



DEPARTMENT OF PLANNING AND BUILDING

JASON GIFFIN
DIRECTOR

TO: Interested Party

DATE: September 30, 2011

FROM: Bill Robeson, Project Manager

SUBJECT: Release of Economic Analysis and Supplemental Memorandum for the Agricultural Cluster Subdivision Program

The economic analysis and supplemental memorandum for the Agricultural Cluster Subdivision Program is complete and available for public review. This study was authored by Lisa Wise Consulting, Inc. (LWC) during the preparation of the Draft Environmental Impact Report (DEIR) for the Agricultural Cluster Subdivision Program. The intent of this study is to analyze and report on the potential economic effects of the proposed Agricultural Cluster Subdivision Program.

Supplemental Memorandum

When LWC completed the draft economic analysis in December 2010, staff was still in the process of preparing the DEIR for the Agricultural Cluster Subdivision Program. During this process, staff revised the project description for the proposed program and changed the methodology for estimating the build-out potential under the existing and proposed ordinance provisions. These changes resulted in some important differences between the analysis in the DEIR and the economic analysis. The following supplemental information is intended to update and finalize the economic study by explaining these key differences:

Differences in Project Description

The project evaluated in the DEIR allows for agricultural cluster subdivisions on agricultural parcels located partially or entirely within **five road miles** of the Urban Reserve Lines (URLs) of Arroyo Grande, Atascadero, San Luis Obispo, San Miguel, Nipomo, Templeton, and Paso Robles. Alternative 2(a) of the DEIR evaluates the impacts of allowing agricultural cluster subdivisions within two (rather than five) road miles of the identified URLs. The economic analysis is based on **the two (rather than five) road mile** locational criteria.

The economic analysis also assumes that the proposed program would eliminate the potential for a second primary residence on standard agricultural parcels of 20 acres or larger. While this potential change is evaluated in Alternative 4 of the DEIR, it is not a component of the proposed program. The proposed program only affects new agricultural cluster subdivisions; it would not affect development potential on existing parcels.

Differences in Build-out Estimates

Some key findings of the economic analysis are based on the County’s build-out estimates under the existing and proposed agricultural clustering standards. As shown in the table below, the build-out estimates used in the economic analysis are slightly different compared to those used in the DEIR:

Comparison of Ag Cluster Build-out Scenarios (new SFRs)

Document	Proposed	Existing	Reduction
Economic Analysis	118 (2 mile URL limit)	3,741	96.85%
DEIR	418 (5 mile URL limit)	4,581	90.87%

This discrepancy is a result of the different methodologies used for calculating build-out potential in each of these documents. While the economic analysis relied on a parcel-by-parcel analysis of subdivision potential, the DEIR calculated subdivision potential based on the total acreage and soil characteristics of the project area. Despite this discrepancy, both scenarios point to a significant reduction in build-out potential compared to the existing ordinance, and would therefore continue to support the relevant conclusions of the economic analysis.

Difference in Ag Land Conversion Estimates

Key finding #1 of the economic analysis is largely based on an estimate that the proposed program would result in a 92 percent reduction in the amount of agricultural land that could potentially be converted to residential use. When applying the five road mile project description and the same build-out methodology used in the DEIR, this estimate is revised as follows:

Reduction in Ag Land Conversion (Revised Estimate)

	Potential Parcels	Minimum Size (Acres)	Acres Potentially Converted to Residential Use
Existing	4,581	1.0	4,581
Proposed	418	2.5 - 5	1,045 - 2,090
Reduction	4,163		3,536 - 2,491
Percent Reduction			54 - 77%

While this reduction is less dramatic under the revised estimates (77% versus 92%), it is still significant, and would therefore continue to support the relevant conclusions of the economic analysis.

If you need more information about the Agricultural Cluster Subdivision Program or the economic analysis, please contact Bill Robeson at (805) 781-5607.



San Luis Obispo County AG CLUSTER ECONOMIC ANALYSIS

FINAL DRAFT | DECEMBER 15, 2010

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lisa wise consulting, inc.

planning economics natural resources

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EXECUTIVE SUMMARY



BACKGROUND AND OBJECTIVES

The intent of this study is to analyze and report on the potential economic effects of the proposed Agricultural Cluster Subdivision Program. The County proposes to amend the agricultural cluster ordinance through changes to the Land Use Ordinance (Title 22 of the County Code), Coastal Zone Land Use Ordinance (Title 23 of the County Code), and the Agriculture Element of the General Plan.

METHODOLOGY

This study develops a conceptual framework for analyzing the impact of the proposed amendments relative to the existing ordinance on the overall economy in terms of value added (Gross Domestic Product), productivity, and social costs. The social and economic impacts of the proposed amendments are identified through review and synthesis of empirical academic literature, case studies, interviews, economic modeling and analysis of data.

RESEARCH QUESTIONS

Below are the questions regarding the impacts of the proposed amendments to the agricultural cluster ordinance relative to the current ordinance that are being addressed:

1. What are the impacts of the proposed amendments on the agricultural economy through its impacts on the use and productivity of agricultural land?
2. What are the impacts of the proposed amendments on the agricultural economy through its impacts on landowners' incomes, access to agricultural financing, and land values?

3. What are the economic and social costs of rural development? Relative to the existing ordinance, do the proposed amendments limit, accelerate, or exert no change to sprawled rural development?
4. Do revenues from property tax on new developments in agricultural land (versus in urban settings where there are existing services), outweigh the cost of providing public infrastructure and extending public services? What are the fiscal impacts of the proposed amendments on the County government?
5. Given the impacts on agriculture, society, and the government, how do the proposed amendments affect the overall economy?

FINDINGS

The following is a summary of findings in this study.

IN THIS ECONOMIC STUDY, AGRICULTURAL PRODUCTIVITY

refers to the ratio of the market value of final agricultural outputs (which excludes intermediate products such as corn feed to animals) relative to agricultural inputs, such as land and labor.

LOSS OF FARMLAND

translates to loss in annual agricultural income, refer to page 23.

FARMLAND PRICES

are more sensitive to real estate market fluctuations than agricultural revenue, refer to page 21.

1. The proposed amendments are expected to have a positive (though not significant) net impact on the agricultural economy.

These benefits arise mainly from the potential of more economically productive land available for agricultural use instead of being converted to residential and other non-agricultural uses. In particular, the amendment to limit agricultural cluster subdivisions to properties within 2 road miles of Identified urban reserve lines (URLs) results in a 92 percent reduction in the amount of agricultural land that could potentially be converted to residential use. The amendments removing the residential density bonus and requiring physically contiguous parcels also minimize the fragmentation of agricultural land, enhancing agricultural productivity. Finally, the amendments would reduce the potential loss in agricultural productivity associated with urban scale water and wastewater systems located in rural areas. In potentially preserving a greater amount of contiguous agricultural acreage, the proposed amendments could serve to enhance agricultural productivity (see page 17 for further discussion).

In addition, studies have shown that as land values increase, it becomes more difficult for farmers to resist the pressures of development because agriculture is no longer as economically profitable. In increasing the returns to agriculture relative to development, the proposed amendments have the potential to enhance the agricultural economy (see page 19 for further discussion).

Lastly, underwriting guidelines for agricultural lending and discussions with industry experts show that agricultural loans are based on the value of a farmer's crops, not the development potential of the land. Thus, the proposed amendments will have no effect on year-to-year agricultural financing (see page 22 for further discussion).

AS LAND VALUE INCREASES AND BECOMES MORE MARKETABLE,

it also becomes more expensive for the farmer (to buy more land or resist the pressures of sale for non agricultural use). However, the intent of the ordinance and proposed change is to create attractive and viable residential opportunities that are compatible with agriculture.

THE LITERATURE CITED

in this document is considered the seminal work on a topic. While there are often more recent publications that cite findings made herein, they refer back to the original work.

2. The proposed amendments have the potential to increase marketability of homes in agricultural cluster subdivisions.

Several studies suggest homeownership in a cluster development under the proposed amendments is financially advantageous to a homeowner. A 1990 study comparing market appreciation of homes in clustered developments versus conventional subdivisions in New England rural communities finds that cluster development properties maintain and often exceeded conventional counterparts in sale-price appreciation over a 20-year period. The proposed amendments require physical contiguity of parcels, resulting in more clustered housing compared to the current ordinance. In addition, several studies find that rural properties closer in distance to urban centers are worth more, and properties located in the urban/rural fringe are worth more than its non-fringe counterparts. The amendment to locate the cluster within 2 road miles from the urban boundary bring clusters closer and perhaps within the urban/rural fringe, translating to higher property values (see page 30 for further discussion).

3. Rural development is costly.

Sprawl indices from the academic literature and a review of historic subdivision activity indicate rural development in San Luis Obispo has followed a pattern of urban sprawl. Given that a majority of new parcels created in the agriculture land use category over the past 20 years have been a direct result of cluster subdivision, the current ordinance can be said to have contributed to the County's urban spatial expansion. Meanwhile, studies show that urban sprawl is very costly. Nationwide projections by Burchell et al (2002) show

that more compact development from 2000 to 2025 can save local governments: 11 percent, or \$110 billion from road-building costs over 25 years; 6 percent, or \$12.6 billion from water and sewer costs over 25 years; and 3 percent or \$4 billion from annual operations and service delivery. In addition, studies show that worker productivity and local and regional economic performance are associated with, and may even be improved by, more compact development patterns, vibrant urban centers, and efficient public transportation systems (see page 35 for further discussion).

4. The proposed amendments would reduce the cost of providing public infrastructure and services.

The costs of public road construction and maintenance, urban scale and waste-water systems in rural areas, and provision of other public services (e.g. schools, emergency, and safety) are reduced by minimizing the distance and dispersion of public good provision. First, by limiting cluster subdivisions to properties within 2 road miles of URLs, public goods and services do not have to be extended as far from the County's various urban cores. Simulation exercises by Speir and Stevenson (2000) show that the costs of providing services increase by 3 percent from a doubling in distance. The proposed amendments also reduce tract dispersion by requiring physical contiguity of lots, reducing the costs in public good provision associated with tract dispersion. Speir and Stevenson (2000) also show that service provision costs increase by 6 percent from a doubling in tract dispersion (see page 46 for further discussion).

5. The proposed amendments will have little to no impact on the overall economy.

Despite enhancing agricultural productivity, the proposed amendments will have little to no impact on the overall economy. This is due to the fact that agriculture comprises a relatively small sector of San Luis Obispo's current economy (in terms of value-added product or GDP). Through the proposed changes to the Agricultural Cluster Subdivision Program,

the County gives rural landowners similar development opportunities as the current ordinance, but influences that development in such a way that the new developments conserve resources shared by agricultural and non-agricultural residents, and minimizes the cost to government and society at large. However, in the long run the social and economic costs of rural sprawl may outweigh any short-term economic benefits. Nonetheless, the proposed amendments are beneficial compared to the existing ordinance (see page 47 for further discussion).

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1. INTRODUCTION

**A 2007 REPORT BY
THE AMERICAN
FARMLAND**

TRUST found that more than half a million acres were urbanized and “paved over” in California between 1990 and 2004, nearly two-thirds of it agricultural land. If such sprawling development patterns continue, another 2 million acres of California land will be paved over by 2050 according to this report.

