October 23, 1989

MEMORANDUM

TO: Olympia City Council; Dick Cushing, City Manager; Art O'Neal, Director of Public Works; Olympia School District

FROM: Randy Wesselman, Traffic Engineering Supervisor

SUBJECT: School Walk Study Update

In November, 1988, the Public Works Department, Transportation Division, in cooperation with the Olympia School District, initiated work to update the existing school walking routes. Attached is a copy of the School Walk Study, Update 1989, which updates the school walking route maps for each of the affected elementary schools in Olympia.

The information gathered as part of this study was used to establish the seven-year sidewalk program which the City Council approved in July, 1989. There is a section in the School Walk Study Update which outlines the seven-year program.

If you have any further questions or comments, please contact me at 753-8477.

RW/gsb
CITY OF OLYMPIA

SCHOOL WALK STUDY
UPDATE 1989

Prepared by Public Works Department
Transportation Division

October, 1989
Table of Contents

PREFACE .................................................................................................................. 1

METHODOLOGY .................................................................................................... 2

BLANK SURVEY RESULTS ................................................................................... 3
  GARFIELD ELEMENTARY SCHOOL ........................................................................ 4
  Figure 1: School Walking Route Plan .................................................................. 5
  LINCOLN ELEMENTARY SCHOOL ........................................................................ 6
  Figure 2: School Walking Route Plan .................................................................. 7
  L.P. BROWN ELEMENTARY SCHOOL ................................................................... 8
  Figure 3: Limited School Walking Route Map ...................................................... 9
  PIONEER ELEMENTARY SCHOOL ...................................................................... 10
  Figure 4: School Walking Route Plan .................................................................. 11
  ROGERS ELEMENTARY SCHOOL ........................................................................ 12
  ROOSEVELT ELEMENTARY SCHOOL .................................................................. 13
  Figure 5: School Walking Route Plan .................................................................. 14
  MADISON ELEMENTARY SCHOOL ..................................................................... 15
  Figure 6: School Walking Route Plan .................................................................. 16
  ST. MICHAEL'S ELEMENTARY SCHOOL ............................................................... 17
  Figure 7: School Walking Route Plan .................................................................. 18

SUMMARY AND RECOMMENDATIONS ................................................................ 19

IDENTIFICATION OF SIDEWALK NEEDS ......................................................... 20
  1989 ................................................................................................................ 21
    Madison School Area ......................................................................................... 21
  1990 ................................................................................................................ 22
    Pioneer School Area ........................................................................................ 22
  1991 ................................................................................................................ 22
    Garfield School Area ......................................................................................... 22
  1992 ................................................................................................................ 23
    Garfield School Area ......................................................................................... 23
  1993 ................................................................................................................ 23
    Roosevelt School Area ...................................................................................... 23
    Reeves School Area .......................................................................................... 24
  1994 ................................................................................................................ 24
    Roosevelt School Area ...................................................................................... 24
  1995 ................................................................................................................ 24
    Madison School Area ......................................................................................... 24

APPENDIX A .......................................................................................................... 28

APPENDIX B .......................................................................................................... 32

APPENDIX C .......................................................................................................... 40
PREFACE

In November, 1988, the City of Olympia Public Works Department, Transportation Division, in cooperation with the Olympia School District, #111, initiated work to update existing walking routes to and from elementary schools in Olympia. The original study, done in 1977, which is contained in the appendix, utilized the overall framework of a recommended practice of the Institute of Transportation Engineers (ITE), A Program for School Crossing Protection.

The intent of this study is to check the validity of the established walking routes and determine where sidewalks are needed along these routes.

The middle schools were also surveyed (Reeves, Washington, and Jefferson) but a limited response to the survey was received. The boundaries of the middle schools encompass the elementary school boundaries, therefore the walking routes of the middle schools follow many of the elementary school walking routes. Those responses which were received from the middle schools were taken into consideration.

The following chapters describe the work involved in updating the existing school walking route plans for seven elementary schools in the Olympia School District and one Catholic elementary school within Olympia. The McKinley Elementary School has been eliminated from this document since it is no longer in use, and the L.P. Brown School has been added.

Recommendations as to where sidewalks should be installed are based upon findings from the original study and the survey done in November, 1988.

This study does not evaluate school crossings for the need or adequacy of signing or markings, or whether apparent hazards exist at these crossings which would require special protection for a school crossing. It is intended that these issues will be addressed through a School Traffic Safety Committee which is a recommendation of this study.

The appendix contains the original School Walking Route Study completed in 1977, letters used for the blank map survey, and other pertinent information.
METHODOLOGY

The process and procedure followed in this study for evaluating the existing walking routes follows to a large extent guidelines established in "A Program for School Crossing Protection" (ITE). This study does not, however, evaluate school crossings for the need or adequacy of signing or markings, or whether apparent hazards exist at these crossings which would require special protection for a school crossing.

The Olympia Public Works Department worked with the Olympia School District Elementary School Principals and Middle School Principals in distributing the "blank map" survey. Students were asked to mark on a map the route she or he followed walking to school or the school bus stop. Students who usually travelled by bicycle were also asked to mark their route. If the return walk was not the same as that going to school it was also asked that it be marked on the map. Students were also asked to indicate the walking routes used during bad weather if they were not the same as good weather routes.

Also attached to the "blank map" was a survey on which parents were asked to answer questions pertinent to the walking routes (see appendix for survey). The responses varied and were summarized. It is intended that the concerns expressed regarding the need or adequacy of signing or markings, and whether apparent hazards exist at any crossings which would require special protection for a school crossing will be addressed by a School Traffic Safety Committee.

The results of the "blank map" survey completed in November, 1988, were mapped and then reviewed by each of the school principals, teaching staff, and associated parent/teacher organization. Any changes to the established walking routes were reflected on the maps. These were then returned to the Public Works Department to be mapped.

Information gathered from the update survey is being used to evaluate where sidewalks are needed along these established routes. A document from the Washington State Superintendent of Public Instruction's office entitled "Guidelines for Determining the Existence of Hazardous Walking Conditions" was used as a guide for evaluating the walking routes. Additional criteria taken into consideration included:

1) Is the street a dead end street?
2) Does the street act as a collector walking route where other walking routes feed into it?
3) Does a sidewalk or all-weather shoulder currently exist along one side of the walking route?
BLANK SURVEY RESULTS

This section details the findings from the blank map survey. An updated walking route map for each of the eight schools studied is contained in this chapter.
GARFIELD ELEMENTARY SCHOOL

Garfield Elementary School, located at 325 North Plymouth, is a Kindergarten through 5th grade school, housing 515 students. The original building (1929) is scheduled for demolition in July, 1989, and a new building will be opened on September 6, 1989.

Garfield is a Chapter One building and provides additional services to children who have academic lags in the areas of reading and math. In addition, Garfield has one of two elementary "English as a Second Language" programs in the Olympia School District. Currently thirty children of Asian descent are served in this program.

The Olympia School District's weekly transportation log shows an average of 135 students being transported to the Garfield Elementary School by bus.

Four intersections are patrolled by adult and student crossing guards. They are: Madison Avenue and Division Street (adult and student guards), Garfield Avenue and Rogers Street (student guards), Harrison Avenue and Perry Street (adult and student guards), and Madison and Plymouth (student guards).

Findings of the Blank Map Survey:

The response to the "blank map" survey was fair, with approximately 20 percent of the students participating. There were 32 responses by students who are bussed to school. Most of these responses reflected that they are picked up within a short distance of their residence. Seventy-five responses were received from students who walked to school.

The established walking routes for the Garfield Elementary School reflect the existing walking routes of students to and from school. No new routes have been established.

Figure 1 is the school walking route plan for Garfield Elementary School. This plan is the same as that established in 1977, with minor changes to which side of the street students should walk on. This is primarily due to sidewalks being constructed on the opposite side of the street for ease of construction.
LINCOLN ELEMENTARY SCHOOL

Lincoln Elementary School, located at 213 E. 21st Avenue, is the Olympia School District's oldest and last remaining multistory classroom building. Construction on Lincoln school was completed in the early 1920's. The building has recently been placed on the Olympia Heritage Society's Historical Site Registry.

Lincoln houses a full, single-track school from Kindergarten through the 5th grade (K-5), a K-5 Options alternative school program, the eastside Program for Academically Talented Students, and classes for the Thurston-Mason Headstart Program. These combined programs draw students throughout the county. Educational services are provided for approximately 375 children.

The Olympia School District's weekly transportation log shows an average of 95 students being transported to the Lincoln Elementary School by bus.

Findings of the Blank Map Survey:

The response to the "blank map" survey was fair, with approximately 20 percent of the students participating. There were approximately 24 responses from bus riders and 40 responses from students who walked to and from school. The majority of students riding a bus indicated that they are picked up within a short distance of their residence.

The established walking routes for the Lincoln Elementary School reflect the existing walking routes of students to and from school. No new routes have been established.

The majority of the sidewalks are in along the established walking routes for the Lincoln Elementary School, with only a few "infill" type sidewalk projects having been identified.

Figure 2 is the school walking route plan for Lincoln Elementary School. This plan is the same as that established in 1977.
L.P. BROWN ELEMENTARY SCHOOL

L.P. Brown Elementary School, located on Olympia’s west side at 2000 - 26th Avenue N.W., serves approximately 350 students in Kindergarten through the 5th grade. The attendance area is north of 14th Avenue off Division Street and Cooper Point Road.

The school has a traditional wing of classrooms, an open media center, and an open concept pod of classrooms. A large multipurpose room is next to a covered play shed and surrounded by a most attractive playground area.

Students ride buses to and from school, with a small number walking or riding bikes as weather permits. The Olympia School District’s weekly transportation log shows an average of 245 students being transported to the L.P Brown Elementary School by bus. L.P. Brown Elementary School is considered an all-bussed school.

Findings of the Blank Map Survey:

The response to the "blank map" survey was fair, with approximately 10 percent of the students participating. There were approximately 14 responses from students who rode the bus all the time and 19 responses from students who indicated how they walked to and from school when they did not ride the bus. The majority of the students riding a bus indicated that they are picked up within a short distance of their residence.

Figure 3 is a limited school walking route map which indicates where students walk when they do not ride the bus. This is due to the lack of sufficient data to develop a comprehensive map and also due to the lack of sidewalks or shoulders for students to walk on in the immediate area around the school. Routes such as Crestline Boulevard do not have adequate shoulders for students to walk along. The School District should work with the parents of students who walk along these routes and instruct the children to use caution when using them.
PIONEER ELEMENTARY SCHOOL

Pioneer Elementary School serves students in kindergarten through fifth grade who live in the neighborhoods surrounding the northwest corner of Olympia High School. Pioneer Elementary School serves 340 students.

Three intersections are patrolled by adult and student (fifth graders) crossing guards. They are: Henderson Boulevard and North Street (adult and student guards), Henderson Boulevard and Carlyon Avenue (adult and student guards), and Carlyon Avenue near Lybarger Street (student guards).

