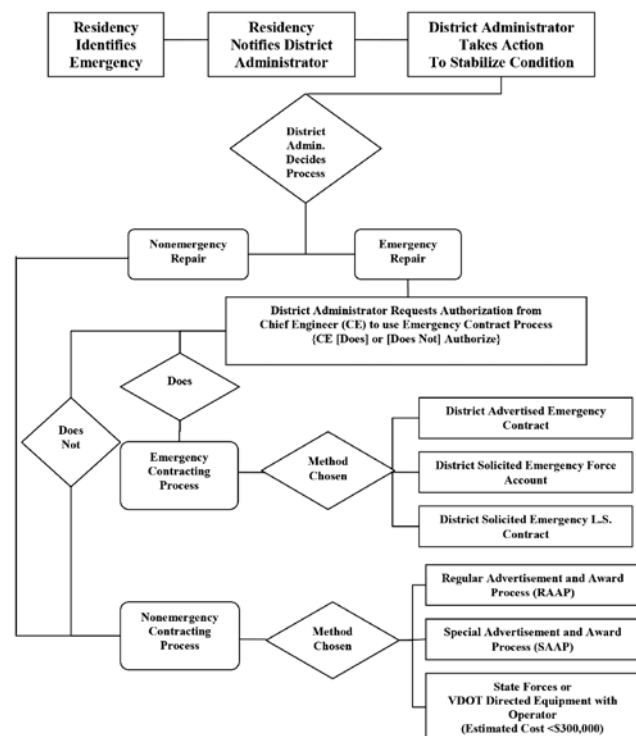


FIGURE 23 Virginia DOT emergency repair decision tool (after VDOT 2012).

The output of the emergency procurement planning process should be a plan that provides definitive guidance for the DOT personnel who are faced with the changed administrative environment demanded in an emergency. Therefore, it stands to reason that the emergency procurement plan might enumerate what the changes will be and how the routine process will be altered to satisfy the six fundamentals of emergency procurement derived from Bai et al. (2006) and other sources in the literature in chapter one.

Planning for Rapid Response

Quick response is the first fundamental. It focuses on reviewing all the regulations, permits, policies, and law that extend the project delivery period of a routine project, regardless of project delivery method. According to Perry and Hines (2007), the following is the list necessary to cover the subject and provide the information needed for expeditious decision making about the procurement process:

- “Flexibilities available in federal procurement;
- Flexibilities identified in the State Model Procurement Code;
- Practices in selected states [with recent emergency experience]; and
- Limitations imposed by federal grant agreements of the Federal Highway Administration (FHWA) and the Federal Emergency Management Agency (FEMA)” (Perry and Hines 2007).

The object of this exercise is not to find a single process that will be applied to all expedited procurements, but rather to identify all the available alternatives and furnish a single point for finding and understanding procurement constraints. An example of how five different DOTs’ emergency procurement documents categorize a crisis situation is depicted in Table 16 and lends structure to the subject of organizing for emergency procurement. California, Florida, and Louisiana essentially differentiate between two levels of emergency: small-scale, frequently occurring incidents and large-scale, infrequent disasters. All three states differentiate the two by whether or not the state government has issued an executive order. Alabama distinguishes among four levels of crisis, which are used to issue warnings to local government and internal operational organizations. Oregon differentiates based on whether a routine level of competition can be used to address the emergency or if time demands that the DOT move directly to a standing list of prequalified design consultants and construction contractors.

The Oregon model appears to support the second chapter one fundamental, “experience counts,” by planning to utilize routine procurement procedures to the greatest extent possible. The Oregon Tier 1 selection utilizes a “mini-solicitation” that includes the following content:

- “Response deadline and location for submittals,
- Project description and objectives (and information from project prospectus, if available),
- Programmed budget for construction (and right-of-way if applicable),
- Schedule to complete the requested Services, and programmed bid let date (if applicable),
- General scope of work and period of performance expected under the Work Order Contract,

- If available, a detailed statement of work... required if cost proposals will be evaluated ...
- Selection criteria and weighting” (ODOT 2010).

TABLE 16
COMPARISON OF EMERGENCY OPERATIONS MODES

State Agency	Modes of Operations	
Alabama (AEMA 2009)	<u>Level I</u>	<u>Level II</u>
	Disaster declared	Potential or emergency or disaster
	Extensive multiagency statewide response	Requires multiagency response
	Federal response and recovery assistance	Possible federal assistance
California (Lo 1997)	<u>Level III</u>	<u>Level IV</u>
	24-hour emergency operations	Potential emergency operations, procurement and construction
	Emergency procurement and construction	
	May required multiagency response	Day-to-day emergency response
Florida (FDOT 2010)	<u>Disaster Mode</u>	<u>Incident Mode</u>
	Daily activities are hindered	Within capabilities of local government
	Governor declares an emergency	Mitigating congestion through a quick response to traffic incidents
	Establish statewide standardized EMS	
Louisiana (LOSP 2011)	<u>Governor-Declared Emergency</u>	<u>Secretary-Declared Emergency</u>
	Emergency operations, procurement, and construction	Localized event
	Statewide events	
Oregon (ODOT 2010)	<u>Catastrophic Emergency</u>	<u>Usual Emergency</u>
	Executive order required	Determination required; written quotes
	Record keeping enhanced	Scope of emergency procurement
Oregon (ODOT 2010)	<u>Two-Tier Selection</u>	
	Tier 1, Solicitation and independent selection	
	Tier 2, Selection from a pool of qualified firms	

Figure 24 is the response to a survey question regarding the difference between DOT project delivery methods and procurement procedures for routine versus emergency projects. With the exceptions of sole source and “other” procurements, there is not an appreciable difference between the delivery method and procurement procedure selections for routine and emergency projects. Although the survey did not specifically ask for the information, one would assume that the major difference is probably the pace at which the emergency projects are brought under contract, as demonstrated by the Oregon DOT “mini-solicitation.” Both observations connect with the information in the literature that advises

sticking to the routine procurement process as much as is both practical and expedient (Christenson and Meeker 2002; Thorn 2006; Perry and Hines 2007; Houston 2011). There is a discomfort level associated with changing procurement procedures that are founded in law. By adjusting existing procedures to fit the crisis timeline, the agency minimizes the hesitancy that its personnel will feel when asked to step outside their comfort zone in an emergency. The I-40 Beckham County Bridge Pier Replacement case study in chapter two is an excellent example of how the Oklahoma DOT was able to expeditiously react to an emergency without throwing out its traditional process. ODOT made two adjustments. First, it awarded sole source contracts to contractors and material suppliers that were working near the incident to immediately erect shoring to keep the overpass from collapsing. Second, it limited its emergency repair solicitation to 12 contractors known to be qualified to do the work. The agency then adjusted its internal process by requiring all the individuals necessary to review bids and award a contract to be physically present at the bid opening. Hence, the permanent repair contract was awarded within a week of the incident. The combination of the content analysis, literature, and case study results leads to the conclusion that emergency procurements can be successfully executed using traditional procedures that have been adjusted to comply with the need for speed and accorded a higher level of priority.

The third fundamental is “incentivize key elements of success.” The Virginia DOT *Emergency Contract Manual* (2012) furnishes guidance in this regard: “The liquidated damages ... amount may not be sufficient to encourage the Contractor to complete the contract on time. If this is the case, adding incentive and disincentive provision to the

contract may be necessary...An analysis establishing the road users cost impact is required to support the incentive and disincentive” (VDOT 2012). The survey found that 60 percent of the respondents rated I/D schemes as either important or essential to the success of emergency projects. This leads to a recommendation for future research on the efficacy of I/D schemes on the success of emergency projects.

Planning for Emergency Contract Execution

The three remaining chapter one fundamentals are “minimize design reviews,” “control the internal technocracy,” and “commit to extraordinary effort.” They all speak to having a plan to adjust internal design and construction administration processes to permit the award of design and construction contracts as fast as is prudent and practical. Since the previous section showed that most emergency repair, restoration, and replacement projects will be delivered using traditional DBB, the idea of minimizing design reviews supports the award of the construction contract in an expeditious manner. Therefore, it is important to develop a plan for quantifying the scope of emergency work. A paper by two contractors indicated that pricing was directly related to the owner’s ability to develop a solid scope of work before asking for bids:

[Owners] can reduce costs by “doing their homework” and by utilizing proper partnering, flexibility, risk allocation, and processes.... Proper “homework” preparation includes developing sound geotechnical and environmental data prior to the bid.... including *hiring the best possible geotechnical and environmental firms to provide early, pre-bid data* on the project (Christensen and Meeker 2002, italics added).

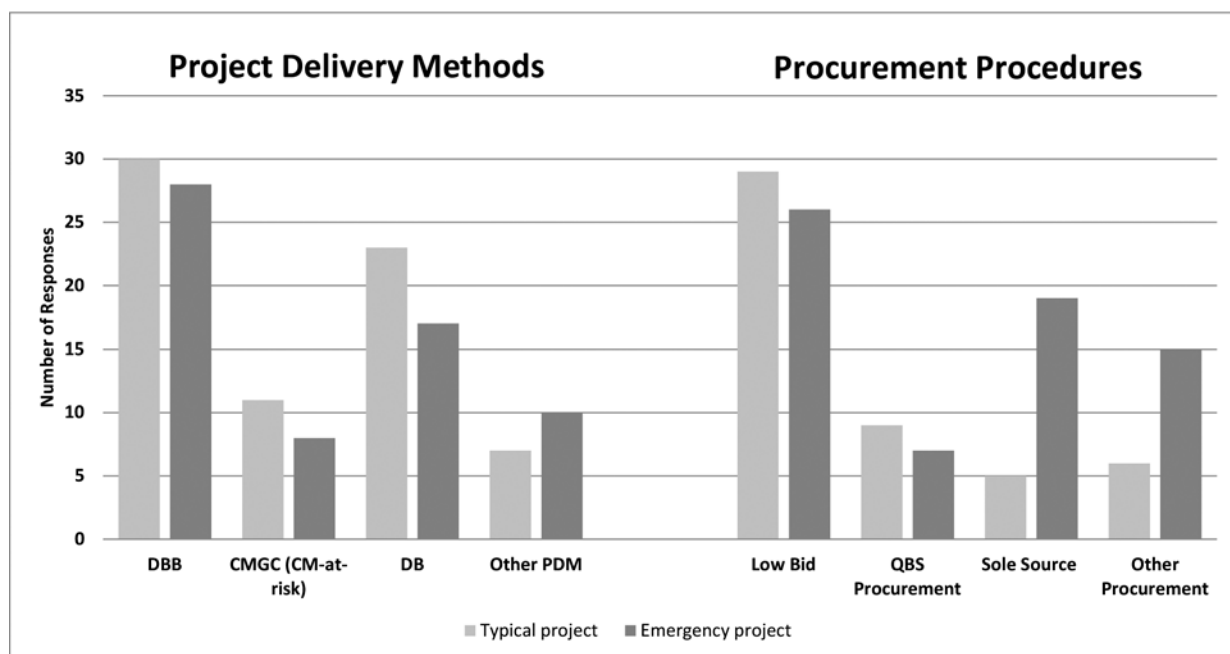


FIGURE 24 Survey project delivery methods and procurement procedures.

The remainder of that paper emphasizes the issues dealing with underground conditions from both the geotechnical impact on the design and the environmental impact on the construction contractor's operations.

The NYSDOT case study demonstrates one tool to react rapidly to emergency technical requirements: the IDIQ contract. IDIQ is a federal contracting term; these contracts are also called "push button contracts" by FDOT, "master contracts" by WSDOT, and "if and when directed" contracts by the New Jersey DOT (Perry and Hines 2007). The IDIQ essentially creates a contractual mechanism to put a construction contractor or an engineering design consultant on standby to do a series of specific types of projects using a task order, without having to advertise and award each task order. Many DOTs use IDIQ-like contracts to retain general engineering consultants (GEC) for planning, design, and analysis work. NYSDOT's IDIQ for emergency bridge construction allowed it to rapidly react to the aftermath of a hurricane.

EMERGENCY PROJECT PLANS FOR MAINTENANCE PROJECTS

Based on the survey responses, the average DOT delivers both emergency construction and maintenance projects. The availability of federal funds often determines whether an emergency project is classified as a maintenance or a construction project. Additionally, most DOTs have a robust internal maintenance workforce complete with its own inventory of equipment and stockpiles of common maintenance project materials. Hence, the magnitude of the damage and the availability of state-owned equipment will lead to most small emergency projects being completed using internal resources.

Emergency Maintenance Provisions

The content analysis found that both the California (2010) and Oregon (2004) DOTs have provisions in their emergency management plans for executing emergency contracts when the situations exceeds in-house capabilities. Oregon puts it this way: "Many repairs of damage from emergency or extraordinary circumstances require resources or expertise not available with maintenance forces. If the situation warrants it, the State Maintenance Engineer, under ODOT Sub-Delegation Order SUB-11, may declare an emergency for the situation" (Oregon DOT 2004). This declaration triggers the ability to consummate "contracts without calling for formal bids." Caltrans takes it a step further and stipulates two possible contracting methods that become available to its maintenance force to augment their capacity, as well as assigns responsibilities for the various portions of the procurement among its operating divisions:

Successful emergency force account and emergency limited bid project delivery requires the cooperation of the

Divisions of Maintenance (Maintenance), Procurement and Contracts, and Construction. Maintenance assesses damage, defines project scope, and estimates the cost to deliver emergency force account and emergency limited bid contracts... District construction takes an active role in assisting Maintenance in scoping and estimating emergency force account and emergency limited bid contract projects... [and] takes the lead on contractor selection for emergency force account work (Caltrans 2010).

Oregon differentiates between "emergency/urgency maintenance" and "extraordinary maintenance" in its maintenance guide (2004). The first category pertains to repair, restoration, and replacement projects that are not eligible for emergency funding outside the DOT's operating budget; the second category pertains to emergency projects that may qualify for external funding reimbursement from special state or federal sources. The Oregon manual also prescribes a different level of authority to trigger emergency contracting procedures. Since "emergency/urgency maintenance" are typically projects necessary because of high-probability events of small scale such as bridge damage from accidents, localized flooding, or unexpected structural deficiencies found during routine inspections, the state maintenance engineer is vested with the authority to declare an emergency situation that qualifies for using expedited procurement procedures. Conversely, "extraordinary maintenance" projects result from low-frequency, large-scale events that can be defined as disasters and require a declaration of an emergency by the governor or a national authority.

The split between the two types of projects gives the Oregon DOT the ability to react more quickly to small, high-frequency emergencies because the authority to trigger expedited procurement procedures is held at a lower level and within the maintenance organization itself, eliminating the need to seek action from an elected official at the state or national level. Table 16 shows that other states have a similar differentiation based level of declaration authority, although not specifically for maintenance like Oregon. The differentiation of emergency maintenance by source of funds is quite logical and furnishes an example of an effective practice that other agencies can use to add structure to their emergency management documents.

Emergency Maintenance Contract Tools

Some DOTs, including California (2010), Florida (2010), and Oregon (2004), maintain a standing list of prequalified contractors who are able and willing to work during an emergency. Additionally, 50 percent of the survey respondents indicated that they also maintain a standing list of prequalified consulting engineering firms and construction contractors for potential use in an emergency. The technique enables a DOT to catalog availability of specific specialties, skills, equipment, and materials before an emergency

and furnishes a ready resource to reduce reaction time in an emergency. Tangentially, this practice may insulate the agency from award protests by making registration for the standing list a condition precedent to being awarded a contract through emergency sole source or limited competition procedures (Blanchard 2007).

FDOT requires its emergency standing list contractors to register and submit bids for typical emergency items such as debris removal before the hurricane season (FDOT 2010). This allows FDOT to obtain competitive pricing for emergency work before the emergency occurs based on the market rather than based on an urgent need. It is important to enumerate the specific qualifications and capabilities to be added to the emergency standing list. Each DOT considers a number of unique factors to procure a contractor for emergency repair contracts. However, the common theme is that the contractor must have the “capacity and ability” to provide adequate staff numbers to work on multiple fronts (Schexnayder and Anderson 2010). Caltrans (2006), which uses postproject performance evaluations on routine projects, furnishes a list of other typical factors:

- “Availability of resources
- Mobilization response time
- Proven management abilities
- Current contractor’s license
- Corporate cooperation history” (Caltrans 2006).

Finally, 28 of 30 survey respondents cited “highly qualified” designers and contractors as either important or essential to the success of an emergency project. Connecting this result with the fact that 50 percent of the respondents actually use a standing list of prequalified designers and contractors and the results of the content analysis previously discussed leads to the conclusion that maintaining an emergency designer/contractor standing list is an effective means to expedite emergency procurement procedures.

CONCLUSIONS, EFFECTIVE PRACTICES, AND FUTURE RESEARCH RECOMMENDATIONS

The analysis and findings in this chapter yielded a number of conclusions, effective practices, and recommendations for future research.

Conclusions

The following conclusions were reached:

- The emergency procurement document content analysis found that state DOT definitions can be grouped in four categories:
 - Event-oriented emergencies;
 - Loss type emergencies;

- Time-related emergencies; and
- Location-based emergencies.

- The survey results and content analysis both found that delegating the authority to waive routine contracting constraints is necessary to achieve a quick response and mitigate the overall impact on the public.
- The Title 23 prohibition on using ER funding for aspects not related to the emergency condition support the conclusion that including betterments in an emergency project violates the fundamental purpose of the procedures: to restore service to pre-emergency levels and eliminate immediate hazards. Note that betterments may be funded with other non-ER federal funds if they are eligible.
- The combination of the content analysis, literature, and case study results leads to the conclusion that emergency procurements can be successfully executed using traditional procedures to the greatest extent practical and adjusting them to account for the higher level of priority that results from the emergency nature of the procurement.
- The survey regarding the need for “highly qualified” designers, the fact that 50 percent of the respondents use a standing list of prequalified designers and contractors, and the results of the content analysis lead to the conclusion that maintaining an emergency designer/contractor standing list is an effective means to expedite emergency procurement procedures.

Effective Practices

The synthesis of various DOT documents, the literature, and the survey results yielded a number of effective practices that most DOTs could use in their emergency contracting plans and programs:

- The “mini-solicitation” used by the ODOT Tier 1 selection process provides a model for expedited selection of design consultants in an emergency.
- The survey responses and the literature support retaining a consultant to prepare a preliminary scope of work and do limited geotechnical and environmental testing as an effective practice that could be included in a DOT’s emergency procurement plan.
- The ODOT approach to emergency maintenance projects by categorizing them based on the source of funding and then delegating the authority to declare an emergency for a project funded by state operating funds to the state maintenance engineer provides a means to expedite response to high-frequency, small-scale emergencies without having to wait for permission from outside the maintenance organization.

Future Research Recommendations

The following are recommendations for future research on topics covered in this chapter:

- The survey found that fewer than half of the responding DOTs had a document that provided guidance for expediting the procurement of emergency projects, and only 5 of the 30 DOTs had a “contract document that was specifically developed for emergency projects.” Thus, research is needed to define the appropriate content of DOT emergency project delivery plans as well as the form and content of tailored emergency contracts and their efficacy for agencies that have used them. The research would aid DOTs to prepare written policies and procedures for each method of procurement used for engineering and design-related services funded with federal-aid highway program funds and submitted to FHWA for approval as specified in 23 CFR 172.9(a).
- Survey respondents identified incentives and disincentives as important to emergency project success, and this finding was validated by the literature review and content analysis. Therefore, research on the costs and benefits of I/D schemes and their impact on the success of emergency projects is recommended.
- Research on preliminary project scoping contracts is recommended to identify the optimal content of this type of contract and document its effectiveness through analysis of its costs and benefits in terms of time/user costs and impact on construction cost growth.

CHAPTER FOUR

EMERGENCY PROCUREMENT DESIGNER/CONTRACTOR SELECTION METHODS

INTRODUCTION

It is imperative for all the parties involved in an emergency project where full and open competition has been waived or limited that the contract award selection method be fair, equitable, and transparent (Houston 2011). An insightful article by Cordell Parvin (2000), a construction attorney, articulated the importance of clearly communicating the method for selecting the winner in a procurement with limited competition. Parvin indicates that it is mandatory that the owner “clearly state the evaluation criteria and weight given for each item and ensure that the evaluation team uses them.” Parvin’s article describes several cases where the award was successfully protested because the method for selecting the winning contractor was unclear and/or subjective. Award protests and their subsequent headaches are completely avoidable if the agency invests the upfront resources necessary to develop a fair and equitable system to select the winning bidder before the emergency event.

Chapter six reviews the case law with regard to emergency procurements. This chapter focuses specifically on the mechanics of selecting both design consultants and construction contractors using expedited procurement procedures. The selection process has three major components:

1. Definition of the appropriate level of competition
2. Requirements for prequalification, if any
3. Pricing/compensation protocols that influence the selection process.

DEFINING THE APPROPRIATE LEVEL OF COMPETITION

The Federal Acquisition Regulation (FAR 2008) uses a definition for “effective competition” that directly applies to emergency procurements:

Effective Competition: “A market condition which exists when *two or more contractors, acting independently*, actively contend for the Government’s business in a manner which ensures that the Government will be *offered the lowest cost* or price alternative or best technical design *meeting its minimum needs*. (FAR 34.001)” (Shields 1998, emphasis added).

The italicized words in the definition stress the operating concepts contained in the idea of not merely competition but *effective* competition. The independent actions of multiple sources of the desired service or product provide the agency with value for money, especially in emergency procurements where betterments must be carefully managed, meeting the minimum need of the emergency. Therefore, when determining an appropriate level of competition in an emergency, the selection official must alter the routine definition of best value to one that solves the problem at hand (1) in a satisfactory manner, (2) on a timely basis, and (3) at a reasonable/realistic cost (Jeffrey and Menches 2008). The remainder of this chapter will use those three tests as the basis to report the findings of the research.

Figure 25 illustrates the spectrum of competition, from sole source at the bottom with no competition to full and open at the top where routine competition is the norm. It is not meant to be all-inclusive but rather to portray the idea that many possible options are open to the agency to procure the requisite design and construction services to resolve an emergency situation.

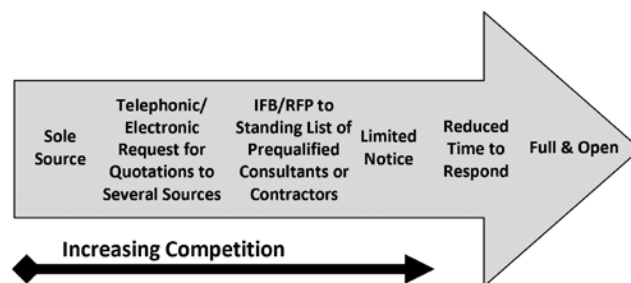


FIGURE 25 Spectrum of increasing competition (after Perry and Hines 2007).

The survey asked respondents to cite the various definitions of competition used in their agencies. They were allowed to select more than one if all selected were used based on situational circumstances. Figure 26 illustrates the result. Minimum numbers of either quotations or competitors was the most often used metric to define competition. In the “other” category, most indicated employing an existing active contract for short-term emergency work by modifying the base contract to cover the emergency scope.

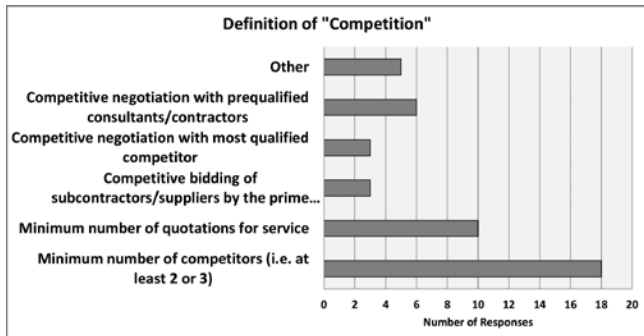


FIGURE 26 Survey result for competition definition.

EMERGENCY PROJECT DELIVERY METHODS

The selection of an engineering consultant or construction contractor on an emergency basis cannot be separated from the DOT’s decision to select a specific project delivery method. A project delivery method is the comprehensive process by which designers, constructors, and consultants provide services for design and construction to deliver a complete project to the owner (Migliaccio et al. 2008). However, terms surrounding project delivery methods can be confusing, and experienced professionals often misuse them. Understanding the differences is essential to understanding project delivery and the facts involved in this study (Molenaar et al. 2009).

- Contract payment provision: The contract language that defines how design and construction professionals will be paid for their services. The four primary

contract payment provisions are lump sum, GMP, unit price, and cost reimbursable.

- Project delivery method: The comprehensive process by which designers, constructors, and consultants provide services for design and construction to deliver a complete project to the owner. Although names can vary in the industry and owners often create hybrid delivery methods, there are essentially three primary project delivery methods: DBB, CMGC/CM-at-Risk, and DB (see glossary for details and diagrams).
- Procurement procedure: The process of buying and obtaining the necessary property, design, contracts, labor, materials, and equipment to build a project. The four primary procurement procedures are low bid, best value, qualifications based, and sole source procurement.

Emergency Project Delivery Method Selection

The literature, survey, content analysis, and case studies all contain examples of the various combinations and permutations possible among the three components. The purpose of this synthesis is not to advocate any specific combination but rather to analyze the options and identify trends that are visible in the record of successful emergency projects. The literature advocates selecting a project delivery method based on the project’s risk profile (Touran et al. 2009). Thus, the survey asked the DOTs to rate each of the three primary project delivery methods based on its ability to address typical risks during both design and construction. Figures 26 and 27 illustrate the results of the survey.

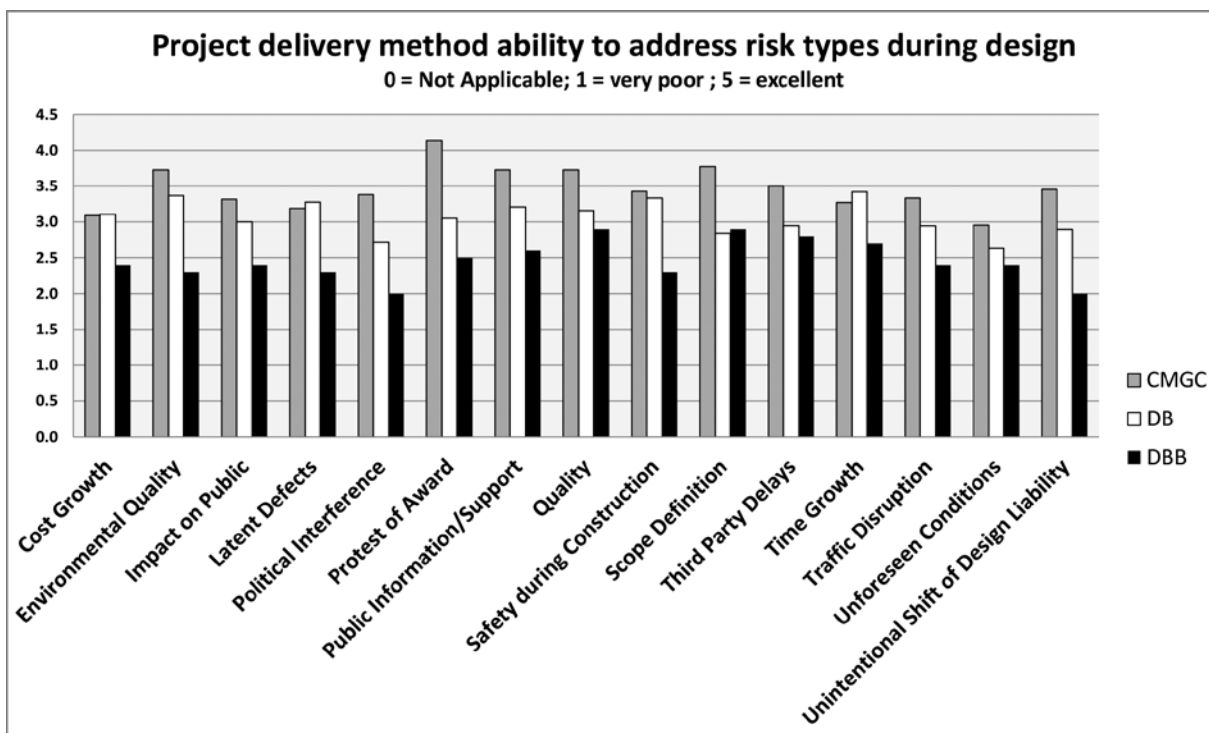


FIGURE 27 Project delivery method vs. risk during design.

