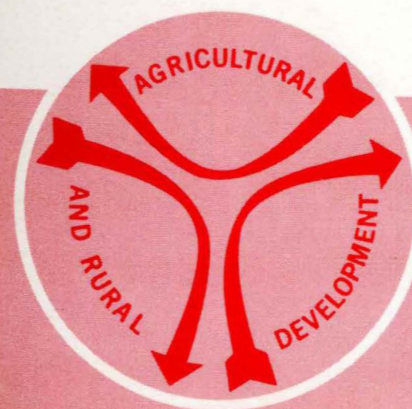


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SUPPLEMENTAL APPENDICES:
**Land Use Inventory and
Projection Model with Applications
to Iowa and Its Subregions**

CARD Miscellaneous Report



THE CENTER FOR
AGRICULTURE AND RURAL DEVELOPMENT
IOWA STATE UNIVERSITY, AMES, IOWA 50011

JAMES A. GIBSON is a member of Management Services, Arthur Young
and Company, So. State University, research
associates.

SUPPLEMENTAL APPENDICES: LAND USE

INVENTORY AND PROJECTION MODEL WITH APPLICATIONS

TO IOWA AND ITS SUBREGIONS

JOHN F. TIMMONS is Charles F. Curtiss Distinguished Professor
of Agriculture and Professor of Economics, Iowa State University.

By

This research was supported by 1) the Iowa Development Commission
2) Title V of the Rural Development Act of 1972, and 3) the Iowa
Agriculture and Home Economics Experiment Station.

James A. Gibson
John F. Timmons

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CARD MISCELLANEOUS REPORT

Center for Agricultural and Rural Development
Iowa State University, Ames, Iowa
October 1978

This report is a supplement to CARD Report 82, "Land Use Inventory
and Projection Model with Applications to Iowa and Its Subregions."

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TO IOWA AND ITS SUBREGIONS

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	1970	1975	1980
1. Total	142	115	127
2. Total	150	150	150
3. Total	140	130	135
4. Total	152	140	151
5. Total	148	137	140

1975 year scale incorporated into survey.

The data presented in this table are based on the 1975 year scale incorporated into the survey. The data are presented in the table in the order in which they appear in the survey. The data are presented in the table in the order in which they appear in the survey.

1. Total - 142; 2. Total - 150; 3. Total - 140; 4. Total - 152; 5. Total - 148.

I. APPENDIX A. DATA SUMMARY TABLES

Table 1. Iowa incorporated place land use proportions^a

"1973" land use acres 1973 total incorporated place land acres	Population size class ^b		
	50,000+	10,001-50,000	5,001-10,000
LU1/total ^c	.264 (.117-.537)	.179 (.093-.281)	.235 (.089-.759)
LU2/total	.033 (.008-.069)	.050 (.003-.116)	.057 (.009-.116)
LU3/total	.044 (.020-.285)	.086 (.014-.476)	.035 (.013-.110)
$\sum_{i=1}^3 \text{LU}_i$ total	.341	.315	.327
LU4/total	.059 (.029-.105)	.058 (.032-.081)	.068 (.008-.251)
$\sum_{i=1}^4 \text{LU}_i$ total	.400	.373	.395
LU5/total	.052 (.002-.165)	.190 (0.00-.537)	.195 (0.00-.578)
LU6/total	.548 (.248-.737)	.437 (.146-.702)	.410 (.028-.730)

^aSource of data: Iowa Incorporated Place Survey, 1975.

^bThe above coefficients represent the summation over incorporated place land use acres divided by the summation over incorporated place total land acres. The coefficients are not the arithmetic average of the individual incorporated place ratios. Coefficients in parentheses indicate the individual incorporated place low to high coefficient range.

^cLU1 - residential and associated land use; LU2 - manufacturing and associated land use; LU3 - wholesale trade, retail trade, services, and associated land use; LU4 - recreational and associated land use; LU5 - undeveloped land use; LU6 - other land uses.

Table 1 (continued)

	Population size class ^a			Entire population
	2,501-5,000	1,501-2,500	1,500 or less	
	.270 (.094-.837)	.279 (.063-.786)	.214 (0.0-.996)	.232 (0.0-.996)
	.073 (.002-.207)	.035 (0.00-.198)	.008 (0.0-.148)	.033 (0.0-.207)
	.047 (0.00-.117)	.062 (0.00-.283)	.025 (0.0-.285)	.046 (0.0-.476)
	.390	.376	.247	.311
	.035 (.001-.094)	.041 (0.00-.143)	.011 (0.0-.119)	.042 (0.0-.251)
	.425	.417	.258	.353
	.069 (0.00-.229)	.064 (0.00-.391)	.027 (0.0-.304)	.075 (0.0-.578)
	.506 (.031-.859)	.518 (0.00-.849)	.716 (0.0-.962)	.563 (0.0-.962)

Table 2. Iowa incorporated place land use proportions and per capita land uses

	Population size class ^a		
	50,000+	10,001-50,000	5,001-10,000
"1967" land use acres ^b			
1967 total employees ^c			
LU2/employees 2 ^d	.068 (.023-.191)	.098 (.036-.359)	.122 (.009-1.000)
LU3/employees 3 ^d	.094 (.024-.299)	.238 (.027-.770)	.101 (.042-.358)
1973 road acres ^e			
1973 total incorporated place land acres	.086 (.048-.134)	.075 (.041-.146)	.107 (.064-.175)
1973 road acres incorporated place land acres	.125 (.063-.150)	.127 (.083-.184)	.155 (.101-.224)

^aThe above coefficients represent the summation over incorporated place land use acres divided by the summation over incorporated place land acres or employment. The coefficients are not the arithmetic average of the individual incorporated place ratios. Coefficients in parentheses indicate the individual incorporated place low to high coefficient range.

^bSource of data: Iowa Incorporated Place Survey, 1975.

^cSource of data: (27)

^dLU2 - manufacturing and associated land use; LU3 - wholesale trade, retail trade, services, and associated land use.

^eSource of data: Unpublished data, Iowa State Highway Commission, Statistics Section.

Table 2 (continued)

2,501-5,000	1,501-2,500	1,500 or less	Entire population
.799 (.112-2.417)	.225 (0.0-6.440)	.151 (0.0-12.000)	.096 (0.0-12.0)
.118 (0.0-.287)	.234 (0.0-20.000)	.313 (0.0-2.308)	.154 (0.0-20.0)
.092 (.028-.204)	.091 (.033-.252)	.077 (.021-.364)	.084 (.021-.364)
.149 (.045-.278)	.172 (.077-.354)	.184 (0.0-.647)	.149 (0.0-.647)

Table 3. Iowa incorporated place land use proportions^a

"1973" land use acres 1973 total nonagricultural incorporated place land acres	Population size class ^b		
	50,000+	10,001-50,000	5,001-10,000
LU1/nonagriculture ^c	.385 (.206-.706)	.298 (.149-.494)	.343 (.141-.930)
LU2/nonagriculture	.048 (.016-.091)	.084 (.005-.191)	.083 (.002-.173)
LU3/nonagriculture	.065 (.025-.123)	.143 (.016-.559)	.051 (.014-.138)
$\sum_{i=1}^3$ LU _i nonagriculture	.498	.525	.477
LU4/nonagriculture	.086 (.039-.147)	.097 (.042-.156)	.099 (.008-.480)
$\sum_{i=1}^4$ LU _i nonagriculture	.584	.622	.576
LU5/nonagriculture	.138 (.004-.279)	.174 (0.0-.560)	.277 (0.0-.621)
LU6/nonagriculture	.799 (.278-1.475)	.729 (.191-1.683)	.599 (.034-1.155)

^aSources of data: Iowa Incorporated Place Survey, 1975. and unpublished agricultural land use data, Iowa Department of Revenue.

^bThe above coefficients represent the summation over incorporated place land use acres divided by the summation over incorporated place nonagricultural land acres. The coefficients are not the arithmetic average of the individual incorporated place ratios. Coefficients in parentheses indicate the individual incorporated place low to high coefficient range.

^cLU1 - residential and associated land use; LU2 - manufacturing and associated land use; LU3 - wholesale trade, retail trade, services, and associated land use; LU4 - recreational and associated land use; LU5 - undeveloped land use; LU6 - other land uses.

Table 3 (continued)

	2,501-5,000	1,501-2,500	1,500 or less	Entire population
	.432 (.170-.937)	.579 (.182-.882)	.590 (0.0-.976)	.420 (0.0-.976)
	.117 (.003-.329)	.073 (0.0-.459)	.021 (0.0-.279)	.059 (0.0-.459)
	.076 (0.0-.180)	.128 (0.0-.509)	.070 (0.0-.448)	.083 (0.0-.559)
	.625	.780	.681	.562
	.057 (.002-.161)	.085 (0.0-.449)	.030 (0.0-.140)	.076 (.002-.480)
	.682	.865	.711	.638
	.121 (0.0-.379)	.050 (0.0-.705)	.074 (0.0-.635)	.139 (0.0-.705)
	.809 (.035-1.556)	.990 (0.0-7.801)	1.979 (0.0-10.561)	1.020 (0.0-10.561)

Table 4. Iowa incorporated place land use proportions and per capita land uses for the year 1930^a

Acres	Population size class						Entire population
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	1,500 or less	
<u>Residential acres</u>							
Total acres	.217	.318	.314	.219	.224	.154	.257
<u>Commercial acres</u>							
Total acres	.018	.033	.013	.010	.016	.014	.020
<u>Industrial acres</u>							
Total acres	.021	.043	.009	.005	.003	.004	.020
<u>Streets acres</u>							
Total acres	.118	.164	.144	.116	.141	.083	.131
<u>Residential acres</u>							
Population	.059	.067	.101	.124	.113	.146	.080
<u>Commercial acres</u>							
Population	.005	.007	.004	.005	.007	.013	.006
<u>Industrial acres</u>							
Population	.005	.009	.002	.002	.001	.004	.006
<u>Streets acres</u>							
Population	.032	.037	.046	.056	.065	.082	.041
Number of incorporated places	4	16	11	37	20	34	122

^aThe above coefficients were calculated from (12, p. 142). They represent summation over Iowa incorporated place land use acres divided by the summation over incorporated total land acres or population.

Table 5. 1960 total agricultural land use acres within Iowa incorporated places divided by 1960 total Iowa incorporated place land acres^a

Region	Population size class ^b						Region total
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	1,500 or less	
1	- ^c	-	.231 (.218-.243)	.496 (.111-.582)	.240 (0.0-.337)	.510 (0.0-.996)	.430 (0.0-.996)
2	-	.291 (.291-.291)	.214 (.154-.319)	.376 (.180-.522)	.589 (.313-.605)	.779 (0.0-.852)	.641 (0.0-.852)
3	-	.351 (.351-.351)	.324 (.296-.342)	.410 (.143-.654)	.352 (.090-.510)	.254 (0.0-.567)	.331 (0.0-.654)
4	.400 (.400-.400) ^d	-	.477 (.469-.488)	.695 (.695-.695)	.253 (.224-.292)	.256 (0.0-.302)	.393 (0.0-.695)
5	-	.110 (.110-.110)	.375 (.375-.375)	.511 (.485-.550)	.657 (.408-.725)	.682 (.052-.972)	.600 (.052-.972)
6	-	.124 (.124-.124)	.345 (.111-.455)	.583 (.559-.597)	.474 (.441-.488)	.350 (.350-.350)	.366 (.111-.597)

^aSources of data: Iowa Incorporated Place Survey, 1975, and unpublished agricultural land use data, Iowa Department of Revenue.

^bThe above coefficients represent the summation over incorporated place agricultural land use acres divided by the summation over incorporated place total land acres. The coefficients are not the arithmetic average of the individual incorporated place ratios. Coefficients in parentheses indicate the individual incorporated place low to high coefficient range.

^cA dash indicates that there was no incorporated place in the given size class in the region.

^dFor some categories, only one incorporated place was considered; hence, no coefficient range is presented.

Table 5. (continued)

Region	Population size class						Region total
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	1,500 or less	
7	.315 (.315-.315)	.138 (.138-.138)	.352 (.056-.462)	.282 (.199-.336)	.523 (.471-.608)	.370 (.370-.370)	.341 (.056-.608)
8	.113 (.113-.113)	.178 (.178-.178)	.407 (.407-.407)	.358 (0.0-.646)	.073 (0.0-.128)	.360 (0.0-.719)	.271 (0.0-.719)
9	.426 (.426-.426)	.302 (.207-.428)	-	.290 (.290-.290)	.438 (.206-.527)	.805 (0.0-.865)	.528 (0.0-.865)
10	.260 (.260-.260)	.301 (.121-.554)	.222 (.221-.224)	.280 (.042-.554)	.143 (.117-.176)	.777 (0.0-.868)	.545 (0.0-.868)
11	.155 (.155-.155)	.387 (.182-.540)	.275 (.070-.607)	.469 (.170-.643)	.360 (.047-.434)	.684 (0.0-1.000)	.397 (0.0-1.000)
12	-	-	.433 (.268-.551)	.570 (.324-.688)	.453 (.039-.630)	.257 (.116-.900)	.309 (.039-.900)
13	.139 (.139-.139)	-	.263 (.185-.344)	.186 (.053-.422)	.359 (.224-.473)	.131 (0.0-.262)	.196 (0.0-.473)
14	-	-	.216 (.216-.216)	.325 (.095-.440)	.456 (.405-.573)	.614 (.146-.831)	.527 (.095-.831)
15	-	.066 (.066-.066)	.226 (.048-.338)	.311 (.185-.378)	.236 (.236-.236)	.610 (.137-.792)	.413 (.048-.792)

^dFor some categories, only one incorporated place was considered; hence, no coefficient range is presented.

Table 5. (continued)

Region	Population size class						Region total
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	1,500 or less	
16	-	.190 (.090-.242)	.163 (.163-.163)	.609 (.609-.609)	.216 (.169-.249)	.419 (0.0-.545)	.262 (0.0-.609)
Size class total	.286 (.113-.426)	.260 (.066-.554)	.301 (.048-.607)	.419 (0.0-.695)	.457 (0.0-.725)	.578 (0.0-1.000)	.435 (0.0-1.000)

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Table 6. 1970 total agricultural land use acres within Iowa incorporated places divided by 1970 total Iowa incorporated place land acres^a

Region	Population size class ^b						Region total
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	1,500 or less	
1	- ^c	-	.310 (.202-.396)	.388 (.078-.486)	.240 (0.0-.337)	.509 (0.0-.996)	.418 (0.0-.996)
2	-	.294 (.294-.294)	.214 (.103-.389)	.356 (.149-.493)	.543 (.140-.744)	.760 (0.0-.833)	.617 (0.0-.833)
3	-	.517 (.517-.517)	.286 (.224-.331)	.347 (.143-.632)	.250 (0.0-.365)	.246 (0.0-.524)	.318 (0.0-.632)
4	.406 (.406-.406) ^d	-	.445 (.394-.488)	.651 (.651-.651)	.198 (.178-.223)	.247 (0.0-.302)	.388 (0.0-.651)
5	-	.398 (.398-.398)	.507 (.507-.507)	.478 (.439-.512)	.637 (.356-.703)	.664 (.080-.912)	.591 (.080-.912)
6	-	.378 (.378-.378)	.327 (.136-.451)	.523 (.485-.544)	.417 (.415-.421)	.350 (.350-.350)	.397 (.136-.544)

11

^aSources of data: Iowa Incorporated Place Survey, 1975, and unpublished agricultural land use data, Iowa Department of Revenue.

^bThe above coefficients represent the summation over incorporated place agricultural acres divided by the summation over incorporated place total land acres. The coefficients are not the arithmetic average of the individual incorporated place ratios. Coefficients in parentheses indicate the individual incorporated place low to high coefficient range.

^cA dash indicates that there was no incorporated place in the given size class in the region.

^dFor some categories, only one incorporated place was considered; hence, no coefficient range is presented.

Table 6. (continued)

Region	Population size class					Region total	
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500		1,500 or less
7	.441 (.441-.441)	.473 (.473-.473)	.311 (.101-.400)	.300 (.232-.386)	.487 (.436-.536)	.290 (.290-.290)	.414 (.101-.536)
8	.104 (.104-.104)	.625 (.625-.625)	.373 (.373-.373)	.425 (0.0-.646)	.060 (0.0-.103)	.295 (0.0-.531)	.399 (0.0-.646)
9	.525 (.525-.525)	.340 (.207-.439)	-	.570 (.570-.570)	.585 (.169-.682)	.787 (0.0-.846)	.570 (0.0-.846)
10	.307 (.307-.307)	.448 (.418-.521)	.439 (.168-.535)	.233 (.061-.469)	.142 (.116-.176)	.679 (0.0-.781)	.456 (0.0-.781)
11	.124 (.124-.124)	.352 (.166-.514)	.342 (.049-.496)	.445 (.153-.600)	.300 (.086-.407)	.590 (.050-1.000)	.370 (.049-1.000)
12	-	-	.394 (.235-.499)	.526 (.274-.661)	.409 (.017-.581)	.255 (.114-.897)	.301 (.017-.897)
13	.348 (.348-.348)	-	.293 (.161-.494)	.172 (.026-.422)	.303 (.177-.414)	.122 (0.0-.256)	.286 (0.0-.494)
14	-	-	.280 (.280-.280)	.330 (.131-.440)	.468 (.406-.552)	.611 (.143-.831)	.529 (.131-.831)
15	-	.035 (.024-.062)	.259 (.180-.314)	.272 (.125-.378)	.194 (.194-.194)	.578 (.137-.780)	.378 (.024-.780)

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Table 6. (continued)

Region	Population size class					Region total	
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500		1,500 or less
16	-	.201 (.082-.247)	.321 (.321-.321)	.560 (.560-.560)	.178 (.154-.194)	.390 (0.0-.507)	.281 (0.0-.560)
Size class total	.346 (.104-.525)	.378 (.024-.625)	.336 (.049-.535)	.400 (0.0-.661)	.434 (0.0-.744)	.537 (0.0-1.000)	.430 (0.0-1.000)

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Table 7. Iowa incorporated place per capita land uses^a

"1970" land use acres 1970 total population	Population size class ^b		
	50,000+	10,001-50,000	5,001-10,000
LU1/population ^c	.080 (.050-.229)	.067 (.024-.127)	.093 (.056-.295)
LU2/population	.010 (.003-.029)	.017 (.001-.033)	.022 (.001-.076)
LU3/population	.014 (.004-.023)	.032 (.003-.099)	.013 (.005-.051)
$\sum_{i=1}^3 \text{LU}_i$ population	.104	.116	.128
LU4/population	.019 (.009-.031)	.020 (.007-.039)	.027 (.003-.129)
$\sum_{i=1}^4 \text{LU}_i$ population	.123	.136	.155
LU5/population	.029 (.001-.080)	.034 (0.0-.091)	.075 (0.0-.306)
LU6/population	.176 (.049-.311)	.139 (.040-.485)	.161 (.011-.532)

^aSources of data: Iowa Incorporated Place Survey, 1975. and 1970 U.S. Census of Population (129).

^bThe above coefficients represent the summation over incorporated place land use acres divided by the summation over incorporated place population. The coefficients are not the arithmetic average of the individual incorporated place ratios. Coefficients in parentheses indicate the individual incorporated place low to high coefficient range.

^cLU1 - residential and associated land use; LU2 - manufacturing and associated land use; LU3 - wholesale trade, retail trade, services, and associated land use; LU4 - recreational and associated land use; LU5 - undeveloped land use; LU6 - other land uses.

Table 7. (continued)

2,501-5,000	1,501-2,500	1,500 or less	Entire population
.140 (.031-.475)	.199 (.054-.717)	.249 (0.0-.802)	.110 (0.0-.802)
.038 (.001-.375)	.022 (0.0-.233)	.007 (0.0-.244)	.014 (0.0-.375)
.023 (0.0-.173)	.044 (0.0-.209)	.028 (0.0-.245)	.021 (0.0-.245)
.201	.265	.284	.145
.018 (0.0-.051)	.027 (0.0-.098)	.013 (0.0-.264)	.020 (0.0-.264)
.219	.292	.297	.165
.041 (0.0-.144)	.022 (0.0-.235)	.032 (0.0-.274)	.036 (0.0-.306)
.255 (0.0-.790)	.294 (0.0-1.537)	.860 (0.0-37.885)	.268 (0.0-37.885)

Table 8. Percentage of Iowa incorporated places that had acreage annexation or de-annexation between 1960 and 1970^a

	Population size class						Row total
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	1,500 or less	
	(percent)						
<u>Annexation</u>							
Had	100.0	88.9	78.8	54.8	54.5	16.0	25.3
Did not have	0.0	11.1	21.2	45.2	45.5	84.0	74.7
Column total	0.7	2.1	3.9	5.0	6.9	81.2	100.0
<u>De-annexation</u>							
Had	14.3	5.6	3.0	2.4	0.0	1.9	2.0
Did not have	85.7	94.4	97.0	97.6	100.0	98.1	98.0
Column total	0.7	2.1	3.9	5.0	6.9	81.2	100.0

^aSource of data: Iowa Incorporated Place Survey, 1975.

Table 9. Percentage of Iowa incorporated places that had a net decrease or increase in population from 1960 to 1970^a

Incorporated place net population change	Population size class						Row total
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	1,500 or less	
	(percent)						
Decreased	28.6	22.2	33.3	33.3	36.4	59.4	54.4
Increased	71.4	72.2	66.7	66.7	63.6	40.5	45.3
Same	0.0	5.6	0.0	0.0	0.0	0.2	0.3
Column total	.7	2.2	3.9	5.0	7.0	81.2	100.0

^aSource of data: Iowa Incorporated Place Survey, 1975.

Table 10. Percentage of Iowa incorporated places that had a net decrease or increase in total incorporated place land area from 1960 to 1970^a

Incorporated place net total land area change	Population size class					Row total
	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	1,500 or less	
Decreased	0.0	0.0	2.4	0.0	1.9	1.6
Increased	100.0	78.1	52.4	54.5	15.8	24.9
Same	0.0	11.1	45.2	45.5	82.3	73.4
Column total	.7	3.8	5.0	7.0	81.3	100.0

(percent)

^aSource of data: Iowa Incorporated Place Survey.

Table 11. Percentage of Iowa incorporated places that had a net decrease or increase in population from 1960 to 1970 compared with the percentage of Iowa incorporated places that had acreage annexation or de-annexation between 1960 and 1970^a

Annexation	Incorporated place net population change			Population Size class
	Decreased	Increased	Same	
(percent)				
Had	100.0	100.0	0.0	50,000+
Did not have	0.0	0.0	0.0	
Had	100.0	84.6	100.0	10,001-50,000
Did not have	0.0	15.4	0.0	
Had	63.6	86.4	0.0	5,001-10,000
Did not have	36.4	13.6	0.0	
Had	35.7	64.3	0.0	2,501-5,000
Did not have	64.3	35.7	0.0	
Had	37.5	64.3	0.0	1,501-2,500
Did not have	62.5	35.7	0.0	
Had	11.5	22.3	0.0	1,500 or less
Did not have	88.5	77.7	100.0	
De-annexation				
Had	0.0	20.0	0.0	50,000+
Did not have	100.0	80.0	0.0	
Had	25.0	0.0	0.0	10,001-50,000
Did not have	75.0	100.0	0.0	
Had	0.0	4.5	0.0	5,001-10,000
Did not have	100.0	95.5	0.0	
Had	0.0	3.6	0.0	2,501-5,000
Did not have	100.0	96.4	0.0	
Had	0.0	0.0	0.0	1,501-2,500
Did not have	100.0	100.0	0.0	
Had	.3	4.2	0.0	1,500 or less
Did not have	99.7	95.8	0.0	

^aSource of data: Iowa Incorporated Place Survey, 1975.

Table 12. Change from 1960 to 1970 in total Iowa incorporated place land acres divided by 1960 total Iowa incorporated place land acres^a

Region	Population size class ^b						Region total
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	1,500 or less	
1	- ^c	-	.709 (.709-.709)	.031 (0.0-.133)	0.0 (0.0-0.0)	.009 (0.0-.038)	.081 (0.0-.709)
2	-	.002 (.002-.002) ^d	.080 (.024-.184)	.179 (0.0-.682)	.024 (0.0-.155)	0.0 (0.0-0.0)	.020 (0.0-.682)
3	-	.096 (.096-.096)	.035 (.017-.051)	.103 (0.0-.336)	.165 (0.0-.381)	.014 (0.0-.071)	.070 (0.0-.381)
4	.148 (.148-.148)	-	.120 (.003-.311)	0.0 (0.0-0.0)	.120 (.070-.189)	0.0 (0.0-0.0)	.108 (0.0-.311)
5	-	1.225 (1.225-1.225)	.569 (.569-.569)	0.0 (0.0-0.0)	.002 (0.0-.011)	.010 (0.0-.413)	.138 (0.0-1.225)
6	-	.790 (.790-.790)	.095 (0.0-.269)	0.0 (0.0-0.0)	.019 (0.0-.027)	0.0 (0.0-0.0)	.231 (0.0-.790)

^aSource of data: Iowa Incorporated Place Survey, 1975.

