MEMORANDUM REPORT NO. 114

TRAFFIC CONTROL STUDY FOR THE VILLAGE OF FOX POINT

MILWAUKEE COUNTY WISCONSIN

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Special acknowledgement is due Mr. Robert E. Beglinger, SEWRPC Principal Engineer, for his contribution to the preparation of this report.

MEMORANDUM REPORT
NUMBER 114

TRAFFIC CONTROL STUDY FOR THE VILLAGE OF FOX POINT

VILLAGE OF FOX POINT
MILWAUKEE COUNTY, WISCONSIN

Prepared by the

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MEMORANDUM REPORT NO. 114

TRAFFIC CONTROL STUDY FOR THE VILLAGE OF FOX POINT, MILWAUKEE COUNTY, WISCONSIN

INTRODUCTION

Officials of the Village of Fox Point have recently identified a need to have a complete inventory and study of the traffic control signing in the Village. Two general concerns were identified with respect to the existing traffic control within the Village: 1) whether the existing signs convey the appropriate traffic control information at selected locations, and 2) whether the signs conform to Federal standards for traffic signs as set forth in the Manual on Uniform Traffic Control Devices[1]. More specifically, Village officials expressed concern that the existing traffic control signing may be deficient based upon sign size and/or location, or on some other condition such as restricted intersection corner sight distance. Finally, concern was expressed about the current three traffic lane operation on N. Lake Drive (STH 32).

Accordingly, Village officials on September 14, 1992, requested the Southeastern Wisconsin Regional Planning Commission to conduct an inventory and evaluation of the existing traffic control signing in the Village and to provide recommendations for modification as appropriate.

PERCEIVED TRAFFIC CONTROL PROBLEMS

Village staff identified 50 locations at which it was perceived that the existing traffic control signing may be deficient based upon sign size and/or location, or where some other deficiency such as restricted intersection corner sight distance may exist. These locations are set forth in Table 1. In addition to

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[1]U. S. Department of Transportation, Federal Highway Administration, "Warrants for the Installation of Traffic Signals and Stop and Yield Signs," Manual on Uniform Traffic Control Devices, 1988.

Table 1

THE LOCATION OF POTENTIAL TRAFFIC CONTROL PROBLEMS
OR DEFICIENCIES IDENTIFIED BY VILLAGE OF FOX POINT STAFF: 1993

Potential Problem or Deficiency	Location
Insufficient Intersection Corner Sight Distance/ Appropriate Signing	N. Santa Monica Boulevard at E. Green Tree Road
	E. Dean Road at E. Fox Lane
	E. Bradley Road at N. Poplar Road
	E. Bradley Road at N. Links Way
	E. Good Hope Road at N. Crossway Road
	The eastbound approach to the following N. Lake Drive (STH 32) intersections:[a] • E. Acacia Road • E. Apple Tree Road • E. Daphne Road • E. Holly Court • N. Service Drive (south) • N. Service Drive (north) • E. Green Tree Road • E. Bell Road • E. Portage Road • E. Calumet Road • E. Hyde Way • N. Links Circle (south) • N. Links Circle (north) • E. Bradley Road • E. Quarles Place • E. Fox Lane • E. Churchill Lane • E. Spooner Road • E. Dean Road
	The westbound approach to the following N. Port Washington Road (CTH W) intersections: • W. Bergen Road • W. Bradley Road • W. Dean Road • W. Bayfield Road • W. Dunwood Road • N. Port Washington Court • N. Indian Creek Parkway

Table 1 (continued)

Potential Problem or Deficiency	Location
School zone signing	Village roadways adjacent to school grounds including the following: • Mapledale Elementary School • Dunwood Center • St. Eugene's Elementary School • St. John's Elementary School • Stormonth Elementary School • Milwaukee Jewish Day School
Railroad Crossing signing	All Chicago & North Western Transportation Company railroad-highway grade crossings: • E. Dean Road • E. Bradley Road • E. Calumet Road • E. Bell Road • E. Green Tree Road
Roadside Hazard signing	N. Santa Monica Boulevard structure
	East and west E. Goodrich Lane structures[b]
	Eastbound Indian Creek Parkway at Manor Lane
Horizontal/Vertical Alignment signing	Beach Drive hill from N. Lake Drive to the bottom of the hill both east- and westbound.
	N. Beach Drive (southern terminus to northern terminus)
	1400 and 1500 blocks of E. Goodrich Lane
	1700 and 1800 blocks of E. Fox Lane
	N. Bell Road at E. MacArthur Road

[a] Concern was also expressed about the current placement of the stop signs on these approaches.

[b] Following the reconstruction of these two structures in 1995, the location and type of object marker signing at the structures was found to conform to the standards set forth in the Manual on Uniform Traffic Control Devices.

Source: SEWRPC.

concerns over traffic signing and sight distance, concern was also expressed regarding the current three traffic lane operation on N. Lake Drive (STH 32). On some segments of N. Lake Drive, the outside lanes provide one traffic lane in each direction of travel with the center lane used by motorists traveling in both directions. On other segments of N. Lake Drive, the outside lanes provide one traffic lane in each direction of travel with the center lane reserved exclusively for left-turn movements. Of specific concern was whether this type of configuration is unsafe, or inappropriate.

EXISTING STREET AND HIGHWAY SYSTEM

This section presents a description of the existing street and highway system of the Village. The information presented includes the functional and jurisdictional classification of each segment of the street system, the number of through traffic lanes and exclusive turn lanes on each street segment, selected average weekday traffic volumes, and historic motor vehicle accident data for the street system.

Functional Classification

The street and highway system of a community must serve several important functions, including: providing for the free movement of through vehicular traffic; providing for access of vehicular traffic to abutting land uses; providing routes for pedestrian and bicycle traffic; and serving as the location for utilities and stormwater drainage facilities.

Because two of these functions--traffic movement and land access--are basically incompatible, street and highway system design must be based upon a functional grouping of streets and highways. The individual facilities constituting the total street and highway system of a community may be classified on the basis of the primary function served, ranging from: providing a high degree of travel mobility while providing limited access to adjacent land uses, to providing a low degree of travel mobility while providing a high degree of access to adjacent land uses. At least three functional classifications of streets and highways should be recognized; 1) arterial streets; 2) collector streets; and 3) local streets.

Arterials are defined as streets and highways which are intended to serve the through movement of fast and heavy traffic, providing transportation service between major subareas of an urban area or through the area. Together, the arterials should form an integrated, areawide system, located and designed to properly carry the imposed traffic loadings. Access to abutting property may be a secondary function of some types of arterial streets and highways, but it should always be subordinate to the primary function of traffic movement.

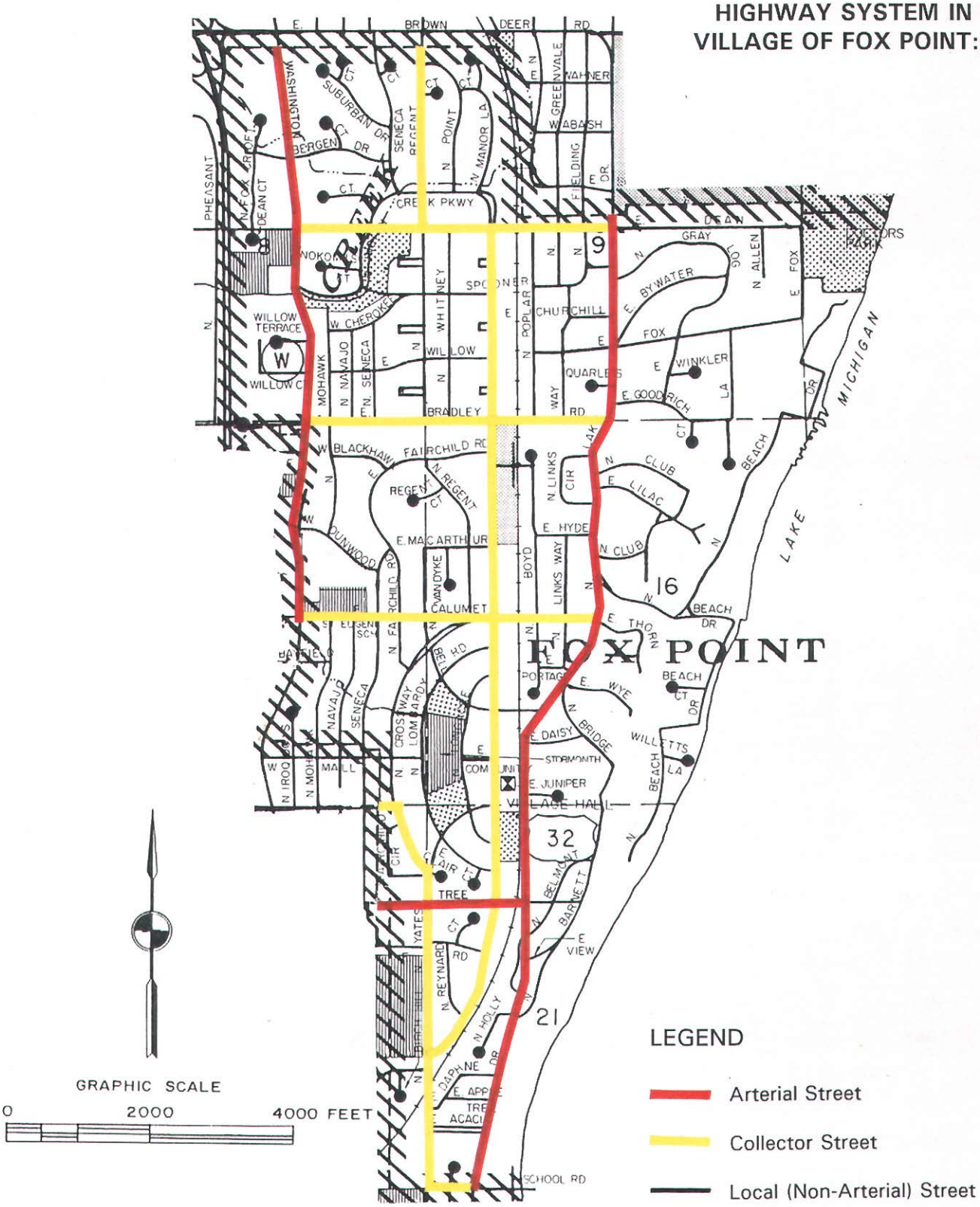
Collector streets are defined as streets and highways which are intended to serve primarily as connections between the arterial system and the land access street system. In addition to collecting and distributing traffic from and to the arterial streets, the collector streets usually provide a secondary function of providing access to abutting property.

Local streets are defined as streets and highways which are intended to serve primarily as a means of access to abutting properties, principally serving the residential areas of a community.

The arterial system for the Village identified by the Regional Planning Commission through application of the foregoing functional classification concepts is shown on Map 1. This identification involved consideration of the existing and proposed land uses to be served, facility design and spacing, current and probable future traffic volumes and trip lengths, and relation to other areawide arterials in adjacent communities. The Wisconsin Department of Transportation (WisDOT) and the Regional Planning Commission functional classification of the streets and highways in the Village concur except that the WisDOT distinguishes between principal and minor arterials. A principal arterial provides for interstate and interregional traffic mobility whereas minor arterials provide intraregional and interarea traffic mobility. It may be noted that N. Port Washington Road (CTH W) is classified as a principal arterial within the Village by the WisDOT and that N. Lake Drive (STH 32) and E. Green Tree are classified as minor arterials. Table 2 indicates the distribution of the street and highway system mileage in the Village, according to functional classification, as identified by the Regional Planning Commission and the WisDOT.

MAP 1

ARTERIAL STREET AND HIGHWAY SYSTEM IN THE VILLAGE OF FOX POINT: 1993



Source: SEWRPC.

Table 2

DISTRIBUTION OF STREET AND HIGHWAY SYSTEM MILEAGE BY FUNCTIONAL CLASSIFICATION IN THE VILLAGE OF FOX POINT: 1993

Classification	Functional Classification by the Southeastern Wisconsin Regional Planning Commission		Functional Classification by the Wisconsin Department of Transportation	
	Miles	Percent	Miles	Percent
Arterial Streets and Highways				
Principal	- -	- -	1.85	4.7
Minor	- -	- -	2.66	6.7
Subtotal	4.51	11.4	4.51	11.4
Collector	6.06	15.3	6.06	15.3
Local	29.03	73.3	29.03	73.3
Subtotal	35.09	88.6	35.09	88.6
Total	39.60	100.0	39.60	100.0

Source: Wisconsin Department of Transportation and SEWRPC.

Jurisdictional Classification

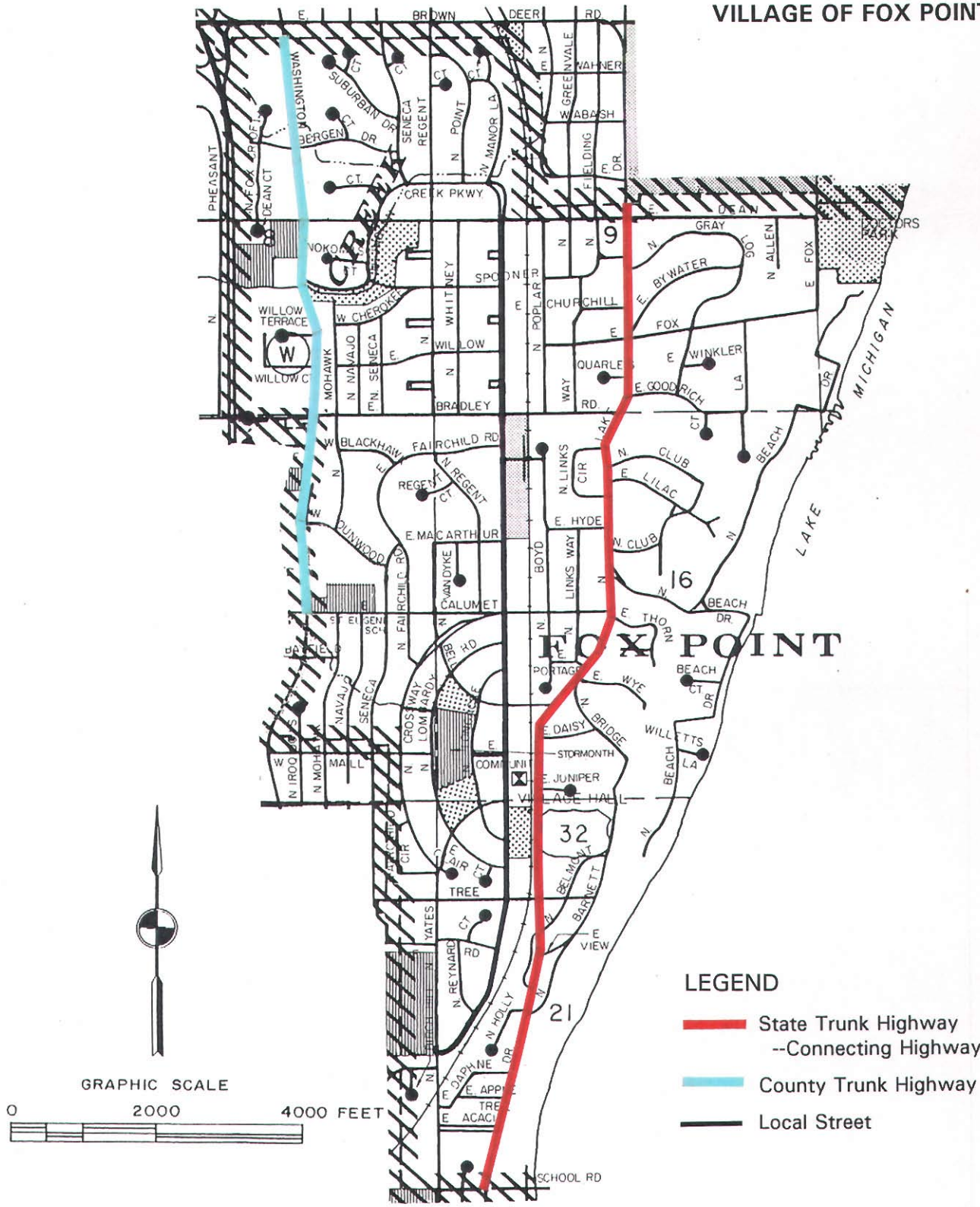
Streets and highways may also be classified according to jurisdiction. The jurisdictional classification establishes which level of government--State, county, or local--has responsibility for the design, construction, maintenance, and operation of each segment of street and highway within a community. A subcategory of state trunk highway within the corporation limits of a city or village is the connecting highway--which is a state highway marked, signed, and routed over a local street--providing for route continuity of the state trunk highway through the municipality. Responsibility for the maintenance and operation of connecting highways has been designated to the local municipality subject to review and approval by the WisDOT. The WisDOT is responsible for the improvement of connecting highways. The approval of WisDOT is required before any action may be taken by the Village which would substantially alter the use or capacity of a connecting highway. Actions requiring approval include prohibiting turning movements, modifying traffic control devices, and changing intersection geometrics. Map 2 shows the jurisdictional classification of streets in the Village for 1994. Of the 39.6 miles of streets and highways within the Village, about 1.5 miles are under the jurisdiction of Milwaukee County. The remaining 38.1 miles are under the jurisdiction of the Village although about 2.7 miles are designated connecting highway and thus subject to WisDOT review.

Traffic Lanes

All of the streets and highways in the Village have one through traffic lane in each direction except N. Lake Drive (STH 32) which has three lanes delineated by pavement markings. Two different pavement marking schemes are utilized to delineate the lanes as shown in Figure 1. Alternative pavement marking scheme 1 shown in Figure 1 is utilized to delineate the three lanes on N. Lake Drive from the south corporate limit to approximately N. Holly Court; from a point about 400 feet north of E. Green Tree Road to E. Juniper Lane; from approximately E. Beach Drive to approximately E. Hyde Way; and from E. Fox Lane to the north corporate limit. Alternative pavement marking scheme 2 shown in Figure 1 is utilized to delineate the three lanes on the intervening segments of N. Lake Drive from approximately N. Holly Court to a point about 400 feet north of E. Green Tree Road; from E. Juniper Lane to approximately E. Beach Drive; and

MAP 2

JURISDICTIONAL CLASSIFICATION OF STREETS IN THE VILLAGE OF FOX POINT: 1993

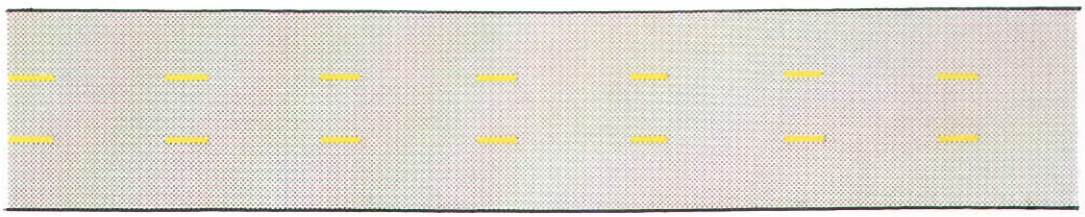


Source: SEWRPC.

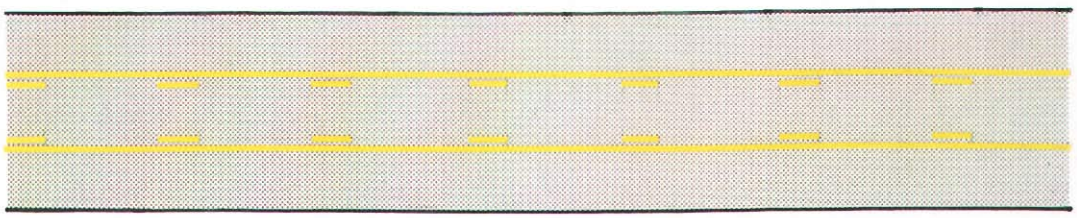
Figure 1

THE EXISTING LONGITUDINAL PAVEMENT MARKING SCHEMES ON N. LAKE DRIVE IN THE VILLAGE OF FOX POINT: 1993

Alternative Scheme One[a]



Alternative Scheme Two[b]



[a] This is the existing pavement marking scheme from the south corporate limit to N. Holly Court; from a point about 400 feet north of E. Green Tree Road to E. Juniper Lane; from E. Beach Road to E. Hyde Way; and from E. Fox Lane to the north corporate limit.

[b] This is the existing pavement marking scheme from N. Holly Court to a point about 400 feet north of E. Green Tree Road; from E. Juniper Lane to E. Beach Road; and from N. Links Circle to E. Fox Lane.

Source: SEWRPC.

from a point between E. Hyde Way and N. Links Circle on the south to a point between E. Goodrich Lane and E. Fox Lane.

Exclusive Turn Lanes

An inventory was conducted to identify all intersection approaches having exclusive turn lanes and to identify signing and pavement markings attendant to these lanes. The N. Port Washington Road (CTH W) approaches at its intersection with W. Calumet Road have been widened to provide two lanes which are separated by solid white longitudinal pavement markings. The left lane is restricted to left-turn movements only with the through and right-turn movements being made from the right lane.

At the intersection of E. Green Tree Road with N. Lake Drive (STH 32), the center lane of the N. Lake Drive has been restricted to left-turn movements only on both approaches. The southbound approach has also been widened to provide an exclusive right-turn lane which is separated from the adjacent lane by solid white longitudinal pavement markings. On this approach then, the through movements are made from the center lane of the approach, and the right-turn movements are made from the right lane. On the northbound approach, both the through and right-turn movements are made from the right lane.

It has been previously noted that the pavement markings on segments of N. Lake Drive restrict the center lane to left-turn movements. As a result, the center lane tends to function similar to an exclusive left-turn lane to the extent that left-turning traffic is provided a refuge from which to execute the left-turn and is separated from through- and right-turning traffic. This situation exists at the following N. Lake Drive intersections: 1) N. Barnett Lane; 2) View Place; 3) N. Belmont Lane; 4) E. Juniper Lane; 5) E. Daisy Lane; 6) E. Bell Road; 7) Bridge Lane; 8) E. Wye Lane; 9) E. Thorn Lane; 10) E. Calumet Road; 11) N. Links Circle; 12) E. Bradley Road; and 13) E. Goodrich Lane.

However, because of the pavement marking scheme employed and a lack of appropriate regulatory signing, motorists are not required to execute a left-turn from the center lane at any of the intersections identified above as they would be if an exclusive left-turn lane was marked and signed. Thus, while the center lane may function as an exclusive left-turn lane at these intersections, because

motorists are not required to execute the left-turn at the intersection and because motorists may enter the center lane at any point from either direction, it should not be considered an exclusive left-turn lane.

Traffic Volumes

Within the Village, N. Port Washington Road (CTH W) has the highest average weekday traffic (AWDT) averaging between 13,300 and 15,000 vehicles as shown on Map 3. The roadway carrying the second highest volume of traffic is N. Lake Drive (STH 32) which averages between 7,500 and 10,300 AWDT. The next two heaviest traveled roadways are E. Green Tree Road and N. Yates Road, both located in the southern portion of the Village and both carrying between 5,600 and 5,900 AWDT.

Traffic Accidents

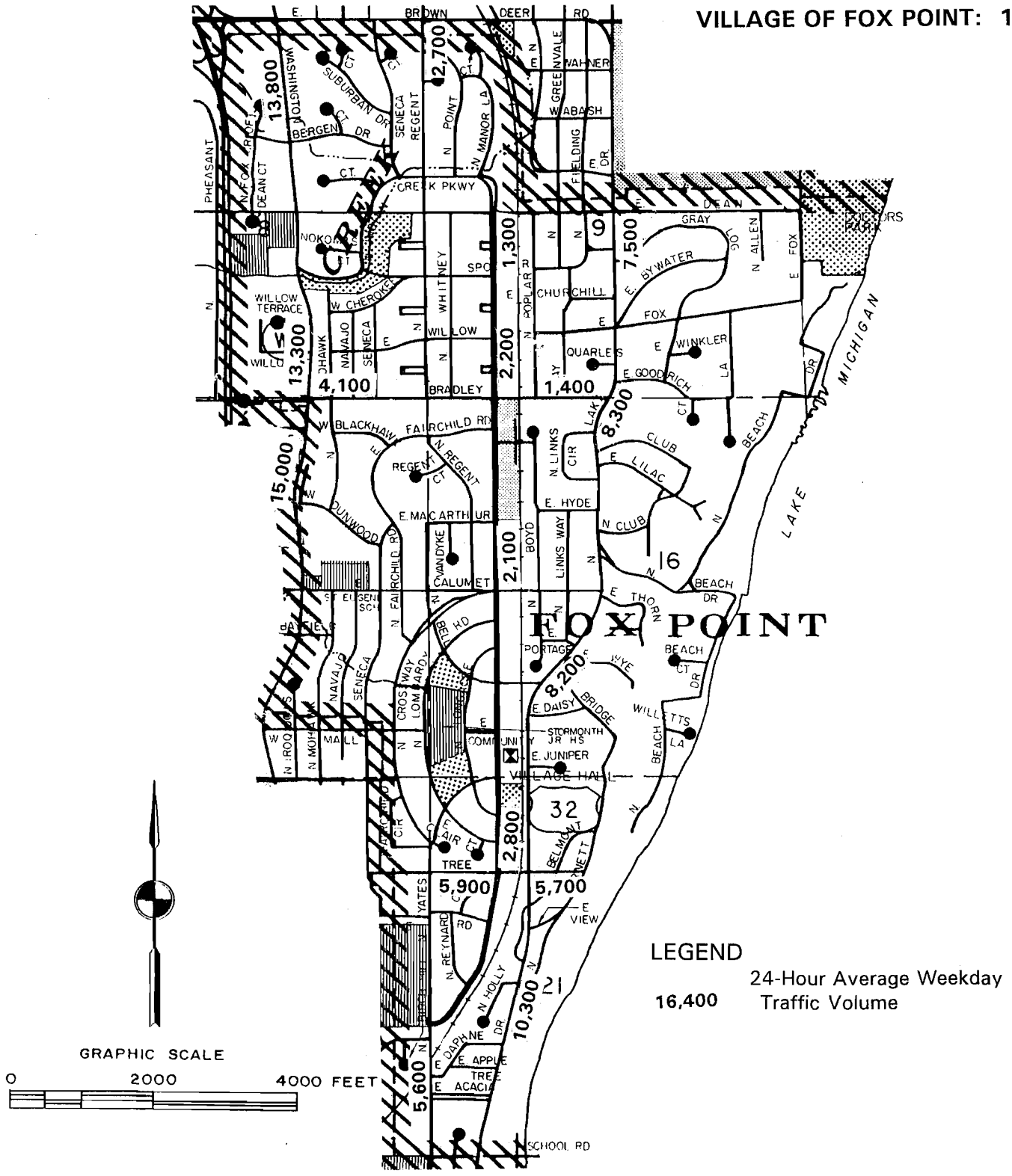
The incidence of traffic accidents is a measure of the efficiency and operating characteristics of the street and highway system. Locations with a history of multiple accidents may indicate a need for additional traffic control devices. Accordingly, historic motor vehicle accident data was reviewed for the period January 1, 1991, through September 30, 1994. There were a total of 59 on-street accidents in 1991, 69 in 1992, 62 in 1993, and 48 in the first nine months of 1994 within the Village. While three or more motor vehicle accidents were reported in a year at the six intersections shown in Table 3, only one of these intersections have experienced three or more motor vehicle accidents each year. In total, over the three and three-quarter year period reviewed, 47 accidents occurred at the six intersections, or about 20 percent of all motor vehicle accidents.

The location at which the greatest number of accidents occurred during the time period reviewed was the intersection of N. Port Washington Road (CTH W) and W. Bradley Road, one of the intersections identified by the Village staff for evaluation by the Commission staff.

In addition to identifying multiple motor vehicle accident locations, the historic motor vehicle accident experience on the 2.7 mile segment of N. Lake Drive through the Village was specifically reviewed to determine if the pavement marking schemes may be contributing to the incidence of motor vehicle accidents

MAP 3

24-HOUR AVERAGE WEEKDAY TRAFFIC VOLUMES ON SELECTED STREETS IN THE VILLAGE OF FOX POINT: 1992



LEGEND

16,400 — 24-Hour Average Weekday Traffic Volume

GRAPHIC SCALE

0 2000 4000 FEET

Source: Wisconsin Department of Transportation and SEWRPC.

Table 3

INTERSECTIONS EXPERIENCING THREE OR MORE MOTOR VEHICLE ACCIDENTS IN A YEAR IN THE VILLAGE OF FOX POINT: JANUARY 1, 1991 TO SEPTEMBER 30, 1994

Intersection	Number of Accidents				Identified as Potential Problem Location by Village Staff
	January 1, Through December 31, 1991	January 1, Through December 31, 1992	January 1, Through December 31 1993	January 1, Through September 30, 1994	
N. Lake Drive (STH 32) At E. Bradley Road	--	--	2	3	No
N. Lake Drive (STH 32) At E. Green Tree Road	2	2	3	2	No
N. Lake Drive (STH 32) At E. Quarles Place	--	3	1	--	No
N. Lake Drive (STH 32) At E. Dean Road	--	1	--	3	No
N. Port Washington Road (CTH W) At E. Bradley Road	6	6	4	3	Yes
N. Santa Monica Boulevard At E. Bradley Road	--	2	3	1	No
Total	8	14	13	12	

Source: Wisconsin Department of Transportation, Division of Motor Vehicles, and SEWRPC.

on that facility. A total of 70 motor vehicle accidents, or 29 percent of all accidents in the Village, occurred on N. Lake Drive between January 1, 1991, through September 30, 1994. Of the 70 accidents, 21 occurred at intersections at which three or more accidents occurred in a year and which are addressed separately. The remaining 49 accidents which occurred on N. Lake Drive, account for about 21 percent of all accidents within the Village from January 1, 1991, to September 30, 1994. Of the remaining 49 accidents, 31, or about 63 percent, occurred at intersections and 18 accidents, or about 37 percent occurred at non-intersection or mid-block locations. No more than two accidents occurred at any location in a single year. It may be noted that 28 of the 49 accidents or about 57 percent, involved only one vehicle, and that 15 of the 28 single vehicle accidents, or about 54 percent, were motor vehicle-deer collisions.