The Olympia School District's weekly transportation log shows an average of 152 students being transported to the Pioneer Elementary School by bus.

Findings of the Blank Map Survey:

The response to the "blank map" survey was good, with approximately 46 percent of the students participating. There were approximately 18 responses from students who rode the bus all the time and 140 responses from students who walked to and from school. The majority of the students riding a bus indicated that they are picked up within a short distance of their residence.

Figure 4 is the school walking route plan for Pioneer Elementary School. This plan is the same as that established in 1977, with minor changes to which side of the street students should walk on. This is primarily due to sidewalks being constructed on the opposite side of the street for ease of construction.
ROGERS ELEMENTARY SCHOOL

John Rogers Elementary School, 2001 Springer Road (26th Avenue), is located in the extreme northeast section of Olympia. Approximately 300 students, from infants through 5th graders are served in the preschool for the handicapped and kindergarten through 5th grade programs for those who are developmentally disabled and those who are not. Almost all students are bused with only about 15 students walking on a regular basis. Approximately sixty employees drive to John Rogers School each day.

The Olympia School District's weekly transportation log shows an average of 139 students being transported to the Rogers Elementary School by bus.

Findings of the Blank Map Survey:

The response to the "blank map" survey was fair, with approximately 20 percent of the students participating. There were approximately 9 responses from students who rode the bus all the time and 26 responses from students who indicated how they walked to and from school when they did not ride the bus. The majority of the students riding a bus indicated that they are picked up within a short distance of their residence.

There was considerable interest shown in developing a walking route along Springer Road (26th Avenue) from approximately Gull Harbor Road to Friendly Grove Road. This same finding was identified in the 1977 school walk study. Major roadway improvements would be necessary to construct a walking path along either side of this roadway. This road is currently maintained by Thurston County.

Bethel Street, Miller Avenue and Friendly Grove Road were also commonly identified as needing some type of walking path.

Development of walking paths along major roads in this area should be considered by both the City of Olympia and Thurston County.

No school walking route map is provided due to the lack of data for establishing one and due to the lack of sidewalks, shoulders, or other all-weather surface for students to walk on.
ROOSEVELT ELEMENTARY SCHOOL

Roosevelt Elementary School, located at 1417 San Francisco Avenue, is a kindergarten through fifth grade school, housing 380 students. A new school has been built and was occupied for the first time in January, 1989.

Roosevelt is a Chapter One School with a high mobility rate. The school provides additional services to children at risk. Roosevelt Elementary is one of the two elementary schools with an "English As A Second Language" program in the Olympia School District.

Approximately two-thirds of the Roosevelt students walk to school.

The Olympia School Districts weekly transportation log shows an average of 154 students being transported to the Roosevelt Elementary School by bus.

Findings of the Blank Map Survey:

The response to the "blank map" survey was fair, with approximately 20 percent of the students participating. There were approximately 12 responses from students who rode the bus all the time and 60 responses from students who walked to and from school. The majority of the students riding a bus indicated that they are picked up within a short distance of their residence.

New walking routes have been identified on Quince Street from Olympia Avenue to Bigelow Avenue, on Bigelow Avenue to Puget Street, and on Puget Street from Bigelow Avenue to Pine Avenue. A walking route on the south side of San Francisco Avenue between Puget Street and Bethel Street has been added.

Figure 5 is the school walking route plan for Roosevelt Elementary School. This plan differs slightly from that established in 1977, with minor changes to which side of the street students should walk on (primarily due to sidewalks being constructed on the opposite side of the street, for ease of construction) and the addition of the above mentioned walking routes.
FIGURE 5
ROOSEVELT ELEMENTARY SCHOOL
MADISON ELEMENTARY SCHOOL

James Madison Elementary, located at 812 S. Central, with school ground borders of 8th Avenue, Central Street and 10th Avenue, serves the southeast section of Olympia. The School is a kindergarten through fifth grade school.

The current student population is approximately 225 students. Of the 225, 125 to 150 are walkers. The Olympia School District’s weekly transportation log shows an average of 88 students being transported to the Madison Elementary School by bus. The student enrollment is expected to increase by 50 to 75 over the next three years, with the additional students being bussed to school.

Two intersections are patrolled by student crossing guards. They are: 8th Avenue and Central Street, 10th Avenue and Central Street.

Findings of the Blank Map Survey:

The response to the "blank map" survey was fair, with approximately 20 percent of the students participating. There were 10 responses by students who are bussed to school. Most of these responses reflected that they are picked up within a short distance of their residence. There were 35 responses received from students who walked.

The established walking routes for the Madison Elementary School reflect closely the existing walking routes of students to and from school. A route on 7th Avenue between Central Street and Fairview Street, and between Edison Street and Boulevard Road has been added.

Figure 6 is the school walking route plan for Madison Elementary School. This plan is the same as that established in 1977, with the exception of an added walking route along 7th Avenue. Minor changes have been made to which side of the street students should walk on. This is primarily due to sidewalks being constructed on the opposite side of the street for ease of construction.
ST. MICHAEL'S ELEMENTARY SCHOOL

St. Michael's School, located at 1203 E. 10th Avenue, serves students in kindergarten through the eighth grade. The current enrollment of St. Michael's is 225 students. St. Michael's is a parochial school, drawing not only students within the neighborhood but throughout the Thurston County area. The largest number of students do come from the east and northeast areas of Olympia.

The majority of students who attend St. Michael's Elementary School are transported by private vehicle. No school buses are provided for transportation. A small percentage use the Intercity Transit bus system.

Four intersections are patrolled by student crossing guards. They are; 10th Avenue and Eastside Street, 10th Avenue at the School, 10th Avenue and Boundary Street, and Union Avenue and Eastside Street.

Findings of the Blank Map Survey:

The response to the "blank map" survey was fair, with approximately 15 percent of the students participating. There were two responses by students who rode transit buses to school. Twenty-one responses were received from students who walked to school. Ten responses were received from students who were dropped off and picked up at school by parents.

Figure 7 is the school walking route plan for St. Michael's Elementary School. This plan is the same as that established in 1977. Minor changes have been made to which side of the street students should walk on. This is primarily due to sidewalks being constructed on the opposite side of the street for ease of construction.
SUMMARY AND RECOMMENDATIONS

It is recommended that a School Traffic Safety Committee be formed and composed of an official school representative, a representative of the Parent-Teacher organization, the City Traffic Engineer, and a representative of the Olympia Police Departments traffic unit. Other interested organizations such as neighborhood associations would serve in an advisory capacity.

The duties of the Committee would be to guide and coordinate all activities connected with the school safety program. These duties could include the following:

1) Establish policies and procedures;
2) Review and approve the various phases of the school safety program;
3) Review and handle complaints and requests;
4) Establish priorities on projects;
5) Promote good public relations;
6) Take immediate action to correct emergency school traffic safety problems.

The Committee could also help to address some of the issues mentioned on the survey which was included along with the "blank map".

As was indicated in the 1977 School Walk study,

"any study dealing with a community's population, and especially school age population with its transience, will provide information that may be valid for only a limited period of time. As demographic patterns change because of housing development, establishment of new shopping centers, shifts in employment locations, and other factors the basic study information may also change."

It is therefore recommended that the school walking routes be reviewed every two years or as necessary to determine if the walking routes established reflect the safest walking route for students to and from school.

The 1977 School Walk Study should continue to be consulted on various recommendations which are still valid, such as development of various walking routes which involve other jurisdictions, in particular Thurston County.
IDENTIFICATION OF SIDEWALK NEEDS

The Capital Improvement Program (C.I.P.) has historically included an allocation of $50,000, plus any carry-over funds, for construction of sidewalks throughout the City.

Information contained in the 1977 School Walk Study, along with that collected as part of the 1989 School Walk Survey, was used for identifying where sidewalks are needed along school walking routes.

Staff conducted a "blank" map survey of the existing school walking routes within the City of Olympia (Olympia School District) in November, 1989. The response to this survey was considered fair. This study was used as a guide for identifying where sidewalks are needed.

Staff worked with each of the elementary school principals, and they worked with their respective teachers and parent/teacher organizations in reviewing the results of the "blank" map survey. It became apparent from the surveys that were returned that school walking routes had not changed to any great degree from those identified in 1977.

The middle schools were also surveyed, but limited response to the survey was received. The boundaries of the middle schools encompass the elementary school boundaries, therefore the walking routes of the middle school students follow many of the elementary school walking routes. Those responses which were received from middle schools were taken into consideration.

A listing of the streets which were identified as walking routes and which did not have sidewalks or other all weather surface on either side of the street is contained in the appendix.

It became apparent when rating the sections of walking routes that the minor walking routes rated low as compared to the main walking routes. The main walking routes, those which acted as a collector for others, naturally rated higher. A field observation of each walking route was made.

Staff took the results from the school walk survey and evaluated each of the school walking routes. A document from the Washington State Superintendent of Public Instruction’s office entitled "Guidelines for Determining the Existence of Hazardous Walking Conditions," was used as a guideline for evaluating the walking routes. Staff also took into consideration the following criteria:

1) Is the street a dead end street?
2) Does the street act as a collector walking route where other walking routes feed into it?
3) Does a sidewalk or all-weather shoulder currently exist along one side of the walking route?
The initial listing of routes needing sidewalks was shortened by looking at the ratings and looking at the walking route maps to determine which locations had the greatest need.

Projects which would require other roadway improvements such as storm sewer or considerable amounts of grade work were also eliminated from the list.

Based on findings from the school walking route survey, the City Council approved the following sidewalk improvement program for construction in the next seven years:

1989

Madison School Area:

a. 7th Avenue from Boulevard to Sawyer and Wilson to Edison.
b. Legion Way from Edison to McCormick.
c. Fir Street from Legion to 7th.

7th Avenue was identified as needing a continuous sidewalk between Boulevard Road and Central Street. Sidewalks will be constructed on 7th Avenue between Boulevard Road and Sawyer Street on the south side of the street, and between Wilson Street and Edison on the north side of the street.

Due to the lack of right-of-way between Wilson Street and Fir Street, sidewalks cannot be constructed immediately on this section of roadway. A project to construct sidewalks on this section is identified in the last year of the seven year program (1995). This will require acquisition of right-of-way.

In order to create a continuous route between Boulevard Road and Central Street, Legion Way was identified as an alternate route which could be developed now. In the future, right-of-way on 7th Avenue will be acquired. Therefore, sidewalks will be constructed on the north side of Legion Way, between Edison Street and McCormick Street.

If adequate funding is available in 1989, sidewalks will be constructed on Legion Way from McCormick Street to Central Street to make a continuous walking route. If adequate funding is not available, this project will be constructed as part of the 1990 program.

Construction of sidewalks on 7th Avenue and Legion Way will create a continuous walking route for students to and from the Madison School.

