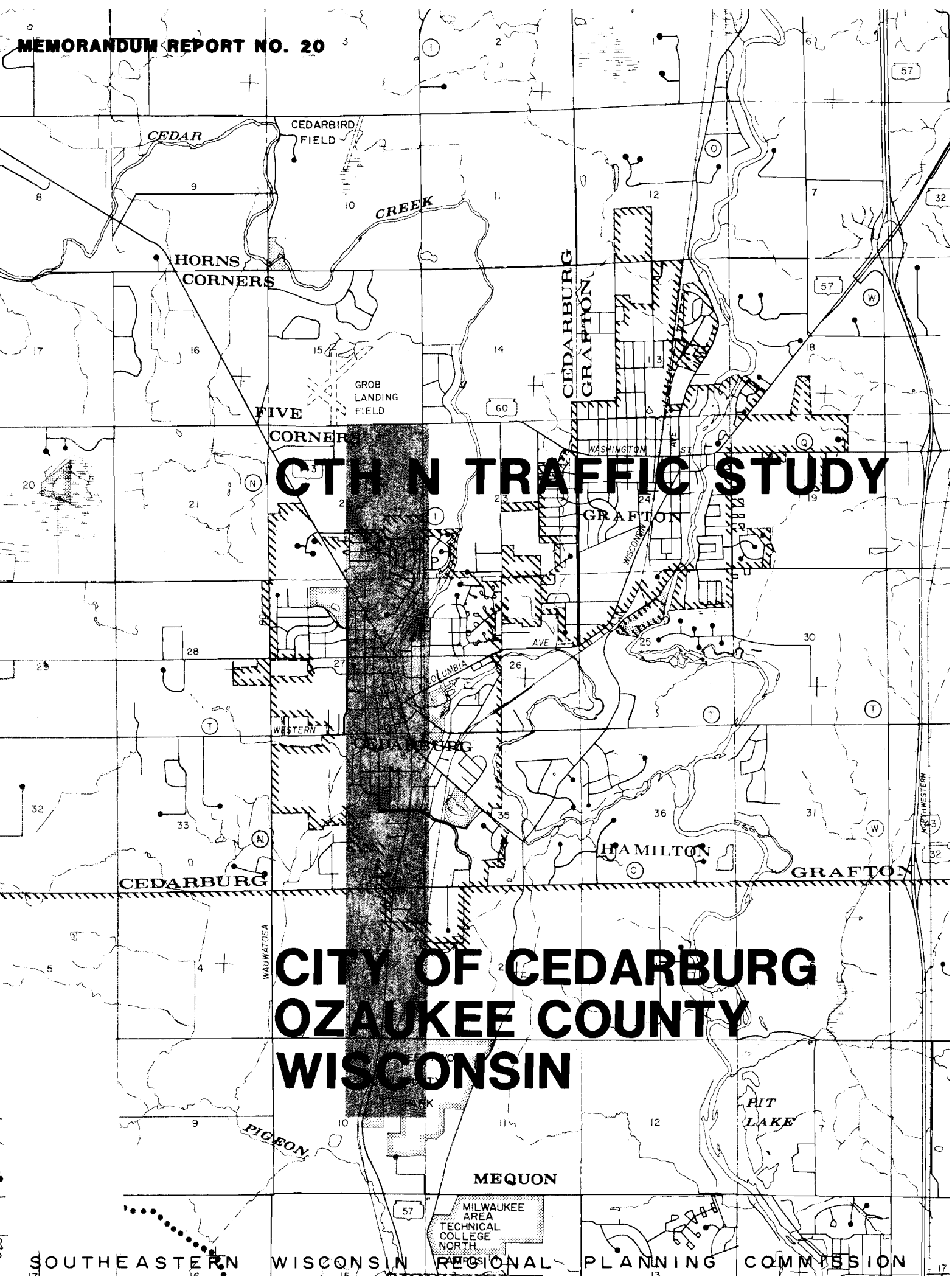
MEMORANDUM REPORT NO. 20



CTH N TRAFFIC STUDY

CITY OF CEDARBURG
OZAUKEE COUNTY
WISCONSIN

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

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MEMORANDUM REPORT NUMBER 20

CTH N TRAFFIC STUDY

CITY OF CEDARBURG
OZAUKEE COUNTY, WISCONSIN

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CTH N TRAFFIC STUDY IN THE CITY OF CEDARBURG

INTRODUCTION

The City of Cedarburg, Wisconsin, is experiencing perceived problems of traffic conflicts and safety along a segment of Wauwatosa Road (CTH N) between Western Avenue (CTH T) and Sherman Road, a distance of about one mile. Measures have been undertaken by Ozaukee County in the recent past to resolve these problems, including the provision of additional traffic lanes and changes in the vertical alignment of the roadway. Nevertheless, concerns have again been expressed recently by residents and elected officials of the City of Cedarburg over perceived existing and expected increases in traffic conflicts and hazards, and particularly such increases attendant to the proposed development of a 60-unit residential addition to the Ozaukee County Lasata Nursing Home located on CTH N south of its intersection with Bridge Street.

To help abate the remaining existing and anticipated future traffic-related problems, the City of Cedarburg on February 4, 1986, requested the Southeastern Wisconsin Regional Planning Commission to conduct a study of traffic operating problems on CTH N. This memorandum report presents the findings of that study. The study examined the number and location of existing driveways, particularly those serving the Webster Middle School and the Lasata Nursing Home; a potential sight distance and vehicular accident problem at the intersection of CTH N and Bridge Street; existing traffic controls and signs, particularly speed limit controls; the potential traffic impact of a proposed 60-unit addition to the Lasata Nursing Home; and the proposed jurisdictional transfer of CTH N from Ozaukee County to the State of Wisconsin.

