

**Report No. FHWA-RD-75-104**

# **SCHOOL TRIP SAFETY AND URBAN PLAY AREAS**

**Vol. I Executive Summary**

**Martin L. Reiss**



**November 1975**

**Final Report**

This document is available to the public  
through the National Technical Information  
Service, Springfield, Virginia 22161

**Prepared for**

**FEDERAL HIGHWAY ADMINISTRATION**

**Offices of Research & Development**

**Washington, D.C. 20590**

## NOTICE

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

The contents of this report reflect the views of BioTechnology, Inc. which is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policy of the Department of Transportation. This report does not constitute a standard, specification, or regulation.

The United States Government does not endorse products or manufacturers. Trade or manufacturers names appear herein only because they are considered essential to the object of this document.

## FHWA DISTRIBUTION NOTICE

Sufficient copies of this report are being distributed by the FHWA Bulletin to provide a minimum of five copies to each regional office, three copies to each division office, and ten copies to each State highway agency.

1. Report No. FHWA-RD-75-104		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle SCHOOL TRIP SAFETY AND URBAN PLAY AREAS Volume I. Executive Summary				5. Report Date November 1975	
				6. Performing Organization Code	
7. Author(s) Martin L. Reiss				8. Performing Organization Report No.	
9. Performing Organization Name and Address  BioTechnology, Inc. 3027 Rosemary Lane Falls Church, Virginia 22042				10. Work Unit No. (TRAIS) FCP 31E2032	
				11. Contract or Grant No. DOT-FH-11-8126	
				13. Type of Report and Period Covered  Final Report	
12. Sponsoring Agency Name and Address U.S. Department of Transportation Federal Highway Administration Offices of Research and Development Washington, D.C. 20590				14. Sponsoring Agency Code	
15. Supplementary Notes  FHWA Contract Manager: John C. Fegan, HRS-41					
16. Abstract  The purpose of the School Trip Safety and Urban Play Areas research project was to develop guidelines for the protection of young pedestrians (5-14 yrs) walking to and from school, entering and leaving school buses, and at neighborhood play. Volume I summarizes the entire project, providing an overview of the other documents developed during this Federal Highway Administration sponsored project. These include:  Volume II -- Student and Driver Perception of School Trip Safety and Traffic Control Devices  Volume III - A Survey of the Characteristics of the Urban Play Street  Volume IV - An Analysis of Daylight Savings Time-Related Student Pedestrian Safety Problems and Countermeasures  Volume V - Guidelines for the Development of Safe Route Maps for the School Walking Trip  Volume VI - Guidelines for Planning School Bus Routing and Scheduling  Volume VII - Guidelines for the Creation and Operation of Urban Play Streets  Research findings obtained under the project indicate that young students (5-9 yrs) are overinvolved in pedestrian accidents and are unaware of, or do not discriminate between various traffic control devices when compared to older students (10-14 yrs). Drivers in school areas do not generally perceive school signs other than the flashing school speed limit signs. School trip safety programs incorporating walking trip maps prepared by traffic engineering personnel permit the school and the parents to focus on a tangible means of improving student safety.  The urban play street, which is a street temporarily closed to traffic while a variety of supervised recreational activities for all age groups take place, provides a safe environment for urban play.					
17. Key Words Student Perception of Traffic, Control Devices, Driver Perception of Traffic Control Devices, Safe School Walking Trip Maps, Operation of Urban Play Streets			18. Distribution Statement No restrictions. This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161		
19. Security Classif. (of this report)  Unclassified		20. Security Classif. (of this page)  Unclassified		21. No. of Pages  13	22. Price

## **PREFACE**

The work accomplished under the young pedestrian research project during the period from July 1973 to June 1975 is reported in six volumes in addition to this executive summary (Volume I).

### **Volume II. Student and Driver Perception of School Trip Safety and Traffic Control Devices**

Volume II describes the conduct of two field surveys; a survey of approximately 1,000 students (kindergarten through 8th grade), and a survey of some 400 motorists at school locations in New York, Maryland, and Virginia. It describes the perceptions and behaviors of the two groups as they relate to specific traffic control devices.

### **Volume III. A Survey of the Characteristics of the Urban Play Street**

Volume III contains a brief review of relevant recreation and pedestrian accident literature. It provides a detailed description of existing play streets based on observations of 100 New York City and Philadelphia play streets, and surveys conducted on 20 New York play streets.

### **Volume IV. An Analysis of Daylight Savings Time-Related Student Pedestrian Safety Problems and Countermeasures**

Volume IV provides a description of the effect of reduced light conditions, resulting from the implementation of Daylight Savings Time (DST), upon the student walking to school or to school buses. The development of a survey to identify increased safety hazards and potential countermeasures is described. A critique of the countermeasures is discussed in terms of their accident reduction potential, cost, user acceptance, and implementation difficulties.

