



AN EXAMINATION OF A DEVELOPMENT RIGHTS PURCHASE PROGRAM FOR ALASKA AGRICULTURAL LANDS

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A report submitted to the Department of Natural Resources, State of Alaska,
in accordance with terms of research contract CC10 1142.

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INTRODUCTION

Overview

Many Alaskans are concerned about the conversion of highly productive agricultural lands to nonagricultural uses now occurring in the state. Land on the urban fringes of Anchorage and Fairbanks that once produced vegetables and grains or supported dairy farms appears most vulnerable to this conversion. As major population centers grow, residential, shopping center and industrial land uses displace agriculture because they render greater returns. This displacement is viewed by some as not being in society's best interest. Those concerned about the loss of agricultural lands argue that these lands are some of the best agricultural lands in the state and are vital to maintaining the agricultural economy of the state. In addition, it is suggested that their preservation will help to maintain a much desired way of life and to provide needed open space.

The state and municipal governments in Alaska have made attempts to intervene in the land market to slow down or stop agricultural land conversion. Methods employed to date include tax incentives and the sale of only the agricultural rights on state or municipal lands. This report discusses the feasibility of an alternative means of preserving agricultural lands, namely, the public purchase of development rights from private landowners. Under this voluntary arrangement, private agricultural landowners would be compensated for giving up their option to develop their land for nonagricultural purposes.

Plan of Report

In discussing the feasibility of a program designed to purchase the development rights from Alaskan farmland owners, we begin with a section that very briefly describes the operation of the market in its resource allocation function. In this section our goal is to establish an analytical framework for examining how market forces may result in nonoptimal amounts of land being allocated to agricultural purposes.

The second section of the report presents information on the nature and magnitude of agricultural land conversion in Alaska. This is followed by a review of the state's agricultural economy and its potential. Next is a section that describes development rights purchase programs operating in other locations in the United States. We then discuss the applicability of such a program in Alaska and review other possible agricultural land preservation tools that might be used either separately or in combination with a development rights purchase plan. Finally, we summarize the report and offer some conclusions.

In a market economy most resource allocation issues are settled through voluntary exchange. The interaction of resource and commodity owners with those desiring possession of these resources and commodities establishes their exchange values and simultaneously determines what is produced, how this production takes place, and how the proceeds from economic activities are distributed. The market system is an effective framework for performing these functions in cases where resources can be readily parceled out to individual owners, where competition exists, and where the individual is in a position to capture all the benefits and is obligated to bear all the costs associated with his actions. In other instances, however, where one or more of these conditions is absent, unfettered private enterprise fails to perform this allocating function in an efficient manner. As a result, privately determined resource use patterns may differ from what society views as optimal.

The use of unobstructed exchange to allocate land resources is one instance in which failures in the market system are alleged to lead to nonoptimal patterns of resource use. As a result, social control over land use has been a pervasive force in this country since colonial times (Clawson, 1974). The range of governmental influences over private land use decisions in modern times seems to reflect a widespread distrust of the free market as an efficacious performer of the land allocation

¹ This section draws heavily on B. Delworth Gardner, "The Economics of Agricultural Land Preservation," American Journal of Agricultural Economics, Vol. 59, No. 5, December 1977.

function. The agricultural land market is currently receiving considerable attention in this regard. For various reasons the developing pattern of nonagricultural use of these lands is viewed by many as not being in society's best interest. As a consequence, governments at all levels have begun to intervene in this market, experimenting with various means to slow or prevent the conversion of high productivity lands to other uses.

While "market failure" has been offered as the justification for public intervention in land use decisions, the removal of the market from the allocation task and the substitution of essentially nonmarket criteria characteristic of many agricultural land preservation programs should be accompanied by some specific rationale. The purpose of this section of the report is to provide a framework for examining how market forces may result in a nonoptimal amount of land being allocated to agricultural purposes.

We may begin by asking what benefits accrue to society from the existence and preservation of agricultural activities and lands. There appear to be at least four jointly produced benefits: (a) food and fiber to meet the demands of growing regional, national and world populations; (b) local economic benefits that derive from an agricultural industry; (c) open space and other environmental amenities that accrue chiefly to urban residents, and (d) more efficient, orderly, and fiscally sound urban development. In addition, one might list the preservation of a "lifestyle" or "way-of-life" as one of the joint benefits of a general policy aimed at preserving agricultural land.

Given that these are the joint benefits that may be achieved by retaining land in agriculture, the key question becomes why won't the land market allocate socially optimal quantities to agricultural use? What is the rationale for extramarket social action?

First, if some of these joint benefits from land are public or collective goods, then the free market will not allocate land among uses efficiently. Collective goods have two distinguishing characteristics: (1) the impossibility of excluding consumers who do not pay for the good in question and (2) consumption by one consumer does not reduce the quantity of the good available to others (Mishan, 1969). So if the good is a collective good (such as open space), the cost of making that good available to one more individual would be zero. This suggests that the socially optimal price of the good would also be zero. At a zero price, obviously no private businessman would be willing to invest in supplying collective goods. The market simply cannot handle the supply problem. With public goods there is also a problem with the demand side of the allocation mechanism. Since no one can be excluded from consumption, whether or not he pays for the good, individuals have an incentive to not reveal their true willingness to pay for the good. Provided the good were made available, an individual could benefit from its presence and become a "free rider."

Externalities are another reflection of market failure and may be defined as unpriced or improperly priced effects emanating from production or consumption that impinge on the satisfaction of third parties (Mishan, 1976). But establishing that external effects exist may not automatically mean that extramarket corrective action is called for.

This depends on the costs of negotiating mutually satisfactory arrangements to establish liability for the externality (Coase, 1960). Still, the existence of unnegotiated or uncompensated external effects, i.e., a divergence between private and social costs, may be another example of market failure in land allocation among uses and a justification for social action.

A third source of market failure is the concentration of power by sellers or buyers in either the product or input markets. There appear to be no advocates of intervention in the agricultural land market who have justified their positions on the basis of such concentration in the markets for land.

Another argument for social interference in the market is that some products are so-called "merit goods." For example, there are some "food fundamentalists" who have argued that food is such a basic human need that the private land market should not be allowed to determine the acreage devoted to food production. Rather, the view is that food and fiber should be provided to all as a "right" and should not be governed by market criteria.

Returning now to the joint products or benefits alleged to be significant in agricultural land retention, we will want to see if there are elements of market failure that justify the removal of the market from land allocation decisions. Consider first the food and fiber products of agriculture. Food and fiber are clearly private goods where exclusion of nonpaying customers poses no problem. Thus, the public good source of market failure is absent. The externality argument also

seems to lack relevance here since significant external effects are not obvious in the consumption of food and fiber. On the other hand there may be external diseconomies in the production of food and fiber (such as in the use of chemicals), but this would suggest too much effort in agricultural production--not too little. Of course, if land and these chemicals were good substitutes rather than complements, less chemicals and more land might well be more efficient.

The "merit good" argument concerning food and fiber is more difficult to deal with. If one believes that food and fiber are somehow special (like safety, education and outdoor recreation apparently are), this may suggest setting prices below marginal supply costs. Even such a cheap food policy should, however, require that a given amount of food and fiber be produced at minimum opportunity cost to society. Some system will be required to establish land values within agricultural uses and between agricultural and other uses. It is not clear that this can be better accomplished by removing land allocation from the market and replacing it with some noneconomic criteria.

Some may argue that income and wealth differences within and among regions may justify agricultural land preservation through social actions in order to prop up a local agricultural industry. This argument seems important only if the concern is for some immobile farm workers who may benefit if local land is left in agriculture. Other decision makers across the spectrum of agriculture--farm operators, processors, suppliers, transporters, university professors in agricultural fields and government agency personnel--have obvious stakes in a viable agricultural industry. However, these are generally not poor people. In addition, they are typically mobile so can adjust to changing land use patterns.

Consider now agricultural land policy and its relationships to urban development. If highly productive agricultural land cannot be developed for urban purposes, demand shifts to parcels not so zoned, thus conferring wealth gains on owners of these parcels. Whether the result is a more or less efficient urban development, however, is not clear. It depends on where these parcels are, how efficient they are in producing urban amenities, what the costs are of bringing public utilities and transport to these parcels, etc. In addition, it is not obvious, without examining specific situations, that urban "leap-frogging" would be reduced over what the free market might produce.

Finally, we come to the case where land market failure is most apparent--in the creation of open space and environmental amenities. These benefits are collective goods and there are elements of important external effects here too. Since market signals are absent with regard to the production of these collective goods, there is little evidence available as to how much these amenities are worth. It would seem, however, that their value would be much higher on the urban fringe of Anchorage or Fairbanks than in the Big Delta area of the Interior. In any case, the market will not provide the optimal quantity of these amenities and there may be some justification for social action to remedy this failure.

As a final point in this section, the main issue with the question of preserving agricultural land appears to be the economic trade-offs at the rural-urban fringe (Gardner, 1975). The primary reason for the inefficiency of agricultural production at the fringe is the extreme amount of uncertainty associated with the likelihood of land shifts.

Farmers appear to have no incentive to invest optimally, especially in durable capital, if the probability is high that they cannot capture the returns from agricultural production. As a result, land is wasted and society suffers the loss of foregone agricultural crops. This may be the principal rationale for some form of land reserve program.

AGRICULTURAL LAND CONVERSION IN ALASKA

Most of the agricultural lands in Alaska that have been converted to nonagricultural uses are in the Matanuska-Susitna Valleys. It is from this area only that information is available about the nature and magnitude of the change. Smaller quantities of agricultural land have been lost around Fairbanks and communities on the Kenai Peninsula but their magnitude has not been documented.

The demand for land in the Matanuska-Susitna Valleys is linked to several factors (Matanuska-Susitna Borough, 1978, p. 31):

1. Growth of Anchorage coupled with a limited supply of land in its immediate vicinity.
2. Natural attractiveness of the Matanuska-Susitna Valleys for housing and recreational homesites.
3. Improved access to Anchorage with completion of the Parks Highway.
4. Selection of the Capital Site near Willow.
5. Speculative forces resulting from all of the above.

The Matanuska-Susitna Borough is undergoing rapid growth. The principal factor in the Borough's recent development has been its relationship to the Anchorage Metropolitan area. In the 1960's the Borough served primarily as a recreation area for Anchorage citizens. As Anchorage began to grow rapidly, rising housing prices within the city and the desire of many people for more living space led to the outward expansion of the urban area. Since Anchorage is confined by

military bases, mountains and the sea, metropolitan growth spread out along the highway south to Kenai and north to the Matanuska-Susitna Valleys. Improved access, such as completion of the Parks Highway, accelerated this spread. The population of the Matanuska-Susitna Borough which had grown by 2.8 percent annually between 1960 and 1970, grew by 20.6 percent annually between 1970 and 1976 (Capital Site Planning Commission, 1978, p. 108).

A major part of Borough growth has come from residential subdivisions, most of which have developed in the Palmer-Wasilla area and in the townships contiguous to the Parks Highway from Willow north to Talkeetna. In 1966 there were approximately 10,000 subdivided lots in the Matanuska-Susitna Borough; by 1976 there were 32,000 lots (Capital Site Planning Commission, 1978, p. 118). Most of these did not have any improvements on them. The Matanuska-Susitna Borough (1978) reported that between 1974 and 1978, 460 subdivision plats were submitted for approval; 300 of these are approved to date. The 460 plats represent 25,760 acres or 12,824 separate lots.

It is not known exactly how much of the subdivided acreage has occurred on agricultural lands. Some of the subdivisions are located in wooded upland areas not suitable for agriculture but within the agricultural zone. Within the Palmer-Butte area, 27 farms have been subdivided within the last three years. Many of the subdivisions along the Parks Highway between Willow and Talkeetna are occurring on agricultural land. Subdivision growth in the Wasilla-Big Lake area is occurring for the most part on marginal agricultural lands.

Table 1 shows the key areas of subdivision activity in the Matanuska-Susitna Borough between 1974 and 1977. Nearly half of the acres subdivided during these years occurred in the six townships surrounding Palmer and Wasilla. Figure 1 shows the relationship of subdivision activity to priority agricultural lands. Much of this activity has occurred on the more productive and accessible agricultural land.

The increased demand for land is reflected in increased land prices. Examples of prices for farmland, residential and commercial land are shown in Table 2. In the mid-1960's farmland was selling for about \$50 per acre. In 1977, the Matanuska-Susitna Borough sold farmland with agricultural rights only for \$100-700 per acre. Farmland purchased without any restrictions was selling for \$1,000-4,000 per acre.

Agricultural land and nonagricultural land purchased for subdivision purposes or individual lots close to the population centers of the Matanuska-Susitna Borough were selling for between \$2,500 and \$45,000 per acre depending on improvements and location. Commercial land in or close to Palmer and Wasilla is being purchased for \$7,800 to \$145,000 per acre.

TABLE 1
 LOCATION OF MAJOR SUBDIVISION ACTIVITY IN THE
 MATANUSKA-SUSITNA BOROUGH, 1974-1977.

Location	No. of Townships	Subdivisions	Acres	Lots
Matanuska Valley in Vicinity of Palmer and Wasilla	6	138	7,977	4,081
Remainder of Matanuska Valley	22	101	7,213	3,655
Willow-Talkeetna Strip	8	15	1,925	850

SOURCE: Capital Site Planning Commission, Socio-Economic Impact Analysis for Juneau and the Matanuska-Susitna Borough, Background Report No. 10, Prepared by Rivkin Associates, (Washington: Rivkin Associates Inc., 1978), pp. 119-120.

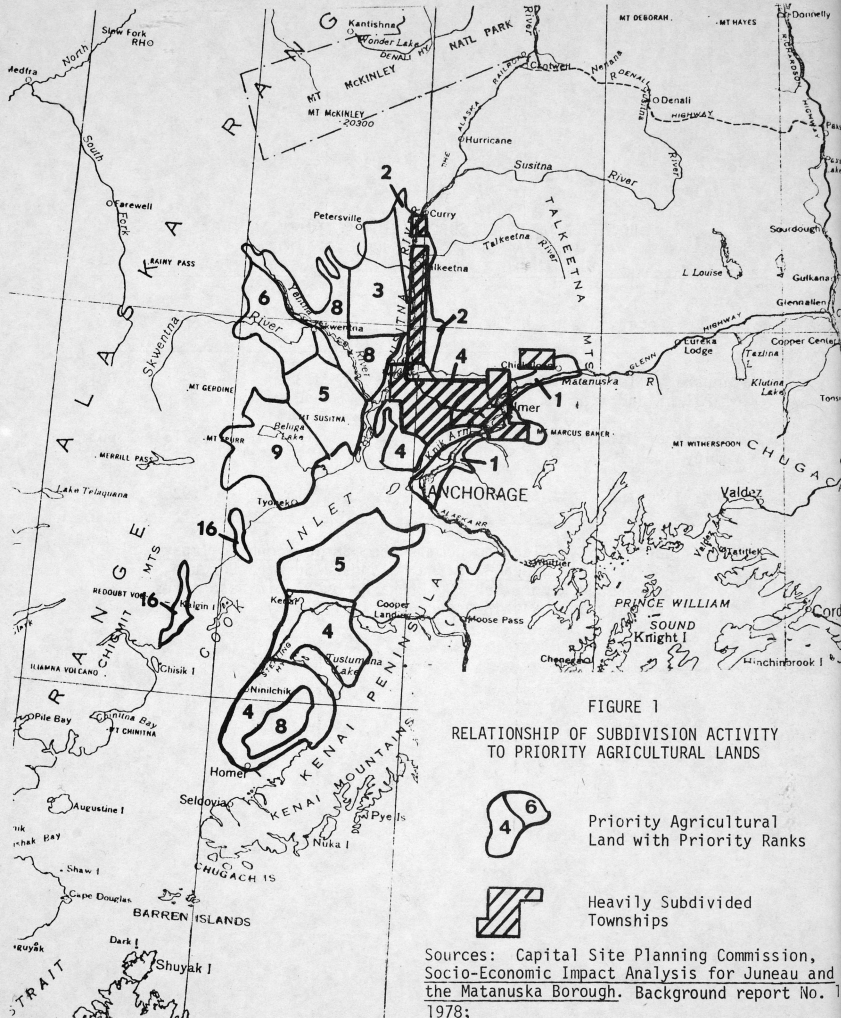


FIGURE 1
RELATIONSHIP OF SUBDIVISION ACTIVITY
TO PRIORITY AGRICULTURAL LANDS



Priority Agricultural Land with Priority Ranks



Heavily Subdivided Townships

Sources: Capital Site Planning Commission, Socio-Economic Impact Analysis for Juneau and the Matanuska Borough. Background report No. 1 1978;

Alaska Department of Natural Resources maps showing agricultural potential on file in Anchorage Office, 1978:

TABLE 2
EXAMPLES OF MATANUSKA-SUSITNA BOROUGH LAND PRICES.

