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PEDESTRIAN SAFETY PROGRAMS - A Review of the Literature and Operational Experience

January 1981
Final Report

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Prepared for
FEDERAL HIGHWAY ADMINISTRATION
Offices of Research & Development
Environmental Division
Washington, D.C. 20590

FOREWORD

This report provides a synthesis from 1966 through 1977 of pedestrian-related literature. Also, the operational experiences of 19 American municipalities with ongoing safety efforts were assessed.

Research in pedestrian and bicycle safety is included in the Federally Coordinated Program of Highway Research and Development as Task 2 of Project 1E, "Safety of Pedestrians and Abutting Property Occupants." Mr. John C. Fegan is the Project Manager.

One copy of this report is being distributed to each FHWA regional and division office.

Charles F. Scheffey
Director, Office of Research
Federal Highway Administration

NOTICE

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16. Abstract

The objective of the research effort was to develop an empirically and experientially based model pedestrian safety program which cities can use as guidelines for pedestrian safety program planning, implementation, and evaluation. The basis of these guidelines is a synthesis of the plethora of pedestrian-related literature from 1966 through 1977 and the operational experiences of several American municipalities with successful ongoing pedestrian safety efforts.

Part 1 of this report presents the results of a screening and review process of pedestrian literature relevant to model safety program development.

Part 2 reports on the city selection methodology and the results of the contacts made. The AAA Pedestrian Safety Inventory, which was used as the initial data base of cities with pedestrian safety programs is described. The methodology for identifying regional, populational, and socioeconomically representative cities is then outlined. Finally, a synopsis of information gathered from contacts and visits with nineteen municipalities is given. Appendix A presents data fron the individual cities.

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I. INTRODUCTION

In response to nearly 10,000 pedestrian fatalities annually, the Federal Highway Administration established a major long-term pedestrian safety research program. Since 1972, over one million dollars in accident data collection, countermeasure design and evaluation, facilities design, guidelines, and cost benefit analysis projects have been conducted. The products of these various efforts are both indepth and highly defined in scope. In addition to this federally sponsored research, numerous individuals and organizations have written articles, performed research, and initiated pedestrian safety programs of their own.

One of FHWA's major missions is to rapidly implement research findings into the operational highway system. This implies a need for translation of research results and general discussions to "real world" programs and wide-spread dissemination to potential users. The intent of the Model Pedestrian Safety Program is to develop an empirically and experiencially based model safety program. The main basis for the program will be pedestrian-related research and related documents and articles.

Part 1 of this report presents the results of a screening and review process of pedestrian literature. Chapter II describes the document selection methodology and development of the review matrix. Appendix A presents the matrix category definitions and the completed matrix. Appendix B contains the bibliography of all documents reviewed in the matrix.

Because no program oriented to one particular aspect of transportation safety will be completely valid if it is developed in a vacuum, the findings and ideas gleaned from the literature must be considered within the context of operational experiences. Data on the "real world" of pedestrian safety efforts were obtained from officials in nineteen cities around the United States. Part 2 of this report describes that effort.

II. REVIEW OF THE LITERATURE AND RESEARCH

Many innovative ideas regarding pedestrian safety have appeared in various documents and research studies. Unfortunately, a large percentage of these are distributed on a limited basis and their contents are never considered for incorporation into ongoing safety programs. The purpose of this literature review is two-fold: to comprehensively identify all documents relevant to model pedestrian safety program development; and to assemble these documents into a useful format for ready reference by anyone interested in pedestrian-related literature.

Document Identification and Selection

Finding and reviewing the massive number of pedestrian documents proved to be a monumental task in itself. Incorporation into a ready reference system was accomplished by the matrix in Appendix A. In general, documents in four broad areas were desired:

- Behavioral, attitudinal, and other aspects of pedestrian-related engineering facilities
- Cost-benefit data of pedestrian safety programs
- Pedestrian accident data, analysis, and analysis procedures
- Pedestrian safety program comparison, development, operation, etc.

Several independent sources were tapped and crosschecked to identify *any* document that might be relevant to the project at hand. Bibliographies (annotated and otherwise), reference lists, at-hand libraries (in-house, Department of Transportation, National Highway Traffic Safety Administration, and University of Maryland), and computer files were all checked.

Abstracts of documents for initial consideration were available in published annotated bibliographies and from a computer literature search of the Transportation Research Information System (TRIS) data file. The TRIS-ON-LINE computer file includes resumes of ongoing and recently completed U.S. and foreign transportation documents. Nine major component files comprise the TRIS data base. These are:

- DOT work in progress
- Highway research in progress
- DOT-sponsored Technical Reports from NTIS
- Transportation Noise Research Information Service Abstracts
- Highway Research Information Service Abstracts (HRIS)
- Railway Research Information Service Abstracts (RRIS)
- Maritime Research Information Service Abstracts (MRIS)
- Special files set up by the Transportation Systems Center Technology Sharing Program
- Air Transportation Research Information Service Abstracts (ATRIS)

Abstracts of all pedestrian-related documents from the last ten years in this data file were obtained. Screening of these 1345 abstracts was completed and pertinent documents included in the subject matrix.

With some exceptions, documents were *excluded* from the matrix if they:

- were published prior to 1966
- dealt with the mechanics of facility installation (e.g., different types of pavement marking materials)
- were simple listings of accident statistics
- discussed the biomechanics of accident injury causation
- dealt with pedestrian/driver alcohol levels in accidents
- were unpublished theses
- were redone versions of earlier or other published documents (i.e., the "same" paper presented at two conferences under different titles. In general, the original document, if identifiable, or the more easily available reference is cited.)

In toto, some 2000 pedestrian articles and manuscripts were screened. About 450 documents are reviewed in the matrix. Appendix B contains the bibliography of all documents reviewed and incorporated in the matrix.

Matrix Development

Two primary reasons stand behind the creation of the Pedestrian Literature Review Subject Matrix (Table II-1). First, during development of the Model Pedestrian Safety Program, considerable time will be saved by using it, and topic comprehensiveness will be assured. Second, it can be generically used by anyone interested in particular topics in the pedestrian field. Categorization of relevant documents was done in five major areas:

- *Facilities:* specific physical and engineering countermeasures designed to aid pedestrians while crossing the street, or to prevent them from entering the street at particular locations. Subcategories identify specific facility types, and behavioral and attitudinal responses to, problems associated with, design of, and warrants for facility installations.

- *Accidents:* unexpected system failures which in some way involve a pedestrian; injury or death to the pedestrian will usually result. Subcategories identify particular groups discussed, locational and environmental factors, and accident types (pre-accident behaviors).

Table II-1

Literature Review Subject Matrix

Facilities																Accidents											Behavior																									Safety Programs												Type of Document								
																																							Handicapped			Children				Driver																							
Safety Islands	Signing	Signalization	Crosswalks, Pavement Mkgs.	Barriers	Sidewalks	Crossing Guards	Grade Separation	Ped. Environment-Urban	Ped. Environment-Residential	Other	Impact	Attitudes Toward	Problems	Design	Warrants	Children	Adults	Elderly, Handicapped	Injury	Urban	Suburban/Residential	Rural	Locational	Environmental	Special Situations	Types	Children	Adults	Elderly	Flow, Movement	Information Processing	Attitude	Urban	Suburban/Residential	Rural	Locational	Environmental	Special Situations	Type of Behavior	Type of Handicap	Special Problems	Countermeasures	Play Streets	School Trip Routing	Special Problems	Countermeasures	Actions, Types	Info. Processing	Attitudes	Type Comparison	Organization, Coordination	Traffic Engineering	Education	Vehicle Modification	Legislation	Law Enforcement	Cost-Benefit	Behavioral Response	Pedestrian Attitude	Authority Attitude	Driver Attitude	Research-Field	Research-Laboratory	Bibliography, Synthesis	Guidelines	Discussion	Survey	Models, Simulations	How to Research	Foreign Data

- *Behavior:* the ways pedestrians act, patterns of action, tendencies to respond in particular manners, reasons for reacting, etc. Subcategories address particular groups (age related, handicapped, driver-related), locational and environmental factors, and behavior types (actions).

- *Safety Programs:* potential and already existing pedestrian safety-oriented efforts, types of safety programs, and responses to these efforts.

- *Type of Document:* the general class of document.

Seventy-one (71) subfactors are identified. Matrix subject and subfactor definitions and the completed matrix appear in Appendix A.

In reading the matrix, dots along the row indicate those topics addressed in that document. To find what topics are discussed in a particular reference, simply check the dotted columns. Conversely, to find out what documents address a particular subject, simply read down the relevant column and crosscheck the dotted row documents.

APPENDIX A

PEDESTRIAN LITERATURE SUBJECT MATRIX

Matrix Subject Category Definitions

Facilities: specific physical and engineering countermeasures designed to promote pedestrian safety while crossing the street, or to prevent pedestrians from entering the street at particular locations; subcategories also include behavioral and attitudinal responses to, problems associated with, design of, and warrants for facility installations.

Safety Islands: pedestrian refuge areas between opposing traffic lanes or within an intersection; locations can be at intersections or nonintersections and vary from raised medians to painted pavement marking areas.

Signing: static devices used to impart information to pedestrians, or to drivers about pedestrians; examples include "Look Both Ways Before Crossing" (pedestrian), or "Crosswalk Ahead" (driver).

Signalization: dynamic devices used to impart information to pedestrians, or to drivers about pedestrians; examples include various types of "WALK/DON'T WALK" signals (pedestrian), or "Stop for Pedestrians When Flashing" (drivers).

Crosswalks: that portion of a roadway designated for pedestrians to cross the street. Crosswalks can be either marked, distinctly indicating pedestrian crossing areas by lines or other markings on the road surface, or unmarked, being designated by the prolongation or connection of the lateral lines of sidewalks on opposite sides of the street. This category includes various types of marking (and nonmarking) procedures; does *not* include descriptions of various materials or methods used to lay markings.

Barriers: physical features separating pedestrians and vehicular traffic (fences, walls, hedges, guardrails).

Sidewalks: at-grade areas designated as places intended for use by pedestrians; includes walkways between the curb lines or the lateral lines of a roadway and the adjacent property lines, and walkways through the middle of a block (e.g., between houses in residential neighborhoods); includes both permanent and temporary walkways of all types of construction materials.

Crossing Guards: parents, police, or older children who responsibly assist others across the street; will usually be associated with school crosswalks and children traveling between home and school.

Grade Separation: facility allowing free-flowing noninteraction of pedestrians and vehicles; includes underground pedestrian ways (tunnels, underpasses, subways, malls) and above ground pedestrian ways (skywalks, skyways, bridges).

Pedestrian Environment–Urban: downtown-city pedestrian areas physically separated from vehicular traffic; includes malls of various types, street closures, auto-free zones, etc.

Pedestrian Environment–Residential: separated pedestrian walkways in housing areas; usually means walkways between/behind the houses rather than adjacent to the street.

Other: any facility not identified above; includes miscellaneous facilities that may not be originally designed and built for, but which contribute to, pedestrian safety (e.g., street lighting); also includes miscellaneous features that can cause pedestrian inconvenience or obstruct existing pedestrian routes (e.g., new subway system lines).

Impact: behavioral responses (pedestrian and driver) caused by installation of a particular facility; includes its usage, effectiveness, detrimental or positive side effects, etc.

Attitude: specific reactions, predispositions, or preferences of persons to actual or proposed facility installations.

Problems: potential or actual detrimental impacts of a facility installation; includes problems in design, efficiency, aesthetic value, enforcement, getting people to use, cost, location, public approval, etc.

Design: planning, structure, and construction of pedestrian facilities, included are shape, size, location, and other physical and aesthetic factors.

Warrants: criteria for installation (or removal) of particular facility types and/or at particular locations.

Accidents: unexpected system failures which in some way involve a pedestrian; injury or death to the pedestrian will usually result.

Children: accidents involving pedestrians less than 18 years old.

Adults: accidents involving pedestrians 18 years old or older; also includes those accident studies where age was not indicated.

Elderly and Handicapped: accidents involving pedestrians over 60 years old, or pedestrians with physiological impairments (visual, aural, physical handicaps).

Injury: description of types of injuries sustained by pedestrians in accidents, injuries as related to other factors, or the mechanics of injury causation.

Urban: accidents occurring within the commercial or industrial area of a city; the central business district; also includes high density "inner city" residential areas.

Suburban/Residential: accidents occurring in a moderate to low density residential, "bedroom" neighborhood.

Rural: accidents occurring outside commercial, industrial, or residential areas.

Locational: accident description by specific geometric variables: intersection/nonintersection, crosswalk/noncrosswalk, school zones; does not mean accidents on particular streets or in specific cities.

Environmental: accident analysis comparing or discussing various situational conditions (time of day, lighting, weather).

Special Situations: accidents involving "uncommon" or unusual conditions or circumstances; included are freeway pedestrian and alcohol-related accidents.

Behavior: studies investigating the ways pedestrians act, patterns of action, tendencies to respond in particular manners, reasons for reacting, etc.

Children: behavioral studies of pedestrians less than 18 years old; includes walking to school, and playing in the street.

Adults: studies of behavior patterns involving pedestrians 18 years or older; also includes studies where age was not indicated.

Elderly: behavior studies of pedestrians over 60 years old.

Flow, Movement: pedestrian walking patterns, speed, grouping, description of pedestrian trips, trip purpose.

Information Processing: thought processes of pedestrians; how they think, understand, and interpret particular stimuli; understanding of their behavior.

Attitude: predispositions, reactions, or preferences of pedestrians concerning traffic, walking, or driving in general (vs. to specific facility installations); attitudes as they affect behavior motivation.

Urban: pedestrian behaviors within the commercial or industrial "downtown" area; includes "inner city" areas.

Suburban/Residential: behavioral studies within moderate to low density residential, "bedroom" neighborhoods.

Rural: pedestrian behavior patterns outside commercial, industrial, or residential areas.

Locational: behavioral descriptions by specific geometric variables, (intersection/non-intersection, crosswalk/noncrosswalk, school zone).

Environmental: analysis of pedestrian behaviors under various situational conditions, (time of day, lighting, weather).

Special Situations: analysis of pedestrian behaviors under "uncommon" or unusual conditions or circumstances; includes alcohol-related unsafe behaviors.

Type of Behavior: general classification of (pedestrian) behaviors by action categories; examples include "dart out," "crossing against signal," and "turn-merge conflicts."

Behavior – Handicapped: documents dealing specifically with pedestrians with physically-limiting impairments.

Type of Handicap: addresses problems of specific handicapped subpopulations (blind, deaf, loss of limb) instead of addressing the handicapped pedestrian issue in general.

Special Problems: discussion of particular considerations and requirements that must be taken into account in designing facilities for the handicapped.

Countermeasures: evaluation or discussion of specific facilities that can assist handicapped pedestrians to interact with vehicular traffic safely.

Behavior – Children: documents dealing specifically with pedestrian-oriented facilities and problems concerning those under 18 years old; includes school and nonschool-related topics.

Play Streets: a residential street, usually in high density urban environments, closed to through vehicular traffic during specified hours to permit a supervised or general program of recreational activities to take place.

School Trip Routing: establishment, organization, and operation of routes for children to use when traveling between home and school.

Special Problems: particular inefficiencies or dysfunctions associated with child pedestrians.

Countermeasures: solutions to problems of child pedestrian safety not specifically addressed by play streets or school trip routing.

Behavior – Driver: documents dealing with the vehicle driver's viewpoint on pedestrian safety issues.

Actions, Types: behavioral description of drivers' responses and reactions to pedestrians or pedestrian facilities.

Information Processing: driver understanding or interpretation of pedestrian-oriented facilities or pedestrian behavior.

Attitude: vehicle driver predispositions toward pedestrians, pedestrian facilities, or pedestrian safety in general.

Safety Programs: discussions of already existing and potential pedestrian safety-oriented efforts, types of safety programs, and responses to these efforts.

Type Comparison: documents comparing different kinds of safety programs.

Organization, Coordination: discussions of how to put a safety program into effect, means of planning, organizing, and coordinating a program.

Traffic Engineering: description of programs oriented around the addition or modification of pedestrian facilities, e.g., putting in barriers, making crosswalks.

Education: instructional programs on safety; place of instruction can be in the schools, at civic organizations, through television and radio advertising, etc.

Vehicle Modifications: alternations in vehicle design (bumper guards, bumper height changes) to lessen pedestrian injury severity in accidents.

Legislation: discussion of vehicle code laws on pedestrian behavior (e.g., jaywalking) or on driver responsibilities in relation to pedestrians (e.g., giving them the right of way).

Law Enforcement: documents addressing programs which emphasize warnings or citations for violators of pedestrian-related laws.

Cost-Benefit: discussions comparing facility or program costs against a quantitative estimation of the effectiveness and benefits received in return.

Behavioral Response: effect of a particular type of safety program on pedestrian or driver behavior.

Pedestrian Attitude: general preferences or predispositions of pedestrians to particular planned or existing safety programs.

Authority Attitude: preferences or predispositions of local government officials, police, traffic engineers, store owners, etc. to planned or existing safety programs.

Driver Attitude: preferences or predispositions of drivers to proposed or existing safety programs and facilities.

Type of Document: description of the general orientation of the document.

Research-Field: full-scale investigation of behavioral, attitudinal, or other responses to a facility installation; any type of pedestrian accident study.

Research – Laboratory: laboratory or mockup simulation investigation of some aspect of pedestrian safety.

Bibliography, Synthesis: annotated or not annotated bibliography of pedestrian safety literature; summary of other research studies.

Guidelines: recommendations for developing a safety program, designing facilities, studying pedestrian behavior, etc.

Discussion: general discussion of some aspect of pedestrian safety; does not include specific research results.

Survey: results of a survey of pedestrian attitude, behavior, etc.

Models, Simulation: mathematical model or simulation of pedestrian behavior or accident analysis.

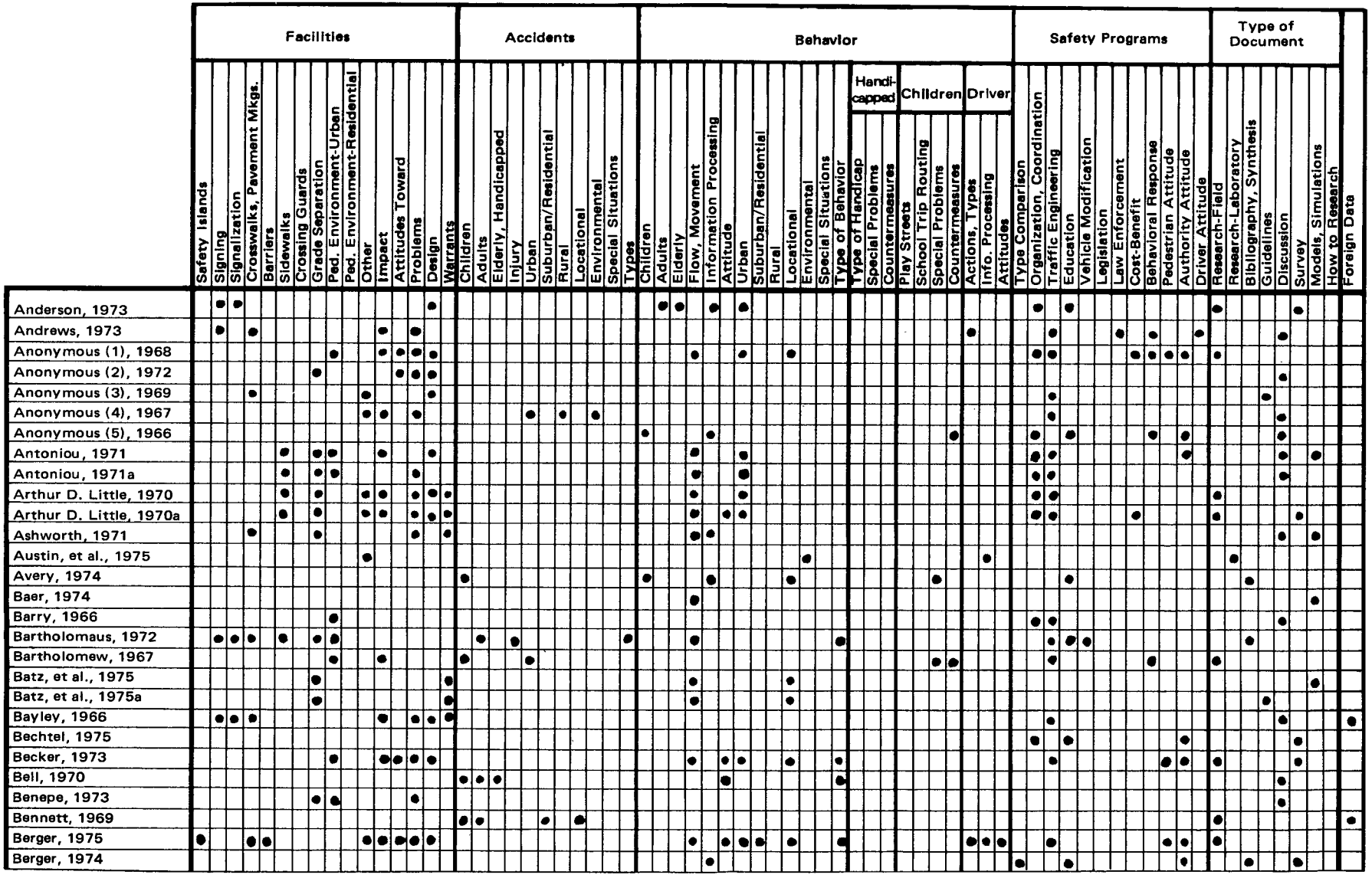
How to Research: indepth methodology for doing research on pedestrians or pedestrian safety.

Foreign Data: information discussed is data based solely on non-American programs, facility installations, or accidents; does not include documents dealing with both U.S. and foreign data.

Table A-1
Pedestrian Literature Subject Matrix

	Facilities																Accidents											Behavior																							Safety Programs												Type of Document								
																																									Handi-capped			Children				Driver																								
	Safety Islands	Signing	Signalization	Crosswalks, Pavement Mkgs.	Barriers	Sidewalks	Crossing Guards	Grade Separation	Ped. Environment-Urban	Ped. Environment-Residential	Other	Impact	Attitudes Toward	Problems	Design	Warrants	Children	Adults	Elderly, Handicapped	Injury	Urban	Suburban/Residential	Rural	Locational	Environmental	Special Situations	Types	Children	Adults	Elderly	Flow, Movement	Information Processing	Attitude	Urban	Suburban/Residential	Rural	Locational	Environmental	Special Situations	Type of Behavior	Type of Handicap	Special Problems	Countermeasures	Play Streets	School Trip Routing	Special Problems	Countermeasures	Actions, Types	Info. Processing	Attitudes	Type Comparison	Organization, Coordination	Traffic Engineering	Education	Vehicle Modification	Legislation	Law Enforcement	Cost-Benefit	Behavioral Response	Pedestrian Attitude	Authority Attitude	Driver Attitude	Research-Field	Research-Laboratory	Bibliography, Synthesis	Guidelines	Discussion	Survey	Models, Simulations	How to Research	Foreign Data
Abrams & Smith, 1976			●									●		●	●	●															●			●			●											●																●			●					
Abramson, 1974																								●																								●																		●		●			●	
ABT Assoc., 1969																																									●	●	●										●						●						●			●					
Aitken, 1972			●	●	●			●			●	●		●																																							●							●								●				●
Alexander, 1975									●			●	●	●	●	●															●			●																		●	●					●	●	●	●							●	●			
Alexander, 1975a									●			●		●	●	●															●			●																		●	●					●									●	●				
Allen, B.L., 1963			●	●								●		●	●																●			●			●															●						●					●								●
Allen, et al., 1970											●				●														●			●						●											●														●								
Allison, et al., 1970				●										●																	●			●			●											●																●								●
Allouche, 1972																															●																											●												●		
AASHO, 1969								●						●	●	●																																																		●					
AAA (1), 1973																																													●		●					●	●	●														●				
AAA (2), 1968																●				●	●		●	●		●	●					●					●	●		●						●																	●					●			
AAA (3), 1971							●					●																																																								●			
AAA (4), 1971a			●									●			●																																																					●			
AAA (5), n.d.							●									●																													●		●					●		●													●					
AAA (6), 1966							●					●		●		●																															●					●		●													●					
AAA (7), 1964	●	●	●	●	●		●	●			●	●	●	●			●	●	●		●	●		●	●	●					●	●	●	●	●					●						●	●	●				●	●	●		●										●	●					
AAA (8), 1965																			●											●		●					●	●														●		●													●				
AAA (9), 1976			●																									●				●					●									●							●												●					
AAA (10), 1968a																																														●					●		●													●					
AAA (11), n.d.a							●																																																●												●			
AAA (12), n.d.b																																													●		●					●		●													●					
AAA (13), 1975																												●				●					●	●		●					●		●					●		●													●					
AAA (14), 1975a																												●				●					●	●		●							●					●		●													●					
AAA (15), 1965a							●				●						●							●	●			●												●						●	●					●		●													●				
American Inst. ..., 1974		●													●																	●																													●									●			
Ameruso, 1974								●	●			●																			●			●			●					●																												●	●		

Table A-1 (Continued)
Pedestrian Literature Subject Matrix



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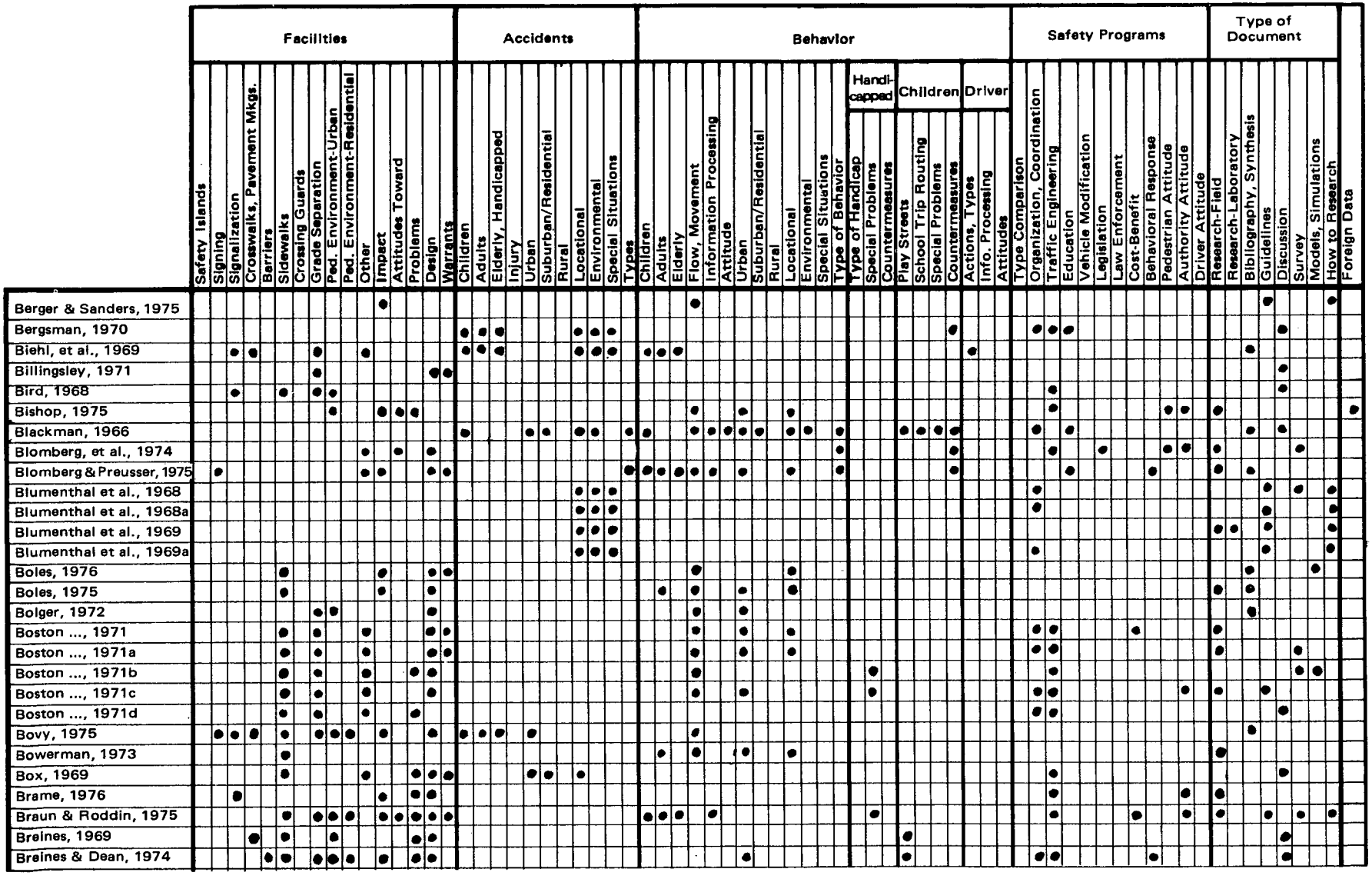

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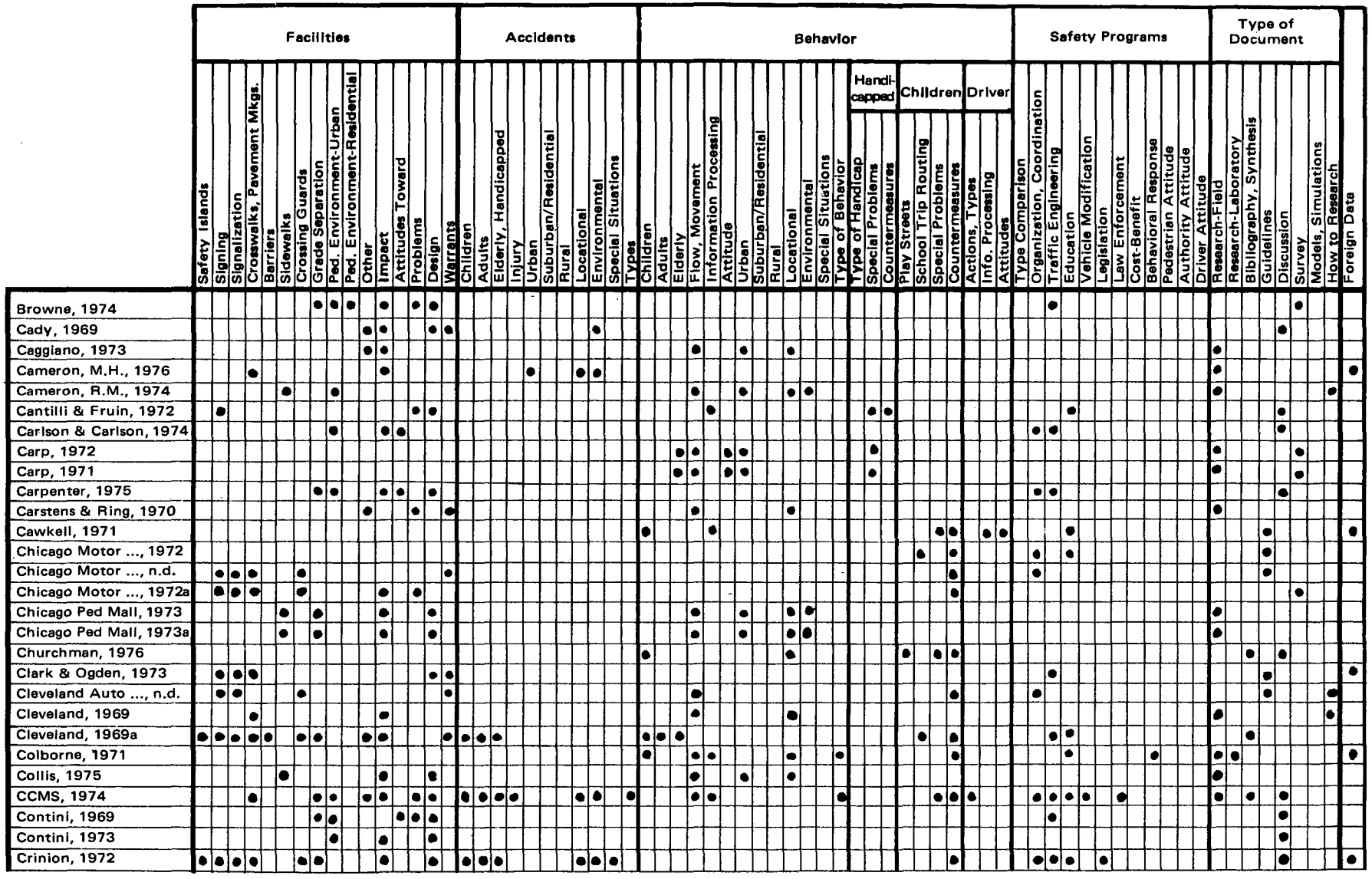

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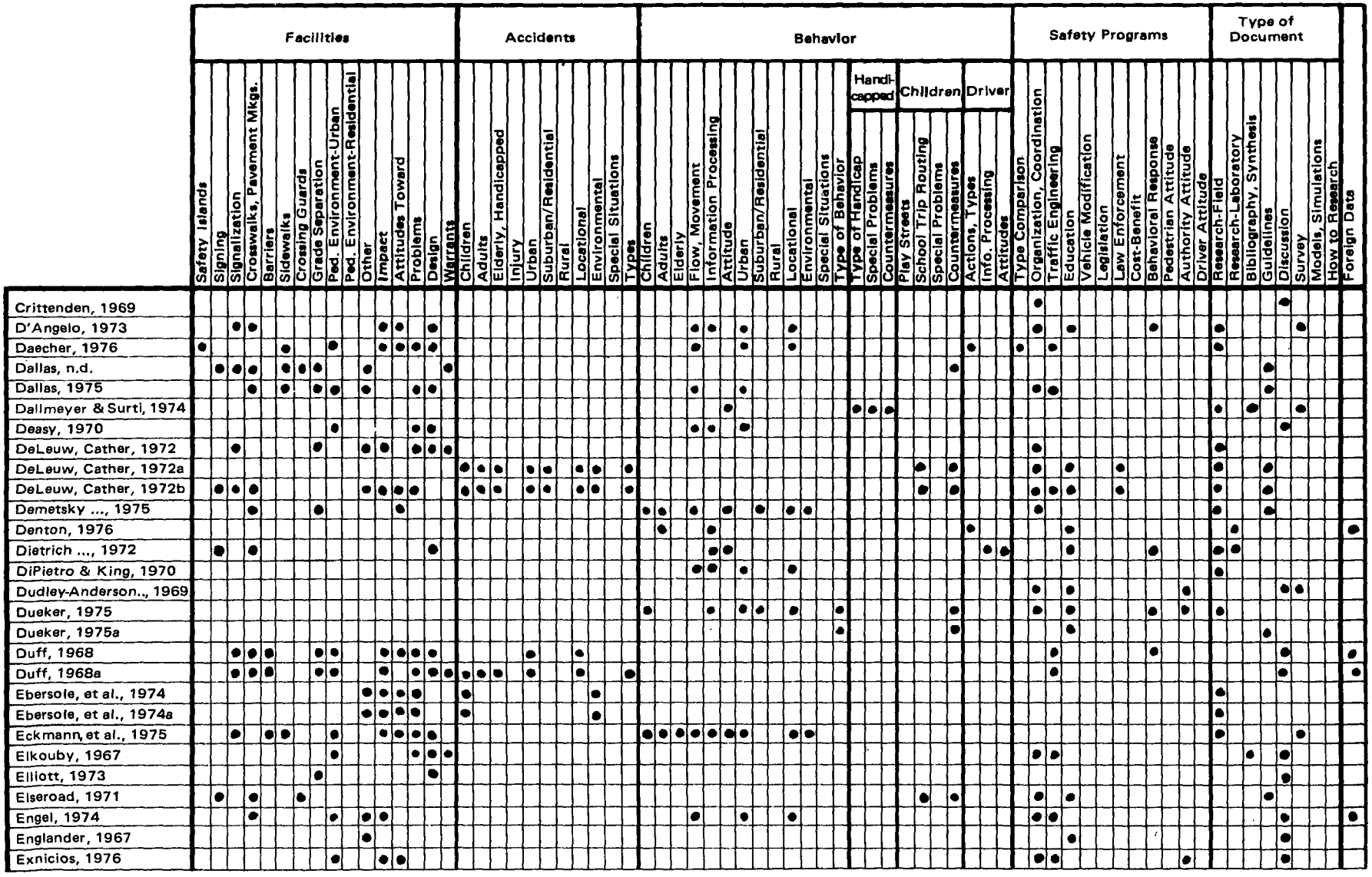

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Pedestrian Literature Subject Matrix

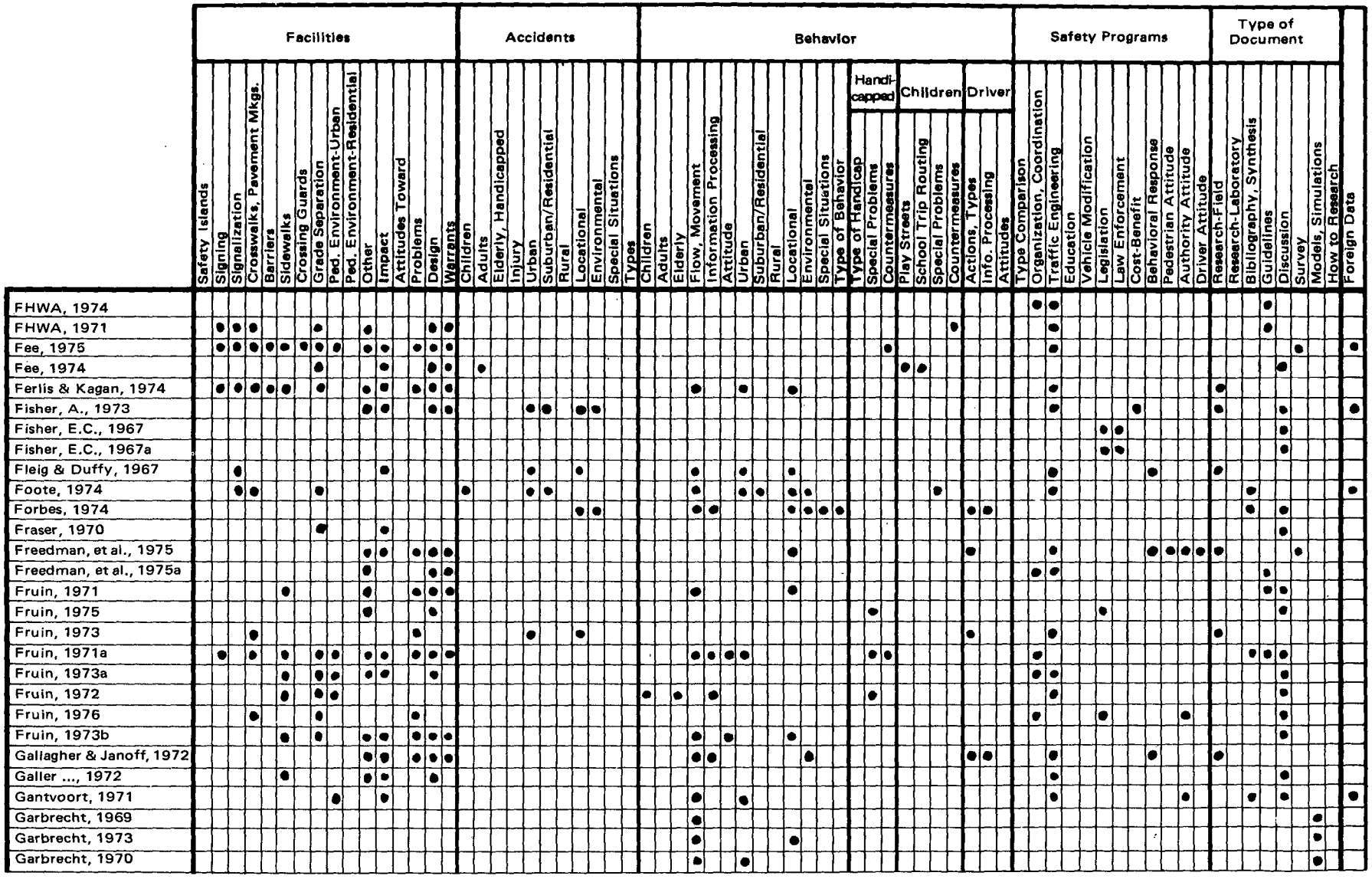

Table A-1 (Continued)
Pedestrian Literature Subject Matrix

	Facilities															
	Safety Islands	Signing	Signalization	Crosswalks, Pavement Mkgs.	Barriers	Sidewalks	Crossing Guards	Grade Separation	Ped. Environment-Urban	Ped. Environment-Residential	Other	Impact	Attitudes Toward	Problems	Design	Warrants
Garbrecht, 1971								●	●	●					●	●
Garbrecht, 1971a											●	●			●	
Goodrich, 1976																
Grayson, 1975	●			●								●				
Greater London..., 1969																
Grey, et al., 1970						●			●		●	●	●			
Haas & Morrall, 1967								●				●		●		
Haines, et al., 1974																
Harrison, 1974																
Hart & Thompson, 1970									●				●	●	●	
Hasell, 1974																
Havard, 1974																
Hazlett & Allen, 1968											●	●				
Heimstra, et al., 1969																
Henderson ..., 1974				●												
Herms, 1970				●								●	●	●	●	●
Herms, 1976				●		●					●		●	●	●	●
Herms, et al., 1975											●	●	●	●	●	●
Higgs, 1972											●		●		●	
Hoel, 1969																
Hoel, 1968						●						●			●	
Holland, 1974																
Howarth, et al., 1974																
Huelke & Davis, 1969																
Huffman, 1969						●		●							●	
Huffman, 1967																
Hulscher, 1975			●	●							●		●	●	●	●
Hurley & Thompson, 1973																