### **Volume V. Guidelines for the Development of Safe Route Maps for the School Walking Trip**

Volume V provides the traffic engineer with a school trip map program based on a series of ten incremental steps. The recommended steps include preparation of a base map, conducting an inventory of the walking areas within the school boundaries, identification of the safest student walking routes, development of handout maps, means of distributing the maps, and evaluating the program.

## **Volume VI. Guidelines for Planning School Bus Routing and Scheduling**

Volume VI recommends the conduct of school bus routing through a series of seven tasks. These include the determination of hazards, development of criteria for routes and schedules, and an evaluation of the program developed. Each task is described in terms of an objective, implementation procedures, and suggested task policy statements.

## **Volume VII. Guidelines for the Creation and Operation of Urban Play Streets**

Volume VII describes the procedures for establishing and improving a city-wide play street program. It discusses the objectives of such a program, the current status of existing programs in the U.S., and the required resources for their implementation. Vehicular control through signing and physical barriers is recommended. The problems of parking and vehicular access are considered.

SCHOOL TRIP SAFETY AND NEIGHBORHOOD  
PLAY AREAS

REPORT REQUEST FORM

PLEASE SEND ME THE VOLUMES I HAVE CHECKED BELOW:

- \_\_\_ VOL. I. EXECUTIVE SUMMARY
- \_\_\_ VOL. II. STUDENT AND DRIVER PERCEPTIONS OF SCHOOL TRIP  
SAFETY AND TRAFFIC CONTROL DEVICES
- \_\_\_ VOL. III. A SURVEY OF THE CHARACTERISTICS OF THE URBAN  
PLAY STREET
- \_\_\_ VOL. IV. AN ANALYSIS OF DAYLIGHT SAVINGS TIME RELATED  
STUDENT PEDESTRIAN SAFETY PROBLEMS & COUNTERMEASURES
- \_\_\_ VOL. V. GUIDELINES FOR THE DEVELOPMENT OF SAFE WALKING  
TRIP MAPS
- \_\_\_ VOL. VI. GUIDELINES FOR PLANNING SCHOOL BUS ROUTING AND  
SCHEDULING
- \_\_\_ VOL. VII. GUIDELINES FOR THE CREATION AND OPERATION OF  
URBAN PLAY STREETS

PLEASE SEND THESE REPORTS TO THE FOLLOWING ADDRESS:

---

---

---

---

PLEASE SEND THIS FORM TO:

Mr. David Solomon  
Federal Highway Administration  
HRS-40  
Washington, D.C. 20590

## PROJECT SUMMARY

This report summarizes the research conducted during the young pedestrian project. The project objective was the development of guidelines for the protection of young pedestrians (ages 5 years to 14 years) walking to and from school, entering and leaving school buses, and at neighborhood play. These guidelines (Volumes V–VII) were based on field surveys of the young pedestrian and the driver regarding designated school zones and specific school crossing protective devices, as well as the play street user population, its needs, and the behavior of traffic in the play street area.

### The Trip to School (Volumes II, IV–VI)

Three sources of information were used to define problems and develop guidelines for safety programs. These included:

- Accident data
- Young pedestrian knowledge and stated behavior (field study)
- Driver knowledge and observed behavior (field study)

The accident data was primarily urban in origin and was used to determine the magnitude of young pedestrian school trip accidents and the specific ages of the young pedestrians involved.

The student survey was conducted in several states at urban, suburban, and rural schools. The objectives of these surveys were:

- Identify the student knowledges that need modification.
- Identify the student behaviors that need modification.
- Identify the procedures for modification of knowledges and behaviors.

The questions addressed by the student survey were:

- What do students know about Traffic Control Devices?
- What fears do students have in reference to traffic?
- How do students select their route to school?
- How do students cross the street?

The survey techniques used were developed through a series of pilot tests. Materials for kindergarten students were highly pictorial in nature and involved a story-line approach. Third, sixth and eighth graders were queried via a self-administered survey incorporating pictorials and other graphics.

The driver surveys were conducted at four school sites in three states. The objectives of these surveys were:

- Identify driver perceptions.

- Identify motivational factors.
- Identify reaction to school zone environment.
- Correlate responses with actual behavior.

The questions addressed by the Driver Survey were:

- How do drivers identify school zones?
- What motivational factors affect performance in the school zone?
- What safety information is conveyed via Traffic Control Devices (TCDs)?
- How effective are TCDs in eliciting safe driving practices?
- What is the consequence of children being present in the school zone?
- How can pedestrian safety be increased in school zones?