Summary

This section summarizes the inventories of selected street and highway system characteristics conducted in the Village of Fox Point. Of the 39.6 miles of streets and highways within the Village, about 4.5 miles are functionally classified as arterials, about 6.1 miles are classified as collectors, and the remaining approximately 29.0 miles are local streets. A total of about 1.4 miles of streets and highways within the Village are under the jurisdiction of Milwaukee County, and about 38.2 miles are under the jurisdiction of the Village. Of the 38.2 miles under the jurisdiction of the Village, about 2.7 miles are designated connecting highway miles over which STH 32 is routed through the Village.

Two through traffic lanes are provided on all streets and highways, one lane for each direction of travel, with the exception of segments of N. Lake Drive (STH 32) on which three lanes have been provided. Other segments of N. Lake Drive have one through traffic lane in each direction, separated by a two-way left-turn lane in the center. Exclusive left-turn lanes are provided on the N. Lake Drive approaches at its intersection with E. Green Tree Road, and on N. Port Washington Road (CTH W) approaches at its intersection with W. Calumet Road. An exclusive right-turn is provided on the southbound approach of N. Lake Drive at its intersection with E. Green Tree Road.

Average weekday traffic volume data from 1992 was collated for selected arterial and collector facilities. Average weekday traffic volumes in the Village ranged from 1,300 to 15,000 vehicles with the highest traffic volumes on N. Port Washington Road.

A three and three-quarter year traffic accident history--January 1, 1991, to September 30, 1994--for Village streets and highways was collated and analyzed. A total of 56 on-street accidents occurred in 1991, 67 in 1992, 64 in 1993, and 51 during the first nine months of 1994. Locations at which multiple accidents occurred each year were identified and included six intersections, four on N. Lake Drive and one each on N. Santa Monica Boulevard and on N. Port Washington Road. In addition to the intersections already identified, the accident history also shows that the entire segment of N. Lake Drive through the Village experiences multiple accidents each year. However, nearly all of those accidents occurred at unique locations.

EXISTING TRAFFIC CONTROL MEASURES

This section describes the inventory of traffic control devices in the Village, including information on traffic signals, regulatory and warning signs, and speed limits on the Village's streets and highways. This information, together with the information on the physical characteristics of the street and highway systems and the traffic control criteria presented in the next section of the report provides a basis for identifying and resolving the traffic problems in the Village.

Traffic control measures have a direct effect on the capacity, operating characteristics, and safety of a roadway facility. The principal traffic control measures that should be inventoried include traffic signals, stop signs and yield signs, school zone signs, railroad crossing signs and control devices turn prohibition signs, and speed limit signs. Because of the concern expressed related to roadway horizontal alignment at various sites throughout the Village, warning signing related to the horizontal alignment changes at those sites was also inventoried.

Intersection Traffic Control Signals and Signing

An inventory of existing traffic control signing in the Village was conducted. The inventory included the number, location, and placement at each location of "STOP" and "YIELD" regulatory signs, as well as certain warning signs. Data were collected with respect to the height of the posted signs. Based on the inventory there are 114 stop signs, and 49 yield signs in the Village. Map 4 shows the location of all traffic signals, stop signs, and yield signs in the Village. Three intersections in the Village were controlled by traffic signals, 83 intersections were stop sign controlled on one or more approach, and 31 intersections were controlled by yield signs on one or more approach. Eighty-five intersections were uncontrolled.

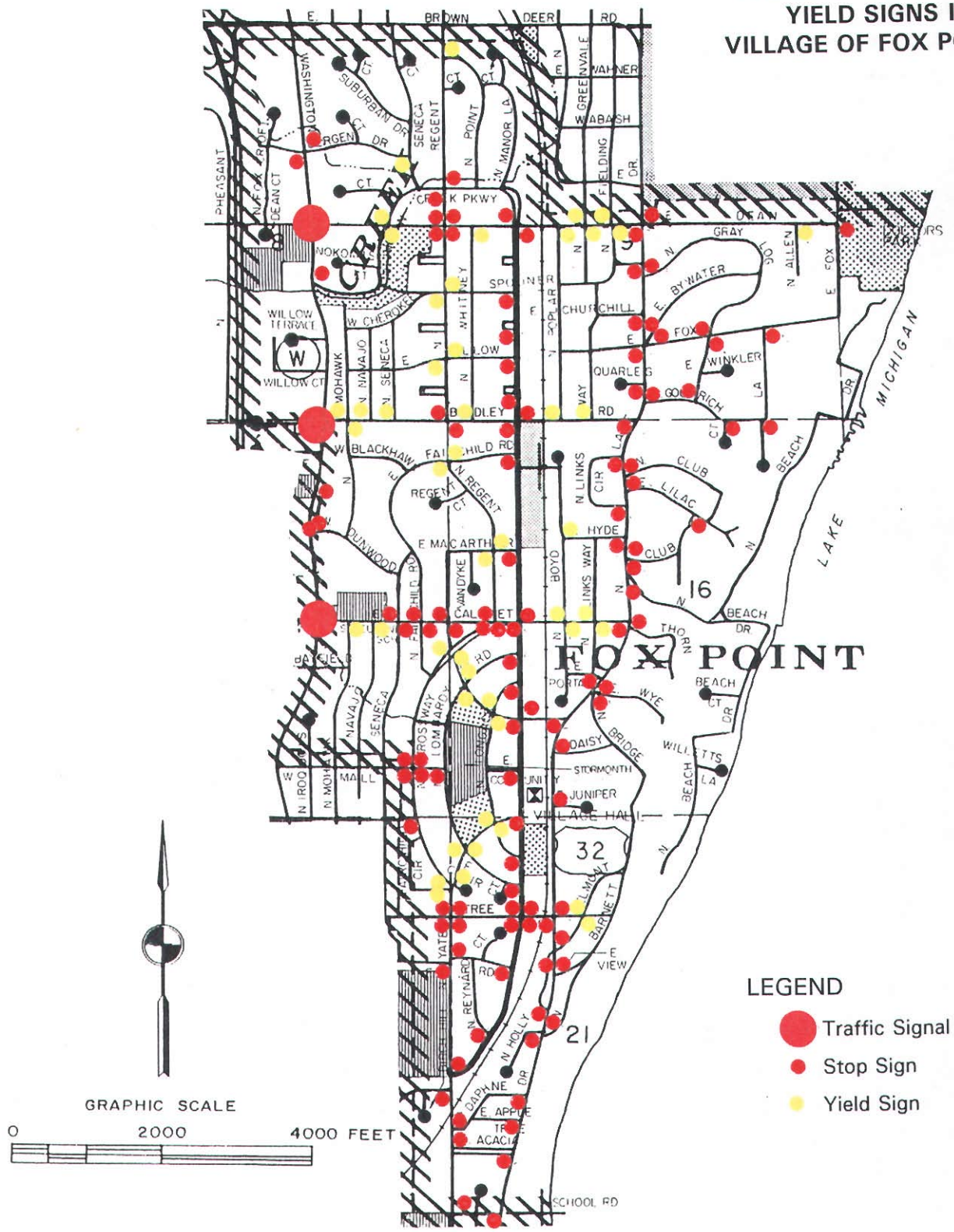
Regulatory signs with the message "CENTER LANE MUST TURN LEFT" are posted in advance of the N. Port Washington Road (CTH W) intersection with W. Calumet Road on both the north- and southbound approaches and at the intersection on the southbound approach. A regulatory sign is posted at the intersection on the northbound approach containing the pictographic message that vehicles in the left lane must turn left, and that vehicles in the right lane may proceed straight ahead or turn right.

A regulatory sign with the message "CENTER LANE MUST TURN LEFT" is posted in advance of the E. Green Tree Road intersection with N. Lake Drive (STH 32) on both the north- and southbound intersection approaches. In addition, pavement word markings with the message "LEFT TURN ONLY" have been applied in the left-turn lanes on both approaches.

A regulatory sign with the message "CENTER LANE MUST TURN LEFT" is posted in advance of the E. Bradley Road intersection with N. Lake Drive on the northbound intersection approach. In addition, pavement word markings with the message "LEFT TURN ONLY" have been applied in the center lane on the northbound approach. It may be noted that there is no southbound left turn lane at this intersection as E. Bradley Road terminates at N. Lake Drive and thus there is no need for appropriate signing or pavement markings on the southbound approach.

MAP 4

LOCATION OF TRAFFIC SIGNALS, STOP SIGNS, AND YIELD SIGNS IN THE VILLAGE OF FOX POINT: 1993



Source: SEWRPC.

Intersection Corner Sight Distance

Village staff expressed concern that insufficient intersection corner sight distance may not be available at 31 intersections--see Table 1--throughout the Village. It may be noted that with three exceptions--N. Poplar Road and N. Links Way at E. Bradley Road and N. Fox Lane at E. Dean Road--the intersections identified are intersections between local or collector streets and arterial streets, and thus are traffic controlled. At these 28 intersections between local or collector and arterial streets the corner sight distances required must provide the required safe stopping sight distances. The safe stopping sight distance requires a clear line of sight from a position on the controlled roadway approach ten feet from the intersecting roadway to a point 250 feet from the intersection on the intersecting roadway for 25 mile per hour speed limits and 350 feet for 35 mile per hour speed limits[2]. As shown in Table 1, nineteen of the 28 are with N. Lake Drive (STH 32), seven of the 28 are with N. Port Washington Road (CTH W) and the two remaining intersections are E. Good Hope Road at N. Crossway Road and N. Santa Monica Boulevard at E. Green Tree Road.

As previously noted, all approaches on the nineteen arterial, collector or land access streets intersecting N. Lake Drive are currently traffic controlled. In addition to the concern that adequate sight distance be available on the eastbound approaches of these streets, the Village staff expressed concern that the stop signs may be located incorrectly due to the bituminous path parallel to and approximately 20 to 25 feet west of N. Lake Drive. The location prescribed for the stop signs in the Uniform Manual is four feet from the edge of the path furthest from the roadway. Thus, all stop signs are correctly located except at the following N. Lake Drive intersections: 1) E. Holly Court; 2) the northern N. Service Drive intersection; and 3) E. Green Tree Road.

Plant materials immediately adjacent to the west edge of the path and/or between the path and the roadway at selected locations screen the motorist's view of N. Lake Drive until after the motorist has crossed the bituminous path when the stop sign is correctly located four feet from the back of the path. The available

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[2] Appropriate adjustments in the required sight distances must be made when the known 85th percentile speed is 10 miles per hour greater than the posted speed limit. The 85th percentile speed is that speed at which 85 percent of all vehicles in the traffic stream on a roadway travel at or below.

sight distance from the intersecting street approaches is less than the safe stopping sight distance of 350 feet at the following N. Lake Drive intersections shown in Table 4. Based upon staff observation, the available sight distance from the prescribed point on the controlled approaches is also less than the required distance on the intersecting roadway at these additional arterial and collector or land access intersections: 1) N. Santa Monica Boulevard at E. Green Tree Road; 2) E. Bradley Road at N. Poplar Road; 3) the westbound approaches to N. Port Washington Road at W. Port Washington Court, and at W. Indian Creek Parkway.

In addition to reviewing the stopping sight distance available from the eastbound approaches of facilities intersecting N. Lake Drive, because of the heavy vegetation on the east side of N. Lake Drive throughout the Village, the stopping sight distance available from the westbound approaches was also reviewed. From a position 10 feet back of the edge of N. Lake Drive the available stopping sight distance on the westbound approaches was generally acceptable. The stopping sight distance to the north is deficient, however, from the westbound approach of the following intersecting streets: 1) E. Dean Road; 2) E. Bywater Lane; 3) Club Circle N.; 4) N. Beach Drive; and, 5) E. Daisy Lane. The stopping sight distance to the south is deficient from the westbound approach of these intersecting streets: 1) E. Gray Log Lane; 2) E. Fox Lane; 3) Club Circle N.; and, 4) E. Daisy Lane.

Of the original 31 intersections identified by Village staff as potentially having inadequate sight distance, the sight distance assessment of all but three has been presented. Two of the three remaining intersections--N. Poplar Road and N. Links Way at E. Bradley Road--are intersections between collector and land access streets and the third--N. Fox Lane at E. Dean Road--is an intersection between two land access streets. The corner sight distances at the intersection of the two local streets were evaluated to determine if the appropriate control is in place based upon the criteria set forth in the next section which suggest clear vision triangles of 200 feet for no control; yield control for clear vision triangles greater than 125 but less than 200 feet; and stop control for vision triangles less than 125 feet along each intersecting roadway dependent upon the accident history. For vision triangles of less than 40 feet, stop control is warranted regardless of the accident history. The corner sight distances at all

Table 4

ASSESSMENT OF AVAILABLE SIGHT DISTANCE ON THE EASTBOUND INTERSECTION APPROACHES TO N. LAKE DRIVE (STH 32) IN THE VILLAGE OF FOX POINT: 1994

Intersection Approaches	Stop Sign Placement[a]	Adequate Stopping Sight Distance[b]	
		To the North	To the South
E. Acacia Road	Behind the Path	Yes	No[c]
E. Apple Tree Road	Behind the Path	No[d]	No[c]
E. Daphne Road	Behind the Path	No[d]	Yes
E. Holly Court	Between the Path and N. Lake Drive	No[d,e]	Yes
N. Service Drive (south)	Behind the Path	Yes	Yes
N. Service Drive (north)	Between the Path and N. Lake Drive	Yes	Yes
E. Green Tree Road	Between the Path and N. Lake Drive	Yes	No[e,f]
E. Bell Road	Behind the Path	Yes	No[e,f]
E. Portage Road	Behind the Path	Yes	No[c,e]
E. Calumet Road	Behind the Path	No[d]	No[c]
E. Hyde Way	Behind the Path	No[d]	No[c]
N. Links Circle (south)	Behind the Path	No[d]	No[c]
N. Links Circle (north)	Behind the Path	No[d]	Yes
E. Bradley Road	Behind the Path	No[d]	No[e,f]
E. Quarles Place	Behind the Path	Yes	No[c]
E. Fox Lane	Behind the Path	No[d]	No[c]
E. Churchill Lane	Behind the Path	Yes	No[c]
E. Spooner Road	Behind the Path	Yes	No[c]
E. Dean Road	Behind the Path	No[d]	Yes

[a] The Manual on Uniform Traffic Control Devices, 1988, prescribes that the stop sign be placed four feet from the non-roadway edge of the sidewalk or path thereby requiring motorists to stop before crossing the sidewalk. The phrase "Behind the Path" in this Table indicates that the stop sign on this intersection approach is located in such a manner as to require that motorists stop before crossing the path.

[b] There should be a minimum of 350 feet of unobstructed vision.

[c] Vegetation restricts the sight distance to the south to less than 350 feet.

[d] Vegetation restricts the sight distance to the north to less than 350 feet.

[e] Sight distance within 350 of the intersection is partially obstructed but is clear both upstream and downstream of the obstruction.

[f] A bus shelter partially restricts the sight distance to the south to less than 350 feet.

Source: SEWRPC.

three intersections were evaluated to determine whether the required safe stopping sight distances were available.

Based upon staff observation, the use of stop sign control at the N. Fox Lane intersection with E. Dean Road is warranted. Further, the available sight distance from the prescribed point on the controlled approaches is less than 250 feet on the intersecting roadway at these intersections.

Finally, the intersection corner sight distances at those intersections within the Village which are currently uncontrolled to determine whether or not the installation of traffic control based on the criteria for such control and the available vision triangles was appropriate. It may be noted that with seven exceptions, the uncontrolled intersections within the Village are intersections between two land access streets. These intersections are between land access street and collector street within the Village and include: N. Regent Drive at Regent Court North; N. Crossway Road at N. Fairchild Circle; and N. Santa Monica Boulevard at Santa Monica Court No. 1 (north); Santa Monica Court No. 2 (north); Santa Monica Court No. 3 (north and south); and E. School Road at N. Berkeley Boulevard. Traffic control at these intersections is governed by criteria related to the control of intersections at differing levels within the street hierarchy not by available sight distance criteria. Thus, the available vision triangles were not reviewed at these intersections. The land access street intersections are shown in Table 5.

As previously noted, stop sign control may be appropriate at the intersection of two land access streets when the unobstructed vision triangle is less than 125 feet on both approach legs, yield control may be appropriate when the unobstructed vision triangle is between 125 and 200 feet, and no control is appropriate when the unobstructed vision triangle exceeds 200 feet dependent upon the accident history. It should be note, however, that stop control is warranted when the vision triangle is less than 40 feet regardless of the accident history. It may be noted that the analysis determined whether or not existing vision triangles met the prescribed criteria, but did not determine the actual size of the vision triangle.

Table 5

LAND ACCESS STREET INTERSECTIONS WITHOUT
TRAFFIC CONTROL IN THE VILLAGE OF FOX POINT: 1994

Number	Intersection	Existing Traffic Control	Less Than 200 Feet
1.	E. Apple Tree Road with E. Daphne Road	Uncontrolled	Yes
2.	N. Barnett Lane with E. Green Tree Road	Uncontrolled	Yes
3.	N. Barnett Lane with N. View Place	Uncontrolled	Yes
4.	N. Barnett Lane with N. Belmont Lane	Uncontrolled	Yes
5.	W. Bayfield Avenue with N. Mohawk Road	Uncontrolled	Yes
6.	N. Beach Drive with N. Beach Court	Uncontrolled	Yes
7.	N. Beach Drive with N. Beach Drive (east)[a]	Uncontrolled	Yes
8.	N. Beach Drive with N. Beach Drive (west)[a]	Uncontrolled	Yes
9.	N. Beach Drive bifurcation north of N. Beach Drive[a]	Uncontrolled	Yes
10.	N. Beach Drive bifurcation east of N. Lake Drive (STH 32)[b]	Uncontrolled	Yes
11.	N. Beach Road with Willetts Lane	Uncontrolled	Yes
12.	W. Bergen Drive with W. Bergen Court	Uncontrolled	Yes
13.	W. Bergen Drive with N. Fox Croft Lane	Uncontrolled	Yes
14.	N. Birch Hill Court with E. Clovernook Lane	Uncontrolled	Yes
15.	W. Blackhawk Road with N. Fairchild Road	Uncontrolled	Yes
16.	W. Blackhawk Road with N. Mohawk Road	Uncontrolled	Yes
17.	N. Boyd Way with E. Portage Road	Uncontrolled	Yes
18.	N. Bridge Lane with E. Daisy Lane	Uncontrolled	Yes
19.	E. Bywater Lane with N. Gray Log Lane	Uncontrolled	Yes
20.	W. Cherokee Circle with N. Mohawk Road	Uncontrolled	Yes
21.	W. Cherokee Circle with N. Navajo Road	Uncontrolled	Yes
22.	W. Cherokee Circle with N. Seneca Road	Uncontrolled	Yes
23.	W. Cherokee Circle with W. Spooner Road	Uncontrolled	Yes
24.	E. Churchhill Lane with N. Links Way (north)[c]	Uncontrolled	Yes
25.	E. Churchhill Lane with N. Links Way (south)[c]	Uncontrolled	Yes
26.	E. Churchhill Lane bifurcation east of N. Links Way[c]	Uncontrolled	Yes
27.	N. Club Circle with E. Lilac Lane (west)[d]	Uncontrolled	Yes
28.	N. Club Circle bifurcation south of E. Lilac Lane[d]	Uncontrolled	Yes
29.	E. Club Circle with N. Merrie Lane (east)[e]	Uncontrolled	Yes
30.	E. Club Circle with N. Merrie Lane (west)[e]	Uncontrolled	Yes
31.	E. Coleman Lane with E. Thorn Lane	Uncontrolled	Yes
32.	E. Community Place with N. Longacre Road	Uncontrolled	Yes
33.	N. Crossway Road with N. Fairchild Road	Uncontrolled	Yes
34.	W. Dean Road with N. Fox Croft Lane	Uncontrolled	Yes
35.	W. Dunwood Road with N. Mohawk Road	Uncontrolled	Yes
36.	W. Dunwood Road with N. Seneca Road	Uncontrolled	Yes
37.	N. Fairchild Road with W. Fairchild Court	Uncontrolled	No
38.	N. Fairchild Road with N. Seneca Road	Uncontrolled	Yes
39.	E. Fox Lane with N. Links Way	Uncontrolled	Yes

Table 5 (continued)

Number	Intersection	Existing Traffic Control	Less Than 200 Feet
40.	E. Fox Lane with N. Poplar Drive	Uncontrolled	Yes
41.	E. Fox Dale Road with E. Fox Dale Court	Uncontrolled	Yes
42.	E. Fox Dale Road with N. Reynard Road	Uncontrolled	Yes
43.	N. Gray Log Lane with E. Winkler Lane	Uncontrolled	Yes
44.	N. Greenvale Road with E. Spooner Road (east)[f]	Uncontrolled	Yes
45.	N. Greenvale Road with E. Spooner Road (west)[f]	Uncontrolled	Yes
46.	N. Greenvale Road bifurcation north of E. Spooner Road[f]	Uncontrolled	Yes
47.	E. Hyde Way with N. Links Way	Uncontrolled	Yes
48.	N. Indian Creek Parkway with W. Indian Creek Court	Uncontrolled	Yes
49.	N. Indian Creek Parkway with N. Manor Lane	Uncontrolled	Yes
50.	N. Indian Creek Parkway with W. Nokomis Court	Uncontrolled	Yes
51.	N. Indian Creek Parkway with N. Point Drive	Uncontrolled	No
52.	N. Indian Creek Parkway with N. Seneca Road	Uncontrolled	Yes
53.	N. Links Way with E. Portage Road	Uncontrolled	Yes
54.	N. Links Way with E. Spooner Road (northeast)[g]	Uncontrolled	Yes
55.	N. Links Way with E. Spooner Road (southeast)[g]	Uncontrolled	Yes
56.	N. Links Way with E. Spooner Road (west)	Uncontrolled	Yes
57.	N. Lombardy Road with N. Lombardy Court	Uncontrolled	Yes
58.	E. MacArthur Road with N. Van Dyke Road	Uncontrolled	Yes
59.	N. Manor Lane with N. Manor Court	Uncontrolled	Yes
60.	N. Manor Lane with N. Point Drive	Uncontrolled	Yes
61.	N. Merrie Lane bifurcation south of E. Club Circle[e]	Uncontrolled	Yes
62.	N. Mohawk Road with W. Willow Road	Uncontrolled	Yes
63.	N. Navajo Road with W. Willow Road	Uncontrolled	Yes
64.	N. Poplar Drive with E. Spooner Road	Uncontrolled	Yes
65.	N. Regent Road with Regent Court South	Uncontrolled	Yes
66.	N. Regent Court with N. Regent Court No. 1-North	Uncontrolled	Yes
67.	N. Regent Court with N. Regent Court No. 1-South	Uncontrolled	Yes
68.	N. Regent Court with N. Regent Court No. 2-North	Uncontrolled	Yes
69.	N. Regent Court with N. Regent Court No. 2-South	Uncontrolled	Yes
70.	N. Regent Court with N. Regent Court No. 3-North	Uncontrolled	Yes
71.	N. Regent Court with N. Regent Court No. 3-South	Uncontrolled	Yes
72.	N. Seneca Road with N. Seneca Court	Uncontrolled	Yes
73.	N. Seneca Road with W. Suburban Drive	Uncontrolled	Yes
74.	N. Seneca Road with W. Willow Road	Uncontrolled	Yes
75.	E. Spooner Road bifurcation east of N. Links Way[g]	Uncontrolled	Yes
76.	E. Spooner Road with N. Whitney Road	Uncontrolled	Yes
77.	W. Suburban Drive with W. Suburban Court	Uncontrolled	Yes
78.	E. Willow Road with N. Whitney Road	Uncontrolled	Yes

Footnotes to Table 5

[a] The north leg of the N. Beach Drive intersection with N. Beach Drive bifurcates approximately 75 feet north of N. Beach Drive effectively creating three intersections; two intersections between N. Beach Drive and the bifurcated N. Beach Drive--identified in preceding Table entries as "east" and "west"--and the third intersection at the point where N. Beach Drive splits into two legs about 75 feet north of N. Beach Drive. Each of these intersections is currently uncontrolled.

[b] N. Beach Drive bifurcates approximately 50 feet east of N. Lake Drive (STH 32) effectively creating three intersections; two intersections between N. Lake Drive and N. Beach Drive, and the third intersection at the point where N. Beach Drive splits into two legs about 50 feet east of N. Lake Drive. The N. Lake Drive intersections are currently "STOP SIGN" controlled, the intersection at the bifurcation is currently uncontrolled.

[c] E. Churchill Lane bifurcates approximately 60 feet east of N. Links Way effectively creating three intersections; two intersections between N. Links Way and the bifurcated E. Churchill Lane--identified in preceding Table entries as "north" and "south"--and the third intersection at the point where E. Churchill Lane splits into two legs about 60 feet east of N. Links Way. Each of these intersections is currently uncontrolled.

[d] N. Club Circle bifurcates approximately 40 feet south of E. Lilac Lane effectively creating three intersections; two intersections between E. Lilac Lane and the bifurcated N. Club Circle--the western intersection is identified in a preceding Table entry as "west"--and the third intersection at the point where N. Club Circle splits into two legs about 40 feet south of E. Lilac Lane. The "east" intersection--is currently "STOP SIGN" controlled and does not appear in this Table; the "east" intersection and the intersection at the point of bifurcation are currently uncontrolled.

[e] N. Merrie Lane bifurcates approximately 60 feet south of E. Club Circle effectively creating three intersections; two intersections between E. Club Circle and the bifurcated N. Merrie Lane--identified in preceding Table entries as "east" and "west"--and the third intersection at the point where N. Merrie Lane splits into two legs about 60 feet south of E. Club Circle. Each of these intersections is currently uncontrolled.

[f] N. Greenvale Road bifurcates approximately 40 feet north of E. Spooner Road effectively creating three intersections; two intersections between E. Spooner Road and the bifurcated N. Greenvale Road--identified in preceding Table entries as "east" and "west"--and the third intersection at the point where N. Greenvale Road splits into two legs about 40 feet north of E. Spooner Road. Each of these intersections is currently uncontrolled.

[g] E. Spooner Road bifurcates approximately 60 feet east of N. Links Way effectively creating three intersections; two intersections between N. Links Way and the bifurcated E. Spooner Road--identified in preceding Table entries as "northeast" and "southeast"--and the third intersection at the point where E. Spooner Road splits into two legs about 60 feet east of N. Links Way. Each of these intersections is currently uncontrolled.

Source: SEWRPC.

School Zone Signing

An inventory was conducted to identify all school zone signing on Village streets which are adjacent to school grounds where grades kindergarten through 12 are taught regularly during the normal school year. The grounds of five schools, St. Eugene's Elementary School, St. John's Lutheran Elementary School, Mapledale Elementary School, the Milwaukee Jewish Day School, and Stormonth Elementary School abut streets within the Village of Fox Point. Map 5 shows the location of all school grounds which require school zone signing on roadways within the Village. Figures 2 through 5 show the locations of all school advance, school crossing, and school zone speed limit signs within the Village.

In addition to the schools identified above, Cardinal Stritch College abuts N. Yates Road between N. Santa Monica Boulevard and E. Fox Dale Road. Advance school warning signs are posted facing north- and southbound N. Santa Monica Boulevard traffic and facing southbound N. Yates Road traffic in the vicinity of the College. No other school zone signing is currently posted in the vicinity of the College.

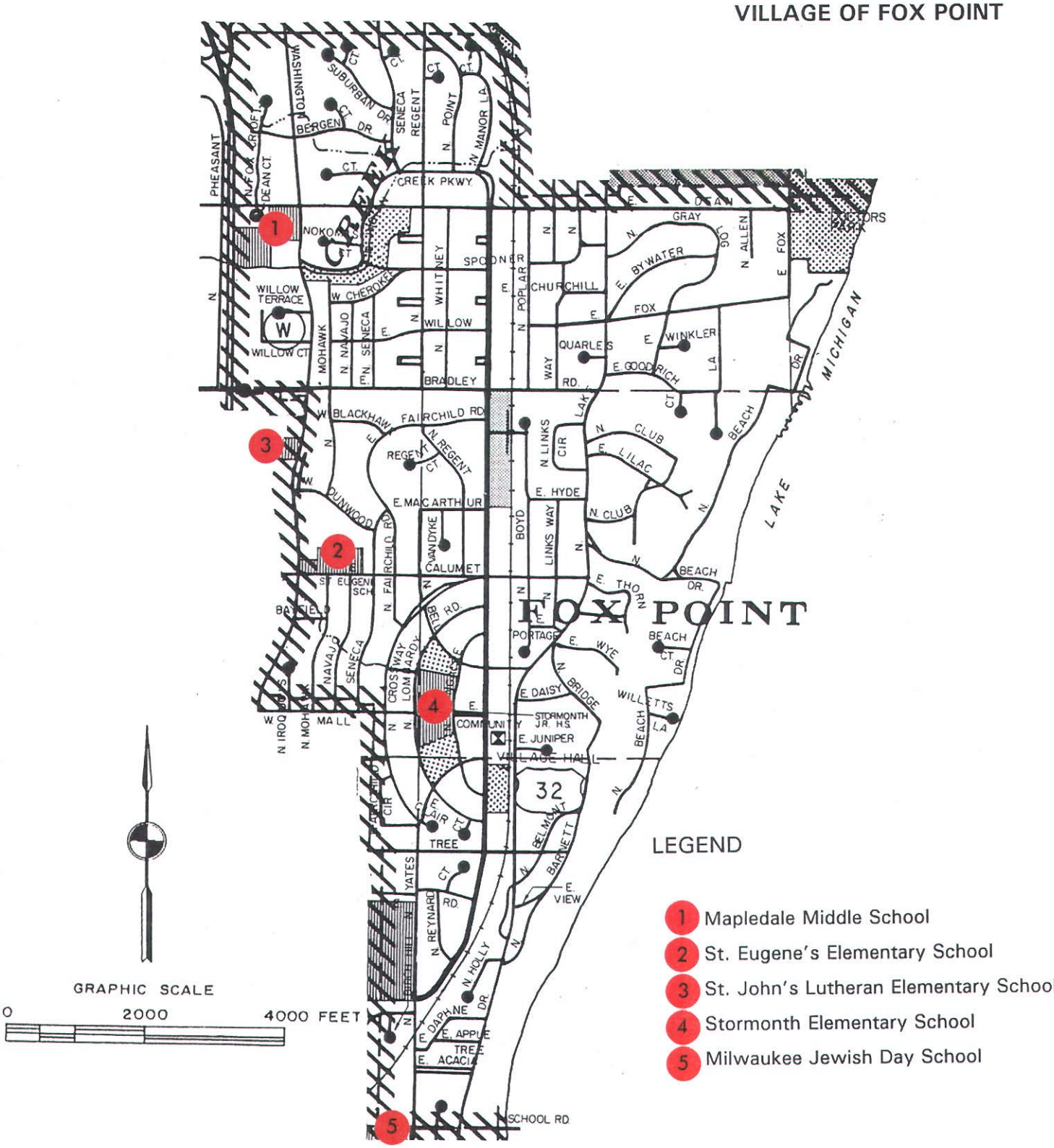
Railroad Crossing Signs

There are five railroad-highway grade crossings in the Village at E. Dean Road, E. Bradley Road, E. Calumet Road, E. Bell Road, and E. Green Tree Road. Based on the inventory of existing regulatory and warning signing related to these crossings, "RAILROAD CROSSING" regulatory signs are posted on each street approach at all five crossings. This regulatory signing is supplemented on each street approach by "Flashing Light Signals" which begin operation when a train approaches the intersecting street. The flashing light signals serve to warn motorists of the approach of a train.