The results of this analysis are quite clear. CMGC is the preferred method for dealing with risk during the design process. The literature credits early contractor involvement in the design process with reducing risk during construction. “Managing risk is the most important aspect of CMGC project delivery success. Risk can be managed by a number of mechanisms such as open books accounting, iterative pricing, and blind bid comparison” (West et al. 2012). Another paper explains the types of risk that CMGC can mitigate: “Contractor experience and expertise can aid the design team in preparing more cost effective traffic control plans, construction staging plans, and perhaps more realistic construction schedules” (Anderson and Damnjanovic 2008). Martinez et al. (2007) advocate making “the construction manager responsible for coordinating and updating the design schedule... the construction manager may be asked to perform quick estimates to be used as part of a [design] decision-making process in selecting systems.” Figure 27 shows that CMGC is judged to be more effective than DB in all categories during design except cost and time growth. Touran et al. (2009) state that owners typically select DB project delivery to accelerate the schedule, which may explain the better rating on time growth. Additionally, DB requires the design-builder to commit to a firm fixed price before design is complete (Koch et al. 2010), so the better cost risk rating is probably the result of the earlier cost certainty to the owner found in DB project delivery.

The result regarding risk during construction (Figure 28) finds DBB as the highest rated project delivery method in every category. Although the questionnaire did not ask for reasons, one must remember that the ratings are for emergency projects, not routine projects. Hence, the greater

control that is afforded the DOT with DBB project delivery may be the reason why the traditional method is perceived to be better at addressing construction risk. This connects with an earlier finding that using a project delivery method with which both the agency and its contractors are familiar removes the stress of implementing a new set of construction administration rules in the midst of a crisis. Since many of the respondents have either limited or no DB experience, it is not surprising that they are expressing a higher level of comfort with DBB than the other methods.

Emergency Procurement Procedure Selection

The survey also asked respondents to rate procurement procedures’ ability to address risk during design and construction. Figure 29 shows the results for design. Low bid was rated the highest only when it came to the risk of protest. QBS was preferred for the rest of the risks in design. This is not surprising, in that QBS is the major procurement procedure used in routine design contracts. Sole source selection ranked second, supporting the literature recommendation to use as much competition as time will allow. A time-critical event requires speedy reaction, and sole source is the fastest (Perry and Hines 2007).

Figure 30 shows the responses to the same question for risk in the construction phase. Although the trend is not as clear as in Figure 28, the same result can be found: Low bid procurement, a hallmark of DBB project delivery, appears to be the preferred method for addressing risk in construction. Again, this is probably the result of the familiarity of both DOT staff and construction contractors with low bid projects.

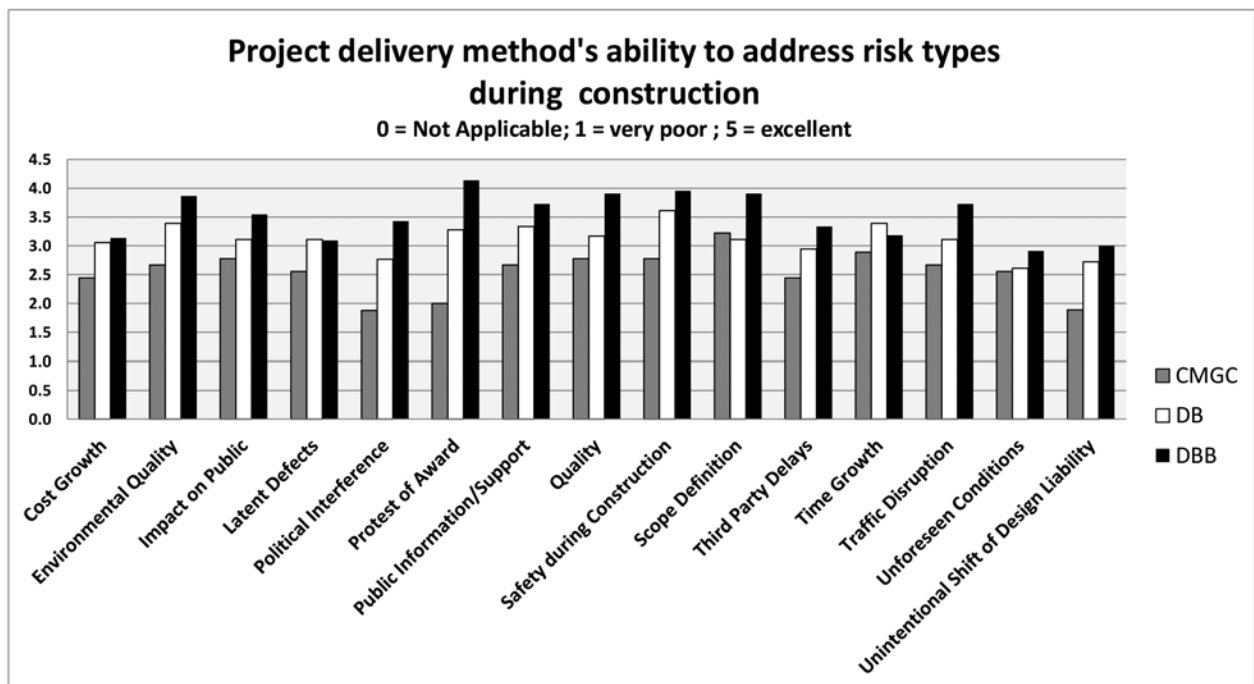


FIGURE 28 Project delivery method vs. risk during construction.

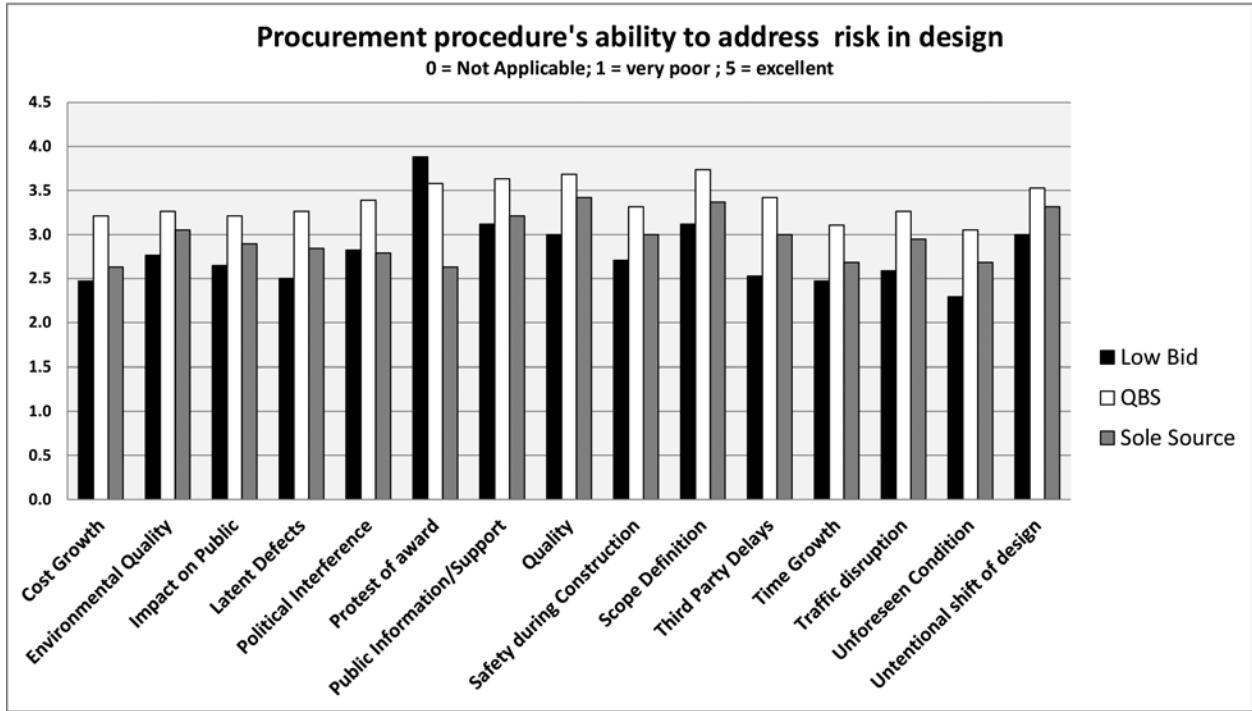


FIGURE 29 Procurement procedure vs. risk during design.

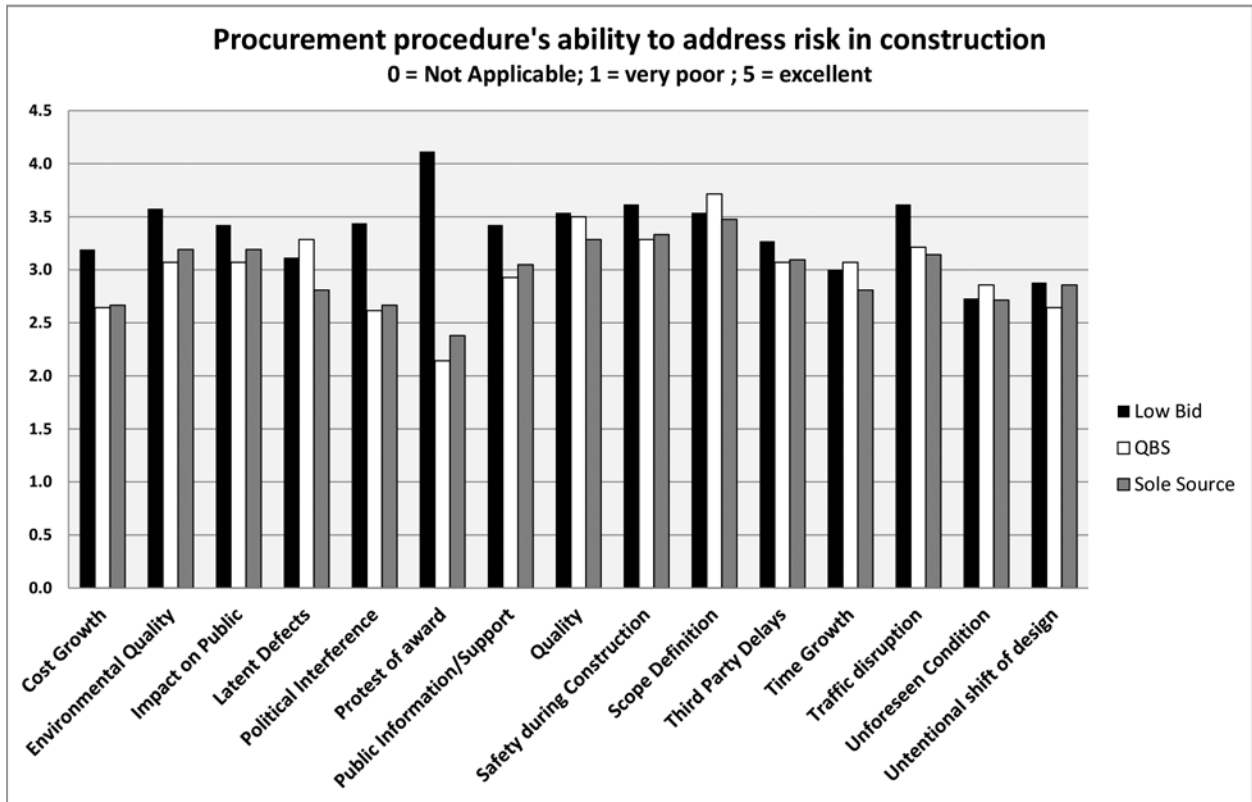


FIGURE 30 Procurement procedure vs. risk during construction.

Emergency Payment Provision Selection

Figure 31 shows the results of the survey with regard to emergency payment provisions. It shows a distinct

preference for lump sum payment. The most often used provision is the combination of lump sum and unit price. Once again, most respondents prefer to stick with routine procedures.

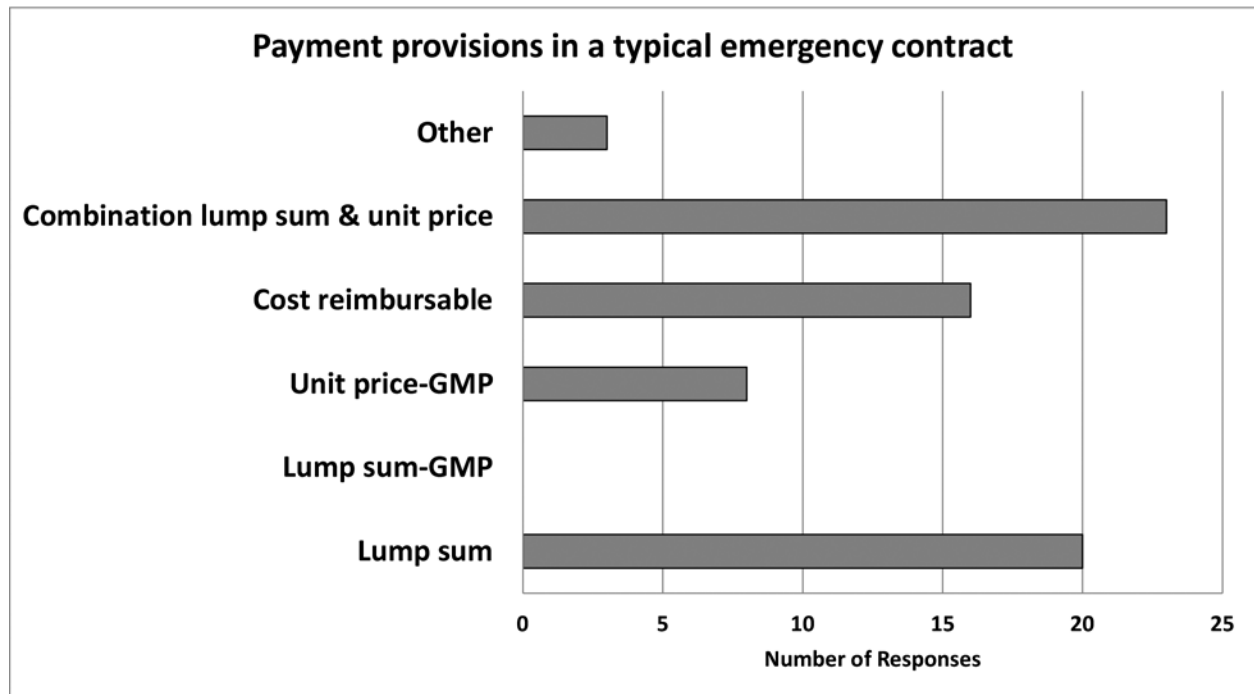


FIGURE 31 Emergency contract payment provisions.

EMERGENCY CONTRACT AWARD PROCEDURES

The emergency project award decision that carries the greatest risk of protest is the method chosen to advertise and award the contract. In this area, design and construction contracts are different. Design consultants are accustomed to being selected on the basis of qualifications as a result of the Brooks Act (NSPE 1995). As a result, that sector is more comfortable with sole source selection and QBS than its counterparts in the construction industry. The construction industry, however, is firmly convinced that full and open competition with the award going to the low bidder is a means of preventing government corruption and providing a level playing field for all contractors (Schexnayder and Mayo 2004). This belief is well documented by the following statement on the Associated General Contractors of Iowa's (AGCI) website: "Competitive bidding on Public Works has provided quality work and good prices for the Iowa taxpayer. Public improvements, other than highways, must be let to the lowest responsible bidder. Highway letting authorities may take into account the price of the bid, financial ability, experience and equipment" (AGCI 2012). As a result, the choice of emergency contract award methods requires careful thought. As previously stated, the rule of thumb is to create as much competition as the circumstances will permit to avoid a protest (Perry and Hines 2007).

Figure 32 illustrates the results of the survey questions regarding the use of various options for advertising and awarding emergency design and construction contracts. The figure shows the stark difference between design and construction contracts. If one removes the result for sole source,

assuming that those awards are used only when there is no other option, the preference for awarding design without price competition is evident, as is a similar preference for awarding construction contracts with as much price competition as practical.

Prequalification Requirements for Emergency Contract Awards

The most often used method was the invitation for bids to prequalified contractors with a low bid award. The result connects with an effective practice to be discussed in chapter five regarding the maintenance of a standing list of prequalified design consultants and construction contractors that are willing to work in an emergency. The literature review found that all authors without exception believe that the qualifications of a given contractor can have a marked impact on the success of the projects it builds. One paper reported that the most qualified contractor "correlates to the lowest administrative burden" for the agency (Molenaar and Songer 1998), implying that a well-qualified contractor requires less oversight and can be trusted to comply with contract requirements such as contractor quality control (CQC). Scott et al. (2006) justify prequalification by saying that "because of constrained staffing and budgets, it is not possible for state agencies to "inspect" quality into the work." The same authors provide a succinct definition and motivation for establishing a thoughtful prequalification process:

Prequalification in its simplest form is an assessment of financial responsibility, which often mirrors what sureties look for in making their underwriting decisions relating to issuance of bonds for public works projects.

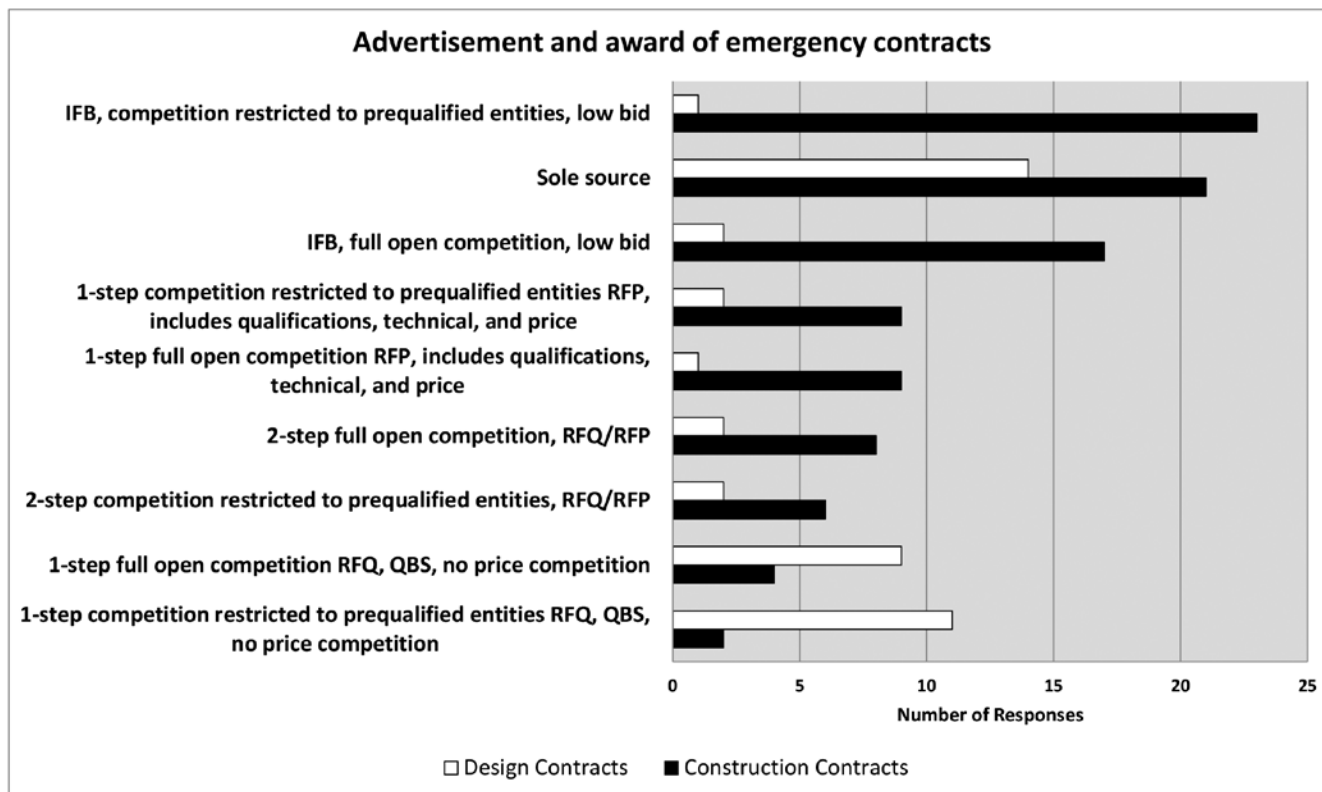


FIGURE 32 Emergency contract advertising and award policies.

It also may include other factors such as demonstrated ability to perform a certain type of work. Whether by prequalification or other methods, public owners are increasingly exploring ways to include non-price factors, both qualitative and quantitative, in the procurement process to motivate contractors not only to improve their performance during construction, but equally as important, to build value into the end products of construction (Scott et al. 2006).

Putting this information into the emergency contract's context, the preference shown for limiting bidding to prequalified contractors leads to the conclusion that maintaining a prequalified list of emergency consultants and contractors is one way for the DOT to manage the increased exposure to risk that comes in a crisis situation. Indeed, this practice allows the DOT to regulate the amount of competition that it allows by the requirements of the emergency. The MoDOT case study project that included a "nested" DB landslide contract is an example of providing full and open competition on the majority of the project while limiting competition to a single prequalified source in the event of an emergency.

Protest Experience on Emergency Projects

Chapter six discusses the salient issues regarding protests in emergency contracts, so this section is restricted to a short discussion of the literature, survey, and case study experience with protest of the award of emergency contracts. The legal review completed by Perry and Hines

(2007) found four practices that had successfully insulated DOTs from protests:

1. "The careful adherence to their laws, regulations, and policies has obviated this problem for most of the states.
2. [E]mergency contracts must be limited to those supplies, services, or construction items necessary to meet the emergency... once the immediate need is met, then further goods or services must be obtained by following usually mandated procedures.
3. Employing regulations that prohibit the renewal, without competitive bidding, of a contract that has been awarded on an emergency basis."
4. The South Carolina DOT "works from a list of prequalified bidders ... all of whom get notice when a contract is to be issued, and in that way has avoided complaints. In the area of equipment purchases, particularly replacement signals, the Florida DOT also employs a prequalified products list."

Six survey respondents reported protests of their emergency contract awards: Alaska, Delaware, Minnesota, Ohio, Oregon, and Utah. All protests except Minnesota's were dropped without going to court. Minnesota successfully defended the process. Thus, the results of the synthesis sur-

vey agree with the 2007 survey by Perry and Hines and find that “there was not a showing or reporting of difficulty experienced in the award of emergency contracts.”

CONCLUSIONS, EFFECTIVE PRACTICES, AND FUTURE RESEARCH RECOMMENDATIONS

Conclusions

Based on the survey and literature, maintaining a prequalified list of emergency consultants and contractors is one way

for the DOT to manage the increased exposure to risk that comes in a crisis situation. Additionally, the use of a prequalified list has been shown to be an effective measure to reduce the potential for a formal protest or a lawsuit.

Effective Practices and Future Research Recommendations

No new effective practices were identified in this chapter. Nor were any recommendations for future research made.

CHAPTER FIVE

EMERGENCY PROCUREMENT CONTRACTS AND POSTAWARD DESIGN/CONTRACT ADMINISTRATION PROCEDURES

INTRODUCTION

“During a construction crisis, traditional contracts are inflexible, restrictive and counter-productive” (Loosemore and Hughes 1998). Selecting an appropriate contract for an emergency project is made more difficult by the emotional environment that surrounds most emergency projects. Typically, contract forms are a function of the project delivery method, strategically chosen to fit the unique condition of the project. However, in an emergency, time is of the essence. “Emergency projects, because of their urgent nature, lend themselves well to time-based innovative bidding techniques” (PennDOT 2011). These techniques include I/D, interim completion dates, cost-plus-time bidding, and lane rental (Anderson and Damnjanovic 2008). These as well as DB and CMGC contracts were all successfully tested in the FHWA Special Experimental Project 14 (SEP-14) (FHWA 2011). This chapter discusses the options found in the study for structuring emergency design and construction contracts, as well as the salient procedures that are associated with each alternative, including scope definition and emergency accounting procedures.

EMERGENCY PROJECT SCOPE DEFINITION

All contracts describe the scope of the work to be accomplished under the contract provisions (Schexnayder and Mayo 2004). A DOT essentially has four options when it comes to defining the scope of an emergency contract:

1. Define the scope using in-house design and construction personnel.
2. Outsource the scope definition process to a preliminary design consultant.
3. Make no effort to explicitly define scope and rely on cost reimbursable payment provisions where the work is paid for on a time and materials basis with some provision to cover the contractor’s general conditions, overhead, and profit.
4. Employ a combination of the previous three as dictated by the emergency.

The amount of time available and the urgency of need will usually make the decision for the agency (Perry and Hines 2007). In theory, consummating a contract with a fully described scope of design and construction work is the least risky for the DOT (Alder 2007; Anderson and Damnjanovic 2008). Thus, this section discusses options 1 and 2. Option 3 is discussed later in the chapter as part of information on emergency accounting procedures. Option 4 is amply demonstrated in the chapter two case studies, where every emergency case study project used more than one of the possible options to restore service.

FDOT defines the “critical success factors” for a consultant contract as follows:

- “Properly define scope [of consultant contract in a manner that is] easily understood by all parties.
- Use established measures [of quality of the consultant’s work].
- Use established procedures and policies including revisions throughout contract period” (SAIC 2003).

The last two bullets advocate using established procedures for the consultant contract, which agrees with the fundamentals in chapter one with regard to using traditional procurement procedures as much as practical on emergency construction projects. Thus, the conclusion reached with respect to construction can be extended to include consultant scope definition contracts as well.

Case for Outsourcing Scope Definition

The survey asked whether DOTs used a preliminary consultant contract to define the scope of work before beginning the procurement to complete project itself. Half of the responses were affirmative, three indicated that they had not done so but could if needed, and only seven were negative. The survey results also yielded 29 of 30 responses that a “sufficient scope definition to allow competitors to price the project without excessive contingencies” was either important or essential to project success. Scope definition is most important when an emergency project is being delivered using lump sum payment provisions, because the contractor must include contingencies for scope risk in the lump sum. In unit price contracts, the owner shares the scope risk with the contractor (Schexnayder and Mayo 2004).