	Accidents										
	Children	Adults	Elderly, Handicapped	Injury	Urban	Suburban/Residential	Rural	Locational	Environmental	Special Situations	Types
Garbrecht, 1971											
Garbrecht, 1971a											
Goodrich, 1976											
Grayson, 1975											
Greater London..., 1969					●						
Grey, et al., 1970											
Haas & Morrall, 1967											
Haines, et al., 1974											
Harrison, 1974											
Hart & Thompson, 1970											
Hasell, 1974											
Havard, 1974	●			●				●	●	●	
Hazlett & Allen, 1968									●	●	
Heimstra, et al., 1969											
Henderson ..., 1974											
Herms, 1970	●	●	●		●	●		●	●	●	
Herms, 1976											
Herms, et al., 1975											
Higgs, 1972											
Hoel, 1969											
Hoel, 1968											
Holland, 1974											
Howarth, et al., 1974	●										
Huelke & Davis, 1969	●	●	●	●	●	●	●	●	●	●	
Huffman, 1969											
Huffman, 1967											
Hulscher, 1975											
Hurley & Thompson, 1973											

	Behavior													Handicapped			Children				Driver		
	Children	Adults	Elderly	Flow, Movement	Information Processing	Attitude	Urban	Suburban/Residential	Rural	Locational	Environmental	Special Situations	Type of Behavior	Type of Handicap	Special Problems	Countermeasures	Play Streets	School Trip Routing	Special Problems	Countermeasures	Actions, Types	Info. Processing	Attitudes
Garbrecht, 1971				●						●													
Garbrecht, 1971a				●	●		●																
Goodrich, 1976				●	●		●						●										
Grayson, 1975	●	●		●			●			●													
Greater London..., 1969				●																			
Grey, et al., 1970				●	●	●	●			●													
Haas & Morrall, 1967				●						●													
Haines, et al., 1974		●		●			●			●													
Harrison, 1974																							
Hart & Thompson, 1970																							
Hasell, 1974				●			●			●	●												
Havard, 1974	●																				●		
Hazlett & Allen, 1968											●	●									●	●	
Heimstra, et al., 1969	●			●						●			●										
Henderson ..., 1974					●		●			●											●		
Herms, 1970				●	●	●	●	●		●	●										●		
Herms, 1976				●			●			●				●	●	●							
Herms, et al., 1975														●	●	●							
Higgs, 1972					●															●			
Hoel, 1969				●			●																
Hoel, 1968				●			●			●	●												
Holland, 1974																							
Howarth, et al., 1974				●			●	●											●				
Huelke & Davis, 1969													●										
Huffman, 1969				●			●																
Huffman, 1967																							
Hulscher, 1975														●	●	●							
Hurley & Thompson, 1973																●		●		●			

	Safety Programs												Type of Document								
	Type Comparison	Organization, Coordination	Traffic Engineering	Education	Vehicle Modification	Legislation	Law Enforcement	Cost-Benefit	Behavioral Response	Pedestrian Attitude	Authority Attitude	Driver Attitude	Research-Field	Research-Laboratory	Bibliography, Synthesis	Guidelines	Discussion	Survey	Models, Simulations	How to Research	Foreign Data
Garbrecht, 1971															●						
Garbrecht, 1971a													●								
Goodrich, 1976													●				●				
Grayson, 1975				●					●				●								●
Greater London..., 1969																	●				●
Grey, et al., 1970													●					●			
Haas & Morrall, 1967													●					●			
Haines, et al., 1974													●			●				●	
Harrison, 1974		●	●	●			●										●				
Hart & Thompson, 1970		●	●							●	●	●	●					●			●
Hasell, 1974													●					●			●
Havard, 1974															●		●				●
Hazlett & Allen, 1968													●	●							
Heimstra, et al., 1969													●							●	
Henderson ..., 1974													●								●
Herms, 1970			●						●				●								
Herms, 1976		●	●							●			●			●		●			
Herms, et al., 1975													●								
Higgs, 1972				●					●	●			●								
Hoel, 1969																			●		
Hoel, 1968													●								
Holland, 1974		●	●	●			●										●				
Howarth, et al., 1974													●					●	●		●
Huelke & Davis, 1969													●								
Huffman, 1969													●					●			●
Huffman, 1967				●		●	●		●								●				●
Hulscher, 1975			●	●									●					●			●
Hurley & Thompson, 1973		●	●	●		●	●									●					

Table A-1 (Continued)
Pedestrian Literature Subject Matrix

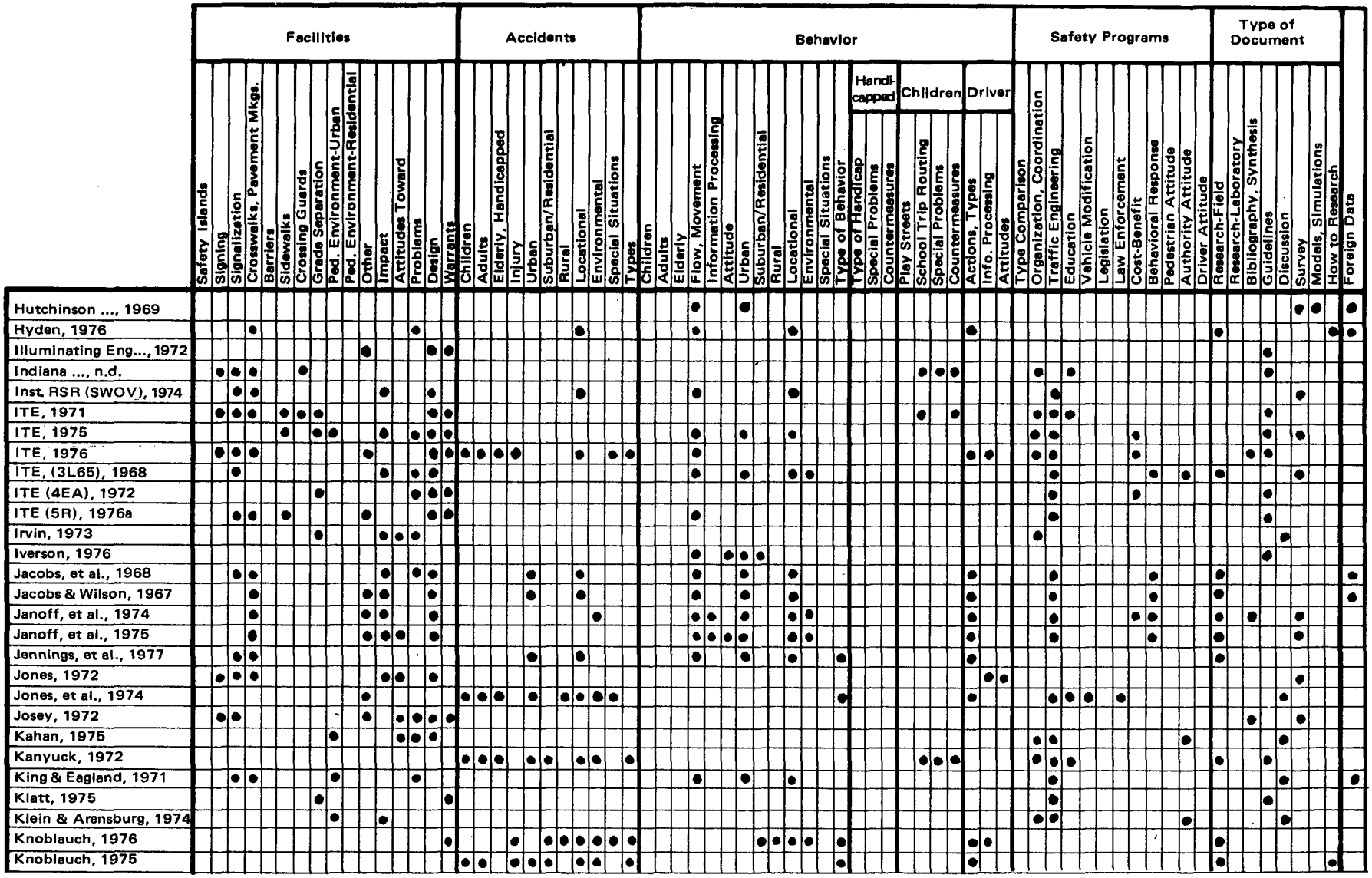

Table A-1 (Continued)
Pedestrian Literature Subject Matrix

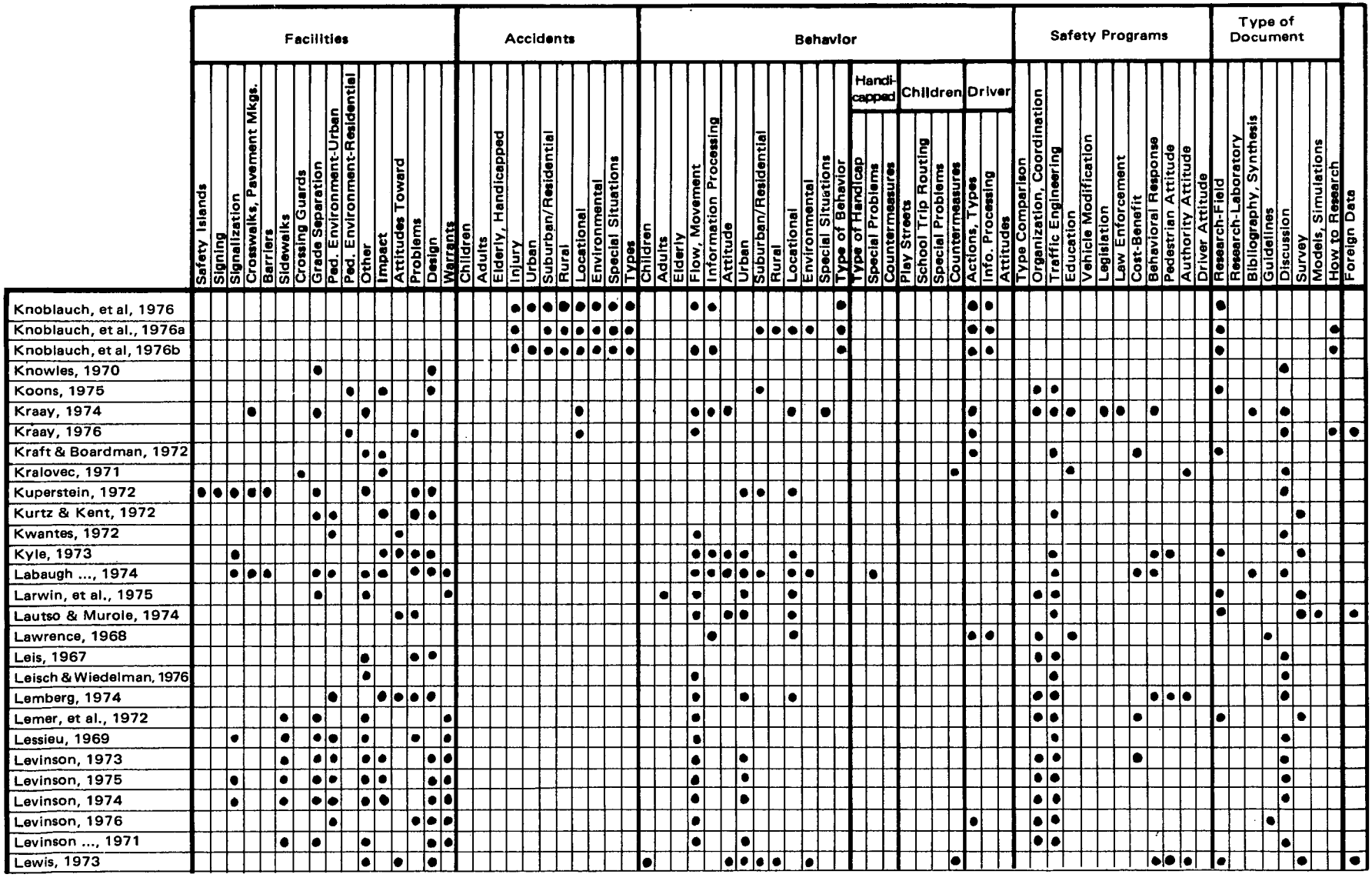

Table A-1 (Continued)
Pedestrian Literature Subject Matrix

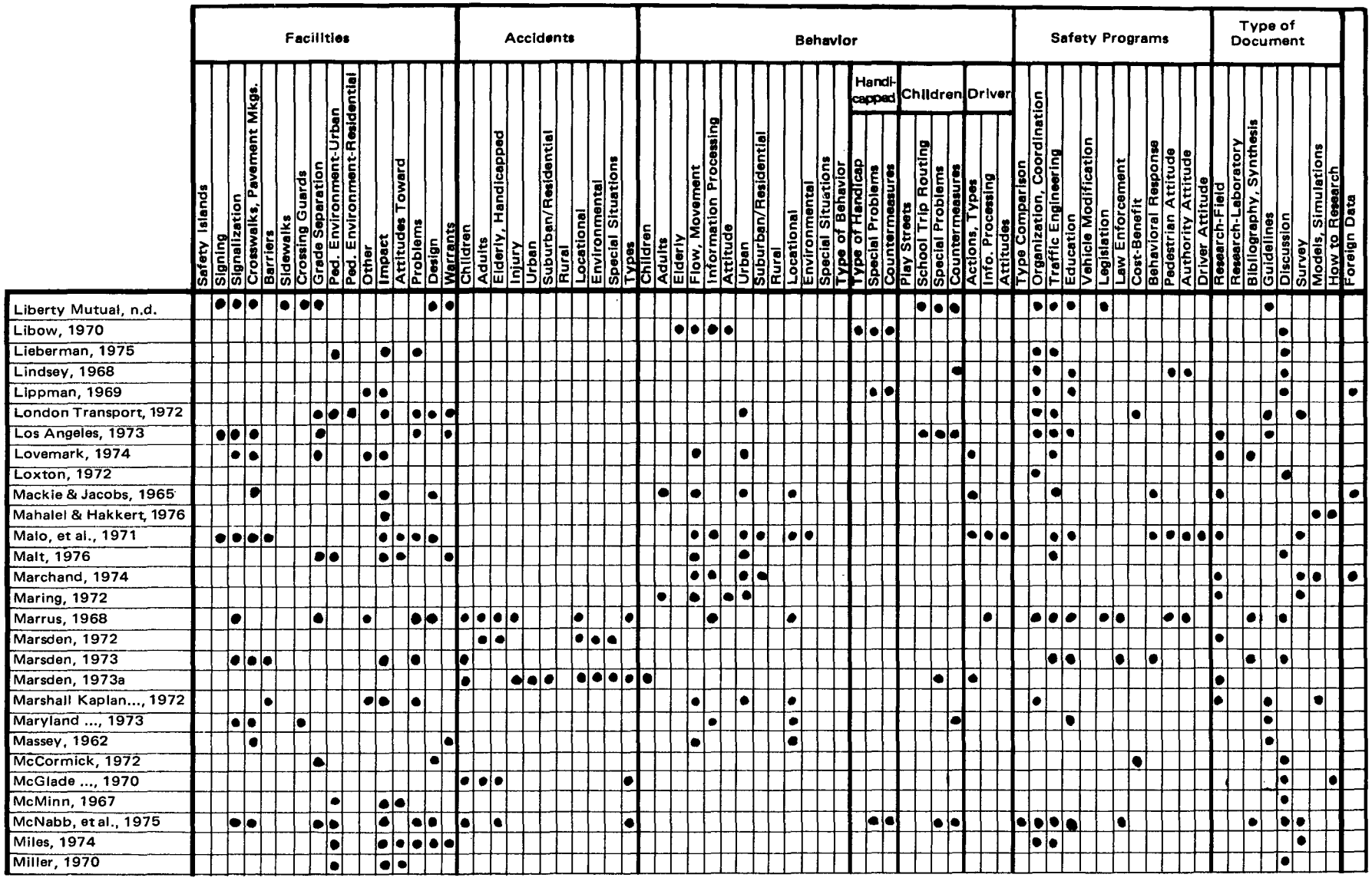

Table A-1 (Continued)
Pedestrian Literature Subject Matrix

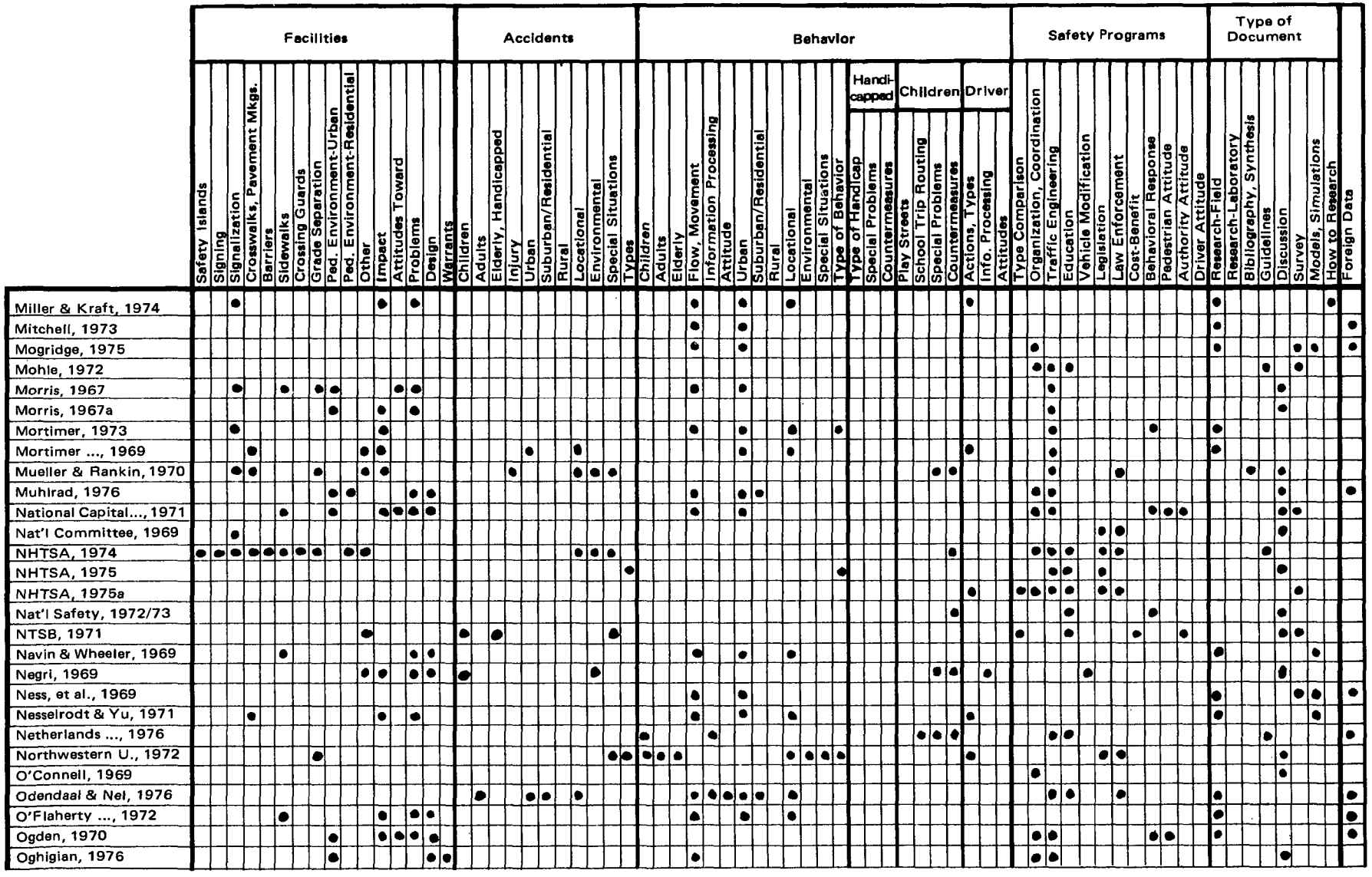

Table A-1 (Continued)
Pedestrian Literature Subject Matrix

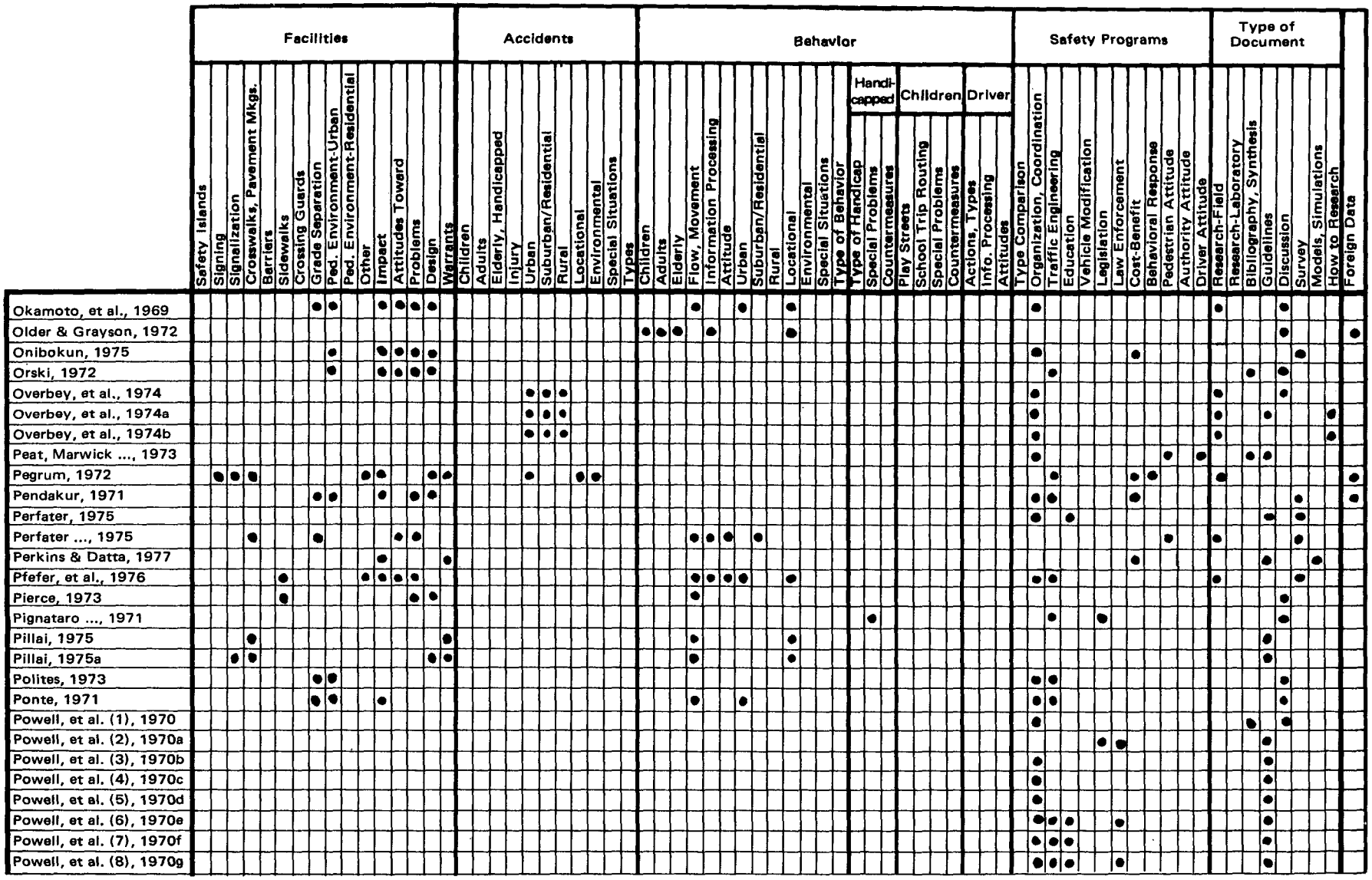

Table A-1 (Continued)
Pedestrian Literature Subject Matrix

	Facilities																Accidents											Behavior																							Safety Programs												Type of Document								
																																									Handicapped			Children				Driver																						
	Safety Islands	Signing	Signalization	Crosswalks, Pavement Mkgs.	Barriers	Sidewalks	Crossing Guards	Grade Separation	Ped. Environment-Urban	Ped. Environment-Residential	Other	Impact	Attitudes Toward	Problems	Design	Warrants	Children	Adults	Elderly, Handicapped	Injury	Urban	Suburban/Residential	Rural	Locational	Environmental	Special Situations	Types	Children	Adults	Elderly	Flow, Movement	Information Processing	Attitude	Urban	Suburban/Residential	Rural	Locational	Environmental	Special Situations	Type of Behavior	Type of Handicap	Special Problems	Countermeasures	Play Streets	School Trip Routing	Special Problems	Countermeasures	Actions, Types	Info. Processing	Attitudes	Type Comparison	Organization, Coordination	Traffic Engineering	Education	Vehicle Modification	Legislation	Law Enforcement	Cost-Benefit	Behavioral Response	Pedestrian Attitude	Authority Attitude	Driver Attitude	Research-Field	Research-Laboratory	Bibliography, Synthesis	Guidelines	Discussion	Survey	Models, Simulations	How to Research	Foreign Data
Project for PS, n.d.				●		●						●		●	●																●			●			●																●						●				●								
Prokopy, 1974						●		●	●		●	●		●	●	●															●																						●					●								●					
Pushkarev & Zupan, 1975						●						●			●																●			●																															●				●		
Pushkarev & Zupan, 1971						●					●	●		●																	●			●			●																										●					●			
Pushkarev & Zupan, 1975a						●		●	●			●		●	●	●															●			●																		●													●	●	●				
Rayner, 1975			●	●								●			●									●																													●						●				●								
Read, 1969																	●	●		●	●	●		●	●	●																					●					●													●		●				
Reading, 1973				●													●				●			●	●			●			●			●			●								●		●					●		●					●				●								
Ready, 1975								●				●	●		●																																					●	●					●									●				
Rector, 1973																	●				●	●		●				●			●	●		●	●		●									●	●					●		●					●		●		●			●					
Reiss, 1975									●		●						●				●	●		●			●	●			●	●	●	●	●					●				●	●								●										●		●						
Reiss, 1975a		●	●	●			●				●	●	●				●					●		●			●	●			●	●			●		●			●					●	●	●	●	●	●	●		●	●						●		●	●		●			●			
Reiss & Shinder, 1975									●			●	●	●	●																●	●	●	●			●							●								●	●						●	●	●		●					●			
Reiss & Shinder, 1975a		●			●				●			●	●		●																			●			●							●								●	●						●	●	●					●		●			
Retzko & Androsch, 1974			●									●		●	●																●			●			●											●					●						●				●								●
Ridley, 1969																	●	●		●	●	●		●																					●		●	●															●					●			●
Roberts, 1972																																	●								●	●	●																									●			
Robertson, H.D., 1977			●									●		●	●														●		●	●		●			●																●										●					●			
Robertson, et al., 1975		●	●	●							●		●	●							●			●			●				●			●			●			●								●					●										●		●			●			
Robertson, J., 1973								●	●		●			●	●																																						●														●				
Robertson, J.T., 1972									●			●			●																●																					●	●														●				
Roed, 1971																			●											●			●																					●													●				
Rosen & Berger, 1975											●	●	●	●	●		●								●																					●	●																●					●			
Rosenberg, 1969						●						●		●		●															●			●			●																														●		●		
Routledge, et al., 1974																												●			●	●	●	●	●		●																										●					●			●
Routledge, et al., 1974a																	●											●			●	●		●	●		●																										●					●			●
RTKL, 1976										●		●	●	●	●	●																																				●	●							●	●				●			●			
RTKL, 1976a								●	●	●		●	●	●	●																●		●	●	●																		●							●	●	●						●			

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Table A-1 (Continued)
Pedestrian Literature Subject Matrix

Facilities

	Safety Islands	Signing	Signalization	Crosswalks, Pavement Mkgs.	Barriers	Sidewalks	Crossing Guards	Grade Separation	Ped. Environment-Urban	Ped. Environment-Residential	Other	Impact	Attitudes Toward	Problems	Design	Warrants
RTKL, 1976b								●	●	●		●		●	●	
Rubenstein, 1972						●		●			●				●	
Rudofsky, 1969						●		●	●		●	●	●	●	●	
Rumar, 1966											●			●		
Russam, 1975				●							●	●			●	
Safety Through ..., n.d.																
Salvatore, 1973																
San Diego, 1971		●	●	●			●	●							●	●
San Jose (1), 1972			●	●			●									●
San Jose (2), 1972a				●			●				●				●	
San Jose (3), 1972b							●									
Sandahl & Percivall, 1972																
Sandels, 1974																
Sandels, 1970																
Sansom, 1967																
Sansom, 1969			●	●								●	●	●	●	●
Sargent & Sheppard, 1974																
Scott, A.J., 1974																
Scott & Kagan, 1973			●			●		●	●			●		●	●	●
Shapiro ..., 1969		●	●	●				●	●		●	●		●		
Sharp, 1969				●							●			●		
Shinder, et al., 1975																
Sidamon-Eristoff, 1973																
Singer, 1969			●													
Skandia Ins. Co., 1971																
Skelton, et al., 1976			●	●								●	●	●		
Skidmore, Owings.., 1970								●	●		●	●		●	●	●
Sleight, 1972		●	●	●		●		●	●			●			●	
Slop, 1976			●	●	●							●		●	●	●

Accidents

	Children	Adults	Elderly, Handicapped	Injury	Urban	Suburban/Residential	Rural	Locational	Environmental	Special Situations	Types
RTKL, 1976b											
Rubenstein, 1972											
Rudofsky, 1969											
Rumar, 1966											
Russam, 1975	●							●			
Safety Through ..., n.d.	●		●								
Salvatore, 1973											
San Diego, 1971											
San Jose (1), 1972	●	●	●		●	●		●	●		
San Jose (2), 1972a											
San Jose (3), 1972b											
Sandahl & Percivall, 1972											
Sandels, 1974	●							●			●
Sandels, 1970											
Sansom, 1967											
Sansom, 1969											
Sargent & Sheppard, 1974											
Scott, A.J., 1974											
Scott & Kagan, 1973					●						
Shapiro ..., 1969	●	●	●	●				●	●	●	
Sharp, 1969								●			●
Shinder, et al., 1975											
Sidamon-Eristoff, 1973											
Singer, 1969											
Skandia Ins. Co., 1971	●			●				●	●		●
Skelton, et al., 1976											
Skidmore, Owings.., 1970											
Sleight, 1972	●		●	●	●					●	
Slop, 1976											

Behavior

	Children	Adults	Elderly	Flow, Movement	Information Processing	Attitude	Urban	Suburban/Residential	Rural	Locational	Environmental	Special Situations	Type of Behavior	Handicapped: Type of Handicap	Handicapped: Special Problems	Handicapped: Countermeasures	Children: Play Streets	Children: School Trip Routing	Children: Special Problems	Children: Countermeasures	Driver: Actions, Types	Driver: Info. Processing	Driver: Attitudes
RTKL, 1976b																							
Rubenstein, 1972																							
Rudofsky, 1969				●			●																
Rumar, 1966											●											●	
Russam, 1975					●					●									●	●			
Safety Through ..., n.d.																							
Salvatore, 1973	●				●														●				
San Diego, 1971																				●			
San Jose (1), 1972					●	●	●	●		●	●								●	●			
San Jose (2), 1972a																			●	●			
San Jose (3), 1972b	●						●	●												●			
Sandahl & Percivall, 1972				●			●																
Sandels, 1974	●				●																●	●	
Sandels, 1970	●			●	●	●		●		●									●				
Sansom, 1967																							
Sansom, 1969																							
Sargent & Sheppard, 1974	●				●														●	●			
Scott, A.J., 1974				●																			
Scott & Kagan, 1973				●			●			●											●		
Shapiro ..., 1969				●						●			●										
Sharp, 1969				●			●																
Shinder, et al., 1975				●														●					
Sidamon-Eristoff, 1973						●	●						●								●		●
Singer, 1969							●			●			●										
Skandia Ins. Co., 1971	●												●										
Skelton, et al., 1976				●	●	●				●											●		
Skidmore, Owings.., 1970																							
Sleight, 1972	●	●	●	●	●	●											●						
Slop, 1976				●			●			●											●		

Safety Programs

	Type Comparison	Organization, Coordination	Traffic Engineering	Education	Vehicle Modification	Legislation	Law Enforcement	Cost-Benefit	Behavioral Response	Pedestrian Attitude	Authority Attitude	Driver Attitude
RTKL, 1976b		●	●									
Rubenstein, 1972												
Rudofsky, 1969												
Rumar, 1966												
Russam, 1975			●	●								
Safety Through ..., n.d.		●										
Salvatore, 1973												
San Diego, 1971												
San Jose (1), 1972		●		●		●	●			●	●	
San Jose (2), 1972a		●		●			●					
San Jose (3), 1972b		●		●								
Sandahl & Percivall, 1972												
Sandels, 1974												
Sandels, 1970												
Sansom, 1967			●	●			●					
Sansom, 1969		●	●	●			●		●	●		
Sargent & Sheppard, 1974		●		●					●			
Scott, A.J., 1974												
Scott & Kagan, 1973			●					●				
Shapiro ..., 1969		●	●	●		●	●					
Sharp, 1969												
Shinder, et al., 1975		●										
Sidamon-Eristoff, 1973			●								●	
Singer, 1969							●		●			
Skandia Ins. Co., 1971												
Skelton, et al., 1976												
Skidmore, Owings.., 1970		●	●									
Sleight, 1972		●	●	●			●		●			●
Slop, 1976			●									

Type of Document

	Research-Field	Research-Laboratory	Bibliography, Synthesis	Guidelines	Discussion	Survey	Models, Simulations	How to Research	Foreign Data
RTKL, 1976b			●			●			
Rubenstein, 1972					●				
Rudofsky, 1969					●				
Rumar, 1966	●								
Russam, 1975			●			●			●
Safety Through ..., n.d.					●				
Salvatore, 1973	●								
San Diego, 1971				●					
San Jose (1), 1972	●		●	●				●	
San Jose (2), 1972a				●					
San Jose (3), 1972b				●					
Sandahl & Percivall, 1972	●						●		
Sandels, 1974	●								●
Sandels, 1970	●								●
Sansom, 1967					●				
Sansom, 1969					●				●
Sargent & Sheppard, 1974	●					●			●
Scott, A.J., 1974							●		
Scott & Kagan, 1973			●	●		●			
Shapiro ..., 1969			●						
Sharp, 1969					●				●
Shinder, et al., 1975				●					
Sidamon-Eristoff, 1973					●				
Singer, 1969	●	●							
Skandia Ins. Co., 1971	●								●
Skelton, et al., 1976	●					●			●
Skidmore, Owings.., 1970				●		●			
Sleight, 1972			●		●				
Slop, 1976					●				●

Table A-1 (Continued)
Pedestrian Literature Subject Matrix

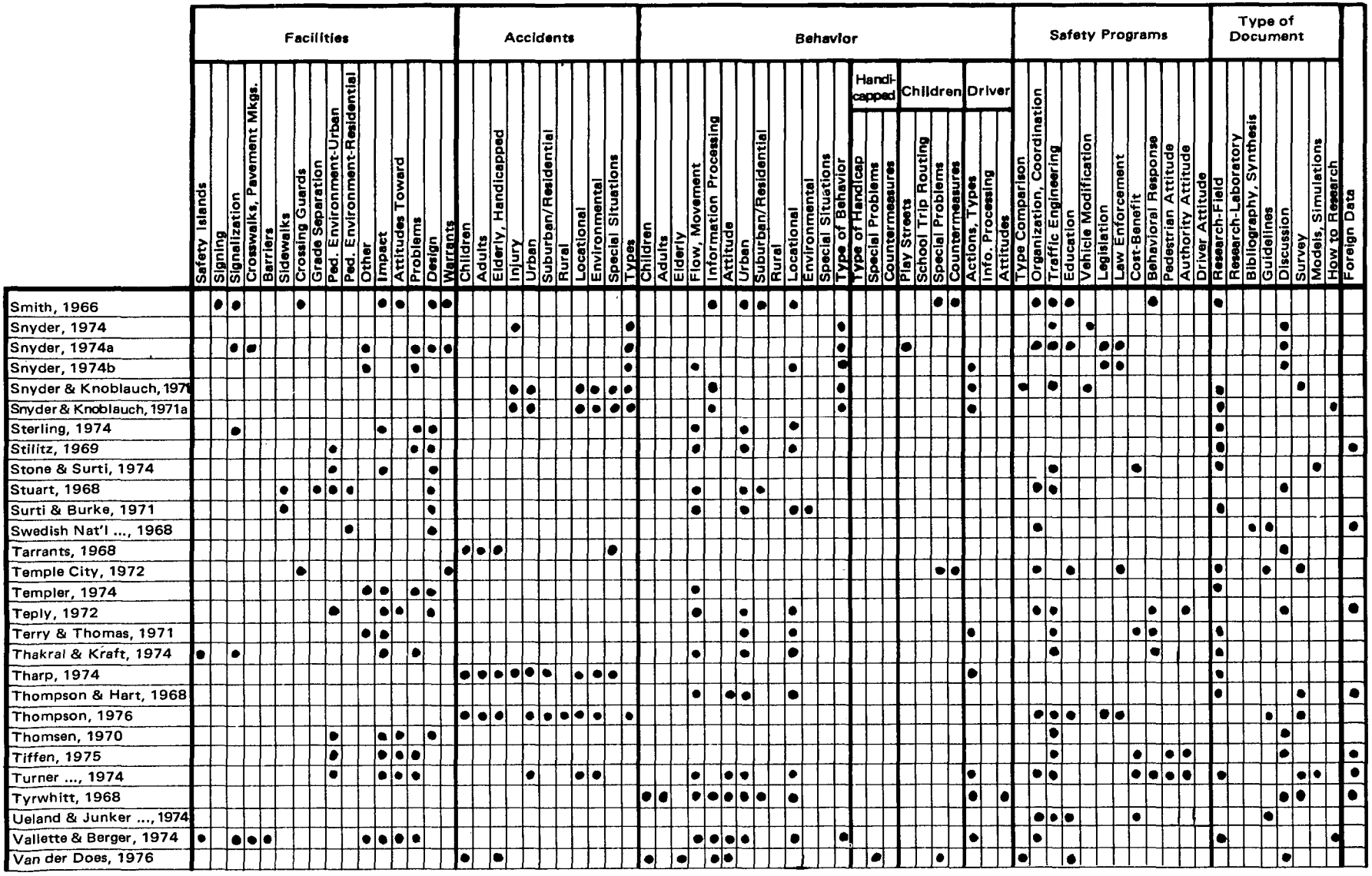
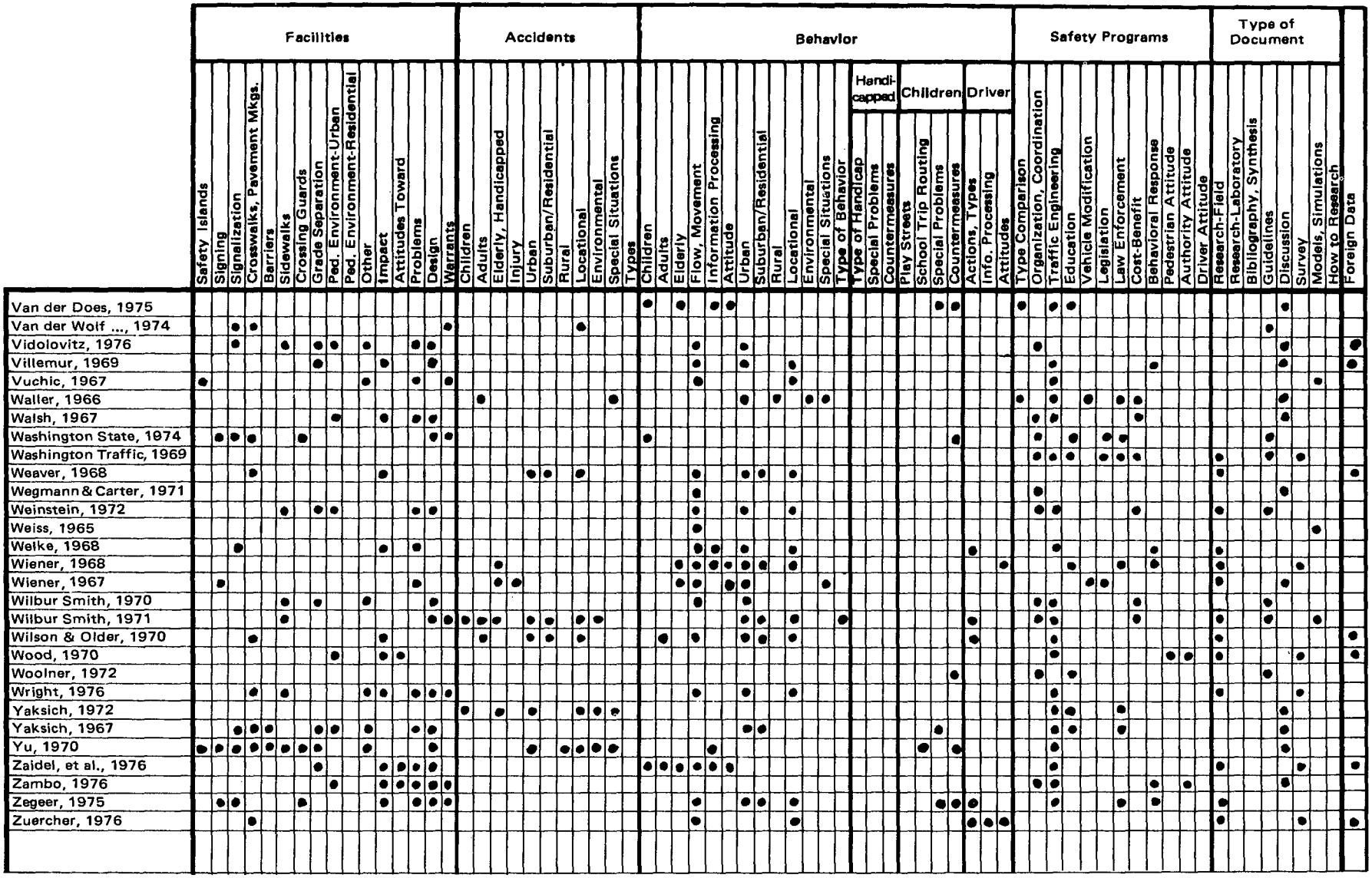


Table A-1 (Continued)
Pedestrian Literature Subject Matrix



APPENDIX B

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COOPERATING ORGANIZATIONS

Any study investigating the operational experiences of several communities depends on the coordinated efforts of numerous people and organizations. The American Automobile Association provided access to its Pedestrian Safety Inventory thus facilitating the task of identifying and selecting cities with successful pedestrian safety programs. Two people in particular at the AAA Headquarters in Falls Church, Virginia were especially helpful:

Dean Childs
Francis C. Kenel

In addition, many individuals in the contacted and visited cities spent their time with project personnel discussing their city's pedestrian safety efforts. Their inputs are invaluable to the model program being developed. The cities and the cognizant city officials are:

Ada, Oklahoma
Donald Henderson, Assistant Chief of Police
Lt. William Smith, Safety Officer, Police Department

Atlanta, Georgia
Joseph Thomas, Assistant Traffic Engineer
Capt. C.V. Forester, Police Department

Concord, California
Richard C. Stockwell, Assistant City Manager
Richard Mitchell, Traffic Engineer

Cuyahoga Falls, Ohio
Donald J. Brown, Chief of Police

Dallas, Texas
John H. Pickett, Traffic Safety Coordinator

Erie, Pennsylvania
Lt. Joseph J. Masi, Safety Officer, Police Department
B. Hill, Deputy Chief of Police
R.G. Lauderbaugh, Traffic Engineer

Frederick, Maryland
Richard J. Ashton, Chief of Police

Grand Island, Nebraska
Sgt. Eugene O. Watson, Traffic Sergeant, Police Department

Janesville, Wisconsin
Officer David J. Burke, Safety Officer, Police Department
Jerry Smith, Field Rep., Wisconsin Div. of Highway Safety Coordination

Manchester, New Hampshire
Lt. Gilbert A. Vaal, Safety Officer, Police Department
Dwight Conant, New Hampshire Division AAA

Milwaukee, Wisconsin
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Darwin Cone, Milwaukee Safety Commission
David Kummel, Assistant Traffic Engineer

Omaha, Nebraska
Robert Blankenship, Director, Traffic Safety Coordination
Richard Klatt, Traffic Engineer

San Diego, California
Bruce F. Herms, Associate Traffic Engineer

Seattle, Washington
Barry W. Fairfax, Assistant Traffic Engineer

Sioux City, Iowa
Daniel S. Brame, Assistant Traffic Engineer
Edward Swanson, Traffic Engineer

Sioux Falls, South Dakota
Dennis Studer, Manager, Safety Council

Spokane, Washington
James E. Borg, Traffic Safety Coordinator
Lt. Fred L. Uttke, Safety Education Officer, Police Department
Stanley E. Miller, Public Affairs Manager, Inland Auto Assoc. (AAA)

Tonawanda, New York
James G. Oldenburg, Chief of Police

West Palm Beach, Florida
Ronald W. Schutta, Traffic Engineer

I. INTRODUCTION

Although pedestrian accidents account for a relatively small portion of the *total* transportation accident statistics, there are some staggering data within the pedestrian accident data base itself. Of the 8600 pedestrians killed in 1975, two-thirds were hit in urban areas. Pedestrians under 15 and over 64 accounted for over half of all fatalities. Half of the fatalities were pedestrians violating a traffic law or committing some other unsafe act. Preschool children, about six percent of the population, were involved in about 20% of the accidents.

