APPENDIX D

LAND PARCEL CHARACTERISTICS

Tables D-1 through D-4 provide information on the sample of floodplain parcels selected, all of which were vacant on January 1, 1976. Table D-1 lists the values of the dependent land market variables. The mean assessed land value varied considerably among the cities. We controlled for differences in land values attributable to differences in city income levels. The odds of development indicate that overall, parcels were .30 times more likely to develop than remain vacant between 1976 and 1985; only in Fargo and Scottsdale were parcels more likely to develop than remain vacant (odds greater than 1.0). The likelihood of development was particularly low in Palatine and Wayne.

Table D-2 provides information on the size and land use of the parcels in the sample. The average size of parcels tended to be quite large, due to large farms and acreage tracts of vacant land. Palatine was an exception, however, with an average lot size of less than an acre (no acreage tracts of land were available for subdivision and development). The parcels remaining vacant in 1985 were also quite large, with an average size of 7 acres.

The amount of floodplain development during the ten-year study period varied considerably among the ten cities. Overall, 77% of the parcels which were vacant in 1975 remained vacant in 1985, 17% were developed for residential use; 4.8% and 1.2%, respectively, for commercial and industrial use. In Scottsdale, 88% of the parcels vacant in 1976 within the Indian Bend Wash floodplain had been developed by 1985. Palatine, by contrast, kept development out of its floodplain and 97% of the parcels there were still vacant. That Palatine and Scottsdale, the two cities with the strongest floodplain land use management programs, had the lowest and highest rates of development among our sample clearly indicates that factors other than floodplain land use management programs determine likelihood of development. Nonresidential development occurred in Omaha, where the city was encouraging commercial and industrial use in some areas of its floodplain. An industrial park was built within the floodplain of Wayne and four companies moved in by 1985.

Table D-3 provides more information on the amount of each parcel which was within the regulatory floodplain. In Wayne Township for example, 91% of the parcels were completely within the floodplain, whereas in Toledo 42% of the parcels had less than a quarter of their area within the regulatory floodplain. The subtotals for vacant and developed parcels indicate that there

is not much difference in floodplain coverage between those parcels which developed and those which remained vacant. Overall, 80% of the parcels had more than half their area within the floodplain and 55% were totally within the floodplain.

A measure combining information on the amount of a parcel within the floodplain, the floodway, and the distance to the stream provides further evidence that the level of the hazard was similar for both vacant and developed parcels: in fact, the mean score for both vacant and developed parcels is 4.9 on a scale of 1 to 12 (see Table D-4). The parcels in the sample are examined in further detail in tables D-5 and D-6, which contain data on the factors affecting the likelihood of a parcel developing and its land value. The average distances to various urban amenities for both vacant and developed parcels are shown in Table D-5. The mean distance to a major thoroughfare varied a good deal from city to city, and the developed parcels were on average closer to thoroughfares. Overall 31% of the developed parcels had thoroughfare frontage whereas only 18% of the vacant parcels were adjacent to a thoroughfare (not shown). Distances to the central business district reflect the fact that the sample contains several suburban cities (Arvada, Scottsdale, and Wayne Township have their CBD's in Denver, Phoenix, and Newark respectively). Tulsa and Omaha parcels were also located a substantial distance from the CBD, indicating that many of the floodplain parcels were on the urban fringe. Recreation areas (parks and schools) tended to be close, within less than a mile on average; however, there was significant variation both within and among cities. The average distance to a freeway interchange (not reported in the table) was within a few miles for all cities except Scottsdale, where parcels averaged greater than nine miles to the closest interchange. On each of those measures, the developed parcels had slightly better access than the parcels remaining vacant; however, except for the thoroughfares, the distances are similar.

Many of the parcels (Table D-6) had road frontage (82% and 100%, respectively, for vacant and developed parcels), and many (70% and 86%, respectively) had been platted or subdivided. Those are two of the prerequisites for development, and the high percentages indicate that land which had remained vacant may be available for development in the future. Wayne Township, Arvada, and Savannah were the only cities where a large number of their floodplain parcels did not have road frontage. Omaha, Savannah, Scottsdale, Toledo and Tulsa had the lowest percentages of subdivided and platted vacant parcels.

Public policies--particularly zoning and provision of public services--also had an impact on the use of land. The last column in Table D-6 shows that for 35% of the vacant parcels commercial or industrial use was allowed on at least

a portion of the parcel. Wayne Township, Toledo, and Omaha had the highest percentages of commercial and industrial zoning. Both Wayne and Omaha, as mentioned earlier, were encouraging commercial and industrial uses in some portions of their floodplains. The lower percentage of commercial and industrial zoning for developed parcels indicates that most development occurred in residential areas.

Agricultural and conservation zoning applied to 9% of the vacant parcels in the sample (mostly in Omaha and Tulsa). Provision of sewer was not a major factor influencing floodplain development in our case study cities since nearly all parcels had sewer service readily available. The exception was Wayne Township, where 72% of the vacant parcels did not have sewer service.

