MEMORANDUM REPORT NO. 128

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ASSESSMENT OF TRAVEL THROUGH THE NEIGHBORHOOD BOUNDED BY W. SILVER SPRING DRIVE, N. PORT WASHINGTON ROAD, N. LYDELL AVENUE, AND W. HENRY CLAY STREET IN THE CITY OF GLENDALE: 1997

# MILWAUKEE COUNTY WISCONSIN

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## MEMORANDUM REPORT NUMBER 128

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#### SEWRPC Memorandum Report No. 128

## ASSESSMENT OF TRAVEL THROUGH THE NEIGHBORHOOD BOUNDED BY W. SILVER SPRING DRIVE, N. PORT WASHINGTON ROAD, N. LYDELL AVENUE, AND W. HENRY CLAY STREET IN THE CITY OF GLENDALE: 1997

#### INTRODUCTION

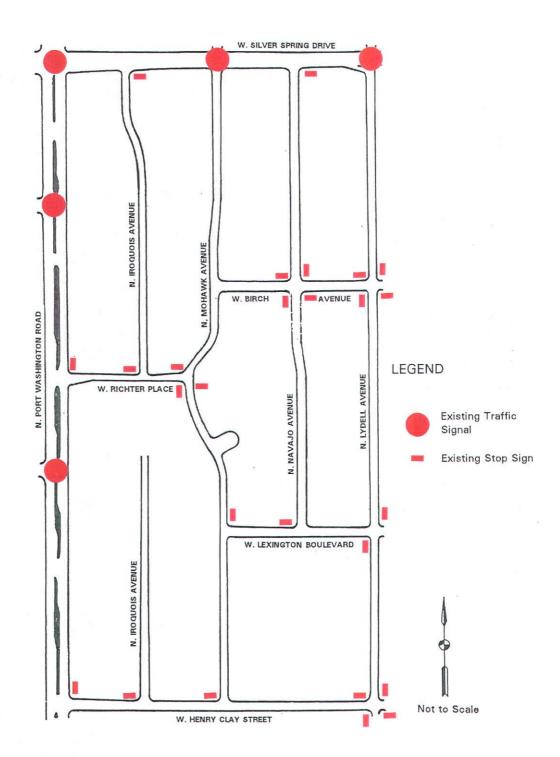
City of Glendale officials, by letter dated June 25, 1996, requested that the Commission staff conduct a traffic study which would assess the volume of traffic traveling through a City neighborhood located adjacent to commercial development on N. Port Washington Road and W. Silver Spring Drive. The neighborhood concerned is bounded by W. Silver Spring Drive on the north; N. Port Washington Road on the west; N. Lydell Avenue on the east; and W. Henry Clay Street on the south, as shown in Figure 1. The request for this study was prompted by a perception that traffic volumes on local streets within the neighborhood are increasing as motorists seek alternative routes to avoid the intersection of W. Silver Spring Drive and N. Port Washington Road.

The purpose of this study was to determine the pattern and amount of traffic which travelled through the study neighborhood, that is, traffic which had neither an origin nor a destination within the study neighborhood. The study was also to identify alternative measures which may be expected to discourage traffic from using the neighborhood streets to avoid the intersection of W. Silver Spring Drive and N. Port Washington Road.

EXISTING STREET AND HIGHWAY SYSTEM JURISDICTIONAL AND FUNCTIONAL CLASSIFICATION

#### Jurisdictional Classification

The street and highway system may be classified with respect to the jurisdictional responsibility, that is, with respect to the level of government responsible for the planning, design, construction, and operation of each street comprising the system. Within the study neighborhood, all of the streets are



THROUGH TRAFFIC STUDY NEIGHBORHOOD IN THE CITY OF GLENDALE

Figure 1

under the jurisdiction of the City of Glendale. At the periphery of the study neighborhood, N. Lydell Avenue, W. Henry Clay Street, and W. Silver Spring Drive are also under the jurisdiction of the City. North Port Washington Road, including its intersection with W. Silver Spring Drive, is under the jurisdiction of the Wisconsin Department of Transportation as a State maintained frontage road to IH 43.

#### Functional Classification

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

Two of these functions--traffic movement and land access--are basically incompatible. Individual facilities constituting the street and highway system 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. Accordingly, three functional types of streets are recognized: 1) arterial streets; 2) collector streets; and, 3) land access streets.

Arterial streets are defined as streets and highways which are intended to serve the through movement of relatively heavy volumes of traffic at relatively high speeds, providing transportation service between major subareas of an urban area or through the area. Access to abutting property may be a secondary function of some types of arterials, but it should always be subordinate to the primary function of traffic movement. Surface arterial streets may carry traffic volumes ranging upward from about 5,000 vehicles per average weekday.

Collector streets are defined as streets 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 land access

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streets and conveying it to arterial streets, collector streets usually serve a secondary function of providing access to abutting property. The maximum desirable and acceptable limits of traffic volumes for a collector street are 3,000 and 4,000 vehicles per average weekday, respectively.

Land access streets are defined as streets which are intended to serve primarily as a means of access to abutting properties, principally serving the residential areas of a community. The maximum desirable and acceptable limits of traffic volumes for a land access street are 1,500 and 2,500 vehicles per average weekday, respectively.

