

# ANALYSIS OF THE DEPLOYMENT OF PARAMEDIC EMERGENCY MEDICAL SERVICES IN MILWAUKEE COUNTY

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**COMMUNITY ASSISTANCE PLANNING REPORT  
NUMBER 8**

**ANALYSIS OF THE DEPLOYMENT OF PARAMEDIC EMERGENCY  
MEDICAL SERVICES IN MILWAUKEE COUNTY**

Prepared for the  
**INTERGOVERNMENTAL CO-OPERATION COUNCIL FOR MILWAUKEE COUNTY**  
by the  
Southeastern Wisconsin Regional Planning Commission  
P. O. Box 769  
Waukesha, Wisconsin 53186

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April 1976

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## INTRODUCTION

In a letter dated November 24, 1975, Mr. Henry F. Mixter, President of the Village of Whitefish Bay, acting on behalf of the Intergovernmental Co-operation Council for Milwaukee County (ICCMC), requested the staff of the Southeastern Wisconsin Regional Planning Commission to review a June 1974 report prepared by the Milwaukee Urban Emergency Medical Services Council (MUEMSC) on the provision of paramedic emergency medical service (EMS) units to communities or groups of communities in Milwaukee County, and suggest to the ICCMC a physical deployment of the EMS units as set forth in the report. This brief report sets forth the procedures utilized in the review and analysis of the MUEMSC study efforts, as well as SEWRPC staff findings, analyses, and recommendations for the physical deployment of paramedic EMS units in Milwaukee County.

## ASSUMPTIONS

In order to review the recommendations that have been advanced in the MUEMSC report on the number and deployment of EMS units in the County, certain important assumptions were made by the Commission staff, including the following:

1. The provision of emergency medical services in Milwaukee County has been determined to be sound and in the public interest.
2. Facts presented in the MUEMSC report on police and fire operations, emergency hospital locations, and similar data are accurate and need not be corroborated.
3. Standards set forth in the report are generally recognized as acceptable for the provision of emergency medical services.
4. Existing facilities recommended to be used as a base location for EMS units would be adaptable to accommodate such units, including equipment and personnel.

## MUEMSC REPORT RECOMMENDATIONS

The MUEMSC report recommends the use of the five existing Civil Defense-Disaster (CDD) zones in Milwaukee County (see Map 1) as the basis for the geographic assignment and location of nine permanently-based emergency medical units and two additional "roving" units to supplement the permanently-located services as follows:

1. One (1) unit to CDD Zone A, which has a resident population of 71,474 persons.<sup>1</sup>
2. Four (4) units to CDD Zone B, which has a resident population of 669,017 persons.<sup>2</sup>
3. Two (2) units to CDD Zone C, which has a resident population of 128,465 persons.<sup>1</sup>
4. One (1) unit to CDD Zone D, which has a resident population of 71,218 persons.<sup>1</sup>
5. One (1) unit to CDD Zone E, which has a resident population of 70,716 persons.<sup>1</sup>
6. Two (2) roving units.

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<sup>1</sup> 1975 estimated population.

<sup>2</sup> 1975 special census.

No specific physical deployment of the nine permanent EMS units is recommended in the report; however, it is recommended that the emergency medical units be deployed geographically within each CDD zone to provide "on-the-scene" emergency medical service within a seven-minute response time.

The report also references national agency and organization literature which indicates that EMS units should be dispersed on the basis of a maximum of 75,000 persons served per unit. Imposing this standard in Milwaukee County would presume a minimum of 13 units being deployed, instead of the initial provision of 11 emergency medical units in a county having a 1975 resident population of 1,010,900.

