SECTION 8

PADUCAH, KY

The estimates of vulnerability and availability presented in this report represent statistical averages and overall assessments resulting from the application of a new, preliminary methodology. They are intended for emergency management and planning purposes only.

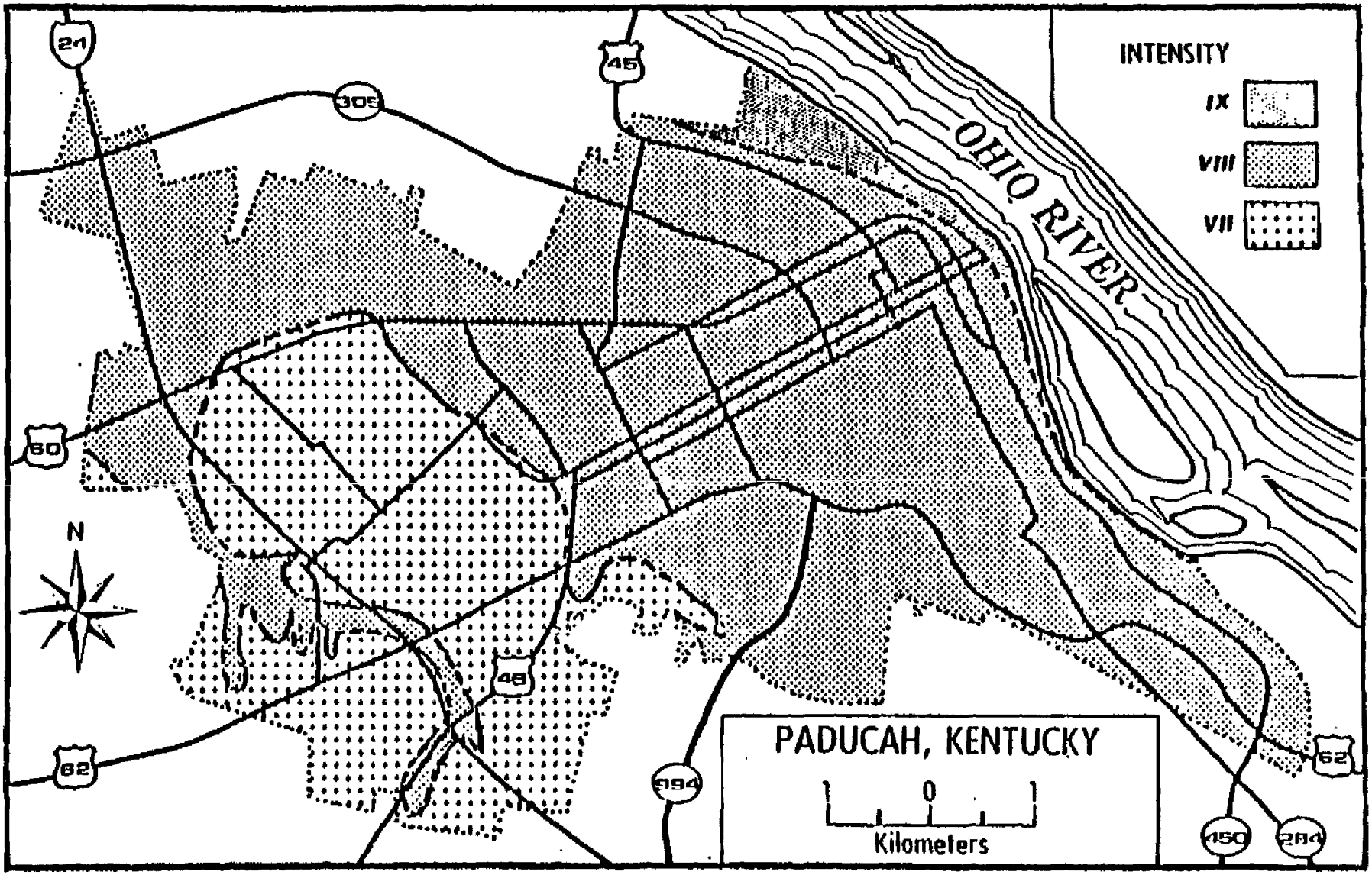
8.1 Location and Characteristics

The City of Paducah, located in western Kentucky on the south bank of the Ohio River, is the fourth most populous of the six cities. Paducah's 1980 population was approximately 42,000 persons. This city contains major resources in the areas of industry, commerce and education. Paducah is a significant regional transportation center.

Physiographic Description (from Reference 16):

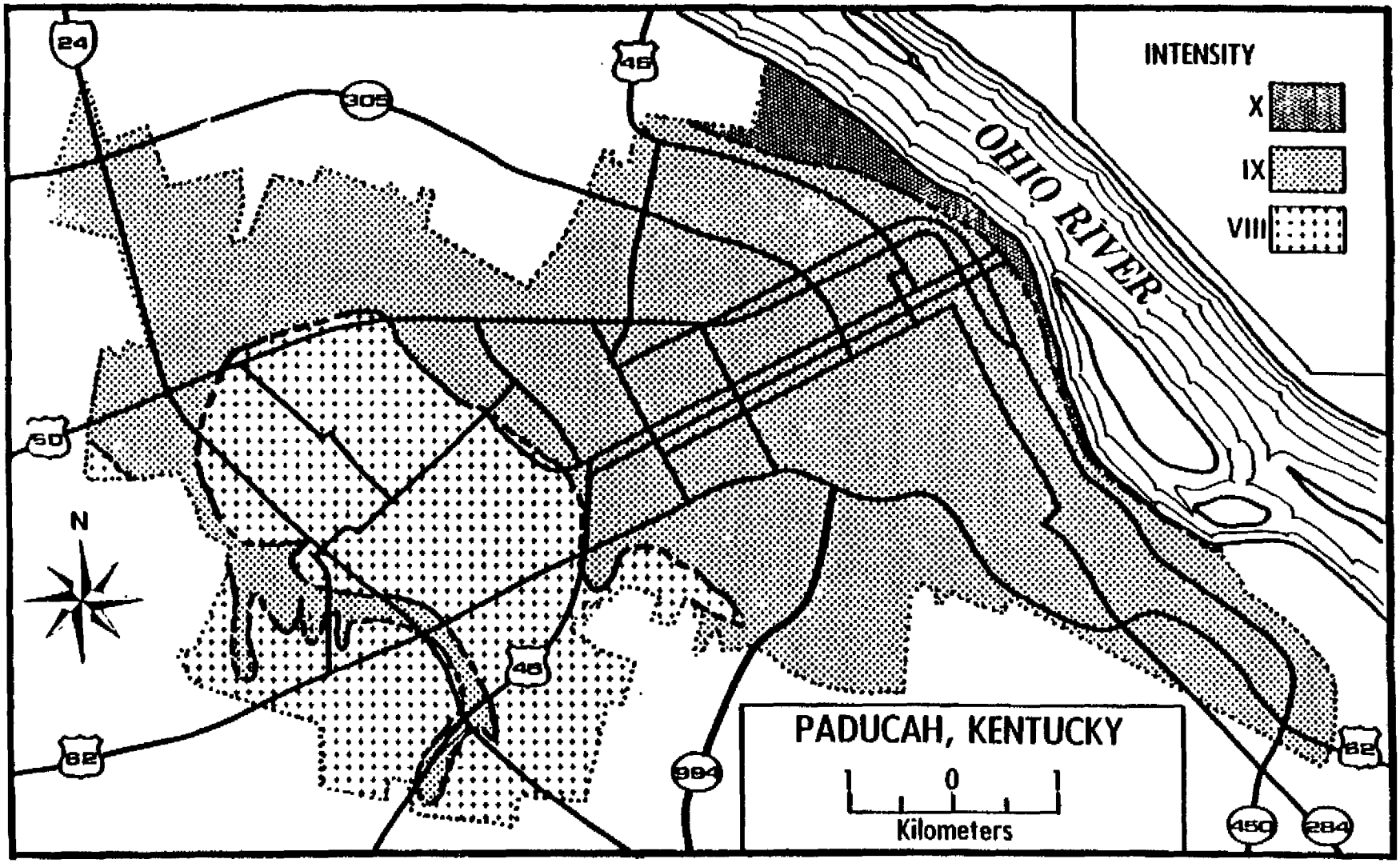
Paducah is situated in the upper part of the Mississippi Embayment that is also called the East Gulf Coastal Plain (Fenneman, 1938) and near the confluence of the Tennessee and Ohio Rivers. Topographic relief is low for most of the city; total difference between the Ohio River and outlying suburbs is about 150 feet (46 m).