West Silver Spring Drive and N. Port Washington Road are classified as arterial streets by the Regional Planning Commission. North Lydell Avenue and W. Henry Clay Street are classified as collector facilities. Each of the facilities within the study neighborhood is classified as a land access street. Because each of the facilities within the study neighborhood is a land access street, only traffic having one end of its trip--either its origin or its destination-within the neighborhood should be observed on those streets. All other traffic should be using either the arterial or the collector streets which act as neighborhood boundaries.

There are a number of visual cues which help motorists determine the functional classification of the streets upon which they are traveling; that is, arterial, collector, or land access. Two of the more obvious cues are the type of intersection traffic control along the street and its speed limit. With respect to land access streets, generally their intersections with other land access streets are uncontrolled, and their intersections with collector or arterial streets have stop sign control on the land access street only. Speed limits on land access streets are usually 25 miles per hour. With respect to collector streets, generally their intersection approach is stop sign controlled; that is, each such intersection approach is stop sign controlled. The type of control at their intersections with arterial streets may vary, depending on the amount of traffic on the collector and arterial streets. The type of control may range from stop sign control. Speed limits

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on collector streets are usually also 25 miles per hour. Traffic control at intersections of two arterial streets is typically traffic signal controlled or multi-way stop controlled. Speed limits on arterials usually range from 25 miles per hour to 65 miles per hour. Providing speed limits on arterials exceeding 25 miles per hour appropriately directs motorists to arterial streets.

The existing traffic control within the study neighborhood is shown in Figure 1. Appropriate traffic control to direct motorists to the proper facility for their trip is generally provided with the exceptions of the traffic signal on W. Silver Spring Drive at N. Mohawk Avenue, and the multi-way stop control on W. Birch Avenue which contribute to the perception that N. Mohawk Avenue and W. Birch Avenue are collector streets. The posted speed limit within and at the periphery of the study neighborhood may be considered appropriate in terms of street functional classification in that the arterials of N. Port Washington Road and W. Silver Spring Drive have speed limits of 35 and 30 miles per hour, respectively, and the remaining collector and land access streets have speed limits of 25 miles per hour.

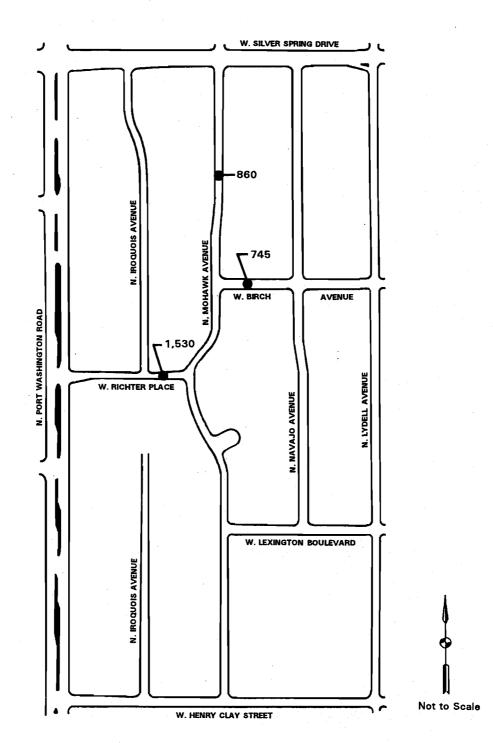
#### TRAFFIC VOLUMES AND PATTERNS

In order to determine the characteristics of the traffic using the neighborhood streets, 24-hour machine traffic counts were conducted by the Commission in July of 1997 on selected land access facilities within the study area. The facilities selected may be expected to comprise routes utilized by motorists attempting to avoid the intersection of N. Port Washington Road and W. Silver Spring Drive. The observed average weekday traffic counts and their locations are shown on Figure 2. Only one of the average weekday traffic counts--1,530 vehicles per average weekday on Richter Place--exceeded the maximum desirable volume of a land access facility, and none approached the maximum acceptable volume of a land access facility.

In order to determine whether motorists were traveling through the study area, the Commission conducted a license plate survey in conjunction with the 24-hour machine traffic counts in July, 1997. License plate data were collected at the sites shown on Figure 3 between 8:00 a.m. and 6:00 p.m. on an average weekday.

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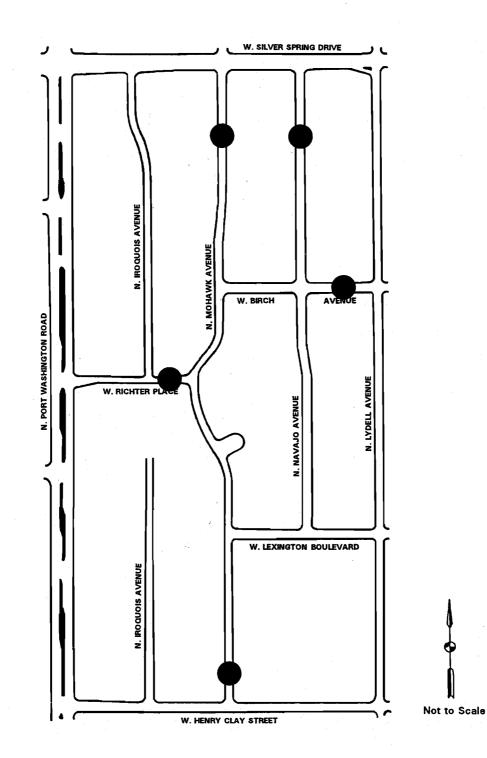
Figure 2



### OBSERVED AVERAGE WEEKDAY TRAFFIC COUNTS ON SELECTED STREETS IN THE STUDY NEIGHBORHOOD: 1997

Source: SEWRPC

-4a-



Source: SEWRPC

LOCATION OF LICENSE PLATE SURVEY STATIONS IN THE STUDY NEIGHBORHOOD: 1997

About 70 percent of total average weekday traffic volume is known to occur during these hours. For the purposes of this study, a vehicle was considered to be traveling through the study neighborhood when a license plate was observed exiting from one station within ten minutes or less from the time it entered the neighborhood at another station.