"Railroad" advance warning signs are also posted on all street approaches at all five railroad-highway grade crossings except the westbound approach on E. Green Tree Road where no advance warning signing is currently provided. It may be noted that the distance between the near rail of the trackage and N. Lake Drive (STH 32) which parallels the trackage is less than that required between the advance warning sign and the near rail of the trackage.

MAP 5

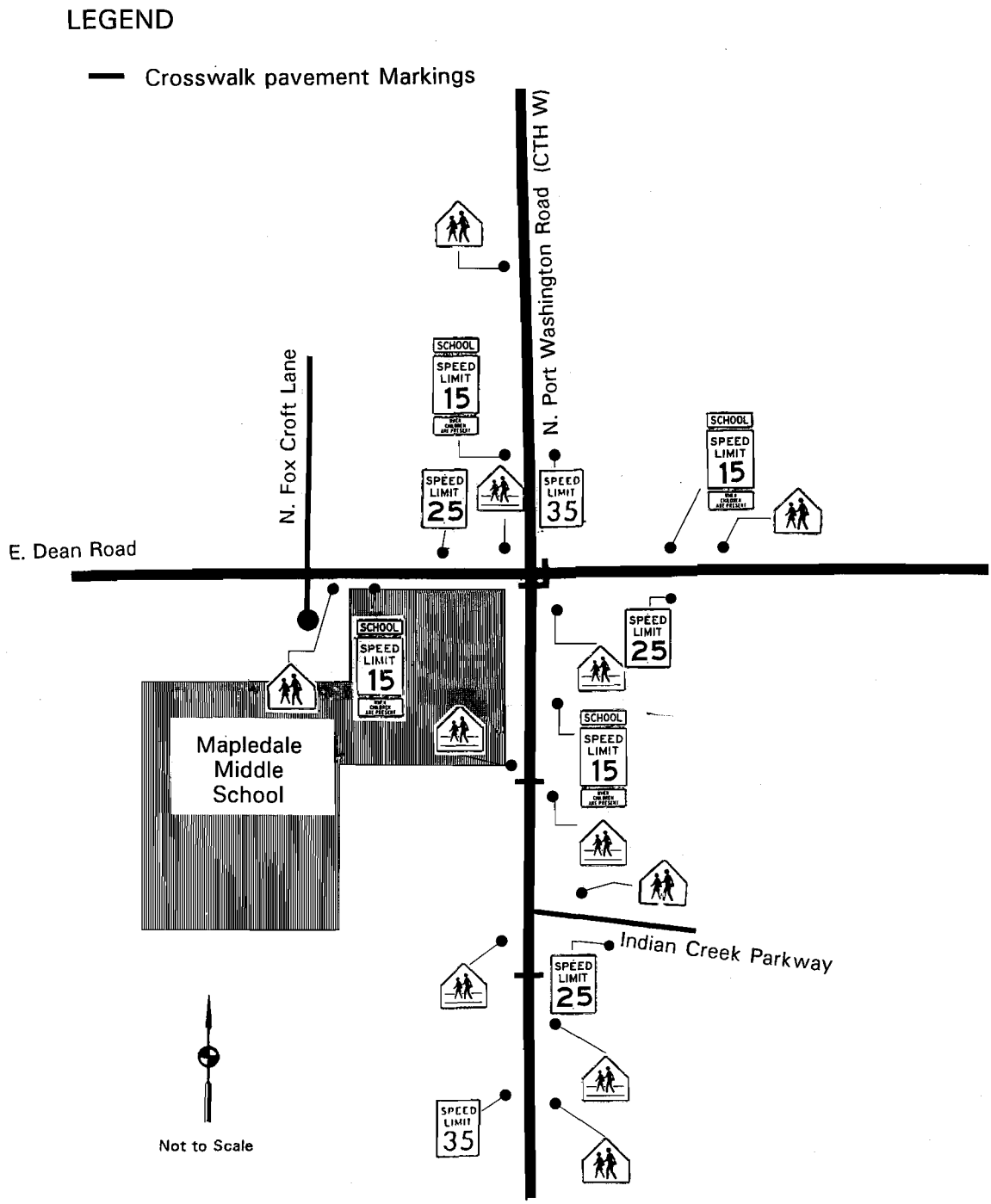
LOCATION OF SCHOOLS WITHIN THE VILLAGE OF FOX POINT



Source: SEWRPC.

Figure 2

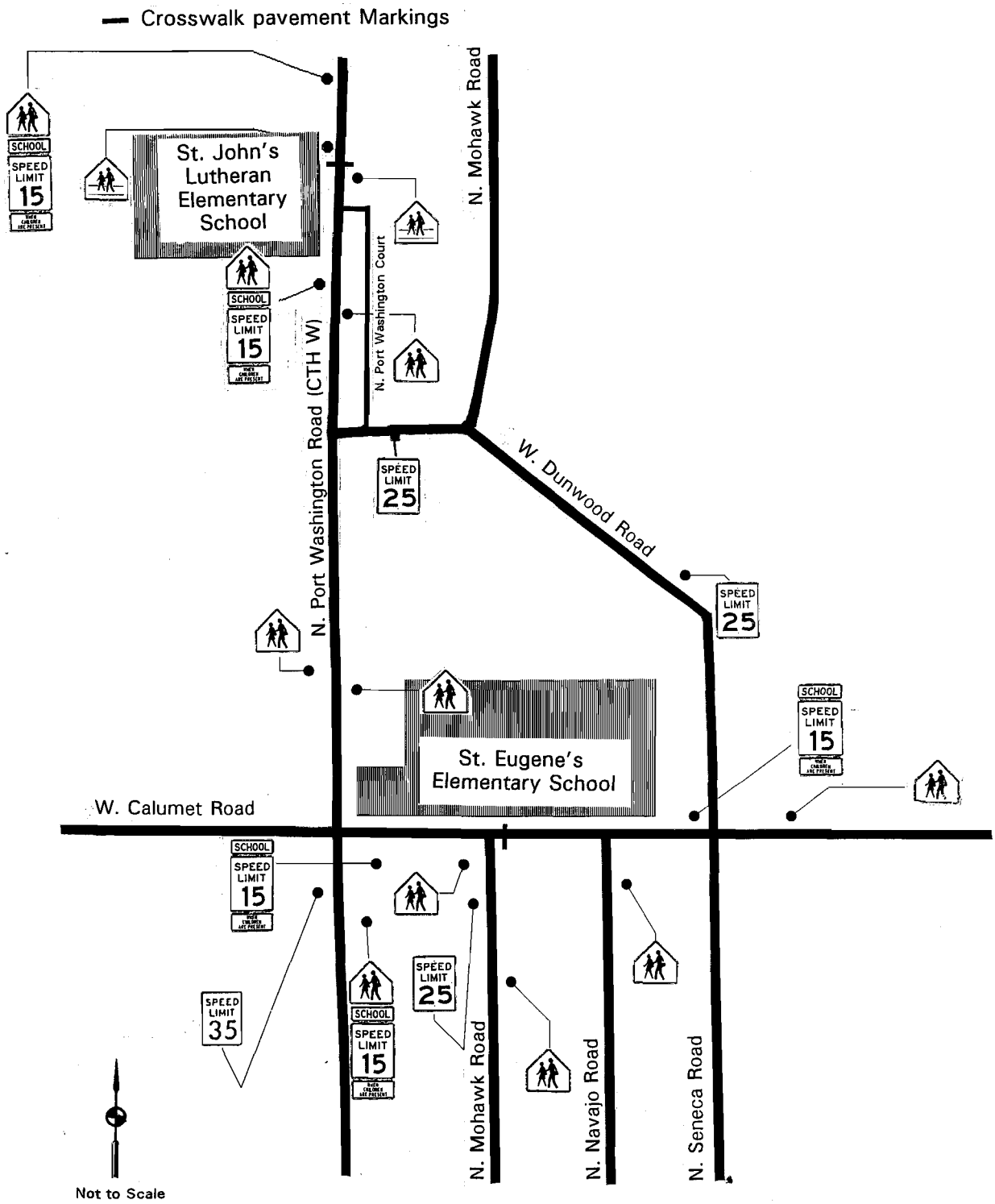
EXISTING SCHOOL RELATED TRAFFIC CONTROLS LOCATED ON ROADWAYS ADJACENT TO MAPLEDALE MIDDLE SCHOOL



Source: SEWRPC.

Figure 3

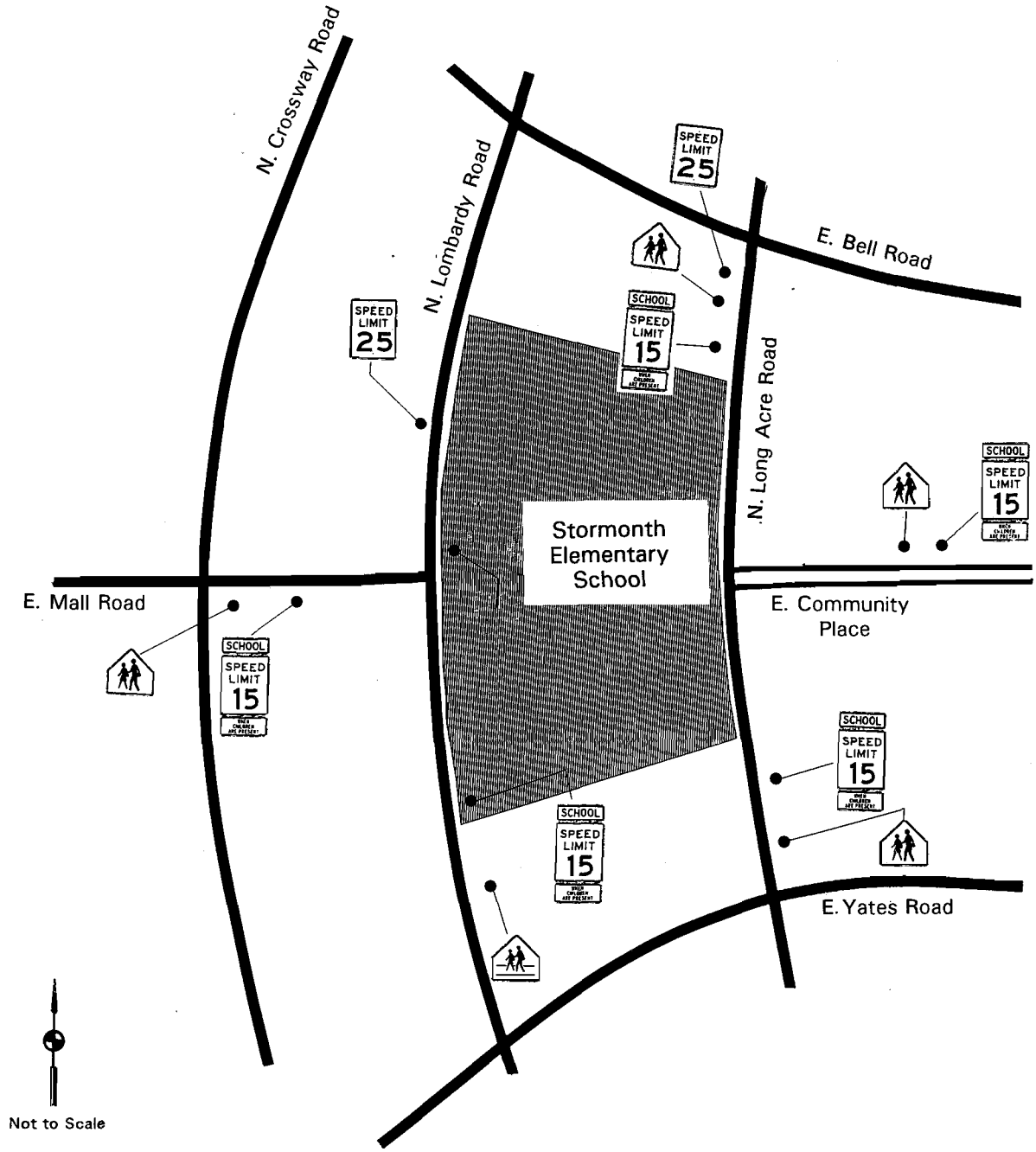
EXISTING SCHOOL RELATED TRAFFIC CONTROLS LOCATED ON ROADWAYS ADJACENT TO ST. EUGENE'S ELEMENTARY SCHOOL AND ST. JOHN'S LUTHERAN ELEMENTARY SCHOOL



Source: SEWRPC.

Figure 4

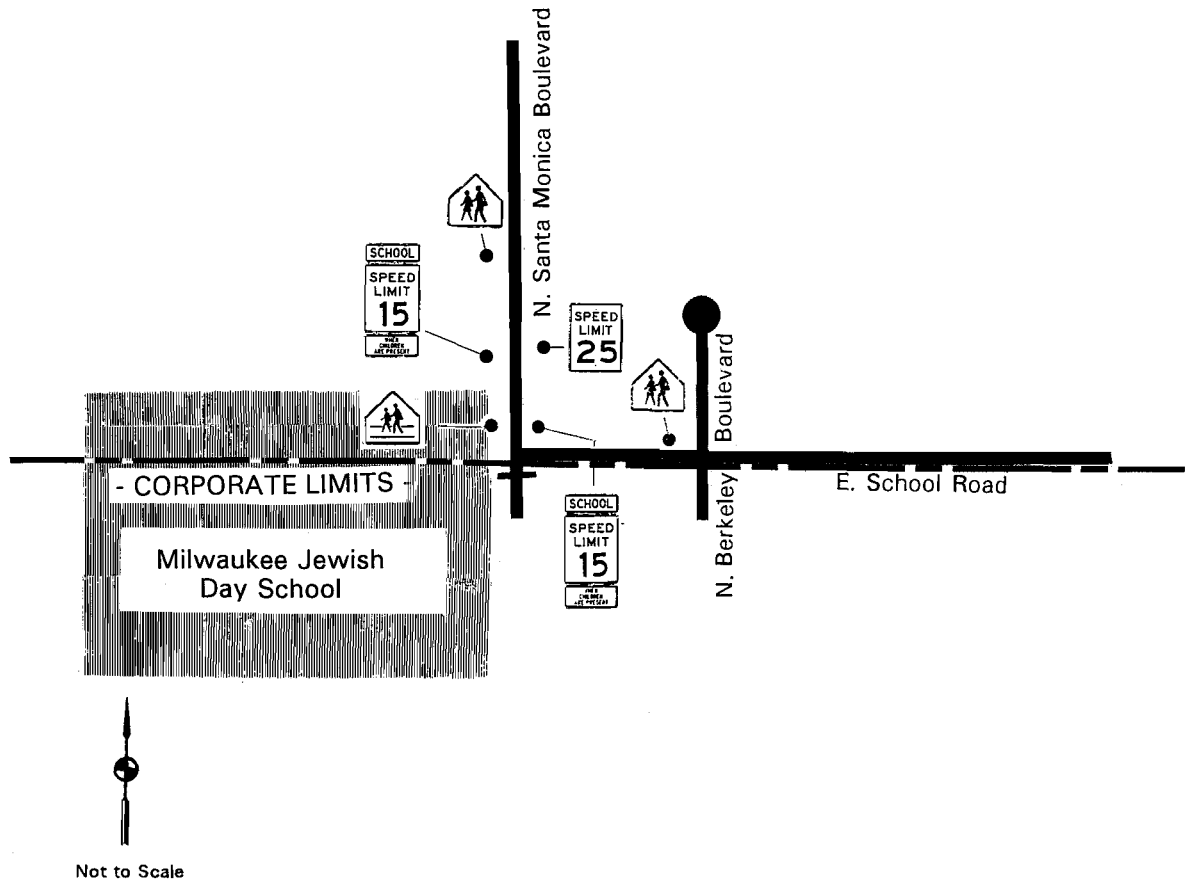
EXISTING SCHOOL RELATED TRAFFIC CONTROLS LOCATED ON ROADWAYS ADJACENT TO STORMONTH ELEMENTARY SCHOOL



Source: SEWRPC.

Figure 5

EXISTING SCHOOL RELATED TRAFFIC CONTROLS LOCATED ON ROADWAYS ADJACENT TO THE MILWAUKEE JEWISH DAY SCHOOL



Source: SEWRPC.

There are no pavement markings related to the railroad-highway grade crossings on any of the street approaches at any of the five such crossings in the Village.

Speed Limits

All streets and highways in the Village have a statutory 25 mile per hour speed limit and are generally posted at that speed, except N. Lake Drive (STH 32) and N. Port Washington Road (CTH W), which have a posted 35 mile per hour speed limit. School speed zones in the Village were identified in the school zone signing section above.

Horizontal Alignment Warning Signs

Pictographic "TURN" warning signs alerting motorists to impending 90 or near 90 degree horizontal alignment changes are posted on the approaches to the E. MacArthur Road at N. Bell Road intersection. These warning signs are also posted in advance of abrupt alignment changes between the 1400 and 1500 blocks of E. Goodrich Lane; the 1700 and 1800 blocks of E. Fox Lane; and the 7820 and 7830 blocks of Club Circle. These pictographic signs indicate the impending alignment change should be negotiated at speeds less than the posted 25 mile per hour speed limit. Additional protection is provided on the outside of the "CURVE" between the 1700 and 1800 of E. Fox Lane where "LARGE ARROW" pictographic warning signs are posted facing approaching traffic in each direction.

Pictographic "TURN" warning signs also posted in advance of the abrupt alignment changes between the 7400 and 7500 blocks of N. Beach Road; on the northbound approach only to the abrupt alignment change between the 7900 and 8000 blocks of N. Beach Road; and on the eastbound approach only to the abrupt alignment change between the 8025 and 8035 blocks of N. Beach Road. Pictographic "LARGE ARROW" warning signs are posted facing eastbound traffic facing on the outside of the abrupt alignment change between the 8000 and 8025 blocks and facing northbound traffic on the outside of the abrupt alignment change between the 8025 and 8035 blocks of N. Beach Road, respectively.

Two additional abrupt 90 or near 90 degree changes in horizontal alignment exist between the 7200 and 7300 blocks and the 7300 and 7400 blocks of N. Beach Road. No advance warning signing to alert motorists of the abrupt alignment changes are

posted on the roadway approaches to these turns. There are no supplemental warning signs posted at either turn.

Finally, "CHEVRON ALIGNMENT" pictographic warning signs are posted facing eastbound traffic on the outside of two N. Beach Road curves. These curves are approximately 300 feet east and approximately 1100 feet east of N. Lake Drive (STH 32). There is also a pictographic "CURVE" warning sign posted at the eastern most curve facing eastbound traffic.

Children At Play Signing

Another sign observed during the inventory of traffic control devices was a sign with the message "CHILDREN AT PLAY" in black lettering with a black border on a yellow background. This color scheme indicates that the sign is a warning sign. These signs are posted at random locations adjacent to land access streets in residential neighborhoods throughout the Village. It may be noted that, under the Manual on Uniform Traffic Control Devices, warning signs are intended to alert motorists to unusual conditions, whereas a "CHILDREN AT PLAY" sign in a residential neighborhood "warns" of a common condition.

Sign Height

The Manual on Uniform Traffic Control Devices requires that traffic control signing be mounted with a minimum of seven feet of ground clearance to the bottom of the sign in commercial and residential districts where parking and/or pedestrian or bicyclist movement may be expected to occur[3]. Because of the general absence of sidewalks within the Village, it may be expected that all pedestrian or bicyclist movement would occur on Village streets and thus this provision of the Manual on Uniform Traffic Control Devices would apply.

Accordingly, the existing signs were inventoried to determine which signs are posted below the prescribed height. That is, the inventory did not establish the actual height of each individual sign, but rather determined which traffic control signs are posted below the prescribed height. The inventory was

[3]The height to the bottom of a secondary sign mounted below another sign may be one foot less.

conducted in this manner because the actual sign mounting height is relevant only in so far as it relates to prescribed height.

Pavement Markings

As noted in the inventory, N. Lake Drive (STH 32) through the Village has three lanes delineated by pavement markings. Two different pavement marking schemes are utilized to delineate the lanes as shown in Figure 1. Alternative pavement marking scheme 1 shown in Figure 1 is utilized to delineate the three lanes on N. Lake Drive from the south corporate limit to approximately N. Holly Court; from a point about 400 feet north of E. Green Tree Road to E. Juniper Lane; from approximately E. Beach Drive to approximately E. Hyde Way; and from E. Fox Lane to the north corporate limit. Alternative pavement marking scheme 2 shown in Figure 1 is utilized to delineate the three lanes in the intervening segments of N. Lake Drive from approximately N. Holly Court to a point about 400 feet north of E. Green Tree Road; from E. Juniper Lane to approximately E. Beach Drive; and from a point between E. Hyde Way and N. Links Circle on the south to a point between E. Goodrich Lane and E. Fox Lane.

Each of the pavement marking schemes conveys different information to motorists utilizing the roadway. The broken yellow longitudinal pavement marking lines shown by alternative pavement marking scheme 1 in Figure 1 delineate the left edge of a lane where travel on the other side of the line is in the opposite direction. Motorists may cross a broken yellow line to overtake and pass a vehicle traveling the same direction.

A double longitudinal line consisting of a normal, broken yellow line and a normal, solid yellow line as shown by alternative pavement marking scheme 2 in Figure 1 delineates a separation between travel paths in opposite directions where overtaking and passing is permitted with care for traffic adjacent to the broken line and is prohibited for traffic adjacent to the solid line. This is a one direction, no-passing marking and is used on two-way, two- and three-lane roadways to regulate passing. It is also used to delineate the edges of a lane in which travel in either direction is permitted (but only as part of a left-turn maneuver). In the latter application, the markings are to be placed with the solid lines on the outside and the dashed lines to the inside of the lane as shown by alternative pavement marking scheme 2 in Figure 1. Traffic adjacent to

the solid line may cross this marking with care only as part of a left-turn maneuver. However, under the Wisconsin Supplement to the Manual on Uniform Traffic Control Devices, this later application is valid only when regulatory signing with the message "TWO WAY LEFT-TURN ONLY" is provided along with this longitudinal marking pattern .

It should be noted that, while not required, pavement marking arrows, as shown in Figure 6, are recommended in the Manual on Uniform Traffic Control Devices to supplement the longitudinal pavement marking pattern and regulatory signing required for operation of the center lane as a two-way left-turn lane. Because the requisite regulatory signing is not provided, it may be concluded that all travel, including left turns, should be excluded from the center lane on those segments of N. Lake Drive where alternative pavement marking scheme 2 exists.

Summary of Existing Traffic Control

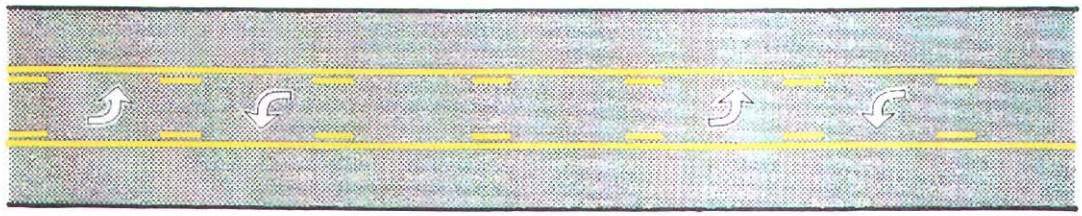
This section summarizes the inventory of existing traffic control within the Village of Fox Point. The inventory included intersection control, regulatory and warning signing, and pavement markings related to lane usage. The inventory of regulatory and warning signing included data on intersection control, school zones, railroad-highway grade crossings, and speed limits.

Based on the inventory data, three intersections are controlled by traffic signals, 83 by stop signs, 31 by yield signs, and 85 have no control. These intersection control data are summarized on Map 4. The corner sight distance at those intersections identified by Village Staff as potentially inadequate was reviewed to determine if changes in control are necessary and/or if sight distances should be improved. The corner sight distance at each of the uncontrolled intersections was also reviewed to determine if control is warranted. The safe stopping sight distance at those intersections shown in Table 4 was observed to be less than desirable.

The location of school zone signing including school advance warning, school crosswalk, and school speed limit signs was inventoried on Village streets adjacent to the five schools with the Village and one school abutting the southern corporate limit of the Village. The inventory findings were summarized in Figures 2 through 5.

Figure 6

REQUIRED LONGITUDINAL AND RECOMMENDED ARROW PAVEMENT MARKINGS FOR THE OPERATION OF A THREE LANE ROADWAY WITH TWO THROUGH TRAFFIC LANES AND A CONTINUOUS TWO-WAY LEFT-TURN LANE IN THE CENTER LANE[a]



[a] In addition to the pavement markings shown in this Figure, the use of regulatory signing with the message "TWO-WAY LEFT-TURN ONLY" is required for the operation of a continuous two-way center left-turn lane, by the Wisconsin Manual on Uniform Traffic Control Devices.

Source: Manual on Uniform Traffic Control Devices, U.S. Department of Transportation, Federal Highway Administration, 1988, and the Wisconsin Manual on Uniform Traffic Control Devices, 1992.

The type and location of railroad advance warning and regulatory signing was inventoried at the five railroad-highway grade crossings in the Village. Flashing light signals are provided on each approach at each railroad-highway grade crossing.

The posted speed limits within the Village were inventoried. Village streets and highways are posted at 25 miles per hour with the exception of N. Lake Drive (STH 32) and N. Port Washington Road (CTH W) which are posted at 35 miles per hour, and within the school zones where 15 mile per hour speed limits are posted.

The existing horizontal alignment warning signs were inventoried at those locations identified by Village Staff as potential problems, and include turn, large arrow, and chevron pictographic warning signs.

Children at play signing was observed to be posted at random locations adjacent to land access streets in residential neighborhoods throughout the Village.

TRAFFIC MANAGEMENT CONTROL CRITERIA

Planning and decision-making for the improvement of the operation of a municipal street and highway system should be based upon criteria which permit the objective determination of the need to implement traffic management control measures. These criteria should be based upon sound engineering principles and the standards for installation should conform to the Manual on Uniform Traffic Control Devices. Traffic management control measures will be effective only if they are truly needed. Measures that are not needed but that are nevertheless implemented will not be obeyed, and such public disregard can spread to measures that are needed and are essential for the safety and efficiency of the street system.

Traffic management control criteria fall into two basic categories: absolute and comparative. An example of an absolute criterion is a warrant for the installation of a traffic control signal at the intersection of two arterial streets. Such a warrant could require a minimum of 500 vehicles per hour for eight hours of the day on the major arterial street and a minimum of 150 vehicles per hour for the same eight hours on the intersecting arterial street.

Comparative criteria must be applied through a comparison of the performance of alternative traffic control measures. An example of such a criterion is the minimization of through traffic on a land access street; alternative traffic control measures are compared to each other and to the existing conditions to identify the measure that best meets the criterion.

The following traffic management control criteria were formulated to serve as guidelines in evaluating the existing traffic control in the Village of Fox Point. They may be utilized in evaluating requests for the installation of, or changes in, existing traffic control measures and devices. Those criteria, as shown in Table 6, are set forth in two basic categories: 1) internal traffic control measure warrants; and 2) peripheral traffic control measure warrants.

The application of the traffic management control criteria set forth in Table 6 is intended to assure uniformity in the placement and installation of traffic control measures throughout the Village. Uniformity simplifies the task of the driver because it aids in recognition and understanding. By treating similar situations in the same way, traffic control measures will be respected and obeyed with a minimum of enforcement. A standard traffic control measure used where it is inappropriate may be expected to result in disrespect at those locations where it is needed, resulting in increased community-wide enforcement and safety costs.

