

Hazard Analysis

Information supplied from the City of Muncie Fire Department indicates that there are seven target locations for hazardous materials. By definition, this means that there are quantities of hazardous materials or the companies use hazardous materials in their processes.

By reviewing the maps, there are two (2) operations in close proximity to the Station 1 and two (2) in close proximity to Station 2 and two (2) in close proximity to Station 3. There is one operation that is northeast of Station 6 and one (1) operation that is northwest of the City, outside the area covered by the department. Four of the facilities sit adjacent to rail lines.

Nursing Home Complexes

There are eight nursing homes identified by the Muncie Fire Department and of the facilities are north of the CSX rail line. Seven of the facilities are located within the 2-mile range of a fire station. Two of the nursing homes are located between two of the major rail lines yet it is more likely that only one line would be blocked at the same time. The nursing home on Jackson Street adjacent to St. Rd. 67 lies outside the 2-mile response area.

High-rise Structures

A review of the high rise structures within the city indicates that the majority of these structures lie within two areas of the city. The area west of Station 1, and south of the river has a high number of the structures that are within the high-rise classification.

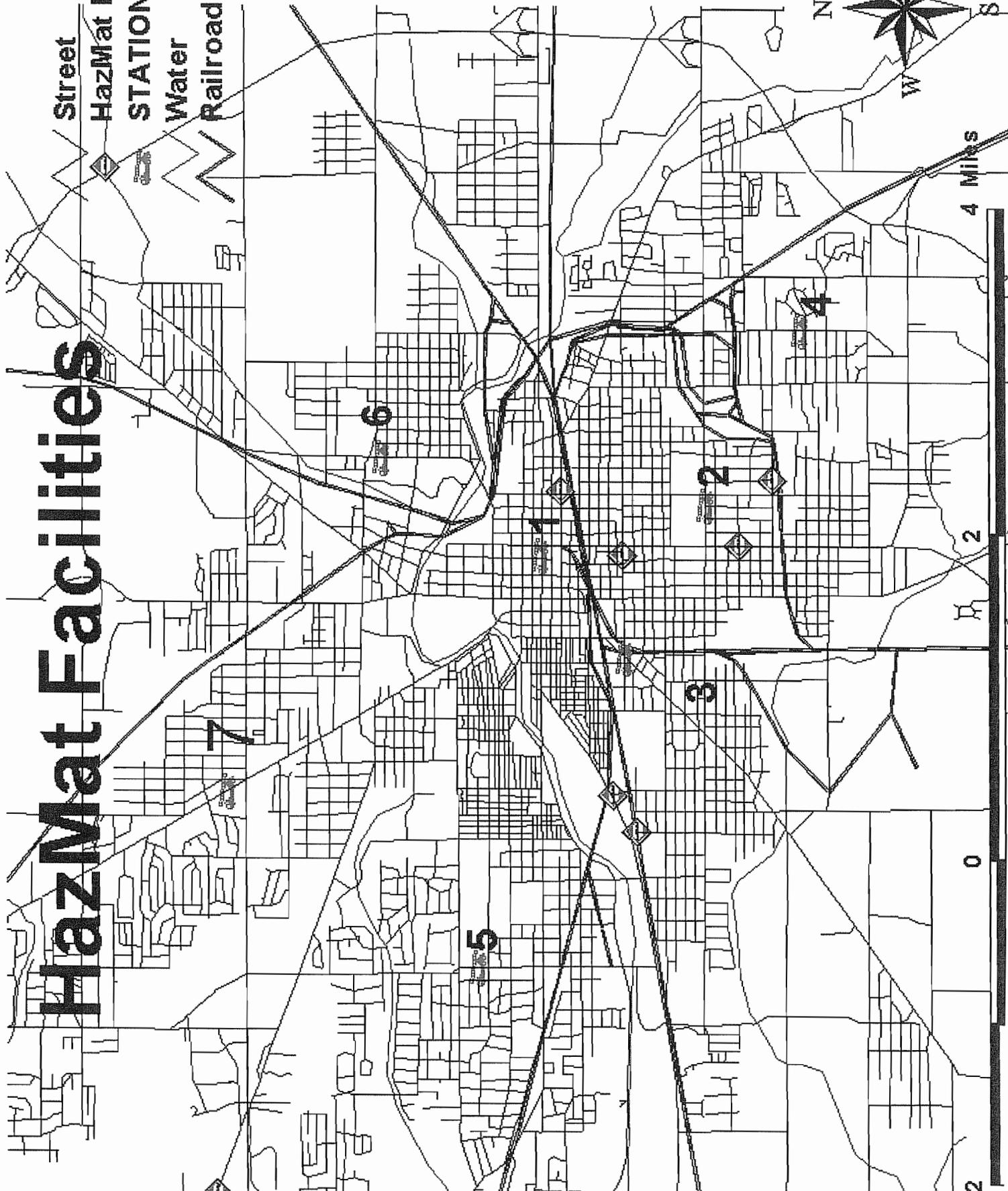
The other area that has a large number of high-rise structures is the Ball State University Campus. These structures not only fall within the high-rise classification, but