## SEWRPC ANALYSIS

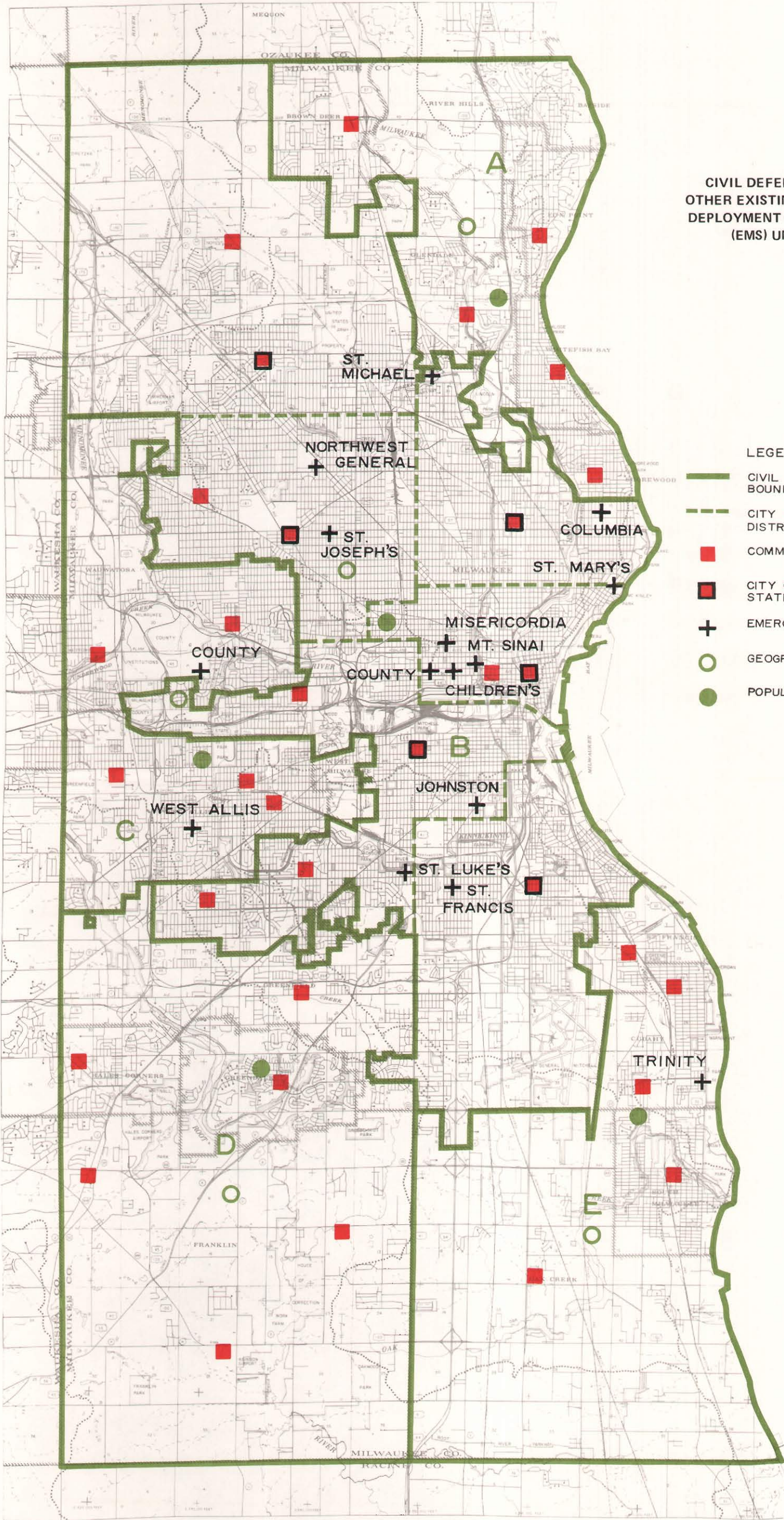
In order to determine the adequacy of the provision of EMS units as recommended in the MUEMSC report, it was first necessary to determine by calculation the population and geographic center of each of the five CDD zones, as well as to identify the location of all existing public fire stations<sup>3</sup> in each CDD zone. This information was derived in order to provide a basis for the initial deployment of EMS units prior to further analysis. The population center and geographic center of each of the five CDD zones are shown on Map 1. Also shown on Map 1 is the location of all of the public fire stations in Milwaukee County. Due to the geographic and population size of the City of Milwaukee, no one facility could provide adequate emergency medical services to the City; and, therefore, the location of the population and geographic centers of the City of Milwaukee are less important considerations in the deployment of EMS units than in those communities or zones which must be served by only one or two units. The City of Milwaukee is presently divided into six fire-rescue squad districts. These districts, which are already the basis for the provision of certain important emergency services, should also provide a reasonable basis for the provision of emergency medical services. It is for this reason that the City of Milwaukee fire-rescue squad district boundaries, as well as the permanent location of the fire-rescue squad in each district, are also shown on Map 1.

Based on the foregoing information, as well as a knowledge of the land use pattern and transportation systems of the various proposed service areas, the Commission staff tentatively selected locations for the assignment of nine recommended permanently based EMS units within the five CDD zones. This selection included four of the six fire-rescue squad stations in the City of Milwaukee (CDD Zone B). A brief description of each base location initially selected follows.

- In CDD Zone A, encompassing the City of Glendale and the Villages of Bayside, Brown Deer, Fox Point, River Hills, Shorewood, and Whitefish Bay, the designated location for the single EMS unit proposed to serve this area would be in the City of Glendale Department of Public Safety building located at 5909 N. Milwaukee River Parkway. This location is approximately three-quarters of a mile southwest of the population center of the zone but, due to the configuration of the arterial street and highway system within the zone, it could be expected to afford better access to a larger segment of the total population of the zone than if located at the actual population center (see Map 2).
- In CDD Zone B (City of Milwaukee), the four recommended EMS units would be located at four of the six fire-rescue squad stations within the six fire-rescue districts. These four stations are located near N. 69th Street and W. Silver Spring Drive, near N. 62nd Street and W. Burleigh, at 3174 S. Chase Avenue, and at 1140 S. 26th Street (see Map 3).
- While review of the location of the two recommended EMS units for CDD Zone C, encompassing the Cities of Wauwatosa and West Allis and the Village of West Milwaukee, was not requested by the Council due to the existence of paramedic units in the Cities of Wauwatosa and West Allis, the

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<sup>3</sup> Fire stations were selected because they appear to offer the broadest flexibility for the deployment of EMS units and also offer the greatest compatibility with other emergency medical services. Accordingly, fire stations have been designated for the location of EMS units.