A sidewalk will be constructed on Fir Street between Legion Way and 7th Avenue so that pedestrians who desire to do so can cross back to 7th Avenue and continue walking on the south side of this street where sidewalks currently exist between Fairview Street and Central Street.
1990

Pioneer School Area:

a. Eskridge Boulevard from Monta Vista to Henderson.

Eskridge Boulevard was identified as a walking route in the Pioneer School area needing sidewalks. This walking route serves students and other pedestrians in the area northwest of the Pioneer School.

Eskridge Boulevard serves as a collector street for the neighborhoods in the area north of the Pioneer School and serves as a collector walking route for pedestrians.

Even though the section of Eskridge Boulevard between Lybarger Street and Henderson Boulevard is not an identified walking route for students, the construction of sidewalks was extended to Henderson Boulevard so that a gap was not left in this pedestrian route.

1991

Garfield School Area:

a. Thomas Street from Bowman to Farwell.

b. Rogers Street from Bowman to Langridge and Giles to Conger.

Thomas Street serves as a major collector street for neighborhood traffic and as the major north/south collector walking route for the walking routes in the area north of the Garfield School.

With the Eastview Estates Development along Thomas, north of Farwell Avenue, it was recognized that Thomas Street would serve not only school age children but all pedestrians.

Sidewalks were constructed on Thomas Street between Madison Avenue and Bowman in 1987 as part of the sidewalk installation program. A sidewalk installation project has been identified on Thomas Street between Bowman Street and Farwell. This project will extend from the end of the original project, done in 1987.

Rogers Street is another major north/south walking route for the Garfield School. This route has continuous sidewalks on the west side of the street between Conger Avenue and Madison Avenue. North of Conger there are gaps. In order to create a continuous walking route, sidewalk projects have been identified on Rogers Street between Bowman Avenue and Langridge Avenue and Giles Avenue and Conger Avenue. This will, in effect, create a continuous walking route between Madison Avenue and Langridge Avenue.
1992

Garfield School Area:

a. Garfield Avenue from Rogers to Sherman and Division to Milroy.

Garfield Avenue acts as an east/west collector walking route on the southern boundary of the Garfield School grounds. This street, between Rogers Avenue and Sherman Street, is narrow and does not have adequate shoulders for pedestrians to walk along. A sidewalk project has been identified on this section of roadway which will, in effect, create a continuous walking route from Sherman Street to Perry Street.

Garfield Avenue also acts as a walking link to Division Street west of the school. A section of sidewalk does exist on Garfield Avenue west of Thomas Street. Construction of sidewalk along this section of street between Division Street and Milroy Street will create a continuous sidewalk link to Division Street.

1993

Roosevelt School Area:

a. San Francisco Avenue from Garrison to Central and Puget to Tullis.
b. Bethel Street from Jasper to Miller.
c. Leavenworth Avenue from Garrison to Marion.

Field observations indicated a well worn path on the south side of San Francisco Avenue between Garrison Street and Central Street, indicating that this is a major pedestrian pathway. The school walking route survey also indicated that pedestrians were using this route.

Considerable interest was shown in having a section of sidewalk constructed on the south side of San Francisco Avenue between Puget Street and Tullis Street. Students who walk from the area south and west of the intersection of Puget Street and San Francisco would not have to cross San Francisco and walk directly to the school. Field observations indicated a well worn path where pedestrians have been walking. With the recent completion of the new Roosevelt School, this would create a continuous sidewalk walking route from Marion Street to Puget Street.

Sidewalks were installed on Bethel Street between San Francisco Avenue and Miller Avenue in 1988 as part of the sidewalk program. There was a block-long gap left between Miller Avenue and Jasper Avenue. North of Jasper there currently exists approximately a one-half block section of sidewalk. Therefore, in order to create a continuous sidewalk for pedestrians from approximately Mission Creek to San Francisco Avenue, a sidewalk project has been identified between Miller Avenue and Jasper Avenue.
With the proposed Rolling Fields Development it was recognized that sidewalks would be needed from this development to the Roosevelt School. Leavenworth Avenue will act as one of the entrances to this development, therefore a sidewalk project was identified on Leavenworth Avenue between Garrison Street and Marion Street which will create a walking route for pedestrians to and from the Roosevelt School. The link from Marion Street into the development will be constructed as part of the development requirements.

Reeves School Area:

a. Quince Street from Reeves School to Milas.

In the Reeves Middle School area, Quince Street serves not only as the main vehicle access to the school but also as the main collector walking route to the school. There is a gap in the asphalt pedestrian/bikeway between approximately Milas Street to the Reeves Middle School. Therefore a project has been identified to extend the pedestrian/bikeway from Milas Street to the Reeves Middle School grounds.

1994

Roosevelt School Area:

a. Pine Street from Puget to Fir.

Pine Street currently serves as a collector walking route for students walking to the Roosevelt School. With the proposed Rolling Fields Development to the east of the Roosevelt School and the increased pedestrian traffic generated by the development, it was recognized that sidewalks would be needed from this development to the School. Pine Street will act as one of the major roadways to this development, therefore a sidewalk project was identified on Pine Avenue from Puget Street to Fir Street which will not only create a walking route for pedestrians to and from the Roosevelt School, but will also create a continuous sidewalk for pedestrians to the area along Puget Street where sidewalks exist. Lybarger Street which will act as the entrance from Pine Street to the development and should be considered for installation of sidewalk if it is not required as part of the development requirements for the Rolling Fields Development.

1995

Madison School Area:

a. Union Avenue from Fir to Fairview.
b. Fir Street from 5th to 10th Avenue.
c. 7th Avenue between Wilson and Fairview.
In the Madison School area Union Avenue acts as a collector walking route for pedestrians in the southeast section of the area served by the school north of I-5. As part of the sidewalk program several years ago sidewalks were constructed on Union Avenue between Central Street and Fir Street. A project has been identified to extend this sidewalk from Fir Street to Fairview Street where Union Avenue becomes Thurston County jurisdiction. This will provide a safe, all-weather walking area for pedestrians.

Fir Street acts as a neighborhood collector street for vehicle traffic and as a collector walking route for the Madison School. Fir Street also has controlled pedestrian crossings at 4th and State Avenues. Sidewalks currently exist on Fir Street south of 4th Avenue up to 5th Avenue. In order to create an all-weather surface for pedestrians between 5th Avenue and 10th Avenue, a project has been identified. The section of sidewalk between Legion Way and 7th Avenue will be completed as part of the 1989 sidewalk program.

Construction of a two-block section of sidewalk on 7th Avenue between Wilson Street and Fairview Street is an important link to the Madison School, but would require purchase of additional right-of-way. Therefore, it is indicated to be constructed in later in the program, in 1985.

As mentioned above, streets which would require major roadway improvements such as curb and gutter sections, street widening, earthwork, or storm drainage were eliminated from the list of potential projects. This was due to the scope of work which would be necessary to construct sidewalks along such roadways. A brief description of the major roads which fell into this category follows.

In the John Rogers School area 26th Avenue (Springer Road), Friendly Grove Road, Bethel Street, Miller Street and Gull Harbor Road were all recognized as needing some type of walking path. Due to the rural characteristics of these roads they would require major roadway improvements. It should be noted that 26th Avenue, Friendly Grove Road, portions of Miller Avenue, and Gull Harbor Road are under Thurston County jurisdiction.

The L.P. Brown School area boundary extends as far south as Walnut Road. The majority of the area served by this school is within Thurston County. Considerable interest was shown in constructing sidewalks along Crestline Boulevard north of Elliott Avenue, which is also partially within the County’s jurisdiction. In order to install sidewalks along this road, major roadway improvements would be necessary. Improvements to Crestline Boulevard are currently being considered as part of a Capital Improvement Project (CIP).

Elliott Avenue between Division Street and Crestline Boulevard was also evaluated but again, due to the current roadway geometrics, sidewalks should be considered as part of other major roadway improvements.

In the area around the Roosevelt School, installation of sidewalks along Ethridge Avenue between Bethel Street and Fir Street was considered. This section of Ethridge Avenue will
serve as the main roadway to the northern section of the Rolling Fields Development. Due to ditches on some sections of the road, other roadway improvements roadway improvements would be required in order to install sidewalks.

The projects in the seven-year program were identified as needing to be constructed but the years for construction were not assigned with any particular priority. Elements taken into consideration when identifying the program were:

1) Group projects identified in a common area all in the same year.
2) Identify the number of lineal feet of sidewalk for the project and determine funding required to complete the project. A figure of approximately $20 per lineal foot was used for figuring costs. Engineering and Contingency require 30% of the available funding, which leaves approximately $35,000 for construction.
3) Have sidewalk projects been completed in an area recently? Staff attempted to spread the projects out in different areas each year.

The projects identified for construction will be reviewed on a yearly basis to determine whether a change has occurred which would change the priority or add new projects. It could mean sidewalks would be constructed in a particular area earlier than identified or a project in another area not identified in the seven year program could be identified as having priority over those identified.
APPENDIX A
November 14, 1988

Dear Parents:

The City of Olympia, with the active cooperation of the Olympia School District, is conducting a study of the walking routes used by our children to and from school and school bus stops. This study will result in updating of the current walking route plans for children to follow when walking to and from school and will also assist the City in identifying needs for improvements in walkways and traffic controls. The study will focus primarily upon areas within the city limits.

Your assistance is urgently needed. Please help your child to mark on the attached map the route she or he follows walking to school or the school bus stop. (Students that usually travel by bicycle should mark their route and note, "bicycle"). If the return walk is not the same as that going to school please show it also. This can be done by using a different color for each direction or by showing directional arrows. Draw the route line on the side of the street generally used and indicate where the child normally crosses the street. Please also indicate the walking routes used during bad weather if they are not the same as good weather routes.

We have also included a few questions concerning your child's walking route on the back of this page. Answering these questions will provide additional information on how we can improve overall safety for your child while he or she walks to and from school. Please have your child return the marked map and survey to school tomorrow.

Thank you for your help in this important task.

Sincerely,

HOLLY GADBAW, MAYOR
City of Olympia

RICHARD HUNTER, SUPERINTENDENT
Olympia School District No. 111

RW/gsb
December 1, 1988

Dear Parents:

The City of Olympia, with the active cooperation of St. Michael's Elementary School, is conducting a study of the walking routes used by our children to and from school. This study will result in updating of the current walking route plans for children to follow when walking to and from school and will also assist the City in identifying needs for improvements in walkways and traffic controls. The study will focus primarily upon areas within the city limits.

Your assistance is urgently needed. Please help your child to mark on the attached map the route she or he follows walking to school. Students that usually travel by bicycle should mark their route and note, "bicycle". If the return walk is not the same as that going to school please show it also. This can be done by using a different color for each direction or by showing directional arrows. Draw the route line on the side of the street generally used and indicate where the child normally crosses the street. Please also indicate the walking routes used during bad weather if they are not the same as good weather routes.