Figures 8-1 and 8-2 show the hypothetical ground shaking intensities estimated in Paducah following an occurrence of the Ms=7.6 and Ms=8.6 earthquakes. Damage and disruption would be significant were Paducah to experience such ground motion. This is reflected in the findings of the vulnerability assessment, presented in this section of the report.



Hypothetical intensity map for Paducah, Kentucky, for a magnitude M(S)=7.6 earthquake. For an earthquake near the north end of the New Madrid seismic zone, intensities projected for Paducah are: IX on the river alluvium, VIII on the lacustrine deposits underlying most of the city, and VII in the hills southwest of the city. For an earthquake near the south end of the New Madrid seismic zone, the intensities at Paducah would be lower.

FIGURE 8-1



Hypothetical intensity map for Paducah, Kentucky. For an Ms=8.6 earthquake near the north end of the New Madrid seismic zone, intensities projected for Paducah are: X on the river alluvium, IX on the lacustrine deposits underlying most of the city, and VIII in the hills southwest of the city. For an earthquake near the south end of the New Madrid seismic zone, the intensities at Paducah would be lower.

FIGURE 8-2

8.2 Medical Resources and Facilities

Paducah possesses a full spectrum of medical services and facilities. These provide medical support to the city, surrounding communities and general region. Medical services surveyed during this period were: Major Hospitals, Blood Banks, Clinical Laboratories, Ambulance Services and Personnel.

8.2.1 Major Hospitals

Two major hospitals, with seven major structures, serve Paducah. These general hospitals provide full service medical care, including emergency services. Both are equipped with emergency electrical generators. These facilities are estimated to be mostly available following either the Ms=7.6 or the Ms=8.6 earthquakes. Table 8-1 shows the results of the availability analysis for major hospitals in Paducah.

TABLE 8-1
AVAILABILITY OF MAJOR HOSPITAL FACILITIES
PADUCAH, KY

Base Information		
Major Hospitals Surveyed	Hospital Structures Surveyed	Beds In Surveyed Structures
2	7	811

AVAILABILITY ANALYSIS

Earthquake	Hospital Structures Estimated To Be Available/Percent	Beds Estimated To Be Available/ Percent	Emergency Power Unit Available
Ms=7.6	6/86%	720/89%	Yes
Ms=8.6	4/57%	600/74%	Yes

8.2.2 Blood Banks

Availability of blood storage facilities in Paducah following the

Ms=7.6 and Ms=8.6 earthquakes is shown in the following table. These structures are normally provided with emergency power units, which are estimated to be available for service.

BLOOD STORAGE FACILITIES
(Blood Banks)
Paducah, Ky

	Number of Facilities Surveyed	Number Estimated to be Available Ms=7.6	Ms=8.6
Major Hospital:	2	2/100%	1/50%
Non-Hospital:	1	1/100%	1/100%
Total	3	3/100%	2/67%

8.2.3 Clinical Laboratories

The availability of clinical laboratory facilities in Paducah following an occurrence of the Ms=7.6 and the Ms=8.6 earthquakes is depicted in the following table. Those facilities associated with major hospitals can utilize the hospitals' emergency power systems. The availability of emergency power to non-hospital laboratories was not inventoried.

AVAILABILITY OF CLINICAL LABORATORIES
PADUCAH, KY

	Total Number Surveyed	Number Estimated To Be Available/Percent Ms=7.6	Ms=8.6
Major Hospitals	2	2/100%	1/50%
Others	2	1/50%	1/50
Totals	4	3/75%	2/50%

8.2.4 Ambulance Services

The availability of ambulance service structures in Paducah following an occurrence of the Ms=7.6 and the Ms=8.6 earthquakes is depicted in the following table. As ambulances are frequently parked outdoors, the survival of vehicles is likely to be good, but

difficult to quantify. Structures contain supplies, communications equipment and personnel, and thus contribute significantly to the provision of this service.

AVAILABILITY OF AMBULANCE SERVICE STRUCTURES
PADUCAH, KY

Number of Structures Surveyed	Number Estimated to be Available	
	Ms=7.6	Ms=8.6
9	6/67%	5/56%

8.2.5 Personnel

Casualties among medical personnel are presented collectively in Tables 3-2 and 3-3, Section 3.

8.3 Public Services

This part presents the estimated availability of selected vital services, facilities and systems in Paducah, following the occurrence of the Ms=7.6 and the Ms=8.6 earthquakes. These services include fire fighting and police.

8.3.1 Fire Services

The following table shows the estimated availability of fire fighting structures. Since fire fighting vehicles and other equipment are typically located inside a structure, the loss of a structure contributes to the non-availability of needed equipment.

AVAILABILITY OF FIRE SERVICE STRUCTURES
PADUCAH, KY

Total Structures Surveyed	Structures Estimated To Be Available	
	Ms=7.6	Ms=8.6
10	6/60%	5/50%

8.3.2 Police Services

The following table shows the estimated availability of police service structures in Paducah.

AVAILABILITY OF POLICE SERVICES STRUCTURES
PADUCAH, KY

Total Structures Surveyed	Structures Estimated To Be Available	
	Ms=7.6	Ms=8.6
Data Not Available	N/A	N/A

8.4 Communications

The following table shows the estimated availability of radio, television, and telephone structures in Paducah following the occurrence of the Ms=7.6 and the Ms=8.6 earthquakes.

AVAILABILITY OF COMMUNICATIONS STRUCTURES
PADUCAH, KY

	Total Structures Surveyed	Structures Estimated To Be Available	
		Ms=7.6	Ms=8.6
Radio	4	2/50%	1/25%
Television	1	1/100%	0/0%
Telephone	1	1/100%	0/0%
Total	6	4/67%	1/17%

8.5 Transportation Systems

8.5.1 Highways

The probable effects of the two earthquakes on major highways in Paducah and McCracken County are summarized in the following distribution of section survival probabilities:

Probability of Survival	Number of Sections (City Only)		Number of Sections (City + County)	
	Ms=7.6	Ms=8.6	Ms=7.6	Ms=8.6
0.00 - 0.25	-	1	-	2
0.26 - 0.50	-	-	1	6
0.51 - 0.75	1	4	5	13
0.76 - 1.00	20	16	44	29
Total	21	21	50	50

The probabilities of survival calculated for the individual sections are shown in Table 8-2. Figures 8-3 and 8-4 indicate graphically the sections most likely to remain passable after the stronger of the two earthquakes.

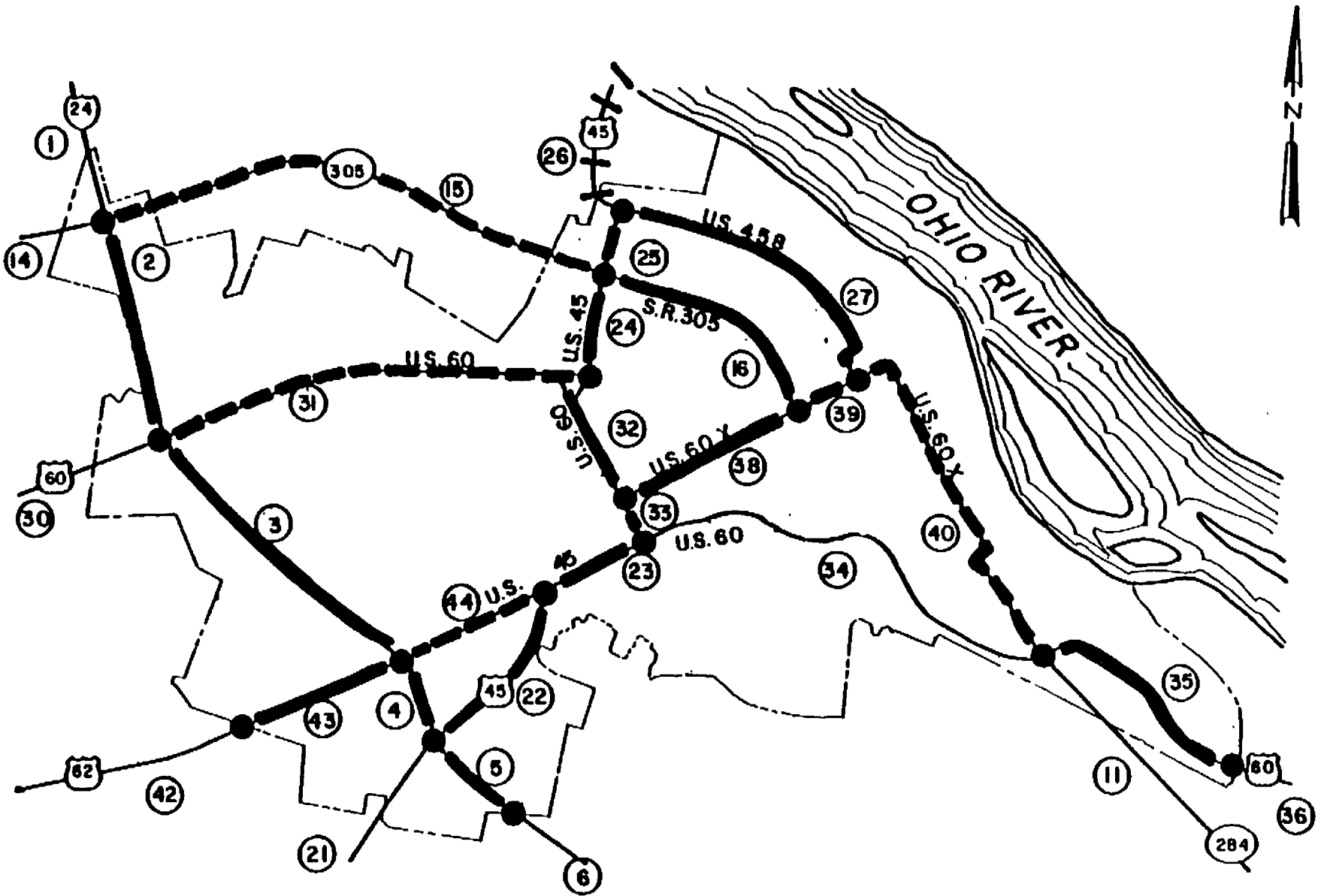
Within the city limits, the earthquake scenario of Ms = 7.6 would cause little or no disruption in the major highway network. With one exception, all sections would have a survival probability of 0.93 or greater. The Ms = 8.6 event would block perhaps three to five sections. Sections of State Route 305, U.S. 60 and U.S. 45 would be especially vulnerable to damage.