The techniques used for the collection of driver data were developed through a series of pilot tests. The driver was interviewed in his vehicle after having driven through the school zone. Driver perception of existing signing was tested and driver speed through school area recorded. The survey format used recall (free response) items rather than recognition (multiple choice).

The significant findings were as follows:

- The youngest students (5-8 years) are overinvolved in in school walking trip accidents.
- The older students (10-14 years) are underinvolved in school walking trip accidents.
- For school trip accidents, there is a decreasing likelihood of accident involvement as pedestrian age increases (from 5 to 14 years of age).
- The school walking trip accident represents between 10 and 20 percent of young pedestrian accidents. On the national level, it can be estimated that these accidents are in the order of 10,000 to 20,000 annually.
- Significantly more of the younger students than the older students indicated: that they are unaware of, or do not discriminate between various traffic control devices; that they consider uniformed crossing guards safer than other traffic control devices; and that they would vary their route to school on the basis of parental instructions.

Each of the four sites in the driver survey was marked with either one or two school warning and/or speed limit signs.

- Most drivers (89%) traveled past the signs one or more times a week. Most drivers (66%) reported seeing a school-related sign as they drove through the school zone.
- Less than half of the total responses correctly identified the signs that were present. The type of sign most frequently identified was the flashing school speed sign.
- The drivers indicated that they were aware of passing through a school zone. Over half (64%) correctly identified the speed limit through the school zone. Eighty-five percent of the drivers exceeded the legal speed limit (by an overall mean speed of ten miles per hour).

At two of the driver survey sites, a comparison was made of the drivers' apparent reaction to a flashing school speed limit sign as reflected by their observed speed. At Site 1, the school was visible to the driver from the location of the flashing speed limit sign. At Site 2, the school was *not* visible to the driver from the location of the flashing speed limit sign.

- No significant reduction in driver speeds was observed with the sign flashing at Site 1.
- A significant drop in speed was observed at Site 2 when the flash was operating compared to when the flash was not operating.

The recommendations made included:

- Development of local and state school safety programs encompassing safety treatments directed toward both the drivers and the students.
- Incorporating a Safe School Walking Route Map into the program.
  - Meetings between traffic engineering representatives and school officials for the purpose of surveying the school areas and developing inventory maps of existing traffic control devices, sidewalks, crosswalks, student patrols, crossing guards, and pedestrian hazards (including poor sight distances).
  - Conducting a traffic engineering analysis of the school areas based on the guidelines provided in the Manual of Uniform Traffic Control Devices.
  - Effecting safety modifications (removal of poorly situated crosswalks, installation of flashing school speed limit signs where sight distance is inadequate, removal of nonstandard signs, etc.).
  - Development of safe walking trip maps after effecting the safety modifications.
- The school safety program should be maintained and periodically evaluated as part of a continuing effort.
- The program cannot stop at the local level. To be successful, a widespread program with similar treatments, based on the same warrants, using standard signs at standard locations, is required.

Two additional aspects of the school trip, school bus routing and daylight savings time were considered and are described in Volumes VI and IV respectively. The guidelines for the accomplishment of the recommendations are provided in Volumes V and VI.

## **The Urban Play Street (Volumes III, VII)**

The primary sources of information relating to the urban play street were field surveys of the street, the play street users, residents and merchants, and the staff supervising the conduct of the play street. These surveys were augmented by interviews with city officials in New York and Philadelphia.

Play streets were first observed in New York City and Philadelphia. Structured surveys were then developed, two pilot tests conducted, and 20 New York City play streets randomly selected for surveys. The survey was designed to determine:

- Vehicular traffic patterns, parking, and means of restricting vehicular access.
- User activities: age, time, and equipment used.
- Reactions of residents and merchants, including problems.
- Changes desired by play street users.
- Play street descriptors: dimensions, population density, ownership of cars, and location of alternative recreation facilities.
- Descriptors of the staff supervising play street activities.

Some of the major findings were as follows:

### **Street and Area Descriptors**

- Most play streets were in densely populated minority areas (with an average of 272 family dwelling units per play street).
- Most play streets were described as having an empty or abandoned building and few commercial establishments.
- Most play streets had no other play streets within five blocks (70%).
- Typical play street hours were from 1 p.m. to 8 p.m. The heaviest use of the play street was at 5 p.m. (112 people per street).
- At any specific point in time, slightly less than half of the street was used for play street activities.

### **Observation of Vehicles on the Play Street**

- The average daily number of emergency and other vehicles driving through was two per street (this includes trucks delivering lunches).
- The average number of cars parked on a street was six vehicles.
- The average percent of parking capacity used was 14 (based on the street dimensions).