TRAFFIC CONTROL DEFICIENCIES AND RECOMMENDED IMPROVEMENTS IN THE VILLAGE OF FOX POINT

This section identifies traffic control deficiencies and potential intersection corner sight distance deficiencies in the Village of Fox Point existing as of June, 1994. The traffic control and intersection corner sight distance deficiencies were identified in two ways. First, the inventory data were compared to appropriate criteria set forth in the Manual on Uniform Traffic Control Devices and in Table 6, entitled, "Traffic Management Control Criteria" of this report. Second, locations experiencing multiple accidents between January 1, 1991, and September 30, 1994, were analyzed to determine if modifications to existing signing or the installation of new signing might abate the traffic safety problems at those locations. Alternative actions which could be expected to abate the existing traffic control deficiencies were identified

Table 6

TRAFFIC MANAGEMENT CONTROL CRITERIA

Traffic Control Category	Street and Highway System	Installation Warrants	
Internal Traffic Control Warrants Includes such traffic control devices as traffic signals, stop signs, yield signs, and pavement markings.	Arterial Streets and Highways[1]	The installation of traffic control devices should conform with the warrants set forth in the Manual on Uniform Traffic Control Devices[2] published by the U.S. Department of Transportation.	
	Non-Arterial Streets[1] (Collector and Land Access Streets)	The installation of traffic control devices should conform to the following warrants:	
		--	Whenever a street intersects a higher order street in the street hierarchy, the street of lower order should be stop sign controlled.
			The intersection of two collector streets should be controlled with multi-way stop signs.
		Each intersection of two land access streets should be analyzed primarily with regard to safety rather than convenience. Generally, intersection control in residential areas should appear reasonable and be designed to minimize conflicts and remove any doubt as to the establishment of rights-of-way. The assumed speed limit for this warrant is 25 miles per hour. Appropriate adjustments for this warrant must be made for higher posted speeds or when the known 85th percentile speed is 10 miles per hour greater than the posted speed. The installation of traffic control devices should conform to the following warrants:	
		--	A two-way "Stop" control should be used to control two approaches at a four-legged intersection of two land access streets whenever one or more of the following conditions exist: the sight distances, as shown in the accompanying diagram, are equal to or less than 125 feet from the uncontrolled approaches; an accident problem evidenced by three or more accidents susceptible to correction by two-way stop control occurs in a 12-month period; or unusual geometrics or pedestrian or vehicle patterns suggest a need for positive control.
			Two-way "Yield" control may be used to control two approaches at a four-legged intersection where sight distance from the uncontrolled approach exceeds 125 feet, provided none of the other stop sign criteria are satisfied. Two-way yield at four-legged intersections should be used only when relatively low volumes of traffic occur.
			Although intersection control at a T-type intersection is generally limited to the approach on the stem of the T, special conditions may warrant consideration of controls on other approaches, when would require special studies. The criteria for placement of stop or yield controls for the stem of the T-type intersections should be the same as for a four-legged intersection. A decision to provide no control at a T-type intersection must represent a clear judgment that conditions are safe beyond reasonable doubt based upon a minimum sight distance of 200 feet on all approaches to the intersection, as well as a lack of an accident problem or geometric deficiencies.
			Multi-way stop controls should be considered only when roadways of equal character intersect and cannot operate at an acceptable level of safety with only one street controlled. Multi-way stops should be considered under the following conditions: a sight distance of 125 feet cannot be obtained for any approach when stop signs are placed on that approach; or evidence exists that a total of three or more accidents susceptible to correction by multi-way stop control have occurred within a 12-month period. Under both criteria, all less restrictive measures to obtain adequate sight distance or improve intersection safety are assumed to have been considered.
			No controls should be provided at intersections of two land access streets when a sight distance of 200 feet is provided on all approaches to the intersection, and provided none of the other stop or yield sign criteria are satisfied.
		Traffic stop signs should not be used for speed control. Studies have shown that this device does not reduce speeds and that the use of unwarranted devices breeds disregard for all traffic control devices and laws and, in many cases, may cause accident problems where no accident problem previously existed.	
		"Children-at-Play" signs attempting to warn motorists of normal conditions in residential areas should be discouraged. Children should not be encouraged to play within the street travelways. Children-at-Play signs serve as a open suggestion that this behavior is acceptable.	

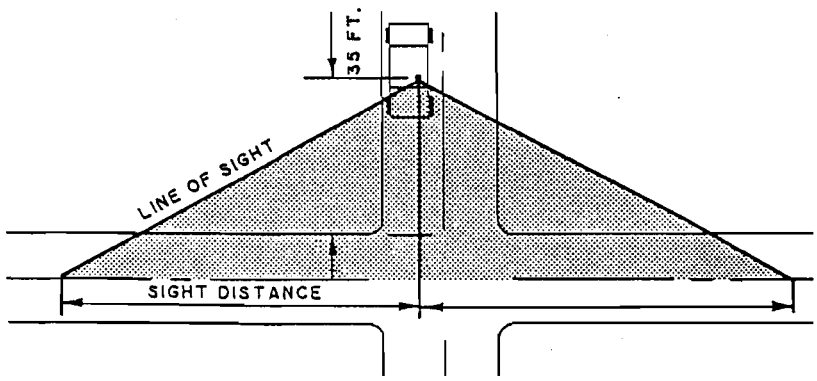
Table 6

(continued)

Traffic Control Category	Street and Highway System	Installation Warrants
Internal Traffic Control Warrants (continued)	Non-Arterial Streets[1] (Collector and Land Access Streets) (continued)	Specific warnings for schools, playgrounds, parks, and other recreational facilities are available for use where clearly justified. These warnings should, according to the Manual on Uniform Traffic Control Devices, be based upon an engineering study, and be erected no less than 150 feet and no more than 700 feet in advance of the school grounds or school crossing, and must be used in advance of every school crossing sign. It is important that a uniform approach to school area traffic controls be applied to assure a uniform behavior on the part of vehicle operations and pedestrians.
		Channelization to discourage through traffic and control vehicle speeds in residential areas includes such devices as roadway narrowings, traffic circles, and cul-de-sacs. Such devices should be used to preserve the integrity of the neighborhood while causing little inconvenience to the residents on the land access street to which they are applied, or to other residents in the neighborhood. These devices are not warranted on arterial facilities and should be applied only on collector and local access streets where identifiable conflicts exist between through and local traffic, or where excessive vehicle speeds are identified through observations or traffic accident patterns.
		Designation of one-way streets in residential areas should be used to discourage through traffic patterns on land access streets, reduce vehicular/pedestrian traffic conflicts, or reduce vehicle conflicts at an identified accident problem location. The designation of a one-way street should not have adverse traffic impacts on other land access streets or create circuitous and time-consuming travel for residents of the neighborhood or community.
		A residential parking permit program is a traffic control action designed to manage on-street vehicular parking in neighborhoods and to enhance the liveability for the residents of those neighborhoods.
Peripheral Traffic Control Warrants Peripheral traffic controls include turn prohibitions, one-way street designations, roadway diverters, and street closures. These controls are designed and used to divert through traffic from residential areas and to discourage "short-cutting" by motorists to avoid arterial street system congestion problems. These traffic control measures shall not be applied unless the volume of traffic on a land access street exceeds 200 vehicles per hour. Streets with peak-hour traffic volumes below 200 vehicles per hour are generally considered by residents as possessing desirable neighborhood amenities with minimum physical danger, noise, vibration, dust, and air pollution.	Non-Arterial Streets[1] (Collector and Land Access Streets)	- -

[1] The Village's street system, as shown on Map 1, is functionally classified into a system of arterials, collectors, and land access streets. This system categorizes streets according to the service they perform, ranging from travel mobility to land access. The arterial streets are intended to carry the heaviest volumes of traffic, including all traffic traveling through the Village. Collector streets are intended to distribute traffic from the arterials to the land access streets, and to collect traffic from the land access streets for routing to the arterials. Land access streets are intended to provide direct access to abutting land development and provide for local traffic movement. Accordingly, traffic control devices should be installed on arterial and collector streets in such a manner as to encourage all through traffic to use arterials and to encourage all traffic between land access and arterial streets to use collector streets.

[2] U.S. Department of Transportation, Federal Highway Administration, "Warrants for the Installation of Traffic Signals and Stop and Yield Signs," Manual on Uniform Traffic Control Devices, 1988.



SIGHT DISTANCE DIAGRAM

Source: SEWRPC.

and evaluated. Finally, a recommended action was identified for adoption and implementation.

Intersection Corner Sight Distances

Adequate sight distance should be available at uncontrolled intersections to permit motorists approaching the intersection an unobstructed view of the entire intersection and sufficient lengths of the intersecting street to avoid collisions with a vehicle traveling on the intersecting street. Inadequate sight distances create potential traffic safety problems. The installation of traffic control devices--either "YIELD" or "STOP" signs--on the approaches of intersecting streets may be appropriate if the sight obstructions concerned cannot be removed to provide adequate sight distance. The sight distance data should then be correlated with historic traffic accident data to determine if the installation of traffic control is warranted.

Sufficient sight distance should also be available at controlled intersections to permit motorists on the controlled approaches to view sufficient lengths of the intersecting street to avoid collisions with vehicles traveling on the intersecting street when entering or crossing the intersecting street traffic stream. Inadequate sight distances create potential traffic safety problems. The installation of "STOP" signs on the uncontrolled intersection approaches may be warranted if the sight obstructions concerned cannot be removed to provide adequate sight distances.

The criteria used to assess available intersection corner sight distance is dependent upon whether or not a particular intersection has either no traffic control, or has partial traffic control; i.e., control on two of four intersection approaches.[4] At uncontrolled intersections between streets of the same hierarchial order, there should be sufficient corner sight distance in each intersection quadrant to permit all motorists an unobstructed view of the

[4] The available intersection corner sight distances at traffic signal controlled intersections should also be evaluated because the traffic signals may operate in a flashing mode during certain hours of the day. In this respect, a flashing amber display to one street with a flashing red display to the intersecting street may be considered to have the same control as an intersection with one uncontrolled street and stop sign control on the intersecting street.

intersection and sufficient lengths of the intersecting street to provide adequate time to perceive, react and take action to avoid a collision with a vehicle on an intersecting approach. At partially controlled intersections, the available corner sight distances from the stopped position on the controlled approaches should provide motorists on those approaches adequate time to perceive cross traffic and evaluate whether the intended maneuver from the controlled approach may be safely executed.

When the available corner sight distance is inadequate, a potential traffic safety problem exists. This potential traffic safety problem may be abated by removing obstacles to improve intersection corner sight distance; the installation of traffic control to provide partial or full intersection control; or a combination of improved corner sight distance and traffic control installation.

Corner Sight Distance at Uncontrolled Intersections: The available intersection corner sight distance in each of the 85 uncontrolled intersections between two streets of the same hierarchial order existing within the Village in 1994 was reviewed to determine if traffic control measures were appropriate. Seven of the 85 intersections within the Village which were uncontrolled in 1994 were intersections between two streets of differing hierarchial order and thus were subject to the installation of traffic control under criteria unrelated to the available intersection corner sight distance. The seven intersections concerned were: N. Crossway Road at N. Fairchild Circle; N. Regent Drive at Regent Court North; N. Santa Monica Boulevard at N. Santa Monica Court No. 1 (north), at N. Santa Monica Court No. 2 (north), and at N. Santa Monica Court No. 3 (north and south); and E. School Road at N. Berkeley Boulevard.

The available intersection corner sight distance in each corner of the remaining 78 uncontrolled intersections was reviewed to determine which of four ranges the existing corner sight distances fall within: 1) less than 40 feet; 2) 40 feet or more but less than 125 feet; 3) 125 feet or more but less than 200 feet; or, 4) 200 feet or more. Installation of traffic control measures based on inadequate sight distance would not be appropriate at intersections with at least 200 feet of corner sight distance in each corner. For corner sight distances of less than 40 feet, the installation of "STOP" signs is warranted regardless of the traffic accident history.

The installation of traffic control at intersections between land access streets may be appropriate when two or more accidents of a type susceptible to correction through the installation of "STOP" or "YIELD" signs occur in any twelve month period. The type of control--stop or yield--would be dependent upon the actual intersection corner sight distance in each corner. That is, if the intersection corner sight distance in any corner is 40 feet or more, but less than 125 feet, the installation of "STOP" signs may be appropriate on the approaches of one of the two intersecting streets, dependent upon the accident history. If the intersection corner sight distance in any intersection corner is 125 feet or more, but is less than 200 feet, the installation of "YIELD" signs may be appropriate on the approaches of one of the two intersecting streets, dependent upon the accident history.

The 78 uncontrolled intersections in 1994 are set forth in Table 7 by range of sight distance available in the intersection corner having the least sight distance. This range is used to establish the appropriate traffic control at the intersection should such control be warranted by the accident history at a particular intersection.

As shown in Table 7, two of the 78 intersections--N. Fairchild Road at N. Fairchild Court; and N. Indian Creek Parkway at N. Point Drive--which were uncontrolled in 1994 had 200 or more feet of intersection corner sight distance available in each corner. Thus, it may be concluded that the installation of traffic control would not be appropriate at these intersections based upon the available sight distance.

Fifteen of the 78 intersections--numbered three through 17 in Table 7--which were uncontrolled in 1994 had intersection corner sight distances in each corner of the intersection of 125 feet or more, but had less than 200 feet of corner sight distance in at least one corner. This is the range of distances at which the installation of "YIELD" signs on selected intersection approaches may be appropriate. However, because the purpose of providing such traffic control is to abate a potential traffic safety problem, any recommendation with respect to the installation of traffic control should also take into consideration historic traffic accident data.

Table 7

OBSERVED INTERSECTION CORNER SIGHT DISTANCE BY RANGE AT LAND ACCESS STREET INTERSECTIONS WITHOUT TRAFFIC CONTROL IN THE VILLAGE OF FOX POINT: 1995

Number	Intersection	Observed Intersection Corner Sight Distance By Range In The Intersection Corner With The Least Available Sight Distance				Appropriate Traffic Control Based Strictly On The Criteria for Available Sight Distance[a]
		Less Than 40 Feet	40 Feet to 125 Feet	125 Feet to 200 Feet	More Than 200 Feet	
1.	N. Fairchild Road with W. Fairchild Court	- -	- -	- -	X	None
2.	N. Indian Creek Parkway with N. Point Drive	- -	- -	- -	X	None
3.	N. Barnett Lane with N. View Place	- -	- -	X	- -	Yield
4.	N. Beach Drive bifurcation east of N. Lake Drive (STH 32)[b]	- -	- -	X	- -	Yield
5.	N. Beach Drive with N. Beach Court	- -	- -	X	- -	Yield
6.	N. Beach Drive bifurcation north of N. Beach Drive[c]	- -	- -	X	- -	Yield
7.	W. Blackhawk Road with N. Fairchild Road	- -	- -	X	- -	Yield
8.	E. Churchill Lane with N. Links Way (north)[d]	- -	- -	X	- -	Yield
9.	E. Churchill Lane bifurcation east of N. Links Way[d]	- -	- -	X	- -	Yield
10.	N. Crossway Road with N. Fairchild Road	- -	- -	X	- -	Yield
11.	N. Greenvale Road with E. Spooner Road (east)[e]	- -	- -	X	- -	Yield
12.	N. Greenvale Road with E. Spooner Road (west)[e]	- -	- -	X	- -	Yield
13.	N. Greenvale Road bifurcation north of E. Spooner Road[e]	- -	- -	X	- -	Yield
14.	N. Indian Creek Parkway with W. Indian Creek Court	- -	- -	X	- -	Yield
15.	N. Manor Lane with N. Manor Court	- -	- -	X	- -	Yield
16.	N. Seneca Road with N. Seneca Court	- -	- -	X	- -	Yield
17.	W. Suburban Drive with W. Suburban Court	- -	- -	X	- -	Yield
18.	E. Apple Tree Road with E. Daphne Road	- -	X	- -	- -	Stop
19.	N. Barnett Lane with E. Green Tree Road	- -	X	- -	- -	Stop
20.	W. Bayfield Avenue with N. Mohawk Road	- -	X	- -	- -	Stop
21.	N. Beach Drive with N. Beach Drive (east)[c]	- -	X	- -	- -	Stop
22.	N. Beach Drive with N. Beach Drive (west)[c]	- -	X	- -	- -	Stop
23.	W. Bergen Drive with W. Bergen Court	- -	X	- -	- -	Stop
24.	W. Blackhawk Road with N. Mohawk Road	- -	X	- -	- -	Stop
25.	W. Cherokee Circle with N. Navajo Road	- -	X	- -	- -	Stop
26.	W. Cherokee Circle with N. Seneca Road	- -	X	- -	- -	Stop
27.	E. Cherokee Circle with E. Spooner Road	- -	X	- -	- -	Stop
28.	N. Club Circle bifurcation south of E. Lilac Lane[f]	- -	X	- -	- -	Stop
29.	E. Club Circle with N. Merrie Lane (east)[g]	- -	X	- -	- -	Stop
30.	E. Fox Dale Road with E. Fox Dale Court	- -	X	- -	- -	Stop
31.	E. Fox Dale Road with N. Reynard Road	- -	X	- -	- -	Stop
32.	W. Dunwood Road with N. Mohawk Road	- -	X	- -	- -	Stop

Table 7 (continued)

Number	Intersection	Observed Intersection Corner Sight Distance By Range In The Intersection Corner With The Least Available Sight Distance				Appropriate Traffic Control Based Strictly On The Criteria for Available Sight Distance[a]
		Less Than 40 Feet	40 Feet to 125 Feet	125 Feet to 200 Feet	More Than 200 Feet	
33.	W. Dunwood Road with N. Seneca Road	- -	X	- -	- -	Stop
34.	N. Fairchild Road with N. Seneca Road	- -	X	- -	- -	Stop
35.	E. Fox Lane with N. Links Way	- -	X	- -	- -	Stop
36.	E. Fox Lane with N. Poplar Drive	- -	X	- -	- -	Stop
37.	N. Indian Creek Parkway with N. Manor Lane	- -	X	- -	- -	Stop
38.	N. Indian Creek Parkway with W. Nokomis Court	- -	X	- -	- -	Stop
39.	N. Links Way with E. Portage Road	- -	X	- -	- -	Stop
40.	N. Links Way with E. Spooner Road (northeast)[h]	- -	X	- -	- -	Stop
41.	N. Links Way with E. Spooner Road (southeast)[h]	- -	X	- -	- -	Stop
42.	N. Links Way with E. Spooner Road (west)	- -	X	- -	- -	Stop
43.	N. Lombardy Road with N. Lombardy Court	- -	X	- -	- -	Stop
44.	N. Manor Lane with N. Point Drive	- -	X	- -	- -	Stop
45.	N. Merrie Lane bifurcation south of E. Club Circle[g]	- -	X	- -	- -	Stop
46.	N. Mohawk Road with W. Willow Road	- -	X	- -	- -	Stop
47.	N. Navajo Road with W. Willow Road	- -	X	- -	- -	Stop
48.	N. Regent Road with Regent Court South	- -	X	- -	- -	Stop
49.	N. Regent Court with N. Regent Court No. 1-North	- -	X	- -	- -	Stop
50.	N. Regent Court with N. Regent Court No. 1-South	- -	X	- -	- -	Stop
51.	N. Regent Court with N. Regent Court No. 2-North	- -	X	- -	- -	Stop
52.	N. Regent Court with N. Regent Court No. 2-South	- -	X	- -	- -	Stop
53.	N. Regent Court with N. Regent Court No. 3-North	- -	X	- -	- -	Stop
54.	N. Regent Court with N. Regent Court No. 3-South	- -	X	- -	- -	Stop
55.	N. Seneca Road with W. Suburban Drive	- -	X	- -	- -	Stop
56.	E. Spooner Road bifurcation east of N. Links Way[h]	- -	X	- -	- -	Stop
57.	E. Spooner Road with N. Whitney Road	- -	X	- -	- -	Stop
58.	E. Willow Road with N. Whitney Road	- -	X	- -	- -	Stop
59.	N. Barnett Lane with N. Belmont Lane	X	- -	- -	- -	Stop
60.	N. Beach Road with Willets Lane	X	- -	- -	- -	Stop
61.	W. Bergen Drive with N. Fox Croft Lane	X	- -	- -	- -	Stop
62.	N. Birch Hill Court with E. Clovernook Lane	X	- -	- -	- -	Stop
63.	N. Boyd Way with E. Portage Road	X	- -	- -	- -	Stop
64.	N. Bridge Lane with E. Daisy Lane	X	- -	- -	- -	Stop
65.	E. Bywater Lane with N. Gray Log Lane	X	- -	- -	- -	Stop
66.	W. Cherokee Circle with N. Mohawk Road	X	- -	- -	- -	Stop
67.	E. Churchill Lane with N. Links Way (south)[d]	X	- -	- -	- -	Stop
68.	N. Club Circle with E. Lilac Lane (west)[f]	X	- -	- -	- -	Stop
69.	E. Club Circle with N. Merrie Lane (west)[g]	X	- -	- -	- -	Stop

Table 7 (continued)

Number	Intersection	Observed Intersection Corner Sight Distance By Range In The Intersection Corner With The Least Available Sight Distance				Appropriate Traffic Control Based Strictly On The Criteria for Available Sight Distance[a]
		Less Than 40 Feet	40 Feet to 125 Feet	125 Feet to 200 Feet	More Than 200 Feet	
70.	E. Coleman Lane with E. Thorn Lane	X	- -	- -	- -	Stop
71.	E. Community Place with N. Longacre Road	X	- -	- -	- -	Stop
72.	W. Dean Road with N. Fox Croft Lane	X	- -	- -	- -	Stop
73.	N. Gray Log Lane with E. Winkler Lane	X	- -	- -	- -	Stop
74.	E. Hyde Way with N. Links Way	X	- -	- -	- -	Stop
75.	N. Indian Creek Parkway with N. Seneca Road	X	- -	- -	- -	Stop
76.	E. MacArthur Road with N. Van Dyke Road	X	- -	- -	- -	Stop
77.	N. Poplar Drive with E. Spooner Road	X	- -	- -	- -	Stop
78.	N. Seneca Road with W. Willow Road	X	- -	- -	- -	Stop

[a] When the available corner sight distance is less than 40 feet, the installation of "STOP" sign control is warranted.

[b] N. Beach Drive bifurcates approximately 50 feet east of N. Lake Drive (STH 32) effectively creating three intersections; two intersections between N. Lake Drive and N. Beach Drive, and the third intersection at the point where N. Beach Drive splits into two legs about 50 feet east of N. Lake Drive. The N. Lake Drive intersections are currently "STOP SIGN" controlled, the intersection at the bifurcation is currently uncontrolled.

[c] The north leg of the N. Beach Drive intersection with N. Beach Drive bifurcates approximately 75 feet north of N. Beach Drive effectively creating three intersections; two intersections between N. Beach Drive and the bifurcated N. Beach Drive--identified in preceding Table entries as "east" and "west"--and the third intersection at the point where N. Beach Drive splits into two legs about 75 feet north of N. Beach Drive. Each of these intersections is currently uncontrolled.

[d] E. Churchill Lane bifurcates approximately 60 feet east of N. Links Way effectively creating three intersections; two intersections between N. Links Way and the bifurcated E. Churchill Lane--identified in preceding Table entries as "north" and "south"--and the third intersection at the point where E. Churchill Lane splits into two legs about 60 feet east of N. Links Way. Each of these intersections is currently uncontrolled.

[e] N. Greenvale Road bifurcates approximately 40 feet north of E. Spooner Road effectively creating three intersections; two intersections between E. Spooner Road and the bifurcated N. Greenvale Road--identified in preceding Table entries as "east" and "west"--and the third intersection at the point where N. Greenvale Road splits into two legs about 40 feet north of E. Spooner Road. Each of these intersections is currently uncontrolled.

[f] N. Club Circle bifurcates approximately 40 feet south of E. Lilac Lane effectively creating three intersections; two intersections between E. Lilac Lane and the bifurcated N. Club Circle--the western intersection is identified in a preceding Table entry as "west"--and the third intersection at the point where N. Club Circle splits into two legs about 40 feet south of E. Lilac Lane. The "east" intersection--is currently "STOP SIGN" controlled and does not appear in this Table; the "east" intersection and the intersection at the point of bifurcation are currently uncontrolled.

[g] N. Merrie Lane bifurcates approximately 60 feet south of E. Club Circle effectively creating three intersections; two intersections between E. Club Circle and the bifurcated N. Merrie Lane--identified in preceding Table entries as "east" and "west"--and the third intersection at the point where N. Merrie Lane splits into two legs about 60 feet south of E. Club Circle. Each of these intersections is currently uncontrolled.

[h] E. Spooner Road bifurcates approximately 60 feet east of N. Links Way effectively creating three intersections; two intersections between N. Links Way and the bifurcated E. Spooner Road--identified in preceding Table entries as "northeast" and "southeast"--and the third intersection at the point where E. Spooner Road splits into two legs about 60 feet east of N. Links Way. Each of these intersections is currently uncontrolled.

Source: SEWRPC.

Analysis of the traffic accident data during the period from January 1, 1991, through September 30, 1994, indicates that traffic accidents occurred at only one of the 15 intersections at which the installation of "YIELD" signs would be appropriate based on the available sight distance criteria. Further, no more than one accident was reported at this intersection during the period for which data were analyzed. Thus, because the incidence of accidents was extremely low at these intersections, no traffic control was recommended at those intersections. It is recommended that the incidence of accidents at these intersections be monitored and that consideration be given to the installation "YIELD" signs at those intersections exhibiting future increases in traffic accidents.

Forty one of the 78 intersections--numbered 18 through 58 in Table 7--which were uncontrolled in 1994 had intersection corner sight distances in each corner of the intersection of 40 feet or more, but less than 125 feet of intersection corner sight distance in at least one corner. This is the range of distances at which the installation of "STOP" signs on selected intersection approaches may be appropriate. However, because the purpose of providing such traffic control is to abate a potential traffic safety problem, any recommendation with respect to the installation of traffic control should also take into consideration historic traffic accident data.

Analysis of the traffic accident data during the period from January 1, 1991, through September 30, 1994, indicates that traffic accidents occurred at only four of the 41 intersections at which the installation of "STOP" signs would be appropriate based on the available sight distance criteria. Further, no more than one accident was reported at any of these intersection during the period for which data were analyzed. Thus, because the incidence of accidents was extremely low at these intersections, no traffic control was recommended at those intersections. It is recommended that the incidence of accidents at these intersections be monitored and that consideration be given to the installation "STOP" signs at those intersections exhibiting future increases in traffic accidents.

Also considered, but rejected as an alternative action to abate the potential traffic safety problem at the 15 uncontrolled intersections at which the installation of "YIELD" signs and the 41 uncontrolled intersections at which the installation of "STOP" signs might be appropriate, was the creation of clear

vision triangles. The size of the clear vision triangle necessary to safely permit uncontrolled intersection operation would be prohibitively large--a triangle with legs approximately 175 feet on the intersecting right-of-way lines. Use of less restrictive yield control rather than stop control would require a clear vision triangle with legs approximating 100 feet on the intersecting rights-of-way lines. Thus, creation of clear vision triangles would have a substantial negative impact on the aesthetic appearance of the Village. Moreover, creation of clear vision triangles would require the cooperation of affected property owners, highly unlikely in many cases. Because of the needed voluntary cooperation of property owners, because of the size of the clear vision triangles required for uncontrolled intersection operation would have a substantial negative on the aesthetic appearance of the Village; and because the majority of the 56 intersections concerned have not experienced an accident for the past three and three-quarter years, this alternative was not recommended for implementation.

Finally, the remaining 20 intersections, numbered 59 through 78 in Table 7, which were uncontrolled in 1994 had less than 40 feet of intersection corner sight distance available in at least one corner. The installation of "STOP" signs is warranted on the approaches of one of the intersecting streets at intersections having less than 40 feet of intersection corner sight distance available in at least one corner regardless of the accident history at the intersection. At each of these intersections the available sight distance is restricted by vegetation and/or fencing, which, if removed would eliminate the need for the installation of "STOP" signs.

The first action considered at the 20 intersections which were uncontrolled in 1994 and had less than 40 feet of intersection corner sight distance available in at least one corner, was the improvement of the existing vision triangles through the removal of existing vegetation and/or fencing. The advantage of this action is that the available sight distance would be increased thereby improving traffic safety and the provision of "STOP" signs would become appropriate only if two or more accidents had occurred at one of the intersections. As noted earlier, none of the uncontrolled intersections experienced more than a single accident in the past three and three-quarter years. The primary disadvantage of this action is that the voluntary cooperation of the landowners concerned is

required. Because the vegetation often serves to screen homes and yards from the adjacent street, resistance to the proposed removal of such vegetation may be expected. Nevertheless, it is recommended that the Village seek to obtain the voluntary cooperation of abutting landowners to improve the corner sight distance through the removal of existing vegetation and/or fencing.

Implementation of this recommendation was estimated to cost an average of $500 per intersection corner at all arterial and all collector street intersections, and an average of about $200 per intersection corner at intersections between two land access streets. However, because the vegetation is on private property, the cost attendant to its removal is the responsibility of the property owner, and there would be no cost the Village to implement this action.

The second action considered at the 20 intersections which were uncontrolled in 1994 and had less than 40 feet of intersection corner sight distance available in at least one corner, was the installation of "STOP" signs on selected intersection approaches. This action would improve traffic safety by requiring motorists on selected approaches to stop before entering the intersection. The primary disadvantage of this action is the increase in travel time, fuel consumption and air pollutant emissions attendant to the additional stops required. It is recommended that the Village install "STOP" signs at those intersections where adequate sight distance cannot be obtained through the voluntary cooperation of the landowners concerned to improve the existing sight distances. The estimated cost to the Village implement this traffic engineering action is $4,400.

Corner Sight Distance at Traffic Controlled Intersections: The Village staff identified 31 traffic controlled intersections within the Village which were perceived to have inadequate intersection corner sight distance, and requested Commission staff analysis of the existing corner sight distance at these intersections to determine its adequacy. The intersections identified by the Village staff are set forth in Table 1.

These intersections were analyzed to determine if the corner sight distance from the controlled approaches is adequate to allow motorists sufficient time to perceive and react to cross-street traffic prior to executing a maneuver.

Adequate corner sight distances require a minimum of 250 feet of the uncontrolled approaches should be visible from a stop line on the intersecting roadway for travel speeds of 25 miles per hour. A minimum of 350 feet of the uncontrolled approaches should be visible from a stop line on the intersecting roadway for travel speeds of 35 miles per hour.

A comparison of available corner sight distances at those controlled intersections requested for analysis by the Village staff to the corner sight distance criteria for such intersections is presented in Table 8. It may be noted that nearly all eastbound approaches to N. Lake Drive (STH 32) are included because of the number of accidents occurring along N. Lake Drive and because of the dense vegetation existing in the intersection corners east of N. Lake Drive. The available corner sight distance was compared to the available corner sight distance criteria appropriate for the speed limit on the uncontrolled street. The findings were then categorized as either: 1) less than the required distance appropriate for the posted speed limit; or, 2) equal to, or greater than the required distance appropriate for the posted speed limit.

N. Lake Drive (STH 32) Approaches: Available stopping sight distance from the "STOP" signs on 22 of the 38 intersecting east- and westbound approaches to N. Lake Drive was found to be less than 350 feet. These approaches listed are in Table 8. The sight obstruction is generally caused by vegetation and/or fences abutting the right-of-way line.