Outside the city limits, the Ms = 7.6 event could close one of the two sections crossing the Ohio River to the north of the city; both could be cut by the Ms = 8.6 earthquake. The access route most likely to survive would be U.S. 45 from the south. All but perhaps one of the routes entering the city from the east and west would survive the Ms = 7.6 event. Two or three of those could be closed by the Ms = 8.6 event, but it is unlikely that all would be lost.

8.5.2 Railways

The probable effects of the two earthquakes on major railway lines in Paducah and McCracken County are summarized in the following distribution of section survival probabilities:

Probability of Survival	Number of Sections (City Only)		Number of Sections (City + County)	
	Ms=7.6	Ms=8.6	Ms=7.6	Ms=8.6
0.00 - 0.25	-	1	-	2
0.26 - 0.50	-	1	-	5
0.51 - 0.75	1	2	3	2
0.76 - 1.00	11	8	18	12
Total	12	12	21	21



● SECTION DIVIDER

○ SECTION NUMBER

HIGHWAY SECTIONS
IN
PADUCAH CITY LIMITS

FIGURE 8-3

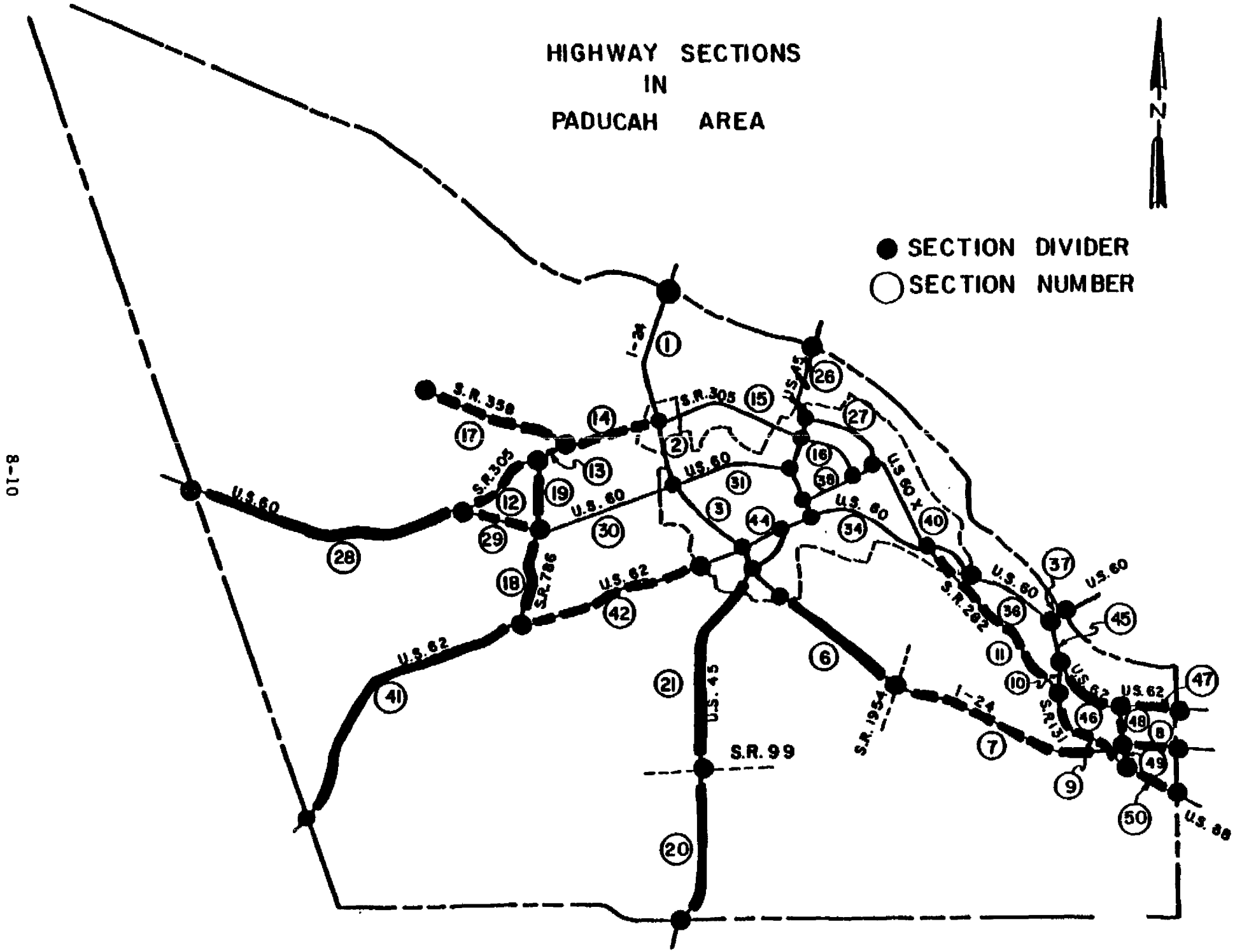

HIGHWAY SECTIONS
IN
PADUCAH AREA
N
SECTION DIVIDER
SECTION NUMBER
I-24
U.S. 45
S.R. 358
S.R. 305
U.S. 60
U.S. 60 X
S.R. 305
U.S. 60
S.R. 786
U.S. 62
U.S. 62
U.S. 45
S.R. 99
S.R. 1954
I-24
S.R. 282
U.S. 60
U.S. 62
S.R. 131
U.S. 62
U.S. 60
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TABLE 8-2