^bThe above coefficients represent the summation over incorporated place net annexed acres divided by the summation over incorporated place total land acres. The coefficients are not the arithmetic average of the individual incorporated place ratios. Coefficients in parentheses indicate the individual incorporated place low to high coefficient range.

^cA dash indicates that there was no incorporated place in the given size class in the region.

^dFor some categories, only one incorporated place was considered; hence, no coefficient range is presented.

Table 12. (continued)

Region	Population size class						Region total
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	1,500 or less	
7	.789 (.789-.789)	1.134 (0.0-1.134)	.006 (0.0-.014)	.101 (.101-.101)	0.0 (0.0-0.0)	.125 (.125-.125)	.513 (0.0-.789)
8	.261 (.261-.261)	2.047 (2.047-2.047)	0.0 (0.0-0.0)	.268 (0.0-.574)	.093 (.061-.116)	.005 (0.0-.017)	.494 (0.0-2.047)
9	.253 (.253-.253)	.376 (0.0-.952)	-	-	.578 (.128-.872)	0.0 (0.0-0.0)	.214 (0.0-.952)
10	.511 (.511-.511)	1.256 (.967-1.400)	.040 (.040-.040)	.026 (0.0-.093)	.031 (0.0-.055)	-.302 (-.399-0.0)	.119 (0.0-1.400)
11	.023 (.023-.023)	.128 (0.0-.311)	.854 (0.0-10.256)	.549 (.013-3.405)	.044 (.004-.156)	.003 (0.0-.088)	.126 (0.0-10.256)
12	-	-	.311 (.211-.373)	.005 (0.0-.032)	.005 (0.0-.016)	.005 (0.0-.058)	.046 (0.0-.373)
13	1.856 (1.856-1.856)	-	.286 (0.0-1.089)	.002 (0.0-.005)	.096 (0.0-.251)	.056 (0.0-.094)	.579 (0.0-1.856)
14	-	-	.127 (.127-.127)	0.0 (0.0-0.0)	.040 (0.0-.098)	.003 (0.0-.019)	.021 (0.0-.127)
15	-	.070 (.036-.171)	.197 (0.0-.445)	.071 (0.0-.243)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	.050 (0.0-.445)

Table 12. (continued)

Region	Population size class					Region total
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500 or less	
16	.371	.091	1.780	.001	0.0	.096
	(.023-1.856)	(.011-.100)	(1.780-1.780)	(0.0-.002)	(0.0-0.0)	(0.0-1.780)
Size class total	.518	.276	.112	.076	-.033	.168
	(0.0-2.047)	(0.0-10.256)	(0.0-3.405)	(0.0-.872)	(0.0-.413)	(0.0-10.256)

Table 13a. Iowa incorporated place land use data table key

Number	Description
1	1970 population within incorporated places ^a
2	1960 population within incorporated places ^a
3	1970 total land acres within incorporated places ^b
4	1960 total land acres within incorporated places ^c
5	1970 agricultural land acres within incorporated places ^d
6	1960 agricultural land acres within incorporated places ^d
7	1970 incorporated place nonagricultural land acres (= 3-5)
8	1960 incorporated place nonagricultural land acres (= 4-6)
9	Change in population from 1960 to 1970 within incorporated places (= 1-2)
10	1970 incorporated place average nonagricultural land absorption coefficient (= 7/1)
11	1960 incorporated place average nonagricultural land absorption coefficient (= 8/2)
12	Change in incorporated place nonagricultural land acres from 1960 to 1970 (= 7-8)
13	Incorporated place 1960 to 1970 average nonagricultural land absorption coefficient (= (10+11)/2)
14	Incorporated place 1960 to 1970 marginal nonagricultural land absorption coefficient

^aSources of data: 1970 and 1960 U.S. Census of Population (128) (129).

^bSources of data: Iowa Incorporated Place Survey, 1975, and 1970 U.S. Census of Population (129) for 1970 land area within incorporated places greater than 2,500 in population in 1970.

^cSources of data: Iowa Incorporated Place Survey, 1975, and U.S. Department of Commerce Area Measurement Reports (116) for 1960 land area within incorporated places greater than 2,500 in population in 1970.

^dSource of data: Unpublished agricultural land use data, Iowa Department of Revenue.

Table 13b. Iowa incorporated place land use data by 16 regions

	1	2	3	4	5	6
Region 1	47,724	47,018	21,203	19,960	8,872	8,578
Region 2	107,555	108,431	87,173	85,337	53,793	54,720
Region 3	94,309	89,530	41,868	36,064	13,293	11,952
Region 4	122,779	124,667	54,407	52,844	21,104	20,791
Region 5	83,028	80,120	62,686	55,840	37,054	33,497
Region 6	54,573	49,197	23,632	18,133	9,386	6,637
Region 7	147,377	132,737	72,830	46,709	30,141	15,913
Region 8	152,378	142,189	60,714	41,253	24,205	11,172
Region 9	169,602	137,992	85,874	69,974	48,934	36,917
Region 10	242,239	194,249	96,082	80,524	43,847	43,859
Region 11	415,092	368,468	158,757	131,024	58,805	52,072
Region 12	58,465	57,984	70,384	68,671	21,151	21,241
Region 13	130,894	125,133	51,906	33,929	14,848	6,634
Region 14	33,081	34,094	34,427	33,671	18,230	17,744
Region 15	86,699	92,232	47,781	45,318	18,076	18,722
Region 16	87,943	88,576	30,041	25,431	8,446	6,671
State total	2,033,738	1,872,617	999,765	844,682	430,185	367,120

Table 13.b. (continued)

	7	8	9	10	11	12	13	14
	12,331	11,382	707	0.26	0.24	949	0.25	0.44
	33,380	30,616	-877	0.31	0.28	2,764	0.30	0.48
	28,574	24,114	4,780	0.30	0.27	4,462	0.29	0.54
	33,304	32,054	-1,890	0.27	0.26	1,250	0.26	0.33
	25,635	22,347	2,906	0.31	0.28	3,288	0.29	0.50
	14,246	11,496	5,376	0.26	0.23	2,750	0.25	0.40
	42,689	30,797	14,641	0.29	0.23	11,892	0.26	0.76
	36,508	30,082	10,189	0.24	0.21	6,426	0.23	0.58
	36,941	33,059	31,610	0.22	0.24	3,883	0.23	0.12
	52,234	36,664	47,991	0.22	0.19	15,571	0.20	0.32
	99,953	78,952	46,625	0.24	0.21	20,999	0.23	0.35
	49,232	47,432	480	0.84	0.82	1,801	0.83	0.53
	37,058	27,294	5,759	0.28	0.22	9,763	0.25	1.05
	16,199	15,927	-1,012	0.49	0.47	273	0.48	0.10
	29,705	26,596	-5,533	0.34	0.29	3,109	0.32	1.01
	21,595	18,760	-633	0.25	0.21	2,835	0.23	0.30
	569,584	477,572	161,119	0.28	0.26	92,015	0.27	0.40

Table 13.c. Iowa incorporated place land use data by population size classes

Size class	1	2	3	4	5
50,000+					
Region 4	85,925	89,159	33,280	32,896	13,507
Region 7	75,533	71,755	37,888	20,096	16,715
Region 8	62,309	56,606	10,496	8,384	1,089
Region 9	98,469	88,981	39,544	31,558	20,745
Region 10	110,642	92,035	32,448	19,136	9,951
Region 11	200,587	208,982	40,448	40,384	4,996
Region 13	60,348	55,641	25,856	10,624	8,997
Size class total	693,813	663,159	219,960	163,078	76,000
10,001-50,000					
Region 2	30,491	30,642	9,747	9,706	2,868
Region 3	10,278	8,864	5,248	2,752	2,713
Region 5	31,263	28,399	9,280	4,352	3,692
Region 6	26,219	22,521	9,344	4,672	3,530
Region 7	29,597	21,195	10,304	4,160	4,878
Region 8	34,719	33,589	21,184	6,592	13,230
Region 9	44,531	32,531	13,824	10,368	4,703
Region 10	64,878	44,325	19,072	8,320	8,549
Region 11	98,467	72,622	36,481	29,704	12,854
Region 15	40,834	44,924	10,560	9,600	365
Region 16	60,993	63,993	15,680	13,696	3,158
Size class total	472,270	403,605	160,724	103,922	60,540
5,001-10,000					
Region 1	15,193	14,717	4,608	3,776	1,429
Region 2	21,730	21,824	6,784	5,952	1,450
Region 3	16,699	15,655	4,864	4,608	1,391
Region 4	15,431	14,491	6,784	5,952	3,020
Region 5	8,488	8,520	4,032	2,432	2,045
Region 6	14,856	12,932	5,376	4,800	1,759
Region 7	18,153	17,593	6,912	6,144	2,148
Region 8	5,677	5,909	1,792	1,792	669
Region 10	12,447	8,394	6,848	2,368	3,008
Region 11	45,635	34,198	18,452	10,396	6,307
Region 12	14,598	12,612	5,824	4,288	2,297
Region 13	29,953	30,129	10,560	8,512	3,098
Region 14	8,234	7,667	3,380	3,000	948
Region 15	20,255	19,725	7,537	6,354	1,954
Region 16	7,007	7,339	4,000	2,526	1,285
Size class total	254,356	231,705	97,753	72,900	32,808

Table 13.c. (continued)

6	7	8	9	10	11	12	13	14
13,144	19,773	19,752	-3,234	0.23	0.22	21	0.23	0.00
6,339	21,173	13,757	3,778	0.28	0.19	7,416	0.24	1.96
944	9,407	7,440	5,703	0.15	0.13	1,967	0.14	0.34
13,444	18,799	18,114	9,488	0.19	0.20	685	0.20	0.07
4,974	22,497	14,162	18,607	0.20	0.15	8,335	0.18	0.45
6,267	35,452	34,117	-8,395	0.18	0.16	1,335	0.17	0.00
1,476	16,859	9,148	4,707	0.28	0.16	7,711	0.22	1.64
46,588	143,960	116,490	30,654	0.21	0.18	27,470	0.19	0.62
2,827	6,879	6,879	-151	0.23	0.22	0	0.23	0.00
965	2,535	1,787	1,414	0.25	0.20	748	0.22	0.53
480	5,588	3,872	2,864	0.18	0.14	1,716	0.16	0.60
579	5,814	4,093	3,698	0.22	0.18	1,721	0.20	0.47
574	5,426	3,586	8,402	0.18	0.17	1,840	0.18	0.22
1,175	7,954	5,417	1,130	0.23	0.16	2,537	0.20	2.25
3,134	9,121	7,234	12,000	0.20	0.22	1,887	0.21	0.16
2,502	10,523	5,818	20,553	0.16	0.13	4,705	0.15	0.23
11,500	23,627	18,204	25,845	0.24	0.25	5,423	0.25	0.21
633	10,195	8,967	-4,090	0.25	0.20	1,228	0.22	2.51
2,604	12,522	11,092	-3,000	0.21	0.17	1,430	0.19	0.00
26,973	100,184	76,949	68,665	0.21	0.19	23,235	0.20	0.28
874	3,179	2,902	476	0.21	0.20	277	0.20	0.19
1,275	5,334	4,677	-94	0.25	0.21	657	0.23	0.57
1,493	3,473	3,115	1,044	0.21	0.20	358	0.20	0.34
2,838	3,764	3,114	940	0.24	0.21	650	0.23	0.47
912	1,987	1,520	-32	0.23	0.18	467	0.21	0.00
1,655	3,617	3,145	1,924	0.24	0.24	472	0.24	0.25
2,162	4,764	3,982	560	0.26	0.23	782	0.24	0.54
730	1,123	1,062	-232	0.20	0.18	61	0.19	0.00
526	3,840	1,842	4,053	0.31	0.22	1,998	0.26	0.49
2,856	12,145	7,540	11,437	0.27	0.22	4,605	0.24	0.39
1,857	3,527	2,431	1,986	0.24	0.19	1,096	0.22	0.55
2,239	7,462	6,273	-176	0.25	0.21	1,189	0.23	0.48
648	2,432	2,352	567	0.30	0.31	80	0.30	0.14
1,439	5,583	4,915	530	0.28	0.25	668	0.26	0.69
411	2,715	2,115	-332	0.39	0.29	600	0.34	0.00
21,915	64,945	50,985	22,651	0.26	0.22	13,960	0.24	0.42

Table 13.c. (continued)

Size class	1	2	3	4	5
2,501-5,000					
Region 1	10,434	9,999	4,160	3,840	1,616
Region 2	12,032	11,184	5,952	5,184	2,117
Region 3	26,891	23,981	13,504	11,328	4,683
Region 4	3,154	3,176	2,880	2,816	1,874
Region 5	12,126	11,644	5,952	5,952	2,845
Region 6	6,223	6,150	4,416	4,224	2,308
Region 7	6,333	5,859	2,176	1,792	653
Region 8	18,072	15,531	12,299	9,758	5,225
Region 9	2,520	1,546	2,432	832	1,387
Region 10	18,571	18,103	5,574	5,305	1,298
Region 11	14,465	10,076	5,376	4,558	2,394
Region 12	10,910	10,852	7,105	7,073	3,736
Region 13	10,982	10,637	4,727	4,721	811
Region 14	5,664	5,523	3,584	3,456	1,181
Region 15	6,869	7,353	3,072	2,752	837
Region 16	3,139	2,560	1,920	768	1,075
Size class total	168,385	154,174	85,129	74,359	34,040
1,501-2,500					
Region 1	5,159	4,654	1,848	1,848	443
Region 2	12,407	11,163	8,416	8,221	4,567
Region 3	13,008	11,209	5,071	4,376	1,266
Region 4	5,772	5,835	2,633	2,350	521
Region 5	12,787	12,881	13,034	13,004	8,305
Region 6	5,971	5,967	3,205	3,146	1,337
Region 7	8,195	7,969	6,255	6,255	3,049
Region 8	6,026	5,586	1,774	1,623	106
Region 9	7,893	5,484	7,804	4,946	4,567
Region 10	5,581	5,326	1,440	1,397	204
Region 11	10,684	8,242	6,849	6,558	2,056
Region 12	5,155	5,534	3,142	3,127	1,286
Region 13	6,889	6,625	3,469	3,165	1,052
Region 14	8,429	8,549	4,807	4,623	2,248
Region 15	2,577	2,492	1,179	1,179	229
Region 16	5,572	5,079	1,728	1,728	307
Size class total	122,105	112,595	72,654	67,546	31,543
1,500 or less					
Region 1	16,938	17,648	10,587	10,496	5,384
Region 2	30,895	33,618	56,274	56,274	42,791
Region 3	27,433	29,821	13,181	13,000	3,240
Region 4	12,497	12,006	8,830	8,830	2,182
Region 5	18,364	18,676	30,388	30,100	20,167
Region 6	1,304	1,627	1,291	1,291	452

Table 13.c. (continued)

6	7	8	9	10	11	12	13	14
1,903	2,544	1,937	435	0.24	0.19	607	0.22	1.40
1,951	3,835	3,233	848	0.32	0.29	602	0.30	0.54
4,649	8,821	6,679	2,910	0.33	0.28	2,142	0.30	0.67
1,956	1,006	860	-22	0.32	0.27	146	0.29	0.00
3,042	3,107	2,910	482	0.26	0.25	197	0.25	0.16
2,461	2,108	1,763	73	0.34	0.29	345	0.31	1.57
506	1,523	1,286	474	0.24	0.22	237	0.23	0.50
3,492	7,074	6,266	2,541	0.39	0.40	808	0.40	0.32
241	1,045	591	974	0.41	0.38	454	0.40	0.47
1,485	4,276	3,820	468	0.23	0.21	456	0.22	0.37
2,137	2,982	2,421	4,389	0.21	0.24	561	0.22	0.13
4,030	3,369	3,043	58	0.31	0.28	326	0.29	1.04
880	3,916	3,841	345	0.36	0.36	75	0.36	0.06
1,123	2,403	2,333	141	0.42	0.42	70	0.42	0.00
855	2,235	1,897	-484	0.33	0.26	338	0.29	0.00
468	845	300	579	0.27	0.12	545	0.19	0.94
31,179	51,089	43,180	14,211	0.30	0.28	7,909	0.29	0.40
443	1,405	1,405	505	0.27	0.30	0	0.29	0.00
4,842	3,849	3,378	1,244	0.31	0.30	471	0.31	0.38
1,540	3,804	2,837	1,800	0.29	0.25	968	0.27	0.52
593	2,112	1,757	-64	0.37	0.30	356	0.33	0.00
8,541	4,730	4,463	-96	0.37	0.35	266	0.36	0.41
1,490	1,868	1,656	4	0.31	0.28	212	0.30	0.22
3,272	3,206	2,983	226	0.39	0.37	223	0.38	0.48
118	1,668	1,505	440	0.28	0.27	163	0.27	0.37
2,166	3,238	2,782	2,409	0.41	0.51	457	0.46	0.19
200	1,236	1,198	255	0.22	0.22	38	0.22	0.00
2,358	4,792	4,199	2,442	0.45	0.51	593	0.48	0.20
1,415	1,855	1,712	-380	0.36	0.31	143	0.33	0.00
1,136	2,418	2,029	264	0.35	0.31	388	0.33	0.79
2,107	2,559	2,515	-120	0.30	0.29	45	0.30	0.43
278	950	901	86	0.37	0.36	49	0.37	0.57
374	1,421	1,354	493	0.26	0.27	66	0.26	0.13
30,873	41,111	36,674	9,508	0.34	0.33	4,438	0.33	0.30
5,358	5,203	5,138	-709	0.31	0.29	65	0.30	5.00
43,825	13,483	12,449	-2,724	0.44	0.37	1,034	0.40	0.00
3,305	9,941	9,696	-2,388	0.36	0.33	246	0.34	0.29
2,260	6,649	6,571	490	0.53	0.55	77	0.54	0.09
20,522	10,223	9,582	-312	0.56	0.51	642	0.53	0.54
452	839	839	-323	0.64	0.52	0	0.58	0.00

Table 13.c. (continued)

Size class	1	2	3	4	5
Region 7	9,566	8,366	9,295	8,262	2,698
Region 8	25,575	24,968	13,169	13,104	3,886
Region 9	16,189	9,450	22,270	22,270	17,532
Region 10	30,120	26,066	30,700	43,998	20,837
Region 11	45,254	34,348	51,151	39,424	30,198
Region 12	27,802	28,986	54,313	54,183	13,832
Region 13	22,722	22,101	7,294	6,907	890
Region 14	10,754	12,355	22,656	22,592	13,853
Region 15	16,164	17,738	25,433	25,433	14,691
Region 16	11,232	9,605	6,713	6,713	2,621
Size class total	322,809	307,379	363,545	362,877	195,254
State total	2,033,738	1,872,617	999,765	844,682	430,185

Table 13.c. (continued)

6	7	8	9	10	11	12	13	14
3,060	6,597	5,203	1,201	0.69	0.62	1,394	0.66	1.16
4,713	9,282	8,392	607	0.36	0.34	890	0.35	0.77
17,932	4,738	4,338	6,739	0.29	0.46	400	0.38	0.06
34,172	9,862	9,824	4,055	0.33	0.38	39	0.35	0.01
26,954	20,955	12,471	10,907	0.46	0.36	8,482	0.41	0.77
13,939	40,481	40,246	-1,184	1.46	1.39	236	1.42	0.30
903	6,403	6,003	619	0.28	0.27	400	0.28	0.01
13,866	8,805	8,727	-1,600	0.82	0.71	78	0.76	0.00
15,517	10,742	9,916	-1,575	0.66	0.56	826	0.61	0.00
2,814	4,092	3,899	1,627	0.36	0.41	194	0.39	0.12
209,592	168,295	153,294	15,430	0.52	0.50	15,003	0.51	0.41
367,120	569,584	477,572	161,119	0.28	0.26	92,015	0.27	0.40

Table 14. 1970 Iowa road system acres^a

	Total acres right-of-way	Acres of interchange	Acres of surface	Acres of shoulder	Acres remaining right-of-way
Interstate	30,868	6,480	3,433	2,289	18,666
Rural primary	153,510	800	22,831	18,219	111,660
Municipal primary	8,927	0	4,437	258	4,232
Secondary rural	842,802	57,052	239,746 ^b	15,572	530,432
Secondary municipal	67,286	1,096	32,349	3,321	30,520
Total	1,103,393	65,428	302,796	39,659	695,510

^aSource: (118) Park Roads within incorporated places and alleys within incorporated places are not included.

^bApproximately 85 percent is gravel or soil surfaced.

Table 15. Estimated acres of secondary rural roads deactivated per year by region

Region	Acres
1	51.8
2	82.6
3	90.7
4	60.2
5	61.5
6	43.2
7	54.7
8	37.6
9	12.9
10	64.3
11	80.9
12	62.8
13	77.4
14	59.3
15	81.0
16	27.7
State total	949 ^a

^aDoes not equal 960 because of rounding errors in calculating regional proportions.

Table 16. Regionalization of projections of additional Iowa road acres, 1970 to 1980

Region	Total rural road acres	Total urban road acres	Rural inter-state acres	Rural free-way acres	Rural express-way acres	Rural primary acres	Municipal primary acres	City street acres	Urban inter-state acres	Urban free-way acres	Urban express-way acres
1	1,608	366	0	0	1,390	218	36	40	0	0	290
2	3,028	577	813	1,211	749	255	55	80	167	119	156
3	1,895	459	0	0	1,604	291	45	80	0	0	334
4	2,641	517	626	1,101	696	218	55	80	128	109	145
5	2,133	332	375	1,540	0	218	36	67	77	152	0
6	1,502	364	250	0	1,070	182	36	53	51	0	223
7	4,458	678	0	3,742	534	182	91	107	0	369	111
8	4,161	676	125	2,641	1,177	218	64	80	26	261	245
9	795	255	501	221	0	73	64	67	103	22	0
10	3,399	678	375	1,540	1,230	254	73	120	77	152	256
11	5,435	1,227	2,626	1,430	1,015	364	109	227	538	141	212
12	2,678	603	0	0	2,460	218	36	53	0	0	513
13	4,601	915	2,314	1,211	749	327	73	93	474	119	156
14	1,823	407	626	0	1,015	182	27	40	128	0	212
15	4,526	795	0	2,310	1,925	291	73	93	0	228	401
16	2,945	381	0	2,747	53	145	45	53	0	271	11
Totals	47,628	9,230	8,631	19,694	15,667	3,636	918	1,333	1,769	1,943	3,265

Table 17. Regionalization of projections of additional Iowa road acres, 1980 to 1990

Region	Total rural road acres	Total urban road acres	Rural inter-state acres	Rural free-way acres	Rural express-way acres	Rural primary acres	Municipal primary acres	City street acres	Urban inter-state acres	Urban free-way acres	Urban express-way acres
1	1,608	366	0	0	1,390	218	36	40	0	0	290
2	2,215	410	0	1,211	749	255	55	80	0	119	156
3	1,895	459	0	0	1,604	291	45	80	0	0	334
4	2,015	389	0	1,101	696	218	55	80	0	109	145
5	1,758	255	0	1,540	0	218	36	67	0	152	0
6	1,252	313	0	0	1,070	182	36	53	0	0	223
7	4,458	678	0	3,742	534	182	91	107	0	369	111
8	4,036	650	0	2,641	1,177	218	64	80	0	261	245
9	294	152	0	221	0	73	64	67	0	22	0
10	3,024	601	0	1,540	1,230	254	73	120	0	152	256
11	2,809	689	0	1,430	1,015	364	109	227	0	141	212
12	2,678	603	0	0	2,460	218	36	53	0	0	513
13	2,287	441	0	1,211	749	327	73	93	0	119	156
14	1,197	279	0	0	1,015	182	27	40	0	0	212
15	4,526	795	0	2,310	1,925	291	73	93	0	228	401
16	2,945	381	0	2,747	53	145	45	53	0	271	11
Totals	38,997	7,461	0	19,694	15,667	3,636	918	1,333	0	1,943	3,265

Table 18. Projections of additional Iowa road acres

	1970 to 1980	1980 to 1990	1970 to 1990
Rural road right-of-way acres			
Interstate acres	8,631.0	0.0	8,631.0
Freeway acres	19,647.5	19,647.5	39,295.0
Expressway acres	15,665.5	15,665.5	31,331.0
Primary acres	3,636.0	3,636.0	7,272.0
Total acres	47,580.0	38,949.0	86,529.0
Urban road right-of-way acres			
Interstate acres	1,768.0	0.0	1,768.0
Freeway acres	1,943.0	1,943.0	3,886.0
Expressway acres	3,266.5	3,266.5	6,533.0
Primary acres	909.0	909.0	1,818.0
City street acres	1,333.5	1,333.5	2,667.0
Total acres	9,220.0	7,452.0	16,672.0
Urban and rural total acres	56,800.0	46,401.0	103,201.0

Table 19. Iowa railroad land use

	Miles, Class I railways	Average annual change in miles, Class I railways	Average annual change in acres, ^a Class I railways
1920 ^b	9,841.99		
1930	9,687.59		
1940	8,940.40		
1950	8,584.29		
1960	8,300.96		
1970	7,795.66		
1920 to 1930		-15.4	-186.6
1930 to 1940		-74.7	-905.3
1940 to 1950		-35.6	-431.4
1950 to 1960		-28.4	-344.2
1960 to 1970		-50.5	-612.0
1930 to 1970		-189.1	-573.2
1970 ^c		-66.0	-799.9
1971		-140.0	-1,696.8
1972		-308.0	-3,732.9
1973		-47.0	-569.6
1974		-33.0	-399.9
1970 to 1974		-119.0	-1,442.2

^aAssumes 12.12 acres per mile.

