



U.S. Department
of Transportation

Federal Highway
Administration

Publication No. FHWA-SA-97-058
April 1997



Demonstration Project No. 105

Moving America More Efficiently



**Advanced Transportation
Management Technologies**

Participant Reference Guide

Office of Technology Applications

TABLE OF CONTENTS

CHAPTER 1. INTRODUCTION	1-1
1.1 OFFICE OF TECHNOLOGY APPLICATIONS	1-3
1.2 BACKGROUND	1-7
1.3 METROPOLITAN AREA INTELLIGENT TRANSPORTATION INFRASTRUCTURE MODEL DEPLOYMENT INITIATIVE	1-17
1.4 OBJECTIVES OF WORKSHOP	1-19
1.5 PURPOSE OF THE REFERENCE MATERIAL	1-19
1.6 ORGANIZATION OF THE REFERENCE MATERIAL	1-19
CHAPTER 2. FREEWAY-MANAGEMENT SYSTEMS	2-1
2.1 RAMP CONTROL	2-4
2.2 FREEWAY MAINLINE CONTROL	2-16
2.3 DYNAMIC ROADWAY CONTROL	2-22
2.4 PRIORITY CONTROL FOR HOV	2-26
2.5 TRANSPORTATION MANAGEMENT DURING RECONSTRUCTION	2-33
2.6 DETECTION	2-37
2.7 TRAFFIC SURVEILLANCE	2-61
2.8 DYNAMIC MESSAGE SIGNS (DMS)	2-69
2.9 HIGHWAY ADVISORY RADIO (HAR)	2-75
2.10 COMMUNICATIONS	2-77
2.11 IN-VEHICLE NAVIGATION SYSTEMS	2-114
CHAPTER 3. TRAFFIC SIGNAL CONTROL SYSTEMS	3-1
3.1 SURFACE STREET CONTROL	3-3
CHAPTER 4. INCIDENT MANAGEMENT	4-1
4.1 FREEWAY INCIDENT-MANAGEMENT SYSTEMS	4-3
4.2 SURFACE ARTERIAL INCIDENT-MANAGEMENT SYSTEMS	4-20
CHAPTER 5. ELECTRONIC TOLL-COLLECTION SYSTEM	5-1
5.1 ETTM COMPONENTS	5-3
5.2 TECHNOLOGIES	5-5
5.3 CASE STUDIES	5-15
5.4 EVOLVING TECHNOLOGIES	5-19

CHAPTER 6.	TRANSIT-MANAGEMENT SYSTEMS.....	6-1
6.1	TECHNIQUES/STRATEGIES	6-3
6.2	TECHNOLOGIES	6-8
6.3	CASE STUDIES	6-11
6.4	EVOLVING TECHNOLOGIES	6-20
CHAPTER 7.	REGIONAL MULTIMODAL TRAVELER INFORMATION CENTER.....	7-1
7.1	BACKGROUND	7-3
7.2	CASE STUDIES	7-6
7.3	EVOLVING TECHNOLOGIES	7-28
CHAPTER 8.	INTEGRATION OF SYSTEMS	8-1
8.1	FREEWAY-MANAGEMENT SYSTEMS	8-3
8.2	TRAFFIC-SIGNAL CONTROL	8-4
8.3	INCIDENT MANAGEMENT	8-4
8.4	ELECTRONIC TOLL COLLECTION	8-4
8.5	TRANSIT AND EMERGENCY MANAGEMENT SYSTEMS	8-5
8.6	REGIONAL MULTIMODAL TRAVELER INFORMATION SYSTEMS	8-5
8.7	CASE STUDIES	8-5
8.8	STANDARDS	8-8
CHAPTER 9.	FUNDING	9-1
9.1	ISTEA	9-4
9.2	NEXTEA	9-10
9.3	PRIVATE FUNDING POTENTIAL	9-38
9.4	INNOVATIVE FINANCING	9-40
9.5	CASE STUDIES ON FINANCING PROJECTS	9-49

APPENDICES:

APPENDIX A. INTELLIGENT TRANSPORTATION SYSTEM BENEFITS	A-1
APPENDIX B. CASE STUDIES: DEPLOYMENT OF ITS IN MAJOR MATROPOLITAN AREAS	B-1
APPENDIX C. INTERAGENCY AGREEMENT FOR A REGIONAL TRANSPORTATION SYSTEM	C-1
APPENDIX D. MINNESOTA GUIDESTAR TEST OF NON-INTRUSIVE TECHNOLOGIES	D-1
APPENDIX E. IMPLEMENTATION PLAN GUIDANCE	E-1
APPENDIX F. OPERATIONS AND MAINTENANCE PLANNING	F-1
APPENDIX G. EVALUATION PROCEDURES FOR SELECTED ITS STRATEGIES	G-1
APPENDIX H. WEATHER AND ENVIRONMENTAL PROTECTION	H-1
APPENDIX I. TRAFFIC MANAGEMENT VIDEO SYSTEM PLANNER	I-1
APPENDIX J. ANALYSIS FOR SELECTING COMMUNICATIONS FOR TRAFFIC CONTROL	J-1
APPENDIX K. AN ARCHITECTURE FOR CORRIDOR-WIDE TRAVELER INFORMATION SYSTEMS	K-1
APPENDIX L. ITS FUNDING OPPORTUNITIES IN ORANGE COUNTY	L-1
APPENDIX M. GLOSSARY	M-1