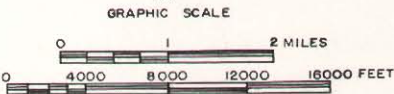


Map 1

CIVIL DEFENSE-DISASTER (CDD) ZONES AND  
OTHER EXISTING INFORMATION RELATED TO THE  
DEPLOYMENT OF EMERGENCY MEDICAL SERVICE  
(EMS) UNITS IN MILWAUKEE COUNTY  
DECEMBER 1975

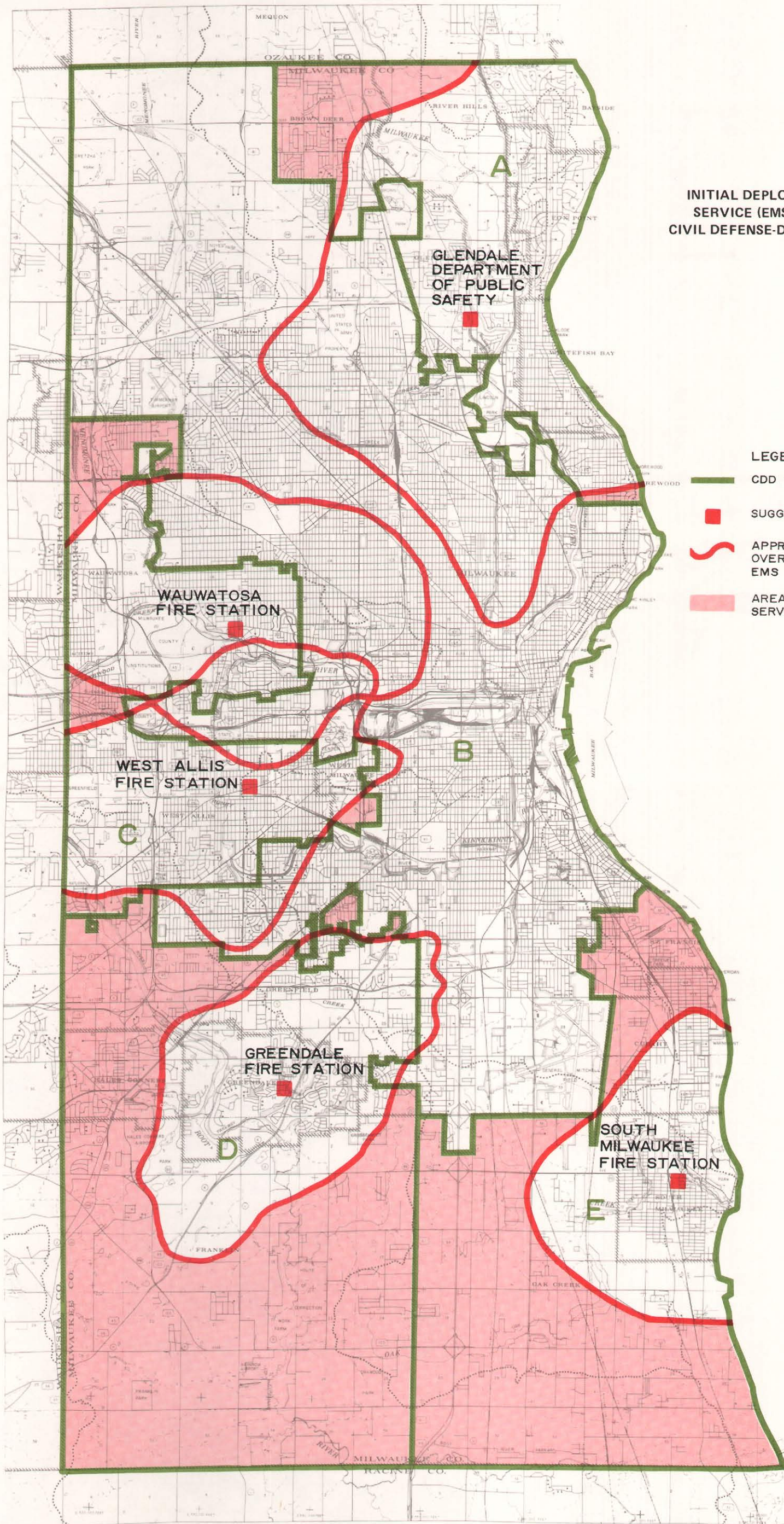
LEGEND

- CIVIL DEFENSE-DISASTER (CDD) ZONE BOUNDARY
- - - CITY OF MILWAUKEE FIRE-RESCUE SQUAD DISTRICT BOUNDARY
- COMMUNITY FIRE STATION
- CITY OF MILWAUKEE FIRE-RESCUE SQUAD STATION
- + EMERGENCY HOSPITAL
- GEOGRAPHIC CENTER OF CDD ZONE
- POPULATION CENTER OF CDD ZONE (1975)



Source: SEWRPC.