PROBABILITY THAT ALL BRIDGES ON AND OVER HIGHWAY SECTIONS WOULD SURVIVE NEW MADRID EARTHQUAKE

PADUCAH/McCRACKEN COUNTY

Highway Section No.	Route No.	No. of Support Structures		No. of Over-passing Struct	Earthquake Intensity (MMI)		Probability of Survival	
		Single Struct.	Parall. Pairs		Ms=7.6	Ms=8.6	Ms=7.6	Ms=8.6
1*	124	1	1		IX/VII	X/IX	.69	.36
2	124		3		VIII	IX	1.00	.89
3	124		3		VIII/VII	IX/VIII	1.00	.86
4	124			1	VIII	IX	.98	.89
5	124		1	1	VIII/VII	IX/VIII	1.00	.89
6*	124		3	1	VII	VIII	1.00	.97
7*	124		3	4	VIII	IX	.93	.52
8*	124			1	VIII	IX	.98	.89
9*	SR131	1			VIII	IX	.95	.69
10*	SR131	1			VIII	IX	.95	.69
11*	SR284	1			VIII	IX	.95	.69
12*	SR305	1			VII	VIII	.97	.75
13*	SR305	2			VIII	IX	.90	.48
14*	SR305	1			VIII	IX	.95	.69
15	SR305	1		2	VIII	IX	.93	.61
16	SR305				VIII	IX	1.00	1.00
17*	SR358	1		1	VII/VIII	VIII/IX	.95	.68
18*	SR786	1			VII	VIII	.99	.95
19*	SR786	1		1	VII	VIII	.99	.93
20*	US45	2			VII	VIII	1.00	.96
21*	US45				VII	VIII	1.00	1.00
22	US45			2	VIII	IX	.96	.79
23	US45			1	VIII	IX	1.00	.98
24	US45				VIII	IX	1.00	1.00
25	US45				VIII	IX	1.00	1.00
26*	US45	2			IX	X	.30	.08
27	US45B				VIII	IX	1.00	1.00
28*	US60	6			VII	VIII	.98	.83
29*	US60	2			VII	VIII	.97	.73
30*	US60	1			VIII	IX	.75	.43
31	US60	2		2	VIII/VII	IX/VIII	.94	.63
32	US60				VIII	IX	1.00	1.00
33	US60				VIII	IX	1.00	1.00
34	US60	3			VIII	IX	.69	.23
35	US60				VIII	IX	1.00	1.00

TABLE 8-2

PROBABILITY THAT ALL BRIDGES ON AND OVER HIGHWAY SECTIONS WOULD SURVIVE NEW MADRID EARTHQUAKE

PADUCAH/McCRACKEN COUNTY (Page 2)

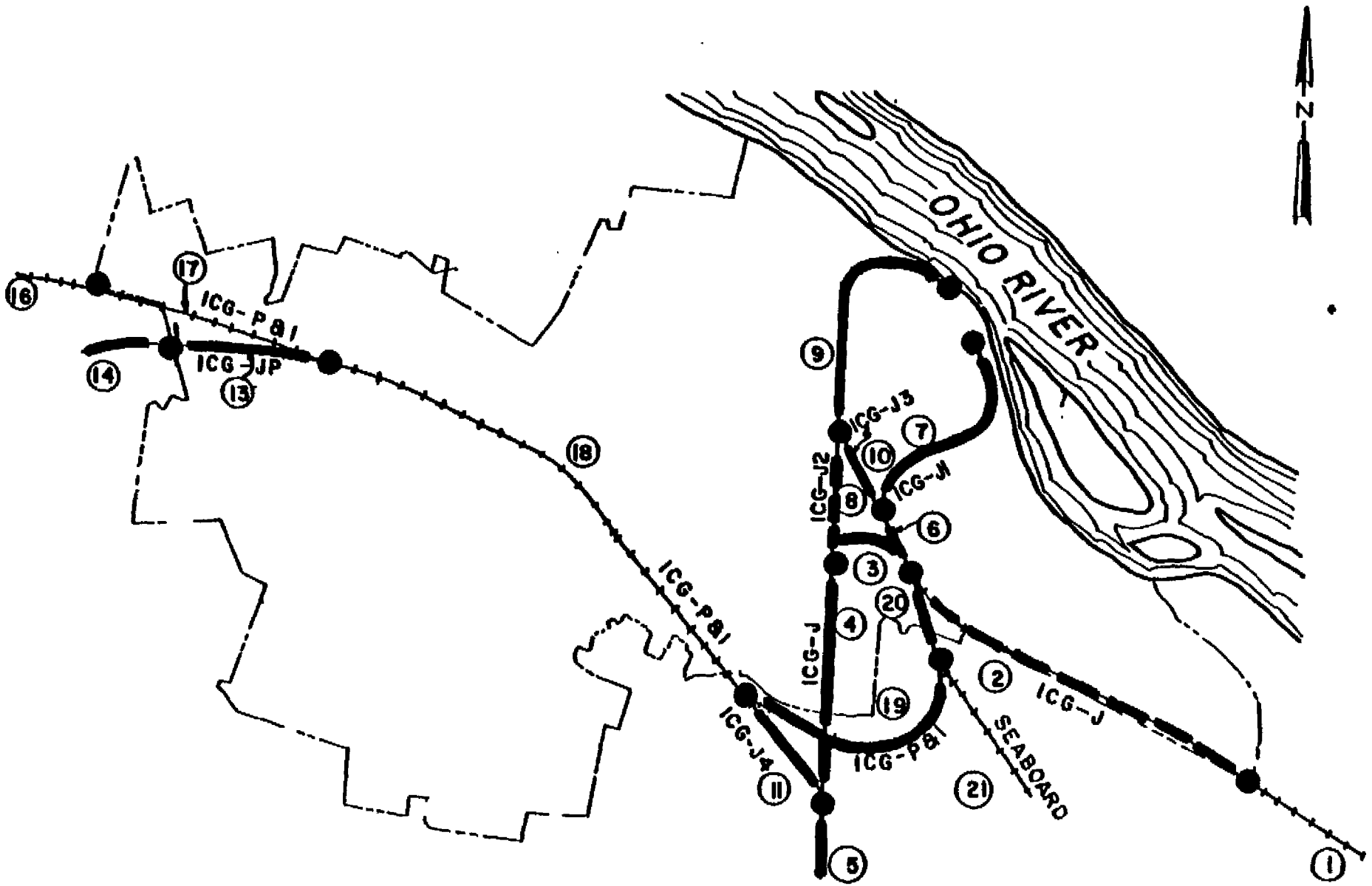
Highway Section No.	Route No.	No. of Support Structures: Single Struct.	No. of Support Structures: Parall. Pairs	No. of Over-passing Struct	Earthquake Intensity (MMI): Ms=7.6	Earthquake Intensity (MMI): Ms=8.6	Probability of Survival: Ms=7.6	Probability of Survival: Ms=8.6
36*	US60	1	1		VIII	IX	.75	.43
37*	US60	1			IX	X	.69	.37
38	US60X				VIII	IX	1.00	1.00
39	US60X				VIII	IX	1.00	1.00
40	US60X	1			VIII	IX	.95	.69
41*	US62	1		1	VII	VIII	.99	.94
42*	US62	9			VII	VIII	.91	.63
43	US62				VII	VIII	1.00	1.00
44	US62	1			VIII	IX	.95	.69
45*	US62		1	2	VIII	IX	.79	.47
46*	US62				VIII	IX	1.00	1.00
47*	US62				VIII	IX	1.00	1.00
48*	US68		1		VIII	IX	1.00	.95
49*	US68				VIII	IX	1.00	1.00
50*	US68				VIII	IX	1.00	1.00

* Located in McCracken County outside the city limits of Paducah.

The probabilities of survival calculated for the individual sections are shown in Table 8-3. Figures 8-5 and 8-6 indicate graphically the sections most likely to remain passable after the stronger of the two earthquakes.

Within the city limits, the line most susceptible to damage would be the ICG-P&I line. Although it could remain in service after the Ms=7.6 earthquake scenario, it would almost certainly be closed by the Ms=8.6 event. One or two other sections could also be made impassable by the larger magnitude earthquake.

