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Final Report

Development of Safety Information Materials and Media Plans for Elderly Pedestrians

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16. Abstract

The objectives of this study were to: 1) develop pedestrian safety messages which will have a countermeasure effect on the specific types of accidents occurring to elderly pedestrians and 2) develop media plans for use by NHTSA in disseminating the information via various organizations. Prior research was reviewed and several recent accident data sets were obtained and analyzed to identify the types of accidents in which the elderly are involved. This effort resulted in identification of the following crash type groupings: Crashes involving vehicles turning at an intersection including *Vehicle Turn/Merge* and *Turning Vehicle*; "Other Intersection" crash types which do not involve turning movements; and the *Backing* crash type. In addition, it was confirmed that elderly accidents increase markedly in the winter months when the sun angle is lowest. This increase appears to be a problem of *Conspicuity*. Pedestrian safety messages were then developed for each of the four defined situations. The risks and behavioral advice were documented in a paper entitled ***Walking Through the Years*** intended as a reference document for potential distributors of the proposed countermeasures. Additional supporting materials included a slide series and presenter's guide to convey study results both to potential distribution organizations and to groups of elderly and a flyer version of the same material prepared for direct distribution to elderly target audiences. Organizations capable of reaching large numbers of the elderly were then identified and plans for use by NHTSA in disseminating the information were prepared.

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DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TECHNICAL SUMMARY

CONTRACTOR	Dunlap and Associates, Inc.	CONTRACT NUMBER DTNH22-89-C-07397
REPORT TITLE	Development of Safety Information Materials and Media Plans for Elderly Pedestrians	REPORT DATE June 1993
REPORT AUTHOR(S)	Richard D. Blomberg, Arlene M. Cleven and Joan M. Edwards	

Older adults are particularly vulnerable as pedestrians. Although they have fewer accidents (7.7%) than would be expected by their numbers in the population (12.5%), they have almost one-quarter (22.7%) of all pedestrian fatalities. NHTSA therefore supported the present study to focus on the pedestrian risks of older adults. The specific objectives of the study were to:

- Develop pedestrian safety messages which will have a countermeasure effect on the specific types of accidents occurring to elderly pedestrians, and
- Develop media plans for use by NHTSA in disseminating the information via various distribution organizations.

The study was initiated with a review of previous research to identify the types of accidents in which the elderly are involved. This review revealed the following accident types to be problems for the older adult: turning vehicles, intersection dash, multiple threat, backing, and midblock darts and dashes. These accident types were identified from a variety of data bases that included approximately 3,000 accident cases. Since much of this research had been done in the 1970s, several recent accident data sets were obtained and analyzed. These included data bases from 1980 through 1988 for various states and localities in the United States. Selected data were also obtained from Australia and Argentina. This effort resulted in the selection of the following target accident situations for countermeasure development:

- Accidents involving turning vehicles at intersections
- Other intersection accidents
- Backing accidents

In addition, it was confirmed from both northern and southern hemisphere data that elderly pedestrian accidents increase markedly in those winter months when the sun angle is lowest. This increase appears to be a problem of:

- Conspicuity

Since the search and course advice for midblock accidents is a less complex subset of that for intersection accidents and since presentation space was limited, no separate coverage of midblock accidents was included in the materials developed for this study.

(Continue on additional pages)

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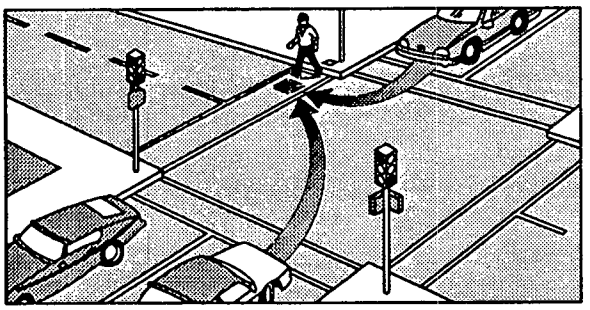
Research on **turning vehicles at intersections** revealed the following:

- Left-turning vehicles are more dangerous than are those making right turns, including right turns on red. The left-turning vehicle typically must cross at least one lane of oncoming traffic before making the turn, and the driver may commit to turning before the pedestrian steps off the curb, or even before the pedestrian is in view.

- The pedestrian is at most risk when first stepping off the curb, that is, the first half of the crossing is more dangerous than the second half. This is because there is less time for both the driver and pedestrian to react to a conflict in the first half of the road.

- Cars leaving the intersection are typically more dangerous than are those that are entering, since they are usually picking up speed.

The highest risk to a pedestrian occurs when all three of these factors are present at the same time. This happens when the center of the intersection is on the pedestrian's left. The pedestrian then encounters left-turning vehicles in the first half of the crossing. In addition, ***all*** vehicles encountered are leaving the intersection.

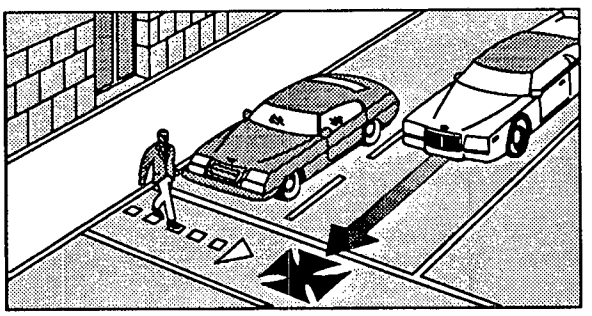


Risks:

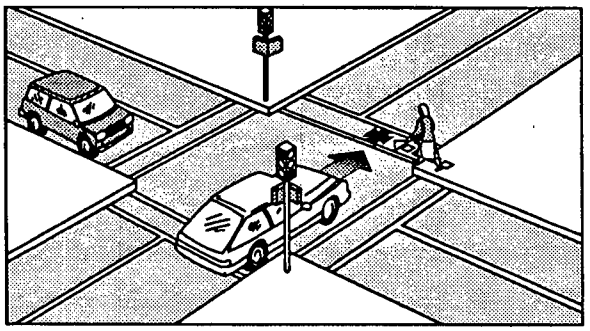
- Intersection on left
- First stepping off curb
- Turning vehicles
- Exiting vehicles

Non-turning vehicles at intersections also account for a large number of older pedestrian accidents at intersections, including the following:

- ***Visual screens***--the pedestrian is screened by another vehicle or object so as not to be visible to the driver until suddenly stepping out in front of the driver.

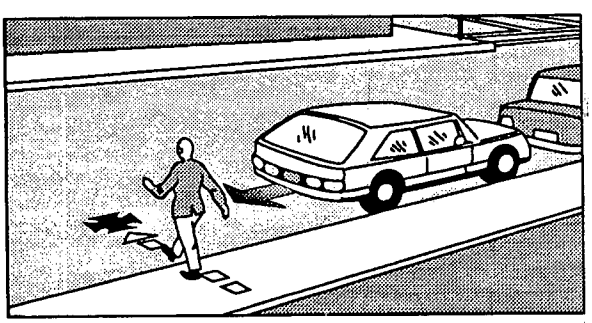


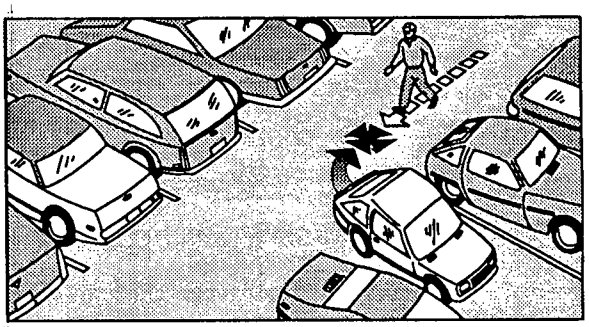
- ***Signal "faith"***--the pedestrian relies completely on the signal and steps into the roadway as soon as the light turns green or the signal says WALK without checking for traffic. The pedestrian is then hit by a car that is still in the intersection.



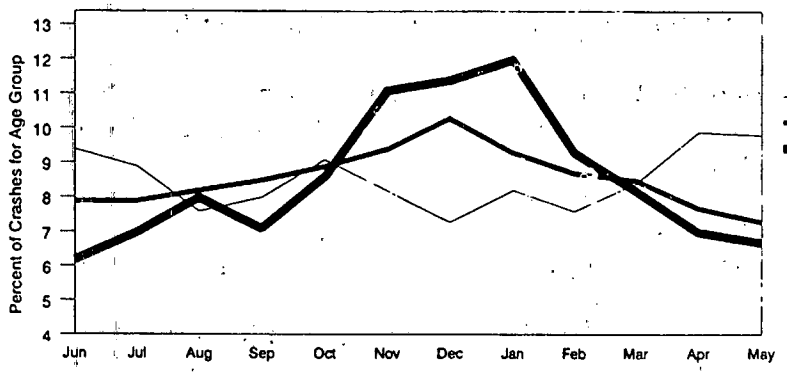
- ***Signal timing***--the duration of the WALK signal may be too short for the slower walking speeds of the older adult. As a result, the pedestrian becomes trapped in the street when the DON'T WALK signal flashes. The older adult sometimes freezes, retreats or panics. Pedestrians of all ages misunderstand the flashing DON'T WALK signal. It means pedestrians shouldn't ***start*** to cross the street. However, if they are already in the middle of the street when the signal flashes, they should continue to the other side at their normal walking speed.

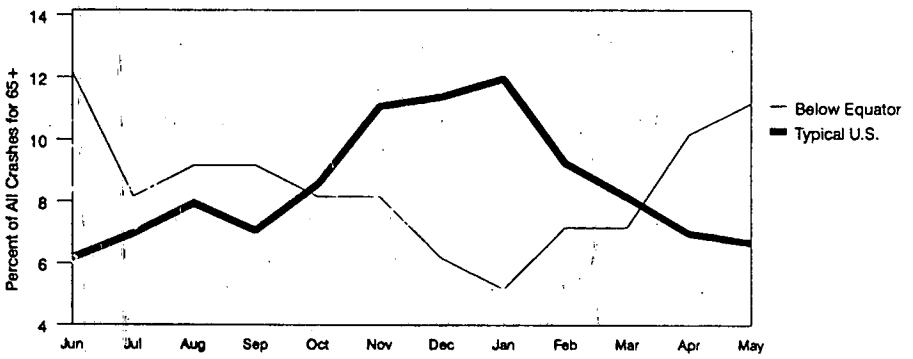
Accidents involving backing vehicles take place in roadways, in driveways and alleys, and in parking lots. Typically, both the driver and pedestrian are inattentive. The driver may not look carefully enough for pedestrians, and rearward visibility from a car is usually poor. Cues such as the sound of the engine may go unnoticed by the pedestrian. In a roadway situation, the pedestrian is concentrating on *moving* cars, not cars that might start to move. The pedestrian can also be particularly inattentive in a parking lot since it may not seem to be a roadway and, therefore, its risks may be underestimated. And, finally, the pedestrian may consider the sidewalk to be completely non-threatening and fail to recognize that a driveway intersecting a sidewalk can be as dangerous as the intersection of two roads.





Older adults also have a marked increase in pedestrian accidents in the winter months (November, December and January). These are the months when the sun is lowest in the sky and shadows are greatest, not necessarily when the weather is coldest. The increase occurs not only in both warm and cold climates in the United States but also during the equivalent winter months in the southern hemisphere. Although all pedestrians tend to wear dark or neutral clothing in winter, it is particularly true of the older adult. With the increased shadows, the pedestrian is simply not conspicuous to the driver. It is therefore especially important that older adults (and, in fact, all pedestrians) wear something light or bright (preferably fluorescent) during daytime in the winter months.





Countermeasures in the form of pedestrian safety messages were then developed for each of the four elderly pedestrian accident situations identified. The message development process was iterative in nature. Initial message contents were proposed based on research and analysis of the elderly pedestrian accident problem. These message contents were then reviewed by elderly discussion groups as well as by pedestrian safety experts at both NHTSA and the Federal Highway Administration (FHWA) not only until relevant and appropriate wording for the target audience was achieved but also until the modified behaviors indicated were deemed to be effective and realistically implementable by the target audience. Capabilities and limitations of the target group of older adults were confirmed through discussions with gerontologists. In addition, specific problems relative to getting the elderly to use bright or high visibility materials to counter the identified problem of conspicuity were discussed with representatives from major merchandising firms.

The final messages were documented in a background paper sponsored by both NHTSA and FHWA and entitled ***Walking Through the Years***. This paper was prepared for potential distributors of the proposed countermeasures. It describes the risks to older pedestrians and provides advice which can be given to them to help avoid accidents. It stresses the importance of checking for cars from ***all*** directions before entering the roadway even when there is a traffic light or pedestrian signal. It also emphasizes the importance of making sure that the pedestrian is seen by a driver. If the driver detects and recognizes a pedestrian, most accidents will be avoided. An example of the advice for the problem of ***signal "faith"*** is shown in the box below.

Sample Advice for Problem of Signal "Faith"

- If you step into the roadway immediately when a green light or WALK signal comes on, you may be hit by a car in the intersection.

  ✔ Green does not mean that you have the right of way. Green means look and, if it's safe, then go.

  ✔ The WALK signal does not mean that it is safe for you to start crossing. Rather, it tells you to stop at the curb and look to make sure that it is safe.

  ✔ Always stop at the curb and look for cars from all directions before entering a roadway. Exaggerate your left-right-left looks so that you see any turning vehicles also.

  ✔ Before crossing at an intersection, you may want to wait for a fresh green light (gives you the most time). Also, look for cars that might be coming (don't assume they will stop).

Additional supporting materials prepared for the study included a slide series and presenter's guide to convey study results both to potential distribution organizations and to groups of elderly. In addition, a flyer version of the same material was prepared for direct distribution to elderly target audiences.

Finally, it was determined that the best media distribution plan for the developed advice was to place primary emphasis on getting groups which already had open communication channels with the elderly to act as primary disseminators. Therefore, organizations capable of reaching large numbers of elderly Americans and with potential high credibility for presenting safety messages were identified. From among these, those willing to serve as distribution channels for the messages were selected, and distribution plans for use by NHTSA in disseminating the information with their assistance were prepared. NHTSA, FHWA and project representatives met directly with three of the major organizations on the distribution list, and support was provided in adapting the study materials to their individual distribution needs.

ACKNOWLEDGMENTS

The authors wish to express their appreciation to those people whose assistance was instrumental in guiding this research and helping ensure the production and distribution of end products with a high potential for improving the safety of older pedestrians. In particular, these include the representatives of the three major organizations contacted by the study who provided excellent advice and planning for the long-term dissemination of the safety advice produced by this study:

- Mr. Dean W. Childs, Director, Traffic Safety Services, The American Automobile Association (AAA)
- Mr. Steve Lee, Program Specialist, Program Coordination and Development/ Programs, The American Association of Retired Persons (AARP)
- Dr. Harold T. Thompson, Manager, Highway Traffic Safety Consulting Services, The National Safety Council (NSC).

Although a study of this complexity could not have been undertaken without the participation of these people and others, the findings and opinions expressed herein are solely those of the authors.

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I. INTRODUCTION

This study represents a further step in the National Highway Traffic Safety Administration's (NHTSA's) systematic approach to the development of pedestrian safety countermeasures. Work to combat pedestrian accidents began with a focus on young children not only because the loss of a child is so tragic and children represent such a large percentage of all pedestrian victims but also because children congregate in schools where they can be relatively easily reached with countermeasures. Later work developed countermeasures for older children and adults and examined drinking pedestrians. The present effort focuses on the older adult (65+) both because our society is aging and because the elderly represent such a large percentage of pedestrian fatalities.

NHTSA records show that 100,000 pedestrians are injured and over 6,000 are killed each year in the United States. Older adults account for fewer pedestrian accidents (7.7%) than would be expected by their numbers in the population (12.5%). However, they account for almost one-quarter (22.7%) of all pedestrian fatalities. It is therefore considered especially important to help this group stay out of pedestrian accidents, and it is hoped that the extension of techniques applied to other age groups of pedestrians will yield similar success with the elderly.

The objectives of the present study were to:

- Develop pedestrian safety messages that will have a countermeasure effect on the specific types of accidents occurring to elderly pedestrians, and
- Develop media plans for use by NHTSA in disseminating the information via various distribution organizations.

The study was initiated with a review of previous research to identify the types of accidents in which the elderly are involved. Since much of this research had been done in the 1970s, several recent accident data sets were obtained and analyzed in order to make certain that selection of accident types would be based on current data. This effort resulted in identification of three basic target crash situations for countermeasure development-- Intersection accident involving vehicle turns (the **Vehicle Turn/Merge** and **Turning Vehicle** crash types); "Other Intersection" crashes (those not involving turning movements); and **Backing** accidents. In addition, it was confirmed that elderly pedestrian accidents increase markedly in those winter months when the sun angle is lowest. This increase appears to be a problem of **Conspicuity**.

Countermeasures in the form of pedestrian safety messages were then developed for each of the four elderly pedestrian accident situations identified. The message development process was iterative in nature. Initial message contents were proposed based on research and analysis of the elderly pedestrian accident problem. These message contents were then reviewed by elderly discussion groups as well as by pedestrian safety experts at both NHTSA and the Federal Highway Administration (FHWA) not only until relevant and appropriate wording for the target audience was achieved but also until the modified behaviors indicated were deemed to be effective and realistically implementable by the target audience. Capabilities and limitations of the target group of older adults were confirmed through discussions with gerontologists. In addition, specific problems relative to getting the elderly to use bright or high visibility materials to counter the identified problem of conspicuity were discussed with representatives from major merchandising firms. The final messages were documented in a background paper sponsored by both NHTSA and FHWA and entitled

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This report is organized primarily in the chronological order in which the tasks were performed. It cannot, however, be completely time sequential due to the iterative nature of some aspects of the study. It includes the following sections:

- This first section (Section I) describes study objectives and approach and explains how the report is organized.
- Section II describes the analysis of elderly pedestrian accidents and identifies the target accident types selected for countermeasure development.
- Section III describes each of the selected accident types in more detail and includes preliminary countermeasures initially proposed for each.
- Section IV describes the procedures used for refinement both of countermeasure messages and of other study concepts. These included discussion groups with the elderly, interviews with gerontologists and interviews with department store managers and buyers.
- Section V presents the final countermeasure messages developed for the study along with the specific problems addressed, objectives of the countermeasures, and the rationale for their inclusion in a compendium of behavioral advice for the elderly pedestrian.
- Section VI describes the materials produced by the study, the distribution efforts that were made, and recommended media plans.

Appendices to the report provide supporting documentation for the study as well as copies of materials produced. Included are tabulations of selected supporting accident data, detailed and summary responses obtained from the elderly discussion groups, the ***Walking Through the Years*** paper prepared for distributors of the pedestrian safety advice, the presenter's guide for the slide series describing the problem, the safety advice and the use of the slides, a flyer summarizing the advice, and a list of organizations which could potentially distribute some or all of the developed materials to audiences of elderly pedestrians.

II. SELECTION OF TARGET ACCIDENT TYPES

Previous research (Preusser, Blomberg, Edwards, Farrell and Preusser, 1983) identified four of the pedestrian crash types defined by Snyder and Knoblauch (1971) that are a particular problem for the older adult. These crash types are:

- Vehicle Turn/Merge (VTM) including Turning Vehicle
- Intersection Dash
- Multiple Threat
- Backing

These accident types were identified from a variety of data bases. They included two large data bases (approximately 1,000 cases each) from Los Angeles, one covering 1973 to 1975 and one covering 1976 to 1978. The other data bases (ranging in size from 61 to 437 cases) came from South Dakota, Washington, Colorado and New Orleans as well as the original urban accident data base of Snyder and Knoblauch (1971) and the data base used by Knoblauch (1977) to define rural/suburban accident types. There were approximately 3,000 cases in all.

Analyses of the various accident data bases also identified descriptors other than defined accident type which were characteristic of the accident experiences of the elderly. These were:

- Time of year - Winter months predominate consistently. November, December and January account for an overly large percentage of the pedestrian accidents.
- Time of day - Daylight and early evening predominate with few late night events.
- Day of week - Weekdays predominate (in contrast to weekends).
- Neighborhood - Business and commercial (in contrast to rural) locations predominate. This suggests that the elderly pedestrian trip is often associated with shopping or other purposeful activity.
- Location - Intersections predominate. These are often signalized with marked crosswalks.
- Sex - Females have a higher involvement than males.

The data used for these early analyses were largely collected in the 1970s. While there was no reason to believe that crash distributions by type had changed markedly from the 1970s, it was nevertheless considered advisable to confirm prior conclusions by an examination of more recent data. Therefore, a new look was taken at crash types involving the elderly. Several large, though not necessarily nationally representative, data sets were available for this purpose:

- Wisconsin pedestrian accident data for the years 1980 - 1986 and Michigan data for 1985 - 1987. These data consisted of magnetic tapes of all motor vehicle crashes for the indicated periods. They were available from other NHTSA studies.

- Data for 1988 from a multi-state sample of crashes collected by NHTSA for other purposes. While not a nationally representative sample, these data provided an additional set of information which included a determination of accident type in accordance with the prevailing NHTSA typology. This typology is a simplified version of the types originally identified by Snyder and Knoblauch (1971).

- Actual hard copy police reports of elderly pedestrian accidents provided by the Florida Department of Transportation for the year 1988. Each of these reports was read by a project staff member, and an accident type was determined.

- Pedestrian fatality data from the Department of Transport and Communications, Canberra, Australia, and pedestrian injury and fatality data from the Asociacion Civil Defensa del Peaton, Buenos Aires, Argentina. These data were received in tabular form and used to examine certain hypotheses with respect to conspicuity-related crashes.

Additional tabulations were run on the Wisconsin and Michigan data and compared with those produced during earlier work. These tabulations did not include consideration of accident type since no type code was available. Tables 1 and 2 show tabulations from the Wisconsin data as an illustration of this type of analysis. The Michigan data were consistent with the Wisconsin findings and are not repeated here.

Table 1 shows hour, day of week and month for all Wisconsin pedestrian crashes 1980 to 1986 (including those involving the elderly) and for only those crashes involving the elderly. The results confirm earlier findings. Elderly crashes are primarily daylight events that occur on weekdays. Table 2 shows crash location, pedestrian sex, vehicle action and traffic control. These crashes are primarily intersection events which often involve turning vehicles and traffic controls. The sex of the pedestrian is more often female; a finding which again distinguishes the elderly crashes from crashes involving other age groups. These findings are quite consistent with the results found in the 1970s, and thus there is no reason to believe that there has been a marked change in elderly crashes over the years.

The next data set examined came from the 1988 multi-state sample. This data set included 1,554 police crash reports involving a pedestrian. Of these, 130 are for pedestrians ages 65 and older. Each of these reports was coded by NHTSA using the *Manual Accident Typing System (MAT)*. There are some structural differences between MAT and the coding systems used to determine accident types for the major research studies during the 1970s (c.f., Blomberg, Preusser, Hale and Leaf, 1983). For instance, MAT's use of 37 type codes as compared to the 15 primary codes used in the 1970s tends to dilute the incidence of major types. Nevertheless, MAT yields crash type information which is similar to and compatible with the earlier research data.

A data set consisting of hard copy police reports covering elderly pedestrians accidents was also examined. These reports were provided by the Florida Department of Transportation and cover 374 Florida events involving pedestrians ages 65 and older for the year 1988. For comparability, the

Table 1.

Pedestrian Crashes by Time, Day and Month
(Wisconsin Statewide 1980-1986)

Hour	% 65+	% All
0	1	5
1	1	5
2	‡	3
3	‡	1
4	‡	‡
5	1	‡
6	1	1
7	3	3
8	4	3
9	8	2
10	7	3
11	7	4
12	7	5
13	8	4
14	9	6
15	11	11
16	7	9
17	7	7
18	5	6
19	5	5
20	2	4
21	2	4
22	1	4
23	1	3
Total	100%	100%
N	1,285	15,403

Day	% 65+	% All
Sun	7	12
Mon	14	13
Tues	13	13
Wed	19	14
Thurs	15	15
Fri	19	17
Sat	12	16

Month	% 65+	% All
Jan	9	8
Feb	7	7
Mar	6	7
Apr	7	8
May	7	9
June	7	9
July	8	9
Aug	8	8
Sept	8	9
Oct	11	9
Nov	11	8
Dec	12	9

Note: ‡ as a table entry indicates less than 1%

Table 2.

Pedestrian Crash Descriptors
(Wisconsin Statewide 1980-1986)

Crash Location	% 65+	% All
Intersection	41	24
Intersection Related	15	14
Non-Intersection	43	61

Pedestrian Gender	% 65+	% All
Male	44	59
Female	56	41

Vehicle Action	% 65+	% All
Left Turn	18	8
Right Turn	15	8
Backing	8	4
Straight	50	70
Other	9	10

Traffic Control	% 65+	% All
Signal	25	16
Stop Sign	11	6
Other Control	3	4
No Control or Off Road	60	74
N	1,285	15,403

Florida reports were coded by project staff members using MAT. The multi-state sample and Florida data are shown in Table 3.

From the multi-state sample, the only two unique crash types that emerged with a high frequency of occurrence among the elderly were VTM and Backing. Intersection events were quite common (particularly since all VTMs in MAT coding occur at intersections). However, the most common intersection event (excluding VTM) was "Intersection Other" which is a crash type that conveys very little countermeasure information because it is basically an outgrowth of insufficient detail on the police accident report. Multiple Threat, Intersection Dash and Trapped combined accounted for only 12 of the 131 cases.

Similar results were seen from the analysis of the hard copy Florida reports. Backing and VTM emerged as unique crash types, and intersection events were largely "Intersection Other." Florida differed from the multi-state sample in that it showed a large number of "Not in Road" events. This difference is likely the result of the sampling characteristics of the multi-state sample and not a difference between Florida and the multi-state sampling sites. The Not in Road crashes and the Backing crashes are primarily parking lot events. As such, parking lots emerge as a major problem for this age group. Unfortunately, this category of accidents can be difficult to analyze as part of evaluation research because some jurisdictions do not collect and file police accident reports on events which take place on private property.

The data from the 1970s were based on eight data sets and covered approximately 3,000 elderly pedestrian events. Over 2,000 of these came from six years of data coding in support of a countermeasures test (see Blomberg et al. 1983) in Los Angeles (1973-1978). The 1988 multi-state sample and Florida data bases cover only 500 events and use the MAT coding system which differs from the coding used in the 1970s. Nevertheless, the 1970s and 1988 data agree on two major points. First, intersection events, including VTM, and accidents occurring in parking lots are major concerns.

Overall, analyses of the new data sets provided strong support for a conclusion that the basic pedestrian accident picture, particularly with respect to the elderly, has not changed materially since the extensive data collection efforts in the 1970s. This, in turn, led to the conclusion that the large sample sizes and rich coding contained in the earlier data bases could be employed to assist in selecting and describing targets for the present effort. Therefore, the Los Angeles data containing 2,030 crashes involving pedestrians 65 years of age or older was retrieved and used extensively in the analytical process.

It should be noted that the multi-state sample, Florida and Los Angeles data all suggest an older elderly target group. For the multi-state sample, 59 percent of the victims over 65 were 75 years of age or older. For Florida, 53 percent of the elderly victims were 75 or older, and for Los Angeles, the percent of elderly 75 or older was 46. The Los Angeles data were examined with respect to accident type and no major differences emerged between elderly over and under 75.

Throughout the years that we have studied pedestrian accidents, we have noted that the frequency of accidents involving the elderly increases during our winter months (particularly November, December and January). We have found the same effect in our more northern, cold cities such as Washington and Detroit and in our cities with moderate winters such as Miami and Los Angeles. The phenomenon has occurred in every data set we have examined.

Table 3.

Accident Types Involving Pedestrians 65+ Years Old
from the Multi-State Sample and Florida Data Bases

Accident Type	% of Multi-State Sample 1988	% of Florida 1988
VTM	17	16
Backing	12	20
Intersection (not VTM or Backing)	31	16
Midblock (not VTM or Backing)	22	22
Walk Along Road	6	3
Not in Road (Not VTM or Backing)	4	19
Other	8	4
N	130	374

Notes: All accident types determined in accordance with the existing NHTSA typology.

Other includes Disabled Vehicle, Two Vehicles Collide, Work on Road, Expressway Crossing, Weird and Inadequate Information types.

Now that the research concentration is exclusively on the problems of the elderly, it was considered essential to attempt to understand this phenomenon and its possible causes. This was accomplished through two separate analyses. First, two data sets from the Southern Hemisphere (Australia and Buenos Aires) were obtained and examined to see if they showed the same effect displaced by six months due to the reversed seasonal cycle. Results showed an increase in elderly pedestrian accidents below the equator in May, June and July. Second, the extensive Los Angeles data set was reanalyzed with specific emphasis on the subset of crashes involving the elderly. This analysis confirmed the previously-noted increase in elderly pedestrian accidents in winter and also showed that the increase comes primarily from vehicles making left turns. Since most people (and the elderly in particular) tend to wear more clothing and dark or neutral colors in winter, this increase in pedestrian accidents was attributed to a problem of conspicuity. It was concluded that the pedestrian in dark winter clothing simply is not seen by a driver who is distracted or overloaded by the driving task. The additional clothing worn in winter months contributes to the problem by masking pedestrian movement and body shape, both of which can be valuable in attracting a driver's attention. These additional analyses have promoted a much greater understanding of the phenomenon and brought it to the point at which it can be reasonably considered as a countermeasure target.

From the examination of the data described above, the following target accident situations were selected for inclusion in the message materials:

- VTM (includes Turning Vehicle)
- Other Intersection crashes (includes a variety of crashes occurring at intersections in which the striking vehicle was not turning)
- Backing (includes crashes in parking lots, driveways and roadways)
- Conspicuity - a mixture of several accident types including VTM and Intersection Dash but with a unique set of potential countermeasures.

These targets are not mutually exclusive with respect to proposed countermeasure treatment. They are, however, sufficiently distinct with respect to causal behaviors, accident location or recommended remedies to warrant separate discussions. The following section of this report (Section III) describes the four countermeasure targets, provides justifications for their selection, and identifies the countermeasures that were initially proposed for each accident type. As indicated previously, these countermeasures were subsequently revised. The final countermeasures are presented in Section V.

III. DESCRIPTIONS OF ACCIDENT TYPES AND PRELIMINARY COUNTERMEASURES

A. VTM Accidents

1. Incidence

The Vehicle Turn/Merge (VTM) type (including the Turning Vehicle situation) is the largest single accident type involving pedestrians 65 or over. As shown in Table 3, the multi-state sample and Florida data sets showed 17 and 16 percent incidence, respectively. Although the categories of "Intersection" and "Midblock" in Table 3 show a larger incidence, they are, in fact, an amalgam of several different accident types sharing common locations. VTM incidence is even more startling in the Los Angeles data. Fully 28.4 percent of the crashes involving pedestrians 65 years of age or older fell in this category. This is contrasted with a VTM proportion in Los Angeles of 15.3 percent for pedestrians between 16 and 64 years old and 7.9 percent for those under 16.

2. Description

The VTM accident type was originally defined by Snyder and Knoblauch (1971) as a situation with an attention conflict. In their research, Snyder and Knoblauch (1971) had access to extensive post-crash interviews which could be used to document attention conflicts. Subsequent accident typing efforts based only on police accident reports, however, did not have interview data to highlight the attention conflict. As a result, many events which were essentially VTMs except for the *documentation* of an attention conflict had to be called "not classifiable." This led to the subsequent derivation of the Turning Vehicle type which has all of the characteristics of the classic VTM except for the documented attention conflict.

As research produced more VTM and Turning Vehicle events for analysis, it became clear that there were no significant functional differences between them. The distinction was more a result of the comprehensiveness of the narrative description of the accident on the police accident report than it was of any real difference in behavioral errors or crash dynamics. Therefore, pedestrian safety research in recent years has tended to combine the two categories and call the amalgam by the original "VTM" name. We concur with this practice and have combined both the data to be presented herein and our thinking with respect to VTM and Turning Vehicle crashes.

VTM accidents typically occur at an intersection. At least part of the problem in understanding intersection crashes is that the intersection itself is the most complicated part of the road. Generally, in a midblock crossing, a pedestrian need only worry about vehicles coming straight from the left or right. At intersections, a vehicle can be going straight or turning, left or right, and can approach the pedestrian from virtually any angle. While vehicle speeds tend to be slow, this benefit is offset by the fact that all parties have a lot to be concerned about with signs, lights, turning traffic, etc. One of the key features of the elderly crashes is that they often occur at intersections. For this age group, it is extremely important to examine the dynamics of intersection crashes and to use these dynamics in the countermeasure development process.

The VTM category includes the situations of:

- Right turning vehicle - the pedestrian is generally crossing with the light if one is present and is struck by a vehicle which makes a right turn on a green signal, if present. The pedestrian's back is towards the turning vehicle when the crash sequence begins.

- Left turning vehicle - the pedestrian is generally crossing with the light if one is present and is struck by a vehicle which makes a left turn on a green signal, if present.

- Right turn on red (RTOR) - the pedestrian typically is crossing with the light and is struck by a vehicle which makes a right turn on a red signal. The driver's attention is diverted to look for oncoming traffic to the left of the vehicle. The situation is functionally similar to a right turning VTM at a stop sign.

The VTM can be characterized as a high *workload* situation for both the driver and the pedestrian. A driver making a turn, particularly a left turn or a right on red, has many conflicting attentional demands. This can lead to an overload situation which, in turn, interferes with the execution and successful completion of a search-detection-evaluation sequence. The pedestrian has a relatively bewildering array of potential threats at an intersection location. This places great demands on the pedestrian's search, detection and evaluation functions. Given the high task demands of the intersection location with turning vehicles and the diminished capacities of the elderly, a focus on the VTM type appears warranted.

There are three primary principles that previous analyses (Preusser et al. 1983) suggest apply to pedestrian hazards at intersections controlled either by a signal (typically red-green-amber) or by a stop sign. These three principles are:

- Left turning vehicles are more dangerous than right turning vehicles.

- The first half of a pedestrian's crossing is more dangerous than the second half

- Vehicles exiting the intersection are more dangerous than vehicles entering the intersection.