Year	Location	Remarks	Price
<u>FARMLAND</u>			
mid-1960's	Mat-su		\$50/acre
	Mat-su	Uncleared Agricultural Land Sold by Borough -	
	Mat-su	Agricultural Rights Only Farmland for Speculation	\$100-700/acre ^a \$ 1,000-4,000/acre
<u>RESIDENTIAL</u>			
1977	Butte		\$25,000 for 5 acres
	Palmer	City Utilities	\$ 7,500 for 7,200 sq. ft.
	Settlers Bay	All Services	\$16,000 for 1/2 acre
	Wasilla	Improved Lot	\$12,000-\$13,000/acre
	Wasilla	Lake View Lot	\$12,000-\$13,000/acre
	S.W. Wasilla	Lake View	\$35,000 for 5 acres
	Willow		\$22,550 for 3 lots
	Rustic Wilderness	Subdivision	\$ 8,000-\$12,000/acre
	Trappers Creek		\$ 2,500-\$ 4,000/acre
	North of Talkeetna		\$ 4,000/acre
<u>COMMERCIAL</u>			
1977	Palmer		\$87,000-\$145,000/acre
	Palmer	Industrial Park, All Services	\$ 7,800/acre
	Wasilla	Highway Frontage	\$35,000 for 1/2 acre
	Wasilla		\$1,000,000 for 27 acres
	Wasilla	Lots near Airport	\$240,000 for 4 acres (offer refused)
	Wasilla to Houston	Highway Frontage	\$3-5/sq. ft.
	North of Talkeetna	Highway Frontage	\$12,000/acre

^a Based on the sale of 3,125 acres of land.

SOURCE: Capital Site Planning Commission, Socio-Economic Impact Analysis for Juneau and the Matanuska-Susitna Borough, Background Report No. 10, Prepared by Rivkin Associates (Washington: Rivkin Associates Inc., 1978), p. 129. Matanuska-Susitna Borough, "Agricultural Land Sale - May 10, 1977" (mimeographed), from office records, Palmer, Alaska.

PRESENT AND POTENTIAL AGRICULTURAL DEVELOPMENT IN ALASKA

Introduction

This section attempts to provide a perspective for evaluating the need to purchase development rights from existing private agricultural lands. First, we will look at present agricultural production in the State. Most of this production is occurring on lands that would be considered in a development rights purchase program. Second, we will consider the agricultural land base that is available for future agricultural production. Finally we will discuss the future demand for agricultural land in Alaska.

Present Agricultural Situation²

The total value of agricultural production when expressed in constant prices has declined slightly since 1960 (Table 3). Expressed in 1967 dollars, the value of production declined from \$6,010,000 in 1960 to \$5,514,000 in 1977. If inflation were not taken into account, the value of production figures expressed in current prices would be misleading. Both the relative value agriculture's contribution to the State's economy and the real value of agricultural production have declined.

The Matanuska-Susitna Valley continues to be the dominant agricultural region in the State. Statistics in Table 4 show that since 1960, over 70 percent of the agricultural production has come from this region.

² Much of the material for this section was taken from the agricultural discussion in the Alaska Statistical Review, 1972, pp. 181-190.

TABLE 3

TOTAL VALUE OF AGRICULTURAL PRODUCTION^a
(In Thousands of Dollars)
1960-1977

Year	Value of Production	
	Current Prices	Constant Prices ^b
1960	\$5,517	\$6,010
1961	5,651	6,089
1962	5,781	6,250
1963	5,451	5,849
1964	5,860	6,241
1965	5,518	5,858
1966	5,560	5,679
1967	5,524	5,524
1968	5,353	5,217
1969	4,574	4,263
1970	5,476	4,911
1971	5,474	4,789
1972	5,997	5,130
1973	6,987	5,644
1974	8,080	5,771
1975	9,226	5,861
1976	8,802	5,252
1977	9,777	5,514

^a Does not include reindeer products.

^b Deflated using Anchorage Consumer Price Index for all Commodities, 1967 = 100. Source: Alaska Department of Commerce and Economic Development, *The Alaska Economy*, (Juneau: Alaska Department of Commerce and Economic Development, 1977), p. 80. While a more appropriate index for deflating this time series of production figures would be the wholesale price index for farm products, this index is not available for Alaska.

SOURCE: Alaska Crop and Livestock Reporting Service, *Alaska Agricultural Statistics*, (Palmer: Alaska Crop and Livestock Reporting Service, 1978); Alaska Department of Economic Development, *Alaska Statistical Review*, (Juneau: Alaska Department of Economic Development, 1972), pp. 181-190.

TABLE 4
ESTIMATED VALUE OF PRODUCT BY AREA
(In Thousands of Current Dollars)
1960-1977

Year	Matanuska Valley		Tanana Valley		Kenai Peninsula		Southeast		Southwest	
	Value	%	Value	%	Value	%	Value	%	Value	%
1960	\$3,663	67	\$ 907	16	\$ 278	5	\$ 264	4	\$ 272	5
1961	3,945	69	842	14	326	5	219	3	319	5
1962	3,939	68	938	16	334	5	217	3	348	6
1963	3,721	68	781	14	383	7	174	3	357	6
1964	4,017	68	872	14	333	5	156	2	458	7
1965	3,406	63	950	17	481	8	134	2	414	7
1966	3,793	69	847	12	453	8	33	1	559	10
1967	3,876	70	673	12	397	7	30	1	548	10
1968	3,021	74	399	10	159	4	8	-	483	12
1969	3,260	71	448	10	305	7	29	1	532	12
1970	4,003	73	634	12	263	5	37	1	541	10
1971	4,102	75	676	12	206	4	22	-	467	9
1972	4,615	77	917	15	219	4	14	-	231	4
1973	5,116	73	1,246	18	274	4	1	-	345	5
1974	6,181	76	1,060	13	405	5	17	-	416	5
1975	6,602	72	1,791	19	506	5	10	-	317	3
1976	6,488	74	1,532	17	407	5	9	-	365	4
1977	7,282	74	1,601	16	597	6	12	-	284	3

SOURCE: Alaska Crop and Livestock Reporting Service, Alaska Agricultural Statistics, (Palmer: Alaska Crop and Livestock Reporting Service, 1978); Alaska Department of Economic Development, Alaska Statistical Review, (Juneau: Alaska Department of Economic Development, 1972). pp. 181-190.

The Tanana Valley has produced about 14 percent of the State's agricultural commodities. The Southwest, Kenai and Southeast regions follow with seven percent, six percent and one percent, respectively.

The most important agricultural commodities produced in the State are shown in Table 5. Milk is by far the most important commodity accounting for nearly 40 percent of the total value of agricultural production in 1977. Hay comprised 19 percent of the total and potatoes ten percent. Eggs were next with eight percent. Other vegetables, reindeer, barley and oats each accounted for either five or six percent of the total production value. Beef and veal comprised four percent of the total while other meats such as poultry, pork, lamb and mutton accounted for two percent. Wool and silage amounted to one percent or less.

Patterns in the value of production do not fully describe tendencies in agriculture in the State. There have been substantial structural changes in Alaska agriculture since Statehood. Since 1959, the monetary return to the farmer for many goods declined in real purchasing power. In addition, the industry came under increasing competitive pressure from imported foods because of changes in production technology in other states and due to more efficient transportation.

Alaska's dairy industry has changed dramatically to meet the challenge of outside competition. The small, poorly capitalized family farms have given way to modern, relatively capital intensive commercial dairies. The number of commercial dairies has decreased from approximately 80 in 1960 to 13 in 1977. Average income from milk per dairy has increased from approximately \$25,000 in 1960 to \$211,000 in 1977. Grain and vegetable farms have also followed the pattern of becoming more capital intensive and increasing production unit size.

TABLE 5
SALES OF AGRICULTURAL PRODUCTS - 1977

Product	Value of Sales	Percent
Milk	\$2,832	39
Hay	1,391	19
Potatoes	715	10
Eggs	600	8
Other Vegetables	444	6
Reindeer	421 ^a	5
Barley & Oats	400	5
Beef & Veal	323	4
Other Meats	169	2
Wool	44	1
Silage	4 ^b	-
TOTALS	\$7,339	100

^a Includes antlers, hides and other by products

^b Estimated.

SOURCE: Alaska Crop and Livestock Reporting Service, Alaska Agricultural Statistics (Palmer, Alaska Crop and Livestock Reporting Service, 1978).

Another change in the dairy industry has been its geographical consolidation. In 1960, the Matanuska Valley produced 80 percent of the State's milk; now it produces 96 percent (Alaska Crop and Livestock Reporting Service [ACLRS], p. 48). The decline of production in the other regions is due in part to their relatively higher production costs.

The production and sales of the State's most important agricultural commodities have remained fairly constant. Milk output and sales have varied little in the past eight years. Production has ranged between 18.0 and 16.6 million pounds (ACLRS, 1978, p. 49). Hay production has also remained relatively stable, but from 1975 through 1977 annual sale value was more than twice that in 1974 (ACLRS, 1978, p. 21). This was due to the purchase of hay by Alyeska Pipeline Company for potential oil spills and to the increased demand generated by the recreational horse industry. Sales to the pipeline company have now ceased, but the demand for horse hay is expected to continue. Potato production and sales likewise have not increased significantly since 1970. This commodity is limited to the fresh market only because of the lack of potato processing facilities. Several unsuccessful attempts have been made to develop frozen food processing facilities in the Matanuska Valley. The estimated value of sales for various agricultural products is provided in Table 6.

The total amount of land utilized for crop production in the State has remained fairly constant since 1970. Total land in crops from 1971 through 1976 averaged nearly 19,300 acres annually. The Matanuska-

TABLE 6

ESTIMATED VALUE OF SALES BY TYPE OF PRODUCT
(Value to Farmer in Thousands of Current Dollars)
1960-1977

Year	Milk	Potatoes	Other Vegetables ¹	Eggs	Hay	Silage	Grain	Beef	Reindeer	Other Meats ²
1960	\$2,277	\$614	\$192	\$454	\$ 96	\$ 2	\$116	\$122	\$132	\$81
1961	2,584	651	196	410	205	17	121	116	136	98
1962	2,340	576	229	400	202	17	115	237	139	83
1963	2,284	467	195	369	58	30	115	209	137	51
1964	2,067	889	202	328	104	28	109	247	180	73
1965	1,954	576	185	584	132	10	84	279	183	120
1966	1,881	520	197	661	186	4	118	350	168	107
1967	1,867	503	204	586	110	8	107	350	188	100
1968	1,807	538	269	483	132	6	96	292	253	113
1969 ³	1,853	290	155	335	112	13	26	329	212	86
1970	1,994	449	238	343	142	22	36	330	236	113
1971	1,838	502	298	420	176	24	47	273	195	111
1972	1,963	658	270	488	336	10	94	278	170	105
1973	2,107	949	261	546	396	18	338	309	178	103
1974	2,449	884	361	499	715	8	106	332	210	146
1975	2,700	940	367	408	1,794	11	256	306	341	95
1976	2,725	870	426	553	1,513	4	238	403	457	105
1977	2,832	715	444	600	1,391	-	400	323	421	169

¹ Includes primarily lettuce, carrots, and cabbage.

² Includes pork, poultry, lamb, and mutton.

³ Declines due to low rainfall and early freeze.

SOURCES: Alaska Crop and Livestock Reporting Service, Alaska Agricultural Statistics, (Palmer: Alaska Crop and Livestock Reporting Service, 1978); Alaska Department of Economic Development, Alaska Statistical Review, (Juneau: Alaska Department of Economic Development, 1972), pp. 181-190.

Susitna area and the Tanana Valley accounted for 59 and 29 percent of this acreage, respectively. The Kenai Peninsula averaged 11 percent of the annual total. Cropland utilization statistics are shown in Table 7.

Agricultural Lands for Future Development

Agricultural lands that are currently being converted to non-agricultural uses are not the only lands available for future development. While these lands are close to the State's major population centers and are felt by some to be the most valuable for agriculture, they are being converted because the market has placed a higher value on them for other uses. It may well be that other lands suitable for agriculture further out from existing agricultural areas will replace the lands being converted. The purpose of this section is to provide a brief overview of the supply of potential agricultural lands, particularly those adjacent to existing agricultural areas.

The Soil Conservation Service (Alaska Rural Development Council, 1974, p. 130) has identified approximately 15.2 million acres of potential agricultural land throughout the State. Because many of these lands are away from population centers and are without surface transportation access, there is little chance of their developing before the turn of the century. There are, however, some lands in the Tanana Valley and the Matanuska-Susitna-Kenai area that are closer to population centers and accessible by surface transportation.

The Alaska Department of Natural Resources (1976) has conducted an analysis of the agricultural lands identified by the Soil Conservation

TABLE 7
AVERAGE CROPLAND UTILIZATION, 1971-1976.

Crops	REGION				State Total
	Tanana Valley	Matanuska-Susitna Valleys	Kenai Peninsula	Southwest	
Commercial Vegetables	197	551	19	--	767
Feed Crops	3,655	3,578	568	--	7,801
Harvested Grassland	1,815	7,163	1,580	142	10,700
Total	5,667	11,292	2,167	142	19,268
Percent	29.4	58.6	11.3	.7	100

SOURCE: Alaska Crop and Livestock Reporting Service, Alaska Agricultural Statistics (Palmer: Alaska Crop and Livestock Reporting Service, 1978), p. 17.

Service and rated these lands by certain criteria³ in order to arrive at a priority ranking of agricultural lands in the State for state selection. The results of this analysis are presented in Table 8.

It is not surprising that the high priority potential agricultural lands are in the State's most important existing agricultural areas since these areas already have a sizable population and existing transportation facilities. What is significant is the large amount of potential agricultural acreage in these areas. If one considers all agricultural lands in the three most important agricultural areas, regardless of priority, there are nearly six million acres available, 32 percent of all agricultural lands in the State. If all priority categories but the top six are eliminated, the six million acres is reduced to 3.8 million, still a healthy amount of land. The top six priority rankings include lands that are relatively unconstrained by access and demands for other uses and could come into production in a reasonable amount of time. Even if the 3.8 million acres are reduced by 1.5 million to account for existing agricultural and nonagricultural uses, the 2.3 million acres could provide substantial agricultural development.⁴

³ These criteria include: (1) present and future access possibilities; (2) productive capability; (3) need for conservation practices; (4) local needs for agricultural products; (5) demand for other uses of agricultural lands; (6) variety of crops that could be grown; (7) timing of agricultural development, and (8) local socioeconomic impact.

⁴ Although this discussion shows that large quantities of potential land are available, at this time its not certain how much, if any, of these lands eventually will come into production since they could be classified by the State for other uses.

TABLE 8
 RANKING OF AGRICULTURAL LANDS BY STATE OF ALASKA^a
 (Thousands of Acres)

Priority	Tanana Valley	Matanuska-Susitna Anchorage	Kenai	Total	% of Priority Rank	Other Areas	% of Priority Rank
1	182.4	206.0	-0-	388.4	100	-0-	-0-
2	288.0	230.4	-0-	518.4	100	-0-	-0-
3	345.6	230.4	-0-	576	100	-0-	-0-
4	537.4	175.0	475.2	1,197.6	85	201.6	15
5	-0-	216.4	239.2	455.6	100	-0-	-0-
6	447.0	192.0	-0-	639.0	89	76.8	11
7	374.4	-0-	-0-	374.4	16	1,895.0	84
8	259.2	134.0	73.0	466.2	67	227.2	33
9	367.2	258.6	-0-	625.8	39	979.2	61
10	-0-	-0-	-0-	-0-	-0-	334.3	100
11	81.0	-0-	-0-	81.0	13	610.4	87
12	231.4	-0-	-0-	231.4	18	1,078.0	82
13	-0-	-0-	-0-	-0-	-0-	311.4	100
14	-0-	-0-	-0-	-0-	-0-	1,295.6	100
15	195.8	-0-	-0-	195.8	12	1,491.5	88
16	192.0	46.0	-0-	238.0	21	897.6	79
17-23	-0-	-0-	-0-	-0-	-0-	3,421.8	100
Totals	3,501.4	1,688.8	787.4	5,977.2	32	12,820.2	68

^a These figures include all lands with agricultural potential regardless of current use.

SOURCE: Alaska Department of Natural Resources, "Priority Values of Agricultural Land for State Selection" (mimeograph), Anchorage: Alaska Department of Natural Resources, 1978.

Not all of the potential agricultural lands are in State ownership. In an effort to gain an idea of the amount of identified agricultural lands held by the State, we examined land status data⁵ for the Tanana Valley and the Matanuska-Susitna Basin. The result of this analysis is shown in Table 9. In the Tanana Valley, the State will eventually receive title to 1.6 million acres (48 percent) of the agricultural land. In the Matanuska-Susitna Basin, 91 percent of the potential agricultural land will be in state ownership. No attempt was made to estimate the percentage of state control by priority rankings, but the very high percentage of state agricultural lands in the Matanuska-Susitna region assures that most of the high priority land there will be in state ownership.