TABLE D-1

LAND MARKET INDICATORS: VALUES OF DEPENDENT VARIABLES

City	Mean* Assessed Value ($/1000 sq. ft.)	Odds of** Development (dev/vac)
Arvada	958	.81
Cape Girardeau	152	.57
Fargo	377	2.04
Omaha	360	.57
Palatine	1,217	.03
Savannah	293	.29
Scottsdale	1,474	7.17
Toledo	383	.22
Tulsa	118	.14
Wayne	1,169	.06
Ten City Sample	958	.30

*Mean land value of vacant parcels available for residential development, n = 511.

**Based on sample of all parcels, n = 1,008.

TABLE D-2

PARCEL SAMPLE: AVERAGE PARCEL SIZE AND CURRENT LAND VALUE

City	----1976*----- # of Parcels	Total Acreage	------1985**---- Vacant %	Developed %R	%C	%I
Arvada	38	392	57	29	11	2
Cape Girardeau	59	366	64	25	10	0
Fargo	73	349	33	63	4	0
Omaha	131	1,333	64	18	13	5
Palatine	135	111	97	3	0	0
Savannah	67	1,047	78	16	6	0
Scottsdale	49	514	12	73	15	0
Toledo	45	498	84	11	5	0
Tulsa	115	1,869	89	9	2	0
Wayne	296	686	94	4	1	1
Total	1,008	7,165	77	17	5	1

*All of the parcels selected in the sample were vacant in 1976.

**Percent of 1976 vacant parcels in each development status in 1985: vacant, residential (R), commercial (C), and industrial (I).

TABLE D-3

CHARACTERIZATION OF FLOODING HAZARD FOR PARCEL SAMPLE

City	Percent of Parcel Within the Regulatory Floodplain				
	< 25%	25-50%	51-75%	76-99%	100%
Arvada	17.1	0.0	11.4	25.7	45.7
Cape Girardeau	10.2	3.4	22.0	27.1	37.3
Fargo	5.5	8.2	2.7	2.7	80.8
Omaha	16.0	24.4	25.2	8.4	26.0
Palatine	19.3	17.0	23.0	5.9	34.8
Savannah	1.5	3.0	9.0	10.4	76.1
Scottsdale	18.4	4.1	18.4	16.3	42.8
Toledo	41.9	20.9	9.3	20.9	7.0
Tulsa	27.8	10.4	15.7	15.7	30.4
Wayne	0.7	2.0	3.0	3.0	1.2
Sub-Total					
Vacant	11.2	9.0	12.7	9.6	57.5
Developed	17.0	10.9	13.5	10.0	50.0
Total	12.5	9.4	12.9	9.7	55.6

TABLE D-4

CHARACTERIZATION OF FLOODING HAZARD FOR PARCEL SAMPLE

Parcel Type	Percent of Parcels Within Categories of Composite Hazard Variable			
	Low Hazard			High Hazard
	1 - 3	4 - 6	7 - 9	10 - 12
Vacant	31.3	48.2	14.9	5.6
Developed	39.9	35.3	12.7	11.9
Total	33.3	45.1	14.4	7.1

TABLE D-5

ACCESSIBILITY CHARACTERISTICS OF FLOODPLAIN PARCELS: 1985

City	Mean Distances to Urban Amenities* Thoroughfare (00 feet) Vac/Dev	CBD (miles) Vac/Dev	Shop (miles) Vac/Dev	Recreation (miles) Vac/Dev
Arvada	5/12	12/13	5/5	0.1/0.1
Cape Girardeau	17/12	2/3	3/2	0.5/0.4
Fargo	21/10	2/4	3/5	0.2/0.5
Omaha	24/26	9/10	3/4	0.6/0.4
Palatine	12/10	3/3	3/4	0.4/0.2
Savannah	20/17	6/7	3/4	1.4/1.5
Scottsdale	2/2	14/13	2/2	0.1/0.1
Toledo	3/6	5/5	5/5	0.9/0.6
Tulsa	6/6	12/15	9/8	1.1/1.2
Wayne	37/14	18+/18 +	3/4	1.1/0.3
Total	23/12	11/10	4/4	0.8/0.5

*Vac = vacant parcels.
Dev = developed parcels.

TABLE D-6

CHARACTERISTICS OF FLOODPLAIN PARCELS: 1985

City	Percent Without Road Frontage Vac/Dev*	Percent in Platted Subdivision Vac / Dev	Percent Zoned Commercial or Industrial Vac / Dev
Arvada	29/0	86/82	29/35
Cape Girardeau	8/0	58/100	16/33
Fargo	0/0	88/98	0/0
Omaha	14/0	56/85	36/36
Palatine	4/0	97/100	15/0
Savannah	23/0	48/80	31/33
Scottsdale	17/0	17/98	38/21
Toledo	16/0	22/50	65/25
Tulsa	10/0	48/71	22/21
Wayne	29/0	80/47	52/41
Total	18/0	70/86	35/24

*Vac = Vacant parcels.
Dev = Developed parcels.

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