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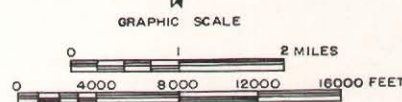


Map 2

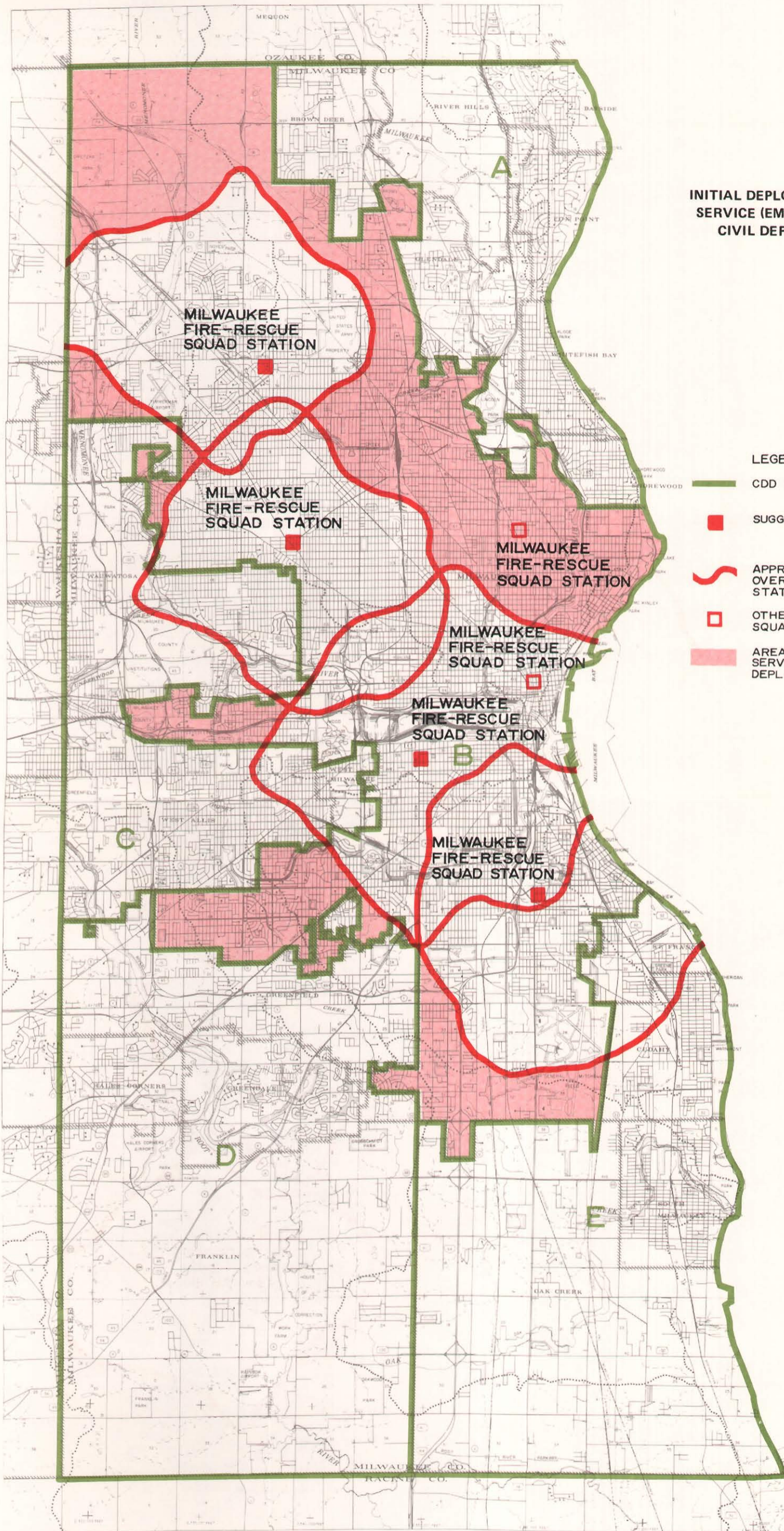
INITIAL DEPLOYMENT OF EMERGENCY MEDICAL  
SERVICE (EMS) UNITS IN MILWAUKEE COUNTY  
CIVIL DEFENSE-DISASTER (CDD) ZONES A, C, D, AND E  
DECEMBER 1975

LEGEND

- CDD ZONE BOUNDARY
- SUGGESTED LOCATION OF EMS STATION
- ~ APPROXIMATE EXTENT OF SEVEN MINUTE  
OVER-THE-ROAD TRAVEL TIME FROM  
EMS STATION
- AREA OF CDD ZONE NOT ADEQUATELY  
SERVED BY EMS UNITS AS DEPLOYED



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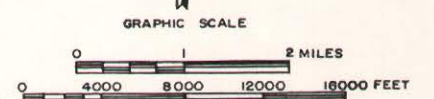