^bSources: (9, p. 188) and (8, p. 13).

^cSource: Unpublished assessment data, Iowa Department of Revenue.

Table 20. 1974 Iowa Airport land use^a

Region	Municipal airport acreage	Number of municipal airports	Private airport acreage	Number of private airports	Municipal and private airport acreage	Acres per municipal airport
1	503	9	10	2	513	55.9
2	1,246	9	84	14	1,330	138.4
3	1,931	16	24	7	1,955	120.7
4	2,934	6	38	8	2,972	489.0
5	1,236	9	28	6	1,264	137.3
6	488	7	49	7	537	69.7
7	2,151	6	56	12	2,207	358.5
8	1,564	5	52	6	1,616	312.8
9	926	2	3	1	929	463.0
10	1,736	7	100	15	1,836	248.0
11	2,224	10	138	11	2,362	222.4
12	1,062	9	9	2	1,071	118.0
13	1,354	9	51	9	1,405	150.4
14	404	7	14	3	418	57.7
15	1,786	9	54	13	1,840	198.4
16	1,095	4	20	4	1,115	273.8
Regional average						182.6
State total	22,640	124	730	120	23,370	

^aSource of data: Unpublished data, Iowa Aeronautics Commission.

Table 21. 1970 extraction land use acres^a

Region	1970 acres					Total
	Coal	Gypsum ^b	Sand and gravel	Lime-stone	Clay	
1	0	0	298	470	43	811
2	0	0	2,823	1,184	87	4,094
3	0	0	4,043	0	0	4,043
4	0	0	559	0	0	559
5	0	0	827	1,440	0	2,267
6	0	0	898	450	0	1,348
7	0	0	649	876	14	1,539
8	0	0	772	950	0	1,722
9	0	0	960	154	0	1,114
10	0	0	114	1,832	0	1,946
11	133	0	743	1,800	0	2,676
12	160	0	2,139	0	0	2,299
13	0	0	322	1,110	40	1,472
14	0	0	440	620	0	1,060
15	638	0	1,070	2,214	0	3,922
16	0	93	141	160	0	394
Total	931	93	16,798	13,260	184	31,266
Percent of county nonresponse	12.1	12.1	11.1	12.1	11.1	

^aSource of data: Iowa Extension Survey, 1975.

^bIn 1973, Webster County, in Region 5, reported 1,800 acres of gypsum. No information was available before 1973 for Webster County.

Table 22. 1970 public recreation land use acres^a

Region	County owned acres	State owned acres	Federal owned acres	Total acres
1	1,421	16,077	47,120	64,618
2	3,020	14,574	2,078	19,672
3	1,091	39,830	0	40,921
4	1,532	3,429	0	4,961
5	1,395	7,550	0	8,945
6	2,322	4,408	0	6,730
7	5,036	6,284	0	11,320
8	1,907	3,975	33,661	39,543
9	1,532	4,362	6,229	12,123
10	7,291	4,278	23,266	34,835
11	6,376	7,684	71,443	85,503
12	1,585	5,973	0	7,558
13	781	10,962	4,444	16,187
14	597	6,982	0	7,579
15	539	15,779	34,890	51,208
16	1,057	11,065	31,099	43,221
Total	37,482	163,212	254,230	454,924

^aSources of data: (6), (5), (7), (4), (3), (10), (9), (11)Table 23. 1970 private recreation land use acres^a

Region	1970 acres					Total
	Golf courses	Drive-in theaters	Fairgrounds and sports assembly complexes	Private parks and private campgrounds	Recreation (second home) subdivisions	
1	1,109	10	41	360	0	1,520
2	1,223	62	270	10	3	1,568
3	1,020	63	44	67	89	1,283
4	348	20	187	197	0	752
5	794	28	48	2,266	2	3,138
6	436	10	15	285	0	746
7	1,132	18	306	36	28	1,520
8	917	45	214	563	2,341	4,080
9	375	0	20	538	58	991
10	784	10	172	792	48	1,806
11	2,259	71	130	5,870	520	8,850
12	481	22	67	0	2,080	2,650
13	635	31	103	118	0	887
14	456	1	194	233	40	924
15	513	40	318	68	0	939
16	442	6	160	468	64	1,140
Total	12,924	437	2,289	11,871	5,273	32,794
Percent of total	39.40	1.33	6.97	36.19	16.07	
Percent of county nonresponse	6.1	6.1	7.1	7.1	8.1	

^aSource of data: Iowa Extension Survey, 1975.

Table 24. 1970 "other urban" land use acres^a

Region	Auto salvage yards, waste and refuse disposal dumps	Ceme-teries	Manu-facturing and associated land use	Wholesale trade, retail trade, services, and associated land use	Privately planned housing (first home) sub-divisions	Mobile home parks	Nonfarm residential and associated land use	Total "other urban" land use acres
1	179	447	266	1,645	90	10	2,334	4,971
2	541	583	1,244	664	1,497	59	1,873	6,461
3	603	601	106	244	74	50	516	2,194
4	425	491	691	341	461	91	694	3,194
5	231	450	683	2,375	829	18	448	5,034
6	284	308	203	720	2,294	37	1,045	4,891
7	327	519	459	553	1,417	126	2,193	5,594
8	125	341	842	1,869	2,745	328	479	6,729
9	144	155	600	308	707	127	825	2,866
10	504	841	1,049	1,491	2,027	165	3,155	9,232
11	433	1,432	1,004	1,330	8,361	336	1,779	14,675
12	344	663	145	304	117	9	1,729	3,311
13	273	1,316	291	1,155	283	8	1,854	5,180
14	244	566	569	365	254	38	319	2,355
15	401	1,091	355	265	280	105	1,204	3,701
16	203	280	19,813	192	372	272	1,261	22,393
Total	5,261	10,084	28,320	13,821	21,808	1,779	21,708	102,781
Percent of total	5.11	9.81	27.55	13.44	21.21	1.73	21.12	
Percent of county nonresponse	6.1	7.1	8.1	9.1	10.1	7.1	14.1	

^aSource of data: Iowa Extension Survey, 1975.

Table 25. "Undeveloped" acres in first and second home subdivisions outside incorporated areas as of December 31, 1974^a

Region	Housing (first home) subdivisions			Recreation (second home) subdivisions		
	Number	Total acres	"Undeveloped" acres	Number	Total acres	"Undeveloped" acres
1	7	168	106	0	0 ^a	0
2	71	1,364	646	3	139	132
3	15	208	95	4	96	57
4	40	1,256	53	1	30	20
5	33	470	277	4	48	3
6	11	2,726	1,603	2	-b	-b
7	55	1,770	988	3	23	0
8	36	921	407	10	2,806	1,884
9	206	2,947	1,168	5	82	6
10	78	2,002	1,267	6	190	40
11	343	14,084	6,651	1	5	2
12	3	37	21	3	3,070	2,952
13	8	400	278	3	1,380	1,380
14	4	207	201	2	2,034 ^a	1,961
15	8	250	105	5	210	40
16	37	492	176	7	218	15
Total	955	29,302	14,042	59	10,331	8,492

^aSource of data: Iowa Extension Survey, 1975.

^bRegion is missing a response from one county.

^cNo data available.

Table 26. Projected Iowa national crop shares^a

Commodity	1971 to 1973 average	Year				
		1980	1990 ^b	2000	2010 ^b	2020
	(percent)					
Corn	21.42	21.68	22.09	22.52	22.76	23.01
Soybeans	16.45	16.46	16.90	17.37	17.78	18.20
Oats	10.08	8.90	7.24	5.89	4.81	3.93
Silage (corn)	7.93 ^c	7.18	7.72	8.31	8.61	8.94
Hay	5.34	6.54	6.71	6.90	7.07	7.25

^aSource of data, unpublished OBERS back-up data, U.S. Department of Agriculture, Economic Research Service.

^bFor projected Iowa national crop shares in the years 1990 and 2010, the following formula was used: $B(1 + \Delta)^n = V_n$; where B is the value in the base year, Δ is the annual rate of change, n is the number of years involved, and V_n is the value in the n-th year. For example, letting the appropriate 1980 projection = B and the 2000 projection = V_n , then Δ can be solved. This Δ is then used to solve for the 1990 projection using the above formula. The 2010 projections are solved for in a similar manner.

^cThis is a 1970-1972 average.

Table 27. Iowa regional crop shares^a

Region	Corn (for grain)			Soybeans (for beans)		
	1934 to 1969 mean	Standard deviation of 1934 to 1969 mean	1959 to 1969 mean	1944 to 1969 mean	Standard deviation of 1944 to 1969 mean	1959 to 1969 mean
1	.041	.011	.036	.015	.003	.015
2	.097	.013	.099	.129	.013	.119
3	.116	.024	.104	.132	.018	.132
4	.067	.006	.064	.054	.012	.057
5	.089	.021	.083	.151	.016	.152
6	.051	.004	.054	.048	.011	.045
7	.063	.009	.062	.056	.019	.048
8	.061	.011	.059	.013	.005	.015
9	.020	.002	.021	.015	.003	.015
10	.073	.004	.072	.042	.010	.042
11	.076	.018	.083	.106	.005	.103
12	.068	.006	.070	.062	.006	.064
13	.079	.027	.086	.039	.028	.060
14	.029	.012	.029	.027	.008	.034
15	.042	.015	.046	.071	.011	.071
16	.026	.005	.030	.040	.010	.032

^aSource of data is the 1969, 1964, 1959, 1954, 1949, 1944, 1939, and 1934 Federal Agricultural Census (18, 19, 20, 21, 22, 23, 24, 25). Regional crop shares for each year available equals the sum of county production in each region divided by the sum of production in the 99 counties. Mean is equal to the sum of regional crop shares divided by the number of years considered. There was no complete federal agriculture census data available for silage for 1934 and 1944; for soybeans for 1934 and 1939; and for hay for 1934 and 1939.

Table 27. (continued)

Oats (for grain)			Silage (corn)			Hay (all)		
1934 to 1969 mean	Standard deviation of 1934 to 1969 mean	1959 to 1969 mean	1939 to 1969 mean	Standard deviation of 1939 to 1969 mean	1959 to 1969 mean	1934 to 1969 mean	Standard deviation of 1934 to 1969 mean	1959 to 1969 mean
.067	.014	.080	.120	.032	.100	.083	.016	.090
.117	.030	.097	.160	.044	.129	.069	.008	.064
.143	.045	.115	.137	.037	.170	.081	.027	.075
.062	.012	.071	.065	.019	.081	.056	.016	.050
.090	.037	.063	.036	.006	.041	.045	.012	.038
.046	.007	.049	.030	.004	.032	.052	.005	.050
.066	.010	.072	.096	.022	.081	.065	.009	.064
.067	.018	.084	.063	.008	.064	.084	.004	.085
.016	.003	.019	.014	.003	.013	.021	.004	.016
.065	.016	.075	.064	.005	.063	.078	.009	.074
.064	.015	.065	.049	.007	.048	.070	.010	.073
.067	.008	.069	.047	.021	.062	.059	.005	.064
.053	.016	.056	.051	.019	.055	.078	.005	.074
.028	.011	.032	.017	.014	.015	.057	.018	.073
.036	.015	.039	.035	.019	.032	.077	.016	.089
.015	.005	.015	.017	.001	.017	.026	.003	.023

Table 28. Annual rates of change in Iowa crop yields

Crop	Annual changes	Linear trend
	1950 to 1970 ^a	1980 to 2020 ^b
Corn (for grain) (bu./acre)	2.450	2.557
Soybeans (for beans) (bu./acre)	0.533	0.556
Oats (for grain) (bu./acre)	0.831	0.904
Silage (corn) (tons/acre)	0.221	0.263
Hay (all) (tons/acre)	0.055	0.059

^aSource of data is unpublished Statistical Reporting Service average state harvested acre yield data obtained from the U.S. Department of Agriculture, Economic Research Service. Annual change, 1950 to 1970, equals:

$$\left[\frac{\text{average yield per harvested acre (1971 + 1970 + 1969)}}{3} \right] - \left[\frac{\text{average yield per harvested acre (1949 + 1950 + 1951)}}{3} \right]$$

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^bThe 1980 to 2020 annual projected changes in yields are obtained from linear regression coefficients in Table 31.

Table 29. 1967 CNI Iowa land use acreage by land capability classes^a

LCC	Cropland	Pasture-range	Commercial forest	Noncommercial forest	Total forest	Other land in farms	Other land not in farms	Total land
1	3,639,680	188,016	54,177	47,274	101,451	119,265	21,507	4,069,919
2E	6,075,292	367,190	54,007	30,717	84,724	289,199	23,916	6,840,321
2S	272,029	28,730	5,693	1,828	7,521	10,112	3,460	321,852
2W	6,093,626	867,913	66,474	57,134	123,608	106,909	21,621	7,213,677
3E	6,943,572	1,105,184	157,511	83,823	241,334	241,909	30,059	8,562,058
3S	90,196	6,574	1,640	409	2,049	2,662	1,659	103,140
3W	879,542	104,870	66,005	38,386	104,391	18,153	10,992	1,117,948
4E	1,277,877	665,974	110,785	62,011	172,796	37,036	4,519	2,158,202
4S	195,545	34,104	18,774	13,572	32,346	7,766	6,757	276,518
4W	71,829	21,908	435	402	837	1,503	871	96,948
5W	119,111	247,587	104,261	72,080	176,341	22,414	3,914	569,367
6E	526,960	479,762	136,047	91,176	227,223	19,291	7,765	1,261,001
6S	33,166	18,887	8,375	2,892	11,267	1,409	0	64,729
7E	163,219	412,897	223,047	140,350	363,397	27,088	3,301	969,902
7S	23,100	94,923	236,395	56,242	292,637	5,504	3,566	419,730
7W	6,717	4,161	196	796	992	792	11,425	24,087
8E	0	0	0	0	0	0	391	391
Total	26,411,461	4,648,680	1,243,822	699,092	1,942,914	911,012		34,069,790

^aSource of data: Unpublished data obtained from the Iowa State University Statistical Laboratory.

Table 30. Statewide surplus or deficit cropland acres remaining after projected baseline crop requirements are fulfilled^a (Nonregionalized, statewide model, yields not by LCC)

Baseline assumptions ^a	Acres (X10 ³)				
	1980	1990	2000	2010	2020
1. TD/TY	4,710	6,518	7,661	8,917	9,809
2. TD/LY	1,475	3,788	5,181	6,641	7,657
3. HD/TY	2,407	3,481	3,918	4,277	4,284
4. HD/LY	-1,188	311	912	1,358	1,370

^aTD = trend crop requirements; HD = high trend crop requirements; TY = trend yields; and LY = low trend yields.

Table 31. Minimum average state crop yields necessary to fulfill baseline cropland resource availabilities and maximum state crop requirements that can be fulfilled by projected average state crop yields

Crop and baseline assumptions ^a	Minimum yields					Maximum crop requirements (X10 ⁶)				
	Year					Year				
	1980	1990	2000	2010	2020	1980	1990	2000	2010	2020
Corn										
1. TD/TY	100.5	111.0	122.2	130.2	138.6	1,595	1,883	2,163	2,447	2,723
2. TD/LY	100.6	111.4	122.9	131.1	139.8	1,386	1,652	1,904	2,155	2,396
3. HD/TY	111.3	128.3	147.4	166.2	187.2	1,525	1,801	2,073	2,352	2,626
4. HD/LY	111.5	128.8	148.3	167.4	188.8	1,324	1,579	1,823	2,070	2,310
Soybeans										
1. TD/TY	30.9	32.4	34.4	35.5	37.0	292	353	415	475	534
2. TD/LY	30.7	32.0	33.9	34.9	36.3	254	309	366	418	470
3. HD/TY	34.2	37.5	41.4	45.4	49.9	321	383	446	501	555
4. HD/LY	34.0	37.1	40.9	44.6	49.0	279	336	392	441	488
Silage										
1. TD/TY	14.1	14.9	15.8	16.4	17.1	11	14	16	19	21
2. TD/LY	13.9	14.6	15.4	16.0	16.6	9	12	14	16	19
3. HD/TY	15.6	17.2	19.1	21.0	23.1	10	13	16	18	21
4. HD/LY	15.4	16.9	18.6	20.4	22.4	9	11	14	16	19
Oats										
1. TD/TY	51.4	53.7	56.8	58.6	60.9	87	75	62	52	43
2. TD/LY	47.9	49.9	52.6	54.0	55.9	76	66	55	46	37
3. HD/TY	56.9	62.1	68.5	74.9	82.3	87	75	63	54	44
4. HD/LY	53.0	57.7	63.4	69.0	75.5	75	66	56	47	39
Hay										
1. TD/TY	2.8	3.0	3.2	3.3	3.5	9	11	13	15	16
2. TD/LY	2.9	3.1	3.4	3.5	3.7	8	10	11	13	14
3. HD/TY	3.1	3.4	3.9	4.3	4.8	9	11	13	15	17
4. HD/LY	3.2	3.6	4.1	4.5	5.0	8	9	11	13	15

^aTD = trend crop requirements; HD = high trend crop requirements; TY = trend yields; and LY = low trend yields.

II. APPENDIX B.
NATIONAL, STATE, AND LOCAL ENTITIES PROVIDING LAND USE DATA

A. Federal Data Sources

1. U.S. Agriculture Stabilization and Conservation Service, Department of Agriculture, 210 Walnut, Des Moines, Iowa, 50309.
 2. U.S. Bureau of Land Management, Department of Interior, Washington, D.C.
 3. U.S. Crop and Livestock Reporting Service, 210 Walnut, Des Moines, Iowa, 50309.
 4. U.S. Department of the Army, Kansas City District, Corps of Engineers, 700 Federal Building, Kansas City, Missouri, 64106.
 5. U.S. Department of the Army, Real Estate Project Office, East First and Walnut, Des Moines, Iowa, 50309.
 6. U.S. Department of the Army, St. Paul District Corps of Engineers, St. Paul, Minnesota, 55101.
 7. U.S. Fish and Wildlife Service, Department of Interior, 210 Walnut, Des Moines, Iowa, 50309.
 8. U.S. North Central Forest Experiment Station, Folwell Avenue, St. Paul, Minnesota, 55108.
 9. U.S. Soil Conservation Service, Department of Agriculture, 823 Federal Building, Des Moines, Iowa, 50309.
 10. U.S. Upper Mississippi River National Wildlife and Fish Refuge, Winona, Minnesota, 55987.
- B. State Data Sources
1. Iowa Aeronautics Commission, Municipal Airport, Des Moines, Iowa, 50319.
 2. Iowa Commerce Commission, Des Moines, Iowa, 50319.
 3. Iowa Department of Agriculture, Capitol Building, Des Moines, Iowa, 50319.
 4. Iowa Department of Health, Lucas State Office Building, Des Moines, Iowa, 50309.

5. Iowa Department of Soil Conservation, Grimes State Office Building, Des Moines, Iowa, 50319.
6. Iowa Development Commission, 250 Jewett Building, Des Moines, Iowa, 50309.
7. Iowa Environmental Quality Control Department, 3920 Delaware, Des Moines, Iowa, 50309.
8. Iowa Geological Survey, Iowa City, Iowa.
9. Iowa Highway Commission, Statistics Section, Ames, Iowa, 50010.
10. Iowa Mines and Minerals Department, Des Moines, Iowa.
11. Iowa Natural Resources Council, Grimes State Office Building, Des Moines, Iowa, 50319.
12. Iowa Office of Planning and Programming, 523 East 12th Street, Des Moines, Iowa, 50319.
13. Iowa Revenue Department, Property Tax Division, Des Moines, Iowa, 50319.
14. Iowa State Conservation Commission, Department of County Conservation Activities, Valley Bank Building 3004, Des Moines, Iowa.
15. Iowa State Conservation Commission, Land and Waters Division, Valley Bank Building 3004, Des Moines, Iowa.

C. Regional Data Sources

1. 16 Regional Planning Commissions of Iowa.

D. County Data Sources

1. Iowa County Conservation Board.

E. Independent Data Sources

1. American Forest Institute, Iowa Forest Industries Committee, Dubuque, Iowa, 52001.
2. Iowa Manufacturers Association, 1212 Des Moines Building, Des Moines, Iowa, 50309.

3. Iowa State Association of Counties, 315 East 5th Street, Des Moines, Iowa, 50219.
4. League of Iowa Municipalities, 444 Insurance Exchange Building, Des Moines, Iowa, 50309.

III. APPENDIX C: DATA SOURCES

A. Railroad Land Use Data

To regionalize the 1970 state railroad acreage data, a U.S. Geological Survey map (Scale 1 inch = 8 miles) that showed railroad lines existing in 1918 and the lines that were abandoned from 1918 to 1967 was obtained from John Milligan of The Institute of Urban and Regional Research at Iowa City. The proportion of the state's total railroad acreage in each region was calculated for both 1918 and 1967. The 16 regional proportions were found to have remained virtually constant. Thus, the 1970 state acreage figure was proportioned to the 16 regions according to the calculated regional coefficients. The sum of 1970 regional rail acreage and the sum of projected regional rail acreage do not exactly equal the corresponding total state figures due to rounding errors.

B. Highway and Road Land Use Data

The following is an explanation of the terminology used and conversion process of miles to acres followed by the Statistics Section of the Iowa Highway Department in generating the unpublished data used in this study.

Terminology:

Municipal - All streets and highways inside city corporation limits.

Rural - All streets and highways outside city corporation limits.

Primary - State primary system, excluding interstate.

Secondary - All rural roads excluding primary and interstate highways.

Local city street - City owned traveled ways open to the public.

Freeway - Roads built to standards identical to those of the federal interstate.

Expressway - Roads similar in design to freeways except grade intersections are allowed at connections with lesser traveled roads.

Paved - High grade bituminous or better surfacing on traveled way.

Gravel - Low grade bituminous or crushed rock surfacing on traveled way.

Surface width - The width in feet measured from edge of pavement to edge of pavement (including curbs); or on gravel roads the width measured between the two foreslopes (grade edges).

Shoulder width - The sum of the shoulder widths in feet. Each shoulder is measured from edge of pavement out to the top of the foreslope.

Remaining R.O.W. - The remaining acreage after subtracting the surface and shoulder widths from the total R.O.W. (right-of-way).

Mileage - Actual miles of road measured along the center line.

Conversion process of miles to acres:

Interstate (rural and municipal) - Before 1960, the total R.O.W. width was 304 feet. Since 1960, the total R.O.W. width has been 350 feet. Each interchange on the average contains 40 acres of roadway and remaining R.O.W.

Primary (rural and municipal) - The average R.O.W. width for rural primary of 150 feet was used to determine total acreage.

Municipal primary required R.O.W.'s ranging from 36 feet up to 150 feet. Expressways use 295 feet R.O.W.