Outside the city limits, the access routes least likely to be

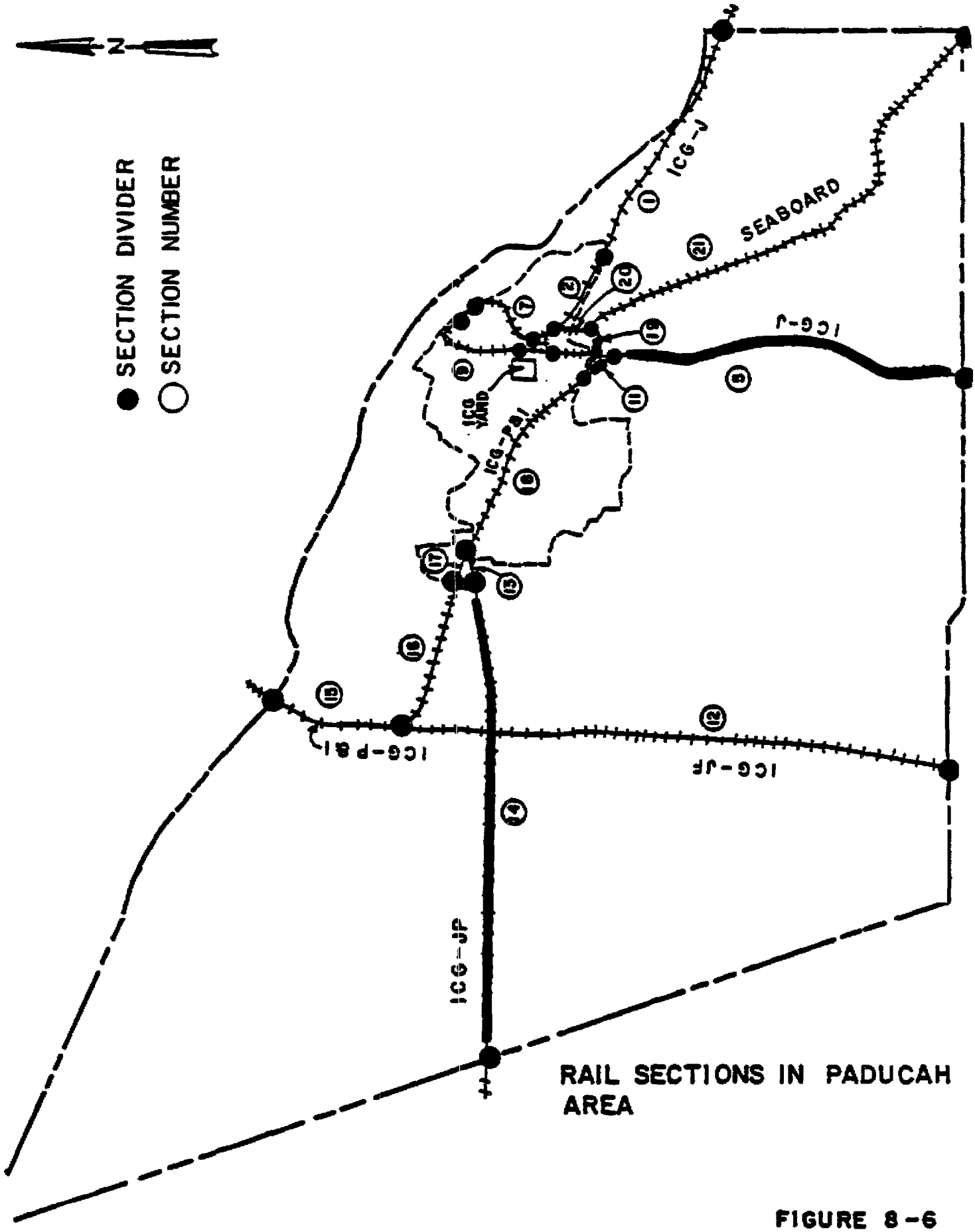


● SECTION DIVIDER

○ SECTION NUMBER

RAIL SECTIONS IN
PADUCAH CITY LIMITS

FIGURE 8-5



RAIL SECTIONS IN PADUCAH AREA

FIGURE 8-6

TABLE 8-3

PROBABILITY THAT ALL BRIDGES ON AND OVER RAILWAY SECTIONS WOULD SURVIVE NEW MADRID EARTHQUAKE

PADUCAH/McCRACKEN COUNTY

Railway Section No.	Route No.	No. of Support Structures		No. of Over-passing Struct	Earthquake Intensity (MMI)		Probability of Survival	
		Single Struct.	Parall. Pairs		Ms=7.6	Ms=8.6	Ms=7.6	Ms=8.6
1*	ICG-J	2		2	VIII	IX	.90	.48
2	ICG-J	2			VIII	IX	.94	.61
3	ICG-J				VIII	IX	1.00	1.00
4	ICG-J	1		1	VIII	IX	.98	.84
5*	ICG-J	5		2	VII	VIII	1.00	.82
6	ICG-J1			1	VIII	IX	.99	.94
7	ICG-J1				VIII	IX	1.00	1.00
8	ICG-J2			1	VIII	IX	.81	.58
9	ICG-J2				VIII	IX	1.00	1.00
10	ICG-J3				VIII	IX	1.00	1.00
11*	ICG-J4				VIII	IX	1.00	1.00
12*	ICG-JF	13		4	VII	VIII	.92	.30
13	ICG-JP			2	VIII	IX	1.00	.96
14*	ICG-JP	6		2	VII	VIII	1.00	.80
15*	ICG-P&I	2			IX/VIII	X/IX	.68	.32
16*	ICG-P&I	1		3	VIII	IX	.62	.23
17	ICG-P&I	1		3	VIII	IX	.75	.35
18	ICG-P&I	5		1	VII/VIII	VIII/IX	.82	.20
19*	ICG-P&I	1			VIII	IX	.97	.78
20	ICG-P&I				VIII	IX	1.00	1.00
21*	Seaboard	2		2	VIII	IX	.87	.38

* Located in McCracken County outside the city limits of Paducah.

damaged would be the ICG lines entering the city from the west and south. With the possible exception of the ICG-P&I line crossing the Ohio River, all sections would probably survive the Ms=7.6 event. An Ms=8.6 earthquake, however, would probably close the Ohio River crossing as well as one or two of the four lines entering the city from the east, south and west.

8.5.3 River Ports

Due to the generally unfavorable soil conditions which are typical for the river bank locations of port and dock facilities, it is estimated that these facilities will not be available for use in Paducah following an occurrence of the scenario earthquakes.

8.5.4 Airports

As discussed in the general section on airports (Section 3.5.4) airport runways will generally be at least partially available for use in Paducah following either earthquake. Delicate and complex landing-aid instruments and devices, as well as general lighting, are not estimated to be available. Airport buildings will sustain damage typical for others in the area of similar structural type.

8.6 Public Utilities

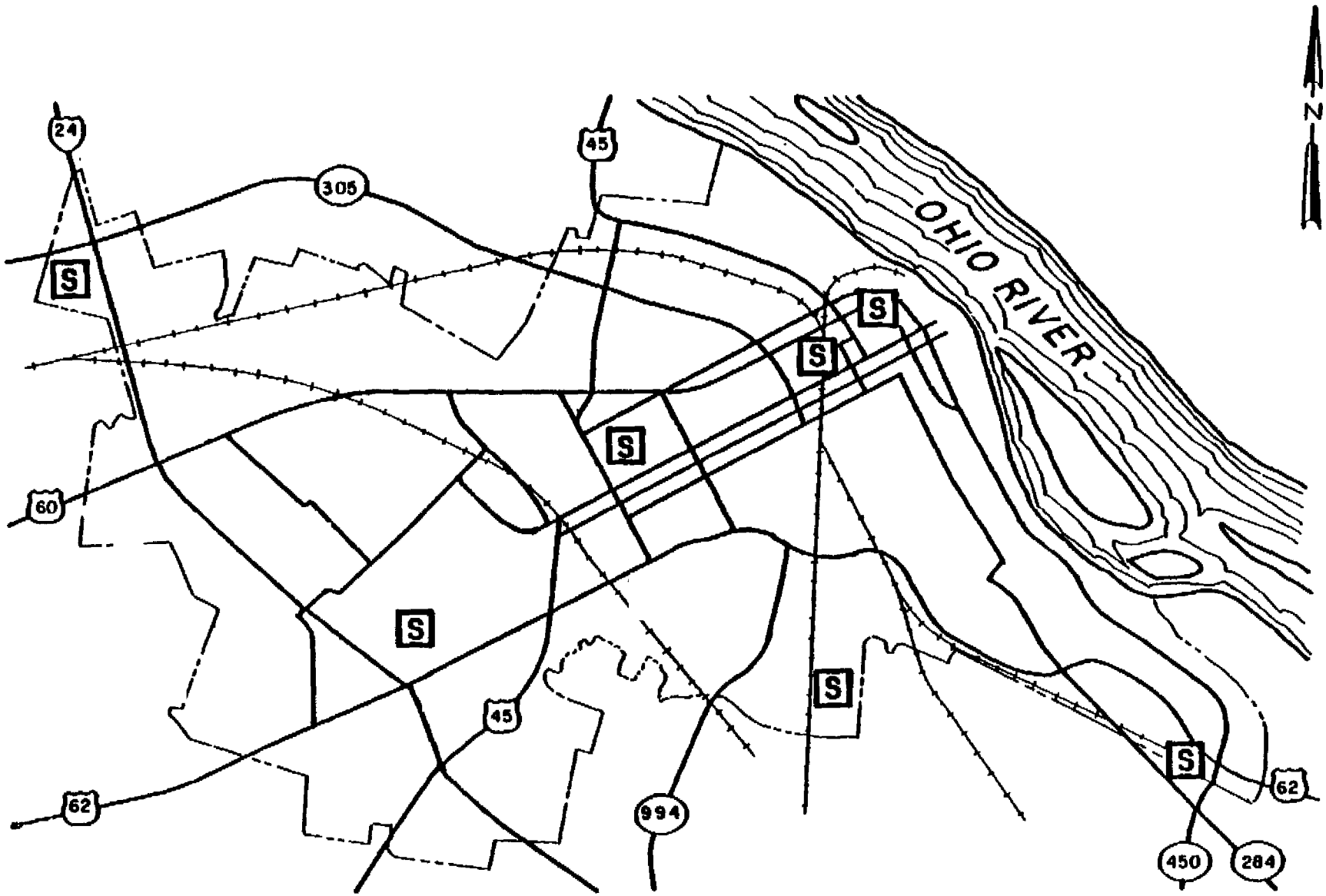
8.6.1 Electric Utilities

Paducah Power System (PPS) serves the city of Paducah and vicinity, population 42,000. PPS has seven distribution substations served from two TVA 161/69kV delivery points. A 69 kV transmission loop serves these substations. PPS has two distribution substations, 73 employees and 22 radio equipped vehicles. PPS would also have access to TVA's mobile facilities.