Future Agricultural Development in Alaska

In order to get some idea of the future agricultural land demand in Alaska, this section will review a recent study made by the University of Alaska (Thomas, 1976) involving projections for agriculture to the year 2000. Assuming: (1) a state population of 820,000; (2) that Alaska would still produce only part of its total consumption; and (3) that Alaska's consumption patterns will be the same as those in the other 49 states, the study predicted the quantity of different types of commodities that would be produced in Alaska and the amount of land that would be needed in the different regions. This information is presented in Tables 10 and 11. At the time of this study, plans had not yet been

⁵ Computer printouts of land status made available by the Alaska Department of Natural Resources, Anchorage, Alaska.

TABLE 9
LAND STATUS OF AGRICULTURAL LANDS

Area	Agricultural Area ^a	STATUS ^b		
		State Lands	Native Lands	Federal Land
-----Thousands of Acres-----				
Tanana Valley	3,433	1,639 (48%)	293	1,500
Matanuska-Susitna	1,001	912 (91%)	075	014
Total	4,433	2,551 (58%)	368	1,514

^a Figures are less than those shown in Table 8 because private and municipal agricultural lands are not included.

^b Anticipated status after state selections and settlement of the Native Claims Settlement Act.

TABLE 10
ESTIMATED ALASKA CONSUMPTION AND PRODUCTION
FOR AGRICULTURAL COMMODITIES FOR THE YEAR 2000

Product	Alaska Consumption 2000	Alaska Production 2000
Beef (mil Lbs. Dressed Weight)	95.5	11.5
Pork (Mil Lbs. Dressed Weight)	51.7	20.7
Lamb & Mutton (Mil Lbs. Dressed Weight)	0.8	.0
Reindeer (Mil Lbs. Dressed Weight)	0.8	2.6
Milk (Mil Lbs.)	200.0	100.0
Eggs (Mil Doz.)	13.4	6.7
Vegetables & Potatoes (Thousand Ton)	79.3	36.2
Fruit & Berries (Thousand Ton)	1.4	.7

SOURCE: Wayne Thomas, "Agriculture in Alaska: 1976-2000 A.D." in Review of Business and Economic Conditions, Vol. XIII, No. 2 (Fairbanks: Institute of Social, Economic and Government Research, June, 1976), p. 18; Alaska Crop and Livestock Reporting Service, Alaska Agricultural Statistics (Palmer: Alaska Crop and Livestock Reporting Service, 1978).

TABLE 11

ACREAGE NECESSARY FOR ESTIMATED ALASKA AGRICULTURAL PRODUCTION
FOR THE YEAR 2000

Commodity	Matanuska-Susitna	Tanana	Kenai	Kodiak	Reindeer Range
<u>Beef</u>					
Barley			5,000 ^b		
Hay/Silage			14,900 ^b		
Pasture			8,300		
Range				921,000	
Other			17,700		
<u>Pork</u>					
Barley		13,500			
Other		8,400			
<u>Reindeer Range</u>					20,000,000
<u>Milk</u>					
Barley	1,400 ^a	8,000			
Oats	1,000 ^a	3,300			
Hay/Silage	3,600 ^a	10,000			
Other	3,800	13,300			
<u>Eggs</u>					
Barley		2,900			
Other		1,800			
<u>Vegetable-Fruit</u>					
Crop	1,950	650			
Other	1,300	450			
Total Acreage	13,050	62,300	45,900	921,000	20,000,000

^a A total of 5,700 acres of barley, 2,200 acres of oats and 6,600 acres of hay/silage will be produced in Tanana Valley for Matanuska-Susitna dairies.

^b A total of 3,400 acres of barley and 10,100 acres of hay/silage will be produced on the Kenai and shipped to Kodiak.

SOURCE: Wayne Thomas, "Agriculture in Alaska: 1976-2000 A.D." In Review of Business and Economic Conditions, Vol. XIII, No. 2 (Fairbanks: Institute of Social, Economic and Government Research, June, 1976).

formulated to undertake large scale production of barley and rapeseed for export. Thus no acreage figures are given for this type of enterprise. It would not be unrealistic to assume that barley and rapeseed production for export would require 500,000 acres of land above that shown in Table 11. The value of the 1976 study is in anticipating the different types of agricultural operations that may take place on a regional basis and how much land would be involved. This is particularly important in the Matanuska-Susitna area where nonagricultural uses are likely to be most predominant, especially if a new State Capital is placed in Willow.

As can be seen in Table 10, Alaska's production of agricultural products in the year 2000 is anticipated to be many times greater than current levels, particularly in the production of red meat. The estimate of agricultural acreage that would be needed by the year 2000 (Table 11) suggests that most of the cropland acreage would be needed in the Tanana and Kenai areas. Acreage requirements in the Matanuska-Susitna area are predicted to be only slightly above the current level of 11,200 because it is anticipated that much of the feed for the Matanuska-Susitna dairies will be grown in the Tanana Valley. If the dairy industry in the Matanuska-Susitna area grows its own feed, then another 14,500 acres would be required bringing the total to 27,500 acres. It should be noted that excluding acreage from the production of barley and rapeseed for the export market, Alaska's needs for cropland in the year 2000 would be only about 120,000 acres. If 500,000 acres were put into production (most likely in the Tanana Valley) for barley and rapeseed, the total would amount to 620,000 acres.

PURCHASE OF DEVELOPMENT RIGHTS

Development rights⁶ are one of the many rights associated with real property. They are analogous to other property rights such as mineral rights or water rights. Specifically, development rights are the right of the landowner to develop his land beyond its current use. Because these rights can be separated from the total bundle of rights associated with a parcel of real property, they can be sold, thus transferring from the landowner the right to develop his land. This, then, is the concept behind the purchase of development rights as an agricultural land control device. In order that land remain in agriculture in areas in which it is being converted rapidly to other uses, governments could purchase development rights from agricultural lands. These lands, because there are no development rights associated with them, could not be put to more developed uses.

⁶ Governments may acquire less than fee simple rights in land. These are commonly called easements and can be of a positive or negative nature. As defined by Ishee (1977, pp. 89-90), "A positive easement transfers certain decision making responsibilities associated with access from the fee simple, private owner to another. . . . Thus, some governments have acquired accessibility rights to some lands for the promotion of selected recreational activities such as hunting, fishing, and trapping. A negative easement, though failing to grant accessibility rights to others, restricts the fee simple owner from certain activities such as construction of billboards which destroy natural, scenic views, or the destruction of trees and shrubs." Purchases of development rights are examples of negative easements.

Although development rights purchase programs have been debated in several states,⁷ only Suffolk County in New York State and Maryland have begun, or will begin shortly, extensive purchases of development rights specifically from agricultural land.⁸ In addition, New Jersey, Massachusetts, and Connecticut have enacted recently more limited programs of development rights acquisitions from farmland (Bardin and Alampi, 1977; Fellows, 1978). Our purpose in this section will be, therefore, to review briefly these five programs. (More information on the operation of the programs in Suffolk County, Maryland, and New Jersey, as well as an evaluation of Suffolk County's program, is provided in Appendix A.) We start with Suffolk County, New York.

Suffolk County

The Suffolk County development rights purchase program is a reaction to residential growth in the county and is an attempt to limit that population growth. Suffolk County is located on the central and eastern portions of Long Island, approximately 40 miles from New York City.

⁷ For discussions of several of these proposals see Sidney Ishee, "Transferable Development Rights as a Means of Influencing Land Use Patterns," IN: Economic Issues in Land Use Planning-Western Rural Development Center, Special Report No. 3, Oregon State University Agricultural Experiment Station, Special Report No. 469, 1977; and Lawrence W. Libby and Mark D. Newman, Land Use Planning and Policy - Michigan in Perspective, Michigan Cooperative Extension Service E-1061, Michigan State University, February, 1977.

⁸ Wisconsin had some of the earliest experience with purchase of development rights when it began a program of scenic easement acquisitions along a Mississippi River highway in 1951. Because this program was not aimed specifically at keeping land in agriculture, a discussion of this program is not included in this report.

Rapid residential growth has taken place in the western half of the county in recent years; the eastern half of the county remains essentially rural in nature. Despite this development, Suffolk is still New York State's leading agricultural county with approximately \$70 million in annual gross agricultural sales (Leshner and Eiler, 1977, p. 6). The major agricultural enterprises in this county include potatoes, flowers, sod, ducks, vegetables, and nursery stock. Approximately 55,000 acres of farmland are located within the eastern portion of the county, the remaining 5,000 acres lying in western Suffolk County. In 1976, the population of Suffolk County was estimated at 1,240,000 residents.

The passage of the purchase of development rights program was a response to the increasing suburbanization of Suffolk County. However, this desire to limit growth was expressed as three objectives. These were: "(1) preservation of a viable agricultural economy; (2) maintenance of an aesthetically pleasing rural environment; and (3) local tax savings" (Leshner and Eiler, 1977, p. 11). This tool was selected by Suffolk County because of the failure of other land control techniques in limiting growth in other semi-urban areas. The techniques that have proven to be ineffective in suburbanizing areas include zoning, use value assessment, and agricultural districting.

History⁹

Prior to 1972, local concern for the preservation of farmland in Suffolk County was not expressed at the county level. This changed in 1972 when a newly elected county executive appointed an Agricultural Advisory Committee to investigate means of retaining land in agriculture. In 1974, the Agricultural Advisory Committee's final report recommended that county funds be used to purchase the development rights to large tracts of farmland. During 1974, each farmland owner in the county was asked to submit a sealed bid giving his asking price for the sale of the development rights to his land. By February, 1975, the county had received 381 offers to sell development rights on 17,000 acres for \$117 million, an average of approximately \$6,900 per acre. In April of 1975, the county evaluated these bids and recommended to the county legislature that an attempt be made to purchase the development rights to 14,000 acres. Anticipated cost was \$84 million. On May 11, 1976, a package of resolutions needed for the implementation of the proposed was tabled, however, by a vote of 10 to 8.

Following this vote, public support for the program intensified, and on September 8, 1976, a special session of the county legislature passed a package of 11 resolutions authorizing a \$21 million program of bond sales to purchase the development rights to 3,883 acres. It was planned to expand the program through 1979, eventually purchasing the development rights to 15,000 acres.

⁹ This history of Suffolk County's purchase of development rights program is taken largely from J. V. Klein, Letter and enclosure dated August, 1974; and William G. Leshner and Doyle A. Eiler, Farmland Preservation in an Urban Fringe Area: An Analysis of Suffolk County's Development Rights Purchase Program, A.E. Research 77-3, Cornell University, March, 1977.

As of July 15, 1978, the development rights from 3,342 acres had been purchased. Because of the recession which hit the state of New York in late 1975 through 1977, land values decreased and the development rights to these 3,342 acres were purchased for \$12 million, an average of approximately \$3,590 per acre. With the remaining \$9 million from the initial authorization of \$21 million, plus additional sums as may be required under the total current Suffolk County legislative authorization of \$55.5 million, the county hopes to complete the purchase of development rights to approximately 15,000 acres of farmland by the end of 1979.

Maryland

Maryland was one of the first states to attempt specifically to preserve land in agriculture. In fact, it was the first state (1956) in the United States to enact use-value assessment as a means of accomplishing this goal. Because of the limited effectiveness of use-value assessment in keeping land in agriculture, and following a report by the Maryland secretary of agriculture in 1974, bills were introduced in the Maryland legislature in 1975, 1976, and 1977 to enact a program of establishing agricultural districts and purchasing development rights from farmland as methods of maintaining farms in production. The 1977 proposal was signed into law and fiscal 1980 is expected to be the first year in which development rights are purchased (Musselman, 1978). Development rights will be purchased by the Maryland Agricultural Land Preservation Foundation. Funding is to be provided by general or special fund appropriations and by grants or transfers from governmental or private sources.

New Jersey, Massachusetts, and Connecticut¹⁰

On July 22, 1976, New Jersey passed legislation authorizing a demonstration program of development rights acquisitions from farmland (P.L. 1976 c. 50). The act, entitled the "Agricultural Preserve Demonstration Program Act," is to be funded by a \$5 million appropriation from the New Jersey State Recreation and Conservation Land Acquisition and Development Fund. Purchases are to be completed by the end of 1978. One year after acquisitions are finalized, a report evaluating the program's success is due the New Jersey state legislature.

Massachusetts and Connecticut have also enacted limited programs of development rights purchases. In both these states, purchases are to be made through the sale of \$5 million in state bonds. At the state level, the Massachusetts program is to be administered by the "agricultural land preservation committee." This committee will evaluate purchase proposals that are submitted by local governments and will select those to be funded. Local administration of the program is expected to be provided by local conservation commissions.

In June, 1978, Connecticut authorized a pilot program of development rights purchases. Land priorities for the program are to include lands which have high food production potential and are likely candidates for development in the near future. As of September, 1978, 107 owners of farmland in Connecticut had offered to sell the development rights to 7,400 acres (Fellows, 1978). The first purchases are antici-

¹⁰ Sources for this section are (1) New Jersey P.L. 1976 c. 50, (2) Connecticut Public Act No. 78-232, and (3) Irving F. Fellows, Personal Communication, September 13, 1978.

pated to take place in November or December of 1978, following final selection of criteria for selecting among offers. An evaluation of the pilot program is to be submitted to the Connecticut General Assembly by December 1979.

Definition of Development Rights

At this point it is useful to discuss the rights purchased under a development rights acquisition program. We can do this by comparing the definitions that are being used in existing programs. All current programs purchase all rights to develop, except for agricultural purposes, and therefore require the land to remain in agriculture. Normally a definition of agricultural use is also provided in the legislation authorizing development rights purchases.

In the Suffolk County program, "Development right shall mean the permanent legal interest in the use of all lands for any purpose other than agricultural production" (Local Law No. 19, Suffolk County, New York, 1974). Agricultural production is defined as "the production for commercial purposes of crops, livestock, and livestock products, but not land or portions thereof for processing or retailing merchandising of such crops, livestock and livestock products. . . ."

In Maryland, a development rights easement is defined as "an encumbrance upon land which restricts the owner's rights to develop, or otherwise use the land for other than agricultural use (Maryland Agricultural Land Preservation Foundation Regulations - Draft, 1978). Further, farm use is defined as "any use of land which directly contributes to the production, primary processing or storage of agricultural products."

New Jersey defines development easement as "the purchase of an interest in agricultural land, specifically, the right to develop, or change the use of the land from active agricultural use to a more intensive use, such as residential, industrial, or commercial (New Jersey P.L. 1976 c. 50). As "prime farmland" is one of the major criteria for inclusion in the demonstration project, prime farmland is defined as "lands classified as land use capability I, II, or III in accordance with the National Cooperative Soil Survey prepared under U.S. Department of Agriculture, Soil Conservation guidelines. . .and such unique farmlands currently used for the production of cranberries, blueberries and other specialty crops" (Joint Rules and Regulations Concerning Farmland Preservation Demonstration Project, 1977).

Connecticut defines development rights as "the rights of the fee simple owner of agricultural land to develop, construct on, sell, lease, or otherwise improve the agricultural land for uses that result in rendering such land no longer agricultural land, but shall not be construed to include. . .the rights of the fee owner of agricultural land to develop, construct, sell, lease or otherwise improve the agricultural land to preserve, maintain, operate or continue such land as agricultural land, including but not limited to construction thereon of residences for persons directly incidental to farm operation and buildings for animals, roadside stands and farm markets for sale to the consumer of food products and ornamental plants, facilities for the storing of equipment and products or processing thereof of such other improvements, activities and uses thereon as may be directly or incidentally related to the operation of the agricultural expertise. . . ." (Connecticut Public Act No. 78-232).

Four important questions related to development rights purchases need discussion: (1) what is the right of the owner to sell his land? (2) can improvements be made on the land? (3) is the building of residences allowed? and (4) are mechanisms provided for repurchase of development rights?

None of the legislation in Suffolk County, Maryland, New Jersey, or Connecticut removes the right of the landowner to sell or lease his land, in whole or in part. However, if land is sold as either whole parcels or as subdivided segments, the land must stay in agriculture as defined in the various states' legislation and regulations.

Next, what development can take place on the farm after the development rights are sold? In Suffolk County, it seems that buildings and structures directly related to agricultural production would be allowed (Leshner and Eiler, 1977, p. 15). However, development related to processing or merchandising of crops and livestock would be prohibited. The Maryland program allows for primary processing and storage of agricultural products (Maryland Agricultural Land Preservation Foundation Regulations, 1978-Draft). New Jersey allows facilities to be built for use in retail merchandising of agricultural products produced on the farm, subject to several restrictions, e.g., no more than two acres may be devoted to a retail merchandising facility (Joint Rules and Regulations Concerning Farmland Preservation Demonstration Project, 1977). The Connecticut program is the most specific of the four programs regarding construction of buildings and allows for buildings for animals, roadside stands, farm markets, and storage facilities for equipment (Connecticut Public Act No. 78-232).

