

TABLE OF CONTENTS

	<u>Page</u>
Project Abstract	iv
Acknowledgements and Advisory Committee	v
<u>Chapters:</u>	
1. SUMMARY AND CONCLUSIONS	
1.1 Key Findings	1-2
1.2 How the Work was Performed	1-8
2. PROJECT SCOPE AND PURPOSE	
2.1 Purpose	2-1
2.2 Objectives	2-2
2.3 Tasks	2-3
3. DESCRIPTION OF STRATEGIES	
3.1 Literature Review Summary	3-1
3.2 Selection of Potential Strategies	3-1
3.3 Descriptions of Potential Strategies	3-3
3.4 Effectiveness of Individual Strategies	3-10
4. EXISTING LAND USE and TRANSPORTATION CONDITIONS	
4.1 Descriptions of Community Types (Urban, Suburban, Exurban)	4-1
4.2 Existing Conditions in California Communities	4-4
4.3 Case Studies of California Communities	4-8
4.4 Communities Outside of California	4-13
5. PERFORMANCE GOALS	
5.1 Methodology for Setting Performance Goals	5-2
5.2 Suggested Performance Goals	5-12
6. STRATEGY RECOMMENDATIONS	
6.1 Recommended Strategies	6-1
6.2 Development of Strategy Recommendations	6-3
6.3 Factors Affecting Strategy Implementation	6-4
6.4 Description of Recommended Strategy Packages	6-7
Strategy Package Tables	
7. IMPLEMENTATION MECHANISMS for RECOMMENDED STRATEGIES	
7.1 Policies	7-2
7.2 Policy Documents	7-8
7.3 Administrative Actions	7-13
7.4 Organizational Tools	7-16
7.5 Resource Tools	7-20
7.6 Problems and Solutions	7-26
7.7 Monitoring Methods	7-29

The following items are not included in the Internet version of this report.

However, they are provided in the printed report, which may be requested from:

the California Air Resources Board, Transportation Strategies Group,
at (916) 323-0439 (fax: 916-322-3646).

TABLE OF CONTENTS (continued)

	<i>Page</i>
GLOSSARY	
APPENDICES:	
Appendix A: Characteristics of Transportation-Related Land Use Strategies	A-1
Appendix B: Summary of Transportation-Related Land Use Strategy Literature and Annotated Bibliography	B-1
Appendix C: Development of Ratings Criteria for Sample Communities	C-1
Appendix D: VMT and Community Characteristics: Summary Tables	D-1
Appendix E: Methodology for Conversion from Daily to Annual Travel Values	E-1
Appendix F: ARB "BURDEN" Travel Activity Data for California counties	
Appendix G: Mode of Travel by Region	G-1
Appendix H: Calculation of Emission Performance Goals	H-1
Appendix I: Monitoring Guidelines for Travel Data	I-1
Appendix J: Method of Setting Densities and Mixture of Uses	J-1
FIGURES:	
Figure 2-1: How to Use the Study Findings	2-5
Figure 6-1: Character of Residential Density	6-35
TABLES:	
Table 7-1: Tools That Can be Used to Implement Recommended Strategies	7-2
Table 7-2: Matrix of Policies and Policy Documents	7-12
Table A-1: Transportation-Related Characteristics of Strategies Examined	A-2
Table A-2: Other Characteristics of Potential Strategies	
Table B-1: Summary of the Literature	B-2
Table I-1: Type of Data Collected by Individual Methods	I-3
Table J-1: Background Information for Floor Area Ratios	J-4
Table J-2: Background Information for Employees Per 1,000 sq.ft. of Building	
Table J-3: Employment Density Calculations	J-6
Table J-4: Residential Density Continuum	J-7
Table J-5: Character of Residential Density	J-8
Table J-6: Minimum Residential Density Specifications	J-9
Table J-7: Mix of Uses (from Calthorpe and Poticha)	J-10
Table J-8: Target Mix of Uses	J-10
Table J-9: Mixed-Use Minimums	J-11

ABSTRACT

The ARB funded this project to obtain a better understanding of the quantitative benefits of land use planning and development in conjunction with multi-modal transportation facilities that provide convenient alternatives to personal vehicle travel. The results of this research are intended to provide information to local governments, air districts, planning organizations, designers, builders and other interested parties. The information may be used in developing land use-related programs that can increase the rate of walking, bicycling and transit use. Such strategies can reduce dependence on automobile travel while helping to ensure personal mobility and providing cleaner air.