EXISTING CONDITIONS

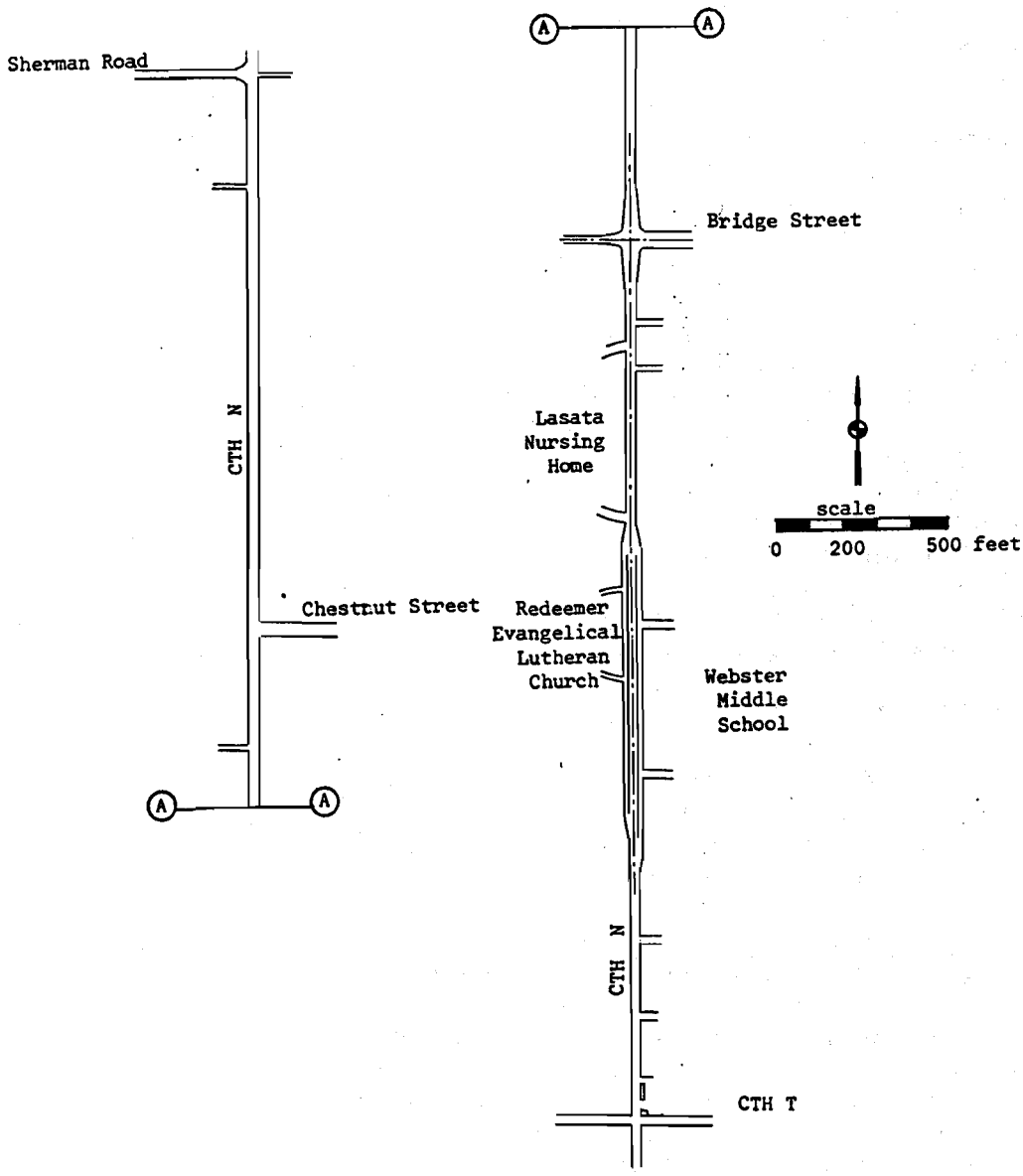
Essential to the identification of existing traffic problems is the collection of basic data concerning roadway geometrics and traffic controls; average weekday and peak hour traffic volumes and turning movements; and a history of motor vehicle accident patterns and frequencies.

Roadway Geometrics and Traffic Controls

The study segment of CTH N consists basically of a 24-foot-wide, two-lane undivided rural highway with gravel shoulders. The principal street intersections along the study segment are located at CTH T (Western Road), Bridge Street, Chestnut Street, and Sherman Road. As shown on Figure 1, CTH N is widened to accommodate right-turn acceleration-deceleration lanes and left-turn bypass lanes at its intersection with Bridge Street and along a 960-foot-long segment in the vicinity of the Webster Middle School. In 1986 there were 14 driveways located along the study segment of CTH N, of which eight provided access to low-traffic-volume-generating residential or agricultural land development, and of which six provided access to the higher traffic volume generating Webster Middle School, Lasata Nursing Home, and Redeemer Evangelical Lutheran Church, each of which had two driveways on CTH N.

Figure 1

EXISTING ROADWAY GEOMETRICS FOR THE STUDY SEGMENT OF CTH N BETWEEN CTH T AND SHERMAN ROAD: 1986



Source: SEWRPC.

The vertical roadway alignment is relatively level along the study segment of CTH N except at its intersection with Bridge Street, which is depressed about one foot below the CTH N approaches to the intersection. Sight distance along CTH N is unrestricted. However, corner sight distance for vehicles on the westbound Bridge Street approach to CTH N is restricted to the south to a distance of about 400 feet by a sloping embankment adjacent to the east side of CTH N opposite the Lasata Nursing Home; and to the north to a distance of about 450 feet by two high voltage electric power transformer enclosures located on the northeast corner of the intersection. Without these two obstructions, sight distances in both directions would be 680 feet or more.

As shown on Figure 2, the basic traffic controls along the study segment of CTH N consist of four-way stop signs at the CTH T intersection; two-way stop signs controlling traffic on Bridge Street; and a stop sign controlling traffic on Sherman Road. The posted speed limit south and north of the study segment is 45 miles per hour (mph), while the posted speed limit on the study segment of CTH N between CTH T to a point 500 feet north of Bridge Street is 35 mph. A reduced school zone speed limit of 25 mph exists on CTH N in the vicinity of Webster Middle School when children are present. The speed limit on Bridge Street is 25 mph east of CTH N and 45 mph west of CTH N.

Traffic studies conducted by the Commission indicate, as shown on Figure 3, that the average speed on the 35 mph zoned segment of CTH N south of Bridge Street was 40 mph in October 1986. The study also indicated that the 85th percentile speed, that speed recognized nationally as determining the safe and reasonable speed limit, was 45 mph; and that 77 percent of the traffic was traveling in the "10 mph pace"--that is, in that 10 mph increment of speed range including the largest number of vehicles--between 37 and 47 mph. This is consistent with earlier findings from studies conducted by the Wisconsin Department of Transportation which indicated an average operating speed of 42 mph, and an 85th percentile speed of 46 mph in 1984, when the posted speed limit on CTH N was set at 45 mph between CTH T and Bridge Street.