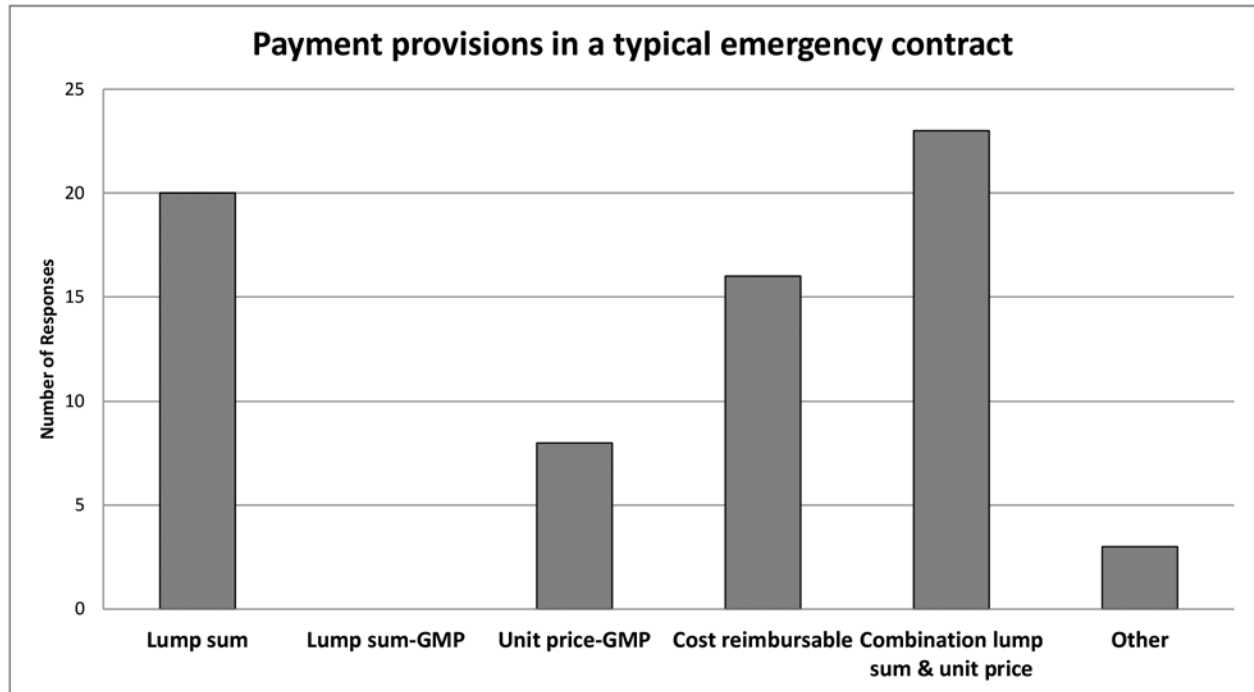


FIGURE 33 Emergency contract payment provisions.

Figure 33 illustrates the survey result regarding emergency contract payment provisions and shows that two-thirds of the respondents use lump sum contracts. The combination lump sum-unit price contract mitigates the risk for the features of work that are unit priced, but the risk for the lump sum portion remains with the contractor. Research by Mogren (1986) and Kirby et al. (1988) proved that the major causes of routine construction contract modifications are *design scope deficiencies*, and correcting the deficiencies accounts for 56 percent of all modifications after construction contract award. Another study found that deviations resulting from design errors discovered during construction account for 79 percent of all modification costs and average 9.5 percent of the total project cost (Burati et al. 1992). A more recent study confirmed the value of a comprehensive scope of work when it found that construction cost growth was inversely proportional to preconstruction/design costs (Gransberg et al. 2007). The agreement between the two survey responses and the literature leads to a conclusion that investing in a preliminary consultant contract to quantify the scope of both the design and construction work appears to be worthwhile. The conclusion is confirmed by two of the case study projects where the DOT actually hired a consultant to develop a preliminary scope of work.

Emergency Scope Definition Contract Content

Table 17 contains the responses of the survey respondents who used a preliminary contract to scope emergency projects. It shows the level of effort in those contracts. Completing a preliminary design is the most frequently included task. It is also worth noting that most of the agencies that use

this approach also ask the consultant to conduct geotechnical investigations and verification testing. These engineering work items connect nicely with the previously quoted contractors' assertion that owners can reduce costs by "doing their homework" and "hiring the best possible geotechnical and environmental firms to provide early, pre-bid data" (Christensen and Meeker 2002). The intersection of these two bits of independently derived information points to retaining a consultant to prepare a preliminary scope of work and perform limited geotechnical and environmental testing as an effective practice that could be included in a DOT's emergency procurement plan. It also demonstrates the need for research to both recommend the optimal content of this type of contract and document its effectiveness through analysis of its costs and benefits in terms of time/user costs as well as its impact on construction cost growth.

EMERGENCY CONTRACT TYPES

NCHRP Synthesis 379 (Anderson and Damjanovic 2008) evaluated routine contracting practices to accelerate the delivery of infrastructure projects. It looked at 43 different methods currently in use. Many of these methods are applicable to expediting procurement procedures for emergency contracts. Those that are not were discarded from the analysis. The content analysis also identified a number of contracting methods that are used specifically for emergency projects. The contract types found in *Synthesis 379* were combined with those found in the content analysis and categorized in three groups. Finally, contract types found in the survey were added to the population.

TABLE 17
PRELIMINARY SCOPE DEFINITION CONSULTANT CONTRACT

Content of Preliminary Scope Definition Contract	No. Responses
Inventory of features of work to be repaired/replaced; preliminary design	10
Inventory of features of work to be repaired/replaced; design recommendations	8
Review of records and geotechnical investigation of critical areas	8
Review of records and preliminary permit(s) development	8
Review of records and limited verification testing	7
Cost estimate	6
Inventory of features of work to be repaired/replaced; no design	5
Traffic control plan and/or implementation	5
Develop and submit permit application(s)	4
Public information planning	4
Risk analyses	2

The first category included contract types with the ability to directly establish an expedited schedule. For instance, cost-plus-time bidding competes the schedule as well as cost, allowing the agency to award to the fastest schedule at a higher price. Sole source contracts eliminate the procurement period, and therefore directly expedite the delivery by eliminating one step in the process. The second category was reserved for methods that indirectly expedite delivery by means of financial incentives and/or disincentives. It also included approaches that took advantage of active contracts and augmenting the internal workforce or adding DOT employee support to consultant/contractor organizations. The final category contained other methods that did not fit in the first two categories but if applied properly could also reduce the reaction time to an emergency. Table 18 is the output from that analysis; it shows 27 different methods uncovered in the literature review, content analysis, and survey. The glossary defines all the methods in the table.

The survey also asked respondents to indicate the types of project delivery methods and procurement procedures that were used in both routine and emergency project. Figure 34 shows the responses to that question and shows that the most commonly used project delivery method is DBB and most common procurement procedure is low bid. This result further supports the idea that the use of traditional contracting techniques to the greatest extent practical is a key success factor for emergency projects. Table 19 provides examples of contracts used in nine states to expedite emergency project delivery that were found in the content analysis. Note that the name for each is a local term. The type of contract can be determined by looking at the procurement procedure column. The table confirms the preference for retaining traditional contracting methods, with six of nine emergency

contracts utilizing a low bid award mechanism. The table also highlights the need to plan for emergency procurements before the emergency occurs, because six of the contract types are consummated before an emergency occurs. This allows time to do the procurement at a normal pace and without the pressure induced by the “severe emotional distress as a result of the incident” (AEMA 2009). The Office of Federal Procurement Policy identifies “the use of IDIQ contracts to have contractors available for a rapid response, and new flexibilities, including an expanded use of simplified acquisition authority” (Perry and Hines 2007).

TABLE 18
CONTRACTING METHODS FOR EXPEDITING DELIVERY OF EMERGENCY PROJECTS

Direct Expediting Contracting Methods	Indirect Expediting Contracting Methods	Other
Construction manager/general contractor (CM-at-risk)*	Alliancing*	Active management payment*
Cost-plus-time bidding*	Augment internal maintenance force with contract personnel	Cost plus
Design sequencing*	Contractor overhead costs*	Letter contract
Design-build*	Incentives/disincentives*	Lump sum bidding*
Early contractor involvement*	In-house support to outsourced consultant contract	Multiparameter bidding*
Flexible notice to proceed*	Lane rental*	
Indefinite delivery/indefinite quantity	Liquidated savings*	Pre-event logistics contract
Interim completion dates*	Modification of existing contract	Qualification-based selection
Limited competition bidding	No-excuse incentives*	
Sole source selection	Quality factors*	

*Contracting method reviewed by *NCHRP Synthesis 379* (Anderson and Damjanovic 2008).

The NYSDOT case study in chapter two demonstrates the value of IDIQ contracts, because they furnished the additional capacity to immediately mobilize design and construction resources in the aftermath of a major disaster. The MoDOT case study validates the importance pre-event contractual contingencies to minimizing the time that service capacity is lost in an emergency. Combining the results of the survey, the content analysis, and the case studies leads to the conclusion that having IDIQ contracts in anticipation of the need for emergency services is the surest contractual means to minimize the impact of an emergency.

EMERGENCY PROJECT DESIGN AND CONSTRUCTION ADMINISTRATION

No repair, restoration, or replacement work on damaged infrastructure can take place until enough of the design has

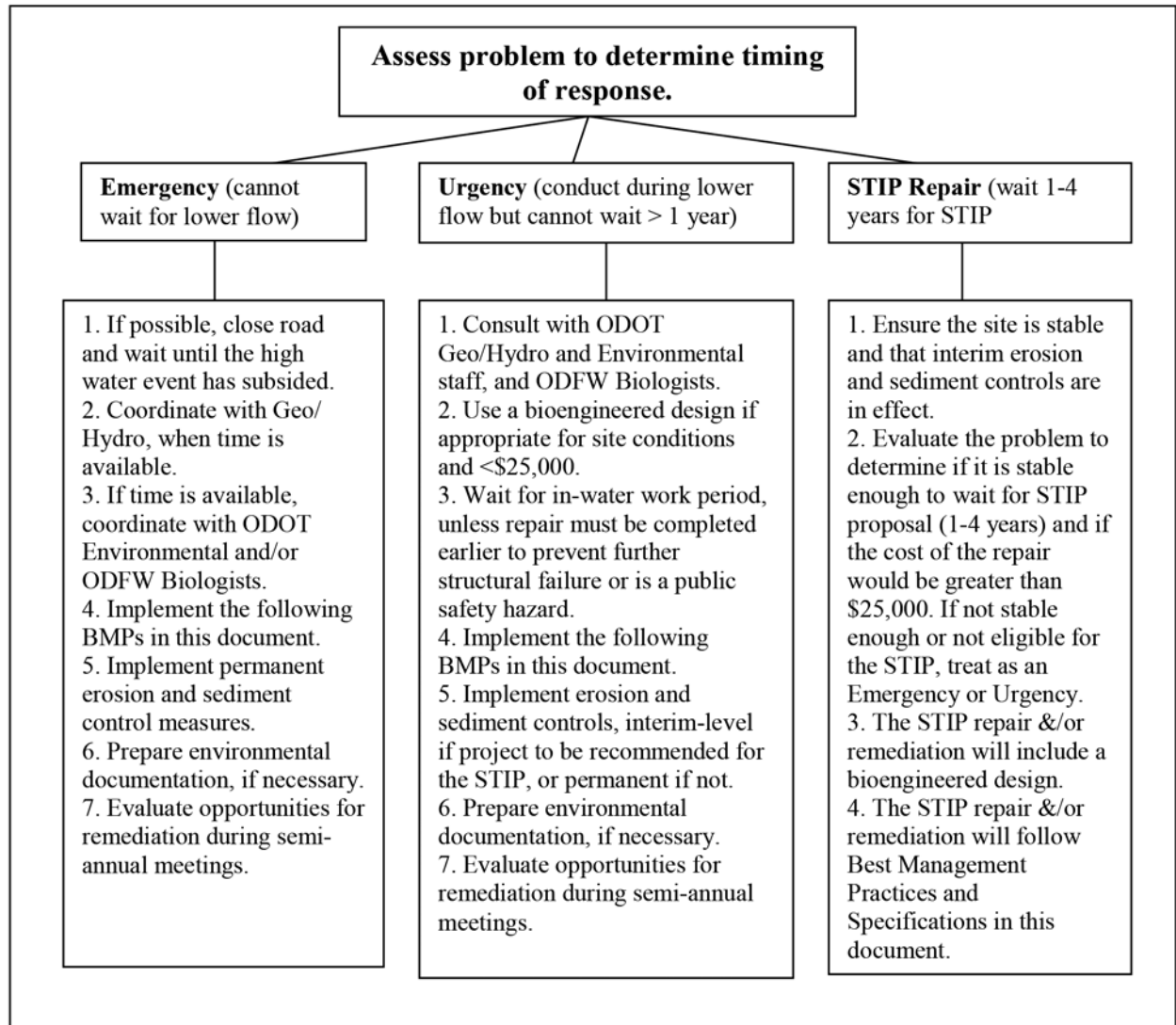


FIGURE 34 Oregon DOT emergency permitting process for emergency slope/bank failures (Apke 2002).

been completed to permit the contractor to identify the means, methods, materials, and subcontractors required to complete the emergency scope of work (Bai et al. 2006). With reaction time as the critical parameter, reducing the time it takes to make the technical decisions necessary to get construction started is paramount. Two primary components must be established: the amount of design that must be completed before releasing construction documents, and the review and approval by the DOT of the design products as they are produced by either consultants or in-house design staff.

The first factor has been facilitated by selecting a project delivery method that involves the contractor in the design process, such as CMGC or DB, or emulating NYSDOT, whose design staff worked hand in hand with the IDIQ statewide emergency bridge contractor. The Utah DOT has found that design products produced in its routine CMGC contracts can be released for construction much earlier because of contractor involvement (Alder 2007). Since the contractor is already on

board, the engineer no longer has to produce biddable construction documents and can wrap up its designs on a feature-by-feature basis when the CMGC declares it has sufficient design detail to bid out the trade subcontract work packages (Alder 2007; Schierholz et al. 2012; West et al. 2012). However, the Title 23 USC (2008) “due diligence” responsibilities of the DOT are not so easily satisfied through outsourced design (Mogren 1996). The major issue is the amount of review that an agency has the time to do in the middle of a crisis such as the aftermath of a flood or earthquake. Obviously, the linear review and comment process used in routine design contracts is not well suited for expediting procurement, and given the previously established preference for accelerating the DBB process for most emergency projects, the design review process must be altered if the required pace of design is to be met. Thus, the literature and the content analysis both found that DOTs were using expedited design review procedures that were originally developed for DB projects (WSDOT 2004; Arizona DOT 2007; Koch et al. 2010).

TABLE 19
EMERGENCY CONTRACTING METHODS FOUND IN THE CONTENT ANALYSIS AND SURVEY

Name of Contract	Agency	Procurement Procedures	Description
Emergency Force Account Contracts	Caltrans (2004)	Sole source	Begins immediately after documentation procedure Estimated total cost Location limits of work
Informal Bid Contracts	Caltrans (2004)	Low bid—As many bids as practical	Begin once the initial disaster response is accomplished
“Cut And Toss” Contract	Florida DOT (2010)	Low bid—Procure before hurricane season Selection based on resources, capabilities, and cost	Begins immediately after governor declared emergency Repair traffic signs/devices Clear debris
“H” Contract	Florida DOT (2010)	Modification to an existing contract for emergency services or materials	Must fall within the original scope or intent of the contract Used for services that will be reimbursed by federal funds FHWA approval before starting work
“Push Button” Contract	Florida DOT (2010)	Pre-event low bid IDIQ contract	Unit price contract Awarded to low bidder
Emergency DB Project	Florida DOT (2010)	Best value	Compressed schedule Minimal public involvement
Emergency Repair Contract Without Bidding	Indiana (2010)	Contract awarded to low bidder without advertising for bids	Invitation to prequalified contractors only Price below the engineer’s estimate Must invite at least one Disadvantaged Business Enterprise if practical
“Nested” DB Contract	Missouri DOT (McLain 2008)	Low bid DBB contract with an on-call DB contract embedded in the project in the event of a landslide	All bidders included a directed allowance for DB landslide repair DB contractor mobilized immediately after event
“If and Where Directed” Contract	New Jersey DOT (Perry and Hines 2007)	Pre-event low bid IDIQ contract	Unit price contract Awarded to low bidder
Statewide Emergency Bridge Contract	New York State DOT (2007)	Pre-event low bid IDIQ contract for emergency bridge work	Payment by force account. Includes cost to install temporary bridging Contractor responds within 24 hours
Debris Site Management and Disposal Contract	North Carolina (2011)	Pre-event low bid IDIQ contract for debris disposal (logistical support)	Unit price contract Awarded to low bidder Secondary contract to second low bidder 12 month duration
Limited Competition Contracts	Utah DOT (2011)	Low bid—3 or more bids; however, document the reasons if time constraints, limited interest, or lack of qualification make it impractical to solicit 3 bids	Verbal approval needed Commence work prior to a signed contract Designate authority
“Master” Contract	Wisconsin DOT (Perry and Hines 2007)	Pre-event low bid IDIQ contract	Unit price contract Awarded to low bidder

Emergency Design Reviews

The Washington State DOT (WSDOT) approach to DB over-the-shoulder design reviews is one tool that has been used to expedite the review of design while satisfying the FHWA requirements for due diligence (WSDOT 2004). The Arizona DOT also advocates this process to expedite construction start (Arizona DOT 2007). A typical WSDOT RFP over-the-shoulder design review clause is as follows:

WSDOT is expecting a proposed project that meets the design criteria and can be further developed for

construction...WSDOT is expecting to be available in a matter of hours or days, not days or weeks, to answer questions and provide feedback during the process. We would like to operate under a partnering environment with over-the-shoulder reviews, if possible (WSDOT 2004).

A second tool that was used by the Mississippi DOT to expedite the design approval process on the emergency replacement of a major highway bridge was to develop an integrated work breakdown structure where direct coordination was created between design and construction work

packages (Blakemore and Konda 2010). This allows the review of those designs to be conducted in a highly prioritized manner and can be incorporated into an emergency project plan. The details are as follows:

To achieve the first [construction] milestone, the design effort was focused to match the planned order of construction with select groups of pile bents, waterline footings, and beams being designed first to provide adequate lead time for the precast suppliers (Blakemore and Konda 2010).

The operating requirement for emergency response is to have a plan for handling the review of necessary design deliverables in a manner that does not delay construction (Kirk 2011). The Title 23 USC requirements for agency oversight are not waived in an emergency (FHWA 2011). Therefore, DOT personnel must understand what the change from routine to emergency project delivery means with regard to design review and how they can facilitate design progress rather than act as a barrier to construction start. The survey respondent from the North Carolina DOT recognized the need to expedite reviews and stated, “time constraints limit review periods.” The same thing is true for the review and approval of construction submittals on projects using expedited procurement procedures.

Emergency Construction Submittal Review

“It is evident that through a partnering atmosphere and contracting methods such as design build plus incentive disincentives clauses, encourages a contractor to expend the planning and effort and resources necessary to reduce construction time” (Schexnayder and Anderson 2010). To maintain the environment of trust and to allow the contractor to accelerate the pace of construction as desired in I/D contracts, construction submittals need to be both minimized and expeditiously reviewed. Construction submittals extend the routine project’s design by furnishing additional detail on materials, fabrications, and other elements that the designer has left open to contractor preference as a means of encouraging competition (Schexnayder and Mayo 2004). The U.S. Army Corps of Engineers (USACE) (2007) utilizes a concept that centers design responsibility on the designer of record regardless of project delivery method. “[The] philosophy is that once the designer of record approves construction and extension of design submittals, the builder can proceed—don’t wait on us, unless there is a specific government approval required” (USACE 2007). This agency hands-off approach removes the linear construction approval process in which the contractor submits to the agency, which passes the submittal to its design consultant and then returns it to the contractor with comments and either an approval or disapproval. A DOT that chose to use the USACE approach for construction submittal review on an emergency project would allow the contractor to furnish necessary construction submittals

directly to the design consultant. The consultant would have the authority to review and approve them without passing them through the DOT unless the submittal was of a specific nature that required agency approval.

One possible added value of this approach is the clarification of design liability between the agency and its consultant for the construction submittals. With the agency outside of the submittal approval loop, the consultant becomes the direct line of design responsibility and clearly liable for its actions or inaction (Mogren 1996). Based on the discussion in this section, it becomes clear that the design review and construction submittal review process could be combined in the emergency procurement management plan, and expedited procedures can be developed that see the process as single task for each work package in the work breakdown structure, as done by the Mississippi DOT (Blakemore and Konda 2010).

EMERGENCY CONTRACT SPECIAL CLAUSES AND ACCOUNTING PROCEDURES

Routine design and construction contracts must be modified to be successfully applied in an emergency situation. The MnDOT replacement of the I-35W Bridge (see chapter six for details) in 339 days (Hietpas 2008) demonstrates expedited procurement procedures in the most favorable light. The survey asked a series of questions concerning the procedures and clauses that are used to deliver emergency projects. Table 20 contains the responses to those questions. The remainder of this section discusses how the other research instruments relate to the survey responses shown in the table.

Emergency Permitting Procedures

Only four survey respondents—California, Kansas, Minnesota, and New York—stated that their emergency contracts were constrained by a pre-event abbreviated permitting procedure. Minnesota stated that its constraints revolved around water quality and soil contamination issues. The other three did not elaborate on their constraints. The survey asked about available forms of expedited permit procedures. The first was the use of an abbreviated permit application (Perry and Hines 2007), and the second was the ability to use a progressive permitting procedure. Progressive permits allow construction to begin based on a limited permit for specific items. As long as the construction activity does not exceed the limits of the permit, it is allowed to continue. As the design becomes more developed and specific environmental protection/mitigation measures are included to address more issues, the authority of the permit gets larger until a complete permit is issued at design completion (Koch et al. 2008). The DOTs in 17 states have some form of expedited permit procedures, as shown in Table 21.

TABLE 20
EMERGENCY PERMITTING PROCEDURES, RISK MANAGEMENT, AND CONTRACT CONTENT

Survey Question			
Permitting Procedures	Yes	No	NA
Are your emergency contracts constrained by expedited, abbreviated, or progressive permitting requirements that were negotiated in advance or as a result of the emergency?	4	13	13
Are abbreviated permit applications authorized to deliver emergency projects?	13	4	13
Are progressive permits authorized for use to deliver emergency projects?	8	2	20
Risk Management	Yes	No	Unsure
Is a formal risk analysis conducted on an emergency procurement prior to?	5	18	7
Do your emergency project cost estimates involve an analysis of uncertainty (i.e., was a range cost estimate developed; rational development of contingency)?	10	20	0
Do you employ any formalized risk allocation techniques to draft the contract provisions?	3	27	0
Contract Content	Yes	No	Unsure
Does your agency currently have a contract document that was specifically developed for emergency projects?	5	25	NA
Are abbreviated contract forms authorized for emergency projects?	19	11	NA
Do you use different contract forms based on the size/value of the emergency projects?	7	20	3
Do you use emergency contract clauses such Davis-Bacon prevailing wage rates that comply with requirements for federal-aid highway funding?	18	4	8
Do you use emergency contract clauses, such as the FEMA schedule of allowable equipment rental rates that comply with requirements for FEMA funding?	13	8	9
Do the project cost and schedule control procedures differ on an emergency contract from those used in a typical contract?	7	19	4
Do the accounting procedures differ on an emergency contract from those used in a typical contract?	9	21	NA
Do your emergency contracts contain liquidated damages?	22	8	0
Do you use warranties in emergency projects?	4	22	4

NA = not available.

TABLE 21
EXPEDITED PERMITTING PROCEDURES

DOT	Abbreviated Permit Applications Authorized	Progressive Permitting Authorized
Alaska	Y	N
California	Y	Y
Colorado	Y	Y
Florida	Y	Y
Maine	Y	Y
Massachusetts	Y	N
Minnesota	Y	Y
Mississippi	N	Y
Montana	Y	Y
North Carolina	Y	N
Nebraska	Y	N
New York	Y	Y
Ohio	Y	N
South Carolina	Y	N
Virginia	N	Y
Washington	Y	N
Wisconsin	Y	N

Y = yes; N = no.

The issue of emergency permits basically revolves around the trade-off between the urgent need to protect life and property and the laws protecting the environment. This is a gray area. However, the Council on Environmental Quality has issued the following guidance on the subject:

Where emergency circumstances make it necessary to take an action with significant environmental impact without observing the provisions of these regulations, the federal agency taking the action should consult with the Council [on Environmental Quality] about alternative arrangements. Agencies and the Council will limit such arrangements to actions necessary to control the immediate impacts of the emergency. Other actions remain subject to NEPA review (40 C.F.R. § 1506.11).

The Vermont Agency of Transportation (VTrans) emergency management manual differentiates between actions necessary during the crisis and the work necessary after the crisis has passed:

Prior to any work being performed under the recovery phase, the [engineer] must make contact with the VTrans Program Development Regional Environmental Specialist and applicable regulatory agencies to advise them of the emergency status of the activities planned and/or underway and to discuss the need for permits or clearances for this work (VTrans 2011).

The Oregon DOT Emergency-Urgency Users Guide (Apke 2002) furnishes a typical example of how one agency deals with emergency permitting requirements. In this case, the flow chart is shown in Figure 34. The figure shows how the Oregon DOT differentiates between an emergency, which must be dealt with immediately, and an “urgency,” which can wait until the high water has dropped. This agrees with the concept discussed earlier by VTrans and the Council on Environmental Quality guidance to the effect that an abbreviated permitting process is authorized *only for those situations where an immediate solution is required*. This leads to the conclusion that emergency permits must be carefully reviewed and the agency must be able to clearly document its rationale for shortcutting or bypassing the routine process based on a clear urgency of need to protect life and property.

Emergency Project Risk Management

Mitigating risk to the community is the essence of emergency contracting. So the survey sought to identify what, if any, formal risk management techniques were appropriate for these types of projects. The results in Table 20 show that cost risk is the one most often addressed, but by only one-third of the respondents. All the respondents that elaborated on that question indicated that they develop contingencies as a risk management tool. Of the three responses to the question about translating risk allocation to contract clauses, one respondent said the DOT does this on a “case by case - things such as day for day weather, allow higher percentage of sub-contracting, and DOT direct purchase of certain materials.” The survey results show that risk management is not an area where DOTs invest a lot of effort on emergency contracts. Roughly 75 percent of the respondents rated development of a formal risk mitigation plan as “not important” for the success of an emergency project. It would seem logical that the reason is that they do not have the time to engage in such an esoteric pursuit during an emergency. Thus, the survey has uncovered a gap in the body of knowledge, and a recommendation can be made to do research in the area of optimizing risk management with the time available to conduct the analyses for emergency projects.

Emergency Contract Content

Table 21 shows that the content of emergency contracts does not differ much from routine contracts. Most of the respondents do not use different contract forms, different project control measures, or special accounting procedures. Most apply liquidated damages to their construction contracts, and the use of warranties does not appear to be higher or lower than normally expected from a national cross section of DOTs (Scott et al. 2011). Taken together, the conclusion reached in an earlier chapter that the use of contracting methods with which the agency is familiar is reinforced. Put another way: Familiarity equals confidence, and confidence permits DOT procurement, design, and construction personnel to accel-

ate the delivery of an emergency project and make the hard, time-sensitive decisions with less fear that they may be in violation of procurement laws and regulations.

Emergency accounting procedures and project control measures are related, since the accounting output becomes input to the cost and time variables for the project control measures. The DOTs that responded that they had different accounting procedures in an emergency contract typically cited the need to track and document costs to gain reimbursement from FHWA ER funding or FEMA funding. Minnesota indicated that it needed to track time for DOT staff and the use of materials on hand as its major change in accounting during an emergency. South Carolina stated that the need to account for expenditures in a cost-reimbursable contract required a different accounting system from the routine.

Anderson and Russell (2001) describe the motivation that underlies the use of warranties on routine contracts:

Warranty contracting has been implemented in an attempt to reduce the amount of [agency] resources required on a highway project, to reallocate performance risk, to increase contractor innovation, to increase the quality of constructed products, and ultimately to reduce the [life cycle costs] of highway projects. *Warranty contracting places a greater emphasis on the quality of the constructed product than the traditional design-bid-build contracting method...* (Anderson and Russell 2001; italics added).

The motivation does not change in an emergency, and the increased project delivery pace demands a “greater emphasis on the quality of the constructed product.” Thus, the use of warranties on emergency projects is not only logical but also justifiable as a risk mitigation measure. However, the use of warranties is controversial in many states because a “warranty is an absolute liability on the part of the Warrantor, and the contract is void unless it is strictly and literally performed” (Hancher 1994). A recent study (Scott et al. 2011) found that “[s]everal DOTs reported quality improvements ... including Mississippi DOT, INDOT, and WisDOT. However, these DOTs admit that accurate, quantitative comparisons to support the effectiveness of warranties are difficult to achieve because of the many variables affecting project performance.”