Approximately 1,825 vehicles were observed on an average weekday entering the study area from one of the peripheral arterial or collector facilities through one of the stations shown in Figure 3. An estimated 485 vehicles, or about 27 percent of the 1,825 vehicles entering the study area, were observed exiting the study neighborhood within ten minutes or less, and, thus, were considered to be traveling through the study neighborhood.<sup>1</sup> The estimated number of vehicles making the various station to station movements on an average weekday in 1997 are shown in Table 1. These data are displayed graphically in Figure 4. It is apparent from Figure 4 that the predominant patterns of through traffic are between Richter Place and Birch Avenue, and between Richter Place and Mohawk Avenue north of Birch Avenue.

The actual volume of through traffic is relatively low, estimated at about 485 vehicles per average weekday. As a result none of the study area land access streets are currently carrying average weekday traffic volumes which approach the maximum acceptable volume for land access streets. Only one of the streets--Richter Place--carries an average weekday traffic volume which approaches, and exceeds, the maximum desirable traffic volume of about 1,500 vehicles per average weekday. However, through traffic is always undesirable to residents. Through

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<sup>&</sup>lt;sup>1</sup>The license plate data were collected in five minute time blocks, as opposed to labeling each entry and exit license plate observation with a discrete time. Because a vehicle observed late in the entry time interval may not have had sufficient time to travel to an exit station before the five minute entry station time interval ended, for every time interval at an entry station it was necessary to search for matching license plates at the exit stations during the both the corresponding time interval and the successive time interval. Thus, because of the manner in which the data were collected, it was necessary to consider all the exit station license plates observed during a ten minute time frame for every five minute time interval at an entry station although it is highly unlikely that any vehicle observed required more than about two minutes to travel through the study neighborhood.

#### Table 1

## ESTIMATED 1997 AVERAGE WEEKDAY STATION TO STATION TRAVEL PATTERN OF VEHICLES TRAVELING THROUGH THE CITY OF GLENDALE NEIGHBORHOOD BOUNDED BY W. SILVER SPRING DRIVE, N. LYDELL AVENUE, N. PORT WASHINGTON ROAD, AND W. HENRY CLAY STREET<sup>a</sup>

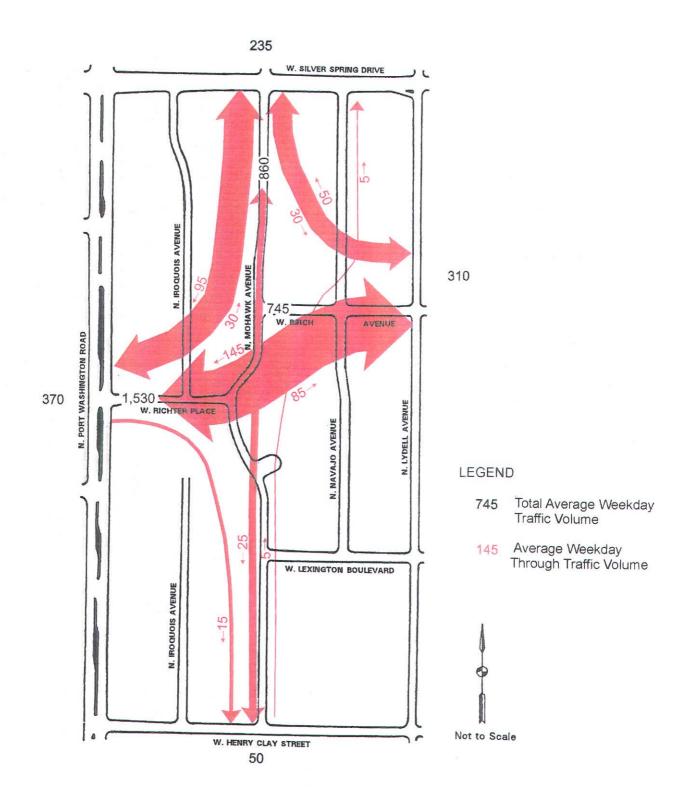
	Exit Station				
Entrance Station	Richter Place	Mohawk Avenue at Silver Spring Drive	Navajo Avenue	Birch Avenue	Mohawk Avenue at Henry Clay Street
Richter Place		30	.0	85	15
Mohawk Avenue at Silver Spring Drive	95		0	50	25
Navajo Avenue	. 0	0		0	0
Birch Avenue	145	30	0		0
Mohawk Avenue at Henry Clay Street	0	5	5	0	

<sup>a</sup> Traffic was considered to be traveling through the neighborhood when a license plate was observed exiting from one station in ten minutes or less from the time it was observed entering at another station.

Source: SEWRPC

## -5b-Figure 4

# THROUGH TRAFFIC PATTERNS OBSERVED IN THE STUDY NEIGHBORHOOD ON AN AVERAGE WEEKDAY: 1997



traffic represents between 24 and 31 percent of the estimated average weekday traffic volumes on Richter Place, Birch Avenue, and Mohawk Avenue. Therefore, alternatives were examined which would reduce through traffic within the study neighborhood.