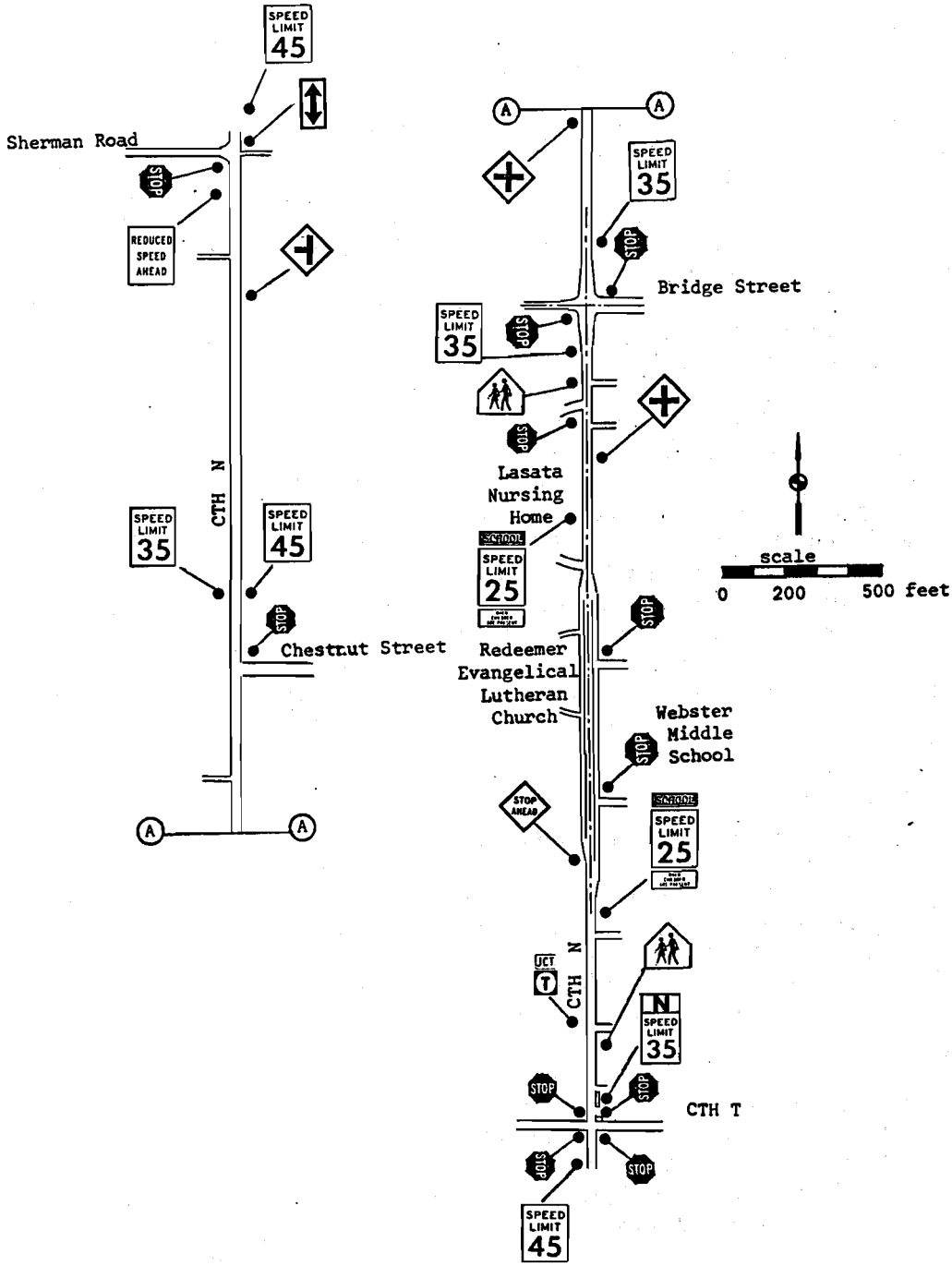
Traffic Volumes

In order to properly quantify existing traffic volumes along the study segment of CTH N, the Commission, in cooperation with the Wisconsin Department of Transportation, undertook 24-hour machine traffic counts on CTH N and at the driveways to both the Webster Middle School and Lasata Nursing Home. As shown on Figure 4, in May 1986 the 24-hour average weekday traffic on CTH N between Bridge Street and CTH T was 6,810 vehicles. In comparison, the total traffic contributed to CTH N by the Webster Middle School and the Lasata Nursing Home was 1,280 and 830 vehicles, respectively.

Even more important than the total volume of weekday traffic in the analysis of traffic operating conditions is the hourly distribution of that volume throughout the day. Accordingly, hourly traffic counts were taken by the Commission on May 6 through 8, 1986. As shown on Figure 5, two peaks of higher than normal hourly traffic flow were found to occur on CTH N. The morning peak was found to occur during the 7:00 to 8:00 a.m. time period, comprising about 680 vehicles. The evening peak was found to occur during an extended three-hour period between 3:00 and 6:00 p.m., comprising between 600 to 690 vehicles per hour, or about 10 to 11 percent of the average weekday hourly volume.

Figure 2

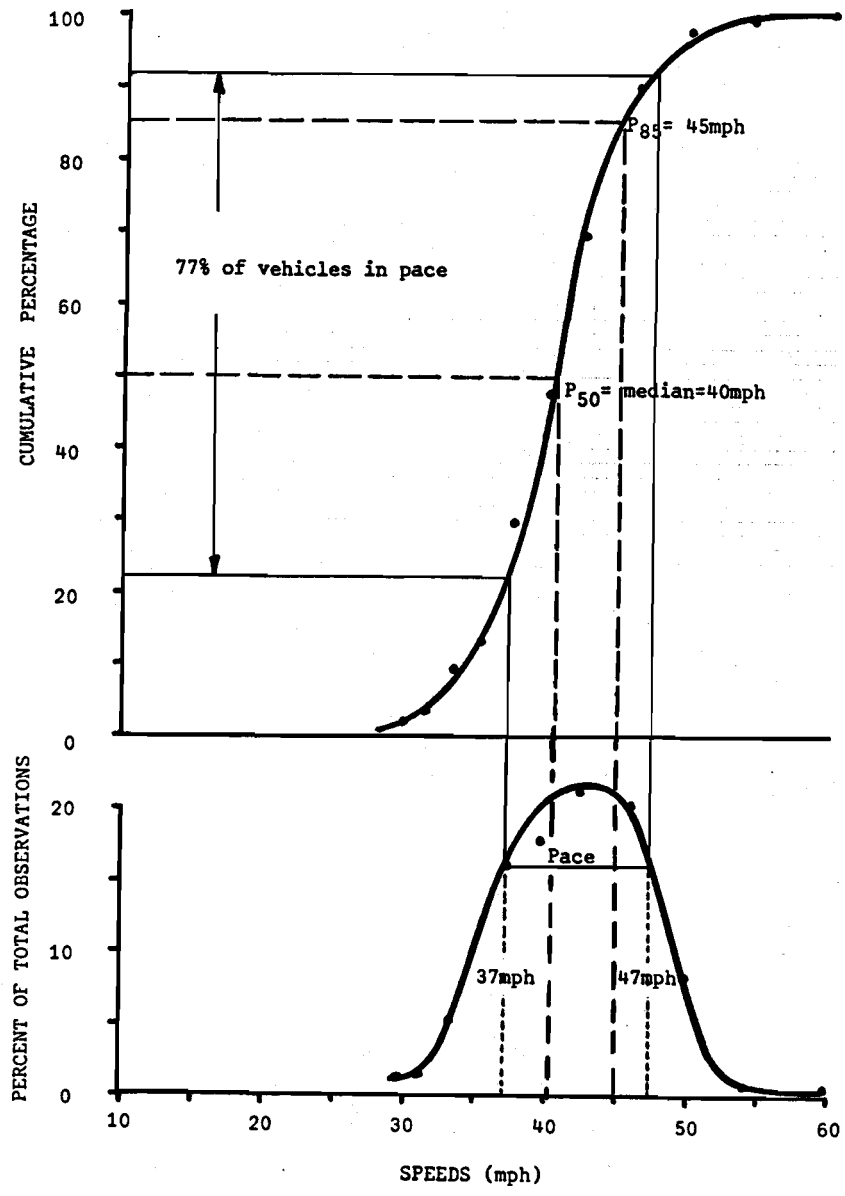
EXISTING TRAFFIC CONTROLS LOCATED ALONG THE STUDY SEGMENT OF CTH N BETWEEN CTH T AND SHERMAN ROAD: 1986



Source: SEWRPC.