The first principle, left versus right turns, has been well known for years and is true for both vehicle-to-vehicle and pedestrian conflicts. The basis of the problem is that the left turning vehicle will typically have to cross at least one lane of oncoming traffic before completing the turn. This adds one more task and one more source of distraction which makes it more difficult to see a crossing pedestrian. Also, a driver may have to commit to making a left turn before a pedestrian making a crossing has even ventured into the street or made some other overt indication of an impending crossing.

The second principle is also well known and is caused by the fact that the pedestrian is at most risk when he or she just steps off the curb. Later in the crossing, the pedestrian has been

in the roadway for some time and drivers have had a chance to see that there is someone crossing. It is also when first stepping off the curb that a pedestrian's failure to search will be most consequential since the time available for corrective actions before encountering a vehicle in the first half can be extremely short.

The third principle is less obvious and was uncovered in an earlier detailed analysis of 220 crashes at intersections controlled by signals or stop signs in Los Angeles and Columbus, Ohio (Preusser et al. 1983). The results showed that 66 percent of the pedestrians were struck by vehicles exiting the intersection and only 34 percent were struck as vehicles entered the intersection. In other words, from the driver's point of view, the "near" crosswalk is much safer than the "far" crosswalk. Consider, for instance, the left turn maneuver in which the vehicle is going straight as it crosses the near crosswalk and drivers have had their entire intersection approach to see a crossing pedestrian. However, drivers cannot see the far crosswalk (i.e., that crosswalk which is on the left side of the intersection) until they are out in the intersection and are preparing to turn. This provides less preview time under conditions of high task loading and thus a crash is more likely. Similarly, for vehicles going straight through the intersection, they have had their entire intersection approach to view the near crosswalk while the far crosswalk may have been blocked by cross street traffic. Vehicles exiting an intersection are also more likely to be accelerating and traveling at higher speeds than those entering it.

These three principles combine to form an instructive threat model for intersection crossings in general and VTM in particular. The key to this model relies on whether or not the intersection is to the pedestrian's left or to the pedestrian's right when commencing a crossing. If the center of the intersection is to the left, then the crossing can be classified as one involving relatively high risk. We have termed these "A" crossings. If the intersection is to the right, then the crossing appears to be relatively lower in risk. We have termed these "B" crossings. Figures 1 and 2 on the next two pages illustrate the "A" (top diagram) and "B" (bottom diagram) situations for the signalized (N = 156) and stop sign (N = 64) controlled intersection events studied in Los Angeles and Columbus. The circled numbers indicate the incidence of crashes with the displayed dynamics.

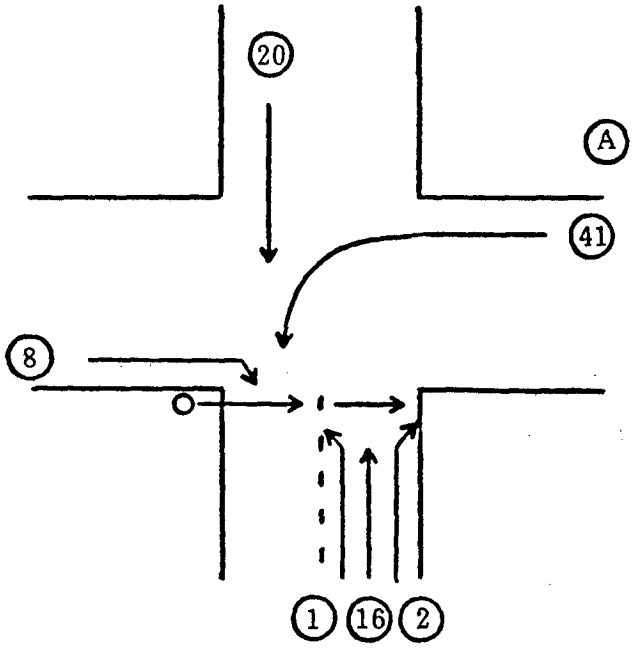
In the "A" or left crossing the pedestrian is exposed to exiting vehicles for the first half of the crossing (and entering vehicles for the second half). This is a worst case situation since it is the first half of the pedestrian's crossing (more dangerous) and the pedestrian is exposed to exiting vehicles (also more dangerous). In the "B" or right crossing the pedestrian is exposed to exiting vehicles during the second half of the crossing which is much safer because the exiting drivers have much more preview time to see that a pedestrian is in the roadway. Pedestrian risk in an "A" crossing is 1.4 times the risk in a "B" crossing based on analysis of the 220 Los Angeles and Columbus crashes. These 220 crashes were distributed as follows:

"A" first half = 97 (44%)	"B" first half = 43 (20%)
"A" second half = 31 (14%)	"B" second half = 49 (22%)

In summary, intersections represent the most complicated part of the roadway for both drivers and pedestrians. The pedestrian can be struck from six different directions at the typical four-leg location by vehicles turning left and right or going straight, each of which may be exiting or entering. The situation has been further complicated by the introduction of right turn on red which is a particular problem for older persons.

Figure 1.

Signalized Intersection Pedestrian Crashes
in Los Angeles and Columbus



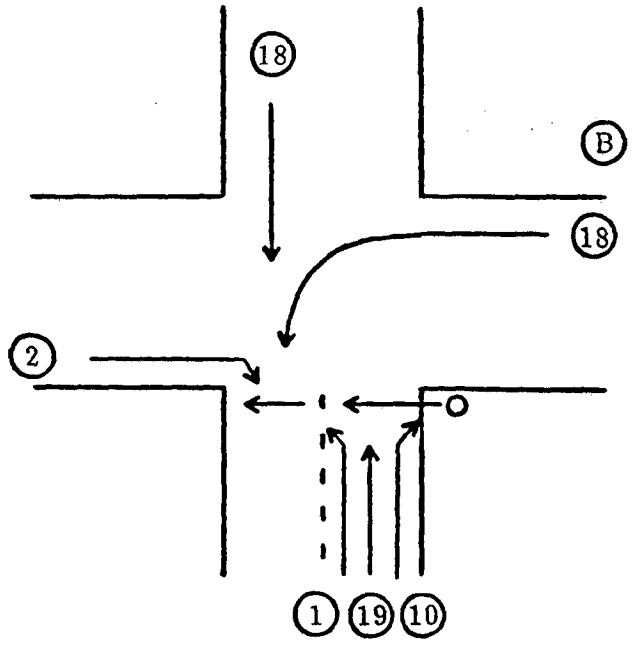
N = 88

1st = 69

2nd = 19

Enter 19

Exit 69



N = 68

1st = 30

2nd = 38

Enter 30

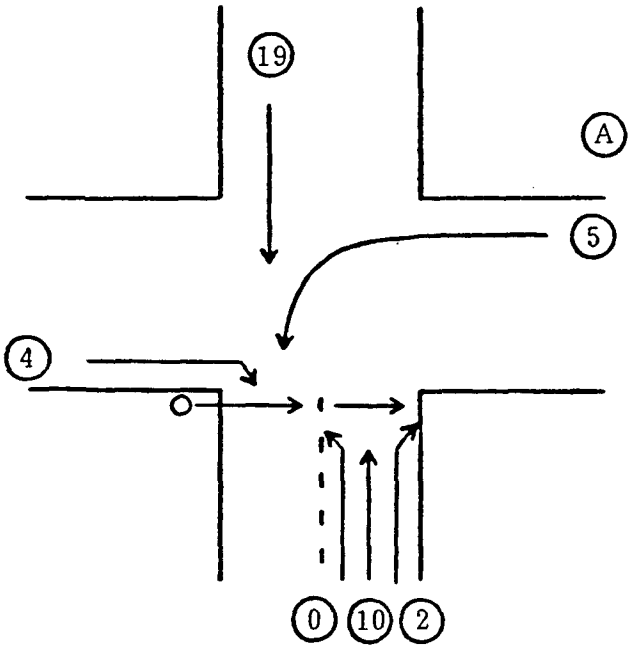
Exit 38

Danger

A - 1st - Exit - 69
B - 2nd - Exit - 38
B - 1st - Enter - 30
A - 2nd - Enter - 19

Figure 2.

Stop Sign Pedestrian Crashes
in Los Angeles and Columbus



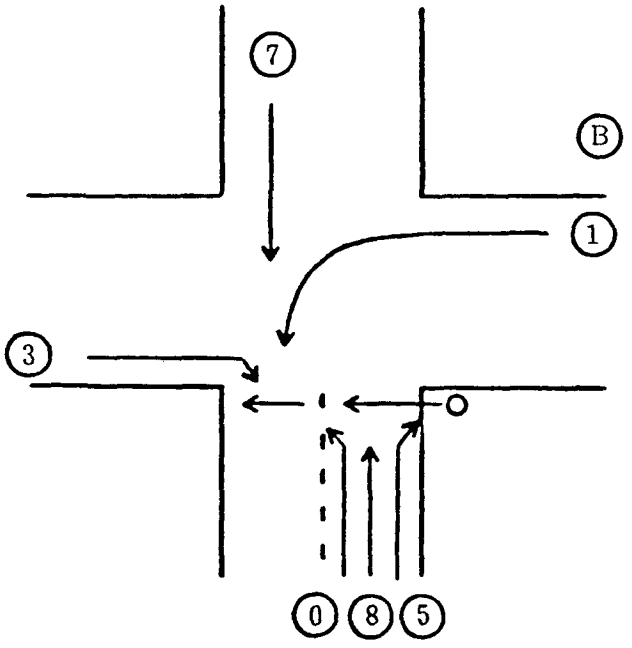
N = 40

1st = 28

2nd = 12

Enter 12

Exit 28



N = 24

1st = 13

2nd = 11

Enter 13

Exit 11

Danger

A - First Exit - 28
All Else - 12 avg.

3. Preliminary Countermeasure Message Contents

Earlier work (Preusser et al. 1983) examined critical errors that led to the crashes of older pedestrians. The most common pedestrian error was pedestrian "search" and pedestrian "course." Typical search errors were "inadequate search" or "inattentive" and typical course errors were "hi-exposure location" and "crossing against the light." There is some indication in the Snyder and Knoblauch (1971) data that "human factors" (includes lack of mobility and diminished eyesight) played a role in these crashes. However, such factors were rarely a primary cause for the crash and, when noted, were typically relegated to the contributory role.

It appears, therefore, that the elderly pedestrian does not search for vehicles and tends to enter the street as soon as the light turns green. This failure to search and blind faith in signals or other forms of intersection controls is not unique to the elderly pedestrian. However, as noted earlier, the capability of the elderly to deal with the high workload at an intersection and evasive measures is diminished.

VTM has already been addressed in a series of public information materials that were previously developed for NHTSA (Blomberg et al. 1983). This package consisted of four TV spots and two radio spots in both Spanish and English. The basic message contents conveyed in that series were considered appropriate to the present study. The following preliminary countermeasure message contents were therefore proposed:

- *Green lights, walk signals and crosswalks do not necessarily mean that it is safe to start crossing. Rather, they tell you to stop at the curb and look to be sure that it is safe. Always stop at the curb and look left-right-left before entering the roadway even when the light is green or the signal says WALK.*

- *Watch for turning vehicles even when you are crossing an intersection on a green light.*

- *Watch for drivers turning right on red. Look at the driver to see if he/she has seen you.*

- *Recognize that your capabilities to search and move are diminished. Therefore, exaggerate your head turns when searching and allow sufficient time to complete a crossing safely.*

- *Descriptions of the "A" crossing and its inherent dangers with turning vehicles.*

- *Lobby communities for engineering changes (i.e., longer green walk lights; exclusive pedestrian phases; elimination of RTOR at specific intersections).*

B. Other Intersection Accidents

1. Incidence

The "Other Intersection" target category includes the MAT types of:

- Multiple Threat At Intersection
- Intersection Dash
- Trapped
- Pedestrian Walks into Vehicle at Intersection
- Intersection--Driver Violation
- Intersection--Other

Subsumed in this group is the phenomenon called "Starting Gun" in our previous research (Blomberg et al. 1983). This "subtype" is characterized by the pedestrian stepping off the curb without adequately searching immediately when the WALK signal comes on or the light turns to green in apparent blind obedience to the traffic controls.

Clearly *Intersection Dash* is an inappropriate name when referring to an elderly event. It is used here simply to remain faithful to the prevailing typology which defined it in terms of ***either*** short-time exposure (i.e., the driver's view of the pedestrian was blocked until just before impact) ***or*** running.

The Florida data presented in Table 3 showed that 16 percent of the accidents were classified as "Other Intersection" events. The multi-state sample data percentage for the same category is 31 percent. The Los Angeles coding did not follow the MAT typology by dividing "Other" and "Not Classifiable" events into "Intersection--Other" and "Midblock--Other." However, Intersection Dash and Trapped alone accounted for over 12 percent of the Los Angeles crashes involving the elderly.

2. Description

The "Other Intersection" target category is characterized by inadequate search on the part of the pedestrian. In some cases, e.g., "Starting Gun," no search was performed at all. In others, e.g., Multiple Threat, the search was inadequate. This may have been due to the position at which the search was undertaken (e.g., not at the edge of the screening vehicle) or because the search was not sufficient to lead to a detection of the vehicular threat.

Theoretically, the addition of traffic signals can be helpful to pedestrians, especially older individuals at sites with an insufficient number of adequate gaps for traffic for pedestrians to cross safely. However, there are many factors that may affect pedestrian accidents at signalized intersections. The factors include pedestrian and motorist compliance with the signals, traffic speeds and vehicle and pedestrian volumes.

Our previous work (Blomberg et al. 1974, Blomberg et al. 1983, Preusser et al. 1983) has indicated that adult pedestrians rely on red-green-amber or WALK signals more often than the younger age groups. In a majority of events, these signals were the only source of information used to determine whether a safe crossing could be made. Pedestrians simply see the green light and step off the curb without performing an adequate search for turning vehicles. Drivers involved in intersection events are also performing inadequate searches. However, the inadequate search on the driver's part results from a driver attention conflict (attending to vehicular traffic) rather than attending only to the traffic controls in the case of pedestrians.

Since many older people have slower walking speeds, the signals often do not allow sufficient time for them to cross a street. It has been found that elderly pedestrians do not understand the flashing DON'T WALK message. They often begin walking correctly during the WALK phase but will turn around and walk back to the curb when they see the flashing DON'T WALK signal (even though they may have ample time to complete the crossing safely). Sometimes they become confused and freeze in the middle of the crossing when the DON'T WALK signal flashes.

3. Preliminary Countermeasure Message Contents

Messages designed to "educate" the elderly pedestrian on the proper use of traffic signals would seem to be indicated for this accident type. This would help overcome the lack of understanding of signals which has been identified. However, any discussion of traffic signals must take place in the context of a broader coverage of the complexities involved with negotiating an intersection as a pedestrian. The number and type of vehicular threats must be understood so that a pedestrian can develop a full appreciation for the need to search completely for threats and to adopt a conservative strategy of allowing vehicles to pass when there is any uncertainty.

The preliminary messages recommended for this category were as follows:

- *Green does not mean right of way. Green means look and, if safe, then go.*
- *The WALK signal does not mean it is safe to start crossing. Rather, it tells you to stop at the curb and look to be sure that it is safe.*
- *Always stop at the curb and look left-right-left before entering the roadway even when the light is green or the signal says WALK.*
- *When crossing at an intersection, wait for a fresh green light (gives you the most time), look for cars that might be coming (don't assume they will stop).*
- *If the DON'T WALK signal comes on when you are in the middle of crossing, continue to walk at your maximum comfortable pace (running is not necessary) until you reach the other side.*
- *Lobby for traffic engineering improvements if warranted, e.g., increased signal clearance times.*

C. Backing Accidents

1. Incidence

This category includes all backing accidents that take place in parking lots, in driveways and on roadways. The majority of these accidents, however, occur in parking lots. The accident typically happens with the driver unaware of the pedestrian and the pedestrian unaware of the vehicle maneuver. Since these accidents often take place on private property, they are likely under-reported. Some police departments will not file pedestrian accident reports when an accident occurs on private property even if it is the busy parking lot of a shopping center.

Table 3 showed that the Backing category represented 12 and 20 percent, respectively, of the multi-state sample and Florida data sets. It is also nine percent of the Los Angeles data, which used a slightly more stringent definition of the Backing type based on the original accident type definitions in Snyder and Knoblauch (1971) which required that the pedestrian had to be clearly unaware that the vehicle was going to back up.

As mentioned earlier, the Florida data differed from those in the multi-state sample because they contained a large number of "Not in Road" events. This result is likely due to the sampling characteristics of the multi-state sample and is probably not a true crash difference between Florida and the multi-state sampling sites. The Los Angeles data were also not collected in a manner which permitted the accidents occurring off roadway to be uniquely identified. Nevertheless, the large number of off roadway events in the Florida elderly data are sufficiently convincing to warrant inclusion of all off road events in this target. Of the 374 Florida pedestrian accidents (age 65+), 70 (19%) took place in a non-roadway location.

2. Description

The Backing accidents which do ***not*** occur on the roadway are primarily parking lot events. As such, parking lots become a major problem for the elderly. However, significant numbers of Backing crashes take place in driveways and on the roadway itself. It is fair to categorize the Backing crash as a situation in which ***both*** the driver and pedestrian lack situational awareness. The driver typically performs an inadequate search to the rear. This search is often hampered by poor rearward vehicle visibility and/or by the use of mirrors to perform the search. The pedestrian is often totally unaware that the backing vehicle is even occupied. Cues such as the sound of the car's engine or the illumination of backup lights have a tendency to go unnoticed by the pedestrian. It is also likely that the pedestrian tends to be inattentive in parking lots because of the failure to relate to them as a roadway environment with all of its inherent risks.

In Florida, the non-roadway locations included parking lots, sidewalks, driveways, etc. In 43 percent of these reports it appears that the accidents were caused mainly by dangerous driving; in other words, there was little that the pedestrian could do to avoid the collision. These types of situations included drivers putting a car into reverse instead of drive, mounting a sidewalk, or otherwise losing control of the vehicle. Twenty percent of the accidents occurred to pedestrians walking the traffic lanes of parking lots without a clear cause. In 15 percent of the total number of accidents, it was reported that the driver failed to see the pedestrian. Darkness appeared to be a factor in three percent of these incidents, the sun and fogging of windshields in another two percent of the cases. In 11 percent of the cases it was reported that the pedestrian stepped in front of the

vehicle. Eleven percent of the incidents took place at driveway and alley locations and are similar to the driveway backing accidents reported previously. In these cases, however, the vehicle is moving forward. Darkness could have been a factor in over a third of these driveway accidents. However, overall, 87 percent of the accidents occurring in non-roadway locations took place in daylight hours.

3. Preliminary Countermeasure Message Contents

Backing and the general problem of moving safely through a parking lot were covered in a series of prototype materials that were previously developed for NHTSA (Preusser et al. 1983). The messages were intended to make the pedestrian more alert for moving vehicles and were considered appropriate to the present study. The following preliminary countermeasures were therefore proposed as appropriate for both Backing and other types of crashes that occur in parking lots:

- *LISTEN for engine noise*
- *LOOK for backup lights*
- *LOOK for drivers in the vehicle*
- *REMEMBER that parking lots are just like roadways--watch for moving cars*
- *Do not ASSUME that you have right of way in a parking lot*
- *KEEP to pedestrian walks where possible*

Preliminary countermeasure messages considered appropriate for Backing and other events that occur in driveways include:

- *SLOW DOWN at driveways or alleys that intersect with sidewalks*
- *LISTEN and LOOK for moving vehicles, particularly ones which are backing*
- *TREAT a driveway or an alley like an intersection--be aware that a vehicle could be entering or exiting.*

Preliminary countermeasures for those Backing accidents that take place on roadways presented a bit of a dilemma. The advice to:

- *LOOK and LISTEN for cars backing*

appeared to be generally applicable and likely productive. However, the previously developed content to:

- *CROSS only at intersection locations*

appeared questionable in view of the relatively greater danger at intersections. It therefore appeared best to avoid mention of crossing location for these on-road crashes and to concentrate instead on the look and listen advice.

D. Conspicuity

1. Incidence and Description

Some of the earliest looks at pedestrian accidents among the elderly highlighted a phenomenon characterized by a sharp increase in the number of accidents through the winter months. Accidents appeared to track available daylight with noticeable increases particularly in November, December and January and a corresponding "dip" in June and July. The same effect has been noted in more northern, cold cities such as Washington, D.C. and Detroit and in cities with moderate winters such as Miami and Los Angeles. The phenomenon has occurred in every data set examined. Figure 3, based on Los Angeles data, illustrates the relatively large seasonal increase for the elderly group. No increase at all is seen for pedestrians under 16, and only a small increase is noted for adults between the ages of 16 and 64. The number of crashes included in the Figure is large, with 7,541, 10,953 and 2,030 for the under 16, 16 to 64 and 65+ groups, respectively.

Table 4 summarizes the seasonal increase for each age group by comparing June to December and July to January. June is the month which contains the longest day, while December includes the shortest. July and January are characterized, respectively, by the most and least hours of daylight. It can be seen from Table 4 that the elderly suffer an increase in accidents from June to December of 88 percent while other adult accidents increase by 31 percent and child accidents actually decline. A similar pattern is seen for the July/January comparison.

With the present study concentrating exclusively on the problems of the elderly, it was considered essential to attempt to understand this phenomenon and its possible causes. Initial hypotheses were that it could be a conspicuity problem due to the reduced amount of daylight and the inclination of the elderly to wear dark clothes or that it could be the result of increased exposure during the year end holidays. In order to examine the matter further, pedestrian accident data from Argentina and Australia were obtained. It was reasoned that a replication of the findings in the Southern Hemisphere would tend to support a relationship to light rather than seasonal activities as the seasons reverse when crossing the equator but the Christmas and New Year's holidays do not.

Table 5 shows a tabulation of all 1989 pedestrian crashes for Buenos Aires, Argentina. Table 6 presents four years of pedestrian ***fatality*** data from Australia. In both of these areas, accidents to the elderly increase in the winters. The effects are summarized in Tables 7 and 8. It can be seen from these tables that the elderly in Buenos Aires and Australia experience a summer to winter (December/June and January/July) increase in pedestrian accidents which is of the same magnitude as that shown in the Los Angeles data. The Buenos Aires data also show even larger increases for younger adults and teenagers than for the elderly.

It is felt that these results from the Southern Hemisphere support the findings observed with U.S. data. It is hypothesized that diminished sunlight and the lower angle of the sun somehow contribute to a lack of conspicuity thereby making it more difficult for drivers to detect pedestrians, particularly the elderly. The colder weather and increased coverage by clothing which

Figure 3.
Los Angeles Pedestrian Accidents by Age

1973-1978

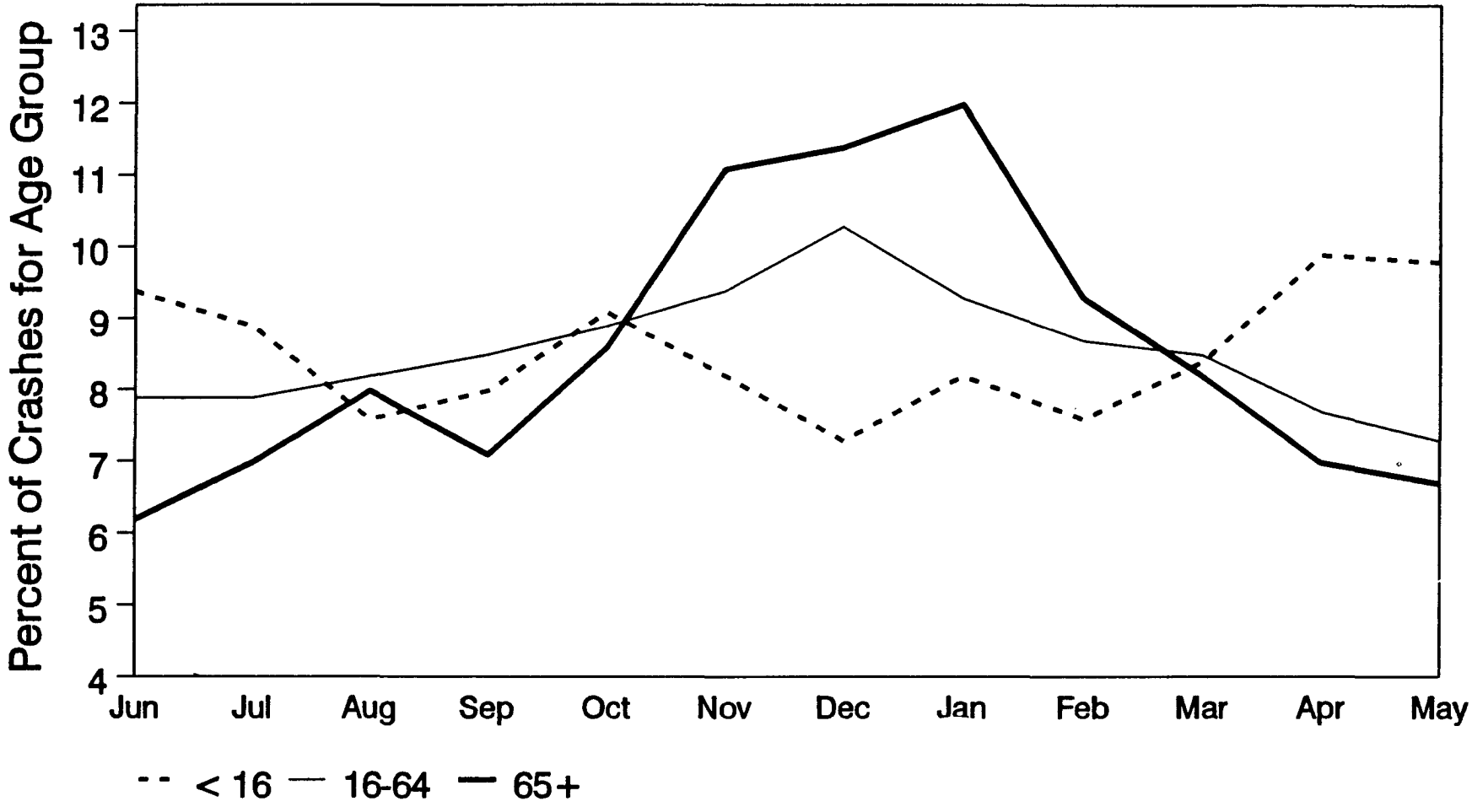


Table 4.

Comparison of Summer and Winter Pedestrian Accident Incidence by Pedestrian Age
Los Angeles - 1973-1978

Victim Age	January	July	July/Jan % Increase	December	June	June/Dec % Increase
1-15	604	655	-8%	534	691	-23%
16-64	995	844	+18%	1,106	842	+31%
65+	239	138	+73%	227	121	+88%

Table 5.

Buenos Aires, Argentina - Pedestrian Accidents, 1989

Age	Month of Accident												Total
	J	F	M	A	M	J	J	A	S	O	N	D	
0-12 N	27	25	20	20	16	10	10	12	19	17	19	26	221
%	12.2	11.3	9.1	9.1	7.2	4.5	4.5	5.4	8.6	7.7	8.6	11.8	100%
12-25 N	20	36	57	59	89	87	96	88	86	57	57	31	763
%	2.6	4.7	7.5	7.7	11.7	11.4	12.6	11.5	11.3	7.5	7.5	4.0	100%
25-64 N	101	115	210	259	298	354	366	376	285	255	196	139	2,954
%	3.4	3.9	7.1	8.8	10.1	12.0	12.4	12.8	9.7	8.7	6.7	4.7	100%
65+ N	33	37	43	47	45	48	55	49	44	51	37	29	518
%	6.4	7.0	8.3	9.1	8.7	9.3	10.6	9.5	8.2	9.9	7.1	5.6	100%

Source: Personal correspondence with Dr. Juan C. Fairstein, Presidente, Asociacion Civil Defensa del Peaton, Buenos Aires, Argentina.

Table 6.

Australia - Pedestrian Fatalities, 1982-1985

Age		Month of Accident												Total
		J	F	M	A	M	J	J	A	S	O	N	D	
< 65	N	100	118	115	117	122	137	139	128	133	120	99	114	1,442
	%	6.9	8.2	8.0	8.1	8.5	9.5	9.6	8.9	9.2	8.3	6.9	7.9	100%
65+	N	38	45	45	68	74	84	58	65	63	55	56	45	696
	%	5.4	6.5	6.5	9.8	10.6	12.1	8.3	9.3	9.1	7.9	8.1	6.4	100%

Source: Personal correspondence with Mr. Keith Wheatley, Federal Office of Road Safety, Canberra, Australia.

Table 7.

Comparison of Summer and Winter Pedestrian Accident Incidence by Pedestrian Age
Buenos Aires, Argentina - 1989

Victim Age	July	January	Jan/July % Increase	June	December	Dec/June % Increase
0-12	10	27	-63%	10	26	-62%
12-24	96	20	+380%	87	31	+181%
25-64	366	101	+262%	354	139	+155%
65+	55	33	+66%	48	29	+65%

Source: Personal correspondence with Dr. Juan C. Fairstein, Presidente, Asociacion Civil Defensa del Peaton, Buenos Aires, Argentina.

Table 8.

Comparison of Summer and Winter Pedestrian Accident Incidence by Pedestrian Age
Australia Fatalities - 1982-1985

Victim Age	July	January	Jan/July % Increase	June	December	Dec/June % Increase
< 65	139	100	+39%	137	114	+20%
65+	58	38	+53%	84	45	+87%

Source: Personal correspondence with Mr. Keith Wheatley, Federal Office of Road Safety, Canberra, Australia.

might slow movement may also be a factor, but the increase in crashes seems to track the sun more than any change in the weather.

In order to obtain a better understanding of the mechanisms which might be causing the observed seasonal differences, further analyses of the Los Angeles data were conducted. Because accident type differences had already been noted for the elderly, the first step was to examine distributions of accident type by month. The relatively large number of elderly accidents in the Los Angeles data set was capable of supporting this analysis for most of the 18 types coded.

It was hypothesized that if the phenomenon were largely a result of exposure changes, no differences among accident types would be seen. It was also assumed that the Auto-Auto type would be a reasonable surrogate for an exposure measure. In this type, the pedestrian is struck ***after*** two or more vehicles collide or a vehicle collides with a fixed object. The pedestrian is typically off the roadway and an innocent victim. As such, the incidence of the Auto-Auto type should be related primarily to exposure, both pedestrian and vehicle, and would not be expected to show any effect of diminished conspicuity unless this caused a large increase in vehicle-to-vehicle accidents, a phenomenon which has not been reported.

The distributions of seven accident types were examined in detail. The month-by-month totals for each of these types are presented in Appendix A to this report. Table 9 summarizes the observed summer to winter increases and compares them with the aggregate for all accident types previously reported in Table 4. The accident types shown in Table 9 and the definitions used in their coding are:

- ID - *Intersection Dash* which involves short time exposure or running at an intersection. This type shows a seasonal increase for all ages.

- VTM - *Vehicle Turn/Merge with Attention Conflict and Turning Vehicle* involves a pedestrian struck by a turning vehicle with or without a documented attention conflict on the part of the driver. This type typically occurs at an intersection, but can be coded anywhere a vehicle can turn. The VTM type exhibits large seasonal increases for all age groups.

- MT - *Multiple Threat* involves a pedestrian struck by a vehicle traveling in the same direction as other cars that stopped for the pedestrian. It is a visual screen situation which is relatively more common in Western states where the pedestrian right of way laws are more stringently enforced. In Los Angeles, this accident occurs quite often at non-signalized intersections. It shows seasonal increases for all ages, although the absolute magnitude of the involvement of the elderly in this type is small.

- BK - *Backing-Up* is a situation in which the pedestrian is struck by a backing vehicle but was not clearly aware of the vehicle movement. This type shows no noteworthy seasonal effects.

- A-A - *Auto-Auto* involves a pedestrian struck in a secondary collision. It shows no meaningful seasonal effects.

Table 9.

Comparison of Summer and Winter Pedestrian Accident Incidence
by Accident Type and Pedestrian Age
Los Angeles - 1973-1978

Accident Type	Victim Age	January	July	July/Jan % Increase	December	June	June/Dec % Increase
ID	1-15	91	49	+85%	64	71	
	16-64	103	48	+114%	80	50	+60%
	65+	29	14	+107%	25	14	+79%
VTM	1-15	81	31	+161%	64	29	+121%
	16-64	216	112	+93%	207	110	+88%
	65+	81	38	+113%	72	26	+176%
MT	1-15	49	46	+6%	36	33	+9%
	16-64	81	70	+16%	82	63	+30%
	65+	14	10	+40%	16	7	+128%
BK	1-15	8	28		22	27	
	16-64	46	77		55	52	+6%
	65+	11	16		17	17	
A-A	1-15	7	10		13	20	
	16-64	46	78		79	82	
	65+	14	10	+40%	8	9	
Trap	1-15	1	2		2	4	
	16-64	7	10		11	4	+175%
	65+	5	1	+400%	2	2	
PNR	1-15	46	49		38	49	
	16-64	105	112		122	118	+3%
	65+	14	10	+40%	14	9	+55%
All Types	1-15	604	655		534	691	
	16-64	995	844	+18%	1,106	842	+31%
	65+	239	138	+73%	227	121	+88%

Notes: ID = Intersection Dash, VTM = Vehicle Turn/Merge (including Turning Vehicle), MT = Multiple Threat, BK = Backing, A-A = Auto Hits Auto Hits Ped, Trap = Trapped, PNR = Pedestrian Not in Roadway (accident type definitions from Blomberg et al. 1983). Empty cells in the Increase column indicate a decrease.

- Trap - *Trapped* accidents occur at a signalized intersection when a pedestrian is struck after a light changes and traffic starts to move. The relatively low incidence of this type precludes drawing a firm conclusion. However, the pattern shown suggests involvement in the seasonal effect.

- PNR - *Ped Not in Roadway* involves situations in which the pedestrian was not in the roadway when struck. This is an amalgam of driveways, parking lots and other off-road situations. It shows a small seasonal effect.

Two factors emerge from an examination of Table 9. First, the Auto-Auto category shows no seasonal increase. This suggests that the phenomenon observed is ***not*** just due to differential monthly pedestrian exposure. This is certainly consistent with intuition since a December/June exposure ratio of almost two to one would be necessary among the elderly to account for the observed increase of 88 percent in all accidents.