The national pedestrian fatality rate in 1975 was about 4 per 100,000 people. The national injury rate was 69 per 100,000. However, these rates vary significantly in different regions of the country. Included among the several factors behind these regional differences are:

- the number of cities in the region and city size
- population density
- per capita vehicle ownership
- percentage of "accident-prone" citizens in the total population
- ethnic composition
- and, most important, the quality and effectiveness of pedestrian safety programs.

The intent of the Model Pedestrian Safety Program is to develop methodological guidelines which communities of all sizes can use to initiate or augment a pedestrian-oriented safety program. Cities with currently successful ongoing safety programs can have much to offer in the way of aid to developing this model program. In part, these guidelines will be based on the operational experiences of a regionally and socioeconomically wide variety of cities with successful pedestrian safety programs.

No valid or reliable model in any area can be developed without fully considering what has been accomplished in the past. Part 2 of this report presents the results of a screening process of research studies and other documents that will form the basis of an empirically and experiencially based Model Pedestrian Safety Program.

However, no program that is to be used in an operational setting will be valid if it is developed without considering the operational experiences of cities with already established safety programs. One of the problems of literature and research in general is that it is occasionally on a plane outside the realm of operational realities. Therefore, to obtain data on the "real world" of pedestrian safety efforts, officials in nineteen cities around the United States were contacted regarding their operational experiences with ongoing pedestrian safety programs. These cities covered a wide range of socioeconomic and population variables.

This document reports on the city selection methodology and the results of the contacts made. The American Automobile Association's (AAA) 1976 Pedestrian Safety Inventory was used as a data base identifying cities with ongoing pedestrian safety efforts. Chapter II describes this survey in detail. Chapter III discusses the methodology used to select the final nineteen cities out of the 2462 in the AAA data base. Chapter IV summarizes the information learned from the contacts and visits to the selected cities. Appendix A gives detailed summaries of the individual city's pedestrian safety programs.

II. AAA PEDESTRIAN SAFETY INVENTORY PROGRAM

The AAA Pedestrian Safety Inventory Program was developed in 1939 to stimulate local official and community interest in and promote awareness of pedestrian safety. The program achieves this by collecting data on local and state safety programs.

During December of each year, survey forms are distributed to the participating cities and states by the local automobile clubs, which publicize and coordinate the program. Small towns, large cities, counties, and states participate voluntarily by filling out a two page survey covering eight topics in two major areas: (1) the pedestrian death and injury record; and (2) the extent of pedestrian safety programs. (See Figure II-1.) Completed forms are forwarded to AAA headquarters in Falls Church, Virginia, for evaluation.

For the evaluation process, cities are grouped into eight population categories:

>1,000,000
500,000 – 1,000,000
200,000 – 500,000
100,000 – 200,000
50,000 – 100,000
25,000 – 50,000
10,000 – 25,000
<10,000

Cities are scored and ranked only against other cities in the same population group. In this way, smaller towns with fewer resources are not competing with larger cities with substantial budgets.

Survey Data Items

A city's pedestrian safety program performance rating is based on an evaluation of activities in eight basic areas: pedestrian deaths and injuries, accident records, legislation, enforcement, traffic engineering, school traffic safety, public information and education, and safety program coordination.

Pedestrian Deaths and Injuries (Part A). The first portion of the survey is a four-year comparative evaluation of pedestrian accident severity. Evaluations are based on death and injury rate comparisons, and the proportion of deaths and injuries. Points are allocated for low death and injury rates. Table II-1 identifies the score allocation procedure and the maximum possible scores.

FOR ALL CITIES

T.....
A.....
P.....
B.....
C.....
D.....
E.....
F.....
G.....
H.....

City ..... State .....
(Incorporated ..... Yes ☐ No ☐)

1976 AAA Pedestrian Safety Inventory

(Based on 1975 Data)

Name .....
(Official Submitting Report)

Title .....

RETURN TO:

Your Local AAA Club

	Est. 1975 Population	Est. 1975 Area in Sq. Miles
City		
Metropolitan Area		

DESCRIBE YOUR COMMUNITY (Check those applicable)

a. Rural in nature ☐ b. Industrial ☐ c. Residential Primarily (Bedroom) ☐ d. Traversed by major arterial highways ☐

A. PEDESTRIAN DEATHS AND INJURIES
(Do not include bicycle accidents under Pedestrian Classification)

	1972	1973	1974	1975
1. Pedestrians killed in traffic				
2. Pedestrians injured (non-fatal) in traffic				
3. Total persons killed in traffic (incl. ped.)				
4. Total persons injured (non-fatal) in traffic (incl. ped)				

DO NOT WRITE IN THIS SPACE					
DR	S	DRC	S	DP	S
IR	S	IRC	S	IP	S

5. Date of last PEDESTRIAN death *prior* to January 1, 1976 (Month)..... (Day)..... (Year).....

B. ACCIDENT RECORDS

6.	1975 Pedestrians Killed					1975 Pedestrians Injured				
AGE	Total	Day †	Night	Male	Female	Total	Day †	Night	Male	Female
1. 0-4										
2. 5-9										
3. 10-14										
4. 15-19										
5. 20-24										
6. 25-34										
7. 35-44										
8. 45-54										
9. 55-64										
10. 65-74										
11. 75 & older										
12. Not stated										
Totals										

† 8 A. M. to 6 P. M. OR IF OTHER INDICATE.

7. PEDESTRIAN ACCIDENTS 1975	Fatal Accidents		Non-Fatal Injury Accidents	
	Total Fatal Accidents	Intersection Accidents	Total Non-fatal Injury Acc.	Intersection Accidents
1. Car going straight				
2. Car turning right				
3. Car turning left				
4. Car backing				
5. All others				
6. Not stated				
Totals				

8. PEDESTRIAN ACTIONS AT INTERSECTIONS 1975		INTERSECTION FATAL ACCIDENTS	INTERSECTION INJURY ACCIDENTS
CROSSING: AT INTERSECTION ONLY	With Signal		
	Against Signal		
	No Signal		
	Diagonally		
	Others		
	Totals		

9. PEDESTRIAN ACTIONS BY AGE	Pedestrians Killed 1975	Total Killed and Injured	Pedestrians Killed and Injured 1975 — Age										
			0-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65 +	N-S
1a. Crossing or entering roadway—at intersection													
b. Same—not at intersection													
2a. Walking in roadway—with traffic													
b. Same—against traffic													
3. Standing in roadway													
4. Getting on or off other vehicle													
5. Pushing or working on vehicle in roadway													
6. Other working in roadway													
7. Playing in roadway													
8. Other in roadway													
9. Not in roadway													
10. Not stated													
Totals													

Figure II-1. AAA Pedestrian Safety Inventory Form.

C. LEGISLATION

1. Do you have an ordinance or law, in effect, in your community, other than the state law, that specifies pedestrian duties and rights in traffic? Yes ☐ No ☐
   If not, please submit copy of your state law specifying pedestrian duties and rights in traffic.

D. ENFORCEMENT

1. In 1975 were traffic citations issued for:
   - Pedestrians: (a) Crossing against signal ..... Yes ☐ No ☐ How Many _____
   - (b) Crossing not at intersection and/or failing to yield right-of-way ..... Yes ☐ No ☐ How Many _____
   - Drivers: (a) Violating pedestrians' right-of-way ..... Yes ☐ No ☐ How Many _____
   - (b) Parking in restricted school areas ..... Yes ☐ No ☐ How Many _____
2. How many arrests or citations were issued for public intoxication (including drugs) in 1975? _____
   (a) Of these, how many were pedestrians? _____
3. Are Blood Alcohol Level tests performed on all adult pedestrians killed? ..... Yes ☐ No ☐
4. Are pedestrian rights and duties included in your police recruit and in-service training program? ..... Yes ☐ No ☐
5. Do you have a special PEDESTRIAN violators school? . . . Yes ☐ No ☐ . . . If not, are pedestrian violators assigned to a regular TRAFFIC violators school? . . . Yes ☐ No ☐ . . . Does TRAFFIC violators school's course of instruction include pedestrian safety regulations? Yes ☐ No ☐.

E. TRAFFIC ENGINEERING

1. Does your city have a professional traffic engineer? ..... Full Time ☐ Part time ☐ None ☐
   If not, how many days of service or counsel did your city have from a professional traffic engineer? _____
2. Have any studies been conducted during 1975 on:
   - (a) Sidewalk and crosswalk needs in the vicinity of schools? ..... Yes ☐ No ☐
   - (b) Other pedestrian traffic problems? ..... Yes ☐ No ☐
   - If yes, submit copy of report.
3. Pedestrian traffic control facilities:
   - (a) % of total warranted intersections with marked crosswalks (warranted by volumes of pedestrians, vehicles, conflicts or special situations) _____%
   - (b) % of total signalized intersections with warranted pedestrian signals (warranted by volumes of pedestrians, vehicles, conflicts, etc.) _____%
   - (c) % of total arterial street mileage with street lighting meeting (Illuminating Engineering Society) standards ..... _____%
   - (d) % of total miles of urban streets with sidewalks on at least one side of the street ..... _____%
   - (e) % of your pedestrian traffic control devices inventoried or inspected within the last year ..... _____%
4. What percent of your signs, signals, and markings relating to pedestrians, conform to the Manual on Uniform Traffic Control Devices for Streets and Highways? _____%
5. Does your city require sidewalks in: (a) new residential development? ..... Yes ☐ No ☐
   (b) new commercial development? ..... Yes ☐ No ☐

F. SAFETY PROGRAM COORDINATION

1. Name and title of local government official responsible for pedestrian safety and program activities.
   Name:..... Title:.....
2. Does your city have an official GOVERNMENTAL committee responsible for coordinating traffic safety activities of different governmental departments, such as: police, public works, courts, schools, etc? Name:..... Yes ☐ No ☐
3. Does your city have a CITIZEN traffic safety organization, such as: Safety Council or Mayor's Traffic Safety Committee, responsible for COORDINATING citizen traffic safety activities? Name:..... Yes ☐ No ☐
   This organization has representation from: Business and Industry ☐ Civic Organizations ☐ Local Government ☐ Schools ☐
4. Does the citizen committee have a pedestrian safety subcommittee? ..... Yes ☐ No ☐
   (a) If yes, how many meetings were held during 1975 by this subcommittee? _____

G. SCHOOL TRAFFIC SAFETY

1. Name and title of SCHOOL PERSON officially designated to supervise and coordinate safety education in schools.
   Name:..... Title:.....
   (a) Does this position receive formal training in safety education or accident prevention? ..... Yes ☐ No ☐
2. Do your elementary schools use pedestrian safety curriculum materials? ..... Yes ☐ No ☐
3. Is school bus safety instruction provided in your schools? ..... Yes ☐ No ☐
4. Do your schools use SAFEST ROUTE TO SCHOOL planning for beginning students? ..... Yes ☐ No ☐
5. Does your police department work with schools in safety patrol, bus patrol or other safety programs? ..... Yes ☐ No ☐
6. Do you have an official committee responsible for uniform application of school crossing protection measures? ..... Yes ☐ No ☐
7. What percent of eligible public, parochial, and private elementary schools in your city have safety patrols, bus patrols, and/or safety committees concerned with pedestrian safety? _____%
8. What percent of your public, private and parochial high schools offer a minimum standard driver education program? ..... Public _____%
   If you have NO PRIVATE OR PAROCHIAL high schools, please check (✓) here ☐ Private and Parochial _____%
9. Do your school bus drivers receive training in the operation and maintenance of their bus? ..... Yes ☐ No ☐

H. PUBLIC INFORMATION AND EDUCATION

1. Are citizens informed through your local news media of:
   - (a) Pedestrian hazards and safe pedestrian practices? ..... Yes ☐ No ☐
   - (b) Pedestrian control regulations in effect in your city? ..... Yes ☐ No ☐
2. Do you distribute, for general information, a summary of pedestrian rights and duties in traffic? (If yes, submit a copy) ..... Yes ☐ No ☐
3. Do you provide special pedestrian safety programs for senior citizens? ..... Yes ☐ No ☐
4. Have you conducted any pre-school child (ages 3-5) pedestrian safety activities? ..... Yes ☐ No ☐
5. Describe briefly local pedestrian safety programs and activities carried out during 1975. Attach samples of materials used. .....

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Figure II-1 (Continued). AAA Pedestrian Safety Inventory Form.

Table II-1

Pedestrian Death and Injury Rate Score Breakdown

	Cities Under 50,000 Pop.*	Cities Over 50,000 Pop.*
Pedestrian Fatality Record		
Death Rate (Ped. deaths/100,000 if >50,000)		
	75	110
Ped. deaths/10,000 if <50,000)		
Death Rate Comparison (Current year compared to average of 3 previous years)	60	85
Pedestrian Injury Record		
Injury Rate (Injuries/100,000 in >50,000)		
	80	90
(injuries/10,000 if <50,000)		
Injury Rate Comparison (Current Year compared to average of 3 previous years)	85	95
Injury Proportion (Ped. % of total injuries)	–	30
Consecutive Years Without A Pedestrian Fatality	50	–
TOTAL POSSIBLE SCORE	350	450

*Cities under 50,000 population are likely to have a lower frequency of accidents simply because of lower pedestrian and traffic volumes. Therefore, the point allocation scheme is different for cities over and under 50,000.

Accident Records (Part B; 70 Points). This section evaluates the thoroughness of a community's accident analysis capabilities. In order to understand the pedestrian safety problem, it is essential that adequate and complete pedestrian accident records be maintained. With a good understanding of pedestrian accidents, it is possible to project solutions which can improve pedestrian safety. Valid solutions must be based upon factual supporting evidence, including full and accurate accounts of the what, where, when, why, who, and how of accidents. Good accident records make it possible to be effective in accident prevention activities.

Legislation (Part C; 15 Points). This is a simple yes or no question identifying special pedestrian laws and regulations, if applicable. Most city laws are virtually identical to the state laws and the *Uniform Vehicle Code and Model Traffic Ordinance* of the National Committee on Uniform Traffic Laws and Ordinances.

Enforcement (Part D; 75 Points). This is a quantitative evaluation of the extent of enforcement of pedestrian-related regulations (e.g., against jaywalking, usurping a pedestrian's right of way). Good legislation and regulations alone cannot be effective without adequate enforcement. Enforcement of reasonable pedestrian laws is mandatory.

The evaluation is based on enforcement factors such as number of arrests or citations for law violations, police officer training in pedestrian rights and duties, and penalties placed on pedestrian violators.

Traffic Engineering (Part E; 85 Points). This section centers on physical and engineering facilities that can lead to a safer environment for pedestrians. Individual questions examine the level of professional traffic engineering staffing, types of studies conducted, the warranted and unwarranted application of control devices, sidewalks, lighting, etc., and traffic engineering regulations required of planners and developers of new facilities.

School Traffic Safety (Part G; 105 Points). This section emphasizes that portion of the total safety program specifically oriented to children. As an age group, children account for the single largest number of pedestrian accident victims. Because early training can lead to safer behavior as adults, the inventory places a special emphasis on programs of school traffic safety.

Included in the evaluation are questions relating to school safety program staffing, curriculum materials, existence of safety patrols (crossing guards, bus patrols), safe route to school programs, driver education for student and bus drivers, and involvement and coordination with police, citizen groups, and other agencies.

Public Information and Education (Part H; 125 Points). The degree to which the general public is informed of traffic-related problems and safety efforts is evaluated in this section. Traffic engineering, legislative, and enforcement efforts are only effective as long as the public is aware of them. Specific questions deal with the use of the local media, talks given to private groups, and programs for elderly, handicapped, or preschool pedestrians.

Safety Program Coordination (Part F; 75 Points). This section reviews the organization of local government, citizen group, business and civic organization, and school committee involvement with each other and with national and regional safety associations.

Because all the above mentioned areas of pedestrian safety involve many different organizations, it is essential that their efforts be coordinated for the most effective results.

Quantitative Evaluation

The inventory forms for each city are evaluated on a competitive basis between cities within each of the eight population categories. Each individual question is evaluated separately. Grading standards for each question are based on the 70th percentile score. To determine this standard, the answers for each question for all cities in a population group are listed and the 70th percentile answer found. (See Figure II-2.)

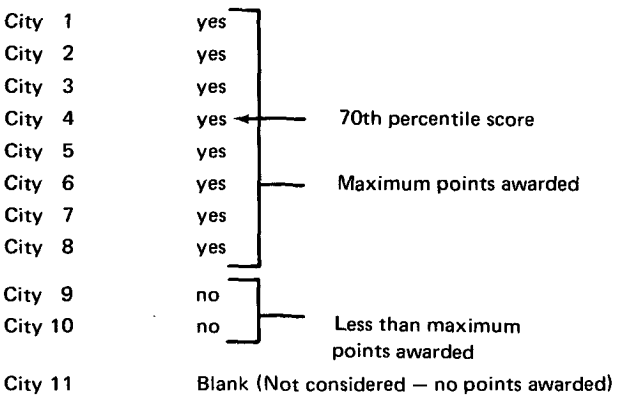


Figure II-2. Determination of 70th percentile score on nonquantitative questions.

Cities with answers or scores at or above the 70th percentile are given the full allocation of points for that question. Scores below the 70% level are given a proportionately lower score for that question. Items not answered are given no points and are omitted when determining the 70th percentile. For example (Figure II-2), with eleven cities on a yes or no item, eight answered "yes," two "no," and one left this item blank. The 70th percentile answer is "yes". *All* cities with a "yes" answer will get the maximum points awarded for that question (say 5 points). The "no" answers will get fewer points. The city that left this question blank will get zero points awarded on this question.

Quantitative data (Pedestrian Deaths and Injuries, Part A; Accident Records, Part B) are converted to a per population figure to put all cities within a group on a common basis. These figures are then evaluated as above. (See Figure II-3.)

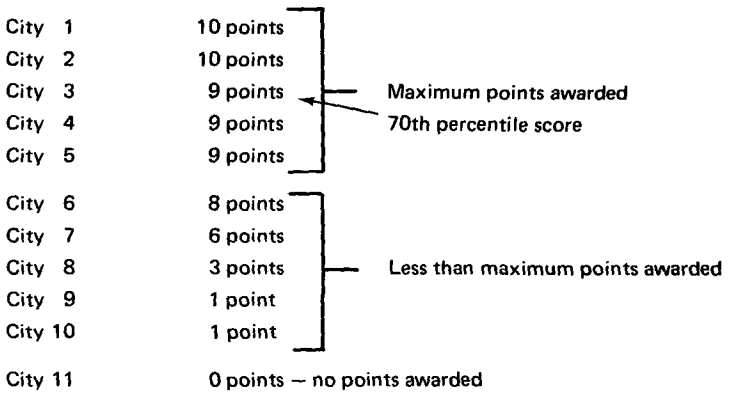


Figure II-3. Determination of 70th percentile score on quantitative questions.

Award Determination

After the scores for all the cities have been tabulated, awards are given to deserving cities in each population group. Award determination is accomplished by an impartial multi-disciplinary Board of Judges – all experts in the field of pedestrian safety. The eight member Board of Judges for the 1976 award selection were drawn from the Federal Highway Administration, national and local AAA clubs, private consulting firms and industry, the Institute of Traffic Engineers, the police, and an elderly persons' organization. Judges are unaware of the identity of the cities during the judging procedures. Assignment of awards is based not only on the score obtained, but also on the innovation of pedestrian safety efforts, and the total orientation of the program.

Three major awards – Grand, Excellence, and Merit – are given based on the following criteria:

- *Grand Award:* presented to cities and states qualifying for the Award of Excellence which have especially outstanding overall safety programs.
- *Award of Excellence:* presented for superior overall performance in both the pedestrian safety record and pedestrian program activities areas.
- *Award of Merit:* presented for balanced achievement in both pedestrian safety record and program activities.

In addition, several Special Citations are awarded for particularly strong efforts in specific areas of pedestrian safety.

- *Special Citation for Outstanding Pedestrian Casualty Records:* based on an evaluation of the pedestrian death and injury rates, rate comparisons, percentage of total traffic deaths and injuries, and fatality-free record; given to cities with low pedestrian accident rates per population.

- *Special Citation for Outstanding Program Activities:* based on an evaluation of a community's efforts in accident reports maintenance, legislation, enforcement of pedestrian-related laws, traffic engineering service for pedestrians, community traffic safety coordination, school traffic safety, and public information and education; given to cities with good overall safety program activities.
- *Special Citation for Pedestrian Program Improvement:* awarded for significant improvement in safety program activities compared to the previous year.
- *Pedestrian Safety Achievement Award:* presented for ten or more consecutive years without a pedestrian fatality.

Safety Program Appraisal

Following the evaluation and judging, a Pedestrian Safety Program Appraisal is provided to each participant. This Appraisal enables a city to measure its pedestrian safety program performance with standards established for other communities in the same population group. Recommendations for improvements are included in the Appraisal and it can be applied as an aid in establishing priorities for strengthing the city's pedestrian safety program in the future.

Effectiveness of the AAA Pedestrian Safety Inventory Program

The 1976 Safety Program Inventory was the 37th consecutive year the AAA has conducted this survey. To evaluate the effectiveness of this program, the Auto Club of Southern California conducted a survey study in 1974. Among other things, the study concluded that the inventory is valuable to the cities in establishing community pedestrian safety programs. Significant findings of the study relative to the Safety Inventory itself include:

- Cities enter in order to receive the AAA evaluation of their pedestrian accident records and safety programs.
- Cities tend to feel that the awards given bring them recognition of their pedestrian safety efforts and assist them in promoting safety activities within the community.
- Pedestrian death and injury rates of entering cities decrease with the length of time the city has been involved in the survey.

III. SELECTION OF CITIES FOR OPERATIONAL EXPERIENCE REVIEW

Data on the operational experiences of American cities with ongoing pedestrian safety programs were obtained to determine how safety programs have been initiated, how modifications are carried out, what budget constraints mean to the overall program, and how other day-to-day events play a role in program evolution.

Selection of the Cities

Cities with ongoing pedestrian safety programs to be contacted were to cover a wide range of socioeconomic factors, be regionally representative, and cover all population categories. A screening process of prospective cities was devised.

Although it is not totally comprehensive in that not every city with an ongoing pedestrian safety program is included, the American Automobile Association's 1976 Pedestrian Safety Inventory was used as a data base of initial cities. The AAA annually collects data from numerous cities. These data are quantitatively evaluated and awards are given to cities with outstanding pedestrian safety programs. Chapter II discussed the AAA questionnaire and the evaluation procedures used in determining city rankings. In all 2462 cities in the 1976 survey were initially considered.

Census Data Evaluation

In order to select cities which were socioeconomically representative of the region and state in which they are located, each of the cities in the AAA data base was evaluated based on 1970 Department of Commerce Census Data.

The 2462 cities in the data base were grouped into the nine regions defined by the Federal Highway Administration. Table III-1 lists the states in each of these regions. Within each region, the cities were subcategorized into three population groupings:

- <50,000: suburban "bedroom" community or rural in nature; light industry if any at all.
- 50,000-500,000: larger, generally self-sufficient; heavier industrial base or business community.
- >500,000: major metropolitan city.

Table III-1

Field Regions of the Federal Highway Administration

Region 1 (Northeast):*	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey
Region 3 (Mid-Atlantic):	Pennsylvania, Delaware, Maryland, Virginia, West Virginia
Region 4 (Southeast):	Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Florida
Region 5 (Mideast):	Ohio, Indiana, Michigan, Illinois, Wisconsin, Minnesota
Region 6 (Southwest):	Arkansas, Louisiana, Texas, Oklahoma, New Mexico
Region 7 (Midwest):	Iowa, Missouri, Nebraska, Kansas
Region 8 (Upper Midwest):	North Dakota, South Dakota, Montana, Wyoming, Colorado, Utah
Region 9 (West):	Arizona, Nevada, California, Hawaii
Region 10 (Northwest):	Oregon, Idaho, Washington, Alaska

*FHWA Region 1 conforms to Standard Regions 1 and 2.

Listing of Statistical Census Data. Using the form shown in Figure III-1, data for seventeen socioeconomic factors were listed for each city. The areas covered, and the rationale behind their inclusion, were as follows:

- Population density: indicator of the potential concentration of pedestrians.
- Percent population change between 1960-1970: growth indicator.
- Percent of the population that is nonwhite: racial balance indicator.
- Percent of the population . . . : indicators of potential child, adult, or elderly accident problems.
  - under 18 years old.
  - 18-64 years old.
  - over 64 years old.
- Persons per household: residential concentration of potential pedestrians.
- Percent of population employed in . . . : indicator of economic base of the community.
  - manufacturing or industry
  - white collar jobs
  - government

City	Pop. Density	1970 Census Data																	
		Population						House-hold	Employment			Income			Transportation			Family
		X 1000	% chg 60 -70	% non-white	< 18	18-64	> 64	Pers. Per H.H.	manf ind	white coll	govt	X 1000	% < povty	% > 15000	POV	mass tran	walk only	family= wed cple

Figure III-1. 1970 Census Data Evaluation Form

- Family income: indicator of community population affluence.
- Percent of families in city earning . . . : community affluence indicators.
  - less than the poverty level
  - greater than $15,000
- Percent of the population . . . : indicator of potential rushhour pedestrians and rushhour accident potential.
  - using their private vehicles to get to work
  - using public/mass transportation to get to work
  - walking to work
- Percent of families that are married couples: household makeup indicator.

Census Data Analysis. Data for each of these items, if available, were listed for each city, by state within the three population groupings. Upon completion of the data cells in the tables, the *state* mean and standard deviation were determined for each factor and population group. For example, all cities in the 50,000-500,000 group in California were evaluated separately; all cities in the <50,000 group in Illinois were evaluated separately, etc.

The state *mean range* for each factor was determined by adding and subtracting one standard deviation from the mean. Mean ranges were determined for all seventeen factors, for all cities in the population group within each state. Approximately two-thirds of the cities lay within this mean range on any one individual factor. Cities (data cells) lying within this range were highlighted.

The next step determined the *regional* mean and mean range for each factor and population group. For example, all 50,000-500,000 cities in Region 5 (Minnesota, Wisconsin, Illinois, Indiana, Michigan, and Ohio) were used to determine that group's Region 5 mean, standard deviation, and mean range. Cities (data cells) lying within these ranges for each factor were highlighted.

Cities were then evaluated for their state and regional socioeconomic representativeness. Cities lying within the mean range of *three-quarters of the state* ranges were indicated. Cities lying within the mean range on *half of the regional* ranges were also indicated. *Only* cities within *both the state and regional* ranges for the required percentage of factors were further considered. This eliminated 2068 cities from the original data base. Table III-2 shows the distribution of these 394 cities by region and population group.

Table III-2

Distribution of Cities by Region and Population Group

	FHWA Region									
	1	3	4	5	6	7	8	9	10	Total
>500,000	0	2	2	3	2	1	1	2	1	14
50 - 500,000	11	3	10	11	4	6	6	18	2	71
10 - 50,000	57	18	47	22	25	17	8	25	2	221
<10,000	26	25	16	6	1	3	1	8	2	88
TOTAL	94	48	75	42	32	27	16	53	7	394

AAA Inventory Data Evaluation

Statistical evaluation of the 1970 census data created a list of 394 cities socioeconomically representative of their state and region. Continuation of the city selection process centered on the Pedestrian Safety Inventory data itself.

Initially, over half of these remaining cities were eliminated for the following reasons. Cities with greater than 1,000,000 population were not considered because of several characteristics generally unique to cities that size (very high density residential areas, large percentages of the total pedestrian population being business commuters from outside the city, funding and political aspects not really relevant to smaller communities). Towns with less than 10,000 people were eliminated because of their high AAA scores were more reflective of a low accident rate (due to few pedestrians and/or little traffic), rather than particularly strong safety programs.

For the remaining cities, each of the item scores on their 1976 forms was evaluated using a six-point ranking scale. The scale was based on the maximum possible number of points available on a particular item and the 70th percentile score of that population group. For example, Item E (Traffic Engineering) has a maximum possible score of 85 points. For the >500,000 population category, the group standard (70th percentile) score is 74 points. For Item F (Safety Program Coordination), the maximum and group standard scores are 75 and 60. The ranking scales for these two items were as follows:

Item E	Item F
5 = 71-75	5 = 76-85
4 = 61-70	4 = 66-75
3 = 51-60	3 = 56-65
2 = 26-50	2 = 41-55
1 = <26	1 = <41
0 = 0	0 = 0

The 70th percentile score was generally in the rank score of 3 or 4, depending on the score distribution. All other item categories were ranked similarly.

For each city item, the appropriate rank score was indicated. For example, on Item E if a city scored 53 points, it received a rank score of 3; 15 points would give it a rank score of 1. Unanswered items received a zero, on both the AAA form and the score ranking.

The ranking technique was used to identify the overall relative quality of each city's safety program. If cities with the highest absolute scores were picked, there would be no way of knowing if it was due to an overall good safety program, or an exceptionally strong program in a couple areas (e.g., no deaths or injuries for that year) and weak programs in other areas. Cities with good overall programs were desired.

Because all the final-selected cities were potentially to be visited, an Accessibility Factor was also assigned. An accessibility rating of 5 meant the city was near a major 24-hour-a-day airport and could easily be visited in one day. An accessibility of 2 meant one had to drive several hours from a minor "daytime only" airport. Cities with accessibility ratings of 2 or less, regardless of the strength of their pedestrian safety program, were eliminated. Cities with poor total ranking scores (the sum of all the rank scores), regardless of accessibility, were also eliminated.

The completed ranking process reduced the data base to about 70 cities. Selection of the final 19 cities was based on a review of the 1976, 1975, 1974, and 1973 AAA inventory forms. This final evaluation was primarily subjective, because all cities at this stage had outstanding programs. Regional and populational balance were prime factors in the ultimate selection. Table III-3 indicates the selected cities by population grouping and FHWA region. Cities with checkmarks were visited.

Table III-3

Selected Cities

	FHWA Region								
	1	3	4	5	6	7	8	9	10
> 500,000	–	–	–	Milwaukee, WI √	Dallas, TX √	–		San Diego, CA √	Seattle, WA √
50-500,000	Manchester, NH √	Erie, PA √	Atlanta, GA √ W. Palm Beach, FL √	Janesville, WI √	–	Omaha, NE √ Sioux City, IA √	Sioux City, SD	Concord, CA √	Spokane, WA √
10-50,000	Tonawanda, NY	Frederick, MD √	–	Cuyahoga Falls, OH	Ada, OK √	Grand Island, NB √	–	–	–

IV. OPERATIONAL EXPERIENCE DATA

Each of the nineteen selected cities was contacted to obtain more detailed data about its pedestrian safety program. Sixteen of the cities were visited for one day to observe the safety efforts in operation. In general, topics of discussion followed the items on the AAA survey form. A summary of the operational data is given below under the following headings:

- Safety Program Coordination
- Traffic Engineering
- School and Child Safety Programs
- Provisions for the Elderly and Handicapped
- Public Information and Education
- Enforcement of Pedestrian-related Laws
- Accident Analysis (special studies)
- Safety Program Recommendations or Philosophy

Safety Program Coordination

Although the selected cities ranged in size from about 14,000 to 800,000 people, there is a remarkable similarity in their governmental organization for dealing with safety problems. Practically every one of the cities has some professional and/or citizen group (Safety Commission, traffic advisory committee, or other name) acting as a buffer between citizens directly affected by a safety program, and the City Council, which approves safety efforts (either directly or through budgetary allowance). In the cities where no official "buffer" committee exists, the traffic engineering department usually receives complaints or requests directly from the citizens. This department then studies the request and makes modifications where necessary. If the citizens react negatively to the change, they can go directly to the City Council.

Another factor which stands out is the support the cities seek and receive from external sources – primarily the local AAA club and their state traffic safety office. Most communities do not have the resources to publish safety materials. On the other hand, the AAA has numerous pamphlets, movies, and other materials available for use in education programs. In addition, it publishes guidelines for setting up various safety efforts (e.g., school crossing guards). By using resources already available, the cities have augmented their programs at minimal cost. The Institute of Traffic Engineers also publishes safety materials used by some of the cities.

The influence of the state safety office is important for two reasons: it can be another source for safety materials and it can provide a meaningful incentive to program development. Financial aid can be obtained from some of the states to augment local safety programs. Because this aid is often based on merit, there is a definite incentive to establish and maintain a strong safety program.

The importance of state influence in municipal safety program achievement is reflected in the state data of the AAA Pedestrian Safety Inventory. As with the cities, each participating state fills out a two-page form identifying statewide programs in pedestrian safety. These are evaluated and awards are given for meritorious achievement. Table IV-1 shows a statistical comparison between *city scores* in states which won major (Grand, Excellence, or Merit) awards and cities in states which did not win any award in 1976. The mean city score was significantly *higher* ($p < .05$) for cities in award winning states than it was in non-award-winning states. Because the state programs are evaluated partially on what they do for the cities, the importance of state incentive is obvious in the quality of the cities safety programs.

Table IV-1

Comparison Between States Winning Major Awards and States Not Winning Awards

State	State Score	State Award	Mean City Score	Number of Cities	Percent of Eligible Cities >5000
South Dakota	893	Grand	540	15	100%
Wisconsin	825	Excellence	541	88	100
Virginia	821	Excellence	612	45	79
Massachusetts	773	Merit	491	84	40
New York	765	Excellence	512	152	78
Ohio	760	Merit	527	223	79
Minnesota	721	Merit	510	64	86
California	663	Merit	548	179	59
			Weighted $\bar{X}$ = 530		
Wyoming	665	–	531	7	71%
Pennsylvania	639	–	481	204	46
Illinois	626	–	483	57	28
Maine	545	–	466	66	82
Montana	513	–	342	3	73
New Mexico	497	–	617	1	13
Maryland	469	–	497	10	36
Oklahoma	448	–	503	32	65
Nevada	386	–	578	2	22
Hawaii	382	–	593	2	100
Texas	369	–	489	64	33
Florida	366	–	482	92	92
			Weighted $\bar{X}$ = 483		

Traffic Engineering

Installation and design of most traffic engineering facilities follow the recommendations of the *Manual on Uniform Traffic Control Devices.* The following discussion therefore deals more with unusual, innovative, or exceptional efforts to accommodate the pedestrian.

Signalization. Most of the cities automatically install pedestrian signals with traffic signals warranted by pedestrian or traffic volumes. In the central business district, the two signals are timed together. Pedestrian signals outside the CBD are generally manually actuated.

There is a wide variety of pedestrian signal phasing. Some cities use the steady WALK in all situations; others use the flashing WALK where there are potential conflicts between vehicles turning into the crosswalk and pedestrians. Use of the steady or flashing DONT WALK was likewise inconsistent. With the major exception of Milwaukee, which recently changed, cities use the long WALK, shorter clearance DONT WALK cycle. Milwaukee uses the short WALK, long DONT WALK cycle.