Figure 3

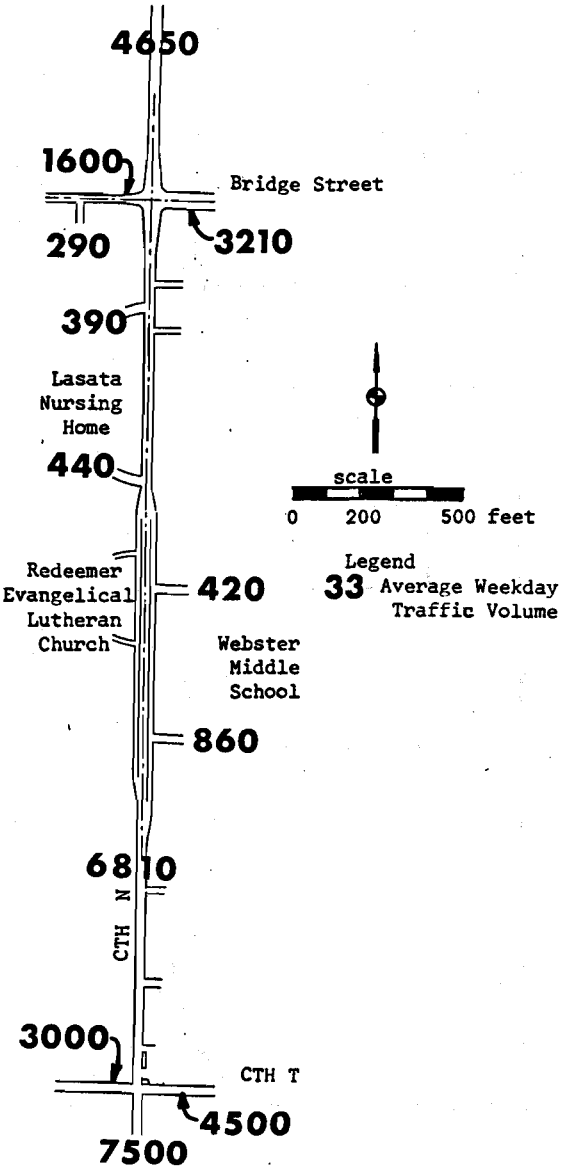
DISTRIBUTION OF VEHICLE SPEED ON CTH N
SOUTH OF BRIDGE STREET: OCTOBER 28, 1986



Source: SEWRPC.

Figure 4

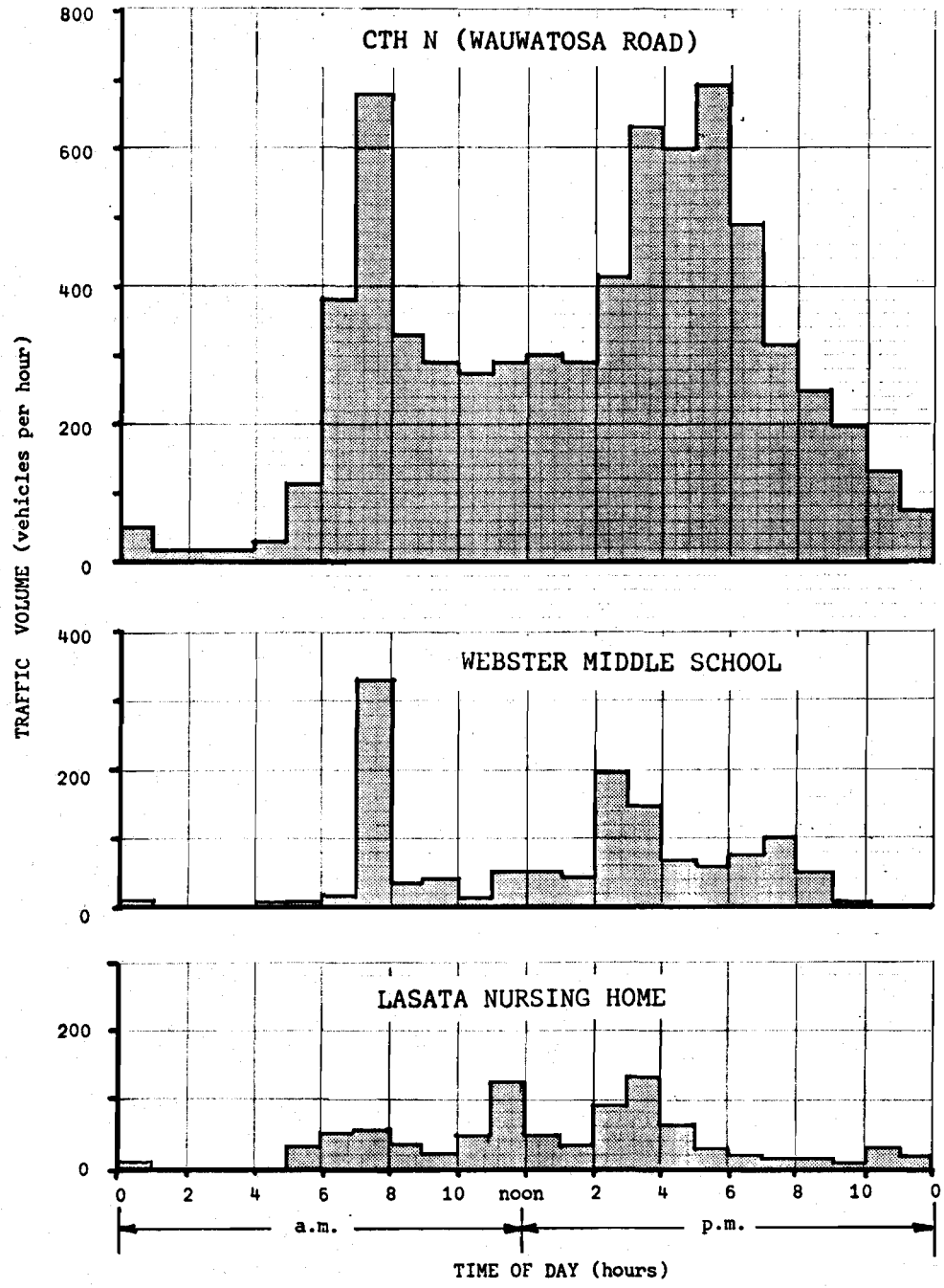
24-HOUR AVERAGE WEEKDAY TRAFFIC VOLUMES AT SELECTED LOCATIONS ALONG THE STUDY SEGMENT OF CTH N BETWEEN CTH T AND SHERMAN ROAD: 1986



Source: Wisconsin Department of Transportation and SEWRPC.