We have also included a few questions concerning your child’s walking route on the back of this page. Answering these questions will provide additional information on how we can improve overall safety for your child while he or she walks to and from school. Please have your child return the marked map and survey to school tomorrow.

Thank you for your help in this important task.

Sincerely,

HOLLY GADBAW, MAYOR
City of Olympia

TODD E. MONOHON, PRINCIPAL
St. Michael's Elementary School

RW/gsb
NAME OF SCHOOL: ____________________________________________

1) Are there any safety problems or hazards along your child's route of which you are aware?
   ___ Poor Sidewalks; Where? ________________________________
   ___ No Sidewalks; Where? ________________________________
   ___ Narrow Street; Where? ________________________________
   ___ No Crosswalk; Where? ________________________________
   ___ Other Problems; Where? ________________________________
   _______________________________________________________
   _______________________________________________________

2) What specific solutions do you feel are reasonable to solve the problems you've cited?
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

3) Is there a Block Watch Program in your neighborhood?
   ___ Yes     ___ No     ___ Don't Know
   In the neighborhoods your child walks through?
   ___ Yes     ___ No     ___ Don't Know

4) Comments: _____________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

Your cooperation is greatly appreciated. If you should have any questions regarding this survey, please call Randy Wesselman, Olympia Public Works, at 753-8314

RW/gsb
| 104 | Eskridge
| 109 | Gov Stevens Boundary to Central N
| 110 | Gov Stevens Central to Lybarger W
| 111 | Gov Stevens W of McCorick S side
| 112 | Gov Stevens (McCorick to Fir S
| 113 | Gov Stevens (McCorick to Cain S
| 114 | McCorick North to 37th Ave E
| 115 | McCorick North to Carlyon E
| 116 | McCorick Gov Stevens to Eskridge (both)
| 117 | Fir (Centerwood to Gov Stevens W
| 118 | Fir (Gov Stevens to Eskridge W
| 119 | Eskridge (Henderson to McCorick S
| 120 | Eskridge (Fir to Cain S
| 122 | Middle (Pifer to Central N
| 123 | Middle (Central to Ross N
| 125 | Quince Mt View to North St (both)
| 126 | Quince S of North St (dead end) (both)
| 127 | Quince Mt View Pl to Carlyon (both)
| 128 | Quince S of Eskridge (dead end) (both)
| 129 | McCorick Henderson to North St E
| 130 | Roadsly North St to Mt View (both)
| 131 | Pifer North St to Mt View (both)
| 133 | Hawthorne S of Eskridge (dead end) both
| 134 | Boundary Carlyon to Gov Stevens (both)
| 135 | Boundary Gov Stevens to Eskridge (both)
| 137 | Cloverfield Dr Carlyon to Gov Stevens E
| 147 | Holiday Dr North St to 37th Ave E
| 148 | Centerwood Dr W of Cain (dead end) both
<p>| 149 | Vista Ave |</p>
<table>
<thead>
<tr>
<th>Station</th>
<th>Destination 1</th>
<th>Destination 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milroy</td>
<td>Conger to Scammel (both)</td>
<td>Scammel to Madison (both)</td>
</tr>
<tr>
<td>Milroy</td>
<td>Garfield to Harrison (both)</td>
<td>Harrison to 4th (both)</td>
</tr>
<tr>
<td>Giles</td>
<td>Division to Thomas (both)</td>
<td>Thomas to Rogers (both)</td>
</tr>
<tr>
<td>Giles</td>
<td>Rogers to Foote (both)</td>
<td>Langridge to Thomas (both)</td>
</tr>
<tr>
<td>Langridge</td>
<td>Thomas to Rogers (both)</td>
<td>4th Ave to Cushing S</td>
</tr>
<tr>
<td>4th Ave</td>
<td>Cushing to Milroy S</td>
<td>Cushing to Decatur S</td>
</tr>
<tr>
<td>Scammel</td>
<td>Milroy to Decatur S</td>
<td>Decatur to Thomas (both)</td>
</tr>
<tr>
<td>Plymouth</td>
<td>Milroy to Thomas (both)</td>
<td>Garfield to Harrison (both)</td>
</tr>
<tr>
<td>4th to 5th W</td>
<td>Plymouth</td>
<td>5th to 6th W</td>
</tr>
<tr>
<td>Columbia</td>
<td>19th Ave to 20th Ave E</td>
<td>Eastside</td>
</tr>
<tr>
<td>Reeves School to Milas E</td>
<td>Legion</td>
<td>Central to Lybarger (both)</td>
</tr>
<tr>
<td>Legion</td>
<td>Lybarger to McCormick (both)</td>
<td>Legion to Fir (both)</td>
</tr>
<tr>
<td>McCormick</td>
<td>Legion to Fir (both)</td>
<td>Legiou to Fairview S</td>
</tr>
<tr>
<td>Fairview S</td>
<td>7th Av</td>
<td>Sawyer to Boulevard S</td>
</tr>
<tr>
<td>Boulevard S</td>
<td>9th Av</td>
<td>McCormick to Fir N</td>
</tr>
<tr>
<td>McCormick to Fir N</td>
<td>9th Av</td>
<td>Fir to Fairview N</td>
</tr>
<tr>
<td>9th Av</td>
<td>Fir to Fairview N</td>
<td>Union</td>
</tr>
<tr>
<td>Fairview to Wilson N</td>
<td>Union</td>
<td>Legion to 5th E</td>
</tr>
<tr>
<td>Lybarger</td>
<td>Legion to 5th E</td>
<td>McCormick</td>
</tr>
</tbody>
</table>
Legend to 5th (both)
235 McCorracle
7th to 9th E
236 McCorracle
Union to 11th (both)
237 McCorracle
11th to 12th (both)
238 McCorracle
12th to 13th (both)
239 Fir
Union to 5th (both)
240 Fir
7th to 8th (both)
241 Fir
8th to 9th (both)
242 Fir
9th to 10th (both)
243 Fir
Union to 11th W
244 Fir
11th to 12th W
245 Fir
12th to 13th W
246 Frederick
4th to 7th W
247 Sawyer
4th to 7th W
248 Sawyer
7th to 9th E
249 Thomas
Farwell to Hays
250 Bethel
Springwood to Jasper
251 Bethel
Jasper to Miller
252 Fir
Union to 10th
253 7th Ave
Wilson to Edison to Fairview
APPENDIX C
SCHOOL WALK STUDY

CITY OF OLYMPIA
Engineering Department

Funded by a grant from the WASHINGTON TRAFFIC SAFETY COMMISSION.
SCHOOL WALK STUDY

Prepared For

City of Olympia, Washington

by the Engineering Department,
Traffic Engineering Division....

Contributors to this study:

Project Director - Allan L. Kimbel, City Engineer
Project Manager - J. Darrel Chambers, Traffic Engineer
Study Consultant - Robert D. Theisen

July 1, 1977
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>1. INTRODUCTION</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. METHODOLOGY</td>
<td>2</td>
</tr>
<tr>
<td>3. FINDINGS AND RECOMMENDATIONS</td>
<td>4</td>
</tr>
<tr>
<td>Garfield Elementary School</td>
<td>4</td>
</tr>
<tr>
<td>Lincoln Elementary School</td>
<td>7</td>
</tr>
<tr>
<td>McKinley Elementary School</td>
<td>8</td>
</tr>
<tr>
<td>Pioneer Elementary School</td>
<td>10</td>
</tr>
<tr>
<td>Rogers Elementary School</td>
<td>12</td>
</tr>
<tr>
<td>Roosevelt Elementary School</td>
<td>13</td>
</tr>
<tr>
<td>Madison Elementary School</td>
<td>15</td>
</tr>
<tr>
<td>St. Michaels Elementary School</td>
<td>17</td>
</tr>
<tr>
<td>General</td>
<td>20</td>
</tr>
</tbody>
</table>

**APPENDIX**
CHAPTER 1
INTRODUCTION

Early in 1977, the City of Olympia, Washington, Engineering Department undertook a comprehensive program to aid children walking to and from elementary schools. This work was initiated in response to numerous individual requests from within the community and recognition of its necessity by the City's staff. The program, utilizing the overall frame work of a recommended practice of the Institute of Transportation Engineers (ITE) A Program for School Crossing Protection, (1) endeavored to identify the needs throughout the entire community. An application was submitted to the Washington Traffic Safety Commission requesting funding support to permit the program to proceed. The application was approved.

The following chapters describe the elements of work involved in developing detailed school walking route plans for seven elementary schools in School District 111 and one Catholic elementary school within Olympia and recommended roadway improvements in their vicinity:

Chapter 2 details the specific steps taken within the study methodology to develop the data base from which conclusions could be reached and recommendations made. Some traffic engineering techniques used in arriving at the final decisions are commented on.

Chapter 3 identifies those findings of fact resulting from the investigations at each school and sets forth the school walking route plan and recommendations which will enhance the safety of school children during their walk to and from school.

An appendix completes the report and includes examples of data acquisition methods used during the study and other pertinent information.
CHAPTER 2

METHODOLOGY

The procedure used in this study parallels to a large extent that established in *A Program for School Crossing Protection* (2) However, certain improvements were incorporated into that process to provide knowledge regarding current walk routes and to establish a less formalized interaction between the cooperating organizations.

The program consisted essentially of six steps:

1. **Organization** - An organizational framework was established for the program. This was accomplished through personal contact between the City's Traffic Engineering Office, the Police Department, the Assistant Superintendent of School District 111 and the principals of each elementary school involved in the study. A brief description of the scope of work involved was given to each individual and their active participation solicited.

2. **Current Route Information** - The second step involved the participation of the students at each school under study and was considered pivotal to the success of the program. A "blank map" technique (3) was employed to determine the current to/from school walk trip for each student. Additionally, walk trips to bus stops, "bad weather" trip routes, and bicycle routes by those students who frequently use this mode of transportation to and from school, were gathered. Each student that used the walk mode was provided with a map that included the school and the home neighborhood. A cover letter to the parents explaining the reasons for the study and instructing them to the use of the map was attached (see Appendix A). Parents were asked to work with their child in marking the map with the walk route and to differentiate between routes where more than one was shown. The information from each individual map was aggregated onto an inbound and an outbound master map (Figures 1 and 2). This process provided a quick and ready source of information showing locations of large concentrations of students crossing roadways or walking along them.

3. **Field Survey** - Observation of the actual conditions of the walk environment was accomplished during normal periods of time when children were present. This provided information which, when combined with the data from the master map, a description of the crossing guard program supplied by the principal of the school, and traffic volume and accident information, established a base from which more detailed analysis could be performed to define the recommended school route plan.
4. Crossing Analysis - All crossings of major roadways and others with potential traffic hazards were evaluated to determine the need for special school crossing protection. The gap study procedure recommended by the ITE (4) was used at high traffic flow locations to determine if additional control was mandatory. During this phase of the study a new technique was devised for measuring pedestrian delay time. This process - the tape recorder method - is fully described in Appendix B.