With respect to the eastbound N. Lake Drive approaches, it may be noted the "STOP" signs are located adjacent to the non-roadway edge of the pedestrian path located approximately 20 to 25 feet west of N. Lake Drive with the exception of the E. Holly Court; the northern N. Service Drive; and, the E. Green Tree Road approaches. At the eastbound approaches to these three N. Lake Drive intersections, the "STOP" signs are located adjacent to N. Lake Drive. Under the Wisconsin Statutes, when "stop line" pavement marking is not present, motorists must stop at the "STOP" sign, but before crossing any marked or unmarked crosswalk. When traffic on an intersecting street cannot be seen from this position, motorists are required to advance slowly, stop again, and then yield to approaching traffic before proceeding. Because the sight obstruction on most of the eastbound intersection approaches to N. Lake Drive is caused by vegetation

Table 8

INTERSECTIONS WITH TRAFFIC CONTROL HAVING SUBSTANDARD STOPPING SIGHT DISTANCES
BASED ON AVAILABLE CORNER SIGHT DISTANCES IN THE VILLAGE OF FOX POINT: 1994

Intersection	Direction in Which Sight Distance is Restricted From The Eastbound Or Southbound Approach	Direction in Which Sight Distance is Restricted From The Northbound Or Westbound Approach	Action Recommended to Abate Restricted Corner Sight Distance
Approaches to N. Lake Drive (STH 32) from:			
• E. Acacia Road	South[1]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].
• E. Apple Tree Road	North[1] and South[1]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].
• E. Daphne Road	North[1]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].
• N. Holly Court	North[1,3]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].
• E. Green Tree Road	South[3,4]	Unrestricted	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2]. • Relocate the bus shelter from its existing location to a point 100 feet south.
• E. Daisy Lane	- -	North[1] and South[1]	• Install a stop line at a point seven feet from the east edge of the pavement on the westbound approach. • Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[2].
• E. Bell Road	South[3,4]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2]. • Relocate the bus shelter from its existing location to a point 100 feet south.
• E. Portage Road	South[1,3]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].
• E. Calumet Road	North[1] and South[1]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].
• E. Beach Road (north)	- -	North[1]	• Install a stop line at a point seven feet from the east edge of the pavement on the westbound approach. • Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[2].
• E. Hyde Way	North[1] and South[1]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].
• E. Links Circle (south)	North[1] and South[d]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].

Table 8 (continued)

Intersection	Direction in Which Sight Distance is Restricted From The Eastbound Or Southbound Approach	Direction in Which Sight Distance is Restricted From The Northbound Or Westbound Approach	Action Recommended to Abate Restricted Corner Sight Distance
• N. Club Circle (north)	- -	North[1] and South[1]	• Install a stop line at a point seven feet from the east edge of the pavement on the westbound approach. • Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[2].
• E. Links Circle (north)	North[1]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].
• E. Bradley Road	North[1] and South[3,4]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2]. • Relocate the bus shelter from its existing location to a point 100 feet south.
• E. Quarles Place	South[1]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].
• E. Fox Lane	North[1] and South[1]	South[1]	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2]. • Install a stop line at a point seven feet from the east edge of the pavement on the westbound approach.
• E. Bywater Lane	- -	North[1]	• Install a stop line at a point seven feet from the east edge of the pavement on the westbound approach.
• E. Churchill Lane	South[1]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].
• E. Gray Log Lane	- -	South[1]	• Install a stop line at a point seven feet from the east edge of the pavement on the westbound approach.
• E. Spooner Road	South[1]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2].
• E. Dean Road	North[1]	South[1]	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[2]. • Install a stop line at a point seven feet from the east edge of the pavement on the westbound approach.
Westbound approaches to N. Port Washington Road (CTH W) from:			
• W. Port Washington Court	- -	North[1]	• Seek voluntary cooperation of abutting landowner in northeast quadrant in relocation of commercial business sign from its existing location to a point about 75 feet north or 10 feet east.
• W. Indian Creek Parkway	- -	North[1]	• Install a stop line at a point seven feet from the east edge of the pavement on the westbound approach.

Table 8 (continued)

Intersection	Direction in Which Sight Distance is Restricted From The Eastbound Or Southbound Approach	Direction in Which Sight Distance is Restricted From The Northbound Or Westbound Approach	Action Recommended to Abate Restricted Corner Sight Distance
Approaches to E. Green Tree Road from:			
• N. Santa Monica Boulevard	West[5]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the southbound approach[2].
			• Install a stop line at a point seven feet from the north edge of the pavement on the southbound approach.
Approaches to N. Santa Monica Boulevard from:			
• E. Green Tree Road	North[5]	- -	• Install a stop line at a point seven feet from the west edge of the pavement on the eastbound approach.[6]
Approach to E. Bradley Road from:			
• N. Poplar Road	West[5]	- -	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the southbound approach[2].
Approaches to E. Dean Road from:			
• N. Fox Lane	- -	West[5]	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the northbound approach[2].

[1] Vegetation restricts the sight distance to less than 350 feet.

[2] The vision triangle at the intersection between an arterial and a collector street or between an arterial and a land access street is the line which connects a point on each intersecting right-of-way line located 50 feet from the point of intersection of the two rights-of-way lines. The estimated cost to remove the vegetation from each intersection corner is about $500 at all arterial and collector street intersections, and about $200 at intersections between two land access streets. Because the vegetation is on private property, the cost for its removal would be the responsibility of the property owner.

[3] Sight distance within 350 feet of the intersection is partially obstructed but is clear both upstream and downstream of the obstruction.

[4] A bus shelter partially restricts the sight distance to the south to less than 350 feet.

[5] Vegetation restricts the sight distance to less than 250 feet.

[6] Under the criteria set forth in Table 6, the "STOP" signs should be removed from the E. Green Tree Road approaches to this intersection. However, it may be noted that the existing four-way stop sign control at this intersection was implemented expressly to promote public safety. Thus, it was recommended that the existing traffic control be retained and that "stop line" pavement marking be provided on this approach to permit motorists to stop nearer N. Santa Monica Boulevard therby improving the sight distance on N. Santa Monica Boulevard from eastbound E. Green Tree Road.

Source: SEWRPC.

abutting the right-of-way line, it is generally possible for motorists following the prescribed procedure to increase the available sight distance to meet or exceed the 350 foot criterion by advancing to a second stopping point near the edge of the N. Lake Drive pavement after first having stopped at the "STOP" sign. Thus, no corrective action would be considered necessary.

Nevertheless, to improve overall traffic safety and, in particular, to reduce the potential for conflict between motor vehicles and pedestrians and bicyclists using the path; it is recommended that Village officials seek the voluntary cooperation of abutting landowners in the creation of vision triangles to improve intersection stopping sight distances. This action would improve traffic safety. The disadvantages of this action include the adverse impact on the aesthetic appearance of the area, and the need for voluntary cooperation. This action is also recommended on those westbound approaches having substandard stopping sight distances.

Implementation of this recommendation was estimated to cost an average of $500 per intersection corner at all arterial and all collector street intersections, and an average of about $200 per intersection corner at intersections between two land access streets. However, because the vegetation is on private property, the cost attendant to its removal is the responsibility of the property owner, and there would be no cost the Village to implement this action.

A third action considered to improve overall traffic safety was the relocation of the bus shelters which impair the stopping sight distances on the eastbound approaches to N. Lake Drive on E. Green Tree Road, E. Bell Road and E. Bradley Road. A potential disadvantage of this action is that the existing attractive, wooden structures may be replaced with less attractive, modern, maintenance-free, aluminum and plexiglass structures. Alternatively, it may be determined that replacement of the existing shelters is not warranted based on boarding passenger volumes and the shelters may be removed. Nevertheless, it is recommended that the Village consider the relocation of the three bus shelters. The estimated cost to implement this action is approximately $15,000.

A final traffic engineering action considered to abate the substandard stopping sight distance on selected westbound approaches to N. Lake Drive was the

provision of "stop line" pavement markings seven feet east of the edge of N. Lake Drive. Under Wisconsin Statutes, motorists must stop at the stop line rather than the "STOP" sign. This traffic engineering action would permit the motorists to stop closer to N. Lake Drive than the existing "STOP" sign, improving the intersection stopping sight distance to the north and south on N. Lake Drive. It is recommended that the Village provide "stop line" pavement markings on the approaches identified in Table 8. The estimated cost to implement this action is approximately $600.

Westbound N. Port Washington Road (CTH W) Approaches: Available stopping sight distance from the stop sign was found to be less than 350 feet on the westbound W. Port Washington Court and W. Indian Creek Parkway approaches to N. Port Washington Road (CTH W). The stopping sight distance on the W. Port Washington Court approach was restricted by a commercial business sign, and on the W. Indian Creek Parkway approach by vegetation.

The action considered to alleviate the restricted stopping sight distance on the W. Port Washington Court approach is the relocation of the commercial business sign from its current location to a point outside the vision triangle. The disadvantage of this alternative is that the voluntary cooperation of the abutting landowner is required to implement this action. It is recommended that Village officials seek the voluntary cooperation of the abutting landowner in improving the vision triangle and the attendant stopping sight distance at this intersection. There would be is no cost to the Village attendant to implementation of this action.

The traffic engineering action considered to abate the substandard intersection stopping sight distance on the westbound W. Indian Creek Parkway approach was the provision of "stop line" pavement marking seven feet east of the edge of the N. Port Washington Road pavement. Under Wisconsin Statutes, motorists must stop at the stop line rather than the stop sign. This traffic engineering action would permit motorists to stop closer to N. Lake Drive than the existing stop sign location, improving the intersection stopping sight distance to the north on N. Port Washington Road. It is recommended that the Village provide "stop line" pavement markings on the westbound Indian Creek Parkway intersection approach. The estimated cost of implementing this action is approximately $100.

E. Green Tree Road and N. Santa Monica Boulevard Approaches: Available stopping sight distance from the "STOP" sign on the eastbound E. Green Tree Road and the southbound N. Santa Monica Boulevard intersection approaches was found to be less than 250 feet, the criterion based on the posted 25 mile per hour speed limit on these facilities.

It should be noted that this intersection is an intersection between two streets of differing hierarchial order with E. Green Tree Road classified as an arterial and N. Santa Monica Boulevard classified as a collector. Under the traffic management control criteria set forth in Table 6, the arterial street approaches, that is the E. Green Tree Road approaches, to this intersection should not be controlled. Thus, it may be concluded that the existing four-way "STOP" sign control at this intersection does not conform to the traffic management control criteria set forth in Table 6.

In order for the traffic control at his intersection to conform to the traffic management control criteria set forth in Table 6, it would be necessary to remove the "STOP" signs from the E. Green Tree Road approaches to this intersection. However, it should be noted that the existing traffic control at the intersection was installed expressly to promote public safety. Therefore, it is recommended to retain the existing four-way "STOP" sign control at this intersection.

The traffic engineering action considered to abate the substandard intersection stopping sight distance on the eastbound E. Green Tree Road approach and the southbound N. Santa Monica Boulevard approach was the provision of "stop line" pavement marking seven feet west of the edge of the N. Santa Monica Boulevard pavement and seven feet north of the edge of the E. Green Tree Road pavement, respectively. Under Wisconsin Statutes, motorists must stop at the stop line rather than the "STOP" sign. This traffic engineering action would permit motorists to stop closer to the respective intersecting streets than the existing stop sign locations, improving the stopping sight distance. It is recommended that the Village provide a "stop line" pavement marking on the eastbound E. Green Tree Road approach and southbound N. Santa Monica Boulevard approach. The estimated cost of implementing this action is approximately $200.

Another action considered to alleviate the restricted stopping sight distance problem on the southbound approach of N. Santa Monica Boulevard is to create vision triangles to improve stopping sight distance. The disadvantages of this action include the adverse impact on the aesthetic appearance of the area, and the need for voluntary property owner cooperation. It is recommended that Village officials seek voluntary cooperation from abutting property owners to create vision triangles to improve the stopping sight distance on the southbound approach.

Implementation of this recommendation was estimated to cost an average of $500 per intersection corner at all arterial and all collector street intersections, and an average of about $200 per intersection corner at intersections between two land access streets. However, because the vegetation is on private property, the cost attendant to its removal is the responsibility of the property owner, and there would be no cost the Village to implement this action.

Southbound N. Poplar Road Approach to E. Bradley Road: Available stopping sight distance from the southbound N. Poplar Road approach to E. Bradley Road was found to be less that 250 feet the criterion based upon the posted 25 mile per hour speed limit on E. Bradley Road. The action considered to alleviate the restricted stopping sight distance problem of the southbound N. Poplar Road approach is to create vision triangles to improve the stopping sight distance. The disadvantages include the adverse impact on the aesthetic appearance of the area, and the need for voluntary cooperation. It is recommended that Village officials seek voluntary cooperation from abutting property owners to create vision triangles to improve the stopping sight distance on the southbound approach.

Implementation of this recommendation was estimated to cost an average of $500 per intersection corner at all arterial and all collector street intersections, and an average of about $200 per intersection corner at intersections between two land access streets. However, because the vegetation is on private property, the cost attendant to its removal is the responsibility of the property owner, and there would be no cost the Village to implement this action.

Northbound N. Fox Lane Approach to E. Dean Road: Available stopping sight distance from the northbound N. Fox Lane approach to E. Dean Road was found to be less than 250 feet the criterion based upon the posted 25 mile per hour speed limit on E. Dean Road. The action considered to alleviate the restricted stopping sight distance problem of the northbound N. Fox Lane approach is to create vision triangles to improve the stopping sight distance. The disadvantages include the adverse impact on the aesthetic appearance of the area, and the need for voluntary cooperation. It is recommended that Village officials seek voluntary cooperation from abutting property owners to create vision triangles to improve the stopping sight distance on the southbound approach.

Implementation of this recommendation was estimated to cost an average of $500 per intersection corner at all arterial and all collector street intersections, and an average of about $200 per intersection corner at intersections between two land access streets. However, because the vegetation is on private property, the cost attendant to its removal is the responsibility of the property owner, and there would be no cost the Village to implement this action.

Intersection Traffic Control and Signing

The existing intersection control was compared to the criteria set forth in Table 6 to determine if the existing control complied with the recommended control. Specifically, the existing intersection control was evaluated to determine if it met the control criteria based upon the relative hierarchial order of the intersecting streets.

Based upon this evaluation it was determined that two arterial street/collector street intersections do not meet the hierarchial street order control criteria. Both intersections are identified in the arterial/collector section of Table 9. Six collector street/collector street intersections were determined to have improper traffic control. The six intersections are identified in the collector/collector section of Table 9. Finally, 24 collector street/land access street intersections were determined to have improper intersection control. The 24 intersections are also identified in Table 9 in the collector/land access section.

Table 9

VILLAGE OF FOX POINT INTERSECTIONS IDENTIFIED AS HAVING IMPROPER EXISTING TRAFFIC CONTROL WITH ACTION RECOMMENDED TO ENSURE CONFORMITY WITH TRAFFIC MANAGEMENT CONTROL CRITERIA

Hierarchial Classification	Intersection	Traffic Management Control Criteria	Existing Traffic Control	Action Recommended to Ensure Conformity With Traffic Management Control Criteria
Arterial/Collector	E. Green Tree Road at N. Santa Monica Boulevard	2-way stop; control on collector approaches only	4-way stop; control on all approaches	Because the existing traffic control at this intersection is a 4-way "STOP" expressly to promote public safety; no change is recommended in the existing traffic control.
	E. Green Tree Road at N. Yates Road	2-way stop; control on collector approaches only	4-way stop; control on all approaches	Because the existing traffic control at this intersection is a 4-way "STOP" expressly to promote public safety; no change is recommended in the existing traffic control.
Collector/Collector	E. Bradley Road at N. Santa Monica Boulevard	4-way stop; control on all approaches	2-way stop; control on E. Bradley Road approaches	Install stop signs on N. Santa Monica Boulevard approaches.
	E. Calumet Road at N. Santa Monica Boulevard	4-way stop; control on all approaches	2-way stopl control on E. Calumet Road approaches	Install stop signs on N. Santa Monica Boulevard approaches.
	E. Dean Road at N. Santa Monica Boulevard	4-way stop; control on all approaches	2-way stop; control on N. Santa Monica Boulevard approaches	Install stop signs on E. Dean Road approaches
	N. Crossway Road at N. Yates Road and E. Clair Court[1]	4-way stop; control on all approaches	Yield control on N. Crossway Road and E. Clair Court approaches	Replace yield signs with stop signs and install stop signs on N. Yates Road approaches
	N. Crossway Road at E. Good Hope Road	4-way stop; control on all approaches	Stop control on E. Good Hope Road approaches	Install stop signs on N. Crossway Road approaches
	N. Santa Monica Road at N. Yates Road	4-way stop; control on all approaches	Stop control on westbound N. Santa Monica Boulevard	Install stop signs on N. Yates Road and northbound N. Santa Monica Boulevard approach
Collector/Land Access	E. Bradley Road at N. Links Way	Stop control on land access approach	Yield control on land access approach	Replace yield sign with stop sign
	E. Bradley Road at N. Mohawk Road	2-way stop control on land access approaches	Yield control on land access approaches	Replace yield signs with stop signs
	E. Bradley Road at N. Navajo Road	Stop control on land access approach	Yield control on land access approach	Replace yield sign with stop sign
	E. Bradley Road at N. Poplar Road	Stop control on land access approach	Yield control on land access approach	Replace yield sign with stop sign
	E. Bradley Road at N. Seneca Road	Stop control on land access approach	Yield control on land access approach	Replace yield sign with stop sign
	E. Bradley Road at N. Whitney Road	Stop control on land access approach	Yield control on land access approach	Replace yield sign with stop sign
	E. Calumet Road at N. Boyd Way	2-way stop control on land access approaches	Yield control on land access approaches	Replace yield signs with stop signs

Table 9 (continued)

Hierarchial Classification	Intersection	Traffic Management Control Criteria	Existing Traffic Control	Action Recommended to Ensure Conformity With Traffic Management Control Criteria
Collector/Land Access (continued)	E. Calumet Road at N. Links Way	2-way stop control on land access approaches	Yield control on land access approaches	Replace yield signs with stop signs
	E. Calumet Road at N. Mohawk Road	Stop control on land access approach	Yield control on land access approach	Replace yield sign with stop sign
	E. Calumet Road at N. Navajo Road	Stop control on land access approach	Yield control on land access approach	Replace yield sign with stop sign
	E. Dean Road at N. Greenvale Road	2-way stop control on land access approaches	Yield control on land access approaches	Replace yield signs with stop signs
	E. Dean Road at N. Indian Creek Parkway	2-way stop control on land access approaches	Yield control on land access approaches	Replace yield signs with stop signs
	E. Dean Road at N. Links Way	2-way stop control on land access approaches	Yield control on land access approaches	Replace yield signs with stop signs
	E. Dean Road at N. Poplar Drive	Stop control on land access approach	Yield control on land access approach	Replace yield sign with stop sign
	N. Crossway Road at N. Fairchild Circle	Stop control on land access approach	Uncontrolled	Install stop sign on land access approach
	E. Dean Road at N. Whitney Road	Stop control on land access approach	Yield control on land access approach	Replace yield sign with stop sign
	N. Regent Road at N. Point Drive	Stop control on land access approach	Yield control on land access approach	Replace yield sign with stop sign
	N. Regent Road at N. Regent Court	Stop control on land access approach	Uncontrolled	Install stop sign on land access approach
	N. Santa Monica Boulevard at N. Santa Monica Court No. 3 (north)	Stop control on land access approach	Uncontrolled	Install stop sign on land access approach
	N. Santa Monica Boulevard at N. Santa Monica Court No. 3 (south)	Stop control on land access approach	Uncontrolled	Install stop sign on land access approach
	N. Santa Monica Boulevard at N. Santa Monica Court No. 2 (north)	Stop control on land access approach	Uncontrolled	Install stop sign on land access approach
	N. Santa Monica Boulevard at N. Santa Monica Court No. 1 (north)	Stop control on land access approach	Uncontrolled	Install stop sign on land access approach
	E. School Road at N. Berkeley Boulevard	Stop control on land access approach	Uncontrolled	Install stop sign on land access approach
	N. Yates Road at N. Fairchild Circle	Stop control on land access approach	Yield control on land access approach	Replace yield sign with stop sign

[1] The N. Yates Road leg on the north side of the intersection and E. Clair Court are land access streets.
Source: SEWRPC.

Arterial Street/Collector Street Intersections: Based upon the traffic management control criteria set forth in Table 6, only the collector street approaches to intersection between arterial streets and collector streets should be "STOP" sign controlled. Thus, the existing four-way "STOP" control at the two intersections between the two arterial streets and collector streets identified in Table 9 does not conform to the traffic management control criteria.

In order for the traffic control at the two intersections between arterial streets and collector streets identified in Table 9 to conform to the traffic management control criteria set forth in Table 6 it would be necessary to remove the "STOP" signs from the arterial street approaches at these intersections. However, it should be noted that the existing traffic control at these intersections was installed expressly to promote public safety. Therefore, it is recommended to retain the existing four-way "STOP" sign control at these intersections.

Collector Street/Collector Street Intersections: The traffic engineering action considered to abate the improper intersection control identified at the intersections between two collector streets was the installation of "STOP" signs on the uncontrolled intersection approaches. The advantages of this alternative action include compliance with the adopted traffic control criteria set forth in Table 6 and a more definitive assignment of right of way at these intersections.

The disadvantage of this alternative is the potential for an increase in the number of rear-end accidents at these intersections. Nevertheless, it is recommended that "STOP" signs be installed on the uncontrolled approaches at the six intersections between two collector streets set forth in Table 9. With the exception of the intersection of N. Clair Court; N. Crossway; and N. Fairchild Circle with N. Yates Road which has an estimated cost of $700, the estimated cost to implement this alternative is $400 per intersection. The total estimated cost to the Village attendant to implementation of this recommendation is $2,700.

Collector Street/Land Access Street Intersections: As previously noted, comparison of existing traffic control to the traffic management control criteria for intersections between collector streets and land access streets indicate that a total of 24 such intersections within the Village currently have improper

traffic control. At 17 intersections, the existing traffic control devices are improper. At the seven remaining intersections there is currently no control. The traffic engineering action considered to abate the problem of improper traffic control devices identified at 17 collector street-land assess street intersections was the replacement of the existing "YIELD" signs with "STOP" signs. The advantages of this alternative action included compliance with the adopted traffic control criteria set forth in Table 6 and a more definitive assignment of right-of-way at these intersections. The disadvantage of this alternative is the potential for an increase in the number of rear-end accidents at these intersections. Nevertheless, it is recommended that the existing "YIELD" signs be replaced with "STOP" signs 17 intersections between collector streets and land access streets set forth in Table 9. The estimated cost to the Village to implement this alternative is $2,300.

The traffic engineering action considered to abate the lack of traffic control identified at seven intersections between land access streets and collector streets set forth in Table 9 was the installation of "STOP" signs on the land access street intersection approaches. The advantages of this alternative action included compliance with the adopted traffic control criteria set forth in Table 6 and a more definitive assignment of right-of-way at these intersections. The disadvantage of this alternative is the potential for an increase in the number of rear-end accidents at these intersections. Nevertheless, it is recommended that "STOP" signs be installed on the land access street approaches at the seven intersections between collector streets and land access streets set forth in Table 9. The estimated cost to the Village to implement this alternative is $1,400.

Regulatory "STOP" Sign Location: As shown in Table 4, the existing regulatory "STOP" signs at three intersections are between the pedestrian path paralleling N. Lake Drive (STH 32) and N. Lake Drive. These intersections include the intersections with N. Holly Court, N. Service Drive (north), and E. Green Tree Road. The Manual on Uniform Traffic Control Devices prescribes that such regulatory signing be four feet from the non-roadway edge of the sidewalk or path. Thus, it may be concluded that the "STOP" signs at these intersections are not in the correct location.

The traffic engineering action considered to abate this deficiency was the relocation of the existing "STOP" signs to a point four feet behind the non-roadway edge of the pedestrian path. The advantages of this action include conformity with the Manual on Uniform Traffic Control Devices and an attendant increase in pedestrian safety. There are no disadvantage to this action. Thus it is recommended that the "STOP" signs at the intersections of N. Holly Court, N. Service Drive (north), and E. Green Tree Road with N. Lake Drive be relocated to a point four feet from the non-roadway edge of the pedestrian path. The estimated cost to the Village to implement this action is $400.

Traffic Accidents

As previously noted, the incidence of traffic accidents is a measure of the operational efficiency of the street and highway system. Locations having a history of multiple accidents on an annual basis may be indicative of a traffic safety problem particularly if there are discernable accident patterns. Locations experiencing an increasing trend in the frequency of accidents may also be indicative of a traffic safety problem. Accordingly, for the multiple traffic accident locations set forth in Table 3, a review of historic traffic accident data was conducted to determine if any accident patterns exist which may be addressed through the installation of additional traffic control devices.

As shown in Table 3, six intersections within the Village of Fox Point experienced at least three accidents per year during the time period from January 1, 1991, through September 30, 1994. A threshold of three accidents was utilized as it represents the minimum number of accidents which may be considered necessary to discern whether the collision types are generally similar or dissimilar. When the type of collision occurs repetitively at a specific location, it may be indicative of unique circumstances which might have the potential to be modified to improve traffic safety.

N. Lake Drive (STH 32) at E. Green Tree Road: Analysis of the historic traffic accident data from January 1, 1991, through September 30, 1994, indicated that two accidents occurred in 1991, 1992, and the first nine months of 1994 while three accidents occurred in 1993. The most predominant collision type was right-angle collisions accounting for five of the nine total accidents or about 56 percent. There were two rear-end collisions or about 22 percent. No other

collision type occurred more that once. It may be noted that one of the two remaining accidents occurring in 1993 was a collision with a deer. There are no traffic engineering actions which may be expected to abate collisions with deer.

Although no more that two right-angle collisions occurred in any one year, because five of the nine total accidents at this intersection involved right-angle collisions, consideration was given to traffic engineering actions which may be expected to abate this collision type. Abatement of right-angle collisions typically requires the provision of additional traffic control to more definitively assign the right of way at the intersection. Because this intersection is already stop sign controlled on the E. Green Tree Road approaches, the provision of additional traffic control would require the installation of stop signs on N. Lake Drive or the installation of traffic signals.

One traffic engineering action considered to abate the traffic accident problem identified at this intersection was the installation of "CROSS ROAD" advance warning sign with "30 MILES PER HOUR" advisory speed plate on the northbound and southbound intersection approaches. The advantage of this alternative action is to provide north- and southbound motorists with advanced warning of the intersection and to advise modestly reduced speeds in the vicinity of the intersection. Traffic safety would be enhanced. The disadvantage of this alternative is that the cooperation of the Wisconsin Department of Transportation is required for implementation. It is recommended that Village officials seek the cooperation of the Wisconsin Department of Transportation in the installation of "CROSS-ROAD" advance warning signs with "30 MILES PER HOUR" advisory speed plate at an estimated cost of $400.

The installation of stop signs on N. Lake Drive was considered but rejected. Under the Manual on Uniform Traffic Control Devices, the installation of multi-way stop signs based on an accident problem is warranted only if five or more reported accidents of a type susceptible to correction by multi-way stop sign installation[5] occur in a 12 month period. No more than two right-angle

[5]Accident types susceptible to correction through the installation of stop signs include left- and right-turn collisions and right-angle collisions.

collisions were observed in any year and no left- or right-turn collisions were observed and thus the accident warrant for the installation of stop signs is not satisfied. Further, the volumes entering the intersection from N. Lake Drive exceed the volumes entering the intersection from E. Green Tree Road by a factor of about 1.8. The installation of multi-way stop signs should not be considered when the ratio of entering volumes exceeds 1.5 because of the unwarranted delay incurred by vehicles on the higher volume approaches. Not only does this delay result in increased air pollutant emissions and fuel consumption, but motorists required to stop even when there is no cross-street traffic tend to disregard the traffic control specifically at this intersection and lose respect for traffic control in general. Finally, the installation of stop signs tends to increase rear-end accidents. Thus, the installation of multi-way stop signs was not recommended.

The installation of traffic signals was also considered, but rejected. The installation of traffic signals would definitively assign the right of way at the intersection, but is not warranted under Warrant 6, Accident Experience, for the installation of traffic signals in the Manual on Uniform Traffic Control Devices. This warrant is based upon the accident experience at an intersection and requires five or more reported accidents of a type susceptible to correction by traffic signal installation[6] in a 12 month period. The installation of traffic signals would also increase delay as some motorists on the higher volume approaches would now be required to stop. Although some motorists on the lower volume approach may benefit through reduced delay, others may actually experience greater delay as they must wait for the green indication rather than being able to use all available gaps of sufficient length in the N. Lake Drive traffic stream as they currently do.

Because of the increased delay to the higher volume of traffic stream, with an attendant increase in air pollutant emissions; because of the estimated cost of installation--about $60,000--; because no more than two right-angle collisions have occurred in any year and no left- or right-turn collisions were observed; and because the installation of traffic signals would not be expected to abate

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[6]Accident types susceptible to correction through the installation of stop signs include left-and right-turn collisions and right angle collisions.

the rear-end collision type; the installation of traffic signals is not recommended at this time. However, it is recommended that the Village continue to monitor the incidence of accidents at this intersection and work with the WisDOT to install traffic signals if the incidence of accidents increases.

N. Lake Drive (STH 32) at E. Bradley Road: Analysis of the historic traffic accident data from January 1, 1991, through September 30, 1994, indicated that no accidents occurred in 1991 or 1992, two accidents occurred in 1993, and three accidents occurred during the first nine months of 1994. There was no predominant collision type although two of the five accidents, or 40 percent, involved single vehicles which left the roadway and struck a fixed object, and two of the five accidents, or 40 percent, involved two vehicles traveling in opposite directions which sideswiped each other. Pavement condition, either snowy or snowy and icy, was cited in the four accidents noted above. Driving too fast for conditions was cited in two of the four accidents and failure to have proper control of the vehicle was cited in a third accident.

Neither of the two apparent patterns in the accidents at this intersection--snowy or icy pavement and lack of appropriate control of the vehicle attendant to the pavement condition--may be directly addressed through the installation of additional traffic control signing.

A potential measure considered to alleviate the accident problem at this intersection was to undertake snow and ice control in the vicinity of this intersection as necessary. The advantage of this measure is that motorists would be better able to control their vehicles during adverse weather which causes icy and/or snowy pavement conditions thereby improving traffic safety. There are no disadvantages to this measure. Therefore, implementation of this measure is recommended. Because N. Lake Drive is on the WisDOT's connecting highway system, the Village is reimbursed by the WisDOT for costs incurred in its maintenance and operation.

N. Lake Drive (STH 32) at E. Dean Road: Analysis of the historic traffic accident data from January 1, 1991, through September 30, 1994, indicated that no accidents occurred at this intersection in 1991, or 1993. One accident, a left-turn collision, occurred in 1992. Three accidents occurred in the first nine

months of 1994, one involving a deer; one rear-end accident and one side swipe accident. There is no pattern attendant to these accidents. Thus, no additional traffic control signing is recommended at this intersection.

It is recommended, however, that this intersection continue to be monitored by Village staff to determine of the incidence if accidents continues to increase and to determine if a pattern of accidents develops.

N. Lake Drive (STH 32) at E. Quarles Place: Analysis of the historic traffic accident data from January 1, 1991, through September 30, 1994, indicated that no accidents occurred in 1991 or 1994, three accidents occurred in 1992, and one accident in 1993. One of these accidents involved a collision with a deer and there were three different vehicular collision types.