TVA's Shawnee steam generating plant is also located in Paducah. Shawnee has 480 employees, a total generating capacity of 1,750 MW and is coal fired. Figure 8-7 shows major elements of the Paducah electric utility system.

Availability Analysis

The following table presents the results of the availability analysis performed for Paducah's electric utility. The findings



S SUBSTATION

ELECTRIC UTILITIES
PADUCAH, KENTUCKY

FIGURE 8-7

indicate that damage would be extensive, to both the power plant and to substations. The system is not estimated to be available following either of the postulated earthquakes.

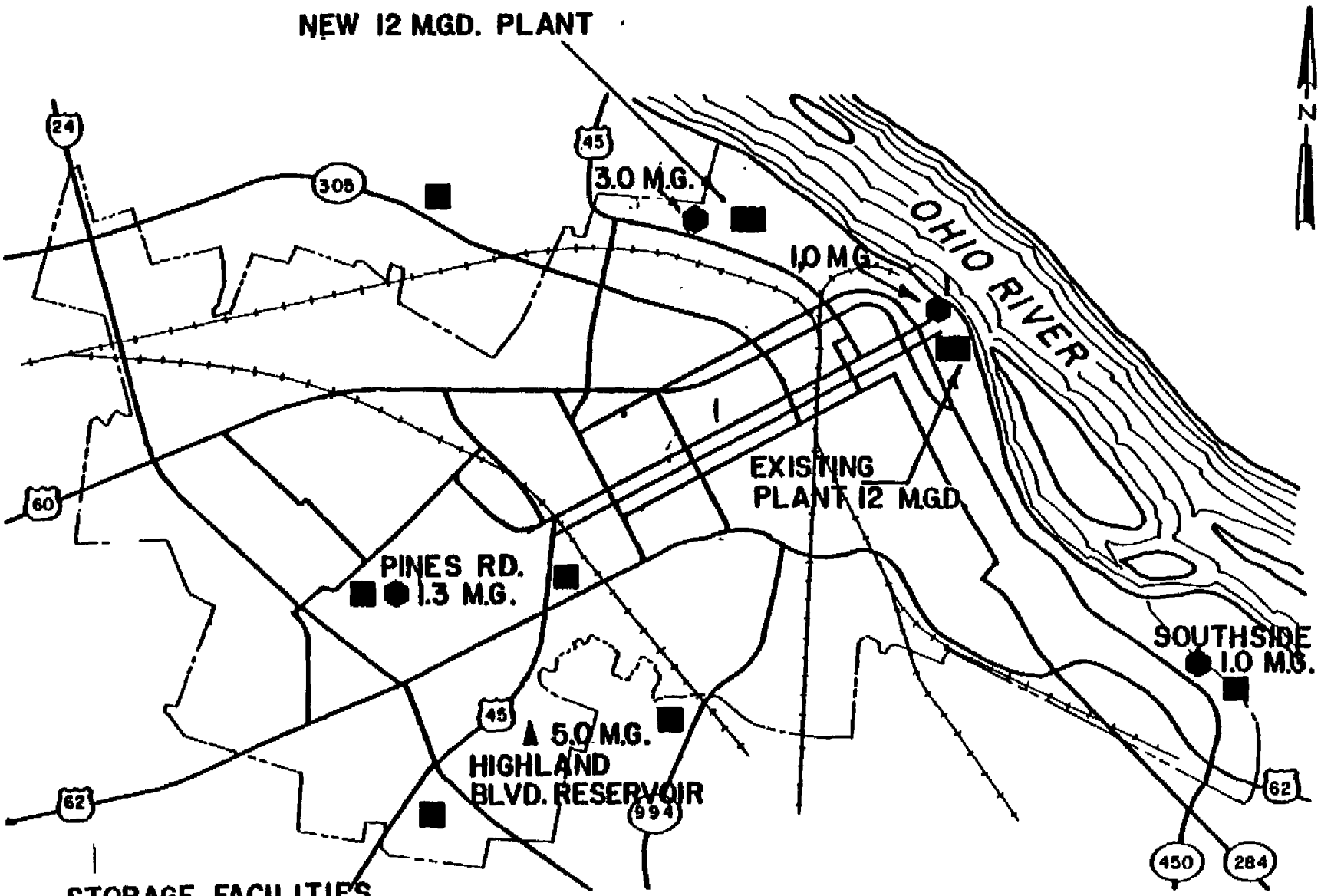
AVAILABILITY OF ELECTRIC UTILITIES
PADUCAH, KY

Total Number Of Structures Surveyed Availability(Yes/No) Ms=8.6		Structures Estimated To Be Available/Percent Ms=7.6	Ms=8.6	Overall System Ms=7.6
Substations	7	3/43%	1/14%	No
No Power Plants	1	0/0%	0/0%	
Total	8	3/38%	1/12%	

8.6.2 Water Utility

The Paducah Water Works Department operates a 12 MGD water treatment plant built in the 1800's. A new 12 MGD treatment plant which was designed for seismic loading was scheduled for completion in early 1984. Within six months to a year after the new plant went on-line the old plant was scheduled to be abandoned. The source of raw water is the Ohio River. Treatment operations at both the existing and future plant consist of coagulation, flocculation, sedimentation, rapid sand filtration, and chlorination. The existing water treatment plant has a gasoline power auxiliary engine which powers only a portion of the plant during an electrical outage. The new water plant will have an emergency generator which will operate the entire plant. Figure 8-8 shows the locations of both water treatment plants.

Paducah has 11.3 MG of water storage capacity composed of four standpipes and one reservoir. The water storage locations are indicated in Figure 8-8.



WATER SYSTEM
PADUCAH, KENTUCKY

FIGURE 8-8

The water distribution system includes water mains ranging from 2 to 30 inches in diameter. The majority of the pipe is cast iron. The 30-inch pipe from the new water plant to the Pine Road tank is concrete. Some subdivisions which have been annexed by the Paducah system may have plastic pipe. There are four booster pumping stations located in the outlying portions of the service area. Both the Pines Road and Southside standpipes have booster pumps.

Availability Analysis

The following table presents the findings of the availability analysis for Paducah. Due to the damage likely to be sustained to the treatment plant and pump stations, the lack of elevated storage and probable loss of electric power, this water system is estimated to be unavailable following an occurrence of either earthquake scenario.

AVAILABILITY ANALYSIS WATER UTILITY
PADUCAH, KY

Total Number of Structures Surveyed		Structures Estimated To Be Available/Percent Ms=7.6	Ms=8.6
Treatment Plants	1	0/0%	0/0%
Storage Tanks:			
Non-elevated	4	2/50%	1/25%
Pump Stations	6	2/33%	1/17%
Total	11	4/36%	2/18%

SYSTEM AVAILABILITY
(Yes/No)

Ms=7.6	Ms=8.6
No	No

8.6.3 Natural Gas Utility

The natural gas system of Paducah, Kentucky is operated by Western Kentucky Gas Company. The system has one (1) purchase point

with 41 district and two border regulator station points. It buys gas from Texas Gas Transmission Company. There are no storage facilities for propane air or LNG. Approximately 40 miles of piping make up the system, most of which is steel with the remaining being cast iron or plastic.

The cast iron piping in the system would crack and rupture in many places in the event of any substantial earth movement in Paducah. Additionally, some damage to service piping and meter sets would occur from buildings and debris hitting meter sets.