### Effective Service Area of the Play Streets

- 67 percent of the users live on the street.
- 28 percent live within three blocks.

### Service Period of the Play Street

- 83 percent use the street every day.
- 13 percent use the street three or four days a week.
- An average of eight hours a day is spent on the play street (supervision is provided seven hours per day).
- 48 percent of the children want the play street to open earlier.
- 69 percent of the children want the play street to stay open later (the desire to extend the hours of the streets was in conflict with the wishes of the adult residents).

### Games and Equipment Used Most Often

- Street Activities (64 percent): basketball, volleyball, stickball
- Sidewalk Activities (36 percent): table pool (table game), nok-hockey (table game), arts and crafts

### Play Street Residents and Merchants

- Most do not own cars (72% of the residents).
- A minority of the car owners (31%) had a problem due to street closure (parking was the major problem followed by difficulties associated with deliveries, noise, being handicapped, vandalism, and trash collection).
- Most adults surveyed (88%) *did not* have a problem due to the streets being closed to traffic.
- Most (93%) would *not* approve of vehicles being permitted to drive through the play street under controlled conditions (5 mph). The primary reason given for controlled vehicular access was for deliveries.
- Most thought the play street “reduces the number of children hit by cars” (96%).
- Most were against lengthening the hours of play street operation (63%).
- A few *were not* “glad street is closed to traffic” (8%); of these, 40 percent indicated that they have taken part in some play street activities.”

### “On-the-Street” Supervisors

- The average age of the staff was 25 years.
- 48 percent were male; 52 percent were female

- The average staff member has worked on a play street one previous summer, has had two additional paid summers of recreational experience, 1½ years of paid recreational experience, and has completed 14 years of schooling.
- The indicated occupations were:
  - teaching
  - social work
  - student
  - recreation director
- The average worker lives 13 blocks from the play street:
  - within 3 blocks=14%
  - 4 to 7 blocks=6%
  - 8 to 15 blocks=9%
  - over 15 blocks=71%
- Benefits seen for the play street program:
  - Social=54%
  - Educational=25%
  - Safety=12%
  - Supervision=9%

**The recommendations made included:**

- The use of signing and barricades to control vehicular access to the play street.
- The use of street selection criteria and traffic engineering surveys to determine play street locations. Primary selection criteria are youngsters using the streets to play and an analysis of the traffic flow in the area to insure that street closure will not create a significant problem.
- The use of surveys and petitions from potential play street residents in ultimate play street selections. The majority of the residents and merchants on the potential play street should:
  - be made aware that vehicular access restrictions will exist during play street hours
  - indicate by petition that they are willing to form a community organization to sponsor the play street
  - indicate by petition that they are willing to provide their time for supervision, coordination with the local agencies, and storage of equipment

The report found that the play street promotes community interest and spirit. The residents of the community believed the play street was beneficial since it reduced the potential for young pedestrian accidents in the area. The staff directing the play street programs described the primary benefits as social, educational, and increased safety.

The guidelines for the accomplishment of the play street recommendations are provided in Volume VII.

#### **Daylight Savings Time and Related Pedestrian Problems (Vol. IV)**

With the implementation of year-round Daylight Savings Time (DST) on January 6, 1974, children in many areas of the continental United States were required for the first time to walk to school or to school busses under conditions of darkness or twilight. The purpose of one aspect of the young pedestrian study was to address the implications these reduced light conditions have for school age pedestrian protection.

The study of the impact of reduced light conditions on school trip safety was performed in two phases. The first was the identification and categorization of increased school trip safety problems associated with DST and the countermeasures in use to mitigate these problems. The identification of increased safety hazards and countermeasures was primarily accomplished through a survey of individuals professionally involved in school trip safety and school trip planning. The major findings of the survey were:

- 78 percent of the survey sample felt year-round DST created additional hazards for children on their trip to school
- 82 percent reported that special measures or precautions had been implemented due to DST

Additionally, school trip safety hazards were identified through an analysis of characteristics of young pedestrian traffic accidents and fatalities. Several accident characteristics were of interest:

- 41 percent of the accident-involved children were struck while *not* attempting to cross the roadway
- 80 percent of children walking beside roadway were walking *with* the traffic
- 9 percent were school bus related

The second phase involved a critique of 14 selected countermeasures by the survey sample in terms of their accident reduction potential, cost, user acceptance and implementation difficulties. Some results of the ratings were:

- *Additional street lighting* and *additional crossing personnel* were the most highly rated countermeasures in terms of accident reduction potential
- Items to *improve crossing personnel conspicuity* received the highest ratings on cost, user acceptance, and implementation