The report suggests community-level performance goals that can reasonably be attained in urban, suburban and rural/exurban communities by implementing packages of transportation-related land use strategies in coordination with a multimodal transportation system. The performance goals are listed in terms of average annual vehicle travel per household and related vehicular emissions. The report recommends eight packages of transportation-related land use strategies appropriate for urban, suburban, and rural/exurban communities. It also provides detailed descriptions of specific strategy characteristics for each type of community, including suggested development densities and mixtures and configurations of land uses. In addition, implementation mechanisms for local governments are listed and examples provided of existing programs.

The performance goals and recommended strategy packages included in Chapters 5 and 6 of the report are based primarily on data gathered in a recent study of travel behavior, land use and transportation characteristics of twenty-eight sample communities in California by Dr. John Holtzclaw. In addition, an extensive review of the literature, as well as travel survey data from communities in California, Oregon and Canada are used. An extensive annotated bibliography and summary of references on the topic are also included (Appendix B).

ACKNOWLEDGEMENTS

California Air Resources Board

Norm Coontz, Research Division

Anne Geraghty, Office of Air Quality and Transportation Planning

Terry Parker, Office of Air Quality and Transportation Planning

PROJECT ADVISORY COMMITTEE:

Association of Bay Area Governments

Raymond Brady

Bay Area Air Quality Management District

Jennifer Dill

California Building Industry Association

Kassandra Fletcher

Amy Glad

John Hunter

California Business Properties Association

Rex Hime

California Housing and Community Development Department

Linda Wheaton

California Association of Realtors

Eileen Reynolds

International Council of Shopping Centers

Doug Wiele

Los Angeles County Metropolitan Transportation Authority

Kendra Morries

City of Modesto

Planning/Community Development Dept.

Brian Smith

Mogavero, Notestine Associates, Architects

David Mogavero

National Resource Defense Council and The Sierra Club

John Holtzclaw

Sacramento Area Council of Governments

Gordon Garry

San Francisco Municipal Railway

Sue Olive

San Joaquin Valley Unified Air Pollution Control District

David Mitchell

City of San Jose

John Bidwell

San Diego Association of Governments

John Duve

George Frank

San Diego Air Pollution Control District

Andy Hamilton

San Bernardino County

Economic and Community Develop. Dept.

Julie Hemphill

Santa Clara Valley Manufacturing Group

Carl Guardino

South Coast Air Quality Management District

Von Loveland

Shashi Singeetham

Southern California Association of Governments

Tabi Hiwot

Erika Vandenbrande

CONSULTANTS:

JHK & Associates, Inc.

Deborah A. Dagang, Project Manager
William R. Loudon, Responsible Officer
Richard W. Lee, Senior Engineer
Loren D. Bloomberg, Transportation
Engineer
Monica Y. Fielden, Clerical Support
Lillian M. Moore, Clerical Support
Marsha A. Isley, Graphics

Brady and Associates

David Early, Principal
Diana Murrell, Planner

K.T. Analytics, Inc.

Thomas Higgins, Vice President

De Venuta & Associates

Anthony De Venuta, President

This report was submitted in fulfillment of Contract #92-348, "Transportation-Related Land Use Strategies to Minimize Motor Vehicle Emissions: An Indirect Source Research Study," by JHK & Associates, Inc., *et.al.*, under the sponsorship of the California Air Resources Board. Work was completed as of May 1995.

DISCLAIMER

The statements and conclusions in this report are those of the Contractor and not necessarily those of the California Air Resources Board. The mention of commercial products, their source or their use in connection with material reported herein is not to be construed as either an actual or implied endorsement of such products.