All crossings for which gap study was performed received special attention from the City Traffic Engineer. Where improvements were needed, alternative methods of reducing hazard were considered. These included; use of adult crossing guards (Police Officers, Para-Police Officers, volunteer parents, and senior high school service club members), traffic control signals or signs, physical changes to the roadway configuration, and pedestrian grade separation structures.

5. Route Path Survey - All major route paths, as defined on the master maps, were surveyed to determine if potential safety hazards did exist. Apparent problems either resulted in recommendations for improvements or, where necessary, a shift in the major route path as shown on the School Walking Route Plan.

6. School Walking Route Plan - A walk route plan was developed for each school with the primary consideration "to provide a maximum of protection for the children at a minimum of cost to the taxpayer" (5). Although information was gathered regarding the walk trip to bus stops in no case did the accumulated volume of students using the same route become so large as to require a walk route plan. The route plan within an area maximized existing walk patterns traffic signs and signalization, marked roadway crossings, school patrol guard locations, and features of convenience and safety like sidewalks and paved roadway shoulders.
CHAPTER 3
FINDINGS AND RECOMMENDATIONS

This chapter details the specific findings and the resulting recommendations arising from investigations of the walk environment for students that attend each of the eight schools studied.

GARFIELD ELEMENTARY SCHOOL

Garfield Elementary School is located at 325 North Plymouth Street and has an enrollment of approximately 525 students. In addition to having the largest enrollment in the school district for an elementary school it has the largest number of children who walk to school. Because the school boundaries include the entire city west of Capitol Lake and Budd Inlet the students come from a variety of residential arrangements; urban, rural, and suburban. The area immediately surrounding the school, from which the majority of walkers come, is characterized by an established community with some sidewalks. This area is divided by two major arterial roadways which large numbers of students must cross on their path to school. These streets are North Division Street on the west and Harrison Avenue on the south. These roadways, and others in the area with a sufficient potential for conflict between motorist and school children, have ample signing and roadway markings to alert motorists to the presence of children in the vicinity. A principal crossing of Harrison Avenue has a traffic control signal with pedestrian controlled buttons. The northerly section is served by three bikeways; from the west along Conger Avenue to Division Street, from the north along Division Street to Conger Avenue, and along Bowman Avenue from Division Street to Roger Street.

Three intersections are patrolled by student crossing guards. They are; Madison Avenue and North Division Street, Garfield Avenue and North Rogers Street, and Harrison Avenue and Perry Street. The crossing guards are volunteer students from the fifth grade who have their parents approval. Two guards are located at each intersection.

Findings - The response to the "blank map" survey was good with approximately 50 percent of the students participating. Because of the small number of bus riders who returned maps and the large number of those maps which were unusable the response by walkers dominates the total responses.

Figure 3 diagrams the walk patterns for Garfield Elementary School. Although walkers come from most areas within a reasonable walk distance a propensity to gather along roadways radiating from the school grounds appears evident. This resulted in three roadways having a continuously high pedestrian volume.
They are: North Thomas Street from Bowman Avenue to the school grounds; the Plymouth Street/Perry Street corridor from 6th Avenue West to the school grounds; and Madison Avenue from the Evergreen Apartments to the school.

Sidewalks are not continuous along Plymouth Street.

There are no sidewalks along North Thomas Street north of Madison Avenue.

Acceptable crossing gaps in traffic on North Division Street at the intersection of Madison Avenue during the afternoon are marginal for the number of students crossing at that location. (See Appendix C).

Many school bicyclists were observed on Madison Avenue riding against traffic in the west bound direction because of the location of the North Division Street marked crosswalk (also location of student patrol).

A substantial number of students walk on West 4th Avenue between North Milroy Street and North Thomas Street.

The signed crossing of West 4th Street at North Milroy Street was not used by any of the students that responded to the "blank map" survey.

Recommendations - Construct portions of sidewalk on the westside of Plymouth Street between 6th Avenue West and 4th Avenue West to create a continuous sidewalk.

Construct a section of sidewalk on the south side of 4th Avenue West between Milroy Street North and Decatur Street North.

Remove school crossing signs at the intersection of Milroy Street North and 4th Avenue West.

Install a sidewalk on the westside of North Thomas Street (or a designated pedestrian/bicycle paved shoulder area) from Bowman Avenue to the existing sidewalk mid-block between Scammell Avenue and Madison Avenue. Install a marked crosswalk across Madison Avenue in line with the new sidewalk. Install school pedestrian crossing signs facing the east and west bound traffic on Madison Avenue.

Provide bicycle ramps at all intersections along the south side of Madison Avenue between North Thomas Street and North Division Street to discourage bicyclist from riding westbound on the wrong side of the roadway. Do not provide a bicycle ramp entering on to North Division Street.

Add a school patrol at the intersection of North Thomas Street and Madison Avenue.
Avenue. Guards could be drawn from the Traffic Safety Service Club at Capitol High, as an adjunct to driver training at that school, or as voluntary assistance from concerned parents. The City of Olympia should reduce the roadway width in the crossing area to minimize the time required to cross and also incorporate features to increase visibility of the crossing area.

Figure 4 is the school route plan for Garfield Elementary School. This plan incorporates the above recommendations and takes advantage of existing student walk patterns, present traffic control devices and roadway markings, existing sidewalks, and school patrol crossing guard locations.
LINCOLN ELEMENTARY SCHOOL

Lincoln Elementary School is located at 312 East 21st Street. It has a student population of about 210 children with almost half of these arriving at school by the school district bus system. The school is located in an established residential area which is bisected by a major arterial roadway, Capitol Way. Most of the streets within the school service area have at least one sidewalk paralleling the roadway. Vehicular flow along Capitol Way is controlled at two locations in the vicinity of the school by traffic signals with pedestrian control buttons. Fast traffic flow within the neighborhood is impeded by extensive use of stop signs. School pedestrian traffic is controlled at three locations by the school patrol. The locations are: 21st Avenue and Washington Street; 21st Avenue and Franklin Street; and Capitol Way and 21st Avenue. The patrol is from the entire fifth grade and place two students at Capitol Way and one each at the other two locations.

Findings - Of the 108 students who use transportation other than school bus 92 (85 percent) responded to the "blank map" survey. (This could be considered as total response as this group also includes those that come by public bus). Seventy-two of the maps were usable and are shown on Figure 5. A very wide dispersion of routes can be noted into all residential sections served by this school. However, two major north/south roadways appear as collectors. These are Franklin Street from 17th Avenue to the school and O'Farrell Avenue/Capitol Way/Washington Street to the school. Present traffic control signs and sidewalk locations tend to favor these walk patterns.

The safety in crossing Capitol Way is enhanced by the traffic signal and school crossing guard location at 21st Avenue.

There is no sidewalk on Franklin Street between 20th Avenue and 21st Avenue along a path of large school pedestrian volume.

Bicycle travel is impeded along the north sidewalk of Capitol Way at O'Farrell Avenue and at 27th Avenue by curbing.

Recommendations - Construct a sidewalk on the west side of Franklin Street between 20th Avenue and 21st Avenue.

Provide bicycle ramps at O'Farrell Avenue and at 27th Avenue along the north sidewalk.

Figure 6 shows the recommended walk route plan for Lincoln Elementary School. This plan takes advantage of existing traffic control devices, sidewalks, school patrol guard locations, the above recommended improvements and current walk patterns of students to this school.
MCKINLEY ELEMENTARY SCHOOL

McKinley Elementary School is located at 1412 Grand Boulevard. It has about 460 students with almost three quarters of these arriving by bus. The area served by this school is one of the largest in the school district with essentially a suburban/rural housing pattern. School patrol crossing guards are located at two places across Boulevard Road: at the marked crosswalk just north of Stevens Street, and the marked crosswalk just north of Union Street. Two students assist at each crossing and come from a volunteer patrol force made up of children who walk to school.

The residential area from which the walk trips originate is divided into a north and a south section by Interstate Highway 5. These two neighborhoods are connected to the school by a major north/south arterial roadway; Boulevard Road. School warning signs for motorists are in place in the vicinity of the school.

Findings – The response to the "blank map" survey was very good with approximately 60 percent (266) of the students participating. The proportion of busser/walkers responding was about that for the entire student population, 2:1. Over ten percent of the maps returned were unusable for a variety of reasons.

Figure 7 diagrams the current route paths of the respondents. The major north/south arterial roadway provides the only collector street for children walking to school. The dispersion of walk trips to bus stops was very large within the school service area. At only one location were the numbers of students using the same bus stop of substantial magnitude. Even in this case the frequency of students using a common route was low and because of the restricted street arrangement did not justify a separate walk plan.

Sidewalks are present on both sides of Boulevard Road from Pacific Avenue to Dayton Street with the exception of the west side of the bridge over Interstate Highway 5. A bicycle path is available for bicycling and pedestrian movement along the west side of Boulevard Road from Dayton Street to Log Cabin Road, well beyond the walk distance of students to this school.

Marked crosswalks in the vicinity of Union Avenue and Dayton Street and the placement of school crossing guards at those locations provides an opportunity for students arriving from areas west of Boulevard Road to cross over to the school side of the roadway.

The sidewalk on the east side of Boulevard Road does not have a bicycle ramp at the Dayton Street crosswalk. Children crossing to the east with bicycles ride against traffic to a dirt path leading to the sidewalk.
A gap study was conducted at the marked crosswalk across Boulevard Road at Dayton Street (see Appendix C). No additional traffic control devices are needed.

A marked crosswalk immediately north of Beacon Street across Boulevard Road and signing indicating to motorized traffic that students cross at this location lacks a connecting pedestrian walkway along the east side of Boulevard Road.

Recommendations - Relocate the marked crosswalk and associated signing from the Beacon Street area to immediately north of Fones Road. Students arriving at this intersection from the east would receive the benefit of this arrangement when crossing to the bicycle path. Additionally, those students walking along the bicycle path who wish to cross to the C & B Market at the northeast corner would have added protection.

Provide a bicycle ramp to the east sidewalk at Boulevard Road and Dayton Street.

Figure 8 is the walk route plan for the McKinley Elementary School and takes advantage of existing student walk patterns, traffic signing and other controls, an existing bicycle path, current school patrol locations and the above noted recommendation.
FIGURE 8
McKINLEY ELEMENTARY SCHOOL
Recommended School Routes
Pioneer Elementary School is located at 1655 Carlyon Avenue and has a student population of about 370 pupils. The area that this school serves is principally suburban with winding streets and large lot sizes. However, because of the close proximity of the home locations to the school almost 60 percent of the students walk or are driven. The school serviced area is divided in the north/south and east/west directions by a number of major arterial roadways. Because of the suburban nature of the community few sidewalks are in place and these generally do not have continuity. Bicycle paths have been provided on four major roadways; Cain Road from North Street in a northerly direction beyond the school serviced area; Henderson Boulevard from North Street north beyond the school serviced area (this is the only bikeway in this part of the City with one way bike paths on each side of the roadway); Carlyon Avenue from Hawthorne Street to Henderson Boulevard and North Street from Hawthorne Street to Cain Road. Ample coverage of the area by school oriented traffic signs and roadway markings is evident. A volunteer patrol force from the fifth grade assist at three locations; Henderson Boulevard at Carlyon Avenue and at North Street, and at Carlyon Avenue and Lybarger Street. One student patrols at each of these intersections.