Figure 5

HOURLY DISTRIBUTION OF AVERAGE WEEKDAY TRAFFIC ON CTH N NORTH OF CTH T AND ON THE CTH N DRIVEWAYS TO WEBSTER MIDDLE SCHOOL AND THE LASATA NURSING HOME: 1986



Source: SEWRPC.

Traffic generated by the Webster Middle School peaks during the 7:00 to 8:00 a.m. time period with about 325 vehicles, or 25 percent of the total average weekday traffic, and during an extended two-hour evening peak of 194 and 141 vehicles, or 15 and 11 percent of the total average weekday traffic, during the 2:00 to 3:00 p.m. and 3:00 to 4:00 p.m. time periods, respectively.

As shown on Figure 5, traffic volumes do not exhibit a morning peak at the Lasata Nursing Home. However, a midday peak was exhibited during the 11:00 a.m. to noon time period, comprising 120 vehicles, or about 15 percent of the total average weekday traffic; and an extended two-hour evening peak during the 2:00 to 3:00 p.m. and 3:00 to 4:00 p.m. time periods, comprising about 90 and 130 vehicles respectively, or 11 and 16 percent of the total average weekday traffic. According to Lasata officials, these peaks were not a common occurrence but were attributed to a special event at the nursing home provided for their residents and guests.

In addition to the special traffic counts taken along CTH N, the Commission staff in May 1986 also counted hourly vehicular turning movements and pedestrian and bicyclist movements during the 7:00 a.m. to 5:00 p.m. time period at the intersection of CTH N and Bridge Street. The pedestrian and bicyclist count included pedestrians and bicyclists crossing CTH N in the vicinity of the Lasata Nursing Home and Webster Middle School. Based on the turning movement count data shown in Appendix A, left turns on CTH N reached a high of 11 vehicles during the 3:00 to 4:00 p.m. period; and 31 vehicles during the 4:00 to 5:00 p.m. period on the south- and northbound approaches to the intersection, respectively. However, northbound right turns were significantly higher throughout the day, reaching a high of 120 vehicles during the 4:00 to 5:00 p.m. period. Turning volumes on Bridge Street concurrently reached a high of 89 westbound left turns and 37 eastbound right turns during the 7:00 to 8:00 a.m. period.

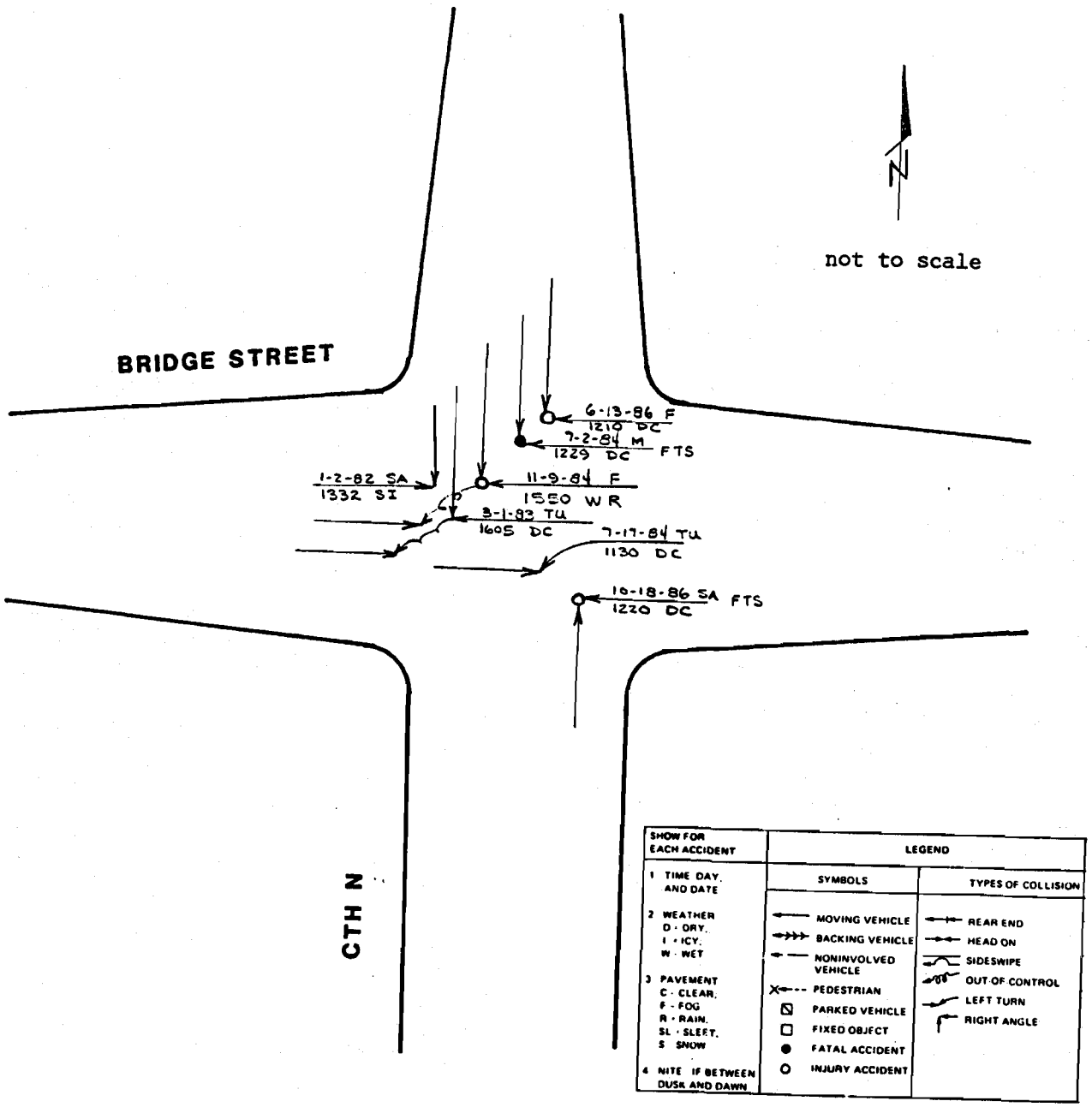
Pedestrian traffic in the area was very low during the 7:00 a.m. to 5:00 p.m. study period. Weather conditions for pedestrian activity were excellent during the study, with 80°F temperatures and sunny skies. As shown in Appendix A, a total of 70 pedestrians and bicyclists crossed the approaches to the intersection of CTH N and Bridge Street, of which 60, or almost 90 percent, were bicyclists. Thirty-one, or half the bicycle crossings, were apparently made by a bicycling group during the midday 11:00 a.m. to 1:00 p.m. time period. Almost all bicycle crossings of the intersection approaches, about 95 percent, crossed CTH N and continued east or west on Bridge Street. All the crossings--pedestrian and bicyclist--except one were made at the intersection and not in the vicinity of the Lasata Nursing Home or Webster Middle School driveways.