Nevertheless, four survey respondents reported using warranties on emergency contracts. Delaware and Florida indicated that they simply promulgate their standard construction warranty as a part of the emergency contract. Minnesota and Mississippi stated that they use warranties only on emergency DB projects. DB project delivery demands that the DOT turn control over the design details to its design-builder (Koch et al. 2010). Therefore, requiring the entity that both designed and constructed the project to furnish a warranty makes sense. Coupling a warranty with the over-the-shoulder design review process previously discussed

enabled MnDOT to satisfy its Title 23 USC (2008) due diligence responsibilities while facilitating the replacement of the I-35W at a record speed (Hietpas 2008). This discussion leads to the need to understand the factors that affect quality of both design and construction in the emergency project.

Factors That Influence the Success of Emergency Projects

Figure 35 shows how the survey respondents rated the importance of various procurement factors. The top four factors are

a clear definition of an emergency, sufficient scope definition, highly qualified designers and contractors, and streamlined permitting process. These results validate the conclusions reached previously in each of those subject areas.

The least important factors all deal with the traditional planning process for both risk and quality management. This result implies that if highly qualified consultants and contractors are retained, expending the time to develop formal risk and quality management plans becomes less critical. The inference agrees with a paper on design and construction quality management in

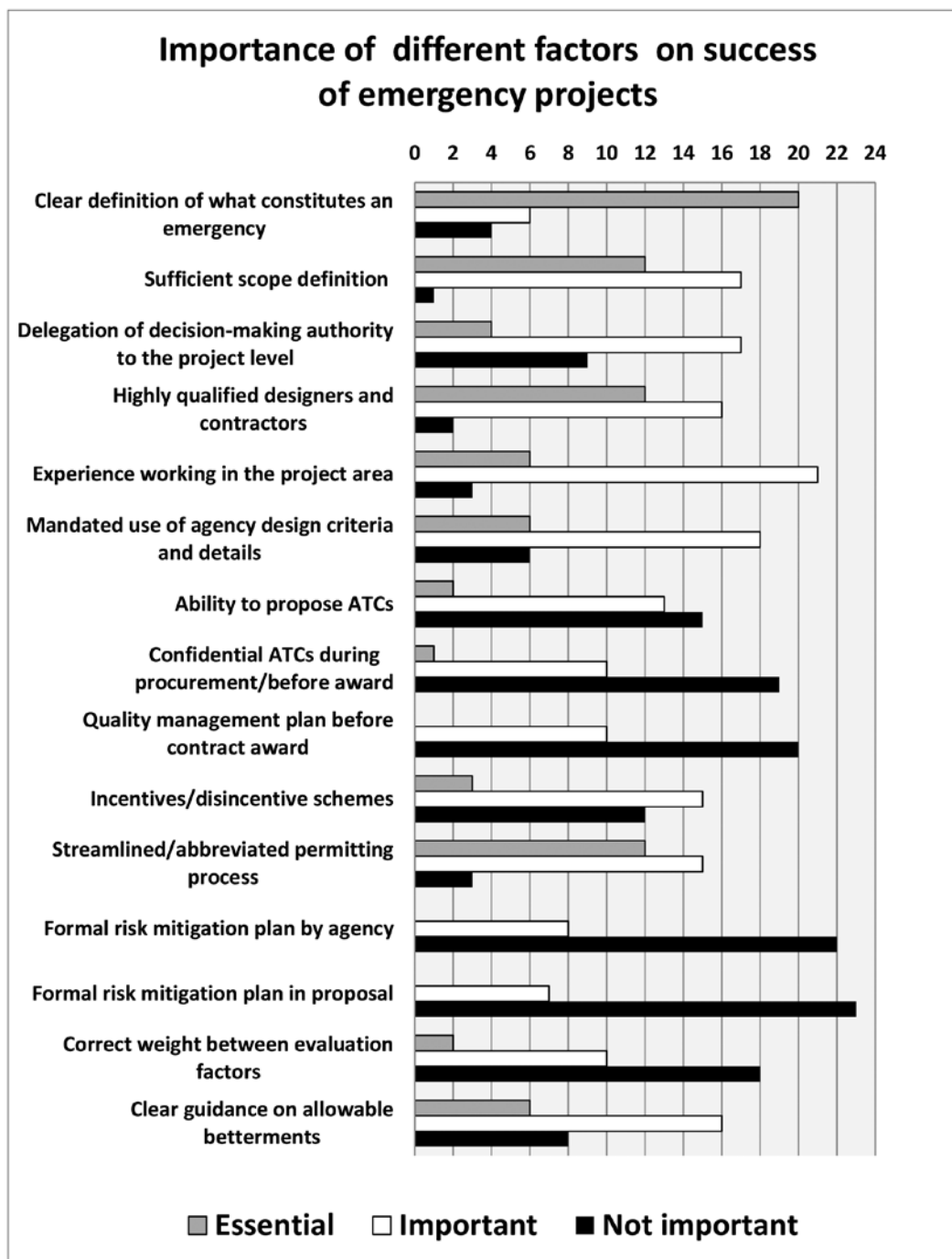


FIGURE 35 Importance of different factors on success of emergency projects.

DB projects, which found that the most frequently used quality management technique was to select highly qualified design and construction personnel who worked for highly experienced firms (Gransberg and Molenaar 2004). The Missouri DOT case study project demonstrates one way to achieve specific emergency qualifications without limiting competition. Its “nested” DB contract ensured that a highly qualified geotechnical DB firm would be immediately available in the event of a landslide. The Utah DOT chose to use CMGC on its Cedar Canyon case study project in order to bring highly qualified designers and contractors to the emergency project. The intersection of the survey, the literature, and the case studies leads to the conclusion that the quality of the personnel and firms that will design and build an emergency project is more important than the administrative planning processes, because time is of the essence in an emergency.

Consultant and Contractor Perspectives on Impact of Expedited Procurement Procedure

Structured interviews were held with four consulting engineers and five contractors, all of whom had experience with

expedited procurement procedures for emergency contracts. The primary goal of the interviews was to gauge perceptions of the efficacy and impact of expediting procurement. In public policy, perceptions are often just as important as facts. Legislative action is heavily influenced by perceptions, and while changing procurement procedures in an emergency is easy to justify, the design and construction industries represent a politically potent group. Hence, emergency public infrastructure projects have to overcome the perceptions that expedited project delivery would result in an inherently poor-quality and possibly unsafe final product. One report on DB implementation classifies perceptions as “barriers to broad acceptance” (Byrd and Grant 1993). Therefore, it is important to see the industry’s perspective and compare it with the agency perspective.

The 10 representatives were asked to rate the importance of a list of project aspects to the success of an emergency project. Figure 36 shows the results of the interviews. Because the consultants were asked about the success of the design and the contractors were asked to focus on the constructed facility, the most notable difference because of the differing

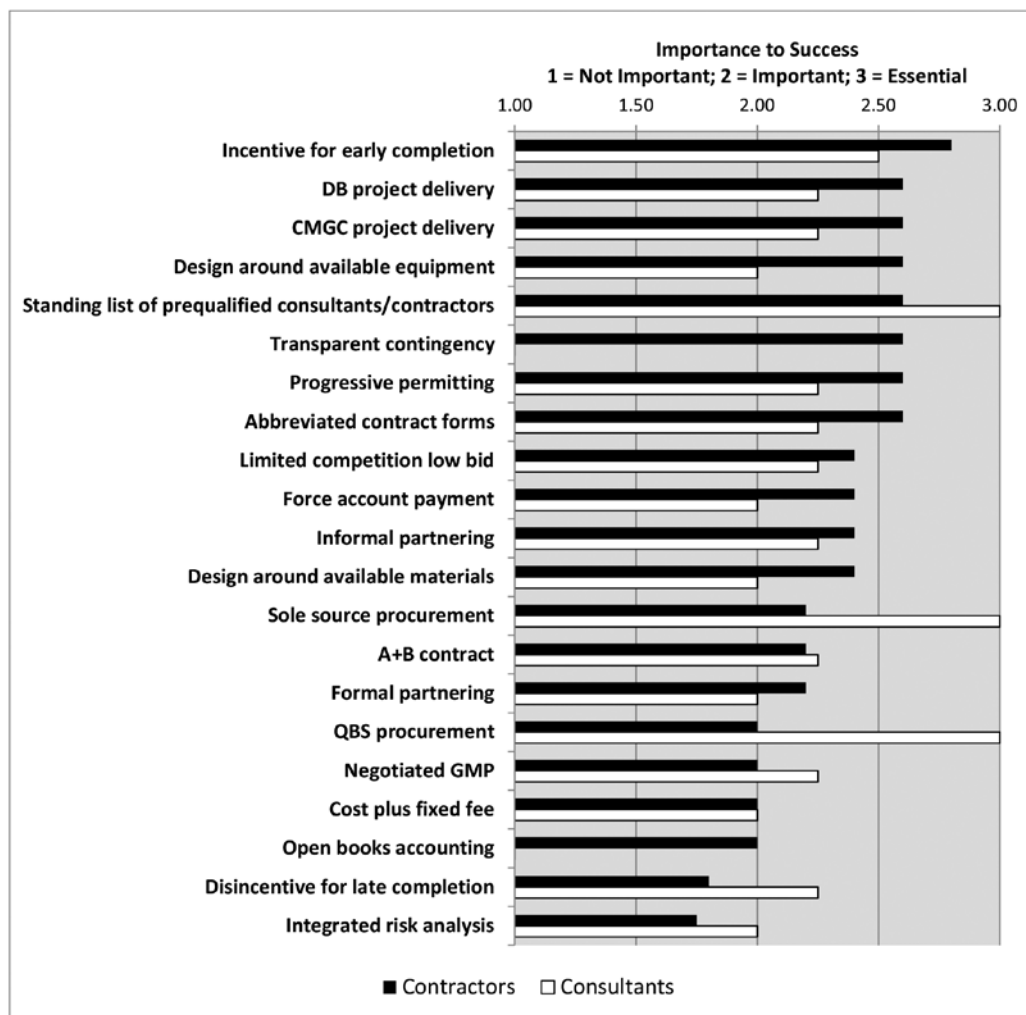


FIGURE 36 Consultant and contractor perceptions of the importance of emergency procurement.

focus is the consultants' rating of sole source and QBS procurement as essential, in contrast to the contractors' somewhat lower rating. However, DOT maintenance of a standing list of prequalified consultants and contractors willing to do emergency work was rated highly by both groups. Each interviewee was asked to name an expedited procurement practice that was particularly effective in his or her opinion, and the prequalified standing list of sources was the most frequently cited practice by both groups. The agreement between the owners regarding the importance of contracting with highly qualified and experienced designers and contractors and the perceptions of industry regarding a standing list leads to the conclusion that developing and maintaining a list of prequalified sources of emergency services is an effective practice. Both the literature review (McLain and Shane 2009; Blake-more and Konda 2010) and the content analysis (ODOT 2010; UDOT 2011) found examples of prequalification procedures and procurement mechanisms for consultants and contractors to register their willingness to make their firms available for emergency work and serves as validation for the conclusion.

Figure 37 shows the industry perceptions of the impact of expedited procurement procedures on the various aspects of the project. Both groups are roughly in agreement, rating all aspects except "achievement of DBE goals" and "probability of protest" in the same range. None of the consultants had an opinion about responsiveness to warranty callbacks, which makes sense since they are often discharged from a project after construction is complete.

The results of the industry structured interviews strongly suggest that the methods in use to expedite the procurement of emergency projects are viewed as both effective and equitable. Figure 37 shows that only two aspects out of 21 are perceived as getting worse when expedited procurement procedures are implemented. Hence, the industry can be eliminated as a barrier to implementation and can be counted on to support the agency when it waives routine competition requirements to swiftly relieve an infrastructure crisis.

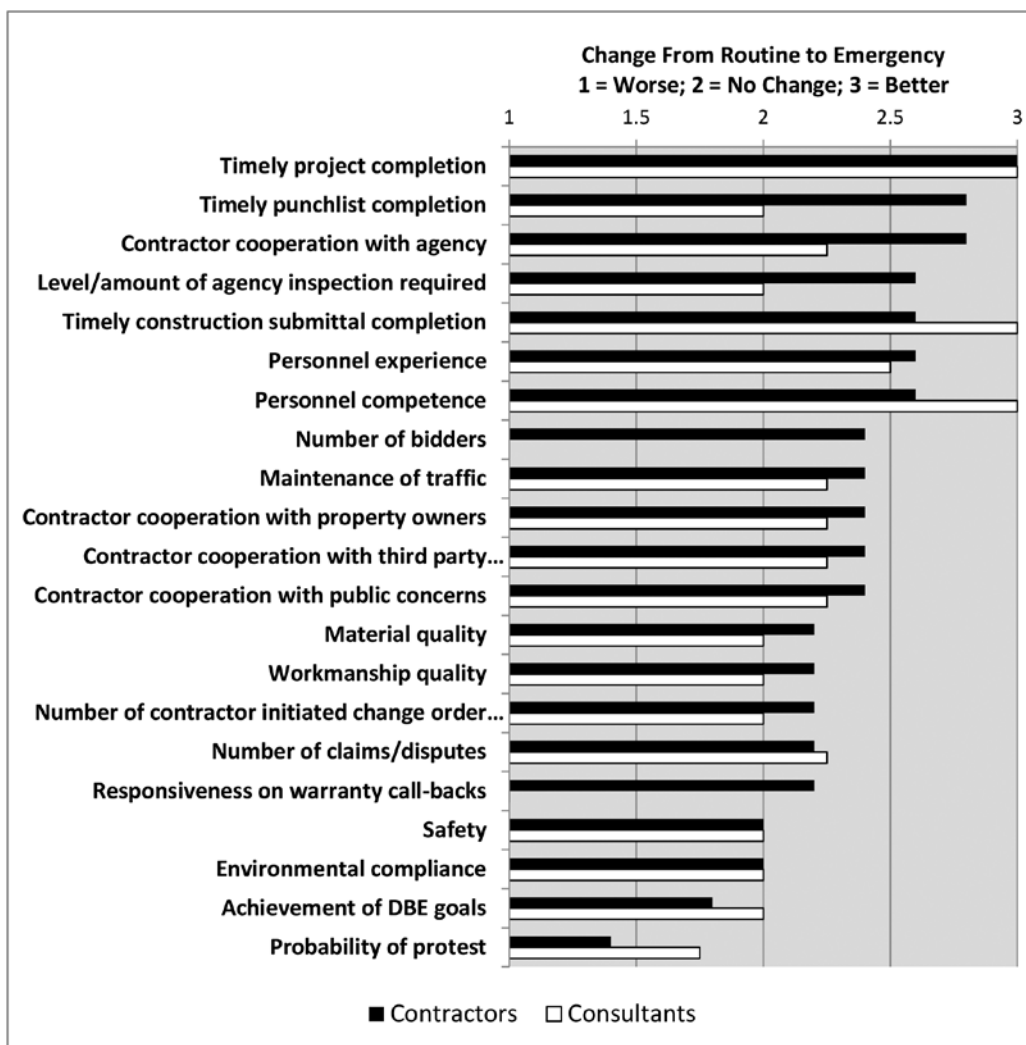


FIGURE 37 Consultant and contractor perceptions of emergency procurement impact.

CONCLUSIONS, EFFECTIVE PRACTICES, AND FUTURE RESEARCH RECOMMENDATIONS

A number of conclusions were reached in this chapter. Additionally, several effective practices and one recommendation for future research are presented here.

Conclusions

Based on the analysis of the information discussed in this chapter, the following conclusions were reached:

- Chapter two concluded that using traditional procurement procedures as much as practical on emergency construction projects was a key to success. That conclusion can be extended to include consultant scope definition contracts as well, based on findings in the literature.
- The survey responses intersected with the literature, supporting a conclusion that investing in a preliminary consultant contract to quantify the scope of both the design and construction work adds value to the expedited procurement process.
- The output from the survey, the content analysis, and the case studies conclude that having IDIQ contracts in anticipation of the need for emergency services is the surest contractual means to minimize the impact of an emergency.
- Careful review of emergency permits helps ensure that the agency has clearly documented its rationale for shortcutting or bypassing the routine process based on a clear urgency of need to protect life and property. The statutes (40 C.F.R. § 1506.11) authorize an abbreviated permitting process *only for those situations where an immediate solution is required*.
- The survey, the literature, and the case studies all support the notion that the quality of the personnel and firms that will design and build an emergency project is more important than the administrative planning processes, because time is of the essence in an emergency.

Effective Practices

This chapter's analysis of DOT emergency management documents, the literature, and the survey results identified a number of effective practices that other agencies could immediately implement:

- NYSDOT's IDIQ contract for statewide emergency bridge work enables the agency to immediately react to a variety of bridge-related emergencies while maintaining full and open competition.
- MoDOT's use of a nested DB contract for specialty services inside a DBB demonstrates another approach to furnishing pre-event capacity to quickly react to a specific emergency such as a landslide without limiting competition on the larger contract.
- By letting seasonal contracts for debris removal and disposal, FDOT provides standby capacity to address high-frequency emergency events such as hurricanes and obtain competitive pricing.
- Developing and maintaining a list of prequalified sources of emergency services is an effective practice based on the agreement found between DOT survey respondents and the consultant/contractor interviewees citing the importance of contracting with highly qualified service providers. These findings support the use of a standing list of prequalified consultants and contractors.

Future Research Recommendations

The recommendation is for research that explores the costs and benefits of implementing formal risk management procedures on emergency projects. The research would weigh the possibility of optimizing risk management with the time available to conduct the analyses for emergency projects.

CHAPTER SIX

EMERGENCY PROCUREMENT LAW, LEGAL CASE STUDIES, AND RELEVANT CASE LAW**INTRODUCTION**

Among the most important legal issues confronting a public agency that is faced with an emergency are those associated with procurement of the repair. The agency's decision maker may confront the following questions:

- Does this situation fit within the definition of emergency repair work?
- Do we have procurement laws that specifically address emergencies, and how much are our hands tied to use truly expedited procurement procedures?
- How do we contract with contractors and others to get them on board with the repair?
- What are our risks for a protest or a lawsuit because of what we are doing?

Although these may be legal questions, they are also policy and project management questions—procurement goes to the heart of how the agency will respond to and remedy the problem. Given that quick action is paramount, the agency needs to consider the answers to these questions well before an emergency hits. This chapter will give some guidance as to what the answers are.

EMERGENCY REPAIR WORK DEFINED

There is a significant difference between what is required to conduct a valid procurement for emergency and nonemergency situations. In general, agencies faced with an emergency have the flexibility to take whatever actions are appropriate to address the emergency. Often, the required scope of work must be quantified before expedited construction can commence. Therefore, having flexibility in the procurement of preliminary design consultant is beneficial. The need for flexibility can also mean that the agency may not be awarding construction contracts to the lowest responsive, responsible bidder, drawing scrutiny on whether the remediation is truly emergency repair work.

23 CFR 668.103 provides important definitions that bear upon this question relative to the policy and program guidance for the administration of emergency funds for the repair or reconstruction of federal-aid highways suffering serious damage from natural disasters. Key definitions from this statute include the following:

Catastrophic failure. “The sudden failure of a major element or segment of the highway system due to an external cause. The failure must not be primarily attributable to gradual and progressive deterioration or lack of proper maintenance. The closure of a facility because of imminent danger of collapse is not in itself a sudden failure.”

Emergency repairs. “Those repairs including temporary traffic operations undertaken during or immediately following the disaster occurrence for the purpose of:

1. Minimizing the extent of the damage,
2. Protecting remaining facilities, or
3. Restoring essential traffic.”

Natural disaster. “A sudden and unusual natural occurrence, including but not limited to intense rainfall, floods, hurricanes, tornadoes, tidal waves, landslides, volcanoes or earthquakes which cause serious damage.”

Serious damage. “Heavy, major or unusual damage to a highway which severely impairs the safety or usefulness of the highway or results in road closure. Serious damage must be beyond the scope of heavy maintenance.”

FHWA cites, as an example of a catastrophic failure from an external cause, a bridge suddenly collapsing after being struck by a barge (Kirk 2011).

Other definitions will be important in answering this question. The President of the United States has authority under Title 42, United States Code, Chapter 68—Disaster Relief, §5121, et seq., to declare emergencies. Consequently, while the most common forms of emergencies are those natural disasters cited previously, the impacts of a terrorist attack can also be classified as emergencies, as was done for New York City on September 11, 2001.

States have their own definitions of what constitutes an emergency. For example, Caltrans relies on the California Public Contract Code, Section 1102, which defines an emergency as “a sudden unexpected occurrence that poses clear and imminent danger, requiring immediate action to prevent or mitigate the loss or impairment of life, health, property,

or essential public services.” Another example is Florida, where an “emergency” for FDOT will be a state of emergency declared by an Executive Order or a Proclamation of the Governor, triggered by a determination by the governor “if she or he finds an emergency has occurred or that the occurrence or the threat thereof is imminent” [Section 252.36(2), F.S.].

Hawaii’s definition is tied to the definition of “emergency procurement,” which can be used when the following conditions occur:

1. A situation of unusual or compelling urgency creates a threat to life, public health, welfare, or safety by a major natural disaster, epidemic, riot, fire, or such other reason determined by the head of the purchasing agency;
2. The emergency condition generates an immediate and serious need for goods, services, or construction that cannot be met through normal procurement methods and the government would be seriously injured if the purchasing agency is not permitted to employ the means it proposes to use to obtain goods, services, or construction; and
3. Without the needed goods, services, or construction, the continued functioning of government, the preservation or protection of irreplaceable property, or the health and safety of any person will be seriously threatened (Section 103D-307, HRS).

The consequences of an agency finding that an emergency exists are profound. It not only is the triggering event for using a specific type of procurement approach, but will also potentially result in sources of funding. A declaration of an emergency under federal law can make money available under both FHWA and FEMA programs. In the case of FHWA programs, funds are made available to reimburse the state for expenditures related to bringing roads back into usable condition. In the case of FEMA programs, funds may be available up front to fund emergency efforts (Perry and Hines 2007).

Some agencies have tried to argue that they have the right to use emergency procurement methods to avoid the lapse of funds at the end of the fiscal year. An example is Illinois, which specifically provides that emergency contracting may be done when “immediate action is necessary to avoid lapsing or loss of federal or donated funds.” Other state procurement handbooks point out that failure to plan ahead, or the possibility of loss of funds at the end of the fiscal year, is not an “emergency.” The *Alaska Field Operations Guide*, for example, states in the introduction that the “potential loss of funds at the end of the fiscal year is not considered an emergency” (Perry and Hines 2007).

PROCUREMENT AND PROJECT DELIVERY APPROACHES GOVERNING EMERGENCY REPAIRS

Once an agency concludes that it has an emergency requiring repairs to its facility, it must decide not only what work needs to be done, but also what type of project delivery and procurement processes it will use. FHWA’s June 26, 2008, Memorandum on the Procurement of Federal-Aid Construction Projects confirms that emergencies do not require award to the lowest responsive, responsible bidder. This memorandum states that emergency repair work may be accomplished by contract, negotiated contract, or public agency force account methods under 23 CFR 668.105(i).

The Model Procurement Code (ABA 2000) provides guidance on emergency procurements, giving the decision maker the authority to procure, “with such competition as is practicable under the circumstances.” §3-206 of the Code (Emergency Procurements) states—

Notwithstanding any other provision of this Code, the Chief Procurement Officer, the head of a Purchasing Agency, or a designee of either officer may make or authorize others to make emergency procurements when there exists a threat to public health, welfare, or safety under emergency conditions as defined in regulations; provided that such emergency procurements shall be made with such competition as is practicable under the circumstances. A written determination of the basis for the emergency and for the selection of the particular contractor shall be included in the contract file.

The commentary to the code highlights that this type of procurement does not permit the delay involved in using more formal competitive methods. Noting that while in a particular emergency an award may be made without any competition, the commentary makes it clear that the intent of the code is to require as much competition as practicable in a given situation and that any procurements treat all bidders fairly.

Every state has its own version of emergency procurement language adapted from the Model Procurement Code. For example, the Virginia Public Procurement Act states that in the case of an emergency, a contract may be awarded without competitive sealed bidding or competitive negotiation; however, such procurement shall be made with “such competition as is practicable under the circumstances.” It requires a written determination of the basis for the emergency and for the selection of the particular contractor. Likewise, the public body will be required, among other things, to issue a written notice stating that the contract is being awarded on an emergency basis and identify what is being procured and the selected contractor.

FDOT’s (2010) emergency procurement procedures state that FDOT may conduct procurement activities for repair, restoration, and other services “as necessary to cope with the emergency.” Although noting that competitive propos-

als “should be acquired, whenever practical,” “in no way should it prevent, hinder, or delay necessary action in coping with the emergency.” The procedures go on to say that at least three quotes/proposals should be considered if FHWA or FEMA reimbursement will be requested, “but in no way should it prevent, hinder, or delay necessary action in coping with the emergency.”

Some agencies use cost reimbursable (also called force account) processes for their emergency procurements. Caltrans does so, and specifically notes that when time is of the essence to reopen the roadway or facility, or there is a need to prevent imminent failure, a no-bid, sole source, emergency contract is allowed for this cost-reimbursable work (Caltrans 2010). Selection of the contractor under Caltrans processes is made on factors that include (a) availability of resources; (b) mobilization response time; (c) proven management abilities; and (d) current contractor’s license.

Agencies that have the authority to use DB and other alternative delivery processes will frequently use them for emergency repair work. FHWA cites numerous examples of delivery systems and procurement approaches that use DB for emergency repairs. Notable is the Louisiana Department of Transportation and Development, which awarded a \$40 million DB contract for the emergency repair of the I-10 Twin Span Bridge project, which is the bridge over Lake Pontchartrain between New Orleans and Slidell. The Twin Spans were severely damaged by Hurricane Katrina, and the primary factor in using DB was to accelerate the project schedule in order to reopen I-10 to traffic as quickly as possible. Among the major emergency repair projects using DB is MnDOT’s I-35W project, which is discussed in more detail later in this chapter.

CONTRACTING APPROACHES

A variety of contracts can be used in emergency repair contracts: oral contracts, letter contracts, limited acquisitions, or full and open competitive bidding. Frequently an agency will issue a modification to an existing contract for work in the area. This type of action can raise an issue over whether the procurement is within the scope of the original contract. To avoid this issue, an agency may decide to procure a new contract, whether on a force account basis or on a stipulated price. The key question is what flexibilities exist in the agency’s contracting procedures to address emergency situations (Perry and Hines 2007).

One of the common legal problems that agencies face is that they are in such a rush to get to a contract that they loosely address important contract issues, such as scope of work, cost, and record-keeping obligations of the contractor. An example was cited by the auditors for the city and county of Honolulu, as they examined the Sole Source, Emergency, and Profes-

sional Services Procurement Practices of the City and County (Report No. 05-01, March 2005). The report noted that in December 2003 and January 2004, heavy rains damaged roads in the heavily traveled streets in downtown Honolulu. Honolulu initiated emergency road repaving services, and contacted three vendors. Only two agreed to handle these repairs. The city budgeted \$1 million for each of the two contractors and issued \$500,000 purchase orders to each of the contractors to initiate the repairs. Both contractors reported to the auditors that the city did not require them to guarantee their repaving work, and one of the contractors commented that had the city included a requirement for a guarantee in the purchase order, the contractor would have agreed to provide it.

The auditor also noted that the city’s procurement files lacked any information identifying the actual locations of the roads to be repaved. One of the contractors involved in the emergency repaving project told the auditors that the scope of work for the emergency repairs was not well defined and was a moving target. A few months after the first set of purchase orders, the city issued a second purchase order for the remaining \$500,000 budgeted for the emergency repaving work, simply using a copy of the original emergency procurement request to justify the purchase. However, the city failed to provide any additional information on the emergency request form on the road locations that would be repaved, even though repair work was under way. The auditors concluded that setting aside \$1 million for emergency repaving without specifying the stretches of road to be restored is “an open-ended approach that is not a prudent way to control the expenditure of city funds for this work.”