Findings – Figure 9 shows the wide dispersion of present walk routes within the area served by Pioneer Elementary School. Of the eight schools surveyed the students at this school consistently walked a greater distance.

Although bus riders represent over 40 percent of the student population they were very under represented in the "blank map" survey response. Only 20 percent (28) of their numbers returned maps whereas over half of the other group responded. The minimal data from bus riders does not permit any conclusions to be reached regarding their walk trips to bus stops.

Gap studies were performed at the intersection of Henderson Boulevard and Carlyon Avenue. The results (See Appendix C) indicates that the present traffic control devices arrangement at this crossing are adequate.

Some parents stop within the bicycle path on the east side of Henderson Boulevard just north of the crosswalk at Carlyon Avenue.

The largest volume of walking students along one route cross an unpaved area between Centerwood Drive and Henderson Boulevard.

Children from Cloverfield Drive must walk adjacent to moving traffic along Carlyon Avenue during a time of high distraction for motorists in the area.
There is no adequate and convenient pedestrian walkway from mid-block on Eskridge Boulevard between Monta Vista Street and Orange Street and the sidewalk on the east side of Lybarger Street.

There is a potential conflict situation at the intersection of McCormick Street intersection with Henderson Boulevard. Sight distance from McCormick Street to approaching northbound bicycles and motor vehicles on Henderson Boulevard is restrictive.

**Recommendations** - A paved path should be constructed connecting Centerwood Drive with Henderson Boulevard. A bicycle ramp should be constructed through the existing curbing at Centerwood Drive to permit riders to conveniently negotiate that obstacle. A barrier should be provided at Henderson Boulevard to restrict bicyclists from entering into the roadway without stopping.

A section of curbing should be placed between the bike path and the moving traffic lane on the east side of Henderson Boulevard north of the east/west crosswalk at Carlyon Avenue. The length of this curbing should be such that motorists who choose to stop in the bike path would not restrict the sight distance of southbound motorists on Henderson Boulevard to the marked crosswalk.

A pedestrian walkway should be provided on the north side of Carlyon Avenue between Cloverfield Drive and Henderson Boulevard.

A sidewalk should be provided on the south side of Eskridge Avenue from mid-block between Monta Vista Street and Orange Street to Lybarger Street.

McCormick Street should terminate north of Arietta Avenue but permit use of the pavement by pedestrians and bicyclists to Henderson Boulevard.

The school walk route plan shown in figure 10 incorporates the above recommendations and current student walk patterns, existing school patrol locations, present bicycle paths and existing traffic control devices.
FIGURE 10
PIONEER ELEMENTARY SCHOOL
Recommended School Routes
ROGERS ELEMENTARY SCHOOL

Rogers Elementary School, with a student population of 238 children, is located in a rural/suburban environment much of which is outside of the corporate limits of the City of Olympia. Almost 80 percent of the students use school buses for transportation. The school grounds border Springer Road on the south a short distance to the west of Friendly Grove Road. Two school crossing guards assist children across Springer Road at each of two marked crosswalks located slightly to the east and west of the school grounds. The entire fifth grade forms the patrol. Roadway spacing within the school service area is large and is in keeping with the housing density. Motor vehicle traffic controls oriented toward informing about school pedestrian presence are frequent along Springer Road.

Findings - The results from the "blank map" survey were inconclusive. Only four of the 24 maps returned were walkers; two of the 24 were unusable. However, a general field survey identified two areas with a common problem that was commented on independently by the principal of Rogers Elementary School.

North Bethel Street for some distance south of Springer Road and Springer Road from approximately Gull Harbor Road to Friendly Grove Road lack safe shoulders for walking because of the deep ditches adjacent to the roadway and grass growing to the edge of the paved surface. It is apparent from the informal path that is worn in the grass that this is used frequently. Children were observed during inclement weather, however, walking on the roadway surface to avoid the mud of the path and the wetness of the grass.

Recommendations - The School District should make individual contacts with parents whose children walk to school to determine what problems currently exist. This information should be made available to the responsible governmental organization with jurisdiction, i.e., the County or City Traffic Engineer.

The roadway should be widened on the easterly side of North Bethel Street from approximately Springwood Avenue to Springer Road and along the south side of Springer Road from Gull Harbor Road to Friendly Grove Road. A paved smooth shoulder should be provided and identified as a "walk only/bike lane". It should be separated from the moving motor vehicle traffic with a mountable curbing, thus permitting two way bicycle operation and providing temporary disabled motor vehicle parking space.

Reduce the number of marked crosswalks across Springer Road to one and improve the remaining one.

No school walking route plan is provided because of the lack of sufficient data for its development.

-12-
ROOSEVELT ELEMENTARY SCHOOL

Roosevelt Elementary School is located in an area bounded by San Francisco Avenue, Leavenworth Avenue, North Tullis Street and North Garrison Street. It has a school population of 447 students of which over fifty percent arrive at school by bicycle, private motor vehicle or walk. Student patrol guards are located at four locations: the intersection of San Francisco Avenue and North Puget Street; the intersection of North Bethel Street and San Francisco Avenue; the intersection of North Garrison Street and San Francisco Avenue; and the intersection of North Garrison Street and Leavenworth Avenue. The school crossing guards are selected from fifth grade volunteers. Two guards are positioned at each of the crossing locations at times when children are present. The long established neighborhood served by Roosevelt Elementary School is characterized by a general lack of sidewalks. Traffic controls oriented to alerting motorist of school children in the area are numerous. The school is well served for bicyclists along the northerly side with a two way bicycle path located on San Francisco Avenue from East Bay Drive to the intersection at North Bethel Street.

Findings - About fifty percent of the 258 students who use transportation methods other than school bus to school responded to the "blank map" survey. This group, 136 in number, resulted in 7 who used bicycles as general school transportation, 104 that walked and 25 that were unusable for a variety of reasons. In addition 36 students responded with their walk route to bus stops. Neither the bicycle nor the bus data provided sufficient information from which any conclusions could be drawn. The walk pattern, as shown on figure 11, shows a general dispersal of routes throughout the area serviced by this school. Other than North Garrison Street from Bigelow Avenue to Roosevelt School and North Bethel Street from Ethridge Avenue to the school no roadway appeared as a consistent choice by children for an appreciable distance.

All roadways approaching the school were well marked with traffic control signs and markings. Motorists driving in this area would be very aware of their close proximity to a school.

Except for the sidewalk along the northeast and eastern perimeter of the school property and the bicycle path along San Francisco Avenue this residential area is almost totally without sidewalks.

Eastbound traffic along San Francisco Avenue approaching North Bethel Street can continue straight or turn left. This is a potential hazard to children crossing in either the north/south or east/west directions. It also creates indecision with the crossing guards until the motorists intention is obvious.

-13-
Many of the students crossing San Francisco Avenue at North Bethel Street live west and north of that intersection.

Recommendations - Provide a sidewalk on the west side of Garrison Street between Bigelow Street and Leavenworth Avenue and between San Francisco Avenue and Ethridge Avenue.

Construct a sidewalk along the west side of North Bethel Street from San Francisco Avenue to Ethridge Avenue.

Install stop signs at North Bethel Street and San Francisco Avenue for east bound and south bound traffic.

Move the north/south cross walk to the west side of North Bethel Street across San Francisco Avenue.

Construct a pedestrian walk path along the southern perimeter of the school grounds from North Tullis Street to the school building, skirting the bus loading zone. Install marked crosswalks across North Tullis Street in line with the south sidewalk on Leavenworth Avenue and across Leavenworth Avenue in line with the east sidewalk on North Tullis Street. Provide school crossing signs east and west on Leavenworth Avenue.

Figure 12 is the walk route plan for the Roosevelt Elementary School. This plan takes advantage of existing walk patterns, traffic signing and other controls, an existing bicycle path, current school patrol locations and the above noted recommendations.
MADISON ELEMENTARY SCHOOL

The Madison Elementary School is located at 812 South Central Street and has a school population of about 220 students. This school is essentially a walk-in school with less than 40 children arriving by buses provided by School District 111. A combination of travel modes are used by the 180 students which commute to the school other than by bus. These include walking, use of bicycles and private motor vehicles. School crossing protection is provided by school patrol guards selected from the fifth grade by teachers. The patrols are located at three intersections of Central Street; those at Legion Way, 8th Avenue and 10th Avenue. The neighborhood is an established part of the City with moderate housing density. About half of the streets also have adjacent sidewalks. Because of the close proximity of this school to St. Michaels Elementary School (see next section) the frequency of school oriented traffic signs in the area is heavy.

NOTE. Some of the findings and recommendations shown here also apply to St. Michaels Elementary School in the following section.

Findings - Almost one-half of the students responded to the "blank map" survey. Only two of these were unusable. The dispersion of walk routes throughout the neighborhood was general. Central Street had the maximum north/south student volumes while 8th Avenue and Union Avenue are the principal east/west collector roadways as shown on Figure 13.

There are no sidewalks along Union Avenue from Central Street to Fir Street; an area with high student usage.

Eastbound traffic on Legion Way is not required to stop at Central Street. Motorists sight distance is restricted approaching this intersection from the west.

There are no sidewalks adjacent to 10th Avenue between Boundary Street and Central Street.

Recommendations - A sidewalk should be provided along the north side of Union Avenue (or a paved shoulder added to the roadway and designated for pedestrian/bicycle use only) between Central Street and Fir Street.

Require eastbound motor vehicle traffic on Legion Way to stop at Central Street.

Curbing and a sidewalk should be provided on the south side of 10th Avenue from Boundary Street to Central Street (see rationale for this recommendation in St. Michaels Elementary School section). Add a marked crosswalk across Boundary Street in line with the south sidewalk.

-15-
Figure 14 is the walk route plan for the Madison Elementary School and takes advantage of existing student walk patterns, traffic signing and other controls, current school patrol locations and the above noted recommendations.
FIGURE 14
MADISON ELEMENTARY SCHOOL
Recommended School Routes
ST. MICHAELS ELEMENTARY SCHOOL

This Catholic elementary school is located at 1203 East 10th Avenue and has a school enrollment of about 215 children. Of that number approximately 35 walk in at least one direction. School crossing guards assist at three locations; the mid-block crossing of 10th Avenue directly in front of the school, at Eastside Street and 10th Avenue, and at Boundary Street and 10th Avenue. These are patrolled by a student patrol force of 26 children drawn from the sixth grade. Six are on duty at one time in 3 teams of 2 students. No school buses are provided for transportation. The previous comments for the Madison Elementary School regarding neighborhood type and traffic controls also apply to this school.