Rural secondary - Mileages for the rural secondary system (both FM-FAS and local) are updated yearly by county engineers. "FM" refers

Listing of county urban regression data

Region	County number	County name	UL60	UL70	UL70- UL60	UP60	UP70	UP70- UP60	UL60/ UP60	UL70/ UP70
1	3	Allamakee	569	708	139	3,639	3,883	244	.156	.182
1	33	Fayette	2,112	2,451	339	10,833	10,359	-474	.195	.237
1	45	Howard	806	1,019	213	3,809	3,927	118	.212	.259
1	96	Winneshiek	1,352	1,545	193	6,435	7,458	1,023	.210	.207
2	17	Cerro Gordo	8,055	8,287	232	36,800	36,921	121	.219	.224
2	34	Floyd	2,327	2,642	315	9,964	9,268	-696	.234	.285
2	35	Franklin	1,224	1,299	75	4,501	4,376	-125	.272	.297
2	55	Kossuth	1,174	1,284	110	5,702	6,032	330	.206	.213
2	66	Mitchell	997	1,089	92	3,753	3,815	62	.266	.285
2	95	Winnebago	1,012	1,447	435	2,930	3,841	911	.345	.377
3	11	Buena Vista	1,261	1,589	328	7,728	8,591	863	.163	.185
3	21	Clay	1,787	2,535	748	8,864	10,278	1,414	.202	.247
3	30	Dickinson	614	1,009	395	2,685	3,014	329	.229	.335
3	32	Emmet	1,854	1,884	30	7,927	8,108	181	.234	.232
3	60	Lyon	907	943	36	2,780	2,632	-148	.326	.358
3	71	O'Brien	999	1,095	96	4,251	4,535	284	.235	.241
3	72	Osceola	658	658	0	2,852	2,749	-103	.231	.239
3	74	Palo Alto	1,134	1,505	371	3,887	4,150	263	.292	.363
3	84	Sioux	2,367	3,611	1,244	7,526	9,811	2,285	.315	.368
4	18	Cherokee	1,902	1,902	0	7,724	7,272	-452	.246	.262
4	67	Monona	860	1,006	146	3,176	3,154	-22	.271	.319
4	75	Plymouth	1,212	1,862	650	6,767	8,159	1,392	.179	.228
4	97	Woodbury	19,752	19,773	21	89,159	85,925	-3,234	.222	.230
5	40	Hamilton	1,520	1,987	467	8,520	8,488	-32	.178	.234
5	46	Humboldt	781	781	0	4,031	4,665	634	.194	.167
5	94	Webster	3,872	5,588	1,716	28,399	31,263	2,864	.136	.179
5	99	Wright	2,129	2,326	197	7,613	7,461	-152	.280	.312

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(continued)

Region	County number	County name	UL60	UL70	UL70- UL60	UP60	UP70	UP70- UP60	UL60/ UP60	UL70/ UP70
6	42	Hardin	2,837	3,077	240	8,790	9,677	887	.323	.318
6	64	Marshall	4,093	5,814	1,721	22,521	26,219	3,698	.182	.222
6	79	Poweshiek	1,365	1,824	459	7,367	8,402	1,035	.185	.217
6	86	Tama	706	824	118	2,925	3,000	75	.241	.275
7	7	Black Hawk	18,835	28,198	9,363	98,688	110,168	11,480	.191	.256
7	9	Bremer	1,342	1,727	385	6,357	7,205	848	.211	.240
7	10	Buchanan	1,148	1,438	290	5,498	5,910	412	.209	.243
7	19	Chickasaw	722	934	212	3,456	3,621	165	.209	.258
7	38	Grundy	564	589	25	2,403	2,712	309	.235	.217
8	16	Cedar	640	640	0	2,862	2,877	15	.224	.222
8	23	Clinton	9,221	12,299	3,078	39,038	41,836	2,798	.236	.294
8	28	Delaware	1,822	2,089	267	7,220	8,078	858	.252	.259
8	31	Dubuque	7,440	9,407	1,967	56,606	62,309	5,703	.131	.151
8	49	Jackson	1,062	1,123	61	5,909	5,677	-232	.180	.198
9	70	Muscatine	4,670	4,670	0	20,997	22,405	1,408	.222	.208
9	82	Scott	21,269	24,295	3,026	102,061	123,115	21,054	.208	.197
10	6	Benton	1,814	2,055	241	7,704	7,655	-49	.235	.268
10	52	Johnson	4,823	10,203	5,380	35,800	52,980	17,180	.135	.193
10	53	Jones	1,454	1,500	46	7,806	7,898	92	.186	.190
10	57	Linn	16,255	25,887	9,632	105,510	131,688	26,178	.154	.197
10	92	Washington	1,296	1,491	195	6,037	6,317	280	.215	.236
11	8	Boone	2,869	2,863	194	12,468	12,468	0	.214	.230
11	25	Dallas	1,416	1,462	46	6,442	6,906	464	.220	.212
11	50	Jasper	2,787	3,403	616	15,381	15,619	238	.181	.218
11	61	Madison	797	813	16	3,639	3,654	15	.219	.222
11	63	Marion	3,083	3,459	376	13,015	14,423	1,408	.237	.240
11	77	Polk	43,220	50,196	6,976	236,641	252,775	16,134	.183	.199

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(continued)

Region	County number	County name	UL60	UL70	UL70- UL60	UP60	UP70	UP70- UP60	UL60/ UP60	UL70/ UP70
11	85	Story	6,681	9,590	2,909	31,230	44,457	13,227	.214	.216
11	91	Warren	1,629	2,420	791	7,062	8,852	1,790	.231	.273
12	5	Audubon	671	744	73	2,928	2,907	-21	.229	.256
12	14	Carroll	1,311	1,763	452	7,682	8,716	1,034	.171	.202
12	24	Crawford	1,120	1,764	644	4,930	5,882	952	.227	.300
12	37	Greene	1,435	1,606	171	4,570	4,735	165	.314	.339
12	81	Sac	937	1,019	82	3,354	3,268	-86	.279	.312
13	15	Atlantic	1,175	1,396	221	6,890	7,306	416	.171	.191
13	43	Harrison	814	814	0	3,567	3,519	-48	.228	.231
13	65	Mills	844	857	13	4,783	4,195	-588	.176	.204
13	69	Montgomery	1,218	1,630	412	6,421	6,210	-211	.190	.262
13	73	Page	2,770	3,012	242	12,468	11,388	-1,080	.222	.264
13	78	Pottawattamie	11,331	19,104	6,073	57,928	63,616	5,688	.196	.300
13	83	Shelby	1,110	1,424	314	4,350	5,049	699	.255	.282
14	20	Clarke	1,042	1,112	70	3,350	3,124	-226	.311	.356
14	27	Decatur	1,291	1,291	0	2,173	2,540	367	.594	.508
14	88	Union	2,352	2,432	80	7,667	8,234	567	.307	.295
15	4	Appanoose	1,695	1,837	142	6,629	6,531	-98	.256	.281
15	26	Davis	782	1,120	338	2,771	2,718	-53	.282	.412
15	51	Jefferson	1,845	2,298	453	8,054	8,715	661	.229	.264
15	59	Lucas	1,375	1,448	73	5,042	5,009	-33	.273	.289
15	62	Mahaska	2,332	2,761	429	11,053	11,224	171	.211	.246
15	68	Monroe	1,115	1,115	0	4,582	4,151	-431	.243	.269
15	90	Wapello	6,635	7,434	799	33,871	29,610	-4,261	.196	.251
16	29	Des Moines	5,924	7,107	1,183	34,990	35,505	515	.169	.200
16	44	Henry	2,115	2,715	600	7,339	7,007	-332	.288	.387
16	56	Lee	5,468	6,260	792	31,563	28,627	-2,936	.173	.219

Listing of county urban regression data

Region	County number	County name	ADJP60	ADJP70	ADJP70- ADJP60	ADJY60	ADJY70	ADJY70- ADJY60
1	3	Allamakee	131.905	179.707	47.802	15,006,595	20,950,432	5,943,837
1	33	Fayette	240.134	297.504	57.370	35,055,104	45,326,400	10,271,296
1	45	Howard	223.223	239.036	15.812	12,144,059	18,320,144	6,176,085
1	96	Winneshiek	182.637	224.418	41.781	22,926,336	33,452,832	10,526,496
2	17	Cerro Gordo	346.109	389.507	43.399	80,801,536	99,991,888	19,190,352
2	34	Floyd	310.032	347.375	37.343	30,411,936	36,351,408	5,939,472
2	35	Franklin	372.039	435.939	63.900	19,766,512	24,078,064	4,311,552
2	55	Kossuth	365.274	409.284	44.010	28,140,000	39,433,920	11,293,920
2	66	Mitchell	291.994	355.114	63.120	17,233,520	21,084,960	3,851,440
2	95	Winnebago	339.344	380.909	41.565	16,828,784	24,546,736	7,717,952
3	11	Buena Vista	357.383	404.985	47.602	28,087,728	40,554,400	12,466,672
3	21	Clay	343.854	389.507	45.654	24,027,328	36,435,472	12,408,144
3	30	Dickinson	304.395	319.860	15.465	15,508,289	23,350,864	7,842,575
3	32	Emmet	330.325	344.796	14.470	19,470,016	25,282,592	5,812,576
3	60	Lyon	341.599	348.235	6.636	14,713,399	21,586,000	6,872,601
3	71	O'Brien	387.822	429.920	42.098	23,382,000	29,717,616	6,335,616
3	72	Osceola	342.726	375.750	33.024	10,967,722	14,199,970	3,232,248
3	74	Palo Alto	306.650	370.591	63.941	14,793,504	22,044,672	7,251,168
3	84	Sioux	395.714	418.742	23.028	29,407,728	44,265,424	14,857,696
4	18	Cherokee	332.580	365.432	32.852	20,580,592	32,335,040	11,754,448
4	67	Monona	219.841	276.868	57.027	16,328,027	19,623,792	3,295,765
4	75	Plymouth	304.395	337.057	32.662	27,443,744	40,883,632	13,439,888
4	97	Woodbury	231.115	287.187	56.072	171,139,840	200,920,688	29,780,848
5	40	Hamilton	395.714	477.211	81.498	27,863,760	35,051,392	7,187,632
5	46	Humboldt	403.605	473.772	70.166	18,489,696	23,475,856	4,986,160
5	94	Webster	395.714	466.893	71.179	75,961,744	95,648,528	19,686,784
5	99	Wright	391.204	465.173	73.969	27,565,312	36,274,720	8,709,408

(continued)

Region	County number	County name	ADJP60	ADJP70	ADJP70-ADJP60	ADJY60	ADJY70	ADJY70-ADJY60
6	42	Hardin	363.020	441.958	78.938	31,339,504	43,627,200	12,287,696
6	64	Marshall	337.089	411.863	74.774	61,828,352	88,758,032	26,929,680
6	79	Poweshiek	273.956	310.402	36.447	23,300,256	34,709,920	11,409,664
6	86	Tama	316.796	362.852	46.056	26,245,216	37,031,184	10,785,968
7	7	Black Hawk	382.185	440.238	58.053	219,770,320	278,242,304	58,471,984
7	9	Bremer	301.013	358.553	57.540	29,767,184	44,315,408	14,548,224
7	10	Buchanan	276.210	350.815	74.604	26,941,104	36,645,296	9,704,192
7	19	Chickasaw	231.115	297.504	66.389	17,204,656	24,541,360	7,336,704
7	38	Grundy	421.644	490.109	68.465	18,845,664	28,151,056	9,305,392
8	16	Cedar	386.695	411.003	24.309	23,034,768	35,628,624	12,593,856
8	23	Clinton	332.580	394.667	62.087	90,430,096	120,317,328	29,887,232
8	28	Delaware	271.701	330.178	58.478	18,288,608	29,719,840	11,431,232
8	31	Dubuque	242.389	337.057	94.668	123,549,328	174,961,968	51,412,640
8	49	Jackson	199.548	264.831	65.283	27,008,448	35,875,936	8,867,488
9	70	Muscatine	341.599	375.750	34.151	53,019,504	79,220,160	26,200,656
9	82	Scott	453.211	523.642	70.432	219,277,168	330,255,360	110,978,192
10	6	Benton	365.274	398.966	33.691	31,246,352	42,653,552	11,407,200
10	52	Johnson	347.236	392.087	44.851	73,290,144	135,183,552	61,893,408
10	53	Jones	259.300	311.262	51.962	25,643,600	34,825,200	9,181,600
10	57	Linn	364.147	427.340	63.194	255,986,048	376,716,544	120,730,496
10	92	Washington	296.503	351.674	55.171	24,247,744	37,657,552	13,409,808
11	8	Boone	360.765	444.537	83.772	38,001,760	50,010,064	12,008,304
11	25	Dallas	334.835	406.704	71.869	36,267,696	56,419,856	20,152,160
11	50	Jasper	276.210	342.216	66.006	57,637,696	76,312,192	18,674,496
11	61	Madison	197.293	241.615	44.322	15,008,554	21,034,960	6,026,406
11	63	Marion	196.166	280.308	84.142	34,409,056	46,985,824	12,576,768
11	77	Polk	419.389	472.912	53.523	503,912,448	667,461,632	163,549,184

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(continued)

Region	County number	County name	ADJP60	ADJP70	ADJP70-ADJP60	ADJY60	ADJY70	ADJY70-ADJY60
11	85	Story	395.714	461.734	66.020	72,708,304	119,325,104	46,616,800
11	91	Warren	216.459	263.111	46.652	31,672,368	58,891,392	27,219,024
12	5	Audubon	253.663	317.281	63.618	11,285,272	14,703,662	3,418,390
12	14	Carroll	339.344	408.424	69.080	28,042,704	36,882,608	8,839,904
12	24	Crawford	237.879	297.504	59.625	21,808,368	32,755,472	10,947,104
12	37	Greene	395.714	417.882	22.168	17,704,080	25,875,392	8,171,312
12	81	Sac	364.147	428.200	64.053	20,805,776	28,218,720	7,412,944
13	15	Atlantic	235.624	289.766	54.141	22,842,032	30,187,536	7,345,504
13	43	Harrison	205.185	276.009	70.824	20,952,992	27,848,688	6,895,696
13	65	Mills	275.083	323.300	48.217	14,544,468	23,172,848	8,628,380
13	69	Montgomery	262.682	299.224	36.542	18,929,872	25,192,608	6,262,736
13	73	Page	249.153	275.149	25.996	25,210,256	32,971,280	7,761,024
13	78	Pottawattamie	280.720	338.777	58.057	135,179,200	176,416,672	41,237,472
13	83	Shelby	294.249	349.955	55.706	17,545,424	26,915,632	9,370,208
14	20	Clarke	118.376	169.388	51.013	9,719,670	13,702,533	3,982,863
14	27	Decatur	107.102	153.052	45.949	9,290,996	12,085,092	2,794,096
14	88	Union	166.854	214.960	48.106	16,954,352	22,813,248	5,858,896
15	4	Appanoose	114.994	166.809	51.815	16,895,936	22,804,928	5,908,992
15	26	Davis	121.758	171.968	50.210	10,508,644	13,863,887	3,355,243
15	51	Jefferson	204.058	249.354	45.296	22,043,088	29,235,536	7,192,448
15	59	Lucas	124.013	177.987	53.974	12,729,622	17,536,624	4,807,002
15	62	Mahaska	282.975	320.720	37.745	30,780,368	38,682,384	7,902,016
15	68	Monroe	103.720	153.911	50.191	12,099,072	15,950,636	3,851,564
15	90	Wapello	215.331	223.558	8.227	75,510,560	82,166,064	6,655,504
16	29	Des Moines	333.707	360.273	26.566	77,159,168	102,471,696	25,312,528
16	44	Henry	305.522	337.057	31.535	23,812,000	37,602,768	13,790,768
16	56	Lee	197.293	262.251	64.958	66,224,144	85,308,640	19,084,496

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Population projections by counties and regions

Region	County number	County name	Year					
			1970	1980	1990	2000	2010	2020
1	3	Allamakee	14,968	17,500	19,900	21,800	24,100	26,800
1	22	Clayton	20,606	23,800	27,400	30,400	34,100	38,500
1	33	Fayette	26,898	28,900	32,100	34,200	36,200	38,400
1	45	Howard	11,442	11,400	12,400	13,400	14,900	16,300
1	96	Winneshiek	21,758	23,900	26,000	26,900	28,300	29,400
Region total			95,672	105,500	117,800	126,700	137,600	149,400
2	17	Cerro Gordo	49,223	51,900	55,100	57,200	59,500	61,100
2	34	Floyd	19,860	21,900	24,800	27,100	29,500	32,100
2	35	Franklin	13,255	13,700	14,800	15,100	16,000	17,000
2	41	Hancock	13,492	15,500	17,900	19,400	21,700	23,700
2	55	Kossuth	22,937	25,100	28,600	31,000	34,600	38,500
2	66	Mitchell	13,108	13,100	14,000	14,600	15,600	16,700
2	95	Winnebago	12,990	15,000	16,500	16,700	17,300	17,200
2	98	Worth	8,968	9,400	10,500	11,200	12,100	12,600
Region total			153,833	165,600	182,200	192,300	206,300	218,900
3	11	Buena Vista	20,693	22,400	24,500	25,200	26,100	27,100
3	21	Clay	18,464	20,200	22,100	22,800	24,100	24,900
3	30	Dickinson	12,565	14,200	15,800	16,500	17,200	17,500
3	32	Emmet	14,009	15,800	17,800	19,100	21,100	22,700
3	60	Lyon	13,340	14,400	16,400	18,300	20,700	23,700
3	71	O'Brien	17,522	19,700	22,000	23,100	24,200	25,900
3	72	Osceola	8,555	8,700	9,700	10,600	11,400	12,800
3	74	Palo Alto	13,289	15,300	17,300	18,900	21,200	23,900
3	84	Sioux	27,996	29,700	32,400	34,600	36,700	39,200
Region total			146,433	160,400	178,000	189,100	202,700	217,700

(continued)

Region	County number	County name	Year					
			1970	1980	1990	2000	2010	2020
4	18	Cherokee	17,269	18,400	19,900	21,400	23,000	24,700
4	47	Ida	9,283	9,600	10,300	11,200	11,800	13,100
4	67	Monona	12,069	13,200	14,500	15,300	16,600	18,200
4	75	Plymouth	24,322	25,300	27,600	29,700	31,500	33,800
4	97	Woodbury	103,052	114,400	126,400	136,300	147,300	158,600
Region total			165,995	180,900	198,700	213,900	230,200	248,400
5	13	Calhoun	14,287	14,700	15,600	16,400	17,000	17,700
5	40	Hamilton	18,383	18,300	18,600	19,500	20,100	21,200
5	46	Humboldt	12,519	13,900	15,200	15,700	16,500	17,300
5	76	Pocahontas	12,757	12,100	12,100	12,400	13,300	14,700
5	94	Webster	48,391	50,600	54,000	56,300	59,100	60,600
5	99	Wright	17,294	17,900	19,300	20,300	20,700	21,600
Region total			123,631	127,500	134,800	140,600	146,700	153,100
6	42	Hardin	22,248	23,000	24,500	25,100	25,900	27,100
6	64	Marshall	41,076	45,100	50,100	53,600	57,200	60,900
6	79	Poweshiek	18,803	21,100	23,000	24,100	24,600	25,200
6	86	Tama	20,147	21,500	23,500	25,500	27,200	29,900
Region total			102,274	110,700	121,100	128,300	134,900	143,100
7	7	Black Hawk	132,916	145,000	157,600	167,700	177,400	185,800
7	9	Bremer	22,737	24,900	26,600	27,700	27,900	28,900
7	10	Buchanan	21,762	23,100	25,500	28,000	31,600	35,300
7	12	Butler	16,953	19,100	21,200	22,700	24,700	26,800
7	19	Chickasaw	14,969	15,700	17,400	19,300	21,400	24,100
7	38	Grundy	14,119	15,400	16,800	17,500	17,700	18,100
Region total			223,456	243,200	265,100	282,900	300,700	319,000

(continued)

Region	County number	County name	Year					
			1970	1980	1990	2000	2010	2020
8	16	Cedar	17,655	18,800	19,700	20,500	21,100	21,500
8	23	Clinton	56,749	64,000	72,000	78,300	85,200	91,100
8	28	Delaware	18,770	20,900	23,900	27,400	31,200	35,600
8	31	Dubuque	90,609	105,600	123,200	137,700	152,700	168,500
8	49	Jackson	20,839	23,500	27,300	30,400	34,300	38,800
Region total			204,622	232,800	266,100	294,300	324,500	355,500
9	70	Muscatine	37,181	42,000	47,900	52,600	57,300	61,900
9	82	Scott	142,687	159,500	179,900	199,100	217,900	236,600
Region total			179,868	201,500	227,800	251,700	275,200	298,500
10	6	Benton	22,885	25,400	27,400	28,700	30,700	31,800
10	48	Iowa	15,419	16,300	17,900	18,900	20,400	22,200
10	52	Johnson	72,127	79,800	87,700	97,000	106,600	115,100
10	53	Jones	19,868	21,300	23,400	24,900	27,600	29,900
10	57	Linn	163,213	180,800	200,400	218,000	233,800	247,700
10	92	Washington	18,967	19,600	20,500	21,300	22,500	24,300
Region total			312,479	343,200	377,300	408,800	441,600	471,000
11	8	Boone	26,470	29,900	32,700	33,900	34,900	35,700
11	25	Dallas	26,085	27,800	29,800	31,400	33,100	34,100
11	50	Jasper	35,425	39,600	43,800	46,700	49,200	51,400
11	61	Madison	11,558	13,800	16,400	17,300	18,300	19,200
11	63	Marion	26,352	28,200	30,300	30,900	31,300	31,300
11	77	Polk	286,101	321,400	356,500	384,500	412,600	438,400
11	85	Story	62,783	75,000	84,400	92,900	100,500	106,300
11	91	Warren	27,432	34,500	41,800	46,800	51,200	54,500
Region total			502,206	570,200	635,700	684,400	731,100	770,900

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(continued)

Region	County number	County name	Year					
			1970	1980	1990	2000	2010	2020
12	5	Audubon	9,595	9,700	10,400	10,900	11,600	12,500
12	14	Carroll	22,912	25,100	28,600	31,600	35,100	39,200
12	24	Crawford	19,198	19,200	20,300	22,200	24,300	26,600
12	37	Greene	12,716	13,200	14,100	14,800	15,700	17,100
12	39	Guthrie	12,243	13,100	14,300	14,500	15,600	16,700
12	81	Sac	15,573	17,000	18,800	20,200	21,900	23,900
Region total			92,237	97,300	106,500	114,200	124,200	136,000
13	15	Cass	17,007	18,600	20,000	20,600	21,700	22,900
13	36	Fremont	9,282	10,500	11,800	12,700	13,700	14,900
13	43	Harrison	16,240	19,300	22,500	25,000	27,700	30,900
13	65	Mills	11,832	13,200	14,600	15,300	15,800	16,200
13	69	Montgomery	12,781	14,800	17,400	18,700	20,000	21,300
13	73	Page	18,537	20,900	22,500	23,900	25,500	26,700
13	78	Pottawattamie	86,991	98,300	111,800	122,600	133,400	144,000
13	83	Shelby	15,528	17,300	19,900	21,400	23,700	25,900
Region total			188,198	212,900	240,500	260,200	281,500	302,800
14	1	Adair	9,487	9,300	9,700	10,300	10,800	11,700
14	2	Adams	6,322	6,400	6,200	6,400	6,400	6,500
14	20	Clarke	7,581	8,400	9,500	10,000	11,000	11,200
14	27	Decatur	9,737	9,700	9,800	9,900	9,700	9,800
14	80	Ringgold	6,373	6,700	7,000	7,100	7,600	8,100
14	87	Taylor	8,790	9,300	9,400	9,700	9,500	9,900
14	88	Union	13,557	14,500	15,300	16,300	16,800	16,800
Region total			61,847	64,300	66,900	69,700	71,800	74,000

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(continued)

Region	County number	County name	Year					
			1970	1980	1990	2000	2010	2020
15	4	Appanoose	15,007	16,600	18,700	19,700	21,100	22,200
15	26	Davis	8,207	8,600	9,600	10,200	10,900	11,300
15	51	Jefferson	15,774	16,400	16,600	16,600	16,700	16,900
15	54	Keokuk	13,943	14,500	15,400	16,300	17,300	18,700
15	59	Lucas	10,163	11,000	11,800	12,000	13,300	14,100
15	62	Mahaska	22,177	23,900	25,000	25,800	26,800	27,200
15	68	Monroe	9,357	9,800	10,300	10,900	11,600	12,600
15	89	Van Buren	8,643	8,900	9,800	10,400	10,700	11,000
15	90	Wapello	42,149	44,900	47,600	49,600	51,200	53,300
15	93	Wayne	8,405	8,800	8,800	8,700	9,000	9,200
	Region total		153,825	163,400	173,600	180,200	188,600	196,500
16	29	Des Moines	46,982	46,500	47,300	49,100	51,000	52,500
16	44	Henry	18,114	18,200	19,200	19,900	21,100	21,800
16	56	Lee	42,996	46,300	50,400	53,400	56,800	60,600
16	58	Louisa	10,682	12,500	14,100	14,200	14,300	14,300
	Region total		118,774	123,500	131,000	136,600	143,200	149,200
	State total		2,825,350	3,102,900	3,423,100	3,673,900	3,940,800	4,204,000

age groups. This cohort-survival method produces a sensitive projection. A brief summary of this method follows.