Realizing the problems that pedestrians have seeing, and therefore properly responding to overhead suspension mounted traffic signals, several cities have either added pedestal mounted signals, removed the wire suspension signals in lieu of pedestal signals, augmented the overhead signals with pedestal pedestrian signals, or at least removed the hoods from the suspension signals.

Several of the cities have a one-way traffic grid in the central business district. Because vehicles would legally be turning into only one of the crosswalks, pedestrian signal timing is different for the two parallel crosswalks. In both Omaha and Sioux City, pedestrians are held back (no WALK signal at green traffic signal onset) for 5-10 seconds at the crosswalk where there will be turning vehicles. The opposite crosswalk gets WALK simultaneously with the traffic signal green. In Milwaukee, just the opposite is done. The traffic green signal is delayed 5-10 seconds allowing pedestrians to get into the crosswalk, establish their right-of-way, and become more visible (better sight distance) prior to releasing turning vehicles.

Several of the cities have installed and are experimenting with some variation of a stop sign/pedestrian signal installation. These facilities normally present a flashing or steady green or amber signal to through traffic. When a pedestrian signal on the side street is actuated, the signal goes to steady red for the through traffic. Side streets have, under nonactuated conditions, a stop sign or flashing red signal. When the pedestrian signal is activated, the signal goes to a steady red. Another variation of this installation (Seattle and Spokane) gives no light to through traffic normally. Signal activation presents a flashing amber to traffic signifying that cars must stop for pedestrians in the crosswalk.

Signing. In general, standard "Pedestrian Crosswalk" and "School Crossing" signs are installed where recommended by the MUTCD. However, one of the major concerns appears to be the potential overuse of signing. For fear that too many signs would lead to motorist confusion and potential noncompliance of the ones that are installed, some cities have limited the number of crosswalk signs. To cut down on the number of signs, Concord added "Next 4 Blocks" under one "Crosswalk Ahead" sign indicating several impending crosswalks.

Signing for handicapped pedestrians was generally done in all cities. These signs ranged from small "Deaf Children" signs under the standard "Pedestrian Crosswalk" sign to the painting of a white cane on the symbolic "Watch for (Blind) Pedestrians" sign.

Crosswalks. Two items stand out in regard to the use of marked crosswalks. Nearly all the cities mark the crosswalks where children would be crossing during their trips between home and school. This brings special attention to the crosswalks and the potential presence of child pedestrians. In addition, it designates to the children the best route to take to school.

Crosswalks at signalized intersections in the central business districts are also marked. Other common locations of marked crosswalks and associated signs are those needing to be stressed (e.g., midblock crosswalks) and those where geometry or high pedestrian volumes warrant such treatment. While most crosswalks are marked with two parallel lines, those needing special emphasis may be painted with zebra stripes.

The second item which stood out in discussing crosswalks is an apparent trend toward de-emphasizing the indiscriminate marking of all crosswalks. Nearly always, the reason given for this minimization of marking crosswalks is the San Diego study on accidents in marked and unmarked crosswalks (Herms, 1970).

Grade Separation. Two types of grade separation facilities were encountered. The first was the pedestrian overpass/underpass. These structures start and end at ground level on opposite sides of a street and, via stairs or ramps, cross above/below the intervening street. These were all financed by the particular city or through public bond sales. Because of their very high cost (up to $500,000 each) their use has been limited. They have been erected where unique geometric situations and/or high volumes exist.

The second grade separation facility is the second level or higher "skyway" between buildings. Normally enclosed, these walkways connect buildings on opposite sides of the street in the central business district. Installation of these facilities has usually been precipitated by urban redevelopment projects or, in the case of Spokane, a World's Fair. The affected businesses have frequently paid for their construction.

Sidewalks. In nearly all of the cities, installation or noninstallation of sidewalks is related to the City Council's motivation to enact a new or enforce an existing sidewalk ordinance. Because sidewalk construction is commonly assessed to the property owner, public pressure *not* to have them required is often quite strong. In three of the cities contacted, this has led to there being no sidewalk ordinance, or just a token ordinance that is virtually meaningless.

On the other hand, Ada, Frederick, and Concord require sidewalks on all city streets and nearly 100% of their streets have either permanent or temporary sidewalks.

In general, where they do exist, sidewalks are required in the vicinity of schools and are used to identify the safe route to school for children. All central business districts have sidewalks, also.

Barriers. Physical pedestrian barriers were not in evidence except at a few schools where fencing is used to channel children to intersections or underpasses. Existing barriers are more frequently vehicle-oriented. Several cities close streets on a temporary basis for pedestrian activities (sledding in the winter, festivals in the summer).

One type of permanent vehicle barrier is in Seattle. Some of the intersections in the residential neighborhoods are partially blocked by raised medians connecting two of the diagonal corners. Vehicles are forced to turn at these intersections. This effectively reduces their speed through the neighborhood and cuts down the number of through vehicles.

Malls. As addressed here, malls are separated pedestrian facilities in the urban business environment. Rarely, if ever, is the sole objective of a mall facility an attempt to increase pedestrian safety. Malls in the contacted cities were all built as part of a program to redevelop and revitalize the central business district. Erie, Sioux City, and West Palm Beach are all closing streets and building malls in an attempt to regenerate interest in the downtown area. Atlanta's mall, Underground Atlanta has become a favorite tourist and night spot in the city. Dallas is in the initial stages of a park and underground pedestrian circulation system redevelopment program covering nearly 10% of its CBD.

School and Child Safety Program

Crossing Guard Program. All of the cities use some sort of crossing guard program at school crosswalks during times when children are traveling between home and school. Whether the emphasis is on the paid adult crossing guard or the student safety patrol depends on several local criteria, but the school crossing guard program is considered the primary reason for low school trip accident rates in all the cities.

Incentive is one factor in the complete or marginal success of both programs. The pay scale for adult crossing guards is minimal. In areas of the country where hard winter weather sets in, these guards can get very discouraged when the cold and snow arrive. Student safety patrols are all voluntary and are selected by the school as a reward for high scholastic achievement. Incentive programs for student patrols range from parties and picnics for all members, to awards for the best patrols, to the Green Pennant program in Erie where the entire school is rewarded for a good safety record.

Guards and patrols are located only at elementary school crossings. Student patrol members are in the third to the eighth grades, with fifth and sixth graders being the most common age group. Adult guards are usually uniformed paraprofessional members of the local police department. The police department hires, trains, and assists them. Most student patrols, although picked by the schools, are also trained and supervised by the police or the adult guards.

One of the major differences found was the variation in the legal rights and responsibilities of the adult and student crossing guards. Because they are members of the police department, adult guards have the right to enter the street and stop traffic to allow students across. The legal rights of student patrols, however, varied considerably. Some student patrols are only allowed to hold children on the curb, releasing them only when a sufficient gap in traffic appears during which they can cross safely. The patrol member never leaves the curb. Other patrols hold students back until a sufficient gap exists, enter the road themselves with flags to ensure that vehicles stop and remain stopped, and then release the children to cross. This is sometimes done at locations with adult guards, where the adult stops the traffic while the student patrol holds back the children. Finally, some student patrols have the right to stop traffic, although this is usually accomplished through signal activation. In Spokane, the patrols have keys which actuate a flashing amber light. Vehicles are required to stop for pedestrians when the light is flashing.

School Crossings/Safe Route Program. Practically every city contacted uses marked crosswalks at school crossings. Because children as a group tend to be less cognizant of the potential threat that vehicles pose, it behooves persons interested in child safety to draw attention to the potential pedestrian. Most school crosswalks are also signed and a couple of cities used SCHOOL X-WALK AHEAD pavement markings in addition. From the children's point of view, marked crosswalks identify the safe route to follow between home and school.

Some of the cities also have *formal* Safe Route to School programs. The primary materials used in these programs are maps outlining the routes that children should follow from any point within the school area to the school. Parents are encouraged to walk this route with their children at the beginning of each school year.

Education. Safety education programs in the elementary schools are run in all the contacted cities. The police department "Officer Friendly" or "Officer Bill" programs are the most common instruction method. Educational efforts are generally done in the fall with the emphasis on safe habits for walking to school. If a second program in the spring is given, the emphasis shifts more toward summer play activities and bicycling. Reinforcement of the program is often done with comic books, retro-reflective material, and other items handed out. Followup discussions led by individual teachers in the classroom also reinforce the official program.

Safety programs are taught in the kindergarten through third grade levels. Spokane, Manchester, and Cuyahoga Falls also make major educational efforts in the preschool system. In Milwaukee, The public Health Department includes information on child pedestrian safety with the materials sent out with the official birth certificate of a newborn baby.

Provisions for the Elderly and Handicapped

Curb ramps for the wheelchair-bound and elderly subpopulations are being put in all of the contacted cities. Most of these ramps are of the curb-cut type and are being made as sidewalks get reconstructed or as demand requires. In some cities, in lieu of cutting the curb, the gutter is being filled in providing a ramp down to the street level.

These ramps are not, however, going in without problems. Complaints have been received from visually impaired pedestrians regarding the loss of a cue telling them when they are at the corner. As a result some cities are testing various modifications to their ramps with striping or rough pavement textures on the ramp itself. Fall and winter weather cause problems with leaves, snow, or ice filling in the ramp wells making them difficult to clean out with conventional street cleaning equipment. Nonhandicapped pedestrians (particularly skateboarders) and bicyclists have been observed riding down these ramps into the street without first looking for oncoming vehicles. At intersections where the ramps are filled in gutters, there have been problems with vehicles cutting the corner and riding up onto the sidewalk.

One final note concerning ramping is the wide variety of places to put them. Some cities have two ramps, one for each direction, perpendicular to the flow of traffic, leading directly into the crosswalk; other locations have one ramp on the arc of the corner for both crosswalks; still others set the ramps back from the crosswalk so that blind pedestrians still have their curb lip cue. The curb lip of the ramp itself is another problem. Wheelchairs cannot negotiate other than a very small lip; blind pedestrians can unknowingly wander into the street without some sort of locational cue.

To accommodate particular handicapped subpopulations at specific locations, several countermeasures have been devised. Included in this list are extending the signal timing at key intersections for slower moving pedestrians, putting in narrow raised strips for blind pedestrians to follow straight across the street, having a bell which rings during the WALK phase of the signal cycle, and putting up signs telling motorists that deaf or blind pedestrians are in the vicinity and that appropriate caution should be exercised.

As part of their community relations efforts, several police departments give talks to organizations for the elderly. These discussions try to make the people aware that their capabilities are not what they used to be and they should act accordingly.

Public Information

Educating the public to local rules of the road, traffic conditions, and problem areas is considered essential to safe traffic operations. In regard specifically to pedestrian safety, the cities use radio, television, and newspaper advertising a great deal. Numerous spot announcements are made in the fall reminding motorists that school is open and there will be more children on the roadway system. Police department personnel give talks to civic organizations, parent-teacher associations, and church groups on pedestrian and vehicle safety. In communities with safety councils, the council meetings act as a public forum for any safety-related matter. In Erie, the local newspaper sponsors and gives a great deal of coverage to the Green Pennant school safety program.

Enforcement

The desire of the police departments and city officials to enforce pedestrian-related laws is present in most of the contacted cities. However, existence of a strong enforcement campaign depends more on whether or not citations are upheld and fines administered in the courts. In cities with the most successful efforts in enforcing pedestrian regulations, courts have sent violators to pedestrian safety lectures or given them substantial fines. In cities where the police have tried to enforce the laws but the courts have not strongly backed them up, the enforcement campaign has diminished.

In Milwaukee, Spokane, and Atlanta, rather than trying to cite all violators wherever they are spotted, a selective and locational enforcement campaign is in effect. The emphasis at any one time is based on accident data, time of day, specific behaviors, location, or other criteria.

Accident Analysis

All of the cities do at least an annual analysis of the accidents that have occurred. However, the more meaningful analyses are the monthly reports or up-to-date pin maps done in some of the cities. Identifying a trend early will help to keep accidents to a minimum. Janesville and Milwaukee are required by state law to maintain pin maps of all accident locations. Dallas, Manchester, and West Palm Beach issue monthly accident statistics. These are all used to locate problem areas for immediate study and rectification if necessary.

Safety Program Philosophy or Recommendations

If any one overriding theme can be found in the attitudes of officials regarding pedestrian safety, it is the recommendation that overall coordination of the safety effort is most important. Although individual philosophies and monetary constraints affect the actual efforts made, all cities incorporated Traffic Engineering, Education, and Enforcement into their safety programs. Education and enforcement were often tied together with enforcement of the law being one way to inform people of proper safe behaviors and thereby teach them to respond appropriately in all situations.

A second theme dealt with the necessity to remain constantly aware of potential problems. While a city might have a low accident record, it would not take many accidents to make that rate climb significantly. Continual vigilance of pedestrian safety must be maintained.

Finally, efforts to make the pedestrian aware that his safety is a responsibility to be shared with the motorist is also very important. Although court interpretations of laws may give the pedestrian the right-of-way in the street, from an injury standpoint, the pedestrian will always be the loser. It therefore behooves him to accept some of the responsibility for his own safety.

APPENDIX A

CITY SAFETY PROGRAM DATA

This appendix presents the data obtained from the individual cities. Each city section begins with a short Community Profile. This information is based on materials received from the local Chambers of Commerce. Safety program data follows and is broken down into the following categories:

- Safety Program Coordination
- Traffic Engineering
- School and Child Safety Programs
- Provisions for the Elderly and Handicapped
- Public Information and Education
- Enforcement of Pedestrian-related Laws
- Accident Analysis (special studies)
- Safety Program Recommendations or Philosophy

Following this information, the statistical AAA Safety Inventory and 1970 Census Data are presented. The AAA data give the city score breakdown, the maximum possible number of points on each item, and the population group standard (70th percentile) score. The census data identifies the value for each of the seventeen socioeconomic factors, the population group regional/state mean value, and the mean value for *all* cities in that population group.

Finally, if available, photographs of some of the outstanding, unique, or representative facilities in that city are shown.

Ada, Oklahoma

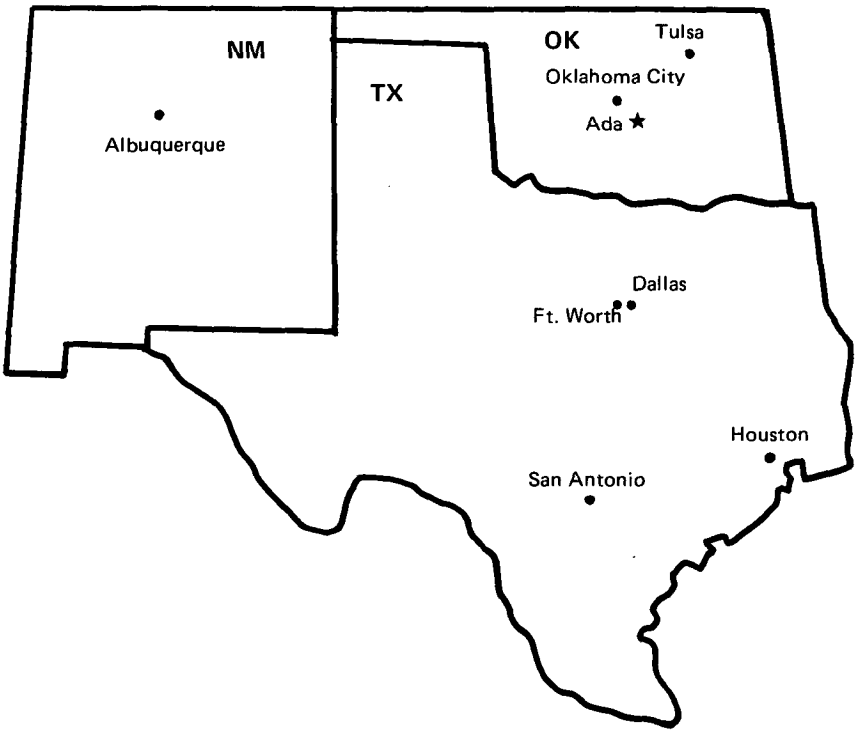
COMMUNITY PROFILE

Located 80 miles southeast of Oklahoma City and 160 north of Dallas, Texas, Ada is a small (17,000 population) midwestern town in the center of an area balanced between industrial and agricultural business. In addition, Ada is situated in the heart of some of Oklahoma's richest oil and natural gas fields.

Light industry, beef processing, and oil play major roles in the local economy. The area surrounding Ada has abundant grass and pastureland for beef cattle raising. The Environmental Protection Agency runs a large-scale regional research and training laboratory in Ada that is concerned with the southwestern area from the Mississippi River to southern California.

Located in the south-central plains, Ada has moderate winters and hot summers. Most of the annual precipitation falls during the warmer weather.

Ada is a deeply religious community that is concerned about a high quality of life for all its citizens. Virtually all municipal and academic buildings and the sidewalks are architecturally barrier free to handicapped pedestrians. The potential problems of the relatively large elderly population are also constantly being acknowledged.



Ada, Oklahoma

Traffic Engineering

Ada has a part-time Traffic Engineer who responds to all suggested modifications to existing conditions and to new proposals. Virtually all intersections have vehicle and pedestrian signals or adequate signing and all possess newly painted crosswalks. Well maintained sidewalks exist in 100% of the city's suburban areas, and over 60% of all sidewalks have smooth, well-delineated curb cuts at the corners.

Signalization. Installation of pedestrian signals at all major intersections within the downtown area is nearly complete. Traffic signals with painted crosswalks and warning signs have been upgraded to include pedestrian crossing signals. At a large number of these intersections the signal activation box has been installed lower than usual to accommodate young and handicapped pedestrians.

Grade Separation. One plan not yet completed is the installation of pedestrian walkways under the street in the vicinity of schools. The level of usage and problems associated with existing pathways will dictate the direction of any future expansion in this area.

Barriers. Fencing surrounding school playgrounds serves to channel school children toward the underground passageway and encourages students crossing the street to use these facilities.

Malls. No permanent pedestrian malls currently exist. However, temporary gathering places are established and controlled as needed. For example, during summer months, portions of shopping center parking lots are closed to traffic to accommodate evening pedestrian activities and gatherings.

School and Child Safety Programs

Education and Safe Route Program. At the start of each school year, representatives from the city government and police talk to students at individual schools and emphasize the need for caution. Literature is sent home to the parents emphasizing the need for parents to map out a "best" route to school for their children and to walk it with the children several times. Television and newspaper reminders of school openings are frequent during the first month of the school term.

Provisions for the Elderly and the Handicapped

There is an active program in Ada to make every place accessible to the elderly and the handicapped population through construction of adequate sidewalks, extensive curb-cut ramping,

and centrally located elderly housing projects. Some banks and shops have accesses from enclosed parking areas so customers need not venture outside.

Public Information

Talks are given to civic groups, churches, and schools on the importance of maintaining a safety-oriented city. Emphasis during these talks is usually on the special needs of children, elderly, and handicapped members of the community.

Enforcement

Traffic violations constitute most of the time and effort required of the police. There is no apparent significant pedestrian law violation problem. Occasional reminders seem to be all that is needed.

Ada, Oklahoma

AAA DATA SUMMARY

Population Group: 10,000 – 25,000

Ranking and Group Size 11 out of 809

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	695	900	515
Pedestrian Death and Injury Record	291	350	279
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	45	75	17
Traffic Engineering	54	85	51
Safety Program Coordination	70	75	25
School Traffic Safety	100	105	90
Public Information and Education	50	125	22

Awards Received

1976 –

1975 –

1974 –

1973 –

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	14,900	–	–
Population Density	1700	–	–
Percent Change 1960-70	+3.6	–	+7.8
Percent Nonwhite	8.0	15.0	4.4
Percent < 18 years old	24.8	34.3	32.2
Percent 18-64 years old	58.5	54.2	56.1
Percent > 64 years old	16.7	11.5	11.7
Percent Family = Wed Couple	87.5	87.9	87.8
Persons/Household	2.5	3.1	2.9
Employment			
Manufacturing/Industry	11.7	20.6	25.1
White Collar	51.1	50.2	50.8
Government	22.2	16.7	17.1
Income			
Mean ($\bar{x}$)	$7,000	$7,840	$9,600
Percent < Poverty	17.3	16.1	8.3
Percent > $15,000	12.4	12.8	19.0
Transportation to Work			
POV	–	–	–
Mass Transportation	–	–	–
Walk Only	–	–	–

Atlanta, Georgia

COMMUNITY PROFILE

Atlanta is recognized as the transportation, communication, financial, and distribution center of the southeast. Several diverse industries are headquartered or have large operations in the city or the immediate surrounding area. Atlanta is the state capitol of Georgia and there are also numerous U.S. government regional offices in the city.

As a major transportation and distribution center, both for freight and passengers, Atlanta has the second busiest airport in the United States (behind Chicago's O'Hare). Seven national and two regional airlines operate in and out of the city. Three interstate highways (I-20, I-75 and I-85) connect Atlanta to cities in all directions. Railroads to all parts of the south and the rest of the country have contributed significantly to the development and growth of the city.

Geographically the city is located about 1000 feet above sea level at the foot of the Blue Ridge Mountains, thus giving it generally rolling to hilly terrain. The effect of this altitude and terrain is to moderate the continental cold winters and hot summers. Rain is the normal form of precipitation during the winter months. Southerly winds during the summer tend to ventilate the city, but also bring humid weather with them.

Historically, Atlanta grew out of a southern railroad terminus. During the Civil War, Atlanta was completely destroyed during General Sherman's march through the south. Today the city's symbol is the phoenix, a tribute to the city which grew into a modern community out of the ruins of the war.

Atlanta, Georgia

Atlanta has some unique traffic problems because of the way the city is laid out. The core city is surrounded by residential and developed areas, in which there are heavily built-up commercial pockets. These outer areas are connected to the city center by large arterial roads. The results of this situation is a heavy flow of traffic both in and out of the city at all times.

Atlanta is in the process of building a rapid transit rail system throughout the city which will ultimately have a great influence on traffic and pedestrian flow.

Safety Program Coordination

In the past, coordination of the city's program was achieved through the Traffic, Parking and Transit Committee. This group, composed of government officials and prominent citizens, met to discuss traffic-related problems and complaints. In 1974, the city government was reorganized to reflect a strong Mayor policy and the Committee was disbanded. The trend today is toward more direct citizen participation: people with complaints go directly to the Mayor's office or Traffic Engineering Department.

Increased citizen participation has also been achieved through the growth of Neighborhood Planning Units. In the past, citizens making complaints would be visited by their District Traffic Engineer, who would evaluate the problem. Eventually the people in a neighborhood banded informally under a spokesman, which led to the establishment of city employees officially representing neighborhoods in their dealings with the city. These NPU's are now strong organizations that can successfully lobby at the Mayor's office, the City Council, and the Traffic Engineering Department.

Through the District Traffic Engineers the T.E. department works closely with the Safety Director and PTA of the schools.

The T.E. Department has worked with the Pedestrian Research Laboratory at the Georgia Institute of Technology on various pedestrian-related projects.

Traffic Engineering

Signalization. Atlanta has a computer-controlled synchronized traffic signal system. Most traffic lights are suspended above the middle of the intersection. However, because pedestrian signals are not located at every signalized intersection, traffic signals are duplicately mounted on pedestals along with the wire suspension signals. The pedestal-mounted signals are more easily seen by pedestrians and are more likely to minimize wrong pedestrian behaviors resulting from their inability to see the overhead signals.

Signing. The Traffic Engineering Department is trying to limit the use of pedestrian signs only to absolutely necessary locations. Presumedly this will minimize motorist confusion and give more meaning to the signs that do exist. At present there are advance pedestrian crossing signs and an overhead sign at midblock and some unsignalized crosswalks. Pedestrian signs are removed from intersections if traffic lights are installed.

There has been overuse of 4-way stop signs to discourage the use of residential streets as arterials. The engineering department has stopped putting in such signs and is considering other ways to isolate and rebuild the streets so they won't be used by through traffic.

Crosswalks. Marked crosswalks are located at every intersection with significant pedestrian use and in all built-up areas. In outlying areas with little overall pedestrian activity, crosswalks are painted only where they are necessary and would be effective.

Although midblock crosswalks are discouraged, two have been installed in areas with very high frequencies of pedestrians crossing midblock. Despite the fact that the crosswalks are signalized (flashing yellow) and marked with signs, there have been complaints about midblock parking and pedestrians walking out from behind parked cars. However, studies have intimated that the adult midblock jaywalker is safer than a pedestrian crossing in a crosswalk because he/she is more aware of the traffic and thus more careful.

Grade Separation. There are about a dozen pedestrian bridges linking buildings in the downtown area. These have been built by the affected businesses. The Engineering Department is trying to encourage the installation of more bridges.

The city has three pedestrian tunnels: from the stadium to parking lots, and under the freeway at the Georgia Institute of Technology. A crime problem in the tunnels has precluded their being very successful.

Malls. Historically, conflicts between street traffic and the railroad system were resolved by building viaducts over the rails for traffic. The original streets were used to service the basements of existing buildings. As the conflict disappeared, these streets were converted into a pedestrian mall with shops located in the building basements. Today this area is "Underground Atlanta." The future of Underground Atlanta is uncertain because of extensive work on the subway system and the destruction of some of the buildings along the mall.

Other pedestrian areas are being considered to revitalize and beautify the downtown area. Such malls would involve the relocation of streets and the development of a park-like area for pedestrian use.

School and Child Safety Program

Crossing Guard Program. Atlanta hires over one hundred adult crossing guards, working one per school. They are trained individually on-the-job for several days to introduce them to the unique characteristics of their posts. One police officer works fulltime coordinating this program and conducting periodic checks of the guards. The crossing guards are responsible to the Police Department and a police officer will fill in for any guard who is ill.

Student Patrols work under the crossing guards and school supervision: they are not involved with the police. Most schools have student patrols, using the post as a reward for attendance.

School Crossings/Safe Route Program. The Traffic Engineering Department works with the schools by developing and installing appropriate traffic control measures. Safe routes to school are identified based on pedestrian flows. These are designated using signing, flashing speed limit signs, and crosswalk markings.

Requests for special traffic signals where children enter main streets from isolated subdivisions are studied as they arise. There have been very few school-trip accidents in Atlanta; however, this may be a side-effect of the bussing program now in operation.

Education. The Police Department, with the help of the Georgia Traffic Safety Council, has administered several educational programs for school children. As part of the "Officer Friendly" program, a police officer will go on request to an elementary school and give a talk to an assembly, usually at the beginning of the year. Materials used are provided by the Council.

Traffic safety programs have also been conducted in shopping centers. Unfortunately, lack of funds has led to their dissolution.

Provisions for the Elderly and the Handicapped

Much of Atlanta's elderly population lives in high-rise developments built in the city center. In building the high-rises, the developers did not consider the needs of the elderly as pedestrians. In response to this, the Traffic Engineering Department has lengthened signal cycles at key intersections. Unfortunately, with the synchronized signal system, this has caused some traffic problems at other intersections.

Spokespersons for the elderly population have been requesting midblock crosswalks for use by those living in midblock apartments. The Engineering Department has not responded because they feel crosswalks tend to be unsafe, giving the pedestrian a false sense of security.

Enforcement

The present government administration is more crime than traffic-oriented. Fewer citations are being written for pedestrian and traffic violations than has been the case in the past.

Accident-involved pedestrians have occasionally been issued citations. In most cases the first violation is excused. Fines are about $15. If there is a special problem location, police officers will watch for violators.

Drunk pedestrians are taken to jail or sent to a prison farm. When the decriminalization of public intoxication is complete, drunk pedestrians will be taken to a detoxification center.

Safety Program Philosophy

The most important factor in pedestrian safety is to have a well organized program involving everyone in the community. Coordination between the administration and the news media is essential to get the message to the public's attention. Cooperation between neighbors, school departments, and the city is also needed. It is also necessary to have a continuing, well publicized enforcement program.

Atlanta, Georgia

AAA DATA SUMMARY

Population Group: 200,000 – 500,000

Ranking and Group Size 12 out of 27

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	624	1000	668
Pedestrian Death and Injury Record	246	450	332
Accident Records	35	70	70
Legislation	15	15	15
Enforcement	44	75	32
Traffic Engineering	71	85	72
Safety Program Coordination	40	75	65
School Traffic Safety	98	105	100
Public Information and Education	75	125	67

Awards Received

1976 –

1975 –

1974 –

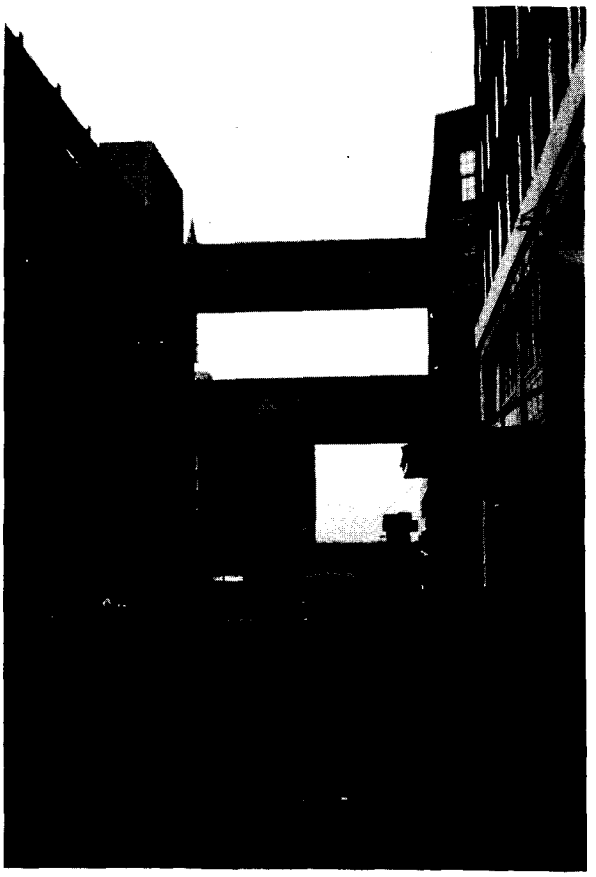
1973 –

1970 CENSUS DATA SUMMARY

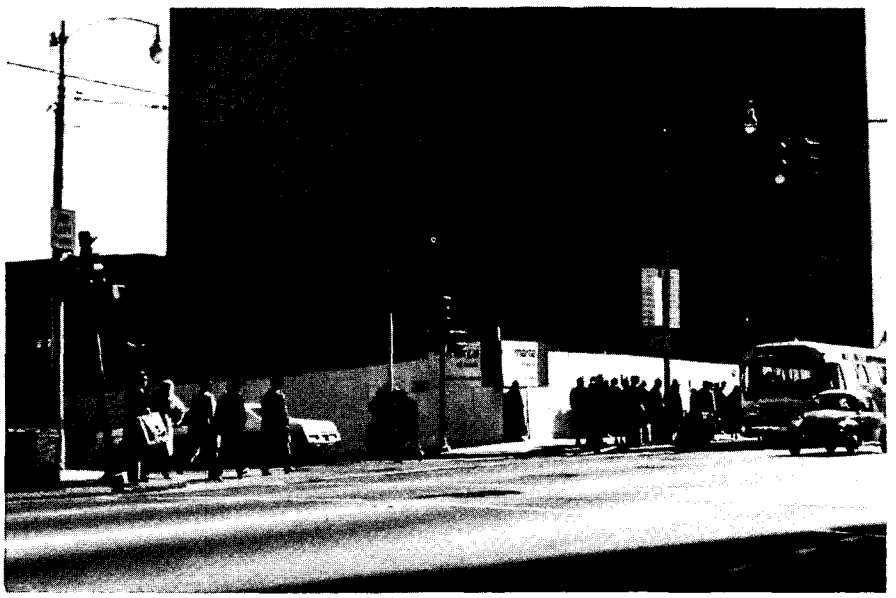
Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	497,000	–	–
Population Density	3,510	–	3,330
Percent Change 1960-70	+2.0	–	+18.0
Percent Nonwhite	51.6	23.2	10.3
Percent < 18 years old	32.1	32.4	34.0
Percent 18-64 years old	58.8	56.1	54.9
Percent > 64 years old	9.1	11.5	11.1
Percent Family = Wed Couple	76.4	82.5	85.6
Persons/Household	3.0	3.0	3.0
Employment			
Manufacturing/Industry	16.7	21.7	22.4
White Collar	49.7	50.2	50.7
Government	17.1	16.2	13.7
Income			
Mean ($\bar{x}$)	$8,400	$8,500	$9,700
Percent < Poverty	15.9	14.0	8.4
Percent > $15,000	18.9	16.7	19.2
Transportation to Work			
POV	71.2	83.1	81.3
Mass Transportation	21.3	5.8	8.2
Walk Only	4.9	6.8	7.4

Atlanta, Georgia

Safety island at complex intersection.



Grade separated walkways from parking garage to business establishments.



Suspended and pole mounted traffic signals.

Curb-cut ramps for elderly and wheelchaired pedestrians.

Concord, California

COMMUNITY PROFILE

Concord is located approximately 25 miles east of San Francisco/Oakland in northern California. It is the east end terminal of the Bay Area Rapid Transit (BART) commuter rail system. Concord has been primarily a "bedroom" community although dramatic growth in recent years has brought in some industry, particularly governmental offices, research firms, and electronics manufacturing. (The population has quadrupled, from 25,000 to nearly 100,000, in the last 20 years.)

Typical of many suburban cities, the development in Concord has emphasized the cultural and leisure-time aspects of living. However, unlike many communities which grow up around a central business core area, Concord has expanded in pockets of commercial, industrial, or service concentrations. There are presently sixteen separate shopping districts and multi-store malls. Although this type of development and the total population might indicate otherwise, the "small-town" impression is still present.

Concord is located in the Diablo Valley physically setting it off somewhat from the larger Bay area cities. The fertile soil of the rolling hills and the abundant sunshine combine to make wine production in the surrounding area a profitable business.

Safety Program Coordination

The Concord Safety Commission, a nonpolitical group composed of professionals from the schools, police, fire, engineering and other related departments, acts as the buffer between the community and the City Council. Complaints received from citizens, council members, the schools, etc. are referred through the Safety Commission to the appropriate department for study. The Commission makes recommendations to the Council for action.

Traffic Engineering

Signalization. Pedestrian signals are installed nearly everywhere there are traffic signals. In the central business district, they are pretimed with the traffic signal and are WALK/DONT WALK on every cycle. Outside the downtown and commercial areas pedestrian signals are primarily manually actuated. The extent of their use is evidenced by observations of bicyclists reaching over to activate the signal for themselves.

Crosswalks. In general, Concord has tried to minimize the use of marked crosswalks. This philosophy is an outgrowth of the San Diego marked/unmarked crosswalk study which intimated that pedestrians are less aware or careful in marked crosswalks than they are in unmarked crosswalks. Most marked crosswalks, located in the downtown and commercial areas, and along routes children take to and from school, are put in to draw drivers' attention to the potential presence of pedestrians.

Marked crosswalks within 1400 feet of a school are painted yellow per the California Vehicle Code. Along school walking routes, all crosswalks are marked. At nonschool walking route intersections, marked crosswalks are put in if warranted by pedestrian (10 per hour) and vehicle (1000 per day) volumes. Zebra markings are reserved for locations with high vehicle speeds or when unusual circumstances indicate that special crosswalk emphasis is necessary.

All crosswalks are indicated with signs and/or pavement markings. However, in the central business district, where there are a series of marked crosswalks along a street, one sign has been identifying several crosswalks.

Although midblock crosswalks are avoided wherever possible, they are allowed in blocks more than 400 feet in length. Some school walk routes follow a pedestrian passage between houses. Because these empty into the street at midblock locations, yellow marked midblock crosswalks exist between the adjoining blocks (see *Barriers* below).

Grade Separation. Concord is at the east end of one of the Bay Area Rapid Transit (BART) lines. On the southwest side of the city the rail lines cut right through one of the school districts. To accommodate children living on the opposite side of the tracks from the school, an overpass was installed between the residential area and the school. The city and BART shared the funding for this overpass.

Sidewalks. There is a city ordinance which requires installation of sidewalks and gutters in all new developments. The developer/property owner is responsible for the cost. There is also a 50% Rule stating that on blocks in which half of the properties have already installed sidewalks, the sidewalk must be completed for the remainder of the block.

In addition, the city has constructed an extensive system of temporary four-foot wide asphalt sidewalks for use by school children. These have been funded 50% by the city and 50% by others, usually the School District. Locations are determined by the Safety Commission following investigation and recommendation by the Traffic Engineering Department. Since 1966, about five miles of temporary walkways have been built under this program. These temporary sidewalks are installed in areas where permanent concrete sidewalks are not legally required.

Barriers. In some residential areas, the children use a passage between houses to walk to and from school. These pedestrian passages are basically sidewalks through the middle of a block. To forestall children running or riding bicycles/skateboards into the street at midblock locations, partial barriers, parallel to the street, have been installed. These barriers effectively slow down passageway traffic prior to its entry into the midblock crosswalk. To increase sight distance at these locations, parking is prohibited for 20-30 feet on either side of the crosswalk.

Studies. Traffic surveys are made before any installations are put in. There are also more informal "after" studies made to see if the countermeasure is eliciting the desired behaviors. Modifications to installations have been made when warranted.

School and Child Safety Programs

Crossing Guards. Adult crossing guards are posted at fourteen locations near schools. A warrant was adopted by the City Council to insure equitable use of this type of protection.

Safe Route Program. The Safe Route to School program is being limited to situations where routes are not readily apparent. Marked crosswalks are used to emphasize the safest route that children should follow. All school crosswalks are marked and signed to draw attention to them.

Education. The Police Department goes into the 32 elementary schools twice a year to talk to children about traffic safety. The Tiny Town program is used as a teaching device.

Provisions for the Elderly and the Handicapped

Ramps are being put in throughout the city as part of the Community Development Program.

Enforcement

There is a concerted effort to enforce pedestrian laws against jaywalking. This is particularly true in the CBD and commercial areas of town where policemen on motorcycles watch for violators. Jaywalking is a particular problem in one shopping area where the blocks are 600-700 feet long with no midblock crosswalks because the road is a major arterial between the freeway and downtown. Enforcement is particularly high along this route.

Citations given to pedestrians are generally upheld in the courts, particularly by the younger judges. Although there is no pedestrian violator's school per se, some jaywalkers are sent to driver rehabilitation classes.

Safety Program Recommendations

While the general inclination in California courts has been to give the pedestrian the absolute right of way in the street, in the safety education programs it is emphasized that safety is a shared responsibility of both the driver and pedestrian. The pedestrian's right of way is not absolute, and even if it is upheld in court, the potential of permanent or fatal injury is very high if there is an accident.

The enforcement program is centered around this philosophy. It is believed that the learning process begins at that point. By pointing out where a pedestrian's behavior is wrong (i.e., unsafe), the likelihood of future exposure to those hazardous situations is presumedly reduced. The enforcement program is seen as part of the educational process.