Motor Vehicle Accidents

Critical to the solution of traffic operating conditions is the identification of historic accident frequencies and patterns. A high frequency of accidents or a pattern of accident collision types is normally reflective of an operational conflict or geometric design problem. Accordingly, traffic accident reports for all accidents reported for the intersection of CTH N and Bridge Street since January 1, 1982, were collected and analyzed by the Commission. As shown on Figure 6, a total of seven accidents was reported at this intersection since 1982. Three of the accidents involved personal injuries and one

Figure 6

MOTOR VEHICLE COLLISION DIAGRAM FOR THE INTERSECTION OF CTH N AND BRIDGE STREET: JANUARY 1, 1982, THROUGH SEPTEMBER 30, 1986



Source: Ozaukee County, City of Cedarburg, and SEWRPC.

accident involved a fatality. The accident frequency, an average of just over one accident per year, and the accident rate of 0.3 accident per million vehicles entering the intersection, were relatively low compared to other accident-prone intersections throughout the Milwaukee area. However, a detailed analysis of the collisions shown on Figure 6 indicates a right-angle accident problem exists, with six of the seven accidents involving right-angle collisions between vehicles on CTH N and vehicles on Bridge Street. Of the seven accidents, five, or over 70 percent, involved southbound vehicles on CTH N, four of which collided with westbound vehicles on Bridge Street. The other interesting pattern exhibited by these seven accidents is that all the accidents occurred essentially during the 12:00 p.m. to 4:00 p.m. afternoon time period.

FUTURE CONDITIONS

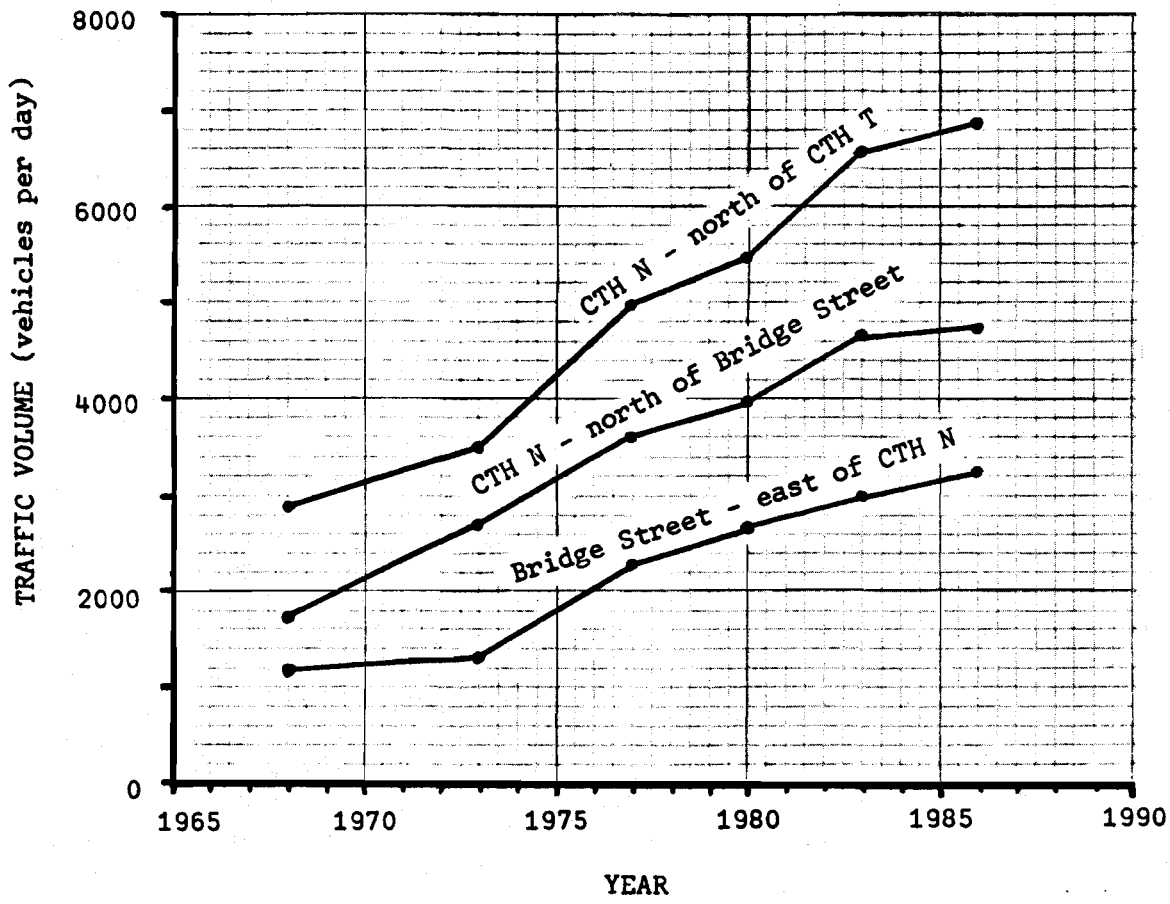
A principal concern to be addressed was the potential impact of traffic generated by a proposed 60-unit addition to the Lasata Nursing Home on traffic conditions on CTH N and potential conflict problems between nursing home traffic and school-generated traffic. It may be expected that the 60-unit addition to the Lasata Nursing Home will generate about 200 vehicle trips per average weekday, resulting in morning 7:00 to 8:00 a.m. and evening 4:00 to 5:00 p.m. peak hour traffic flows of about 25 vehicles per hour. Review of the hourly traffic flow data shown on Figure 5 and the roadway geometric data shown on Figure 1 indicates that this additional daily and peak hour traffic should not adversely impact existing traffic conditions along CTH N, nor should it adversely conflict with Webster Middle School-generated traffic. Driveway spacing along CTH N is adequate to provide safe and controlled access to both facilities.

As shown on Figure 7, traffic on CTH N, as well as on Bridge Street, has been steadily increasing at a rate of about 5 percent per year since 1968. As traffic continues to increase--with continued increases in urban land use development in the Cedarburg area--traffic conflicts and accident problems may also be expected to increase. Traffic forecasts prepared by the Commission as part of its long-range transportation planning for southeastern Wisconsin indicate that traffic volumes on CTH N may be expected to reach between 12,000 to 14,000 vehicles per day by the year 2000, and will require improvement of the roadway to provide four traffic lanes. Increased control over access and roadway capacity will be required along CTH N to ensure the safe and efficient flow of traffic as traffic volumes continue to increase.