Similar to other regions of the country, the growth of the metropolitan region of San Luis Obispo resulted in housing and other infrastructure development in previously agricultural areas.

In 2008, the San Luis Obispo County Board of Supervisors adopted strategic growth principles designed to focus development in existing urban areas with adequate services, while simultaneously protecting open space and agricultural land and resources.

The County has had an Agricultural Cluster Subdivision Program in place since 1984. The ordinance allows landowners to develop a portion of their property, preserving the rest for agricultural and/or open space uses in perpetuity.

The proposed changes to the Agricultural Cluster Subdivision Program are aimed at improving the consistency between the County's land use ordinances, the Agriculture Element, and the 2008 strategic growth principles of the County Land Use Element.

This study analyzes the potential economic effects of the proposed Agricultural Cluster Subdivision Program. How the proposed amendments impact the agricultural economy and land values is the focus of the first part of this report. The second half is focused on the impacts of rural development on the overall economy and society.

The following questions are the focus of this report:

1. What are the impacts of the proposed amendments on the agricultural economy through its impacts on the use and productivity of agricultural land?

2. What are the impacts of the proposed amendments on the agricultural economy through its impacts on landowners' incomes, access to agricultural financing, and land values?
3. What are the economic and social costs of rural development? Relative to the existing ordinance, do the proposed amendments limit, accelerate, or exert no change to sprawled rural development?
4. Do revenues from property tax on new developments in agricultural land (versus in urban settings where there are existing services), outweigh the cost of providing public infrastructure and extending public services? What are the fiscal impacts of the proposed amendments on the County government?
5. Given the impacts on agriculture, society, and the government, how do the proposed amendments affect the overall economy?

The remainder of this report is organized as follows. A brief background on the current agricultural cluster program and proposed changes are in the next section, followed by a description of the conceptual framework, methodology, and data sources. Section 4 presents the analysis and discussion of key findings, while Section 5 offers a summary of key findings and conclusions.

2. BACKGROUND



The current cluster ordinance has allowed non-agricultural residential development to be located throughout the County, creating residential development removed from urban services and increasing vehicle miles traveled, associated air quality impacts, and other impacts associated with vehicular use. The proposal seeks to reduce vehicle miles traveled by locating residential development much closer to urban services and by protecting twice as much agricultural land when compared to the ten percent development allowed in the minor cluster. The expected outcome will be consistent with adopted policies by avoiding impacts associated with development removed from urban areas and the continued loss of agricultural land.

CLUSTER LOCATION

Currently, major agricultural cluster subdivisions are limited to Inland areas of the county on properties that are partly or entirely within five (5) miles of the Urban Reserve Lines (URLs) of Arroyo Grande, Atascadero, San Luis Obispo, San Miguel, Nipomo, Paso Robles, and Santa Maria and the Creston Village Reserve Line (VRL) (LUO Section 22.22.152.A). The remaining unincorporated areas are eligible for minor clustering. The proposed changes limit agricultural clustering only to properties that are partly or entirely within two miles of the Urban Reserve Lines (URLs) of Arroyo Grande, Atascadero, San Luis Obispo, San Miguel, Nipomo and Paso Robles, and all residential cluster parcels would be located within the 2-mile area. Under the proposed amendments, there will be no distinction made between major and minor agricultural clusters.

DENSITY CALCULATION

Currently, residential density for major clusters is based upon the maximum number of parcels that could result through a conventional subdivision based upon either the site's existing use or the site soils' capability coupled with a 100 percent density bonus. Residential density for minor clusters is determined in the same way but with a 25 percent density bonus, or at least one additional residential parcel. Under the proposed ordinance, inland residential density would be based upon conventional subdivision based solely upon the site's recent existing use. No residential density bonus would be granted and the minimum qualifying parcel size would be 40 acres. The agricultural parcel would be a bonus parcel. In the Coastal Zone, residential density would be based upon the number of existing legal lots of record.

ALLOWED DEVELOPMENT AREA

The current cluster ordinance restricts development to 5 percent and 10 percent of the total site area for major and minor clustering, respectively. The proposed changes to the ordinance limit cluster development to 5 percent of the total site area and specify that agricultural buffering must occur in the residential parcel land, so as not to take away from the agricultural land.

RESIDENTIAL PARCEL SIZE

The current cluster ordinance allows the minimum residential parcel size for major clusters to be as small as 10,000 square feet (20,000 square feet for minor clusters) and establishes waivable maximum parcel sizes of 2.5 acres (5 acres minor clusters). Under the proposed ordinance, residential parcels could be no small than 2.5 acres, enabling parcels to have individual wells and wastewater systems as required by the proposed ordinance. The maximum parcel size would be 5 acres but only if needed to ensure adequate agricultural buffers.



LAYOUT AND DESIGN STANDARDS

Layout and design standards will remain essentially the same but with clarifying language which ensures clustered residential parcels be physically contiguous and in a single development envelope. The current allowance for developing ten percent of the site under the minor cluster would be eliminated, limiting all clusters to a development envelope of only five percent of the site.

PHYSICALLY CONTIGUOUS RESIDENTIAL PARCELS

The current ordinance requires that an agricultural cluster, "Cluster proposed residential structures, to the maximum extent feasible, so as to not interfere with agricultural production and to also be consistent with the goal of maintaining the rural character of the area" (Title 22, p. 3-168). The proposed agricultural cluster ordinance requires residential cluster parcels to be physically contiguous with one another, providing a clearer objective for the landowner, developer or the County.

RESIDENTIAL DENSITY IN AGRICULTURAL CATEGORY (LUO SECTION 22.30.480.A AND CZLUO SECTION 23.08.167)

The current housing density allowed for a parcel of 20 acres or greater is two primary residences inland, and one primary residence under the coastal land use regulations (Section 22.30.480.A and Section 23.08.167, respectively). Under the recommended changes, Section 22.30.480.A of the Land Use Ordinance would be amended to allow only one primary residence and eligible farm support quarters on all agriculturally-zoned parcels in the inland area, consistent with current residential density standards in the Coastal Zone Land Use Ordinance. Under the proposed changes, owners who have utilized this bonus will be allowed to maintain their current development configuration as a legal non-conforming use, and will be allowed to remain as such provided there are no significant expansions or changes to their property.

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3. CONCEPTUAL FRAMEWORK AND METHODOLOGY



This study develops a conceptual framework for analyzing the impact of the proposed amendments on the overall economy in terms of value added, productivity, and social costs. The methodology includes research synthesis, reviewing the sizable bodies of independent reports, books, and peer-reviewed academic articles in agricultural economics, urban economics, and urban planning. The report also utilizes publicly available data on land use, economic activity, demographic statistics, survey of government finances, and other sources that are cited below.

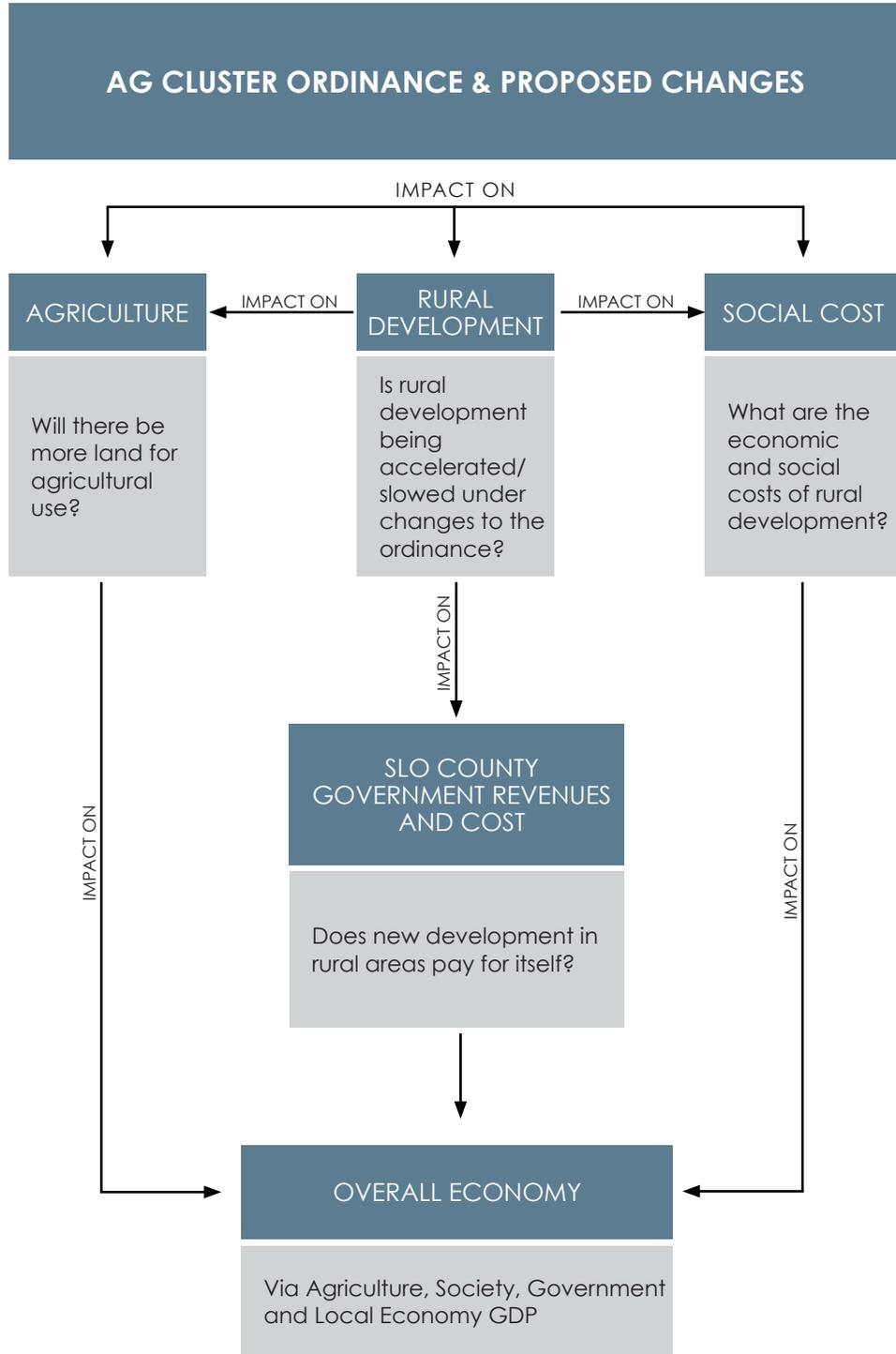
CONCEPTUAL FRAMEWORK

An economic analysis of a policy typically measures the change in the level of economic activity generated from adopting that policy, relative to the existing local economy without that policy. Estimating the economic impact of the ordinance change thus first requires identifying sectors of the economy that may be affected by the ordinance change. These sectors are primarily the agricultural economy (including landowners), the County government (via potential changes in tax revenues and service costs), and the general public (or any social costs and benefits).

Figure 1 illustrates the various sectors of the economy that could be affected by the ordinance change and the mechanisms or channels through which they impact the local economy.