#### THROUGH TRAFFIC DIVERSION ALTERNATIVES

As already noted and illustrated in Figure 4, the predominant patterns of through traffic within the study neighborhood are between Richter Place and Birch Avenue, and between Richter Place and Mohawk Avenue north of Birch Avenue. Thus, any alternatives considered should make it more difficult, if not impossible, to traverse the neighborhood on these facilities.

There are, generally, two basic alternatives which may be utilized to attempt to divert through traffic from the neighborhood: passive controls and physical controls. Passive controls consist of traffic control signing such as turn prohibition signs, stop signs, speed limit signs, and one way signs. Passive controls command or advise that certain actions be taken or not taken, but may be disregarded by the motorist.

Physical controls consist of a range of barriers constructed to modify the street configuration or other devices which impact the operation of a vehicle. Physical controls range from speed humps to cul de sacs. Physical controls may not be ignored, and, thus, either prevent the motorist from or force the motorist to take certain actions. Thus, physical controls provide more positive control than passive control devices.

Physical controls located at the periphery of a neighborhood are usually the most effective in eliminating through traffic from neighborhood streets. Physical controls located within the neighborhood are more effective than passive controls, but do allow through traffic to enter the neighborhood where it then circulates on neighborhood streets before exiting the neighborhood. In general, however, the more effective a control measure is in terms of diverting through traffic from a neighborhood, the more likely it will also disrupt neighborhood traffic.

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With respect to this particular neighborhood, it may also be possible to enhance travel on the peripheral arterial and collector streets or to provide an alternate route for through traffic. Unlike the two basic alternatives identified above, neither of these alternatives would rely on controls of any kind to divert traffic. Accordingly, they are referred to herein as "travel enhancement" alternatives.

#### Passive Control Alternatives

The first passive alternative considered would make use of regulatory traffic control signing. Under this alternative, such signing would include installing stop signs on the Richter Place approaches to Iroquois Avenue, and the Mohawk Avenue approaches to Birch Avenue. The estimated cost to implement this alternative is approximately \$950. The primary advantage of this alternative is that through traffic using these intersections would be somewhat inconvenienced by the delay associated with having to stop at two additional intersections.<sup>2</sup> There would not be any travel indirection for neighborhood residents.

The primary disadvantage of this alternative is that the proper function of stop signs is to assign the right of way at an intersection. Studies have indicated that when stop signs are used for some other purpose--generally, to impose delay and thereby modify motorist behavior--they tend to be very in-effective. Typically, motorists increase their travel speeds on intervening roadway segments to offset any delay imposed by the stop signs. Because stop signs do not effectively reduce overall travel time, little diversion may be expected. Further, if motorists perceive that stop signs are not necessary to assign right of way as manifested by a lack of traffic on the intersecting approaches, they tend to disregard the stop signs and to acquire diminished respect for all traffic control. Finally, motorists could choose to make "rolling" stops or to ignore the stop signs completely, thereby creating a safety and law enforcement problem. Therefore, this alternative is not recommended.

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<sup>&</sup>lt;sup>2</sup>All approaches at the intersections of Mohawk Avenue and Richter Place and Birch Avenue and Navajo Avenue are currently stop sign controlled requiring all motorists to stop at these intersections.

The second passive alternative considered would also make use of regulatory traffic control signing. Such regulatory signing would include left-turn prohibitions on the eastbound Richter Place approach to Mohawk Avenue, and the westbound Birch Avenue approach to Mohawk Avenue. It would also include a right-turn prohibition on the southbound Mohawk Avenue approach to Richter Place. The estimated cost to implement this alternative is approximately \$600. The primary advantage of this alternative is that the movements between Richter Place and Birch Avenue and the southbound Mohawk Avenue movement to Richter Place would be prohibited thereby eliminating from these facilities the through traffic currently making these movements.

The primary disadvantage of this alternative is that internal neighborhood traffic patterns would be disrupted as neighborhood traffic would also be subject to the same turn prohibitions. There would be some travel indirection for neighborhood residents and increased neighborhood traffic estimated at about 500 vehicles per average weekday on Mohawk Avenue south of Richter, and about 200 vehicles per average weekday on Navajo Avenue and on Lexington Boulevard. Another potential disadvantage is that the through traffic between Richter Place and Mohawk Avenue could shift to Mohawk Avenue between Birch Avenue and Henry Clay Street. Finally, motorists could choose to ignore the turning movement prohibitions thereby creating a law enforcement problem. Therefore, this alternative is not recommended.

The third passive alternative considered would also make use of regulatory traffic signing. Such signing would include a left-turn prohibition on the westbound W. Richter Place approach to N. Port Washington Road. The estimated cost to implement this alternative is approximately \$200. The primary advantage of this alternative is that the left-turn movement from westbound W. Richter Place to N. Port Washington Road would be prohibited thereby eliminating from W. Richter Place the through traffic currently making this movement.

The primary disadvantage of this alternative is that internal neighborhood traffic patterns would be disrupted as neighborhood traffic would also be subject to the same left-turn prohibition. There would be some travel indirection for neighborhood residents and increased neighborhood traffic estimated at about 500

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vehicles per average weekday on Mohawk Avenue south of Richter, and about 200 vehicles per average weekday on Navajo Avenue and on Lexington Boulevard. Another potential disadvantage is that the through traffic between Richter Place and Mohawk Avenue could shift to Mohawk Avenue between Birch Avenue and Henry Clay Street.