Map 3

**INITIAL DEPLOYMENT OF EMERGENCY MEDICAL  
SERVICE (EMS) UNITS IN MILWAUKEE COUNTY  
CIVIL DEFENSE-DISASTER (CDD) ZONE B  
DECEMBER 1975**

**LEGEND**

- CDD ZONE BOUNDARY
- SUGGESTED LOCATION OF EMS STATION
- ~ APPROXIMATE EXTENT OF SEVEN MINUTE OVER-THE-ROAD TRAVEL TIME FROM EMS STATION
- OTHER CITY OF MILWAUKEE FIRE-RESCUE SQUAD STATION
- AREA OF CDD ZONE B NOT ADEQUATELY SERVED BY EMS UNITS AS INITIALLY DEPLOYED



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Commission staff did review the same information as available for the other four CDD zones in the County. As shown on Map 1, the center of population of CDD Zone C is located on S. 84th Street just north of W. Greenfield Avenue near the southwest corner of State Fair Park. The geographic center of the zone, however, is located to the north and actually not within the zone due to the extension of the Juneau area of the City of Milwaukee which separates the City of Wauwatosa from the City of West Allis. The geographic center of Zone C is just south of W. Blue Mound Road and west of S. 92nd Street in the City of Milwaukee. In reviewing the location of the fire department facilities in both the City of West Allis and the City of Wauwatosa, it seemed most appropriate to locate one of the two EMS units designated for this CDD zone in the Wauwatosa fire station located at 1463 Underwood Avenue just north of the Menomonee River Parkway. While this location is east of the geographic center of the City of Wauwatosa, it should provide good access to the majority of the population within the City. Also, it would seem most appropriate to locate the second recommended EMS unit in West Allis at the West Allis fire station at 7332 W. National Avenue, a site that would afford the best surface access to both the population of the City of West Allis and the Village of West Milwaukee within the zone (see Map 2).

- Apparently because of the population size of CDD Zone D, one EMS unit was recommended for location in this zone. After a review of the location of the community fire departments within the Cities of Franklin and Greenfield and the Villages of Greendale and Hales Corners as they relate to both the population and geographic centers, it was determined that the most appropriate location of the station for location of the one recommended EMS unit would be at the Greendale fire station located at 6200 W. Loomis Road. This location is approximately one-half mile east of the center of population and approximately two miles north of the geographic center of the zone, and should provide the best accessibility to the largest portion of the population residing in the zone (see Map 2).
- Again, due apparently to the population size, only one EMS unit was recommended to be located in CDD Zone E, which encompasses the Cities of Cudahy, Oak Creek, South Milwaukee, and St. Francis. While the geographic center of the zone is located approximately three blocks south of E. Drexel Avenue and about four blocks west of S. Pennsylvania Avenue in the City of Oak Creek, the population center of the zone is located on the north side of the City of South Milwaukee one block south of E. College Avenue on 16th Avenue. Following a review of the location of fire stations in the four communities, it was determined to be most appropriate to locate the one EMS unit recommended for the zone in the City of South Milwaukee fire station south of E. Rawson Avenue on 10th Avenue. This location would be expected to afford the best access to the entire population of the zone even though periodic blockage of railroad track crossings in the vicinity of the station may cause critical delays in service (see Map 2).

Following the initial geographic location of the nine recommended "permanent" EMS units, the Commission staff, utilizing existing data derived in the preparation of the regional land use and transportation plans, prepared plots of seven-minute<sup>4</sup> travel times from the location of the nine units to the area within each CDD zone or, in the case of the City of Milwaukee, within the City. The results of the travel time analyses are shown on Maps 2 and 3. Following is a brief analysis of the location of EMS units in the five CDD zones:

- Zone A—As shown on Map 2, the seven-minute over-the-road travel time from the City of Glendale Department of Public Safety located on the Milwaukee River Parkway provides fairly good access within seven minutes to most of the population residing within the zone. The Village of Brown Deer, however, would not be provided with adequate service, with more than 50 percent of the Village population residing beyond seven minutes over-the-road travel time from the EMS unit station. All of the other communities within this zone, however, would be within seven minutes over-the-road

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<sup>4</sup>Due to the higher-than-average speeds of emergency vehicles, the travel time of 10 minutes or less was construed as 7 minutes or less. This assumption was borne out in subsequent field time runs made by the SEWRPC staff.

travel time from the emergency medical unit base of operations, with the exception of the southeast corner of the Village of Shorewood. Approximately 14,000 population, or 20 percent of the total population of the zone, would not be adequately served by the recommended deployment of the one EMS unit.

Because of the lack of adequate coverage in the Village of Brown Deer from an EMS unit based in the City of Glendale, a second, more central location was explored—the police station in the Village of River Hills. A plot of over-the-road travel time within seven minutes from this second location would encompass most of the Village of Brown Deer within an adequate service area; however, the entire Village would still not be within the seven-minute over-the-road travel time, and most of the Village of Whitefish Bay and all of the Village of Shorewood would be beyond the seven-minute travel time from this location. Based on this analysis, it was determined that the Glendale Department of Public Safety would appear to be the best location of the one EMS unit.