The proposed amendments could impact the agricultural economy by affecting the quantity and quality of agricultural land available

Figure 1. Summary of Conceptual Framework



for agricultural production. In affecting agricultural productivity, the proposed amendments could change the returns to agriculture relative to developing agricultural land.

Meanwhile the proposed amendments could also affect the extent of rural development in San Luis Obispo County, relative to the current ordinance. Rural development can affect the fiscal balance sheets of the County government, in that property tax revenues from new developments need to be weighed against the costs of providing public infrastructure and services. On the other hand, rural development can also have costs and benefits to society at large.

Conceptually, then, the total economic effect of the proposed amendments is the sum of its effects on economic activity generated in the agriculture sector, the government sector, and society as a whole.

DATA SOURCES

The following data sources are used in this study. A comprehensive list of sources can also be found in the References Section.

BUREAU OF ECONOMIC ANALYSIS (BEA)

Data on total and sectoral Gross Domestic Product (GDP) in the San Luis Obispo-Paso Robles Metropolitan Statistical Area (MSA), as well as other MSAs and for the State of California, come from the Bureau of Economic Analysis, the agency that also calculates GDP for the National Income Accounts. While the San Luis Obispo-Paso Robles MSA geographic area does not overlap perfectly with the County of San Luis Obispo, MSA-level GDP is the best available measure for local economic activity.

U.S. CENSUS OF GOVERNMENTS

To estimate the per-resident cost of providing public infrastructure and services and the per-resident revenues from property taxes in San Luis Obispo County, a cost-benefit analysis of new developments in

San Luis Obispo County is performed using data from the U.S. Census of Governments. These estimates will facilitate discussion whether new development can pay for itself, and the impact of the proposed ordinance changes on local government's fiscal balance.

FARMLAND MAPPING AND MONITORING PROGRAM (FMMP) OF THE CALIFORNIA DEPARTMENT OF CONSERVATION

The FMMP uses aerial photography, soil information, and GIS technology to count and map land use and land use changes at two-year intervals.

THE CENSUS OF AGRICULTURE

The census of agriculture details the production of crops and agricultural resources on farms producing or selling \$1,000 or more agricultural products. The census also looks at farm size and ownership, and

provides a general overview of agricultural economic trends every five years.

ECONOMIC CENSUS

The economic census takes place every five years, and details information on sales produced and the number of employees from each sector of the economy.

COMPTROLLER'S HANDBOOK

The Office of the Comptroller charters, regulates, and supervises all national banks. As part of their mission, the Comptroller issues rules, regulations, and legal interpretations governing bank lending. The Comptroller's Handbook includes a booklet providing guidelines specifically on agricultural lending. This booklet can be accessed directly at: <http://www.occ.gov/static/publications/handbook/aglend.pdf>

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4. ANALYSIS

KEY FINDING #1: The proposed amendments are expected to have a positive (though not significant) net impact on the agricultural economy. These benefits arise mainly from the potential of more economically productive land available for agricultural use instead of being converted to residential and other non-agricultural uses. In particular, the amendment to limit agricultural cluster subdivisions to properties within 2 road miles of Identified urban reserve lines (URLs) results in a 92 percent reduction in the amount of agricultural land that could potentially be converted to residential use. The amendments removing the residential density bonus and requiring physically contiguous parcels also minimize the fragmentation of agricultural land, enhancing agricultural productivity. Finally, the amendments would reduce the potential loss in agricultural productivity associated with urban scale water and waste-water systems located in rural areas. In potentially preserving a greater amount of contiguous agricultural acreage, the proposed amendments could serve to enhance agricultural productivity.

In addition, studies have shown that as land values increase, it becomes more difficult for farmers to resist the pressures of development because agriculture is no longer as economically profitable. In increasing the returns to agriculture relative to development, the proposed amendments have the potential to enhance the agricultural economy.

Lastly, underwriting guidelines for agricultural lending and discussions with industry experts show that agricultural loans are based on the value of a farmer's crops, not the development potential of the land. Thus, the proposed amendments will have no effect on year-to-year agricultural financing.

Table 1. San Luis Obispo County 1984-2008 Land Use Summary

LAND USE CATEGORY	ACREAGE BY CATEGORY (1)													1984-2008 NET ACREAGE CHANGED	AVERAGE ANNUAL ACREAGE CHANGE
	1984	1986	1988	1990	1992	1994	1996 (2)	1998	2000	2002 (3)	2004	2006	2008 (4)		
Prime Farmland	37,119	39,371	38,996	40,763	41,441	39,978	40,208	39,895	41,391	41,294	40,509	39,724	39,614	2,495	104
Farmland of Statewide Importance	12,763	12,146	12,195	12,697	12,858	11,940	11,658	13,912	17,262	19,357	19,750	19,722	19,719	6,956	290
Unique Farmland	24,811	27,256	27,145	27,829	28,177	26,803	26,749	30,098	34,979	38,613	35,697	36,411	37,106	12,222	512
Farmland of Local Importance	317,349	316,529	283,189	277,106	277,443	280,779	278,987	273,867	261,911	179,797	180,410	174,550	173,527	-143,822	-5,993
Agricultural Land Subtotal	392,042	395,302	361,525	358,395	359,919	359,500	357,602	357,772	355,543	279,061	276,366	270,407	269,966	-122,076	-5,087
Grazing Land	648,684	639,380	667,867	665,970	663,754	662,835	662,367	661,939	661,737	749,786	750,811	742,004	739,610	90,926	3,789
Agricultural + Grazing Subtotal	1,040,726	1,034,682	1,029,392	1,024,365	1,023,673	1,022,335	1,019,869	1,019,711	1,017,280	1,028,847	1,027,177	1,012,411	1,009,576	-31,150	-1,298
Urban and Built-Up Land	34,303	34,555	33,399	34,788	35,190	35,997	37,054	37,184	39,380	41,361	42,126	43,729	44,385	10,082	420
Other Land	218,055	223,845	230,129	233,721	234,014	234,809	234,759	234,888	234,902	221,353	222,267	235,511	237,690	19,635	818
Water Area	9,087	9,087	9,251	9,294	9,294	9,029	10,389	10,389	10,607	10,607	10,603	10,522	10,521	1,434	60
Total Area Inventoried	1,302,171	1,302,169	1,302,171	1,302,168	1,302,171	1,302,170	1,302,171	1,302,172	1,302,169	1,302,168	1,302,173	1,302,173	1,302,172	1	0

(1) Figures are generated from the most current version of the GIS data. Files dating from 1984 through 1992 were reprocessed with a standardized county line in the Albers Equal Area projection, and other boundary improvements.

(2) Acreage for Water changed in 1996 when refinements were made to lake and river boundaries from imagery and 1:24,000-scale quadrangles.

(3) Due to the incorporation of digital soil survey data (SSURGO) during this update, acreages for farmland, grazing and other land use categories may differ from those published in the 2000-2002 California Farmland Conversion Report.

(4) County acreages exclude Carrizo Plain addition to the survey in 2008.

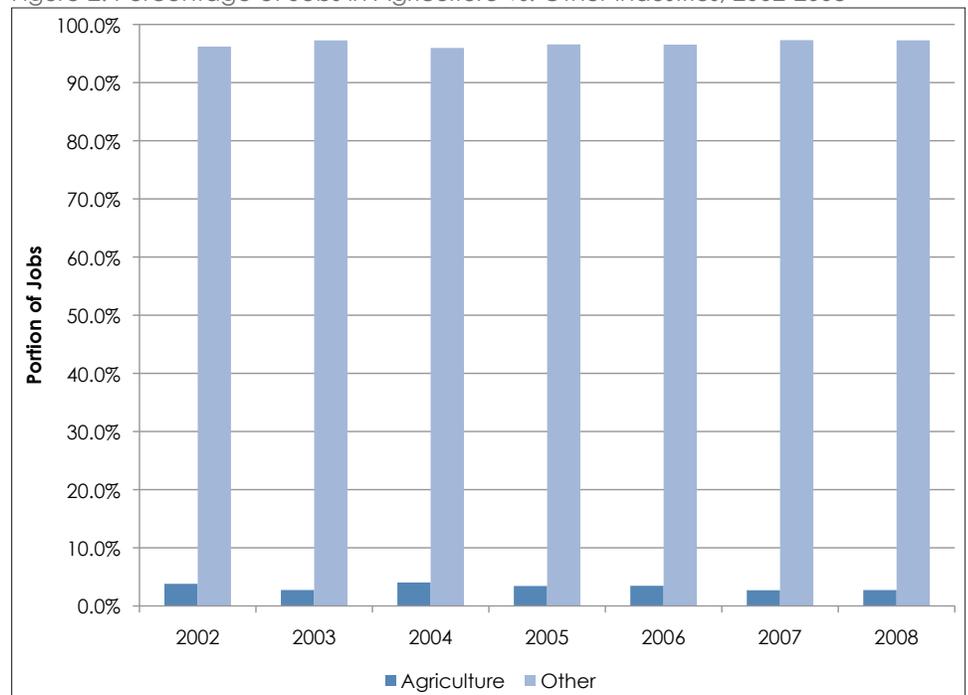
Source: Farmland Mapping and Monitoring Program, California Department of Conservation

THE ROLE OF AGRICULTURE: LAND, LABOR FORCE, AND THE ECONOMY

About a fifth of the land in San Luis Obispo County is devoted to agricultural production (see Table 1). Data gathered from the Farmland Mapping and Monitoring Program of the California Department of Conservation indicate that, in 2008, 270,000 acres of the County's 1.3 million acres are used towards agricultural production. This includes nearly 40,000 acres classified as "prime" farmland, nearly 20,000 acres classified as farmland of statewide importance, 37,000 acres of unique farmland, and 175,000 acres farmland of local importance. Another 739,000 is grazing land which can also be considered as part of agricultural production. Over 44,000 acres are classified as "urban and built up".