To avoid problems of having to quickly enter into contracting relationships, many DOTs have used IDIQ contracts to literally put a contractor on call to perform a specific set of services. This is a contract arrangement extensively used by the federal government to enter into a contract that identifies the type of work to be performed, and generally negotiates most rates, but does not specify where and when the work is to be performed until the work is needed. Specific work assignments and work details are set forth by the issuance of task orders against the IDIQ. This allows an agency to have contractors on standby, and generally multiple contractors are awarded these contracts. There are many nuances to this type of contracting approach, but suffice it to say that this is a prudent way of being able to mobilize a contractor on emergency projects. For example, the oil and gas industry routinely uses IDIQ contracts to address emergency responses for environmental incidents, including oil spills. FDOT uses them extensively to stage prehurricane debris removal efforts.

CONFLICTS AND CASE LAW

Unlike many other areas of construction and government contract law, relatively few cases address legal issues associ-

ated with an emergency procurement. It is highly likely that there are informal protests over an agency's actions that are not reported. Many of these protests would likely deal with "normal" issues associated with selection, such as whether the evaluation of the proposers was flawed and whether the agency made a mistake in how it assessed one proposer versus another. Other likely disputes are more typical construction disputes dealing with delays, differing site conditions, changes, and failure to perform the work as specified. There is nothing unique about emergency procurements that would affect the way these types of issues are to be handled, unless the contract (e.g., purchase order) was less than complete.

The three cases discussed here involve unique issues associated with the procurement of emergency transportation projects. Each provides an example of what could go wrong and how an agency might have to respond.

Challenges Over Whether a Project Should Be Considered for Emergency Procurement Techniques

As noted earlier, there are opportunities for disputes over whether a situation can be properly characterized as an "emergency" that allows the use of emergency procurement legislation. One of the cases addressing this directly is *Sloan v. Department of Transportation*, a South Carolina case decided in 2008.

In 2000, the South Carolina DOT (SCDOT) entered into a construction contract with Eagle Construction Company (Eagle) for a road-widening project. Eagle was consistently behind schedule and, as a result, was default terminated. Eventually, SCDOT rescinded the default letter and terminated the contract with Eagle for convenience. SCDOT justified this action by concluding that the involvement of Eagle's bonding company in a default situation would delay the project by 6 months, and that even if SCDOT had itself performed a competitive bidding process for a replacement contractor, it would have taken 4 months.

Two weeks after SCDOT terminated Eagle for convenience, Sanders Brothers Construction Company (Sanders), an existing subcontractor on the project, began working on the project. Although approximately \$5–6 million remained unpaid on the Eagle contract, SCDOT directly negotiated a contract with Sanders for just under \$8 million. SCDOT did not solicit bids to complete the project.

SCDOT's director of construction wrote a memorandum to SCDOT's executive director, asking that the project be subject to the emergency procurement procedures of South Carolina law "due to the significant delays on this project and enormous inconvenience to the public" caused by the Eagle delays and termination. He noted that the emergency procurement was justified based on public safety and convenience, stating that "a large number of residences and commercial businesses

have been and are continuing to be adversely impacted by the construction. Traffic control devices are in place throughout the majority of the project and at many high volume intersections. These conditions are an ongoing safety concern and also cause significant inconvenience for residences and business owners." He further took the position that the procurement of a replacement contract through the standard bidding procedures would cause an unacceptable delay and increase frustration among the already frustrated public who live and conduct business in the area. The executive director approved his request to procure a replacement contractor using a negotiated contract method.

Sloan, a taxpayer, read about the negotiated contract between SCDOT and Sanders, and ultimately filed a lawsuit on the grounds that this situation did not constitute an emergency. Sanders ultimately completed all of the work by the time the case was heard. The South Carolina court noted that ordinarily this would mean the case would be moot. However, since there were no cases dealing with SCDOT's authorization of emergency procurement, it wanted to hear the case anyway: "Because this is a matter that could occur at any time (given the inherent unpredictability of emergencies), we find there is an urgent nature to this issue."

The South Carolina Supreme Court noted that the general rule regarding contracts is that the work must be advertised for at least 2 weeks, and then the "lowest qualified bidder" must be chosen. The only exception is in cases of emergencies, as determined by the Secretary of the State Department of Transportation. SCDOT argued that it had the discretion to decide what would be considered an emergency. Because the alternative to using the emergency procurement provision would have been to leave the construction project unfinished, and therefore a dangerous work zone, for 4 to 6 months, SCDOT argued that the facts of the case showed that it properly exercised its discretion.

The court disagreed. It cited two references in the South Carolina procurement codes that dealt with emergencies. One read that emergency procurements can only be used when there is "an immediate threat to public health, welfare, critical economy and efficiency, or safety under emergency conditions . . . and provided, that such emergency procurements shall be made with as much competition as is practicable under the circumstances." Another code reference defined "emergency" as: "a situation which creates a threat to public health, welfare, or safety such as may arise by reason of floods, epidemics, riots, equipment failures, fire loss, or such other reason as may be proclaimed by [an authorized official]. The existence of such conditions must create an immediate and serious need for supplies, services, information technology, or construction that cannot be met through normal procurement methods and the lack of which would seriously threaten: (1) the functioning of State government; (2) the preservation or protection of property; or (3) the health or safety of any person."

The South Carolina Supreme Court held that there was not an emergency as defined in that regulation or as the word “emergency” is understood in its plain meaning—which is, by its very nature, a sudden, unexpected onset of a serious condition. It stated,

Here, there was a five-mile construction zone which, according to the DOT, had “safety concerns.” These hazards, however, had existed throughout the course of the construction project and likely would have been present to some degree in any major construction project of this type. Put simply, these safety concerns did not appear unexpectedly [at the time of the termination], thereby suddenly creating a public safety risk. Furthermore, the record reflects that any urgency felt by the DOT was, in large part, due to the delays on the project and the resultant frustration by the affected community. These factual circumstances, however, do not constitute an emergency under [the South Carolina Code], as that plain and ordinary term was likely intended by the Legislature.

Challenges to the Procurement Processes Used by an Agency

Although the advantages of using DB are well known and well documented, some state statutes make it difficult to implement the process. Among the statutes that create the most challenges are those that call for construction projects to be awarded to the lowest bidder. These type of statutes impede (or even preclude) an agency’s use of qualifications and technical proposals as a component of the selection process. This can be a problem for an agency that wants to use these factors in the selection of an emergency repair contractor on a DB basis.

One of the most recent cases looking at the procurement practices of a state came in Pennsylvania, *Brayman Construction Corp. v. Pennsylvania* (2011). This case involved a contractor who mounted a successful challenge to a two-step design-build best value (DBBV) procurement by Pennsylvania DOT (PennDOT). The project arose out of PennDOT’s desire to rebuild two bridges whose structural integrity had been compromised by cracks, corroding, and other defects. PennDOT sought to reduce the overall time from the start of design to completion of the project by using a relatively new internal PennDOT publication, Publication 448, *Innovative Building Toolkit* (PennDOT 2011), which established methods for innovative procurements, including DB.

In reliance on Publication 448, PennDOT issued an advertisement seeking statements of interest from DB teams wishing to enter into a DBBV contract for the project. The advertisement requested, among other things, each team’s qualifications, resumes of key personnel, and organization charts. The advertisement notified respondents that PennDOT would “short-list” three firms based on weighted selection criteria. The short-listed firms would each receive an RFP and would then be asked to submit a technical approach with a price. Seven teams submitted timely state-

ments of interest, including a venture between Brayman Construction and its designer, Dewberry-Goodkind. The Brayman team was not one of the short-listed teams.

Brayman eventually sought an injunction in state court, asking that PennDOT’s handling of the procurement be declared illegal and in violation of the state’s procurement code. Specifically, Brayman argued that the state statute required competitive sealed bidding for this project, and PennDOT was not authorized to utilize the DBBV method. Following a hearing at the preliminary injunction, the state court ruled that the DBBV procurement was overly subjective and that PennDOT’s reliance on Publication 448 was not authorized under state law. It preliminarily enjoined PennDOT from seeking and evaluating two-step DBBV “or any other ‘innovative method’ that does not award the bid based on sealed competitive bids” for its procurements. Despite this, however, the court ruled that, “in the interest of public safety,” PennDOT was permitted to continue with its procurement of the two bridges through DBBV to avoid delays and potential safety issues. PennDOT and Brayman both appealed to the Pennsylvania Supreme Court.

The Supreme Court rejected PennDOT’s argument that its use of the DBBV method was valid, because, among other things, Pennsylvania law expressly allowed a two-step process when retaining design-professionals. The court concluded that the DB contract ultimately to be awarded by PennDOT was for the design and construction of the bridges, not just the pure design of the bridges.

The Supreme Court also adopted the trial court’s analysis on the issue of subjectivity—that the best value methodology should be stricken because such a two-step process entails evaluating bids based on factors not enumerated in the IFB. The court specifically noted that the agency’s employees at the injunction hearing “were unable to give a clear description of how its best-value analysis works.” Indeed, some PennDOT employees conceded that the process is “kind of nebulous” and includes “some subjectivity” on the qualitative assessment of key personnel resumes submitted.

Although the Supreme Court affirmed the ruling of the lower court as to the DBBV procurement on future projects, it also adopted the lower court’s “carve-out” with respect to PennDOT’s current bridge project. The court noted that out of Pennsylvania’s 25,000 state-owned bridges, the bridges in question were ranked to be in the 26th worst condition. Because these bridges carry more than 40,000 vehicles per day, the Supreme Court found safety considerations to justify allowing PennDOT to use the DBBV method for these particular bridges.

Although Brayman was the clear winner on the issue of whether PennDOT could use the DBBV process under Publication 448, it ultimately lost the real battle. Because Bray-

man did not make the short list under the DBBV process, it was not given an opportunity to bid on the bridge project. As for PennDOT, the Pennsylvania courts made it clear that the Publication 448 procurement processes were problematic because of their lack of objectivity.

Although PennDOT did not use this procurement on a stated “emergency” basis, one can conclude that the same issues would have arisen had it done so directly. An interesting feature of this case is that the Pennsylvania court essentially examined it from the perspective of an emergency procurement, finding that the safety concerns on these bridges justified PennDOT going on with the process even though it was flawed.

Challenges of the Merits of the Agency’s Procurement Evaluation

The August 1, 2007, collapse of the I-35W Bridge near Minneapolis is considered one of the most significant structural failures in the United States. This evening rush-hour collapse killed 13 people, injured more than 140 more, and caused state departments of transportation around the country to rethink the safety of their existing infrastructure assets. This collapse set into motion an expedited procurement process by MnDOT to replace the bridge. Flatiron–Manson, a joint venture (Flatiron), was awarded a DB contract on October 8, 2007, and the bridge was open for traffic on September 18, 2008, less than 14 months after it had collapsed.

Although the industry has widely praised MnDOT and Flatiron for this exceptional performance, the procurement of the bridge was somewhat controversial. Shortly after the award to Flatiron, a Minnesota taxpayer filed a lawsuit seeking an injunction and declaratory relief that Flatiron’s proposal should have been rejected as being nonresponsive. The taxpayer was unsuccessful at the trial court, and appealed to the Minnesota Court of Appeals. The decision of this appellate court, *Sayer v. Minnesota Department of Transportation*, was issued on July 28, 2009. It too rejected the taxpayer’s arguments and found the procurement by MnDOT to be proper. The subsequent appeal to the Supreme Court was decided in 2010, and affirmed the previous courts’ rulings. Although the I-35W litigation was not technically based on an “emergency” procurement, its lessons are helpful in understanding the potential legal issues confronting an agency using a classic emergency procurement process.

MnDOT decided to use a DBBV procurement process. The RFP was sent to a short list of teams, and contained detailed project-specific requirements. MnDOT also issued instructions to proposers, which stated that the contract would be awarded only to a proposal that met the standards established by MnDOT and described the weighted criteria by which the proposals would be evaluated.

A six-member technical review committee (TRC) evaluated the four proposals that were ultimately submitted. Flatiron’s proposal received the highest technical score, 91.47 out of 100 possible points. The next highest score was 67.88 out of 100. Although Flatiron had the highest price and tied with another company for submitting the longest delivery time, its high technical score enabled Flatiron to win under MnDOT’s best value formula.

The taxpayer argued that the TRC should have rejected Flatiron’s proposal because it was nonresponsive to the RFP by having two technical components that deviated from the RFP and the invitation to propose (ITP). One component involved Flatiron’s statement that it would be working outside of specified right-of-way (ROW) limits. The other was that Flatiron proposed a design that used concrete-box girders with only two webs each, contradicting the RFP’s requirement that concrete-box designs use a minimum of three webs. The taxpayer argued that under Minnesota law MnDOT did not have discretion to determine whether a proposal responded to the specifications of the RFP, and had no choice but to reject Flatiron’s proposal as being nonresponsive.

The Minnesota Supreme Court noted that in a traditional DBB process, the taxpayers might be right. However, under Minnesota’s 2001 DB statute, MnDOT was authorized to use a “best value selection process,” which, by its nature, allowed the consideration of factors other than cost when awarding contracts. The court noted that the design in a DB RFP is not complete and that the proposers will be submitting technical approaches based on these incomplete designs.

As to the ROW issue, the taxpayer relied upon an instruction in the ITP that proposed work for the project was not to include any additional ROW, and that Flatiron’s proposal required work outside the ROW defined in the RFP for the purpose of lowering Second Street. MnDOT countered by arguing that this instruction was added after MnDOT received a request for clarification from another contractor that was planning to take additional ROW and add traffic capacity in an area of the project that would have required more environmental review and more municipal consent. MnDOT claimed that the instruction relied upon by the taxpayer was not intended to be a “project-wide directive” to proposers on ROW limitations and that neither the ITP nor the RFP forbade any proposer from obtaining ROW on Second Street. The court agreed with MnDOT and rejected the taxpayer’s argument that Flatiron’s proposal was nonresponsive because it involved additional ROW on Second Street.

As to the concrete-box girder issue, the court found that Flatiron’s proposal included eight webs, four in each direction of traffic, but only two webs per concrete-box girder. The court interpreted the RFP to require a minimum of three webs per direction of traffic, not three webs per concrete-box

girder. Because Flatiron's proposal exceeded this minimum requirement, the court rejected the taxpayer's argument that the proposal was nonresponsive.

It is noteworthy that the appellate court had focused on the DB statute. It believed that the legislature's intent is to permit the TRC to apply its judgment and to evaluate proposals where no finished design exists. As a result, the court found that the TRC had discretion to decide whether a DB proposal is responsive, which decision could only be reversed if there was an error of law, or if the TRC's findings were arbitrary, capricious, or unsupported by substantial evidence. The two issues raised by the taxpayer did not trigger any reason to overturn the TRC's decision. This was not addressed by the majority opinion of the Supreme Court, but was cited by a concurring opinion.

CONCLUSIONS

Three conclusions can be drawn from the legal case studies:

1. The SCDOT case demonstrates the need to be sure that a given situation actually meets the state's statutory definition of an emergency before proceeding with expedited or abbreviated procurement procedures.
2. The PennDOT case shows that an expedited procurement process can be justified for the right reasons even if its procedures are flawed. In other words, safety trumps legal procedures.
3. The Minnesota case illustrates the requirement for transparency and consistency in emergency procurements.

CHAPTER SEVEN

CONCLUSIONS, EFFECTIVE PRACTICES, AND RECOMMENDATIONS FOR FUTURE RESEARCH**INTRODUCTION**

The criteria for drawing conclusions and identifying effective practices are detailed in chapter one. When two or more sources of information from the survey, literature review, case studies, and/or content analysis intersected, the juncture was considered important and used to develop the conclusions and candidates for the list of effective practices. Subjects where only one source furnishes substantive information on emergency project success were used as a point of departure to explore the potential for future research. That process was followed rigorously throughout the entire report. The conclusions and effective practices reported in this chapter are based on the four review instruments used to collect the information in the synthesis: comprehensive literature review, survey of U.S. agencies, department of transportation emergency management document content analysis, and case studies. When a gap in the body of knowledge was revealed, a recommendation for future research was made. Based on that foundation, this chapter presents the conclusions, effective practices, and recommendations for future research.

CONCLUSIONS

The synthesis' most significant conclusion is to use procurement processes, if practical, with which the agency is familiar and has experience to procure emergency design and construction. In most cases, this will be an accelerated version of design-bid-build and acts as a risk mitigation tool. Every study instrument supports this conclusion. Additionally, the use of a familiar project delivery method complies with the concept of allowing as much competition as time and circumstances permit, and thereby reduces the probability of a substantive protest. Put another way: Familiarity equals confidence, and confidence permits DOT procurement, design, and construction personnel to accelerate the delivery of an emergency project while making the hard, time-sensitive decisions required with less fear that they may be in violation of procurement laws and regulations.

The remainder of the conclusions in the preceding chapters are as follows:

1. Four different types of criteria are used to define the circumstances that constitute an emergency: event type, loss type, time, and location.
2. Delegating the authority to waive routine contracting constraints to emergency project level helps to achieve a quick response and mitigate the overall impact to the public.
3. The Title 23 prohibition on using emergency relief funding for aspects not related to the emergency condition support the conclusion that including betterments in an emergency project violates the fundamental purpose of the procedures: to restore service to pre-emergency levels and eliminate immediate hazards. Betterments may be funded with other nonemergency relief federal funds if they are eligible.
4. Emergency procurements can be successfully executed using traditional procedures to the greatest extent practical and adjusting them to account for the higher level of priority because of the emergency nature of the procurement.
5. A standing list of prequalified designers and contractors, willing to quickly deploy to react to an emergency, is an effective means to expedite procurement procedures. Maintaining a prequalified list is one way for the DOT to manage the increased exposure to risk that comes in a crisis situation. Additionally, such a list has been shown to be an effective measure to reduce the potential for a formal protest or a lawsuit.
6. The previous conclusion that using traditional procurement procedures as much as practical on emergency construction projects was a key to success can be extended to include consultant scope definition contracts.
7. Investing in a preliminary consultant contract to quantify the scope of both the design and construction work adds value to the expedited procurement process.
8. Establishing indefinite delivery/indefinite quantity contracts in anticipation of the need for emergency services is the surest contractual means to minimize the impact of an emergency.

9. Careful review of emergency permits helps ensure that the agency has clearly documented its rationale for shortcutting or bypassing the routine process based on a clear urgency of need to protect life and property.
 10. The quality and qualifications of the personnel and firms that will design and build an emergency project is more important than the administrative planning processes, because time is of the essence in an emergency.
 11. The fastest way to react to an emergency is to anticipate it and make provisions in advance of the event. The Montana DOT's rockfall remediation project, the Missouri DOT's "nested" design-build contract and the New York State DOT's Statewide Emergency Bridge indefinite delivery/indefinite quantity contract are all examples of successfully developing the capacity to react to an emergency without the need to expedite procurement procedures.
 12. Streamlined procedures for design-bid-build, design-build, and construction manager/general contractor delivery of emergency projects can be developed to accelerate the procurement of design and construction assets in response to a major emergency.
- frequency, small-scale emergencies without having to wait for permission from outside the maintenance organization.
4. The New York State DOT's indefinite delivery/indefinite quantity contract for statewide emergency bridge work enables the agency to immediately react to a variety of bridge-related emergencies.
 5. The Missouri DOT's use of a nested design-build contract for specialty services inside a design-bid-build contract demonstrates another approach to furnish pre-event capacity to quickly react to a specific emergency such as a landslide.
 6. By letting seasonal contracts for debris removal and disposal, the Florida DOT provides standby capacity to address high-frequency emergency events such as hurricanes.
 7. Developing and maintaining a list of prequalified sources of emergency services is an effective practice based on the agreement found between DOT survey respondents and the consultant/contractor interviewees citing the importance of contracting with highly qualified service providers and supports the use of a standing list of prequalified consultants and contractors.
 8. The chapter two case study projects demonstrated another 41 practices that are not repeated here.

EFFECTIVE PRACTICES

The most promising and well-documented practice was the use of a standing list of prequalified design consultants and construction contractors. The practice accrues benefits by reducing the time needed to identify qualified sources of design and construction services as well as materials and equipment. It reduces the risk of executing an emergency contract with a designer or contractor who does not have the technical and financial wherewithal to deliver the needed services. Finally, it acts as a protest avoidance measure by maximizing the amount of competition that can be permitted in a crisis situation. Other effective practices are as follows:

1. The "mini-solicitation" used by the Oregon DOT Tier 1 selection process provides a model for expedited selection of design consultants in an emergency.
2. Retaining a consultant to prepare a preliminary scope of work and do limited geotechnical and environmental testing is an effective practice that could be included in a DOT's emergency procurement plan.
3. The Oregon DOT approach to emergency maintenance projects by categorizing them based on the source of funding and then delegating the authority to declare an emergency for a project funded by state operating funds to the state maintenance engineer provides a means to expedite response to high-

FUTURE RESEARCH RECOMMENDATIONS

Future research is suggested in the following areas:

1. The survey found that fewer than half of the responding DOTs had a document that provided specific guidance for expediting the procurement of emergency projects, and only five had a "contract document that was specifically developed for emergency projects." Thus, research is needed to define the appropriate content of DOT emergency project delivery plans as well as the form and content of tailored emergency contracts and their efficacy for agencies that have used them. It would cover options to prepare written policies and procedures for each method of procurement used for engineering and design-related services funded with federal-aid highway program funds and submitted to FHWA for approval as specified in 23 CFR 172.9(a).
2. Survey respondents identified incentives and disincentives as important to emergency project success, and this finding was validated by the literature review and con-

tent analysis. Therefore, research on the costs and benefits of incentive/disincentive schemes and their impact on the success of emergency projects is recommended.

3. Research on preliminary project scoping contracts is recommended to both identify the optimal content of this type of contract and document its effectiveness through analysis of its costs and benefits in terms of time/user costs as well as impact on construction cost growth.

4. Research is needed that explores the costs and benefits of implementing formal risk management procedures on emergency projects. The research would weigh the possibility of optimizing risk management with the time available to conduct the analyses for emergency projects.

Appendix B contains an NCHRP Research Needs Statement for implementing the suggested research.

REFERENCES

- ABC News, “FEMA Director Removed From Katrina Duty,” ABC News.com, Politics, Sep. 9, 2005. [Online]. Available: <http://abcnews.go.com/Politics/HurricaneKatrina/story?id=1111074&page=1> [accessed Apr. 12, 2012].
- Alabama Emergency Management Agency (AEMA), *The State of Alabama’s Emergency Operations Plan*, AEMA, Clanton, Jan. 2, 2009, 410 pp.
- Alaska Department of Transportation and Public Facilities (ADOT&PF), *Alaska Field Operations Guide*, Publication 132, ADOT&PF, Juneau, Jan. 2005.
- Alder, R., “UDOT Construction Manager General Contract (CMGC) Annual Report,” Utah Department of Transportation Project Development Group, Engineering Services and Bridge Design Section, Salt Lake City, 2007, 39 pp.
- American Bar Association (ABA), *Model Procurement Code for State and Local Governments*, ABA House of Delegates, Washington, D.C., 2000, 7 pp.
- Anderson, S.D. and J.S. Russell, *NCHRP Report 451: Guidelines for Warranty, Multi-Parameter, and Best Value Contracting*, Transportation Research Board, National Research Council, Washington, D.C., 2001, 101 pp.
- Anderson, S.D. and I. Damjanovic, *NCHRP Synthesis 379: Selection and Evaluation of Alternative Contracting Methods to Accelerate Project Completion*, Transportation Research Board of the National Academies, Washington, D.C., 2008, 77 pp.
- Apke, G., *ODOT Emergency and Urgency Maintenance of Cut or Fill Slope Failures User’s Guide*, Oregon DOT, Salem, Apr. 2002, p. 7.
- Arizona Department of Transportation (ADOT), *Design-Build Procurement & Administration Policy*, Arizona Department of Transportation, Phoenix, 2007.
- Associated General Contractors of Iowa (AGCI), “Public Bidding in Iowa,” AGCI, Des Moines, 2012 [Online]. Available: <http://www.agcia.org/iowaPublicBidding.asp> [accessed Apr.12, 2012].
- Bai, Y., W.R. Burkett, and P.T. Nash, “Lessons Learned from an Emergency Bridge Replacement Project,” *Journal of Construction Engineering and Management*, ACSE, Vol. 341, 2006, pp. 338–344.
- Blakemore, F.P. and T.F. Konda, “Design–Build Replacement of US-90 Bridge over Bay St. Louis, Mississippi,” *Transportation Research Record: Journal of the Transportation Research Board*, No. 2201, Transportation Research Board of the National Academies, Washington, D.C., 2010, pp. 106–112.
- Blanchard, B., “Design-Build Lessons Learned Florida DOT,” *Proceedings, Louisiana Transportation Engineering Conference*, Baton Rouge, Feb. 2007, pp. 6–14.
- Blanchard, B.A., T.R. Bohuslav, C. Schneider, S. Anderson, C.J. Schexnayder, S. DeWitt, G. Raymond, and R. Sheffield, *Best Practices in Accelerated Construction Techniques*, NCHRP20-68A Domestic Scan Report 07-02, Transportation Research Board of the National Academies, Washington, D.C., 2009, 192 pp.
- Brick T., “Proper Prior Planning Prevents Pitifully Poor Performance,” *Print News Today*, Oct. 2005 [Online] Available: http://www.af.mil/news/story_print.asp?id=123012084 [accessed Apr. 22, 2012].
- Burati, J.L., J.J. Farrington, and W.B. Ledbetter, “Causes of Quality Deviations in Design and Construction,” *Journal of Construction Engineering and Management*, Vol. 118, No. 1, 1992, pp. 34–49.
- Byrd, L.G. and A.A. Grant, “Prerequisites for a Successful Design/Build/Warranty Highway Construction Contract,” A Report to the U.S. Department of Transportation, Federal Highway Administration, Washington, D.C., Mar. 1993 [Online]. Available: <http://www.fhwa.dot.gov/programadmin/contracts/byrd.cfm> [accessed Feb. 4, 2012].
- California Department of Transportation (Caltrans), *Construction Manual, Chapter 5-5 Emergency Contract Administration*, Caltrans, Sacramento, 2006.
- California Department of Transportation (Caltrans), “Administration of Emergency Force Account and Limited Bid Contracts,” *Construction Policy Bulletin CPB 10-3*, Caltrans, Sacramento, Apr. 7, 2010, pp. 1–3.
- Carpenter, J., “WSDOT Design-build Project Delivery Guidance Statement: Alternative Technical Concepts,” Washington State DOT, Olympia, Apr. 10, 2010, 15 pp.
- Christensen M.R. and L.E. Meeker, “Design/Build Projects—Lessons Learned from the Contractor’s Perspective,” *Proceedings, American Railway Engineering and Maintenance-of-Way Association*, Lanham, Md., 2002, 22 pp.
- Design-Build Institute of America (DBIA), *Design-Build Manual of Practice*, Design-Build Institute of America, Washington, D.C., 2009, pp. 6–35.
- Diekmann, J.E. and M.C. Nelson, “Construction Claims: Frequency and Severity,” *Journal of Construction Engineering and Management*, Vol. 111, No. 1, 1985, pp. 74–81.