Because there was no pattern to the accidents occurring at this intersection and because the frequency of accidents has decreased since 1992, no traffic engineering actions were considered at this intersection.

N. Santa Monica Boulevard at E. Bradley Road: Analysis of the historic traffic accident data from January 1, 1991, through September 30, 1994, indicated that no traffic accidents occurred in 1991, but that two accidents occurred in 1992, three accidents occurred in 1993, and one accident occurred in the first nine months of 1994. The predominant collision type was right-angle with four of the six accidents, or 67 percent, involving right-angle collisions. Failure to yield the right of way was cited in each of the three accidents occurring in 1993.

An alternative traffic control measure considered to alleviate the traffic safety problem at this intersection was the installation of stop signs on the N. Santa Monica Boulevard intersection approaches. The advantages of this alternative include: 1) compliance with the traffic management control criteria[7] set forth in Table 6; and, 2) improved traffic safety as the right of way is more definitively defined at this intersection. Further, the fact that failure to yield the right of way was identified in 60 percent of the accidents may indicate

[7]The traffic management control criteria indicate that intersections between two collector facilities should be controlled by multi-way stop signs. Currently only motorists on E. Bradley Road are required to stop.

that motorists on E. Bradley Road--recognizing that N. Santa Monica Boulevard and E. Bradley Road are of the same order in the street hierarchy--expect N. Santa Monica Boulevard traffic to stop. The disadvantage of this alternative measure is that the installation of stop signs tends to increase rear-end accidents.

Nevertheless, it is recommended that stops signs be installed on the N. Santa Monica Boulevard intersection approaches at an estimated cost to the Village of $400.

N. Port Washington Road (CTH W) at E. Bradley Road: Analysis of the historic traffic accident data from January 1, 1991, through September 30, 1994, indicated that six accidents occurred in 1991; six accidents in 1992; four accidents in 1993; and three accidents in the first nine months of 1994. The most predominant collision type was rear-end with eight of the 20 total accidents, or about 40 percent, involving read-end collisions. Four of the total 20 accidents, or about 20 percent, involved vehicles striking fixed objects off the roadway to the right, and three of the 20 total accidents, or about 15 percent, involved left-turning vehicles. The remaining five accidents involved four different collision types.

It may be noted that the three collisions involving left-turning vehicles occurred prior to 1993. Because no such collisions occurred within the past 21 months, no traffic control measures were specifically considered to abate this collision type.

The first collision type considered for abatement through the implementation of alternative traffic control measures was the rear-end collision type. The first alternative traffic control measure considered was to increase the size of the traffic signal lenses to 12 inches and to equip them with backplates. The advantage of this alternative measure is to substantially improve the visibility of the traffic signals. The only disadvantage to this alternative measure is that the traffic signal is under the jurisdiction of Milwaukee County, and thus the Village must seek the County's cooperation in implementing this measure. It is recommended that this alternative traffic control measure be implemented at an estimated cost to the County of $3,000.

Another alternative traffic control measure considered was the installation of an advance warning sign facing northbound traffic with the pictographic message "SIGNAL AHEAD". The advantage of this alternative measure is to alert motorists to the upcoming traffic signal and the potential that they may be required to stop. The only disadvantage to this alternative measure is that N. Port Washington Road is under the jurisdiction of Milwaukee County, and thus the Village must seek the County's cooperation in implementing this measure. It is recommended that this alternative traffic control measure be implemented at an estimated cost to the County of $200.

Another traffic control measure considered but rejected was a reduction in the posted speed limit on N. Port Washington Road in the vicinity of the intersection. Although this measure would be expected to provide motorists with more time to perceive and react to unexpected traffic situations, it may also induce greater disparity in travel speeds and require a substantial increase in directed law enforcement activity to achieve compliance. As the disparity in travel speeds increases, the probability for both the incidence and severity of traffic accidents increases. Thus, a reduction in the posted speed limit is not recommended at this time.

N. Lake Drive (STH 32) from the South Corporate Limit to the North Corporate Limit: Analysis of the historic traffic accident data from January 1, 1991, through September 30, 1994, indicated that 17 accidents occurred in 1991; 23 occurred in 1992; 16 occurred in 1993; and 14 occurred in the first nine months of 1994. As previously noted, 21 of these accidents occurred at multiple accident locations and have been analyzed within that context. The following analyses will be directed to the remaining 49 accidents.

As previously noted, 28 of the 49 accidents, or about 57 percent, involved a single vehicle. Of those 28 accidents, 15 or about 54 percent involved deer, and 9 accidents, or about 32 percent involved a collision with a fixed roadside object. Snowy or icy pavement conditions were a probable factor in five of the nine collisions with a fixed roadside object. Wet pavement may have been a factor in two other collisions with fixed roadside objects and in five of the 15 collisions with deer.

Of the 21 multi-vehicle accidents, 9 accidents, or about 43 percent, were right-angle collisions and seven accidents or about 33 percent were rear-end collisions. Three accidents, or about 14 percent, were sideswipe accidents between vehicles traveling in the same direction and one accident or 5 percent was a head-on collision. These are the only accident types that may indicate that the existing pavement marking on N. Lake Drive may be contributing to a traffic safety problem. Thus, it was concluded that the pavement marking on N. Lake Drive does not constitute a significant traffic safety problem, and there is no evidence to indicate that these accidents would not have occurred absent the current pavement markings.

Finally, it may be noted, 23 of the 49 accidents, or about 47 percent, occurred at night when ambient light levels are low. However, because 15 of the 23 accidents, or about 65 percent, involved either a collision with a deer or running off the road and colliding with a fixed object, the number of accidents which would be expected to benefit from the provision of artificial light is reduced to 8 or about 16 percent of all accidents, and thus was not considered significant.

It is important to note again that there is no concentration of accidents occurring at any single location. For this reason alone, the application of traffic engineering measures to abate or reduce the incidence of accidents on this segment of N. Lake Drive would be expected to have only a marginal impact. Further, the most predominant collision type on this segment of N. Lake Drive is a collision with a deer. It is the only collision type which, on average occurs three or more times annually, the threshold number of accidents considered to indicate a pattern of accidents as opposed to random occurrences. Because such a collision may occur at virtually any time and at any location, the potential for a traffic engineering action to abate this problem is very limited. Warning signs displaying the pictograph which indicates a potential for deer to cross the roadway are posted to alert both north- and southbound motorists as they enter the Village.

One traffic engineering action was considered to abate this traffic safety problem. This action was to add supplementary advisory distance plate to the existing "DEER" warning signs with the message "NEXT 2 1/2 MILES". The advantage

of this action would be to inform motorists that the potential of encountering a deer is not limited to the vicinity of the warning sign itself, but exist through the entire Village. There are no disadvantages to this alternative action. Therefore, it is recommended that supplemental advisory distance plates with the message "NEXT 2 1/2 MILES" be posted on the existing "DEER" warning signs at an estimated cost to the Village of $200.

One alternative non-traffic engineering action considered to abate all traffic accidents on this segment of N. Lake Drive was a reduction in the posted speed limit from 35 miles per hour to 30 miles per hour. The advantage of this alternative action would be to reduce travel speeds thereby reducing the distance a vehicle travels between the time a potential hazard is perceived and the motorist reacts. The actual stopping distance required would also be reduced from 350 feet to 300 feet. The primary disadvantage of this alternative action is the potential need for an increase in directed law enforcement activity to achieve compliance with the speed limit. Nevertheless, it is recommended that consideration be given to reducing the speed limit from 35 to 30 miles per hour. The estimated cost to the Village to implement this action is $700.

It is further recommended that this action be implemented on a trial basis for six months. At the end of the trial period, the incidence and type of accidents should be carefully reviewed to assess the impact of the reduced speed limit. Before and after travel speed data including the 85th percentile speed and the 10 mile per hour pace range of speeds should also be carefully reviewed to determine motorist compliance. If motorist compliance with the 30 mile per hour speed limit is good and the incidence of accidents is reduced, consideration may be given to making the proposed trial reduction in the speed limit permanent[8].

Another alternative non-traffic engineering action considered to abate the traffic accidents on this segment of N. Lake Drive was the creation of unobstructed vision triangles at each intersection. Although Village officials expressed concern about potentially inadequate vision from the eastbound

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[8] Implementation of this action would eliminate the need to install advisory speed plates on the "CROSS-ROAD" advance warning signs as recommended to abate the traffic accident problem observed at the intersection of E. Green Tree Road and N. Lake Drive (STH 32).

intersection approaches, it maybe noted that vision from the westbound approaches may also be restricted by vegetation. The size of the clear vision triangle would be dependent upon the hierarchy of the intersecting streets. At any intersection involving an arterial or collector street a clear field of vision should exist within a triangle which has the intersecting right-of-way lines as two of its sides. Each of these sides should be 50 feet in length from the point of intersection. The third side of the triangle would be the line connecting the two points on the right-of-way lines 50 feet from their point in intersection. At any intersection involving two land access streets the length of the sides on the intersecting right-of-way lines should be 25 feet from the point of intersection. The third side would be the line connecting the two points on the right-of-way lines 25 feet from their point of intersection.

The advantage of creating vision triangles is to substantially improve stopping sight distance available from the intersecting street approaches, thereby, reducing the potential for traffic accidents, particularly right-angle collisions. The disadvantage of this action is that the creation of these vision triangles may be expected to occur only with the voluntary cooperation of abutting property owners. Nevertheless, it is recommended that the Village adopt a vision triangle policy and seek the voluntary compliance of affected property owners.

Implementation of this recommendation was estimated to cost an average of $500 per intersection corner at all arterial and all collector street intersections, and an average of about $200 per intersection corner at intersections between two land access streets. However, because the vegetation is on private property, the cost attendant to its removal is the responsibility of the property owner, and there would be no cost the Village to implement this action.

Railway Crossings

The existing railway-highway grade crossing protection was reviewed for conformance to the requirements of the Manual on Uniform Traffic Control Devices. As noted in the inventory of traffic control devices, each of the five railway-highway grade crossings within the Village is protected by the obligatory "RAILROAD CROSSING" regulatory signing in conformance with the Manual on Uniform Traffic Control Devices.

Supplemental "Flashing Light Signals" are provided on each street approach in conformance with the Manual on Uniform Traffic Control Devices. "RAILROAD" advance warning signs[9] are also posted on all street approaches except the westbound E. Green Tree Road approach. Because the distance along E. Green Tree Road between N. Lake Drive (STH 32) and the railway trackage is less than 100 feet, the Manual on Uniform Traffic Control Devices does not require the posting of "RAILROAD" advance warning signs on the westbound E. Green Tree Road approach to the railway trackage.

Thus, no deficiencies with respect to railway-highway grade crossing regulatory and advance warning signing were identified. However, the Manual on Uniform Traffic Control Devices does permit the installation of type "W10-2" "RAILROAD" warning signs on highways paralleling railway trackage to warn motorists making a turn that a railway crossing is ahead. This warning sign is a pictograph showing an intersection with railway tracks parallelling one roadway and crossing the intersecting roadway. The installation of these warning signs on the N. Lake Drive approaches to its intersection with E. Green Tree Road were considered but rejected. The installation was rejected because review of the historic traffic accident data from January 1, 1991, through September 30, 1994, did not indicate that a traffic safety problem exists at this railway highway grade crossing.

The inventory of traffic control devices at the railway-highway grade crossing indicated that there are no existing pavement markings. The Manual on Uniform Traffic Control Devices does require the use of pavement markings essentially as illustrated in Figure 7 on all paved approaches where grade crossing signals are provided. The Wisconsin Supplement to the Manual on Uniform Traffic Control Devices, however, permits the omission of such pavement markings where the approach distance is less that 100 feet as is the case on the westbound E. Green Tree Road approach to the railway crossing. Thus, with respect to the prescribed pavement markings, none of the street approaches complies with the Manual on Uniform Traffic Control Devices except the westbound E. Green Tree Road approach.

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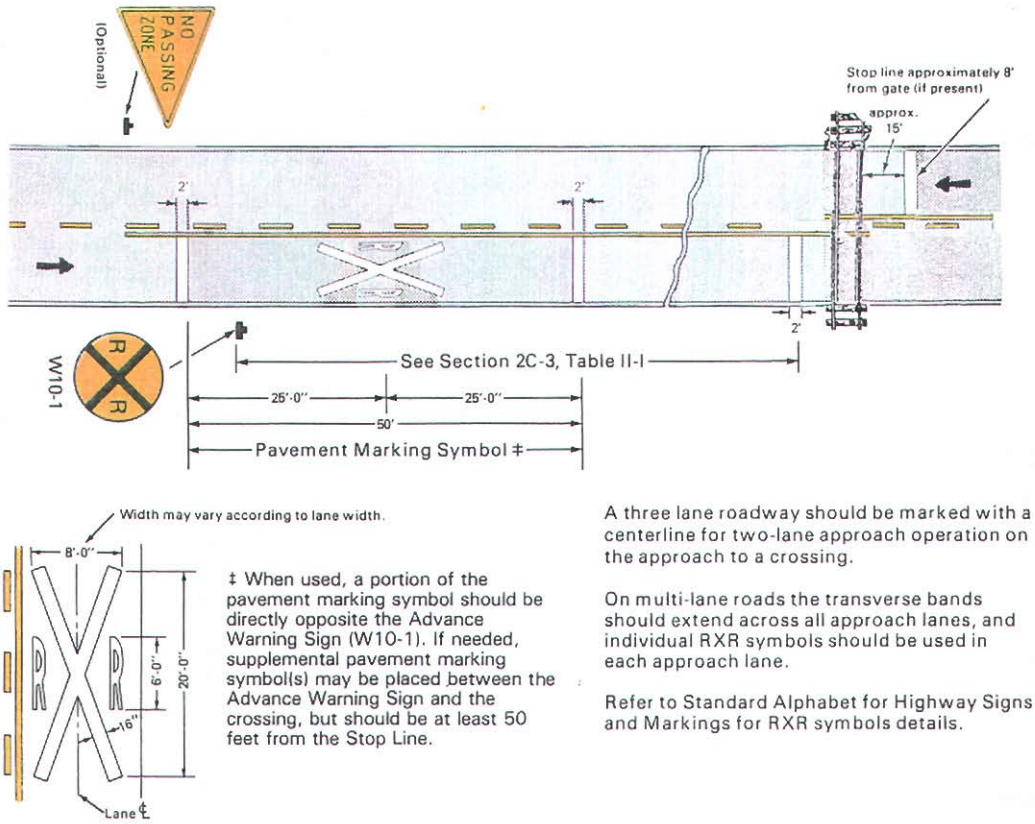
[9]The "RAILROAD" advance warning signs posted are type "W10-1", a 36" diameter circle with black crossbucks and black lettering on a yellow background.

Figure 7

TYPICAL PLACEMENT OF WARNING SIGNS AND PAVEMENT MARKINGS AT RAILROAD-HIGHWAY GRADE CROSSINGS



‡ When used, a portion of the pavement marking symbol should be directly opposite the Advance Warning Sign (W10-1). If needed, supplemental pavement marking symbol(s) may be placed between the Advance Warning Sign and the crossing, but should be at least 50 feet from the Stop Line.

A three lane roadway should be marked with a centerline for two-lane approach operation on the approach to a crossing.

On multi-lane roads the transverse bands should extend across all approach lanes, and individual RXR symbols should be used in each approach lane.

Refer to Standard Alphabet for Highway Signs and Markings for RXR symbols details.

Figure 8-2. Typical placement of warning signs and pavement markings at railroad-highway grade crossings.

Source: Manual on Uniform Traffic Control Devices, U.S. Department of Transportation, Federal Highway Administration, 1988.

The traffic engineering action considered to abate the pavement marking deficiency on the street approaches to the railway-highway grade crossing in the Village was the installation of the prescribed pavement markings. The advantages of this alternative action are to provide additional warning to motorists that they are approaching a railway crossing and compliance with the Manual on Uniform Traffic Control Devices. The disadvantage of this alternative is that under certain conditions such as snow, the pavement markings may be obscured.

It is recommended that pavement markings be installed on all street approaches to the railway-highway grade crossings within the Village except the westbound E. Green Tree Road approach as illustrated in Figure 7. The estimated cost to the Village to implement this action is $7,000.

N. Lake Drive (STH 32) Longitudinal Pavement Marking

Pavement markings have definite and important functions to perform in a proper scheme of traffic control serving to effectively convey certain regulations and warnings not otherwise clearly understandable. The broken yellow line pavement markings utilized on N. Lake Drive (STH 32) in the Village are intended: 1) to delineate the left edge of a travel path where travel on the side of the line is in the opposite direction; and, 2) overtaking and passing in the opposing lane is permissible. Thus, the existing N. Lake Drive pavement markings creates motorist confusion by indicating that there are multiple travel lanes in each direction, and that overtaking and passing is permitted from both the center and left lanes. This confusion may be expected to increase the potential for vehicular accidents although it should be noted that 17 of the 42 vehicular accidents from January 1, 1991, to June 30, 1993, were single vehicle accidents and thus the number of lanes does not appear to have been a factor. Nevertheless, because broken yellow lines generally delineate the centerline of a two-lane, two-way roadway and because of the non-standard use on N. Lake Drive, the existing pavement markings may be considered inappropriate and a potential traffic safety problem.

Two alternative longitudinal pavement marking schemes were considered to replace the existing inappropriate scheme. The first alternative longitudinal pavement marking scheme considered was to provide centerline and lane edge pavement markings which would result in two traffic lanes and a paved shoulder approxi-

mately six feet wide, one in each direction. The existing exclusive left-turn lanes at the E. Green Tree Road and E. Bradley Road intersections with N. Lake Drive would be retained by transitioning the centerline and lane edge pavement markings to the existing left-turn lanes, in effect, dropping the paved shoulder. The advantages of this alternative include: 1) conformity with the pavement marking standards set forth in the Manual on Uniform Traffic Control Devices; 2) reduction in motorist confusion; 3) improvement in traffic safety; and, 4) a two-lane roadway provides adequate capacity to accommodate travel demand. The disadvantage of this alternative is that a left-turning vehicle may temporarily block a traffic lane. It is, therefore, recommended that this alternative longitudinal pavement marking scheme be implemented at an estimated cost to the Village of $12,500.

A second alternative longitudinal pavement marking scheme considered but rejected was to provide a three lane roadway with two traffic lanes with a continuous two-way left-turn lane in the center. The advantage of a continuous left-turn lane is that left-turning traffic is separated from the through traffic. This is a significant advantage in areas where: 1) the left-turning volumes exceed 20 percent of the through traffic volumes; 2) there exist 60 or more driveways per mile; and 3) average weekday traffic volumes exceed 10,000 vehicles. Because average weekday traffic volumes on N. Lake Drive north of E. Green Tree Road are less than 10,000 vehicles and because the residential land uses abutting N. Lake Drive would not be expected to generate left-turning volumes in excess of 20 percent of the through traffic any advantage of this alternative is obviated. Therefore, implementation of this alternative longitudinal pavement marking scheme is not recommended.

Horizontal Alignment Warning Signing

Locations throughout the Village of Fox Point where 90 degree or near 90 degree abrupt changes in alignment occur were inventoried to determine the existing warning signing. Advanced warning "TURN" signs alert the motorist that an abrupt turn is ahead which will require the motorist to negotiate that turn at a speed below the posted speed limit on the roadway. These signs are currently posted between the 1400 and 1500 blocks of E. Goodrich Lane, the 1700 and 1800 blocks of E. Fox Lane, the 7400 and 7500 blocks of N. Beach Road, and between E. MacArthur Road and N. Van Dyke Road on both roadway approaches to these turns.

A "TURN" sign is also posted facing northbound traffic between the 7900 and 8000 block of N. Beach Road and facing eastbound traffic between the 8025 and 8035 blocks of N. Beach Road. There are no "TURN" signs between the 8000 and 8025 block of N. Beach Road or the curves between Beach Court and Willetts Lane. There are also "LARGE ARROW" signs facing both roadway approaches to a turn between the 1700 and 1800 blocks of E. Fox Lane facing northbound traffic between 8025 and 8035 blocks of N. Beach Road and facing eastbound traffic between the 8000 and 8025 blocks of N. Beach Road. It may be noted that a "LARGE ARROW" sign is intended to supplement the "TURN" sign.

The lack of "TURN" signs on either approach to the N. Beach Road turn between the 8000 and 8025 blocks of N. Beach Road and to the turns between Beach Court and Willetts Lane on N. Beach Road, as well as the northbound approach to the turn between 8025 and 8035 blocks of N. Beach Road and the westbound approach to the turn between the 7900 and 8000 blocks of N. Beach Road should be considered an advanced warning sign deficiency. Since the "LARGE ARROW" sign is intended to supplement a "TURN" sign, its exclusive use on the northbound approach to the turn between 8025 and 8035 blocks of N. Beach Road and the eastbound approach to the turn between the 8000 and 8025 blocks of N. Beach Road is inappropriate.

The first alternative traffic engineering action considered to abate the problem of insufficient advance warning of abrupt changes in horizontal alignment was to install pictographic "TURN" warning signs on all roadway approaches to 90 degree or near 90 abrupt changes in horizontal alignment which are currently unsigned. These approaches currently include the westbound approach to the abrupt horizontal alignment change between the 7900 and the 8000 blocks of N. Beach Road, the northbound approach to the abrupt horizontal alignment change between the 8025 and 8035 blocks of N. Beach Road, and both approaches to the N. Beach Road abrupt horizonal alignment changes between the 8000 and 8025 blocks of N. Beach Road and abrupt horizontal changes on N. Beach Drive between Beach Court and Willetts Lane. The advantage of installing these "TURN" advance warning signs is to alert motorists to the abrupt alignment change ahead which will require them to negotiate that turn at speeds below the posted speed limit, thereby, improving traffic safety. These signs are warranted under the Manual on Uniform Traffic Control Devices. There are no disadvantages to the installation of these signs. Therefore, it is recommended that "TURN" advance

warning signs be posted at the locations cited above at an estimated cost to the Village of $1,600.

The second alternative traffic engineering action considered to abate the horizontal alignment warning sign deficiency problem was the installation of "LARGE ARROW" signs. The advantages of these warning signs are to provide the motorists with additional warning and as well to define the location of the turn as they are posted on the outside of the abrupt change in alignment facing oncoming traffic. There are no disadvantages to this alternative. It is therefore recommended that "LARGE ARROW" signs be posted facing both approaches to the 90 or near 90 degree alignment changes between the 1400 and 1500 blocks of E. Goodrich Lane, the 7400 and 7500 blocks of N. Beach Road, the 7900 to 8000 blocks of N. Beach Road, the two turns on N. Beach Road between Beach Court and Willetts Lane, and the eastbound approach to the abrupt alignment change between the 8025 and 8035 blocks of N. Beach Road and the southbound approach to the abrupt alignment change between the 8000 and 8025 blocks of N. Beach Road. Large arrow signs should also be posted at the abrupt alignment change between E. MacArthur Road and N. Bell Road. The estimated cost to the Village to implement this alternative action is $2,800.

Also considered but rejected was the installation of advisory speed plates. The advantage of providing advisory speed plates is to inform the motorists of the safe speed at which the abrupt alignment change can be negotiated. It may be noted that there are no disadvantages to this action. Review of the historic traffic data, however, indicates that there is no need for the additional warning. Thus, because there is no need indicated for additional warning and because of the additional cost to install and maintain these signs it is recommended that the advisory speed plates not be installed at this time.

In addition to the abrupt 90 or near 90 degree changes in horizontal alignment, the Village staff requested that the existing horizontal alignment signing adjacent to E. Beach Road from its intersection with N. Lake Drive (STH 32) to a point about 1,500 feet east of that intersection, to evaluate its adequacy. The horizontal alignment of this roadway segment includes four curves beginning at a point about 300 feet east of N. Lake Drive. The longest tangent section on this roadway section is less than 400 feet.

"CHEVRON ALIGNMENT" pictographic warning signs are posted facing eastbound traffic on the outside of two E. Beach Road curves, the first about 300 feet east of N. Lake Drive and the second about 1,100 feet east of N. Lake Drive. A pictographic "CURVE" warning sign is also posted facing eastbound at the curve about 1,100 feet east of N. Lake Drive. The "CHEVRON ALIGNMENT" warning signs, while appropriate, should be extended in advance of and beyond the curves. The pictographic "CURVE" warning sign indicates that the recommended speed on the curve is 30 miles per hour or greater and equal to or less than the legal speed limit on a particular roadway segment. Thus, because the legal speed limit is 25 miles per hour on E. Beach Road, it may be concluded that the "CURVE" warning sign in not appropriate and that the horizontal alignment signing is inadequate for this roadway segment.

The first traffic engineering action considered to abate the inadequate horizontal alignment signing problem was to remove the existing "CURVE" warning sign and replace it with "WINDING ROAD" pictographic warning signs about 200 feet and about 1,600 feet east of N. Lake Drive facing east- and westbound traffic respectively. The "WINDING ROAD" warning sign is intended for use where there are three or more curves separated by tangent distances of less than 600 feet.

The advantage of this sign is to warn motorists that the horizontal alignment of the roadway ahead is comprised of a series of curves, thereby improving traffic safety. There is no disadvantage to this alternative except that there is an intersection approximately 200 feet west of the eastern most sign location. Thus, westbound motorists west of the sign are not warned. Nevertheless, it is recommended that "WINDING ROAD" pictographic warning signs be installed at an estimated cost to the Village of $400.

The second traffic engineering action considered to abate the inadequate horizontal alignment signing problem was to install light-retroreflecting roadway delineators mounted at the side of the roadway. The advantage of installing roadway delineators is the definitive guidance provided to the motorist through the horizontal alignment changes particularly during periods of low ambient light. The disadvantage of roadway delineators is a diminution of their effectiveness during periods of intense ambient light levels. To offset the diminished effectiveness of the roadway delineators, consideration should be

given to increasing the number of "CHEVRON ALIGNMENT" warning signs at each existing location in advance of and beyond each of the two curves. Thus, it is recommended that roadway delineators be installed on both sides of E. Beach Road from a point about 200 feet east of N. Lake Drive to a point about 1,600 feet east of N. Lake Drive and to supplement the roadway delineators with additional "CHEVRON ALIGNMENT" warning signs at each curve where such signing is in place. The estimated cost to the Village to implement this recommended action is about $3,000.

Traffic Control For School Areas

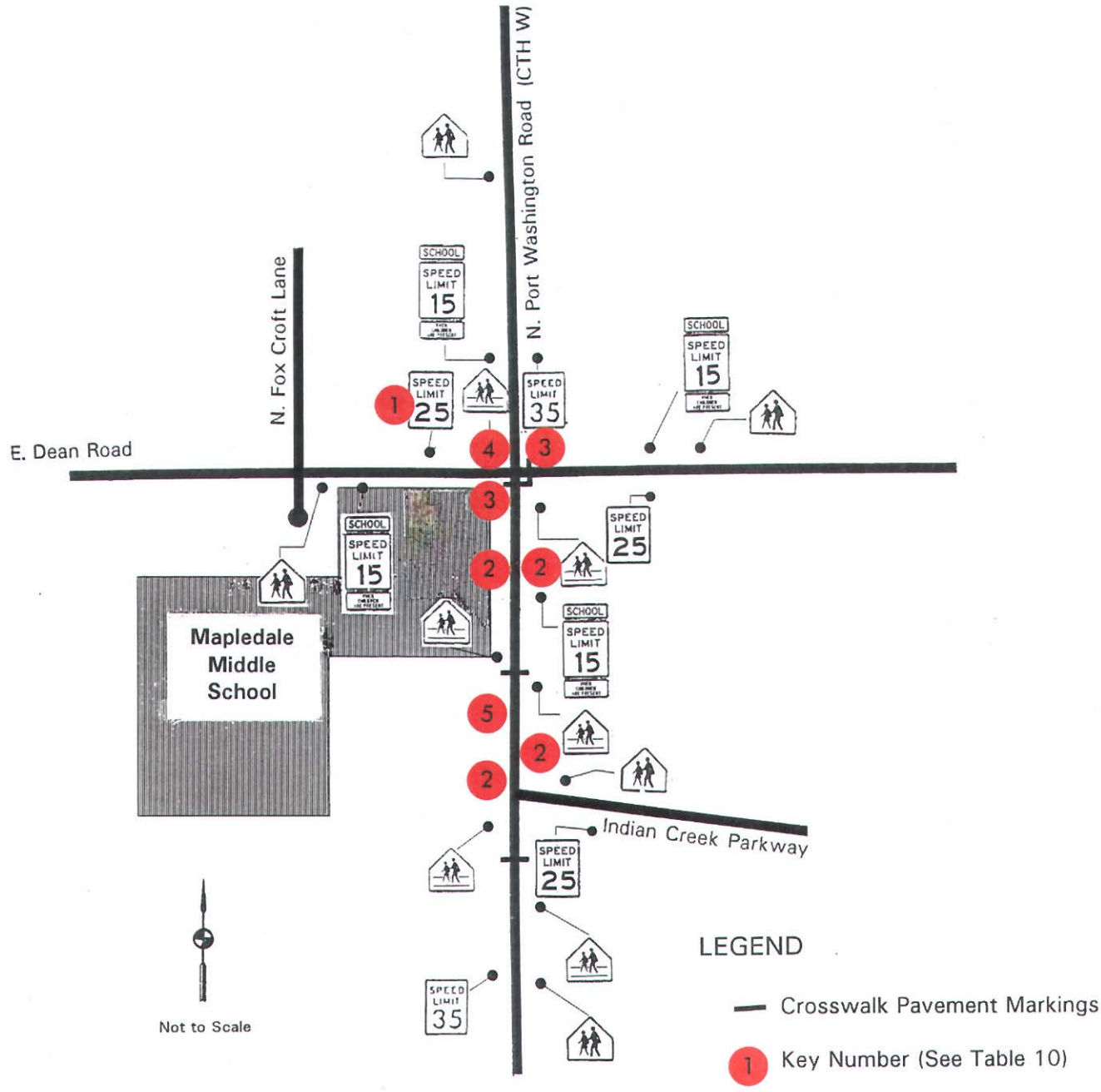
It is important to stress the point that regardless of the school location, safe and effective traffic control may best be obtained through the uniform application of realistic policies, practices, and standards throughout. Non-uniform procedures and devices may cause confusion among pedestrians and vehicle operators, prompt incorrect decisions and contribute to accidents. In order to achieve a uniformity of traffic control in school areas, comparable traffic situations must be treated in the same manner. Each traffic control device described in this section fulfills a specific function related to specific traffic conditions.