An important consideration in the development and control of traffic operating conditions along CTH N is the level of government that should have jurisdictional authority over, and be responsible for, the operation, maintenance, and improvement of CTH N. A jurisdictional highway system plan was prepared by the Regional Planning Commission for the seven counties in southeastern Wisconsin, and that plan was adopted by the Ozaukee County Board in 1979. That plan is documented in SEWRPC Planning Report No. 25, A Regional Land Use Plan and a Regional Transportation Plan for Southeastern Wisconsin--2000, and recommends jurisdictional classifications for each segment of the total arterial street and highway system of the County according to three basic characteristics: 1) the type and volume of trips served; 2) the land uses connected and served; and 3) the operational characteristics of the facility. The plan recommended that CTH N should be transferred to the state trunk highway system.

Figure 7

HISTORIC TRAFFIC VOLUME PATTERNS AT SELECTED LOCATIONS ALONG THE STUDY SEGMENT OF CTH N BETWEEN CTH T AND SHERMAN ROAD: 1968-1986



Source: Wisconsin Department of Transportation and SEWRPC.

The transfer of the jurisdictional responsibility is an important element in the achievement of the objectives of the long-range regional transportation system plan, especially as those objectives pertain to the more systematic programming of arterial improvements to assure the most effective use of the total public resources invested in the provision of essential highway improvements, and the more equitable distribution of arterial highway system development costs and revenues among the levels and agencies of government concerned.

It is, therefore, recommended that Ozaukee County and the Wisconsin Department of Transportation, in keeping with the recommendations contained in the Commission's adopted long-range year 2000 transportation system plan, proceed with actions to transfer CTH N to the state trunk highway system.

ANALYSIS AND RECOMMENDATIONS

Based upon an analysis of existing roadway traffic operation and historic accident data, it may be concluded that a right-angle accident problem exists at the intersection of CTH N and Bridge Street; and that a speeding problem exists on the 35 mph posted segment of CTH N between CTH T and a point 500 feet north of Bridge Street. These two problems constitute the only traffic problems identified along the segment of CTH N studied.

Accident Problem

The accident problem at the intersection of CTH N and Bridge Street may be attributed to inadequate corner sight distance, inattentive driving by motorists on Bridge Street, and speeding on CTH N. The provision of safe and adequate corner sight distances is related to vehicle speeds, i.e., a 35 mph speed requires a 435-foot sight distance, while a 45 mph speed requires a longer, 560-foot sight distance.

The following traffic engineering actions are recommended to solve the accident problem at the intersection of CTH N and Bridge Street: 1) increase the sight distance for westbound vehicles on Bridge Street by relocating the westbound stop sign on Bridge Street from the existing light pole approximately 30 feet away from CTH N to a separate sign pole located six feet from CTH N--at an estimated cost of about $100; 2) installing stop line pavement markings at both the east- and westbound Bridge Street stop sign locations at its intersection with CTH N--at an estimated cost of about $100; and 3) installing a red flashing beacon at the relocated westbound stop sign on Bridge Street--at an estimated cost of about $1,000. These actions should serve to increase corner sight distance to about 600 feet and improve motorist awareness of the stop sign controls on Bridge Street.

The following actions were also considered to resolve the accident problem at the intersection of CTH N and Bridge Street, but are not recommended for implementation: 1) installation of four-way stop signs--at an estimated cost of about $200; 2) installation of traffic signals--at an estimated cost of about $35,000; 3) reconstruction of the intersection to eliminate the slight vertical curve on CTH N--at an estimated cost of about $50,000; 4) adoption of a reduced speed limit--at an estimated cost of about $200; 5) installation of an advance warning "Stop Ahead" sign--at an estimated cost of about $100; 6) transverse grooving on the westbound approach of Bridge Street to CTH N--at an estimated cost of about $10,000; lowering the embankment along the east side

of CTH N south of Bridge Street--at an estimated cost of $15,000; and 8) relocating the high voltage transformer enclosures located on the northeast corner of the intersection--at an estimated cost of about $10,000.

The installation of stop signs or traffic signals, while controlling vehicle conflicts through the intersection, are not warranted based upon current traffic volume count data. Such traffic control devices would needlessly increase vehicle delays, create disrespect for warranted traffic control devices, and potentially replace the right-angle accident problem with a rear-end accident problem. The additional traffic generated by the 60-unit addition to the Lasata Nursing Home is not expected to significantly change traffic conditions and, therefore, will not warrant stop sign or signal installation.

Reconstruction of the intersection to eliminate the vertical curve depression at Bridge Street would not significantly improve corner sight distance concerns, which is restricted primarily because of obstructions along the east side of CTH N and not because of the vertical roadway alignment.

A reduction in the posted speed limit below the posted 35 mph limit would not be effective. As previously noted, a speeding vehicle problem already exists along CTH N, with the 85th percentile speed, that speed at or below which 85 percent of the motorists are driving, having been measured at 45 mph. Motorists will normally drive at the speed they consider to be safe and appropriate under prevailing conditions. A reduced speed limit would not be effective under those conditions and would potentially create additional accidents along CTH N as motorists attempt to pass vehicles traveling at the posted speed, as well as increase disrespect for other warranted traffic controls.

The installation of an advance warning sign or transverse grooving on Bridge Street would serve to increase driver attentiveness at the intersection. However, such actions are considered unnecessary as the stop sign relocation and the addition of a red flashing beacon on the westbound approach to Bridge Street are expected to resolve the problem.

Regrading of the roadway embankment along the east side of CTH N south of Bridge Street and relocation of the high voltage transformers located on the northeast corner of the intersection both serve to remove sight distance obstructions to westbound vehicles on Bridge Street. Relocation of the previously recommended stop signs on Bridge Street increases corner sight distance to 600 feet or greater, sufficient to eliminate the need for implementation of these actions.

Speeding Vehicle Problem

With one exception, there are no traffic management actions that may be considered effective in resolving the speeding vehicle problem along the study segment of CTH N. As illustrated in the recent speed study conducted by the Commission staff and noted above, motorists will normally drive at the speed considered safe and appropriate under prevailing conditions. Existing 85th percentile and average speeds of 45 and 40 mph, respectively, are practically identical to corresponding speed values independently measured by the Wisconsin Department of Transportation--46 and 42 mph, respectively--when the posted speed limit was set at 45 mph in September 1984. Unrealistically low speed limits in outlying areas of low land use intensity are ineffective and can

actually increase accident problems due to the variance in traffic stream speeds between those motorists traveling at the posted speed and other motorists illegally traveling at higher speeds.

The provision of channelized bypass lanes at the Webster Middle School and Bridge Street intersection, and the 25 mph school zone speed controls, as currently exist are considered the safest and appropriate action necessary to control traffic conflicts at these locations.