It is clear that no one unit could provide adequate service to this odd shaped geographic area based on the seven-minute response time standards, and auxiliary or supplemental emergency medical service may be required in the northern part of the County to provide adequate service to the Village of Brown Deer and also, perhaps, to the northwest area of the City of Milwaukee as that area develops and increases in population.

- Zone B—Following the calculation of over-the-road travel times within seven minutes of the four fire-rescue stations in the City of Milwaukee initially designated as potential EMS unit bases, it was clear, as shown on Map 3, that large areas of the City, including the densely-populated northeast area near the UWM Campus, would not be adequately served by emergency medical services located at only the four stations. In fact, approximately 226,000 persons, or 22 percent of the population of the City, would not be adequately served. Other areas not served included the far north side near the Northridge Shopping Center, the extreme western part or Juneau area of the City, the area south of the City of West Allis, and the area southwest of General Mitchell Field.
- Zone C—As shown on Map 2, the over-the-road travel time within seven minutes of the City of Wauwatosa fire station located on Underwood Avenue would provide most of the population of the City of Wauwatosa with adequate emergency medical services. Only the area of the City north of W. Capitol Drive would not be adequately served by emergency medical services based at the Underwood Avenue fire station. Also, as shown on Map 2, the EMS unit based at the W. National Avenue fire station in the City of West Allis would adequately serve almost all of the population of the City as well as the population of the Village of West Milwaukee. The two units as deployed would adequately serve all but about 12,000 population within the zone, or about 9 percent of the 1975 population.

It should be noted that an EMS unit based at the Underwood Avenue fire station could serve a substantial part of the west side of the City of Milwaukee in addition to the City of Wauwatosa. It should also be noted that an EMS unit based at the W. National Avenue fire station in West Allis could adequately serve the Juneau area of the City of Milwaukee, and might also serve that area of the City of Milwaukee south of the City of West Allis.

- Zone D—As shown on Map 2, an EMS unit based at the Greendale fire station located on W. Loomis Road, while adequately serving all of the Village of Greendale and over one-half of the population of the City of Greenfield, would not adequately serve, within a seven-minute over-the-road travel time, the population of either the Village of Hales Corners or the City of Franklin. This situation is due primarily to the large geographic area of the zone. In fact, about 36,000 persons, or 50 percent of the population of the zone, would not be adequately served. Because of the dispersed population and the consequent dispersal of existing emergency services, one EMS unit based at any of the existing fire stations could not serve this zone adequately.

- **Zone E**—As shown on Map 2, an EMS unit based at the City of South Milwaukee fire station located on 10th Avenue would adequately serve within seven minutes travel time all of the City of South Milwaukee, approximately 50 percent of the City of Cudahy, and about 25 percent of the City of Oak Creek. The northern one-half of the City of Cudahy, all of the City of St. Francis, and approximately three-quarters of the City of Oak Creek would not be adequately served by an emergency medical services unit based at the City of South Milwaukee fire station. In this case, about 33,000 persons, or about 47 percent of the total zone population, would not be adequately served. Again, however, due to the geographic configuration of the zone as well as zone size, one unit placed at any of the existing fire stations within the zone could not adequately serve the entire zone.

Map 4 is a combination of Maps 2 and 3 and shows the gaps that would exist in the seven-minute travel time accomplished on a zonal basis. A total of 321,000 persons, or about 32 percent of the County population, would not be adequately served, even when supplemented by two roving units. It is clear from a review of the travel time analysis, as depicted on Maps 2, 3, and 4, that the location of nine permanently-based emergency medical units logically spaced within the five CDD zones in the County would not adequately serve a large segment of the population of the County. Zone C would have the best coverage and, presumably, the best service. This is due, for the most part, because of the density of development and the relatively small size of the areas being served. For example, comparing the size of the combined areas of the City of West Allis and the Village of West Milwaukee with the four communities comprising Zone D clearly illustrates the problem of trying to serve large geographic areas with a time-critical service.