- Federal Emergency Management Agency (FEMA), "About FEMA," 2012 [Online]. Available: <http://www.fema.gov/about/> [accessed Mar. 15, 2012].
- Federal Highway Administration (FHWA), "SEP-14 Active Project List," 2011 [Online]. Available: <http://www.fhwa.dot.gov/programadmin/contracts/sep14list.cfm> [accessed Dec. 2, 2011].
- Federal Highway Administration (FHWA), "Glossary of Award Types," 2010 [Online]. Available: <http://www.fhwa.dot.gov/aaa/glossary.htm> [accessed Apr. 20, 2012].
- Fellows, R. and A. Liu, *Research Methods for Construction*, 3rd ed., Wiley-Blackwell, Boston, Mass., 2008.
- Flatiron, Inc., "Florida's New I-10 Bridge Opens to Traffic," Jan. 4, 2007 [Online]. Available: <http://www.flatiron-corp.com/index.asp?w=pages&r=9&pid=42&n=26> [accessed Apr. 12, 2012].
- Florida Department of Transportation (FDOT), *Project Management Handbook*, Chapter 18—Emergency Contracting, FDOT, Tallahassee, 2010, p. 134.
- Florida State Government, Florida Senate, Ch. 252.38, *Emergency Management Powers of Political Subdivisions*, 2010 [Online]. Available: http://archive.flsenate.gov/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0200-0299/0252/Sections/0252.38.html [accessed Mar. 14, 2012].
- Gilson, M., State of Alaska Department of Law, *Memorandum: Succession to the Office of the Governor in Relation to Certain Disaster Management Issues*, State of Alaska, Juneau, Alaska, 1997.
- Gonderinger, C., "TH 14/218 Design-Build Project Technical Memorandum Quality Management Plan (QC/QA Requirements)," Minnesota Department of Transportation Technical Memorandum, St. Paul, 2001, pp. 1–17.
- General Accounting Office (GAO). Using Structured Interviewing Techniques, GAO/PEMD-10.1.5, General Accounting Office, Washington, D.C., June 1991, 191 pp.
- Gransberg, D.D., C. Lopez del Puerto, and D. Humphrey, "Relating Cost Growth from the Initial Estimate Versus Design Fee for Transportation Projects," *Journal of Construction Engineering and Management*, ASCE, Vol. 133, No. 6, June 2007, pp. 404–408.
- Gransberg, D.D. and K.R. Molenaar, "Analysis of Owner's Design and Construction Quality Management Approaches in Design-Build Projects," *Journal of Management in Engineering*, ASCE, Vol. 20, No. 4, Oct. 2004, pp. 162–169.
- Gransberg, D.D. and C. Riemer, "Impact of Inaccurate Engineer's Estimated Quantities on Unit Price Contracts," *Journal of Construction Engineering and Management*, ASCE, Vol. 135, No. 11, Nov. 2009, pp. 1138–1145.
- Gransberg, D.D. and J.S. Shane, *NCHRP Synthesis 420: Construction Manager-at-Risk Project Delivery for Highway Programs*, Transportation Research Board of the National Academies, Washington, D.C., 2010, pp. 96–97.
- Hancher, D., *NCHRP Synthesis of Highway Practice 195: Use of Warranties in Road Construction*, Transportation Research Board, National Research Council, Washington, D.C., 1994.
- Hietpas, J., "I-35W St. Anthony Falls Bridge: Planning the Replacement," *Aspire*, Fall 2008, pp. 24–27.
- Houston, N., "Emergency Procurement—When Is an Emergency Really an Emergency?" Coates' Canons: NC Local Government Law Blog, June 7, 2011 [Online]. Available: <http://sogweb.sog.unc.edu/blogs/localgovt/?p=4717> [accessed Apr. 12, 2012].
- Jeffrey, J.T. and C.L. Menches, "Emergency Contracting Strategies for Federal Projects," *Journal of Professional Issues in Engineering Issues in Education and Practice*, Vol. 134, No. 4, Oct. 2008, pp. 371–379.
- Kirby, J.G., D.A. Furry, and D.K. Hicks, "Improvements in Design Review Management," *Journal of Construction Engineering and Management*, Vol. 114, No. 1, 1988, pp. 69–82.
- Kirk, R.S., "Emergency Relief Program: Federal-Aid Highway Assistance for Disaster-Damaged Roads and Bridges," Congressional Research Service Report for Congress 7-5700 R4202.1, Sep. 23, 2011, 11 pp.
- Koch, J.E., D.D. Gransberg, and K.R. Molenaar, *Project Administration for Design-Build: A Primer for Owners, Engineers, and Contractors*, ASCE Press, Reston, Va., 2010, 286 pp.
- KTLA News, "Caltrans Closes 60 Fwy. Lanes to Demolish Damaged Overpass," Feb. 27, 2012 [Online]. Available: <http://www.ktla.com/news/landing/ktla-60-fwy-tanker-explosion,0,7111758,full.story>.
- Lo, H.K., "Organizing for Intelligent Transportation Systems Case Study of Emergency Operations in San Francisco Bay Area," *Transportation Research Record 1603*, Transportation Research Board, National Research Council, Washington, D.C., 1997, p. 34–40.
- Loosemore, M. and K. Hughes, "Emergency Systems in Construction Contracts," *Engineering, Construction and Architectural Management*, Vol. 5, No. 2, 1998, pp. 189–198.
- Louisiana Office of State Purchasing (LOSP), *Helpful Information about Louisiana Emergency Procurement*, LOSP, Baton Rouge, Mar. 2011, pp. 2–5.
- Maine Department of Transportation (Maine DOT), *Request for Proposals, Design-Build Services for Memorial Bridge Replacement Project*, Maine DOT, Montpelier, 2011, p. 57.

- Maxey, D., "Emergency Repair of the I-10 Bridge Over Escambia Bay," FICE/FDOT Design Conference, Orlando, Fla., Aug. 2006, 43 pp.
- McLain, K.W., "Design-Build Procurement Process for Slope Repairs and Slope Stabilization Projects for Roadways on the Missouri State System," Master's Thesis, Iowa State University, Ames, 2008, 66 pp.
- McLain, K.W. and J.S. Shane, "A Case for Design-Build with the Missouri Department of Transportation," *Kansas City Business Journal*, Supplement, Design Build Institute of America, Washington, D.C., 2009, 4 pp.
- McMinimee, J.C., "CMGC Project Delivery," Presentation, FHWA Every Day Counts Summit Conference, Minneapolis, Minn., Oct. 2010, 77 pp.
- Migliaccio, G.C., S.M. Bogus, and A. Chen, "Effect of Duration of Design-Build Procurement on Performance of Transportation Projects," *Transportation Research Record: Journal of the Transportation Research Board*, No. 2151, Transportation Research Board of the National Academies, Washington, D.C., 2010, pp. 67–73.
- Migliaccio, G.C., G.E. Gibson, and J.T. O'Connor, "Changing Project Delivery Strategy, an Implementation Framework," *Public Works Management & Policy*, Vol. 12, No. 3, 2008, pp. 483–502.
- Minnesota Department of Transportation (MnDOT), "I-35W Streamlining for Emergency Relief Program Provisions," Unpublished working paper, MnDOT, St. Paul, Dec. 2008, pp. 1–2.
- Minnesota Department of Transportation (MnDOT), "Force Account," St. Paul, 2011 [Online]. Available: <http://www.dot.state.mn.us/const/tools/forceaccount.html>, [accessed Apr. 20, 2012].
- Molenaar, K.R. and A.D. Songer, "Model for Public Sector Design-Build Project Selection," *Journal of Construction Engineering and Management*, ASCE, Vol. 124, No. 6, 1998, pp. 467–479.
- Molenaar, K.R., N. Sobin, D.D. Gransberg, T.L. McCuen, S. Korkmaz, M. Horman, and D. Riley, "Sustainable, High Performance Projects and Project Delivery Methods: A State-of-the-Practice Report," White paper, Charles Pankow Foundation, Ontario, Calif., 2009, 30 pp.
- Molenaar, K., D. Gransberg, and D. Sillars, "Alternative Quality Management Systems for Highway Construction." NCHRP 10-83, Transportation Research Board of the National Academies, Washington, D.C., 2011, p. 146.
- Montana Department of Transportation (MDT), *Design-Build Request for Proposal US 2—Rockfall Mitigation, Flathead County*, Project # SFCN 1-2(169)154, Montana Department of Transportation, Helena, Mar. 25, 2011, 39 pp.
- Mogren, E.T., *Claims by the Federal Government Against its A/E—Guidelines for Improving Practice*, Office for Professional Liability Research, Victor O. Schinner and Co., Washington, D.C., 1996.
- National Society of Professional Engineers (NSPE), "Design/Build in the Public Sector," NSPE Board of Directors, Position Statement #1726, 1995 [Online] Available; <http://www.nspe.org/govrel/gr2-ps1726.asp> [accessed Nov. 17, 2011].
- Neuendorf, K.A., *The Content Analysis Guidebook*, Sage Publications, Thousand Oaks, Calif., 2002, 300 pp.
- New Mexico Department of Transportation (NMDOT), *New Mexico Department of Transportation Internal Procedures Manual*, Section L—Emergency Purchase, NMDOT, Santa Fe, 2007, p. 124.
- New York State Department of Transportation (NYSDOT), "Statewide Emergency Bridge Contract: Guidance," NYSDOT Engineering Instruction EI 07-012, NYSDOT, Albany, 2007, pp. 1–3.
- Oklahoma Department of Transportation, *Oklahoma Department of Transportation Special Provisions for E-SAP-105N(162), J/P 25007(04), Beckham County*, Oklahoma Department of Transportation, Oklahoma City, Okla., Sep. 4, 2007.
- Oklahoma Department of Transportation, "Emergency Bridge Repair Project to Be Let June 18, 2010, Logan County," Invitation for Bids, Oklahoma Department of Transportation, Oklahoma City, Okla., June 16, 2010.
- Oppenheim, A.N., *Questionnaire Design, Interviewing and Attitude Measurement*, Continuum, London, U.K., 1992.
- Oregon Department of Transportation (ODOT) "ODOT Two-Tiered Selection & Work Assignment Procedure For Personal Services Contracts for Local Agency A&E Services," ODOT Policy Administration 28347 thru 28356, Salem, Sep. 8, 2010, pp. 1–5.
- Oregon Department of Transportation (ODOT) Maintenance Guide—Section 180 Emergency Maintenance, ODOT, Salem, Oct. 2004, pp. 180-1 to 180-2.
- Parvin, C., "Design-build: Evaluation and Award," *Roads and Bridges*, Vol. 38, No. 12, 2000, p. 12.
- Pennsylvania Department of Transportation (PennDOT), *Innovative Bidding Toolkit*, PennDOT Publication 448, Bureau of Project Delivery, Harrisburg, 2011, 197 pp.
- Perry, J.L. and M.L. Hines, *NCHRP Legal Research Digest 49: Emergency Contracting: Flexibilities in Contracting Procedures During an Emergency*, Transportation Research Board of the National Academies, Washington, D.C., 2007, pp. 3–25.

- Primer on Contracting for the Twenty-first Century*, 5th ed., American Association of State Highway and Transportation Officials, Washington, D.C., 2006 [Online]. Available: www.transportation.org/sites/construction/docs/Primer%20on%20Contracting%202006.pdf [accessed May 25, 2012].
- Pulver, B., “Maine DOT Accelerated CMGC,” FHWA 2012 CMGC Peer Exchange, Boston, Mass., May 2012, 35 pp.
- Schexnayder, C.J. and R. Mayo, *Construction Management Fundamentals*, McGraw-Hill Professional, New York, N.Y., 2004, pp. 282–283.
- Schexnayder, C. and S.M. Anderson, “Emergency Accelerated Construction,” *Proceedings, Construction Research Congress*, Innovation for Reshaping Construction Practice, Banff, Alberta, Canada, May 8–10, 2010, pp. 837–848.
- Schierholz, J., D.D. Gransberg, and J. McMinimee, “Benefits and Challenges of Implementing Construction Manager/General Contractor Project Delivery: The View from the Field,” TRB 91st Annual Meeting Compendium of Papers, DVD, Paper #12-1206, Washington, D.C., Jan. 22–26, 2012.
- Schofield Construction Law*, “Construction Contract Terminology,” 2012 [Online]. Available: <http://www.contract-laws.com/terminology.html> [accessed May 25, 2012].
- Science Applications International Corporation (SAIC), *NCHRP Web Document 59: Outsourcing of State DOT Capital Program Delivery Functions*, Final Report, Nov. 2003 [Online]. Available: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_w59.pdf [accessed Apr. 9, 2012].
- Scott, S., K.R. Molenaar, D.D. Gransberg, and N. Smith, *NCHRP Report 561: Best Value Procurement for Highway Construction Projects*, Transportation Research Board of the National Academies, Washington, D.C., Sep. 2006.
- Scott, S., T. Ferragut, M. Syrnick, and S.D. Anderson, *NCHRP Report 699: Guidelines for the Use of Pavement Warranties on Highway Construction Projects*, Transportation Research Board of the National Academies, Washington, D.C., 2011, 64 pp.
- Sechrist, R., E. Westhuis, and D. Kenneally, “Hurricane Irene, Tropical Storm Lee, Preparation, Response and Recovery,” *Proceedings 17th Statewide Conference on Local Bridges*, Syracuse, N.Y., Oct. 26, 2011 [Online]. Available: <https://www.dot.ny.gov/divisions/engineering/structures/events-news/2011/presentations> [accessed Apr. 9, 2012].
- Shane, J.S., D.D. Gransberg, K.R. Molenaar, and J.R. Gladke, “Legal Challenge to a Best-Value Procurement System,” *Journal of Leadership and Management in Engineering*, ASCE, Vol. 5, No. 1, Jan. 2006, pp. 1–6.
- Shane, J.S., K. Strong, and D.D. Gransberg, *Draft Guidebook for Managing Complex Projects*, Transportation Research Board of the National Academies, Washington, D.C., July 2011, 130 pp.
- Shields, M.D., *Glossary of Federal Acquisition Terms*, Federal Acquisition Institute, Washington, D.C., December 1998, 121 pp.
- State of Minnesota, *Glossary of Common Procurement Terms*, Department of Administration, Materials Management Division, St. Paul, 2011 [Online]. Available: <http://www.mmd.admin.state.mn.us/mn06008.htm>.
- Thorn, T., “Orleans Ave. Project Achieves On-Time Completion,” *Kiewits*, July 2006, p. 9.
- Touran, A., D.D. Gransberg, K.R. Molenaar, K. Ghavamifar, and P. Bakhshi, *ACRP Report 21: A Guidebook for Selecting Airport Capital Project Delivery Methods*, Transportation Research Board of the National Academies, Washington, D.C., 2009, 90 pp.
- Touran, A., D.D. Gransberg, K. R. Molenaar, and K. Ghavamifar, “A Decision Support System for Project Delivery Method Selection in Transit,” *Transportation Research Record: Journal of the Transportation Research Board*, No. 2111, Transportation Research Board of the National Academies, Washington, D.C., 2010, pp. 148–157.
- Trauner Consulting Services, *Innovative Procurement Practices Alternative Procurement and Contracting Methods*, California Department of Transportation Report No. 53A0104, Sacramento, 2007, pp. 10–12.
- USLegal, “Letter Contract Law and Legal Definitions,” 2012 [Online] Available: <http://definitions.uslegal.com/1/letter-contract/> [accessed Apr. 20, 2012].
- United States Code (USC), Title 23 USC- Highways, As Amended Through Public Law 106-347, Oct. 13, 2000, 213 pp. [Online]. Available: <http://epw.senate.gov/title23.pdf> [accessed Mar. 20, 2012].
- United States Code (USC) “Robert T. Stafford Disaster Relief and Emergency Assistance Act,” Public Law 93-288, as amended, 42 U.S.C. 5121-5207, and Related Authorities, United States Code Title 42. The Public Health and Welfare, Chapter 68. Disaster Relief, June 2007, 125 pp.
- U.S. Army Corps of Engineers (USACE), *MILCON Transformation Model RFP*, Department of the Army, Washington, D.C., 2007 [Online]. Available: <ftp://ftp.usace.army.mil/pub/hqusace/MILCON%20TRANSFORMATION/> [accessed Apr. 14, 2007].
- Utah Department of Transportation (UDOT), *Emergency Contracting/Procurement Procedure*, UDOT, Salt Lake City, 2011a, pp. 1–34.
- Utah Department of Transportation (UDOT), *Request for Streamlined Proposal Construction Management/Gen-*

- eral Contractor (CMGC) Services, Project No. F-0014(34)6, SR-14; Landslide Emergency Repair*, UDOT, Salt Lake City, Nov. 21, 2011b, 32 pp.
- Vermont Agency of Transportation (VTrans), *Policy Manual; Subject: Disaster Management Response and Recovery*, VTrans, Montpelier, June 13, 2011, pp. 1–2.
- Warne, T., “The St. Anthony Falls Bridge Project, Successful for Many Reasons: Lessons Learned,” Tom Warne and Associates Report for the Minnesota Department of Transportation, St. Paul, Dec. 8, 2008, 26 pp.
- Washington State Department of Transportation (WSDOT), *Guidebook for Design-build Highway Project Development*, WSDOT, Olympia, 2004, 109 pp.
- Washington State Department of Transportation (WSDOT), *Emergency Relief Procedures Manual (M 3014.03)*, Maintenance Operations Division, WSDOT, Olympia, 2012.
- West, N.J.N., D.D. Gransberg, and J. McMinimee, “Effective Tools for Projects Delivered Using the Construction Manager/General Contractor,” TRB 91st Annual Meeting Compendium of Papers, DVD, Washington, D.C., Jan. 22–26, 2012.
- Ziegler, F.G., *North Dakota Department of Transportation, Emergency Relief Manual, Procedures for Administering Emergency Relief Funds*, Draft, Bismarck, 2011.

GLOSSARY

- A + B Bidding:** “Cost-plus-time bidding, more commonly referred to as the A+B method, involves time, with an associated cost, in the low bid determination. Under the A+B method, each bid submitted consists of two components: (1) the ‘A’ component is the traditional bid for the contract items and is the dollar amount for all work to be performed under the contract; and (2) the ‘B’ component is a ‘bid’ of the total number of calendar days required to complete the project, as estimated by the bidder. Calendar days are used to avoid any potential for controversy that may arise if work days are used. The bid for award consideration is based on a combination of the bid for the contract items and the associated cost of the time, according to the formula: Bid Award Cost = A + (B · Road User Cost/Day)” (*Primer on Contracting for the Twenty-first Century* 2006).
- Advertise:** “To make a public announcement to purchase goods or services with the intention of increasing the response and enlarging the competition. The announcement must conform to the legal requirements imposed by established laws, rules, policies and procedures to inform the public” (Shields 1998).
- Alliancing:** A project deliver method where the owner, designer, and contractor form a legal consortium (also called a relational contract). Similar to a public/private partnership.
- Alternative technical concepts (ATCs):** A procedure where the designers and/or contractors are asked to furnish alternative design solutions for features of work designated by the agency in its DB Request for Proposals (RFP) (Carpenter 2010).
- Award protest:** A dispute to a selection of a consultant or contractor by an interested party.
- Best value:** “A method of awarding a contract based on price and other factors, such as technical excellence, management capability, past performance, and personnel qualifications” (Anderson and Russell 2001).
- Bid protest:** The process by which an unsuccessful bidder may seek remedy for unjust contract awards (*Schofield Construction Law* 2012).
- Case study:** An in-depth investigation within the research subject through interviews with key actors and literature reviews (Fellows and Liu 2008).
- Catastrophic failure:** The sudden and complete failure of a major element or segment of the highway system that causes a disastrous impact on transportation services (FHWA 2012).
- Construction-manager-at-risk (CMR):** “A project delivery method where the contractor is selected during design and furnishes preconstruction services” (DBIA 2009). In CMR there is no requirement for the general contractor to self-perform any of the construction (McMinimee 2010).
- Construction manager/general contractor (CMGC):** “A project delivery method where the contractor is selected during design and furnishes preconstruction services (DBIA 2009). In CMGC there is a minimum requirement for the general contractor to self-performance (McMinimee 2010).
- Contract:** A mutually binding legal relationship obligating, the contractor for its services or supplies and the owner to pay for them (FHWA 2010).
- Contract modification:** Any written change in the terms of a contract. Also referred to as a modification (FAR 43.101).
- Contractor’s general conditions:** A set of guidelines that define many of the rights, responsibilities, and limitations of authority of the owner and contractor, and include the general procedures governing the performance of the work (*Schofield Construction Law* 2012).
- Conventional contracting procedures:** An agency’s standard procedure for advertising and awarding a design or construction contract.
- Cost growth:** The change in contract amount in the period between award and final payment.
- Cost plus:** A contract payment provisions where the contractor is paid its actual costs plus an amount for its profit. There are a number of ways to determine that amount including a percentage of costs, a fixed fee, etc. (*Schofield Construction Law* 2012).
- Cost-plus-time:** See A+B bidding.
- Design sequencing:** A method variation of DBB contracting that allows an agency to award a contract when the design is partially complete, usually at least 30 percent (Caltrans 2006).
- Design-bid-build (DBB):** “The ‘traditional’ project delivery approach where the owner commissions a designer to prepare drawings and specifications under a design services contract, and separately contracts for construction, by engaging a contractor through competitive bidding or negotiation” (DBIA 2009).
- Design-build (DB):** “The system of contracting under which one entity performs both architecture/engineering and construction under a single contract with the owner” (DBIA 2009).

- Disaster:** “Any natural catastrophe, including any: hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought or, regardless of cause, any fire, flood” (FEMA 2012).
- Early contractor involvement (ECI):** A project delivery method that involves bringing the constructor into the planning and permitting process. The contractor is typically selected much earlier than in CMGC or CMR (Gransberg and Shane 2010).
- Emergency management plan:** A comprehensive plan of action for emergency situations.
- Emergency project:** A project initiated due to some unexpected circumstance that affected the capacity/level of service of a given transportation facility (road, bridge, tunnel, etc.) to the point where the agency believes it to be great enough as to warrant special treatment in the procurement phase.
- Emergency:** “A threat to public health, welfare, or safety that threatens the functioning of government, the protection of property or the health or safety of people” (State of Minnesota 2011).
- Flexible notice to proceed:** A document that authorizes the contractor to mobilize and begin construction when it is suitable to do so.
- Force account:** A payment provision that is used if the contractor and the owner have not agreed on a unit price or lump sum amount. Force account payments cover labor, materials, and equipment (MnDOT 2011).
- Full and open competition:** “All responsible sources are permitted to compete for a contract action” (FAR 6.003).
- Incentives/disincentives:** A contract provision that compensates the contractor for a specified amount of money for each day work that is completed ahead of schedule and a deduction for each day that the contractor overruns the specified schedule (FHWA 2012).
- Indefinite delivery:** “A contract that may be used to acquire supplies and/or services when the exact times and/or exact quantities of future deliveries are not known at the time of contract award. There are three types: definite quantity; requirements; and indefinite quantity” [FAR 16.501-2(a)].
- Indefinite quantity:** An indefinite-delivery contract that provides for an indefinite quantity, within stated limits (minimum and maximum), of supplies or services to be furnished during a fixed period, with deliveries or performance to be scheduled by placing orders with the contractor [FAR 16.504(a)].
- In-house support:** Assistance acquired from internal organizational assets as opposed to outsourcing (SAIC 2003).
- Interim completion dates:** A portion of the contract that is accomplished within a set duration or by a specified date earlier than the contract completion date. The portion requiring an interim completion may also include a prescribed start date (WSDOT 2012).
- Invitation for bids (IFB):** “A solicitation for offers under sealed bidding” (Shields 1998).
- Invitation to propose (ITP):** A solicitation for proposals where factors other than price will be evaluated to select the winning proposal (Heitpas 2008).
- Lane rental:** A contract payment provision where the contractor must rent a lane in order to close it. This creates a monetary incentive for the contractor to be innovative and minimize the duration of lane closures (WSDOT 2012).
- Letter contract:** A written preliminary contractual instrument that authorizes the contractor to begin immediately manufacturing supplies or performing services (FAR 16.603-1).
- Limited competition bidding:** The owner has chosen to or is forced to use a reduced number of applicants to compete for work (Caltrans 2010).
- Liquidated savings:** An incentive that contractors can receive for early completion. Typically, there is no cap on the maximum amount of liquidated savings a contractor can receive (MnDOT 2012).
- Lowest responsible bidder:** The bidder with the lowest price whose past performance, reputation and financial capability is deemed acceptable (State of Minnesota 2011).
- Lump sum:** A single fixed price offered for furnishing a given scope of services or quantity of materials (USLegal 2012).
- Modification:** See contract modification.
- Multiparameter bidding:** A contract award method that extends the A+B bidding concept to include an additional cost parameter (C) that may include a quality or warranty parameter. The total bid value is used only to evaluate the low bidder. The contract amount is based on the bid price (A), not the total bid value (A+B+C). The “C” component can increase or decrease the bid value. For example, if “C” is a bid warranty period, a higher “C” value should result in a lower bid value to reflect the added benefit to the agency (Trauner 2006).
- No-excuse incentives:** A contract provision which compensates the contractor for a specified amount of money. The contractor must meet all of the requirements specified in the contract, with no partial acknowledgment (FHWA 2012).
- Outsource:** Assistance acquired from outside a given organization, as opposed to in-house (SAIC 2003).
- Overhead:** Indirect costs other than those related to general and administrative expense and selling expenses or gen-

- eral terms often used to identify any indirect cost (State of Minnesota 2012).
- Permitting:** The act or process of obtaining consent or permission from a third party stakeholder such as a resource agency or utility company. Typically refers to environmental or planning obligations.
- Pre-event logistics contract:** A contract that is established before a predictable natural or man-made event that could create an emergency occurs for supply materials and/or services.
- Preliminary scope of work:** Initial effort to quantify the magnitude of the design and construction effort needed to resolve an emergency situation. Usually includes an inventory of work and repairs and preliminary design assumptions necessary to generate quantities of work.
- Procurement constraints:** Regulatory or statutory limitations or restrictions on the process of acquiring supplies or services.
- Procurement:** The combined functions of purchasing, inventory control, traffic and transportation, receiving, inspection, store keeping, and salvage and disposal operations (State of Minnesota 2011). “All stages involved in the process of acquiring supplies or services, beginning with the determination of a need for supplies of services and ending with contract completion or closeout” (Shields 1998).
- Profit:** “The difference between total cost and revenue” (Shields 1998).
- Project delivery method (or system):** A contractual arrangement of the parties involved in a construction project (i.e., CMGC, CMR, DB, DBB, etc.) (Touran et al. 2009).
- Qualifications based selection (QBS):** A procurement method where the consultant or contractor is selected on a basis of qualification alone with no price factors. Price is negotiated with the best qualified competitor [Touran et al. 2009; 23 USC 112(b)(2)(A) and 23 CFR 172.5(a)(1)].
- Quality:** “(1). The degree of excellence of a product or service; (2) the degree to which a product or service satisfies the needs of a specific customer; or (3) the degree to which a product or service conforms with a given requirement” (Molenaar et al. 2011).
- Request for bid (RFB):** A solicitation in which the terms, conditions, and specifications are described and responses are not subject to negotiation (State of Minnesota 2012).
- Request for qualifications (RFQ):** solicitation documents requiring contractors to submit specific information on qualifications, which does not include any cost or pricing information (Gransberg and Shane 2010).
- Sole source:** A procurement method where the agency is authorized to award directly to the consultant/contractor of its choice without competition (Shields 1998).
- Solicitation:** “The process used to communicate procurement requirements and to request responses from interested vendors. A solicitation may be, but is not limited to a request for bid and request for proposal” (State of Minnesota 2011). “(1) A document sent to prospective contractors by a Government agency requesting submission of an offer, quote, or information. (2) The process of issuing a document requesting submission of an offer, quote, or information and obtaining responses” (Shields 1998).
- Special interest group:** A stakeholder group with particular interest or demands that influence the decisions involving them.
- State-of-the-practice:** The current practices and procedures used by federal and state agencies.
- Triangulation:** The use of two or more research techniques together to study the topic; can be a powerful means to gain insights and results, and to assist in making inferences and in drawing conclusions (Fellows and Liu 2008).
- Typical project:** A project delivered using procedures considered by the respondent to be normal.
- Unit price:** The price of a selected unit of a good or service (e.g., pound, labor hours) (State of Minnesota 2012).
- User costs:** The cost associated with the traveling public an indirect cost.
- Value for money:** The most economical purchase of goods and services.