Concord, California

AAA DATA SUMMARY

Population Group: 50,000 – 100,000

Ranking and Group Size 94 out of 169

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	609	1000	694
Pedestrian Death and Injury Record	235	450	381
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	18	75	27
Traffic Engineering	79	85	67
Safety Program Coordination	70	75	55
School Traffic Safety	105	105	99
Public Information and Education	17	125	42

Awards Received

1976 –

1975 –

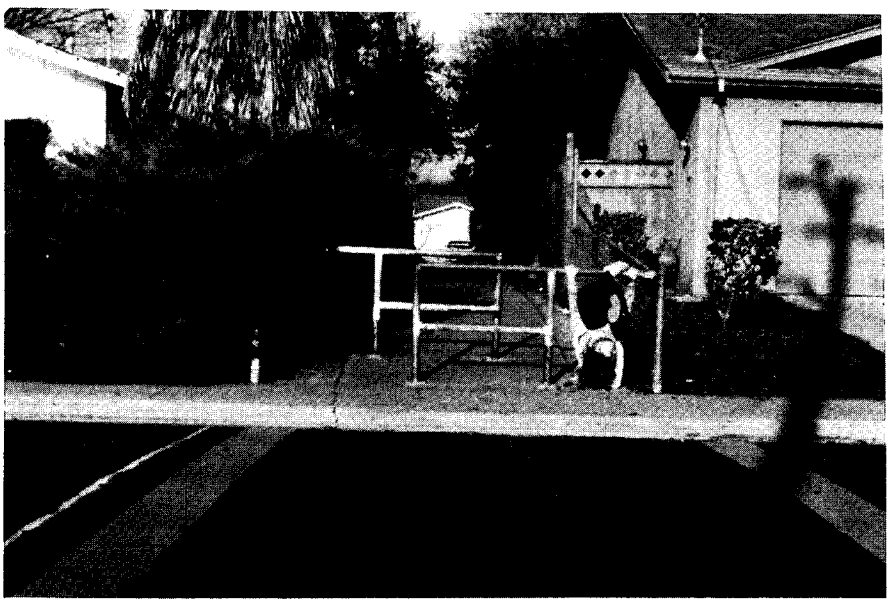
1974 –

1973 –

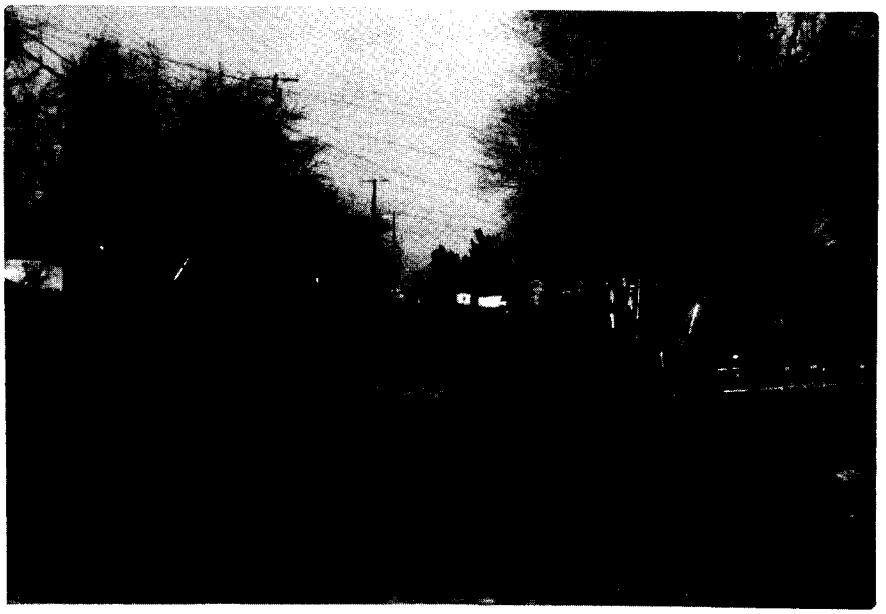
1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	85,100	–	–
Population Density	3540	–	3330
Percent Change 1960-70	+135.2	–	+18.0
Percent Nonwhite	2.1	11.8	10.3
Percent < 18 years old	40.1	39.1	34.0
Percent 18-64 years old	55.7	55.0	54.9
Percent > 64 years old	4.2	5.9	11.1
Percent Family = Wed Couple	91.1	87.6	85.6
Persons/Household	3.4	3.4	3.0
Employment			
Manufacturing/Industry	17.2	17.0	22.4
White Collar	57.5	45.8	50.7
Government	21.0	17.2	13.7
Income			
Mean ($\bar{x}$)	$12,600	$9,750	$9,700
Percent < Poverty	4.1	9.5	8.4
Percent > $15,000	32.4	19.8	19.2
Transportation to Work			
POV	87.9	88.8	81.3
Mass Transportation	4.3	2.9	8.2
Walk Only	2.5	3.8	7.4

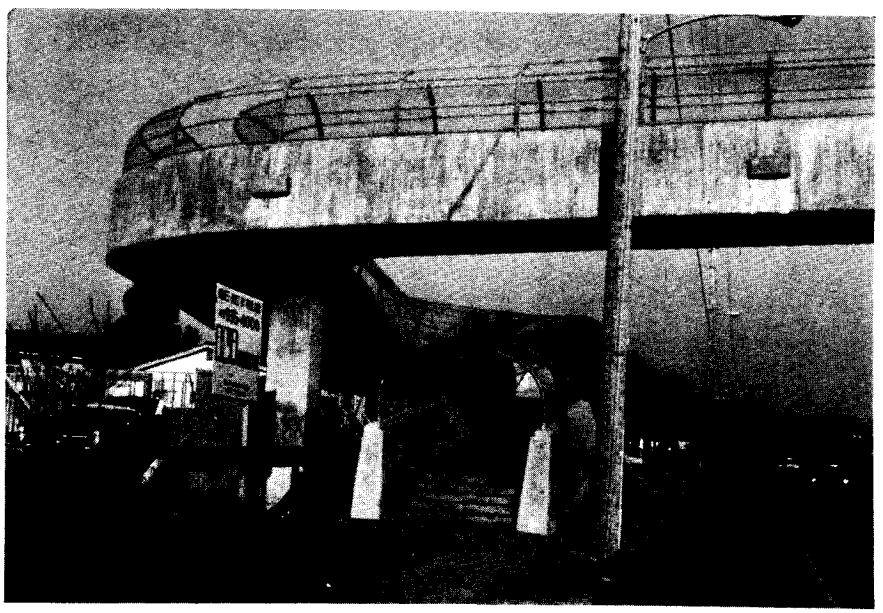
Pedestrian crossing sign indicating several impending crosswalks.



Midblock crosswalk and barrier at end of
midblock pedestrian passageway.



Signing and pavement markings for school crosswalk.



Pedestrian crossover between residential neighborhood and school separated by BART rail lines.

Cuyahoga Falls, Ohio

COMMUNITY PROFILE

Cuyahoga Falls, a city of about 51,000 people, is located just northeast of Akron and 35 miles south of Cleveland and Lake Erie in the northeastern portion of Ohio .

Although it is primarily a "bedroom" community for commuters to Akron and Cleveland businesses, there are local industries in Cuyahoga Falls as well. Primary among these are dairy products, rubber goods (a spillover from Akron's world-leading rubber manufacturing facilities), steel and wire machinery supplies, medical supplies, and chemicals.

The climate of the Allegheny plateau on which Cuyahoga Falls is situated produces generally temperate although quite variable weather. Winter weather in one season can be alternately blizzard-warm-blizzard. Summer weather is warm to hot.

Cuyahoga Falls, Ohio

Safety Program Coordination

All traffic safety matters are channeled through the Ex-Officio Traffic Committee, formed by the Police Chief to alleviate citizen pressure on city councilmen in the area of safety. This committee is composed of members of the Police, Signal and Engineering Departments, City Council members, and citizens in law, school, and other areas. Traffic and pedestrian problems and resolutions are cleared through this committee, before going to the City Council for approval.

Traffic Engineering

Signalization. Pedestrian signals are placed at heavily used intersections and at midblock locations in areas with high pedestrian volumes. The majority of these signals are pedestrian-activated.

Crosswalks. Crosswalks are being marked along all school routes, defining the safe routes to follow.

Studies. Special pedestrian studies are initiated by the Ex-Officio Traffic Committee. At present, a study is being developed to improve pedestrian safety for the elderly.

School and Child Safety Program

Crossing Guard Program. Cuyahoga Falls uses both adult and student crossing guards, trained and supervised by a police officer. The adult guards are selected by the Police Department after a thorough investigation of their qualifications. The student patrols are chosen by school principals on the basis of academic performance and conscientiousness. Guards are posted at all major intersections near schools.

Safe Route Program. During the summer, the school officer and two other police officers work with the Jaycees on a Safety Town model at the city playgrounds to familiarize preschool children with traffic safety. During these programs they also go over with the children and their parents the safest route to follow to school. The schools reinforce this by sending letters to parents showing the safest and shortest routes to school.

Education. The Cuyahoga Falls school system cooperates with a neighboring village in the "Officer Bill" program, designed to familiarize grade-school children with traffic signs, signals, etc. A police officer from the neighboring village talks to children in the Cuyahoga Falls schools. Police officers from Cuyahoga Falls also go to the schools about twice a year.

Provisions for the Elderly and the Handicapped

Curb cuts are being put in at intersections and crosswalks. Police officers visit groups of senior citizens and talk to them on pedestrian safety. The Parks and Recreation Department is strongly senior-citizen oriented. The elderly use two city parks five days a week. Police officers visit these facilities several times a year.

Enforcement

City ordinances and pedestrian-related laws (crossing against the light, jaywalking) are being enforced. Citations are upheld by the courts. Fines for pedestrian offenses could be as high as $50, but more commonly a warning or a $5 fine is given.

Safety Program Recommendations.

Enforcement of pedestrian and driver-related laws in the most important component of a safety program. Pedestrians must be trained and retrained to act safely in traffic.

Cuyahoga Falls, Ohio

AAA DATA SUMMARY

Population Group: 25,000 – 50,000

Ranking and Group Size 56 out of 374

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	623	900	551
Pedestrian Death and Injury Record	215	350	266
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	61	75	21
Traffic Engineering	55	85	60
Safety Program Coordination	50	75	45
School Traffic Safety	105	105	96
Public Information and Education	52	125	40

Awards Received

1976	Special Citation for Pedestrian Program Improvement
1975	–
1974	Special Citation for Pedestrian Casualty Record
1973	Special Citation for Pedestrian Casualty Record

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	49,700	–	–
Population Density	5790	–	–
Percent Change 1960-70	+3.7	–	+7.8
Percent Nonwhite	0.2	2.3	4.4
Percent < 18 years old	35.7	35.0	32.2
Percent 18-64 years old	6.0	54.9	56.1
Percent > 64 years old	8.3	10.1	11.7
Percent Family = Wed Couple	90.8	90.1	87.8
Persons/Household	3.2	3.2	2.9
Employment			
Manufacturing/Industry	37.2	31.4	25.1
White Collar	60.0	53.1	50.8
Government	11.6	14.5	17.1
Income			
Mean ($\bar{x}$)	$11,800	$11,300	$9,600
Percent < Poverty	3.1	5.9	8.3
Percent > $15,000	26.9	25.7	19.0
Transportation to Work			
POV	–	–	–
Mass Transportation	–	–	–
Walk Only	–	–	–

Dallas, Texas

COMMUNITY PROFILE

Located in the north-central portion of Texas, Dallas is the heart of the southwest's economic growth and development. Because it had no significant geographical or natural resource advantages, Dallas' emergence into a city of 900,000+ inhabitants and headquarters for numerous large and small corporations was due primarily to the ambitious and far-sighted plans of its citizens.

Growing out of a small frontier trading settlement in the mid-1800s, Dallas grew rapidly after local townspeople persuaded the railroads to swing south in 1874. Today, rail lines, four interstate highways (I-20, I-30, I-35, and I-45), buslines, and twelve national and international airlines connect the city with all sections of the United States. The Dallas-Ft. Worth airport is physically the largest and the fourth busiest in the country.

As with most large cities, no one single industry dominates the local economy. Dallas has the third largest (behind New York and Chicago) concentration of national corporate headquarters in America. It is also one of the major tourist/convention centers in the country.

The climate of this northern portion of Texas is generally warm and dry. Winter temperatures do drop below freezing and snow does fall occasionally. Summers are hot, but relatively arid. The wet months are primarily during the spring.

Dallas is a cosmopolitan city always looking and planning ahead to meet future needs. The current major redevelopment project covering nearly 10% of the central business district reflects this attitude. Several new municipal and commercial buildings are being constructed around new park areas and a separated underground pedestrian mall.

Safety Program Coordination

Dallas has an active pedestrian safety program under the direction of the Office of Traffic Safety. A Citizen's Safety Advisory Committee, reporting directly to the City Council, conducts monthly meetings to consider requests for changes, improvements, implementation, or elimination of facilities. If requests are approved, a formal recommendation is made to the City Council.

The subcommittees on Child Safety, Traffic, and Pedestrians also meet monthly and are comprised of representatives from public and private schools, police, AAA, special interest safety-oriented groups, and citizens at large.

Traffic Engineering

The Traffic Engineering Department plays an active role in any recommendations which go before the City Council. The department is represented at the Citizen's Subcommittee meetings and makes frequent on-site observations of existing conditions upon request of subcommittee members. By the time a proposal has been submitted to the City Council, all traffic engineering implications have already been addressed and little if any time is spent by Council members readdressing engineering-oriented questions.

Signalization and Signing. Most major streets in Dallas are signalized. Attention is presently being directed toward increasing the number of intersections signalized for pedestrians. Similarly, pedestrian signing is under constant review. Dallas is currently experimenting with several signs which exceed the standard dimensions for pedestrian signs.

Crosswalks. Virtually all intersections heavily used by pedestrians are marked with painted crosswalks. Using the funds allocated to crosswalk painting and repair, conventionally painted crosswalks are being replaced by a tape-like substance which is laid across the road. Although initially quite expensive, it is expected that these crosswalks will last five or more years instead of requiring annual repainting.

Grade Separation. Dallas is in the preliminary implementation stages of a massive multi-level pedestrian circulation system throughout the central business district. The mall development program is part of a total effort to make the CBD area more safe and conducive to pedestrian usage. The increased number of pedestrian signal installations and marking of crosswalks is another part of this effort.

Sidewalks. The Citizen's Subcommittee on Child Safety is extremely active in focusing attention on sidewalk construction. The Citizen's Committee, upon receiving a request for sidewalk facilities, evaluates the need and passes on their recommendations for approval to the City Council. In most cases these recommendations have been approved. Community development funds are being used for sidewalk repair in inner city target areas.

School and Child Safety Programs

Crossing Guards, School Crossings, and Safe Route to School Program. Crossing guards are used extensively in the Dallas area, at both high density intersections, and at many low density-high threat areas. Continuing efforts are being made to handle the increased school child population with the limited number of crossing guards available. Towards this end, a Safe Route to School Program is being implemented. Crossing guards will be assigned to intersections accordingly. Crossing areas and school zones are well signed with reduced speed limits and flashing warning lights during school trip hours.

Education. There is an extensive pedestrian safety education program in Dallas. Presentations are made to all special interest groups, school classes, PTA meetings, club meetings, etc. Pedestrian safety-oriented circulars, pamphlets, films, kindergarten coloring books, grade school comic books, book markers, calendars and such are made available to schools and groups upon request.

Provisions for the Elderly and the Handicapped

Ramps are being installed as part of an ongoing sidewalk modification process. During normal repairs to a section of sidewalk, a ramp is added at appropriate corners by filling in the curb area. The City Council requires that curb ramps be built on all sidewalk intersections as part of any street construction or improvement program.

Public Information

The Citizen's Safety Advisory Committee plays an active role in disseminating information to the public. In addition to providing circulars, pamphlets, and a film library, the city has a good rapport with the media and safety-related bulletins get wide exposure. A 30-second television and radio spot emphasizing pedestrian safety is being prepared.

Enforcement

The Dallas Police Department places heavy emphasis on control of pedestrian behavior. Enforcement of pedestrian violations is encouraged, and the number of citations issued for improper pedestrian behavior remains consistently high. Courts generally assign safety-related essay papers to juvenile (fourteen and under) pedestrian offenders. Older violators are sent to a six-hour driver improvement course.

Accident Analysis

Several small studies have been conducted in Dallas to evaluate pedestrian accident causation, identify potential countermeasures, and monitor pedestrian usage patterns resulting from changed conditions. Appropriate countermeasures are often determined from these studies.

Dallas, Texas

AAA DATA SUMMARY

Population Group: 500,000 – 1,000,000

Ranking and Group Size 4 out of 14

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	806	1000	794
Pedestrian Death and Injury Record	437	450	411
Accident Records	36	70	70
Legislation	15	15	15
Enforcement	39	75	34
Traffic Engineering	62	85	74
Safety Program Coordination	62	75	60
School Traffic Safety	103	105	105
Public Information and Education	52	125	56

Awards Received

1976	Special Citation for Casualty Record
1975	Special Citation for Casualty Record
1974	–
1973	Special Citation for Casualty Record

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	844,400	–	–
Population Density	2,960	–	–
Percent Change 1960-70	+24.2	–	10.3
Percent Nonwhite	25.8	20.3	15.0
Percent < 18 years old	34.1	36.1	31.3
Percent 18-64 years old	58.1	56.4	58.4
Percent > 64 years old	7.8	7.5	10.3
Percent Family = Wed Couple	86.4	84.8	84.4
Persons/Household	3.0	3.2	2.9
Employment			
Manufacturing/Industry	20.4	17.0	21.3
White Collar	56.2	53.8	54.9
Government	10.2	15.4	16.5
Income			
Mean ($\bar{x}$)	$10,000	$9,200	$10,200
Percent < Poverty	10.1	12.8	8.6
Percent > $15,000	25.1	20.4	22.9
Transportation to Work			
POV	83.7	84.5	77.4
Mass Transportation	10.6	8.6	11.5
Walk Only	2.7	3.3	7.6

Erie, Pennsylvania

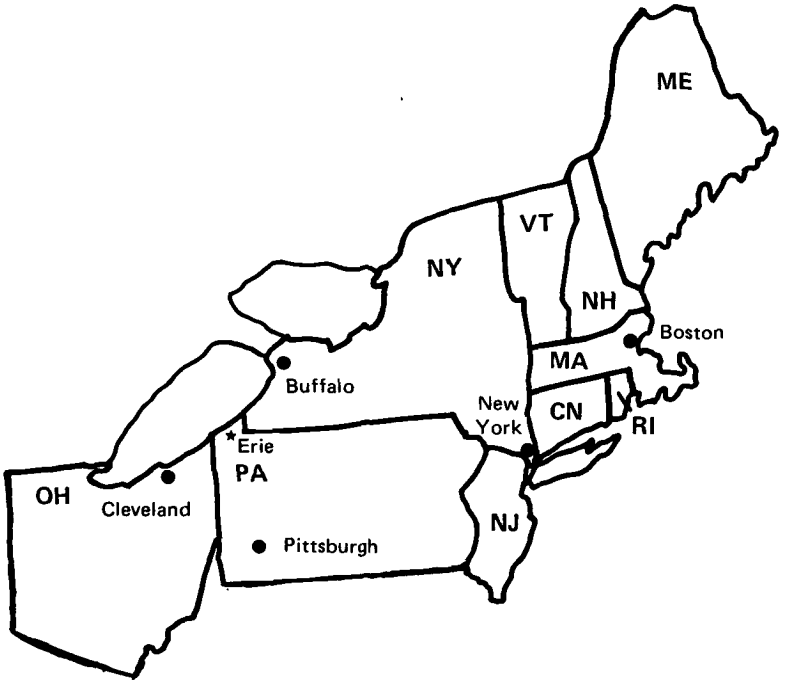
COMMUNITY PROFILE

Erie is a moderately large city (125,000 people) located on the southeastern shore of Lake Erie in the northwestern corner of Pennsylvania. Although the meteorological effect of the lake does put Erie on the edge of the western New York snow-belt, the overall cooling effect makes for hot but comfortable summers. The lake additionally provides much of the recreational activity available with year-round fishing, and summer boating and swimming being very popular sports.

Located midway between Cleveland, Ohio and Buffalo, New York (100 miles west or east) and 130 miles north of Pittsburgh, Erie is very accessible by highway (I-90 or I-79), railroad, airlines (Allegheny Airlines), and bus. However, from an industrial viewpoint, more significant is one of the world's finest land-locked harbors. Direct access is available to the upper Great Lakes, or to the Atlantic Ocean via the St. Lawrence Seaway.

Its very diversified industrial base provides a wide variety of materials for export. Erie County ranks fourth among Pennsylvania counties as an exporter of products. Primary industries include metals and metal product manufacturing, petroleum product refinement, and drilling for petroleum and related products in the surrounding area.

Erie grew to its present size out of a wilderness and trading outpost. As part of the present day growth, the downtown area is being revitalized with the construction of numerous modern office buildings.



Erie, Pennsylvania

Safety Program Coordination

The pedestrian safety program in Erie has concentrated on school safety. This is a program they have found works well and lowers the accident rate. Traffic engineering and police officials have been limited in the changes they can make by Pennsylvania law and associated "red tape."

The Erie Traffic Safety Council (composed of representatives from the Police, Traffic Engineering Department, Chamber of Commerce, utilities, industry, business, the taxi service, schools, and merchants), coordinates most of the safety programs. Monthly meetings are held at which a speaker talks on some aspect of traffic safety. The members have a chance to air their problems and discuss the topic.

Cooperation with the AAA is excellent. The AAA works closely with the city and provides all of the literature for the Green Pennant school program.

Traffic Engineering

Signalization. Erie has been installing pedestrian signals downtown to reflect recent changes in the Pennsylvania Motor Vehicle Code. The Downtown Redevelopment Authority provided 50% – 100% of the funds for this upgrading. There have been some complaints from pedestrians about the new signals because they don't want to have to wait for the light to cross.

In the past, traffic signals were located above the middle of the intersection. They are now being installed on pedestals on the far corners of major intersections. Pedestrian signals use a steady WALK when there are no vehicle-pedestrian conflicts and a flashing WALK for crosswalks at intersections where there may be turning vehicles.

Any new installation of lights is done by the state and charged to the city. The police and engineering office do traffic studies and then petition the state for new lights. This often is a lengthy and time consuming process.

Crosswalks. In the central business district, crosswalks are located at most signalized intersections. They are also located at school crossings and other high-use areas. In the winter, snow causes problems by obscuring the crosswalks.

Malls. As part of redevelopment and city beautification projects, Erie has turned the main downtown shopping street into a pedestrian mall. The mall is closed to all traffic except buses and emergency vehicles traveling at 15 mph. There are problems in the winter with snow removal in the mall.

School and Child Safety Program

Crossing Guards Program. The Police Department has hired 58 adult crossing guards who work two or three times a day. AAA guidelines are followed in choosing the guards and student patrol members. In August every year the adults go through a one day classroom training program. They are continually checked during a probationary period and periodically thereafter. The student patrols are trained by the schools with the assistance of the police. Adult guards supervise the student patrols at the crossings. Police officers substitute for absent crossing guards when necessary.

Since the 1940's Erie schools have been involved in the Erie Times Green Pennant Program, a local effort rewarding schools which have no pedestrian traffic accidents. Schools with one accident-free year are given a green pennant to put on their flagpole. For each subsequent accident-free year, a gold star is added to the pennant. An assembly is held at the school to present the pennant, and the awards are highly publicized in the media. At the end of the year a picnic is held for the Safety Patrols of schools with green pennants. The school and the patrol members receive certificates.

Schools that have a child pedestrian accident may not fly their pennant for a month, and must take off a gold star. This applies to *any* pedestrian accident involving a child that attends that school. When an accident occurs, a "suspension" letter is sent to the school and to the local newspaper. Because its stars are highly valued by the schools and children, this program almost forces them to be aware of traffic safety.

School Crosswalks. All school-related intersections have marked crosswalks. There are some problems with parents who park on the crosswalks while picking up their children. Snow and large snowbanks also cause difficulties by hiding children from a motorist's view. Children are forced to climb over the snow to get to the street.

Education. Safety education programs have largely been left up to the schools. Some schools have their own safety programs, assemblies, or plays. The police are ready to give talks to assemblies when requested and to help in the safety program in any other way. At these assemblies the police try to develop a good rapport with the children, talking about all aspects of their work and often demonstrating the use of police dogs and motorcycles. If a school area has a particularly poor accident record, or a large number of safety related complaints from parents or the PTA, the police will initiate a visit to see if a crossing guard or other countermeasure is required.

Some teachers have individually initiated a Safe Route to School program for their students. The police will assist in setting this up if requested.

There are many private schools in Erie, each with its own rules and programs. In general, the private schools seem more willing to invite the police to participate in their safety instruction. Some preschools and churches also have safety programs in which the police come and talk to the children. Often they will have a safety week, during which pedestrian safety is stressed.

Two other practices related to school safety are the distribution of AAA bumper stickers saying "School's Open: Drive Carefully" and the AAA safety poster design contest which Erie children enter.

Provisions for the Elderly and the Handicapped

All new construction in the city must consider the needs of the handicapped. Curb cuts have been put in at corners and along the pedestrian mall. However, again there is a winter-time problem with snow and ice filling up these curb cuts. There have been complaints from some blind pedestrians about the placement of light poles and other "street furniture" along this mall.

Recently the Traffic Engineering Department received a request for a sign to protect a deaf child. This has not been done before in Erie, but as there is a section in the City Code covering such signs, the department is considering installing it. A school for exceptional children would also like to have such signs installed. In both cases there are problems with state law and "red tape."

Public Information

The Erie Police Department has had a good working relationship with the media. The city newspaper monitors the Green Pennant Program and will include articles and pictures of award ceremonies. Television and the newspaper cover the organizational meetings with the school guards, and publish articles on the opening of schools and the need for care when driving during the school year.

Enforcement

The Police Department has tried to cut down on accidents by enforcing motorist laws on speeding and yielding the right of way to pedestrians in crosswalks. Pedestrian laws on jaywalking are difficult to enforce because the courts generally have not upheld these citations. Pedestrians involved in accidents while crossing against a light or in midblock are usually deemed at fault.

Safety Program Recommendations

Education through the schools and the media is felt to be the most important component of a safety program. The Police Department would like to have the funds and manpower to develop an ongoing pedestrian safety program involving police-initiated visits to schools and other groups, films, and a Safe Route to School program. To date, this has not been possible.

Erie, Pennsylvania

AAA DATA SUMMARY

Population Group: 100,000 – 200,000

Ranking and Group Size 25 out of 63

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	625	1000	668
Pedestrian Death and Injury Record	230	450	345
Accident Records	70	70	70
Legislation	0	15	15
Enforcement	31	75	24
Traffic Engineering	67	85	72
Safety Program Coordination	75	75	55
School Traffic Safety	105	105	100
Public Information and Education	47	125	45

Awards Received

1976 –
1975 –
1974 –
1973 –

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	129,200	–	–
Population Density	5,890	–	3,330
Percent Change 1960-70	−6.7	–	+18.0
Percent Nonwhite	6.8	16.4	10.3
Percent < 18 years old	34.0	39.7	34.0
Percent 18-64 years old	55.0	49.1	54.9
Percent > 64 years old	11.0	11.3	11.1
Percent Family = Wed Couple	–	85.1	85.6
Persons/Household	3.1	2.9	3.0
Employment			
Manufacturing/Industry	39.8	25.0	22.4
White Collar	45.7	50.9	50.7
Government	9.9	17.8	13.7
Income			
Mean ($\bar{x}$)	$8,900	$9,100	$9,700
Percent < Poverty	7.7	11.4	8.4
Percent > $15,000	13.3	17.6	19.2
Transportation to Work			
POV	81.3	75.4	81.3
Mass Transportation	11.1	10.2	8.2
Walk Only	10.4	10.9	7.4

Green Pennant with three stars.

Crossing guard halting traffic for children.

Frederick, Maryland

COMMUNITY PROFILE

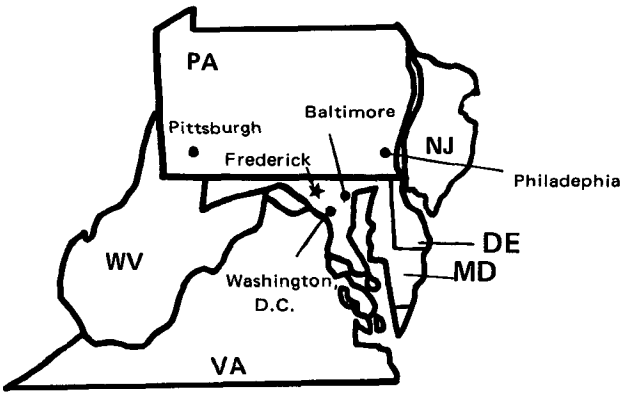
Located 40 miles west of Baltimore and 45 north of Washington, D.C., Frederick has played a prominent role throughout the history of the United States. Situated on the oldest public highway in the country (the National Pike, U.S. Route 40 from the east coast through Baltimore and west), Frederick has been accessible since its early settlements.

Historically and presently, Frederick has been somewhat of a rural refuge for people who work in Baltimore and Washington. Several prominent early Americans had country homes in and around the town. Today, two interstate highways (I-70 east, and I-270 south) and local train service take citizens to jobs as far away as Baltimore or Washington.

Numerous battle monuments, parks, and trails commemorate the strategic importance of Frederick during both the Revolutionary and Civil Wars. Antietam Battlefield is not far from present day Frederick.

As might be expected in a historically important community, the antiques business is a popular attraction. Other businesses in Frederick are of the light industry type.

Located on the eastern side of the Appalachian and Blue Ridge Mountains, Frederick's climate gives warm, relatively humid summers and cold winters with snow likely.



Frederick, Maryland

Safety Program Coordination

Several organizations exist in the community which act as sounding boards and channels for safety-related issues. In the business district, the Downtown Merchant's Association discusses CBD-related traffic problems during its weekly meetings. The city's Traffic Safety Committee meets with the Merchant's Association about once a quarter to discuss the overall business district traffic situation although more urgent problems are brought to the attention of the TSC immediately. In the residential neighborhoods, Civic Associations relate local desires and opinions regarding traffic safety problems to the TSC. The local Association for Retired Persons also meets periodically, but apparently they have noted few problems regarding elderly pedestrian safety.

The Traffic Safety Committee is composed primarily of members of the Police and Public Works Department. They are responsible for determining which safety measures will be used to counteract potential and actual accident problems.

Complaints received are evaluated by the Traffic Unit of the Police Department. The Traffic Unit is a five-man team which investigates fatal accidents and also serves as the Traffic Engineering Department of the city. Its primary concern is safety-related investigations. (This is different from the street patrol which is concerned with speeders, crime, etc.) If a change is warranted and budgeted, it will probably be made immediately. If the required change is more costly, it will be requested in the following year's budget.

Traffic Engineering

Signalization. Four intersections are equipped with full pedestrian WALK/DONT WALK signals. Three of them are at the major intersections in the downtown area and are tied in to the traffic signal. The fourth, at the Maryland School for the Deaf, is pedestrian activated. The solid WALK/flashing DONT WALK sequence is used. More pedestrian signals would be installed, except that the local judicial system has dismissed jaywalking tickets and an accident case related to the pedestrian signals.

The "scramble" sequence was tried, but low pedestrian volumes did not warrant its continuation. Vehicle volumes are fairly high and stopping all lanes for few pedestrians disturbed vehicle flow too much.

Hoods on suspension-mounted traffic signals were removed at nonpedestrian-signalized intersections because pedestrians (particularly children) were unable to see them and respond appropriately. Many of these have been replaced by mast arm or pedestal mounted signals.

Signing. Near the area where there is a school for the deaf, the "Pedestrian/Children Ahead" signs are supplemented with signs indicating "Caution: Deaf Children." There are as many as eight of these supplemental signs at each intersection in the school area.

Crosswalks. All intersections in the downtown business district have marked crosswalks. All crosswalks at intersections used by children between home and school are also marked.

Sidewalks. Several years ago a campaign was started by the administration to build sidewalks along all streets in the city. Federal funds were available for some of the construction and now almost 100% of the streets have sidewalks on both sides.

Barriers. No permanent barriers have been erected to counteract jaywalking pedestrians, particularly from crossing midblock. However, there are few midblock jaywalking problems in the downtown area because the high density of parallel-parked cars present an effective barrier to potential jaywalkers on both sides of the street. Cars are parked closely together so there is little room to get out between them.

Studies. Traffic studies are initiated upon demand by citizens and suggestions by street patrolmen. Changes are rarely made without some sort of survey being done first.

School and Child Safety Program

Crossing Guard Program. There are nineteen people employed by the police department as school crossing guards. Their locations are determined in cooperation with the school system.

Safe Route Program. Apparently there is no "Safe Route to School" program per se. What is done is more along the lines of determining where children are crossing streets on their way to school and putting in marked crosswalks along that route. There is no direct attempt to steer children to particular intersections.

Education. Patrolmen go into the schools, give talks, and show movies to young children on bicycle and pedestrian safety, the law, how to avoid accidents, and how to behave safely in traffic. Follow-up of these talks depends on the individual teachers.

Provision for the Elderly and the Handicapped

All of S. Market Street (the main street) has curb-cut ramps for handicapped and elderly pedestrians. These were put in by the city at a time when the state, prior to turning the street over to the city, redid the sidewalks. More ramps will be put in as other sidewalks are improved.

Meetings are held periodically with organizations for the handicapped and elderly to discuss their traffic-related problems. The handicapped are allotted special parking spaces and can request a parking space in front of their house.

The Police Department has one member knowledgeable in sign language who teaches a program on pedestrian safety and other aspects of police work at the School for the Deaf.

Public Information

The Police Department puts out articles in the papers and gives talks to civic groups on request. Subjects covered at these talks are generally specified by the group, although they quite often center on traffic safety. Newspaper articles often spur interest in particular topic areas.

Enforcement

There is no sustained enforcement of pedestrian laws. Citations given have not been backed up by the courts.

Frederick, Maryland

AAA DATA SUMMARY

Population Group: 25,000 – 50,000

Ranking and Group Size 45 out of 374

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	642	900	551
Pedestrian Death and Injury Record	256	350	266
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	13	75	21
Traffic Engineering	71	85	60
Safety Program Coordination	60	75	45
School Traffic Safety	100	105	96
Public Information and Education	57	125	40

Awards Received

1976 –

1975 –

1974 –

1973 –

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	23,700	–	–
Population Density	2,300	–	–
Percent Change 1960-70	+8.7	–	+7.8
Percent Nonwhite	12.7	23.5	4.4
Percent < 18 years old	30.3	33.4	32.2
Percent 18-64 years old	58.1	54.4	56.1
Percent > 64 years old	11.5	11.8	11.7
Percent Family = Wed Couple	85.5	83.4	87.8
Persons/Household	2.9	3.0	2.9
Employment			
Manufacturing/Industry	16.3	31.7	25.1
White Collar	52.4	47.3	50.8
Government	25.2	16.8	17.1
Income			
Mean ($\bar{x}$)	$9,900	$8,080	$9,600
Percent < Poverty	7.8	15.7	8.3
Percent > $15,000	21.1	14.0	19.0
Transportation to Work			
POV	–	–	–
Mass Transportation	–	–	–
Walk Only	–	–	–

Fredrick, Maryland

Signalized intersection with pedestrian signals at the School for the Deaf. Signs indicate deaf children in the area.

Grand Island, Nebraska

COMMUNITY PROFILE

Grand Island is located on the midwest plains along the Platte River valley in central Nebraska. It is approximately 120 miles west of Omaha and 400 miles east of Denver. Agriculture in the surrounding county and manufacturing provide the economic base of the community.

Lying in the heart of Nebraska's irrigated agricultural belt, Grand Island is the focus of the local cattle feeding and corn production industries. With a tripling in the number of manufacturing jobs in the last 10 years, the city has also become one of the leading industrial cities in Nebraska. Farm equipment, food and livestock processing, plastics, and munitions are the community's leading industries. Outstanding transportation facilities (interstate highway I-80, the mainlines of the Union Pacific and Burlington Northern Railroads, two buslines, and Frontier Airlines) make it the largest freight distribution center between Omaha and Denver.

The climate presents quite typical midwest plains weather. Winters are cold and snowy; summers are hot and dry. Recreational activities during the summer include all water sports and golfing. Numerous parks are located throughout the city for pedestrian and recreational outlets.

Historically, Grand Island was named by French fur traders to designate the large island in the Platte River south of the present city. Prominent throughout western history as one of the crossroads of the westward migration trails, the city was first settled in 1857. Today Grand Island has developed into a modern city of 35,000+ inhabitants.

Grand Island, Nebraska

Safety Program Coordination

The pedestrian safety program in Grand Island is coordinated by a traffic officer in the Police Department. He monitors the safety-related activities of other city departments and works closely with the Nebraska AAA.

The elementary school principals, PTA, City Public Works Department, City Engineer, and the police have developed a close relationship by working together on changes for school areas. This cooperative relationship is reflected in Grand Island's successful safety record.

Traffic Engineering

Signalization. Traffic and pedestrian signals are installed in response to community demand rather than traffic or accident studies. It is felt that the warrants expressed in the *Manual on Uniform Traffic Control Devices* are not relevant to small towns because they require such high volumes of pedestrians. Pedestrian signals have been removed from the CBD because there was a high level of noncompliance. The remaining signals are located almost exclusively at school crossings.

Studies. When an improvement is requested, the Public Works Department does a thorough study of the problem and forwards the request and study results to the City Manager and City Council for action.

Sidewalks. There is no formal sidewalk program. The PTA at each elementary school decides where sidewalks are needed and requests them from the Department of Public Works. Requests for sidewalks are almost always granted by the City Council.

School and Child Safety Programs

Crossing Guard Program. Four school crossing guards are posted at critical or high-hazard locations (e.g., intersections with left-turn arrows). There has not been a formal training program. Traffic and pedestrian volumes around the elementary schools have not warranted more than the four adult guards. Although there is presently no requirement for a student patrol program, the idea is being considered for the future.

School Crossings. Within the last six years, midblock crossings with pedestrian-activated signals have been installed for schools. Motorist compliance with these signals has been high. Flashing red beacons have been installed near schools to create a four-way stop situation during school hours. This slows traffic and warns drivers of the proximity of a school. School zone speed limits exist near each school.

Education and Safe Route Program. The safety education program in the schools is conducted by the Police Department. During the first two weeks of school, and again in the spring, pedestrian safety lectures are given to all children in kindergarten through grade two. Talks on bicycle safety are given in the third through sixth grades. These lectures are designed specifically for each grade level and are constantly modified to keep them interesting and up to date. New and clever approaches are tried to help children remember safety rules.

One particularly effective part of safety education is the "Foolish Freddy" program. Children are shown the potential results of disobeying safety rules and running out into the street through a simulated accident. A dummy built using a traffic safety cone and a styrofoam head is run over by a police car traveling at 25 miles per hour. Seeing what happens to the dummy presumedly impresses on the children what can happen to them if they are hit by a car.

School talks are followed up through the distribution of safety coloring books that reinforce the lecture and let parents know what material has been covered for further reinforcement at home. In addition, individual teachers may follow up on their own.

Another part of the school program are on-site visits to the locations of all the kinds of traffic control devices a child might encounter on the way to school (intersection and midblock crosswalks, push-button signals, etc.). The children are shown the proper use of these facilities, but are reminded that they should always look both ways before crossing because some cars don't stop for pedestrians. These visits have resulted in a good understanding of traffic control devices and a high compliance rate.

Provisions for the Elderly and Handicapped

Sidewalk ramps for the elderly and handicapped are located at all intersections in the CBD. They are of little use in the winter because ice and snow pile up in the well areas.

Grand Island, Nebraska

AAA DATA SUMMARY

Population Group: 25,000 – 50,000

Ranking and Group Size 52 out of 374

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	628	900	551
Pedestrian Death and Injury Record	271	350	266
Accident Records	65	70	70
Legislation	15	15	15
Enforcement	18	75	21
Traffic Engineering	69	85	60
Safety Program Coordination	48	75	45
School Traffic Safety	102	105	96
Public Information and Education	42	125	40

Awards Received

1976 –

1975 –

1974 –

1973 –

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	31,300	–	–
Population Density	2,820	–	–
Percent Change 1960-70	+21.5	–	+7.8
Percent Nonwhite	0.6	3.0	4.4
Percent < 18 years old	33.7	32.2	32.2
Percent 18-64 years old	53.0	54.7	56.1
Percent > 64 years old	13.2	13.1	11.7
Percent Family = Wed Couple	87.5	89.2	87.8
Persons/Household	2.9	2.9	2.9
Employment			
Manufacturing/Industry	19.5	18.9	25.1
White Collar	48.0	54.1	50.8
Government	14.6	17.0	17.1
Income			
Mean ($\bar{x}$)	$8,900	$9,690	$9,600
Percent < Poverty	7.4	7.7	8.3
Percent > $15,000	12.9	18.4	19.0
Transportation to Work			
POV	–	–	–
Mass Transportation	–	–	–
Walk Only	–	–	–

Janesville, Wisconsin

COMMUNITY PROFILE

Janesville is located in the south-central portion of Wisconsin about 35 miles south of Madison and 120 miles northwest of Chicago. Manufacturing and agriculture provide the economic base of the city.

The Chevrolet Motor Company has a major car and truck production facility and the Parker Pen Company is headquartered in Janesville. Other smaller companies manufacture high pile fabrics, assembly machinery, electronic equipment, and organs. Economic support from the rural area is received from very strong agribusiness. Corn, soybeans, alfalfa, and oats are the primary grain products grown. Livestock, in particular the raising of cow herds for milk and other dairy products, and poultry are also mainstays of the agriculture economy in the immediate area surrounding Janesville.

The climate contributes to a prosperous growing season. Summers are warm and generally moist with two-thirds of the annual precipitation falling during this period. Winters are moderately cold and snowy.

Freight transportation needs are served by trucking companies traveling I-90 or U.S. routes running through Janesville, or by the two major railroads serving the city. Greyhound Buslines and North Central Airlines also operate in and out of Janesville facilities.

Safety Program Coordination

Several committees exist and work together to ensure a coordinated safety effort in Janesville. Included in this list are the Janesville Safety Council, the Ad Hoc School Safety Committee, and the Traffic and Parking Committee. Augmenting these are the County and State Traffic Safety Commissions which assist all local committees.