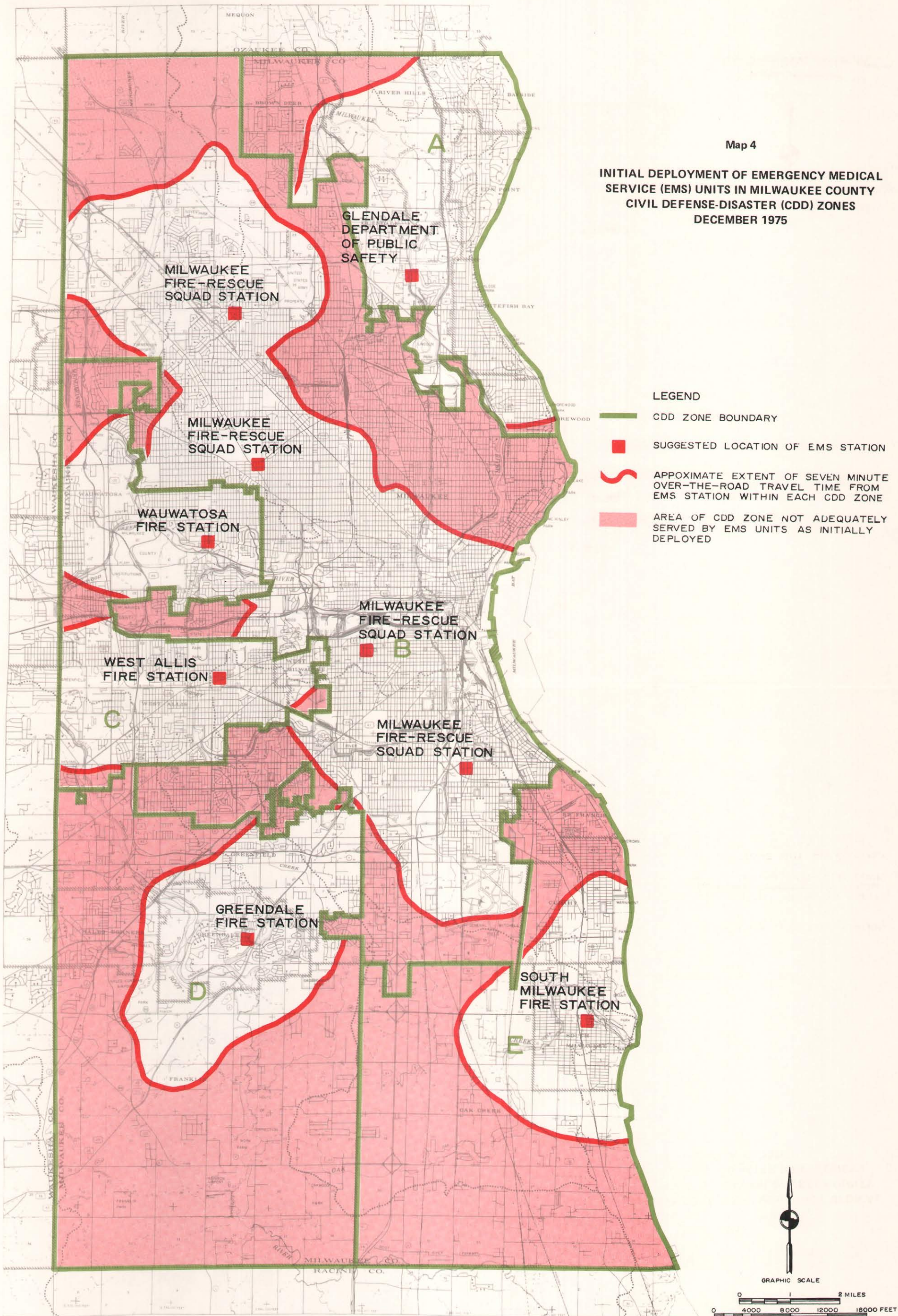
## CONCLUSIONS AND RECOMMENDATIONS

Two basic means of providing better service to the communities involved appear to be available. One means would be to supplement the four permanent EMS units now proposed for the City of Milwaukee and the five permanent EMS units in the suburban communities with at least four “floating” EMS units, with two of the “floating” units serving the south side of the County and two “floating” units serving the far north side of the County. Even with such a program, it can be expected that there would be areas inadequately served by EMS units within a seven-minute over-the-road travel time due to the configuration of the communities as well as the location of existing emergency service structures.

A second means of adequately serving the population of the County would be to deploy 13 permanently based EMS units, as shown on Map 5. Such a deployment would result in one unit based at the Glendale Department of Public Safety building; one unit based in the northern area of the County, either at the City of Milwaukee fire station at 7717 W. Good Hope Road or at the Village of Brown Deer municipal facilities on N. 43rd Street; five units based in the City of Milwaukee at the four fire-rescue squad stations as shown on Map 3 plus the fire-rescue squad station near N. 3rd Street and W. Burleigh Street; one unit based in the City of Wauwatosa; and one unit based in the City of West Allis; one unit based on W. Loomis Road in Greendale to serve the City of Greenfield and the Villages of Hales Corners and Greendale; one unit based at the Franklin fire station at 7811 W. Ryan Road to serve the City of Franklin; one unit based at the Oak Creek fire station located at 240 E. Puetz Road to serve the City of Oak Creek; and one unit based at the Cudahy fire station located at S. Barland Avenue and E. Ramsey Avenue to serve the Cities of St. Francis, Cudahy, and South Milwaukee. This recommendation, as shown on Map 5, would result in a total of 13 EMS units based in the County, which would reduce the population served by each unit from approximately 92,000, as essentially recommended in the MUEMSC report, to approximately 78,000, which is closer to but still higher than the maximum standard of 75,000 cited in the MUEMSC report.

