

The Highway Revolution, 1895–1925

The Highway Revolution, 1895–1925

*How the United States Got
Out of the Mud*

I.B. Holley, Jr.
DUKE UNIVERSITY

CAROLINA ACADEMIC PRESS
Durham, North Carolina

Copyright © 2008
I.B. Holley, Jr.
All Rights Reserved

Library of Congress Cataloging-in-Publication Data

Holley, I. B. (Irving Brinton), 1919–

The Highway revolution, 1895–1925 : how the United States got out of
the mud / by I.B. Holley, Jr.

p. cm.

Includes bibliographical references and index.

ISBN 978-1-59460-353-2 (alk. paper)

1. Roads--United States--History. 2. Road machinery--United States--
History. I. Title.

HE355.H58 2007

388.10973'09041--dc22

2007021265

Carolina Academic Press
700 Kent Street
Durham, NC 27701
Telephone (919) 489-7486
Fax (919) 493-5668
www.cap-press.com

Printed in the United States of America

CONTENTS

Preface

vii

Introduction

ix

Chapter 1

To Get Out of the Mud: Who Pays?

3

Chapter 2

What Kind of Road?

The Macadam Era, 1816–1916

15

Chapter 3

Educating the Rural Highway Builders:
Getting out the Word on Construction Methods

25

Chapter 4

Horse-Drawn Road Machinery

37

Chapter 5

Steam-Powered Machinery for Highway Building

51

Chapter 6

The Contractor

75

Chapter 7

The Long Road from Asphalt Streets to Asphalt Highways

91

Chapter 8	
Gasoline Power and Highways, 1908–1918	
	105
Chapter 9	
Cement, Concrete, and Mixers	
	119
Chapter 10	
Concrete Highways: The Boom Years	
	133
Chapter 11	
Retrospective on a Revolution	
	153
Notes	
	165
Bibliography	
	187
Index	
	193

PREFACE

Several years ago I wrote a family memoir in which I included a chapter on my father's business as a highway contractor. He and his partner were pioneer builders of concrete highways in Connecticut and New York state. In compiling that chapter, I was surprised at the paucity of historical writing about highway building in general and road-building equipment in particular. There are, to be sure, some excellent studies on some aspects of the road-building story. Bruce Seely's *Building the American Highway System* is an outstanding account, but it offers largely a top-down administrative view. I have endeavored to present a muddy-boots view at the tactical level, reconstituting as far as possible what was actually involved in building inter-urban highways.

Apart from a scattering of finds such as the excellent article on the early steam shovel by Samuel Stueland and the illustrated volume on steamrollers by Robert Rhode and Ray Drake, there are few scholarly studies. Stone crushers, rock drills, asphalt machinery and concrete mixers all lack comprehensive studies, although there are a few company histories, usually produced for advertising purposes. My original goal was to provide a technological history of each piece of road-building equipment, but the absence of adequate secondary literature forced me to settle for descriptive accounts in more instances than I wished. More than one lifetime will be required to compile an exhaustive history of road-building machinery. I have spun off an article on asphalt and another on steamrollers. No one has yet scratched the surface of wagon technology culminating in dropbottom wagons, which were widely in vogue just before the coming of gasoline-powered trucks. Finally, historical studies of highway contracting as a business are notably lacking.

In the chapters that follow I have made only a sparse beginning. They definitely fail to accomplish all I originally intended to achieve, but I hope I have presented a sufficiently detailed account to give a reasonably well-rounded picture of the various elements that constituted the "highway revolution." Like any good historian, I set out to tell a chronological story, but I soon found it wouldn't work. The development of asphalt and concrete spread over many

years as did the evolution of the significant items of machinery used in road building. So I finally settled on a series of topical chapters set insofar as possible in chronological order.

I believe very strongly in Jacques Barzun's view that the historian's primary task is to tell a good story rather than concoct some great theory, in this case some great theory of highway construction. All I have tried to do is to paint a picture of the problems encountered and the solutions devised to leave the reader with a fuller understanding of this largely unheralded aspect of the nation's essential infrastructure.

The author wishes to acknowledge the extensive support he has received over a period of many years from the Reference staff of the Duke University Library, including the Vesic Engineering Library. Without the help of these dedicated individuals I doubt I could have completed this volume.

INTRODUCTION

The United States at the beginning of the 21st century has the greatest highway system the world has ever known. It goes far beyond the splendid network of roads the Romans built to hold their empires together. In what we call the automobile age, the highways of the nation are an essential infrastructure. Highway transportation characterizes our very culture, shaping the way we live even more than did the wonderful network of rail lines that spread throughout the 19th century.

How many of our citizens ever stop to think how relatively recent is our impressive highway system? Paved highways in the United States have been with us for barely two generations. When political authorities began to think about paving highways toward the end of the 19th century there were paved streets in urban areas, but highways were still largely lacking any sort of hard surface and were veritable mudholes in wet weather. Even as late as the first two decades of the 20th century, pictures of vehicles hub-deep in mud remind us of how long and slow was the process of paving.

The chapters that follow tell the story of how the nation learned to build highways, learned how to finance them, mastered the problem with intractable materials, developed the machinery required, and perfected the contracting organizations, the technical and managerial talent needed to pave soundly at a cost acceptable to the taxpayers.