One action that could serve to ameliorate the speeding problem involves increased enforcement of the 35 mph speed limit. The action will, however, require a continuing police presence, as it may be expected to be effective only during those times that a police presence is noticeable to motorists on CTH N. Strict speed limit enforcement along CTH N is difficult to accomplish because of the irregular boundary line between the City and Town of Cedarburg along CTH N. Police jurisdiction continuously changes as CTH N passes through both city and town lands. It is therefore recommended that the City proceed with actions to annex those portions of the Town of Cedarburg that are necessary to provide continuous jurisdiction along CTH N or that actions be taken by the City of Cedarburg to contract with the Town of Cedarburg for police department authority along the study segment of CTH N.

SUMMARY AND CONCLUSION

The study segment of CTH N between CTH T and Sherman Road in 1986 carried a traffic volume of about 6,800 vehicles per average weekday on a 24-foot-wide undivided two-lane roadway. The CTH N pavement is widened in the vicinity of the Webster Middle School and at its intersection with Bridge Street to accommodate special bypass and acceleration-deceleration lanes. Driveway access along CTH N is minimal, with a total of 12 driveways, of which two each serve the following three land developments: the Webster Middle School, the Lasata Nursing Home, and the Redeemer Evangelical Lutheran Church. Vertical roadway alignment along CTH N is relatively level except for a slight one-foot depression in the vicinity of its intersection with Bridge Street. Corner sight distance for westbound vehicles on Bridge Street is restricted to about 400 feet to the south by a sloping embankment along the eastern edge of the roadway; and to about 450 feet to the north by two electric power transformer enclosures located on the northeast corner of the intersection.

Traffic controls along the study segment of CTH N consist of four-way stop signs at its intersection with CTH T; a posted speed limit of 35 mph from CTH N to a point 500 feet north of Bridge Street; and a reduced school zone speed of 25 mph in the vicinity of Webster Middle School. Both Bridge Street and Sherman Road are controlled by stop signs at their intersections with CTH N. The average speed of traffic on the study segment of CTH N was measured in October 1986 at 40 mph, with the 85th percentile speed at 45 mph.

The Webster Middle School and the Lasata Nursing Home generate about 1,300 and 800 vehicle trips on an average weekday. The morning school peak traffic volume of about 325 vehicles occurs between 7:00 and 8:00 a.m., which coincides with, and is a part of, peak traffic volume of about 680 vehicles on CTH N. The evening school peak traffic volume occurs between 2:00 and 4:00 p.m., with a high of 194 vehicles, which coincides with the Lasata

Nursing Home evening peak of 82 vehicles and the start of the CTH N 3:00 to 6:00 p.m. peak traffic period, which ranges between 600 and 690 vehicles per hour.

Turning movement and pedestrian and bicyclist activity at the CTH N intersection with Bridge Street was relatively low. Based on counts taken in May 1986, the number of northbound vehicles on CTH N turning left onto Bridge Street was 31 between 4:00 p.m. and 5:00 p.m.--the highest traffic volume hour of the day. Northbound right turns of 120 vehicles peaked during the same time period. During the 7:00 a.m. to 5:00 p.m. time period, a total of 10 pedestrians and 60 bicyclists crossed at the intersection of CTH N and Bridge Street, about half of the bicyclist crossings were apparently made by a bicycle group during the 11:00 a.m. to 1:00 p.m. time period. Only one pedestrian crossed CTH N south of its intersection with Bridge Street.

A total of seven motor vehicle accidents was reported since January 1, 1982, at the intersection of CTH N and Bridge Street, identifying a midday southbound right-angle collision problem.

The planned 60-unit addition to the Ozaukee County Lasata Nursing Home may be expected to generate about 200 vehicle trips per day, or about 25 trips each during the morning and evening peak periods on an average weekday. This additional traffic should not significantly exacerbate existing or create new vehicle conflict problems along CTH N as driveway spacing between the nursing home and Bridge Street and the Webster Middle School is adequate to accommodate the potential modest increase in traffic volume.

Additional increases in average weekday traffic are expected to continue, however, with increased urban land development in the Cedarburg area resulting in a need by the year 2000 to widen CTH N to a four-traffic-lane arterial roadway. It is recommended, based on traffic characteristics and land uses served, that CTH N be jurisdictionally transferred from Ozaukee County to the state trunk highway system, as long recommended in the adopted jurisdictional highway system plan for Ozaukee County.

Based upon inventories and analyses of the existing roadway geometric conditions, traffic volumes and speeds, and historic accident data, it was determined that traffic accident and speeding vehicle problems do exist along the study segment of CTH N. More specifically, a midday right-angle collision pattern involving southbound vehicles exists at the intersection of CTH N and Bridge Road; and vehicles were found to be traveling from between 40 to 45 mph in the 35 mph posted speed zone area on CTH N.

The right-angle accident problem, it was concluded, may be attributed to inadequate sight distance, inattentive driving of motorists on the westbound approach to Bridge Street, and speeding on CTH N. Alternative traffic engineering actions were analyzed to resolve this accident problem. The findings of these analyses resulted in a recommendation that the sight distance concerned be improved to satisfy existing travel speeds on CTH N by relocating the stop sign controlling westbound traffic from its present location on a light pole about 30 feet east of the intersection to a separate sign pole about six feet from the intersection. To resolve the inattentive motorist problem it is recommended that the stop sign concerned by relocated as already noted; stop line pavement markings be provided on both the east- and westbound

intersection approaches of Bridge Street; and that a red flashing beacon be installed in conjunction with the relocated westbound stop sign. The total cost of implementing these recommneded traffic improvement actions is estimated at about $1,200.

With respect to the speeding problem on CTH N, it was noted that most motorists will normally travel at a speed considered to be safe and appropriate under prevailing conditions. Prior to November 1984, the posted speed on CTH N was 45 mph and the 85th percentile speed was found to be 46 mph. In October 1986, after the posted speed was lowered to 35 mph, the 85th percentile speed was found to be unchanged at 45 mph. Existing land use development and roadway geometrics in the area are typical of those normally associated with safe operating speeds of 45 mph. In keeping with local concerns and desires to maintain a 35 mph speed limit on CTH N, it is recommended that police enforcement of the posted speed limit be increased. Increased speed limit enforcement requires a local commitment to devote additional police officer patrol time on CTH N. The annual cost of that enforcement would be determined by the number of hours committed by the City of Cedarburg Police Department to patrolling CTH N. In order for the City of Cedarburg to effectively enforce the 35 mph speed limit on CTH N, it is recommended that the City take action to either annex those portions of CTH N that lie in the Town of Cedarburg, or contract with the Town of Cedarburg to provide city police enforcement authority over the entire study segment of CTH N.

Implementation of the traffic engineering improvement actions recommended in this report may be expected to resolve the existing accident problem and control travel speeds on CTH N, thereby providing safer operating conditions for traffic generated by land development adjacent to CTH N, as well as other traffic traveling on CTH N.