The initial analysis of the school zone signing consisted of a comparison of the current signing to the standards set forth in the Manual on Uniform Traffic Control Devices and the Wisconsin Manual on Uniform Traffic Control Devices promulgated by the WisDOT and which supplements the Manual on Uniform Traffic Control Devices promulgated by the U. S. Department of Transportation and Federal Highway Administration. The existing school zone signing was also reviewed for consistency at each site to ensure uniformity of the signing at the school locations.

Deficiencies in existing school zone signing were identified at each school site within the Village. The location of the deficiencies are shown on Figures 8 through 11 and the nature of the deficiency is identified in Tables 10 through 13. The recommended traffic engineering actions to abate the deficiencies identified at each site are also set forth in Tables 10 through 13 along with the advantages of implementing these recommended traffic engineering actions. The total estimated cost to implement the recommended actions is approximately

Figure 8

EXISTING AND RECOMMENDED SCHOOL ZONE TRAFFIC CONTROL ON ROADWAYS ADJACENT TO MAPLEDALE MIDDLE SCHOOL



Source: SEWRPC.

Table 10

DEFICIENCIES IN EXISTING SCHOOL ZONE SIGNING AT
MAPLEDALE MIDDLE SCHOOL: 1995

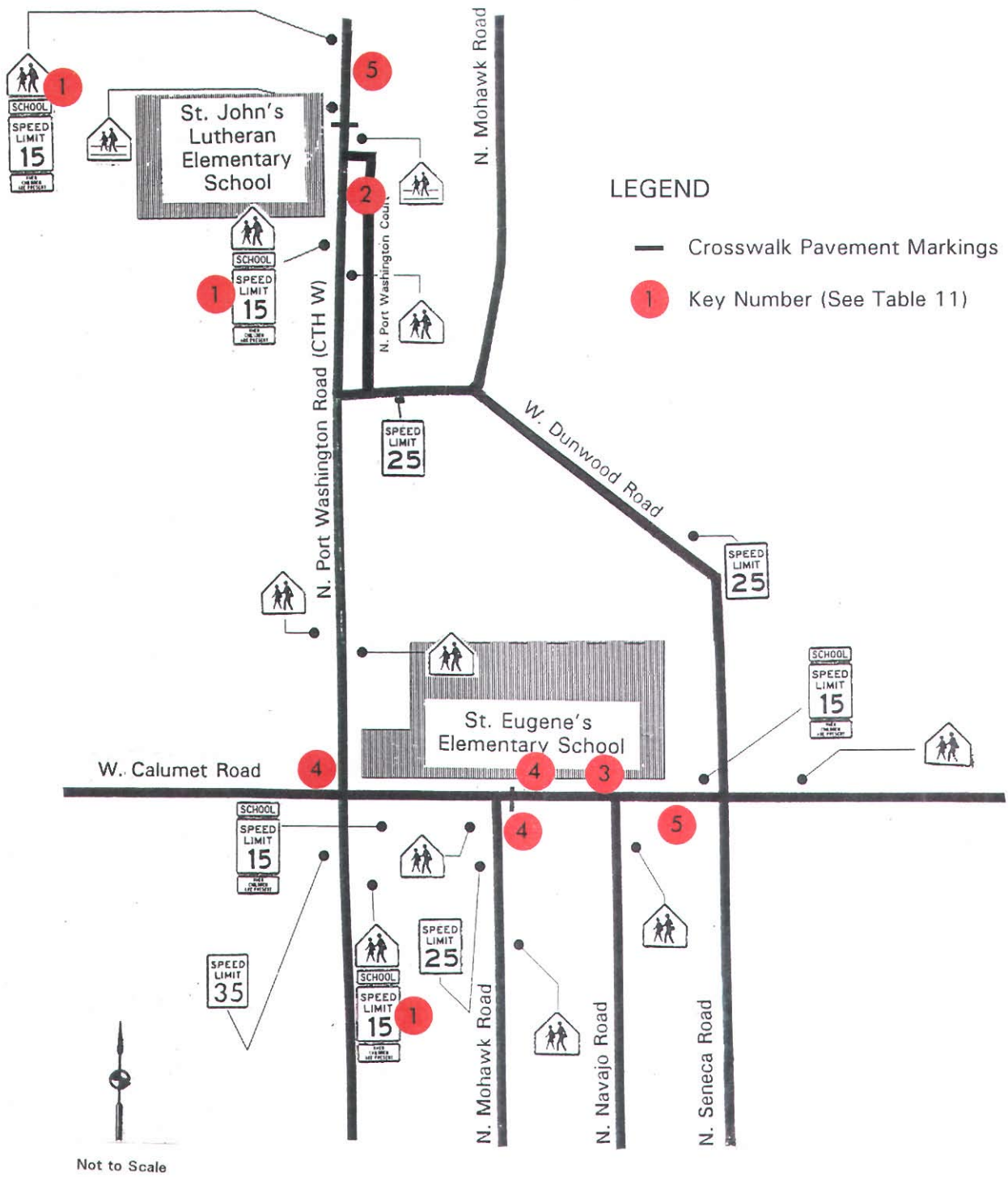
Figure Key Number[a]	Deficiency	Recommended Traffic Engineering Action to Abate Deficiency	Advantages
1	• The standard Speed Limit regulatory sign may be used to mark the end of an authorized and posted school speed zone.[b]	• Relocate this sign at the boundary of the school grounds.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
2	• Lack of School Advance warning signs preceding existing School Crossing warning signs.	• Install School Advance warnings signs preceding existing School Crossing warning signs.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
3	• Lack of School Crossing warning signs.	• Install School Crossing warning signs.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
4	• Lack of Crosswalk pavement markings on the southbound and eastbound intersection approaches.	• Install Crosswalk pavement markings on the southbound and eastbound intersection approaches.	• Utilize existing pedestrian walk/don't walk signals and pedestrian push buttons. • Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
5	• Lack of standard Speed Limit regulatory signs or "END SCHOOL ZONE" regulatory signs.	• Install standard Speed Limit regulatory sign indicating the end of the school zone.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.

[a]The figure key number refers to Figure 8, "Deficiencies in Existing School Zone Signing at Mapledale School."
[b]The Manual of Uniform Traffic Control Devices requires that the end of an authorized and posted school speed zone be marked with a standard Speed Limit sign showing the speed limit for the section of highway which follows or with an "END SCHOOL ZONE" regulatory sign.

Source: SEWRPC.

Figure 9

EXISTING AND RECOMMENDED SCHOOL ZONE TRAFFIC CONTROL ON ROADWAYS ADJACENT TO ST. EUGENE'S ELEMENTARY SCHOOL, AND ST. JOHN'S ELEMENTARY SCHOOL



Source: SEWRPC.

Table 11

DEFICIENCIES IN EXISTING SCHOOL ZONE SIGNING AT
ST. EUGENE SCHOOL, AND ST. JOHN SCHOOL: 1995

Figure Key Number[a]	Deficiency	Recommended Traffic Engineering Action to Abate Deficiency	Advantages
1	• Advance School warning signs and School Speed Limit signs mounted on the same post.	• Relocate School Speed Limit signs on separate posts downstream of the Advance School warnings signs.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
2	• Lack of School Speed Limit signing.	• Install School Speed Limit signing.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
3	• Lack of Advance School warning signs.	• Install Advance School warning signs.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
4	• Lack of School Crossing warning signs.	• Install School Crossing signs at existing crosswalk on W. Calumet Road east of N. Mohawk Road and on all approaches to the W. Calumet Road intersection with N. Port Washington Road (CTH W).	• Utilize existing crosswalk pavement markings; pedestrian walk/don't walk signals and pedestrian push buttons. • Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
5	• Lack of Standard Speed Limit regulatory sign or "END SCHOOL ZONE" regulatory sign.[b]	• Install Standard Speed Limit regulatory sign indicating the end of the school zone.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.

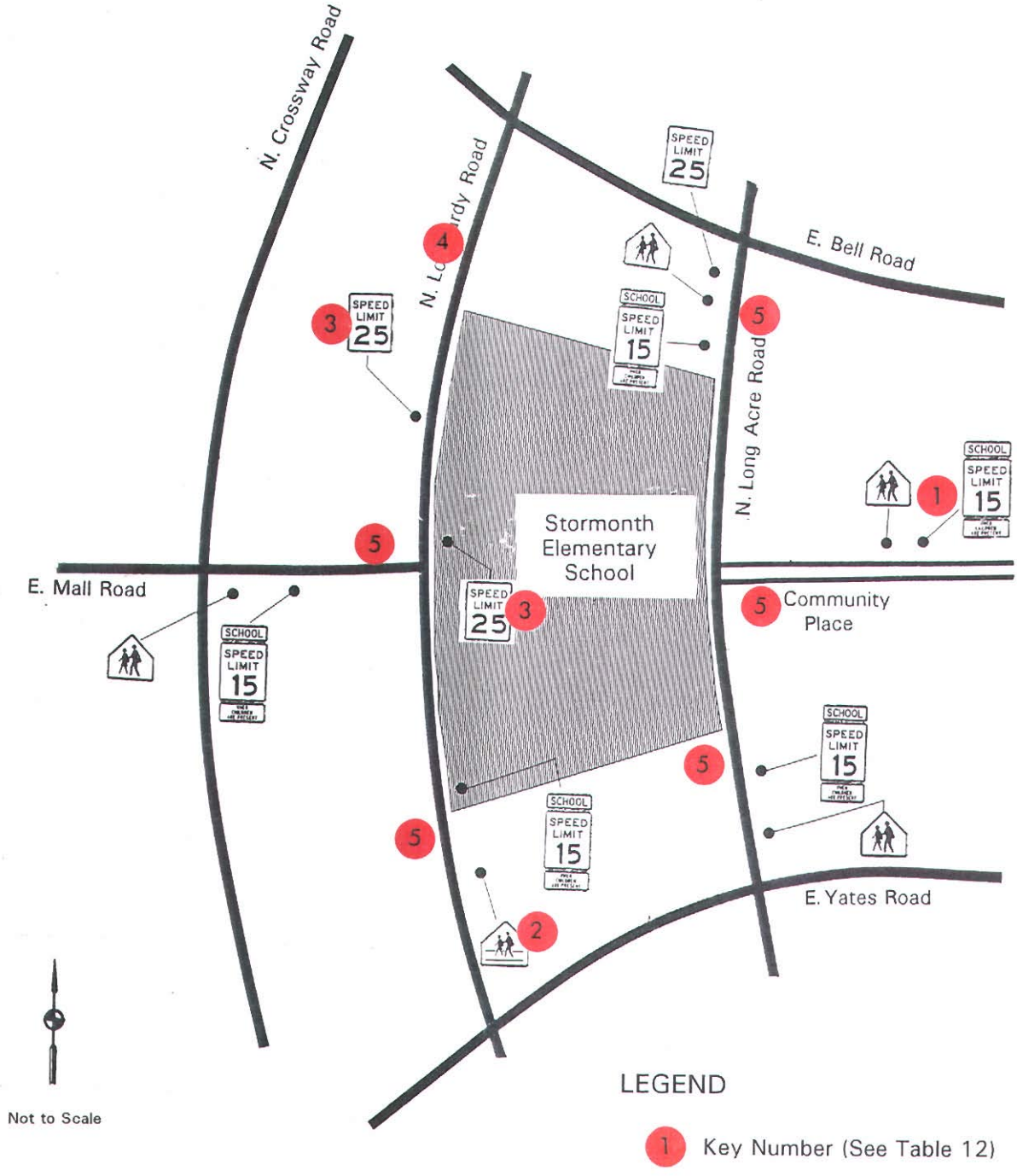
[a]The figure key number refers to Figure 9, "Deficiencies in Existing School Zone Signing at St. John School and St. Eugene School".

[b]The Manual of Uniform Traffic Control Devices requires that the end of an authorized and posted school speed zone be marked with a standard Speed Limit sign showing the speed limit for the section of highway which follows or with an "END SCHOOL ZONE" regulatory sign.

Source: SEWRPC.

Figure 10

EXISTING AND RECOMMENDED SCHOOL ZONE TRAFFIC CONTROL ON ROADWAYS ADJACENT TO STORMONTH ELEMENTARY SCHOOL



Source: SEWRPC.

Table 12

DEFICIENCIES IN EXISTING SCHOOL ZONE SIGNING AT STORMONTH SCHOOL: 1995

Figure Key Number[a]	Deficiency	Recommended Traffic Engineering Action to Abate Deficiency	Advantages
1	• Advanced school warning sign should precede School Speed limit regulatory sign.	• Reverse the order of these two signs.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
2	• Advance School warning sign required. There is no crosswalk as indicated by existing School Crossing warning sign.	• Replace School Crossing warning sign with Advance School warning sign.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
3	• The standard Speed Limit regulatory sign may be used to mark the end of an authorized and posted school speed zone.[b] Thus, these signs indicate that the school speed zone ends at a point adjacent to the school grounds.	• Relocate these signs at the boundaries of the school grounds.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
4	• Lack of Advance School warning sign and School Speed Limit regulatory signing.	• Install Advance School warning sign and School Speed Limit regulatory signing.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.
5	• Lack of standard Speed Limit regulatory signs or "END SCHOOL ZONE" regulatory signs.	• Install standard Speed Limit regulatory signs indicating the end of the school zone.	• Conformity with Manual of Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point.

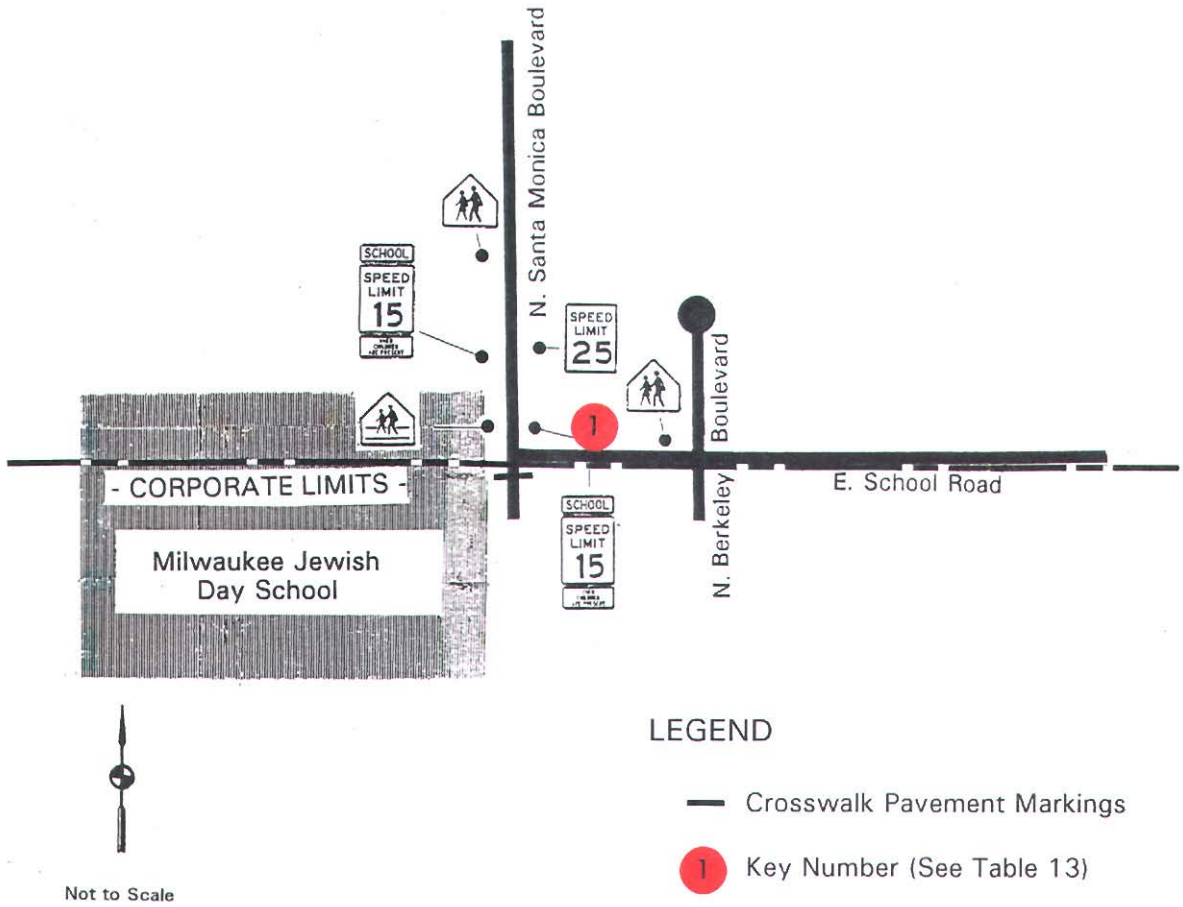
[a]The figure key number refers to Figure 10, "Deficiencies in Existing School Zone Signing at Stormouth School."

[b]The Manual of Uniform Traffic Control Devices requires that the end of an authorized and posted school speed zone be marked with a standard Speed Limit sign showing the speed limit for the section of highway which follows or with an "END SCHOOL ZONE" regulatory sign.

Source: SEWRPC.

Figure 11

EXISTING AND RECOMMENDED SCHOOL ZONE TRAFFIC CONTROL ON ROADWAYS ADJACENT TO MILWAUKEE JEWISH DAY SCHOOL



Source: SEWRPC.

Table 13

DEFICIENCIES IN EXISTING SCHOOL ZONE SIGNING AT
MILWAUKEE JEWISH DAY SCHOOL: 1995

Figure Key Number[a]	Deficiency	Recommended Traffic Engineering Action to Abate Deficiency	Advantages
1	• Lack of standard Speed Limit regulatory signing.	• Install School Speed Limit regulatory signing.	• Conformity with Manual fo Uniform Traffic Control Devices and Wisconsin Supplement. • Improve student pedestrian safety. • Uniformity with other School Zone signing within the Village of Fox Point

[a] The figure key number refers to Figure 11, "Deficiencies in Existing School Zone Signing at Milwaukee Jewish Day School."

Source: SEWRPC.

$8,250, with Milwaukee County responsible for an estimated $3,650 in costs, or about 44 percent of the total costs, and the Village responsible for the remaining $4,600 in costs, or about 56 percent of the total costs.

Children at Play Signing

"CHILDREN AT PLAY" warning signing was observed at several locations adjacent to land access streets in residential neighborhoods throughout the Village. According to the Manual on Uniform Traffic Control Devices warning signs are intended to alert motorists to unusual conditions, whereas a "CHILDREN AT PLAY" sign in a residential neighborhood "warns" of common condition in such neighborhoods and thus serves no practical function. The posting of such signs may give children a false sense of protection and may encourage them to play in Village streets, which is unsafe. Thus it is recommended that such signing be removed at an estimated cost to the Village of $500.

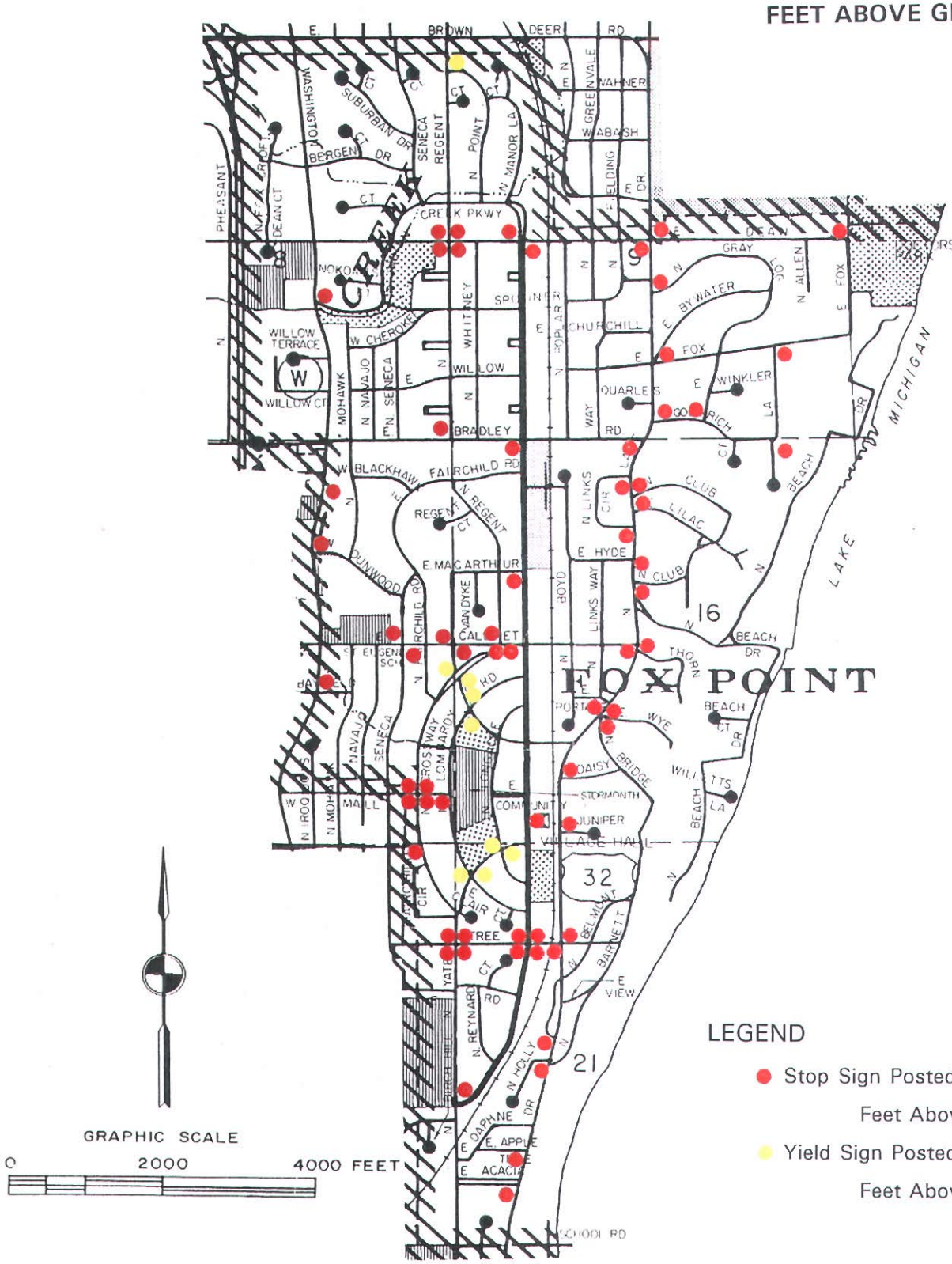
Traffic Control Deficiencies--Sign Height

In business, commercial, and residential districts where parking and/or pedestrian or bicyclist movement may be expected to occur, the Manual on Uniform Traffic Control Devices requires that traffic control signs be posted with a minimum of seven feet of ground clearance to the bottom of the sign. Comparison of the sign heights inventoried to this standard resulted in the identification of 73 signs shown on Map 6 posted with substandard ground clearance.

The alternative action considered to abate the problem of traffic control signs posted with substandard ground clearance was to raise these signs to meet the minimum seven foot height requirement. One advantage of posting signs at the required height is to substantially reduce the potential for a sign to be obstructed from a motorist's view thereby improving traffic safety. Another advantage is conformity with the sign height set forth in the Manual on Uniform Traffic Control Devices. A disadvantage of increasing the ground clearance to seven feet would not be effective if the sight obstruction is created by a truck making deliveries or collecting trash for example. Nevertheless, it is recommended that signs currently posted with substandard ground clearance be raised to seven feet at an estimated cost to the Village of $4,500.

MAP 6

STOP AND YIELD SIGNS POSTED LESS THAN SEVEN FEET ABOVE GROUND: 1993



Source: SEWRPC.

Sign Size

The installation of a number of new regulatory and warning signs has been recommended within the Village of Fox Point. The size of sign installed should generally reflect the hierarchial classification of the facility being signed; that is, larger signs should be posted on arterial and collector streets, and smaller signs should be posted on land access streets. Larger regulatory signing--such as "STOP" or "YIELD" signing should be also be posted on the land access street approaches to arterial and collector streets. A guide to sign size is set forth in Table 14.

It may be noted that as existing signing is replaced due to routine maintenance or because of damage to the sign or to its mounting post, the replacement signing should conform to the sizes set forth in this table.

Summary

This section of the report identifies traffic control deficiencies and potential intersection corner sight distances deficiencies in the Village of Fox Point. These deficiencies were identified in one of two ways: 1) the inventory data were compared to appropriate criteria set forth in the Manual on Uniform Traffic Control Devices, and in Table 6, entitled, "Traffic Management Control Criteria" of this report; and 2) locations experiencing multiple accidents between January 1, 1991, and September 30, 1994, were analyzed to determine if modifications to existing signing or the installation of new signing may abate the traffic safety problems at those locations. Alternative actions which may be expected to abate the existing traffic control deficiencies and improve traffic safety were identified and evaluated, and selected actions recommended for implementation.

There were 202 intersections in the Village in 1994. Of these, 117 were traffic controlled, and 85 were uncontrolled. Of the 85 uncontrolled intersections, seven were intersections between streets of differing hierarchial order, and thus subject to traffic control under criteria set forth in Table 6 and designed to assign the right-of-way to the highest order facility.

Analyses indicated that the existing intersection sight distance was adequate at two of the remaining 78 uncontrolled intersections in the Village, but substandard in at least one intersection corner the other 76 intersections.

Table 14
RECOMMENDED SIZES FOR SELECTED REGULATORY AND WARNING SIGNING IN THE VILLAGE OF FOX POINT

SIGN	RECOMMENDED MINIMUM SIGN SIZE BY HIERARCHIAL CLASS	
	ARTERIAL/COLLECTOR	LAND ACCESS
STOP	30" X 30"	24" X 24"
YIELD	- -	36" X 36" X 36"
SPEED LIMIT	24" X 30"	24" X 30"
WARNING		
SCHOOL ADVANCE	36" X 36"	30" X 30"
SCHOOL CROSSWALK	36" X 36"	30" X 30"
CROSSWALK	36" X 36"	30" X 30"
TURN	- -	30" X 30"
LARGE ARROW	48" X 24"	48" X 24"
CHEVERON ALIGNMENT	18" X 24"	18" X 24"
WINDING ROAD	36" X 36"	30" X 30"

Source: Manual on Uniform Traffic Control Devices and SEWRPC.

Analyses indicated that the existing intersection sight distance was sufficiently restricted at 56 intersections that the installation of either "STOP" or "YIELD" signs might be appropriate based upon the sight distance criteria. However, because review of the traffic accident data at these intersections indicated that virtually no accidents have occurred at these intersections during the past three and three-quarter years, no proactive action was recommended. However, it is recommended that the incidence of accidents at these intersections be monitored to determine if changing conditions warrant the installation of traffic control. At 20 of the uncontrolled intersections, the sight distance was found to be sufficiently restricted to warrant the installation of "STOP" signs. It was recommended that the Village seek voluntary cooperation from abutting landowners to improve the existing sight distance through the removal of existing plant material at these intersections to alleviate the need for "STOP" signs. In the event that such cooperation is not received, it is recommended that the Village install "STOP" on the approaches of one of the intersecting streets at these intersections.

Analyses also indicated that the existing corner sight distance at the controlled intersections was substandard at 22 of the 31 intersections analyzed at the request of the Village. To abate this deficiency it was recommended that the Village seek the voluntary cooperation of abutting landowners to remove vegetation or signs to create or improve the vision triangles at 18 of the 22 intersections. It was also recommended that stop line pavement markings be provided at the four intersections at which the improvement or creation of vision triangles was not recommended and at two intersections at which the improvement or creation of vision triangles was recommended.

Review of location of existing regulatory "STOP" signs relative to the pedestrian path paralleling N. Lake Drive (STH 32) and N. Lake Drive indicated that the "STOP" signs at these intersections were not in the correct location at the intersections with N. Holly Court, N. Service Drive (north), and E. GreenTree Road. The traffic engineering action recommended to abate this deficiency was to relocate the "STOP" signs at the intersections of N. Holly Court, N. Service Drive (north), and E. Green Tree Road with N. Lake Drive to a point four feet west of the non-roadway edge of the pedestrian path.

Analysis of historic traffic accident data on all Village streets and highways for the period from January 1, 1991, through September 30, 1994, was conducted. Based on the number of accidents which occurred during that time period, six intersections and the segment of N. Lake Drive from the northern to southern Village limits were identified as potential traffic safety problems requiring further analyses. These additional analyses would determine if any accident patterns exist which might be susceptible to correction through the installation of traffic control devices. At two of the intersections--N. Lake Drive (STH 32) with E. Quarles Place and with E. Dean Road--there was no pattern of accidents and, thus, no corrective actions recommended. At a third intersection--N. Lake Drive with E. Green Tree Road--the installation of "CROSS ROAD" advance warning signing with a "30 MILE PER HOUR" advisory speed plate was recommended along with consideration of the installation of traffic signals if the incidence of accidents increases. At a fourth intersection--N. Lake Drive with E. Bradley Road--it was recommended that the Village undertake additional snow and ice control. At a fifth intersection--N. Santa Monica Boulevard with E. Bradley Road--it was recommended that the traffic control at the intersection be converted from a two-way stop to a four-way stop. At a sixth intersection--N. Port Washington Road (CTH W) with E. Bradley Road--it was recommended that the traffic signal lenses be increased to 12 inches and equipped with backplates, and that an advance warning sign be posted on the northbound approach. On the segment of N. Lake Drive it was recommended: 1) a supplementary advisory distance plate with the message "NEXT 2 1/2 MILES" be added to the existing "DEER" warning signs; 2) voluntary cooperation of abutting property owners be sought to create or improve vision triangles at each intersection; and 3) a reduction in the speed limit from 35 miles per hour to 30 miles per hour, initially for a six month trial, and then permanently if compliance with the new speed limit is good.

Analyses of existing traffic control at Village intersections indicated that the existing traffic control does not comply with the criteria based upon the hierarchial classification of the intersecting facilities at the 32 intersections listed in Table 9. Although the existing four-way "STOP" sign control at two arterial street/collector street intersections--E. Green Tree Road with N. Santa Monica Boulevard and with N. Yates Road--was found to be nonconforming; retention of the existing four-way "STOP" sign control was recommended because such control had been installed expressly to promote public safety. It was also recommended

that "STOP" signs be installed on the land access street approaches at seven collector street/land access street intersections listed in Table 9; and that "STOP" signs be installed on the uncontrolled collector street approaches at six collector street/collector street intersections listed in Table 9. Finally, it was recommended that the existing "YIELD" signs be replaced with "STOP" signs on the land access street approaches at 17 collector street/land access street intersections listed in Table 9.