Second, events which occur at intersections appear to be displaying the effect quite strongly while those which occur away from an intersection show little or no seasonal variation. Among the intersection events, the VTM predominates and has a particular impact on the elderly. As mentioned earlier, fully 28 percent of elderly accidents in Los Angeles are VTMs as compared with only 15 percent for those 16 to 64 and about eight percent for pedestrians 15 and under. Simply, a large proportion of the total effect ***for the elderly*** comes from the VTM type. Other pedestrian ages seem to experience a similar increase in VTMs in the winter, but the total impact on their accident experience is smaller because of their proportionately lower involvement in VTMs.

The prominence of the VTM type suggested that it be examined further in an attempt to understand the operative mechanisms. An obvious first hypothesis was that more of these crashes were occurring in darkness. Therefore, the police officer's code of lighting condition (daylight, dusk, dawn or dark) was examined. Overall, only 70 of the 576 VTM accidents involving the elderly (12.2%) were coded as "dark." While there was an increase in "dark" events in the winter months, the magnitude of the change was far too small to explain the total increase in the observed data. In June, only one of 26 VTMs involving the elderly was coded as taking place in darkness (3.8%). This rose to 13 of 72 VTMs in December (18.1%). July was characterized by two of 38 VTMs in darkness (5.3%) compared with 20 of 81 in January (24.7%). This level of increase appears consistent with the fewer available hours of light in the winter. That is, if elderly pedestrians follow the same walking patterns year round, one would expect more accidents in darkness during the winter months.

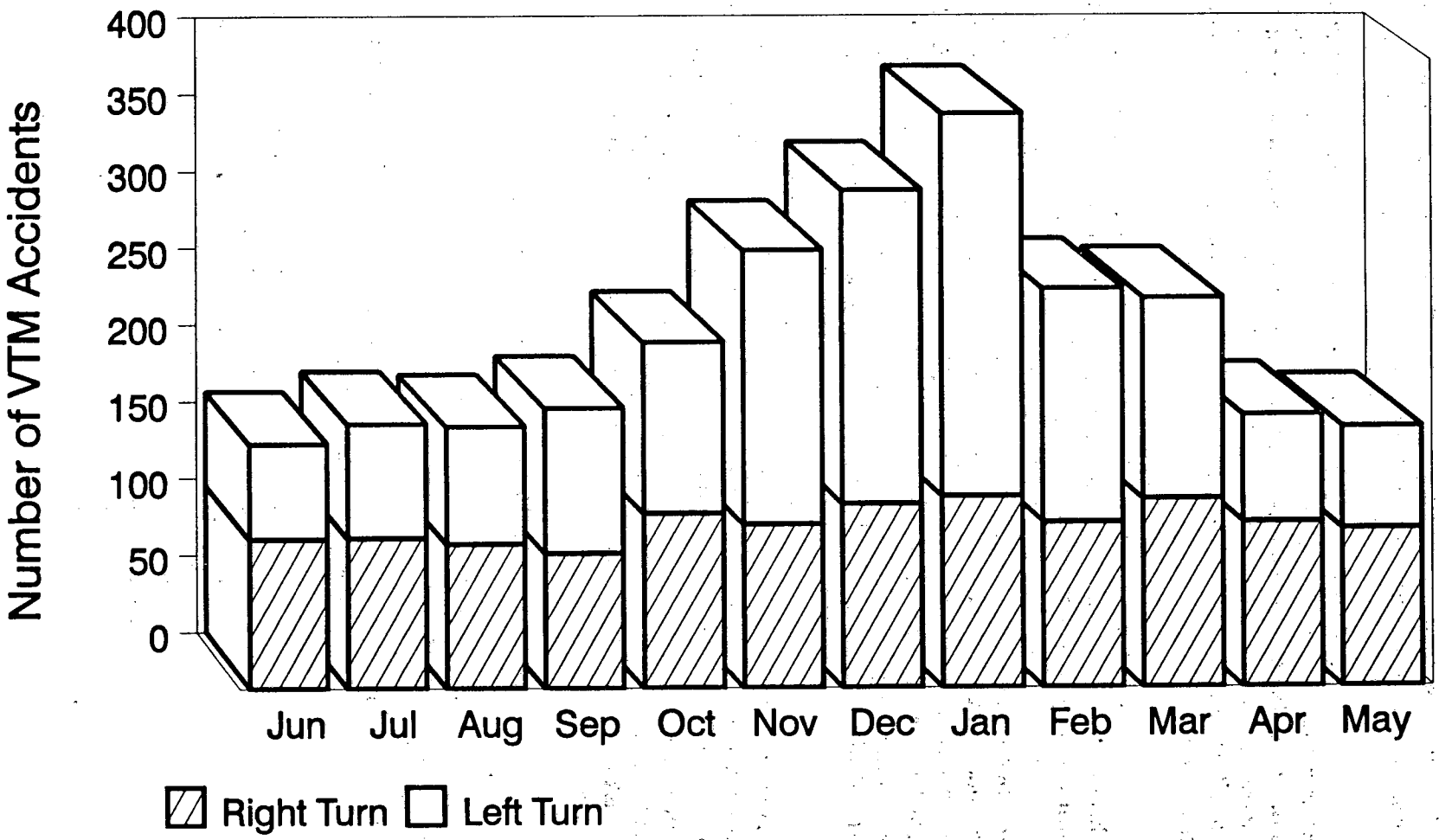
It was also possible that at least part of the seasonal accident variation could have been due to changes in pedestrian or driver characteristics. The gender of the pedestrian victim and the age of the striking driver were therefore examined. Neither showed any meaningful pattern of relationship with the seasonal increase in VTM accidents. Likewise, the mix of accidents occurring at signalized versus stop sign versus uncontrolled intersections showed no consistent seasonal pattern.

As a final step, the vehicle action immediately preceding the VTM crash was examined. Here, a startling pattern arose. Figure 4 shows the relative numbers of VTM accidents with left and right turns by month for pedestrians of all ages combined. The number of accidents in which the vehicle was turning right remains relatively constant while the number of left turning

Figure 4.

Left vs. Right Turns in VTM Accidents

Los Angeles 1973-1978 (All Ages)



accidents increases markedly in the winter months. The same pattern is repeated for VTM accidents involving the elderly as shown in Figure 5.

This finding leads to several immediate conclusions. First, the left turn had already been analyzed as more dangerous than the right (see Section III.A). Thus, it is reasonable to postulate that the diminished light levels and poorer light quality in winter months are exacerbating the most difficult pedestrian/driver interaction. If the left turning maneuver is only marginally safe, the additional difficulty posed by degraded illumination may be all that is required to change a near miss to a crash.

Second, it is reasonable to assume that more of a typical urban intersection will be in shadow during the winter months when the sun's angle is low. This means that left turns will almost always be characterized by having the driver and pedestrian in different light conditions at the start of the accident sequence. For example, if the intersection shown previously in Figure 1 were oriented in a pure north/south direction, there would be considerably more shadow on the north side of the street during the winter months than in the summer when the sun moves almost directly overhead. As a result, the depicted left turn at the top of Figure 1 if executed in the winter would have the driver moving from the shade into the sun and attempting to detect a pedestrian moving out of shadow. In fact, an analysis of the various right and left turn possibilities shows that left turns will likely always involve a sun/shade or shade/sun situation while right turns will not.

The foregoing analyses do not prove the cause of the observed phenomenon. They do, however, clarify the nature of the accident changes and are highly suggestive that the accident increase is due to a diminished capability of the driver and pedestrian to detect each other during winter months. Since the vast majority of the accidents in question occur during daylight, it is reasonable to conclude that the pedestrian and vehicle targets were always supra-threshold, i.e., detectable but not seen. This is a classic daytime conspicuity problem in which competing attentional and task demands prevent a target from being detected. As a result, countermeasures based on enhancing conspicuity appear warranted.

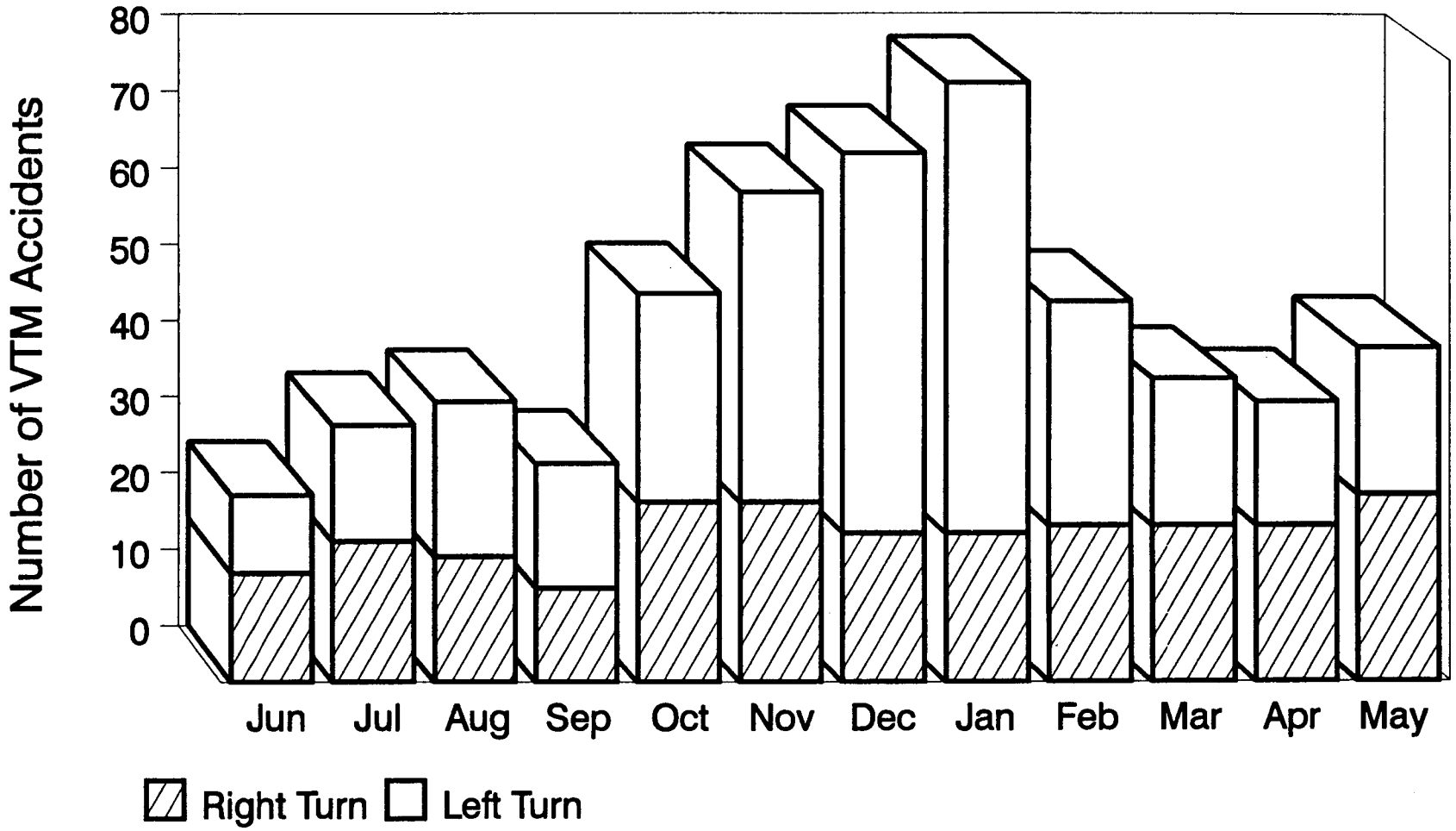
2. Preliminary Countermeasure Message Contents

The nature of the identified problem suggests that the following message contents might have a countermeasure value:

- *As days grow shorter, shadows become longer. This makes intersections a much more dangerous place.*
- *In the winter, you wear more clothes and these tend to be darker. As a result, your search may be restricted, and drivers certainly have a more difficult time seeing you. Therefore, increase your search activity in the darker months.*
- *Since you are less visible to drivers in the darker months, always dress conspicuously.*

Figure 5.
Left vs. Right Turns in VTM Accidents

Los Angeles 1973-1978 (Age 65+ Only)



- *Left turning vehicles and "A" crossings are much more dangerous to you. Before crossing an intersection: 1) determine all places that left turning vehicles might come from; 2) check the entire intersection for threats, then; 3) check the left turn locations again before leaving the curb.*

- *Lobby for exclusive pedestrian phases at intersections, especially from October through March, inclusive.*

The message contents of some of these preliminary countermeasures, particularly those relating to relative intersection dangers, were considered to be extremely complex and therefore potentially difficult to convey successfully to an elderly audience.

IV. REFINEMENT OF COUNTERMEASURE MESSAGES AND STUDY CONCEPTS

As indicated in the previous section of this report, preliminary countermeasure message contents were initially specified for each accident type that was selected by the study as being of significant importance to the older pedestrian. Some of these messages were derived from prior research, and some resulted from the accident analyses conducted for the present study. Once the target message contents were identified, it became necessary to assess the appropriateness of each message for the target audience and to develop the message contents further into finished presentations. As part of this process, it was necessary to obtain a clear understanding of the problems the elderly face as pedestrians and to identify the best means of reaching the elderly with messages. In addition, because the identification of the conspicuity problem involved some supposition, it was desirable to determine if, in fact, the elderly do choose dark and neutral colors to wear in the winter months. Several techniques were used to obtain the needed information. Brief summaries of each technique appear in the following paragraphs. They are followed by details of each procedure.

First, throughout the problem definition and message development phases of the study, structured discussions were held with groups of elderly pedestrians to assure that study results would be responsive to their needs. Thus, the specific problems they encountered as pedestrians were explored and feedback was obtained on candidate pedestrian safety messages as they were being developed. The best vehicles for distributing messages to the elderly were also examined. In general, these groups were very receptive to the messages that were presented to them. They provided many helpful ideas on ways to simplify the messages to ensure that they would be understandable to the target group. They did not, however, provide a consensus on the best means of distributing information to the target group, although many favored use of the radio.

Second, telephone interviews were conducted with representatives from the medical community who deal with the elderly. The major areas explored were capabilities and limitations of the elderly as pedestrians and means of reaching the elderly. These discussions confirmed that the capabilities and limitations of this group are as diverse as those in the population at large and produced no reason to believe that the messages would not be understood by the target group. As with the elderly themselves, the medical community presented no clear single means of reaching the target group.

Third, telephone interviews were conducted with store buyers and managers whose responsibility encompassed dealing with adults including the elderly. The objective of these discussions was to learn if the elderly do tend to wear dark and neutral colors in winter and, if so, whether or not it is a matter of personal choice or simply one of the selection available to them. It was discovered that there are typically no major groups of manufacturers, stores or departments in stores that cater primarily to the elderly. The elderly select their clothing from the variety of items available to all age groups. The merchandising representatives confirmed that the elderly do tend to wear dark or neutral colors in winter.

Fourth, although not discussed further in this section, there was virtually continuous interaction throughout the study with other pedestrian safety experts to obtain reactions, advice and guidance and solicit reviews to ensure that developed messages were clearly presented and understandable to the target audience. In addition to specialists at NHTSA and FHWA, other

experts were contacted through the Pedestrian Committee of the Transportation Research Board (TRB).

A. Elderly Discussion Groups

Discussions were held with five different groups of elderly individuals. The first three of these groups concentrated on pedestrian problems occurring while crossing streets (particularly at intersections) and problems occurring in parking lots and driveways. For the last two groups, the problem of conspicuity was added. In addition, the specific messages presented to the last two groups differed markedly from those presented to the first three groups. The changes were based on the status of the research at the time the discussions were held. A structured topical outline assured presentation of the same information and questions. There were two such outlines--one for the first three groups and one for the last two.

A total of 43 individuals participated in the discussions; 30 were female and 13 were male. Their ages ranged from 60 to 86. All reported that they walk locally, and 18 still drive at least occasionally. The first three groups met at senior centers in Connecticut--one in a small affluent suburban community and two in a section of a large city which might be characterized as "low" in terms of socioeconomics (but well above the poverty level). The last two groups were residents of private retirement facilities--one in Florida and one in Connecticut. In both facilities, residents live in their own apartments and have common dining, social and medical facilities. The Florida residence has a number of apartments set aside for elderly with limited incomes. The Connecticut residence provides housing for individuals with low to moderate incomes.

Summaries of the information obtained from the five groups are presented in the following paragraphs. The topic outlines for groups 1 through 3 and groups 4 and 5 are presented in Appendix B. Detailed responses from each discussion group, and a summary of each group's responses are also provided in Appendix B.

1. Intersection Crossings

A series of questions explored the participants' opinions about intersection risks and how they can be minimized. These questions were directed toward obtaining the following information:

- Where they cross the street and why.
- If they find crossing at an intersection difficult or dangerous and why.
- What procedures they follow at intersections.
- If they understand the meaning of WALK signals.

Participants were also asked to suggest ways to improve the safety of intersection crossings. Finally, they critiqued selected messages designed to promote intersection safety.

All participants recognized the dangers of intersection crossings, although most still felt that the intersection is the safest place to cross the street. A small number favored the midblock crossing since the pedestrian needs to check only left and right for vehicles moving straight. In contrast, at an intersection, the pedestrian must also watch out for turning vehicles. Some say they cross midblock when an intersection is not near simply to save the walking distance and time. Others select a midblock crossing as a safer means of getting across the street. In this instance, they report watching the traffic at a nearby intersection. They cross the street immediately when the intersection traffic stops. They report that this procedure gives them adequate time for the crossing.

The specific problems mentioned by the participants and their ideas about improving intersection safety depended on the specific intersections which they used most frequently. These intersections tended to be near the senior centers where they meet or facilities in which the participants reside. Those who have policemen routinely stationed at their nearby intersections expressed enthusiasm for this method of ensuring a safe street crossing and were concerned about recent moves to have lights installed. Those without lights or any form of crossing support would be grateful to have lights installed, particularly lights with separate pedestrian WALK signals. They also would appreciate well-marked crosswalks with signs indicating that the crosswalks are for pedestrians and feel that flashing lights would help to slow traffic. Only one of the groups reported having an intersection with a refuge island in the center of the crossing. They found this intersection preferable to a closer intersection without an island.

Practically all participants reported experiencing problems with the duration of green lights and WALK lights. They simply do not feel they have enough time to negotiate a crossing safely. They find the flashing WALK/DON'T WALK lights disturbing. Even those who know the meaning of the flashing light and feel they have time to negotiate a safe crossing find that it makes them nervous.

Many participants place the blame for intersection safety problems on the driver. They find that the drivers move too fast, ignore traffic lights and are generally inconsiderate of the pedestrian. Some also blame traffic laws that permit drivers to make turns, for example, right turns on red, when the traffic lights are in the pedestrian's favor.

The participants were asked to critique a variety of messages on pedestrian safety at intersections. As indicated previously, the specific messages presented to the participants varied depending on whether the participant was in the first three or the last two discussion groups. However, they all included the following concepts:

- The dangers of turning vehicles.
- The importance of checking for turning vehicles.
- The fact that green lights, WALK signals and crosswalks do not necessarily mean that it is safe to cross.
- The importance of a thorough search before entering the roadway.
- Procedures for making a thorough search.

In general, the participants liked all the messages presented. Their only comments were concerned with simplification of wording to ensure that the messages would be understood by the average lay person. For example, they objected to the word "threat" and preferred the word "danger." They also suggested that messages be kept short and simple. One suggested that a good message would be, "Don't count on drivers, watch out for yourself."

2. Parking Lots and Driveways

A series of questions was used to explore the participant's opinions on pedestrian risks that occur in parking lots and in driveways. With regard to parking lots, they were asked:

- If they feel comfortable walking in them.
- If they find them to be dangerous and what the specific dangers are.
- Who has to yield the right-of-way in a parking lot.
- What they do when they are aware that a car is backing up.

With regard to driveways, they were asked:

- If driveways presented any special problems.
- What they do when they are walking along a sidewalk and come to a driveway.

Participants were then asked to suggest ways to improve the safety of pedestrians in parking lots and driveways. Finally, they were asked to critique a series of messages designed to improve the safety of the older adult in parking lots and driveways.

In general, the participants recognized the dangers of parking lots. They felt that cars travel in wrong directions, drivers back out of parking spaces without looking, and drivers don't stop for pedestrians. They were aware of the signs of car movement and recognized the importance of being alert to these signs. They felt that wearing bright colors might help improve their visibility in parking lots, particularly in bad weather. One group reported that guards controlling traffic patterns in parking lots would be helpful as would signs that tell drivers to yield to pedestrians.

Participants were also aware of the dangers of driveways and the need to be alert to the fact that vehicles can be entering or leaving at any time. One participant reported having been knocked down by a car which was leaving an intersection and entering a main highway. This participant admitted that she should have made sure that she had eye contact with the driver before crossing in front of the car. The members of this particular discussion group felt that it is unreasonable to expect pedestrians to wait for lines of traffic to exit before they can cross a driveway. They felt that they do look out for themselves, but drivers just don't care.

The participants were asked to critique a variety of messages on pedestrian safety in parking lots and driveways. Again, specific messages varied with the different groups. In general, however, the following concepts were covered:

- The signs of car movement or indications that a car may move soon.
- The need to watch for moving vehicles in parking lots.
- The importance of keeping to pedestrian walkways when available.
- Recognizing that the pedestrian does not have the right-of-way in a parking lot.
- The importance of treating a driveway like an intersection.

In general, participants felt that the messages were clear and straightforward and that the concepts were important. However, one group felt that no messages would work--that people just plain aren't going to listen.

3. Conspicuity

A series of questions was posed to the last two discussion groups to determine their awareness of the conspicuity problem and obtain their ideas on how they can make themselves more conspicuous to drivers. Specifically, they were asked:

- What colors they wear in the winter.
- Whether or not they wear hats and scarves and if so, the colors of the hats and scarves.
- How they react to the fact that elderly pedestrians appear to have accidents because they are not conspicuous.

Many of the participants had not considered the fact that a driver might not be able to see them. Some found this hard to believe for daytime but conceded that it might be a problem at night. However, most admitted to wearing dark clothing in the winter and, after discussing the problem, they became receptive to the idea that improving conspicuity might reduce accidents. Most agreed to consider wearing something light or bright (like a scarf) in the winter, and some even reported they would be willing to attach a piece of fluorescent material to a purse or cane.

The messages on conspicuity presented the following concepts:

- Shadows become longer as days grow shorter, and therefore intersections become more dangerous.
- People wear more clothes in the winter, and these clothes tend to be dark. Search is thus restricted, and drivers have more difficulty seeing pedestrians.
- Search should be increased in winter.
- Pedestrians should always dress conspicuously.

Although they agreed with the concepts, participants found the messages to be too long and complicated. They particularly objected to the one about shadows in winter; they did not understand what it meant. They also did not like the use of the word "search." They suggested using simple messages like, "Always be conspicuous."

4. Sending the Message

Finally, participants were asked how best to reach the elderly with pedestrian safety messages. Specifically, they were asked what media approaches would be most effective--radio, TV, pamphlets, speeches, etc.

Most participants favored radio as a means of reaching the elderly. They report that most of them listen to the news, and information presented before a news broadcast would be attended to. Some felt that TV would be effective. Some felt that speakers would be listened to, but not in all circumstances. Those who lived in residences felt that signs in elevators would be helpful.

With regard to publications, membership in The American Association of Retired Persons (AARP) appears to depend on economic status. Older adults with moderate to high incomes belong to AARP and read their publications. Those in low socioeconomic groups are not members, and AARP publications are not typically available to them.

B. Gerontology Interviews

Telephone interviews were conducted with four representatives of the medical community who serve the elderly. Two were physicians in geriatric medicine with practices in a large Maryland city. Two were nurses providing public health services in two different Connecticut cities. Interviews explored one or more of the following topics:

- What are the capabilities and limitations of the elderly that affect their performance and safety as pedestrians?
- What are good ways of reaching the elderly to distribute information?
- What are good ways of persuading the elderly?
- What do the elderly like to be called?

Information obtained from the interviews is summarized in the following paragraphs.

1. Capabilities and Limitations of the Elderly

Participants reported that capabilities and limitations among the elderly are as diverse as they are among the general population. Some older people are very normal in all their responses while others have specific problems. Vision and mobility problems were the major limitations mentioned.

Comments made relative to limitations of **vision** were as follows:

- Cataracts can cause problems in depth perception. Seniors have trouble with curbs and even wheelchair ramps since there is no visual contrast to help them get around the depth perception problem. (In the home situation, they recommend that seniors use stair runners of a contrasting color to help with depth perception problems.)

- Persons with limited vision can have trouble seeing signs. WALK signs (the hands and little men) are too small for some seniors to see clearly.

- Cervical arthritis can limit side-to-side head movements and thus limit visual search, although this is not a problem across the board. Some people in their 90's are very limber. Others have severe limitations of angular movement.

- Although not strictly a vision problem, individuals who are cognitively impaired can have problems concentrating on and interpreting roadway signs and can make errors in crossing due to the concentration problems.

Comments made relative to **mobility** limitations were as follows:

- Seniors can be limited in mobility. Some have transient dizzy spells. Some have Parkinsons. Many have arthritis. Their reflex time is slowed, and they can't initiate movements rapidly enough to avoid danger.

- Sometimes seniors use poor judgment in responding to WALK signs and because of mobility problems have trouble crossing the street. For example, they will just go when they see the WALK sign without stopping to assess whether or not it has said WALK for awhile. They get part of the way across the street when the sign changes, and then they have trouble negotiating the rest of the crossing because of arthritis or other mobility limitations. (Note: This person acknowledged that younger people also have trouble responding to WALK signs and have to "sprint across" at times.)

- Seniors who have shortness of breath or arthritis frequently cross the street where it is convenient (that is, in midblock) rather than walk to a corner--even on a very busy street. They want to use the shortest route possible.

- Fear of falling is a major problem affecting the mobility of seniors. Their balance may not be what it used to be, and a small crack in the sidewalk can make them fall. If they have fallen before, they are afraid of doing so again. Some will therefore be extra cautious (that is, slow) if they walk outside at all. (It was noted that a great deal has been communicated to seniors about home safety to minimize falls, for example, by eliminating scatter rugs.)

Other comments made by the gerontologists relative to the safety of elderly pedestrians included the following:

- Elderly patients complain about right turn on red. They feel that drivers do not give way to pedestrians.

- Bright colors might make pedestrians more visible. Some elderly patients have bought white canes to make themselves more visible since they don't think motorists look out for them.

- The main problem lies with the driver. Pedestrians should be given the right-of-way when they enter the roadway as they are in California.

- Some WALK signs permit vehicles to make left turns when the sign is illuminated. Thus the WALK sign does not mean that the pedestrian has exclusive use of the roadway.

2. Distribution and Persuasion

With regard to **distributing** materials to the elderly, the gerontologists recommended senior centers and residences as well as local government agencies. Other recommendations included AARP publications and meetings, church groups and social organizations. Specifically, the following suggestions were made:

- Senior citizen centers and housing complexes are good places to distribute information to the elderly. Local government agencies that provide services to the elderly are also good distribution centers.

- AARP is **the best** way to reach the elderly of moderate means. Everyone goes to the AARP meetings. AARP is crucial to their lives. It's not wise to schedule any activity for seniors if there is an AARP meeting going on.

- Minority groups that are not very well off are not affected by AARP. Church groups provide a good way to reach minorities. Some specific groups (Koreans, for example) are best reached through their social organizations.

Comments made relative to **persuading** the elderly revolved around the difficulty of persuasion. They reported that, although some older adults can be difficult to persuade, by no means can they be said to be difficult as a group. They can be as variable on this factor as can members of any other age group. Comments included the following:

- The elderly can be difficult to persuade but not in terms of their health. The major difficulty with health is that they tend to underreport problems. They will pass off problems as old age and not report them until they are serious. You have to question them carefully since they won't complain unless asked. When a problem has been discovered, they will respond to directions. With regard to things other than their health, they like to make their own choices.

- There is a certain vanity among the elderly. For example, they will cling to their high-heel shoes until a painful foot problem develops. Only then will they consider shifting to something more sturdy and practical.

- Older citizens are no different from those of other age groups in terms of persuasion. It depends on the basic makeup of the individual. Some people will do anything. Some will do nothing. For example, some who can walk very well won't even go out of the house. Others will go everywhere.

3. Labels

When asked what the elderly like to be called, interviewees reported that they had not heard much discussion on the topic. Comments made regarding **labels** were as follows:

- Some like to be called senior citizens. They get discounts under this term so they don't mind it.

- Some seniors dislike all labels. Spanish-speaking people don't like to be called senior citizens.

- As long as their health is good, they don't care what they are called. However, no one likes to be called "old."

C. Interviews with Department Store Buyers/Managers

Telephone interviews were conducted with four representatives of major department stores. One was a senior buyer located at the central headquarters of a national department store chain. The other three were managers of departments (sportswear, women's wear) of Connecticut branches of major department stores. Interviews explored the following topics:

- Are there clothing manufacturers that cater to the elderly?

- Are there specific clothing stores or departments within stores that cater to the elderly?

- Do the elderly tend to buy clothing in neutral (black, navy, tan) colors?

Information obtained from the interviews is summarized in the following paragraphs.

1. Clothing Manufacturers

There are apparently no clothing manufacturers that design clothing specifically for the elderly. One interviewee reported that there is at least one manufacturer who designs clothes that appeal to the "mature" woman in that the clothing is cut for the mature woman, soft colors are used, and pants have elastic waists. However, the clothing comes in both misses and women's (large) sizes and is bought by people of all ages. In addition, one department store chain is experimenting with a women's line of clothing called "easy dressing" since the clothes have larger than normal sleeves and use velcro closures. But again, this clothing comes in all colors and is bought by people of all ages. Although a complete market analysis was not conducted, even the limited sample of discussions suggested that there is no significant segmentation of the clothing market for the elderly.

2. Stores/Departments for the Elderly

No clothing stores or departments within stores that cater specifically to the elderly were identified. Clothing is ordered in the range of sizes and colors provided by the manufacturer and is purchased by people of all ages depending on their preferences. Although women's clothing (and store clothing departments) are typically separated by group (that is, misses, women's, juniors and petites), the different groups serve all ages with the exception of the junior group. One interviewee did comment that older women who are small and fit in the petite category can have difficulty buying clothing since petites can sometimes not be appropriately designed for a mature person. The clothing industry is characterized by widespread knowledge of fashion and sales trends. Therefore, even though the sample interviewed was small, some mention of marketing direct to the elderly would have been expected if the practice was at all widespread.

3. Color Preferences

In general, interviewees agreed that the elderly tend to buy clothing in neutral or dark colors. They attributed this to several reasons. One is that we all tend to become more conservative as we age. Interviewees provided comments such as: "taste tends to become fixed and more conservative," "older people tend to freeze their outlook on clothes," and "the elderly have run the gamut of fashion and are content to be simply well dressed--this doesn't mean dull but it also doesn't mean bright." One interviewee commented that the elderly are primarily bargain conscious and, if they end up with conservative clothes, it's because the store itself is essentially conservative in both clothing and accessories.

The elderly also tend to be more practical and want to buy things that will last awhile. This is particularly true of an item like a winter coat. The elderly might have one coat for "dress-up" and another for everyday use. These coats will typically be purchased in dark or neutral colors so that they will last longer by not looking out of style as tastes in brighter colors shift. Younger people buy dark coats in the winter also, but they typically have more variety in both clothing and accessories.

The above comments on color preferences pertain to winter and not summer clothing. In the summer, white is very popular among the elderly as are bright colors. There is a tendency for women to wear dark pants and white or bright tops. Thus, as one interviewee noted, the conspicuity problem exists primarily in the winter and not in the summer. This individual also commented that people of all ages have a conspicuity problem when it rains since we all tend to wear tan or other neutral-colored raincoats.

Interviewees also noted that men tend to dress more conservatively as they age. However, it was reported that men do not have as many choices as do women. It is more socially acceptable for women to wear a variety of colors and styles both at work and in social settings. In addition, it was reported that women are more adventurous with color at all ages. "Men tend to buy a blue suit and wear it forever."

Although the discussions centered around what is usual for the elderly, one interviewee commented that there are elderly who are very fashion conscious and buy the same things that younger people buy. Their only concern is in finding clothes that don't look too immature for them.

V. ELDERLY PEDESTRIAN SAFETY ADVICE

As indicated previously, the development of safety messages for elderly pedestrians was an iterative process. Initial messages were proposed based on an analysis of the types of accidents in which older adults are overrepresented (see Section III). These messages were subjected to an extensive review process and revised as necessary to assure their appropriateness to the target audience.

The accident types described in Section III included VTM, "Other Intersection," Backing and Conspicuity. Since the first two of these accident types were intersection events, the advice for each group was combined. The final advice was therefore organized into the following groups or "modules":

- Intersection safety
- Backing safety
- Conspicuity safety.

It was considered important to "modularize" the advice somewhat to facilitate selecting subsets for presentation when space or time is limited or for addressing only one part of the overall problem.

The recommended advice is presented below. Included with the advice is the problem addressed, the objective of the advice and the rationale for its inclusion.

A. Intersection Safety

1. First Stepping Off the Curb

- **Advice:** *You are at most risk when first stepping off the curb because drivers may not see you until you're actually in the roadway.*
  - *Always stop at the curb and look left-right-left for cars before entering the roadway.*
  - *Look left-right-left even when the light is green or the signal says WALK.*
  - *Always look left **last** since that is the direction cars will come from when you **first** step off the curb.*
- **Problem:** The first half of the crossing is more dangerous than the second because the pedestrian is most at risk when first stepping into the roadway. The driver is attending to roadway events and may not even see the pedestrian until the pedestrian is actually in the road. In the second half of

the crossing, the driver has had an opportunity to observe the pedestrian in the roadway for some time.

- **Objective:** Ensure that the pedestrian makes a thorough left-right-left search ***before*** entering the roadway in order to minimize the risk of an accident when the pedestrian first steps off the curb.

- **Rationale:** The slower walking speed of the older adult places extra emphasis on the importance of a thorough search of the roadway to assure that the pedestrian can negotiate the crossing safely. In addition, since older adults tend to assume that it is safe to cross if the light is green or the signal says WALK, they must be reminded that right of way doesn't mean that it is safe to cross. A thorough search is ***always*** required prior to entering the roadway.

