



Title

PRELIMINARY DRAFT OR FINAL REPORT

Insert a Good Photo representing the project

Prepared by:
Research Agency Line 1
Research Agency Line 2
Research Agency Line 3
Research Agency City
Report # FHWA-AK-RD-XX-XX
Date Month Year

Prepared for:
Alaska Department of Transportation & Public Facilities
Statewide Research Office
3132 Channel Drive
Juneau, AK 99801-7898

Publication Number

REPORT DOCUMENTATION PAGE			Form approved OMB No.
Public reporting for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestion for reducing this burden to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-1833), Washington, DC 20503			
1. AGENCY USE ONLY (LEAVE BLANK)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED	
4. TITLE AND SUBTITLE		5. FUNDING NUMBERS State project numbers Federal project numbers	
6. AUTHOR(S)			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)		8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) State of Alaska, Alaska Dept. of Transportation and Public Facilities Research and Technology Transfer 3132 Channel Drive Juneau, AK 99801-7898		10. SPONSORING/MONITORING AGENCY REPORT NUMBER Federal project numbers	
11. SUPPLEMENTARY NOTES Performed in cooperation with			
12a. DISTRIBUTION / AVAILABILITY STATEMENT No restrictions		12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) An abstract of 200 words or less (i.e., no longer than one page of double-spaced typewritten material), suitable for use in computerized information storage and retrieval systems, should be presented after the acknowledgment. The abstract will be provided to the Transportation Research Information Service (TRIS) and the National Technical Information Service (NTIS). It should use direct statements in complete sentences to describe the work scope and principal findings. An example follows: <i>This report documents and presents the results of a study of the safety aspect of curb use. Full-scale tests in combination with computer simulations were applied to investigate vehicle behavior upon impact with a series of commonly used curbs. Three curb designs taken from the AASHTO geometric design manual, and a special configuration 13 in. high, were given consideration in the study. The four curbs were investigated at three vehicle approach angles and at three speed levels. Such vehicle responses as redirection, trajectory, path, roll and pitch, and acceleration were observed and evaluated. The model results correlated well with the full-scale results. The findings of the study suggest that curbs of the configurations tested have no redirection capabilities to enhance safety in a high-speed travel environment.</i>			
14- KEYWORDS :		15. NUMBER OF PAGES	
		16. PRICE CODE N/A	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT N/A

Notice

This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in this document. The U.S. Government does not endorse products or manufacturers. Trademarks or manufacturers' names appear in this report only because they are considered essential to the objective of the document.

Quality Assurance Statement

The Federal Highway Administration (FHWA) provides high-quality information to serve Government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. FHWA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

Author's Disclaimer

Opinions and conclusions expressed or implied in the report are those of the author. They are not necessarily those of the Alaska DOT&PF or funding agencies.