As shown on Map 5, certain areas of the County would still not be adequately served by EMS units; however, under this recommendation, only about 57,000 persons, or about 6 percent of the County population, would not be adequately served. The Juneau area of the City of Milwaukee and the area south of the City of West Allis would be served by the West Allis based unit. Also, because of the geographic configuration of communities and the existing placement of surface transportation routes, some areas of the County could be served by more than one unit within a seven-minute over-the-road travel time. It should be noted that the Commission staff, as a part of this analysis, conducted timed automobile runs from each of the 13 recommended EMS unit locations as well as from the alternative northern EMS unit station in the Village of Brown Deer. In each case, the travel time, as plotted on Maps 2, 3, 4, and 5, did not exceed eight and one-half minutes at posted speed limits; and it is assumed, therefore, that adequate seven-minute over-the-road service could be provided by EMS units within the service areas shown.

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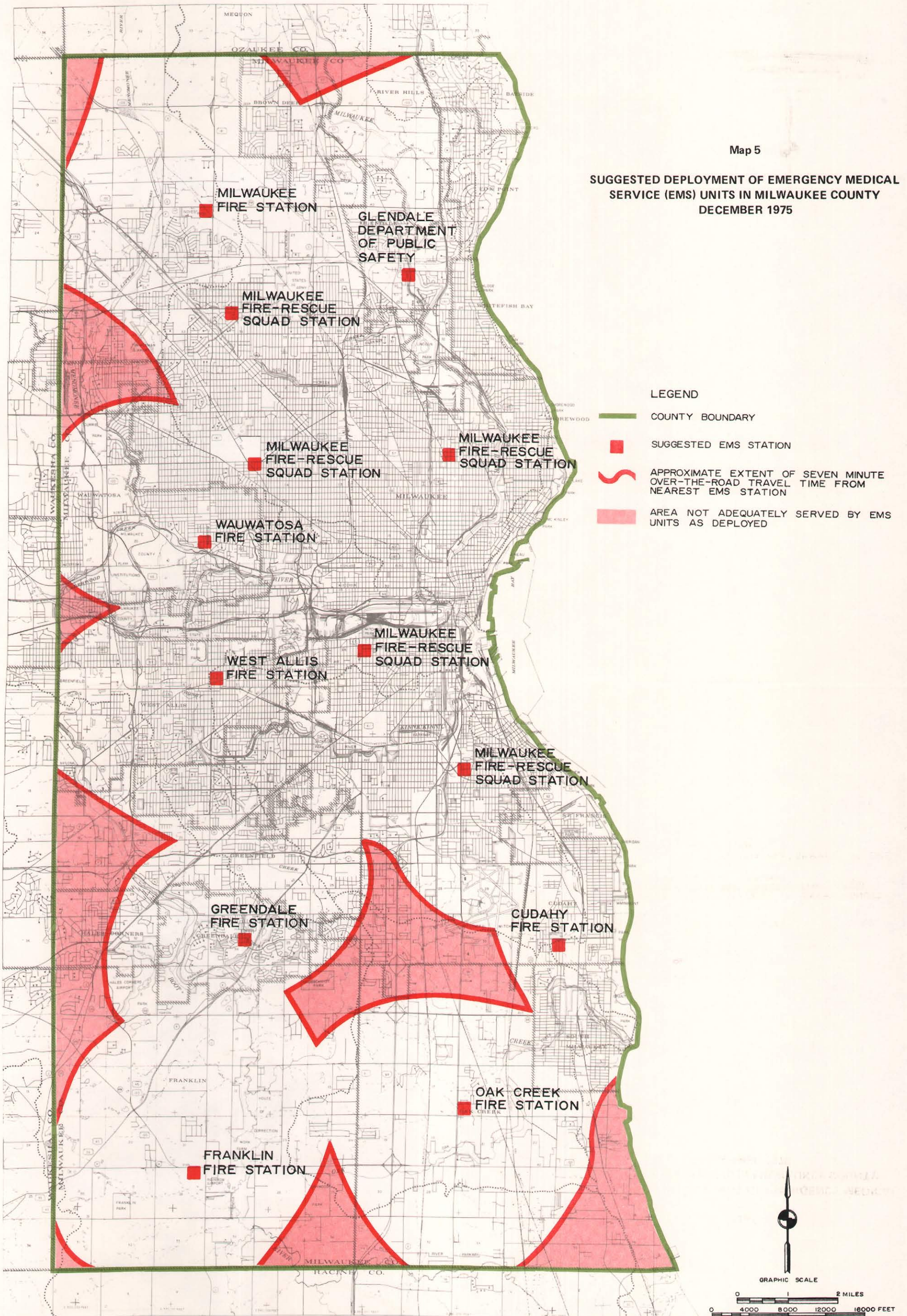


Source: SEWRPC.

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Map 5

**SUGGESTED DEPLOYMENT OF EMERGENCY MEDICAL SERVICE (EMS) UNITS IN MILWAUKEE COUNTY  
DECEMBER 1975**



Source: SEWRPC.