2. Turning Vehicles

- **Advice:** *Turning vehicles are especially dangerous at intersections because drivers are concentrating on making their turns and may not notice you.*

  - *Exaggerate your head turns so that you look in **all** traffic directions, including behind you.*

  - *Make sure you look for vehicles making right turns on red and for vehicles making left turns.*

  - *Make sure the driver of a turning vehicle sees you. **Look at the driver, not just the vehicle.** The car won't stop unless the driver sees you.*

- **Problem:** Turning vehicles at intersections are responsible for a number of pedestrian accidents. When a vehicle is turning, extra diligence is required on the part of both the driver and the pedestrian. The driver has a particularly difficult task because it is necessary to determine the best time to turn based on the presence of other vehicles and pedestrians in the intersection. In addition, the car's rearview mirror or the A-pillar may block a pedestrian from the driver's view while the car is turning. Left-turning vehicles are involved in more accidents with pedestrians than are right-turning vehicles. The left-turning vehicle has to cross at least one lane of oncoming traffic before making the turn. The driver may also have to commit to making the turn before the pedestrian steps off the curb or even before the pedestrian is in view.

- **Objective:** Ensure that the pedestrian looks for all turning vehicles at an intersection. If the intersection is on the pedestrian's left, the pedestrian must look over the left shoulder to check for vehicles making right turns. If the intersection is on the pedestrian's right, the pedestrian must look over the right shoulder for vehicles making left turns.

- **Rationale:** Limited peripheral vision may require large head movements on the part of the older adult to make a proper search for turning vehicles. In fact, if cervical arthritis or other physical limitations prevent large head movements, body movements may be required to look over the left and right shoulders. It is especially important that the older adult understand the need for a thorough search (including a search for turning vehicles) and not permit physical limitations to prevent such a search.

3. Intersection on Left

- **Advice:** *An intersection on your left is more dangerous than one on your right because you may encounter turning vehicles when you first step off the curb. Also, all vehicles you encounter are exiting the intersection and picking up speed.*

  - *When you come to an intersection, lift your left hand slightly. If your hand points toward the center of the intersection, be especially careful in searching for vehicles from **all** directions before entering the roadway.*

  - *Look over your left shoulder for vehicles making right turns on red and look across the intersection for vehicles making left turns.*

- **Problem:** Major risks at intersections occur when the pedestrian first steps off the curb, encounters turning vehicles (particularly left-turning vehicles), and encounters exiting vehicles. The greatest probability of an accident exists when all these risks occur together. This happens when the center of the intersection is on the pedestrian's left. The pedestrian then encounters left-turning vehicles in the first half of the crossing and all vehicles encountered in the first half of the crossing are exiting the intersection.

- **Objective:** Ensure that the pedestrian recognizes the special dangers of intersections on the left and compensates for these dangers by making an especially careful search before entering the roadway. When making the left-right-left search, the pedestrian must look over the left shoulder for vehicles making right turns on red and must visually sweep ***through*** the intersection for vehicles making left turns.

- **Rationale:** Limited peripheral vision and limited body motions may require an older adult to turn the body physically to the left to search for right-turning vehicles. Slow movements may require extra time for the older adult to make a thorough search. Knowledge of the procedures required may minimize confusion at these intersections and aid the search process.

4. Visual Screens

- **Advice:** *Cars and other objects can screen you from a driver's view.*
  - *Before stepping off the curb, try to make sure that all vehicles in the roadway have stopped and that all drivers see you.*
  - *When a vehicle has stopped to let you cross, don't blindly "accept this offer" and enter the roadway. There may be another vehicle (#2 vehicle) overtaking the stopped vehicle. And the #2 driver can't see you because of the stopped car.*
  - *Be especially careful about stepping in front of a stopped bus because, due to its size, it's even harder for an overtaking driver to see you.*
  - *When you want to cross in front of any "screen," stop at the outside edge of the screen and look around it for any vehicles that might be coming.*

- **Problem:** There are numerous situations in which a pedestrian is screened so as not to be visible to an oncoming vehicle until the pedestrian suddenly steps out in front of that vehicle. The screen may be a parked car, another vehicle that has stopped to let the pedestrian pass or it may be a bus that has stopped at a bus stop. It could also be a bush, a mailbox or any other object that prevents the driver from seeing the pedestrian, and vice versa.

- **Objective:** Promote the identification of visual screens, and ensure that a thorough search of the roadway takes into account anything that might be screening the pedestrian's or the driver's view. Also, assure that, even though a thorough search is made before the pedestrian leaves the curb, a separate thorough search is made at the edge of any screen so that the pedestrian sees all oncoming vehicles and all drivers see the pedestrian.

- **Rationale:** Reduced visual and auditory acuity and possibly even lack of attentiveness may make the older pedestrian less aware of traffic cues and potential traffic dangers than the younger pedestrian. In addition, the older pedestrian tends to rely on green lights and WALK signals as indicators that it is safe to cross the street and may also interpret a stopped car as an indication that it is safe to cross in front of the car. It is important that the older pedestrian recognize and take appropriate care to search carefully whenever the pedestrian is screened from oncoming traffic. While the problem and solutions are the same for pedestrians of any age, the diminished capacity of the older pedestrian to take evasive maneuvers warrants special attention to the visual screen problem.

5. **Signal "Faith"**

- **Advice:** *If you step into the roadway immediately when a green light or WALK signal comes on, you may be hit by a car in the intersection.*
  - *Green does not mean that you have the right of way. Green means **look** and, if it's safe, then go.*
  - *The WALK signal does not mean that it is safe for you to start crossing. Rather, it tells you to stop at the curb and look to make sure that it is safe.*
  - *Always stop at the curb and look for cars from all directions before entering a roadway. Exaggerate your left-right-left looks so that you see any turning vehicles also.*
  - *Before crossing at an intersection, you may want to wait for a fresh green light (gives you the most time). Also, look for cars that might be coming (don't assume they will stop).*
- **Problem:** In this situation, the pedestrian relies completely on the signal as an indication of pedestrian right of way. Without looking for cars that might still be in the intersection, the pedestrian starts to cross the street as soon as the light turns green or the signal says WALK. The pedestrian is then hit by a car that is still in the intersection.
- **Objective:** Ensure that the pedestrian makes a thorough search of the intersection regardless of whether or not the light is green or the signal says WALK.
- **Rationale:** Many older adults have complete faith in traffic and pedestrian signals and must learn that a green light or WALK signal means ***only*** that it is the pedestrian's turn, not that it is safe to cross. A careful search of the roadway is still required. Because of reduced mobility, it is advisable for older pedestrians to wait for a fresh green light or WALK signal so that they will have the maximum time available to cross the street.

6. **Signal Timing**

- **Advice:** *When you are in the middle of the road and the DON'T WALK signal flashes, don't stop or return to the curb. Continue to walk at your maximum comfortable pace (running is not necessary) until you reach the other side. If you're not sure that a driver has seen you, move your arms a bit. Remember, you won't get hit if the driver sees you.*
- **Problem:** In these accidents, the pedestrian gets partway across the street when the DON'T WALK signal starts to flash. This signal flashes to indicate

that the pedestrian shouldn't ***start*** to cross the street. However, if the pedestrian is already in the roadway, the pedestrian should continue to cross to the other side rather than return to the curb.

- **Objective:** Ensure that the pedestrian understands the meaning of the flashing DON'T WALK signal so that the pedestrian doesn't become confused, panic or "freeze" in the middle of the street when the signal flashes.

- **Rationale:** Because of reduced mobility, the older adult may not get as far across the street as a young person would when the signal starts to flash. Many times the older person returns to the curb rather than continuing with the crossing. Sometimes, the older pedestrian becomes confused, "freezes" in the middle of the street and becomes a target for an oncoming vehicle.

B. Backing Safety

1. Parking Lots

- **Advice:** *Parking lots can be just as dangerous as roadways. Be particularly alert for backing cars because the driver may not see you. Specifically:*

  - *Listen for engine noise.*
  - *Look for backup lights.*
  - *Look for drivers in vehicles.*
  - *Watch for moving cars.*
  - *Do not assume that you have the right of way.*
  - *Keep to pedestrian walks where possible.*
  - *Walk in front of parked cars rather than behind them whenever possible.*

- **Problem:** Many backing accidents occur in parking lots where vehicles can be entering or leaving at any time and defined pedestrian paths are frequently not available. Most cars are parked in spaces from which they must back out to leave. The driver may not look carefully enough, and rearward visibility from a car is usually poor. The pedestrian can be particularly inattentive in a parking lot since it may not seem to be a roadway and its dangers may be underestimated.

- **Objective:** Ensure that the pedestrian is as cautious in parking lots as in the roadway.

- **Rationale:** Accidents between vehicles and pedestrians in parking lots can frequently be described as "bumps" or "brushes." Many young people might be unaffected by them. However, because of the increased frailty of the older adult, minor bumps and brushes with vehicles can result in serious injuries. Because hearing losses are common among older adults, the sounds of car movement may go unnoticed. It is especially important, therefore, that older pedestrians understand ***all*** cues of car movement and use all that are available to them.

2. Driveways and Streets

- **Advice:** *When a vehicle is backing up on a street or in a driveway, the driver's rear vision may be blocked due to the design of the vehicle or because the driver is relying on the view from the rearview mirror. Be particularly alert for backing vehicles. Specifically:*

  - *Listen for engine noise.*
  - *Look for backup lights.*
  - *Look for drivers in vehicles.*
  - *Do not enter a roadway if there is any possibility that a car may back up.*
  - *Treat a driveway which crosses a sidewalk as though it were an intersection. Slow down and look both ways. Be aware that a vehicle could be entering or leaving at any time.*

- **Problem:** In backing accidents, typically both driver and pedestrian are inattentive and lack "situational awareness." The driver may not look carefully enough, and rearward visibility from a car is usually poor. In the roadway situation, the pedestrian is concentrating on moving cars, not cars that might ***start*** to move. And the pedestrian may consider a sidewalk to be non-threatening and fail to recognize that a driveway intersecting a sidewalk can be as dangerous as the intersection of two roads.

- **Objective:** Ensure that the pedestrian is alert to ***all*** signs of car movement and will not enter the roadway if there is any possibility that a car will back up. In addition, the pedestrian must treat a driveway like an intersection and search for entering and exiting cars.

- **Rationale:** Because of hearing losses, the sounds of car movement may go unnoticed by older pedestrians. Older pedestrians must, therefore, understand and use ***all*** cues available to them in order to avoid backing accidents in driveways and streets.

C. Conspicuity Safety

1. Winter Conspicuity

- **Advice:** *Drivers have difficulty seeing pedestrians in the winter months because there are more shadows and we tend to wear dark clothing.*
  - *If your winter clothing is dark, always wear something light or bright (like a white scarf) to make you more conspicuous.*
  - *Better still, buy a piece of high visibility fluorescent material and attach it to your purse or briefcase or to anything else that is in plain view. This will greatly increase the chances that you will be seen.*
- **Problem:** There is a sharp increase in accidents involving older adults in the winter months. This occurs both in the United States (November, December and January) and in the Southern Hemisphere (May, June and July). It appears to result from decreased daylight and increased shadows that occur from low sun angles during these months. Since most people tend to wear dark clothing in the winter months, the pedestrian simply becomes inconspicuous to the driver.
- **Objective:** Make the pedestrian more conspicuous to drivers, particularly in winter.
- **Rationale:** Although most people tend to wear dark clothing in the winter, this practice is particularly prevalent among older adults. Older adults therefore markedly increase the risk that they won't be seen by drivers in the winter months.

2. Conspicuity and Left-Turning Vehicles

- **Advice:** *Vehicles making left turns at intersections are especially dangerous to you in the winter months when visibility is poor.*
  - *Before you enter an intersection, make sure you look in* ***all*** *directions for oncoming vehicles, especially for turning vehicles. Check the entire intersection for threats.*
  - *If you're not sure that a driver has seen you, let the car go by before you attempt to cross the street.*
- **Problem:** The winter conspicuity problem interacts with other roadway dangers. Pedestrian accidents involving right-turning vehicles stay essentially constant throughout the year. In contrast, accidents involving left-turning vehicles increase markedly in the winter months. Being less conspicuous, the winter pedestrian is not seen before it is too late.

- **Objective:** Ensure that the pedestrian makes an especially thorough search at intersections in the wintertime when visibility is unusually poor.

- **Rationale:** Older adults are overrepresented in accidents in the winter months, particularly those involving left-turning vehicles. Therefore, they should not only do everything they can to make themselves more conspicuous but should be especially careful to perform a thorough search for all vehicles (including turning vehicles) before entering the roadway.

VI. MEDIA MATERIALS AND PLANS

Final study activities involved identification of organizations to distribute the pedestrian safety information and development of media materials and plans for the dissemination process. A study previously sponsored by NHTSA (see Worthington et al., 1986) served as a resource for the initial identification of appropriate distribution organizations, and a variety of materials were prepared to assist NHTSA in the distribution process. It is important to reiterate that the objectives of the present effort were not necessarily to produce finished materials for final distribution to elderly pedestrians. Rather, the concept being pursued was to research the problem, identify solutions and pass this information in appropriate forms to "gatekeepers," i.e., those organizations which have the ability, experience and credibility to distribute safety materials to the elderly. As work progressed, it was decided that both NHTSA and FHWA were, themselves gatekeepers for the elderly and for organizations concerned with the elderly. Therefore, efforts were divided between preparing finished materials which NHTSA and FHWA could distribute and "catalysts" for prompting other groups to disseminate the developed advice to their own constituents.

The Worthington study identified organizations that could distribute traffic safety information to older drivers and pedestrians. From an initial group of some 69 organizations, it selected 20 potential distributors with high, repeated exposure to large numbers of elderly people, a central distribution point, and established information dissemination mechanisms, among other characteristics. These 20 organizations were selected as a core group for examination in the present study. Eighteen of the 20 were either still obviously involved with the elderly or showed some interest in dissemination of pedestrian safety information when approached by the project. One of the organizations could no longer be located, and one was absorbed in a corporate takeover. The remaining 18 organizations are listed in Appendix F.

When examining the list of major potential distribution groups, two things became immediately apparent. First, the largest two or three organizations had the potential to address much larger numbers of the elderly target audience than did the balance of those on the list. These organizations included the American Association of Retired Persons (AARP), the American Automobile Association (AAA) and the National Safety Council (NSC). Second, each of the major distributors had its own "style" of reaching the elderly audience. For example, AARP publishes *Modern Maturity* magazine, which has an extremely large circulation; AAA distributes much safety information in the form of pamphlets; and NSC is currently developing and distributing the *Walk Alert* program under contract to NHTSA and FHWA.

Informal discussions with several of the 18 organizations indicated that they would prefer to prepare their own materials based on the current research rather than distribute a "standard" publication. This would permit them to adapt both the content and format to the needs and problems of their particular constituents. Moreover, it allowed for a customization of style and approach which could not be possible if the project provided them with finished materials.

Based on this input, it was determined that a background paper that would summarize the research results of the study should be the initial media piece produced. This summary document would serve to familiarize the distribution organizations with the older pedestrian safety problem and with the basic countermeasures which had been devised. Once it had been reviewed by the various major distribution groups, additional materials would be developed for more widespread distribution.

The resulting paper, entitled ***Walking Through the Years***, describes the major risks facing older pedestrians and recommends specific ways for them to improve their safety. These risks and the recommended advice have been described in detail in the preceding section of this report (Section V) and will not be repeated here. A copy of ***Walking Through the Years*** is reproduced in Appendix C.

Walking Through the Years was initially aimed at potential distributors or "gatekeepers," including the NHTSA and FHWA Regional Offices, and as an aid to NHTSA and FHWA personnel in describing the study and its results to any interested groups. Once prepared, however, it became apparent that it could also be disseminated directly to the target audience or to the population at large. Although the advice is directed to the older adult, it is appropriate to pedestrians of all ages. Distributing the information to the general public, therefore, could aid all pedestrians in improving their safety. In addition, if younger adults are aware of appropriate pedestrian behaviors, they may reinforce those behaviors in their older relatives and friends.

Once ***Walking Through the Years*** was completed, it was decided the most efficient dissemination of the study results with the available resources would be accomplished through a "bi-level" strategy. Under this approach, direct contacts and cooperative efforts would be initiated with AARP, AAA and NSC, the organizations with the largest potential future distribution. To the extent permitted by resources, additional prototype or finished materials would be prepared to support the distribution efforts of these three groups. Simply, a determination of the needs of these three groups for additional materials based on ***Walking Through the Years*** was deemed to be the best possible guidance for directing the balance of the media preparation efforts within this study. It was concluded that the majority of the potential audience of older pedestrians could be reached by these three organizations. Further, the materials developed in response to their needs could still be distributed to the remaining, smaller identified organizations by mail.

A brief description of the three organizations selected for the initial contacts clearly highlights the basic reason why the bi-level distribution strategy was adopted:

- **American Association of Retired Persons (AARP)** -- This organization represents the largest audience of elderly people. It distributes information through its magazine, newsletter, television show, paid advertisements, news releases and a publication catalog. In addition, it makes information available through meetings, training programs and conferences, senior centers, local community facilities and local AARP chapters.

- **American Automobile Association (AAA)** -- This organization represents the second largest elderly audience. It distributes information through meetings (in cooperation with local clubs), conferences, news releases and publication catalogs.

- **National Safety Council (NSC)** -- Although this organization does not represent an overly large elderly audience, it was included as an initial distributor because of its national stature and its work on the current *Walk Alert* program. It publishes a quarterly magazine and has a network of affiliated local safety councils.

No other organization listed in Appendix F even approaches the potential audience penetration of any one of these three. Collectively, their cooperation with and commitment to a program to

disseminate advice to elderly pedestrians would almost certainly guarantee its success in reaching large numbers of the population at risk.

Meetings were scheduled with representatives from each of the three selected groups. The ***Walking Through the Years*** paper was reviewed in detail, and each group expressed interest in disseminating the information it contained and in exploring media support that could be provided by the project for the dissemination effort. It was generally agreed that the various groups would be in the best position to adapt the information in ***Walking Through the Years*** to the specific media and formats they typically disseminated. However, all three groups expressed a desire and need for two additional presentations of the content in ***Walking Through the Years***. These were:

- A set of 35 mm slides summarizing the information contained in the basic paper. A set of slides (25 in all) was therefore prepared as a product of the present study. The slides describe the older adult pedestrian problem and the approach used in this study to define pedestrian risks and countermeasures. For each risk, the appropriate pedestrian advice is presented. In essence, the slide set summarizes all information presented in ***Walking Through the Years*** as well as the process by which it was generated. In addition, an accompanying document was prepared to aid in presenting the slides. Called a *Presenter's Guide*, it describes the slide contents and provides certain background information that the presenter may wish to use to amplify the contents of selected slides as appropriate. A copy of the *Presenter's Guide* containing miniature representations of the slides is included in Appendix D.

- A flyer that could be included in routine mailings or as a handout directly to the older adult. A 12-page flyer summarizing the contents of ***Walking Through the Years*** was therefore prepared. Measuring four by nine inches, the flyer was designed to fit in a standard business envelope so that it could be included in routine mailings made by a distributing organization to its membership. A copy of the flyer is included in Appendix E.

In addition to the two preceding items, several specific requests were received from AAA to assist them in disseminating study results. Because of the size of the elderly population which the AAA is capable of reaching and their enthusiasm for the effort, it was agreed to prepare the following items for use specifically by the AAA:

- A shortened version of the flyer -- Since AAA is concerned primarily with roadway accidents and since backing accidents occur largely in parking lots, they requested a flyer that eliminated backing accidents. This request resulted in the preparation of an eight page version of the basic 12-page flyer. In addition to eliminating backing accidents, this version of the flyer shortened the discussion on conspicuity in order to meet the space limitations suggested by AAA.

- An article describing the study and its results that could be published in magazines/newspapers that are sent by AAA clubs to their members -- This request resulted in the preparation of a brief (3+ pages) draft article describing the basic study results but, again, eliminating backing accidents.

- An editorial that could be published in magazines/newspapers that are sent by AAA clubs to their members -- This request resulted in the preparation of a brief draft editorial describing the study and expressing AAA's support of NHTSA's efforts to improve pedestrian safety. There is precedent for the National AAA to use proposed editorials as a means of disseminating new safety advice.

In summary, three major media items were prepared in finished form as part of this study:

- The background paper, ***Walking Through the Years***, intended as an introduction to the elderly pedestrian safety problem and its solutions. Although originally intended for "gatekeepers" as a means of enlisting their support, the paper appears to have widespread potential as a countermeasure presentation when people have expressed an interest in the subject area.

- A slide series with accompanying guide. By using various subsets of the slides, presentations ranging from a summary of the research effort to training of groups of elderly pedestrians can be supported.

- A flyer version of the material suitable for mass distribution by NHTSA/FHWA or by cooperating media distributors.

Strategically, major initial efforts in reaching the target audience of elderly pedestrians have already been completed as a result of the agreements reached with AARP, AAA and NSC. Their agreement to accept and use the output of the present effort in their routine efforts to improve the safety of their membership virtually assures reaching a large segment of the target audience. To attempt to reach the balance of the possible audience, the following activities are recommended:

- Distribute ***Walking Through the Years*** as widely as possible among NHTSA/FHWA personnel and Governor's Highway Safety Representatives and support it to the extent possible with presentations of the slide set. This should serve to sensitize a core group of safety professionals who have continuing contact with both groups of the elderly and "gatekeepers."

- Make technical presentations at pedestrian conferences and other safety meetings to spread further knowledge of the study results among the technical and implementation communities.

- Prepare a mailing to the balance of the organizations listed in Appendix F. This mailing might profitably include a "personalized" letter, a copy of this final report as a "reference" document and one or more copies of ***Walking Through the Years***. In addition, the letter should offer copies of the slides and/or a reproducible of the flyer.

- Prepare a distribution to Community Traffic Safety Programs (CTSPs) by mail or through NHTSA/FHWA Regional Offices and/or Governor's Highway Safety Representatives. This might include this report, reproducible copies of ***Walking Through the Years*** and the associated slides and flyers as well as related pedestrian safety materials such as those which define pedestrian accident types and those needed to accomplish accident typing.

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APPENDICES

A. **Los Angeles Pedestrian Accident Tabulations by Month, Victim Age and Type, 1973 - 1978 Combined**

B. **Discussion Group Topic Outlines, Detailed Results and Summaries**

C. **Background Paper:** *Walking Through the Years--Pedestrian Safety for the Older Adult*

D. **Presenter's Guide for Slide Series:** *Walking Through the Years*

E. **Flyer for** *Walking Through the Years*

F. **Distribution Organizations**

APPENDIX A

Los Angeles Pedestrian Accident Tabulations

by Month, Victim Age and Type

1973-1978 Combined

This Appendix contains month-by-month tabulations for seven different pedestrian accident types collected as part of an Experimental Field Test of Proposed Pedestrian Safety Messages (Blomberg, Preusser, Hale and Leaf, 1983). The accident types follow the definitions developed by Snyder and Knoblauch (1971) which, though different from the currently used NHTSA typology, are consistent with it. The seven types shown were selected because they are relevant to the discussion of the elderly pedestrian in this report, particularly the analysis of conspicuity problems in Section III.

Table A-1

Los Angeles - Vehicle Turn Merge (Including Turning Vehicles), 1973-1978

Age		J	F	M	A	M	J	J	A	S	O	N	D	UNK	Total
1-15	N	81	51	57	49	44	29	31	25	39	64	61	64	1	596
	%	13.6	8.6	9.6	8.2	7.4	4.9	5.2	4.2	6.5	10.7	10.2	10.7	1.2	
16-64	N	216	164	159	98	89	110	112	110	119	124	168	207		1676
	%	12.9	9.8	9.5	5.9	5.3	6.6	6.7	6.6	7.1	7.4	10.0	12.4		
65+	N	81	50	39	39	44	26	38	38	29	54	66	72		576
	%	14.1	8.7	6.8	6.8	7.6	4.5	6.6	6.6	5.0	9.4	11.5	12.5		

Table A-2

Los Angeles - Intersection Dash, 1973-1978

Age		J	F	M	A	M	J	J	A	S	O	N	D	UNK	Total
1-15	N	91	69	74	81	74	71	49	47	57	79	76	64		832
	%	10.9	8.3	8.9	9.7	8.9	8.5	5.9	5.7	6.9	9.5	9.1	7.7		
16-64	N	103	76	79	53	51	50	48	59	78	66	94	80		837
	%	12.3	9.1	9.4	6.3	6.1	6.0	5.7	7.1	9.3	7.9	11.2	9.6		
65+	N	29	21	27	13	12	14	14	20	11	18	22	25		226
	%	12.8	9.3	12.0	5.8	5.3	6.2	6.2	8.9	4.9	8.0	9.8	11.1		

Table A-3

Los Angeles - Trapped, 1973-1978

Age		J	F	M	A	M	J	J	A	S	O	N	D	UNK	Total
1-15	N	1	0	2	2	3	4	2	2	3	7	9	2		37
	%	2.7	0	5.4	5.4	8.1	10.8	5.4	5.4	8.1	18.9	24.3	5.4		
16-64	N	7	6	8	7	1	4	10	5	10	5	12	11		86
	%	8.1	7.0	9.3	8.1	1.2	4.7	11.6	5.8	11.6	5.8	14.0	12.8		
65+	N	5	5	2	2	0	2	1	1	1	1	2	2		24
	%	20.8	20.8	8.3	8.3	0	8.3	4.2	4.2	4.2	4.2	8.3	8.3		

Table A-4

Los Angeles - Multiple Threat, 1973-1978

Age		J	F	M	A	M	J	J	A	S	O	N	D	UNK	Total
1-15	N	49	37	42	41	47	33	46	36	39	40	64	36	1	511
	%	9.6	7.2	8.2	8.0	9.2	6.5	9.0	7.1	7.6	7.8	12.5	7.1	.2	
16-64	N	81	69	69	64	59	63	70	51	56	75	81	82		820
	%	9.9	8.4	8.4	7.8	7.2	7.7	8.5	6.2	6.8	9.2	9.9	10.0		
65+	N	14	15	19	10	8	7	10	11	9	9	25	16		153
	%	9.2	9.8	12.4	6.5	5.2	4.6	6.5	7.2	5.9	5.9	16.3	10.5		

Table A-5

Los Angeles - Backing, 1973-1978

Age		J	F	M	A	M	J	J	A	S	O	N	D	UNK	Total
1-15	N	8	29	14	20	21	27	28	32	21	23	17	22		262
	%	3.1	11.1	5.3	7.6	8.0	10.3	10.7	12.2	8.0	8.8	6.5	8.4		
16-64	N	46	55	57	56	65	52	77	60	43	65	51	55		682
	%	6.7	8.1	8.4	8.2	9.5	7.6	11.3	8.8	6.3	9.5	7.5	8.1		
65+	N	11	16	12	14	11	17	16	13	22	15	16	17		180
	%	6.1	8.9	6.7	7.8	6.1	9.4	8.9	7.2	12.2	8.3	8.9	9.4		

Table A-6

Los Angeles - Auto/Auto, 1973-1978

Age		J	F	M	A	M	J	J	A	S	O	N	D	UNK	Total
1-15	N	7	7	3	18	10	20	10	16	16	22	8	13		150
	%	4.7	4.7	2.0	12.0	6.7	13.3	6.7	10.7	10.7	14.7	5.3	8.7		
16-64	N	46	72	52	73	85	82	78	82	82	78	65	79		874
	%	5.3	8.2	6.0	8.4	9.7	9.4	8.9	9.4	9.4	8.9	7.4	9.0		
65+	N	14	9	8	9	4	9	10	17	9	8	8	8		113
	%	12.4	8.0	7.1	8.0	3.5	8.0	8.9	15.0	8.0	7.1	7.1	7.1		

Table A-7

Los Angeles - Pedestrian Not in Roadway, 1973-1978

Age		J	F	M	A	M	J	J	A	S	O	N	D	UNK	Total
1-15	N	46	45	43	53	46	49	49	33	46	46	41	38		535
	%	8.6	8.4	8.0	9.9	8.6	9.2	9.2	6.2	8.6	8.6	7.7	7.1		
16-64	N	105	121	99	107	113	118	112	118	111	121	91	122	1	1339
	%	7.8	9.0	8.0	8.4	7.4	8.8	8.4	8.8	8.3	9.0	6.9	9.1	.1	
65+	N	14	10	14	12	8	9	10	16	13	13	13	14	.5	146
	%	9.6	6.9	9.6	8.2	5.5	6.2	6.9	11.0	8.9	8.9	8.9	9.6		

APPENDIX B

DISCUSSION GROUP TOPIC OUTLINES, DETAILED RESULTS AND SUMMARIES

Topic Outline -- Groups One - Three

Detailed Results -- Group One
Summary -- Group One

Detailed Results -- Group Two
Summary -- Group Two

Detailed Results -- Group Three
Summary -- Group Three

Topic Outline -- Groups Four - Five

Detailed Results -- Group Four
Summary -- Group Four

Detailed Results -- Group Five
Summary -- Group Five

TOPIC OUTLINE (GROUPS ONE - THREE)

OLDER ADULT PEDESTRIAN DISCUSSION GROUPS

INTRODUCTION:

We are visiting you today to talk about pedestrian safety. We want to discuss with you your perceptions about crossing the street and walking through parking lots. We are working to improve pedestrian safety but in order to accomplish this it is important for us to understand how people feel about crossing the street and walking in parking lots and find out what kind of problems exist and if pedestrians can be helped to avoid accidents. The first item we are going to discuss is crossing the street.

Participant Characteristics

How much walking do you do?

every day?

less than 1/2 mile

more than 1/2 mile

Where do you walk?

roads with sidewalks

roads without sidewalks

streets with crosswalks and signals

Do you often walk through parking lots?

Awareness (Crossing Streets)

- Do you think that most people are aware of the pedestrian accident problem
- If need to cross a street, where do you cross?
- Why do you cross at that particular place?
- Do you find crossing the street at an intersection difficult?
- If difficult why?
- What do you do at an intersection?

- Are there any dangers in crossing at an intersection?

- What are "walk" lights intended for?

Countermeasures

- What do you think could be done to make it easier for you to cross a street (at an intersection)?

- What changes would you like?

- We are trying to find ways to help people cross the street safely. Assume that we can't change the way the lights operate or the way the driver drives his vehicle, what message could we send out to pedestrians to make it safer for them?

- Many people are injured at intersections that have traffic and walk lights because cars are making left and right turns. Therefore, even if a pedestrian is crossing on a walk light, a car could still be turning into his path. If we assume that we cannot change the way that the driver operates a vehicle, what can we tell the pedestrian to do that would make him or her safer?

- Many drivers report that they do not see the pedestrian. Is there anything we could suggest to improve visibility?

- Do you think if we suggested wearing a bright scarf or other brightly colored item to make the pedestrian more visible, that people might respond to this message?

- Do you have any problems with curbs?

- What about problems with the size of the print or color of the traffic signal?

Messages

We have developed several possible messages designed to promote safety at intersections and we would like your reaction to them:

- A "walk" signal does not always mean that it is safe to walk

- Drivers do not always yield to a pedestrian in a crosswalk

- Be aware of "right turn on red," look at the driver, watch for the vehicle's right turn signal

- When crossing on a "walk" signal be aware that drivers can be turning into your path

For each of these messages ask:

- What does this message mean to you?
- Is the message clear?
- Is it accurate?
- Is it appropriate?
- Does it have any negative connotations?

etc ????

Awareness (Parking Lots/Driveways)

- Do you feel comfortable walking in a parking lot?
- What do you watch out for?
- Does it feel dangerous to you?
- What do you think the dangers might be when walking through a lot?
- Who has right of way in a parking lot?
- If you see a car starting to back, what do you do?
- Do driveways present any problem to you?
- When you are walking along a sidewalk and come to a driveway, what do you do?

Countermeasures

- A lot of people are injured by cars backing out of parking spaces in parking lots. Assuming that we can't change what the driver does, what could we do to prevent pedestrians from being hurt?
- What do we have to tell people to warn them of the dangers?
- What else could be done to help make parking lots safer?
- Some people are injured by cars backing from driveways. How can we help this problem.

Messages

We have developed several ideas for messages to help warn people of the risks in parking lots and driveways and we would like to obtain your reaction to them:

- Do not assume that you have right of way in a parking lot
- Keep to pedestrian walks where possible
- Watch for signs that a vehicle is beginning to move - sounds of engines starting - exhaust fumes - driver in car, backing lights, etc.
- Be alert at all times for moving vehicles in traffic lanes
- Treat a driveway like an intersection--be aware that a vehicle could be entering or exiting

Same questions as for crossing the street.

We would like to discuss with you your ideas on how we can get these messages to people.

Sending the Message

- If we develop messages to help people be safer in crossing the street or walking in parking lots, how can we get the message to you, for example?
- If pamphlets were distributed, would you read them?
- If centers like this were to have someone talk about pedestrian safety, would you go?
- What about TV commercials, would you watch a message about pedestrian safety?
- What about magazine articles?

DETAILED RESULTS

DISCUSSION GROUP ONE

Participant Characteristics

Three females, 2 males, ages ranging from 70-85. All walk a little more than half a mile most days when the weather permits. They walk down town on sidewalks. They encounter intersections and driveways. Both males drive cars.

Location Characteristics

The group met at a senior center which has a large membership. The center is located in the down-town area of a small, affluent, suburban town.

Introduction

The participants were told that they would be discussing various aspects of pedestrian safety. They were told that the purpose is to gain an understanding of how they feel about crossing streets and walking in parking lots, etc., and to hear their views on what might be done to make it safer for them.

Awareness (Crossing Streets)

- Most people are aware that it is dangerous to cross the streets.
- Cars go through intersections on red lights and on yellow lights.
- A lot run the red light.
- The drivers are careless.
- Everyone is in a hurry--they are not going anywhere to begin with.
- It seems as if there is very little concern for the pedestrian. The main issue these days is to get in your car and get to where you are going as fast as possible. It's almost as if that if you are walking you shouldn't be walking. You shouldn't be taking your time. That's the feeling you get.
- The trouble is that the police are a bit lax. Years back as soon as you ran a red light they would ticket you.
- They are not so quick to do that now.
- The lights are timed so that you can safely cross the Post Road area but if you are going further the lights are not long enough. You have to walk fast to make it.