APPENDIX A

Survey and Survey Output

NCHRP Synthesis Topic 43-11: Expedited Procurement Procedures for Emergency Construction Services

INTRODUCTION/BACKGROUND:

The purpose of this questionnaire is to identify state highway agency policies and procedures for delivering emergency construction projects. The results of the study will be a synthesis of highway agency procurement procedures for agencies that using expedited procedures for emergency project delivery. Its specific focus is on the specific policies and contractual content used during emergency procurements. It seeks to identify successful approaches to managing risks across the emergency project's life cycle as well as discuss those practices that did not adequately address the special requirements of expedited procurement and caused the agency to hold liability that it had hoped to shed.

DEFINITIONS:

The following definitions are used in conjunction with this questionnaire:

- Emergency project: A project initiated due to some unexpected circumstance that impacted the capacity/level of service of a given transportation facility (road, bridge, tunnel, etc.) to the point where the respondent believed it to be great enough as to warrant special treatment in the procurement phase.
- Typical project: A project delivered using procedures considered by the respondent to be normal.
- Alternative technical concepts (ATC): A procedure where the designers and/or contractors are asked to furnish alternative design solutions for features of work designated by the agency in its procurement documents.
- Design-bid-build (DBB): A project delivery method where the design is completed either by in-house professional engineering staff or a design consultant before the construction contract is advertised. Also called the "traditional method."
- Construction Manager/General Contractor (CMGC): A project delivery method where the contractor is selected during design and furnishes preconstruction services. Also called CM-at-Risk.
- Design-build (DB): A project delivery method where both the design and the construction of the project are simultaneously awarded to a single entity.
- Qualifications Based Selection (QBS): A project delivery method where the consultant or contractor is selected on a basis of qualification alone with no price factors. Price is negotiated with the best qualified competitor.
- Sole source: A project delivery method where the agency is authorized to award directly to the consultant/contractor of its choice without competition.

Please e-mail, fax, or post this questionnaire by one of the following means:

Doug Gransberg, PhD, PE
 Civil, Construction, and Environmental Engineering
 Iowa State University
 494 Town Engineering Building
 Ames, IA 50011
 Voice: 515-294-1703 Fax: 515 294-3845

General Information:

1. US state in which the respondent is employed: _____
2. You are employed by what type of organization?
 - State department of transportation
 - Other public transportation agency; Name of agency: _____
 - Federal agency; Name of agency: _____
 - Other, please describe: _____

3. What group/section do you work in?

- Design group/section
- Construction group/section
- Operations group/section
- Maintenance group/section
- Alternative project delivery group/section
- Materials group/section
- Contracts/procurement group/section
- Other, please specify:

4. On average, how many *emergency* projects does your agency deliver each year?

- None
- 1–2
- 3–5
- 6–10
- >10

5. Does your agency use different procurement procedures to deliver emergency projects than it uses for routine projects?

- Yes
- No

If your agency does not use separate procedures for emergency project delivery please skip to the final question.

Emergency Procurement Policies and Procedures:

6. What project delivery methods is your organization allowed to use for typical versus emergency projects? Check all that apply.

7.

PROJECT DELIVERY METHOD	TYPICAL PROJECT	EMERGENCY PROJECT
DBB	<input type="checkbox"/>	<input type="checkbox"/>
CM-at-Risk or CMGC	<input type="checkbox"/>	<input type="checkbox"/>
DB	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify	<input type="checkbox"/>	<input type="checkbox"/>
Procurement Method		
Low Bid	<input type="checkbox"/>	<input type="checkbox"/>
QBS	<input type="checkbox"/>	<input type="checkbox"/>
Sole Source	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify:	<input type="checkbox"/>	<input type="checkbox"/>

8. If you only use DBB on emergency projects, indicate the reason(s) below

- No statutory authority to use alternative project delivery methods
- Liability considerations are not favorable for the agency on an unfamiliar method during an emergency
- Not willing to give up control of the design

- Could use alternative methods on these projects but political/policy issues prevent use
- Could use alternative methods on these projects but agency upper management is unwilling
- Other, please specify: _____

9. Please rank the following project delivery and procurement methods based on your opinion of each method’s ability to adequately address the risk types in the following table.

RANKING: 1 = VERY POOR; 2 = BARELY ADEQUATE; 3 = SATISFACTORY; 4 = GOOD; 5 = EXCELLENT											
Risk	Project Delivery Method			Procurement Method							
	DBB	CMGC	DB	Design				Construction			
				Low Bid	QBS	Sole Source	Other	Low Bid	QBS	Sole Source	Other
Scope definition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unforeseen conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Time growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Latent defects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety during construction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Traffic disruption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Third party delays	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Impact on public	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protest of award	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unintentional shift of design liability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public information/support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Political interference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Does your agency have a manual or document that specifically describes the procedures to be used with emergency projects?
- Yes No
11. Does your agency encourage or require a formal partnering process on emergency projects?
- Yes No
12. How does your agency define an “emergency” that qualifies for expedited project procurement? Check all that apply.
- Federal declaration of emergency
 - State declaration of emergency
 - Agency director declaration of emergency
 - Specific set of circumstances
 - Dollar value of damage to be repaired

- Dollar value of contract
- Other, please specify: _____

13. Is a formal risk analysis conducted on an emergency project in any of the following areas?

- Project Scope
- Project Schedule
- Project Cost
- Contracting Risk

14. Do your emergency project cost estimates involve an analysis of uncertainty (i.e., was a range cost estimate developed; rational development of contingency)?

- Yes
- No

15. Do you employ any formalized risk allocation techniques to draft the contract provisions?

- Yes
- No

If yes, please describe: _____

16. Do your emergency contracts contain liquidated damages?

- Yes
- No

17. If yes, how do you set the value of liquidated damages? please describe:

18. What policy or procedure changes occur in an emergency project procurement?

Check all that apply	Planning	Permitting	Contract Award	Does Not Apply
Preapproved expedited procedures are authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prequalified sources of design and construction services are authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competition requirements are reduced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competition requirements are eliminated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Level of design completion before construction is reduced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Level of design completion before construction is eliminated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Level of monetary decision authority is raised for project personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Level of monetary decision authority is eliminated for project personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Level of design approval decision authority is reduced for project personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Level of design approval decision authority is eliminated for project personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Abbreviated permit applications are authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Progressive permitting is authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Abbreviated contract forms are authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. Do your emergency procurement procedures allow the improvement/betterment of the project beyond its condition before the emergency?
- No
 - Yes minor improvements
 - Yes, it may be enhanced to meet current standards (i.e., bridge clearances, current codes, etc.)
 - Yes, no restrictions
20. Have you used preliminary emergency contracting to define the scope of the emergency project before beginning procurement?
- No
 - Not yet, but we could
 - Yes, always
 - Yes, sometimes
 - Don't know
21. If the answer to the previous question is "yes," what is included in the preliminary contract to define the scope of the emergency project? Check all that apply.
- Inventory of features of work to be repaired/replaced; no design
 - Inventory of features of work to be repaired/replaced; design recommendations
 - Inventory of features of work to be repaired/replaced; preliminary design
 - Review of records and limited verification testing
 - Review of records and geotechnical investigation of critical areas
 - Cost estimate
 - Risk analyses
 - Other, please specify: _____

Emergency Procurement Selection Information

22. How do you advertise and award an emergency contract?

No.	Advertise/Award Method	Design	Construction
1	IFB, full open competition, low bid	<input type="checkbox"/>	<input type="checkbox"/>
2	IFB, competition restricted to prequalified entities, low bid	<input type="checkbox"/>	<input type="checkbox"/>
3	1-step full open competition RFQ, QBS, no price competition	<input type="checkbox"/>	<input type="checkbox"/>
4	1-step full open competition RFP, includes qualifications, technical, and price	<input type="checkbox"/>	<input type="checkbox"/>
5	2-step full open competition, RFQ/RFP	<input type="checkbox"/>	<input type="checkbox"/>
6	1-step competition restricted to prequalified entities RFQ, QBS, no price competition	<input type="checkbox"/>	<input type="checkbox"/>
7	1-step competition restricted to prequalified entities RFP, includes qualifications, technical, and price	<input type="checkbox"/>	<input type="checkbox"/>
8	2-step competition restricted to prequalified entities, RFQ/RFP	<input type="checkbox"/>	<input type="checkbox"/>
9	Sole source	<input type="checkbox"/>	<input type="checkbox"/>
10	Other, please specify		
11	Other, please specify		

86

23. Have you had a protest of an award an emergency contract?

Yes No

If yes, which Advertise/Award Method Number in the above question was used for:

design contract no. _____ and construction contract no. _____

24. What was the result of the protest?

Protest was upheld
 Protest was overturned
 Protest was dropped

Comments? _____

25. Rank the following areas as to importance to the success of the emergency project during the procurement process 3 = essential; 2 = important; 1 = not important.

_____ Sufficient scope definition allow the competitors to price the project without excessive contingencies

_____ Highly qualified designers and contractors

_____ Verification of knowledge and experience working in the project area

_____ Mandated use of agency design criteria and details

_____ Ability to propose ATCs

_____ Ability to propose ATCs confidentially

_____ Design/construction quality management plan in proposal

_____ Incentives/disincentive schemes

_____ Streamlined/abbreviated permitting process

_____ Formal risk mitigation plan by agency

_____ Formal risk mitigation plan in proposal

_____ Correct weight between technical factors, schedule factors and price

Emergency Project Contracting Information

26. Does your agency currently have a contract document that was specifically developed for emergency projects?

Yes No

If “yes,” please indicate the differences between an emergency contract form and a typical contract form.

27. If you are required to have some form of competition before award, how is “competition” defined?

Minimum number of competitors (i.e., at least 2 or 3)
 Minimum number of quotations for service
 Competitive bidding of subcontractors/suppliers by the prime contractor
 Competitive negotiation with most qualified competitor
 Competitive negotiation with prequalified consultants/contractors
 Other, please specify: _____

28. Do you use contract clauses that comply with requirements for federal-aid highway funding?
 Yes. If "yes," what types? _____ No
29. Do you use contract clauses that comply with requirements for FEMA funding?
 Yes. If "yes," what types? _____ No
30. Are your contracts constrained by expedited, abbreviated, or progressive permitting requirements that were negotiated in advance or as a result of the emergency?
 Yes. If "yes," what types? _____ No
31. Do you use different contract forms based on the size/value of the emergency projects?
 Yes. If "yes," what are the differences? _____ No
32. What type of payment provisions are contained in your typical agency emergency projects?
 Lump sum
 Lump sum–guaranteed maximum price (GMP)
 Unit price–GMP
 Unit price
 Cost reimbursable
 Combination lump sum and unit prices
 Other, please specify: _____
33. Do the project cost and schedule control procedures differ on an emergency contract from those used in a typical contract?
 Yes. If "yes," what are the differences? _____ No
34. Do the accounting procedures differ on an emergency contract from those used in a typical contract?
 Yes. If "yes," what are the differences? _____ No
35. Do you use warranties in emergency projects?
 Yes. If "yes," what types? _____ No
36. If you have used expedited delivery procedures on an emergency project, would you be willing to allow the consultants to contact you to do a structured interview and collect case study information?
 Yes No
 Please furnish contact information:
 Contact name: _____
 Phone number: _____
 E-mail address: _____
37. Do you have anything else you would like to share regarding the expedited procurement procedures on your emergency projects?

Survey Results—Note: If a given respondent did not respond to all the questions on the following summary pages, the line was deleted to save room.																		
Survey Question #			6- Project delivery and procurement methods allowed															
1	4	5	DBB		CMGC		DB		Other PDM		Low Bid		QBS		Sole Source		Other	
State	Emergency projects/ year	Different procedures	Typical project	Emergency project	Typical project	Emergency project	Typical project	Emergency project	Typical project	Emergency project	Typical project	Emergency project	Typical project	Emergency project	Typical project	Emergency project	Typical project	Emergency project
AK	3 to 5	Yes	x		x		x	x			x	x	x			x		
AR	1 to 2	No																
AZ	3 to 5	No																
CA	>20	Yes	x	x						x	x	x				x		x
CO	1 to 2	Yes	x	x	x		x		x			x	x					
CT	None	Yes																
DE	3 to 5	Yes	x	x			x	x			x	x	x	x	x	x		x
FL	10 to 20	Yes	x	x	x		x	x			x	x						
GA	3 to 5	Yes																
HI	>20	Yes	x	x	x	x	x	x			x	x	x	x			x	x
IA	10 to 20	Yes	x		x		x			x		x		x				
ID	1 to 2	Yes																
IL	10 to 20	Yes																
KS	6 to 10	Yes									x	x				x		
MA	6 to 10	Yes	x	x			x	x			x					x		
ME	3 to 5	Yes	x	x		x	x									x		x
MD	3 to 5	No																
MI	1 to 2	Yes	x	x	x	x	x	x	x	x	x	x						x
MN	6 to 10	Yes	x	x			x	x	x	x	x	x				x	x	x
MO	6 to 10	Yes	x	x					x	x	x	x						
MS	3 to 5	Yes	x	x			x	x		x	x	x				x		
MT	6 to 10	Yes	x	x			x	x			x	x					x	x
NC	1 to 2	Yes	x	x			x	x			x	x	x	x		x		
NE	1 to 2	Yes	x	x		x		x		x	x	x		x		x		x
NJ	3 to 5	No																
NM	3 to 5	Yes	x	x							x					x		
NY	6 to 10	Yes	x	x				x	x	x	x	x					x	x
OH	10 to 20	Yes	x	x			x				x	x	x			x		
OK	3 to 5	Yes	x	x							x	x				x		x
OR	6 to 10	Yes	x	x	x	x	x	x			x	x	x	x		x		
PA	10 to 20	No																
SC	3 to 5	Yes	x	x			x	x			x	x			x	x		
TN	3 to 5	Yes	x	x			x				x	x						
UT	3 to 5	Yes	x	x	x		x		x	x	x		x		x			
VT	1 to 2	Yes	x	x	x	x	x				x	x	x			x		
VA	10 to 20	Yes	x	x			x				x	x						x
WA	6 to 10	Yes	x	x			x		x	x	x			x				x
WI	6 to 10	Yes	x	x				x			x					x	x	x
WV	3 to 5	Yes																
WY	3 to 5	Yes									x	x						x
WFLHD	1 to 2	Yes	x	x	x	x	x	x			x	x			x	x	x	x
EFLHD	1 to 2	Yes	x	x	x	x	x	x			x	x			x	x		
CFLHD	6 to 10	Yes																

Q#	Ranking: 0 = not applicable; 1 = very poor; 2 = barely adequate; 3 = satisfactory; 4 = good; 5 = excellent												8 - Rank the following project delivery method's ability to adequately address the risk types during the design and construction																					
	Scope Definition				Quality				Unforeseen Conditions				Cost Growth				Time Growth				Latent Defects													
	DBB - Design	CMGC - Design	DBB - Design	DB - Design	CMGC - Design	DBB - Design	DB - Design	DB - Const	CMGC - Const.	DBB - Const	DB - Const	CMGC - Const.	DBB - Const	DB - Const	DBB - Design	CMGC - Design	DB - Design	DBB - Design	CMGC - Const.	DB - Const	DBB - Design	CMGC - Design	DB - Design	DBB - Const	CMGC - Const.	DB - Const								
Sta																																		
AK				3				3				3					3									3								
CA	5			5			5				5				5			5				5												
CO	3	3		3	4	4		3	4	4		2	4	4		2	3	4			3	3	3											
DE	5	0	4	5	0	3	5	0	3	4	0	4	3	0	4	3	0	3	0	3	4	0	5	4	0	5	4	0						
FL	3		3	3	4	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							
ME	2	3	0	2	4	0	3	4	0	3	0	3	3	0	2	2	0	2	3	0	3	4	0	3	4	0	3	4	0					
MI	5	5	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3					
MIN	3		3	4	4	3	4	4	4	4	4	3	2	3	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4					
MO	4	0	4	0	4	0	4	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0				
MS	4		4	4		4	4		4	4		4	4		4	4		4	4		4	4		4	4		4	4	4					
MT	4	0	1	4	0	3	3	0	3	3	0	3	3	0	1	3	0	5	3	0	5	3	0	5	3	0	5	3	0					
NC	4		3	4		3	3		3	2		2	2		2	2		3	2		3	2		3	2		3	2	4					
NE	3		3		5		5		3		3		3		3		3		3		3		3		3		3		3					
NY	5		3	5		5	5		5	5		4	5		4	3		5	3		5	3		5	3		5	5	5					
OH	5	5	3	5	3	4	4	3	4	5	2	4	5	2	4	4	2	4	4	2	4	4	2	4	4	2	4	5	2					
OK	4		4		4		4		3		3		3		3		3		3		3		3		3		3		3					
OR	3	3	2	3	3	3	3	3	3	4	3	1	5	3	3	4	3	2	5	3	4	3	2	5	4	3	3	3	3					
SC	3		4	4		3	3		3	1		2	1		2	2		2	2		2	2		4	1		3	1	3	2	2			
TN	4		4		4		4		3		3		3		3		4		4		3		3		3		3		3					
UT																																		
VT	5	5		5		4	5		4	3		3	3		3	5		5	5		5	5		5	5		5	3	3	3				
VA							4		4				4					3					3											
WA	3		4	4		3	4		3	2		3	3		4	2		4	3		4	2		4	3		4	3	4	3	4			
WFLHD	3	5	3	3	5	4	3	5	4	2	2	4	2	3	4	4	3	3	4	3	4	4	4	3	4	4	4	2	4	2	3	4		
EFLHD	3	5	3	3	5	4	3	5	4	2	2	4	2	3	4	4	3	4	4	4	3	4	4	4	4	4	4	2	4	2	4	2	3	4

Q#	Ranking: 0 = not applicable; 1 = very poor; 2 = barely adequate; 3 = satisfactory; 4 = good; 5 = excellent																													
	8 - Rank the following project delivery method's ability to adequately address the risk types during the design and construction																													
Sta	Safety during Construction					Traffic Disruption					Third Party Delays					Impact on Public					Environmental Quality					Protest of Award				
	DBB - Design	CMGC - Design	DB - Design	DBB - Const.	CMGC - Const.	DB - Const.	DBB - Design	CMGC - Design	DB - Design	DBB - Const.	CMGC - Const.	DB - Const.	DBB - Design	CMGC - Design	DB - Design	DBB - Const.	CMGC - Const.	DB - Const.	DBB - Design	CMGC - Design	DB - Design	DBB - Const.	CMGC - Const.	DB - Const.	DBB - Design	CMGC - Design	DB - Design	DBB - Const.	CMGC - Const.	DB - Const.
AK	3		3	3		3		3		3		3		3		3		3		3		3		3		3		3		3
CA	5		5	5		5		5		5		5		5		5		5		5		5		5		5		5		5
CO	3	3	3	3		3	4	4		3	4	4		3	4	4		3	4	4		3	3	3		4	3	3		4
DE	5	0	5	5	0	4	4	4	4	5	0	4	5	0	4	5	0	4	5	0	4	5	0	4	5	0	4	5	0	4
FL			3	3		3		3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ME	0	0	5	5	0	0	0	0	3	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	5	5	5	5	4	4	4	4	4	5	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
MN	4	4	4	4		4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MO	4	0	4	0	0	4	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MS	3	4	4	4		3	3	3	3	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3
MT	0	0	4	0	4	0	0	0	4	3	0	2	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NC	4	4	4	4		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NE	3		3	3		2		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NY	5	5	5	5		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
OH	4	4	4	4	3	3	3	3	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
OK	3		3	3		3		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
OR	3	3	3	3	3	3	5	3	3	3	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
SC	4	3	3	3		3	3	3	3	3	4	2	4	2	4	3	3	4	2	4	3	3	3	3	3	3	3	3	3	3
TN	4		4	4		4		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
UT																														
VT	5	5	5	5		5	5	5	5	3	5	3	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
VA			4	4		3		3		3		3		3		3		3		3		3		3		3		3		3
WA	2	4	4	4		3	4	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
WFL	3	4	4	3	4	4	4	4	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3
EFL	3	4	4	3	4	4	4	4	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3

8 - Rank the following project delivery method's ability to address risk																		
State	Unintentional Shift of Design Liability						Public Information/Support						Political Interference					
	DBB - Design	CMGC - Design	DB - Design	DBB - Const	CMGC-Const.	DB - Const	DBB - Design	CMGC - Design	DB - Design	DBB - Const	CMGC-Const.	DB - Const	DBB - Design	CMGC - Design	DB - Design	DBB - Const	CMGC-Const.	DB - Const
AK			3			3			3			3			3			3
CA	5			5			5			5			5			5		
CO	2	3	4				3	3	3				3	3	3			
DE	5	0	3	4	0	3	5	0	4	4	0	3	4	0	2	4	0	2
FL	1		1	1		1	4		3	4		3	1		1	1		1
ME	0	0	0	0	0	0	4	3	0	4	3	0	0	0	0	0	0	0
MI	5	4	4	5	4	4	5	5	5	5	5	5						
MN	4		3	4		4	4		4	4		4	4		3	4		4
MO	0	0	0	0	0	0	4	0	0	4	0	0	4	0	0	4	0	0
MS	3		4	3		4	3		3	3		4	2		2	2		2
MT	5	0	3	0	0	0	3	0	3	3	0	3	3	0	3	3	0	3
NC	4		2	2		2	3		3	3		3	3		3	3		3
NE	4			4			4			4			5			5		
NY	5		5	5		5	5		5	5		5	5		5	5		5
OH	4	4	3	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4
OK	4			4			3			3			4			4		
OR	3	3	2	2	3	2	3	3	3	3	4	4	3	3	3	3	3	3
SC	5		3	4		3	2		3	2		4	1		3	2		3
TN	3			3			4			4			4			4		
UT																		
VT	4		5	4		5	4		4	4		4	4		4	4		4
VA										4						4		
WA	4		4	3		4	4		3	4		3	4		2	3		2
WFL	3	3	3	3	3	3	3	4	4	3	4	4	4	4	4	4	4	4
EFL	3	3	3	3	3	3	3	4	4	3	4	4	4	4	4	4	4	4

Q#	8 - Please rank the following procurement method's ability to address risk																							
	Scope Definition				Quality				Unforeseen Condition				Cost Growth				Time Growth				Latent Defects			
Sta	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Constr.	QBS - Constr.	Sole Source-Constr.	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Constr.	QBS - Constr.	Sole Source-Constr.	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Constr.	QBS - Constr.	Sole Source-Constr.	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Constr.	QBS - Constr.	Sole Source-Constr.
AK	3	3	4	3	3	3	3	1	4	2	2	3	2	2	3	2	3	3	3	3	2	3	2	3
CA	5	2	4	4	3	3	4	2	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4
CO	3	3	3	3	4	3	2	3	3	4	3	3	3	3	3	2	3	3	3	3	3	3	3	3
DE	5	5	5	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
FL	3	3	4	4	4	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HI	4	5	2	4	3	5	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
KS			4	4	4	4		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
ME	5	5	5	5	4	5	3	3	3	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4
MI		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
MN	3	4	4	4	4	4	2	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MO	0	3	0	4	0	4	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3
MS		3	3	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MT	2	0	0	1	0	3	0	2	0	0	3	0	2	0	0	3	0	2	0	0	3	0	3	0
NC		3	4	4	3	4	3	2	2	2	2	2	3	2	2	3	2	2	3	2	2	3	2	3
NE		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
NY	3	5	5	5	3	5	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
OH	4	5	4	4	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
OK	1	4	3	3	4	3	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
OR	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
SC	3	5	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TN			3	4	4	4		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
VT	5	5	5	5	2	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
VA			4	4	4	4		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
WA	3	4	3	4	5	4	3	4	3	3	3	3	4	3	4	3	4	3	4	3	4	3	4	3
WY	3						3																	
WFL		3	3	3	4	3	3	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4
EFL		3	3	3	4	3	3	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4

Q#	8 - Please rank the following procurement method's ability to address risk																													
	Safety during Construction				Traffic disruption				Third Party Delays				Impact on Public				Environmental Quality				Protest of award									
Sta	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Design	QBS - Design	Sole Source-Design
AK	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CA	4	3	4	3	4	3	5	3	4	2	4	2	4	3	4	2	4	3	4	3	4	3	4	3	4	3	4	3	4	3
CO	3	3	3	3	4	3	3	4	3	3	4	3	4	3	3	3	4	3	4	3	3	3	4	3	4	3	4	3	4	3
DE	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
FL	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HI	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3
KS			4				4			4			4			4			4			4			4			4		
ME	0	0	5	5	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
MI	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
MN	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
MO	0	3	0	4	0	3	0	4	0	3	0	3	0	4	0	3	0	4	0	3	0	4	0	3	0	4	0	3	0	4
MS		3	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MT	0	0	3	0	0	3	0	3	0	0	3	0	3	0	0	3	0	3	0	0	3	0	0	3	0	0	3	0	0	3
NC		4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NE		4	4	4	4	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
NY	3	5	5	5	3	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
OH	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
OK	2	4	3	3	2	3	3	3	3	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
OR	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
SC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
TN			4				4			4			4			4			4			4			4			4		
VT	5	5	5	4	4	3	4	4	5	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
VA			3				4			3			3			3			3			3			3			3		
WA	3	4	3	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
WY	3																													
WFL		3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
EFL		3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Q#	8 - Please rank the following procurement method's ability to address risk																	
	Unintentional shift of design liability						Public Information/Support						Political Interference					
Sta	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Constr.	QBS - Construction	Sole Source-Constr	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Constr.	QBS - Construction	Sole Source-Constr	Low Bid - Design	QBS - Design	Sole Source-Design	Low Bid - Constr.	QBS - Construction	Sole Source-Constr
AK		3		3		3		3		3		3		3		3		3
CA	5		3	4		3	5		3	5		3	4		3	5		3
CO	2	4	3	2	4	3	3	3	3	3	3	3	3	3	3	3	3	3
DE	4	4	4	4	4	4	4	4	4	3	3	4	3	3	2	3	3	2
FL	1			1			4			4			1			1		
HI	4	3		2	2		2	4		2	3		4	4		2	3	
KS				4		4				4		4				4		4
ME	4	4	4	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4
MI		4		4	4			4		4	4							
MN	4	4	4	4		4	4	4	4	4		4	4	4	4	4		4
MO	0	3	0	0	0	0	0	3	0	4	0	0	0	3	0	4	0	0
MS			3	3		3			3	3		3			2	5		2
MT	2	0	0	0	0	0	2	0	0	2	0	0	3	0	0	3	0	0
NC		2	4	4	2	4		3	3	3	3	3		3	3	3	3	3
NE		5	5	5		5		5	5	5		5		5	5	5		5
NY	3	5	5	5	5	5	3	5	3	5	4	3	3	3	3	5	3	3
OH	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
OK	3	3	3	3	3	2	3	3	3	3	2	1	3	3	2	3	2	1
OR	3	3	3	3	3	3	3	3	4	2	3	4	3	3	3	3	3	2
SC	3		3	2		2	2		2	2		3	1		1	1		1
TN				3						4						4		
VT	3	5	4	4	3	3	4	5	4	4	4	4	3	4	3	4	3	2
VA										3						3		
WA	3	4	4	2	3	2	3	4	4	3	4	3	2	4	3	2	3	2
WY	3						3						3					
WFL		4	4	3		3		4	4	3		3		4	4	4		4
EFL		3	3	3		3		4	4	3		3		4	4	4		4