The Suffolk County program allows housing to be built for the farm owner and full-time employees. In Maryland, a landowner who has sold his development rights may request to use one acre or less for his and his children's residential use (Maryland Agricultural Land Preservation Foundation Regulations, 1978-Draft). In addition, housing may be permitted for tenants as long as construction does not exceed one tenant house per 100 acres. New Jersey permits the construction of new residences for the household which derives its primary income from the farm (Joint Rules and Regulations Concerning Farmland Preservation Demonstration Project, 1977). Also, residences are allowed for labor employed on the farm. The Connecticut program allows for the building of residences for persons directly incidental (directly incidental has not been specifically defined) to the farm operation (Connecticut Public Act No. 78-232).

The intent of purchase of development rights programs is that the land remain in agriculture in perpetuity. However, existing programs include provisions to allow the landowner to regain development rights under special conditions, typically if farming becomes unprofitable.

In Suffolk County, development rights can be resold to the landowner only if voters agree in a countywide referendum (Newton, 1975, p. 5). These development rights can revert only to the land from which they originally came. The Maryland program allows for the repurchase of development rights after 25 years if farming becomes unprofitable and if approval is granted by the Maryland Agricultural Land Preservation Foundation and the local county government (Maryland Agricultural Land Preservation Regulations, 1978-Draft). New Jersey allows for the sale of development rights purchased by the state only with the approval of

the Commissioner of Environmental Protection, the Secretary of Agriculture, the State House Commission and following a public hearing at least one month prior to any final approval (P.L. 1976 c. 50). In Connecticut, repurchase of development rights are to be initiated by a petition from the farmland owner to the local governing body (Connecticut Public Act No. 78-232). If the petition is approved by the governing body of the town in which the farm is located, approval is next sought from the Commissioner of Agriculture. The Commissioner can approve the petition only if he determines there is an overriding necessity in the public interest to relinquish the development rights. Final approval will come from a referendum held in the town in which the land in question is located.

Strengths and Weaknesses of Development Rights Purchases

Sargent (1976) has evaluated the strengths and weaknesses of various agricultural land preservation tools in relation to eight criteria. His conclusions concerning development rights purchases are likely to apply to the Alaska situation. These eight criteria are (1) landowner compensation, (2) relative permanence, (3) penalization of landowner, (4) coverage of all agricultural land, (5) public costs, (6) private costs, (7) special suitability, and (8) general acceptability.

The strengths of development rights purchases are that they compensate landowners, they are relatively permanent, they do not penalize the landowner, and they involve no private costs. The greatest strength of this tool is that it compensates a landowner for loss of opportunity, i.e., the opportunity to sell farmland for development at a price above

the agricultural value of the land. This removes the major problem associated with zoning--taking from a landowner without compensation. This characteristic of a buy-back program is likely to be particularly attractive to operators desiring to keep the land in agricultural production, for either themselves or their families, but who, at the same time, want to capture the capital gains of increased land values by "cashing out" on their investment.¹¹

Weighed against these strengths are some weaknesses. These are high public costs, the variable suitability of development rights purchases, and the limited acceptability of purchases to voters, taxpayers, and farmers. Much of the disadvantage of development rights acquisitions arise from their high costs and only in special situations is it likely that taxpayers will agree to the expense involved. Purchases of development rights have variable suitability. For example, they may be more suitable to metropolitan areas than to rural areas since less expensive tools (e.g. agricultural districts) may be just as effective in rural locations. In addition, farmers are not particularly enthused, at least initially, to the idea of losing their right to develop their land. This lack of interest was shown in our survey of Alaska farmers discussed in the next section of the report.

¹¹ The degree of enthusiasm among farmers for such an opportunity to "cash out" would depend of course on the treatment of these capital gains by the I.R.S. and the state income tax provisions. Several of the Alaskan farmers we interviewed brought this important point to our attention.

APPLICABILITY OF A DEVELOPMENT RIGHTS PROGRAM IN ALASKA

Introduction

The objective of this section is to discuss how a development rights program could be applied in Alaska and what its costs and benefits might be. Before entering into this discussion we will first review the results of a development rights survey and comment on the most efficient size of agricultural operations which might be considered when carrying out a development rights program.

Development Rights Survey in Alaska

During August 1978 a questionnaire was mailed to 263 agricultural landowners¹² in the five major agricultural regions in the State. The objective of the questionnaire was to determine the interest that farm-land owners had in selling development rights to their land and how much these rights were worth to them. A sample questionnaire is provided in Appendix B.

Response

Of the 263 questionnaires mailed, 18 were returned as undeliverable, leaving 245 that actually reached their destination. A total of 112 (45%) of the delivered questionnaires were returned (See Table 12). The response rate differed by region with the Kenai-Kodiak and Copper River

¹² The list of agricultural landowners was supplied by the Agricultural Experiment Station in Palmer, Alaska.

TABLE 12
QUESTIONNAIRE RESPONSE BY REGION

Region	Questionnaires Delivered	Questionnaires Returned	Percent
Fairbanks	52	24	46
Delta	34	10	29
Copper River	15	10	67
Matanuska-Susitna	106	41	39
Kenai-Kodiak	38	27	71
TOTALS	245	112	46

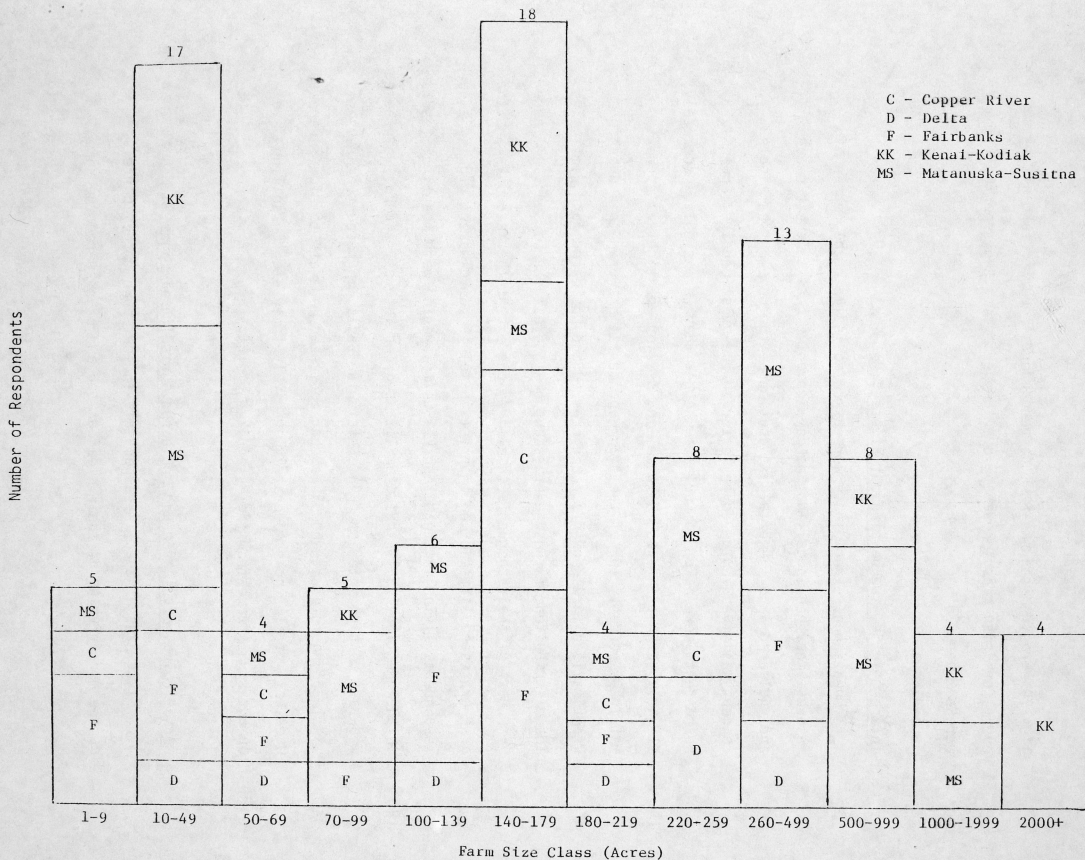
regions having the highest with 71 percent and 67 percent return rates, respectively. The Delta region had the lowest return rate with only 29 percent of the questionnaires returned. The Fairbanks and Matanuska regions, which contain the majority of agricultural operations in the state, had return rates of 46 percent and 39 percent, respectively. Although the overall response rate of 46 percent is quite satisfactory for a mailout questionnaire, the data suggest that we may not have obtained an adequate sample response to some questions to have high confidence in our analysis.

Farm Size of Respondents

There was a wide range of farm sizes reported by the respondents (Figure 2). One-half of the 96 respondents who gave farm size statistics reported one of three farm size classes: 10-49 acres, 140-179 acres, or 260-499 acres. The remaining 48 respondents were distributed relatively uniformly among the other classes. The acreage figures given by the respondents included land leased or rented from other private landowners or the government in addition to their own land.

The farm size pattern differs somewhat by region. All of the respondents who indicated a farm size above 500 acres were in the Matanuska-Susitna or Kenai-Kodiak regions. Large acreages of grazing land are leased from the government on Kodiak Island. Most of the respondents from the Fairbanks and Copper River areas reported farm sizes below 180 acres. A high proportion of the respondents from the Kenai Peninsula reported farm sizes of between 10 and 49 acres and

FIGURE 2. RESPONDENTS IN EACH FARM SIZE CLASS BY REGION



140-179 acres. Matanuska-Susitna respondents reported farm sizes in every farm size class; however, over 50 percent of the reported farms were between 220 and 999 acres.

Interest in Selling Development Rights

Questionnaire recipients were asked to indicate the degree of interest they had in selling the development rights to their cleared and uncleared land. A brief explanation of the development rights concept was given in the cover letter to the questionnaire (Appendix B). Respondents were asked to indicate whether they were highly, moderately, slightly, or not interested in selling development rights. Approximately 94 percent, 106 of the 112 respondents, answered this question. Practically all respondents rated cleared and uncleared land similarly. The distribution of these expressions of interest can be seen in Figure 3.

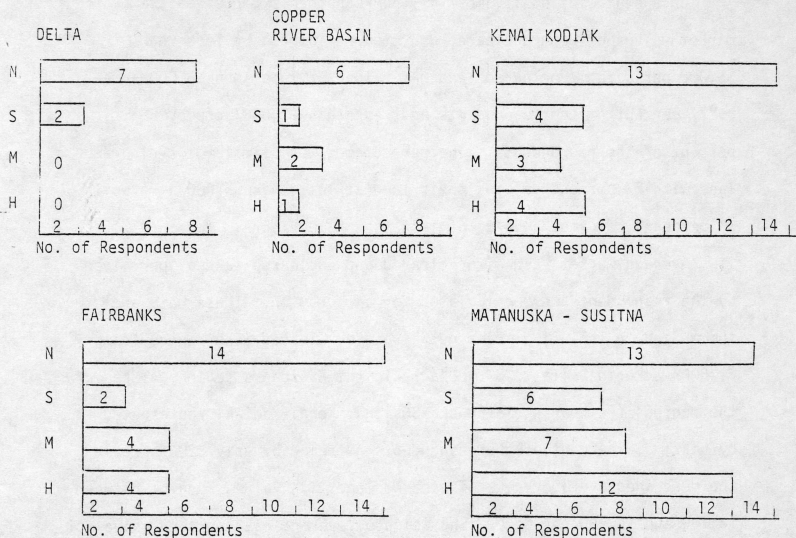
Most of the respondents in all regions except the Matanuska-Susitna area expressed little or no interest in selling development rights. Those respondents living in the Matanuska-Susitna region were evenly divided on the question. Half indicated little or no interest and half expressed moderate to high interest. On a statewide basis, 65 percent expressed little or no interest and 35 percent indicated moderate to high interest. Over half of all those moderately or highly interested in selling development rights were from the Matanuska-Susitna region.

Market Values of Cleared and Uncleared Agricultural Lands

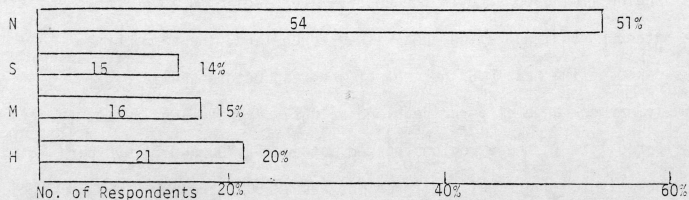
Sixty-nine of the 112 respondents indicated what they perceived as the market value of their cleared land and 62 answered the same

FIGURE 3.

DEGREE OF INTEREST* IN SELLING DEVELOPMENT RIGHTS TO AGRICULTURAL LAND



STATEWIDE



*N - No Interest

M - Moderate Interest

S - Slight Interest

H - High Interest

question about uncleared land. The distributions of these values are shown in Figure 4.

On a statewide basis, most of the respondents perceived the market values of both uncleared and cleared land to be less than \$5,000 per acre. Uncleared land was valued at less than \$5,000/acre by 77 percent of the respondents and less than \$3,000/acre by 65 percent of the respondents. The percentages were similar for cleared land with 77 percent valuing their land at less than \$5,000/acre while 56 percent indicated a value of less than \$3,000/acre.

Average market values for cleared and uncleared land as perceived by the respondents were calculated for each region. These data are summarized in Table 13. Average values for cleared land ranged from \$1,500/ acre in Delta to \$3,900/acre in the Fairbanks region. Three of the regions (Fairbanks, Matanuska-Susitna, Kenai-Kodiak) represented by nearly 80 percent of the respondents differed by only \$200/acre in the perceived average value of cleared land with values ranging between \$3,700 and \$3,900 per acre. The weighted average cleared land value for the five regions was \$3,300/acre.

Uncleared land values averaged slightly lower than cleared land values ranging from \$900/acre in the Copper River region to \$3,600/acre in the Matanuska-Susitna region. As with cleared land, the same three regions representing nearly 80 percent of the respondents showed a relatively narrow range of perceived land values. Average land values for uncleared land in these regions ranged between \$2,900 and \$3,600 per acre. The weighted average for all regions was \$2,800/acre.

FIGURE 4.

Perceived Market Values of Cleared and Uncleared Lands

(Dollars per Acre)

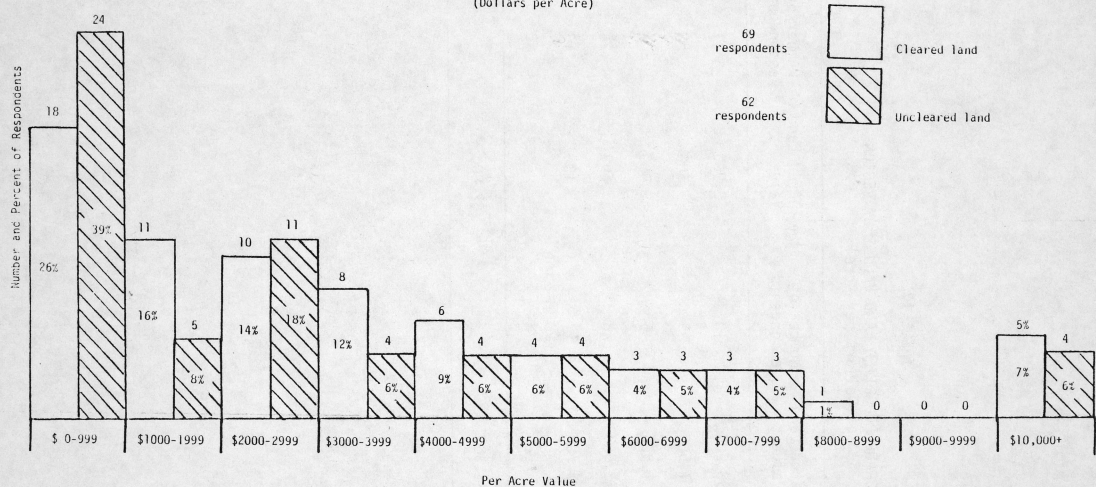


TABLE 13
 AVERAGE PERCEIVED LAND VALUES BY REGION
 (Dollars per Acre)

Region	Cleared Land Value	Number of Respondents	Uncleared Land Value	Number of Respondents
Fairbanks	\$3,900	13	\$2,900	11
Delta	1,500	9	1,300	8
Copper River	1,900	6	900	6
Matanuska-Susitna	3,800	28	3,600	24
Kenai-Kodiak	3,700	13	3,100	13
TOTALS		69		62
Weighted Average	\$3,300		\$2,800	

The difference between cleared and uncleared land average values per acre was smallest in the Matanuska-Susitna region (\$3,800 vs. \$3,600) and greatest in the Fairbanks region (\$3,900 vs. \$2,900).

Value of Development Rights

A value for development rights was reported by 39 of the 112 respondents (35%). Thirty-four of these responses were from the Fairbanks, Matanuska-Susitna, and Kenai-Kodiak areas. Nearly 70 percent of the respondents valued their development rights at less than \$4,000/acre. The distribution of development rights values can be seen in Figure 5.