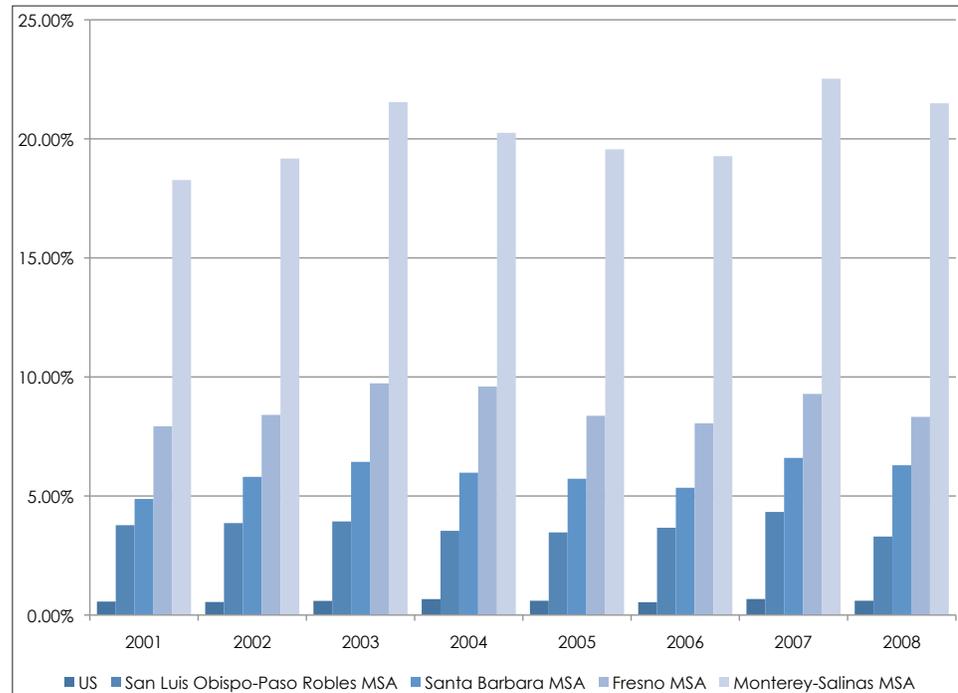
Meanwhile, between 1984 and 2008, over 122,000 agricultural acres were converted to other land uses, at an average annual loss of 5,087 acres. Over the same period, an average of 3,789 acres were converted to grazing land annually, and an average of 420 acres were converted for urban uses annually. The conversion of land away from agriculture and increased conversion towards grazing and urban uses reflects the changing mix of agricultural and animal production in the County, land conservations, as well as the housing and other infrastructure development in the rural parts of the County.

Figure 2. Percentage of Jobs in Agriculture vs. Other Industries, 2002-2008



Source: American Community Survey 2002-2008

Figure 3. Agricultural Sector by Percent of Area GDP, 2002-2008



Source: Bureau of Economic Analysis

While the acreage of farmland still comprises 20 percent of land use in San Luis Obispo, agricultural employment is less than 10 percent of the County's labor force (See Figure 2). The ratio of land use to labor force represents a very high level of agricultural productivity, in the sense that agriculture uses fewer labor inputs per unit of output produced.

Thus, to evaluate the role of agriculture in the local economy, it is useful to examine the production value contribution of agriculture to the County's total product or GDP.

Figure 3 presents the agricultural sector's share of GDP in the San Luis Obispo-Paso Robles MSA, from 2001-2008. In 2008, the Bureau of Economic Analysis estimates agriculture contributed \$349 million in economic value to San Luis Obispo's local economy. This constitutes less than 5 percent of San Luis Obispo's total GDP. When agriculture's associated activities are considered (e.g., agricultural supplies, services, and processing), agriculture's contribution to the region's economic product is greater. Such a calculation (regional economic multiplier effects) is beyond the scope of this study.

In 2007, the Paso Robles Wine Country Alliance and the Economic Vitality Corporation (EVC) of San Luis Obispo County commissioned a wine business consulting firm to prepare the region's first economic multiplier study. The full report can be found at: http://www.pasowine.com/media/economic_impact.php

Agriculture is currently a relatively small sector of the economy of San Luis Obispo County, particularly when compared to other nearby agricultural areas, such as Santa Barbara, Monterey, and Fresno Counties.

Moreover, in terms of the economic well-being of today's farmer, agricultural production typically accounts for only a minority of a farm household's earnings. Nationwide, 80 percent of all farms, or those selling less than \$100,000 annually in farm products, earn more than 90 percent of their household incomes from off-farm sources. The diversification in the sources of farm household income is indicative of the larger trend of agricultural production being concentrated in larger farms; in 1996 farms with more than \$250,000 in sales account for 85 percent of net farm income (Gardner 2002).

DETERMINANTS OF AGRICULTURAL LAND PRICES: A BRIEF LITERATURE REVIEW

Meanwhile, agricultural land values in real terms have been increasing since the second half of the 20th century (Gardner 2002). Today's farmers' agricultural production decisions can be distorted by the speculative development potential of his/her farmland. While traditionally rural land values in San Luis Obispo and elsewhere have been determined by site characteristics such as soil quality, drainage, and exposure, population and economic growth has led to an increased demand for rural land, raising the values of farmland.

Conceptually, land is a resource that can be used in various production activities. The value of a piece of land differs across parcels based on its production attributes for agriculture and other activities. Thus, the greater of potential returns from agricultural or non-agricultural activities are what is capitalized into current farmland prices.

Empirical farmland price studies are generally one of two types. The first are studies that assess the influence of returns to agriculture or value of agricultural production on land prices. In general, these studies find that farm returns, farm size, expected capital gains, capitalized farm and agricultural policy benefits, and interest rates are key determinants of farmland prices (Shi, Phipps and Colyer 1997).

PROFITABILITY IN AGRICULTURE

refers to the difference between a farm's total revenue from the sale of its agricultural products less all the costs to produce those products.

Hardie et al (2001) find that a 1 percent change in county-wide housing prices in the Mid-Atlantic region generates a larger response in farmland prices than a 1 percent change in agricultural revenues.

A second set of studies focus on the impact of non-agricultural factors on farmland prices. These studies consider the influence of location, population density, infrastructure, urban access, and environmental amenities, among others.

Both streams of the literature verify that the speculative development potential of agricultural land is capitalized into current farmland prices. While farm earnings and development potential both play significant roles in determining farmland prices, the price of farmland is relatively more responsive to development potential. Hardie et al (2001) find that a 1 percent change in county-wide housing prices in the Mid-Atlantic region generates a larger response in farmland prices than a 1 percent change in agricultural revenues. Plantinga and Miller, (2001) using data in New York State, and Drescher et al (2001) using data in Minnesota, find similar results, in that the returns from development exceed those from agriculture.

On the other hand, the literature on the impact of suburbanization and rural development on agricultural production and income is relatively limited. For empirical tractability, most studies focus on partial effects and are more qualitative. For instance, Berry (1978) finds agricultural land tends to be idled in anticipation of being developed. Quantitative studies tend to have a complete theoretical framework and a corresponding econometric model. Results show that suburbanization and rural development changes crop choices, the sensitivity of farmers to crop prices (supply elasticities), the extent of agricultural activities, and rural land prices (e.g., Lopez et al 1988; Plantinga and Miller 2001).

Overall, land economics literature demonstrates that as rural land values increase, agricultural activities increasingly become less profitable, making it more difficult for farmers to resist the pressures of development.

AGRICULTURAL LAND VALUES AND AGRICULTURAL FINANCING

Since farmland is often used as collateral for agricultural loans, an examination of the guidelines for agricultural lending reveals how farmland values and the land's speculative development potential are used in writing these loans. According to the Comptroller's Handbook on Agricultural Lending (the Office of the Comptroller charters, regulates, and supervises

all national banks), the underwriting process for agricultural loans and subsequent loan administration are fairly similar to conventional lending. One unique requirement is that the market value of agricultural land should not be used as the sole collateral when determining debt repayment capacity. Collateral assessment should be based on the revenue the land is expected to produce when operated as a farm, with market value of the land serving only as additional collateral. When farmland values are escalating, both the market (appraised) and production value of the land should be used to determine available collateral; "Differences between the economic value and the market value of the land should be reconciled" (Comptroller's Handbook, 1998, p.13).

These guidelines suggest that farmers' access to the market for agricultural loans do not depend on the underlying development potential of their farmland. Bankers are explicitly instructed to focus their evaluation of a farmer's ability to repay an agricultural loan based primarily on the successful production and marketing of their products, and only secondarily on the collateral farmers put down for the loan. Thus, the amendments will have no effect on year-to-year agricultural financing.

PROPOSED AMENDMENTS' IMPACT ON AGRICULTURE

A rigorous analysis of the potential effects of the proposed amendments on the County's agricultural economy would not be reliable, given the host of variables that can affect agricultural productivity and farmland prices, such as: demand for the agricultural products of the County, food prices and foreign competition, farm laborers' wages and supply, the likelihood of pest infestation, weather and climate change, water supply, and other government regulations and programs, among others, are all variables that have to be taken into account in addition to the proposed amendments.

Certainly land taken out of agricultural production reduces the contribution of agriculture to the local economy. A study in the Sacramento region of California estimates the economic impact of the urban conversion of 31,000 agricultural acres in 1988-1998 led to a reduction of about \$20 million in annual income received by plant and animal growers for their products, under certain assumptions for the prices of crop and land

Sokolow and Kuminoff (2000) estimate the urban conversion of 31,000 agricultural acres in Sacramento led to a **loss of \$20 million in annual income for farmers.**

affected (Sokolow and Kuminoff 2000). This \$20 million loss in annual farm income translates to less value-added product of farm-owners to the local economy.

Thus, while a precise value cannot be confirmed, having more land devoted to agriculture should increase the productivity and value of the agricultural economy.

Several features of the proposed amendments are likely to make more agricultural land available for productive agriculture uses instead of being converted to residential and other non-agricultural uses.

1. RESIDENTIAL DENSITY

The amendment to allow the potential number of residential parcels to be equal to the number of conventional parcels that would result from a standard subdivision reduces residential density in land zoned for agriculture while also minimizing the fragmentation of agricultural land. This results in more land potentially available for agricultural use.

In addition, allowing fewer houses built on agricultural land lowers the opportunity cost of devoting land to agriculture, that is, as opposed to the rents or proceeds from its next best use as a residential development. The likely impact of the proposed amendments on property values is discussed in more detail below.

2. CLUSTER LOCATION

Under the proposed amendments, less land will be available for agricultural cluster subdivisions relative to the existing ordinance. Estimates by LWC, Inc. and the County's Department of Planning and Building indicate the change in cluster location results in a 95 percent reduction in the amount of agricultural land that could potentially be converted to residential use.

Agricultural lands outside two miles of the URLs will still be subject to conventional agricultural subdivision standards. Conventional subdivision on these lands will more than likely reduce applications for subdivision, and larger, more productive parcels will be maintained for agricultural use. As Panel A of Table 2 demonstrates, figures provided by the County show an approximately 97 percent reduction in the number of potential units as a result of proposed amendments relative to the current ordinance.

AGRICULTURE ELEMENT POLICY

20(B): Where a land division is proposed, the proposed parcels should be designed to ensure the long term protection of agricultural resources.

Table 2. Panel A. GIS Agricultural Data

BUILD-OUT COMPARISON (AG ONLY)			
URL Distance	Proposed	Existing	Reduction
No Limit	2,598	3,741	30.55%
2 straight miles	157	3,741	95.80%
2 road miles	118	3,741	96.85%
5 road miles	450	3,741	87.97%
5 straight miles	658	3,741	82.41%

Table 2. Panel B. Developed Parcels in Agricultural Areas Under "Worst Case" Development

DEVELOPED PARCELS IN AGRICULTURAL AREAS UNDER "WORST CASE" DEVELOPMENT			
	Potential Parcels	Minimum Size (Acres)	Acres Converted
Existing	3,719	1.0	3,719
Proposed	118	2.5	295
Reduction	3,601		3,424
Percent reduction			92%

Source: San Luis Obispo County Department of Planning and Building

Furthermore, Panel B of Table 2 shows County estimates of acres converted from agricultural use and the resulting number of parcels created in a "worst case" development scenario under both the existing and proposed agricultural cluster subdivision ordinance. In a "worst case" scenario, the existing ordinance could result in the creation of 3,719 additional parcels in agricultural areas of the County. Assuming an average parcel size of 1 acre, these 3,719 potential lots could convert 3,719 acres of agricultural land to residential and non-agricultural uses. In contrast to the "worst case" development scenario, the proposed amendments would result in only 118 potential cluster parcels. Given the 2.5 acre minimum parcel size, these 118 cluster parcels could convert up to 295 acres of agricultural land. Therefore, the proposed amendments result in a 92 percent reduction in the amount of agricultural land that could be converted as a result of agricultural cluster subdivisions.