The age-sex specific survival rates for the state as a whole and the age-sex specific fertility rates and migration rates for each county were determined. According to assumptions about change between 1970 and 1975, each rate for each cohort in each county was applied to the 1970 population of that cohort, resulting in a projected cohort population to 1975 for all 99 counties. Then each specific rate, newly adjusted according to assumptions of change between 1975 and 1980, was applied to its corresponding 1975 cohort population. This resulted in a projected cohort population to 1980. The procedure was repeated for each projected period -- each new projection calculated from the previously projected figure -- according to assumptions about changes in rates of components.

The period from 1969 to 1971 provided the basis for determining the fertility and survival rates, and the census decade 1960 to 1970 provided the base for calculating the net migration rates. Five-year survival rates for Iowa males and females, by age, were calculated and tied in with the United States projected rates. It was assumed that the state age and sex specific survival rates were sufficiently uniform to be applicable to all 99 counties. United States survival rates showed a slight increase in the future. Age specific fertility rates calculated for each county were adjusted to follow the national trend of Series E. Series E assumes ultimate completed fertility of 2.1 children per woman. County migration rates, by age and sex, based on the 1960 to 1970 net migration experience, were adjusted to conform

with the 1970-1973 trends.¹ Because of the uncertainty of these trends continuing over time, they have been gradually reduced to 0 by the year 2000.

E. Agricultural Land Use Within Incorporated Places Tables

¹The net migration rates used in these projections were based on 1974 U.S. Census Bureau control figures that were subsequently revised downwards slightly. But disregarding the exact magnitude of the effect, the major migration trend from 1970 to 1973 is a drastic lessening of the historically large migration of Iowans to other states.

Agricultural land use acres within incorporated places by size classes and regions

County number	County name	Population size class											
		50,000+				10,001-50,000				5,001-10,000			
		1963	1967	1970	1973	1963	1967	1970	1973	1963	1967	1970	1973
Region 1													
3	Allamakee	0	0	0	0	0	0	0	0	0	0	0	0
22	Clayton	0	0	0	0	0	0	0	0	0	0	0	0
33	Fayette	0	0	0	0	0	0	0	0	727	442	414	405
45	Howard	0	0	0	0	0	0	0	0	0	0	0	0
96	Winneshek	0	0	0	0	0	0	0	0	393	1,066	1,015	1,701
Region total		0	0	0	0	0	0	0	0	1,120	1,508	1,429	2,106
Region 2													
17	Cerro Gordo	0	0	0	0	2,653	2,653	2,868	8,569	512	491	896	787
34	Floyd	0	0	0	0	0	0	0	0	425	427	302	263
35	Franklin	0	0	0	0	0	0	0	0	0	0	0	0
41	Hancock	0	0	0	0	0	0	0	0	0	0	0	0
55	Kossuth	0	0	0	0	0	0	0	0	299	275	252	242
66	Mitchell	0	0	0	0	0	0	0	0	0	0	0	0
95	Winnebago	0	0	0	0	0	0	0	0	0	0	0	0
98	Worth	0	0	0	0	0	0	0	0	0	0	0	0
Region total		0	0	0	0	2,653	2,653	2,868	8,569	1,236	1,193	1,450	1,292
Region 3													
11	Buena Vista	0	0	0	0	0	0	0	0	531	481	459	410
21	Clay	0	0	0	0	965	870	2,713	2,673	0	0	0	0
30	Dickinson	0	0	0	0	0	0	0	0	0	0	0	0
32	Emmet	0	0	0	0	0	0	0	0	963	928	932	977
60	Lyon	0	0	0	0	0	0	0	0	0	0	0	0
71	O'Brien	0	0	0	0	0	0	0	0	0	0	0	0
72	Osceola	0	0	0	0	0	0	0	0	0	0	0	0
74	Palo Alto	0	0	0	0	0	0	0	0	0	0	0	0
84	Sioux	0	0	0	0	0	0	0	0	0	0	0	0
Region total		0	0	0	0	965	870	2,713	2,673	1,494	1,409	1,391	1,387

(continued)

County number	County name	Population size class											
		50,000+				10,001-50,000				5,001-10,000			
		1963	1967	1970	1973	1963	1967	1970	1973	1963	1967	1970	1973
Region 4													
18	Cherokee	0	0	0	0	0	0	0	0	1,441	1,841	1,810	1,784
47	Ida	0	0	0	0	0	0	0	0	0	0	0	0
67	Monona	0	0	0	0	0	0	0	0	0	0	0	0
75	Plymouth	0	0	0	0	0	0	0	0	997	1,224	1,210	1,139
97	Woodbury	13,894	13,908	13,507	13,056	0	0	0	0	0	0	0	0
Region total		13,894	13,908	13,507	13,056	0	0	0	0	2,438	3,065	3,020	2,923
Region 5													
13	Calhoun	0	0	0	0	0	0	0	0	0	0	0	0
40	Hamilton	0	0	0	0	0	0	0	0	908	868	2,045	2,310
46	Humboldt	0	0	0	0	0	0	0	0	0	0	0	0
76	Pocahontas	0	0	0	0	0	0	0	0	0	0	0	0
94	Webster	0	0	0	0	297	4,048	3,692	3,535	0	0	0	0
99	Wright	0	0	0	0	0	0	0	0	0	0	0	0
Region total		0	0	0	0	297	4,048	3,692	3,535	908	868	2,045	2,310
Region 6													
42	Hardin	0	0	0	0	0	0	0	0	1,411	1,411	1,471	1,362
64	Marshall	0	0	0	0	1,110	3,664	3,530	3,303	0	0	0	0
79	Poweshiek	0	0	0	0	0	0	0	0	171	237	288	200
86	Tama	0	0	0	0	0	0	0	0	0	0	0	0
Region total		0	0	0	0	1,110	3,664	3,530	3,303	1,582	1,648	1,759	1,562
Region 7													
7	Black Hawk	6,099	16,194	16,715	16,271	3,013	5,396	4,878	10,118	931	929	833	817
9	Bremer	0	0	0	0	0	0	0	0	1,206	1,337	1,153	1,156
10	Buchanan	0	0	0	0	0	0	0	0	497	231	162	332
12	Butler	0	0	0	0	0	0	0	0	0	0	0	0

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(continued)

County number	County name	Population size class											
		50,000+				10,001-50,000				5,001-10,000			
		1963	1967	1970	1973	1963	1967	1970	1973	1963	1967	1970	1973
Region 7 (continued)													
19	Chickasaw	0	0	0	0	0	0	0	0	0	0	0	0
38	Grundy	0	0	0	0	0	0	0	0	0	0	0	0
Region total		6,099	16,194	16,715	16,271	3,013	5,396	4,878	10,118	2,634	2,497	2,148	2,305
Region 8													
16	Cedar	0	0	0	0	0	0	0	0	0	0	0	0
23	Clinton	0	0	0	0	1,269	1,334	13,230	13,291	0	0	0	0
28	Delaware	0	0	0	0	0	0	0	0	0	0	0	0
31	Dubuque	617	1,152	1,089	1,574	0	0	0	0	0	0	0	0
49	Jackson	0	0	0	0	0	0	0	0	748	708	669	700
Region total		617	1,152	1,089	1,574	1,269	1,334	13,230	13,291	748	708	669	700
Region 9													
70	Muscatine	0	0	0	0	1,667	1,333	1,218	1,342	0	0	0	0
82	Scott	16,575	21,481	20,745	19,798	1,921	3,250	3,485	7,933	0	0	0	0
Region total		16,575	21,481	20,745	19,798	3,588	4,583	4,703	9,275	0	0	0	0
Region 10													
6	Benton	0	0	0	0	0	0	0	0	0	0	0	0
48	Iowa	0	0	0	0	0	0	0	0	0	0	0	0
52	Johnson	0	0	0	0	612	3,265	5,650	5,773	159	674	2,707	2,606
53	Jones	0	0	0	0	0	0	0	0	0	0	0	0
57	Linn	10,490	10,555	9,951	9,449	2,281	3,057	2,899	2,942	0	0	0	0
92	Washington	0	0	0	0	0	0	0	0	333	317	301	301
Region total		10,490	10,555	9,951	9,449	2,893	6,322	8,549	8,715	492	991	3,008	2,907
Region 11													
8	Boone	0	0	0	0	596	892	849	2,224	0	0	0	0
25	Dallas	0	0	0	0	0	0	0	0	363	429	394	490

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(continued)

County number	County name	Population size class											
		50,000+				10,001-50,000				5,001-10,000			
		1963	1967	1970	1973	1963	1967	1970	1973	1963	1967	1970	1973
50	Jasper	0	0	0	0	1,376	1,483	1,333	1,442	0	0	0	0
61	Madison	0	0	0	0	0	0	0	0	0	0	0	0
63	Marion	0	0	0	0	0	0	0	0	754	718	785	1,547
77	Polk	5,666	5,240	4,996	4,582	9,368	8,776	8,930	8,587	1,088	1,006	2,748	2,522
85	Story	0	0	0	0	2,384	2,155	1,742	1,788	0	0	0	0
91	Warren	0	0	0	0	0	0	0	0	740	775	2,380	2,286
Region total		5,666	5,240	4,996	4,582	13,724	13,306	12,854	14,041	2,945	2,928	6,307	6,845
Region 12													
5	Audubon	0	0	0	0	0	0	0	0	0	0	0	0
14	Carroll	0	0	0	0	0	0	0	0	468	474	541	408
24	Crawford	0	0	0	0	0	0	0	0	1,444	1,854	1,756	1,703
37	Greene	0	0	0	0	0	0	0	0	0	0	0	0
39	Guthrie	0	0	0	0	0	0	0	0	0	0	0	0
81	Sac	0	0	0	0	0	0	0	0	0	0	0	0
Region total		0	0	0	0	0	0	0	0	1,912	2,328	2,297	2,111
Region 13													
15	Cass	0	0	0	0	0	0	0	0	460	369	268	268
36	Fremont	0	0	0	0	0	0	0	0	0	0	0	0
43	Harrison	0	0	0	0	0	0	0	0	0	0	0	0
65	Mills	0	0	0	0	0	0	0	0	0	0	0	0
69	Montgomery	0	0	0	0	0	0	0	0	673	784	738	653
73	Page	0	0	0	0	0	0	0	0	735	754	700	642
78	Pottawattamie	1,477	1,851	8,997	8,520	0	0	0	0	0	0	0	0
83	Shelby	0	0	0	0	0	0	0	0	414	357	1,392	1,360
Region total		1,477	1,851	8,997	8,520	0	0	0	0	2,282	2,264	3,098	2,923

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(continued)

County number	County name	Population size class											
		50,000+				10,001-50,000				5,001-10,000			
		1963	1967	1970	1973	1963	1967	1970	1973	1963	1967	1970	1973
Region 14													
1	Adair	0	0	0	0	0	0	0	0	0	0	0	0
2	Adams	0	0	0	0	0	0	0	0	0	0	0	0
20	Clarke	0	0	0	0	0	0	0	0	0	0	0	0
27	Decatur	0	0	0	0	0	0	0	0	0	0	0	0
80	Ringgold	0	0	0	0	0	0	0	0	0	0	0	0
87	Taylor	0	0	0	0	0	0	0	0	0	0	0	0
88	Union	0	0	0	0	0	0	0	0	682	659	948	920
Region total		0	0	0	0	0	0	0	0	682	659	948	920
Region 15													
4	Appanoose	0	0	0	0	0	0	0	0	844	769	787	731
26	Davis	0	0	0	0	0	0	0	0	0	0	0	0
51	Jefferson	0	0	0	0	0	0	0	0	108	265	503	669
54	Keokuk	0	0	0	0	0	0	0	0	0	0	0	0
59	Lucas	0	0	0	0	0	0	0	0	451	687	664	609
62	Mahaska	0	0	0	0	149	222	183	197	0	0	0	0
68	Monroe	0	0	0	0	0	0	0	0	0	0	0	0
89	Van Buren	0	0	0	0	0	0	0	0	0	0	0	0
90	Wapello	0	0	0	0	350	390	182	330	0	0	0	0
93	Wayne	0	0	0	0	0	0	0	0	0	0	0	0
Region total		0	0	0	0	499	612	365	527	1,403	1,721	1,954	2,009
Region 16													
29	Des Moines	0	0	0	0	1,776	1,660	2,058	1,960	0	0	0	0
44	Henry	0	0	0	0	0	0	0	0	404	1,051	1,285	1,466
56	Lee	0	0	0	0	802	960	1,100	1,620	0	0	0	0
58	Louisa	0	0	0	0	0	0	0	0	0	0	0	0
Region total		0	0	0	0	2,578	2,620	3,158	3,580	404	1,051	1,285	1,466
State total		54,818	70,381	76,000	73,250	32,589	45,408	60,540	77,627	22,280	24,838	32,808	33,766

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Agricultural land use acres within incorporated places by size classes and regions

County number	County name	Population size class							
		2,501-5,000				1,501-2,500			
		1963	1967	1970	1973	1963	1967	1970	1973
Region 1									
3	Allamakee	71	68	60	59	0	0	0	0
22	Clayton	0	0	0	0	688	661	646	613
33	Fayette	466	695	591	597	280	296	320	276
45	Howard	1,030	950	965	951	0	0	0	0
96	Winneshiek	0	0	0	0	150	146	126	126
Region total		1,567	1,713	1,616	1,607	1,118	1,103	1,092	1,015
Region 2									
17	Cerro Gordo	0	0	0	0	0	0	0	0
34	Floyd	0	0	0	0	0	0	0	0
35	Franklin	1,336	1,329	1,261	1,221	390	409	403	403
41	Hancock	0	0	398	347	226	303	297	284
55	Kossuth	0	0	0	0	0	0	0	0
66	Mitchell	223	223	188	205	0	0	0	0
95	Winnebago	400	366	267	267	1,025	1,009	891	880
98	Worth	0	0	0	0	2,000	1,953	1,904	1,850
Region total		1,959	1,918	2,114	2,040	3,641	3,674	3,495	3,417
Region 3									
11	Buena Vista	0	0	0	0	234	178	194	194
21	Clay	0	0	0	0	0	0	0	0
30	Dickinson	149	106	207	176	22	20	0	0
32	Emmet	0	0	0	0	0	0	0	0
60	Lyon	1,693	1,657	1,617	1,593	0	0	0	0
71	O'Brien	460	465	953	882	265	287	299	291
72	Osceola	113	110	110	100	0	0	0	0
74	Palo Alto	566	539	735	702	0	0	0	0
84	Sioux	1,532	1,092	1,059	1,153	509	479	370	426
Region total		4,513	3,969	4,681	4,606	1,030	964	863	911

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(continued)

County number	County name	Population size class							
		2,501-5,000				1,501-2,500			
		1963	1967	1970	1973	1963	1967	1970	1973
Region 4									
18	Cherokee	0	0	0	0	0	0	0	0
47	Ida	0	0	0	0	189	214	171	160
67	Monona	1,932	1,911	1,874	1,864	194	193	178	190
75	Plymouth	0	0	0	0	0	0	0	0
97	Woodbury	0	0	0	0	0	0	0	0
Region total		1,932	1,911	1,874	1,864	383	407	349	350
Region 5									
13	Calhoun	0	0	0	0	4,965	5,367	5,296	5,224
40	Hamilton	0	0	0	0	0	0	0	0
46	Humboldt	1,004	893	819	795	0	0	0	0
76	Pocahontas	0	0	0	0	143	196	169	257
94	Webster	0	0	0	0	0	0	0	0
99	Wright	2,223	2,205	2,026	2,028	484	486	422	424
Region total		3,227	3,098	2,845	2,823	5,592	6,049	5,887	5,905
Region 6									
42	Hardin	1,538	1,488	1,532	1,509	510	510	478	479
64	Marshall	0	0	0	0	0	0	0	0
79	Poweshiek	0	0	0	0	0	0	0	0
86	Tama	813	810	776	742	1,127	930	905	720
Region total		2,351	2,298	2,308	2,251	1,637	1,440	1,383	1,199
Region 7									
7	Black Hawk	0	0	0	0	1,188	3,678	4,602	5,189
9	Bremer	0	0	0	0	733	739	737	700
10	Buchanan	0	0	0	0	599	599	498	444
12	Butler	0	0	0	0	22	162	108	87

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(continued)

County number	County name	Population size class							
		2,501-5,000				1,501-2,500			
		1963	1967	1970	1973	1963	1967	1970	1973
19	Chickasaw	335	351	282	669	940	974	829	763
38	Grundy	148	385	371	357	388	377	360	360
Region total		483	736	653	1,026	3,870	6,529	7,134	7,543
<u>Region 8</u>									
16	Cedar	15	0	0	0	0	0	0	0
23	Clinton	1,494	2,053	3,110	3,157	0	0	0	0
28	Delaware	1,056	1,065	1,163	1,439	0	0	0	0
31	Dubuque	1,058	922	953	860	80	80	72	77
49	Jackson	0	0	0	0	0	0	0	0
Region total		3,623	4,040	5,226	5,456	80	80	72	77
<u>Region 9</u>									
70	Muscataine	0	0	0	0	239	224	204	397
82	Scott	241	200	1,387	1,385	1,365	1,405	2,973	5,571
Region total		241	200	1,387	1,385	1,604	1,629	3,177	5,968
<u>Region 10</u>									
6	Benton	1,090	1,044	953	1,960	0	0	0	0
48	Iowa	0	0	0	0	133	136	138	675
52	Johnson	0	0	0	0	0	0	0	0
53	Jones	204	286	298	1,331	11	11	11	10
57	Linn	78	73	47	220	37	95	128	157
92	Washington	0	0	0	0	0	0	0	0
Region total		1,372	1,403	1,298	3,511	181	242	277	842
<u>Region 11</u>									
8	Boone	0	0	0	0	475	425	396	389
25	Dallas	0	0	0	0	473	472	460	1,934

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(continued)

County number	County name	Population size class							
		2,501-5,000				1,501-2,500			
		1963	1967	1970	1973	1963	1967	1970	1973
50	Jasper	0	0	0	0	30	30	64	49
61	Madison	165	147	147	288	0	0	0	0
63	Marion	0	0	0	0	0	0	0	0
77	Polk	1,602	1,589	1,674	1,452	912	783	757	2,349
85	Story	646	604	573	406	455	452	507	467
91	Warren	0	0	0	0	396	390	385	543
Region total		2,413	2,340	2,394	2,146	2,741	2,552	2,569	5,731
<u>Region 12</u>									
5	Audubon	312	294	281	282	0	0	0	0
14	Carroll	0	0	0	0	893	899	860	860
24	Crawford	0	0	0	0	0	0	0	0
37	Greene	1,527	1,507	1,466	1,377	0	0	0	0
39	Guthrie	0	0	0	0	25	24	11	10
81	Sac	2,026	1,998	1,989	1,915	0	0	0	0
Region total		3,865	3,799	3,736	3,574	918	923	871	870
<u>Region 13</u>									
15	Cass	0	0	0	0	0	0	0	0
36	Fremont	0	0	0	0	57	57	57	57
43	Harrison	543	560	594	441	136	159	160	94
65	Mills	165	165	158	153	0	0	0	0
69	Montgomery	0	0	0	0	0	0	0	0
73	Page	0	0	0	0	0	0	0	0
78	Pottawattamie	121	59	59	59	621	575	564	612
83	Shelby	0	0	0	0	0	0	0	0
Region total		829	784	811	653	814	791	781	763

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(continued)

County number	County name	Population size class							
		2,501-5,000				1,501-2,500			
		1963	1967	1970	1973	1963	1967	1970	1973
Region 14									
1	Adair	0	0	0	0	543	528	524	523
2	Adams	0	0	0	0	150	205	166	160
20	Clarke	243	215	168	58	0	0	0	0
27	Decatur	955	924	1,013	742	251	457	396	373
80	Ringgold	0	0	0	0	518	633	755	742
87	Taylor	0	0	0	0	365	365	365	390
88	Union	0	0	0	0	0	0	0	0
Region total		1,198	1,139	1,181	800	1,827	2,188	2,206	2,188
Region 15									
4	Appanoose	0	0	0	0	0	0	0	0
26	Davis	178	160	160	172	0	0	0	0
51	Jefferson	0	0	0	0	0	0	0	0
54	Keokuk	0	0	0	0	487	436	399	431
59	Lucas	0	0	0	0	0	0	0	0
62	Mahaska	0	0	0	0	0	0	0	0
68	Monroe	676	720	677	619	0	0	0	0
89	Van Buren	0	0	0	0	0	0	0	0
90	Wapello	0	0	0	0	0	0	0	0
93	Wayne	0	0	0	0	188	161	155	146
Region total		854	880	837	791	675	597	554	577
Region 16									
29	Des Moines	446	815	1,075	1,327	0	0	0	0
44	Henry	0	0	0	0	81	81	74	74
56	Lee	0	0	0	0	0	0	0	0
58	Louisa	0	0	0	0	150	197	134	130
Region total		446	815	1,075	1,327	231	278	208	204
State total		30,873	31,043	34,036	35,860	26,342	29,446	30,918	37,560

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Agricultural land use acres within incorporated places by size classes and regions

County number	County name	Population size class							
		1,500 or less				Total			
		1963	1967	1970	1973	1963	1967	1970	1973
Region 1									
3	Allamakee	410	409	409	373	481	477	469	432
22	Clayton	4,021	3,850	3,716	3,698	4,709	4,511	4,362	4,311
33	Fayette	2,697	2,751	2,711	2,724	4,170	4,184	4,036	4,002
45	Howard	1,679	1,680	1,691	1,694	2,709	2,630	2,656	2,645
96	Winneshiek	4,475	4,571	4,579	4,496	5,018	5,783	5,720	6,323
Region total		13,282	13,261	13,106	12,985	17,087	17,585	17,243	17,713
Region 2									
17	Cerro Gordo	4,051	3,973	3,938	3,713	7,216	7,117	7,702	13,069
34	Floyd	1,837	1,812	1,782	1,751	2,262	2,239	2,084	2,014
35	Franklin	8,690	8,647	8,594	8,667	10,416	10,385	10,258	10,291
41	Hancock	2,180	2,251	2,236	2,243	2,406	2,554	2,931	2,874
55	Kossuth	1,212	1,225	1,241	1,223	1,511	1,500	1,493	1,465
66	Mitchell	988	961	958	885	1,211	1,184	1,146	1,090
95	Winnebago	1,864	1,830	1,836	1,823	3,289	3,205	2,994	2,970
98	Worth	2,600	2,557	2,514	2,460	4,600	4,510	4,418	4,310
Region total		23,422	23,256	23,099	22,765	32,911	32,694	33,026	38,083
Region 3									
11	Buena Vista	896	871	865	870	1,661	1,530	1,518	1,474
21	Clay	1,289	1,314	1,303	1,302	2,254	2,184	4,016	3,975
30	Dickinson	1,397	1,424	1,220	1,506	1,568	1,550	1,427	1,682
32	Emmet	1,008	1,007	997	1,121	1,971	1,935	1,929	2,098
60	Lyon	4,022	3,997	3,967	3,967	5,715	5,654	5,584	5,560
71	O'Brien	1,022	1,118	1,135	1,128	1,747	1,870	2,387	2,301
72	Osceola	1,346	1,314	1,302	1,292	1,459	1,424	1,412	1,392
74	Palo Alto	739	803	815	810	1,305	1,342	1,550	1,512
84	Sioux	1,479	1,561	1,440	1,564	3,520	3,132	2,869	3,143
Region total		13,198	13,409	13,044	13,560	21,200	20,621	22,692	23,137

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(continued)

County number	County name	Population size class							
		1,500 or less				Total			
		1963	1967	1970	1973	1963	1967	1970	1973
Region 4									
18	Cherokee	1,387	1,304	1,295	1,282	2,828	3,145	3,105	3,066
47	Ida	694	695	778	774	883	909	949	934
67	Monona	1,208	1,217	1,215	1,249	3,334	3,321	3,267	3,303
75	Plymouth	844	754	756	1,102	1,841	1,978	1,966	2,241
97	Woodbury	1,431	1,785	2,306	2,275	15,325	15,693	15,813	15,331
Region total		5,564	5,755	6,350	6,682	24,211	25,046	25,100	24,875
Region 5									
13	Calhoun	4,787	4,756	4,763	4,722	9,752	10,123	10,059	9,946
40	Hamilton	4,293	4,283	4,290	4,272	5,201	5,151	6,335	6,582
46	Humboldt	3,810	3,420	3,928	3,383	4,814	4,313	4,747	4,178
76	Pocahontas	1,243	1,257	1,279	1,274	1,386	1,453	1,448	1,531
94	Webster	8,366	8,344	8,270	6,748	8,663	12,392	11,962	10,283
99	Wright	1,432	1,422	1,365	1,367	4,139	4,113	3,813	3,819
Region total		23,931	23,482	23,895	21,766	33,955	37,545	38,364	36,339
Region 6									
42	Hardin	3,141	3,144	3,437	3,511	6,600	6,553	6,918	6,861
64	Marshall	2,489	2,518	2,479	2,335	3,599	6,182	6,009	5,638
79	Poweshiek	2,271	2,291	2,248	2,341	2,442	2,528	2,536	2,541
86	Tama	2,587	2,589	2,615	2,501	4,527	4,329	4,296	3,963
Region total		10,488	10,542	10,779	10,688	17,168	19,592	19,759	19,003
Region 7									
7	Black Hawk	851	1,067	953	941	12,082	27,264	27,981	33,336
9	Bremer	1,116	1,102	1,097	1,162	3,055	3,178	2,987	3,018
10	Buchanan	1,017	1,113	1,082	1,000	2,113	1,943	1,742	1,776
12	Butler	3,763	3,723	3,693	3,653	3,785	3,885	3,801	3,740