Average development rights values as perceived by the respondents were calculated for the Fairbanks, Matanuska-Susitna and Kenai-Kodiak regions. These values are shown in Table 14. Average values were not calculated for the Copper River and the Delta regions because so few of the respondents in these areas responded to this part of the questionnaire. Average development rights values in the three areas mentioned ranged between \$3,100/acre and \$3,600/acre. Values were highest in the Matanuska-Susitna region. The development value data lacks reliability because of the small sample. In addition, comments and figures from some of the questionnaires indicated that some of the respondents apparently did not understand how to evaluate the value of development rights to their farmland.

Average development rights values were also calculated by degree of interest, again using the data from the Fairbanks, Matanuska-Susitna and Kenai-Kodiak regions. Calculations showed that those with a moderate or high interest in a development rights program on the average

FIGURE 5.
Value of Development Rights
(Dollars per Acre)

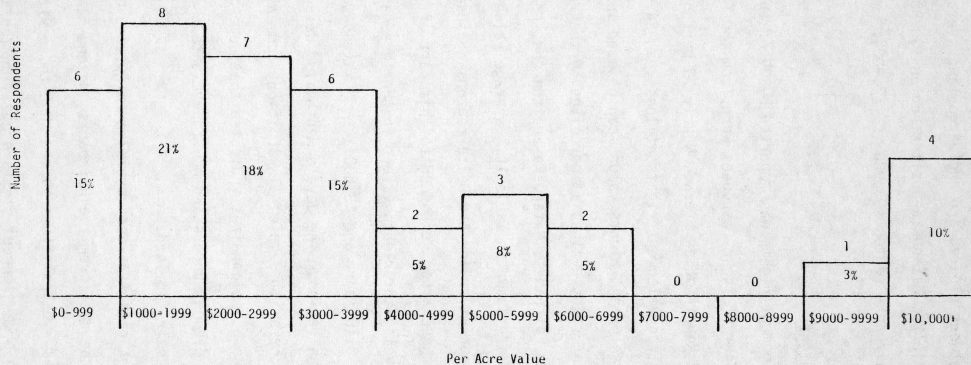


TABLE 14
 AVERAGE DEVELOPMENT RIGHTS VALUES
 (Dollars per Acre)

Region	Value	No. of Respondents
Fairbanks	\$3,200	5
Matanuska-Susitna	3,600	21
Kenai-Kodiak	3,100	<u>8</u>
TOTAL		34
Weighted Average	\$3,400	

valued these rights at \$2,145/acre. Those not interested in the program put a much higher value on these rights, \$4,662/acre. Respondents in the moderate to high interest categories accounted for 63 percent of the total acreage represented in the survey responses.

Distance from a Population Center, Interest in Selling Development Rights, and Perceived Value of Development Rights

Additional analysis of the survey data was undertaken to determine whether or not a landowner's interest in a development rights purchase program and/or his perceived value of these rights were related to the distance between his farm and the nearest population center. Table 15 presents a summary, in percentage terms, of the data relating to the interest/distance question. One can observe that the distributions of responses are similar between the moderate or high and low or no interest categories and are, therefore, similar to the pattern shown for all responses.¹³ This close relationship suggests that farmers' interest in selling development rights is not significantly influenced by the location of his farm relative to a population center. When data for just those farm owners living near Palmer and Wasilla were broken out and analyzed in the same way the identical conclusion was drawn.

We also addressed the issue of whether a landowner's perception of the value of the development rights to his property was influenced by the location of the farm relative to a population center.

¹³ Using the chi square test for independence with the data on which Table 15 is based, we were not able to reject the hypothesis of independence of interest and distance at any reasonable level of significance. One must recognize, however, that these data were not obtained through random sampling. Thus, our conclusions must be viewed with caution.

TABLE 15
 FARM DISTANCE FROM NEAREST COMMUNITY
 RELATED TO DEGREE OF INTEREST^a

	Distance Categories				
	0-5	6-10	11-15	16-20	21+
Percent of Farmers Reporting	41	24	16	7	12
Percent of Farmers with Moderate or High Interest	39	29	12	5	15
Percent of Farmers with Little or No Interest	43	21	19	9	9

^a Based on 111 farmers reporting.

The expectation here was that the closer the farm was to a town or city, the more attractive would be that land for development purposes and that this relative attractiveness would be reflected in the perceived value of the development rights. Unfortunately the quality of the data obtained through the survey did not allow a rigorous test of this proposition on either a local or statewide basis. The data in Table 16 is presented to show the nature of the relationship or lack thereof between distance and development rights value as perceived by farmers near Palmer. No clear pattern emerges but, again, this conclusion must be qualified by recognizing that the data are not taken from a random sample. The fact that the expected relationship did not occur may perhaps also be explained by the existence of unrealistic expectations on the part of some land owners regarding the development value of their property. This should not be taken to mean, however, that these perceived values represent the minimum payments that these land owners might be willing to accept to forego their development options.

Economic Size Agricultural Operations

A key factor in the attempts to maintain and/or expand agricultural production in the State is the development of economic size agricultural operations. Thomas (1976, p. 15) noted that one of the major problems with agriculture in the Matanuska Valley was the small size of individual farms. The Alaska Power Administration (1970, pp. 46-53) has determined the most economically efficient sizes for dairy, small grain and potato operations. Each of these enterprises is discussed below.

TABLE 16
 RELATIONSHIP BETWEEN DEVELOPMENT RIGHTS
 VALUE AND DISTANCE FROM PALMER

Distance (Miles)	Stated Values
0-1	\$10,000 7,700
1	3,000
2	10,000 3,500 1,500
3	3,500 1,000 5,500
4	2,000
5	600
6	-
7	3,000
8	500
9	-
10	850
11	1,000

Dairy operations in the Matanuska Valley would have to approach 60 cows to be considered an economic unit. Such a unit would require 280 acres to grow the necessary feed. A 60 cow dairy is estimated to be a minimum economic size and is probably just above being marginal. A more realistic size would be a 120 cow enterprise based on 560 acres. A budget analysis of this larger enterprise showed a return on investment of 8.8 percent after allowing for the operator's salary and the value of perquisites.

There is some concern that if the number of dairy cows in the Matanuska Valley declines further, the creamery that processes the milk will go out of business. We were unable to verify this. Husby (1978) has indicated that approximately 750 cows are needed to support a creamery, thus, barring other problems, the present milk cow herd of 1,500 animals would have to decline by almost one-half for the creamery to discontinue operation, assuming that Alaska dairy enterprises are the only source of supply. The present creamery, however, is importing milk for processing from Washington State. If the Alaskan supply of milk declines it may be possible to import a greater proportion of non-Alaskan milk to maintain operations.

The 1970 study by the Alaska Power Administration determined that for small grain farms the minimum economic unit was 320 acres. Thomas, et al. (1977) in evaluating potential barley production in the Delta-Clearwater, consider this to be too small under current agricultural conditions and suggest that 3,000 acres would be the minimum economic unit for a grain farm.

A potato farm of about 40 acres was identified as the minimum sized unit that could support a farmer and his family. Potato farms require less investment than either grain or dairy farms. Labor requirements are more than for grain farms but less than for dairy farms.

The Alaska Power Administration Study did not consider vegetable farms other than potatoes. Interviews with vegetable farmers in the Matanuska Valley indicated that a minimum economic unit would be about 15 acres.

Potential Costs of a Purchase of Development Rights Program

An important consideration in examining the applicability of a purchase of development rights program for Alaska is the potential costs of such a program. These costs would vary widely depending on the scope of the program. Estimated purchase costs (the value of development rights) for several alternative purchase programs are provided in this section. Estimated development rights values are derived from two sources: the survey of Alaskan farmers that was described earlier and, for the Matanuska-Susitna Valleys, from Alaska's program of use-value assessment of agricultural land.

Estimates of purchase costs for three alternative acquisition programs are provided in Table 17. These estimates are for (1) the cost of purchasing development rights to all acres in Alaska planted to crops in 1977, (2) the cost of purchases by specific region in the state and (3) the cost of purchases in the Matanuska-Susitna Valleys by level of interest among farmers. Following a short discussion of these esti-

TABLE 17

ESTIMATED PURCHASE COSTS OF ALTERNATIVE DEVELOPMENT RIGHTS PURCHASE PROGRAMS

Scope of Purchase	Acres Available ^a	Cost (per acre)		Cost (per acre) ^b	
		From Farmer Survey	Total Cost	From Use-value Assessment	Total Cost
1. State-wide	19,005	\$3,400	\$64,617,000	--	--
2. By region ^c					
a. Tanana Valley	5,633	3,200 ^d	18,025,600	--	--
b. Matanuska-Susitna Valleys	11,222	3,600	40,399,200	\$747	\$8,382,834
c. Kenai Peninsula	2,050	3,100	6,355,000	--	--
3. By interest (Matanuska-Susitna Valleys) ^e					
a. High & moderate interest	7,070	2,145	15,165,150	747	5,281,290
b. Low & no interest	4,152	4,662	19,356,624	747	3,101,544

^a Acres planted to crops in 1977 (ACLRs, 1978, p. 16).

^b This value is from Janet McCabe, The Urban Fringe: Methods of Land Use Direction, Federal-State Land Use Planning Commission for Alaska, Study No. 35, 1978.

^c One hundred acres in Southwest Alaska are excluded.

^d Values provided by Fairbanks area farmers were applied to all of the Tanana Valley.

^e Total available acres for this alternative were determined by multiplying the total acres in the Matanuska-Susitna Valleys by the percent of acres in high-moderate and low-no interest categories as taken from returned questionnaires. Sixty-three percent of reported acres were in the high-moderate category while 37 percent were in the low-no category.

mates, an examination of the potential costs of purchasing the development rights to a specific agricultural enterprise in the Matanuska Valley is provided.

If the development rights to all acres planted to crops in 1977 (ACLRs, 1978, p. 16) were purchased, the estimated total purchase cost, using the average state-wide value of \$3,400 per acre for development rights as determined by farmer survey, would be approximately \$64,600,000. Approximately \$40,400,000 (63%) of this total would apply to Matanuska-Susitna Valleys. In the Tanana Valley, the estimated cost would be \$18,000,000. For the Kenai Peninsula, estimated cost would be approximately \$6,000,000.

An alternative purchase cost estimate for the Matanuska-Susitna Valleys is approximately \$8,400,000. This estimate was calculated by using the base for deferred taxes under Alaska's use-value assessment program as the development rights value. If current records of agricultural value and market value of agricultural lands were kept, then the difference between these two figures could be viewed as the development rights value. However, it appears that development rights values and thus probable purchase costs may be greatly underestimated using this procedure. This is not unexpected since farmland market values are typically undervalued by assessors in the United States. This often happens because assessing departments are not able to do yearly assessments because of staff and budget limitations.

Because the Matanuska-Susitna Valleys are presently the most important agricultural area in Alaska, and also because this region is

facing the most intense development pressure, we show two additional cost estimates. These estimates are by level of interest among farmers and by type of operation.

For the Matanuska-Susitna Valleys, an estimate of the costs of purchasing development rights by level of interest among farmers is also provided in Table 17. In this estimate, the available acres with high-moderate interest and low-no interest were determined by extrapolation from the acres reported by farmers responding to our survey to the total acres available (11,222). Because we were unable to obtain a random sample of farmers, there is likely to be considerable error in our estimate of acres within high-moderate and low-no interest categories. If a random sample of farmers were obtained, more confidence could be placed in these estimates.

Agricultural enterprises that currently exist in the Matanuska-Susitna Valleys include dairying, potato-vegetables, hay and silage, and a small amount of beef and swine production. For various reasons there may be greater rationale for purchasing the development rights to those acres needed to maintain dairying for any other single type of enterprise in this area. For potato-vegetable enterprises, for example, farmers surveyed expressed little interest in participation in a development rights purchase program. Also, because these crops are land intensive, the current amount of land available does not appear to be a critical factor. Next, for hay and silage enterprises, few people are involved in full-time operations and production units are not easily identifiable. Those acres involved in forage production

that would be critical for the maintenance of dairying are covered in the following dairy discussion. Finally, beef and swine production is a minor part of the agricultural economy in this region and accounts for only a small amount of land use.

As of January 1, 1978, there were 13 Grade A dairy herds in Alaska (ACLRS, 1978, p. 34). Eleven of these herds were located in the Matanuska Valley. Herds in the state were estimated to total 1,500 dairy cows, 1,400 of which were in the Matanuska Valley. This is the lowest number of dairy cows in the state since 1960. The high year was 1962 when 3,200 dairy cows in 35 Grade A herds were located in Alaska.

Because of the decrease in dairies and cows in Alaska, interest has been expressed at maintaining dairy operations at least at their current levels. Because most of the dairying activity is in the Palmer area, a way to possibly insure the maintenance of the dairy industry would be to purchase the development rights to the acres needed to support the current number of cows in this area. It has been estimated that for operations larger than 120 cows, approximately 4.67 acres are needed to support a cow annually (Alaska Power Administration, 1978, p. 48). Thus, approximately 6,538 acres would be necessary to sustain the dairy industry at its current level in the Matanuska Valley.

Three estimates of the cost of acquiring the development rights to this number of acres are provided in Table 18. These estimates of development rights values are: (1) the average development rights value of the four dairymen in the Matanuska Valley who answered our questionnaire and showed some interest in selling these rights; (2) the average value of all respondents in the Matanuska Valley, and (3) the average

development rights value of all respondents in the Matanuska-Susitna area who showed high or moderate interest in selling their development rights.

TABLE 18
ESTIMATED COSTS OF DEVELOPMENT RIGHTS PURCHASES TO MAINTAIN
THE MATANUSKA DAIRY INDUSTRY

Acres Needed	Total Cost Four Dairymen ^a	Total Cost All Respondents, Matanuska Valley ^b	Total Cost High-moderate Interest Matanuska Valley ^c
6,538	\$24,700,000	\$23,500,000	\$14,000,000

^a \$3,775/acre.

^b \$3,600/acre.

^c \$2,145/acre.

Other Costs

Besides the direct purchase costs associated with development rights acquisition, other costs would be a part of such a program. Two of these potential costs, easily identifiable but not so easily quantifiable, are administrative and legal costs and property tax losses.

Administrative and legal costs would arise from (1) activities involved with the actual purchases and (2) from continuing administration once land was in an acquisition program. In the initial purchase effort, costs would be associated with such activities as contacting farmers, identifying and describing parcels included in any program, preparing legal documents, negotiating sales with farmers, closing sales,

etc. Once land was actually in a program, continuing administration of the program would be needed. This would entail making sure contracts and regulations were followed. For example, someone would have to make certain that any building that took place on land under an acquisition program was in accordance with the program's regulations.

Our literature search of existing programs failed to disclose any documentation of the above costs. However, assuming that once the program was underway, two full-time professionals and a secretary were adequate to administer the program, a gross estimate of administrative costs might be as follows:

Estimated Annual Administrative Costs*

Salaries	
Program leader	\$35,000
Assistant	22,000
Secretarial	16,000
Travel	5,000
Supplies	2,000
Total	<u>\$80,000</u>

*(It is assumed that legal advice would come from attorneys already employed by the state. New legal costs would then be slight if these attorneys were able to assume this increased work load without seriously detracting from their current assignments.)

Another possible cost to local governments would be a reduction in property tax revenues due to the decrease in land values following the sale of development rights. Currently, under Alaska's agricultural land use-value assessment law, property taxes that are lost by a borough when

farmland is placed under the use-value assessment program are reimbursed by the state. However, the market value of land under a development rights acquisition program would be the land's use-value, and boroughs would not be entitled to reimbursement for losses in property taxes, since none would occur. Although borough governments would lose property tax revenues under a development rights purchase program, there would be a corresponding reduction in costs to the state government, assuming all land involved was previously enrolled in the use-value assessment program.

Benefits of Development Rights Acquisition

Earlier in this report it was suggested that the preservation of agricultural activities has associated with it a set of joint benefits (see section on market failure). In assessing the feasibility of a public program to maintain land in agriculture in Alaska it is, of course, important to consider these benefits in relationship to the costs of achieving this end. Some of the benefits attributable to the presence of agricultural activities, however, do not lend themselves to objective quantification. They are public goods. As is the case with any good, a person's subjective evaluation of the relative importance of this class of benefits depends on his own personal value system. But unlike conventional private goods, the absence of an organized system of exchange for these collective goods stands in the way of our use of market signals (prices) to measure society's willingness to pay for these benefits.¹⁴

¹⁴ Similar problems have been encountered in other public policy issues in Alaska such as the proposed relocation of the state capital and the debate involving the use of the North Slope haul road.

An alternative approach to actual quantification is to present to the public and to government officials in the state a listing and discussion of the potential benefits stemming from a development rights purchase program. This information, along with the program costs estimates, may then be employed by the decision maker in assessing the overall desirability of a given policy. Specifically, the program costs estimates represent the minimum value that must be achieved by the joint benefits in order for the program to be economically feasible.