3. DENSITY CALCULATION

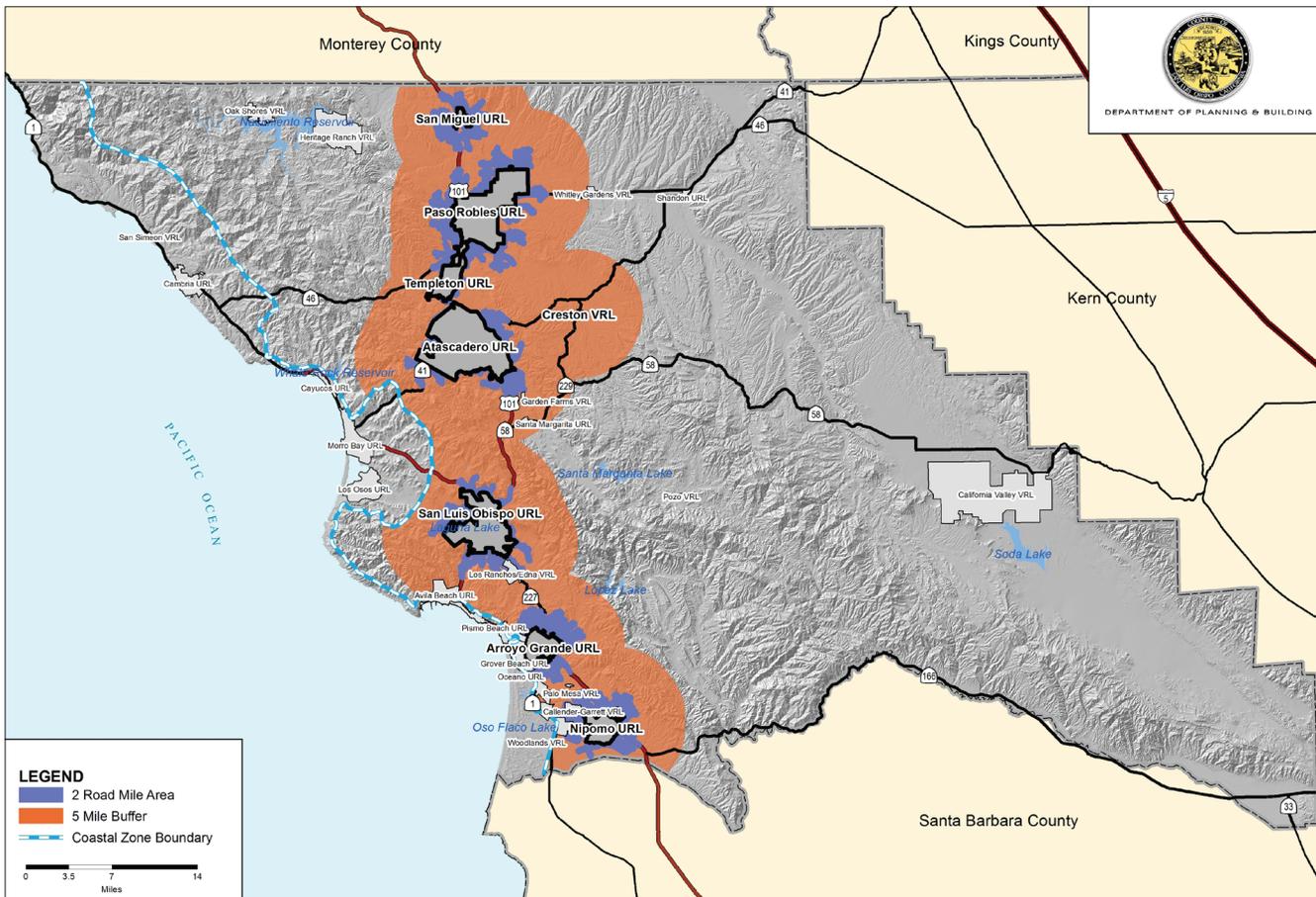
Proposed changes allow the number of residential cluster parcels to match those in conventional subdivisions except that the minimum base density parcel size is limited to 40 acres. With this minimum, the proposed change effectively reduces the total number of residential parcels allowable in

an agriculturally-zoned area. In turn, fewer residences on agricultural land increase the amount of land potentially available for agricultural production.

4. ALLOWED DEVELOPMENT AREA

The allowable development area under the current ordinance is 5 percent and 10 percent for major and minor clusters, respectively. The proposed change requires all development to occur on 5 percent of any clustered lands. This proposed amendment allows more agricultural land to be preserved (92 percent) per cluster. Together with the physical contiguity requirement, the 5 percent allowed development area limits the dispersion of subdivision lots across agricultural land. Given the greater quantity of less fragmented agricultural land for agricultural use, the productivity and value of the County's agricultural land will be maintained or enhanced relative to the current cluster ordinance.

Figure 4. Agricultural Land, 2 and 5 Miles from Eligible URLs



Source: San Luis Obispo County Department of Planning and Building

In addition, under the current ordinance, major clusters have to occur within five miles of a URL, while minor clusters are not restricted by distance from URLs. The area where clusters (relative to traditional subdivision) are allowed is thus reduced by the proposed amendment. The extent of this reduction is shown in Figure 4. The orange area represents the land that would no longer be eligible for a major agricultural cluster subdivision under the proposed changes. Eliminating minor clustering preserves more land for agriculture and open space.

While the decrease in the developable land (from 10 percent to 5 percent) might decrease the gross value of the project, the literature reviewed below demonstrates this compact form of development actually increases land values per acre.

5. PHYSICALLY CONTIGUOUS RESIDENTIAL PARCELS

The proposed introduction of physical contiguity of residential parcels has a similar effect as the restriction of development coverage to 5 percent; a smaller proportion of the project area will be subject to development. Under the current ordinance, land that is not part of the residential lot counts towards the remaining 92 percent of what is reserved for agriculture. However, land between lots might not be deemed agriculturally viable due to its proximity to residential lots. For instance, trespassing, destruction of crops or farm equipment or harassment of farm animals by children and adults from the residential development may prevent a landowner from utilizing that land for agricultural production. According to Lisansky (1986), this type of vandalism is a major concern for farmers at the suburban fringe. Reduction of coverage and contiguity reduce proximity and potential conflict between possibly incompatible uses. New non-agricultural residents often advocate for services not generally supported by neighboring farmers (e.g. public trails), increased and concentrated traffic on rural roadways, potentially resulting in conflict with the movement of agricultural equipment and goods, as well as increased regulation in air emission standards that impact the farm productivity directly.

As Figure 5 demonstrates, the current ordinance and associated policies have allowed parcels to be physically separate from one another. The purple area in the figure represents potential agricultural land effectively

lost due to parcels that are not contiguous. While some of the land between parcels is being used for grazing in current agricultural clusters, a number are not being used for agricultural purposes at all. Requiring physically contiguous parcels eliminates this inefficiency.

As Figure 6 demonstrates, current approved cluster subdivisions have not been plotted so as not to interfere with agricultural production, nor does the parceling resemble much more than the traditional suburban subdivision in Figure 7.

Requiring physical contiguity will eliminate the de facto open space that dispersed parcel layout has caused. Instead, residential parcels will abut neighboring parcels and preserve more agricultural land. The increased functionality of this agricultural land will benefit the farmer with greater agricultural productivity and income from sale of agricultural products.

Figure 5. Excluded Agricultural Land



Source: San Luis Obispo County Assessor's Office

Figure 6. Agricultural Cluster Parcel Map



Source: San Luis Obispo County Assessor's Office

Figure 7. Residential Parcel Map



Source: Google Earth

Finally, contiguous parcels decrease development costs, as private infrastructure requirements are reduced due to the more compact nature of the subdivision. Less sprawled parcels are also less costly for services, allowing for faster response times from county fire, police, medical emergency, and other time-dependent services (Esseks et al, 1999). More efficient public services mean better agricultural protection and increased safety for all residents in the event of a fire or other natural calamity as well as less cost for the County.

6. PARCEL SIZE

The minimum residential parcel size allowed is proposed to increase from less than a quarter-acre to 2.5 acres. This increase means landowners are more likely to have the requisite land area to provide required on-site water and wastewater systems. Another potential benefit of the increased minimum parcel size is greater filtration of run-off from the project site. On-site filtration of storm water is preferable for a healthy water table than runoff from impermeable surfaces. While a precise estimate of the monetary costs of urban scale water and wastewater systems is beyond the scope of this analysis, the health of the water table translates to greater agricultural yield, enhancing agricultural productivity and values. Larger parcel size reduces impacts on, and thus potential conflict in, the use of limited groundwater resources between the agricultural and non-agricultural residents.

LARGER PARCEL SIZE reduces impacts on, and thus potential conflict in, the use of limited groundwater resources between the agricultural and non-agricultural residents.

The amendments also propose a possible maximum parcel size of 5 acres in order to accommodate agricultural buffers. This represents an increase in the maximum residential parcel size. This change alone would reduce available agricultural land. However, this change comes with the requirement that buffering from agricultural uses occurs on residential parcels, not agricultural land. The proposed ordinance thus limits the amount of agricultural land that is subject to buffering.

The amendments resulting in larger residential parcels sizes ensure better physical separation between non-agricultural residential use and adjoining agricultural uses through adequate agricultural buffers, in addition to ensuring stormwater infiltrates, recharging the underlying groundwater and not adversely affecting adjoining agricultural lands.

To summarize, key features of the proposed amendments jointly serve to enhance agricultural productivity by making more land potentially available for agricultural use and by minimizing the fragmentation of agricultural land. More productive acreage of farmland is preserved under the proposed amendments relative to the current ordinance, while simultaneously allowing landowners to consider the benefits of development on up to 5 percent of their land. The proposed amendments could thus result in increased profitability in agricultural production, all else equal, leading to a positive net economic impact on the agricultural economy.

KEY FINDING #2: The proposed amendments have the potential to increase marketability of homes in agricultural cluster subdivisions.

Several studies suggest homeownership in a cluster development under the proposed amendments is financially advantageous to a homeowner. A 1990 study comparing market appreciation of homes in clustered developments versus conventional subdivisions in New England rural communities finds that cluster development properties maintain and often exceeded conventional counterparts in sale-price appreciation over a 20-year period. The proposed amendments require physical contiguity of parcels, resulting in more clustered housing compared to the current ordinance. In addition, several studies find that rural properties closer in distance to urban centers are worth more, and properties located in the urban/rural fringe are worth more than its non-fringe counterparts. The amendment to locate the cluster within 2 road miles from the urban boundary bring clusters closer and perhaps within the urban/rural fringe, translating to higher property values.