Q#	9 - Agency emergency procure-ment manual		10 - Formal partner- ing process on emer- gency projects?			11 - How does your agency define an “emergency” that qualifies for expedited project procurement?							12	13	14	15	18
	Yes	No	Reqd	Encouraged	None	Federal declaration	State declaration	Agency declaration	Specific circumstances	Dollar value of damage	Dollar value of contract	Other					
AK	x				x	x	x	x					Yes	No	No	Yes	Don't know
CA	x				x	x	x		x					No	No	No	Yes-current
CO	x				x	x	x	x	x					Yes	No	Yes	No
DE		x			x	x	x	x					No	No	No	Yes	Yes, no restrictions
FL	x				x			x					No	No	No	Yes	Yes-current
HI		x			x				x				No	No	No	No	Yes-current
IA		x									x						Yes-current
KS		x			x		x	x	x				No	No	No	No	Yes-minor
MA	x				x	x	x	x					Yes	No	Yes	Yes	Don't know
ME		x		x		x	x		x				No	Yes	No	Yes	Yes-current
MN		x			x	x	x	x						Yes	Yes	Yes	Yes-current
MO		x		x					x			x	No	Yes	No	Yes	Don't know
MS		x		x		x	x	x	x				No	No	No	Yes	No
MT		x			x	x	x	x	x				No	Yes	No	Yes	Yes-minor
NC	x				x	x	x	x						Yes	Yes	Yes	No
NE		x		x				x					Yes	Yes	No	Yes	Yes, no restrictions
NM		x			x	x	x	x					No	No	No	Yes	Don't know
NY	x				x	x	x	x					No	No	No	Yes	No
OH		x			x	x	x	x	x	x	x		No	No	No	Yes	Yes-current
OK		x			x	x	x	x	x					No	No	Yes	Yes-current
OR	x				x	x	x	x					Yes	No	No	No	Don't know
SC	x				x	x	x	x					No	No	No	No	Don't know
TN		x			x	x	x		x				No	No	No	Yes	Yes-minor
UT	x				x	x	x	x	x				No	Yes	No	Yes	No
VT		x			x	x	x	x	x				No	No	No	Yes	
VA	x				x			x					No	No	No	Yes	Yes-minor
WA	x			x		x	x	x				x	No	Yes	No	No	Don't know
WI	x				x	x	x						Yes	No	No	No	Don't know
WY		x			x		x	x	x				No	Yes	No	No	Don't know
WFL		x		x		x	x	x	x					No	No	Yes	Yes-current
EFL		x		x		x	x	x	x					No	No	Yes	Yes-current

Q#	17 - What policy or procedure changes from the typical occur in an emergency project procurement?																							
	Expedited procedures are authorized				Prequalified sources are authorized				Competition requirements are reduced				Competition requirements are eliminated				Level of design before construction is reduced				Level of design before construction is eliminated			
Sta	Planning	Permitting	Contract award	Does not apply	Planning	Permitting	Contract award	Does not apply	Planning	Permitting	Contract award	Does not apply	Planning	Permitting	Contract award	Does not apply	Planning	Permitting	Contract award	Does not apply	Planning	Permitting	Contract award	Does not apply
AK	x	x	x		x	x	x		x	x	x				x					x			x	
CA	x		x					x			x				x		x					x		
CO	x	x	x		x	x					x					x	x	x	x					x
DE			x				x				x				x				x				x	
FL			x				x				x				x					x				x
HI		x	x			x	x		x	x	x		x	x						x				x
IA				x				x				x				x				x		x		
KS			x				x				x				x				x					x
MA			x		x		x				x				x				x					x
ME	x	x	x				x					x				x	x	x	x					x
MN	x	x	x		x		x				x					x		x	x					x
MO	x		x					x				x				x	x		x					x
MS	x		x					x			x				x					x				x
MT				x	x							x				x				x				x
NC	x	x	x		x	x	x		x	x	x				x				x					x
NE			x				x				x				x				x					x
NM			x					x			x				x					x				x
NY			x		x		x				x				x	x	x	x						x
OH	x	x	x		x	x	x		x	x	x		x	x	x		x	x	x		x	x	x	
OK			x					x			x				x					x				x
OR	x	x	x					x	x		x				x	x	x	x			x	x	x	
SC			x					x			x				x	x		x						x
TN		x	x									x								x				x
UT	x		x					x			x				x					x				x
VA			x					x			x				x		x		x					x
WA			x								x				x				x					x
WI			x					x	x		x				x				x					x
WY				x								x				x				x				x
WFL		x	x					x			x				x				x	x				x
EFL		x	x					x			x				x				x	x				x

Q#	17 - What policy or procedure changes from the typical occur in an emergency project procurement?																											
Sta	Level of monetary authority raised for project personnel				Level of monetary authority eliminated for project personnel				Level of design approval authority reduced for project personnel				Level of design approval authority eliminated for project personnel				Abbreviated permit applications are authorized				Progressive permitting is authorized				Abbreviated contract forms are authorized			
	Planning	Permitting	Contract award	Does not apply	Planning	Permitting	Contract award	Does not apply	Planning	Permitting	Contract award	Does not apply	Planning	Permitting	Contract award	Does not apply	Planning	Permitting	Contract award	Does not apply	Planning	Permitting	Contract award	Does not apply	Planning	Permitting	Contract award	Does not apply
AK				x				x				x				x				x				x				x
CA				x				x				x				x				x				x				x
CO				x				x				x			x	x	x	x		x		x	x		x	x	x	
DE				x				x				x							x					x				x
FL				x				x				x							x									x
HI		x	x					x				x							x					x				x
IA			x			x						x							x					x				x
KS				x				x				x							x					x				x
MA				x				x				x							x					x				x
ME				x				x				x							x					x				x
MN				x				x				x							x					x				x
MO			x					x				x							x					x				x
MS				x				x				x							x					x				x
MT				x				x				x							x					x				x
NC				x				x				x							x					x				x
NE				x				x				x							x					x				x
NM				x				x				x							x					x				x
NY				x				x				x							x					x				x
OH				x				x				x			x	x	x	x						x				x
OK				x				x				x							x					x				x
OR				x				x				x							x					x				x
SC				x				x				x							x					x				x
TN				x				x				x							x					x				x
UT				x				x				x							x					x				x
VA				x				x				x							x					x				x
WA			x					x				x							x					x				x
WI				x				x				x							x					x				x
WY				x				x				x							x					x				x
WFL				x				x				x							x					x				x
EFL				x				x				x							x					x				x

Q#	19	20 - If the answer to the previous question is yes, what is included in the preliminary contract to define the scope of the emergency project?											22	23	
		Inventory - no design	Inventory- design recommendation	Inventory-preliminary design	Record review-limited testing	Record review-geotechnical	Record review-preliminary permit	Develop and submit permit application	Cost estimate	Risk analyses	Public information plan	Traffic control plan			Other
State	Scope definition contract													Protest	Protest result
AK	Sometimes			x		x								Yes	Dropped
CA	Sometimes					x	x	x	x		x			No	
CO	No													No	
DE	Sometimes	x	x	x	x	x	x	x	x			x		Yes	Dropped
FL	Sometimes	x	x									x		No	
HI	Sometimes								x					No	
IA	Don't know											x		No	
KS	No													No	
MA	Always			x	x		x					x		No	
ME	No but could													No	
MN	Sometimes	x	x	x	x	x	x	x	x	x	x	x		Yes	Won
MO	No													No	
MS	Sometimes	x	x	x		x	x							No	
MT	Don't know													No	
NC	Sometimes			x		x								No	
NE	No													No	
NM	Always			x	x									No	
NY	No													Yes	
OH	Don't know													Yes	Dropped
OK	Sometimes		x	x		x				x				No	Dropped
OR	Sometimes		x	x	x		x					x		Yes	Dropped
SC	Don't know													No	Dropped
TN	Don't know													No	
UT	No													Yes	Dropped
VA	Don't know													No	
WA	Sometimes	x	x	x	x	x	x	x	x	x		x	x	No	
WI	Sometimes		x		x		x							No	
WY	No													No	
WFLHD	No but could													No	
EFLHD	No but could													No	

Q#	21 - How do you advertise and award an emergency contract?																		31				
	IFB, full open low bid		IFB to prequal, low bid		1-step full open RFQ, QBS		1-step full open RFP		2-step full open RFQ/RFP		1-step prequal. RFQ, QBS		1-step prequal. RFP		2-step pre-qual. RFQ/RFP		Sole source		Type of payment provisions				
	Design	Const	Design	Const	Design	Const	Design	Const	Design	Const	Design	Const	Design	Const	Design	Const	Design	Const	LS	UP-GMP	Cost+	Combo LS/UP	
AK				x	x													x	x	x		x	x
CA		x		x																x			
CO		x																					
DE				x																x			x
FL				x						x						x	x	x					x
GA																							
HI		x		x	x			x		x	x		x		x				x		x		x
IA		x		x		x		x		x		x		x		x			x				
KS								x												x			x
MA				x	x													x	x	x	x	x	
ME		x		x										x					x	x		x	x
MN	x	x	x				x	x	x	x	x			x	x	x	x	x	x	x		x	x
MO				x							x										x		x
MS		x		x	x					x	x							x	x	x		x	x
MT	x	x								x	x									x		x	x
NC				x										x	x				x	x	x		x
NE		x									x								x	x		x	x
NM		x		x	x														x	x	x	x	
NY		x		x	x	x		x			x			x					x	x	x		x
OH				x							x								x	x	x		x
OK		x		x							x									x	x	x	x
OR					x			x											x	x	x		x
SC				x							x								x	x	x		x
TN		x		x																			x
UT				x											x					x	x	x	x
VA				x																	x		x
WA		x		x		x															x		x
WI											x								x	x			x
WY		x		x		x		x		x				x		x				x			x
WFL		x		x	x			x		x				x		x			x	x	x	x	x
EFL		x		x	x			x		x				x		x			x	x	x	x	x

Ratings: E = Essential; I = Important; N = Not important															
Q#	24 - Rate the following as to importance to the success of the emergency project during the procurement process														
State	Clear definition	Sufficient scope definition	Delegation of decision-making authority to the project level	Highly qualified designers and contractors	Local knowledge and experience	Mandated use of agency design criteria and details	Ability to propose ATCs	Confidential ATCs before award	Quality management plan before contract award	Incentives/ disincentive schemes	Streamlined/abbreviated permitting process	Formal risk mitigation plan by agency	Formal risk mitigation plan in proposal	Correct weight between factors	Clear guidance on allowable betterments
AK	E	I	I	E	N	N	I	N	N	N	E	N	N	N	E
CA	I	I	I	I	I	N	N	N	N	N	E	N	N	N	I
CO	E	E	E	E	I	I	N	N	I	I	I	I	I	I	I
DE	N	I	N	I	I	I	I	N	N	I	I	N	N	N	N
FL	N	I	N	E	E	I	N	N	N	I	I	N	N	I	N
HI	I	I	I	I	I	I	N	N	N	N	E	I	I	N	I
IA	N	N	N	N	N	N	N	I	N	N	N	N	N	N	N
KS	E	E	I	I	I	I	I	I	I	N	I	N	N	N	I
MA	E	E	I	I	E	E	N	N	N	N	E	N	N	N	I
ME	E	I	I	E	I	I	I	N	N	I	E	N	N	N	N
MN	E	I	N	E	I	I	I	I	I	I	I	I	I	E	I
MO	E	I	N	I	I	I	I	E	N	I	I	I	I	I	I
MS	N	E	I	I	I	E	I	I	N	E	I	N	N	I	I
MT	E	E	I	I	I	I	I	N	I	N	I	I	I	N	I
NC	E	E	I	E	I	I	I	I	I	I	I	I	I	I	I
NE	E	E	E	E	E	N	I	I	N	I	E	N	N	N	N
NM	E	E	I	I	I	E	N	N	N	I	I	N	N	N	I
NY	E	I	I	E	E	I	N	N	I	E	I	N	N	E	I
OH	E	E	I	E	E	E	I	I	I	I	I	I	I	I	I
OK	E	I	I	E	I	I	E	I	N	E	E	N	N	I	I
OR	E	I	E	I	N	I	E	N	N	I	E	N	N	N	E
SC	I	I	I	E	I	I	I	N	N	N	I	N	N	N	I
TN	I	I	I	I	I	I	N	N	N	I	E	N	N	N	N
UT	E	E	N	I	I	E	N	N	I	N	N	N	N	N	N
VA	I	I	I	I	I	I	N	I	I	N	I	N	N	I	I
WA	E	E	E	E	E	I	I	I	I	I	E	I	N	N	E
WI	E	E	I	I	I	E	N	N	N	N	I	N	N	N	E
WY	I	I	N	N	I	I	N	N	N	N	N	N	N	N	N
WFL	E	I	N	I	I	N	N	N	N	I	E	N	N	I	E
EFL	E	I	N	I	I	N	N	N	N	I	E	N	N	I	E

Q#	25	26 - Competition defined					27	28	30	31 - Type of payment provisions				32	33	34
		Special emergency contract document	Min # bidders	Min # quotations	Bidding of sub-suppliers	Competitive negotiation				Competitive negotiation w/prequal bidders	Emergency federal contract clauses	Emergency FEMA contract clauses	Different contract forms based size/ value			
State																
AK	Yes						DK	DK	Yes	x		x	x	No	No	DK
CA	Yes	x					Yes	Yes	No		x			Yes	Yes	No
CO	No	x	x				No	No						No	No	No
DE	No	x					Yes	No	No	x			x		No	Yes
FL	No		x				Yes	Yes	No				x	No	No	Yes
HI	No						No	No	No	x		x	x	No	Yes	No
IA	No															
KS	No						Yes	No	No				x	Yes	No	No
MA	No	x	x	x			Yes	Yes	No	x	x	x		No	No	No
ME	No	x			x	x	Yes	No	No	x		x	x	No		No
MN	No	x	x			x	Yes	Yes	Yes	x		x	x	Yes	Yes	Yes
MO	No						Yes	No	No		x		x	No	Yes	No
MS	No	x	x				Yes	Yes	No	x		x	x	Yes	No	Yes
MT	No	x		x		x	Yes	Yes	Yes	x		x	x	No	No	No
NC	No	x				x	Yes	Yes	Yes	x			x	Yes	Yes	No
NE	No						Yes	No	Yes			x	x	Yes	Yes	No
NM	No		x				DK	Yes	No	x	x	x		No	No	No
NY	Yes	x	x				No	Yes	Yes	x		x	x	No	No	No
OH	No	x	x				DK	DK	No	x		x	x	No	No	No
OK	No						Yes	Yes	No	x	x		x	No	No	No
OR	No		x		x		DK	Yes	No	x		x		No	No	DK
SC	No						DK	DK	DK	x		x	x	DK	Yes	No
TN	No	x					Yes	No	No				x	No	Yes	No
UT	Yes	x					No	Yes	No	x	x	x	x	Yes	No	No
VA	No	x					Yes	DK	No	x			x	DK	No	No
WA	Yes	x					Yes	DK	Yes	x		x	x	No	Yes	No
WI	No	x	x				Yes	Yes	No			x		No	No	DK
WY	No			x	x		Yes	DK	No				x	No	No	No
WFLHD	No	x				x			No	x	x		x	No	No	No
EFLHD	No	x				x			No	x	x		x	No	No	No

DK = Don't know

APPENDIX B

Research Needs Statement

Chapter seven included four areas of recommended research. This appendix combines the four into a single research needs statement in NCHRP format, ready for submittal to TRB committees AFH10—Construction Management and AFH15—Project Delivery Methods.

**AASHTO STANDING COMMITTEE ON RESEARCH
AMERICAN ASSOCIATION OF STATE HIGHWAY AND
TRANSPORTATION OFFICIALS**

I. PROBLEM NUMBER

To be assigned by NCHRP staff.

II. PROBLEM TITLE

Guidebook for Emergency Procurement

III. RESEARCH PROBLEM STATEMENT

The past decade has provided a seemingly never-ending series of natural and man-made catastrophes that resulted in the loss of major components of the national highway network. From the devastation wreaked by Hurricane Katrina on the Gulf Coast and Interstate 10 to the sudden collapse of the Interstate 35W Bridge over the Mississippi River in Minnesota, state departments of transportation (DOTs) have had to step into the public spotlight and implement expedited procurement procedures to restore vital links in the transportation network with the media scrutinizing their work every night on the evening news. Although high-profile emergency projects are well known to the traveling public, the more common case is the loss of a culvert on a farm-to-market road due to flash flooding or a freeway overpass damaged and closed due to a traffic accident. These mundane local emergencies sometimes go unmentioned in the news, but are every bit as critical to the traveling public in the area and require just as much haste to restore service and remove threats to life and property. The difference between the two is often industry's willingness to accept a change in routine rules for free and open competition. In major disasters, the publicity brings with it a "do whatever it takes" attitude due to the emotions surrounding the event that are not usually present in the local incidents. Hence, uniform guidance is needed at the national level for both large and small emergency procurements.

NCHRP Synthesis 43-11 *Expedited Procurement Procedures for Emergency Construction Services* validated the need when it found that fewer than half of the responding DOTs had a document that provided guidance for expediting the procurement of emergency projects, and only five DOTs had a "contract document that was specifically developed for emergency projects." The needed research will define the appropriate content of DOT emergency project delivery plans as well as the form and content of tailored emergency contracts and their efficacy for agencies that have used them. Additionally, it will document the costs and benefits of incentive/disincentive schemes and their impact on the success of emergency projects as a basis for furnishing guidance on the most important aspect of an emergency procurement: restoring service in the least amount of time. The research will also explore the emergency applications for indefinite delivery/indefinite quantity (IDIQ) contracts and preliminary design and geotechnical investigation contracts to quantify the scope of the emergency construction. Finally, the costs and benefits of conducting formal risk analysis and risk management procedures will be included. The proposed research will address the following questions:

- What are the best practices for pre-event emergency contracts, such as the Florida DOT "Cut and Toss" debris removal and the New York State DOT "Statewide Emergency Bridge Repair" IDIQ contract, for both design and construction services?
- What is the optimal content of a DOT emergency procurement manual?

- What are the roles of the DOT in-house design, construction, and procurement personnel in an emergency, and how can the value of internal resources be leveraged to expedite resolution of the emergency?
- What are the advantages and disadvantages of various project delivery methods such as IDIQ, DBB, CMR, and DB in an emergency procurement?
- What types of emergency projects are good candidates for procurement with each type of project delivery method?
- What types of risk analysis can be used prior to and during the emergency procurement to best assign, mitigate, and retire the risks inherent in the process?
- What are the barriers to changing the aspects of current emergency project delivery and how can they be surmounted?
- How can betterments be incorporated into emergency projects without violating statutory constraints on federal emergency relief reimbursements?

IV. RESEARCH OBJECTIVE

The main research objective is to produce a guide that state DOTs can use to develop internal processes and procedures to react to and resolve all scales of emergency projects. It will quantify the costs and benefits of various effective practices found in Synthesis 43-11 as well as identify best practices for these types of contracts. One of the major outcomes of this study is the discovery of surmountable barriers to implementation. A second outcome will be a critical analysis of those features of current project delivery that unnecessarily drive up the cost of design and construction. The study will then assemble a set of best practices and conduct a comparative analysis that can be utilized by agencies wishing to implement these practices in their emergency project delivery programs. The primary deliverable will be a guide that details the salient research findings and recommendations along with quantitative measures of effectiveness.

Specific tasks of the research to accomplish the main objective are as follows:

- **Task 1**—Define the state of the practice in emergency procurement procedures through a comprehensive literature, the collection and analysis of relevant procurement documents, typical design, and construction contracts. Review the federal and state statutory constraints on expediting procurement and identify barriers to changing procurement requirements that trigger unrecognized costs and needlessly extend the time it takes to resolve emergency situations.
- **Task 2**—Survey state DOTs, transit agencies, airport authorities, and other public transportation agencies to identify the specific expedited procurement practices that are currently used in conjunction with the various project delivery methods and other project delivery characteristics.
- **Task 3**—Select a representative set of case study projects from public transportation agencies with a varied set of emergency procurement procedures on a diverse set of project types across the nation that can be studied in depth to identify both best practices and lessons learned.
- **Task 4**—Prepare a research work plan that describes the details of the research methodology and methods for identifying best practices and developing conclusions.
- **Task 5**—Execute the research work plan and prepare an interim research report that articulates the data collection and analysis as well as emerging conclusions, best practices, lessons learned, and a proposed outline for the guidebook.
- **Task 6**—Prepare the draft report evaluating the costs and benefits of emergency procedures such as selection of the project delivery method and project payment provisions. Incorporate review comments as required and validate the report's efficacy on a range of U.S. projects.
- **Task 7**—Publish a guidebook that can be used to develop DOT emergency procurement plans for a cross section of typical emergency projects and a final research report that details the full results of the research.

V. ESTIMATE OF PROBLEM FUNDING AND RESEARCH PERIOD

Recommended Funding:

Recommended funding for the project is \$400,000 to \$500,000.

Research Period:

It is estimated that 30 months will be required to perform the research.

The anticipated budget and schedule are based on assumptions for required resources to support limited on-site collection of performance contract case study project data, the assembly of the contents of the guidebook, and the validation of the findings from the case study DOT simulation.

VI. URGENCY, PAYOFF POTENTIAL, AND IMPLEMENTATION

The continuing deterioration of the nation's highway network and the constraints imposed by a down economy and perpetual backlog of unfunded maintenance and repair projects greatly increase the probability of catastrophic failures like the I-35W bridge in Minnesota because DOTs are unable to address structurally deficient infrastructure assets. Increased traffic on the nation's roads and waterways also makes the probability and frequency of accidental/catastrophic failure to bridges and other structures higher than ever before. Combining these with the unknown aspects of climate change on severe weather patterns creates the "perfect storm" that defines the urgency of need for highly developed expedited procurement procedures to restore service to the national transportation network. The intent of this project is to educate public agency engineers on the options available to execute emergency design and construction in a highly expedited fashion and minimize the constraints imposed by statutory, environmental, and policy constraints. Understanding the various alternatives through the use of a guidebook will add another layer of sophistication to the decision-making process and create a more contractually efficient environment in which an emergency project can be delivered. The result will likely be the initiation of efforts to eliminate barriers and articulate potential benefits to upper management and legislative authorities.

The payoff of this research is likely to be significant in that it comes at a time when a large influence can be applied to the programs all 50 states. By evaluating the costs and benefits of various expedited procurement practices, it will highlight areas where rules, regulations, and policies can be amended to use available public capital more efficiently. It creates another benefit in that it provides a full suite of possible emergency project delivery options and instruments that may be used for projects that traditionally use other methods.

VII. PERSON(S) DEVELOPING THE PROBLEM

Douglas D. Gransberg, PhD, PE, Professor, Iowa State University; and the NCHRP 43-11 Synthesis Panel.

VIII. PROBLEM MONITOR

TRB Committees AFH10: Construction Management and AFH15: Project Delivery Methods are submitting this problem statement through the sponsorship of the [insert DOT sponsor] Department of Transportation.

IX. DATE AND SUBMITTED BY

APPENDIX C

State Emergency Procurement Statutes and Delegation of Authority

State	Emergency Procurement Statute	Delegation of Authority*
Alabama	Code of Alabama, Title 31, Chapter 9, Section 6 (31-9-6) Alabama Emergency Management Act of 1955; Act 47	Other DOT designee
Alaska	Alaska Statute § S 26.23.020	Director
Arizona	Arizona Revised Statute § 35-192, Authorization for Declaration of Disaster	Other DOT designee
Arkansas	Arkansas Statute Annotated §19-11-204(4)	Governor
California	California Emergency Services Act; Government Code, Title 2, Division 1, Chapter 7	Other DOT designee
Colorado	Fiscal Rule 2-2 of the State of Colorado Fiscal Rules	Director
Connecticut	Connecticut General Statutes Ch. 242, § 13b-26(f)	Secretary/commissioner
Delaware	Delaware Code Ch. 29, Title 69 § 6907	Director
Florida	Sub-section 337.11(6)(a), Florida Statutes	Director
Georgia	Georgia Code § 32-2-1	Governor
Hawaii	Hawaii Revised Statute § 103 D-307, Ch. 128,	Other DOT designee
Idaho	Idaho Code §40-310	Governor or secretary/commissioner
Illinois	30 Illinois Compiled Statutes 500/art. 20	Other DOT designee
Indiana	2010 Indiana Code, Title 8. Utilities and Transportation, Article 23 Chapter 11. Emergency Repairs without Bidding	Governor
Iowa	Iowa Code § 313.10,	Director
Kansas	Kansas Standard Operating Manual 1.9.4, 3.3.10, Kansas Statute Annotated 48-904,	Director
Kentucky	Kentucky Revised Statutes § 12.250	Governor
Louisiana	Louisiana Revised Statute §29:722(c);	Governor or secretary/commissioner
Maine	23 Maine Revised Statute Annotated §753-A	Director
Maryland	Title 14 of the Public Safety Article of the Annotated Code of Maryland	Governor
Massachusetts	801 Massachusetts Code Regulations 21.00	Director
Michigan	Michigan Compiled Laws Section 550.1, Section 1	Other DOT designee
Minnesota	Minnesota Statute 161.32, Subdivision 3	Director
Mississippi	The Mississippi Emergency Management Law, MS Code Ann. § 33-15(1972)	Other DOT designee
Missouri	Missouri Revised Statutes §34.045 Emergency procurement, waiver of competitive bids or proposals	Other DOT designee
Montana	Montana Code Annotate 60-2112 (2) (2007)	Director
Nebraska	Revised Statutes of Nebraska Section 81-829.31	Director
Nevada	Nevada Revised Statutes (NRS) Chapter 414, Emergency Management	Governor or secretary/commissioner
New Hampshire	New Hampshire Revised Statues Annotated 228 of the State Emergency Management Act	Other DOT designee
New Jersey	New Jersey Statute 52:34-10	Governor
New Mexico	New Mexico Statute § 13-1-127 (1978)	Director
New York	Executive Law, Article 2-B, Section 23	Director
North Carolina	North Carolina Statutes, 3.133	Director
North Dakota	North Dakota Central Code 24-03-04,	Director
Ohio	Ohio Revised Code § 5517.02, 5526.08	Director
Oklahoma	Oklahoma Statute Ch. 61 0.5 § 130,	Director
Oregon	Oregon Revised Statutes § 401.092	Director
Pennsylvania	62 Pennsylvania Compiled Statutes §516	Director
Rhode Island	Rhode Island General Laws 42-13-1,	Director
South Carolina	South Carolina Code of Laws Title 25—Chapter 1. Article 4; Sections 25-1-420 thru 460 (Emergency Powers Act).	Director

Table continued on p.106

Table continued from p.105

State	Emergency Procurement Statute	Delegation of Authority*
South Dakota	South Dakota Codified Laws § 33-15-8	Governor or secretary/commissioner
Tennessee	Tennessee Code Annotated 54-1-135	Director
Texas	Title 43, Texas Administrative Code, Chapter 9; Section 223.102 of the Texas Transportation Code	Other DOT designee
Utah	Utah Code Section 63G-6-411	Director
Vermont	19 Vermont Statute Annotated Section 303	Director
Virginia	Code of Virginia Section 2.2-4303	Other DOT designee
Washington	Revised Code of Washington 47.28.170	Other DOT designee
West Virginia	West Virginia Code § 148-1-7.6 State Purchasing, § 15-5-6 Governor, § 17-2A-8 DOH Commissioner	Other DOT designee
Wisconsin	Wisconsin Statute 16.75(6)(e); 166.03(1)(b)1,4,544	Other DOT designee
Wyoming	Wyoming DOT Policy No. 24, issued 3/1/97; 24-1, issued 3/23/06; 24-9, issued 3/3/06	Director

* Because of the different executive titles used within state DOTs, "Director" is recorded only in those instances where the word was specifically called out in the literature. "Other DOT designee" refers to language that indicated that an official below the DOT director, such as the state maintenance engineer or district engineer, was delegated authority to declare an emergency, usually for localized emergency events.

Abbreviations and acronyms used without definitions in TRB publications:

AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI-NA	Airports Council International-North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	Air Transport Association
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
EAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation

TRANSPORTATION RESEARCH BOARD
500 Fifth Street, N.W.
Washington, D.C. 20001

ADDRESS SERVICE REQUESTED

THE NATIONAL ACADEMIES™

Advisers to the Nation on Science, Engineering, and Medicine

The nation turns to the National Academies—National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council—for independent, objective advice on issues that affect people's lives worldwide.

www.national-academies.org

ISBN: 978-0-309-22378-2