The Janesville Safety Council (JSC), a subgroup of the Wisconsin and National Safety Councils, is concerned with *all* aspects of safety, not just traffic. It serves as a public forum which airs safety-related problems. Members of the JSC belong to the city government, and police, fire, school, engineering and other departments. Anyone in the community can become a member by paying the required membership dues. Many of the movies and other safety program facilities used in the city are purchased by the Safety Council. Funds for these materials are obtained from membership dues.

The Ad Hoc School Safety Committee is the initial sounding board for all school-related problems. Usually it brings these problems to the attention of the Traffic and Parking Committee.

The authority to actually initiate safety-related efforts exists with the Traffic and Parking Committee, comprised of members of the City Council and appropriate police and engineering personnel. Complaints are channeled through this committee. All modifications are initiated at this level. The T and P Committee, through the Traffic Engineering Department, does an evaluation of a noted problem and makes a correction proposal. This recommendation then goes to the City Council, where a public hearing is held. The hearing is the actual determinant of the final outcome of a proposed change. All such major changes must go through the City Council hearing process. The Traffic and Parking Committee acts purely in an advisory capacity.

Many proposals recommended by the T and P Committee die in the pubic hearings. The City Council has yielded to public pressures "against" traffic engineering and safety oriented problems on occasion.

Traffic Engineering

Signalization and Signing. As do most states in the U.S., Wisconsin allows right-turn-on-red (RTOR) except where otherwise signed. At one signalized intersection, where there is a high volume of children crossing, there is a folding "No Turn On Red" sign on the signal pedestal. During periods when children are going to or from school, the adult crossing guard opens this sign, thus prohibiting RTOR. At other times during the day, the sign is folded closed and RTOR is allowed. This prohibition eliminates potential turning vehicle-pedestrian conflicts that might otherwise occur.

Sidewalks. No city ordinance *requires* sidewalk construction. Even when recommended by the Traffic Engineering Department, the City Council has often yielded to public pressure not to require them. Because the cost of sidewalk installation is assessed to the property owners, the issue is quite politically entangled. There is a 50% Rule, where blocks in which half the property already have sidewalks installed, the remainder of the block must construct them also. However, it has not been enforced.

Barriers. The only consistent use of a physical barrier is during the winter when one street is blocked off to allow sledding on the hill. Most winter activities occur in the several park areas located throughout the city.

School and Child Safety Programs

Crossing Guard Program. All school crosswalks use crossing guards. Most of these are sixth grade students in the School Safety Patrol. There are also about eight adult crossing guards at intersections with higher vehicle or pedestrian volumes. The Safety Patrols are located within sight and sound of the corresponding school. The Safety Patrol does *not* have the right to stop traffic. They must wait for a large enough vehicle gap prior to entering the roadway. (Wisconsin state law does require vehicles to stop for pedestrians in marked or unmarked crosswalks.)

Adult crossing guards are located at major intersections where vehicle and pedestrian volumes warrant their presence. These persons are hired employees of the Police Department and are uniformed on duty. They *do* have the authority to stop and direct traffic to allow children time to cross the street. Portable stop signs are put out at these locations during school trip hours. Other locations use flashing signals timed to school hours indicating a 15 mph school speed zone before and after school hours.

Safe Route Programs. All school crosswalks are marked. These crosswalks indicate to the children their safest route to school. In addition, on the curb at most of these crosswalks, bright orange paint has been put down indicating where children must stay until a guard has released them.

A companion to this countermeasure is found in the street at intersection curbs along bike routes. Pavement markings saying "Bicycles Stop" are put in bike lanes telling cyclists that they also are required to stop at signed and signalized intersections.

Education. The Police Department has an "Officer Friendly" program for kindergarten through third grade. Movies (received from the AAA and the State Division of Highway Safety), the "Talking Car," and pamphlets are used. During these presentations, bright yellow tote bags in which children can carry books are handed out. During the Daylight Savings experiment, retro-reflective "Hot Dots" and stripes for use on clothing were also issued.

Provisions for the Elderly and the Handicapped

There is a fairly large school for the visually handicapped in Janesville. However, other than one or two trail-blazer directional signs on the main road several blocks away, there are no signs indicating there are blind or partially blind pedestrians in the area. At the signalized intersections near the school with pedestrian activated signals, a loud bell is incorporated in the system telling the blind persons when the WALK phase is activated.

Public Information

A local radio talk show is often used as an outlet for traffic safety-related topics (e.g., the folding No-Turn-On-Red sign). In addition, meetings of the Janesville Safety Council act as public forums.

The Police and Traffic Engineering Departments have taken slides and movies of particular problem areas. These have been presented at various community organization meetings. After discussion of the problem, the public is asked for suggestions on how to solve it. Simply making the public aware of a problem has often alleviated the situation itself.

Enforcement

Wisconsin state law gives local jurisdictions the option to establish jaywalking laws. In Janesville, it is not against the law to cross against a signal. If a pedestrian is seen doing that, he may receive a "lecture" from a policeman, but rarely will a citation be issued. It is a violation to stand in the road and block traffic; however, that is not considered jaywalking.

Accident Analysis

In Wisconsin, each county is required to have a County Traffic Safety Commission which evaluates all accidents in that county. Recommendations are then made to the appropriate person or organization to correct the apparent problems. In Janesville, this is the Traffic and Parking Committee. In addition, state law requires each city with more than 5000 residents to maintain a pin map and photo location file of all accidents in the city. These are used to identify particularly hazardous locations and to prioritize safety efforts.

Janesville, Wisconsin

AAA DATA SUMMARY

Population Group: 50,000 – 100,000

Ranking and Group Size 2 out of 169

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	891	1000	694
Pedestrian Death and Injury Record	450	450	381
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	10	75	27
Traffic Engineering	69	85	67
Safety Program Coordination	75	75	55
School Traffic Safety	100	105	99
Public Information and Education	102	125	42

Awards Received

1976	Award of Excellence
1975	–
1974	–
1973	–

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	46,400	–	–
Population Density	2290	–	3330
Percent Change 1960-70	+32.0	–	+18.0
Percent Nonwhite	0.3	5.6	10.3
Percent < 18 years old	39.4	33.6	34.0
Percent 18-64 years old	52.1	57.3	54.9
Percent > 64 years old	8.5	9.1	11.1
Percent Family = Wed Couple	88.7	88.9	85.6
Persons/Household	3.3	3.1	3.0
Employment			
Manufacturing/Industry	41.1	31.0	22.4
White Collar	43.9	54.7	50.7
Government	11.8	14.9	13.7
Income			
Mean ($\bar{x}$)	$10,800	$11,700	$9,700
Percent < Poverty	4.4	5.3	8.4
Percent > $15,000	21.4	28.3	19.2
Transportation to Work			
POV	–	82.2	81.3
Mass Transportation	–	6.4	8.2
Walk Only	–	7.7	7.4

Manchester, New Hampshire

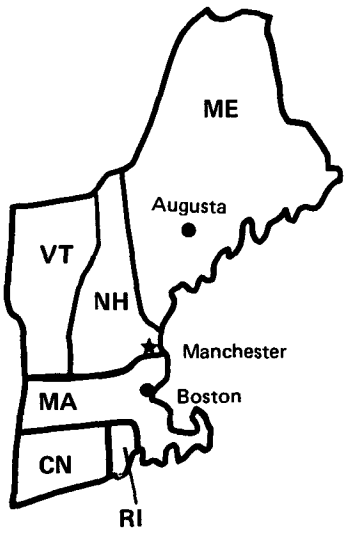
COMMUNITY PROFILE

Manchester, on the southern border of New Hampshire, is the largest city in the state, with nearly 100,000 inhabitants in the corporate city. It is located about 60 miles north of Boston.

Chartered as a city in 1846, Manchester grew up around the numerous cotton textile mills in the area. As the textile industry diminished in the 1930s, the city attracted other diversified industries to help rehabilitate itself. Today's industries manufacture electrical and electronic instruments, leather goods, plastics, and automobile accessories in addition to textiles.

The climate of southern New Hampshire provides full four-season years. Summers are warm enough for enjoyment of water-related and other recreational activities. The Atlantic seacoast is 45 minutes away. Winters are cold and snowy and there are plenty of hills in the city for sledding and skiing. The highest mountains in the northeast are within an hour of downtown Manchester.

Connected to Boston by expressway, Manchester is also served by railway lines, buslines, and Delta Airlines.



Manchester, New Hampshire

Safety Program Coordination

The ongoing Manchester safety program is administered by the Police Department and coordinated by the Manchester Highway Safety Committee. This Committee is composed of representatives from the fire department, schools, city government, police, Board of Aldermen, highway department, and the AAA. The Chamber of Commerce and members of local service clubs provide additional support. The Committee has the authority to recommend and carry out changes through the members organizations.

Recently the Committee implemented a new program with the help of the AAA to improve their preschool child safety program. In numerous instances the AAA acts in an advisory or catalytic capacity.

The State of New Hampshire provides additional highly qualified assistance when needed. There is little local or state "red tape" and contact with the top can be made quickly. Political appointments are qualified professionals with the result being a statewide awareness of safety needs. Manchester works with other cities and the AAA on many programs.

Traffic Engineering

Signalization. Pushbutton scramble signals are located at all intersections with pedestrian signals (all major intersections) in the downtown business district.

Signs. Manchester is in the process of installing a new sign at downtown intersections telling motorists to yield the right of way to pedestrians. The sign is about 3' x 3', white, with a Yield sign and lettering in red and black (Figure A-1). A total of fourteen will be put at intersections where they are warranted.

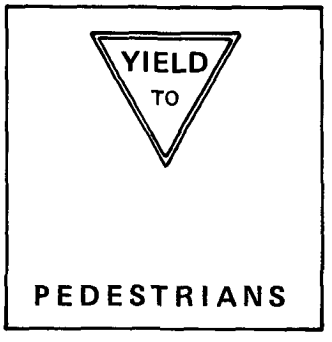


Figure A-1.

In the two months since the signs were first installed, evidence of their effectiveness and visibility has been forthcoming. Citizens are calling with favorable comments about motorists stopping at the crosswalks. Police officers are reporting fewer jaywalkers.

Crosswalks. There are problems with the weather and crosswalks often cannot be seen during the winter. A new painting truck has been purchased to keep up with the necessary repainting.

Studies. Traffic patterns are considered to be integral with pedestrian safety. Traffic on some north/south streets has been converted to one-way flow, taking some of the burden off the main streets and reducing the frequency of vehicle-pedestrian conflicts. (One dysfunction of this change is higher speeds on the one-way streets. The police have started using radar to enforce the posted speed limit.)

The Police Department keeps records on accidents and other statistics, and makes follow-up investigations of apparent trends. Traffic studies at problem areas are made. Police officers are encouraged to notice and report problems. Other studies are initiated by the AAA appraisal. The city has received special federal funds to conduct studies.

School and Child Safety Programs

School Crossing Guards. Manchester has adult school crossing guards at all elementary schools. These are supplemented by student patrols where necessary. Guards are on duty during the morning, noon and afternoon travel times. Additional crossing guards will be hired when additional funds become available. The success of the program has been reflected in the infrequency of school crosswalk-related accidents.

Education. The Manchester Police Department has a strong educational program in the schools. As part of the "Officer Friendly" program (funded by Sears, Roebuck & Co.), two officers go to every city school during the year. Their talks and movies center on safety and the functions of the police. They are considering giving a short quiz after the talks to see how well the children have understood them. In 1976, the first and second grades were visited several times. They hope to expand to other age groups as well in the near future.

The police also lecture at high school driver education courses several times a year. Emphasis is on driving and pedestrian safety. One current topic of discussion in these sessions deals with the jaywalking problem and a stricter enforcement of jaywalking laws.

The AAA is involved in these programs by providing materials and consultation. Currently there is a proposal in New Hampshire to hire a consultant to develop a state-wide safety curriculum for schools.

Manchester will be receiving a grant this year to develop a preschool childrens' safety program and to buy literature for schools and senior citizens.

Provisions for the Elderly and the Handicapped

In response to fatalities involving elderly pedestrians, several changes have been made to accommodate them. There are three high-rise apartment buildings for the elderly in the downtown area with smaller developments scattered throughout the city. A meeting was held recently to talk to the elderly about their problems. In response, the signal phases were lengthened and curb-cut ramps have been made at street corners and on median safety islands.

In 1974, Manchester put out a special pamphlet, "Senior Citizen Pedestrian Safety Tips" covering the elderly pedestrian accident situation in the city. Pictures of safe pedestrian behavior and explanations of some pedestrian laws were included. There is currently a special senior citizen safety program being run in cooperation with the AAA.

For the handicapped, signs warning motorists of the presence of blind or deaf pedestrians will be installed upon request. There have been few complaints from the handicapped.

Public Information

The Manchester Police Department has a very good working relationship with the local media. Newspapers and radio stations help launch new programs and give them free publicity. An officer from the traffic division has a program on the radio every day in which he relays messages about ongoing construction, possible traffic tie-ups, accidents, safety tips, etc.

These Police Department ties with the media have had a positive effect on other aspects of the Department's work as well. This public relations work has publicized the varied activities of the police and has brought about a change in attitude toward the police that will benefit the safety program.

Enforcement

In the past many citations were issued to pedestrians for violating jaywalking laws. Although this enforcement had slacked off for awhile, the police are again running a program to strictly enforce the laws on jaywalking and motorists' failing to yield the right of way to pedestrians. There is a problem with children and teenagers walking in the streets, skateboarding in the summer, and sledding in the winter. They are planning to enforce laws against these activities because of the potential danger involved.

There has been difficulty identifying the best way to stop illegal pedestrian behaviors. At one time they tried stationing a policeman at a corner with a bullhorn to warn people they were jaywalking and to attempt to embarrass them into stopping. This didn't work very well, resulted in negative feelings toward the police, and was dropped.

They are now planning to give a verbal warning for first offense, and a summons to come to court for subsequent infractions. Judges in the city have agreed to this enforcement program and will stand behind the police. Punishment can range from a warning to a $100 fine. This enforcement program is ongoing. Street patrolmen are reminded daily of pedestrian-related laws.

Safety Program Philosophy

The three essential parts of a safety program are traffic engineering, education, and enforcement. Equally important is the continuation of these policies or changes; one must follow through with programs, constantly be aware of new needs and problems, and continually enforce pedestrian and motorist laws. It is necessary to have an interested and dedicated coordinator for the safety program and cooperation from the community.

Manchester, New Hampshire

AAA DATA SUMMARY

Population Group: 50,000 – 100,000

Ranking and Group Size 18 out of 169

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	779	1000	694
Pedestrian Death and Injury Record	413	450	381
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	37	75	27
Traffic Engineering	67	85	67
Safety Program Coordination	60	75	55
School Traffic Safety	100	105	99
Public Information and Education	17	125	42

Awards Received

1976	Special Citation for Pedestrian Casualty Record
1975	Special Citation for Pedestrian Casualty Record
1974	–
1973	Special Citation for Pedestrian Casualty Record

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	87,800	–	–
Population Density	2800	–	3330
Percent Change 1960-70	−0.6	–	+18.0
Percent Nonwhite	0.4	7.1	10.3
Percent < 18 years old	32.4	31.4	34.0
Percent 18-64 years old	54.9	56.2	54.9
Percent > 64 years old	12.7	12.4	11.1
Percent Family = Wed Couple	85.6	84.2	85.6
Persons/Household	3.0	3.0	3.0
Employment			
Manufacturing/Industry	33.6	34.1	22.4
White Collar	44.4	49.8	50.7
Government	11.6	13.4	13.7
Income			
Mean ($\bar{x}$)	$9,500	$10,300	$9,700
Percent < Poverty	7.2	7.1	8.4
Percent > $15,000	15.8	21.4	19.2
Transportation to Work			
POV	80.2	74.1	81.3
Mass Transportation	6.5	11.7	8.2
Walk Only	10.6	11.3	7.4

Nonsignalized midblock crosswalk.

Sign indicating handicapped pedestrians in vicinity.

Milwaukee, Wisconsin

COMMUNITY PROFILE

Milwaukee, a city of 680,000+ people, is located on the west shore of Lake Michigan about 80 miles north of Chicago. Its position on the lake makes it an ideal inland port city with access to the rest of the world through the Great Lakes and the St. Lawrence Seaway, or through locks and channels to the Mississippi River and the Gulf of Mexico.

Although it ranks 14th in population size, Milwaukee is 10th in volume of industrial production. Heavy duty machinery, diesel and gasoline engines, electrical equipment, agricultural machinery, and steel foundries lead the way in the industrial economy. And, of course, Milwaukee has three of the nations five largest breweries and produces more beer than any other city in the country. Other lighter industries include food, paper, and leather product processing.

Possibly one of the reasons behind Milwaukee's lead in industrial capabilities is the composition of the population. Very large segments of the population are of German or Polish extraction. In addition to their high quality of work, these ethnic peoples have worked to make Milwaukee one of the safest large cities in the country (from both a crime *and* traffic accident point of view). In return for the high productivity and quality work they do to keep the economy viable, the people expect and insist on good basic civic services.

This cleanliness and security aspect of the local community is manifest in a significant amount of recreational and relaxational activities being outdoor-oriented. Milwaukee is studded with innumerable large and small parks to which people go for strolls and other activities. The summer recreational scene includes boating, fishing, bicycling, baseball, and all other common sports. Winter activities both within the city limits and the surrounding counties include skiing, sledding, ice fishing, and snowmobiling.

The local climate provides appropriate weather for these activities to occur. Summer temperatures are generally very warm, while below freezing temperatures are common during the winter. Lake Michigan tends to moderate the temperature extremes experienced further west in the plains states. Although most of the annual precipitation falls during the growing season, substantial snowfall covers the city every winter.

Milwaukee is very accessible by all means of transportation. Besides the large port facilities, the city is served by three national and two regional airlines, five freight carrying railroads, Amtrak, and Greyhound Buslines. Vehicular traffic can travel intercity on interstate I-95 or the US-41 expressway.

Milwaukee, Wisconsin

Safety Program Coordination

Final approval or rejection of all traffic-related ordinances is done by the Milwaukee Common (City) Council. When a complaint is received or a problem identified, the Council requires the Traffic Engineering Department to do a study evaluating the situation. If a modification is warranted, it must be approved by the Council prior to the change being made.

Because citizens of Milwaukee pay higher than average city taxes, they demand a high level of service. Therefore, every request and complaint (some 2000 in 1976) is investigated. Favorable responses are made (that is, something is done) on nearly half of all requests.

Under the Mayor and Common Council is the Milwaukee Safety Commission (MSC) whose primary purpose is to be a vehicle for public information on all aspects of safety (fire, home, traffic, etc.). The Commission has eighteen members who oversee activities and ten advisory members. These people are appointed by the Mayor and approved by the Common Council. All disciplines (police, fire, engineering, school, medical, etc.) are represented on the Commission.

The MSC has several committees which deal with specific safety problems. The Traffic/Schools Committee works closely with the Police, Traffic Engineering Department, and the school systems on traffic-related problems. This Committee also monitors the school crossing guard, Safety Cadet, and safety education programs.

Traffic Engineering

Signalization. Milwaukee's overriding philosophy has been to accommodate the pedestrian in the total traffic system. Toward this end they have automatically installed pedestrian signals with traffic signals. Nearly 100% of the intersections with traffic lights also have pedestrian signals.

Along the major arterial streets in the city, all traffic signals are synchronized. However, as part of the effort to facilitate pedestrians, special cycles have been programmed into the signal system. For example, on one six-lane arterial, there is an elderly population living on one side which uses a shopping center on the opposite side. The normal synchronized traffic cycle is 60 seconds. When the pedestrian signal button is pushed, the signal goes through two 90-second cycles, thereby giving the slower moving elderly pedestrians more time to cross the major street. The phasing reverts back to the 60-second cycle at the end of an even number of 90-second cycles, thus falling back into synchronization with the rest of the road. (Return to the 60-second cycle after an odd number of longer cycles would result in that signal being 30 seconds out of synchronization with the rest on that arterial.) The signal remains on the longer cycle as long as the pedestrian signal button is

activated. A sign is posted on the signal pedestal stating "Elderly/Disabled Push Button for Extra Walk Time."

Another example of facilitating the pedestrian is as follows. On other arterial streets, the traffic signals are on a 90-second cycle during the day, but, due to lower volumes relative to the side streets, at night they are on a 45-second cycle. Signs are posted at these intersections telling pedestrians to cross only half-way (to or from the median) during each 45 – second cycle between 10 p.m. and 6 a.m.

In regards to pedestrian signals themselves, a major change was instigated in signal phase timing about four years ago. Prior to that change, each cycle had a long WALK/short clearance DON'T WALK phase. This was changed to the presently used short WALK/long clearance DON'T WALK sequence. Numerous television spot advertisements were aired to explain the change.

At signalized intersections where there is a shared cycle for vehicles and pedestrians, the "WALK lead" is used. The pedestrian WALK light will activate before the green traffic light. This allows pedestrians to get out into the street before any turning vehicles, and gives drivers a better line of sight for pedestrians in the crosswalk. This technique is more effective in a *non*congested traffic situation. It does delay some vehicles, giving about 5-10 seconds less green signal time.

Several marked crosswalks have pedestrian activated traffic signals. With no pedestrians present, the traffic signal normally shows a flashing amber light. Upon activation by the pedestrian, the light turns green for ten to fifteen seconds, then turns red. After four more seconds, the WALK phase shows on the pedestrian signal. This delay was incorporated because pedestrian traffic is very light and the signal is used infrequently. As a result, drivers don't expect to see the red light and sometimes run it when it is activated. The delay gives an additional margin of safety to the crossing pedestrian.

Crosswalks. Marked crosswalks are being limited to major arterials and signal controlled intersections. Pedestrians are seemingly more attentive to traffic when crossing at unsignalized intersections. Marking a crosswalk at these locations may give pedestrians a false sense of security because the state law gives pedestrians the right of way in marked crosswalks.

Grade Separation. There are a few pedestrian overpasses in the city situated at unique geometric or high traffic volume locations. It is felt that if the signalization system is utilized properly by both drivers and pedestrians, there should be no need for grade separation in most situations. Public awareness and compliance are cheaper and should be more cost-effective.

School and Child Safety Programs

The Milwaukee Safety Commission, in cooperation with the public and parochial school systems is responsible for developing and teaching all school safety education programs.

Crossing Guard Program. Milwaukee has some 9000 trained Safety Cadets, taken from the third through eighth grades. The responsibility of the Safety Cadets at school crossings is to keep the children on the curb until there is a sufficient gap in the traffic for them to cross. The Cadets *don't* go into the streets themselves, except to look around parked vehicles. Local MacDonald's Restaurants have been involved in the awards and incentive program by giving away T-shirts and other awards to Cadets. Other prizes include trips to baseball games, the Wisconsin Dells (a large state park near Madison), parks, etc. for the best Safety Cadets at the end of the school year.

Four employees of the MSC go to the 220 elementary schools and hold training programs for new Cadets during the spring. By the time they start working in September, the new members have had some experience.

The 260 adult crossing guards are uniformed, paid paraprofessional police personnel posted only at major arterial highway crossings. They *do* enter the road to stop traffic when necessary. Adult guards and Safety Cadets are used only at elementary school crossings.

School Crossings/Safe Route Program. All signed school crosswalks also have pavement markings. This serves to keep the children within fairly well defined limits, and also brings drivers' attention to the possibility of children in the vicinity.

The Safe Route to School program designed by the Institute of Traffic Engineers is used. School district maps, marked with arrows indicating preferred streets for children to follow to and from school are handed out in the classrooms.

Education. The MSC gives over 900 "Officer Friendly" type presentations each year to both public and private schools. Preschool programs are made available in the public libraries. The Public Health Department encloses pedestrian safety literature in the package sent to new parents with their baby's birth certificate.

Because of the large number of school-age children to be reached, the Safety Commission uses School Cadets as supplemental instructors. The School Cadets are taught by the MSC. Cadets then go into individual classrooms and explain the pedestrian signal system, using an instructional aid, "Minisignal."

Provisions for the Elderly and the Handicapped

Curb-cut ramps are being put in at newly constructed or replaced intersections. However, there are very few people in wheelchairs using the ramps in the city. There have been problems with these ramps: the Sanitation Department is unable to properly clear out ice and debris in the ramps, and skateboarders and bicyclists ride down them into the street with little regard for vehicular traffic in the road.

Safety lectures have been given to organizations for the elderly. Attempts have been made to get elderly persons involved in this lecture process (as with the Safety Cadets in the schools). However, their reduced capability for travel and other limitations precluded this from being very successful.

A study done on the elderly in Milwaukee indicated that most elderly pedestrians have never driven a car. They are therefore often unaware of driving practices and have a limited capability to judge vehicle speeds and stopping distances. Part of the education process is oriented to teaching elderly persons about this potential handicap.

Enforcement

One of Milwaukee's public relations statements is that it is a "Safe Place to Live." While this slogan is oriented around anticrime programs, it also relates to the relatively low accident rate in the city.

Enforcement of traffic laws is considered a prime factor in inducing people to use the safety facilities provided. Police Department philosophy states that traffic and pedestrian law violators will be arrested. A selective enforcement program is in effect, concentrating on specific locations, times of day, days of week, seasons, etc.

Accident Analysis

Milwaukee has had (through 1975) a dramatic decrease in pedestrian accidents for several years in a row. There is an ongoing study trying to determine specifically why this has been the case.

In addition, there is a program starting (with the aid of a federal grant) to collect more detailed accident data (e.g., whether they occur during a child's trip to/from school, at night, etc.). These data, in combination with the coroner's report which the Commission receives for all fatal accidents, should lead to clues identifying possible safety practices that will make the city safer.

Safety Program Philosophy

The overall emphasis in the safety program in Milwaukee is on the pedestrian – both from an educational and facilities installation standpoint. They are trying to make the city safer for pedestrians "from the cradle to the grave." Only through an informed general public can the safety countermeasures be workable. Their public information programs hopefully will augment the physical installations and enforcement.

Milwaukee safety personnel know they are doing a good job because this is reflected in the accident statistics. However, it does not take much for the accident rate to start climbing again. Therefore, the "pressure" must be kept on in all areas of traffic and pedestrian safety.

While state law does give pedestrians the right of way in a crosswalk, in *reality* cars take the right of way. Only through constant vigilance in all areas can the city be kept safer for pedestrians.

Milwaukee, Wisconsin

AAA DATA SUMMARY

Population Group: 500,000 – 1,000,000

Ranking and Group Size 2 out of 14

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	864	1000	794
Pedestrian Death and Injury Record	392	450	411
Accident Records	60	70	70
Legislation	15	15	15
Enforcement	46	75	34
Traffic Engineering	79	85	74
Safety Program Coordination	60	75	60
School Traffic Safety	105	105	105
Public Information and Education	107	125	56

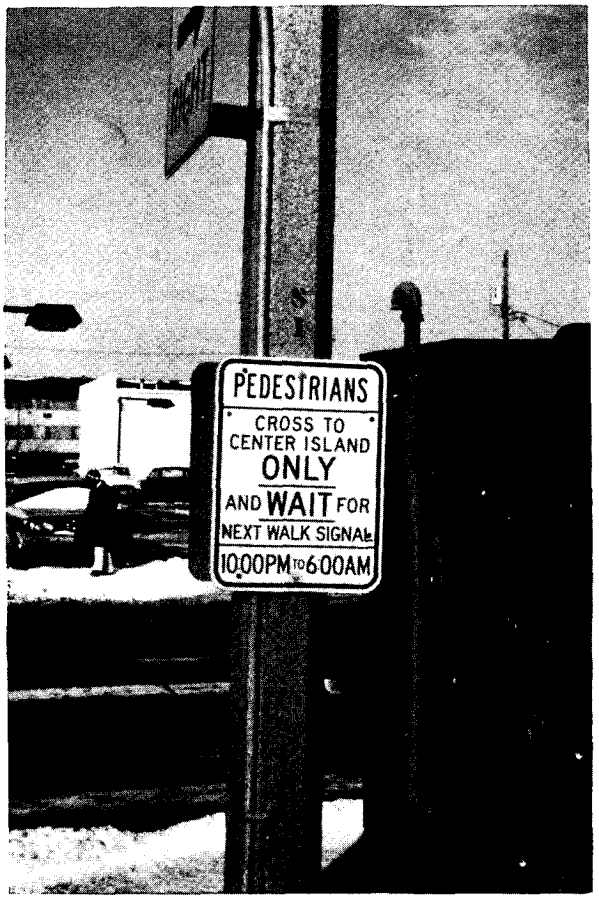
Awards Received

1976	Award of Merit
1975	–
1974	–
1973	Special Citation for Pedestrian Program Activities

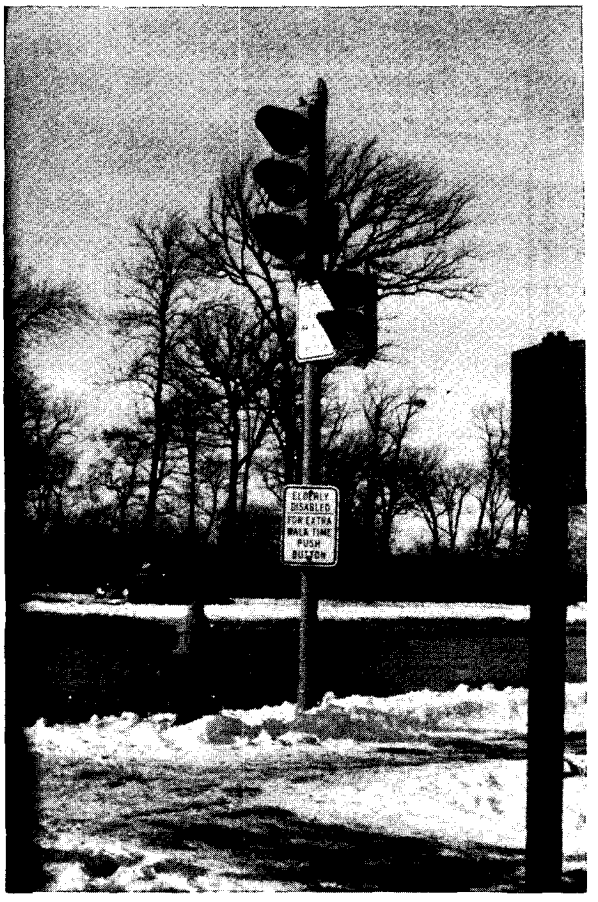
1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	717,100	–	–
Population Density	7,290	–	4,050
Percent Change 1960-70	−3.3	–	+10.3
Percent Nonwhite	15.6	26.9	15.0
Percent < 18 years old	32.8	33.6	31.3
Percent 18-64 years old	56.2	56.2	58.4
Percent > 64 years old	11.0	10.2	10.3
Percent Family = Wed Couple	83.2	81.4	84.4
Persons/Household	3.0	3.0	2.9
Employment			
Manufacturing/Industry	34.8	33.1	21.3
White Collar	45.0	45.4	54.9
Government	13.2	13.7	16.5
Income			
Mean ($\bar{x}$)	$10,300	$10,100	$10,200
Percent < Poverty	8.1	9.8	8.6
Percent > $15,000	19.2	20.7	22.9
Transportation to Work			
POV	70.2	68.8	77.4
Mass Transportation	19.2	21.4	11.5
Walk Only	8.1	7.3	7.6

Milwaukee, Wisconsin



Pedestrian signal giving extra time to slower pedestrians.



Traffic signal on short cycle at night.

Omaha, Nebraska

COMMUNITY PROFILE

Omaha, a modern city with 375,000+ inhabitants, is situated on the rolling hills of the west bank of the Missouri River along the eastern boundary of Nebraska. Located in the heart of the fertile Corn Belt, Omaha grew out of a trading center during the westward expansion of the 1800s. Although selected as the territorial capital in 1854, the city did not begin to really progress until the arrival of the railroad and telegraph lines in the 1860s. Its location helped it become the transportation "Crossroads of the Nation."

Today, the result of the growth of these transportation facilities has helped Omaha become a major distribution center of the country. Seven major airlines, eight freight railroads, Amtrak, bargelines on the Missouri River, and interstate highways I-80 and I-29 all make the city very accessible to the rest of the country.

The major businesses using these facilities are very diverse, ranging from meat packing and food processing to communications equipment to commercial insurance. Offutt Air Force Base, headquarters of the Strategic Air Command, also plays a major role in the economy of the city. Father Flanagan's Boys Town is also in Omaha.

Although located between two distinctive climatic zones, the humid east and the dry west, Omaha's climate is typically continental, with relatively warm summers and cold, dry winters. An adequate annual precipitation level assures abundant crops of corn in the surrounding region.

Omaha has a strong midwestern religious heritage which has played a role in its entire development. In addition, the Knights of the Ak-Sar-Ben, a civic organization founded in 1895, promotes the interests of the city and its citizens and is a powerful force behind the development of the community.

Safety Program Coordination

The overall safety program in Omaha is the responsibility of the Public Safety Department. In the specific area of traffic safety, much of the burden falls on the Traffic Engineering Division of the PSD. Complaints received from the public, schools, or other sources (some 2000 per year), are investigated by the Traffic Engineering Division, which then makes whatever corrective measures necessary to alleviate the problem.

If the public disagrees with the traffic engineers' recommendations, they may appear before the Mayor's Traffic Safety Committee. This Committee is comprised of persons from the city Safety Office, traffic engineering, police and planning departments, the manager of the Omaha Safety Council, and sometimes the AAA and local school system. The function of this group is to act as a review board or board of appeals for traffic safety related matters. The Committee reviews the complaint and makes a recommendation to the City Council. The Committee acts as a buffer between the public and the City Council. It is an ad hoc group initiated by the Mayor in 1968. Its continued existence has been deemed necessary by each succeeding administration, rather than by city ordinance or resolution.

The Mayor's office has a Public Safety Division. This office oversees the police, fire, and other divisions, and insures excellent coordination between most departments. It also reduces the likelihood of a duplication of effort by different groups.

Traffic Engineering

Signalization. Most of the downtown CBD has one-way traffic flow streets. To minimize potential vehicle-pedestrian turn-merge conflicts, the WALK phase of the pedestrian signal of the crosswalk into which vehicles will be turning is delayed for 5-10 seconds after onset on the green traffic light. On the parallel crosswalk, where there would be no conflicts, the WALK comes on simultaneously with the green phase.

Grade Separation. Omaha is installing pedestrian overpasses at numerous school locations throughout the city. Initial funding for these overcrossings was obtained by a bond issue. Ten were to be built for $800,000. Matching TOPICS funds were sought with the hopes of increasing the number to 17. However, the nonavailability of funds resulted in only nine being initially installed. Since then, additional funds have become available and there are presently 16 erected around the city. The design of these overpasses varies considerably and each is unique to its location. Some have curved ramps, others are angular or straight. One location, over three streets, has three separate entry ramps. There are also several underpasses located near some of the schools.

The overpasses are presently being erected over the more heavily traveled highways and intersections. One of the initial problems with obtaining approval and funds to build the overpasses was in convincing the public of their need. This problem was partly due to the fact that, in the 175-year history of the Omaha School System, there has never been a fatal accident at a crossing guard patrolled school crossing. Today, although crossing guards are still working where overpasses have not been installed, the general public is cognizant of the need for this safety countermeasure.

Sidewalks. In the early 1970's, the City Council passed an ordinance requiring sidewalks on all major streets. These are being put in on a sequential basis. After that, sidewalks are constructed based on complaints from schools, PTA, or other organizations. Traffic and pedestrian counts are made to establish the need for a sidewalk. There are no definitive standards for when or where a sidewalk should be installed. The original city ordinance was initiated after two or three fatal accidents occurred to pedestrians walking in the street.

School and Child Safety Program

Crossing Guard Program. Fifth and sixth graders are used as crossing patrols at the elementary schools. In areas where the fifth and sixth grades are bussed out, adult guards are replacing them. The Police Department's Community Relations Division has responsibility for this program. Portable (pedestal) stop signs are used by the crossing guards to stop traffic.

Education. The Police Department also goes into the elementary schools with safety talks. Movies and the "Talking Traffic Light" programs are used. A Safe Route to School program is established for each school.

Provisions for the Elderly and the Handicapped

Ramp installation is required on all new sidewalk construction. Ramp design at these locations is of the curb-cut in the sidewalk variety. Ramps at intersections where reconstruction is not in progress are built by filling in the gutter area from the sidewalk down to the street level.

At the school for the deaf and in neighborhoods where there is a deaf child, signs indicating "Caution: Deaf Children" are put in. In the residential areas these are usually in front of the home of the deaf child.

Talks with organizations for the elderly are held periodically to sound out their complaints and desires. Some changes have been made as a direct response of these meetings. For instance, parking spots for handicapped persons only are being designated in the downtown areas.

Enforcement

Enforcement of pedestrian laws against jaywalking are viewed by the Police Department as poor public relations. While citations will usually stand up in court, there is a general lack of enthusiasm to cite jaywalking pedestrians.

Omaha, Nebraska

AAA DATA SUMMARY

Population Group: 200,000 – 500,000

Ranking and Group Size 8 out of 27

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	668	1000	–
Pedestrian Death and Injury Record	281	450	332
Accident Records	55	70	70
Legislation	15	15	15
Enforcement	24	75	32
Traffic Engineering	75	85	72
Safety Program Coordination	75	75	65
School Traffic Safety	96	105	100
Public Information and Education	47	125	67

Awards Received

1976	–
1975	Award of Merit
1974	–
1973	–

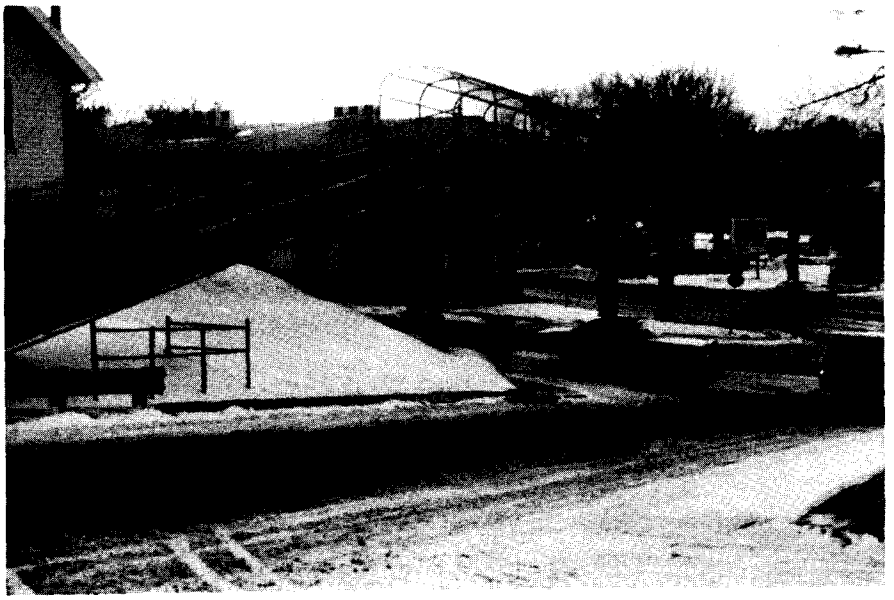
1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	391,400	–	–
Population Density	4680	–	–
Percent Change 1960-70	+15.2	–	+18.0
Percent Nonwhite	10.6	6.1	10.3
Percent < 18 years old	35.2	33.7	34.0
Percent 18-64 years old	54.7	56.9	54.9
Percent > 64 years old	10.1	9.4	11.1
Percent Family = Wed Couple	86.3	88.7	85.6
Persons/Household	3.1	3.0	3.0
Employment		21.4	
Manufacturing/Industry	17.2	54.7	22.4
White Collar	54.6	17.1	50.7
Government	13.4		13.7
Income			
Mean ($\bar{x}$)	$10,200	$10,100	$9,700
Percent < Poverty	7.2	6.9	8.4
Percent > $15,000	21.8	20.1	19.2
Transportation to Work			
POV	80.9	86.1	81.3
Mass Transportation	9.3	4.8	8.2
Walk Only	6.6	5.6	7.4

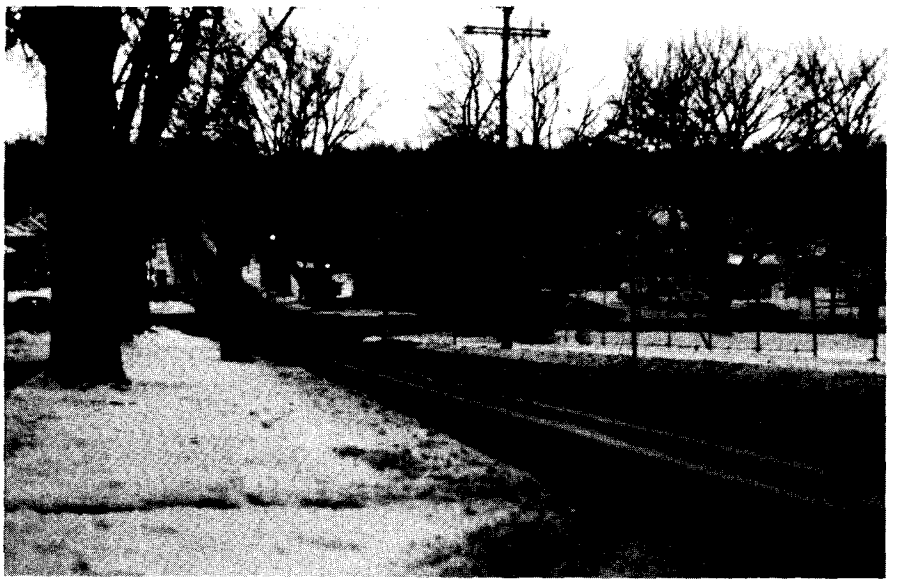
Omaha. Nebraska

Partial WALK and turning vehicle phase of signal cycle.