METRIC (SI*) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS					APPROXIMATE CONVERSIONS FROM SI UNITS				
Symbol	When You Know	Multiply By	To Find	Symbol	Symbol	When You Know	Multiply By	To Find	Symbol
<u>LENGTH</u>					<u>LENGTH</u>				
in	inches	25.4	mm	mm	millimeters	0.039	inches	in	
ft	feet	0.3048	m	m	meters	3.28	feet	ft	
yd	yards	0.914	m	m	meters	1.09	yards (statute)	yd	
mi	Miles (statute)	1.61	km	km	kilometers	0.621	Miles (statute)	mi	
<u>AREA</u>					<u>AREA</u>				
in ²	square inches	645.2	millimeters squared	cm ²	mm ²	millimeters squared	0.0016	square inches	in ²
ft ²	square feet	0.0929	meters squared	m ²	m ²	meters squared	10.764	square feet	ft ²
yd ²	square yards	0.836	meters squared	m ²	km ²	kilometers squared	0.39	square miles	mi ²
mi ²	square miles	2.59	kilometers squared	km ²	ha	hectares (10,000 m ²)	2.471	acres	ac
ac	acres	0.4046	hectares	ha					
<u>MASS (weight)</u>					<u>MASS (weight)</u>				
oz	Ounces (avdp)	28.35	grams	g	g	grams	0.0353	Ounces (avdp)	oz
lb	Pounds (avdp)	4.54	kilograms	kg	kg	kilograms	2.205	Pounds (avdp)	lb
T	Short tons (2000 lb)	0.907	megagrams	mg	mg	megagrams (1000 kg)	1.103	short tons	T
<u>VOLUME</u>					<u>VOLUME</u>				
fl oz	fluid ounces (US)	29.57	milliliters	mL	mL	milliliters	0.034	fluid ounces (US)	fl oz
gal	Gallons (liq)	3.785	liters	liters	liters	liters	0.264	Gallons (liq)	gal
ft ³	cubic feet	0.0283	meters cubed	m ³	m ³	meters cubed	35.315	cubic feet	ft ³
yd ³	cubic yards	0.765	meters cubed	m ³	m ³	meters cubed	1.308	cubic yards	yd ³
Note: Volumes greater than 1000 L shall be shown in m ³									
<u>TEMPERATURE (exact)</u>					<u>TEMPERATURE (exact)</u>				
°F	Fahrenheit temperature	5/9 (°F-32)	Celsius temperature	°C	°C	Celsius temperature	9/5 °C+32	Fahrenheit temperature	°F
<u>ILLUMINATION</u>					<u>ILLUMINATION</u>				
fc	Foot-candles	10.76	lux	lx	lx	lux	0.0929	foot-candles	fc
fl	foot-lamberts	3.426	candela/m ²	cd/cm ²	cd/cm ²	candela/m ²	0.2919	foot-lamberts	fl
<u>FORCE and PRESSURE or STRESS</u>					<u>FORCE and PRESSURE or STRESS</u>				
lbf	pound-force	4.45	newtons	N	N	newtons	0.225	pound-force	lbf
psi	pound-force per square inch	6.89	kilopascals	kPa	kPa	kilopascals	0.145	pound-force per square inch	psi
These factors conform to the requirement of FHWA Order 5190.1A *SI is the symbol for the International System of Measurements									

Redlined text is for instructional purposes only.

This research report template has been adapted from Appendix A ([Instructions for Preparation of Cooperative Research Program Reports](#)) of the Transportation Research Board (TRB), National Cooperative Highway Research Program.

The acceptability of final reports is judged by three criteria: (1) fulfillment of project objectives as set forth in the contract; (2) adequacy of documentation; and (3) clarity of presentation. Reports should be complete in all their parts, organized appropriately to serve their purposes, correct in matters of fact and documentation, and edited for basic uniformities of style and usage. *Research project reports must be written in active voice to the maximum extent practicable.* Time and effort devoted to the preparation of a quality report is clearly a worthwhile investment, because poorly organized and poorly written reports will not be acceptable in fulfilling contract requirements. *Furthermore, all text, tables, and figures should be suitable for publication with a minimum of editing, because extensive changes made by an editorial staff unfamiliar with the research cause delay and may easily result in unintended changes of meaning.*

Table of Contents

Table of Contents	v
List of Figures	v
List of Tables	v
Acknowledgements	vi
Executive Summary	Error! Bookmark not defined.
Chapter Sections	2
CHAPTER 1 - INTRODUCTION AND RESEARCH APPROACH	2
CHAPTER 2 - FINDINGS	3
CHAPTER 3 - INTERPRETATION, APPRAISAL, AND APPLICATIONS	4
CHAPTER 4 - CONCLUSIONS AND SUGGESTED RESEARCH	5
REFERENCES	6
APPENDIXES	A

List of Figures

List of Tables

Acknowledgements

The acknowledgments section in the report should include titles and affiliations of the research team members and other contributors at the time the research was conducted, and their connection with the research should be reported. If changes in title or affiliation have occurred, the titles or affiliations at the time of report submission also should be stated. Acknowledgments do not cite either NCHRP/TCRP staff assistance or, usually, the assistance of typists or proofreaders, for example. A typical acknowledgment statement follows:

The research reported herein was performed under NCHRP Project 12-7 by the Fritz Engineering Laboratory, Department of Civil Engineering, Lehigh University, and the Department of Mechanics and Civil Engineering, Drexel University. Lehigh University was the contractor for this study. The work undertaken at Drexel University was under a subcontract with Lehigh University. John W. Fisher, Professor of Civil Engineering, Lehigh University, was the principal investigator. The other authors of this report are Pedro A. Albrecht, former Research Assistant at Fritz Engineering Laboratory, now Assistant Professor of Civil Engineering, University of Maryland; Ben T. Yen, Associate Professor of Civil Engineering, Lehigh University; David J. Klingerman, Research Assistant, Fritz Engineering Laboratory; and Bernard M. McNamee, Professor of Civil Engineering, Drexel University. The work was done under the general supervision of Professor Fisher. The work at Drexel was done under the super-vision of Professor McNamee with the assistance of Richard Gray and Robert Baldassano, Research Assistants, and Allen Yerger, Technician. The work at Lehigh was under the supervision of Professors Fisher and Yen, with the assistance of Messrs. Albrecht and Klingerman.