Apart from the proposed amendments' impacts on agricultural productivity and values, another question of economic importance is: what is the proposed amendments' impact on property values?

Hedonic price models (Rosen 1974) have been used extensively to estimate the value of agricultural land attributes and development potential on property values. Hedonic analysis is a statistical approach for estimating the economic value of characteristics that do not have a direct market value by linking a good traded in the marketplace (for instance, a parcel of land) with an attribute that is not traded in the market at a point in time (for example, air quality).

The price of a property is comprised of a bundle of characteristics reflecting structural (e.g. number of bedrooms of a house), environmental (e.g. air quality, coastal view), and neighborhood attributes (e.g. school quality). Hedonic prices are the implicit prices of that property's utility-bearing attribute. Under certain assumptions (e.g. the land market is in equilibrium), and if the hedonic function is accurately estimated, the slope or partial derivative of this regression function represents the marginal willingness to pay for that characteristic.

Thus, even without a well-defined market for a property attribute, such as distance to the nearest city, one can estimate the value of being one mile closer to an urban boundary by calculating consumers' willingness to pay for that attribute using sales transactions data.

HEDONIC ANALYSIS

Hedonic price models (Rosen 1974) have been used extensively to estimate the value of agricultural land attributes and development potential on property values.

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marketplace (for instance, a parcel of land) with an attribute that is not traded in the market at a point in time (for example, air quality).

PROPOSED AMENDMENTS AND PROPERTY PRICES

There are several features of the proposed amendments that enhance the incentive for a landowner to subdivide under the agricultural cluster rather than a conventional subdivision. In particular, these features make it more attractive for a homebuyer to purchase a home in an agricultural cluster subdivision under the proposed amendments compared to the current one:

1. CLUSTERING HOUSING BY REQUIRING PHYSICAL CONTIGUITY OF PARCELS MAKE IT MORE ATTRACTIVE FOR POTENTIAL SUBDIVISION HOMEOWNERS.

Lacy (1990) compared property value of homes in a cluster development versus a conventional subdivision in Concord and Amherst, Massachusetts. In Concord, clustered properties appreciated 168 percent between 1980 and 1988, compared to 46.8 percent of the town as a whole. In Amherst, houses in a cluster subdivision appreciated 462 percent between 1968 and 1989, while houses of similar size and initial price in a conventional subdivision appreciated only 410 percent over the same period. Changing the cluster location from within 5 straight miles of a URL to instead be within 2 road miles of a URL make it more attractive for potential homeowners in the cluster subdivision.

2. CHANGING THE LOCATION FOR MAJOR CLUSTER SUBDIVISIONS FROM WITHIN 5 STRAIGHT MILES OF A URL TO INSTEAD BE WITHIN 2 ROAD MILES OF A URL MAKES IT MORE ATTRACTIVE FOR POTENTIAL HOMEOWNERS IN THE CLUSTER SUBDIVISION.

Using data from Cook County, Illinois, Colwell and Munneke (1998) find a significant positive (concave and nonlinear) relationship between closer distance to the urban center and property values. Colwell and Munneke's analysis take into account that as parcel sizes increase the further a parcel is from the city center, increased parcel sizes and distance would then be associated with lower unit (e.g. per acre) land prices. Even taking into account the nonlinearity, Colwell and Munneke (1998) find land values are higher the closer they are to the urban center.

Fakhruddin and Espey (2007) show that location in the urban/rural fringe in South Carolina has a significantly higher return (9 to 11 percent, depending on the model and the form of spatial correlation it accounts for) than an

urban or a rural location, everything else constant. Moving the clusters to within 2 miles of a URL places these subdivisions closer if not within the fringe.

Hedonic analysis of rural land market sales from 1993-1996 by Henning et al (2000) in southeast Louisiana also show that, as distance to the nearest city declines by one mile, the per acre value of land increases by \$27.69. Access to a paved road is valued at \$569.26 per acre. The same analysis found that rural tracts located within a metropolitan statistical area (MSA) sell for \$1,574 more per acre than tracts not within an MSA. This study suggests that the move of the cluster location closer to a paved road and within 2 road miles of URLs make it more attractive for potential homeowners in a new development.

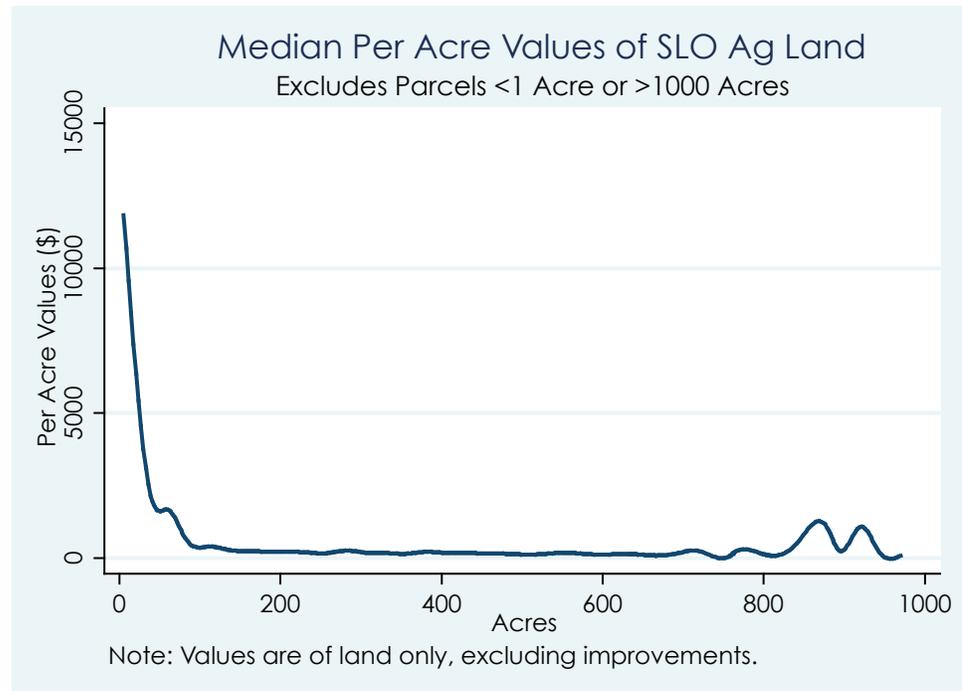
In addition, the proposed requirement for residential cluster parcels to be located as close as possible to existing access roads limits areas of a project to those that are most appropriate for residential development. This in turn would force development to concentrate nearest to existing infrastructure. The effect would be less private infrastructure (Burchell et al 2005), a savings that would be passed down to the potential homeowner in their purchase price and/or homeowner's associations' fees.

One caveat to the findings discussed above is that they pertain to different regions of the country whose housing markets and other characteristics are different from San Luis Obispo. However, data from the Assessor's Office in San Luis Obispo County show similar overall patterns as the rest of the country. One stylized fact of rural land values particularly applies to SLO as well as in other rural land markets across the country: as the parcel size of rural land increases, the per acre value of that land declines (see Figure 8 to illustrate this concave relationship).



Figure 8 plots a median (cubic) spline of the per acre values of agricultural parcels in San Luis Obispo County against the size of parcels. Median cubic splines graphically illustrate the relationship between two variables allowing for the non-linearity in that relationship. Agricultural parcels less than 1 acre are generally not buildable since they do not technically meet the minimum site area requirements for on-site wells and septic systems, so parcels less than an acre are not included in this plot. The values on this figure include only land values, and exclude the value of improvements.

Figure 8. Median per Acre Values of SLO Ag Land, for Parcels up to 1000 Acres



Calculating simple averages of per acre land values by parcel size can be unstable and unreliable, as outlier data points can skew the values. For instance, Table 3 reports the median per acre values for different parcel size intervals. This table shows that parcels between 1 to 2.4 acres have the greatest per acre land values. However, the estimated median for 1 to 2.4 acre parcels is skewed by a couple of parcels, resulting in a median value of \$53,677 per acre—considerably larger than the median of \$13,630 for 2.5 to 5 acre sized parcels. For a graphic exploration of the relationship between parcel size and land values, a median spline is more appropriate to handle outlier data.

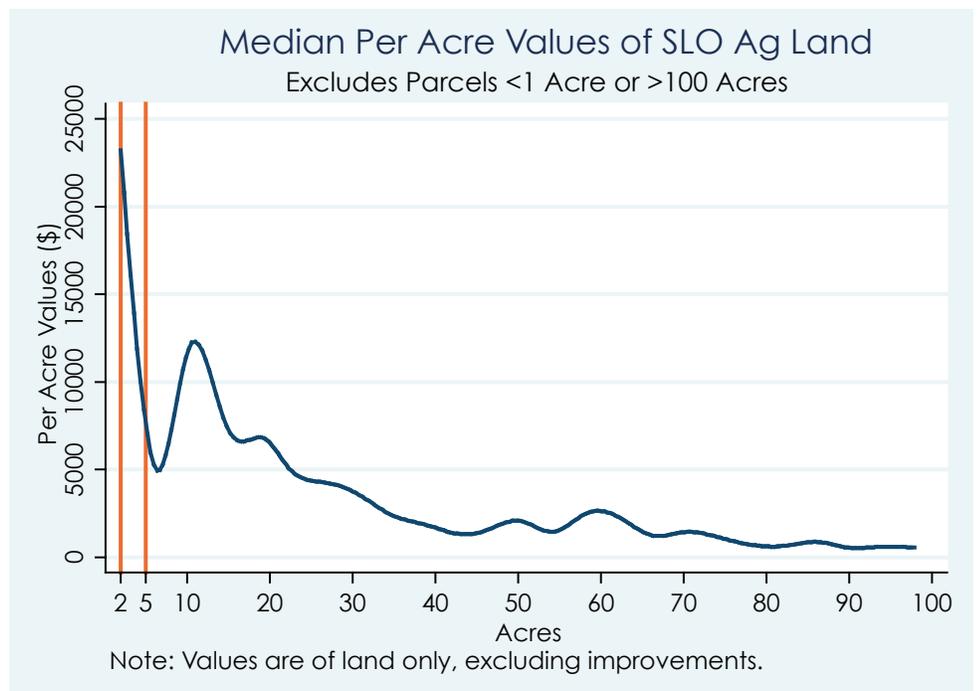
Both Figure 8 and Table 3 indicate that while the general pattern is a decline in per acre values as parcel sizes increase, lower parcel sizes (less than 10 acres) have the highest per acre values.

Table 3. Median per Acre Values for Parcels

ACRES	NO. OF PARCELS	MEDIAN PER ACRE VALUES
1-2.4	1,436	\$53,677.12
2.5-5	678	\$13,630.34
5.1-10	787	\$8,600.14
10.1-40	2,341	\$5,118.83
40.1-100	1,850	\$1,325.45
>100	3,620	\$182.50

In addition, a closer look at Figure 8 above indicates the amendment to increase parcel sizes to 2.5 acres and limit them to 5 acres is attractive and valuable to potential homeowners in a cluster subdivision. As with Figure 8, Figure 9 plots the median (cubic) spline of values per acre against parcel size for parcels between 1 to 100 acres. Parcels between 2-5 acres clearly have higher per acre values compared to larger parcels, suggesting the limitation to 5 acres is advantageous to potential homeowners. While a buildable cluster of 1 acre are likely to be more valuable per acre than a buildable cluster lot of 2.5 acres, a cluster that is less than an acre would negate the benefits to agriculture that could be provided by a buffer.