Analysis of the existing railway crossing traffic control indicated that the crossings lack the prescribed pavement markings. Accordingly, it was recommended that the prescribed pavement markings be installed on all street approaches to the railway crossings with the exception of the westbound E. Green Tree Road approach because the distance between the trackage and N. Lake Drive is less than 100 feet.

Analysis of the two existing pavement marking schemes on N. Lake Drive--one providing three traffic lanes and the other providing two traffic lanes with two-way left turn lane in the center--indicated that they generally do not conform to the standards for such markings. Further the provision of the two-way center left turn lane is not warranted based upon left turning volumes. It was recommended that the pavement markings be modified to provide two traffic lanes, retaining the exclusive left turn lanes at E. Green Tree Road and E. Bradley Road.

Analysis of the existing horizontal warning signing indicated that there is no advanced warning signing at five locations and that the existing warning signs at two of those five locations is inappropriate. Accordingly, it was recommended that pictographic "TURN" advance warning signs be installed at five locations. It was also recommended that supplemental "LARGE ARROW" signs be installed at eight locations. It was also recommended that the existing "CURVE" warning sign be replaced with "WINDING ROAD" pictographic warning signs; install roadway delineators and additional "CHEVRON ALIGNMENT" signs along E. Beach Road just east of N. Lake Drive.

Analysis of the existing school zone signing indicated that deficiencies exist in such signing at each school site in the Village. The deficiencies and the

actions recommended to abate them are set forth in Tables 10 through 13, and shown in Figures 8 through 11. Actions recommended at various locations to abate the deficiencies included: 1) install, or relocate, speed limit signs to mark the end of the school zone; 2) install school advance warning signs; 3) install school crossing signs; 4) install school speed limit signs; 5) the separation to individual posts of school advanced warning and school speed limit signs; 6) apply crosswalk pavement markings; 7) replace selected standard speed limit signs; and 9) replace selected school crossing signs with school advance warning signs.

"CHILDREN AT PLAY" warning signs were posted adjacent to land access streets in several residential neighborhoods. Because such signs do not warn of an uncommon condition, and because they may provide children with a false sense of security and may encourage play in the streets, these signs are recommended for removal.

Finally, 73 traffic control signs provides substandard ground clearance. It was recommended that these signs be raised to provide adequate ground clearance.

The locations at which deficiencies were identified are set forth in Table 15 by deficiency category. The actions recommended to abate these deficiencies are also summarized in Table 15 by location. Finally, the estimated cost to implement the recommended actions and the agency responsible for implementation are also set forth in Table 15. The total cost to implement the recommended actions is estimated to be approximately $65,900. Of the estimated total cost to implement the recommended actions, Milwaukee County is expected to be responsible for about $6,200, or about 9 percent, and the Village of Fox Point is expected to be responsible for about $59,700, or about 91 percent.

SUMMARY

On September 14, 1992, Village of Fox Point Officials requested that Regional Planning Commission staff conduct an inventory and evaluation of the existing traffic control measures in the Village and to provide recommendations for modification as appropriate. The Village staff identified 50 locations at which the existing traffic control was perceived to be deficient based upon sign size and or location or where some other deficiency such as restricted corner sight

Table 15

SUMMARY OF TRAFFIC CONTROL OR SIGHT DISTANCE DEFICIENCIES IDENTIFIED WITHIN THE VILLAGE OF FOX POINT
AND THE ACTIONS RECOMMENDED TO ABATE THEM WITH THEIR ESTIMATED IMPLEMENTATION COSTS AND THE UNIT OF GOVERNMENT RESPONSIBLE FOR IMPLEMENTATION

Identified Deficiency	Location	Action Recommended to Abate Identified Deficiency	Estimated Cost	Implementing Agency
Substandard Intersection Corner Sight Distance At Uncontrolled Intersections	Eastbound N. Belmont Lane approach to N. Barnett Lane	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1]. Install a "STOP" sign on the eastbound intersection approach if the existing vision triangle cannot be improved.	$ 0[2]	Village of Fox Point
	East- and westbound W. Bergen Drive approaches to N. Fox Croft Lane . . .	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the east- and westbound approaches[1]. Install "STOP" signs on the east- and westbound intersection approaches if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Northbound N. Birch Hill Court approach to E. Clovernook Lane	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the northbound approach[1]. Install a "STOP" sign on the westbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Westbound W. Portage Road approach to N. Boyd Way	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[1]. Install a "STOP" sign on the westbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Eastbound E. Daisy Lane approach to N. Bridge Lane	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1]. Install a "STOP" sign on the eastbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Eastbound E. Bywater Lane approach to N. Gray Log Lane	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1]. Install a "STOP" sign on the eastbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Westbound W. Cherokee Circle approach to N. Mohawk Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[1]. Install a "STOP" sign on the westbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Northbound N. Links Way (south) approach to E. Churchhill Lane . . .	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the northbound approach[1]. Install a "STOP" sign on the northbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Northbound N. Club Circle approach to E. Lilac Lane (west)	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the northbound approach[1]. Install a "STOP" sign on the northbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Northbound N. Club Circle approach to E. Merrie Lane (west)	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the northbound approach[1]. Install a "STOP" sign on the northbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Eastbound E. Coleman Lane approach to N. Thorn Lane	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1]. Install a "STOP" sign on the eastbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Westbound E. Community Place approach to N. Longacre Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[1]. Install a "STOP" sign on the westbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Westbound E. Dean Road approach to N. Fox Croft Lane	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[1]. Install a "STOP" sign on the westbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Westbound E. Winkler Lane approach to N. Gray Log Lane	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[1]. Install a "STOP" sign on the westbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point

Table 15 (continued)

Identified Deficiency	Location	Action Recommended to Abate Identified Deficiency	Estimated Cost	Implementing Agency
Substandard Intersection Corner Sight Distance At Uncontrolled Intersections (continued)	Northbound N. Links Way approach to E. Hyde Way	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the northbound approach[1]. Install a "STOP" sign on the northbound intersection approach if the existing vision triangle cannot be improved.	$ 0[2]	Village of Fox Point
	Southbound N. Seneca Road approach to N. Indian Creek Parkway	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the southbound approach[1]. Install a "STOP" sign on the southbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Northbound N. Van Dyke Road approach to E. MacArthur Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the northbound approach[1]. Install a "STOP" sign on the northbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Westbound E. Spooner Road approach to N. Poplar Drive	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[1]. Install a "STOP" sign on the westbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	East- and westbound W. Willow Road approaches to N. Seneca Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the east- and westbound approaches[1]. Install "STOP" signs on the east- and westbound intersection approaches if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
	Westbound Willetts Lane approach to N. Beach Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[1]. Install "STOP" signs on the westbound intersection approach if the existing vision triangle cannot be improved.	0[2]	Village of Fox Point
Subtotal			$ 0[2]	
Substandard Intersection Corner Sight Distance	Approaches to N. Lake Drive (STH 32) from:			
	• E. Acacia Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	$ 0	Village of Fox Point
	• E. Apple Tree Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
	• E. Daphne Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
	• N. Holly Court	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
	• E. Green Tree Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
		• Relocate the bus shelter from its existing location to a point 100 feet south.	5,000	Village of Fox Point
	• E. Daisy Lane	• Install a "STOP" line at a point seven feet from the east edge of the pavement on the westbound approach.	100	Village of Fox Point
		• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[1].	0	Village of Fox Point
	• E. Bell Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
		• Relocate the bus shelter from its existing location to a point 100 feet south.	5,000	Village of Fox Point
	• E. Portage Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
	• E. Calumet Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point

Table 15 (continued)

Identified Deficiency	Location	Action Recommended to Abate Identified Deficiency	Estimated Cost	Implementing Agency
Substandard Intersection Corner Sight Distance (continued)	• E. Beach Road (north)	• Install a "STOP" line at a point seven feet from the east edge of the pavement on the westbound approach.	$ 100	Village of Fox Point
		• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[1].	0	Village of Fox Point
	• E. Hyde Way	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
	• N. Links Circle (south)	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
	• N. Club Circle (north)	• Install a "STOP" line at a point seven feet from the east edge of the pavement on the westbound approach.	100	Village of Fox Point
		• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the westbound approach[1].	0	Village of Fox Point
	• E. Links Circle (north)	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
	• E. Bradley Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
		• Relocate the bus shelter from its existing location to a point 100 feet south.	5,000	Village of Fox Point
	• E. Quarles Place	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
	• E. Fox Lane	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
		• Install a "STOP" line at a point seven feet from the east edge of the pavement on the westbound approach.	100	Village of Fox Point
	• E. Bywater Lane	• Install a "STOP" line at a point seven feet from the east edge of the pavement on the westbound approach.	100	Village of Fox Point
	• E. Churchill Lane	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
	• E. Gray Log Lane	• Install a "STOP" line at a point seven feet from the east edge of the pavement on the westbound approach.	100	Village of Fox Point
	• E. Spooner Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
	• E. Dean Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the eastbound approach[1].	0	Village of Fox Point
		• Install a "STOP" line at a point seven feet from the east edge of the pavement on the westbound approach.	100	Village of Fox Point
	Westbound approaches to N. Port Washington Road (CTH W) from:			
	• W. Port Washington Court	• Seek voluntary cooperation of abutting landowner in northeast quadrant in relocation of commercial business sign from its existing location to a point about 75 feet north or 10 feet east.	0	Village of Fox Point
	• W. Indian Creek Parkway	• Install a "STOP" line at a point seven feet from the east edge of the pavement on the westbound approach.	100	Village of Fox Point
	Approaches to E. Green Tree Road from N. Santa Monica Boulevard . . .	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the southbound approach[1].	0	Village of Fox Point
		• Install a "STOP" line at a point seven feet from the north edge of the pavement on the southbound approach.	100	Village of Fox Point

Table 15 (continued)

Identified Deficiency	Location	Action Recommended to Abate Identified Deficiency	Estimated Cost	Implementing Agency
Substandard Intersection Corner Sight Distance (continued)	Approaches to N. Santa Monica Boulevard from E. Green Tree Road .	• Install a "STOP" line at a point seven feet from the west edge of the pavement on the eastbound approach.	$ 100	Village of Fox Point
	Approach to E. Bradley Road from N. Poplar Road	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the southbound approach[1].	0	Village of Fox Point
	Approach to E. Dean Road from E. Fox Lane	• Seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangle on the northbound approach[1].	0	Village of Fox Point
Subtotal			$ 16,000	
Improper Traffic Control	E. Green Tree Road at N. Santa Monica Boulevard	• Retain the existing multi-way "STOP" sign control.[3]	$ 0	Village of Fox Point
	E. Green Tree Road at N. Yates Road .	• Retain the existing multi-way "STOP" sign control.[3]	0	Village of Fox Point
	E. Bradley Road at N. Santa Monica Boulevard	• Install "STOP" signs on N. Santa Monica Boulevard approaches.	400	Village of Fox Point
	E. Calumet Road at N. Santa Monica Boulevard	• Install "STOP" signs on N. Santa Monica Boulevard approaches.	400	Village of Fox Point
	E. Dean Road at N. Santa Monica Boulevard	• Install "STOP" signs on E. Dean Road approaches.	400	Village of Fox Point
	N. Crossway Road at N. Yates Road and E. Clair Court[4]	• Replace existing "YIELD" signs with "STOP" signs and install "STOP" signs on N. Yates Road approaches.	700	Village of Fox Point
	N. Crossway Road at E. Good Hope Road	• Install "STOP" signs on N. Crossway Road approaches.	400	Village of Fox Point
	N. Santa Monica Road at N. Yates Road	• Install "STOP" signs on N. Yates Road and northbound N. Santa Monica Boulevard approach.	400	Village of Fox Point
	E. Bradley Road at N. Links Way . . .	• Replace existing "YIELD" sign with "STOP" sign.	100	Village of Fox Point
	E. Bradley Road at N. Mohawk Road . .	• Replace existing "YIELD" signs with "STOP" signs.	200	Village of Fox Point
	E. Bradley Road at N. Navajo Road . .	• Replace existing "YIELD" sign with "STOP" sign.	100	Village of Fox Point
	E. Bradley Road at N. Poplar Road . .	• Replace existing "YIELD" sign with "STOP" sign.	100	Village of Fox Point
	E. Bradley Road at N. Seneca Road . .	• Replace existing "YIELD" sign with "STOP" sign.	100	Village of Fox Point
	E. Bradley Road at N. Whitney Road . .	• Replace existing "YIELD" sign with "STOP" sign.	100	Village of Fox Point
	E. Calumet Road at N. Boyd Way	• Replace existing "YIELD" signs with "STOP" signs.	200	Village of Fox Point
	E. Calumet Road at N. Links Way . . .	• Replace existing "YIELD" signs with "STOP" signs.	200	Village of Fox Point
	E. Calumet Road at N. Mohawk Road . .	• Replace existing "YIELD" sign with "STOP" sign.	100	Village of Fox Point
	E. Calumet Road at N. Navajo Road . .	• Replace existing "YIELD" sign with "STOP" sign.	100	Village of Fox Point
	E. Dean Road at N. Greenvale Road . .	• Replace existing "YIELD" signs with "STOP" signs.	200	Village of Fox Point
	E. Dean Road at N. Indian Creek Parkway	• Replace existing "YIELD" signs with "STOP" signs.	200	Village of Fox Point
	E. Dean Road at N. Links Way	• Replace existing "YIELD" signs with "STOP" signs.	200	Village of Fox Point
	E. Dean Road at N. Poplar Drive . . .	• Replace existing "YIELD" sign with "STOP" sign.	100	Village of Fox Point
	N. Crossway Road at N. Fairchild Circle	• Install "STOP" sign on land access approach.	200	Village of Fox Point
	E. Dean Road at N. Whitney Road . . .	• Replace existing "YIELD" sign with "STOP" sign.	100	Village of Fox Point
	N. Regent Road at N. Point Drive . . .	• Replace existing "YIELD" sign with "STOP" sign.	100	Village of Fox Point
	N. Regent Road at N. Regent Court . .	• Install "STOP" sign on land access approach.	200	Village of Fox Point
	N. Santa Monica Boulevard at N. Santa Monica Court No. 3 (north)	• Install "STOP" sign on land access approach.	200	Village of Fox Point
	N. Santa Monica Boulevard at N. Santa Monica Court No. 3 (south)	• Install "STOP" sign on land access approach.	200	Village of Fox Point

Table 15 (continued)

Identified Deficiency	Location	Action Recommended to Abate Identified Deficiency	Estimated Cost	Implementing Agency
Improper Traffic Control (continued)	N. Santa Monica Boulevard at N. Santa Monica Court No. 2 (north)	• Install "STOP" sign on land access approach.	$ 200	Village of Fox Point
	N. Santa Monica Boulevard at N. Santa Monica Court No. 1 (north)	• Install "STOP" sign on land access approach.	200	Village of Fox Point
	E. School Road at N. Berkeley Boulevard	• Install "STOP" sign on land access approach.	200	Village of Fox Point
	N. Yates Road at N. Fairchild Circle	• Replace existing "YIELD" sign with "STOP" sign.	100	Village of Fox Point
	E. Green Tree Raod at N. Lake Drive	• Relocate existing "STOP" signs four feet from non-roadway edge of pedestrian path paralleling N. Lake Drive.	200	Village of Fox Point
	E. Holly Court at N. Lake Drive	• Relocate existing "STOP" signs four feet from non-roadway edge of pedestrian path paralleling N. Lake Drive.	100	Village of Fox Point
	N. Lake Drive at N. Service Road	• Relocate existing "STOP" signs four feet from non-roadway edge of pedestrian path paralleling N. Lake Drive.	100	Village of Fox Point
Subtotal			$ 6,800	
Traffic Accident Problem	N. Lake Drive at E. Green Tree Road	• Install pictographic "CROSS ROAD" advance warning signs with advisory "30 MPH" speed plates on the north- and southbound approaches to the intersection. Monitor the incidence of traffic accidents, if the number or severity of accidents increases, seek the cooperation of the Wisconsin Department of Transportation to install traffic signals.	$ 400	Village of Fox Point
	N. Lake Drive at E. Bradley Road	• Pay particular attention to snow and ice control in the vicinity of this intersection.	0[5]	Village of Fox Point
	N. Santa Monica Boulevard at E. Bradley Road	• Install "STOP" signs on the north- and southbound approaches to this intersection.	400	Village of Fox Point
	N. Port Washington Road (CTH W) at E. Bradley Road	• Increase the size of the signal lenses to 12 inches and equip them with backplates, and install a pictographic "SIGNAL AHEAD" advance warning sign.	3,200	Milwaukee County
	N. Lake Drive from the north corporate limits to the south corporate limits	• Install "NEXT 2 1/2 MILES" advisory distance plates on the two existing pictographic "DEER" warning signs; seek voluntary cooperation of abutting landowners to remove vegetation within the vision triangles at intersecting streets[4]; and reduce the speed limit from the existing from the existing 35 mile per hour limit to a 30 mile per hour limit from a six month trial period. Monitor motorist compliance with the lower speed limit, and at the end of the trial period, evaluate the impact of the reduced speed limit to determine if the change should be made permanent[6].	900	Village of Fox Point
Subtotal			$ 4,900	
Lack of Railroad Crossing Pavement Markings	All street approaches at of the five railroad crossings in the Village	• Provide the railroad crossing pavement markings prescribed in the Manual of Uniform Traffic Control Devices on all approaches except the westbound E. Green Tree Road approach.	$ 7,000	Village of Fox Point
Subtotal			$ 7,000	
Inappropriate Longitudinal Pavement Markings	N. Lake Drive (STH 32)	• Provide centerline pavement markings for two traffic lanes and retain the existing exclusive left-turn lanes at E. Green Tree Road and E. Bradley Road	$ 12,500	Village of Fox Point
Subtotal			$ 12,500	
Lack of Or Inappropriate Horizontal Alignment Warning Signing	Both approaches to the N. Beach Road turn between the 8000 and 8025 blocks of N. Beach Road	• Install pictographic "TURN" advance warning signs on all approaches to the abrupt change in horizontal alignment.	$ 400	Village of Fox Point
	Both approaches to two N. Beach Road turns between Beach Court and Willetts Lane	• Install pictographic "TURN" advance warning signs on all approaches to the abrupt change in horizontal alignment, and install "LARGE ARROW" warning signs at all abrupt changes in horizontal alignment.	1,600	Village of Fox Point
	Northbound approach to the N. Beach Road turn between the 8025 and 8035 blocks of N. Beach Road	• Install pictographic "TURN" warning sign on the northbound approach to the abrupt change in horizontal alignment.	200	Village of Fox Point

Table 15 (continued)

Identified Deficiency	Location	Action Recommended to Abate Identified Deficiency	Estimated Cost	Implementing Agency
Lack of Or Inappropriate Horizontal Alignment Warning Signing (continued)	Westbound approach to the N. Beach Road turn between the 7900 and 8000 blocks of N. Beach Road	• Install pictographic "TURN" warning sign on the westbound approach to the abrupt change in horizontal alignment.	$ 200	Village of Fox Point
	Southbound approach to the N. Beach Road turn between the 8000 and 8025 blocks of N. Beach Road	• Install "LARGE ARROW" warning sign at the abrupt change in horizontal alignment.	200	Village of Fox Point
	Eastbound approach to the N. Beach Road turn between the 8025 and 8035 blocks of N. Beach Road	• Install "LARGE ARROW" warning sign at the abrupt change in horizontal alignment.	200	Village of Fox Point
	Both approaches to the E. Goodrich Lane turn between the 1400 and 1500 blocks of E. Goodrich Lane	• Install "LARGE ARROW" warning signs at all abrupt changes in horizontal alignment.	400	Village of Fox Point
	Both approaches to the N. Beach Road turn between the 7400 and 7500 blocks of N. Beach Road	• Install "LARGE ARROW" warning signs at all abrupt changes in horizontal alignment.	400	Village of Fox Point
	Both approaches to the N. Beach Road turn between the 7900 and 8000 blocks of N. Beach Road	• Install "LARGE ARROW" warning signs at all abrupt changes in horizontal alignment.	400	Village of Fox Point
	Both approaches to the turn between E. MacArthur Road and E. Bell Road . . .	• Install "LARGE ARROW" warning signs at all abrupt changes in horizontal alignment.	400	Village of Fox Point
	E. Beach Road between N. Lake Drive and a point approximately 1400 feet east	• Replace on existing "CURVE" warning sign with "WINDING ROAD" warning sign and add three new "WINDING ROAD" warning signs. Install roadway delineators on both sides of E. Beach Road from a point approximately 200 feet east to N. Lake Drive to a point approximately 1600 feet east and add "CHEVRON ALIGNMENT" warning signs to the two curves currently posted with such signing.	3,400	Village of Fox Point
Subtotal			$ 7,800	
Inadequate School Zone Signing	Mapledale Middle School	• Relocate standard Speed Limit sign to the boundary of the school grounds;	$ 100	Village of Fox Point
		• Install School Advance warnings signs preceding existing School Crossing warning signs; install School Crossing warning signs; install Crosswalk pavement markings on the southbound and eastbound intersection approaches; and install standard Speed Limit regulatory sign indicating the end of the school zone.	1,700	Milwaukee County
	St. Eugene's Elementary School, and St. John's Elementary School	• Relocate School Speed Limit signs on separate posts downstream of the Advance School warnings signs; install School Speed Limit signing; install Advance School warning signs; install School Crossing signs at existing crosswalk on W. Calumet Road east of N. Mohawk Road; install standard Speed Limit regulatory sign.	1,000	Village of Fox Point
		• Relocate School Speed Limit signs on separate posts downstream of the Advance School warnings signs; install standard Speed Limit regulatory sign; and install School Crossing signs at existing crosswalks on all approaches to the W. Calumet Road intersection with N. Port Washington Road (CTH W).	1,300	Milwaukee County

Table 15 (continued)

Identified Deficiency	Location	Action Recommended to Abate Identified Deficiency	Estimated Cost	Implementing Agency
Inadequate School Zone Signing (continued)	Stormonth Elementary School	• Reverse the order of the School Speed Limit sign and the advance "SCHOOL" warning sign; replace a School Crossing warning sign with an Advance School warning sign; relocate standard Speed Limit signs at the boundaries of the school grounds; install Advance "SCHOOL" warning sign and School Speed Limit regulatory signing; and install standard Speed Limit regulatory signs indicating the end of the school zone.	$ 1,600	Village of Fox Point
	Milwaukee Jewish Day School	• Install School Speed Limit regulatory signing.	$ 200	Village of Fox Point
Subtotal			$ 5,900	
Inappropriate Warning Signing	Adjacent to selected residential streets throughout the Village	• Remove existing "CHILDREN AT PLAY" Warning signing.	$ 500	Village of Fox Point
Subtotal			$ 500	
Inadequate Sign Height	Selected regulatory signs throughout the Village	• Increase the height of these signs to provide seven feet of ground clearance to bottom of primary sign.	$ 4,500	Village of Fox Point
Subtotal			$ 4,500	
Total			$ 65,900	

[1] The vision triangle at the intersection between an arterial and a collector or between an arterial and land access street is the line which connects a point on each intersecting right-of-way line located 50 feet from the point of intersection of the two rights-of-way lines. The estimated cost to remove the vegetation from each intersection corner is about $500 at all arterial and collector street intersections, and about $200 at intersections between two land access streets. Because the vegetation is on private property, the cost for its removal would be the responsibility of the property owner.

[2] The estimated cost to remove the vegetation from each intersection corner is about $500 at all arterial and collector street intersections, and about $200 at intersections between two land access streets. Because the vegetation is on private property, the cost for its removal would be the responsibility of the property owner. Thus, there would be no cost to the Village if the vision triangles can be improved through the voluntary cooperation of the property owners. The Village should install "STOP" signs on those intersection approaches indicated at locations where voluntary cooperation is not forthcoming. The estimated cost to install the "STOP" signs would be approximately $4,400 if signing is required at each location specified.

[3] Because the existing traffic control at this intersection is multi-way "STOP" control expressly to promote public safety, no change is recommended in the existing multi-way "STOP" control.

[4] The N. Yates Road leg on the north side of the intersection and E. Clair Court are land access streets.

[5] Because N. Lake Drive is a connecting street on the state trunk highway system, the Village of Fox Point is reimbursed for snow and ice control by the Wisconsin Department of Transportation.

[6] Implementation of this action would eliminate the need to install the advisory speed plates on the "CROSS-ROAD" advance warning signs as recommended to abate the traffic accident problem identified at the intersection of E. Green Tree Road and N. Lake Drive.

[7] The total cost of implementing all the recommendations contained herein may increase by as much as $4,400 from $67,000 to $71,400 if it becomes necessary to install "STOP" signs on all existing uncontrolled intersection approaches with severely restricted corner sight distance. (See the first distance identified in this Table and footnote 2.)

Source: SEWRPC.

distance might exist. The Village staff also expressed concern with respect to the current three traffic lane operation on N. Lake Drive (STH 32).

Accordingly, the Commission staff conducted a series of inventories of existing traffic control measures and selected physical and operational characteristics of the Village street and highway system to identify deficiencies existed. These inventories were designed to also provide the basis for any recommended changes to the existing traffic control measures within the Village and to implementation responsibilities. The inventories found that there were as of January 1, 1991, a total of 39.6 miles of streets and highways in the Village. Of this total, about 4.5 miles, or about 11 percent, are functionally classified as arterials, about 6.1 miles, or about 15 percent, as collectors, and the remaining approximately 29.0 miles, or about 74 percent, as land access facilities. A total of about 1.4 miles of streets and highways within the Village were under the jurisdiction of Milwaukee County, and about 38.2 miles were under the jurisdiction of the Village. Of the 38.2 miles under the jurisdiction of the Village, about 2.7 miles are designated connecting streets over which STH 32 is routed through the Village.

Two through traffic lanes were generally provided on all streets and highways within the Village, one lane for each direction of travel, with the exception of segments of N. Lake Drive (STH 32) from the south corporate limit to approximately N. Holly Court; from a point about 400 feet north of E. Green Tree Road to E. Juniper Lane; from approximately E. Beach Drive to approximately E. Hyde Way; and from E. Fox Lane to the north corporate limit on which three lanes were provided with the center lane used for passing and left turns. Other segments of N. Lake Drive have one through traffic lane in each direction, separated by a two-way left-turn lane in the center. Exclusive left-turn lanes were provided on the N. Lake Drive approaches at the intersections with E. Green Tree Road and E. Bradley Road, and on the N. Port Washington Road (CTH W) approaches at the intersection with W. Calumet Road. An exclusive right-turn is provided on the southbound approach of N. Lake Drive at the intersection with E. Green Tree Road.

Average weekday traffic volume data from 1992 was collated for the arterial facilities. Traffic volumes in the Village ranged from 1,300 to 15,000 vehicles

per average weekday with the highest traffic volumes being on N. Port Washington Road.

Traffic accident data were collected for the period from January 1, 1991, through September 30, 1994--for all streets and highways within the Village. A total of 56 on-street accidents occurred in 1991, 67 in 1992, 64 in 1993, and 51 during the first nine months of 1994. Locations at which multiple accidents occurred each year were identified and found to include six intersections, four on N. Lake Drive at E. Bradley Road, E. Dean Road, E. Green Tree Road, and E. Quarles Place; one on N. Santa Monica Boulevard E. Bradley Road; and one on N. Port Washington Road at E. Bradley Road. The accident data also indicated that the entire segment of N. Lake Drive through the Village experienced multiple accidents each year.

The inventory of existing traffic control measures within the Village included type of intersection control; regulatory and warning signing related to intersection control, school zones, railway-highway grade crossings, speed limits, and horizontal alignment; and pavement markings related to lane usage.

The inventory indicated that of in June, 1994, of the 202 intersection within the Village, three were controlled by traffic signals, 83 by stop signs, 31 by yield signs, and 85 have no control. The corner sight distances at the 31 intersections with traffic control identified by Village Staff as potentially inadequate was reviewed to determine if changes in control were necessary and/or if sight distances should be improved. The corner sight distance and accident history at each of the 85 uncontrolled intersections was also reviewed to determine if control was warranted.

The locations of school zone signing including school advance warning, school crosswalk, and school speed limit signs were inventoried on Village streets in the vicinity of the six schools within the Village.

The type and location of railway advance warning and regulatory signing was inventoried at the five railway-highway grade crossings in the Village. Flashing light signals are provided on each approach at each railway-highway grade crossing.

Posted speed limits within the Village were inventoried. The inventory found that Village streets and highways were generally posted at 25 miles per hour with the exception of N. Lake Drive (STH 32) and N. Port Washington Road (CTH W) which were posted at 35 miles per hour, and segments of streets and highways within the school zones where 15 mile per hour speed limits were posted.

The existing horizontal alignment warning signs were inventoried at those locations identified by Village Staff as potential problems, and include turn, large arrow, and chevron pictographic warning signs. Children at play signing was observed to be posted at random locations adjacent to land access streets in residential neighborhoods throughout the Village.

Traffic control deficiencies and potential intersection corner sight distance deficiencies in the Village of Fox Point were identified in two ways. First, the inventory data were analyzed and evaluated using criteria which permit the objective determination of the need to implement traffic management control measures. These criteria found in Table 6 and in the Manual on Uniform Traffic Control Devices are based upon sound engineering principles. The standards for installation should conform to the Manual on Uniform Traffic Control Devices. Second, locations experiencing multiple accidents between January 1, 1991, and September 30, 1994, were analyzed to determine if modifications to existing signing or the installation of new signing could serve to abate the traffic safety problems identified at those locations. Alternative actions to abate the existing traffic control deficiencies were identified and evaluated. Finally, recommended actions were identified for implementation. The standards for installation of recommended traffic control measures should conform to the Manual on Uniform Traffic Control Devices.

The locations at which deficiencies were identified are set forth in Table 15 by deficiency category. The actions recommended to abate these deficiencies are also summarized in Table 15 by location. Finally, the estimated cost to implement the recommended actions and the agency responsible for implementation are also set forth in Table 15. The total cost to implement the recommended actions is estimated to be approximately $65,900. Of the estimated total cost to implement the recommended actions, Milwaukee County is expected to be

responsible for about $6,200, or about 9 percent, and the Village of Fox Point is expected to be responsible for about $59,700, or about 91 percent.