Another potential disadvantage of this alternative is that motorists who currently exit the business in the southwest quadrant of the N. Port Washington Road and W. Richter Place intersection on to Richter Place and then turn left onto N. Port Washington Road could no longer do so, and would have two options to head south on N. Port Washington Road. First, they might exit the business onto northbound Port Washington Road, cross two lanes of traffic in a distance of approximately 50 feet to the median break at the intersection of N. Port Washington Road and W. Richter Place and make a U-turn. Alternatively, they might travel through the neighborhood by turning right onto W. Richter Place and then turn right onto Mohwak Avenue traveling south to Henry Clay Street. Finally, motorists could choose to ignore the turning movement prohibitions thereby creating a law enforcement problem. Therefore, this alternative is not recommended.

#### Physical Control Alternatives

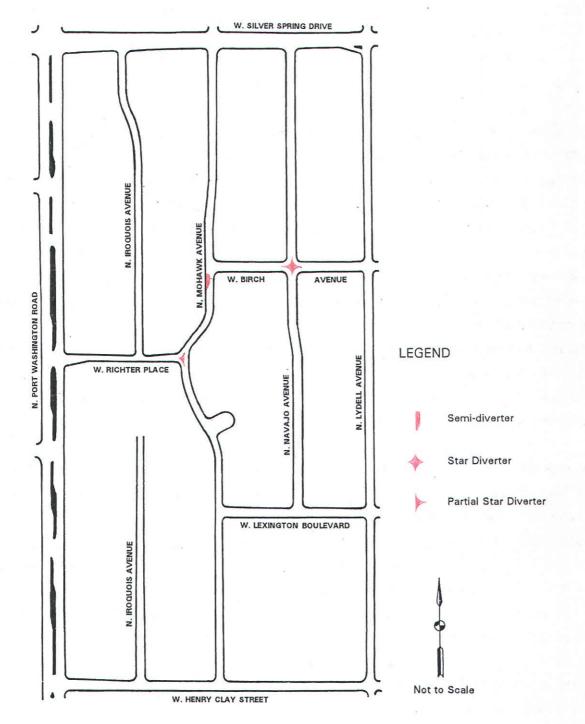
A physical alternative considered would make use of barriers constructed to prevent certain movements. Specifically, a full star diverter would be constructed at the intersection of Birch Avenue and Navajo Avenue, a partial star diverter would be constructed at the intersection of Richter Place and Mohawk Avenue, and a semi-diverter would be constructed on the west half of Mohawk Avenue just south of Birch Avenue, as shown on Figure 5. These barriers reduce the pavement width to effectively restrict traffic to a single lane and consequently a single direction. The estimated cost to implement this alternative is approximately \$22,400.

The primary advantage of this alternative is that star diverters "channel" traffic into right turns and make left-turning or through movements at an intersection all but impossible. Thus, movements between Richter Place and Birch Avenue and between Richter Place and Mohawk Avenue north of Birch Avenue would

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# Figure 5

PHYSICAL CONTROL ALTERNATIVE ONE INCLUDES CONSTRUCTION OF A STAR DIVERTER, A PARTIAL STAR DIVERTER, AND A SEMI-DIVERTER AT SELECTED INTERSECTIONS



Source: SEWRPC

be significantly impaired, substantially reducing the through traffic currently making these movements. Further, the westbound left turn from Birch Avenue to Mohawk Avenue would be all but impossible, and southbound Mohawk Avenue traffic would be forced to turn left at its intersection with Birch Avenue because of the semi-diverter on Mohawk Avenue. Temporary barricades could be erected for a trial period to assess the impacts of this alternative prior to permanent construction.

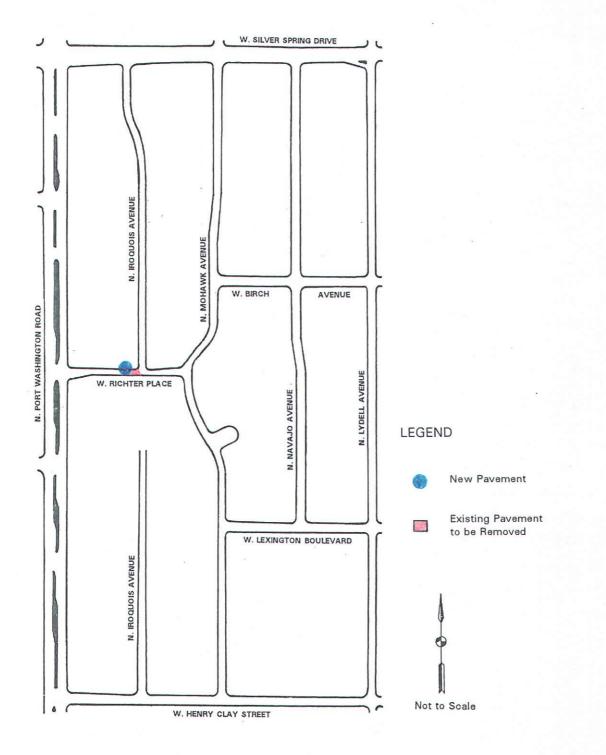
The primary disadvantage of this alternative is that internal neighborhood traffic circulation is impaired as neighborhood traffic would also be forced to make right turns at the intersections noted above. This would create some travel indirection for neighborhood residents. Another potential disadvantage is that the through traffic between Richter Place and Birch Avenue could shift to a route comprised of Mohawk Avenue, Lexington Boulevard, Navajo Avenue and Birch Avenue to travel through the neighborhood. An estimated 350 vehicles per average weekday would be added to Mohawk Avenue south of Lexington Boulevard and to Lexington Boulevard, and about 200 vehicles per average weekday to Navajo Avenue. Finally, because the average weekday traffic volumes on neighborhood streets is low, determined motorists may choose to turn left at a star diverter as the probability of meeting opposing traffic would be low. Therefore, this alternative is not recommended.