- The lights change too quickly for us to get across safely. (All)
- I need the time to properly cross at my own speed without falling just to get out of the way of a car.
- We don't feel that the pedestrian has the right of way. Definitely they don't.
- I think that when a green walk light comes on that means caution.
- We think it means that you have the right of way and should go.
- I expect the crosswalk to be clear of traffic when the walk light is green.
- I think the lane should be clear.
- I think that right turn on red light is very dangerous for pedestrians crossing.
- It is very dangerous for pedestrians. A lot of people complain about that.
- That's the whole problem today. People say you are infringing upon my rights. That's for the birds. We have rights, too.
- The driver and lack of police enforcement are the main reasons for crossing accidents. They don't enforce the laws like they used to.
- I don't think that the visibility of the pedestrian is a problem during the daytime. It's at night that it might be a problem.
- Not many old people go out at night.
- The drivers are lying if they say they don't see the pedestrian during the day. If your eyesight is good you can see a pedestrian.
- If you are driving a car your eyesight should be good.
- I think we are typical of the seniors here. They are aware of the problems when walking.
- You really have to be careful to look out for yourself. We have all slowed up.
- But we are enjoying life more than most people are.

Countermeasures

- The intersection outside the center is very dangerous. However, we have a policemen on duty all the time. He is wonderful. He stops the traffic in all directions as soon as he sees us. I wouldn't move without him telling me to.

- We prefer the policeman to lights. It is very important to us because of the large number of seniors using the center. There is a move to install a light instead, but it is the busiest spot in town and if a policeman wasn't there would be many accidents.
- The traffic light would never take the place of a policeman, that is understood.
- A light would be helpful on a Sunday as there is no police officer there on Sunday, only at the church.
- A lot of intersections in this town have a policeman on duty. It's well patrolled.
- There are other dangerous intersections that do not have a policeman.
- In Europe they have the white lines like they have at the hospital and you have to stop if anyone is walking across the street.
- That gives the pedestrian right of way but you don't have that here.
- The hospital is the only place in town where they have those white stripes across the intersection.
- The white stripes would help some.
- I don't think white stripes would take the place of a policeman. You would have traffic backed up for miles.
- Some people drivers and pedestrians should not be on the road. Their eyesight fails and they are unsteady on their legs. I know it is hard for them to give in to it because once they do they are finished.
- It's tough to face that because I'm getting there myself.
- Believe it or not some of them really hold up the traffic. They shouldn't be out there.
- Their reflexes are too slow.
- You can only turn right on red at certain places. You have to look up at the sign to find out whether cars might be turning.

Messages

- I think the messages are all good.
- They are all appropriate
- We all agree the messages are good. No one would be offended. They don't sound like you are talking down to anyone.

- We all agree that the messages are clear and logical.
- I think people would respond to the message to wear bright colors to make themselves more visible.

Awareness (Driveways and Parking Lots)

- Drivers have no rights coming out of driveways.
- You know that main roads have right of way and drivers take tests and should know that. Time and time again people come out of driveways and go plowing right out into the traffic.
- We have trouble in our shopping area. The sidewalks don't get plowed and we have to walk in traffic.
- When you are in a parking lot you have to be careful of people backing out.
- A lot of people just don't care. They get behind the wheel and just back out.
- They don't look.
- You have to be aware of your safety constantly.
- You have to be aware at all times that you are in danger.
- We have just had a very serious accident with one of our seniors in a parking lot. She was loading groceries into a car and another car came and pinned her to the trunk of her own car.

Countermeasures

- Parking lots are OK if you stay out of the road part. A lot of people walk in the road part.
- I look for the backup lights on a car.
- Bright colors would help a backing car to see you.
- You have to be very careful.
- Always be aware that someone may move.
- Look for signs that a car is beginning to move.
- You have to be aware that cars come in the wrong way. You have to watch out for that too.

- In bad weather you have to be extra careful. The visibility is bad and drivers can't see you.
- You should keep the pedestrian walks although there are too many lots with them.
- It's a jungle--those are the right words--its a jungle.

Messages

- All the messages are very clear.
- They are good messages.
- I would respond to a message to wear bright clothes.
- I think that law enforcement people visiting the senior center to talk about safety programs could be instituted. Particularly for older people. I don't think enough stress is put on what you can do to keep yourself walking and what you can do to keep yourself safe. As you get older you think more about that. If the drivers aren't going to look out for you, then you have to look out for yourself.
- That's a pretty good message. (all)
- I think that the police coming to see us would be a good idea.
- I think if someone came here you would get a good response.
- If it went on too long, people would get bored.
- Forty-five minutes to an hour would be good. Longer than that you would lose people's attention. They would begin to get bored and think about lunch.
- A morning between 10:30 and 11:30 would be good.
- An article could be put in our newspaper.
- AARP could publish something
- I think you should have spots on the radio.
- We think that seniors listen to the radio a lot, especially in the morning. They listen to the news. (all)
- Radio would be better than TV.
- I like the radio better for news than the TV.

- News on the TV is very distressing. I don't like to watch it. It bothers me and I can't sleep with all that worry on my mind.

SUMMARY -- GROUP ONE

This group of people were elderly, 70-85. They were bright and informed and seemed to understand the potential dangers to pedestrians. Because this is an affluent town, it is able to provide them with safety measures not enjoyed by many communities. Most of the major intersections have police officers directing traffic and the participants were enthusiastic about this kind of protection.

This group had strong negative feelings about drivers. They termed them careless, in too much of a hurry, and drive dangerously by going through yellow and red lights at intersections. However, they were very positive about the help they get from the town. Most of the major intersections are policed and particularly where the center is located, the police are very kind and helpful to the elderly citizens.

They expressed problems at intersections with traffic lights. They complained they don't stay green long enough for them to walk across the road at their own pace. They expect that when they have a green walk light that the crosswalk should be clear of traffic. They blame any accidents that happen in areas that are not policed, on lack of traffic law enforcement. They disputed the idea that pedestrians might lack visibility. They felt that this could only be true during the night hours.

They feel that the best way to prevent accidents is to have the police on duty. They view with alarm recent moves to have lights installed to take the place of the officers. They feel the lights should only be installed for use when the police are not routinely on duty, as is the case on Sundays. They thought that white stripes on pedestrian crossings might help and believe that this method has been successful in other places.

The group liked the messages presented to them and felt that they could be useful. They considered them appropriate, clear and logical.

With regard to driveways and parking lots, they seemed aware of the possible dangers associated with driveways and parking lots. Again, they felt that in parking lots drivers did not take proper care. They were knowledgeable about warning signs of cars backing up. They thought that wearing bright colors could help their visibility in parking lots, especially in bad weather. They said that a parking lot is a jungle and you have to be very careful.

The potential messages for this accident type were also well received. They suggested that another good message might be "If the drivers aren't going to look out for you, then you have to look out for yourself."

In the discussion of how best to convey pedestrian messages to senior citizens, they were all in favor of the radio as the best medium. It is their opinion that the radio is listened to frequently by the elderly, especially for the news broadcasts. They also would welcome a speaker to the center and think that an event such as this would be well attended. They also considered that an article in the center paper might be useful and that AARP might want to include safety messages in its publication.

In summary, the group was articulate, informed, and interested in the pedestrian safety problem. They feel fairly secure in their immediate area but have concerns about intersections and roads that are not patrolled by the police. They feel that a pedestrian safety program directed to the elderly would provide a useful and necessary service.

DETAILED RESULTS

DISCUSSION GROUP TWO

Participant Characteristics

Seven females, 2 males, ages ranging from 65 to 86. Six people walk at least half mile a day, 3 walk somewhat less. Three also drive.

Location Characteristics

The group met at a senior center which has a large membership. The center is located in a low socio-economic area of a large city.

Introduction

The participants were told that they would be discussing various aspects pedestrian safety. They were told that the purpose is to gain an understanding of how they feel about crossing streets and walking in parking lots, etc., and hear their views on what might be done to make it safer for them.

Awareness (Crossing Streets)

- People should be aware of the pedestrian accident problem but some are absent minded.
- I never used to be nervous but I have become so during the past 2 or 3 years. I think that is because we have had so many problems.
- We all feel nervous.
- A lady was killed here (outside the senior center). It took half an hour for the ambulance to get here.
- The trouble is the drivers, this is the worst city in the whole United States. They go 60-70 miles an hour right outside here. The speed limit is supposed to be 25 mph. You never see a cop. They go right through the red lights. The worst drivers are the young girls. In one hand they have a cigarette and the other hand is on the wheel. They seem to be saying, "I'm coming, look out."
- They speed to get through the lights outside here. It's terrible.
- If we have to cross outside here we cross at the crosswalk. There isn't a light there but they have lines painted on the road. The lines have faded, though, and they have repainted them. As there are no signs, the driver can't even see the crosswalk.
- My sister was badly injured recently two blocks from this building. There is a traffic light but no walk light, just a painted crosswalk. The lines were so faded they

couldn't be seen. They repainted them the day after the accident. The driver of the car was drunk, however.

- Two other women were killed 2 years ago a couple of blocks from here as well as the one killed last summer. Her sister was the fourth one to be hit in this area.

- Three of the accidents took place at the traffic light, but the one outside the building was just at a crosswalk.

- None of our traffic lights have walk lights. I don't think we have any walk lights in the city.

- I don't think a crosswalk is that safe but if it is well painted there might be a chance the driver might stop.

- I don't trust drivers. Sometimes they are mad at things or have had a fight at home. Then they get behind the wheel and open up.

- We teach children only to cross at the light yet we are all guilty of crossing in the middle of the block.

Countermeasures

- Drivers are bad but old people have to be careful too.

- Speeds should be cut down, especially here.

- We need some signs. They have them outside schools and churches but we have none outside the center. It wouldn't cost the city that much money to put up signs. Lights cost a lot of money. I don't think we have any walk lights in this city.

- We should have lights outside the center that tell people to slow down when they are flashing. Like they have outside schools.

- It you are crossing at a traffic light it is no longer sufficient that the light is red. You still have to look because it seems as drivers going through a red light is more and more common. You can't depend on the light.

- We need walk lights.

- They should not give drivers who are drinkers licenses. The driver who killed my sister has had his license suspended previously but they keep giving it back to him. He did not even make payments on his insurance. A policy is good for a year so as long as you make the first payment you are OK.

- When people get a driver's license they should be told to be aware of children and elderly people. Children dash across the street and people who are elderly walk slowly. The drivers see them but just don't care.

- If at all possible you should cross at the street light. At least you have that going for you.

- Oh yes, it is safer to cross at the light (most).

- We would like to have "walk" lights.

- Or, at least, it's safer to cross at a crosswalk.

- We need signs out here which say "slow down," or "slow when you see a pedestrian".

- I cross at the crosswalk but I wait until the cars are far down the block before starting as I walk very slowly.

- I think that if the city doesn't paint the crosswalk and doesn't put up signs, we should have the right to sue the city if there is an accident.

- We need safe walkways. They should be well marked and signs should be posted. They should install flashing lights at the crosswalk.

- I think that at intersections the traffic should be stopped in all directions so that people can cross.

- In California, if a pedestrian puts one foot in the street all traffic stops.

- The speed limits should be enforced.

- They tell us that they don't have enough police officers on the force.

- We think that people would be accepting of the message to wear bright colors.

- You can't expect people to go out and buy new wardrobes but a bright scarf might be a good idea.

- We feel that we are expected to stay home--that we are in the way.

- I don't take full responsibility for myself either. I know better than to dash across the street in the middle of the block but I do it and then think that if I had been hit it would have been my own fault. I cross midblock sometimes when there is a traffic light just a little down the block. Are we really taking responsibility for ourselves? If I am thinking about other things I can do something dangerous.

Messages

- The message about a walk signal does not always mean it is safe to walk is a good one.
- I think a green walk light means it is OK to walk. Cars should stop and wait for people to walk.
- Another message might be that you shouldn't be preoccupied when crossing the street. Say, "pay attention to the traffic."
- All the other messages are good.

Awareness (Driveways and Parking Lots)

- Some driveways are hard to pass by.
- I don't think that many people think about the dangers of cars coming out of driveways.
- I always do. However, most of the driveways I encounter have a clear view.
- I pass two gas stations and I have to be very careful there.
- The grocery store entrance is very dangerous.
- We all know of the dangers of a parking lot.
- The pedestrian has the right of way in the parking lot by law.
- There are no pedestrian walks in our parking lots.
- The problem is that when people are backing out they move their heads quickly from side to side and are not really looking.
- The drivers are always in a hurry.

Countermeasures

- The driveway I use is blind and when I am driving I have to proceed very slowly and blow my horn.
- You have to watch to see what's coming behind you.
- You have to watch those trucks that make a sound when they back up. Someone got killed because he didn't hear it.

- I watch for cars backing out.
- I can't hear so I look to see if there is a driver in the seat.
- You look for brake lights because the driver always puts his foot on the brake before backing out.
- You have to watch for back up lights.
- I wait to see if a car is starting to back up.
- When I see a car backing up I look at the driver to see if he's looking at me. If he is I will motion him to go on, I won't cross behind him.
- I wait for cars to move. I wait. They are bigger than I am.
- I think there should be signs in the parking lots. Signs would help those who don't want to obey the law.

Messages

- All the messages about driveways and parking lots are good ones.
- TV spots would be good. Just before the news starts--not at the end because people turn it off and you have to fool people.
- The best way to reach our members is to have someone come and speak to them.
- Newspaper ads would be good.
- Sheets made up and distributed to senior centers would be good.
- Churches might become involved.
- We don't get the AARP newspaper (7 out of 9).
- We like the radio. We listen to the news every morning.

SUMMARY -- GROUP TWO

This group of people who were quite elderly, mostly over 70. They seemed to be quite aware of pedestrian hazards and were in agreement on most of the issues that were discussed. Their center is located in a dangerous area with little traffic control and apparently very little traffic law enforcement. The fact that in the very recent past they have had three deaths and one serious injury in the immediate area contributes to their awareness of the problem.

They expressed a lot of hostility towards drivers who they characterize as uncaring of the elderly and whose only interest is to get where they are going as fast as they can. They also feel that they do not have any support from the city in terms of police enforcement of even in maintaining the crosswalks by keeping the lines painted.

They feel that the accident countermeasures that could be implemented would include traffic lights with walk signals, flashing lights to slow traffic outside the center, signs at the crosswalks, and efforts to stop cars from speeding and going through red lights. However, they feel that city budget problems preclude any hope of assistance and seem to have accepted the fact that they have to rely on themselves to get across roads the best way they can.

They thought the idea of making themselves more visible by wearing bright colors to be a good one. They thought that wearing a bright scarf would be an inexpensive way of accomplishing this.

They liked the messages that we presented for their consideration. They had no problems with their accuracy or clarity. In addition they thought that it could be suggested that people pay attention to traffic and not allow themselves to be preoccupied when crossing the street.

The group was similarly aware of the dangers encountered in walking past driveways. They said that they do take care in passing areas where cars might be entering and exiting gas stations or grocery stores. With regard to parking lots, the group seemed aware of the need to be cautious and quite informed of safe behaviors. They talked about the need to watch for the signs that a car was backing out of a parking space-- i.e, look for a driver in the car, watch for backing lights or exhaust fumes.

The suggested messages were well received. They thought they would be useful and could help people be more aware of potential problems in parking lots. They had several suggestions with regard to conveying these messages. Most thought that radio would be a good media as a lot of elderly people listen to the news and radio spots just prior to the news would have a large listening audience. They also suggested TV spots and magazine articles. They responded negatively to the suggestion that information be contained in the AARP publication. Only 2 out of the 9 participants were aware of such a magazine. They liked the idea of flyers being placed in churches and senior centers and also having people come to talk to them about pedestrian safety.

In summary, this group seemed well informed regarding the need for pedestrian safety, mostly because of the accidents that have taken place in the area over recent years. They seemed resigned to the fact that they can expect little help from the police or town and have recognized that they have to take care of themselves the best way they can.

DETAILED RESULTS

DISCUSSION GROUP THREE

Participant Characteristics:

Five females, 4 males, ages ranging from 60 - 86. All but two walk a half a mile or more on most days. One walks in excess of 2 miles per day. All do their walking on sidewalks and all also drive.

Location Characteristics:

The group met at a senior center which has a large membership. The center is located in a low socio-economic area of a fairly large city.

Introduction

The participants were told that they would be discussing various aspects of pedestrian safety. They were told that the purpose is to gain an understanding of how they feel about crossing streets and walking in parking lots, etc., and to hear their views on what might be done to make it safer for them.

Awareness (Crossing Streets)

- They used to have crosswalks painted on the street but now the paint has faded, people jay walk. They cross where ever they are.
- The city says that it does not have to money to keep the crosswalks painted.
- Stop signs don't mean anything to some drivers.
- Drivers around here don't even take notice of school guards half the time.
- In some cities when you step out onto a crosswalk, cars are supposed to stop. They don't have that here in the East. In other places, once you get 2 feet into the street, the cars stop.
- The type of people driving now. They don't believe in stop signs or stopping before a right turn. That's why some people get hurt.
- Cars don't even stop at stop signs.
- They catch you in the middle of the street. They don't stop for you. If you are not fast on your feet you are going to stumble or fall.
- If I had to cross outside this building I would walk down to the light.

- I always go to the corner.
- The people who cross here to go the Shriners don't go to the light. They cross outside this building.
- I take the chance of crossing here. It's too far to go down to the light.
- Many times I take a chance when I am walking with the dog and cross in the middle of the block.
- I take the chance of crossing here because its a long way to the corner and its all up hill.
- It's not hard to cross the road here if you watch.
- You have to be careful, though, because they come up fast over the hill and you can't see them until they are close. They come very fast.
- The speed limit is 25 but they do at least 50.
- Especially the young ones after midnight. They go like mad. I see them when I walk the dog.
- The young girls are the worst. If you don't move out of their way they make rude gestures. They have coffee in one hand and they are sometimes combing their hair as they drive along.
- There are people who drive through red lights.
- There's a class of people in this area where signs don't mean anything.
- When they get arrested they don't understand why.
- Some of them can't read. I don't know how they get a license to drive.
- Did you see the large percentage of uninsured motorists in the newspaper? I don't believe this. How do these people get away with it?
- They pay the first 3 months premium to get their registration and license and then don't pay any more. They can drive up to 2 years without a problem.
- Its the young people--they think of all of that.
- Those kind of people don't care if they get in an accident.
- A lot of these senior citizens don't look when they cross. It's their own fault. They expect drivers to stop.

- Years ago drivers would stop for you but no more.
- Drivers today don't see pedestrians because they are going too fast.
- I don't have trouble crossing the road if I go to the corner. Crossing midblock I have trouble.
- People don't look when they cross.
- None of our traffic lights have "walk" lights.
- There are some lights that have "walk" lights but they are down town.
- When the walk light comes on it means you can cross but you still have to be careful.

Countermeasures

- We need cops at the intersections to help us cross.
- There are not enough police around.
- Walk lights with buttons would help a lot.
- They don't have the money to install lights like that.

Messages

- A good message would be "don't walk in between cars when crossing midblock."
- "Don't jay walk".
- We might respond to a message to wear something bright at nighttime.
- Visibility isn't a problem during the day.
- All the messages we discussed are good.
- The messages are clear and straight forward.

Awareness (Driveways and Parking Lots)

- If you are stupid enough to walk in front of a driveway you are stupid enough to get hit.
- We don't feel comfortable walking in a parking lot.
- Cars almost kill you.

- Drivers don't care.
- All they want is a parking space
- Teenagers with wagons are bad.
- We saw a woman hit by a guy backing out.
- No one pays attention to people walking.
- People in parking lots come right out. They don't look.
- They turn corners so fast looking for parking spots and you can be right there in their path.
- You want to go there when they have sales--its terrible.
- Pedestrians don't look.
- Everyone is careless in a parking lot. Drivers and pedestrians.
- They don't pay attention.
- Pedestrians don't assume they have the right of way. They don't care.
- A lot of people do stop and look.

Countermeasures

- Just tell them to watch out for cars when they go shopping.
- You can say that but they are not going to do it.
- The only way to be safe is to stay home.
- In a parking lot I'm looking for cars.
- I look to see if the tail of the car is moving out.
- Parking lots should have loading areas so that you don't have to walk the carts through the lot.
- I don't like that. You have to wait and I can't afford to tip them.
- I don't like that.
- You could have beepers fitted on cars that sound when the cars back up--like trucks.

- Pedestrians have to watch out for the cars.
- People should have right of way in parking lots

Messages

- The messages you read are good but no messages will work. You are going to tell me or her what to do--no--they are not going to listen to you.
- All you can say is be careful.
- I like the idea of TV spots on the news. We all watch the news on TV
- The radio is best--we all listen to the radio.
- I don't read magazines
- We get the AARP publication (3 out of 9).
- A program at the center would be OK if they did it just before lunch.
- If you want people to listen to you give them free food.
- They would listen if the speaker hollered.
- Don't come when people are eating.
- You could put an article in our senior newspaper. People read that.
- Posters would be good. They could be distributed at senior centers.
- People do read our newspaper.
- When we leave here we are not going to think of any of this at all. I'm serious.
- People don't pay attention to advice.

SUMMARY -- GROUP THREE

This group of people had ages ranging between 60 and 86. They were, in general, accepting of the dangers they encounter as pedestrians, and pessimistic about the possibility that accident countermeasure efforts might succeed.

They were very hostile towards drivers. They perceive young drivers in particular, but all drivers in general, as uncaring. They mentioned that cars travel at high rates of speed outside the center and ignore traffic lights and stop signs. Although they said that more police officers were needed, they did not ascribe blame to law enforcement, but merely accepted that this is the way of life.

They noted that the crosswalks in their area are badly in need of maintenance but appeared to be accepting of budget constraints which prevent not only maintenance but installation of needed traffic lights with "walk signals". They felt that at least they should have some warning signs for the crosswalks.

Most said they took chances in crossing midblock, but found that preferable to walking the distance to the nearest intersection crossing. They had a sense that if they watched out for themselves they would be safe.

The fact that a lot of drivers in their area are uninsured makes them angry. They also feel a lack on the part of the motor vehicle department for allowing people they see as unfit, being issued driving licenses.

The group felt that the messages presented to them were clear and straight forward, but were not optimistic that they would be useful.

With regard to driveways and parking lots. Again, they saw the dangers but felt that there was little that could be done to make them safer. The same thoughts as expressed earlier with regard to crossing highways were repeated--that drivers are careless and don't pay attention to pedestrians. Telling pedestrians to look out for themselves was felt to be the best message.

They were not enthusiastic about the messages. Again they felt that people would not pay attention. If messages were to be developed and distributed, they liked the idea of radio spots, more so than TV spots. They thought people might listen to a speaker at the center, but only under certain conditions. They also suggested a good vehicle would be the newspaper that is distributed to all senior centers in the city.

This group had negative feelings in all areas discussed--the drivers on the roadway; the pedestrians who failed to take care; the likelihood that anything could be changed by a pedestrian safety program. They felt that people do not heed advice and that any messages presented would not stay long in people's minds.

TOPIC OUTLINE (GROUPS FOUR - FIVE)

OLDER ADULT PEDESTRIAN DISCUSSION GROUPS

INTRODUCTION:

We are visiting you today to talk about pedestrian safety. We want to hear you describe where you walk, how you walk and what you wear when you walk. We want to hear your views on why pedestrian accidents happen.
First, we would like to know a little bit about you.

- Would you describe to me your most frequent or "typical trip?"
- What does the environment look like?
- How difficult do you find it make that trip?
- What kind of problems do you have?
- Have you or your friends ever had a near miss? If so, tell us about it.

CONSPICUITY

Awareness

- When you are out walking in the winter, can you describe to us a typical outfit you would wear? What color(s) is it?
- What is the color of your favorite winter coat?
- What is the color of other coats you might wear?
- Do you wear a hat? What color is it?
- Do you wear a scarf? If so, what colors do you wear?
- It appears that elderly pedestrians have accidents because they are not very conspicuous when they are walking. How do you feel about that?

Countermeasures

- Can you think of ways of making people more visible to drivers when they are at intersections?
- Do you think that it would help for people to wear something bright? Would you?

- How can we persuade people to wear something brightly colored or something that stands out from the environment when walking?

Messages

- As days grow shorter, shadows become longer. This makes intersections a much more dangerous place

- In the winter, you wear more clothes and these tend to be darker. As a result, your search may be restricted and drivers certainly have a more difficult time seeing you. Therefore, increase your search activity in the darker months.

- Since you are less visible to drivers in the darker months, always dress conspicuously.

INTERSECTIONS

Awareness

- If need to cross a street, where do you cross?

- Why do you cross at that particular place?

- Do you find crossing the street at an intersection difficult?

- If difficult why?

- What do you do at an intersection?

- Are there any dangers in crossing at an intersection?

- What are "walk" lights intended for?

Countermeasures

- Many people are injured at intersections that have traffic and walk lights because cars are making left and right turns. Therefore, even if a pedestrian is crossing on a walk light, a car could still be turning into his path. If we assume that we cannot change the way that the driver operates a vehicle, what can we tell the pedestrian to do that would make him or her safer?

- Left turning vehicles are the most dangerous vehicles at an intersection. How can we warn people about that?

- How would you accept the idea of requesting the town or the police to make sure that all traffic stops at busy intersections to allow people time to cross?

- Do you think people would do that if they knew how to do it?

Messages

- Left turning vehicles are much more dangerous to you. Before crossing at an intersection: 1) determine all places that left turning vehicles might come from; 2) check the entire intersection for threats, then; 3) check the left turn locations again before leaving the curb.

- Green lights, walk signals and crosswalks do not necessarily mean that it is safe to start crossing. Rather, they tell you to stop at the curb and look to be sure that it is safe. Always stop at the curb and look left-right-left before entering the roadway even when the light is green or the signal says WALK.

- Watch for turning vehicles even when you are crossing an intersection on a green light.

- Watch for drivers turning right on red. Look at the driver to see if he/she has seen you.

- Recognize that your capabilities to search and move are diminished. Therefore, exaggerate your head turns when searching and allow sufficient time to complete a crossing safely.

- Lobby communities for engineering changes (i.e., longer green walk lights; exclusive pedestrian phases, elimination of Right turn on red at specific intersections.

- Green does not mean right of way. Green means look and, if safe, then go.

- WALK signal does not mean it is safe to start crossing. Rather, it tells you to stop at the curb and look to be sure that it is safe.

- Always stop and the curb and look left-right-left before entering the roadway even when the light is green or the signal says WALK.

- When crossing at an intersection, wait for a fresh green light (gives you the most time), look for cars that might be coming (don't assume they will stop).

- If the DON'T WALK signal comes on when you are in the middle of crossing, continue to walk at your maximum comfortable pace (running is not necessary) until you reach the other side.

PARKING LOTS/DRIVEWAYS

Awareness

- Do you feel comfortable walking in a parking lot?

- What do you watch out for?
- Does it feel dangerous to you?
- What do you think the dangers might be when walking through a lot?
- Who has right of way in a parking lot?
- If you see a car starting to back, what do you do?
- Do driveways present any problem to you?
- When you are walking along a sidewalk and come to a driveway, what do you do?

Countermeasures

- A lot of people are injured by cars backing out of parking spaces in parking lots. Assuming that we can't change what the driver does, what could we do to prevent pedestrians from being hurt?
- What do we have to tell people to warn them of the dangers?
- What else could be done to help make parking lots safer?
- Some people are injured by cars backing from driveways. How can we help this problem.

Messages

- LISTEN for engine noise
- LOOK for backup lights
- LOOK for drivers in the vehicle
- REMEMBER that parking lots are just like roadways--watch for moving cars
- DO not ASSUME that you have right of way in a parking lot
- KEEP to pedestrian walks when possible.
- SLOW DOWN at driveways that intersect with sidewalks
- LISTEN and LOOK for moving vehicles, particularly ones which are backing

- TREAT a driveway like an intersection--be aware that a vehicle could be entering or exiting

PROMPTS FOR ALL MESSAGES

- What does this message mean to you?
- Is the message clear?
- Is it accurate?
- Is it appropriate?
- Does it have any negative connotations?

etc ????

SENDING THE MESSAGE

- If we develop messages to help people be safer in crossing the street or walking in parking lots, how can we get the message to you, for example?
- If pamphlets were distributed, would you read them?
- If centers like this were to have someone talk about pedestrian safety, would you go?
- What about TV commercials, would you watch a message about pedestrian safety?
- What about magazine articles?
- Do you ever get any safety messages now?
- Where do you hear them or read them?

pamphlets
articles
video
posters
speakers
tv
radio

DETAILED RESULTS

DISCUSSION GROUP FOUR

Participant Characteristics:

Two males, six females, ages 70 - 86. All walk daily except on very hot days. They walk to the local stores and in the area surrounding the facility. One male and three females still drive occasionally.

Location Characteristics:

All the participants live in a privately operated retirement facility located in a large Florida city. Residents live in private apartments with community dining, social and medical facilities. As the facility receives some federal subsidy, a number of apartments are set aside for residents with limited incomes.

Introduction:

The participants were told that the purpose of the meeting was to discuss pedestrian safety. They were told that they would be asked to describe where they walked, how they walked and how they were dressed when they walk. They were also told that we wanted to hear their views on why pedestrian accidents happen.

- We all walk around the perimeter of this facility which has sidewalks.
- When we walk to the store we walk on the side of the street which has a sidewalk which is along side a parking lot.
- We have to walk across the street to the shopping center. We cross the street at an intersection which has a traffic light.
- It took us a year for us to get the town to put the light out there. We finally had to go to the Commissioner to get it.
- It is very hard to cross the road because the walk light does not stay green long enough. The cars begin to cross our path when we are half way across the road. We have to dodge cars to complete the crossing.
- Sometimes we cross the street a little further down because at that intersection there is an island half way across. When the cars start to move we stand on the island and wait for the lights to change again to complete the crossing.
- Many people limit their shopping to a small place a little nearer because they don't dare cross the road.
- Many would prefer to shop at Publix but they don't dare walk there.

- I drive my car over there as it is too dangerous to walk.
- Most of the time drivers stop their cars on the pedestrian crossings and you have to walk around them.
- Just outside the facility there is a curve in the road and the cars come around it very fast.
- We lack sidewalks for some of our trips.
- A lot of people ride their bicycle on the sidewalk and they give us a lot of problems when we are walking.
- I don't know of any accidents around here.
- I did hear of someone being killed at the intersection.
- We walk more in the winter. In the summer it is too hot.
- We never walk at night.

Conspicuity:

- It gets cold here and in the winter I wear a tan coat.
- I wear a dark blue coat.
- We tend to wear darker colors in the winter. My coat is brown.
- I always wear light colors, winter and summer.
- My hat matches my coat (dark blue).
- I sometimes wear a scarf but it is not brightly colored.
- We have never thought about the idea that drivers might not see us.
- I never think about color when I am going out.

Countermeasures:

- We think it is reasonable that choice of clothing might be a factor in accidents.
- We suppose we might be more careful about what we wore if we were sure that wearing something bright might help avoid an accident.
- I can see where the need to wear brighter colors might be true at night.

- When I was driving one night we almost hit a pedestrian and they only thing that made us see her was that she was wearing white stockings.
- I suppose tying something like that retroreflective colored tape to our purse might work--maybe we could do something like that.
- I suppose we could wear something like the workmen or police wear--orange colored vests--it would make us more visible but we wouldn't wear such a thing.
- A white scarf would help and I find that a little more acceptable than that orange color.
- All, a white scarf might do it.
- Crossing guards use an orange vest but I agree that a white scarf would be more acceptable.
- I don't like the idea of an arm band.
- That fluorescent strip on bicycle wheels helps you see them.
- A bright scarf might be the answer.

Messages:

- All the messages are OK.
- The first one--as days grow shorter, shadows become longer..etc. It is complicated.
- We really don't know what that one means.
- The second--In the winter, you wear more clothes..your search may be restricted... It is not clear. The word search is not clear. We don't know what you mean by that.
- Searching activity means look right and left.
- I think that is a bad phrase.
- "Always be conspicuous" is a simpler message.
- Yes, it is harder to turn your head to look when you are wearing a heavy coat.
- Yes, we think you could persuade people to wear brighter colors if you could convince them that visibility is a problem.

Intersections:

- Several of us cross down the block some way as it is easier. We wait for the light to change at the intersection down the block and then cross as it gives you more time to get across.

- I cross midblock because there is less traffic and there is not enough time to cross at the lights. There are no lights where we cross but we are safer.

- To cross midblock you have to walk through the parking lot and that isn't safe either.

- The lights are intended to make you safe but they don't.

- I have a bad hip and can't move fast. I can't get across in the time they give me.

- The lights are not timed correctly. They are not long enough for us to get across. Some years ago we asked the town the make the walk light longer. We went out with stop watches to time the lights. The length of the light was half of what the town said it was. They wouldn't change it, however.

Countermeasures:

- I think intersections should be engineered better.

- In California, pedestrians have right of way. They are stricter with drivers out there.

- Pedestrian walks should be painted a brighter color.

- In Las Cruces they have a law that makes drivers stop for you every time.

- You just have to tell people to be careful.

- You have to tell people to watch out.

- All turning vehicles are dangerous so you have to tell them watch out.

- It would be nice if all the traffic stopped to let you cross. There are some crossings like that but not many.

Messages:

- c hDEhage (Many people are injured at intersections....) is too complicated. You say "threats" and that it not clear.

- I would prefer the word "danger" to "threat."

- The messages are OK.
- I don't like the word "search."
- It's no use lobbying the town for changes--they won't do it.

Parking Lots:

- They are dangerous.
- Cars back out without looking.
- Cars go down the lanes the wrong way.
- Pedestrians always have right of way in parking lots.
- Cars never stop for pedestrians.

Countermeasures:

- I always wait for the car to move.
- I don't know what you can tell people except "look out".
- You have to tell people to pay attention at all times.
- Parking lots need guards to make sure that the traffic travels in the proper lanes.
- Stores should have signs which tell cars to watch for pedestrians.
- They need signs which say "yield to pedestrians."