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(continued)

County number	County name	Population size class							
		1,500 or less				Total			
		1963	1967	1970	1973	1963	1967	1970	1973
19	Chickasaw	1,607	1,530	1,545	1,531	2,882	2,855	2,656	2,963
38	Grundy	1,403	1,363	1,344	1,305	1,939	2,125	2,075	2,022
Region total		9,757	9,898	9,714	9,592	25,856	41,250	41,242	46,855
Region 8									
16	Cedar	476	477	1,061	914	491	477	1,061	914
23	Clinton	1,402	1,342	1,349	1,307	4,165	4,729	17,689	17,755
28	Delaware	1,237	1,228	1,467	1,530	2,293	2,293	2,630	2,969
31	Dubuque	1,919	2,342	2,797	2,851	3,674	4,496	4,911	5,362
49	Jackson	2,777	2,841	2,833	2,815	3,525	3,549	3,502	3,515
Region total		7,811	8,230	9,507	9,417	14,148	15,544	29,793	30,515
Region 9									
70	Muscatine	84	109	109	2,370	1,990	1,666	1,531	4,109
82	Scott	3,106	3,283	3,958	4,256	23,208	29,619	32,548	38,943
Region total		3,190	3,392	4,067	6,626	25,198	31,285	34,079	43,052
Region 10									
6	Benton	851	841	785	786	1,941	1,885	1,738	2,746
48	Iowa	94	94	94	109	227	230	232	784
52	Johnson	574	1,144	3,141	3,706	1,345	5,083	11,498	12,085
53	Jones	1,100	1,049	1,074	1,012	1,315	1,346	1,383	2,353
57	Linn	5,120	4,394	4,244	4,179	18,006	18,174	17,269	16,947
92	Washington	1,010	1,141	1,077	998	1,343	1,458	1,378	1,299
Region total		8,749	8,663	10,415	10,790	24,177	28,176	33,498	36,214
Region 11									
8	Boone	1,771	1,644	1,621	1,600	2,842	2,961	2,866	4,213
25	Dallas	1,949	1,941	1,914	2,266	2,785	2,842	2,768	4,690

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(continued)

County number	County name	Population size class							
		1,500 or less				Total			
		1963	1967	1970	1973	1963	1967	1970	1973
50	Jasper	847	871	846	1,202	2,253	2,384	2,243	2,693
61	Madison	2,469	2,441	2,410	2,357	2,634	2,588	2,557	2,645
63	Marion	1,580	1,437	1,184	1,197	2,334	2,155	1,969	2,744
77	Polk	2,498	2,585	7,076	12,017	21,134	19,979	26,181	31,509
85	Story	3,691	3,619	3,518	3,605	7,176	6,830	6,340	6,266
91	Warren	1,544	1,509	1,491	1,477	2,680	2,674	4,258	4,308
Region total		16,349	16,047	20,060	25,721	43,838	42,413	49,180	59,066
Region 12									
5	Audubon	1,186	1,212	1,238	1,221	1,498	1,506	1,519	1,503
14	Carroll	3,488	3,565	3,550	3,509	4,849	4,938	4,951	4,777
24	Crawford	1,796	1,817	1,830	1,801	3,240	3,671	3,586	3,504
37	Greene	7,276	7,263	7,254	7,245	8,803	8,770	8,720	8,622
39	Guthrie	1,379	1,374	1,384	1,494	1,404	1,398	1,395	1,504
81	Sac	1,805	1,782	1,726	1,749	3,831	3,780	3,715	3,664
Region total		16,930	17,013	16,982	17,019	23,625	24,063	23,886	23,574
Region 13									
15	Cass	1,218	1,104	1,113	1,108	1,678	1,473	1,381	1,376
36	Fremont	1,284	1,309	1,291	1,278	1,341	1,366	1,348	1,335
43	Harrison	1,810	1,799	1,845	1,573	2,489	2,518	2,599	2,108
65	Mills	704	677	650	647	869	842	808	800
69	Montgomery	1,057	1,074	1,050	1,018	1,730	1,858	1,788	1,671
73	Page	1,437	1,386	1,387	1,368	2,172	2,140	2,087	2,010
78	Pottawattamie	1,092	985	1,245	1,311	3,311	3,470	10,865	10,502
83	Shelby	1,675	1,637	1,671	1,678	2,089	1,994	3,063	3,038
Region total		10,277	9,971	10,252	9,981	15,679	15,661	23,939	22,840

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(continued)

County number	County name	Population size class							
		1,500 or less				Total			
		1963	1967	1970	1973	1963	1967	1970	1973
Region 14									
1	Adair	810	831	961	947	1,353	1,359	1,485	1,470
2	Adams	627	634	641	641	777	839	807	801
20	Clarke	503	503	531	550	746	718	699	608
27	Decatur	492	515	557	518	1,698	1,896	1,966	1,633
80	Ringgold	2,690	2,760	2,753	2,753	3,208	3,393	3,508	3,495
87	Taylor	1,032	1,037	1,029	979	1,397	1,402	1,394	1,369
88	Union	629	637	623	587	1,311	1,296	1,571	1,507
Region total		6,783	6,917	7,095	6,975	10,490	10,903	11,430	10,883
Region 15									
4	Appanoose	3,666	3,708	3,735	3,910	4,510	4,477	4,522	4,641
26	Davis	329	328	328	328	507	488	488	500
51	Jefferson	1,429	1,432	1,448	1,367	1,537	1,697	1,951	2,036
54	Keokuk	2,849	2,856	2,802	2,809	3,336	3,292	3,201	3,240
59	Lucas	870	854	853	850	1,321	1,541	1,517	1,459
62	Mahaska	1,287	1,275	1,246	1,216	1,436	1,497	1,429	1,413
68	Monroe	608	616	616	521	1,284	1,336	1,293	1,140
89	Van Buren	2,671	2,672	2,622	2,635	2,671	2,672	2,622	2,635
90	Wapello	530	514	552	537	880	904	734	867
93	Wayne	2,112	2,013	2,083	2,389	2,300	2,174	2,238	2,535
Region total		16,351	16,268	16,285	16,562	19,782	20,078	19,995	20,466
Region 16									
29	Des Moines	676	658	658	664	2,898	3,133	3,791	3,951
44	Henry	1,016	984	913	946	1,501	2,116	2,272	2,486
56	Lee	732	745	747	766	1,534	1,705	1,847	2,386
58	Louisa	838	1,356	1,093	1,000	988	1,553	1,227	1,130
Region total		3,262	3,743	3,411	3,376	6,921	8,507	9,137	9,953
State total		189,344	189,847	198,061	204,505	356,246	390,963	432,363	462,568

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Comparison of projected change in urban land use acres with available 1970 agricultural land use acres within incorporated places by counties and regions

County	Ag. within, 1970	Δ URB 1970-1980	Remain-der	Δ URB 1980-1990	Remain-der
Allamakee	469	992	-523	955	-1,478
Clayton	4,362	1,179	3,183	1,294	1,889
Fayette	4,036	842	3,194	1,181	2,013
Howard	2,656	264	2,392	558	1,834
Winneshek	5,720	882	4,838	870	3,968
Total, Region 1	17,243	4,159	13,084	4,858	8,226
Cerro Gordo	7,702	1,033	6,669	1,181	5,488
Floyd	2,084	853	1,231	1,096	135
Franklin	10,258	401	9,857	587	9,270
Hancock	2,931	844	2,087	955	1,132
Kossuth	1,493	888	605	1,266	-661
Mitchell	1,146	273	873	530	343
Winnebago	2,994	844	2,150	700	1,450
Worth	4,418	398	4,020	587	3,433
Total, Region 2	33,026	5,534	27,492	6,902	20,590
Buena Vista	1,518	758	760	870	-110
Clay	4,016	767	3,249	813	2,436
Dickinson	1,427	738	689	728	-39
Emmet	1,929	782	1,147	841	306
Lyon	5,584	575	5,009	841	4,168
O'Brien	2,387	892	1,495	926	569
Osceola	1,412	316	1,096	558	538
Palo Alto	1,550	845	705	841	-136
Sioux	2,869	758	2,111	1,039	1,072
Total, Region 3	22,692	6,431	16,261	7,457	8,804
Cherokee	3,105	595	2,510	700	1,810
Ida	949	365	584	474	110
Monona	3,267	595	2,672	643	2,029
Plymouth	1,966	552	1,414	926	488
Woodbury	15,813	3,487	12,326	3,671	8,655
Total, Region 4	25,100	5,594	19,506	6,414	13,092
Calhoun	10,059	392	9,667	530	9,137
Hamilton	6,335	252	6,083	360	5,723
Humboldt	4,747	666	4,081	643	3,438
Pocahontas	1,448	90	1,358	275	1,083
Webster	11,962	901	11,061	1,238	9,823
Wright	3,813	447	3,366	672	2,694

(continued)

Δ URB 1990-2000	Remain-der	Δ URB 2000-2010	Remain-der	Δ URB 2010-2020	Remain-der
813	-2,291	926	-3,217	1,039	-4,256
1,124	765	1,322	-557	1,521	-2,078
870	1,143	841	302	898	-596
558	1,276	700	576	672	-96
530	3,438	672	2,766	587	2,179
3,895	4,331	4,461	-130	4,717	-4,847
870	4,618	926	3,692	728	2,964
926	-791	955	-1,746	1,011	-2,757
360	8,910	530	8,380	558	7,822
700	432	926	-494	841	-1,335
955	-1,616	1,294	-2,910	1,379	-4,289
445	-102	558	-660	587	-1,247
332	1,118	445	673	247	426
474	2,959	530	2,429	417	2,012
5,062	15,528	6,164	9,364	5,768	3,596
474	-584	530	-1,114	558	-1,672
474	1,962	643	1,319	502	817
474	-513	474	-987	360	-1,347
643	-337	841	-1,178	728	-1,906
813	3,355	955	2,400	1,124	1,276
587	-18	587	-605	757	-1,362
530	8	502	-494	672	-1,166
728	-864	926	-1,790	1,039	-2,829
898	174	870	-696	983	-1,679
5,621	3,183	6,328	-3,145	6,723	-9,868
700	1,110	728	382	757	-375
530	-420	445	-865	643	-1,508
502	1,527	643	884	728	156
870	-382	785	-1,167	926	-2,093
3,077	5,578	3,388	2,190	3,473	-1,283
5,679	7,413	5,989	1,424	6,527	-5,103
502	8,635	445	8,190	474	7,716
530	5,193	445	4,748	587	4,161
417	3,021	502	2,519	502	2,017
360	723	530	193	672	-479
926	8,897	1,068	7,829	700	7,129
558	2,136	389	1,747	530	1,217

(continued)

County	Ag. within, 1970	Δ URB 1970- 1980	Remain- der	Δ URB 1980- 1990	Remain- der
Total, Region 5	38,364	2,748	35,616	3,718	31,898
Hardin	6,918	488	6,430	700	5,730
Marshall	6,009	1,414	4,595	1,690	2,905
Poweshiek	2,536	925	1,611	813	798
Tama	4,296	658	3,638	841	2,797
Total, Region 6	19,759	3,485	16,274	4,044	12,230
Black Hawk	27,981	3,695	24,286	3,841	20,445
Bremer	2,987	888	2,099	757	1,342
Buchanan	1,742	654	1,088	955	133
Butler	3,801	883	2,918	870	2,048
Chickasaw	2,656	482	2,174	757	1,417
Grundy	2,075	638	1,437	672	765
Total, Region 7	41,242	7,240	34,002	7,852	26,150
Cedar	1,061	599	462	530	-68
Clinton	17,689	2,327	15,362	2,539	12,823
Delaware	2,630	878	1,752	1,124	628
Dubuque	4,911	4,518	393	5,256	-4,863
Jackson	3,502	1,028	2,474	1,351	1,123
Total, Region 8	29,793	9,350	20,443	10,800	9,643
Muscatine	1,531	1,639	-108	1,945	-2,053
Scott	32,548	5,033	27,515	6,048	21,467
Total, Region 9	34,079	6,672	27,407	7,993	19,414
Benton	1,738	987	751	841	-90
Iowa	232	525	-293	728	-1,021
Johnson	11,498	2,447	9,051	2,511	6,540
Jones	1,383	681	702	870	-168
Linn	17,269	5,252	12,017	5,822	6,195
Washington	1,378	455	923	530	393
Total, Region 10	33,498	10,347	23,151	11,302	11,849
Boone	2,866	1,246	1,620	1,068	552
Dallas	2,768	761	2,007	841	1,166
Jasper	2,243	1,457	786	1,464	-678
Madison	2,557	910	1,647	1,011	636
Marion	1,969	798	1,171	870	301
Polk	26,181	10,264	15,917	10,208	5,709
Story	6,340	3,733	2,607	2,935	-328

(continued)

Δ URB 1990- 2000	Remain- der	Δ URB 2000- 2010	Remain- der	Δ URB 2010- 2020	Remain- der
3,293	28,605	3,379	25,226	3,465	21,761
445	5,285	502	4,783	615	4,168
1,266	1,639	1,294	345	1,322	-977
587	211	417	-206	445	-651
841	1,956	757	1,199	1,039	160
3,139	9,091	2,970	6,121	3,421	2,700
3,134	17,311	3,020	14,291	2,652	11,639
587	755	332	423	558	-135
983	-850	1,294	-2,144	1,322	-3,466
700	1,348	841	507	870	-363
813	604	870	-266	1,039	-1,305
474	291	332	-41	389	-430
6,691	19,459	6,689	12,770	6,830	5,940
502	-570	445	-1,015	389	-1,404
2,058	10,765	2,228	8,537	1,945	6,592
1,266	-638	1,351	-1,989	1,521	-3,510
4,379	-9,242	4,520	-13,762	4,747	-18,509
1,153	-30	1,379	-1,409	1,549	-2,958
9,358	285	9,923	-9,638	10,151	-19,789
1,605	-3,658	1,605	-5,263	1,577	-6,840
5,709	15,758	5,595	10,163	5,567	4,596
7,314	12,100	7,200	4,900	7,144	-2,244
643	-733	841	-1,574	587	-2,161
558	-1,579	700	-2,279	785	-3,064
2,907	3,633	2,992	641	2,681	-2,040
700	-868	1,039	-1,907	926	-2,833
5,256	939	4,747	-3,808	4,209	-8,017
502	-109	615	-724	785	-1,509
10,566	1,283	10,934	-9,651	9,973	-19,624
615	-63	558	-621	502	-1,123
728	438	757	-319	558	-877
1,096	-1,774	983	-2,757	898	-3,655
530	106	558	-452	530	-982
445	-144	389	-533	275	-808
8,199	-2,490	8,227	-10,717	7,576	-18,293
2,681	-3,009	2,426	-5,435	1,917	-7,352

(continued)

County	Ag. within, 1970	Δ URB 1970-1980	Remainder	Δ URB 1980-1990	Remainder
Warren	4,256	2,276	1,980	2,341	-361
Total, Region 11	49,180	21,445	27,735	20,738	6,997
Audubon	1,519	305	1,214	474	740
Carroll	4,951	895	4,056	1,266	2,790
Crawford	3,586	276	3,310	587	2,723
Greene	8,720	412	8,308	530	7,778
Guthrie	1,395	518	877	615	262
Sac	3,715	679	3,036	785	2,251
Total, Region 12	23,886	3,085	20,801	4,257	16,544
Cass	1,381	726	655	672	-17
Fremont	1,348	620	728	643	85
Harrison	2,599	1,141	1,458	1,181	277
Mills	808	663	145	672	-527
Montgomery	1,788	847	941	1,011	-70
Page	2,087	944	1,143	728	415
Pottawattamie	10,865	3,476	7,389	4,096	3,293
Shelby	3,063	777	2,286	1,011	1,275
Total, Region 13	23,939	9,194	14,745	10,014	4,731
Adair	1,485	223	1,262	389	873
Adams	807	298	509	219	290
Clarke	699	507	192	587	-395
Decatur	1,966	265	1,701	304	1,397
Ringgold	3,508	368	3,140	360	2,780
Taylor	1,394	420	974	304	670
Union	1,571	542	1,029	502	527
Total, Region 14	11,430	2,623	8,807	2,665	6,142
Appanoose	4,522	726	3,796	870	2,926
Davis	488	387	101	558	-457
Jefferson	1,951	453	1,498	332	1,166
Keokuk	3,201	433	2,768	530	2,238
Lucas	1,517	512	1,005	502	503
Mahaska	1,429	763	666	587	79
Monroe	1,293	401	892	417	475
Van Buren	2,622	348	2,274	530	1,744
Wapello	734	1,054	-320	1,039	-1,359
Wayne	2,238	387	1,851	275	1,576
Total, Region 15	19,995	5,464	14,531	5,640	8,891

(continued)

Δ URB 1990-2000	Remainder	Δ URB 2000-2010	Remainder	Δ URB 2010-2020	Remainder
1,690	-2,051	1,521	-3,572	1,209	-4,781
15,984	-8,987	15,419	-24,406	13,465	-37,871
417	323	474	-151	530	-681
1,124	1,666	1,266	400	1,436	-1,036
813	1,910	870	1,040	926	114
474	7,304	530	6,774	672	6,102
332	-70	587	-657	587	-1,244
672	1,579	757	822	841	-19
3,832	12,712	4,484	8,228	4,992	3,236
445	-462	587	-1,049	615	-1,664
530	-445	558	-1,003	615	-1,618
983	-706	1,039	-1,745	1,181	-2,926
474	-1,001	417	-1,418	389	-1,807
643	-713	643	-1,356	643	-1,999
672	-257	728	-985	615	-1,600
3,332	-39	3,332	-3,371	3,275	-6,646
700	575	926	-351	898	-1,249
7,779	-3,048	8,230	-11,278	8,231	-19,509
445	428	417	11	530	-519
332	-42	275	-317	304	-621
417	-812	558	-1,370	332	-1,702
304	1,093	219	874	304	570
304	2,476	417	2,059	417	1,642
360	310	219	91	389	-298
558	-31	417	-448	275	-723
2,720	3,422	2,522	900	2,551	-1,651
558	2,368	672	1,696	587	1,109
445	-902	474	-1,376	389	-1,765
275	891	304	587	332	255
530	1,708	558	1,150	672	478
332	171	643	-472	502	-974
502	-423	558	-981	389	-1,370
445	30	474	-444	558	-1,002
445	1,299	360	939	360	579
841	-2,200	728	-2,928	870	-3,798
247	1,329	360	969	332	637
4,620	4,271	5,131	-860	4,991	-5,851

(continued)

County	Ag. within, 1970	Δ URB 1970-1980	Remain-der	Δ URB 1980-1990	Remain-der
Des Moines	3,791	139	3,652	502	3,150
Henry	2,272	300	1,972	558	1,414
Lee	1,847	1,210	637	1,436	-799
Louisa	1,227	790	437	728	-291
Total, Region 16	9,137	2,439	6,698	3,224	3,474
State total	432,363	105,810	326,553	117,878	208,675

(continued)

Δ URB 1990-2000	Remain-der	Δ URB 2000-2010	Remain-der	Δ URB 2010-2020	Remain-der
785	2,365	813	1,552	700	852
474	940	615	325	474	-149
1,124	-1,923	1,238	-3,161	1,351	-4,512
304	-595	304	-899	275	-1,174
2,687	787	2,970	-2,183	2,800	-4,983
98,240	110,435	102,793	7,642	101,749	-94,107

IV. APPENDIX D. INCORPORATED PLACE SURVEY

A. Background Information

The incorporated place survey was conceived in order to obtain nonagricultural land use data for land areas inside incorporated places within the state. Before writing this survey, various state agencies and planning entities in Iowa were personally contacted to discuss unpublished land use data availability. Knowledge of available published secondary land use data sources was obtained. The above investigations were made so as not to include any questions in the mail survey whose answers could readily be obtained from other sources.

Several initial drafts of this survey were made. Many subjective decisions had to be made regarding what type of questions to include in the survey. Relevant considerations included length of survey, data needs, and the ability of an incorporated place to supply accurate data.

A draft of the survey was pre-tested in four incorporated areas. Two of the pre-test surveys were lost in the mail because of a faulty method of addressing the surveys. This subsequently resulted in using the 1974 Directory of Iowa Municipal Officials to address the surveys to the clerk of each incorporated place. Major revisions were made in the incorporated place survey in light of knowledge gained from the two returned pre-test surveys. Personal interviews with the two city clerks revealed that a sparse amount of reliable land use data could be presently obtained from incorporated places. Therefore, an eighth

major revision of the incorporated place survey was undertaken. The author's own land use classification was discarded in favor of a much more aggregated modified Urban Renewal Administration - Bureau of Public Roads Standard Land Use Code (2, p. 269). The author's own intensive land use categories were also discarded in favor of those categories used by the U.S. Department of Commerce, Census of Manufacturers (200).

The county recorder, auditor, and assessor in both Story and Marshall counties were also personally interviewed with regard to the land use data they could provide. It was determined from these interviews that the total amount of agricultural land within incorporated places for the last 10 years could be obtained from the Iowa Department of Revenue.¹ These data were subsequently collected. It was also determined from these interviews that highly detailed land use acreage, ownership, plot size, and use data could be obtained from county assessor tax records, but this would be too extensive and expensive an undertaking and outside the scope of the present study. This source of data should be considered for future in-depth regional land use studies.

The incorporated place survey was differentiated by the population size of the incorporated place it was sent to. There are three different questions, III.1, corresponding to if the incorporated place is less

¹From Iowa Code 426.1, agricultural land is defined as land greater than or equal to 10 acres and assessed as agricultural land or a plot of land less than 10 acres but attached to another parcel greater than or equal to 10 acres and assessed as agricultural land.

than 2,500 in population, between 2,500 and 10,000 in population, and greater than 10,000 in population in 1970. Less data were asked for those incorporated places greater than 2,500 in population, for it was obtained from the 1963 and 1967 U.S. Department of Commerce, Census of Manufacturers (26, 27).

B. Description of Sampling Procedure and Survey Follow-up

According to the 1970 U.S. Census (29), there were 950 incorporated places in Iowa in 1970. Of these 950, 774 of them had 1,500 or less population. Because of the large number of incorporated places in this population size class, a 10 percent, systematic, stratified sample was taken. The 176 incorporated places greater than 1,500 in population were completely enumerated. The official planning regions, as given by the State of Iowa Office of Planning and Programming, were used to divide the state of Iowa into 16 strata. Within each odd numbered stratum (1, 3, 5, etc.), the incorporated places with populations less than 1,500 were ordered low to high by population. Within each even numbered stratum (2, 4, 6, etc.), the incorporated places with population less than 1,500 were ordered high to low by population. A systematic sample of every tenth incorporated place was selected from the ordered strata. In addition to the 76 incorporated places less than 1,500 in population sampled above, the 11 remaining incorporated places in Story County and 46 remaining incorporated places in region V that were less than 1,500 in population but were not included in the above sample were also sent surveys. Complete enumeration of all incorporated places in the above respective

county and region was desired so these data could be compared to the Story County aerial photo land use study and another complementary land use research project being simultaneously undertaken in region V. Thus, a total of 309 incorporated surveys was sent out.

The survey was sent out in the mail November 20, 1974, with a requested return date of December 13, 1974. On November 27, 1974, a thank you follow-up post card was sent out. On December 14, 1974, a follow-up letter with another survey enclosed was sent to those incorporated places who had not yet responded. This second enclosure had a return requested date of January 15, 1975. Finally, for those incorporated places that still did not respond, a telephone follow-up was made from the 15th to the 25th of January, 1975.

C. Survey Response Rate

Out of 309 surveys sent out, 247 (80 percent) were returned with at least questions II.1 and II.2 of the survey completed. Approximately 75 (30 percent) of the 247 responses could be attributed alone to the telephone follow-up. Below is a table of response rates broken down by incorporated place population size class.