The second physical alternative considered was the construction of a cul de sac on Richter Place just west of Iroquois Avenue as the barrier to prevent certain movements, and as shown on Figure 6. The estimated cost to implement this alternative is approximately \$31,000 not including right-of-way acquisition. The primary advantage of this alternative is that the movements between Richter Place and Birch Avenue and between Richter Place and Mohawk Avenue north of Birch Avenue would be no longer be possible, thereby eliminating the through traffic currently making these movements. Access from Richter Place to parking lots at the rear of the commercial properties abutting N. Port Washington Road would remain. Temporary barricades could be erected for a trial period to assess the impacts of this alternative prior to permanent construction.

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# Figure 6

PHYSICAL CONTROL ALTERNATIVE TWO INCLUDES CONSTRUCTION OF A CUL DE SAC ON RICHTER PLACE JUST WEST OF IROQUOIS AVENUE



The primary disadvantage of this alternative is that neighborhood access would also be impeded as entry to the neighborhood via Richter Place would no longer be possible. There may be some travel indirection for neighborhood residents and increased neighborhood traffic may be expected on Mohawk Avenue south of Richter Place--an estimated 350 vehicles per average weekday. Another potential disadvantage is that the through traffic could shift from Richter Place south to Henry Clay Street and utilize the segment of Mohawk Avenue between Henry Clay Street and Richter Place, thus traversing the entire neighborhood. Therefore, this alternative is not recommended.

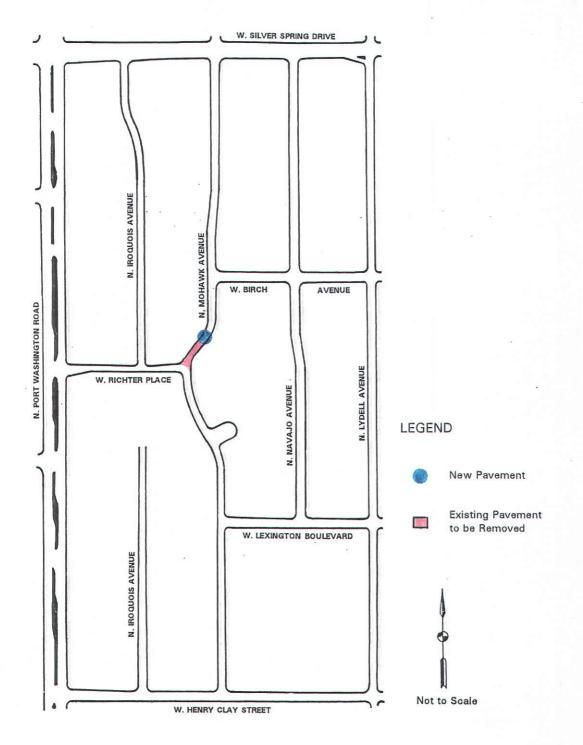
Constructing the cul de sac on Mohawk Avenue between Richter Place and Birch Avenue and abandoning about 200 feet of Mohawk Avenue between Richter Place and the proposed cul de sac, as shown on Figure 7, was the third physical alternative considered. The estimated cost to implement this alternative is approximately \$35,100 not including right-of-way acquisition. This alternative would have essentially the same advantages and disadvantages as a cul de sac on Richter Place just west of Iroquois Avenue, except that motorists would not be able to travel through the neighborhood on Mohawk Avenue. It would, however, be possible for motorists to use a route comprised of Mohawk Avenue, Lexington Boulevard, and Navajo Avenue to travel through the neighborhood. An estimated 300 vehicles would be added to Mohawk Avenue south of Lexington Boulevard and to Lexington Boulevard and an estimated 250 vehicles would be added to Navajo Avenue on an average weekday. The travel indirection imposed on neighborhood residents would be greater than that imposed if the cul de sac was constructed on Richter Place. Nevertheless, because this alternative would be the most effective of the range of passive and physical control alternatives evaluated in eliminating the existing through traffic, it is recommended to be considered for implementation. Temporary barricades are recommended to be erected for a trial period to assess the impacts of this alternative prior to permanent construction of a cul de sac.