Messages:

- Watch for backing lights is OK
- Look for a driver in the car is a good idea.
- All the messages are OK

Sending the Message:

- We all read the AARP publications.
- You could put a safety pamphlet in our elevator.
- We don't listen to the radio very much.

- We watch TV
- All I know about safety is the AARP defensive driving course.
- They would put an article in our community magazine.
- People would read it.

SUMMARY -- GROUP FOUR

Discussions with this group began with descriptions of their most frequent and typical walk and problems they might encounter. This was followed by efforts to determine their awareness of a possible pedestrian conspicuity problem. Difficulties encountered at intersections and parking lots were discussed and for each of these issues, potential countermeasures and safety messages were topics for discussion. Finally, suggestions for dissemination of safety information were obtained.

This was very little disagreement among this group with regard to the problems they encounter when walking. As they all reside in the same facility, they all have occasion to walk the same routes to the local stores and they all have difficulty in crossing the major road necessary to reach the shopping area. There appears to be three alternative routes to the stores: the nearest and most convenient route involves crossing at an intersection at a walk light; the second route which takes a little longer involves crossing at an intersection which has a walk light but also has an island half way across the road. The third option is to walk through a parking lot and cross midblock. All members of the group agreed that the last two options although not safe, are the least dangerous.

The problem appears to be that the walk light does not allow sufficient time for these elderly pedestrians (ages 70-86) to cross safely. It was necessary to lobby the city for a year to get the traffic light installed at the intersection and further efforts to get the timing changed have not been successful. The group members said that they are only able to get half way across the road before traffic begins turning into their paths. Therefore, the intersection where there is an island is preferable because it provides a place where they can wait for the traffic light to recycle before completing the crossing. Several members of the group preferred to take their chances with a midblock crossing several hundred yards from the intersection. They cross immediately they see the traffic stop at the intersection and this gives them the time they need to cross.

With regard to the conspicuity problem none of the participants had considered that drivers might have difficulty in seeing them. They agreed that at night conspicuity might be a problem but not during the day. The majority of the group admitted to wearing darker clothing in the winter and conceded that there could be some credibility to the idea that this darker clothing might make them less visible to drivers. They all became receptive to the idea that improving conspicuity might help reduce accidents. Although they recognized the worth of fluorescent material, they did not accept it to the extent of expressing a willingness to wear something like a fluorescent vest or an arm band. They said they might consider tying fluorescent tape to a purse but appeared more interested in the possibility of wearing something bright or white like a scarf. They said they would in future pay more attention to their dress in terms of contrast or brightness.

As noted above, intersection crossings are major problem for this group and a lot of time was spent discussing possible countermeasures. In addition to changing the timing of the traffic light devices, they would like stronger enforcement of pedestrian right-of-way laws. They would also like crosswalks painted in brighter colors to make them more visible to drivers. They felt that intersections could be engineered better and that four-way stopping of traffic would be very nice.

Several potential messages were presented to them and although they felt them to be appropriate, they found them to be rather complicated and use unfamiliar terms like "threat" instead of "danger" and "search" instead of "look."

Walking in parking lots was the next topic discussed. All participants agreed that walking in these locations is dangerous. They said that cars travel in the wrong directions, drivers back out without looking and cars never stop for pedestrians. They would like to having guards controlling traffic patterns and signs which tell drivers to yield to pedestrians. They found all of the potential messages to be good and they liked their conciseness..

The final topic area was message distribution. They suggested that safety pamphlets posted in the elevators and articles in their community newsletter would be useful. They all read AARP publications and think that AARP would publish safety articles. They also think that TV spots would find a large audience among the elderly.

In conclusion, this group were very concerned about pedestrian safety and would welcome help particularly at intersection crossings. They were interested in the discussion of pedestrian conspicuity and were accepting of the possibility that by making minor changes in their dress habits, accidents might be prevented. They like brief, simple messages and suggested a number of locations where they might be used effectively.

DETAILED RESULTS

DISCUSSION GROUP FIVE

Participant Characteristics:

Three males, nine females, ages 65-85. All walk daily. They walk to the local stores and in the area surrounding the facility. None drive cars.

Location Characteristics:

All of the participants live in congregate housing facilities in Connecticut. The facilities are operated with federal and local funds and provide housing for low to moderate income, elderly people. The residents live in private apartments with community dining and social amenities.

Introduction:

The participants were told that the purpose of the meeting was to discuss pedestrian safety. They were told that they would be asked to describe where they walk, how they walk and how they dress when they walk. They were also told that we wanted to hear their views on why pedestrian accidents happen.

Awareness:

- I walk about 1-1½ hours per day here in the neighborhood and to the stores. You have to be alert all the time--there is a lot of traffic.
- We walk almost every day--to the stores sometimes.
- We also have a van which takes us to the stores but we walk around when we get to the shopping area.
- We walk on mostly residential streets and shopping areas.
- We don't have any problems.
- The local newspapers say that it is very dangerous downtown for pedestrians.
- It is. (All)
- Drivers consider us a nuisance.
- Drivers just don't anticipate seeing pedestrians.

- I had an accident. I was walking along a sidewalk crossing an exit to a parking lot. This car was half way out onto the street, blocking the sidewalk, stopped, waiting for the traffic to clear. I was carrying a broom I had just bought and waved it at the driver and kept waving it as I stepped into the road and crossed in front of the car. She started the car moving and knocked me down. She said she didn't see me. I should have made sure she saw me by catching her eye but I didn't. Drivers have no right to come out and block the sidewalk like that.

- Sometimes on Vine Road, if it is an overcast day and there are a lot trees the drivers can't see you too well, so I go where there is a side street and I cross there because they can see you better. It is important that the cars have a chance to see the pedestrian. They don't expect you in the first place, you are sometimes almost an extinct rare bird, so you have to understand their feelings. They make a race course out of it.

- We don't know of any other near misses or accidents to our friends.

Conspicuity:

- My winter coat is dark purple.

- Our coats are brown. (3)

- Ours are beige (2)

- Mine is black.

- I wear a dark navy blue raincoat. My raincoat is dark red. These are not really good colors, you have to make yourself a little conspicuous.

- Our hats generally match our coats.

- We all agree that we tend to wear clothes of more subdued colors in the winter.

Countermeasures:

- We think that it is reasonable to assume that if people wore brighter clothes in the winter they would be seen better.

- I don't wear a contrasting scarf but I think that we should.

- I think wearing a brightly colored scarf is a good idea.

- I think I would wear a bright orange vest like the road workers wear.

- We would wear a piece of bright tape on our purses when we go out--the fluorescent kind you just showed us.

- We can see that contrasting colors help.
- I don't know whether I would put ribbon on my cane.
- I think that would be a good idea.
- It isn't pleasant to walk with a cane.
- Maybe a brightly colored umbrella would help.

Messages:

- We don't like long complicated messages.
- The messages: "As the days grow shorter...." is too complicated.
- The message that says always dress conspicuously is OK.

Intersections:

- We always cross at the corner. (Most)
- It is safer to cross at the corner. (Most)
- I cross in the middle of the block because I think it is safer. If you stand by the road and wait until the light changes down the block you have more time to cross. At the intersection you have cars coming at you two or three ways.
- It is best to cross in the middle of the block.
- I think it is more dangerous because you have to come out between parked cars.
- I still say your best bet is to cross in the middle of the block and look for the light changing down at the intersection.
- The rest of us cross at the intersection. It is not as dangerous there, you are protected.
- I have trouble crossing the road because I can't walk very fast. The light doesn't last long enough for me to get across.
- You press the button and you get a white hand but the white hand doesn't stay on very long. If you walk fast you get half way across the road and the hands starts flickering. That makes me very nervous--but there is enough time because after I have crossed the road there is still time before the traffic gets the go ahead. But it is very eerie.

- Sometimes you have to wait several minutes after pressing the button before it changes into a lit white hand. Then you cross. I am a fast walker for my age but, even so, when I am half way across it starts flashing. It does give you time to get across, though.
- I know that a flickering hand means the traffic is still stopped.
- But why do they do that? Why don't they let it stay a steady light?
- That flickering light gives you the feeling "hurry up, hurry up." You know that it might change any moment.
- The flickering light tells you to hurry.
- If the hand is flickering when you get to the curb it means "stop."
- There is an area on High Ridge that if you cross it is not clear to the driver which way which way you are going so I stick out my hand.
- The right turners are a problem. They go no matter what. You can be in the middle of the street and they keep going. They don't stop.
- I have a problem with cars turning right turn on red. Even if I have a walk light, cars still can turn in your path.
- We have an intersection where cars stop in all directions while the pedestrian light is on.
- Even at those intersections cars can still turn right on red.
- At an intersection where they only stop cars in one direction, cars can turn into your path even though you have a walk light.
- You can't trust the drivers.
- You never know what they are going to do.

Countermeasures:

- We need a longer light.
- Everything should stop when the walk light is on.
- Cross midblock, that is the safest.
- You have to tell people to watch out for turning cars.
- The police could be ordered to keep a closer watch on what drivers do.

Messages:

- We like messages that are short and simple.
- Watch out for turning cars is the message.
- Don't trust the driver, watch out for yourself is a good message. (All)
- "Trust" is a strong word, don't "count" on the driver is a better word.

Parking Lots:

- It doesn't bother me to walk in a parking lot.
- You just have to be careful.
- Our bus drops us off at the shopping center so we don't have to walk through the parking lot.
- We really don't have problems in parking lots.
- Passing the entrances to parking lots is our problem.
- The drivers always try to beat you to it. The drivers don't generally give way. Some are nice and let you pass but don't count on it.
- We are all aware of the possibilities of cars crossing our path when we are walking on the sidewalk.
- I had my accident at a driveway to a parking lot.

Countermeasures:

- When you go to a certain parking lot you have to pass a gas station and there are lots of cars entering and leaving it. Cars leaving the gas station obstruct the sidewalk that legally belongs to the pedestrian. Now I realize better that we have right of way at all times and if you make them go back they will do it. But you have to make sure with eye contact with the driver that they really understand the message. You have to see them do it (back up) to be sure. I think it is ridiculous that we have to wait three or four minutes while five cars in a row wait for the traffic to open up so they can enter the highway. They should stay within their limits to let pedestrians pass the driveway.
- We never think we have right of way as pedestrians. It is dangerous to think that way.
- We do watch out for ourselves, it is the drivers that don't care.

- In California if you step into the street at all, every car stops. Even where there is not traffic lights, all cars stop. I don't know why that is so in California but that is what should happen here.

Messages:

- The messages are good.

Sending the Message:

- We all listen to the radio
- Most of our friends listen to the radio.
- Commercials on radio would help.
- Most people our age watch TV more than they listen to the radio.
- Messages on TV would be good.
- Only two of us read AARP publications.
- We read the newspapers.
- We have a community newsletter every month and most of us read articles in it.
- We don't have a newsletter at our facility.
- We have speakers sometimes.

SUMMARY -- GROUP FIVE

Discussions with this group began with descriptions of their most frequent and typical walk and problems they might encounter. This was followed by efforts to determine their awareness of the conspicuity problem. Difficulties encountered at intersections and parking lots were discussed and, for each of these issues, potential countermeasures and safety messages were topics for discussion. Finally, suggestions for dissemination of safety information were obtained.

Generally, walking for this group is limited to areas either close to the facility or in shopping areas where they are transported by van. When discussions began most denied that they had problems when walking. As the discussions continued, it became apparent that they do experience some difficulties, especially at intersections and with cars entering and exiting parking areas.

One group member described the problem of conspicuity before the issue had been raised by the moderator. She said that overcast skies and trees can make it difficult for a driver to see a pedestrian and added that pedestrians have to be aware that most drivers do not expect to see them.

When the conspicuity problem was raised by the moderator, all participants admitted that their winter clothes tend to be dark or subdued colors. They were accepting of the idea that wearing something to make them more conspicuous might be a good idea. They said that they would be willing to make an effort to wear a bright or contrasting scarf and even said they would be willing to tie some fluorescent material to their purse or cane.

When asked to comment on the proposed messages which address this issue, they did not like the ones they considered long and complicated. They said they like messages to be simple.

There was a lot of discussion with regard to intersection crossing. Most agreed that the intersection is the safest place to cross. However, one member said that he disagreed. He said that it is his experience that crossing midblock is easier. He said that he waits until the light changes down the block and this not only gives him time to cross, but he does not have to deal with cars turning in his path as cars can only come from the left or right.

All of the participants have problems with the pedestrian walk light. They seemed to be aware that when a steady light changes to a flickering light, there is still some time to complete the crossing. However, they all feel that this flickering light means that they have to hurry and it makes them very nervous. They said that the light is just not long enough and only the fastest walkers can make the crossing comfortably.

They all complained about cars turning right on red. They said that even at intersections where they have a walk light, cars can still turn in their path. They said that you just can't trust drivers as you never know what they are going to do. They would like a law which says that everyone has to stop for the pedestrian walk signal and they would like more police enforcement of pedestrian yield laws.

Again they mentioned that they like messages that are short and simple. They said that a good message would be "Don't count on drivers, watch out for yourself."

The group does not appear to have many problems in parking lots. However, they do have problems with cars entering and exiting from driveways which cross sidewalks. One group member said that she was knocked down by a car which had stopped waiting to enter the traffic on the main highway. She stepped into the road and as she passed in front of the car the car started moving and she was hit. She noted that she was trying to attract the driver's attention with a package she was carrying but she realizes she should have made sure that she made eye contact with the driver.

The group feels that drivers are inconsiderate and that they should give way to pedestrians. They feel it is unreasonable to expect the pedestrian to wait for rows of traffic to exit a lot before they can cross the driveway. They said that they do look out for themselves but the drivers don't care. They agreed that all the messages presented to them were good ones.

With regard to how best to convey messages to the older citizen, they said they all listen to the radio but that commercials on TV would reach more people. Only two of the group read the AARP publications but they all read the newspapers. Both facilities have speakers sometimes but only one facility publishes a monthly newsletter.

In conclusion, this group shared with previous groups the feeling that drivers are inconsiderate and uncaring of pedestrians and that traffic lights don't meet their needs. Some participants demonstrated interesting insights into certain pedestrian problems, especially those relating to conspicuity and midblock crossings.

APPENDIX C

BACKGROUND PAPER: *WALKING THROUGH THE YEARS--*

PEDESTRIAN SAFETY FOR THE OLDER ADULT

WALKING THROUGH THE YEARS...

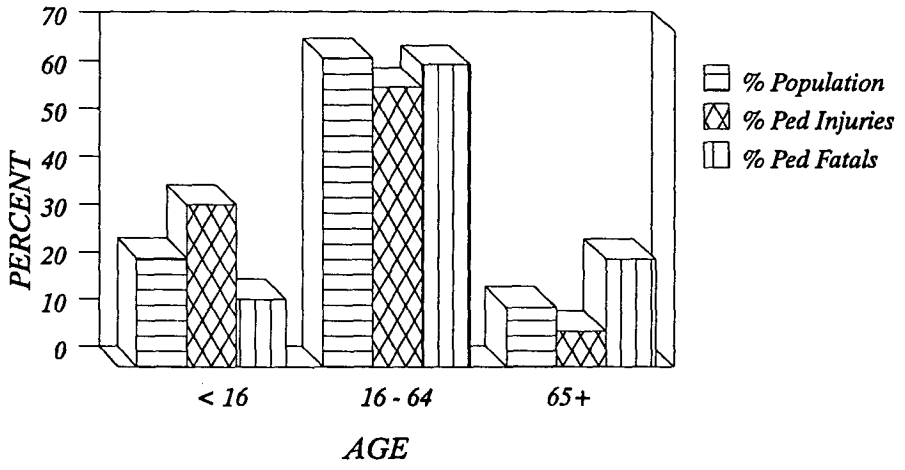
Pedestrian safety for the older (65+) adult

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
FEDERAL HIGHWAY ADMINISTRATION
400 SEVENTH STREET, S.W.
WASHINGTON, D.C. 20590

Introduction

At the National Highway Traffic Safety Administration (NHTSA) and the Federal Highway Administration (FHWA), we monitor pedestrian accidents, injuries and fatalities on a national basis. We also support studies that look at where and under what conditions these accidents occur and to whom. Our objective is to gain an understanding of pedestrian risks and to suggest safe walking practices for pedestrians of all ages so that fewer accidents happen. We are also looking for physical changes that we can make to the highway system to reduce these accidents.

Our records show that over 100,000 pedestrians are injured and over 6,000 are killed each year in the United States. Older adults account for fewer pedestrian accidents (7.7%) than would be expected by their numbers in the population (12.5%). However, they account for almost one-quarter of all pedestrian fatalities (22.7%). Other things being equal, a pedestrian accident is a far more catastrophic event for the older adult than for the young. It is especially important, therefore, that we help this group stay out of pedestrian accidents.



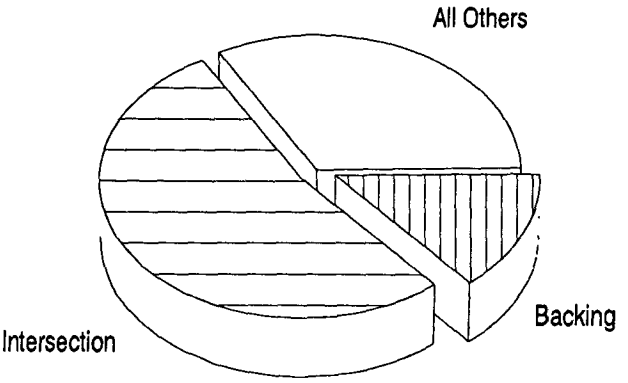
Nearly all of us are pedestrians during some part of our day regardless of age. We walk to school and to work, walk to parked cars, walk to shops and entertainment events, or just plain walk for social and health benefits. We can't always count on drivers to ensure our safety, nor can we always rely on traffic devices or other physical aids (such as pedestrian islands and walkways) to protect us. But we *can* learn to look out for ourselves and to be safe pedestrians as we walk through the years.

In this paper, we describe the major pedestrian risks facing older (65+) adults and suggest actions that they can take to avoid accidents. We include information from a variety of studies done over the years by NHTSA, FHWA, and other highway safety organizations.

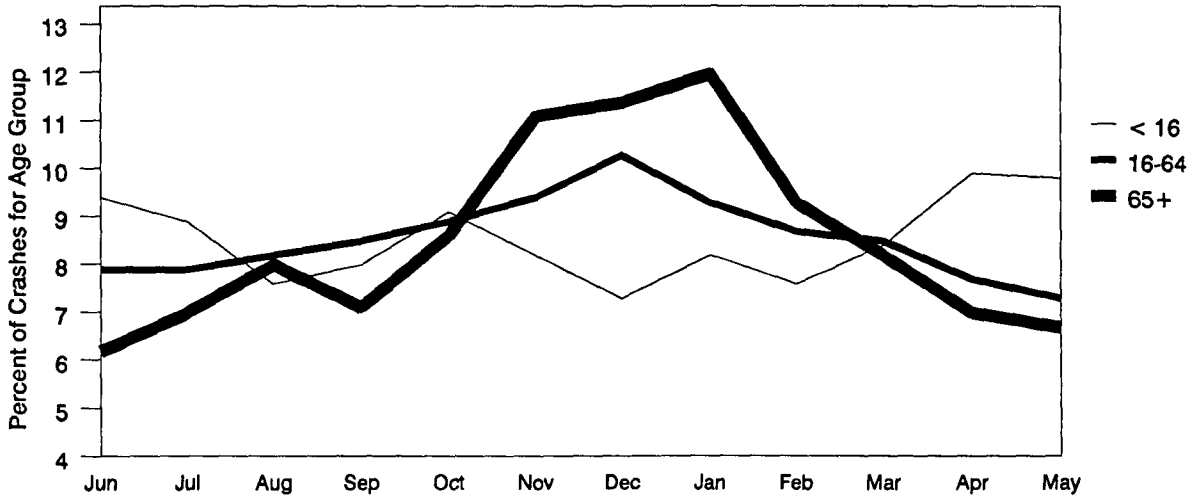
Older Pedestrian Risks

In our research, we have learned that the majority of accidents involving older adults occur at intersections--both with and without crossing aids. We have therefore selected *intersection accidents* as our first major risk area for the older pedestrian.

Older adults also have a high incidence of accidents involving backing vehicles. These accidents occur in streets, in driveways and in parking lots. We have therefore selected *backing accidents* as our second major risk area for the older pedestrian.



Finally, we have found that accidents involving older pedestrians increase markedly in the winter months. Most of this increase occurs during daylight hours. When we shift to warmer winter clothing, we tend to wear dark or neutral colors. With the lower sun angle in winter and the increase in shadows from buildings and trees, we simply become less conspicuous to drivers. In fact, we camouflage ourselves and can become "invisible people." Since pedestrian accidents in winter increase more for older adults than they do for other age groups, we have selected what we call *conspicuity* as our third major risk area. Conspicuity relates to how visible the pedestrian is relative to the environment. If a pedestrian is not conspicuous, the likelihood of an accident increases.



Intersection Risks

Despite the availability of signal lights, walk lights, crosswalks and stop signs, we have found intersections to be particularly difficult for the older pedestrian. Their complexity requires extra effort on the pedestrian's part to ensure that a crossing is made safely.

TURNING VEHICLES at intersections are responsible for a number of pedestrian accidents. When a vehicle is turning, extra diligence is required on the part of both driver and pedestrian. The driver has a particularly difficult task because it is necessary to determine the best time to turn based on the presence of other vehicles and pedestrians in the intersection. In addition, the car's rearview mirror or the A-pillar may block a pedestrian from the driver's view while the car is turning. The pedestrian, in turn, must not only look left and right on the road being crossed but must look both forward and backward for turning vehicles from the intersecting road.

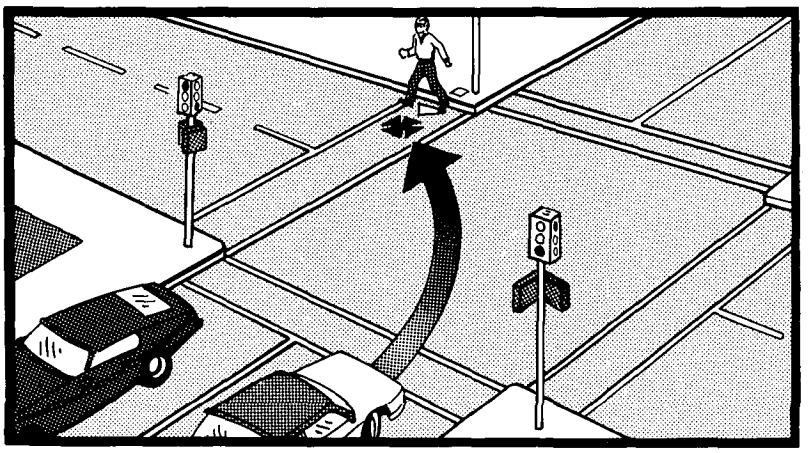
Our research on turning vehicles has revealed three major pedestrian hazards at intersections:

- *LEFT-TURNING VEHICLES*--Left-turning vehicles are more dangerous, that is, they are involved in more accidents with pedestrians, than are right-turning vehicles. The left-turning vehicle typically has to cross at least one lane of oncoming traffic before making the turn. This adds one more task and one more source of distraction for a driver who already has a lot to look out for. The driver may also commit to making a turn before the pedestrian steps off the curb or even before the pedestrian is in view.

- *FIRST STEPPING OFF THE CURB*--The pedestrian is at most risk when first stepping off the curb because the driver may not notice the pedestrian until the pedestrian is actually in the roadway. The first half of the crossing is therefore more dangerous than the second half where the driver has had an opportunity to see the pedestrian in the roadway for some time.

- *CARS EXITING THE INTERSECTION*--Cars leaving the intersection are typically more dangerous than those entering the intersection. Drivers may not see pedestrians in the "far" crosswalk as easily as they do those in the "near" crosswalk. In addition, drivers are typically increasing their speed as they exit the intersection.

The highest risk to a pedestrian occurs when all three of these factors come together. This happens when the center of the intersection is to the pedestrian's left. The pedestrian then encounters left-turning vehicles in the first half of the crossing. In addition, *all* vehicles encountered in the first half of the crossing are exiting the intersection.

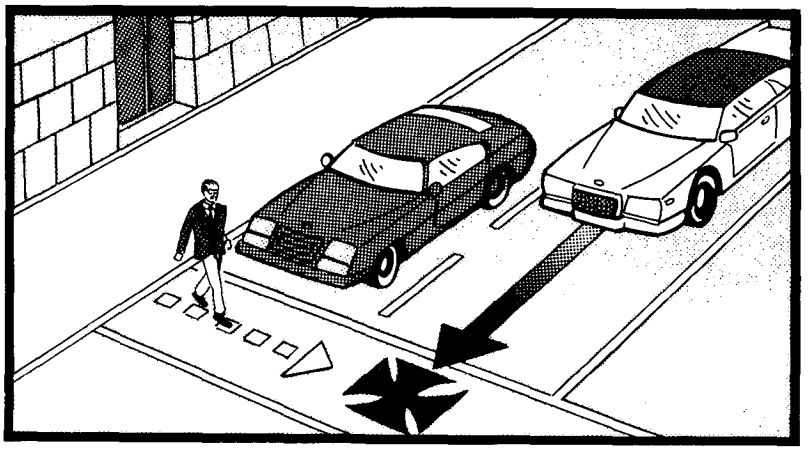


Risks:

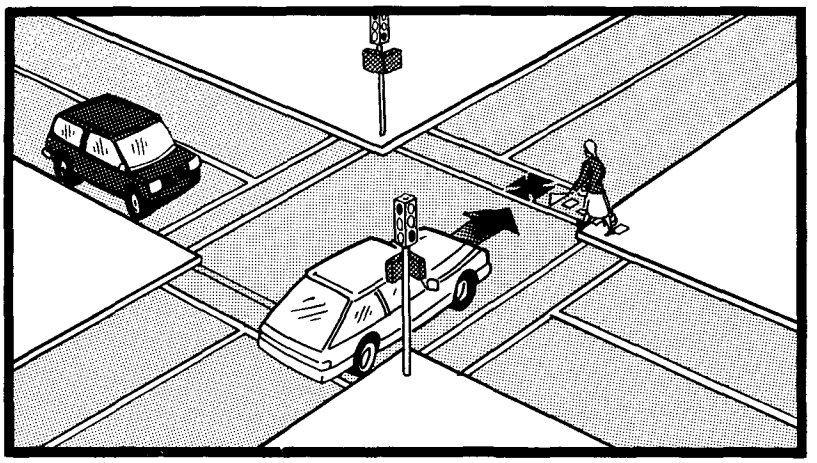
- Intersection on left
- First stepping off curb
- Turning vehicles
- Exiting vehicles

NON-TURNING VEHICLES also account for a variety of pedestrian accidents at intersections. They can be summarized as follows:

- *VISUAL SCREENS*--In these accidents, the pedestrian is screened so as not to be visible to an oncoming vehicle until the pedestrian suddenly steps out in front of that vehicle. The screen may be another vehicle, for example, a car that has stopped to let the pedestrian pass or a bus that has stopped at a bus stop. But, it could be a bush, a mailbox or any other object that prevents the driver from seeing the pedestrian, and vice versa.



- *SIGNAL "FAITH"*--Here, the problem is that the pedestrian relies completely on the signal and, without looking for cars, starts to cross the street as soon as the light turns green or the pedestrian light says WALK. The pedestrian is then hit by a car still in the intersection.



- *SIGNAL TIMING*--In these accidents, the pedestrian gets partway across the street when the DON'T WALK signal starts to flash. Pedestrians of all ages misinterpret this signal. The flashing DON'T WALK means that pedestrians shouldn't *start* to cross the street. However, if they are in the street when the signal flashes, they should continue to cross rather than stop or return to the curb from which they started. Because of reduced mobility, the older pedestrian may not get as far across the street as a young person would before the signal begins to flash. Sometimes, the older person becomes confused, "freezes" in the middle of the street, and becomes a target for an oncoming vehicle.

Intersection Safety Advice

We recommend that the following advice be given to older pedestrians to help them cross intersections safely:

- You are at most risk when first stepping off the curb because drivers may not see you until you're actually in the roadway.

- ✔ Always stop at the curb and look left-right-left for cars before entering the roadway.

- ✔ Look left-right-left even when the light is green or the signal says WALK.

- ✔ Always look left *last*, since that is the direction cars will come from when you *first* step off the curb.

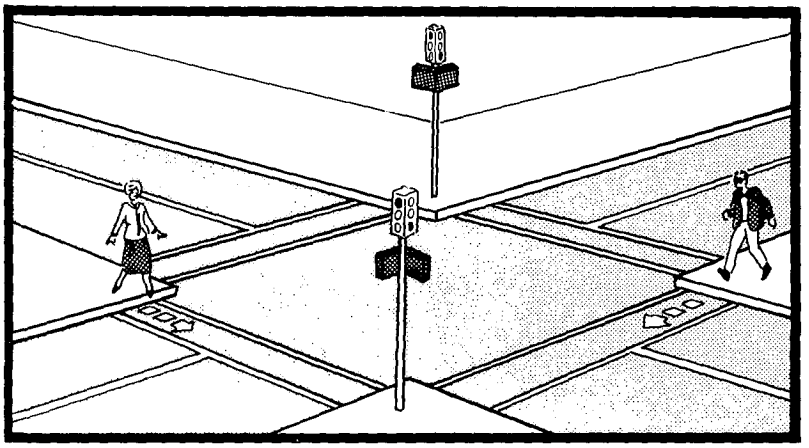
- Turning vehicles are especially dangerous at intersections because drivers are concentrating on making their turns and may not notice you.

  - ✔ Exaggerate your head turns so that you look in *all* traffic directions, including behind you.

  - ✔ Make sure you look for vehicles making right turns on red and for vehicles making left turns.

  - ✔ Make sure the driver of a turning vehicle sees you. Look at the driver, not just the vehicle. The car won't stop unless the driver sees you.

- An intersection on your left is more dangerous than one on your right because you may encounter turning vehicles when you first step off the curb. Also, all vehicles you encounter are exiting the intersection and picking up speed.



INTERSECTION ON PEDESTRIAN'S LEFT

INTERSECTION ON PEDESTRIAN'S RIGHT

✔ When you come to an intersection, lift your left hand slightly. If your hand points toward the center of the intersection, be especially careful in searching for vehicles from *all* directions before you enter the roadway.

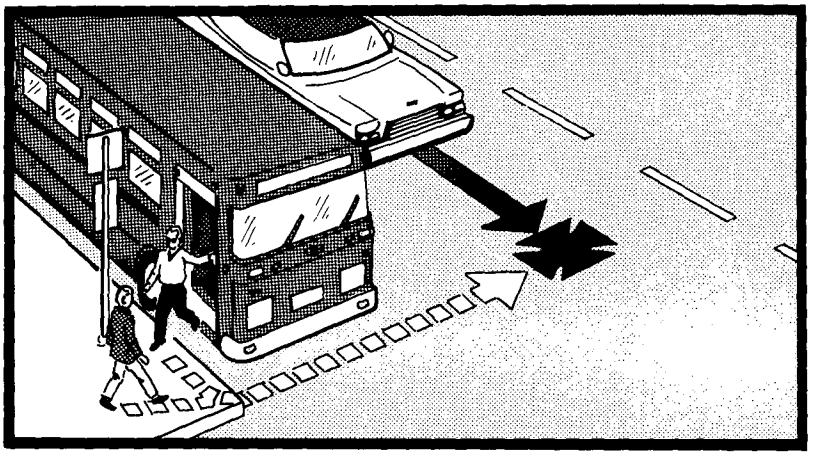
✔ Look over your left shoulder for vehicles making right turns on red and look across the intersection for vehicles making left turns.

- Cars and other objects can screen you from a driver's view.

✔ Before stepping off the curb, try to make sure that all vehicles in the roadway have stopped and that all drivers see you.

✔ When a vehicle has stopped to let you cross, don't blindly "accept this offer" and enter the roadway. There may be another vehicle (# 2 vehicle) overtaking the stopped vehicle. And the #2 driver can't see you because of the stopped car.

✔ Be especially careful about stepping in front of a stopped bus, because, due to its size, it's even harder for an overtaking driver to see you.



✔ When you want to cross in front of any "screen," stop at the outside edge of the screen and look around it for any vehicles that might be coming.

- If you step into the roadway immediately when a green light or WALK signal comes on, you may be hit by a car in the intersection.

  ✔ Green does not mean that you have the right of way. Green means look and, if it's safe, then go.

  ✔ The WALK signal does not mean that it is safe for you to start crossing. Rather, it tells you to stop at the curb and look to make sure that it is safe.

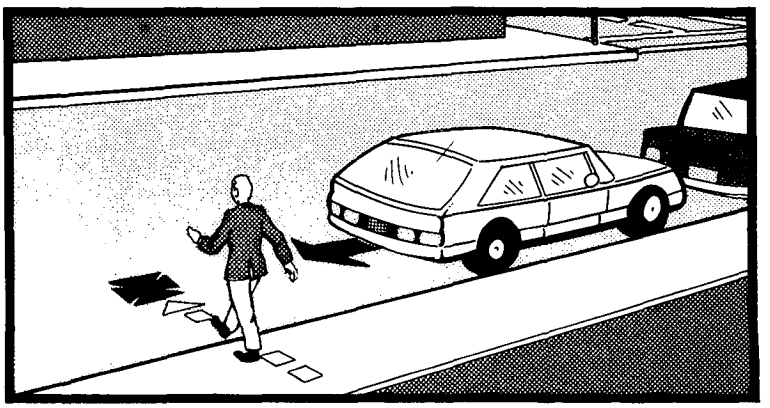
  ✔ Always stop at the curb and look for cars from all directions before entering a roadway. Exaggerate your left-right-left looks so that you see any turning vehicles also.

  ✔ Before crossing at an intersection, you may want to wait for a fresh green light (gives you the most time). Also, look for cars that might be coming (don't assume they will stop).

- When you are in the middle of the road and the DON'T WALK signal flashes, don't stop or return to the curb. Continue to walk at your maximum comfortable pace (running is not necessary) until you reach the other side. If you're not sure that a driver has seen you, move your arms a bit. Remember, you won't get hit if the driver sees you.