Full WALK phase of signal cycle.



Three-legged pedestrian overcrossing.



Pedestrian overcrossing.

San Diego, California

COMMUNITY PROFILE

San Diego, a physically very large city, covering 320 square miles with a population of only 770,000+ people, is located on the Pacific Ocean shoreline at the south end of California only 20 miles north of Tijuana, Mexico. Its topography ranges from beaches and bays to canyons and mesas. The climate of the City of San Diego is very mild, primarily due to the natural air conditioning effect of the ocean. During the summer, the relatively cooler ocean cools the heat extremes found further inland. In the winter, the relatively warmer ocean moderates the colder air felt in the inland county away from the coastal city. Although snow falls annually in the mountains east of San Diego, it has never been recorded in the city itself.

The economic stability of San Diego is supported by a diversified number of industries. Although the major employer is the aerospace industry, other products manufactured include electronic equipment, clothing apparel, and surfboards. Numerous research and development firms are located in San Diego.

The fishing and ship building industries are also major economic contributors. The San Diego harbor, one of the largest and finest protected harbors in the world, is the home of the Pacific Coast fishing fleet (primarily tuna fishing). The harbor is also the home port of the U.S. Navy Pacific Fleet. Military, fishing, merchant, and recreational vessels are built in local shipyards. In addition, the harbor houses one of the major westcoast port facilities for goods shipment.

Tourism is another drawing card for San Diego. All forms of transportation (five national and three regional airlines, Amtrak, two national buslines, and two interstate highways (I-5 and I-8)) give easy access to the San Diego area.

Historically, San Diego has been a port city for most of its life. San Diego Bay was first discovered in 1542 by Spanish explorers. As with most of California and Mexico, the earliest permanent settlements were Missions. The first of 21 California Missions was dedicated in San Diego in 1769. Constantly being captured and recaptured during successive Mexican-American wars, San Diego came permanently under the American flag in 1846. Incorporated as a city in 1850, San Diego is California's oldest community.

San Diego, California

Safety Program Coordination

The City Department of Transportation has budgeted six full-time positions aimed at traffic safety functions. Close coordination is maintained between traffic engineers, the Police Department and the Department of Education. Further safety coordination with the community is provided through the San Diego Public Safety Committee (founded in 1921), the local chapter of the National Safety Council, and the local Parent-Teachers Association.

For the most part, San Diego has avoided highly publicized short range safety programs in favor of long range behind-the-scenes safety efforts, involving envorcement personnel, educators, engineers and other key safety elements in the community. Consequently, there is less thrust on producing "immediate results" and less chance of disillusionment and possible abandonment of safety efforts.

Traffic Engineering

Signalization. All signalized intersections have pedestal mounted signals with most arm signals provided where needed. No span wire signals are used because they are difficult for pedestrians to see and account for much pedestrian frustration and possible pedestrian accidents where they are used. All "pedestal signals" are easily seen by pedestrians. Supplementary WALK/DONT WALK signals are provided at the following locations:

- Fixed Time Signals requiring a pedestrian clearance interval because of heavy pedestrian traffic, heavy vehicular traffic, and/or excessive street width.
- Traffic-Actuated Signals requiring special detection and timing for pedestrians. Pushing the pedestrian button not only activates the WALK signal, but also gives the pedestrian additional time to cross the street.

Pedestrian activator buttons are used at all traffic-actuated signals. Local surveys have indicated that pedestrians, particularly from the eastern cities, seem to have a poor understanding of the purpose and use of pedestrian buttons. Special efforts are made to educate school children in their proper use. The City has a few signals that are installed exclusively to accommodate school crossings at *midblock* locations. These are also equipped with pedestrian activator buttons.

San Diego cooperated with the 3M Company by installing and helping to evaluate the innovative and promising "Dynamic Pedestrian Signal." Basic signal design allows persons walking in the crosswalk to always see a WALK message, while pedestrians arriving at the curb late in the cycle would see DONT WALK. That is, pedestrians already walking would know to continue, rather than have a DONT WALK message presented when they are halfway across the street.

Unfortunately, field tests indicated that the signal did not function properly for short persons (children and the elderly). This problem was accentuated at hilly sites. Other problems centered around its electro-mechanical operation which occasionally stuck on WALK when the cross traffic had a green light. As a result, further field evaluations were terminated.

Crosswalks. A five-year study of accidents in marked versus unmarked crosswalks found that twice as many pedestrians were hit and killed in marked crosswalks. As a result, San Diego took the following steps:

- Revised its crosswalk warrants and greatly restricted the installation of new marked crosswalks.
- Reevaluated all existing crosswalks under its street resurfacing program. If an old crosswalk failed to meet the new warrants, it was not remarked.
- Started an education program in cooperation with the Police Department, city schools, senior citizens center, and the media to alert pedestrians to being just as careful while using marked crosswalks as they are when crossing in unmarked crosswalks.

Less than 7 percent of the City's 13,000+ intersections have marked crosswalks. (This includes marked crosswalks at signals and school crossings.) On all new marked crosswalks "ladder-striping" is being used because it is easier for motorists to recognize than other striping patterns.

Grade Separation. Separate pedestrian bridges are used extensively over the freeway system. These are all equipped with special screen guards to prevent vandals from dropping objects on the road below. In addition, approximately 20 pedestrian bridges cross arterial (surface) streets to facilitate pedestrian safety and mobility. The newest bridges are wheelchair accessible and quite aesthetically pleasing. Pedestrian bridges are particularly useful in the vicinity of local university campuses. At one time San Diego had about ten pedestrian tunnels serving various high schools and junior high schools in the area. The last of these tunnels was closed about a year ago because of vandalism and other social problems.

Sidewalks. San Diego inherited a sizeable sidewalk deficiency problem about 20 years ago when it began expanding and annexing previously semi-improved unincorporated areas. To overcome this, the City has published special brochures encouraging property owners to install sidewalks, curbs, and to upgrade their property by means of the California 1911 Act Improvement and Assessment Procedures. Where it is not possible for property owners to install sidewalks, and where there is a demonstrated need for a walkway, the City has provisions for installing temporary asphalt walkways on at least one side of the street. To date, over ten miles of such walkways have been installed. Particular attention is given to the needs of school children and the disabled.

Barriers. Extensive use is made of pedestrian barriers and diversion signs to direct pedestrians from high hazard crossings to legs of the intersections having reduced exposure to traffic or improved sight characteristics. Chain-link fence has also been used effectively as a pedestrian barrier on medians where there is a midblock crossing problem. These are frequently associated with a grade-separated crossing facility.

School and Child Safety Programs

In San Diego, the School Traffic Safety Program is composed of four elements: safety planning, safety education, safety operation, and special arbitration.

Safety Planning. This is a joint function of the School District, and Planning, Transportation, and Police Departments. The purpose is to forestall future pedestrian problems by determining the best locations for new schools, school boundaries and school routes such that there will be a minimal conflict between school children and traffic.

Safety Education. The main thrust of pedestrian safety education occurs at the elementary school level and is handled primarily by the Police Department. A special School Safety Unit consisting of 14 policemen has been established on a *full-time* basis by the Police Department. This unit works directly with each school principal in both the public and private schools. The officers conduct safety classes for the students, give talks and show films. Of particular interest are some of their special programs and live demonstrations including: "Kids and Skids," "Officer Friendly," "Bicycle Rodeos" and "Safe Route to School Programs."

Having the Police Department handle this program has been extremely effective in terms of safety, and has given children an opportunity to become personally acquainted with police officers under friendly and favorable circumstances, thereby forming positive attitudes on safety and law enforcement.

Safety Operations. The core of the safety operations is the School Safety Patrols which guard selected crossing locations and control the movement of school children and vehicular traffic at these locations. This function is also under the responsibility of the Police Department School Safety Unit. Fifth and sixth grade boys and girls are selected on the basis of leadership, scholarship and citizenship to participate in this program. They wear special easily seen uniforms consisting of white trousers, red blazers, and yellow caps. They receive individual training under police supervision and meet weekly with their assigned police officer supervisor to discuss problems and procedures. Special incentive awards and activities are provided including scholarships, summer camp, Christmas barbeque picnics, and special outings to pro-baseball/pro-football games, the zoo, etc. The effectiveness of this program can be measured by the fact that in 42 years since its inception, there have been no fatalities and only two child injuries in a school crossing.

Special Arbitration. Special school safety problems that cannot be resolved in the usual manner at the working level (between the parent, the school authorities, the Police Department and the City Traffic Engineer) are referred to the "School Safety Advisory Committee" for review and arbitration.

Provisions for the Elderly and the Handicapped

"Save-Our-Seniors." In 1970 San Diego initiated a "defensive walking" program aimed at senior citizens. This program recognizes that the senior pedestrians undergo a loss of visual acuity, ambulatory ability, and head and neck mobility as they grow older. Also they tend not only to be more vulnerable to traffic accidents but less apt to recuperate after being hit than younger pedestrians. As a result, it is extremely important for senior citizens to avoid involvement in *any* pedestrian accidents. This program was developed in cooperation with the Senior Citizens Coordinator, the Police Department, the Traffic Engineers Office, the Auto Club of Southern California, and the National Sa fety Council.

Guidestrips for the Blind. Two-inch wide epoxy-gravel tactile guidestrips for blind pedestrians were developed as a joint effort by the City Traffic Engineers and the Service Center for the Blind as a means of helping blind pedestrians find their way across complex and confusing intersections. Blind pedestrians use it by straddling the strip with their feet and touching the strip with the tip of their canes in a sweeping motion on every other step. The guidestrips help orient the blind user and help prevent their drifting into the path of traffic, particularly while crossing skew intersections.

Removal of Mobility Barriers. In 1975 San Diego created an ad hoc Advisory Committee for the Removal of Architectural Barriers. This committee consisted of representatives of the blind community, the wheelchair community, the elderly, and others with disabilities. The purpose of this committee was to advise City staff on the most effective ways to eliminate mobility barriers on the public right-of-way. The major accomplishments were to (1) develop an improved design for wheelchair ramps that were satisfactory to both the blind and wheelchair communities, and (2) develop a cost effective program of "preferred wheelchair routes." Routes are identified that will provide optimum service for the elderly and disabled in terms of access to medical facilities, recreational facilities, senior citizens hi-rise apartments, and educational and employment opportunities. Consideration is given to topography, availability of sidewalks, and other safety and mobility features. In certain cases, ramps may be routed on only one side of the street to provide maximum continuous route mobility and more favorable safety characteristics.

Public Information and Education

San Diego has good cooperation with the television and newspaper media in getting exposure on safety matters. The San Diego Union/Tribune has published a public service booklet entitled "You and Traffic" which covers various types of vehicle and pedestrian traffic problems. The City, in cooperation with the Auto Club of Southern California, has published a booklet entitled: "Engineering For Your Safety – Understanding San Diego's Traffic Engineering Programs" which is distributed to citizens requesting information on traffic control devices. Many public safety talks are provided by police and traffic engineering staff.

Enforcement

In 1976, the San Diego Police Department issued 11,046 citations against pedestrians for miscellaneous violations and 1,634 citations against motorists for violating the pedestrian's right-of-way. During 1976 the Juvenile Traffic Court handled 2,836 citations against juvenile pedestrians and 3,365 citations against juvenile bicyclists.

Accident Analysis

A key element in the City's safety program is the comprehensive and sophisticated accident surveillance system maintained by the Traffic Operations Section. The Police Department cooperates by providing reports on virtually every traffic accident occurring on the public right-of-way, regardless of severity. The *circumstances* of the accident, rather than *severity*, are considered to be most relevant to effective accidents analysis. Over 20,000 accidents per year are pinned on a wall map and coded into the City's computer for a wide variety of computer listings used by the traffic engineers and Police Department. Past accident records are maintained for a period of ten years to provide an in-depth look at accidents on a city-wide basis or at individual locations. Priority lists of intersections and street sections are provided in terms of frequency and accident rates.

Accident data is used by the Police Department in its selective enforcement program and by the traffic engineers in their signal priority program and in the evaluation of other traffic control devices. Computer accident lists are supplemented by detailed collision diagrams and strip maps which are very useful in identifying accident patterns and other recurring accidents subject to correction. San Diego places special emphasis on its surveillance of pedestrian accidents. This is where the extensive accident history becomes particularly useful in identifying accident patterns of a low frequency nature which might not otherwise be recognized.

Emergency Medical Services

The San Diego Police Department operates the city's primary ambulance service. Because these units are deployed in the field with other patrol units, the average response to an accident or emergency is five minutes. This rapid response time is helpful in reducing the mortality and severity of injury accidents, especially those involving senior citizens.

Safety Program Philosophy

The Traffic Engineers' job is to maximize *people* flow, whether they are in vehicles, on bicycles, or are pedestrians. California traditionally tends to favor the pedestrian. However, the vehicle code does *not* give the pedestrian the absolute right-of-way. The pedestrian has certain responsibilities that he or she shares with the motorist in using the street in a safe and reasonable manner. Education programs are aimed to emphasize the need for pedestrians to watch out for vehicles. Whether he has the right-of-way or not, the pedestrian usually is the loser if an accident occurs.

San Diego, California

AAA DATA SUMMARY

Population Group: 500,000 – 1,000,000

Ranking and Group Size 1 out of 14

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	958	1000	794
Pedestrian Death and Injury Record	416	450	411
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	72	75	34
Traffic Engineering	80	85	74
Safety Program Coordination	75	75	60
School Traffic Safety	105	105	105
Public Information and Education	125	125	56

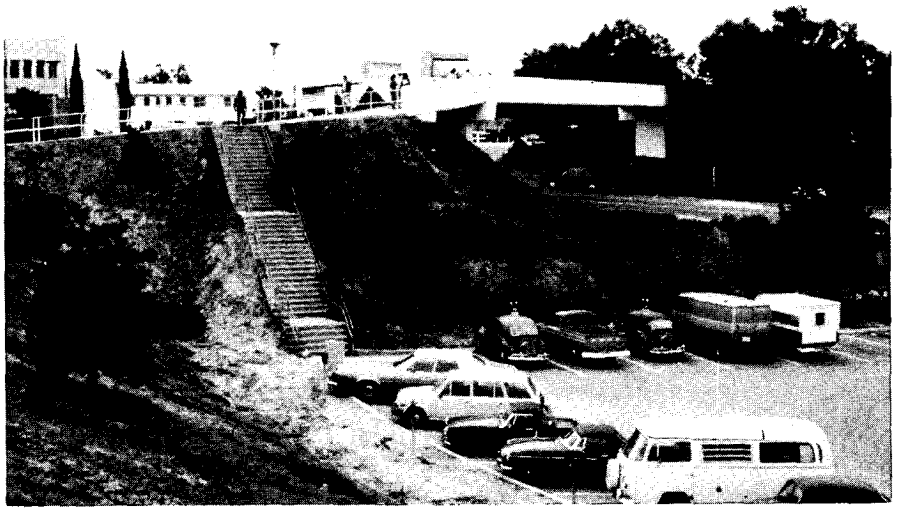
Awards Received

1976	Award of Excellence and Grand Award
1975	Award of Excellence and Grand Award
1974	Award of Excellence and Grand Award
1973	Award of Excellence and Grand Award

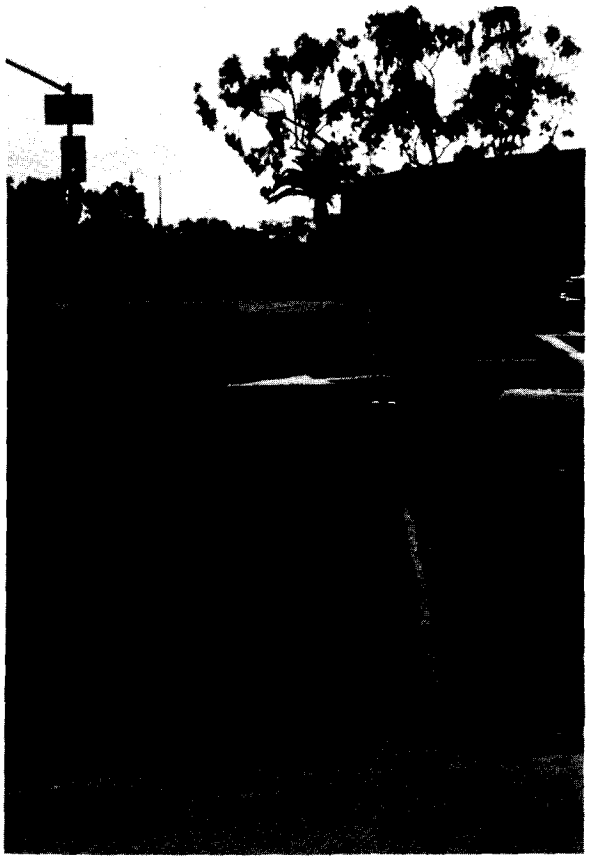
1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	696,800	–	–
Population Density	2,420	–	4,050
Percent Change 1960-70	+21.6	–	+10.3
Percent Nonwhite	11.1	17.0	15.0
Percent < 18 years old	30.6	30.4	31.3
Percent 18-64 years old	60.6	60.2	58.4
Percent > 64 years old	8.8	9.5	10.3
Percent Family = Wed Couple	85	83.0	84.4
Persons/Household	2.8	2.7	2.9
Employment			
Manufacturing/Industry	17.7	20.9	21.3
White Collar	58.5	58.0	54.9
Government	22.7	18.4	16.5
Income			
Mean ($\bar{x}$)	$10,200	$10,350	$10,200
Percent < Poverty	9.3	9.6	8.6
Percent > $15,000	24.4	26.3	22.9
Transportation to Work			
POV	75	78.3	77.4
Mass Transportation	5.5	7.4	11.5
Walk Only	14.7	9.8	7.6

Bus stop with pedestrian crossover to Balboa Park.



Pedestrian crossover between parking lot and campus of University of San Diego; barrier on roadway median to prevent grade level crossings.



Guide strip and marker (on curb) for blind pedestrians.

Diagonal parking on one side of street; very visible wheelchaired pedestrian travelling on clear side.

Seattle, Washington

COMMUNITY PROFILE

Located in the center-west section of Washington, Seattle is built on hilly terrain on the eastern shore of Puget Sound. Nearly any high point in the city can provide a spectacular panorama of mountain, forest, and/or oceanic scenery. Strong environmentalist influences are continually working to preserve this beauty and a high quality of life for the residents.

Known as "The Gateway to the Orient" and a jumpoff point to Alaska, Seattle has become one of the ten leading American ports. It is geographically the closest major U.S. port to Alaska and the Far East. The shipping industry (as a distribution center and in ship building), has always played a major role in the economic viability of the city.

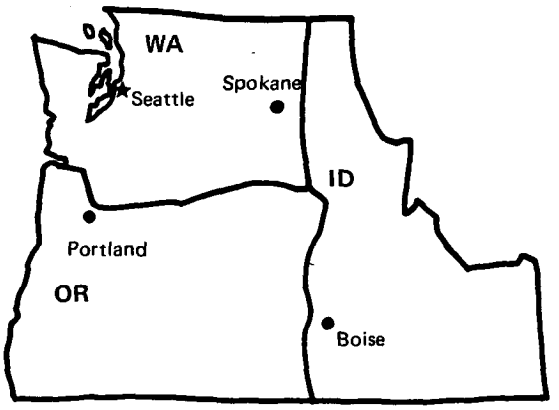
Historically, the northwest lumber industry was the initial impetus behind Seattle's growth. During the early 1900s, Seattle capitalized on the Yukon and Alaskan gold rushes with most of the miners leaving the continental U.S. through the city. Currently, incoming Alaskan oil is expected to keep Seattle's port facilities in full operation for several years into the future.

Several other industries also contribute to the economic base of Seattle. Although not as strong as it was during the 1960s, the aerospace industry still has several large operations in the area. Boeing Corporation's headquarters and aircraft manufacturing plants are in Seattle.

The fishing industry also plays a major role with Pacific Ocean crab, oysters, salmon, and a variety of other fish available in nearby waters.

Seattle has also become a popular convention city. The fairgrounds of the 1962 World's Fair have been converted into a convention and family entertainment center. The Space Needle monument and the Monorail between the center grounds and downtown contribute to the attractiveness of the city. Contrasting the modernness of the fairground facilities is the old open air Farmer's Market and mall area downtown.

The northern latitude of Seattle gives short winter days and very long summer days. The climate is generally mild throughout the year with moderate temperatures in the summer (low 60s average) and few snow days during the winter. However, all winter sports are available in the mountains within an hour's drive from downtown. Popular summer recreational activities include all fresh- and salt-water sports.



Seattle, Washington

Safety Program Coordination

The Seattle City Council has ultimate authority in determining what efforts will be made in regards to safety. However, they have given the Traffic Engineering Department a lot of freedom to do as it sees fit.

Complaints and requests for changes are generally sent directly to the Traffic Engineering Department. In the case of a school-related traffic complaint, the School Safety Committee (composed of members from the police, fire, traffic engineering departments, the Safety Council, AAA, and the schools) will first review the request. If a study is required, the T.E. Department will do it and make the final decision on whether or not a change is made.

Traffic Engineering

The T.E. Department has been given authority by the City Council to be innovative where it is deemed necessary in order to make the streets safe for users – especially pedestrians.

Signalization. Pedestrian WALK/DON'T WALK signals are put in automatically with new traffic signals, whether warranted by pedestrian volumes or not. However, at several older traffic signals, where there are presently no pedestrian signals, their installation in the future will depend on the pedestrian volume.

There are several intersections where the signals have been installed for pedestrian use only. Most of these have an overhead steady green signal presented to through traffic with stop signs on the side streets. When activated by the pedestrian, the signal goes to red, allowing the pedestrian to cross the through street. One experimental location is testing a flashing green instead of a steady green light. Other similar installations present no signal to through traffic. Upon pedestrian signal activation, a flashing amber is presented and drivers are thereby alerted that pedestrians want to cross. Drivers should slow or stop to give pedestrians the right-of-way.

Another special facility is the "Beacon – Luminaire" signal. These are located in a high density, multiple-dwelling housing area of Seattle where there is a high frequency of pedestrians crossing at a major arterial road. The "Beacon – Luminaire" signals consist of a back-lighted sign that says CROSSWALK. It is suspended above and shines a light down onto the crosswalk. Accident statistics have not shown these to be more effective than standard crosswalks. Because the light illuminates only the top of a pedestrian's head, the pedestrian is no more conspicuous than if he/she were in an unlit crosswalk.

Signing. The level of experimentation taking place in Seattle is most evident with some of the signing being installed. In residential areas where there are generally moderate to low volumes of pedestrians, crosswalks have been identified using large overhead signs above the marked crosswalks. It is felt that these signs designate the crosswalk's presence better than standard ground-mounted signs.

Near areas where there are blind pedestrians, the figures on the symbolic "Pedestrian Crossing" signs have had reflective white canes added, thus indicating a crosswalk used by the blind.

Crosswalks. Unsuccessful attempts were made to establish statistical warrants for marking crosswalks. Currently, crosswalks are marked only if one or more of three criteria are met:

- At signalized locations where vehicular traffic might block pedestrian travel when stopping for the red signal indication;
- At designated school crossings; and
- At nonsignalized locations where the level of usage and the geometry of the location would make the use of specially-aligned crosswalks desirable.

Most of the crosswalks put in are standard two-line markings. However, ladder-style markings are being used in midblock and high density pedestrian crossings to draw more attention to the potential presence of pedestrians.

Grade Separation. One pedestrian overcrossing has been constructed in the last 7-8 years. With a cost of about $600,000, very few are likely to be built in the future. This installation goes over a major double arterial road between a residential area and a large school. There are also bus stops beneath it which generate a high volume of pedestrians.

Sidewalks. Sidewalks have been built by the local improvement districts over the years. No city ordinance requires sidewalks in new developments. Local neighborhoods, if they desire a sidewalk, must first petition the City Council. If it is approved, a cost estimate is obtained from the Engineering Department. If the neighborhood still wants the sidewalk, the Engineering Department designs the project and hires a contractor to the job. Costs are assessed to the property owners.

Barriers. Some use has been made of pipe and chain fences to channel pedestrians to marked crosswalks. However, the more common uses of barriers are vehicle-oriented.

In residential areas, a raised median or traffic diverter has been constructed connecting two of the diagonal corners at designated intersections. Traffic is thus required to turn at these intersections. Two benefits are seen from these installations: reduced overall vehicle speed through these neighborhoods, and reduced volumes of thru traffic through the residential neighborhood.

School and Child Safety Programs

School Crossing and Safe Route Program. Every school crosswalk across a major arterial is marked on the pavement and with a sign. These markings are also used to define the safest path for children to follow. The Traffic Engineering Department has made up maps for every public school identifying the safe routes for children to take to their school. The schools hand out the maps in a packet of safety literature at the beginning of the school year. There are attempts to have a kindergarten "Walk Day" where parents will shown new students the safe route for them to take to school.

Crossing Guards. Of the some 750 marked school crosswalks, about 250 also have adult or student safety patrols. The Police Department School Safety Education Unit organizes and instructs the student patrols and the adult crossing guards. Adult crossing guards are paid by the city. There are also several "Officer Friendly" patrolmen who go to the elementary schools and teach safety practices.

Provisions for the Elderly and the Handicapped

Wheelchair ramps are being put in all over the city. Several types have been put in over the last couple of years and modifications are being made based on geometrics (there are difficulties with ramps in the CBD because of the hilly terrain), and complaints (blind persons are having much difficulty with them).

As part of a Capital Improvements Program, surveys are being made as to where wheelchairs are being used. There will eventually be a point-to-point route for wheelchair users.

Public Information

Television spots are used quite extensively to transmit traffic-related information. These are usually done by the Washington State Traffic Safety Program or the AAA.

Enforcement

Strict enforcement of pedestrian-related regulations is upheld. In court, the violating pedestrian can pay up to a $15 fine or go to pedestrian safety school, which is a two-hour lecture on safety held in the evening.

Seattle, Washington

AAA DATA SUMMARY

Population Group: 500,000 – 1,000,000

Ranking and Group Size 3 out of 14

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	816	1000	794
Pedestrian Death and Injury Record	393	450	411
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	59	75	34
Traffic Engineering	74	85	74
Safety Program Coordination	60	75	60
School Traffic Safety	105	105	105
Public Information and Education	40	125	56

Awards Received

1976	Special Citation for Pedestrian Casualty Record
1975	Award of Excellence
1974	Award of Merit
1973	Award of Excellence

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	530,800	–	–
Population Density	5,470	–	4,050
Percent Change 1960-70	−4.7	–	+10.3
Percent Nonwhite	12.6	–	15.0
Percent < 18 years old	25.5	–	31.3
Percent 18-64 years old	61.4	–	58.4
Percent > 64 years old	13.1	–	10.3
Percent Family = Wed Couple	85.0	–	84.4
Persons/Household	2.5	–	2.9
Employment			
Manufacturing/Industry	18.6	–	21.3
White Collar	58.8	–	54.9
Government	19.1	–	16.5
Income			
Mean ($\bar{x}$)	$11,000	–	$10,200
Percent < Poverty	6.0	–	8.6
Percent > $15,000	27.2	–	22.9
Transportation to Work			
POV	73.8	–	77.4
Mass Transportation	14.9	–	11.5
Walk Only	7.2	–	7.6

Sioux City, Iowa

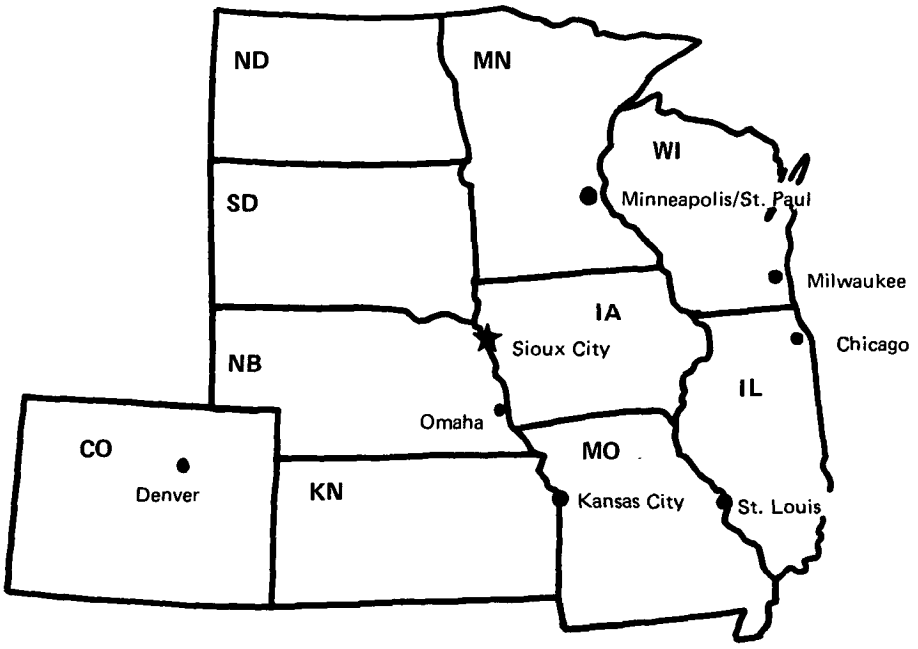
COMMUNITY PROFILE

Sioux City is in the northwestern section of Iowa at the Missouri River junction of Iowa, Nebraska, and South Dakota. The central city lies in the river valley with the residential areas spread over the surrounding rolling hills. The climate is generally cold in the winter, and warm during the summer. Most of the annual precipitation falls during the warmer months which provides a favorable climate for raising abundant crops of corn, small grain, and grass food products in the neighboring counties. Large livestock herds are also nourished on the local pasturelands.

The major businesses in Sioux City are centered around these farming and livestock industries. Food and meat processing, and chemical products (fertilizers, pesticides) provide the bulk of the industrial base. Other large-scale companies manufacture fabricated metal, tool, and transportation equipment products.

Freight shipping is primarily served by rail, water-barge, and trucking facilities. Four major railroads operate through Sioux City. The city is the northernmost terminal city on the inland waterways system. Interstate I-29 runs from Kansas City through Sioux City and on into Canada.

In an effort to revitalize the downtown business district, the Industrial Development Council of Sioux City has initiated numerous projects in an urban renewal program. Certainly the most visible signs in this direction are the pedestrian mall and skyway system being built.



Sioux City, Iowa

Safety Program Coordination

The chartered duties of the city Transportation Engineering and Traffic Operations Departments are to keep the roads safe for all users – including pedestrians. To accomplish this, the department is given a fair amount of rein to test new or innovative safety installations. For example, a new signal can be put in as a "test" installation. In order for that signal type or location to become permanent, the City Council has 90 days to establish or amend an ordinance allowing that type of signal at that locational setting. If the City Council gives the initial authorization to put something in, approval of the affected ordinance is usually rather quick.

Safety countermeasure development and installation are usually based on traffic studies. Some of these changes are an outgrowth of complaints received from citizens, schools, etc., while others are initiated by the City Council or the Transportation Department.

Successful implementation generally occurs only when the affected local neighborhood has been involved from the beginning. In some cases, when the City Council has tried to initiate changes without first establishing local community support (e.g., requiring sidewalks within 2000 feet of every school), public pressure has lead to resolution defeat.

Many of the programs in Sioux City have been initiated with federal funding assistance. Taking advantage of research opportunities has aided much of the safety effort.

Traffic Engineering

Signalization. The central business district is primarily a one-way grid system for vehicular traffic. All intersections within this grid have traffic and pedestrian signals. To reduce the frequency of vehicle-pedestrian turn-merge conflicts, the WALK signal for the crosswalk into which vehicles will turn is delayed about ten seconds to allow the turning vehicles clearance. On the opposite crosswalk, where there will be no turning vehicles because of the one-way road, the WALK signal comes on simultaneously with the green light. Turning vehicles are given a green arrow during the DON'T WALK phase of the pedestrian signal cycle. This green turn arrow is off when the WALK is on. The following diagram illustrates this sequence.

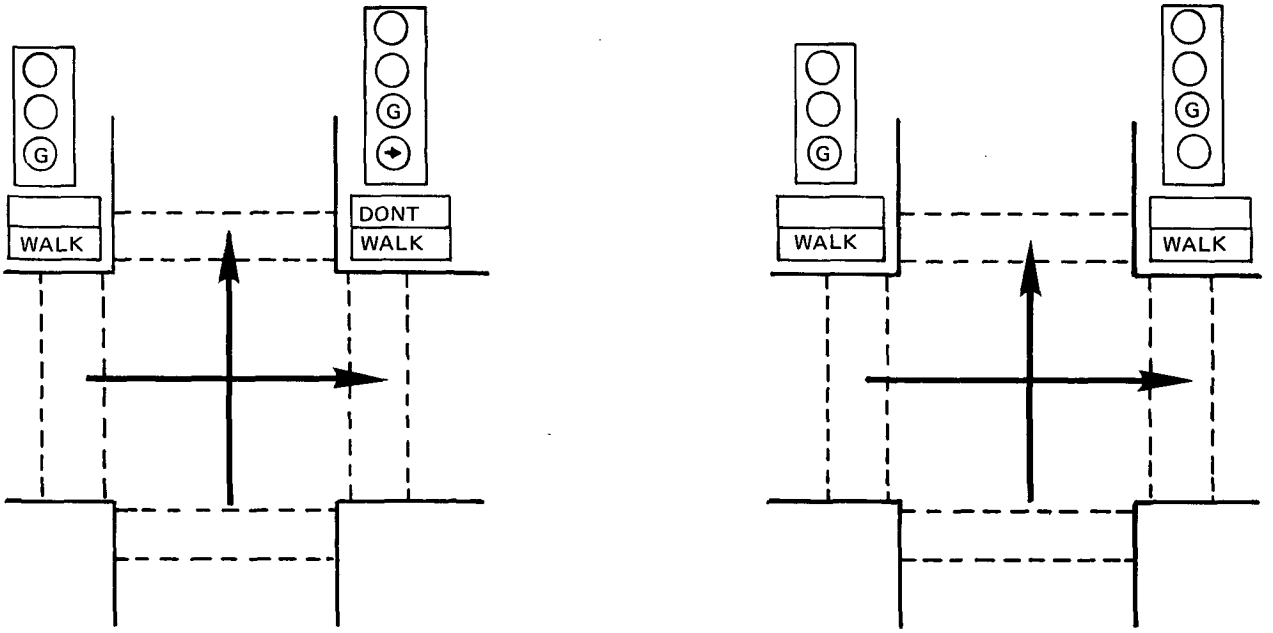


Figure A-2. Signal phase sequencing.

Sioux City has been experimenting with "Stop Sign/Pedestrian Signal" installations. Two types of installations are currently being tested. At one type, an amber signal is presented to through traffic except when the pedestrian signal to cross the main road is activated. When the signal button is pushed, the through amber goes to a solid green, then amber, then red. Pedestrians are given a WALK indication to cross the street. After allowing pedestrians to cross, the through signal returns immediately to a flashing amber. Other installations of this type present a solid green to through traffic except when pedestrian-activated. The sequence is then amber, red, and return to green. The side streets at some of these locations have stop signs. Other, signalized, locations are normally presented with a flashing red, and with a *solid* red when pedestrians are crossing. Signs are mounted on the side street signal pedestals instructing drivers to "Stop, Proceed with Caution when Flashing. Stop and Remain Stopped when Solid."

The 3M Dynamic Pedestrian Signals were installed and tested at six intersections with 44 signal heads. However, these were taken out fairly quickly because the city experienced 40 electro-mechanical failures per month (e.g., getting stuck on WALK when the traffic signal was red). While the traffic engineers are pleased with the concept of these signals, they do not plan on installing them again without improvements in the mechanical operation.

Grade Separation/Malls. Three distinct steps are being taken as part of an effort to upgrade the central business district: zoning laws have inhibited the development of large shopping centers outside the downtown area; a five-block long mall, made by closing off one street, is being developed in the CBD; and second-level skywalks are being built connecting all the stores around this mall. When the whole program is completed, there will be a second-level "ring" surrounding the central mall. At the corners of this ring will be five multi-level parking garages to facilitate the increase in traffic coming into the downtown area.

The mall itself is being financed by the city as part of an urban renewal project. The skyways are primarily being funded by the businesses directly affected.

Sidewalks. Sidewalk installation is required by City Council ordinance in all new developments in the city. However, the warrants for installation in already developed subdivisions are rather weak. The Transportation Department is attempting to get the Safe Route to School program tied into sidewalk installations by making the parents aware of the safety hazards associated with walking in the streets. This has been a difficult task because the property owners are the ones who will pay for any new installations.

Studies. Time-lapse photography has been used often to evaluate problem areas. The use of film, versus observers sitting in cars counting traffic, allows documentation when presenting problems to affected groups. For example, the problem of parents dropping off their children at school crosswalks and impeding other traffic was virtually eliminated when films of this behavior were shown at PTA meetings.

School and Child Safety Programs

Education. The Sioux City Police Department Community Relations Division is extensively involved with school and child safety education programs. The "Officer Bill" program (started in 1971) is used in the first-grade classes at all public and private elementary schools. About two years ago the Police Department wanted to phase out "Officer Bill," feeling it couldn't afford to lose an officer for one or more months each year. However, the schools backed the program vigorously and were able to keep it intact. It is now one of the many public information duties of the Community Relations Division.

Crossing Guard Program. Student Safety Patrols are used to assist elementary-grade children in crossing the street going to and from school. All training of the Safety Patrol members is done by the Police Community Relations office in conjunction with the AAA and the school safety office. Incentives to do a good job on the patrol are offered in the form of parties and prizes at the end of the school year.

Safe Route Program. The Traffic Engineering Operations Department is in charge of developing safe route maps for each school. For the most part, these are along streets with sidewalks. Because sidewalks are not universally installed, parents of school children have become strongly involved in determining where sidewalks are required, and therefore where the safest routes are. Most safe route maps will have to be redone soon because of changes in sidewalk patterns, and school and residential developments.

Public Information

Between March and December 1976, over 9500 television spot announcements on all aspects of traffic safety were aired on local television. Most of these were developed by the city Transportation Department, the Police Community Relations Office, and the local AAA. In addition, newspapers and news broadcasters are involved in disseminating traffic-related information to the general public.