Figure 9. Median per Acre Values of San Luis Obispo County Ag Land



KEY FINDING #3: Rural development is costly. Sprawl indices from the academic literature and a review of historic subdivision activity indicate rural development in San Luis Obispo has followed a pattern of urban sprawl. Given that a majority of new parcels created in the agriculture land use category over the past 20 years have been a direct result of cluster subdivision, the current ordinance can be said to have contributed to the County's urban spatial expansion. Meanwhile, studies show that urban sprawl is very costly. Nationwide projections by Burchell et al (2002) show that more compact development from 2000 to 2025 can save local governments: 11 percent, or \$110 billion from road-building costs over 25 years; 6 percent, or \$12.6

billion from water and sewer costs over 25 years; and 3 percent or \$4 billion from annual operations and service delivery. In addition, studies show that worker productivity and local and regional economic performance are associated with, and may even be improved by, more compact development patterns, vibrant urban centers, and efficient public transportation systems.

The U.S. Census Bureau projects California population to grow from 32.5 million in 2000 to 49.3 million in 2025. The California Department of Finance projects California population will reach almost 60 million by 2050. San Luis Obispo County's population is projected to increase by 116,426 between 2000 and 2050 (Source: California Department of Finance). With these facts in mind, spatial growth and some form of rural development will be needed to accommodate this expanding population.

Given rising populations, a relevant question for the County is: how desirable will it be if a majority of its population growth occurs at low density at the fringe of its current urban boundaries?

Questions of this nature and the more general concept of urban sprawl have been used to frame policy debates over land use regulations, population growth, and population shifts in metropolitan areas across the United States. To evaluate the economic impact of the proposed amendments, it is also important to examine the costs of development into previously agricultural areas and urban sprawl more generally.

WHAT IS URBAN SPRAWL?

The Planning Commissioners Journal (2002) describes urban sprawl as “dispersed development outside of compact urban and village centers along highways and in rural countryside.” As Ned Levine, urban sociologist, planner and policy analyst puts it, “What to one person is ‘sprawl’ to another is his/her home.”

From an economic perspective, sprawl refers to the excessive suburbanization or decentralization and spatial growth of cities. Urban economists have documented, modeled, and examined the process of suburbanization and spatial growth of cities. The urban economics literature argues that urban spatial expansion is attributable to three powerful forces: U.S. population growth, rising incomes, and falling commuting costs (Brueckner 2001). As populations rise, it becomes increasingly more difficult

to locate people and firms within a central place if urban boundaries remained fixed. Larger homes and relatively more inexpensive land to build on happen to be more available at the fringes of developed urban areas. Thus, as U.S. incomes rise, residents with higher incomes demand greater quantities of housing at the urban/rural fringe areas. Finally, subsidized highways and the relatively low private cost of automobiles spur the suburbanization of American residents.

Suburbanization and decentralization of economic activity in urban areas does not in and of itself constitute “sprawl.” However, urban growth in response to the three forces (population growth, rising incomes, and declining commuting costs) can reach an excessive—that is, above the economically efficient—level when further urban spatial expansion imposes greater net marginal costs on everyone in the metropolitan area than if the development had remained more centralized (Brueckner 2000). The comment by Ned Levine does point out that people (and firms/businesses) freely choose to decentralize their location because presumably, the private benefits are greater than the private costs. However, the costs to society include not just the private costs born by the individual households and businesses, but also the additional costs to the public that result from the location decisions made by others. For instance, private location decisions fail to take into account the social benefits of open space, the social benefits of more local food sources, or the social costs of traffic congestion and air pollution.

In the economic sense, urban growth thus becomes excessive when the sum of private and public costs exceeds the private and social benefits from the decentralized (as opposed to centralized) location decisions of its residents.

Economists use this concept of net marginal cost to identify the point at which sprawl occurs, and this is the point at which society reaches a suboptimal allocation of land between agricultural and urban uses. Accounting for the public costs and benefits of sprawl, Lopez, Shah, and Altobello (1994) estimate that land allocated to agriculture is as much as 20 percent lower than the economically optimal level in a group of Massachusetts counties. It is in this sense that urban growth is no longer economically efficient.

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CURRENT ORDINANCE SPURRED URBAN EXPANSION

The economic concept of identifying urban sprawl is sound in theory, but may be too abstract to implement. In practice, the literature often identifies sprawl by characterizing the degree (as opposed to existence) of sprawl across metropolitan areas.¹

One of the accepted ways of empirically identifying sprawl is quantifying the extent of decentralization of the population in that metropolitan area. This is measured by calculating the percentage of the population residing within the urban center of a metropolitan area. Since sprawl in this sense is relative, a metropolitan area's level of population decentralization at one point in time needs to be compared with both its level at some other point, as well as the degree of decentralization in similar metropolitan areas over time.

The following Table (Table 4) is excerpted from Table 4 in Wassmer (2002), "An Economic Perspective on Urban Sprawl: With an Application to the American West and a Test of the Efficacy of Urban Growth Boundaries," a report prepared for the California Integrated Waste Management Board. This paper calculated sprawl indices for various metropolitan statistical areas in the western United States using Census data. The U.S. Census Bureau defines a metropolitan statistical area (MSA) to include one central urban area or urban cluster and the surrounding county or county-equivalent that are socially and economically integrated with the urban core.

As shown in the top row of Table 4, in both 1990 and 1998, nearly the same percentages (40 percent) of California's metropolitan populations were living in central places. In the San Luis Obispo MSA, this was 38.5 percent in 1990 and 37.6 percent in 1998, indicating a 2.31 percentage-point decline of residents living within its central urban areas. This is in contrast to the Santa Barbara MSA which had a 0.77 percent point increase of population moving within central places.

An alternative sprawl measure quantifies the degree of farmland loss in the metropolitan area. Analogous to the population measurement, this is calculated as the percentage of metropolitan land area that is farmland.

¹ Studies that quantify and explicitly account for the net marginal costs are reviewed further in subsequent sections of this document.

Loss (or gain) of farmland is quantified by comparing the percentages over time and relative to other metropolitan areas' farmland loss (or gain) over time.

Over this same 10-year period, the County lost 9.87 percent of land devoted to farming within its metropolitan area, slightly greater than the statewide loss of 9.41 percent. This is certainly less than the 53 percent loss over the same period in the Los Angeles metro area, but greater than the 6 percent loss of farmland in the Santa Barbara metro area.

Table 4. Farm Activity and Distribution of Population Changes for Metropolitan Areas in Western United States

1990 METROPOLITAN AREA NAME	1987 FARM LAND/ METROPOLITAN LAND	1997 FARM LAND/ METROPOLITAN LAND	1987 TO 1997 % CHANGE IN FARM LAND/ METROPOLITAN LAND	1990 CENTRAL PLACE POPULATION/ METROPOLITAN POP	1998 CENTRAL PLACE POPULATION/ METROPOLITAN POP	1990 TO 1998 % CHANGE IN CENTRAL PLACE POP/ METROPOLITAN POP
California average for (P) MSAs	0.47	0.443	-9.41	0.402	0.402	0.21
Bakersfield MSA	0.583	0.547	-6.11	0.322	0.333	3.53
Chico-Paradise MSA	0.471	0.385	-18.27	0.22	0.241	9.55
Fresno MSA	0.527	0.487	-7.67	0.469	0.457	-2.43
LA-Long Beach PMSA	0.108	0.05	-53.3	0.468	0.465	-0.6
Orange PMSA	0.215	0.115	-46.63	0.278	0.271	-2.57
Riverside-San Bernardino PMSA	0.125	0.082	-34.07	0.2	0.199	-0.53
Ventura PMSA	0.278	0.293	5.26	0.138	0.134	-2.88
Merced MSA	0.85	0.714	-15.97	0.315	0.3	-4.7
Modesta MSA	0.753	0.766	1.79	0.558	0.543	-2.86
Redding MSA	0.156	0.131	-16.06	0.452	0.474	4.92
Sacramento PMSA	0.217	0.169	-22.33	0.276	0.264	-4.29
Yolo PMSA	0.78	0.828	6.13	0.61	0.637	4.5
Salinas MSA	0.651	0.726	11.51	0.396	0.417	5.5
San Diego MSA	0.197	0.176	-10.39	0.499	0.492	-1.4
Oakland PMSA	0.473	0.435	-8.06	0.265	0.238	-9.96
San Francisco PMSA	0.356	0.299	-15.94	0.451	0.443	-1.86
San Jose PMSA	0.421	0.386	-8.3	0.721	0.723	0.15
Santa Cruz-Watsonville PMSA	0.194	0.249	28.82	0.349	0.355	1.7
Santa Rosa PMSA	0.545	0.566	3.87	0.403	0.41	1.79
Vallejo-Fairfield-Napa PMSA	0.572	0.567	-0.86	0.55	0.539	-1.96
Visalia-Tulare-Porterville MSA	0.457	0.424	-7.14	0.444	0.467	5.18
SLO-Atasc-Paso Robles MSA	0.683	0.616	-9.87	0.385	0.376	-2.31
Santa Barbara-Santa Maria-Lompoc MSA	0.496	0.466	-6.08	0.499	0.503	0.77
Stockton-Lodi MSA	0.92	0.903	-1.81	0.547	0.538	-1.55
Yuba City MSA	0.733	0.705	-3.79	0.224	0.241	7.6