Backing Risks

People get hit by cars going backward as well as forward. Accidents involving backing vehicles occur in streets, in driveways and in parking lots. Typically, both the driver and the pedestrian are inattentive. The driver may not look carefully *enough* for pedestrians, and rearward visibility from a car is usually poor. Cues such as



the sound of the car engine often go unnoticed by the pedestrian. In a roadway situation, the pedestrian is concentrating on seeing if it is safe to cross the street and is looking for *moving* cars, not parked cars that might start to move. The pedestrian can also be particularly inattentive in a parking lot since it may not seem to be a roadway and, therefore, its risks may be underestimated. And, finally, the pedestrian may consider the sidewalk to be completely non-threatening and fail to recognize that a driveway intersecting a sidewalk can be as dangerous as the intersection of two roads.

Backing Safety Advice

We recommend that the following advice be given to older pedestrians to aid them in coping with backing dangers that occur in *parking lots*:

- Parking lots can be just as dangerous as roadways. Be particularly alert for backing cars because the driver may not see you. Specifically:

  ✔ Listen for engine noise.

  ✔ Look for backup lights.

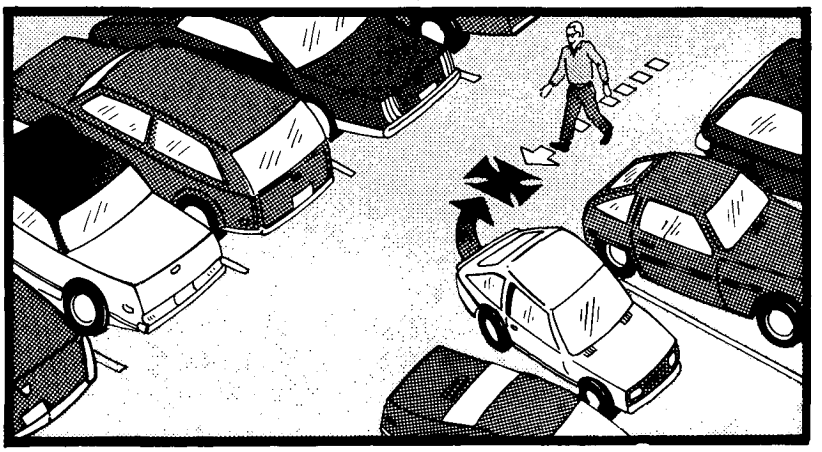
  ✔ Look for drivers in vehicles.

  ✔ Watch for moving cars.

  ✔ Do not assume that you have the right of way.

  ✔ Keep to pedestrian walks where possible.

  ✔ Walk in front of parked cars rather than behind them whenever possible



We recommend that the following advice be given to older pedestrians to aid them in coping with backing dangers that occur in *driveways* and on *streets*:

- When a vehicle is backing up on a street or in a driveway, the driver's rear vision may be blocked due to the design of the vehicle or because the driver is relying on the view from the rearview mirror. Be particularly alert for backing vehicles. Specifically:

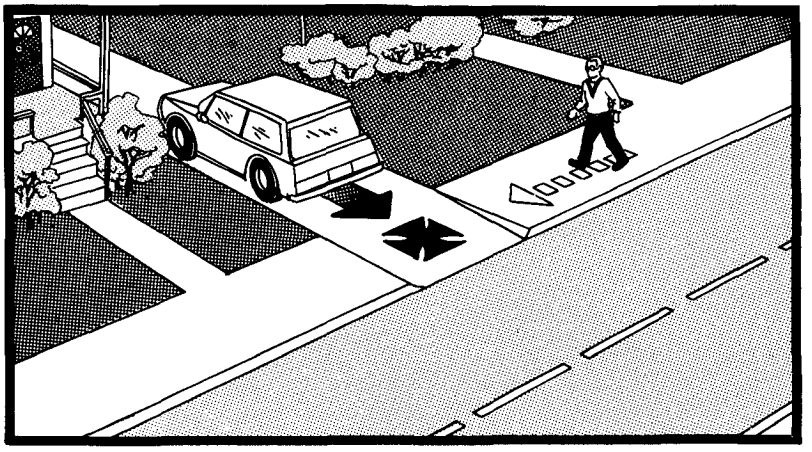
  ✔ Listen for engine noise.

  ✔ Look for backup lights.

  ✔ Look for drivers in vehicles.

  ✔ Do not enter a roadway if there is any possibility that a car may back up.

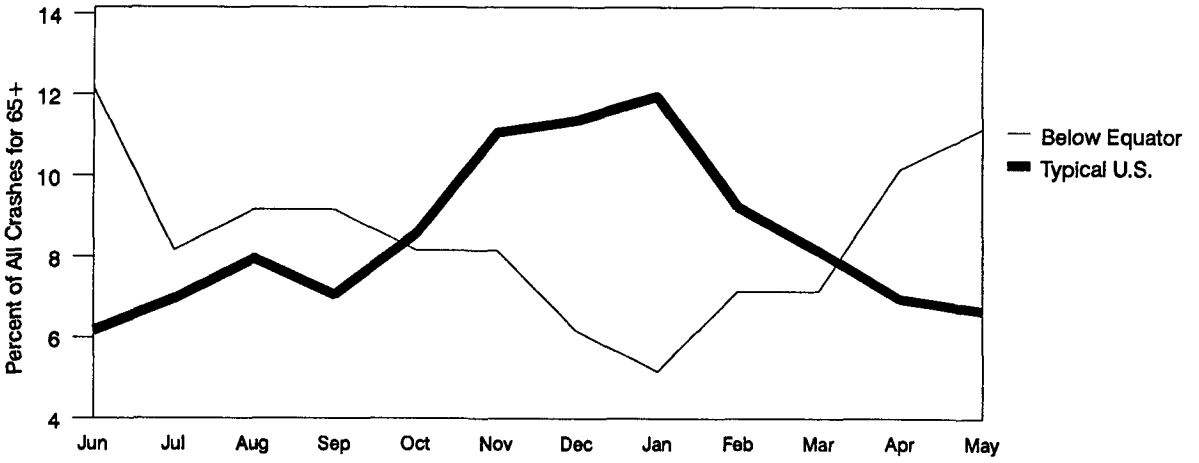
  ✔ Treat a driveway like an intersection. Slow down and look both ways. Be aware that a vehicle could be entering or leaving at any time.



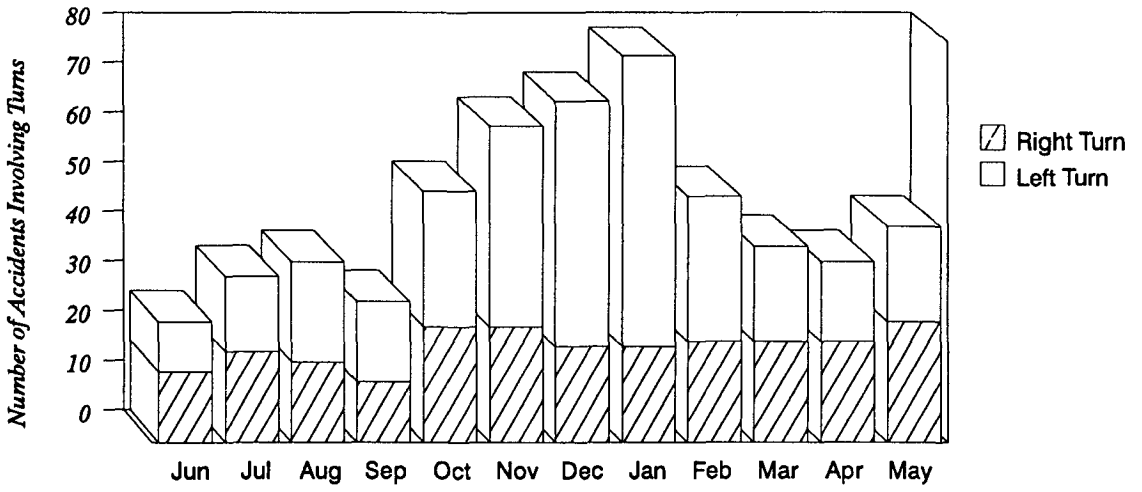
Conspicuity

Our research has shown that there is a sharp increase in the number of accidents involving the older pedestrian in the winter months--both in the United States and in the Southern hemisphere. This phenomenon appears to be the result of a "camouflage

effect" arising from decreased daylight combined with a tendency of most persons to wear dark clothing in the winter. With increasing shadows from lower sun angles, pedestrians in dark winter coats are simply less conspicuous. A driver who might see a more brightly-dressed summer pedestrian simply may not see the winter pedestrian.



The conspicuity problem interacts or combines with other roadway dangers. For example, pedestrian accidents for right-turning vehicles in a typical, large U.S. city stay essentially constant throughout the year. In contrast, accidents involving left-turning vehicles (a major danger to the older pedestrian) increase markedly in the winter months. This is likely because there is little margin for error in the more complex left-turning maneuver. The winter pedestrian, being less conspicuous, is not noticed by the driver until it is too late. The darker clothing is just enough to make the difference between being seen and not being seen under these conditions.



Conspicuity Safety Advice

We recommend that the following advice be given to older pedestrians to aid them in coping with conspicuity problems:

- Drivers have difficulty seeing pedestrians in the winter months because there are more shadows and we tend to wear dark clothing.

  ✔ If your winter clothing is dark, always wear something light or bright (like a white scarf) to make you more conspicuous.

  ✔ Better still, buy a piece of high visibility fluorescent material and attach it to your purse or briefcase or to anything else that is in plain view. This will greatly increase the chances that you will be seen.

- Vehicles making left turns at intersections are especially dangerous to you in the winter months when visibility is poor.

  ✔ Before you enter an intersection, make sure you look in *all* directions for oncoming vehicles, especially for turning vehicles. Check the entire intersection for threats.

  ✔ If you're not sure that a driver has seen you, let the car go by before you attempt to cross the street.

Making Pedestrian Safety Work

In this paper, we have described the major risks facing the older (65+) pedestrian and have recommended specific ways for older adults to improve their safety as pedestrians. This advice can only be effective if it reaches the appropriate audience. The information needs to be distributed in a variety of ways by a number of organizations so that it reaches all members of the target group. And it needs to be repeated sufficiently often over time so that the recommended behaviors become a routine part of older pedestrians' lives.

The information can be distributed by all organizations dealing with the health and safety of pedestrians, particularly older pedestrians. These include public and private organizations concerned with satisfying the medical, recreational, religious, educational and housing needs of the older adult as well as organizations concerned with public safety.

To be effective, the information must be presented directly and consistently to the target group, preferably in a variety of media formats so that the group, in fact, becomes "immersed" in safe pedestrian behaviors. Speeches can be made directly to target group members at meetings of organizations dedicated to the older adult, at senior citizen housing complexes and other places where older adults congregate for recreational or other activities. Articles can be written and published in magazines and newsletters directed to the older adult as well as those directed to the general population. Brochures and flyers can be prepared, and posters can be designed to illustrate pedestrian dangers and appropriate actions to be taken to avoid accidents. Public service announcements can be made on television and radio. Finally, the appropriate behaviors can be depicted as routine whenever older adults are included in media presentations. For example, they can be shown wearing bright clothing to be conspicuous when walking and can be shown exhibiting appropriate behaviors in roadways and parking lots.

While the information provided in this paper is directed to the older adult, it is also appropriate to pedestrians of all ages. Distributing the information to the public at large, therefore, can aid all pedestrians in improving their safety. In addition, if younger adults are aware of appropriate pedestrian behaviors, they may reinforce those behaviors for their older relatives and friends.

The first part of the job has been done. Research sponsored by NHTSA and FHWA has identified the problems and proposed reasonable solutions. Now it is hoped that those groups and individuals who are experienced in communicating with the older adult will include the developed information as part of their regular programs. This combination of carefully researched advice and demonstrated distribution experience will contribute to safer walking through the years.

APPENDIX D

PRESENTER'S GUIDE FOR SLIDE SERIES

WALKING THROUGH THE YEARS

Presenter's Guide to Slides

for

WALKING THROUGH THE YEARS

Pedestrian Safety for the Older (65+) Adult

National Highway Traffic Safety Administration
Federal Highway Administration

INTRODUCTION

This document describes a set of 25 slides that illustrate major pedestrian risks facing older (65+) adults and behavioral changes they can make to minimize these risks. The slides summarize the pedestrian safety information contained in the publication entitled *Walking Through the Years*, sponsored by the National Highway Traffic Safety Administration (NHTSA) and the Federal Highway Administration (FHWA). That document was prepared to familiarize organizations that might distribute pedestrian safety information to older adults with the latest research information on the problem and possible countermeasures.

The slide series has three basic uses:

- As a *treatise* on the state-of-the-art of pedestrian safety for the older adult;
- As a *countermeasure* presentation to attempt to engender improved pedestrian hazard recognition and walking behaviors on the part of the audience; or
- As a *promotional* vehicle to attempt to catalyze involvement in countermeasure development and implementation.

When used as a *treatise* on the research and its results, the slide series should be presented in its entirety. When employed as a *countermeasure* presentation to older adults, the presenter might include all information (slides 4 through 24) that deal with the older adult risks and specific pedestrian advice or concentrate on only specific risks, such as intersection problems (slides 5 through 14), backing problems (slides 15 through 18) or conspicuity (slides 19 through 23). Use of the slides in *promotional* presentations would, of necessity, involve selecting only those slides likely to motivate the particular audience being addressed. In order to make an appropriate slide selection and an effective presentation, the presenter must become familiar with the material well in advance of the presentation.

For each slide, the *Presenter's Guide* provides certain points to be made. Although these points are listed in outline form, they have been written so that they can be read directly to the audience. Thus, they can serve as a script for the slide presentation if the presenter so desires. In addition, certain background information is provided for selected slides. The presenter may wish to use this information to amplify the slide contents.

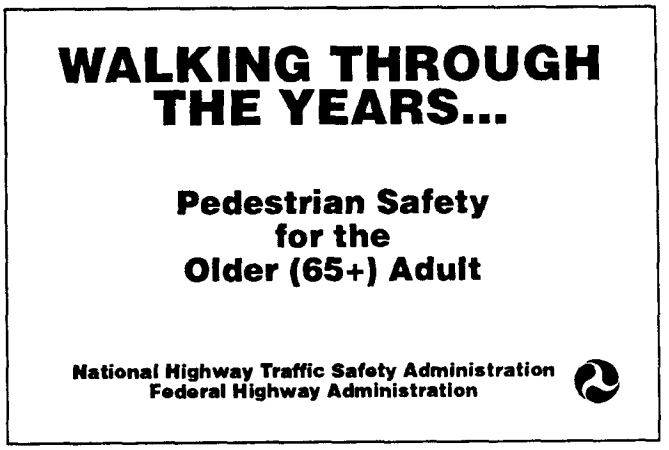
It should be noted that, although the advice has been prepared for older adults, it is appropriate to pedestrians of all ages. Thus, the slides describing specific risks and advice could be presented to any adult group.

1. TITLE SLIDE

- This slide series is called *Walking Through the Years.*

- It describes the major pedestrian risks facing older adults and suggests actions that they can take to avoid accidents.

- It includes information from a variety of studies done over the years by the National Highway Traffic Safety Administration (NHTSA), the Federal Highway Administration (FHWA) and other highway safety organizations.



Background: NHTSA and FHWA monitor pedestrian accidents, injuries and fatalities on a national basis. They also support studies that look at where and under what conditions these accidents occur and to whom. Their objective is to gain an understanding of pedestrian risks and to suggest safe walking practices for pedestrians of all ages. They also are looking for physical changes that can be made to the highway system to reduce these accidents.

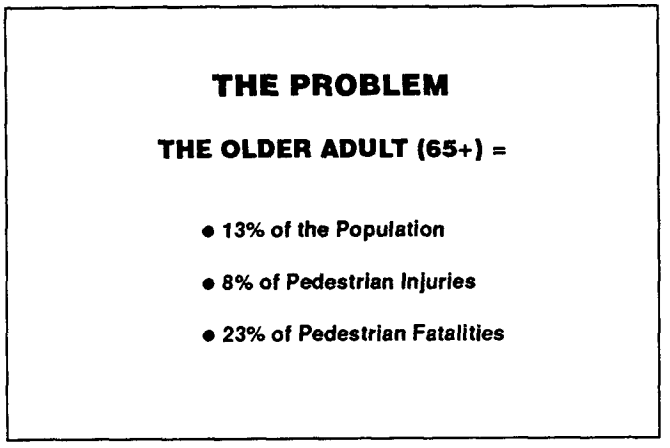
2. THE PROBLEM

- Over 100,000 pedestrians are injured and over 6,000 are killed each year in the U.S.

- Older adults account for fewer pedestrian accidents (8%) than would be expected by their numbers in the population (13%).

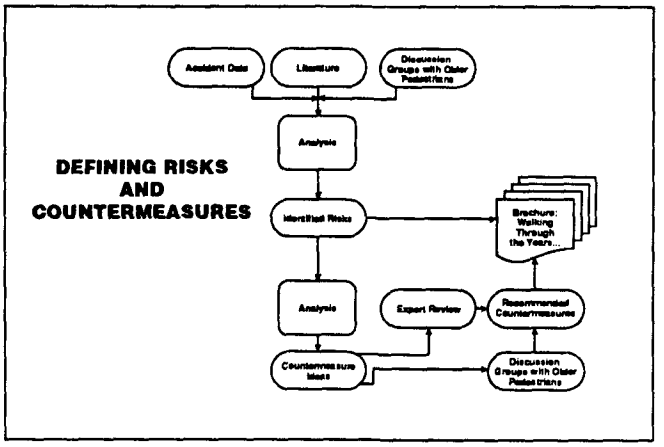
- However, older adults account for almost one-fourth (23%) of all pedestrian fatalities.

- A pedestrian accident is typically a far more catastrophic event for the older adult than it is for a younger person. This "frailty" factor makes it particularly important to examine ways to prevent pedestrian accidents to older adults.



3. DEFINING RISKS AND COUNTERMEASURES

- The information presented in this slide set is the result of a carefully researched study.
- In that study, pedestrian risks to the older adult were identified through analysis of accident data, reviews of relevant literature and discussions with older adults themselves.
- Measures to counter the risks were then proposed. These "countermeasures" took the form of advice that could be given to older adults to help them avoid pedestrian accidents.



- This advice was reviewed both by safety experts and by groups of the elderly.
- The result was a group of pedestrian safety messages developed specifically to help older adults function safely as pedestrians even in the presence of the major identified risks.
- The risks and countermeasures were documented in a brochure and pamphlet called *Walking Through the Years*.
- The remaining slides will summarize these risks and the recommended pedestrian safety advice.

4. MAJOR RISKS TO OLDER PEDESTRIANS

- The research study identified three major risks to older pedestrians.
- First, older adults have a high incidence of accidents that take place at intersections.
- Second, many of their accidents involve backing vehicles.
- Third, accidents involving older pedestrians increase markedly in the winter months. This increase in wintertime accidents appears to be a problem of conspicuity.

- Conspicuity relates to how visible the pedestrian is relative to the environment. If the pedestrian is not conspicuous, the likelihood of an accident increases.

- People tend to wear darker clothing in winter than they do in the summer, and this is particularly true of the older adult. A pedestrian in dark clothing is harder to see.

- Each of these risks will be explained in more detail in subsequent slides.

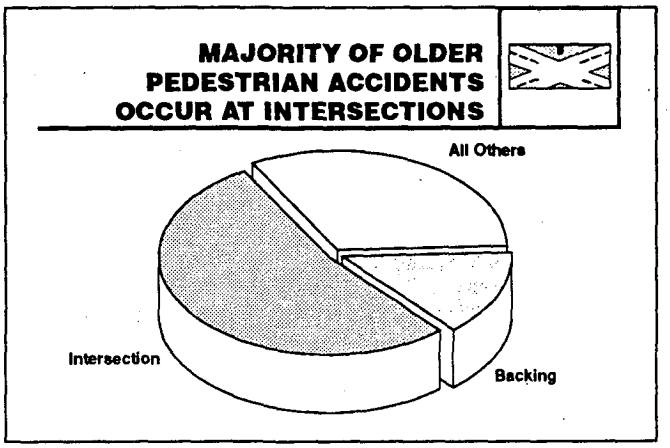
5. MAJORITY OF OLDER PEDESTRIAN ACCIDENTS OCCUR AT INTERSECTIONS

- Despite the availability of signal lights, walk signs, crosswalks and stop signs, intersections are particularly dangerous for older pedestrians.

- This slide shows that over half of all pedestrian accidents for the older adult occur at intersections.

- They include accidents with turning vehicles as well as with vehicles that are going straight.

- Since they may involve different types of pedestrian problems, accidents with turning vehicles will be discussed separately from those in which the vehicle is going straight.

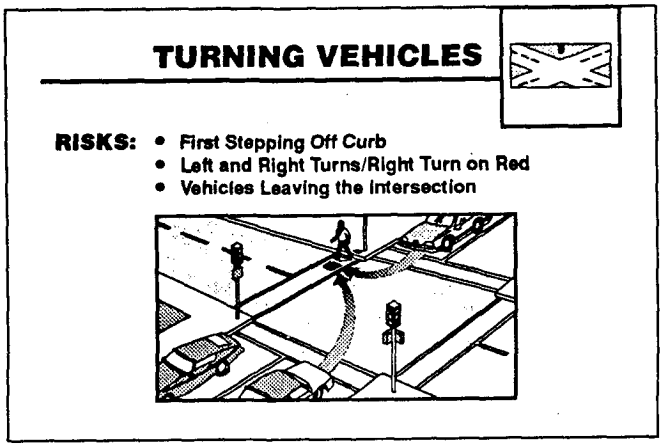


6. INTERSECTION RISKS--TURNING VEHICLES

- There are three major pedestrian risks involving turning vehicles at intersections.

- The ***first*** risk occurs when the pedestrian first steps off the curb because the driver may not notice the pedestrian until the pedestrian is actually in the roadway.

- Thus, the first half of the crossing is more dangerous than the second when the pedestrian has been in the roadway for some time.



- ***Second***, although all turning vehicles are potentially dangerous, those making left turns are involved in more accidents with pedestrians than are those making right turns, including right turns on red.

- The left-turning vehicle typically has to cross at least one lane of oncoming traffic before making the turn. This adds one more task and one more source of distraction for a driver who already has a lot to look out for.

- The driver may also have to commit to making a left turn before the pedestrian steps off the curb or even before the pedestrian is in view.

- ***Third***, cars leaving the intersection are typically more dangerous than are those entering the intersection, probably because they are picking up speed.

Background: When a vehicle is turning, extra vigilance is required on the part of both driver and pedestrian. The driver has a particularly difficult task because it is necessary to determine the best time to turn based on the presence of other vehicles and pedestrians in the intersection. In addition, the car's rearview mirror or "A-pillar" may block a pedestrian from the driver's view while the car is turning. The pedestrian, in turn, must look not only left and right on the road being crossed but must look both forward and backward for turning vehicles from the intersecting road.

7. INTERSECTION ADVICE--TURNING VEHICLES

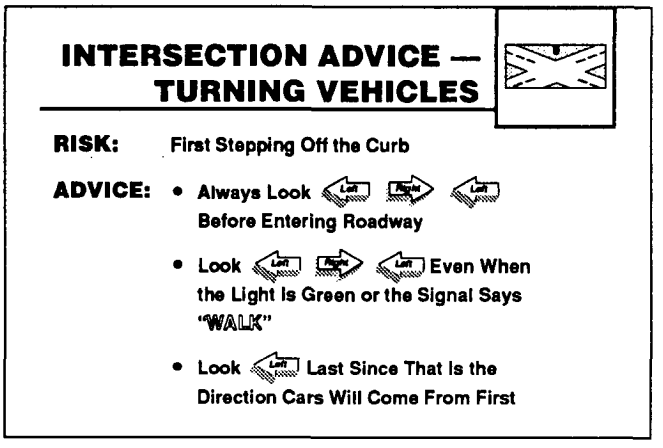
- The pedestrian is at risk of an accident when first stepping off the curb because drivers may not see the pedestrian until the pedestrian is actually in the roadway.

- Therefore, we want to make sure that the pedestrian takes a thorough ***LOOK*** for vehicles ***before stepping off the curb***. The recommended advice is:

  - Always ***LOOK LEFT-RIGHT-LEFT*** before entering the roadway.

  - ***LOOK LEFT-RIGHT-LEFT*** even when the light is green or the signal says WALK.

  - ***LOOK LEFT last*** since that is the direction cars will come from ***first***.

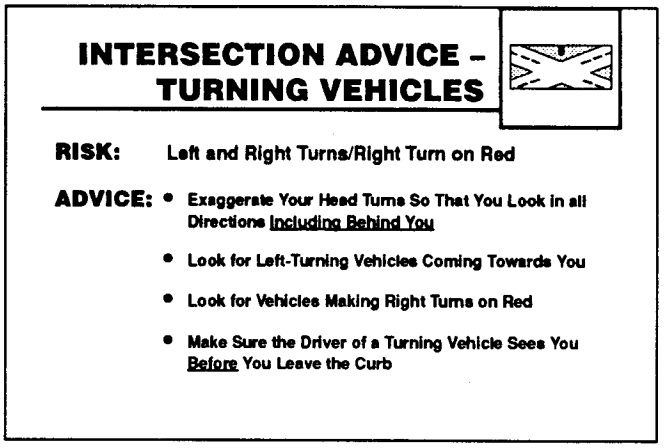


Background: The pedestrian looks left first because that is the direction from which cars will be coming when the pedestrian first enters the roadway. The look to the right is to check for traffic the pedestrian will encounter in the second half of the crossing. Then, the final look to the left makes sure that the traffic picture hasn't changed since the first left look.

8. INTERSECTION ADVICE--TURNING VEHICLES

- Turning vehicles are especially dangerous at intersections because drivers are concentrating on making their turns and may not notice the pedestrian. The recommended advice is:

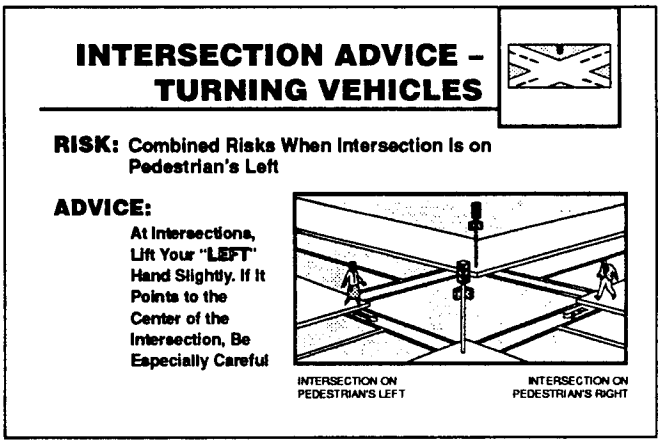
  - Exaggerate your head turns so that you ***LOOK in all*** traffic directions ***including behind you.***
  - ***LOOK*** for left-turning cars coming toward you.
  - ***LOOK*** for vehicles making right turns on red.
  - Make sure the driver of a turning vehicle sees you ***before*** you leave the curb. ***LOOK at the driver***, not just the vehicle. The car won't stop unless the driver sees you.



Background: If the intersection is on the left, pedestrians will need to look over their left shoulders (that is, look behind them) for vehicles making right turns and will need to look across the intersection for vehicles making left turns. If the intersection is on the right, pedestrians will need to look over their right shoulders for vehicles making left turns.

9. INTERSECTION ADVICE--TURNING VEHICLES

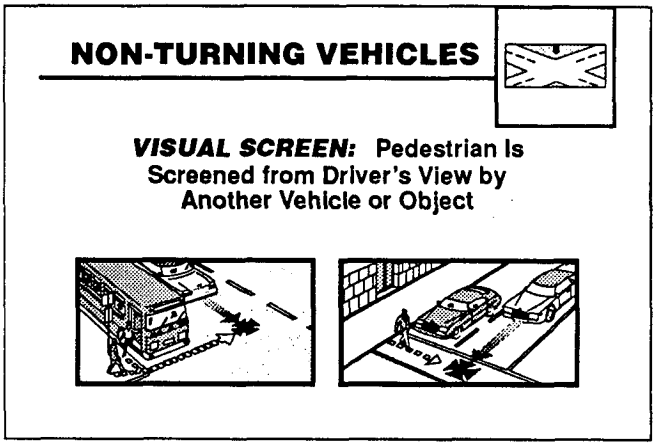
- The greatest risk to the pedestrian occurs when all risk factors involving turning vehicles occur together.
- This happens when the center of the intersection is on the pedestrian's left.
- The pedestrian then encounters both left- and right-turning vehicles in the first half of the crossing.
- In addition, ***all*** vehicles encountered in the first half of the crossing are leaving the intersection.



- The recommended advice to identify dangerous intersection crossings is:
  - At intersections, lift your left hand slightly.
  - If it points to the center of the intersection, be especially careful.

10. INTERSECTION RISKS--NON-TURNING VEHICLES

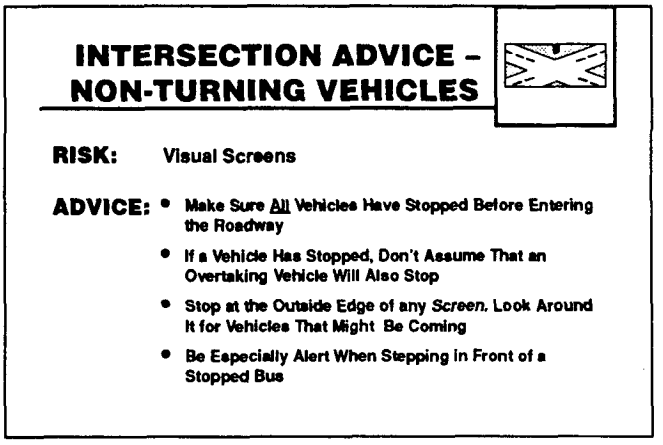
- There are also risks at intersections involving non-turning vehicles.
- The first risk is known as a ***visual screen*** because the pedestrian is "screened" or blocked from the driver's view by another vehicle or object.
- The pedestrian is therefore not visible to an oncoming vehicle until the pedestrian suddenly appears in front of the screen.
- The screen could be a car that has stopped to let a pedestrian pass or a bus at a bus stop.



- It could also be a bush, a mailbox or any other large object that prevents the driver from seeing the pedestrian and vice versa.

11. INTERSECTION ADVICE--NON-TURNING VEHICLES

- There are special rules to follow when the pedestrian is ***screened*** from the driver's view in any way. The recommended advice is:
  - Make sure ***all*** vehicles have stopped before you enter the roadway.
  - If a vehicle has stopped, don't assume that an overtaking vehicle will also stop. The driver of the overtaking vehicle may not even know that you are there because you are blocked from view by the stopped car.



- ***STOP*** at the outside edge of any screen and ***LOOK*** around it for vehicles that might be coming.

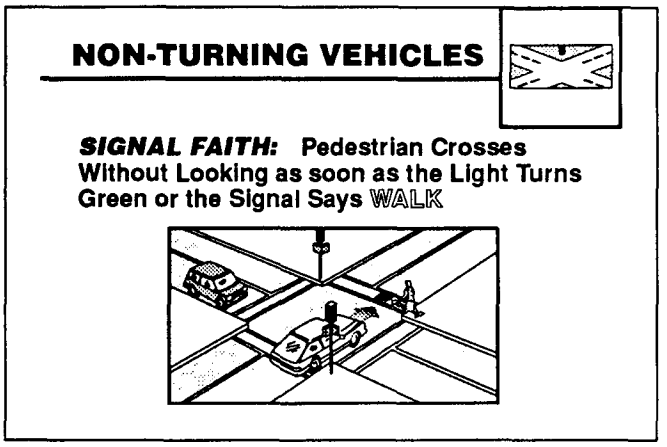
- Be especially alert when stepping in front of a stopped bus because, due to its size, it's even harder for an overtaking driver to see you.

12. INTERSECTION RISKS--NON-TURNING VEHICLES

- There is another accident involving non-turning vehicles that is dangerous for older adults. This accident arises because of ***signal faith***.

- In this accident, the pedestrian relies completely on the signal and, without looking for cars, starts to cross the street as soon as the light turns green or the signal says WALK.

- The pedestrian is then hit by a car still in the intersection.



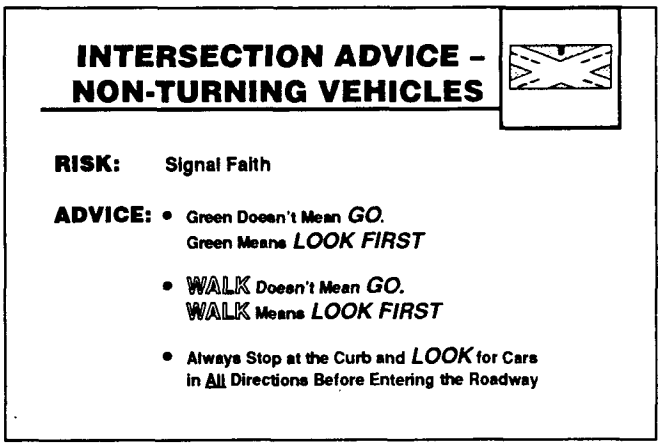
13. INTERSECTION ADVICE--NON-TURNING VEHICLES

- Problems resulting from ***signal faith*** can be avoided if pedestrians don't rely totally on signals. Specifically, the following advice is pertinent:

  - Green doesn't mean you have the right-of-way or that you can GO. Green means ***LOOK FIRST***, then ***GO*** if it's safe.

  - The WALK signal doesn't mean that it is safe for you to start crossing. It means to stop at the curb and ***LOOK FIRST*** to make sure it is safe.

  - Always ***STOP*** at the curb and ***LOOK*** for cars from ***all*** directions before entering the roadway. Exaggerate your left-right-left looks so that you see any turning vehicles also.