Findings - The response to the "blank map" survey was favorable with about 80 percent of the estimated number of walking students responding. From the total of 28 responses 2 indicated that they generally traveled to and from school by bicycle. Four identified a return direction different than their inbound trip or walked only on their home bound trip and 2 were not usable. Figures 1 and 2 illustrate the inbound and outbound route patterns. As can be seen the current walk routes are highly defined with few individual deviations. No substantial difference is apparent between the inbound and outbound walk patterns.

The general neighborhood has a substantial percentage of roadway length flanked by existing sidewalks.

All approach roadways to the school grounds have marked crossings, adequate coverage of school crossing warning signs and school period speed restriction signs.
A traffic operations problem exists along the south side of 10th Avenue from Eastside Street to Boundary Street in the morning while students are being delivered to school and again in the afternoon during the pickup period. Those portions of the roadway where parking is permitted are occupied by vehicles belonging to the staff of the school and other employees involved in church related activities. Parents arriving at the school either park in no parking curb areas or double park in the roadway. This behavior does obstruct proper visibility to the marked mid-block crosswalk. Some children were observed walking in the moving traffic lane in order to approach or leave their vehicle. One motorist was observed backing across the mid-block crosswalk while departing from a parked position in a no parking zone.

A gap study was performed at the intersection of 10th Avenue and Eastside Street to determine if additional controls, other than the existing school patrol guard, were necessary (see Appendix C). This arterial crossing is the most important from a standpoint of motor vehicle traffic volume that the pedestrians at this school encounter. (An analysis of the situation at this intersection clearly indicates that no additional control is needed).

A portion of sidewalk is missing on the west side of Boundary Street between 9th Avenue and 10th Avenue and the entire length on the east side.

Recommendations - The potential hazards along 10th Avenue can be reduced by adoption of the following two recommendations by the authorities at St. Michaels Elementary School.

1. All persons involved in the day to day functions of St. Michaels Church and Elementary School be directed to not park their motor vehicles on either side of 10th Avenue between Eastside Street and Boundary Street. Adequate parking should be provided in a location south of the church and full day parkers instructed to use 11th Avenue to and from that location.

2. Parents bringing or picking up students should be cautioned against parking in the no-parking areas. They should be encouraged to use the south curb and to use extreme caution during all parking and driving maneuvers. The safety aspects of parking in a location that provides maximum visibility between other drivers and school children crossing the roadway should be pointed out.

Provide a sidewalk and curbing on both the north and south side of 10th Avenue from Boundary Street to Central Street. (It is anticipated that some of the school/church staff displaced from parking between Eastside and Boundary Streets will move to this location. Unless formalized parking is established new problems may be created for school children walking along this roadway).

Provide a sidewalk on the west side of Boundary Street from 9th Avenue South to mid-block.
Add a marked east/west crosswalk on the north side of the Central Street/Boundary Street intersection.

Figure 15 shows the walk route plan for St. Michaels Elementary School. This plan takes advantage of current student walk patterns, existing sidewalks and traffic controls, school patrol locations, and the physical changes and anticipated operational modifications recommended above.
FIGURE 2
ST MICHAELS ELEMENTARY
Outbound Trips
FIGURE 15
ST MICHAELS ELEMENTARY SCHOOL
Recommended School Routes
General - A number of items became apparent during the course of this study that need to be highlighted and taken into consideration. The responsibility for such action belongs at times with the parents of school age children, the school district administration and staff, the City of Olympia or a combination of all these:

The use of fifth grade students as school patrol crossing guards is customary in School District III. This issue was commented on, and concern expressed, by all responsible persons in the school district. It was stressed that children of this age - and especially at the beginning of the school year in the fall - have an extremely wide range of maturity. This was observed during the field survey. Some crossings did not have a patrol guard show up during the period of time when children were present. At other locations the patrol guard would cease operation even though students were still crossing the roadway. Horse play was common between the patrol guards and students and in some cases the guards did not exert any authority over the students. This resulted in a constant dribble of children across the roadway. Hesitant signaling during the crossing operation to approaching motorist often created confusion.

It is strongly recommended that the school district consider two approaches to alleviating this problem:

2. Establish a demonstration project requiring the student driver curriculum to include a number of hours guarding a school crossing. This can result in an enhanced level of safety at the crossings and greater sensitivity by the trainees to pedestrian problems. (Funding for this type program available from the National Highway Traffic Safety Administration).

Voluntary involvement by senior high school service organizations in assisting the present patrol systems.

During the "blank map" survey parents were asked to comment on any item they wished relative to this study. The parents from Garfield, Pioneer, and McKinley Elementary Schools took advantage of this request to the largest degree. However, comments were received from all school areas. Some of those most frequently noted are paraphrased below.

"Don't move the bus stop. My child catches the bus in front of our house."

"There are no sidewalks along (name of roadway) street. Children must walk in the middle of the roadway".

"The cars use (name of roadway) as a drag strip".

"It was difficult to read the small printing on the map".

"The bus stop should (should not) be moved".

"Thank you for allowing this opportunity to express my concern."
"The children take a short cut along a dirt path through our development area. The City should build a path before a house is built across the path".

"Provide more bike paths". (Jones Road and 18th Avenue were most often mentioned as recommended sites).

"I would like to suggest either a larger map, clearer printing or a magnifying glass (possibly all three)".

A few parents expressed their concern for the personal safety of their child on a walk trip to school.

The school district should establish a standard procedure for elementary school patrol systems. It should include a student selection method, the required numbers of students to a crossing location, and effective operational monitoring techniques.

Conclusions - This study developed many facts relative to the walk patterns of students at elementary schools within Olympia, Washington. Unfortunately, within the time and funding constraints of this study it was not possible to include the three middle schools--Jefferson, Reeves and Washington--each of which has a substantial portion of the student population which walks to school. The momentum and interest generated by this study within the community and all effected organizations should be maintained.

A walk study of the three middle schools should be undertaken utilizing those portions of this study methodology deemed most effective.

Those recommendations that fall within the jurisdiction of the City of Olympia should be considered for implementation, prioritized and possible funding sources identified. Other organizations affected by the study recommendations should give serious consideration to their incorporation. Citizens in the community and especially those with school age or future school age children should constantly monitor the level of commitment to the study recommendations by responsible authorities.

Any study dealing with a community's population, and especially the school age population with its transientness, will provide information that may be valid for only a limited period of time. As demographic patterns change because of housing development, establishment of new shopping centers, shifts in employment locations and other factors the basic study information may also change. It is therefore highly recommended that a periodic review of the walking patterns of elementary school children be undertaken every three years.
REFERENCES


2. Ibid.


APPENDIX

A. Mayor's Letter

B. Tape Recorder Method

C. Gap Studies
APPENDIX A

Dear Parents

The City of Olympia, with the active cooperation of the Olympia School District, is doing a study of the walk routes used by our children to and from school and bus stops. This study will result in a school route plan with suggested routes for children to follow when walking to and from school.

The study will also assist the City in identifying needs for improvements in walkways and traffic controls. While the study will focus primarily upon those areas within the city, the information will be shared with county authorities for their consideration in identifying needed improvements.

Your assistance is urgently needed. Please aid your child in marking the route on the attached map which she/he follows walking to school or the school bus stop. (Students that usually travel by bicycle should mark their route and note, "bicycle"). If the return walk is not the same as that going to school please show it also. This can be done by using a different color for each direction or showing directional arrows. Draw the route line on that side of the street generally used and crossing streets where this normally happens. We also want the walk routes used during bad weather if they are not the same as good weather routes. Please have your child return the marked map to school tomorrow.

Similar information was received from some schools last year. That data will provide a valuable means of comparison with today's walking patterns.

Thank you for your help in this important task.

THOMAS P. ALLEN, Mayor
City of Olympia

HOWARD M. COBLE, Superintendent
Olympia School District No. 111

TPA/HMC:mah
Attachment
APPENDIX B

TAPE RECORDER METHOD

In order to use Figure B-1 to determine the need for traffic controls at a specific crossing location the percent of pedestrian delay time must be established. This requires that the time intervals between passing motor vehicles be measured during the survey period. Two methods are described in the Institute for Transportation Engineer's booklet, "A Program for School Crossing Protection". They are: the graphic recorder method and the metronome method. The first technique requires expensive equipment not readily available to many smaller communities. The second method makes use of a metronome—a low cost instrument available in most places—but requires the observer to count the number of one-second clicks of the metronome between passing motor vehicles and to record this information on a survey form.

The tape recorder method developed for this study, makes use of a common battery powered tape recorder. The observer notes on the tape the beginning time and ending time of the survey period. The instant in time that a vehicle passes a specific observation point (e.g., a marked crosswalk) is identified by a sharp mechanical sound recorded on the tape. This can be followed by the observer noting a number sequence of the passing motor vehicle as an aid to later tabulation. The survey period should begin and end at the passing of a vehicle. The time interval between the sharp sounds is the gap time. The tabulation technique and computation of actual pedestrian delay is the same as that for the above noted methods.

This method releases the observer from counting of metronome clicks and the large probability of error. At the end of the survey period the delay time study can be completed immediately or put aside until a more convenient period. An additional advantage to this technique is the opportunity to rerun the taped information should a major error occur during transcription. The most important benefit, however, is that during the gap study other observations can be made. The pedestrian group sizes, the mix of motor vehicle traffic, the walk patterns to and from the crossing, and other observations can be noted and recorded without adverse affect on the gap study.
DETERMINATION OF NEED FOR TRAFFIC CONTROL AT SCHOOL CROSSINGS

CONTROLS NEEDED

CONTROLS NOT NEEDED

WIDTH OF ROADWAY $W$ IN FEET

PERCENT PEDESTRIAN DELAY TIME $D$

$N = 1$
# PED DELAY TIME STUDY

**DATE:** 4.20.77  
**LOCATION:** N. Division/Madison Avenue

**CROSSWALK ACROSS:** Division Street  
**South Side**

**START:** 8:29 AM/9:01 AM  
**END:** 8:57 AM/9:15 AM

**NO. OF ROWS (N) = 2**  
**ROADWAY WIDTH (W) = 44'**

**TOTAL SURVEY TIME:** 2520 secs.

**ADEQUATE GAP TIME (G) = 18**

<table>
<thead>
<tr>
<th>GAP SIZE</th>
<th>NO. OF GAPS</th>
<th>TOTAL SECS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>19</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>5</td>
<td>105</td>
</tr>
<tr>
<td>22</td>
<td>3</td>
<td>66</td>
</tr>
<tr>
<td>23</td>
<td>3</td>
<td>69</td>
</tr>
<tr>
<td>24</td>
<td>5</td>
<td>120</td>
</tr>
<tr>
<td>25</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>52</td>
</tr>
<tr>
<td>27</td>
<td>3</td>
<td>81</td>
</tr>
<tr>
<td>29</td>
<td>1</td>
<td>29</td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>35</td>
<td>4</td>
<td>140</td>
</tr>
<tr>
<td>39</td>
<td>1</td>
<td>39</td>
</tr>
<tr>
<td>41</td>
<td>1</td>
<td>41</td>
</tr>
<tr>
<td>42</td>
<td>2</td>
<td>41</td>
</tr>
<tr>
<td>43</td>
<td>2</td>
<td>86</td>
</tr>
<tr>
<td>44</td>
<td>1</td>
<td>44</td>
</tr>
<tr>
<td>49</td>
<td>1</td>
<td>49</td>
</tr>
<tr>
<td>51</td>
<td>2</td>
<td>102</td>
</tr>
<tr>
<td>54</td>
<td>1</td>
<td>51</td>
</tr>
<tr>
<td>60</td>
<td>1</td>
<td>60</td>
</tr>
</tbody>
</table>

(Note: Discard gaps less than 18 secs.)