The fourth physical alternative considered was the construction of a cul de sac on N. Iroquois Avenue just south of the alley south of and parallel to W. Silver Spring Drive to prevent certain traffic movements, and as shown on Figure 8. The estimated cost to implement this alternative is approximately \$31,000 not including right-of-way acquisition. The primary advantage of this alternative

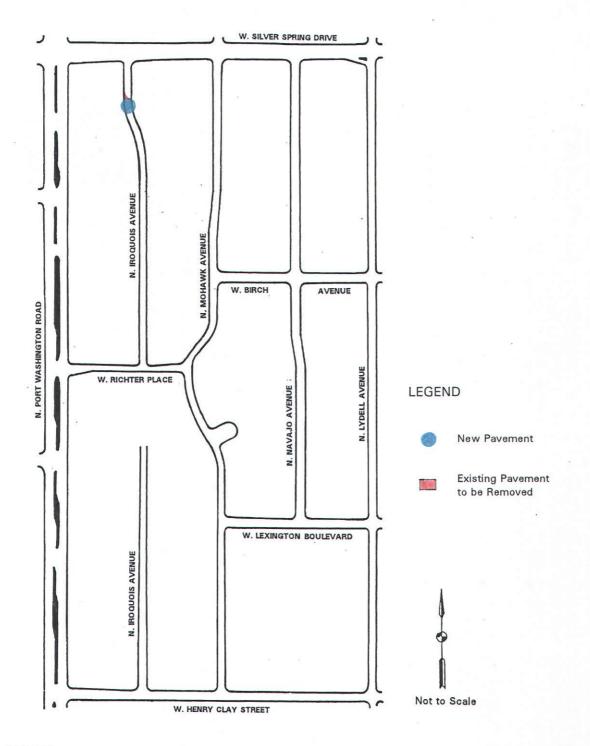
-11-

# Figure 7

PHYSICAL CONTROL ALTERNATIVE THREE INCLUDES CONSTRUCTION OF A CUL DE SAC ON MOHAWK AVENUE BETWEEN RICHTER PLACE AND BIRCH AVENUE



PHYSICAL CONTROL ALTERNATIVE FOUR INCLUDES CONSTRUCTION OF A CUL DE SAC ON IROQUOIS AVENUE SOUTH OF THE ALLEY PARALLEL TO W. SILVER SPRING DRIVE



is that the movements between Richter Place and W. Silver Spring Drive via Iroquois Avenue would no longer be possible, thereby eliminating the through traffic currently making these movements. Through traffic currently making these movements would be directed to the intersections of W. Silver Spring Drive and N. Port Washington Road or at W. Silver Spring Drive and Mohawk Avenue where traffic signals facilitate entering or crossing the W. Silver Spring Drive traffic stream. Access from Richter Place to parking lots at the rear of the commercial properties abutting N. Port Washington Road would remain. While this access may ultimately result in trips on Iroquois Avenue between Richter Place and W. Silver Spring Drive; such trips wuold not be considered "through" trips for the purposes of this study because there was a destination within the study neighborhood. Temporary barricades could be erected for a trial period to assess the impacts of this alternative prior to permanent construction.

The primary disadvantage of this alternative is that it does not discourage the principal through traffic movement within the neighborhood between Richter Place, Birch Avenue, and Mohawk Avenue. In addition, the through traffic currently using Iroquois Avenue would most likely shift to Richter Place between Iroquois Avenue and Mohawk Avenue and Mohawk Avenue between Richter Place and W. Silver Spring Drive which currently carry a significant proportion of the traffic observed traveling through the neighborhood. Another disadvantage is that neighborhood access would be impeded as entry to the neighborhood via Iroquois Avenue would no longer be possible. Some travel indirection would be imposed on Iroquois Avenue residents, some of whom may be expected to divert to Mohawk Avenue north of Richter Place -- an estimated 50 vehicles per average weekday. This alternative would result in a cul de sac having a length of about 1,100 feet, about 500 feet longer than the maximum recommended cul de sac length of 600 feet. Approximately 0.4 miles of travel indirection would be added to provide emergency services to residents at the northern end of the cul de sac. Therefore, this alternative is not recommended.

#### Travel Enhancement Alternatives

The first travel enhancement alternative considered was the improvement of traffic flow through the intersection of N. Port Washington Road and W. Silver Spring Drive by constructing an exclusive right-turn lane on the northbound N.

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Port Washington Road approach. This right-turn lane would bypass the traffic signal at the intersection, and be controlled by a stop sign. The estimated cost to implement this alternative is approximately \$21,700 not including right-of-way acquisition. The primary advantage of this alternative would be to reduce delay for northbound to eastbound motorists at this particular intersection.

The primary disadvantage of this alternative is that the most significant movement of through traffic observed was not from south to east but from east to south, or the direction opposite that which may benefit from this improvement. Thus, any reduction in delay would not be realized by the predominant through traffic movement, and this traffic would have no incentive to modify its travel Further, it may be anticipated that some of the traffic observed pattern. between Richter Place and Birch Avenue has either its origin or destination in the neighborhood east of N. Lydell Avenue, south of W. Silver Spring Drive. Such traffic would not be expected to travel north to W. Silver Spring Drive and then south again either at N. Lydell Avenue or another street east of N. Lydell Avenue because of the attendant indirection. Another disadvantage of this alternative is that motorists may encounter a red signal indication at other traffic signal controlled intersections on N. Port Washington Road and W. Silver Spring Drive and be subjected to delay as a result. Finally, both N. Port Washington Road and W. Silver Spring Drive are under the jurisdiction of the Wisconsin Department of Transportation at their intersection, and any physical change would require the concurrence of the Department. Therefore, this alternative is not recommended.