the Ball Memorial Hospital also falls within the high life hazard. A few of the structures are located throughout the city but Station 4 does not currently have any of these structures within its primary district.

Those structures within the high rise classification based upon horizontal square-footage where not considered.

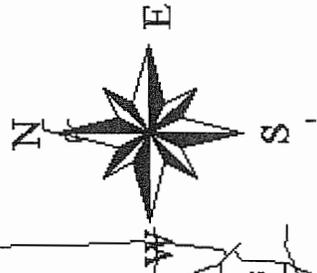
HazMat Facilities

Street
HazMat Facilities
STATIONS
Water
Railroad



Muncie Nursing Facilities

Street
Nursing Facilities
STATIONS
Water
Railroad

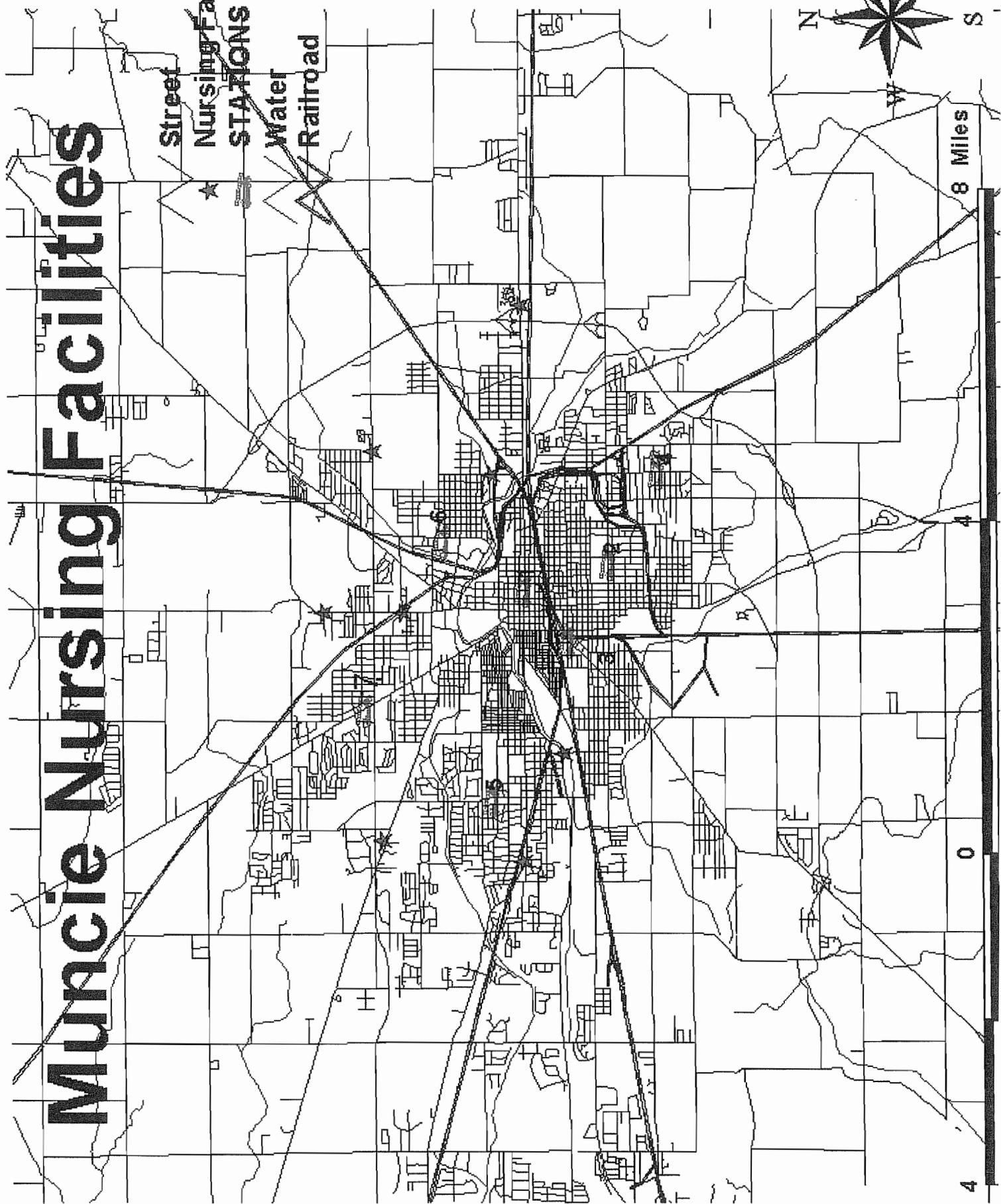


8 Miles

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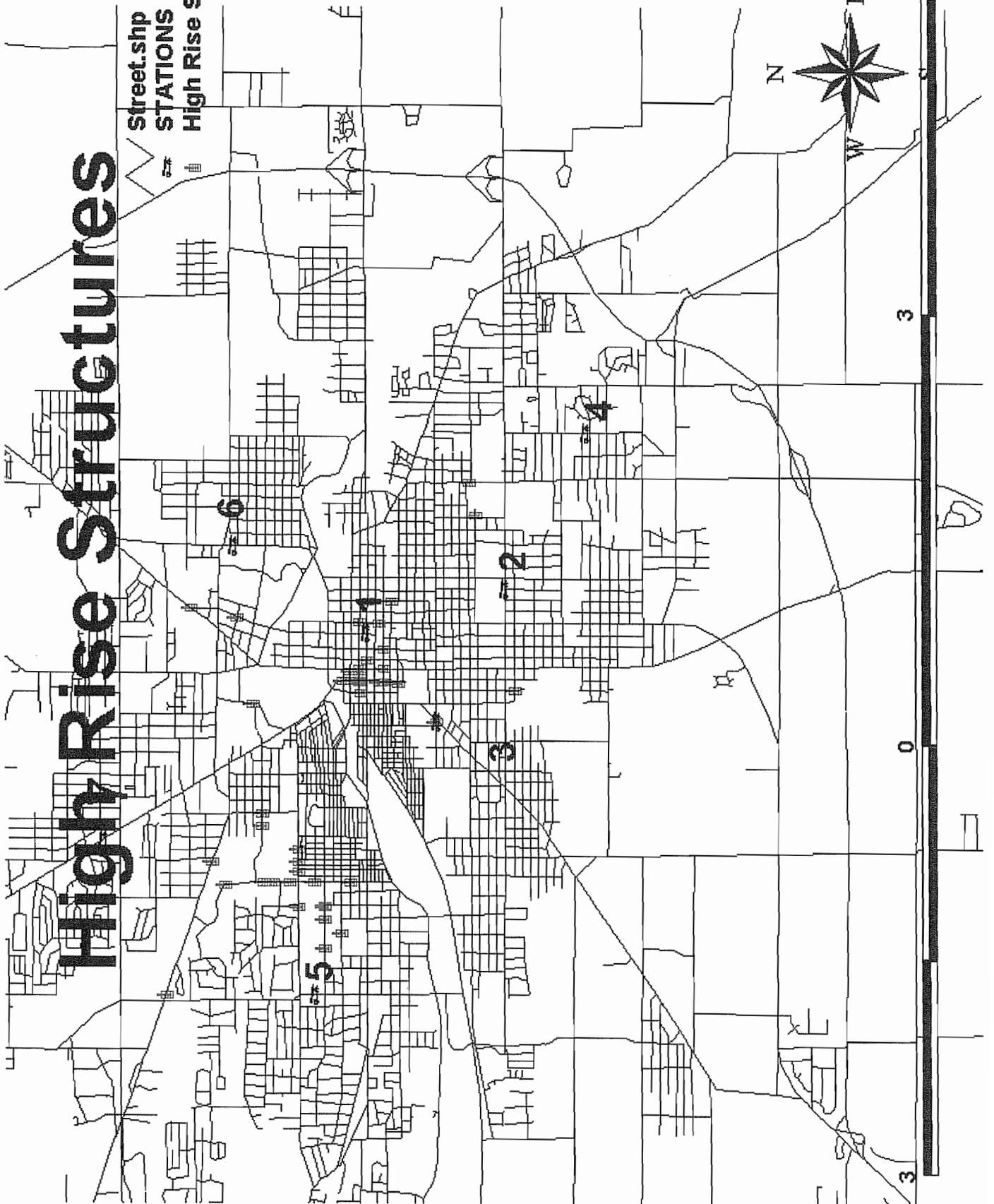
4