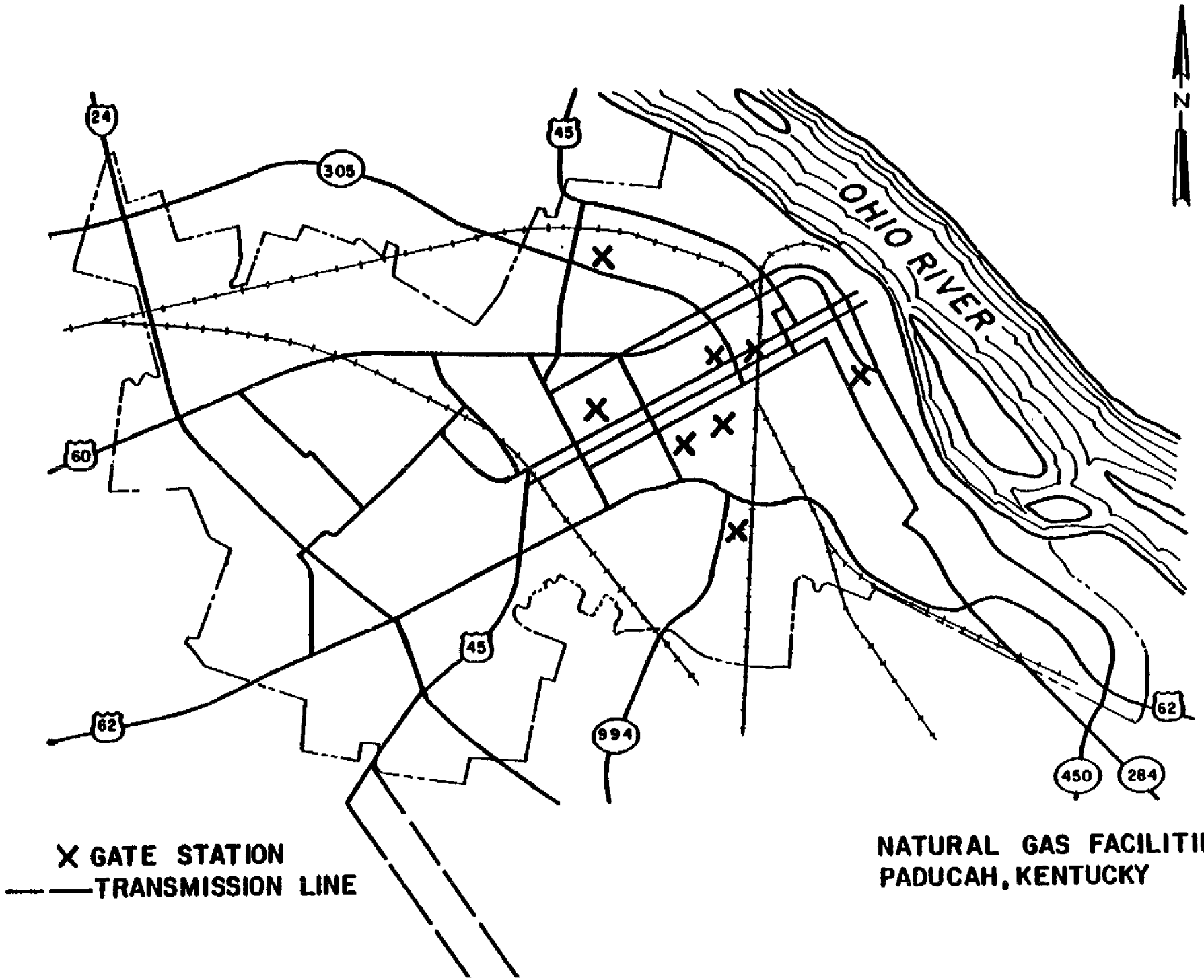
The natural gas distribution system serving Paducah would have to be shut down immediately following a major quake. Small sections of the system could be restored in twenty-four hours to provide heat for selected shelters. The remainder of the system would have to be restored on a street by street, customer by customer basis. This process would take about four weeks. Figure 8-9 shows major system elements.

Availability Analysis

As described above, this system is estimated to be unavailable following an occurrence of either postulated earthquake.

8.6.4 Sewage System

The Paducah Sewage Treatment Department serves the City of Paducah with a 8 MGD activated sludge wastewater treatment plant. The treatment processes include an influent pump station, grit chambers, primary settling tanks, aeration basins, secondary settling tanks, chlorine contact tanks, and sludge treatment facilities. The treated wastewater is discharged into the Ohio River. There are no emergency power facilities. The location of the wastewater treatment plant is shown in Figure 8-10.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OHIO RIVER
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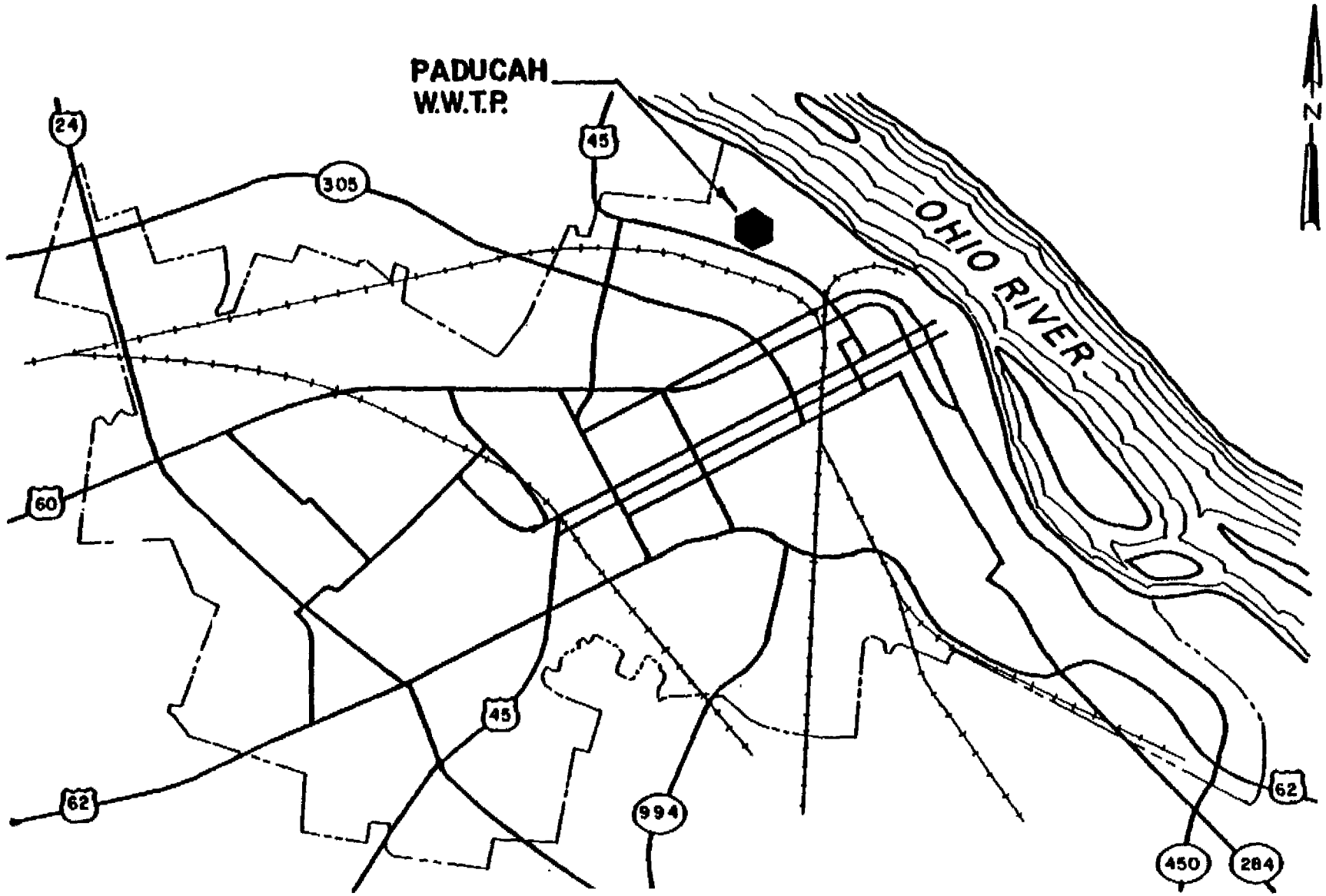
X GATE STATION
——TRANSMISSION LINE
NATURAL GAS FACILITIES
PADUCAH, KENTUCKY



WASTEWATER TREATMENT PLANT (W.W.T.P.)