The second travel enhancement alternative considered was the extension of the segment of N. Iroquois Avenue between W. Henry Clay Street and its current terminus approximately 250 feet south of Richter Place, northerly, to Richter Place at its intersection with N. Iroquois Avenue to the north. The estimated cost of implementing this alternative is approximately \$55,000 not including right-of-way acquisition. The advantage of this alternative would be the provision of a continuous route paralleling N. Port Washington Road between W. Henry Clay Street and W. Silver Spring Drive located between N. Port Washington Road and N. Mohawk Avenue. The properties abutting the west side of the proposed route are all commercial in nature, and it may be expected that any additional traffic would not objectionable to these properties.

However, as shown in Figure 4, very little through traffic was observed between W. Henry Clay Street and W. Silver Spring Drive on Mohawk Avenue. Further, staff observation indicated that the predominant movement at the intersection of Richter Place and Iroquois Avenue is through the intersection on Richter Place with very few turning movements. Thus, given existing traffic and street patterns, there is little reason to expect that traffic would be diverted to a continuous Iroquois Avenue. Further, this alternative would provide access via the extension to the fast food businesses on the east side of N. Port Washington Road just south of Richter Place. Although one of those businesses currently has access via Richter Place, traffic to the other business would be able to access it without having to use N. Port Washington Road as it currently must do. This added convenience may actually increase non-neighborhood traffic through the neighborhood. Therefore, this alternative is not recommended.

### Conclusions and Recommendations

The analysis indicated that there is a modest amount of through traffic--485 vehicles on an average weekday--traveling on streets through the study neighborhood. On an average weekday, approximately 370 through vehicles were observed on W. Richter Place between N. Iroquois Avenue and N. Mohawk Avenue. Approximately 235 through vehicles were observed on N. Mohawk Avenue north of W. Birch Avenue and about 310 through vehicles were observed on W. Birch Avenue west of N. Lydell Avenue. None of the study neighborhood streets, however, carry average weekday traffic volumes approaching the maximum acceptable volume for a land access street. Only Richter Place carries volumes which approach the maximum desirable volume threshold for a land access street.

A range of alternatives including passive and physical control alternatives and travel enhancement alternatives was evaluated to remove through traffic from study neighborhood streets. Passive controls consist of traffic control signing which rely on voluntary motorist compliance. Physical controls consist of a range of barriers which seek to either modify or prevent existing travel patterns. Travel enhancements seek to create a more attractive alternative to current travel patterns. Of the alternatives evaluated, the alternative which may be expected to be the most effective in removing through traffic from the study neighborhood appears to be the construction of a cul de sac on Mohawk Avenue between Richter Place and Birch Avenue. This alternative appears to be the most effective because it makes travel through the neighborhood the most difficult. If implemented, however, this alternative would result in less direct neighborhood access and egress thereby shifting an estimated 300 vehicles per average weekday to Mohawk Avenue south of Lexington Boulevard and to Lexington Boulevard and about 250 vehicles per average weekday to Navajo Avenue. Because the through traffic concerned was found to be modest, the redistribution of neighborhood traffic may be as disruptive and undesirable as the through traffic itself. As a result, City officials may elect to implement the passive control alternative prohibiting selected turning movements or to retain the status quo at the present time with a periodic review of the situation.

Prior to the implementation of any alternative, it is recommended that neighborhood residents be apprised of the alternatives along with the advantages and disadvantages of each and given an opportunity to comment. Implementation of any alternative, particularly those requiring construction, should be for a six month trial period with the impacts being evaluated before a decision is made to implement on a permanent basis.

#### SUMMARY

At the request of City of Glendale officials, the Commission staff conducted a traffic study to assess the pattern and amount of traffic traveling through a City neighborhood; that is, traffic which had neither an origin nor a destination within the study neighborhood. The study neighborhood is bounded by W. Silver Spring Drive on the north, N. Port Washington Road on the west, N. Lydell Avenue on the east, and W. Henry Clay Street on the south.

The boundary streets are classified as either arterial facilities whose primary function is to carry through traffic, or collector facilities whose primary function is to serve as a connection between the arterial system and land access streets. The streets within the study neighborhood are classified as land access streets whose primary function is to provide access to abutting property. Ideally, there would not be any through traffic on a land access street.

In order to assess the characteristics of the traffic using the neighborhood streets, the Regional Planning Commission conducted 24-hour machine traffic counts and a license plate survey in July 1997. The observed average weekday traffic counts were low and only at one location--on Richter Place--did the observed count equal the maximum desirable volume of a land access facility, and none approached the maximum acceptable volume of a land access facility. Patterns of through traffic were identified based upon the license plate survey, with the predominant patterns of through traffic between Richter Place and Birch Avenue, and between Richter Place and Mohawk Avenue. The volume of through traffic found was, however, quite modest, approximating 485 vehicles per average weekday spread over three land access streets.

A total of nine alternatives including three using passive controls, four using physical controls, and two using travel enhancement were considered to address the through traffic problem. The implementation of one of the positive control alternatives, the construction of a cul de sac on Mohawk Avenue between Richter Place and Birch Avenue, was recommended for consideration because it would provide the most effective diversion of the observed through traffic. The estimated cost to implement this alternative is approximately \$35,100. In the consideration of this alternative, it should be noted that the volume of through traffic is low and disruption to the travel patterns of neighborhood residents may in fact be more undesirable than the problem it would address. As a result, City officials may elect to implement the passive control alternative which would prevent select turning movements or to retain the status quo at the present time with a periodic review of the situation. It is recommended that neighborhood residents be apprised of the potential advantages and disadvantages of the alternatives and their reaction taken into consideration prior to the implementation of any changes.

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