Maintenance of the Local Agricultural Economy

From a state-wide perspective, agriculture currently contributes relatively little monetarily to the Alaska economy. Statewide, agricultural activities accounted for an estimated two percent of the Gross State Product prior to start-up of petroleum production from the Prudhoe Bay field (Logsdon, 1975). Comparable statistics for local areas within the state are not available. The degree of dependence of the Palmer-Wasilla area, for example, on the agricultural industry has not been documented. One can easily observe, however, that the relative position of agriculture in this area is of much greater significance.

In measuring the "local agricultural economy" benefits associated with a development rights buy-back program, one must look beyond the agricultural landholders themselves. These farmers and ranchers, in deciding whether to continue their agricultural operations or to develop their land,¹⁵ presumably consider only the implications for their own

¹⁵ "Develop their land," as used here, includes the sale of the land to others who in turn develop the land.

private welfare. In the absence of any public program that might prevent the conversion of agricultural lands to other uses, one would expect these individuals to remain in agriculture only if the private gains of doing so were greater than the returns from converting the land to an alternative use. Thus, if one observes agricultural land being developed in an area, one must conclude that the landholders who sell or subdivide their land are better off economically without than with agriculture.¹⁶ What is not taken into account in the decisions of these landholders is the effect their actions might have on the welfare of other individuals--processors, farm suppliers, etc.--whose business activities are somehow linked to the production of agricultural commodities on these lands.

What do these businesses that represent the infrastructure for the agriculture industry stand to lose if land is converted to nonagricultural uses? Clearly it is the difference between their net earnings in the presence of agricultural production and what they could earn in their next best alternative. The net effect on these businesses, then, depends largely on how specialized they are, or, stated differently, on the mobility of the resources that they employ. It is conceivable that

¹⁶ Since participation in the development rights purchase program as it is envisioned would be voluntary, one would expect farmers or ranchers to forfeit their development options only if they receive compensation at least equal to the discounted value of future development benefits. While the initial asking price for development rights could very likely exceed this minimum value, one might reason that bargaining between the state and the landholder concerning development rights values would generate an "equilibrium" price at which the landholder was indifferent between selling and retaining these rights. If this were the case, landowners who participate in the program will, upon the establishing of this theoretical limiting price, be just as well off with the program as in its absence.

some firms such as financial institutions would be better off after the conversion of land to nonagricultural uses. The only people who would clearly be made worse off by the conversion of agricultural land would be some immobile farm workers whose absence of skills outside the agricultural industry would prevent them from easily adjusting to the changing economic scene (Gardner, 1977).¹⁷ Regarding this latter class of resources, one must face the issue of whether retaining land in agriculture is the least cost method of providing these individuals with their present standard of living. It may well be that publically financed programs of direct economic assistance and/or retraining could achieve this end more efficiently.

Locally Produced Food

As pointed out before, food is a private good produced in a competitive environment and as such there is little evidence that the market will allocate a nonoptimal amount of land to food production. In Alaska, however, one often hears the argument that we are too dependent on out-of-state sources for our food supply. It is further argued that by promoting a local agricultural industry we can lower our food costs. What is the relationship of a development rights buy-back program to these issues? Can the preservation of currently and potentially productive private agricultural land reduce our dependence on outside food sources and lower our food costs? To address these issues one might

¹⁷ Although these individuals would surely be worse off, this is not to say that no others would suffer. Other individuals might also be faced with resource immobility.

first ask what are the benefits to be gained by reducing our food imports? It would seem that only if there were some cost advantages would it be in the interest of Alaskan consumers to buy their food from local sources.¹⁸ The important question then centers around the ability of Alaska farmers and ranchers to compete successfully with other agricultural producers in providing food supplies to Alaska consumers. Alaskan agricultural firms are small relative to their competitors, and therein lies an important part of the explanation of why production costs are higher in Alaska, even in the presence of any environmental advantages that are related to long daylight periods and the relative freedom from insects that damage crops.

While the agricultural land mass in private ownership could support a larger number of efficient-sized intensive agricultural enterprises (e.g. vegetable farms), the market for products from these firms is currently limited to in-state sales due to the absence of processing facilities. A relatively small acreage planted to garden vegetables could supply the entire state's population with fresh produce. But larger acreages would be needed to support an infrastructure and to provide Alaska consumers with an opportunity to benefit from the potentially lower prices associated with large scale production. In the

¹⁸ It is sometimes suggested that by reducing our food imports, we may become less vulnerable to disruptions in food delivery systems linking Alaska with current food sources. It is difficult to evaluate this alleged benefit of local food production on any objective basis. One's view on this issue depends on his perception of the reliability of food transport systems and on how much he is willing to pay in order to insure that a disruption in this system will not affect the availability of food in the state.

absence of product export opportunities that might be made possible if processing facilities were available, there is little incentive to bring a critical mass of vegetable farms into production.

Open Space and Other Public Good Amenities

Open space is only one of several "external benefits" that accrue to Alaskans from the decision by agricultural landowners to keep their land either uncleared or in agricultural use. Other benefits in this class are the maintenance of wildlife habitat, watershed protection, and the preservation of a visible, perhaps romantic, "lifestyle." Since farmers and ranchers are not in a position to capture the full value of these benefits, they have little incentive to provide a socially optimal quantity of environmental amenities. The market system will often fail to efficiently allocate resources in situations such as this where property rights to certain benefits are undefined.¹⁹

While Alaska, with its vast area, has a great deal of open space and related environmental amenities to offer its residents, understandably the highest value is placed on these benefits in situations where they are in short supply. In areas around Anchorage and Fairbanks where population and industrialization have expanded recently, these benefits take on high value indeed. It is in these relatively densely populated areas that the preservation of open space promises to have significant

¹⁹ Since this class of benefits are public goods in addition to being externalities, we are faced with a further problem on the supply side as discussed earlier (see page 4). Specifically, even if a beneficiary could be forced to pay for the good, it would be inefficient to levy a charge since the marginal cost of extending a collective good to an additional consumer is zero.

social value. Since these benefits accrue chiefly to urban residents, an equitable program for preserving these opportunities would presumably also have the urban residents paying the bulk of the costs associated with their preservation.

Removal of Uncertainty

A final potential benefit to be mentioned in association with a development rights purchase program is the effect that such a program could have on investment decisions by farmers and ranchers. An important reason for the inefficiency of agricultural production at the urban fringes around Anchorage and Fairbanks is the great amount of uncertainty these farmers associate with the likelihood of land use shifts. Farmers have little incentive to invest optimally, especially in durable capital, if the probability is high that they will soon choose to abandon farming and thus forego the opportunity to capture the returns on agricultural investments (Gardner, 1975). As a result, farmers earn smaller net returns in their enterprises than they would if they invested in more efficient operations. A development rights buy-back program would serve to remove this uncertainty by compensating farmers to forfeit the development option in return for keeping land in agriculture for a period sufficiently long to capture the benefits from long term investment.

OTHER AGRICULTURAL LAND CONTROL TOOLS

The purchase of development rights is only one of the tools used in the United States in an attempt to keep land in agriculture. Other land control techniques in current use include use-value assessment of farmland, zoning, and agricultural districts. Although not currently used, zoning by eminent domain and transfer of development rights are new concepts in agricultural land control that may see application in the future. (More information about the specifics of agricultural land control techniques other than purchase of development rights is provided in Appendix D).

The State of Alaska has attempted to protect agricultural land through legislation designed to classify and dispose of agricultural land for agricultural purposes only. The Agricultural Land Classification Law calls for the classification of approximately 650,000 acres of Class II or Class III land for agricultural purposes. By April, 1978, about 165,000 acres of state land had been classified as agricultural. The Agricultural Land Disposal Law provides for the conveyance or lease of agricultural interests only on state lands classified for agriculture. Under this law there is a provision for the conveyance of the remaining interests if it is in the public interest.

In another program, Alaska is using use-value assessment of farmland as a method of improving the economic viability of agriculture. Under this program, owners of farmland who receive more than ten percent of their annual gross income from farming can apply to have their farm property assessed at its use value in agriculture rather than at market

value. This is known as use-value assessment and the tax obligation from this assessment is less than from assessment at market value. If, however, the property is converted to nonfarm use, the owner must pay a penalty tax equal to the difference between the current tax bill when assessed at use-value and what would have been the tax bill had the property been taxed at market value. This tax bill is due not only for the year of conversion but also for up to the preceding six years. An eight percent interest charge is included for each of the years for which the penalty tax is calculated.

At the local level, the Matanuska-Susitna Borough has been debating an ordinance involving the acquisition of development rights from agricultural land and the payment for these rights in land in lieu of money (Matanuska-Susitna Borough, Ordinance No. 78-48 [Draft]). If passed, this ordinance would allow the Borough to trade Borough land to farmland owners in exchange for the development rights to agricultural land that is under development pressure.

With several tools available in addition to the purchase of development rights, what techniques should be employed if citizens of a state conclude that extra-market techniques to keep land in agriculture are desirable? Because all land control tools have limited applicability and effectiveness when evaluated using specific criteria, they should not be viewed as mutually exclusive; that is, the use of one does not exclude the use of another. Part of the decision as to which tool(s) would be most effective depends on the goals of a land control program. For example, if the goal is to keep land permanently in agriculture, one technique or set of techniques may be best. If, however, the goal is to

allow for more orderly development, other tools may be more suitable. Also, the acceptability to various interest groups of one technique versus another is an important consideration. With all tools, the costs associated with their use should be weighed carefully against the probable benefits of their use.²⁰

Comparison of Agricultural Land Preservation Tools

A comparison of alternative agricultural land preservation tools is provided in Table 19. Each tool is evaluated using seven criteria. It should be noted that the evaluations of each technique involve some degree of subjective analysis by the developers (Gray, 1975; Sargent, 1976) of the table. This is especially true in the case of columns two, four, and seven. All tools were evaluated using the developers' judgments of their performance across the United States. However, it should be remembered that what might be true as the general evaluation of a specific technique with respect to a certain criterion for the United States as a whole may not be true in a specific location. For example, although purchase of development rights may have limited acceptability in most parts of the United States, in a specific location, e.g., Suffolk County, it may be very acceptable.

²⁰ Fitch and Stoevener (1977, p. 35) have suggested six criteria by which alternative land control devices may be evaluated. These are: "(1) effectiveness in achieving planned objectives, (2) effects on the distribution of associated benefits and costs, (3) the costs required for organization and administration, (4) the degree of directness or indirectness, (5) political and legal acceptability, and (6) effects on the provision of (other) public services." Some of these criteria are discussed in detail in their paper.

TABLE 19

COMPARISON OF ALTERNATIVE AGRICULTURAL LAND PRESERVATION TOOLS

Tool	Compensates Landowner (1)	Relative Permanence (2)	Penalizes Landowners (3)	Covers all Agricultural Land (4)	Public Costs (5)	Private Costs (6)	General Acceptability (7)
1. Purchase of Development Rights	yes	yes	no	no	high	none	limited
2. Public Purchase	yes	yes	no	no	high	none	very limited
3. Zoning	no	no	yes	possible	low	loss of opportunity	limited
4. Use-value Assessment							
a. preferential assessment	yes	no	no	no	low	none	limited
b. deferred tax	yes	no	no	no	low	penalties	limited
c. restrictive agreement	yes	no	no	no	low	penalties	limited
5. Agricultural Districts	no	yes	yes	possible	low	loss of opportunity	good
6. Zoning by Eminent Domain	yes	yes	no	possible	low ^a	low	not tested
7. Transfer of Development Rights	yes	yes	no	possible	low	low	not tested
8. Selling only Agricultural Rights	N.A.	yes	no	no	low	low	limited
9. Payment for Development Rights with Land	yes	yes	no	no	high	low	not tested

^a Only if gainers are taxed to compensate losers.

SOURCES: Gray, William H. Methods of Agricultural Land Preservation. Washington Cooperative Extension Service E.M. 3906, Washington State University, February 1975; and Sargent, Fredric O. Keeping Land in Agriculture. Vermont Agricultural Experiment Station MS#88, University of Vermont, December 1976.

SUMMARY AND CONCLUSIONS

The conversion of farmland to nonagricultural uses is progressing at a fast pace in Alaska as in other parts of the country. The purpose of this study was to examine the feasibility of the use of public purchase of development rights from agricultural landowners in the state as a means of slowing this trend. The framework for analysis called for an assessment of the potential benefits and costs of such a public policy designed to stall the market forces that are leading to these shifts in rural land use patterns.

Initially, the inquiry dealt with the question of why the patterns of resource use generated by the land market might be socially undesirable. The principal determination here was that some of the benefits that flow from the existence of agricultural land use are not captured by the farm or ranch operators. Rather they are external benefits which accrue to persons outside the agricultural sector and as such are not considered by the landowner in his decisions regarding land use. Since some of these benefits, such as open space and other environmental amenities, are also collective goods, a voluntary exchange market system provides no adequate mechanism by which those desiring these goods may register their preferences with the landowners. Thus, there may be a justification for social action to correct this market failure.

While conversion of agricultural land to residential and industrial uses is widespread in Alaska, the greatest shifts in land use patterns are taking place within commuting distance of the more densely populated areas around Fairbanks and Anchorage. This pattern is particularly

noticeable in the Matanuska Valley near the communities of Palmer and Wasilla. Understandably then, the greatest support for a public program to preserve these agricultural lands exists in this region. This support is reflected in a resolution, under consideration by the Matanuska-Susitna Borough Assembly, to compensate current farmers with land grants to forego the development of their lands.

Our examination of present and potential agricultural development in the state revealed that the economic contribution of the agricultural industry to the Alaska economy is currently quite small. In the local area of the Matanuska Valley, however, agriculture continues to represent a more significant portion of the economic base. Further, it was determined that a significant amount of potentially productive agricultural land exists in this area. Much of this land is held by the state and borough governments. The public sector, then, is in a position to determine future use of these lands through its land disposal programs. Recent sales in which only the agricultural rights were conveyed to the private sector illustrate the influence that government may have on land use patterns. These findings also suggest that the future of agriculture in the Matanuska Valley (as well as other parts of the state), and, hence, the availability of the other amenity values associated with this industry, may not depend on the lands currently in production. At issue, of course, is whether the least cost method of achieving the social benefits produced by an agricultural industry is to maintain the land currently in production or to use state and local government land disposal policy to achieve this end.

A review of development rights purchase programs in other parts of the country was instructive, although experiences with this public policy tool are too few and relatively untested for one to adequately evaluate their success. The one fact that stands out, however, is that the purchase of development rights on agricultural lands is a very expensive undertaking. Unlike the Alaska situation, the acquisition programs initiated elsewhere are aimed at preserving agricultural economies that are currently quite viable. Another important characteristic of these programs is that they are being used in areas where there are few opportunities for expansion of the existing agricultural activity.

A condition necessary for the success of a development rights purchase program is that it be acceptable to agricultural landholders. Our survey of farmers and ranchers in the state showed only a small amount of interest among these individuals on a state-wide level. Most of the interest expressed was concentrated among those landholders in the Matanuska and Susitna Valleys. The survey results also provided information regarding the potential purchase price of development rights. This information again showed a development rights purchase program to be a costly proposition.

Information regarding the size of agricultural firms in Alaska shows that in many cases the scale of operation is inadequate to take advantage of size economies. One thing that a development rights buy-back program might accomplish would be to allow the expansion of individual operations through the availability of lower priced agricultural land. Related to this, the buy-back method might be useful for acquiring

the development rights to existing non-agricultural "inholdings" within areas of agricultural activity in the state. The acquisition of development rights to these isolated inholdings could reduce the risk of having a land use develop which was incompatible with agriculture. At the same time, the use of the program in this context could facilitate the application of large-scale agricultural operations in farming areas.

Public acquisition of development rights is only one of a number of tools available for use in attempting to preserve agricultural lands. The main advantages of such a program have to do with the equitable treatment of farmland owners and the opportunity provided for long term maintenance of agricultural activities. These advantages must be balanced, of course, against the high relative cost of this approach.

As stated before, the primary benefit attributable to the preservation of private agricultural land in the state appears to be the open space and related environmental amenity values associated with this land. This is particularly the case when applied to maintaining certain scenic areas around communities or along highways. These benefits, by themselves, may justify some extra-market control of the conversion of agricultural lands to other uses in some critical areas. In Alaska these concerns are naturally most important in the urbanized areas, particularly in locations within commuting distance of Anchorage. The critical questions here, of course, are how much are Alaskans willing to compensate landowners, through the purchase of development rights, to forego the option of converting their land, and how are these costs to be distributed among the state's residents.

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APPENDIX A

OPERATION OF PURCHASE OF DEVELOPMENT RIGHTS PROGRAMS

Operation of Suffolk County's Program

Suffolk County's program of farmland development rights purchases is founded on two statutes. These two statutes are Section 247 of New York's General Municipal Law and Suffolk County Local Law Number 19 (Newton, n.d., p. 4). Section 247 gives local government the right to acquire full or lesser interest in land used for open space while local law Number 19 authorizes the expenditure of county funds for the purchase of development rights on farmland.