Sioux City, Iowa

AAA DATA SUMMARY

Population Group: 50,000 – 100,000

Ranking and Group Size 13 out of 169

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	799	1000	694
Pedestrian Death and Injury Record	423	450	381
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	14	75	27
Traffic Engineering	75	85	67
Safety Program Coordination	40	75	55
School Traffic Safety	95	105	99
Public Information and Education	67	125	42

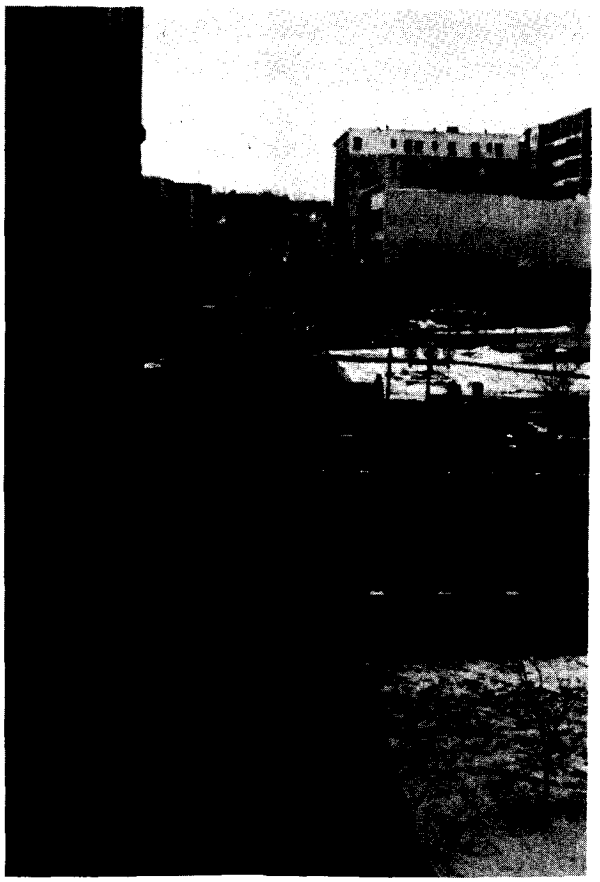
Awards Received

1976	Special Citation for Pedestrian Casualty Record
1975	–
1974	–
1973	–

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	85,900	–	–
Population Density	1640	–	3330
Percent Change 1960-70	−3.6	–	+18.0
Percent Nonwhite	2.2	5.6	10.3
Percent < 18 years old	34.1	33.6	34.0
Percent 18-64 years old	53.4	57.3	54.9
Percent > 64 years old	12.6	9.1	11.1
Percent Family = Wed Couple	87.4	88.9	85.6
Persons/Household	3.0	3.1	3.0
Employment			
Manufacturing/Industry	18.1	30.5	22.4
White Collar	51.4	54.7	50.7
Government	11.2	14.9	13.7
Income			
Mean ($\bar{x}$)	$9,300	$11,700	$9,700
Percent < Poverty	8.2	5.3	8.4
Percent > $15,000	16.4	28.3	19.2
Transportation to Work			
POV	83.9	82.2	81.3
Mass Transportation	4.3	6.4	8.2
Walk Only	8.0	7.7	7.4

Stop sign/pedestrian activated signal installation.



Downtown pedestrian mall.

Sioux Falls, South Dakota

COMMUNITY PROFILE

Sioux Falls is the largest city in South Dakota with a population of 85,000 people. It is located in the southeast corner of the state near the borders of Iowa and Minnesota. The city is situated on the banks of the Big Sioux River where a natural falls exists which gives the city its name.

Located in the area first explored by Lewis and Clark in the early 1800s, Sioux Falls was first settled by traders and trappers in search of fur-bearing animals. Troubled by Indian uprisings for several years, the town was permanently settled in the 1850s. A military outpost fort was built in 1865 which helped to secure the area.

Today, industry consists primarily of food processing – particularly meats. Livestock for meat and dairy products are raised on the rich pasturelands surrounding the city. Large supplies of corn, oats, and soybeans for shipment through Sioux Falls are also grown. Nonagricultural products manfactured include sheet metal products, mill work, and agricultural equipment. Shipment of locally produced and processed items is facilitated by two interstate highways (I-29 and I-90) and four major railroads.

The local area economy is also served by the Department of the Interior's Earth Resourcers Observation System (EROS) satellite Data Center located northeast of Sioux Falls.

The climate in Sioux Falls, as with the whole northern plains area, has typically cold snowy winters and warm summers.

Sioux Falls, South Dakota

Safety Program Coordination

Two groups have inputs into the Sioux Falls pedestrian safety program. The Traffic Safety Committee, a subcommittee of the Sioux Falls Safety Council, is made up of judges, sheriffs, police officers, and representatives from insurance companies, bus lines, trucking companies and the AAA. An effort is made to recruit those who are involved in traffic or safety related areas, but any interested citizen can be a member. The committee meets monthly to thoroughly discuss and brainstorm solutions to a particular safety problem. The meeting also serves to keep the members up to date on the activities of the Safety Council and current safety problems and solutions.

The Mayor's Committee, made up of city officials, traffic engineers, police, and representatives from the Safety Council, also meets monthly. This Committee addresses public complaints and acts as a sounding board for the City Council.

Traffic Engineering

Signalization and Signing. Standard pedestrian signals are located at intersections with pedestrian traffic.

Four 3M variable-message signs are located near two school crossings. A timer is set so that during the times children are walking to or from school, a beacon flashes and the sign posts the speed limit as 15 mph. At other times the speed limit reads 30 mph. These signs were installed due to public pressure about speed limits. Neither location had had any reported pedestrian accidents.

Crosswalks. Pedestrian crosswalks in Sioux Falls are painted in the zebra-stripe design using reflective paint. In an attempt to minimize the need for maintenance, the "black," unpainted stripe of the pattern is put where the tire tracks of vehicles generally are. This will reduce the wear on the white stripes.

Grade Separation. Two pedestrian overpasses that had been installed were recently removed; one for structural reasons, the second because of lack of use.

Studies. The Traffic Engineering Department initiates studies on school crossings. Presently, the department is trying to develop warrants for pedestrian facilities that will reflect the decrease in pedestrian volumes and the needs of Sioux Falls.

Specific complaints or problem areas brought to their attention will be investigated by the T.E. Department for recommended modifications.

School and Child Safety Program

Safety Patrol Program. The city of Sioux Falls has no adult crossing guards; traffic signals or student patrols are used instead. The student patrols are trained and supervised by the School Safety Officer. Materials for the program are provided by the AAA.

Safe Route Programs. The Safe Route to School program is a major focus in Sioux Falls. The Safety Council works with school principals, police, traffic engineers, and the PTA to determine safe routes, especially at schools with accident problems. At the beginning of the program, careful studies were done considering all possible routes. Safety officials determined safe routes and children documented the routes they actually followed. These were processed by the city computer to determine the "best" routes.

Education. The School Safety Officer of the Police Department goes into classrooms and assemblies at elementary schools to talk on pedestrian safety. He also takes students to crosswalks to demonstrate their proper use. There has been a problem in the past with accidents involving children in crosswalks.

A pilot project, Safety City, is being tested for use with preschool children. It is felt to be particularly important to work with this age group.

Provisions for the Elderly and the Handicapped

An increase of accidents involving elderly pedestrians has led to the development of a special safety effort oriented to this age group. This program is run through the Senior Citizen's Center. Safety officials speak to groups of elderly persons on their physical limitations and how this affects their safety in traffic. They also work with small groups of senior citizens, who then lead study groups or discussions on safety at the center.

The Traffic Engineering Department has started installing curb ramps at intersections throughout the city.

Public Information

Information on pedestrian safety is disseminated through radio spot announcements, television, and newspaper articles. These focus on pedestrian and motorist responsibilities and on the proper use of pedestrian WALK/DON'T WALK signals, a particular problem in the city.

Enforcement

Pedestrian laws are not enforced due to lack of support from the courts. No arrests of pedestrians have been made for jaywalking or of motorists involved in accidents with pedestrians.

Safety Program Recommendations

Education of children and adults is particularly important. A strong program in the schools is necessary. Coordination of the school program by a safety officer is essential. For the adult population, the use of media campaigns and factual programs is effective.

Sioux Falls, South Dakota

AAA DATA SUMMARY

Population Group: 50,000 – 100,000

Ranking and Group Size 10 out of 169

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	825	1000	694
Pedestrian Death and Injury Record	410	450	381
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	18	75	27
Traffic Engineering	62	85	67
Safety Program Coordination	70	75	55
School Traffic Safety	100	105	99
Public Information and Education	80	125	42

Awards Received

1976	Special Citation for Pedestrian Casualty Record
1975	–
1974	–
1973	–

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	72,500	–	–
Population Density	2470	–	3330
Percent Change 1960-70	+10.7	–	+18.0
Percent Nonwhite	1.0	2.1	10.3
Percent < 18 years old	35.6	35.2	34.0
Percent 18-64 years old	54.1	56.1	54.9
Percent > 64 years old	10.3	8.6	11.1
Percent Family = Wed Couple	88.1	89.1	85.6
Persons/Household	3.1	3.1	3.0
Employment			
Manufacturing/Industry	16.2	10.6	22.4
White Collar	56.1	58.3	50.7
Government	12.4	20.1	13.7
Income			
Mean ($\bar{x}$)	$ 9,600	$10,100	$9,700
Percent < Poverty	7.2	7.7	8.4
Percent > $15,000	16.6	19.5	19.2
Transportation to Work			
POV	80.9	83.7	81.3
Mass Transportation	3.3	1.9	8.2
Walk Only	11.0	9.8	7.4

Spokane, Washington

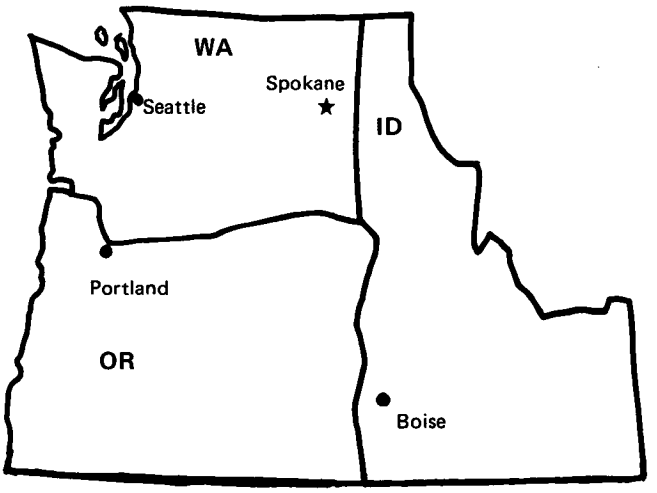
COMMUNITY PROFILE

Spokane is located 2356 feet above sea level on the west side of the Rocky Mountains in eastern Washington. With a population over 170,000, it is the largest city between Seattle (290 miles to the west) and St. Paul, Minnesota. Spokane is the hub of the "Inland Empire" market area covering eastern Washington, northern Idaho, and western Montana. The city is the largest rail center west of Omaha.

Both historically and into the present day, Spokane has been a center of the lumber industry in the northwest. The first settlement in the area in 1871 consisted of a house and a sawmill. Today the market is primarily made up of lumber and related products, mining (lead, zinc and silver), and agriculture (hops, apples, pears, wheat, lentils, and dry field peas). Outside of these three major industries, the majority of the work population are employed in the service, wholesale and retail trade, and governmental professionals.

The site of the World's Fair Expo '74 in downtown Spokane is being developed into a large central city park area. Convention facilities are being developed on these grounds to make the city an increasingly popular convention center. Numerous lakes, and National Parks and Forests in the surrounding area add to the attractiveness of this part of Washington.

The climate of the area is generally mild and arid in the summer, and cold and humid in the winter. Camping, hiking, fishing and hunting are popular summer activities. Winter sports include all snow-related activities (sledding, skiing, skating, etc.).



Spokane, Washington

Safety Program Coordination

The Spokane City Council has the approving authority for traffic safety and pedestrian programs. The City Manager is charged with carrying out the policies of the council. Coordination of all safety efforts rests with the Traffic Safety Commission. The Official Coordinating Committee for Traffic Safety, which has been a functioning committee of the TSC since 1951, brings city government and community representatives from the school system, AAA and insurance companies to focus upon major issues in the pedestrian and traffic safety field. This committee tries to identify possible future problem areas and works to inhibit their actual occurrence. The committee is also an information center, informing the community of what is being done in regard to traffic safety. The Traffic Safety Coordinator of the Safety Commission serves within this system and reaches out to civic, school, and business groups to focus attention on pedestrian and traffic safety activities.

There is a complaint and suggestion system available to the public through the Traffic Engineering Department. Issues presented through this system are handled on a high priority basis.

In addition to local, city-initiated programs, the local chapters of the National Safety Council and the American Automobile Association work very closely with the Spokane Traffic Safety Commission and Police Department by providing expert assistance and materials for ongoing safety programs.

Traffic Engineering

Signalization. Nearly all (90+%) of the signalized intersections have pedestrian signals. In the CBD, they are automatically tied into the traffic signal system. In the outlying areas, the WALK phase will go on only when manually activated. Marked crosswalks are put in at all locations with pedestrian signals.

Grade Separation. One of the continuing outgrowths of the World's Fair Expo '74 is the erection of a series of safety skywalks between buildings. Except for one constructed prior to 1972, these are all enclosed, second-story walkways in the central business district. Businesses owning the connected buildings have paid for all of these skywalks. They have improved the safety of pedestrians by reducing their exposure to vehicular traffic at street level. In addition, they have increased the economic stature of the connected establishments by increasing the amount of business conducted on the second and higher levels of the building without reducing the first floor business activity.

Sidewalks. There is a city ordinance requiring sidewalk installations in new developments. However, the City has not always required the developer or property owner to install the sidewalks. Recently the AAA approached the Official Coordinating Committee with the request that a study be made to consider the installation of sidewalks within ten blocks of every school. Action on this matter is pending in the Official Coordinating Committee.

Barriers. By City Council proclamation, streets are occasionally blocked off for pedestrian-related activities, such as play streets in the summer and sledding in the winter.

School and Child Safety Programs

Crossing Guard Program. Crossing guards are used at all elementary school crosswalks to assist children in crossing the street to and from school. The large majority of these are students who belong to the School Safety Patrol. Patrol members are at two or more school crossings per school. Students in the Patrol are generally fifth graders and are recommended by their teacher or principal.

All school crosswalks are marked. At unsignalized crossings, two Patrol members are used. At signalized crossings, three are present. Some crosswalks have special patrol activated traffic signals. Upon activation by the third Safety Patrol member using a key (vs. pushbutton), flashing amber lights are presented to the traffic lanes. Vehicles are required to stop when these lights are flashing. After vehicles have halted, the Patrol member blows a whistle indicating a sufficient gap is present and the other two members enter the street with "STOP" sign flags to keep vehicles halted; the third member holds the children back on the curb. After the two street members are in place, the whistle is again blown allowing the children to cross. After they have finished crossing, the whistle is blown a third time, telling the two guards to return to the sidewalk. The signal is deactivated (no flashing lights) until the next group of children arrive at the corner.

Although the Patrols have the right of way in the street, they are instructed to wait until a sufficient gap is present prior to entering. The Safety Patrol is present at the crosswalks in the morning, noon, and afternoon school trip times. Most student patrols are posted within one or two blocks of the school.

The Safety Education Division of the city Police Department is in charge of school and adult Patrol training. The following year's Patrol members are selected and initially trained during the previous spring semester. The local public television station (which is owned by the school system) is involved in this training process. The success of the school patrol program depends in part on incentive programs, such as parties, letters of recognition, awards, etc.

There are presently four intersections where adult crossing guards are being used. These guards are hired by the school. There is a desire to have more, but there has been a great deal of difficulty finding volunteers (because of the sometimes very cold winter weather, or the minimum pay scale). Adult guards when available, patrol the busier intersections.

School Crossings/Safe Route Program. All school crosswalks are marked. Parking is prohibited immediately adjacent to the crossings to allow greater pedestrian and driver sight distances.

There is also a Safe Route to School program using AAA materials. The AAA encourages schools to establish and identify safe routes for their students.

Education. To increase visibility to vehicles, children are issued retroreflective "Hot Dots" and stripes. At all levels, from preschool day care centers up to and including the sixth grade, these programs have proven beneficial in providing a great emphasis upon the need for children to be seen. Along with the improvement in visibility, the day care centers have been emphasizing the training of children in proper pedestrian techniques through an AAA program entitled, "Preschool Children in Traffic".

Provisions for the Elderly and the Handicapped

Curb-cut ramps are being put in throughout the city for elderly and wheelchaired persons. Assistance to the visually handicapped has appeared in the form of orange paint on the risers of city busses to provide better visual cues for climbing aboard. Talks are given to organizations for the elderly on all aspects of safety (traffic, home, fire, etc.). Emphasis in these talks has centered on the limitations that old age puts on a person's capabilities. Retroreflective materials have been given to elderly persons to augment their conspicuity at night.

Enforcement

Pedestrian safety involving jaywalking in the central business district has had to be placed in its proper priority basis with other traffic safety matters. With limited manpower in the Police Department and statistics which indicate low accident frequency and injury severity resulting from jaywalking maneuvers at midblock locations, the police have concentrated on enforcing the law at intersections. Disobedience to traffic signals and pedestrian signal indicators is the prime focus of the enforcement campaign.

Safety Program Recommendations

The number of pedestrians injured and killed in the City of Spokane has decreased every year since 1972. Several factors influence this trend. Among them are continued improvement in traffic engineering features, such as improved lighting, installation of more pedestrian traffic control devices, and greater use of channelization. There has also been continuing pedestrian and driver education programs, enforcement of pedestrian related laws at intersections and in crosswalks, and an overall emphasis on "obeying the law."

Spokane, Washington

AAA DATA SUMMARY

Population Group: 100,000 – 200,000

Ranking and Group Size 5 out of 62 (1975)

Category Breakdown	City Score (1975)	Maximum Possible	Pop. Group Standard
Total	866	1000	668
Pedestrian Death and Injury Record	390	450	345
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	43	75	24
Traffic Engineering	76	85	72
Safety Program Coordination	70	75	55
School Traffic Safety	100	105	100
Public Information and Education	102	125	45

Awards Received

1976	–
1975	Award of Merit
1974	Award of Excellence
1973	Award of Excellence

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	170,500	–	–
Population Density	3050	–	3330
Percent Change 1960-70	−6.1	–	+18.0
Percent Nonwhite	3.0	3.5	10.3
Percent < 18 years old	31.2	30.0	34.0
Percent 18-64 years old	54.8	56.9	54.9
Percent > 64 years old	14.0	13.1	11.1
Percent Family = Wed Couple	85.4	86.1	85.6
Persons/Household	2.7	2.7	3.0
Employment			
Manufacturing/Industry	10.8	12.5	22.4
White Collar	54.5	56.9	50.7
Government	15.2	19.4	13.7
Income			
Mean ($\bar{x}$)	$9,100	$9,450	$9,700
Percent < Poverty	9.3	8.7	8.4
Percent > $15,000	17.2	19.3	19.2
Transportation to Work			
POV	82.3	81.7	81.3
Mass Transportation	6.3	5.7	8.2
Walk Only	6.7	7.9	7.4

Tonawanda, New York

COMMUNITY PROFILE

Located just north of Buffalo along the Niagara River, Tonawanda is in the heart of the snow-belt of western New York state. Prior to being settled during the post Revolutionary War period in the early 1800s, this area was a stronghold of the Iroquois Indians. The name Tonawanda is an Indian word describing the "swift running water" of the creek flowing between what is now Tonawanda and North Tonawanda.

The first settlement was an outpost to provide protection against hostile Indians and British marauders from Canada. When the Erie Barge Canal was begun in 1823, the outpost quickly developed into a bustling community. By the mid-1800s, forestry became the prime industry with several sawmills and associated lumber businesses being established.

Although the lumber trade dwindled considerably with the gradual exhaustion of the lumber supply, the city's strategic location in the Niagara Frontier helped it emerge into a city with a widely diversified industrial base.

Tonawanda is directly accessible by the New York State Thruway (I-90), two public bus lines, and three railroad lines. Three major airlines serve Buffalo Airport.

Although famous for its cold, very snowy winters, western New York has a moderate summer climate with numerous recreational parks available for all types of sporting activities.

Tonawanda, New York

Safety Program Coordination

Pedestrian safety in Tonawanda is coordinated through the Traffic Safety Council. This is a committee of citizens who have some experience with traffic safety problems. They meet once a month, or more often if necessary, to discuss study requests, complaints, and proposed changes. If necessary, city officials or traffic engineers are consulted. Recommendations then go to the City Council. Each year the members of the Police Department responsible for pedestrian safety review problems that have come up during the previous year in an attempt to avoid similar problems in the future.

Traffic Engineering

Signalization. Intersections in the central business district all have pedestrian signals with the traffic signals where heavy pedestrian and/or vehicle traffic warrant. The signals were installed two to three years ago as part of the extensive redevelopment of the downtown area.

Signing. New York State code requires school crossing signs at all school crosswalk intersections. Pedestrian crossing signs are also located at crossings near swimming pools.

Crosswalks. Marked crosswalks have been painted at most intersections following an extensive campaign to make intersections more noticeable. Children going to pools in the summer tended to cross at midblock, so midblock crosswalks have been painted in some pool areas.

Studies. When accidents occur frequently at a particular location, the police and the Engineering Department work together to survey the situation.

School and Child Safety Programs

Crossing Guard Program. Crossing guards hired by the city are posted at most school intersections. They are trained for three to four days during the summer at a special class run by the Buffalo Police Department. A police officer or experienced guard works with them on location for several days. They are used as substitutes until they work their way up to full guard status. The police periodically check each guard and occasionally meet with all the guards to discuss responsibilities and problems.

The schools run a program of student safety patrols. Honor students generally are selected to be patrol members.

Education. The schools, assisted by the police, run traffic safety education programs. The Police Department requests that the schools allow them to come in and give speeches to classes in an attempt to reach everyone. They try to vary their school lectures every year to keep the attention of the students. Materials produced by the Police Department are handed out for children to take home.

Public Information

The Police Department is particularly aware of the need for public information and education. The department occasionally puts out pamphlets and leaflets on safety problems and countermeasures. Lectures are given on request to civic groups.

The police also make use of the mass media: writing articles for the newspaper and periodically making radio announcements reminding people of special problems (seasonal, construction, etc.). Throughout 1975 the Tonawanda Chief of Police and three other area Police Chiefs wrote a weekly newspaper article covering traffic, pedestrian and bicycle safety, crime, rape, etc.

Enforcement

The policy of the Tonawanda Police Department is to use common sense in enforcing pedestrian laws. Summonses are given for flagrant violations, repeated offenses, and disregard of police warnings. Many children and students walk in the streets (especially in the winter) and disregard the traffic. They are warned to get out of the street, and if they don't obey, are given a summons. The courts generally uphold citations issued, either fining violators or putting them on probation.

Many of the pedestrian accidents occurring in Tonawanda involve drunk pedestrians. Although it is no longer legal to arrest people for public intoxication, intoxicated pedestrians are sent to a halfway house or taken to the police station to sober up before being sent home.

Safety Program Philosophy

The most important considerations in developing and running a safety program are to use common sense and consider the human element. One must find effective ways to inform and educate people about safe pedestrian behavior. This is especially true for the children and elderly persons.

Those involved with traffic and pedestrian safety should become and remain aware of the problems in their city and continually work for improved pedestrian safety.

Tonawanda, New York

AAA DATA SUMMARY

Population Group: 25,000 – 50,000

Ranking and Group Size 11 out of 374

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	735	900	551
Pedestrian Death and Injury Record	280	350	266
Accident Records	70	70	70
Legislation	0	15	15
Enforcement	64	75	21
Traffic Engineering	80	85	60
Safety Program Coordination	64	75	45
School Traffic Safety	100	105	96
Public Information and Education	77	125	40

Awards Received

1976	Special Citation for Pedestrian Program Activities
1975	Award of Merit
1974	Special Citation for Pedestrian Program Activities
1973	–

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	21,900	–	–
Population Density	7690	–	–
Percent Change 1960-70	+1.6	–	+7.8
Percent Nonwhite	0.4	2.1	4.4
Percent < 18 years old	36.4	34.7	32.2
Percent 18-64 years old	54.7	55.4	56.1
Percent > 64 years old	8.9	9.8	11.7
Percent Family = Wed Couple	87.7	88.5	87.8
Persons/Household	3.3	3.3	2.9
Employment			
Manufacturing/Industry	40.8	31.6	25.1
White Collar	42.7	53.0	50.8
Government	12.0	14.4	17.1
Income			
Mean ($\bar{x}$)	$10,500	$11,800	$9,600
Percent < Poverty	6.1	5.8	8.3
Percent > $15,000	21.6	27.8	19.0
Transportation to Work			
POV	–	–	–
Mass Transportation	–	–	–
Walk Only	–	–	–

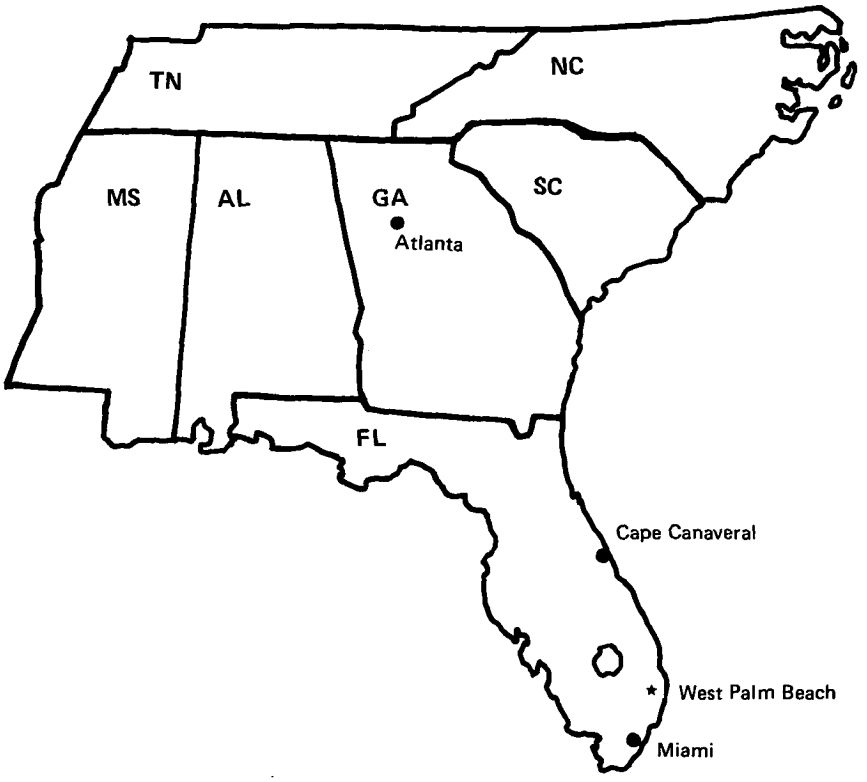
West Palm Beach, Florida

COMMUNITY PROFILE

West Palm Beach is located on the Atlantic shore of Florida about 65 miles north of Miami. Typical of most of this area of Florida, the main portion of the economy is centered around the retail business associated with the high level of tourism. Other major industries include aerospace, electronics, marine and oceanography, and construction. In addition, the surrounding area is prime agricultural land with citrus fruits, vegetables, or sugar cane being grown throughout the year. Cattle raising is another important local business.

To support these industries and the influx of the tourist population, West Palm Beach is served by all modes of transportation. Four major airlines (National, Delta, Eastern and United) fly into the local airport. Amtrak regular and Autotrain routes, plus the Seaboard Coast Line Railroad stop in West Palm Beach. The port and marinas serve interstate and international shipping as well as local yachting. Long distance automobile and truck traffic can reach the city on U.S. Highway 1, interstate I-95, or the Sunshine State Parkway.

The relatively mild climate has also made West Palm Beach an ideal retirement community. Several communities of elderly people exist throughout the city. To provide some recreational activities for these people, there is a multitude of parks scattered around the city.



Safety Program Coordination

The Traffic Engineering Department deals with most complaints and problems as they arise. They meet annually with the Florida Department of Transportation and the Palm Beach County School Department to plan for problems that may come up during the year.

Because they are dealing with safety every day, the traffic engineers have established a close relationship with the police, schools, and citizen groups. They work closely with the Director of Transportation for the School Board.

Traffic Engineering

West Palm Beach has a fluctuating population made up of the permanent residents and in-season visitors. To accommodate these visitors, the *Manual on Uniform Traffic Controls and Devices* is followed as strictly as possible. Conformity with the rest of the country should reduce the potential problem of misunderstanding of local procedures by the transient population.

Signalization. Intersections in West Palm Beach have been signalized individually according to pedestrian flow. The city is doing extensive upgrading of its signals, particularly those near schools. There is an attempt to unify all signals to the standards in the MUTCD. Traffic signals are being relocated to hang above the middle of traffic lanes, with smaller signals mounted on poles on the corners of one-way streets for use by pedestrians.

Pushbutton pedestrian signals are located at major intersections downtown and near schools. In the downtown area there are five intersections with separate "scramble" signal phases for pedestrians. Most of the signals have steady WALK/steady DONT WALK phases although they are starting to use the Flashing WALK phase at locations with possible vehicle-pedestrian conflicts.

Right-turns-on-red are permitted in West Palm Beach except at blind intersections and intersections with scramble signals. There have been few problems with this.

Signing. The T.E. Department is trying to avoid overuse of signs because they are not heeded and cause confusion. Crosswalk signs are located at midblock crossings and places where the crosswalk is to be emphasized. A "Pedestrian Don't Cross Here" sign at one location was ignored, so a crosswalk was put in and the sign taken out.

Crosswalks. Crosswalks are located at urban intersections, at schools, and midblock in some areas. On the main shopping street, the sidewalks were brought further into the street at crosswalks to shorten the distance to be crossed. In some cases traffic signals have been taken out because they were not warranted and crosswalks have been painted.

In residential areas where marked crosswalks are not warranted, a stop bar is painted delineating where cars should stop.

Malls. To the detriment of the city center, many shopowners have been moving from downtown to a large mall on the edge of town. In an effort to revitalize the CBD, there are plans for turning the major shopping street into a pedestrian mall for three blocks to give pedestrians a safer and more pleasant environment. Some work has been done in this direction by widening the sidewalks and putting in benches and plants.

Studies. Studies are carried out in response to complaints, or when changes are being considered by the T.E. department. In addition, the monthly police accident statistics report is evaluated to pinpoint problem areas and identify trends.

School and Child Safety Problems

Crossing Guard Program. The Police Department trains and supervises 22 adult school crossing guards located at the elementary schools. The guards are given one week of classroom instruction, supplemented by audio-visual materials, at the Police Academy. One guard is delegated supervisor, and checks each intersection daily. She or an alternate fill in for absent guards. Two traffic officers supervise this program and help at intersections with special problems.

Student patrols are trained by the schools and supervised by the adult guards. The Police Department fosters competition for safe intersections by giving awards for the best patrols.

School Crossings. The Traffic Engineering Department has been modernizing school intersections, adding pedestrian-actuated signals with steady or flashing WALK phases. The department coordinates with the school board in identifying problem locations and determining where to install signals or crossing guards. Most crosswalks have been painted on one side of the intersection only, channeling all pedestrians to cross there.

Signs warn motorists about school zones, and at some locations the word SCHOOL is painted on the street. Marked crosswalks are located at all school intersections and directly in front of schools. The Traffic Department annually checks for changes in pedestrian or vehicle flow and warranted adjustments are made.

Education. The Police Department gives safety education lectures to elementary level children. The Traffic Engineering Department talks to the PTA and other citizen groups.

Provisions for the Elderly and the Handicapped

All new sidewalk construction must allow for curb-cut ramps. There have already been problems with this with the nonhandicapped not expecting the cuts and tripping over them. In some cases the state has put in cuts that are not wide enough to accommodate wheelchairs.

At one signal on a wide street with a median, a pushbutton has been installed on the median for those who can't cross the entire street during the WALK phase of one cycle. Pedestrians cross half way during each cycle green phase.

A special signal for the blind was installed about fifteen years ago. The signal is located midblock at a bus stop and leads from a shopping center and the bus stop to a factory employing many blind workers. The signal is pedestrian actuated and a loud bell rings during the WALK phase.

Public Information

The Traffic Engineering Department has not found a very satisfactory method of educating or communicating with the public, so it is concentrating on making facilities consistent, simple, and easy to understand. Press releases are written on major changes and there have been 30-second spots on television to explain new signs. Educating media personnel is often found to be necessary. The department prefers to work internally through schools, churches, civic organizations, etc.

An additional problem with public education results from the high level of transient visitors. It is virtually impossible to inform this subpopulation of all unique or important traffic situations in the city. This lack of knowledge can lead to safety-related problems for themselves and the permanent residents.

Accident Analysis

The Police Department gathers detailed accident data in a monthly statistical report. This report is studied by the Traffic Engineering Department to identify special problem areas.

Safety Program Recommendations

Uniformity is a necessary feature of a good safety program. Education of the public is important and use of visual aids (movies, slide shows, booklets and pamphlets) along with presentations would be useful. Traffic and accident studies should be an ongoing part of the program. *Qualified* people should be involved in these studies.

West Palm Beach, Florida

AAA DATA SUMMARY

Population Group: 50,000 – 100,000

Ranking and Group Size 32 out of 169

Category Breakdown	City Score	Maximum Possible	Pop. Group Standard
Total	736	1000	694
Pedestrian Death and Injury Record	409	450	381
Accident Records	70	70	70
Legislation	15	15	15
Enforcement	21	75	27
Traffic Engineering	69	85	67
Safety Program Coordination	25	75	55
School Traffic Safety	90	105	99
Public Information and Education	37	125	42

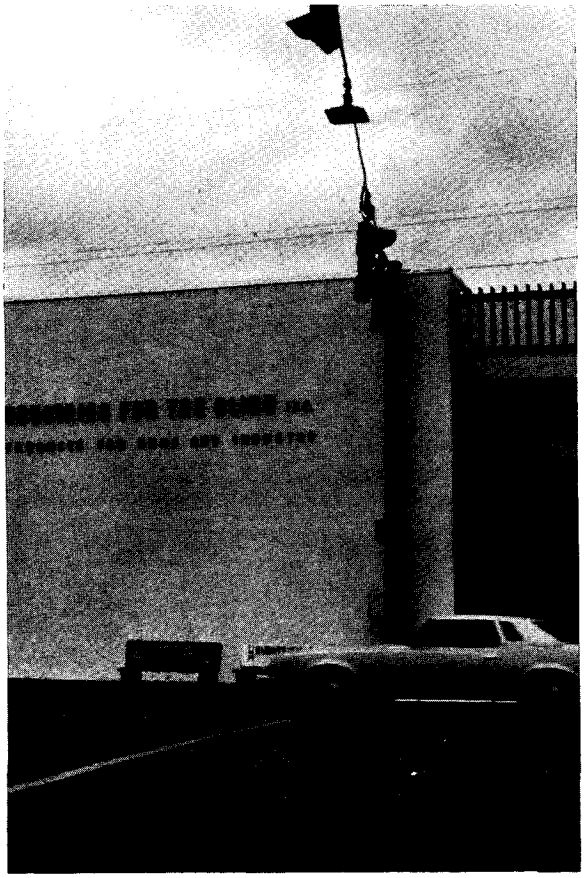
Awards Received

1976	Special Citation for Pedestrian Casualty Record
1975	–
1974	–
1973	–

1970 CENSUS DATA SUMMARY

Category Breakdown	City Data	Pop. Group Region/State $\bar{x}$	Data Base City $\bar{x}$
Population	57,400	–	–
Population Density	3380	–	3330
Percent Change 1960-70	+2.1	–	+18.0
Percent Nonwhite	24.7	23.2	10.3
Percent < 18 years old	25.5	32.4	34.0
Percent 18-64 years old	55.7	56.1	54.9
Percent > 64 years old	18.8	11.5	11.1
Percent Family = Wed Couple	81.5	82.5	85.6
Persons/Household	2.5	3.0	3.0
Employment			
Manufacturing/Industry	12.9	21.7	22.4
White Collar	49.5	50.2	50.7
Government	13.0	16.2	13.7
Income			
Mean ($\bar{x}$)	$8,400	$8,500	$9,700
Percent < Poverty	12.3	14.0	8.4
Percent > $15,000	17.8	16.7	19.2
Transportation to Work			
POV	83.5	83.1	81.3
Mass Transportation	7.1	5.8	8.2
Walk Only	5.9	6.8	7.4

West Palm Beach, Florida

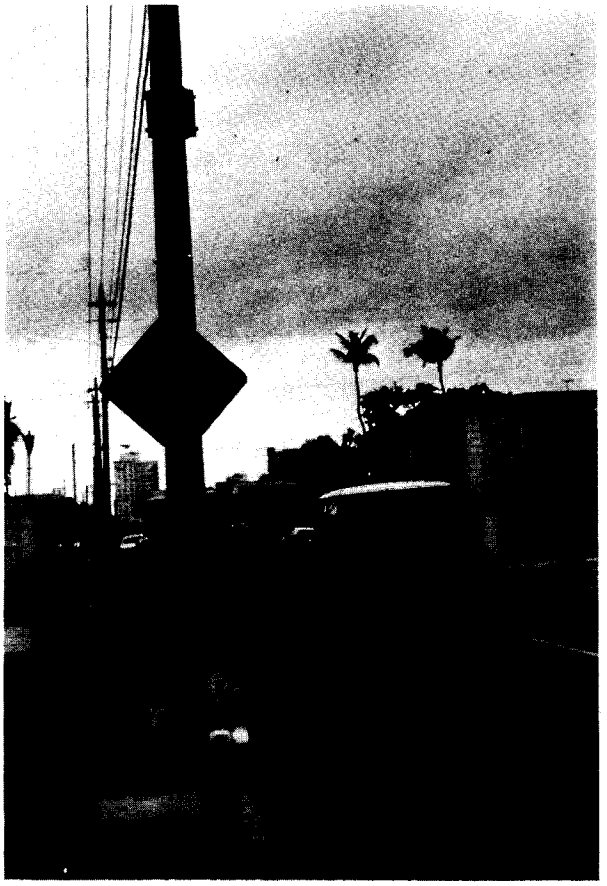


Midblock crosswalk with pedestrian activated signal; bell (located above the roadway) clangs for pedestrians when the WALK phase is on.

Midblock crosswalk; sidewalks extended into parking lane giving greater visibility of pedestrians and shorter walking distance.

West Palm Beach, Florida

Post on median activates signal for pedestrians unable to cross all the way on one cycle.



Midblock crosswalk with flashing yellow beacon.

* U.S.G.P.O. 726-833/1302-1473

FEDERALLY COORDINATED PROGRAM (FCP) OF HIGHWAY RESEARCH AND DEVELOPMENT

The Offices of Research and Development (R&D) of the Federal Highway Administration (FHWA) are responsible for a broad program of staff and contract research and development and a Federal-aid program, conducted by or through the State highway transportation agencies, that includes the Highway Planning and Research (HP&R) program and the National Cooperative Highway Research Program (NCHRP) managed by the Transportation Research Board. The FCP is a carefully selected group of projects that uses research and development resources to obtain timely solutions to urgent national highway engineering problems.*

The diagonal double stripe on the cover of this report represents a highway and is color-coded to identify the FCP category that the report falls under. A red stripe is used for category 1, dark blue for category 2, light blue for category 3, brown for category 4, gray for category 5, green for categories 6 and 7, and an orange stripe identifies category 0.

FCP Category Descriptions

1. Improved Highway Design and Operation for Safety

Safety R&D addresses problems associated with the responsibilities of the FHWA under the Highway Safety Act and includes investigation of appropriate design standards, roadside hardware, signing, and physical and scientific data for the formulation of improved safety regulations.

2. Reduction of Traffic Congestion, and Improved Operational Efficiency

Traffic R&D is concerned with increasing the operational efficiency of existing highways by advancing technology, by improving designs for existing as well as new facilities, and by balancing the demand-capacity relationship through traffic management techniques such as bus and carpool preferential treatment, motorist information, and rerouting of traffic.

3. Environmental Considerations in Highway Design, Location, Construction, and Operation

Environmental R&D is directed toward identifying and evaluating highway elements that affect the quality of the human environment. The goals are reduction of adverse highway and traffic impacts, and protection and enhancement of the environment.

4. Improved Materials Utilization and Durability

Materials R&D is concerned with expanding the knowledge and technology of materials properties, using available natural materials, improving structural foundation materials, recycling highway materials, converting industrial wastes into useful highway products, developing extender or substitute materials for those in short supply, and developing more rapid and reliable testing procedures. The goals are lower highway construction costs and extended maintenance-free operation.

5. Improved Design to Reduce Costs, Extend Life Expectancy, and Insure Structural Safety

Structural R&D is concerned with furthering the latest technological advances in structural and hydraulic designs, fabrication processes, and construction techniques to provide safe, efficient highways at reasonable costs.

6. Improved Technology for Highway Construction

This category is concerned with the research, development, and implementation of highway construction technology to increase productivity, reduce energy consumption, conserve dwindling resources, and reduce costs while improving the quality and methods of construction.

7. Improved Technology for Highway Maintenance

This category addresses problems in preserving the Nation's highways and includes activities in physical maintenance, traffic services, management, and equipment. The goal is to maximize operational efficiency and safety to the traveling public while conserving resources.

0. Other New Studies

This category, not included in the seven-volume official statement of the FCP, is concerned with HP&R and NCHRP studies not specifically related to FCP projects. These studies involve R&D support of other FHWA program office research.

* The complete seven-volume official statement of the FCP is available from the National Technical Information Service, Springfield, Va. 22161. Single copies of the introductory volume are available without charge from Program Analysis (HRD-3), Offices of Research and Development, Federal Highway Administration, Washington, D.C. 20590.