Population size class	Surveys Sent	Surveys Returned
50,000+	7	7 (100%)
10,000-50,000	20	18 (90%)
5,000-10,000	36	33 (92%)
2,500- 5,000	48	42 (88%)
1,500- 2,500	65	44 (68%)
Less than 1,500	133	103 (77%)
Total	309	247 (80%)

D. Survey Sample, Response Factors,
and Other Data Adjustments

In analyzing the returned surveys, data from each of the 76 sampled incorporated places less than 1,500 in population returned were given a weight of 10. In other words, data from each of these 76 sampled incorporated places returned were assumed to represent data from 10 other incorporated places in this population size class. Data from those surveys returned by the 57 other incorporated places less than 1,500 in population in Story County and region V that had been sent surveys were given a weight of one, because they were not sampled. Similarly, data from those surveys returned of the 176 incorporated places greater than 1,500 in population that had been sent surveys were given a weight of one.

To correct for survey nonresponse, a factor of $\left[\frac{1 + \text{number nonresponse}}{\text{number response}} \right]$ was used. This assumed that those incorporated places in a given population size class that did not respond would respond the same as the arithmetic mean of those in the same size class that did respond.

Four different response correction factors were used. For those incorporated places with a 1970 population greater than 2,500 but less than 50,000, a factor of 1.11 or $[1 + 11/93]$ was used. Similarly, the response factors used for those places greater than 50,000, between 1,500 and 2,500, and less than 1,500 were respectively, 1.00, 1.47, and 1.29.

For those incorporated places in 1970 with population greater than 2,500, in addition to the incorporated place survey data, U.S. Department of Commerce, Bureau of Census, data were available for total land

area (square miles) inside the incorporated place in 1970 (29). For 1960, total land area (square miles) within incorporated places greater than 1,000 inhabitants was available from U.S. Department of Commerce Area Measurement Reports published in 1967 (16). This 1967 source provided figures more accurate than the total land areas given in the 1960 U.S. Census of Population (28). For the urban land use projection regressions on a county level, and for the urban size class regressions for places greater than 2,500, basically the above 1970 census data and 1967 Area Measurement Report data were used, except where gross errors were found. These revised census data were also used for those places greater than 2,500 in population in 1970 in Table 4.13. Area data in all other tables on incorporated places greater than 2,500 in population were obtained from the incorporated place survey.

Six gross errors were found in the 1970 census data, and nine gross errors were found in the 1967 Area Measurement Report data. The above census and Area Measurement Report area data were checked for consistency with returned survey data, along with Iowa Department of Revenue agricultural land area data and Iowa Highway Commission maps showing incorporated areas. Survey data for those places less than 2,500 in population were also checked for consistency with the Iowa Highway Commission maps and the Iowa Department of Revenue agricultural data. One recurring problem for all the incorporated places area data was annexation of land in a terminal year. For example, if land was annexed in 1970, it may or may not have gotten picked up in the total land area on the survey, census data, or Department of

Revenue agricultural data. Thus, when change in urban land area from 1960 to 1970 was calculated, inconsistent results would occur. Many of the complications with the census area data and Area Measurement Report data can be attributed to the census failing to pick up annexation that occurred right in 1960 and 1970. Several major errors were also found in the returned survey data with respect to total area within the incorporated places. Many of these errors can be attributed to the person filling out the survey just not knowing how many acres were within the incorporated area. Most of these errors tended to be gross underestimates of the actual total area within the incorporated place. Some of these errors may be attributed to neglecting to include agricultural land within the incorporated area. For example, approximately 30 (20 percent) of the 147 incorporated places less than 2,500 in population that returned surveys grossly underestimated the total land within their incorporated place. For any incorporated place where gross errors were found in the survey total area data, either corrections were made in the data or it was thrown out of the data set. Similarly, tabular data from question IV of the survey were either corrected, if possible, or discarded from the data set. Thus, any large discrepancies between the census area data and the survey data were corrected on both data sets. Small discrepancies were not removed. Hence, with regard to total area within incorporated places, there were two slightly different data sets for places greater than 2,500 in population. For the regressions, the revised census data were used. For all other analysis, corrected survey data were used.

Data on the amount of agricultural land within incorporated places for all 99 counties in Iowa were obtained for 1973, 1972, 1970, 1967, and 1963 from the Iowa Department of Revenue. Since the Department of Revenue retains records for only 10 years, agricultural land area data inside incorporated places for 1960 were obtained by calling each of the 99 county assessors and asking for a copy of the relevant section of the 1960 county abstract of assessment. For a few counties, agricultural land area data for their incorporated places were not available. A few assessors refused to respond. For those incorporated places missing 1960 agricultural land data, the same proportion of agricultural land to total incorporated area that held in the next closest available year to 1960 was assumed. This was usually either 1961 or 1962. The latest year used was 1963. This procedure was used for approximately 30 incorporated places with missing data. There were approximately 10 cases where towns less than 2,500 in population had no reported change in total land area, but the Department of Revenue agricultural land data indicated small changes in the amount of agricultural land within the incorporated place. While recognizing the possibility that agricultural land may come in and out of use, for consistency these few small changes in agricultural land area within incorporated places were forced to no change by using the arithmetic average agricultural land within the incorporated place for the years considered.

For the data on incorporated places land use proportions for 1973, if the individual survey land use data were complete, they were used along with the appropriate correction factor. If they were not complete,

then data for 1972 were used for land use categories 1 to 5. This assumed that any change in land use from 1972 to 1973 occurred in land use category 6. These approximated 1973 data were corrected with the appropriate factor. Finally, if 1972 data were not completed on the survey, the next earliest year completed data were used. The percentage of land use to total incorporated place area in that year was multiplied times the 1973 total incorporated place area to estimate the land use in 1973. Again, this was corrected with the appropriate factor.

For the data on incorporated places land use population proportions for 1970, if the individual survey land use data were complete, they were used along with the appropriate correction factor. If they were not complete, then the next earliest year completed data were used. The percentage of land use to total in that year was multiplied times the 1970 total incorporated place area to estimate the land use in 1970 and was again corrected with the appropriate factor.

For the data on incorporated places land use employment proportions for 1967, if the individual survey land use data were complete, they were used along with the appropriate correction factor. If they were not complete, then the next earliest year completed data were used. The percentage of land use to total incorporated place area in that year was multiplied times the 1967 total incorporated place area to estimate the land use in 1967. This was corrected with the appropriate correction factor.

E. Incorporated Place Survey Form

then data for 1972 were used for land use categories 1 to 5. This assumed that any change in land use from 1972 to 1973 occurred in land use category 6. These approximated 1973 data were corrected with the appropriate factor. Finally, if 1972 data were not completed on the survey, the next earliest year completed data were used. The percentage of land use to total incorporated place area in that year was multiplied times the 1973 total incorporated place area to estimate the land use in 1973. Again, this was corrected with the appropriate factor.

For the data on incorporated places land use population proportions for 1970, if the individual survey land use data were complete, they were used along with the appropriate correction factor. If they were not complete, then the next earliest year completed data were used. The percentage of land use to total in that year was multiplied times the 1970 total incorporated place area to estimate the land use in 1970 and was again corrected with the appropriate factor.

For the data on incorporated places land use employment proportions for 1967, if the individual survey land use data were complete, they were used along with the appropriate correction factor. If they were not complete, then the next earliest year completed data were used. The percentage of land use to total incorporated place area in that year was multiplied times the 1967 total incorporated place area to estimate the land use in 1967. This was corrected with the appropriate correction factor.

E. Incorporated Place Survey Form

Iowa State University of Science and Technology Ames, Iowa 50010



IOWA AGRICULTURE AND HOME ECONOMICS EXPERIMENT STATION
STATEWIDE LAND USE SURVEY
Project: 102-40-09-09-2045

November 20, 1974

Dear Clerk

In 1964, the Iowa Agriculture and Home Economics Experiment Station published results of a land use study revealing major uses of the state's land as of 1960, with projections to 1980. These data, although still used in current publications, are obsolete in light of dynamic land use changes. Needs for up-to-date and improved land use data are becoming increasingly apparent through numerous requests to Iowa State University by state of Iowa regional planning areas, county, and other local public and private entities. Presently, up-to-date land use inventory data are not available. With your cooperation in providing the information requested, (see attached survey) we hope to collect and publish such statewide land use data that will be of use to your incorporated area in planning future development.

SINCE WE DO NOT KNOW IF YOUR INCORPORATED AREA HAS A PAID PLANNING COMMISSION RESPONSIBLE FOR LAND USE DATA AND PLANNING IN YOUR INCORPORATED AREA, WE ARE ADDRESSING THIS SURVEY TO YOU. IF YOUR INCORPORATED AREA DOES HAVE A PAID PLANNING COMMISSION, THIS SURVEY SHOULD BE IMMEDIATELY REDIRECTED TO THAT COMMISSION SO THAT THEY MAY COMPLETE THIS SURVEY. IF YOUR INCORPORATED AREA DOES NOT HAVE A PAID PLANNING COMMISSION, WE WOULD LIKE FOR YOU AND YOUR ASSOCIATES TO COMPLETE THIS STUDY.

In order to compile, analyze, and publish the data in the near future, we would appreciate your returning the attached survey in the enclosed envelope by December 13, 1974. It is hoped that our combined efforts will prove beneficial to your incorporated area in planning future development. Any questions regarding this survey should be directed to James Gibson, Research Assistant at 515/294-2210.

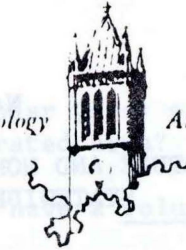
Thank you for your cooperation.

Sincerely,

John F. Timmons
Charles F. Curtiss Distinguished
Professor

gdn
Enclosure

Iowa State University of Science and Technology Ames, Iowa 50010



IOWA AGRICULTURE AND HOME ECONOMICS EXPERIMENT STATION
STATE WIDE LAND USE SURVEY
PROJECT: 102-40-09-09-2045

December 26, 1974

Dear Clerk

Recently you received a land use survey sponsored by the Iowa Agriculture and Home Economics Experiment Station. Numerous requests for the type of information found in this survey have been made to Iowa State University by Iowa regional planning areas, county officials, and other local public and private planning entities.

We addressed this survey to you since we did not know if your incorporated area had a paid professional planning staff. If your incorporated area does have a paid planning staff however, we asked that this survey be directed to their offices. If your incorporated area is without a paid planning staff, we asked you and your associates to complete this survey. We have not yet received the survey from your incorporated area, but if it is completed and in the mail, we would again like to thank you for spending the time necessary to complete the survey.

If your survey is not in the mail and if you as clerk are the party responsible for completing this survey, we would appreciate its completion and return as soon as possible. We are enclosing an additional copy of the survey for your convenience. If your incorporated area has a paid planning staff responsible for this type of information, we would again appreciate your cooperation in forwarding this material on to them.

In order to publish this data in the near future, we would appreciate the return of this survey no later than January 17, 1975. Any questions regarding this survey should be directed to James Gibson, Research Assistant at 515/294-2210.

Thank you again for your cooperation in this important survey.

Sincerely,

John F. Timmons
Charles F. Curtiss Distinguished
Professor

gdn
Enclosure

Name of Incorporated Area: _____

IOWA AGRICULTURE AND HOME ECONOMICS EXPERIMENT STATION
STATEWIDE LAND USE SURVEYGeneral Instructions for Completing This Survey

Your careful evaluation of this survey is very important in determining the use of Iowa's land resources. Therefore, please complete this survey to the best of your ability.

Much of the information asked in this survey can be obtained without too much time or difficulty. Some of the information asked, if not immediately at hand, will require additional sources. Other incorporated areas, in a pre-test of this same survey, found sources such as their local Chamber of Commerce, local commercial and industrial development commission, local utility companies, county recorder and assessor, etc., helpful in completing this survey. Your assistance in taking the time to search out these more demanding questions will be greatly appreciated. If you would like us to send you a summary of the results of this survey, please put a check in this box .

I. In this first section we would like some general information about the administrative structure of your incorporated area with respect to land use.

1. Does your incorporated area have a paid planning commission?

No _____ → Go to Q. 2.

Yes _____

If yes, this paid planning commission should be responsible for completing the rest of this survey.

a. Specify the name, address, and telephone number of the planning commission:

Name: _____

Address: _____

Telephone Number: _____

b. How many years has this planning commission been in existence? _____

(years)

c. How many full-time paid personnel are on this planning commission staff, not including secretaries? _____

(number)

(Note: Please use fractions to designate part-time paid personnel.)

(Question 1 continued on next page)

d. What was the 1973 (calendar year) planning commission budget for your incorporated area? \$ _____

2. Does your incorporated area have a volunteer planning commission?

No _____ → Go to Q. 3.

Yes _____

If yes:

a. Specify the name, address, and telephone number of the planning commission:

Name: _____

Address: _____

Telephone Number: _____

b. How many years has this planning commission been in existence? _____

(years)

3. Does your incorporated area hire the professional services of private engineering or planning consultants with regards to land use data and planning?

No _____ → Go to Q. 4.

Yes _____

If yes: Specify the name and address of the private consultant(s). (Use reverse side of this sheet if additional room is needed.)

Name: _____

Address: _____

4. Does your incorporated area have any material prepared within the last twenty years by your planning commission or by private consultants which contains either land use acreage, population, and/or employment data (past, present, and/or projected)?

No _____ → Go to Section II.

Yes _____

If yes: Please list the title(s) of the material and the date(s) they were prepared. (Use reverse side of this sheet if additional room is needed.)

Title

Date

II. In this second section we would like data on total population and total acreage in your incorporated area. The three questions in this section are **VERY IMPORTANT**. We would appreciate any extra effort on your part to complete them as accurately as possible. Additional sources of information such as your county auditor's plat books and county recorder's annexation data may be helpful in completing these questions.

1. How many acres were annexed, both voluntarily and involuntarily, to your incorporated area as of December 31, for the following calendar years? Fill in every blank. If zero acres were annexed in that year, fill in 0 in the blank.

1973 _____ (acres)	1968 _____ (acres)	1963 _____ (acres)
1972 _____ (acres)	1967 _____ (acres)	1962 _____ (acres)
1971 _____ (acres)	1966 _____ (acres)	1961 _____ (acres)
1970 _____ (acres)	1965 _____ (acres)	1960 _____ (acres)
1969 _____ (acres)	1964 _____ (acres)	

2. How many total acres were INSIDE your incorporated area as of December 31, of the following years? (Note: Acreage growth inside your incorporated area should correspond to acres added through annexation as recorded in question 1 above.)

1973 _____ (acres)	1967 _____ (acres)
1972 _____ (acres)	1963 _____ (acres)
1970 _____ (acres)	1960 _____ (acres)

3. a. What was the approximate population of your incorporated area as of December 31, for the following years. Do not just give the 1960 and 1970 census figures. (Note: Some incorporated areas found water and other utility accounts and their local Chamber of Commerce helpful in making these estimates.)

1973 _____ (number)	1967 _____ (number)
1972 _____ (number)	1963 _____ (number)

b. Please specify what method was used to estimate population in your incorporated area for each of the years listed in Q. 3, part a.

1973 _____

1972 _____

1967 _____

1963 _____

III. In this third section we would like information on the intensity of land use activity in your incorporated area.

1. For the specified years, what was the approximate number of full-time paid employees during an average week in your incorporated area for the following economic sectors:

Sector	Year			
	1973	1972	1967	1963
Manufacturing (Includes all manufacturing, fabricating, processing, and assembly locations)				
	(number)	(number)	(number)	(number)
Wholesale trade, retail trade and services (services include: finance, personal business, repair, professional, governmental, and educational services)				
	(number)	(number)	(number)	(number)

2. Does your incorporated area have a zoning ordinance?

No _____

Yes _____

b. Please specify what method was used to estimate population in your incorporated area for each of the years listed in Q. 3, part a.

1973 _____

1972 _____

1967 _____

1963 _____

III. In this third section we would like information on the intensity of land use activity in your incorporated area.

1. For the specified years, what was the approximate number of full-time paid employees during an average week in your incorporated area for the following economic sectors:

Sector	Year			
	1973	1972	1967	1963
Manufacturing (Includes all manufacturing, fabricating, processing, and assembly locations)				
Wholesale trade, retail trade and services (services includes: finance, personal business, repair, professional, governmental, and educational services)	(number)	(number)	(number)	(number)
	(number)			

2. Does your incorporated area have a zoning ordinance?

No _____
Yes _____

b. Please specify what method was used to estimate population in your incorporated area for each of the years listed in Q. 3, part a.

1973 _____

1972 _____

1967 _____

1963 _____

III. In this third section we would like information on the intensity of land use activity in your incorporated area.

1. For the specified years, what was the approximate number of full-time paid employees during an average week in your incorporated area for the following economic sectors:

Sector	Year
	1973
Manufacturing (Includes all manufacturing, fabricating, processing, and assembly locations)	
	(number)
Wholesale trade, retail trade and services (services include: finance, personal, business, repair, professional, governmental, and educational services)	
	(number)

2. Does your incorporated area have a zoning ordinance?

No _____
Yes _____

V. In this fifth section we would like some information about land use planning procedures in your incorporated area.

1. Does your incorporated area use a land use classification system to categorize land use acreage data?

No → Go to Q. 2.
 Yes

If yes: Circle the system(s) used by your incorporated area.

- a. U.S. Department of Transportation Standard Land Use Code. (Their "Standard Land Use Coding Manual" was published in 1965 and reprinted in 1969.)
- b. The land use classification used by the U.S. Geological Survey. (Their "A Land Use Classification System" was published in 1972.)
- c. Bureau of the Budget Standard Industrial Classification. (Their "Standard Industrial Classification Manual" was published in 1957 and reprinted in 1972.)
- d. Your own land use classification, please specify main categories (add additional sheets if necessary): _____
- e. Other land use classifications not named above, please specify main categories (add additional sheets if necessary): _____

2. Does your incorporated area make projections of future needs for land use acreage?

No → Go to Section VI.
 Yes

If yes: Answer question 3.

3. Circle those dates for which your incorporated area has made projections for future needs for land use acreage.

- a. 1975
- b. 1980
- c. 1985
- d. 1990
- e. 2000
- f. 2010
- g. 2020
- h. Other, please specify: _____

VI. In this sixth and final section we would like to give you the opportunity to express your opinion of this survey, land use, or any other relevant topic. (Use reverse side of this sheet if additional room is needed.) _____

SIGNATURE OF RESPONDENT: _____

TITLE: _____

DATE: _____

THANK YOU FOR YOUR COOPERATION

Table 10.1. Percent of Iowa incorporated places with a planning staff (December 1974)

	Population size class				(percent)
	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	
PAID STAFF					
No	26.6	39.7	97.4	95.1	
Yes	71.4	60.3	2.6	4.9	
Column total	1.8	1.7	6.8	6.6	
Volunteer Staff					
No	20.0	21.6	7.9	43.0	
Yes	80.0	78.6	92.1	55.0	
Column total	1.8	1.7	4.8	6.6	

F. Incorporated Place Survey Summary Tables

1. Does your incorporated area make projections of future needs for land use acreage?
 Yes _____ No _____ Go to Section VI.

If yes, Answer question 3.

2. Circle those dates for which your incorporated area has made projections for future needs for land use acreage:
 a. 1975
 b. 1980
 c. 1985
 d. 1990
 e. 2000
 f. 2010
 g. 2020
 h. Other, please specify: _____

3. Other land use classifications not named above, please specify on additional sheets if necessary: _____

4. Your own land use classification, please specify with categories (add additional sheets if necessary): _____

5. The land use classification used by the U.S. Geological Survey (MOTLANDS) for the 1957 and reprinted in 1972, was published in 1972. (STAD)

6. The land use classification used by the U.S. Geological Survey (MOTLANDS) for the 1957 and reprinted in 1972, was published in 1972. (STAD)

7. Bureau of the Budget Standard Industrial Classification (SIC) Standard Industrial Classification Manual was published in 1957 and reprinted in 1972.

8. Your own land use classification, please specify with categories (add additional sheets if necessary): _____

Table 10.1. Percent of Iowa incorporated places with a planning staff (December 1974)

	Population size class					Row total
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500	
	(percent)					(percent)
<u>Paid staff</u>						
No	28.6	35.7	92.6	97.4	95.1	100
Yes	71.4	64.3	7.4	2.6	4.9	0.0
Column total	.8	1.7	3.3	4.8	6.6	82.9
<u>Volunteer staff</u>						
No	20.0	21.4	7.4	7.9	45.0	90.6
Yes	80.0	78.6	92.6	92.1	55.0	9.4
Column total	.8	1.7	3.3	4.8	6.6	82.9

Table 10.2. Percent of Iowa incorporated places with a land use classification system (December 1974)

Classification system	Population size class					Row total	(percent)
	50,000+	10,001-50,000	5,001-10,000	2,501-5,000	1,501-2,500 or less		
No	14.3	30.8	37.5	50.0	85.3	97.6	91.2
Yes	85.7	69.2	62.5	50.0	14.7	2.4	8.8
Column total	.8	1.7	3.3	4.8	6.6	82.9	100

V. APPENDIX E. EXTENSION SURVEY AND REGIONAL SURVEY

A. Extension Survey Information

The extension survey was conceived in order to obtain nonagricultural land use data for land areas outside incorporated places within the state. The extension survey was developed concomitant with the incorporated place survey so that the land use categories and dates are compatible. Dr. Robert Crom, Assistant Director of the Iowa Cooperative Extension Service, gave full cooperation of the 99 county extension directors. The survey was formulated under close supervision of the 12 area extension directors so as not to include any questions in the survey that would not be obtainable in many of the counties. The survey was pre-tested in Hardin County. Minor revisions were made in the extension survey after the pre-test. A 100 percent survey response was obtained from the 99 county extension directors.

B. Regional Survey Information

A regional survey was prepared and sent to the regional planning director of each of the 16 Iowa multi-county planning areas. The purpose of this survey was to provide locally generated qualitative information about the present extent of land use information and planning, recent patterns and trends of urbanization with future

expectations, and to obtain the kinds of zoning and development policies that are either being brought to bear or being considered in light of these trends. The regional planning directors responded to the survey in 14 of the 16 regions.

C. Extension Survey Form



December 18, 1974

To: Area Extension Directors

Dear Co-Workers:

You may recall that we have visited on two different occasions about a land use research project being directed by Dr. John Timmons. Enclosed are the survey forms for distribution to each of the county extension directors in your area. Dr. Eber Eldridge visited briefly about this survey with field staff involved in the CRD training earlier this fall.

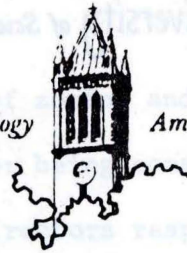
We will appreciate your help and/or that of the area resource development specialists in reviewing this survey with county extension directors at the earliest possible date, and encouraging them to return the completed questionnaires as specified in the directions attached.

Sincerely,

Robert L. Crom
 Assistant Director

RLC/mas
 Enclosures

Iowa State University of Science and Technology Ames, Iowa 50010



IOWA AGRICULTURE AND HOME ECONOMICS EXPERIMENT STATION
STATEWIDE LAND USE SURVEY
PROJECT: 102-40-09-09-2045
December 26, 1974

Dear

In 1964, the Iowa Agriculture and Home Economics Experiment Station published results of a land use study revealing major uses of the state's land as of 1960, with projections to 1980. These data, although still used in current publications, are obsolete in light of dynamic land use changes. Needs for up-to-date and improved land use data are becoming increasingly apparent through numerous requests to Iowa State University by State of Iowa regional planning areas, county officials, and other local public and private entities. Presently up-to-date land use inventory data are not available. With your cooperation in providing the information requested (see attached survey) we hope to collect and publish such statewide land use data that will be useful to your county in planning future development.

In order to compile, analyze, and publish the data in the near future, we would appreciate your returning the attached survey in the enclosed envelope by January 24, 1974. We hope that our combined efforts will prove beneficial to your county in planning future development. Any questions regarding this survey should be directed to James Gibson, Research Assistant, at 515/294-2210.

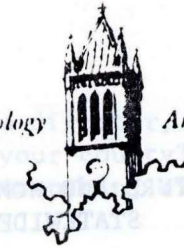
Thank you for your cooperation.

Sincerely,

John F. Timmons
Charles F. Curtiss Distinguished
Professor

cc
Attach.

Iowa State University of Science and Technology Ames, Iowa 50010



Department of Economics

January 7, 1975

TO: AREA EXTENSION DIRECTORS

FROM: James A. Gibson

REGARDING: Iowa Agriculture and Home Economics Experiment Station
Statewide Land Use Survey

Please have your county extension directors note that Extraction land use on page 7 of the survey includes extraction land that is presently idle (used for no other purpose) but had been mined in the past, in addition to land that is presently mined.