The Suffolk County program is administered by the Suffolk County Farmlands Development Rights Committee, a permanent county agency (Leshner and Eiler, 1977, p. 15). The purchase program has worked in the following manner. Letters are sent to farmland owners asking for bids for the sale of development rights to their land. These bids are evaluated by eight criteria. These criteria are: (1) acreage - tracts, individually or in groups, should total 200 acres or more; (2) soil - Class I and II soils are given priority; (3) price - should be reasonable; (4) contiguity - individual parcels should be adjacent to open farmland; (5) development pressure - parcels with extreme development pressures are given priority; (6) buffer zones - land bounded by roads or open spaces is preferred; (7) current use - land actively cultivated is preferred; and (8) owner - preference is given to active farmers (Newton, n.d., p. 7).

Owners of acceptable bids are then asked to sign options and authorize appraisals of their farmland. Appraisals are then conducted to determine development rights values. Next, bids are re-evaluated using appraisal information, and owners of acceptable bids are asked to accept appraised values and to sign contracts. If the owner accepts, the county signs a contract with the owner and the development rights are transferred to the county. Farm owners retain all other rights, including the right to sell the land. Farmland owners receive the value of the development rights in a lump sum. Suffolk County is financing these purchases through the sale of 30 year municipal bonds (Newton, n.d., p. 6).

Operation of Maryland's Program¹

Maryland's program is administered by the Maryland Agricultural Land Preservation Foundation, each county's governing body, and county Agricultural Preservation Boards. Membership on the Foundation is by appointment of the governor. Its functions include approval of agricultural districts, purchases of development rights, and adoption of rules and regulations to implement the law. County boards advise county governments regarding the establishment of agricultural districts and the approval of development rights purchases.

The first step in Maryland's preservation program is the formation of agricultural districts. The initiation for these districts is by petition from farmers to the county governing body. The petitions are evaluated by the Agricultural Preservation Advisory Board and the county

¹ The source for this section is William J. Bellows, Maryland Agricultural Land Preservation Foundation: A Summary, Maryland Cooperative Extension Service Leaflet 88, University of Maryland, 1977.

planning and zoning agency based on specific criteria. If a petition is recommended for approval by either the board or planning and zoning agency, a public hearing on the petition is held before the local county government. If they approve the recommendation, it goes to the Preservation Foundation for final approval. Following the formation of districts, counties must permit the following activities: (1) farm use of land; (2) operation of farm machinery at any time; and (3) any normal agricultural operation in accordance with sound husbandry practices which does not endanger bodily injury or health.

Once land is included in a district, the landowner must keep the land in agriculture for five years. Additionally, the land owner may offer to sell development rights to his farmland to the Maryland Agriculture Land Preservation Foundation. Sale of these rights prohibit residential subdivision for commercial purposes. After a landowner has been in a district for five years, he may terminate his inclusion if he has not sold his development rights. One year's notice is required to terminate a farmer's participation in a district.

Maryland has a multi-step procedure by which development rights are to be purchased. The first step is an application by a landowner to the Foundation offering to sell development rights. Included is the landowner's asking price. After an application is received by the Foundation, the Foundation notifies the appropriate local county governing body. They in turn notify the County Agricultural Preservation Advisory Board of the application. The Advisory Board recommends either approval or disapproval to the county government. The county then notifies the Foundation as to its recommendation. Finally, the Foundation approves

or disapproves the application based on two criteria: (1) land must meet requirements to be included in an agricultural district, and (2) priority of approval for purchase is determined by a ranking system based on the discount of the asking price below the development rights value, as a percentage of the development rights value. The formula for determining this value is:

$$\text{Ratio} = \frac{\text{development rights} - \text{asking price}}{\text{development rights}}$$

where, development rights = fair market value - agricultural value

If a farmer sets his asking price equal to the value of the development rights, the ratio would be zero. Purchases cannot be made at prices above the development rights value. Bids are then ranked as to their discount below the full development rights value. The higher the ratio, the higher the bid is ranked.

The Foundation can approve purchases only to the extent that funds are available and thus the need for ranking bids. The Foundation will make purchases through the Maryland Agricultural Land Preservation Fund. This fund is to be financed by general or special fund appropriations and by grants or transfers from governmental or private sources. Maryland has a complex system to allocate the fund, but basically it will work as follows: half the money made available to the fund is to be allocated equally for purchases in each county; the other half is to be made available to counties having approved matching fund programs. The Fund expects to have between \$4.5 and \$6.5 million annually starting in 1980 to purchase development rights (Musselman, 1978).

A sale of development rights prohibits residential subdivision for commercial purposes. However, the landowner who sold the development rights may request to use one acre or less for his and his children's residential use. This is permitted only once for that owner and each child. In addition, housing may be permitted for tenants as long as construction does not exceed one tenant house per 100 acres. After 25 years the development rights can be repurchased by the landowner if farming is unprofitable and if approval is granted by the Foundation and local governing body.

Operation of New Jersey's Program²

Because of the limited amount of funds available for acquisitions, and because this is only a demonstration project, purchases will be made in only one New Jersey county. Burlington County has been selected as the area to test the concept of development rights purchases. Acquisitions are to be made in a contiguous area so that an agricultural district is developed.

The program is working as follows:

(1) New Jersey solicits offers from farmers to sell their development rights.

(2) Offers to sell are preliminarily evaluated, and farmland owners are informed of the evaluations. The major criteria for selection include price, soil classification, and proximity to other farmland selected for the demonstration project.

² This section is taken from David J. Bardin and Phillip Alampi, Letter dated April 18, 1977.

(3) Appraisals are made of those farms which appear to be candidates for inclusion in the project.

(4) Following return of appraisals, preliminary selections of lands for inclusion are announced.

(5) Next, final negotiations and signing of contracts with owners is undertaken.

(6) Following some additional time for title searches, surveys, and other legal work, final closings, signing of deed covenants, and payment of monies will be made.

Purchases of development rights are to be made at prices no greater than the difference between the land's market value and agricultural value. Further, no purchases are to be finalized until all owners of farmland which are to be included in the project have signed purchase agreements. All purchases and the payment of monies are to be concluded before December 31, 1978.

Evaluation of Suffolk County's Development Rights Purchase Program

An evaluation of Suffolk County's farmland development rights purchases should weigh the costs of the program against the benefits and ability of the purchases to meet the program's goals (preserve agricultural economy, maintain rural environment, and provide local tax savings). The current legislative authorized expenditures for purchases are \$55.5 million (Klein, 1978, p. 5). This figure does not include debt service or legal and administrative costs, which appear to be substantial. Leshner and Eiler (1977) have evaluated Suffolk County's program and its ability to meet these three objectives. Their conclusions are discussed in this section.

In regard to preserving a viable agricultural economy, the program's ability to accomplish this task is doubtful for at least three reasons. First, the program is purchasing the development rights to only 15,000 acres, approximately 1/4 of the currently available farmland. This may not be enough acres to maintain a critical mass for agriculture in the county. Second, this program is concentrating on purchasing the rights to land-extensive crops (i.e., potatoes), although these crops provide relatively little to gross farm receipts when compared to land intensive crops (e.g. ducks, flowers). Thus, purchases of development rights are concentrated on land for which the agricultural enterprises being operated have less chance of survival vis-a-vis more land-intensive enterprises. Finally, the program may encourage the development of small county estates since there is no prohibition to subdividing the land as long as it remains in agricultural production.

In achieving the second objective, the maintenance of a pleasing rural environment, this program may keep some land in agricultural and thus visually pleasing. However, even without the program, it is unlikely that all the agricultural land in the eastern part of the county will be developed in the near future. Currently, of the total quantity of land in Suffolk County, 270,000 acres are developed (includes land in agriculture), another 60,000 acres are permanently committed to recreation or conservation, and an additional 270,000 acres are in undeveloped use. At present rates of population growth it is estimated that it would take 34 years before population growth could be limited by the nonavailability of the 15,000 acres planned for the program.

It has been argued that this program will save tax dollars (third objective) in the form of education costs, since school tax revenues from additional residential development will be less than the cost of providing additional educational resources (Klein, 1974). However, this argument assumes that one acre preserved means one acre not developed. But since there will not be pressure to develop these lands (assuming other nondeveloped land is available and present population growth continues) for 34 years, these savings must be discounted to have economic meaning. Leshner and Eiler (1977, p. 19) found the costs of purchasing development rights more than four times greater than the savings in educational costs. Their analysis was based on the purchase of development rights at \$6,000 an acre; however, the first purchases were made for approximately \$3,600 per acre. Still, this is 2.5 times greater than the anticipated increased education costs. All other public services not needed would have to provide savings 2.5 times greater than the development rights purchase costs for the argument of tax savings to be valid.

APPENDIX B



UNIVERSITY OF ALASKA, FAIRBANKS
Fairbanks, Alaska 99701

School of Agriculture and Land Resources Management
Agricultural Experiment Station

August 14, 1978

Dear

The Agricultural Experiment Station at the University of Alaska is conducting a survey of Alaskan farmers. This survey is part of a study concerning the future use of agricultural lands near population centers of Alaska. We need your assistance to make this study a success.

Agricultural lands are rapidly being converted to other uses such as residential lots, airports, and shopping centers. Land is becoming more expensive and some farmland owners are convinced that it makes more sense to develop agricultural land than to farm it. Other people are concerned that we are converting too much of the farmland near cities to nonagricultural uses and that it would be wise to preserve these lands so that food can be grown close to large population centers and so that there will continue to be open space near urban areas.

Many ways are being tried to preserve agricultural lands in other areas of the United States. Some of these include tax incentives, zoning and the trading of land. Another way is for a state or municipality to purchase from the farmland owner his right to develop his land for anything but farming. For a price, the farmer would give up his option to use his land for nonagricultural purposes; the land would still be his, but he could do nothing that would impair its agricultural potential.

The principal objective of our study is to determine (1) farmers' interest in selling development rights and (2) what it might cost the State of Alaska to purchase these rights. A short questionnaire is enclosed and we would be grateful if you will fill it out and return it to us in the enclosed postage paid envelope before September 1, 1978. All information will be kept confidential. If you desire we will be happy to send you a final report at the completion of the study.

Thank you for your cooperation,

Dr. William G. Workman
Resource Economist

WGW:ks
Enclosures

APPENDIX B - CONTINUED
ALASKA AGRICULTURAL LANDS SURVEY

1. How many acres do you currently farm or ranch?

Your own land _____
 Land rented or leased _____
 From other landowners _____
 From the government _____
 Total acres _____

2. What crops or livestock do you produce?

<u>Crops</u>	<u>Acres</u>		
	<u>Your own land</u>	<u>Rented from others</u>	<u>Leased from government</u>
Vegetables or potatoes	_____	_____	_____
Small grains	_____	_____	_____
Hay or Silage	_____	_____	_____
Planted Pasture	_____	_____	_____
Native Pasture	_____	_____	_____
<u>Livestock</u>	<u>Number of Head</u>	<u>Livestock</u>	<u>Number of Head</u>
Dairy cattle	_____	Swine	_____
Beef cattle	_____	Poultry	_____
Sheep	_____	Other (specify)	_____

3. What do you estimate is the per acre market value of agricultural land:

Your own land: Cleared _____\$/acre Uncleared _____\$/acre.
 That you rent (exclude government leases): Cleared _____\$/acre.

4. Would you be interested in selling development rights to your agricultural land? Selling such rights would mean that your land could be used for agricultural or forestry purposes only.

<u>Degree of interest</u>	<u>Cleared</u>	<u>Uncleared</u>
Not interested	_____	_____
Slightly interested	_____	_____
Moderately interested	_____	_____
Highly interested	_____	_____

5. At what price would you sell the development rights to your agricultural land? _____\$/acre.

6. Please describe the location of your farm or ranch.

Nearest town _____ Distance from town _____
 Direction from town _____

Thank you for your cooperation. A summary of the results of this survey will be available to you on request.

APPENDIX C

ADDITIONAL COMMENTS FROM RESPONDENTS

"Ranching on Kodiak is going down the drain. Too much government interference. After private enterprise developed it over a period of 75 years, the government gave our ranches to the Natives. I have just completed 22 years. The Wholesome Meat Act forced us to build a \$150,000.00 slaughter house which we did not need and etc. Until the government quits trying to run agriculture in the state, it will decline as it has in the last 20 years."

"This is the most ridiculous thing I ever heard of. A state with the smallest amount of land in private ownership and this you bureaucrats want to take away from us. If you want land, take from the State or U.S."

"We would need a more detailed explanation of all phases of a sale of any rights to our property. We intend to will our land to our boys, but it will be set up so that the land cannot be used for anything but farm or possibly forestry, ever. We hope you understand our position."

"The reason we are not interested, is because it would be such an expense to the state. Why can't the state give their agricultural land that they hold to people on the basis of long term leases, 55 years with renewal rights, then let them have the freedom to ranch or farm just like they own it - but if they do not use the land or show reasonable intent and action to do so - they would lose the lease. I think the 55 year lease we have is a good one."

"A few years ago when you started telling people they had to do something or lose their lease, I know, personally, of several that moved onto them and started trying to farm or raise cattle."

"The agricultural land sales you have been having are sickening. Speculators and people looking for summer places bid them up until people who will and know how to use the land for agriculture can't afford to touch it. The policies at the land office change so fast a person trying to do anything are unable to make long range plans. Given them a headquarters sight to own, land to work with then get off their backs and let them do it. This survey is a good idea. Hope the people making the final decision have horse sense along with "Book Learning!!!"

"If the state is interested in keeping farms and green areas near town, I'd suggest that the state develop farms (with state held land) as they are doing in Delta but lease them out - not sell "agricultural rights" - full rights (Developmental) - can quickly be given back to these "farmers" (lawyers, doctors, districts and anyone else who needs a tax shelter). When the farms fold and there is other need for the land since agriculture proved to be "not economically feasible."

"I can't see selling my developmental rights because I've given up my right to property as quaranteed by the Constitution. My property near Fairbanks will probably become homes, etc. in the not too distant future. You people are 15 years late in your concern for farmers etc. Most people who wanted to farm have left the area. The real estate people have reaped the benefits from the necessary development which has taken place due to pouplation increase."

"A few questions:

1. The state now holds most of the land. Buying the developmental rights would put the state in more control of the land. (land that is in private hands now). That's socialism.

2. What's to prevent the State from developing the land for other uses? It would be a simple matter to buy the less costly agricultural rights. You wouldn't even have to threaten the owner with eminent domain since he doesn't own much anyway.

3. If I wanted to farm like they do in Iowa or California - I'd go there - it's better farming country. Farming here is marginal - but free. Keep the government the hell out of farming."

"I believe a man should be able to own his property in fee simple from center of earth to outer space and that what I do with it or on it is my business as owner and no person, group of persons, bureaucrat government entity can dictate to me what I do on it or with it as long as I am not infringing on rights of others. Their rights don't include telling me I can't build a trailer court or junk yard or hog farm. Therefore, I am opposed to buying agricultural rights with taxpayers money and also to zoning. Tax incentives might be a method of approach to keep our lands in agriculture - maybe some smart persons can come up with better methods - but incentive methods are acceptable - dictatorial zoning methods are not."

"In our area it would be rather expensive for the state to purchase rights, being the development value of land in our area has just reached \$4,500 per acre as is - changed or not. To have land subdivided, selling price has gone to a high of \$9,000 per 40,000 square feet. Also our area has started to be listed as being close to the recreation sight - which increases the price more. Would be nice to have farm land remain under cultivation rather than subdivisions. Subdivisions belong in the hills."

"Farmers should have control locally of their financial institutions as in the rest of America. Alaska will never have a decent agricultural industry under present set-up."

"I have felt for a long time that if the State wanted to keep farm land they should pay for it. I feel anyone who buys land with no strings attached should be able to do what they want with it. I also feel that good farm ground should be kept for that purpose. However, circumstances sometimes force people to do things they do not really want to do. I also think a fruitful farm could be as small as ten (10) acres, possibly 5 acres. I would like your opinion on this."

"I feel the only fair way agricultural land can be kept for agricultural purposes is to pay owner difference between commercial price and agricultural sale price at whatever time the owner decides to sell. Because prices are changing everyday, some wish to retain land to take advantage of rising prices, others are satisfied to live on their property and farm it."

"I hope you can interest the state in this as I don't want to subdivide but I feel it will be necessary within 2 years to reduce debt loss."

"We did try to farm. Had a loan from the Agricultural Revolving loan fund. When we got our cattle they wouldn't loan any more for machinery so we are stuck years paying it off."

"I feel that if a person wants to farm his land he will do so - not because of government or for government but because he is a farmer. Government has no right to subsidize any one segment of America without being obligated to every American living today, which they are almost doing now."

"I can't believe someone is being paid to ask these questions. Farmers have been forced out over the years by the financial clique - you are wasting your time."

"We've been here since '55 and wish things to stay as they are on our place."

"The land would produce 3, 4, or 5 times as much as it does now with 1 or 2 houses per acre, with people occupying them that are more educated along the self sufficiency line and with the ambition and incentive to do so."