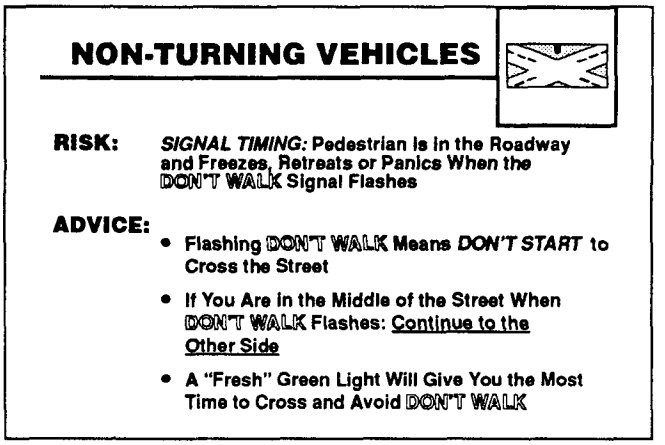
14. INTERSECTION RISKS AND ADVICE--NON-TURNING VEHICLES

- The third accident involving non-turning vehicles is a result of ***signal timing***. In these accidents, the pedestrian gets partway across the street when DON'T WALK starts to flash and then freezes, retreats or panics instead of continuing across the street.

- The recommended advice is:

  - The flashing DON'T WALK signal means ***DON'T START*** to cross the street.

  - However, if you are in the middle of the street when the DON'T WALK signal flashes, ***continue to the other side at your normal pace.***



  - Waiting for a "fresh" green light will give you the most time and may help you avoid having to deal with a flashing DON'T WALK signal.

Background: Pedestrians of all ages misunderstand the flashing DON'T WALK signal. However, because of reduced mobility, the older person may not get as far across the street as would a younger person before the signal begins to flash. Also, the older person may become confused and freeze in the middle of the street. It is especially important that older pedestrians understand that, if they have already started crossing when the signal flashes, they should continue to the other side at their normal walking pace.

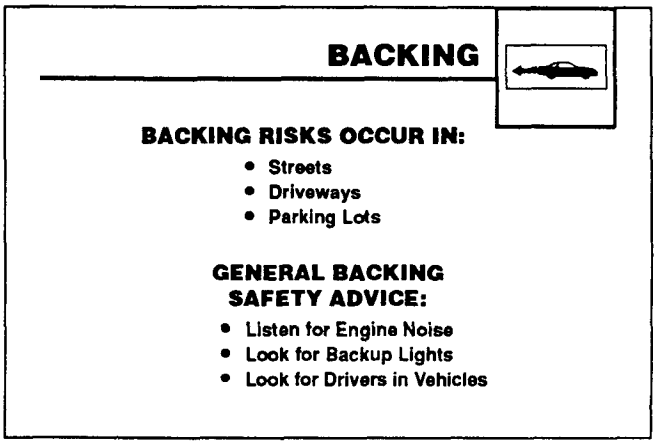
15. BACKING

- People get hit by cars going backward as well as forward.

- Accidents involving backing vehicles occur in streets, in driveways and in parking lots.

- Typically, both the driver and pedestrian are inattentive.

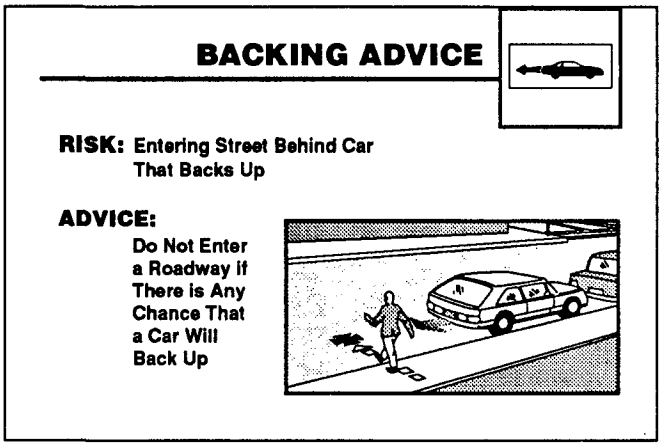
- The pedestrian must be alert to the signs that a car may be about to move backwards.



- Specifically, any time a backing vehicle may be encountered the pedestrian should:
  - ***LISTEN*** for engine noise.
  - ***LOOK*** for backup lights.
  - ***LOOK*** for drivers in vehicles.

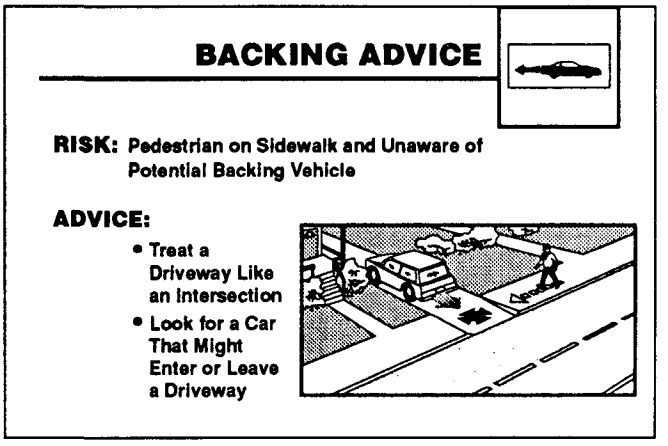
16. BACKING ADVICE

- The major roadway danger with backing vehicles occurs when the pedestrian enters the street behind a car that backs up. The recommended advice is:
  - Do not enter the roadway if there is ***any*** chance that a car will back up.
  - Check for all signs that the car might move backward --Is there engine noise? Are the backup lights lit? Is there a driver in the car?



17. BACKING ADVICE

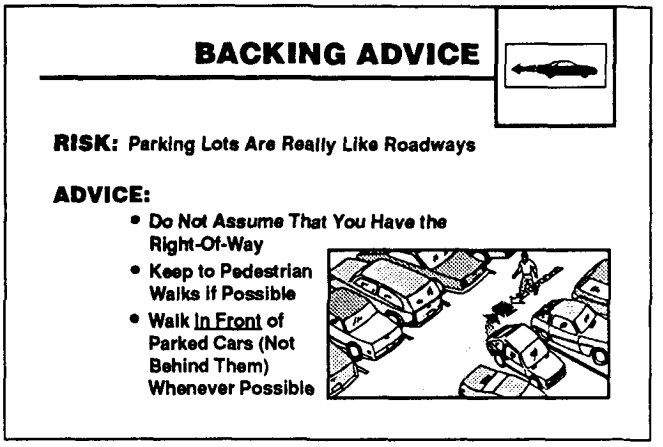
- Pedestrians on sidewalks are sometimes completely unaware that a vehicle may back out of a driveway. The recommended advice for this risk is:
  - Treat a driveway like an intersection.
  - ***LOOK*** for cars that might enter or leave a driveway at any time.



18. BACKING ADVICE

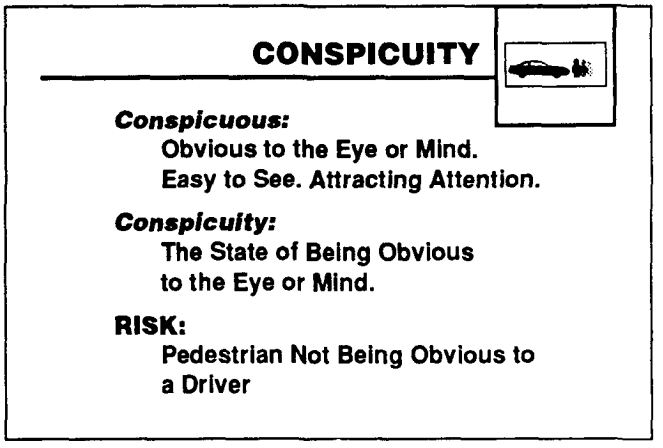
- Parking lots can be just as dangerous as roadways. The recommended advice is:

  - Do not assume that you have the right-of-way.
  - Keep to pedestrian walks if possible.
  - Walk ***in front*** of parked cars (not behind them) whenever possible.



19. CONSPICUITY

- A major problem in pedestrian safety for the elderly appears to be related to conspicuity.
- This slide describes what conspicuity means.
- Conspicuous means "obvious to the eye or mind," "easy to see," or "attracting attention."
- Conspicuity, therefore, is "the state of being obvious to the eye or mind." It is the *opposite* of camouflage.
- If the pedestrian is not obvious to the driver, it is less likely that the driver will see the pedestrian. This leads to an increased risk of an accident.



20. CONSPICUITY

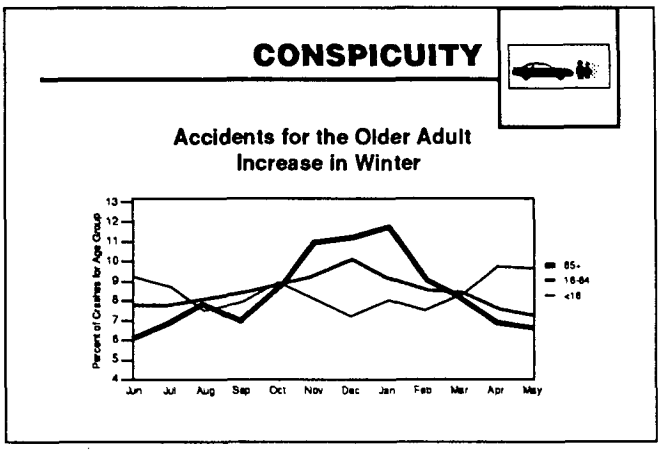
- Daytime accidents involving older pedestrians increase markedly in the winter months.
- This increase in wintertime accidents is not apparent for other age groups.

- The increase occurs in November, December and January when the sun angles are lowest, not necessarily when the weather is coldest.

- Most people tend to wear darker clothing in the winter, and this is particularly true of the older adult.

- We also wear more clothing in the winter months. This extra coverage hides some of the arm and leg motion which makes pedestrians conspicuous to drivers.

- With the lower sun angles and increased shadows in winter, a pedestrian in dark clothing simply becomes less conspicuous to a driver.



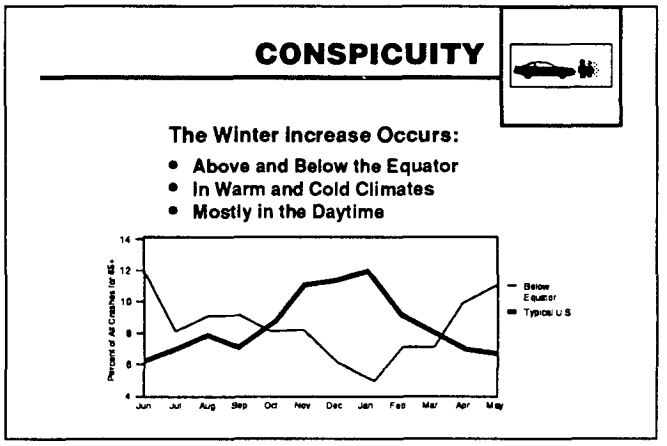
21. CONSPICUITY

- The conspicuity problem occurs both in the United States and in the equivalent winter months in the southern hemisphere.

- As mentioned before, in the United States, these months are November, December and January.

- The equivalent months in the southern hemisphere are May, June and July.

- The fact that the same problem occurs in both hemispheres suggests that it is related to something which changes with the seasons.



- The fact that the problem occurs in both warm and cold climates during wintertime suggests that it is *not* related to winter weather conditions.

- It has therefore been concluded that darker, more abundant pedestrian clothing and increased winter shadows simply make it more difficult for drivers to see pedestrians.

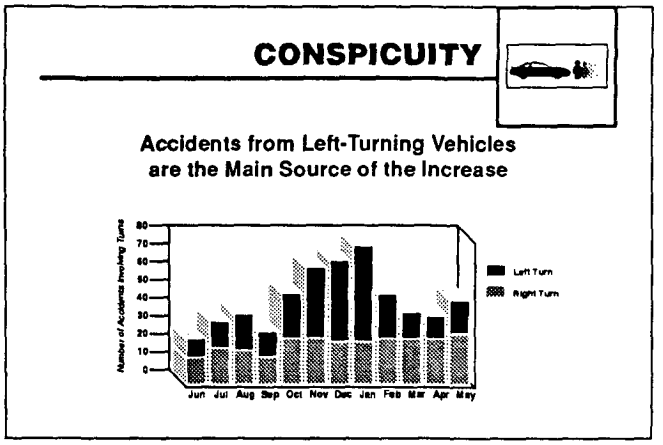
22. CONSPICUITY

- The conspicuity problem interacts or combines with other roadway dangers.

- The rate of pedestrian accidents involving right-turning vehicles stays about the same regardless of month.

- Accidents with left-turning vehicles (a major problem for the older adult) increase markedly in the winter months.

- The winter pedestrian, being less conspicuous, is not noticed by the driver until it is too late.



- The left-turning situation is particularly dangerous because of its complexity. Drivers have to cut across oncoming traffic, and often must commit to making a turn before the pedestrian is even in the street.

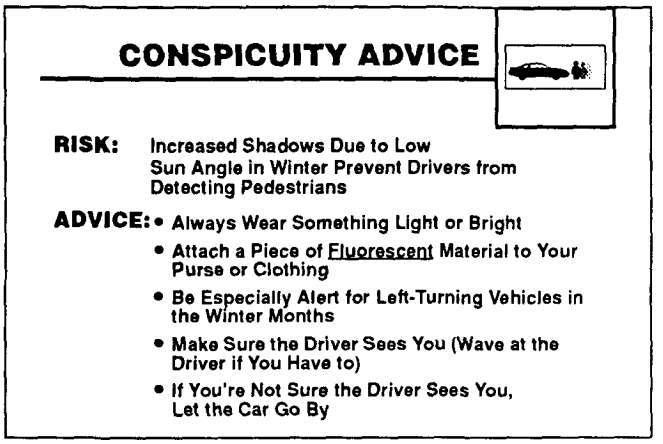
- The darker clothing appears to be just enough to make the difference between being seen and not being seen under these conditions.

23. CONSPICUITY ADVICE

- It appears, then, that increased shadows due to low sun angles in winter prevent drivers from seeing pedestrians in dark winter clothing. The recommended advice is:

  - Always wear something light or bright. This increases the chance that a driver will notice you.

  - Better still, attach a piece of fluorescent material to your purse or clothing. This material is designed to maximize your conspicuity during the daytime and at dusk and dawn.



  - Be especially alert for left-turning vehicles in winter months.

  - Make sure the driver sees you. Wave at the driver if you have to.

  - If you're not sure the driver sees you, let the car go by.

24. THE BASICS

- In summary, the basic advice to the pedestrian is: *Don't depend on anything or anyone but **yourself**.*

- Always ***STOP before*** going into any street or roadway. This gives you time to look for cars and gives a driver time to see you.

- Always ***LOOK***. Your best defense against a pedestrian accident is your eyes.

- Always ***BE SEEN***. If a driver can see you in time, your risk of being involved in a pedestrian accident is extremely small.

THE BASICS

DON'T DEPEND ON ANYTHING OR ANYONE BUT YOURSELF

- **ALWAYS *STOP***
- **ALWAYS *LOOK***
- **ALWAYS *BE SEEN***

25. THE CHALLENGES

- We now understand the problems and some good ways to avoid them. However, challenges still remain if we are all going to be successful in reducing pedestrian accidents involving the older adult.

- Getting the information to the older pedestrian is the first essential step.
  - Safety advice for the older adult can only be effective if it reaches the appropriate audience.
  - The information needs to be distributed in a variety of ways by a number of organizations so that it reaches all members of the target group.

THE CHALLENGES

- **Getting the Information to the Older Pedestrian**
- **Reinforcing and Repeating the Messages**
- **Changing Behavior**
- **Getting Feedback for Further Improvement**

- Reinforcing the messages is also necessary.
  - The messages need to be repeated as often as possible so that the recommended behaviors become a routine part of older pedestrians' lives.

- Changing behavior is critical. Accidents won't decrease unless either older adults or the drivers who encounter them change the way they do things.

- Getting feedback for further improvement is an important part of the process of preventing accidents.

    - Feedback allows advice to be refined to cover special situations or simply to be made more effective.

APPENDIX E

FLYER FOR *WALKING THROUGH THE YEARS*

WALKING THROUGH THE YEARS...

Pedestrian Safety for the Older (65+) Adult

This pamphlet describes:

- ✓ major pedestrian risks to older adults
- ✓ actions they can take to help avoid accidents

National Highway Traffic Safety Administration
Federal Highway Administration

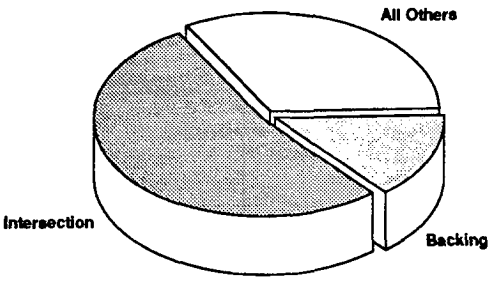
Contract Number DTNH22-89-C-07397

The Problem

Over 100,000 pedestrians are injured and over 6,000 are killed each year in the United States. Older adults (65+) have fewer pedestrian accidents (8%) than would be expected by their numbers in the population (13%). However, they are involved in almost one-quarter (23%) of all pedestrian fatalities. It is therefore especially important to help this group stay out of pedestrian accidents.

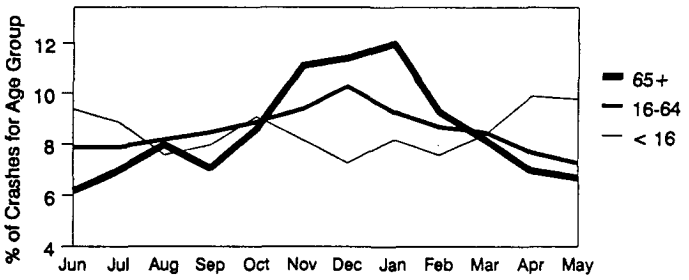
The Risks

Over half of the pedestrian accidents involving older adults occur at ***intersections***. Older adults also have a high incidence of accidents involving ***backing*** vehicles.



Finally, pedestrian accidents involving older adults increase markedly during daylight in the winter months. This wintertime increase appears to be a problem of ***conspicuity***, which means that the pedestrian simply isn't seen by a driver who is distracted by the driving task.

Pedestrian Accidents by Age Group



Intersection Risk--Turning Vehicles

There are three major pedestrian risks involving turning vehicles at intersections:

- The ***first half of the crossing***, that is, when the pedestrian first steps off the curb, is more dangerous than when the pedestrian has been in the roadway for some time.

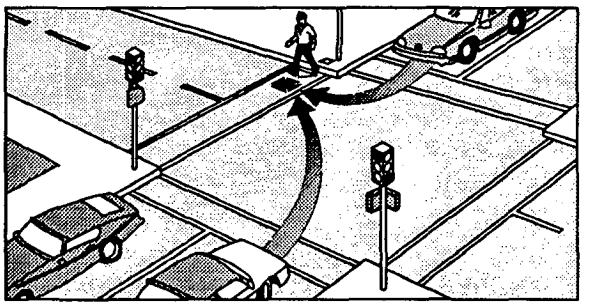
- ***Left-turning vehicles*** are more dangerous than those making right turns, including right turns on red.

- ***Cars leaving the intersection*** are typically more dangerous than those entering the intersection, likely because they are traveling at higher speeds.

The highest risk occurs when all these factors are present simultaneously. This happens when the center of the intersection is on the pedestrian's left. The pedestrian then encounters left-turning vehicles in the first half of the crossing (when first stepping off the curb). In addition, ***all*** vehicles encountered in the first half of the crossing are leaving the intersection.

Risks:

- Intersection on left
- First stepping off curb
- Turning vehicles
- Exiting vehicles



Advice:

First half of the crossing:

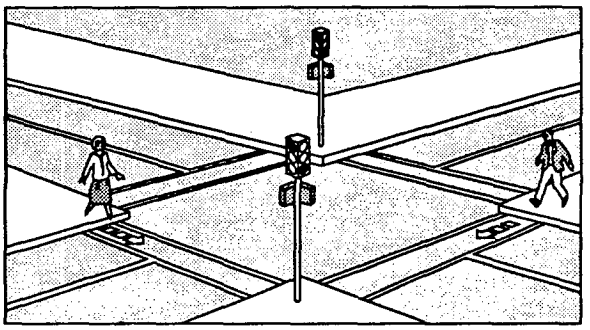
- LOOK *left-right-left* ***before*** you step off the curb.
- LOOK *left-right-left* even if the light is green or the signal says WALK.
- LOOK *left* ***last*** since that is the direction cars will come from first and the situation may have changed while you were looking to the right.

Turning vehicles:

- Exaggerate your head turns so that you LOOK in ***all*** directions from which traffic could come, including behind you.
- Make sure you LOOK for left-turning vehicles and for vehicles making right turns, including right turns on red.
- Make sure the driver of a turning vehicle sees you before you step off the curb. ***LOOK at the driver, not just the car.***

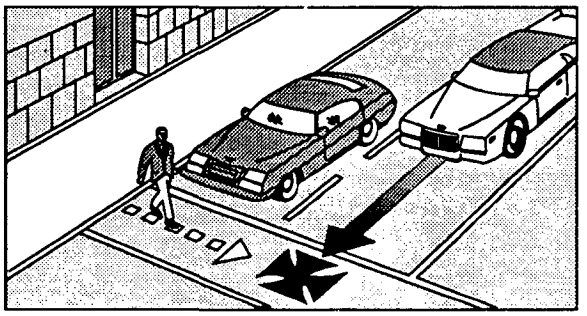
Intersection on the left:

- Lift your left hand slightly. If it points to the center of the intersection, be especially careful.



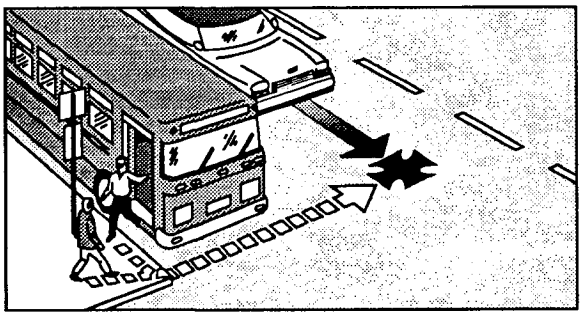
Intersection Risk--Visual Screen

The pedestrian is screened from the driver's view by another vehicle or object.



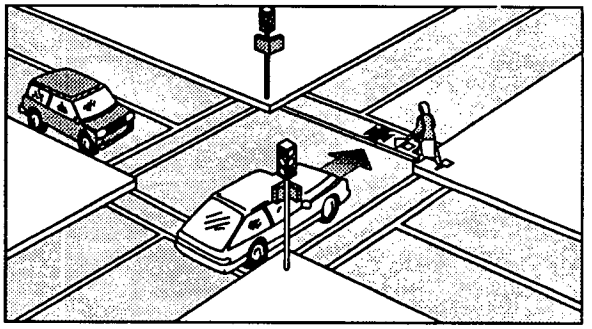
Advice:

- Make sure ***all*** vehicles have stopped before you enter the roadway.
- If one vehicle has stopped, don't assume that an overtaking vehicle will also stop.
- Stop at the outside edge of any screen and LOOK around it for vehicles that might be coming.
- Be especially alert when stepping in front of a stopped bus since, due to its size, it's even harder for an overtaking driver to see you.



Intersection Risk--Signal Faith

The pedestrian relies too much on the traffic signal and, without looking, steps into the roadway as soon as the light turns green or the signal says WALK. The pedestrian is then hit by a car that is still in the intersection.



Advice:

- A green light doesn't mean that you have the right-of-way. Green means LOOK and, if it's safe, then go.
- The WALK signal doesn't mean that it is safe to cross the street. It tells you to stop at the curb and LOOK *left-right-left* to make sure it's safe.
- ***Always*** stop at the curb and LOOK *left-right-left* before entering the roadway.
- Exaggerate your *left-right-left* looks so that you see turning vehicles also.
- You may want to wait for a fresh green light--it will give you the most time to cross the street.

Intersection Risk--Signal Timing

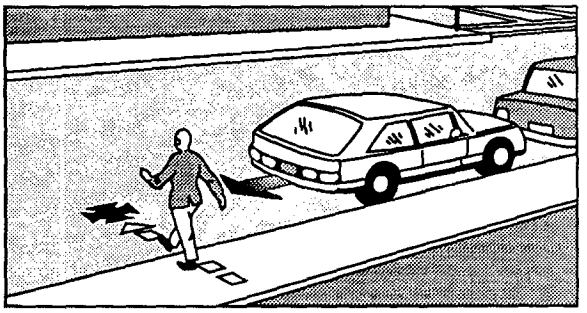
The pedestrian freezes, retreats or panics in the roadway when the DON'T WALK signal flashes.

Advice:

- The flashing DON'T WALK means ***don't start*** to cross the street.
- If you are in the middle of the street when the DON'T WALK signal begins flashing, continue to the other side. Don't stop or return to the curb.
- If you are not sure that a driver sees you, wave your arms a bit. You won't get hit if the driver sees you.

Backing Risks

Accidents involving backing vehicles occur in streets, driveways and parking lots. Typically, both the driver and the pedestrian are not attentive. The pedestrian is looking for cars moving forward, not cars that might start to move backward.

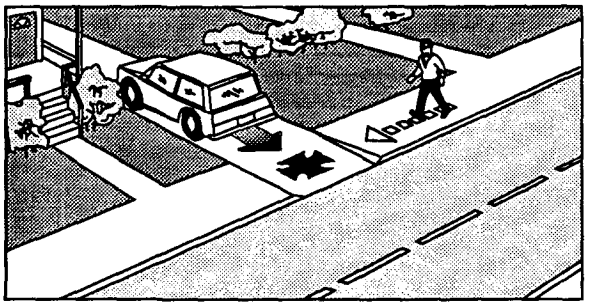


General Backing Advice:

- ***Listen*** for engine noise.
- LOOK for backup lights.
- LOOK for drivers in vehicles.

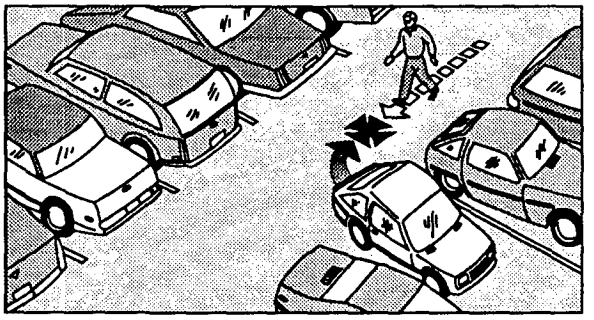
Advice--Roadways and Driveways:

- Do not enter a roadway if there is any chance that a car will back up.
- Treat a driveway like an intersection--a car can be entering or leaving at any time.



Advice--Parking Lots:

- Do not assume that you have the right-of-way.
- Keep to pedestrian walks if possible.
- Walk ***in front of*** parked cars (not behind them) whenever possible.

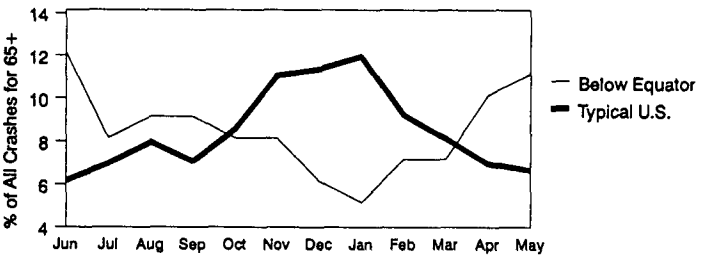


Conspicuity Risk

Conspicuity relates to how visible a person is relative to the environment. It means "obvious to the eye or mind," "easy to see," or "attracting attention." If a pedestrian is not *conspicuous* to a driver, the likelihood of an accident increases.

Accidents involving older pedestrians increase markedly in the winter months. This increase occurs both in the United States and in the equivalent winter months in the southern hemisphere. And it occurs mostly in the daytime. In the United States, it happens in November, December and January (May, June and July below the equator) when the sun angle is lowest (not necessarily when the weather is coldest).

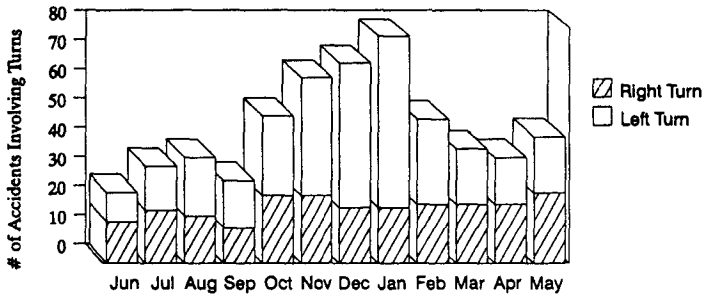
Pedestrian Accidents Above and Below the Equator



People tend to wear darker clothing in winter than they do in summer. Although this holds true for all pedestrians, it is especially true for the older adult. With the lower sun angle and increased shadows in winter, the pedestrian in dark winter clothing simply is not seen by the driver. The additional clothes everyone wears in the winter also help hide pedestrian movement which can attract a driver's attention.

The *conspicuity* problem occurs primarily with left-turning vehicles. In fact, pedestrian accidents for right-turning vehicles stay essentially constant throughout the year. Thus, the conspicuity problem interacts with other roadway dangers.

Left-Turning Vehicles are the Main Source of Winter Accident Increase



Advice:

- If your winter clothing is dark, always wear something light or bright (like a white scarf) to make you more conspicuous.
- Better still, buy a piece of high visibility fluorescent material and attach it to your purse or briefcase or anything else that is in plain sight.
- Be especially alert for left-turning vehicles.
- Before you leave the curb, LOOK for vehicles coming from all directions, particularly turning vehicles.
- If you're not sure that a driver has seen you, let the car go by.

The Basics:

Nearly everyone is a pedestrian during some part of the day regardless of age. People walk to school and to work, walk to and from parked cars, walk to shops and entertainment events, or just plain walk for social or health benefits. Drivers can't always be counted on to watch out for pedestrians. And traffic lights or roadway aids (such as pedestrian islands or walkways) aren't always available or effective. The pedestrian, particularly the older pedestrian, needs to take several precautions to help make walking as safe as it can be.

The basic advice then is:

- Don't depend on anyone but yourself.
- Always stop at the curb before entering the roadway.
- Always LOOK *left-right-left* for vehicles.
- Always make sure that you are seen by the driver.
- Learn to look out for yourself and to be a safe pedestrian as you walk through the years.

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APPENDIX F

DISTRIBUTION ORGANIZATIONS

This appendix contains the names and addresses of the organizations identified by Worthington et al., 1986, as potential distributors of highway safety information to older drivers and pedestrians. There were originally 20 names on this list. Since one was unable to be located and one has been taken over by another organization, there are 18 names that comprise the core list of potential distributors for the highway safety information developed in this study.

ORGANIZATIONS ALREADY ENLISTED TO DISTRIBUTE ELDERLY PEDESTRIAN SAFETY ADVICE:

1. AMERICAN AUTOMOBILE ASSOCIATION
1000 AAA Drive
Heathrow, FL 32746-5063

Dean W. Childs
Director, Traffic
Safety Services
(407) 444-7910

2. AMERICAN ASSOCIATION OF
RETIRED PERSONS
1909 K Street, N.W.
Washington, D.C. 20049

Steve Lee
Program Specialist
Program Coordination
& Development
(202) 622-4863

3. NATIONAL SAFETY COUNCIL
444 North Michigan Avenue
Chicago, IL 60611

Harold T. Thompson
Manager
Highway Traffic Safety
Consulting Services
(312) 527-4800

ORGANIZATIONS STILL TO BE ENLISTED:

4. AMERICAN RED CROSS
Health and Safety
18th and D Streets, N.W.
5th Floor
Washington, D.C. 20006

Donna H. Feeley
Special Projects
Associate
(202) 639-3086

5. AMERICAN GERIATRICS SOCIETY
770 Lexington Avenue
Suite 300
New York, New York 10021

Jennifer Herbst
Asst Comms Director
(212) 308-1414

6. CHILDREN OF AGING PARENTS
2761 Trenton Road
Levittown, PA 19056

Mirca Liberti
Co-Executive
Director
(215) 945-6900

7.	CONSUMER INFORMATION CENTER General Services Administration 18th and F Streets, N.W. Room G142 Washington, D.C. 20405	Annette Duff (202) 501-1794
8.	COOPERATIVE EXTENSION SERVICE U.S. Department of Agriculture 14th and Independence, Room 3443-S Washington, D.C. 20250-0900	Jeanne Priester National Program Leader (202) 447-2908
9.	GRAY PANTHERS 1424 16th Street, N.W. Suite 602 Washington, D.C. 20036	Gary Christopherson Executive Director (202) 387-3111
10.	INSURANCE INFORMATION INSTITUTE Consumer Affairs 110 William Street New York, New York 10038	Jill Wolper 212) 669-9200
11.	NATIONAL ASSOCIATION FOR RETIRED CREDIT UNION PEOPLE 5910 Mineral Point Road P.O. 391 Madison, WI 53701	Philip Tschudy Executive Director (608) 238-4286
12.	NATIONAL ASSOCIATION OF RETIRED FEDERAL EMPLOYEES 1533 New Hampshire Avenue, N.W. Washington, D.C. 20036	Carolyn Leedecker Business Manager (202) 234-0832
13.	NATIONAL COUNCIL OF SENIOR CITIZENS 925 15th Street, N.W. Washington, D.C. 20005	Theresa McKenna Director Information Department (202) 347-8800
14.	NATIONAL INSTITUTE OF SENIOR CENTERS National Council on the Aging 600 Maryland Avenue, S.W. West Wing 100 Washington, D.C. 20024	Diana Porter Public Policy (202) 479-1200

15. MOTOR VEHICLE MANUFACTURERS ASSOCIATION OF THE U.S.
7430 Second Avenue
Suite 300
Detroit, MI 48202

Linda Busse
Public Relations
(313) 872-4311

16. THE RETIRED OFFICERS ASSOCIATION
201 N. Washington Street
Alexandria, VA 22314

Col Charles Cooper
Editor (Magazine)
or
Capt Donald Repass
Public Relations
(703) 549-2311

17. SUPERMARKET COMMUNICATIONS SYSTEMS, INC.
148 East Avenue
Norwalk, CT 06851

John Jones
Director, Government Relations
(203) 852-0888

18. UNIVERSITY OF MARYLAND
CENTER ON AGING
College Park, MD 20742-2611

Laura Wilson
Director
(301) 405-2469