4



High Rise Structures

Street.shp
STATIONS
High Rise Structures



RESPONSE ANALYSIS

One method for analyzing the response data was to consider all responses for the four-year period and determining the distance on average that fire apparatus was averaging in responses within the various fire districts. Through the use of this data Senefeld and Associates were able to plot where apparatus was able to travel within the given time frame.

A second method used by the staff of Senefeld and Associates using the dBase IV file program. Using a predetermined speed it was calculated the amount of time it should take for fire apparatus to respond to all areas of the city. Then using a given average speed of apparatus maps could be generated that would indicate the distance that apparatus could travel in the 4 minute allotted time. Since speed limits vary throughout the city, apparatus must de-accelerate for stoplights, traffic, or to make turns and then re-accelerate, it was determined that 30 miles per hour would be the speed that would be factored in for an average. The total time then factored into the study was 6 minutes.

Also used by Senefeld and Associates was the method of encircling each station with a two mile ring. Under normal conditions apparatus can achieve this distance within four (4) minutes. This method was used to compare the conclusions that were achieved by the first and second methods of analysis.

It should be noted that recently with the backing of a great deal of firefighter unions and fire chiefs across the nation NFPA adopted a document that will have effects on fire departments nationwide. One of the major requirements of the recently adopted National Fire Protection Association 1710 is that fire departments "have first arriving company on scene with 4 minutes ninety percent (90%) of the time or the full first alarm assignment within 8 minutes ninety percent (90%) of the time. This NFPA standard also provides for a length of time before the 4-minute time period starts to meet the standard for the response to begin being dispatched and personnel to move to the apparatus. For the purposes of the study, conducted by Senefeld and Associates: 2 minutes were given

for personnel to begin receiving the call and to arrive at the apparatus, place their fire protective gear on and begin to move out of the station.

As shown in the next series of maps (generated by Senefeld and Associates) the distance that apparatus from each station using the methods described illustrate the distance apparatus should be able to travel within the four minutes was plotted on traveling the streets of the City. Not factored into these maps was time that apparatus could be delayed because of train traffic crossing a street. The trains that pass through the City are usually moving within the speed limits permitted by the railroad. The length of each train could vary and result in errors for response time accuracy. It should be noted the impact of trains passing through the city was considered in the recommendations for station locations.

The shaded area of each map illustrates the total distance that fire apparatus was able to or was projected to travel at the designated speed. The furthest point of travel was selected and for identification purposes, the closet intersection was identified for each direction.