"I want to farm. I am not interested in selling my land. I hope I don't have to sell for any reason."

"I have pushed this concept for years, and believe it is the only good possible approach."

"Because of low market prices and high production costs there is likelihood of negative value for agricultural land."

"We think the interest in agricultural lands is about 5 years too late - much of the land in this area has been sub-divided."

"Not interested. Feel Matanuska Valley is lost to developers already. Land left is too small of parcels."

"We filed on 640 acres, but land was withdrawn. Seems unlikely we can ever raise livestock as planned (had a couple dozen sows, 2 big boars, beef and dairy stock, etc.). Have sold all of hogs, most of cattle, and no longer try to grow grain. Just am trying to survive till remainder of kids are grown."

"I don't do much farming, we have 4 horses - I raise feed for them. I believe a tax break for farm land to help keep it as farm land would be one way that might help. I am also concerned about our farm land that is being used for other purposes - the good land should be set aside for farming only."

"I am sorry for the condition of the survey sheet and for not putting this reaction of mine in more of a standard form but when my temper flares I have to get the words down as quick as possible or I get so mad I can't remember them all."

I realize that you have no control over any of this and are simply taking a survey but maybe you know the right people to pass this word on to and that's why I'm sending this letter along with my thoughts on the back of the survey sheet.

I'm not necessarily up on the news and current legislations, etc., so can't outright argue with anyone except on one point and that's human nature. People will put up with rules and have even if they don't particularly agree with them - but our nation and our state are making a big mistake. They have been shoving laws and rules down our throats for so long and no one has said much because Alaskans being what they are, have never complained much, but its all being over done. We the people? Yes, we the people, we're getting a belly full. You do a little reading on the 3rd Riech and then step back, clear your mind and compare.

All in all I'd say your survey is fine. The tax incentives, the land trade, even the zoning and purchase of all but agricultural option of land use would be O.K. except for this one thing. If it ever gets started even as a freedom of choice, it's just a matter of time until these better interest groups make it a law. Then what happens to we the people and our freedom of choice? Gun Controls, Price Controls, Fuel Rationing, D-2 Lands, Native Land Claims - what is wrong with everybody? Do We the People really look that stupid?"

"To come to the final point of all this gibberish - I think your survey should be conducted with every Alaskan voter and be arrived at getting more agricultural land available and through the state and federal not through individuals and a little financial assistance for the farmers that he can afford - not setting up a means of depriving him of his freedom to sell out to the highest bidder and forcing him to sell to the lowest. If the state wants to buy up my rights they are for sale but after they buy them at current market values they'll own that chunk of ground and they can kill themselves trying to get a crop off of it if they want. If they buy the rights, then they buy the whole thing - but at my price - not theirs.

My father wouldn't have married his wife as she is Catholic if he hadn't have made sure that his kids didn't have to be Catholic when they were born. I won't make a decision now that will take away my children and grandchildren's freedom of choice 50 years from now even if I have to put up a 10 foot barbed wire fence and run guard dogs and shoot the damned tax assessor and all of the State Bureaucracy."

"Unless a person is given a choice. There seems to be too many mandatory laws as things stand. This is supposed to be a free country. As far as future planning you'll find that most farmers are more concerned with feeding people than the officials who want all of these controls. Who ever heard of a farm in the middle of a city anyway? Left alone this will take care of itself. As a city grows and rural areas become populated the ranchers near town become housing projects and the farmer moved to the new rural areas further out. We truck food all over the nation and world - why all the hassle over 10 miles? I haul hay 100 miles to Anchorage and have even sold to stock owners in Fairbanks 260 miles North. You are not asking the right questions here. The problem lies in the fact that there's not enough private land out here so that when property prices near the city go up the farmer can sell out and buy more land 20 miles out. Why shouldn't the farmer be able to make a little money off of his investment? Is it true that since in our nation's history farmers have always been those poor, dumb, people with the buck toothed kids and the 1950 Ford or Chevy pickup and in hock to the bank for everything they have, that we have to stay that way? Just because the Governor, Secretary of Interior is afraid to open up land to farming as they used to do, I don't tell a property owner in Anchorage or Fairbanks whether or not he can sell - so what's the difference with the farmer? The problem is not with disappearing agricultural ground. It's with the non-renewing of it. To hell with free land to Alaskan residents, to hell with State controlled agricultural ground (Hammond's law for agricultural lease sell is more like something Hitler would come up with). Take and open up some of this State and Federal land to homesteading with even tighter agricultural oriented rules and then with this same money you would buy up all other property rights now, set up a low interest, federal or state loan establishment for farmers. Give the man the land, help finance his start and then what happens. Most farmers are like me. Part of the reason they are farmers is because they don't like cities. Why shouldn't I be able to sell out at a profit and move to another location? Too much government we've got. Too much private land we don't got."

APPENDIX D
ALTERNATIVE AGRICULTURAL LAND CONTROL TECHNIQUES

Various techniques are currently in use, or have been proposed for use, to control or influence development of privately owned agricultural land. Four of these methods--(1) public purchase in fee simple, (2) public purchase of less than fee simple, (3) direct regulation (traditional zoning), and (4) taxation--were recognized prior to 1960 (Ishee, 1977, p. 89). Since 1960, three specific techniques, agricultural districts, zoning by eminent domain, and transfer of development rights, have been proposed as new tools useful in solving the real or imagined misallocation of private lands.¹ Although this report is concerned with the cost and effectiveness of the purchase of development rights (public purchase of less than fee simple) as an agricultural land control measure, it is useful to define briefly and examine other available tools.

Public Purchase in Fee Simple

One possible method for keeping land in agriculture is through public purchase in fee simple. Obviously, any land purchased by governments could be used for any purposes desired. Purchases could be either through voluntary agreements with land owners or through the use of eminent domain. The use of eminent domain has a long history of use in

¹ Zoning by eminent domain is actually not a new idea. It originated around the turn of the century and was used briefly in St. Paul, Minneapolis, and Kansas City. However, its use was not extensive and its recent rediscovery by Hagman (1972, 1974) allows the concept to be viewed as new. Transferable development rights schemes have had even less use, and all since 1960.

the United States as a means of acquiring land for such things as parks or highways. Recently, some states have extended authorization of eminent domain to include open space lands.

The use of fee simple purchase of agricultural land to keep land in agriculture has seldom, if ever, occurred in the United States. If such a program of public purchase of private land was instituted, one form might be government purchase of land and then the resale or lease of the land's agricultural rights back to either the original owner or another party, restricting the uses for which the land could be employed (Gray, 1975, p. 6). This might be the only way the land would stay in production, since a government may have a difficult time managing a farm.

Although not a public purchase in fee simple, another technique discussed by Gray (1975, p. 6) is public lease of private lands. Advantages of this procedure may include the smaller costs of lease compared with purchase and the possible willingness of land owners to lease land versus relinquishing total ownership.

Direct Regulation

The most common method of land use control in the United States has been direct regulation, commonly referred to as zoning. Since the 1920's, each of the 50 states has passed enabling legislation allowing local governments to regulate land use through zoning. Following Ervin, et al. (1977, p. 61), "zoning is the practice of dividing a land area such as a city or county into districts within which only specific activities may take place." Zoning is derived from the police power of the state. The police power "involves the sovereign power of governments

to limit personal liberties and property rights in the interest of public health, safety, morals, and the general welfare" (Barlowe, 1972, pp. 391-392). Because zoning has been found by courts to be a proper use of the police power, compensation is not required for individuals who are damaged by this action.

Zoning has been used typically as an urban land control measure and has been used largely to protect residential housing values. Zoning began in Boston during the years 1904-1905 when districts with varying building heights were established.² Los Angeles was the second city to use zoning; in the period 1909-1911 it established seven industrial districts separated from residential areas. The first comprehensive zoning ordinance, however, was passed in New York in 1916. This ordinance provided building height, bulk, and setback requirements throughout the city. Following these first uses, many questioned the legality of zoning and it was not until 1926 that a definitive court ruling on zoning was delivered. In the case Village of Euclid vs. Ambler Realty Co., the United States Supreme Court held that zoning was a proper use of the police power. Following this ruling, zoning has become the dominant land use control measure in the United States.

In only a few instances has zoning been used directly in the United States in an attempt to preserve agricultural areas. California has applied zoning on the county level to agriculture, while Hawaii has had state agricultural zoning for several years (Libby and Newman, 1977, p. 8; Gray, 1975, p. 4). In the case of California, zoning has been

² This history of zoning was drawn from David E. Ervin, et al., Land Use Control: Evaluating Economic and Political Effects, Bollinger Publishing Company, Cambridge, Massachusetts, 1977.

ineffective in limiting development. An example is Santa Clara, California, which found zoning not to be effective in maintaining agriculture. During the years it has zoned for agriculture, the area has gone from a major fruit growing center to a major electronics center. This is not an isolated example because zoning is difficult to maintain when there is intense pressure to development. Zoning boards normally grant variances under heavy citizen pressure. This is not all bad since planning tools should be flexible.

Currently, some states are giving zoning a new look as a development control device. Several townships near Detroit have zoned areas as Agricultural-Industrial Zones and are planning to exclude activities not conducive to farming (Libby and Newman, 1977, p. 8). In 1977, a bill passed the Wisconsin State Legislature allowing for the zoning of exclusive agricultural areas in some Wisconsin counties by 1982 (Barrows, 1977). These ordinances, if passed, will exclude nonagricultural development. Outside of the United States, the Province of British Columbia has established a network of agricultural reserves; land in these reserves must stay in agriculture.

Taxation

Traditionally, private property has been assessed for property tax purposes at market value. It has been argued that this assessment procedure can at times force farmers out of agriculture, although they desire to remain in farming. The logic is as follows: agricultural land near expanding urban areas face increasing tax burdens when the

value of land increases as development pressures increase. Where property taxes are a large segment of production costs, a property tax may make farming uneconomical. If, however, farmland is assessed at use-value (value of land in specific use, in this case agriculture) it has been argued that farmers will be able and will often elect to continue production, instead of selling their farms for development.

Following Hady (1977), use-value assessment laws can take three general forms. These are (1) preferential assessment, (2) deferred tax, and (3) restrictive agreements. Under preferential assessment, agricultural land is assessed at use-value instead of market value. No penalties are imposed if the land is developed. The second form, deferred taxation, is currently the most widely used by states. Under these programs, agriculture is assessed at use-value; however, if land is developed an additional tax is due. The final form, restrictive agreements, require farmers to sign contracts agreeing to keep land in agricultural production if use-value assessment is to be received. As of 1976, about 40 states, including Alaska, had passed use-value assessment laws in response to the "farmer forced to sell" argument (Collins, 1976, p. 185).

Generally, the most commonly used use-value assessment programs (deferred taxation) work as follows: as long as a farmer continues in agriculture he is assessed at use-value. If, however, the land is sold for other uses, a tax bill is due on the property for the sum of the difference between the use-value assessment and what would have been the market value assessment. Normally, this development tax is rolled back

for a number of years, commonly three to seven, and usually an interest charge is added, often six percent.³

Studies of the success of use-value assessment in preserving agricultural lands have shown discouraging results. These studies have found use-value assessment: (1) does not effect the conversion of agricultural land to other uses; (2) at best only temporarily holds land in agriculture; and (3) benefits those who would have continued in agriculture in any case (Ishee, 1977, p. 94).

Agricultural Districts⁴

New York is an example of a state which has adopted a program of agricultural districts to try to keep land in agriculture. Once formed, these districts provide a variety of incentives for agricultural production. First, farms are assessed at their use-value, instead of at market value. Next, local governments are prohibited from enacting ordinances which restrict farm practices or structures beyond that required for health or safety. Third, state agencies must modify regulations and procedures to encourage agriculture to the extent possible under existing health, safety, and federal regulations. Fourth, agencies are required to give serious consideration to alter-

³ In some states, for example California, these programs take the form of restrictive agreements. In California, for a farmer to receive use-value assessment a ten or twenty year nondevelopment contract is signed. For a ten year contract, the contract is automatically annually renewed; for a twenty year contract, renewal is automatic after ten years. If a farmer gives a nonrenewal notice, the assessment is increased yearly until by the end of the ten years the property is assessed at market value.

⁴ This discussion of agricultural districts is from William G. Leshner, Land Use Legislation in the Northeast: New York, A.E. Research 75-23, Cornell University, January, 1975.

native areas before farmland is taken by eminent domain for public purposes. Next, the right of agencies to advance funds that would encourage nonfarm development are modified. Finally, the power of special districts to make special assessments on farmland for sewer, water, lights, or maximum drainage is limited.

Zoning by Eminent Domain

It is often argued that zoning is unsatisfactory as a land control technique because it is inequitable, i.e., some individuals are losers while others are gainers. The gains and losses are due to the increase or decrease in land values following zoning. Although those gaining as a result of zoning will justify its use for the public good, those losing, if politically able, will restrict zoning's use. In addition, losers will argue that any one individual should not reap major benefits from an activity pursued in the public's interest. In response to this problem of wipeouts and windfalls, two techniques, zoning by eminent domain and transfer of development rights, have been proposed as potential solutions. Zoning by eminent domain is discussed in this section, with a discussion of transfer of development rights in the following section.

Zoning by eminent domain, as described by Hagman (1974), would work as follows. As a start, land would be zoned in the traditional manner as, for example, residential, industrial, or possibly agricultural or open space. The zoning authority (city, county, etc.) acquires the development rights for all other purposes not permitted under the zoning

ordinance. Land owners are then paid damages for any loss in land values due to the removal of development rights. Conversely, those who have gained as a result of zoning are taxed through a special assessment to capture these increases in land values. It is theoretically possible for the value recaptured from gainers to completely compensate the losers. However, as a practical result this is difficult to determine without actual experience.

Zoning by eminent domain had limited use near the turn of the century. The widest application was in Minnesota when a zoning act based on eminent domain was passed in 1915. A more limited use of zoning by eminent domain occurred in Kansas City in 1893. In addition, a short-lived experiment with the concept occurred in a Wisconsin village in 1917. The problems of zoning by eminent domain that have been identified for the Minnesota experience are probably applicable for all these early experiments. Ervin, et al. (1977, p. 106), citing Anderson (1927), indicates the major problems as "(1) the cost of condemning restricted properties and identifying, measuring, and determining property value adjustments, (2) the possibility that property owners in restricted districts would falsely announce development intentions and thereby receive damages, and (3) the inflexibility of land use patterns in a district once restrictions were applied." Hagman (1974, p. 126) suggests that computerization and greater experience with zoning by eminent domain could overcome at least some of the problems associated with the technique.

Transferable Development Rights

A second technique which has been suggested to overcome zoning's difficulties in protecting agriculture and open space lands, and also overcoming the problems of windfalls and wipeouts, is transferable development rights. Although several forms of transferable development rights schemes have been noted in the literature (Chavooshian, et al., 1973; Rose, 1975; Clark, 1977; Ishee, 1977; Ervin, et al., 1977), the general proposal is as follows. The process starts as areas are identified for preservation or increased development. Land owners in areas where development is prohibited are issued certificates (TDRs) as compensation for the loss in property values. TDRs are also issued to land owners in areas where intensified development is to take place. For certain types of development, specific numbers of TDRs are required. However, land owners in areas scheduled for increased development will own fewer TDRs than would be required for the expected development. They must then purchase TDRs from land owners in areas of prohibited development if the new development is to take place. The lure of transferable development rights proposals is that a private market is created to deal with the problem of windfalls and wipeouts.

In actual practice, the only use of transferable developments rights has been to preserve historic buildings in New York City and Washington, D.C. (Ervin, et al., 1977, pp. 132-134). Also, a small transferable development rights program has been instituted to preserve open space in a small Vermont hamlet. These current uses are on a small scale, and although larger proposals have been made in a few states, none have been authorized.

Sale of Agricultural Rights

Alaska has large quantities of potential cropland in state and federal ownership. A small amount of the state owned land that has been classified as agricultural land has been transferred to private ownership. In an attempt to develop a viable agricultural economy, the state is using a unique technique to put this land in agriculture. In the disposal of these lands, only the fee simple agricultural rights are being sold. Two noteworthy examples are the Tanana Loop sale and the Delta sale. Small amounts of Matanuska-Susitna Borough lands which contain only agricultural rights have also been transferred into private ownership. Advantages of this procedure include the insurance of at least an attempt to put undeveloped land into agriculture and the lower cost to farmers for the land because only the agricultural rights are purchased. Since this is not a traditional type of real property ownership, problems may arise between the state and the farmers as to what exactly can be done on the farm. A second problem may arise if the land is or becomes uneconomical to the landowner to farm. What then happens to the development rights on the land? Can they then be repurchased by the current agricultural rights owner thus allowing him to more intensively develop the land, or must the land remain in agriculture? The current Alaska Statutes allow for the conveyance or lease of the remaining interests in the land if it is determined to be in the public interest. This conveyance or lease is to be at public auction with the landowner having a preference right to meet the high bid within 30 days after the day of the auction.