BODY OF THE REPORT

The body of an ADOT&PF research report is designed to provide information to the department administrator, to the operations-oriented transportation professional, or to any other reader whose primary concern is to put research results into practice. For this reason, the report organization is very important, and a standard structure is recommended.

Executive Summary

The summary of findings is often the most influential part of the report and must be written with the busy transportation administrator in mind. It should contain a readable yet condensed description, explained within the context of the project scope and objectives, of the research findings and conclusions that evolved from the project. It should contain only information that is essential to an understanding of the findings and how they relate to the solution of operating problems. It is not an abbreviated version of the full report.

CHAPTER SEQUENCE

Note: Report chapters should be structured in a concise and logical manner suitable to the subject matter, clearly describing the research approach, findings, and conclusions.

The recommended sequence of chapters is outlined below, with a description of the typical content for each chapter. However, the structure of some reports may not conform to this sequence.

Chapter Sections

Within the chapter structure, subheadings should be employed to distinguish separate subject matter. Properly used headings can be very helpful to readers, especially to those with limited reading time who must concentrate on what are to them the most consequential parts of a report.

CHAPTER 1 - INTRODUCTION AND RESEARCH APPROACH

Discussions of the problem that led to the study, current knowledge that can help in its solution, the objectives and scope of the assigned research, and the approach that was used in attempting to solve the problem, are presented in this section. This chapter does not contain the details of any state-of-the-art survey that may have been made; it contains no forms that may have been used in soliciting information; and it does not give details regarding test procedures or mathematical analyses that may have been used. Those details are placed in appendixes.

Suggested subheadings:

Problem Statement and Research Objective

Scope of Study

Research Approach

Methodology

CHAPTER 2 - FINDINGS

The material in this chapter enlarges on that presented in the Summary of Findings. By definition, a "finding" is the result of an examination. Summary data, principal mathematical formulas that have developed, and other information that represents study findings may be presented here. Details are presented in the appendixes. Discussion of the findings is presented in Chapter 3. Generalized conclusions that are based on the findings are presented in Chapter 4.

Suggested subheadings:

State-of-the-Art Summary

Other Subheadings as Appropriate

CHAPTER 3 - INTERPRETATION, APPRAISAL, AND APPLICATIONS

What the findings mean, in terms of use in standards, specifications, policies, and procedures, is discussed in this chapter. What they add to an understanding of the problem and what effects they have on economy, safety, amenities, and convenience are appropriate subjects for discussion. An assessment of their limitations is an important item for inclusion here. Nomographs, design charts, proposed specifications, and other items of immediate use to practicing engineers or other users should be presented here.

Suggested subheadings:

General Recommendations

Other Subheadings as Appropriate

CHAPTER 4 - CONCLUSIONS AND SUGGESTED RESEARCH

The conclusions are concerned with general principles suggested in the findings of Chapter 2. They differ from the findings in that they are extensions of the findings beyond conditions specific to the project. If the project findings have revealed specific areas where further research would be valuable, this chapter is the place to enumerate and describe them.

Suggested subheadings:

Conclusions

Suggested Research

REFERENCES

The last item within the body of the report is a listing of the references that have been cited within the text. The method for presenting references is prescribed under Section III of these Instructions.

APPENDIXES

Preceding sections of the final report have been directed to practitioners, public officials, and administrators. Appendix presentations are designed for the researcher, developer of manuals and guidelines, and other professional users of the research results who are interested in the maximum degree of technical detail provided by the project effort.

In some cases, the appendixes may be minimal in number and content; in others, the appendixes may be larger than the body of the report. Each appendix must be designated by letter and title, and references to appendixes should be made, as necessary, at appropriate places in the text.

Appendix Content

Appendixes typically include the following items:

1. Manuals and guidelines
2. Documentation and further elaboration of research findings
3. Forms
4. Mathematical analyses
5. Bibliography

Ordinarily, bulky background data (such as computer-related files) are not reported but are retained by the research agency.