T = TOTAL SURVEY TIME = 42 x 60 = 2520 Secs.

t = total time = 1326 secs.

D = \( \frac{T-t}{t} \times 100 \)

= \% Ped Delay Time

D = \( \frac{2520-1326}{2520} \times 10 \)

= 47\%
**PED DELAY TIME STUDY**

**DATE** April 20, 1977  
**LOCATION** North Division Street/Madison Avenue

**CROSSWALK ACROSS** Division Street South Side  
**START** 9:56 AM  
**END** 10:15 AM  
**TOTAL SURVEY TIME** 1140

**NO. OF ROWS (N) = 1**  
**ROADWAY WIDTH (W) = 44-feet**

**ADEQUATE GAP TIME (G) = 18 seconds**

<table>
<thead>
<tr>
<th>GAP SIZE</th>
<th>NO. OF GAPS</th>
<th>TOTAL SECS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>42</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>27</td>
</tr>
<tr>
<td>28</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td>33</td>
<td>1</td>
<td>33</td>
</tr>
<tr>
<td>35</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>40</td>
<td>1</td>
<td>40</td>
</tr>
</tbody>
</table>

\[ t = \frac{T}{t} \times 100 \]

\[ D = \frac{1140 - 346}{1140} \times 1 \]

\[ D = 69.7\% \]
PED DELAY TIME STUDY

DATE April 20, 1977
LOCATION North Division Street/Madison Avenue
CROSSWALK ACROSS Division Street South Side
START 2:21 PM
END 2:47 PM
NO. OF ROWS (N) = 1
ROADWAY WIDTH (W) = 44-feet

TOTAL SURVEY TIME 1560 seconds,
ADEQUATE GAP TIME (G) = 18 seconds

<table>
<thead>
<tr>
<th>GAP SIZE</th>
<th>NO. OF GAPS</th>
<th>TOTAL SECS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

(Note: Discard gaps less than ___ secs.)

\[ T = \text{TOTAL SURVEY TIME} = 26 \times 60 = 1560 \text{ Secs.} \]

\[ t = \text{total time} = \text{than 18 secs.} \]

\[ D = \frac{T-t}{t} \times 100 = \% \text{ Ped Delay Ti} \]

\[ D = \frac{1560 - 317}{1560} \times 1 = 79.7\% \]
PED DELAY TIME STUDY

DATE: April 14, 1977

LOCATION: Division Street/Madison Avenue

CROSSWALK ACROSS: Division Street

START: 3:06 PM

END: 3:48 PM

TOTAL SURVEY TIME

ADEQUATE GAP TIME (G) = 18 seconds

<table>
<thead>
<tr>
<th>GAP SIZE</th>
<th>NO. OF GAPS</th>
<th>TOTAL SECS.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(NOTE: Discard gaps less than 18 secs.)</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>5</td>
<td>90</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td>22</td>
<td>2</td>
<td>44</td>
</tr>
<tr>
<td>23</td>
<td>3</td>
<td>69</td>
</tr>
<tr>
<td>24</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>25</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>52</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>27</td>
</tr>
<tr>
<td>28</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td>30</td>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td>33</td>
<td>1</td>
<td>33</td>
</tr>
<tr>
<td>34</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td>38</td>
<td>2</td>
<td>76</td>
</tr>
<tr>
<td>45</td>
<td>1</td>
<td>45</td>
</tr>
</tbody>
</table>

\[ t = \frac{T}{T-t} \times 100 \]  
\[ D = \frac{2520 - 741}{2520} \times 10 \]  
\[ D = 70.6\% \]
DETERMINATION OF NEED FOR TRAFFIC CONTROL AT SCHOOL CROSSINGS

WIDTH OF ROADWAY "W" IN FEET

PERCENT PEDESTRIAN DELAY TIME "D"

CONTROL NEEDED

CONTROL NOT NEEDED
**PED DELAY TIME STUDY**

DATE: April 12, 1977  
LOCATION: Eastside Street/10th Avenue

CROSSWALK ACROSS: Eastside Street

START: 8:05 AM  
NO. OF ROWS (N) = 1

END: 8:30 AM  
ROADWAY WIDTH (W) = 44-feet

TOTAL SURVEY TIME

ADEQUATE GAP TIME (G) = 15 seconds

<table>
<thead>
<tr>
<th>GAP SIZE</th>
<th>NO. OF GAPS</th>
<th>TOTAL SECS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>32</td>
</tr>
<tr>
<td>17</td>
<td>4</td>
<td>68</td>
</tr>
<tr>
<td>18</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>42</td>
</tr>
<tr>
<td>22</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>23</td>
<td>2</td>
<td>46</td>
</tr>
<tr>
<td>24</td>
<td>2</td>
<td>48</td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>26</td>
<td>3</td>
<td>78</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>27</td>
</tr>
<tr>
<td>34</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td>38</td>
<td>1</td>
<td>38</td>
</tr>
<tr>
<td>39</td>
<td>1</td>
<td>39</td>
</tr>
<tr>
<td>53</td>
<td>1</td>
<td>53</td>
</tr>
<tr>
<td>32</td>
<td>1</td>
<td>32</td>
</tr>
</tbody>
</table>

T = TOTAL SURVEY TIME

\[ T = 25 \times 60 \]

\[ = 1500 \text{ Secs.} \]

\[ t = \text{total time} \leq 690 \text{ secs.} \]

\[ D = \frac{T - t}{t} \times 100 \]

\[ = \% \text{ Ped Delay Time} \]

\[ D = \frac{1500 - 690}{1500} \times 1 \]

\[ = 54\% \]
PED DELAY TIME STUDY

DATE April 21, 1977

LOCATION Henderson Boulevard/Carlyon Ave.

CROSSWALK ACROSS Henderson South Side

START 3:12 PM

END 3:27 PM

TOTAL SURVEY TIME 900 seconds

NO. OF ROWS (N) = 2

ROADWAY WIDTH (W) = 47-feet

ADEQUATE GAP TIME (G) = 18 seconds

<table>
<thead>
<tr>
<th>GAP SIZE</th>
<th>NO. OF GAPS</th>
<th>TOTAL SECS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>4</td>
<td>84</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>23</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>24</td>
<td>2</td>
<td>48</td>
</tr>
<tr>
<td>28</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td>29</td>
<td>1</td>
<td>29</td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>32</td>
<td>2</td>
<td>64</td>
</tr>
<tr>
<td>35</td>
<td>2</td>
<td>70</td>
</tr>
<tr>
<td>36</td>
<td>2</td>
<td>72</td>
</tr>
<tr>
<td>40</td>
<td>1</td>
<td>40</td>
</tr>
</tbody>
</table>

\[ T = \text{TOTAL SURVEY TIME} = 15 \times 60 = 900 \text{ Secs.} \]

\[ t = \text{total time} = \text{time less than 18 secs.} \]

\[ D = \frac{T - t}{t} \times 100 = \% \text{ Ped Delay Time} \]

\[ D = \frac{900 - 594}{900} \times 100 = 34\% \]
PED DELAY TIME STUDY

DATE       April 21, 1977
LOCATION  Henderson Boulevard/Carlyon
CROSSWALK ACROSS  Henderson South Side
START      8:40 AM
END        9:18 AM
NO. OF ROWS (N) = 2
ROADWAY WIDTH (W) = 47-feet
TOTAL SURVEY TIME  2280 seconds
ADEQUATE GAP TIME (G) = 18 seconds

<table>
<thead>
<tr>
<th>GAP SIZE</th>
<th>NO. OF GAPS</th>
<th>TOTAL SECS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>.19</td>
<td>3</td>
<td>57</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>3</td>
<td>63</td>
</tr>
<tr>
<td>22</td>
<td>4</td>
<td>88</td>
</tr>
<tr>
<td>23</td>
<td>3</td>
<td>69</td>
</tr>
<tr>
<td>24</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>27</td>
<td>4</td>
<td>108</td>
</tr>
<tr>
<td>28</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td>29</td>
<td>1</td>
<td>29</td>
</tr>
<tr>
<td>30</td>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td>31</td>
<td>3</td>
<td>93</td>
</tr>
<tr>
<td>33</td>
<td>1</td>
<td>33</td>
</tr>
<tr>
<td>34</td>
<td>2</td>
<td>68</td>
</tr>
<tr>
<td>35</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>37</td>
<td>1</td>
<td>37</td>
</tr>
<tr>
<td>43</td>
<td>3</td>
<td>129</td>
</tr>
<tr>
<td>45</td>
<td>1</td>
<td>45</td>
</tr>
<tr>
<td>47</td>
<td>3</td>
<td>141</td>
</tr>
<tr>
<td>49</td>
<td>1</td>
<td>49</td>
</tr>
<tr>
<td>51</td>
<td>1</td>
<td>51</td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>53</td>
<td>1</td>
<td>53</td>
</tr>
<tr>
<td>54</td>
<td>1</td>
<td>54</td>
</tr>
<tr>
<td>59</td>
<td>1</td>
<td>59</td>
</tr>
<tr>
<td>60</td>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>63</td>
<td>1</td>
<td>63</td>
</tr>
<tr>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>70</td>
<td>1</td>
<td>70</td>
</tr>
</tbody>
</table>

T = TOTAL SURVEY TIME
   = 38 x 60
   = 2280 secs.

t = total time =
    than 18 secs.

D = \frac{T-t}{t} \times 100
    = \% Ped Delay Ti

D = \frac{2280 - 1755}{2280} \times 2280
    = 23\%

\[ t = 1755 \]
DETERMINATION OF NEED FOR TRAFFIC CONTROL
AT
SCHOOL CROSSINGS

CONTROL
NEEDED

CONTROL
NOT
NEEDED

WIDTH OF ROADWAY "w" IN FEET

PERCENT PEDESTRIAN DELAY TIME "D"

W = 1