Thank you for your attention.

gdn

Year	Number	Number	Number
1974	(number)	(number)	(number)
1973	(number)	(number)	(number)
1972	(number)	(number)	(number)
1971	(number)	(number)	(number)
1970	(number)	(number)	(number)
1969	(number)	(number)	(number)
1968	(number)	(number)	(number)
1967	(number)	(number)	(number)
1966	(number)	(number)	(number)
1965	(number)	(number)	(number)
1964	(number)	(number)	(number)
1963	(number)	(number)	(number)
1962	(number)	(number)	(number)
1961	(number)	(number)	(number)
1960	(number)	(number)	(number)

2. Does your county have any rural (outside incorporated areas) privately planned recreation (second home) subdivisions?

No → Go to Q. 3, Section II.
 Yes

If yes, please list the names of the subdivisions, their corresponding total acreage, and the ratio of lots subdivided to homes actually constructed as of December 31, 1974, for each one listed. (Use reverse side of this sheet if additional room is needed.)

Name of subdivision	Total acres	Ratio of lots subdivided to homes actually constructed as of December 31, 1974

3. Does your county have any rural (outside incorporated areas) mobile home parks?

No → Go to Q. 1, Section III.
 Yes

If yes, please list the name of the mobile home park, and its corresponding acreage as of December 31, 1974.

Name of mobile home park	Total acres

III. Planning Procedures

1. What development regulations are there on rural (outside incorporated areas) privately planned housing (first home) subdivisions, recreation (second home) subdivisions, and mobile home parks in your county?

(Question 1 continued on next page)

OUTSIDE INCORPORATED AREAS

	Housing (first home) subdivisions	Mobile home parks	Recreation (second home) subdivisions
a. Minimum lot requirements	No <input type="checkbox"/> Yes <input type="checkbox"/> → What size? _____ (acres)	No <input type="checkbox"/> Yes <input type="checkbox"/> → What size? _____ (acres)	No <input type="checkbox"/> Yes <input type="checkbox"/> → What size? _____ (acres)
b. Design restrictions	No <input type="checkbox"/> Yes <input type="checkbox"/> → What? _____	No <input type="checkbox"/> Yes <input type="checkbox"/> → What? _____	No <input type="checkbox"/> Yes <input type="checkbox"/> → What? _____
c. Water supply and sewage disposal standards	No <input type="checkbox"/> Yes <input type="checkbox"/> → What? _____	No <input type="checkbox"/> Yes <input type="checkbox"/> → What? _____	No <input type="checkbox"/> Yes <input type="checkbox"/> → What? _____
d. Other (please specify)			

2. Has your county recently designated any open spaces worthy of special attention? (For example, land for future recreation uses, buffer zones between urban areas, etc.)

No → Go to Q. 1, Section IV.
 Yes

If yes, please specify with corresponding acreage:

IV. Intensive Measures

1. Are there any feeding operations within your county with greater than 1,000 beef animals, 700 dairy cows, or 2,500 hogs?

No → Go to Q. 2, Section IV.
 Yes

(Question 1 continued on next page)

If yes, how many feeding operations are there with greater than:

- a. 1,000 beef animals _____
(number)
- b. 700 dairy cows _____
(number)
- c. 2,500 hogs _____
(number)

2. What was the approximate gross value of extraction materials (coal, metals, gypsum, sand and gravel, limestone, etc.) for your county during the following calendar years? (Dollars are for the year indicated and do not account for inflation.)

1973 \$ _____
 1972 \$ _____
 1970 \$ _____
 1967 \$ _____
 1963 \$ _____
 1960 \$ _____

3. Approximately how many acres of roads and right-of-ways outside of incorporated areas have been converted to agricultural land in your county between December, 1968, and December, 1973?

_____ (acres)

V. Past and Present Land Use

Fill in the appropriate data on past and present land use acreage OUTSIDE OF INCORPORATED AREAS for your county in the following table. Fill in every blank. If acreage for the category is known to be zero, fill in 0 in the blank. (Note: Associated land use includes parking areas and other areas strictly associated with the parent land use.)

Code	Land use	Dec. 31,	Dec. 31,
		1973	1972
1	Auto salvage yards, waste and refuse disposal dumps		
2	Cemeteries		
3	Golf courses		
4	Drive-in theaters		
5	Fairgrounds and sports assembly complexes		
6	Private parks and private campgrounds		
7	Manufacturing and associated land use (includes all manufacturing, fabricating, processing, and assembly locations)		
8	Wholesale grade, retail trade, services, and associated land use (services include finance, personal, business, repair, professional, governmental, and educational services) (Note: This land use category 8 does not include categories 1, 2, 3, 4, or 5 above.)		
9	Privately planned housing (first home) subdivisions		
10	Privately planned recreation (second home) subdivisions		
11	Mobile home parks		

Fill in the appropriate data on past and present land use acreage OUTSIDE OF INCORPORATED AREAS for your county in the following table. Fill in every blank. If acreage for the category is known to be zero, fill in 0 in the blank. (Note: Associated land use includes parking areas and other areas directly associated with the parent land use.)

Total county acres in land use OUTSIDE INCORPORATED AREAS, both publicly and privately owned (unless otherwise specified) as of:

	Dec. 31, 1970	Dec. 31, 1967	Dec. 31, 1963	Dec. 31, 1960
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

V. Continued

Code	Land use	Dec. 31, 1973	Dec. 31, 1972
12	Non-farm residential and associated land use (includes houses, duplexes, apartments, and institutional residences) (Note: This land use category does not include categories 9, 10, or 11 above.)		
13	Extraction land		
a	Coal		
b	Metals		
c	Gypsum		
d	Sand and gravel		
e	Limestone		
f	Other		

Signature of County Extension Director
 Date
 THANK YOU FOR YOUR COOPERATION

V. Continued

Total county acres in land use OUTSIDE INCORPORATED AREAS, both publicly and privately owned (unless otherwise specified) as of:

Code	Dec. 31, 1960	Dec. 31, 1963	Dec. 31, 1967	Dec. 31, 1970
1				
2				
3				
4				
5				
6				
7				
8				
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10				
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Signature of County Extension Director _____

Date _____

THANK YOU FOR YOUR COOPERATION



IOWA STATE UNIVERSITY
 IOWA AGRICULTURE AND HOME ECONOMICS EXPERIMENT STATION
 STATISTICAL LAND USE SURVEY

IOWA AGRICULTURE AND HOME ECONOMICS EXPERIMENT STATION
 STATISTICAL LAND USE SURVEY
 Project: 102-40-09-09-2042
 Your careful evaluation of this survey is important in determining the use of your land. Therefore, please complete this survey to the best of your ability. If you wish to check this survey, please put a check in the box

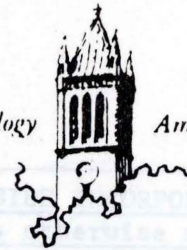
In 1964, the Iowa Agriculture and Home Economics Experiment Station published results of a land use study covering the use of the state's land as of 1960, with projections to 1980. These data, although still used in current publications, are obsolete in view of dynamic land use changes. Needs for up-to-date and improved land use data and information, becoming increasingly apparent through the rapid growth of Iowa State University by state and private planning agencies, county, state, and federal local public and private agencies, and the need for more accurate data and information are not available. With your cooperation in providing the information requested (see attached survey) we hope to collect and publish such data for the use of state and local planning agencies.

D. Regional Survey Form

In order to compile, analyze, and publish the data in the near future, we would appreciate your returning the attached survey in the enclosed envelope by January 17, 1975. It is hoped that our combined efforts will provide a basis for future planning and development. Any questions regarding this survey should be directed to James Gibson, Research Assistant, at 215/234-2310.

- Thank you for your cooperation. If you circle the system(s) used, say if:
- U.S. Department of Transportation Standard Land Use Code. (Their "Standard Land Use Coding Manual" was published in 1963.)
 - The land use classification used by the U.S. Geological Survey. (Their "Land Use Classification System" was published in 1963.)
 - Bureau of the Budget Standard Industrial Classification. (Their "Standard Industrial Classification Manual" was published in 1957.)
- (page text on previous page)

Iowa State University of Science and Technology Ames, Iowa 50010



IOWA AGRICULTURE AND HOME ECONOMICS EXPERIMENT STATION
STATEWIDE LAND USE SURVEY
Project: 102-40-09-09-2045
December 26, 1974

Dear Regional Planning Director

In 1964, the Iowa Agriculture and Home Economics Experiment Station published results of a land use study revealing major uses of the state's land as of 1960, with projections to 1980. These data, although still used in current publications, are obsolete in light of dynamic land use changes. Needs for up-to-date and improved land use data and information are becoming increasingly apparent through numerous requests to Iowa State University by state of Iowa regional planning areas, county officials, and other local public and private entities. Presently, up-to-date land use inventory data and information are not available. With your cooperation in providing the information requested, (see attached survey) we hope to collect and publish such statewide land use data that will be of use to your region in planning future development.

In order to compile, analyze, and publish the data in the near future, we would appreciate your returning the attached survey in the enclosed envelope by January 17, 1975. It is hoped that our combined efforts will prove beneficial to your region in planning future development. Any questions regarding this survey should be directed to James Gibson, Research Assistant, at 515/294-2210.

Thank you for your cooperation.

Sincerely,

John F. Timmons
Charles F. Curtiss Distinguished
Professor

gdn
Enclosures

Region: _____

IOWA AGRICULTURE AND HOME ECONOMICS EXPERIMENT STATION
STATEWIDE LAND USE SURVEY

General Instructions for Completing This Survey

Your careful evaluation of this survey is very important in determining the use of Iowa's land resources. Therefore, please complete this survey to the best of your ability. If you would like us to send you a summary of the results of this survey, please put a check in this box .

I. General Information

1. How many years has your regional planning commission been in active existence? _____
(years)
2. How many full-time paid personnel are on this planning commission staff, not including secretaries? (Note: Please use fractions to designate part-time paid personnel.)
_____ (number)
3. What were your 1973 and 1974 (calendar year) regional planning commission budget expenditures? \$ _____ 1973,
\$ _____ 1974

II. Planning Procedures

1. Does your Planning Region use a land use classification system to categorize land use data in your region?
No _____ → Go to Q. 2.
Yes _____
If yes, circle the system(s) used by your Planning Region:
 - a. U.S. Department of Transportation Standard Land Use Code. (Their "Standard Land Use Coding Manual" was published in 1965 and reprinted in 1969.)
 - b. The land use classification used by the U.S. Geological Survey. (Their "A Land Use Classification System" was published in 1972.)
 - c. Bureau of the Budget Standard Industrial Classification. (Their "Standard Industrial Classification Manual" was published in 1957 and reprinted in 1972.)

(Question 1 continued on next page)

2. Does your county have any rural (outside incorporated areas) privately planned recreation (second home) subdivisions?

No → Go to Q. 3, Section II.
 Yes

If yes, please list the names of the subdivisions, their corresponding total acreage, and the ratio of lots subdivided to homes actually constructed as of December 31, 1974, for each one listed. (Use reverse side of this sheet if additional room is needed.)

Name of subdivision	Total acres	Ratio of lots subdivided to homes actually constructed as of December 31, 1974

3. Does your county have any rural (outside incorporated areas) mobile home parks?

No → Go to Q. 1, Section III.
 Yes

If yes, please list the name of the mobile home park, and its corresponding acreage as of December 31, 1974.

Name of mobile home park	Total acres

III. Planning Procedures

1. What development regulations are there on rural (outside incorporated areas) privately planned housing (first home) subdivisions, recreation (second home) subdivisions, and mobile home parks in your county?

(Question 1 continued on next page)

d. Your own land use classification, please specify main categories (use reverse side of this sheet if additional room is needed):

e. Other land use classifications not named above, please specify main categories (use reverse side of this sheet if additional room is needed):

2. Does your Planning Region make projections of future needs for land use acreage in your region?

No → Go to Q. 4.
 Yes

3. Circle those dates for which your Planning Region has made projections for future needs for land use acreage in your region.

- a. 1975
- b. 1980
- c. 1985
- d. 1990
- e. 2000
- f. 2010
- g. 2020
- h. Other, please specify: _____

4. Does your Planning Region have any material prepared within the last eight years by your staff or by private consultants which contains either land use acreage, population, and/or employment data for your region (past, present, and/or projected)? (This would include county comprehensive land use plans.)

No → Go to Q. 1, Section III.
 Yes

If yes: Please list the title(s) of the material, the date it was prepared, the author, and the type of information contained within it. (Use reverse side of this sheet if additional room is needed.)

(Question 4 continued on next page)

<u>Title</u>	<u>Date</u>	<u>Author</u>	<u>Type of Information</u>

III. Past, Present, and Projected Regional Land Use

1. What, in your judgment, are the major trends in land use for urban expansion in relation to the following categories of urban growth in your region. Please give a brief statement as to the role, if any, for each category of urban growth for the main incorporated areas in your region involved in urban expansion. (Use reverse side of this sheet if additional room is needed.)

a. Second Cycle Growth (the redevelopment of existing built-up urban areas, or the second time land has been developed for urban uses): Incorporated area and type of growth (For example, expanding, contracting, remaining the same, etc.):

- i. _____
- ii. _____
- iii. _____
- iv. _____

b. Fringe growth (urban expansion which occurs just beyond the edge of existing urban development)

- Incorporated area and type of growth:
- i. _____

(Question 1 continued on next page)

- ii. _____
- iii. _____
- iv. _____

c. Large Outlying Developments (large-scale planned urban development subdivisions)

- Incorporated area and type of growth:
- i. _____
 - ii. _____
 - iii. _____
 - iv. _____

d. Other (please specify)

- Incorporated area and type of growth:
- i. _____
 - ii. _____
 - iii. _____
 - iv. _____

2. Of the four major categories of urban development in question one, how would you distribute the expected residential dwelling units to be added in your region in the next 10 years?

a. Second Cycle Growth	_____ %
b. Fringe Growth	_____ %
c. Large Outlying Developments	_____ %
d. Other	_____ %
	100 %

3. What are the present and anticipated trends in agricultural zoning in your region for each of the five categories below?

a. Rapid conversion to urban zoning classification on urban fringes

Present trends: _____

Anticipated trends: _____

b. Scattered conversion on urban fringes with enclaves of agricultural zoning

Present trends: _____

Anticipated trends: _____

c. Preservation of agricultural belts or other areas defined by natural resources and local conditions

Present trends: _____

Anticipated trends: _____

d. Expanding agricultural zoning

Present trends: _____

Anticipated trends: _____

e. Protective agricultural zoning

Present trends: _____

Anticipated trends: _____

4. What are the present and anticipated trends for industrial zoning in your region for each of the three categories below?

a. Reduction of land presently zoned industrial

Present trends: _____

(Question 4 continued on next page)

Anticipated trends: _____

b. Expansion of land presently zoned industrial

Present trends: _____

Anticipated trends: _____

c. Change in types of land presently zoned industrial

Present trends: _____

Anticipated trends: _____

5. Would you characterize the past 10 years in your region as an era of rapid conversion of open land to urban purposes?

No _____

Yes _____

Why? _____

6. In the next 10 years would you anticipate for your region an era of rapid conversion of open land to urban purposes?

No _____ → Go to Q. 7.

Yes _____

If yes:

a. Are there any current local policies that may change the character of this growth? If yes, what are they? If no, do you feel there should be? What would they be? _____

7. If no to question 6:

a. What types of land use changes are anticipated? _____

b. Are there any current local policies that may change the character of this growth? If yes, what are they? If no, do you feel there should be? What would they be? _____

8. In your opinion, are there any desirable policies that should be enacted to influence land use in your region? If so, what should these policies be? _____

9. Are there any significant large urban land development projects occurring within your region? (Describe nature and extent of development.)

a. Are there any anticipated in the next ten years? _____

10. Is there any significant conversion of nonagricultural to agricultural land occurring within your region? (For example, conversion of forests or swamps to agricultural land.) Describe nature and extent of developments. _____

a. Is there any anticipated conversion in the next ten years? _____

11. Have any incorporated areas in your region had a net disincorporation of land in the past 15 years?

No _____ → Go to Section IV.

Yes _____

If yes, please list the incorporated area, the year(s) of disincorporation, and the corresponding number of acres.

Incorporated area	Year(s) of disincorporation	Number of acres lost from each disincorporation of land
-------------------	-----------------------------	---

IV. In this fourth and final section we would like to give you the opportunity to express your opinion of this survey, land use, or any other relevant topic. (Use reverse side of this sheet if additional room is needed.)

SIGNATURE OF PLANNING DIRECTOR: _____

DATE: _____

THANK YOU FOR YOUR COOPERATION

E. Summary of Regional Survey

10. Are there any anticipated conversion in the next five years?

11. Describe the nature and extent of developments.

12. Are there any significant conversion of non-agricultural land to agricultural land occurring within your region? (For example, conversion of forests or swamps to agricultural land.) Describe the nature and extent of developments.

13. Are there any significant projects occurring within your region? (Describe the nature and extent of development.)

14. Are there any significant projects occurring within your region? (Describe the nature and extent of development.)

15. Are there any significant projects occurring within your region? (Describe the nature and extent of development.)

16. Are there any significant projects occurring within your region? (Describe the nature and extent of development.)

Table 11.1. Summary of regional survey^a

Region	Years in existence	Personnel	Expenditures (\$)		Land use classification			Projections		
			1973	1974	No	Yes	Type	No	Yes	Dates
1	2.0	2.0	28,500	30,000	X	-	-	X	Increase	-
2	1.5	3.0	-	50,648	-	X	a	X	10	-
3	1.0	4.0	0	47,000	X	-	-	X	Increase	-
4	10.0	11.5	114,000	212,682	-	X	c	X	10	b,d,e
5	3.0	2.0	34,000	52,784	X	-	-	X	10	-
6	0.5	2.0	-	-	X	-	-	X	10	-
7	-	-	-	-	-	-	-	-	10	-
8	10.0	5.0	0	32,093	X	-	-	X	10	-
9	8.0	31.0	424,706	439,906	-	X	d	X	10	c,h
10	1.5	1.0	0	16,600	X	-	-	X	10	-
11	-	-	-	-	-	-	-	-	10	-
12	1.0	1.0	-	24,421	X	-	-	X	10	-
13	7.0	29.0	525,886	1,459,061	-	X	a,c,e	X	10	d,h
14	1.7	3.0	30,000	30,000	X	-	-	X	10	-
15	0.5	10.0	0	66,000	X	-	-	X	10	-
16	2.0	3.0	30,000	33,000	X	-	-	X	10	-

^aA dash indicates no survey response.

Table 11.1. Continued

Region	Second cycle (a)	Fringe (b)	Outlying developments (c)	Other (d)	Percentage			
					(a)	(b)	(c)	(d)
1	Remaining the same and expanding	Expansion	None	-	15	85	0	0
2	Remaining the same and expanding	Remaining the same and expanding	None	-	50	50	0	0
3	-	Expanding	-	-	10	60	20	10
4	Contracting and expanding	Expanding	None	-	15	75	0	10
5	Expanding	Expanding	None	-	5	95	0	0
6	Remaining the same and expanding	Remaining the same and expanding	Remaining the same	-	40	50	5	5
7	-	-	-	-	-	-	-	-
8	Contracting	Expanding	Remaining the same and expanding	-	10	80	5	0
9	Remaining the same and expanding	Expanding	Remaining the same and expanding	-	5	70	15	10
10	Expanding	Expanding	Expanding	-	10	70	10	10
11	-	-	-	-	-	-	-	-
12	Remaining the same and expanding	Contracting, remaining the same, and expanding	None	None	20	80	0	0
13	Remaining the same and expanding	Remaining the same and expanding	Remaining the same and expanding	-	10	80	10	0
14	Contracting and remaining the same	Contracting, remain- ing the same, and expanding	-	-	10	90	0	0
15	-	-	-	-	-	-	-	-
16	Expanding	Expanding	Expanding	Increase density of existing places	45	10	5	40

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Table 11.1. Continued

Region	Rapid conversion of agricultural zoning		Scattered conversion of agricultural zoning		Agriculture preservation zoning	
	Present	Anticipated	Present	Anticipated	Present	Anticipated
1	Very little	Continue	Some	Continue	None	Increase
2	Increase	Decrease	Increase	Decrease	None	Increase
3	Some	-	Normal case	Continue	None	Increase
4	Increase	Increase	Expanding	Increase	-	-
5	None	Increase	None	None	None	-
6	Very little	Slight increase	Very little	Continue	-	-
7	-	-	-	-	-	-
8	None	-	None	-	-	-
9	Some	Decrease	Some	Increase	None	Increase
10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	None	Continue	Very little	Continue	-	-
13	Limited	Continue	Limited	Decrease	-	Increase
14	-	-	-	-	-	-
15	Slight	-	Slight	-	-	-
16	Slow trend	Continue	Slow trend	Continue	None	Increase

147

Table 11.1. Continued

Region	Agricultural zoning		Protective agricultural zoning		Reduction of industrial zoning	
	Present	Anticipated	Present	Anticipated	Present	Anticipated
1	2 of 5 counties have	Increase	None	Increase	None	None
2	Slow trend toward	Increase	None	Increase	None	Little change
3	6 of 9 counties have	State mandate needed for others	None	Increase	None	Same
4	-	-	-	-	-	-
5	None	-	None	-	None	None
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	Trend toward	Increase	Trend toward	-	If not developed in 5 years	-
9	Some	No	None	-	None	None
10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	3 of 6 counties have	Increase	-	Increase	None	None
13	-	Increase	No	No	None	None
14	-	-	-	Increase	-	-
15	-	-	-	-	-	-
16	None	-	Being studied	-	None	None

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Table 11.1. Continued

Region	Expansion of industrial zoning		Change in type of industrial zoning		Rapid conversion		Why?
	Present	Anticipated	Present	Anticipated	No	Yes	
1	Some increase	Same	No change	Same	X		Out migration of people
2	None	Little change	Being considered	Consideration of land suitability	X		Redevelopment
3	Little expansion	Remain constant	-	Industrial land in less prime areas	X		Lost population
4	-	-	-	-	X		Agriculture area
5	Some	Increase	-	-	X		-
6	Little	Same	-	-	X		-
7	-	-	-	-	-		-
8	Limited	Same	-	-		X	Residential sprawl
9	Frequent	Continue	Yes, lands adjacent to transportation	Continue		X	Substantial land conversion
10	-	-	-	-	-	X	Growth in Cedar Rapids and Iowa City
11	-	-	-	-	-	-	-
12	Two cities	Expansion	None	No change	X		Loss of population and a non-metropolitan region
13	Expansion	Expansion	None	None	X		Population loss
14	Industrial parks	-	-	-	X		Population loss
15	-	-	-	-	X		-
16	Some	Same	Trend away from prime agriculture land	Same	X		Slow population growth

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Table 11.1. Continued

Region	Anticipated conversion		Policy needed	Changes anticipated if no	Policies
	No	Yes			
1	X			Preservation of river corridors, historic areas, and timber	Zoning
2	X			Extensive redevelopment	No
3	X			Slow conversion of agriculture land	Encouragement of managed industrial growth
4	X			Slow conversion	No
5	X			Policy on prime agriculture land preservation	State guidelines
6	X			None	-
7	-			-	-
8		X	Zoning ordinance needed for Dubuque County	-	-
9		X	Development guides away from rural areas	-	-
10	X			Fill-in of annexed areas	Sewer limits as a basis for political decisions
11	-			-	-
12	X			Convert roads to agriculture. Disincorporation of land.	Have fewer small communities
13	X			Limited development	Discourage fringe growth
14	X			None	Encourage industrial growth
15	-			-	-
16	X			-	-

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Table 11.1. Continued

Region	Desirable policies	Urban development projects		Anticipated		Nonagricultural to agricultural conversion		Net disincorporation		
		No	Yes	No	Yes	Present	Anticipated	No	Yes	Acres
1	Zoning	X		X		Tiling of marsh land	-		X	
2	Decisions based on land capabilities	X		X		Drainage of wet lands and timber clearing	Continue		X	
3	Discourage scattered development		One	X		No	No		No, but should be	
4	Zoning and official planning		Shopping centers		X	No	No		X	
5	Land use planning	X		X		No	No		X	
6	-	X			Some	No	No		-	
7	-	-		-		-	-		-	
8	Regional land use plan with citizen participation	X		X		No	No		X	
9	Guide development away from rural areas		Many		X	No	No		X	
10	-		X			-	-		X	
11	-					-	-		-	
12	Federal aid for soil conservation	X		X		No	Yes-roads and land within incorporated boundaries		X	
13	-		Urban renewal		X	No	Yes-forest to agriculture		X	
14	County zoning	X		X		X			X	-
15	-	-		-		-	-		-	
16	-	X		X		None	None		X	

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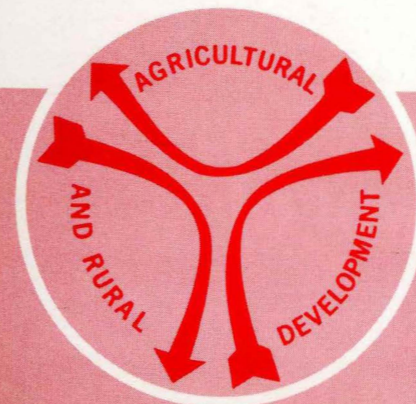
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