WASTEWATER TREATMENT FACILITIES
PADUCAH, KENTUCKY

There are twenty-four lift stations located throughout the city. Pumping capacities range from 50 gpm to 900 gpm. The sanitary and storm wastewaters are combined in Paducah. Sanitary sewers are 8 inches to 102 inches in diameter and storm sewers range from 12 inches to 102 inches. The sewer pipes are primarily clay. However, there is some concrete pipe and very little plastic pipe.

Availability Analysis

As shown in the following table, this system is not estimated to be available following either earthquake. This is due to the probable loss of electric power, collection system damage and damage to the treatment plant.

AVAILABILITY ANALYSIS SEWAGE SYSTEMS
PADUCAH, KY

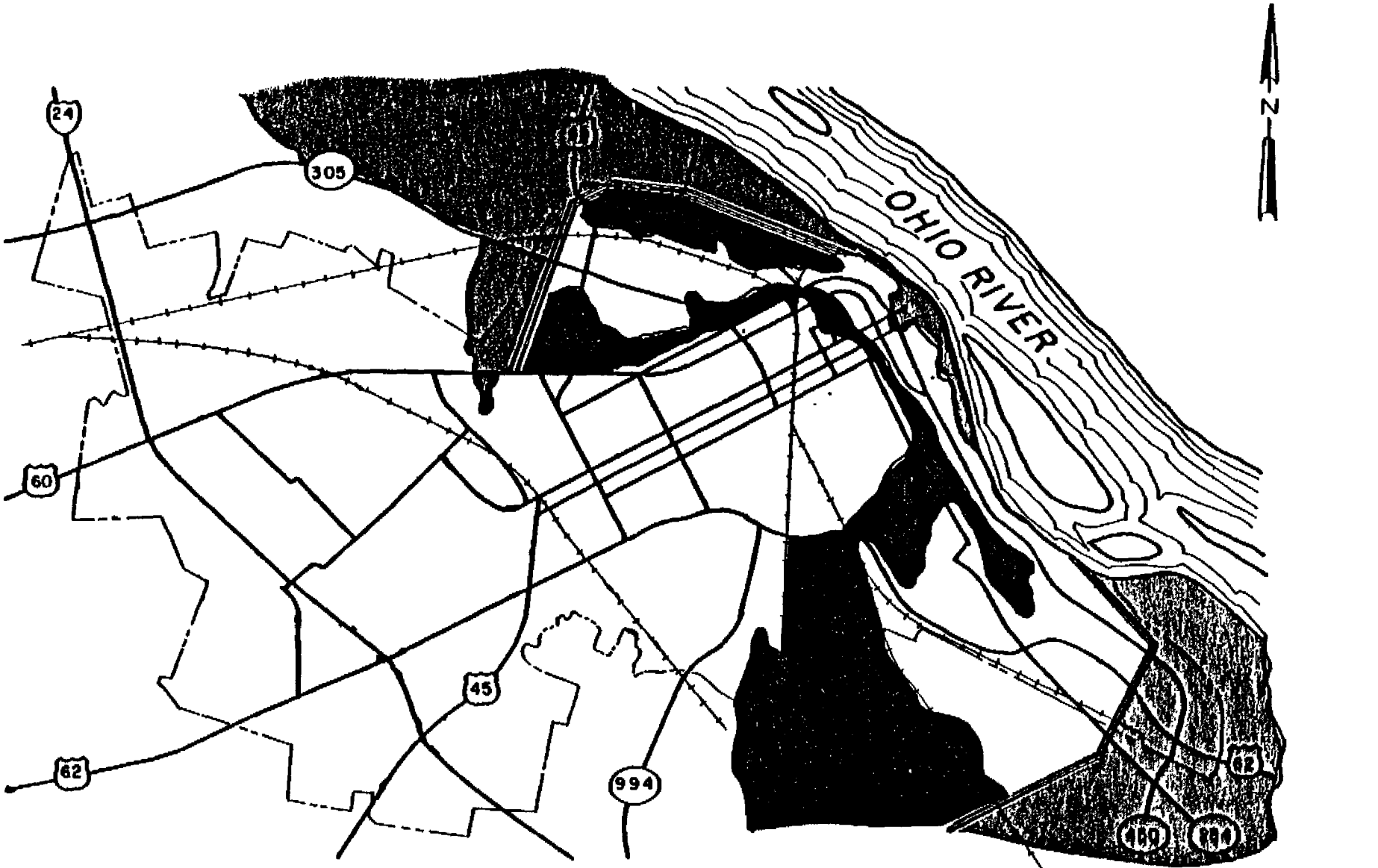
Number of Structures Surveyed		Structures Estimated To Be Available/Percent Ms=7.6	Ms=8.6
Treatment Plants	2	0/0%	0/0%

SYSTEM AVAILABILITY
(Yes/No)

Ms=7.6	Ms=8.6
No	No

8.7 Dams and Levees

The general circumstances involved with the failure of dams and levees was discussed in Section 3.7. Figure 8-11 depicts areas of Paducah which are subject to flooding should levee failure be caused by either the Ms=7.6 or the Ms=8.6 earthquake. Persons displaced by flooding are tabulated in Section 6.9.2. Paducah may also be susceptible to dam failure following an occurrence of the Ms=7.6 or



PADUCAH, KENTUCKY
AREAS SUBJECT TO FLOODING

FIGURE 8-11

the Ms=8.6 earthquake. This is due to the existence of two large reservoirs, Kentucky Lake on the Tennessee River and Lake Barkley on the Cumberland River. Both these rivers enter the Ohio River a relatively short distance upstream from Paducah. These reservoirs are retained with large earthen dams.

It was determined, for the purposes of this report, that the simultaneous failure of these dams, caused by an occurrence of either of the earthquake scenarios at a time when there was a 100 year flood water level occurring on the Ohio River, was far too improbable to be realistically evaluated. Therefore, flooding due to levee failure was estimated as described above, and the effects of the simultaneous failure of the two large dams was evaluated assuming "normal" water levels in the Ohio, Tennessee and Cumberland Rivers. Two studies which are evaluating the effects of the failure of these dams are now underway by the Corps of Engineers and Tennessee Valley Authority; their results were not available during preparation of this report. When available, their findings should be incorporated into planning activities.

However, indications are that, at "normal" river water levels, the failure of these dams would result in flooding, in Paducah, of a magnitude comparable to that of the 100 year flood.

8.8 Residential, Commercial and Industrial Buildings

Section 3.8, (Tables 3-6 and 3-7) contains tabulations of damage to these structures for Paducah. This information was used to compute casualties and building availability.

8.9 Casualties, Displaced Persons and Shelter

8.9.1 Deaths, Injuries and Displaced Persons

The estimated deaths and injuries which would occur in Paducah as a consequence of the two postulated earthquakes are summarized in the following table:

Source of Casualties	Ms=7.6				Ms=8.6			
	Deaths		Injuries		Deaths		Injuries	
	Night	Day	Night	Day	Night	Day	Night	Day
Residential struct.	42	15	167	62	91	34	363	134
Commercial/industrial	4	76	15	303	6	119	24	475
Hospitals	1	1	3	4	3	3	10	13
Schools		21		86		38		152
Universities		3	1	11	1	7	3	26
Total Est. Casualties	47	116	186	466	101	201	400	800
Per 100,000 population*	112	276	443	1,109	240	478	952	1,904

* Based upon U.S. Bureau of Census Figure

In comparison to the other cities, residential casualties would be high in Paducah because of the large proportion of non-wood frame multi-family structures, especially in the western part of the city between U.S. Routes 60 and 45, where about two-thirds of the residential casualties would occur. Approximately 70 percent of the daytime non-residential casualties would be concentrated in the downtown area on the eastern side of the city along the Ohio River. About 20 percent of the total daytime casualties would occur in schools.

Damage to residences, some of which would no longer be habitable, would displace the following estimated numbers of persons:

	Estimated Number of Displaced Persons	
	Ms=7.6	Ms=8.6
From single family residences	6,320	12,475
From multi-family structures	7,000	10,125
Total	13,320	22,600
Percentage of population	32%	54%

An additional 5,000 people could be displaced and one or two killed or injured from flooding, especially if either of the upstream dams failed.

8.9.2 Shelter

The following table shows the number of school structures estimated to be available for use as shelters for both earthquakes.

AVAILABILITY OF SCHOOL STRUCTURES FOR SHELTERS
PADUCAH, KY

Total Structures Surveyed	Structures Estimated To Be Available/Percent	
	Ms=7.6	Ms=8.6
36	6/17%	2/6%