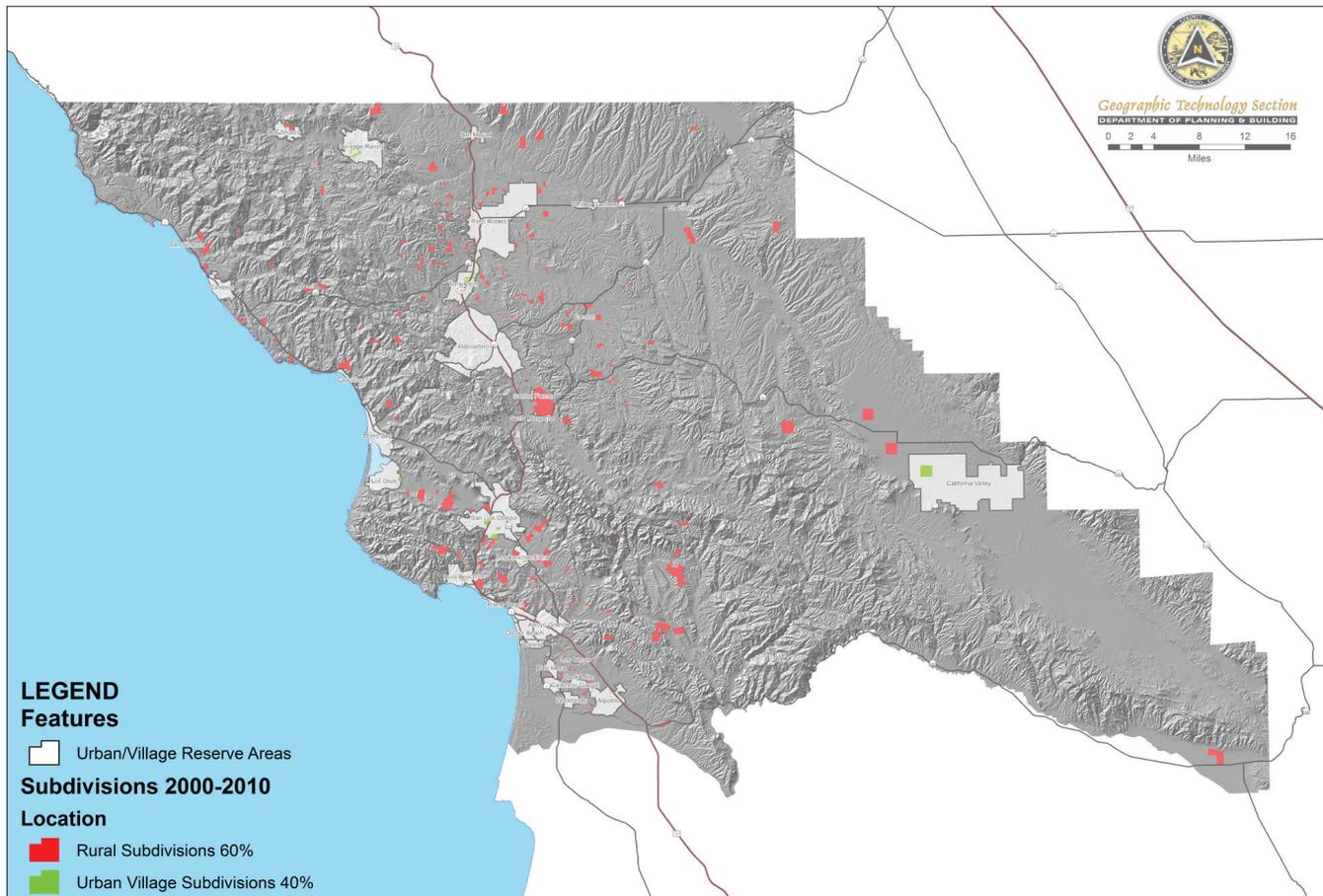
Source: Table 4, <http://www.csus.edu/indiv/w/wassmerr/sprawl.pdf>

Thus, while the extent of sprawl in San Luis Obispo has not been as great in degree as more popular examples of urban sprawl (e.g. Orange County), two different ways of measuring sprawl (loss of farmland and population decentralization) indicate urban sprawl has also occurred in San Luis Obispo.

In addition, specific observable traits of development are sometimes used to identify sprawl: scattered, low-density, and/or dispersed development; separation of where people live from where they work; leapfrog and strip commercial development. A visual mapping of proposed subdivisions in the County can also be indicative of the extent of sprawled rural development.

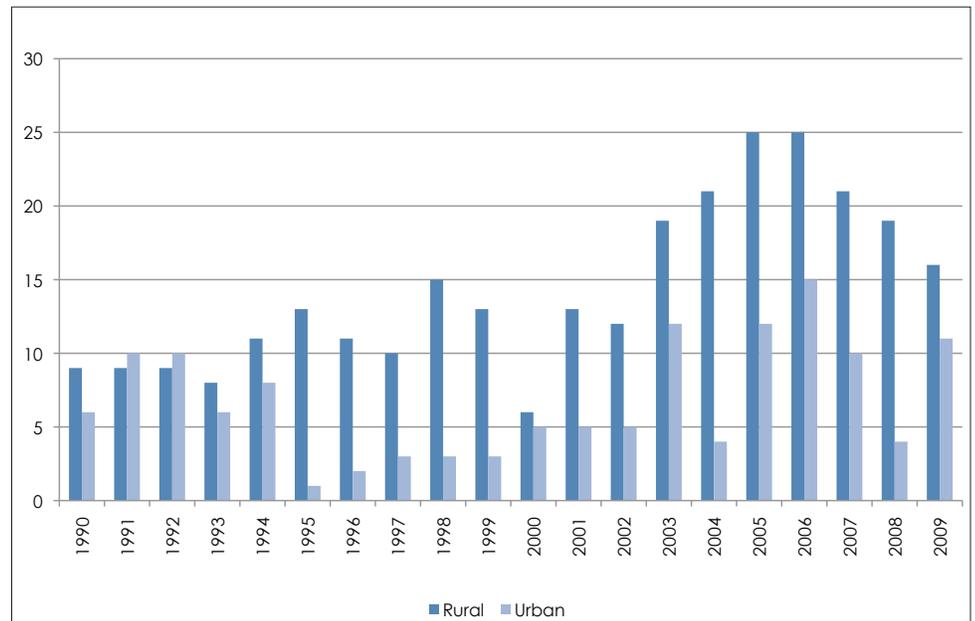
Figure 10 demonstrates the scattered nature of rural land development in San Luis Obispo. 60 percent of total pending subdivision applications from 2000 to 2010 were in rural areas and outside of urban or village reserves. A

Figure 10. Pending Land Subdivisions, 2000-2010



Source: San Luis Obispo County Department of Planning and Building

Figure 11. Second Primary Dwellings Construction, Rural vs. Urban, 1990-2009



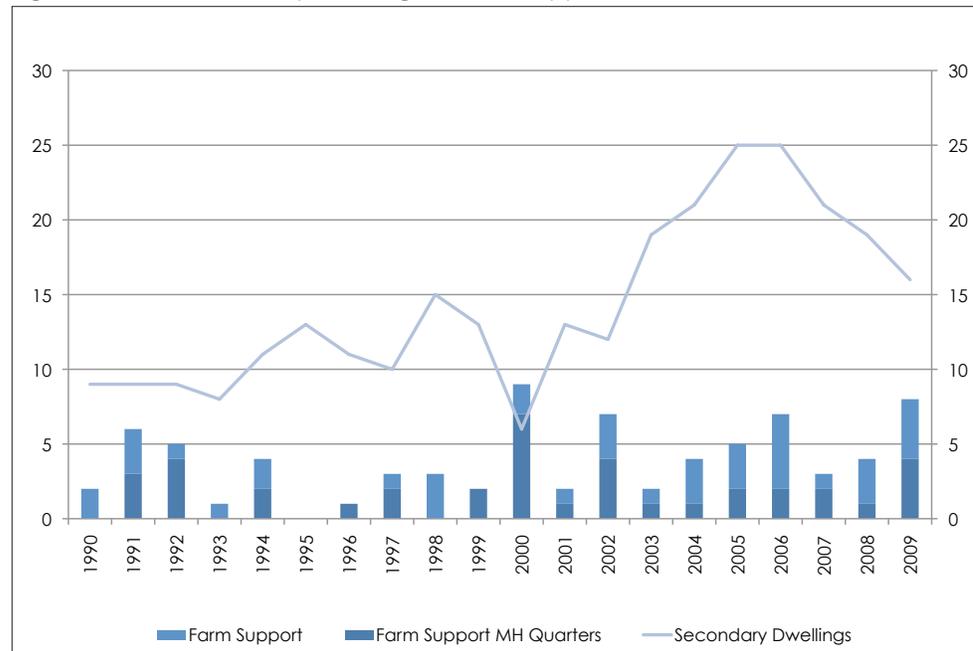
Source: San Luis Obispo County Department of Planning and Building

majority of these applications were clearly spurred by the current cluster ordinance. In fact, according to Department of Planning and Building records, agricultural cluster subdivisions have accounted for nearly 75 percent of new parcels created in the Agriculture land use category since 1996.

Allowing for two primary residences under the current ordinance has also led to a greater number of second dwellings in rural areas. For eighteen of the past twenty years, there have been more rural second primary dwellings than urban second primary dwellings (See Figure 11).

On the other hand, if rural land development in the County were enhancing the viability and productivity of farmland, one would expect farm support structure numbers to keep pace with the dramatic growth in second primary dwellings. However, as Figure 12 indicates, there was no such growth in farm support structures. The number of farm support structures and farm worker quarters constructed in the past twenty years are significantly less than the number of second primary structures constructed during the same time period. During this period, second primary structures were constructed an average of four times more than the combined totals of farm support structures.

Figure 12. Second Primary Dwellings vs Farm Support Structures, 1990-2009



Source: San Luis Obispo County Department of Planning and Building

To summarize, measures of sprawl indicate development in San Luis Obispo has followed a pattern of urban sprawl. Given that an overwhelming majority of agricultural subdivisions in the County are a direct result of cluster subdivision, the current ordinance can be said to have contributed to the County's urban spatial expansion.

COSTS OF SPRAWL

Studies that estimate the costs of sprawl vary in their implicit and explicit definitions of sprawl, methodologies, setting, and findings. Most studies conclude that costs are generally higher with sprawl-type development, especially when compared with some alternative (e.g. "smart growth" or compact development). Some studies are more theoretical and illustrate their findings using simulation and hypothetical cases. While others examine existing development, some study specific geographic areas and still others analyze the country as a whole. Many of the studies measure a particular aspect of the costs of urban sprawl, but no one study measures all the potential added costs of sprawl in a true sense of net marginal cost.

Rather than an exhaustive review of the literature, the enumeration that follows is a synthesis of the quantitative and qualitative costs of sprawl:

1. COSTS OF PUBLIC INFRASTRUCTURE AND SERVICES

Sprawl incurs capital costs related to extending roads, building more schools, water and sewer lines and stormwater drainage systems, even as existing infrastructure may already be operating below capacity. The literature generally finds operations and maintenance costs for schools, roads, water and sewer lines, stormwater drainage, police, fire, general government, recreation, and other public works, are greater for low density versus compact development.

Sprawl can also have an indirect cost (opportunity cost) in that it can lead to suboptimal public infrastructure investments. For instance, instead of raising current teacher salaries to improve student academic achievement, the school district's budget would be shifted towards building and operating a new school or transporting students from further locales.

While one argument for new developments is the increase in the property tax base, studies find the increase in local government revenues can be outweighed by the costs of providing public infrastructure and services. Burchell et al (2005) project that allowing for sprawl growth between 2000 to 2025, sprawl development is forecast to cause an annual fiscal deficit of \$43.8 billion (or 30 percent less revenues than costs) at the national level. At the regional level, revenues are projected to exceed cost only in the Northeast region, while the West is projected to have the highest fiscal deficit. The deficit would be smaller by about 10 percent under a compact growth scenario (at \$39.6 billion annually).

According to the United States Department of Finance (2002), San Luis Obispo County's costs of public service per resident have been increasing over time. To determine whether public service costs exceed property tax revenues in the County, data on the costs of public infrastructure and services was collected from the most recent publicly available U.S. Census of Governments, in 2002. Following the methodology in Burchell et al (2005), costs across various categories and property tax revenues are calculated in per capita terms. Table 5 summarizes these figures for San Luis Obispo County. Per capita revenues from property taxes in San Luis Obispo County was \$1,140.19 (in 2002 dollars) while per capita county expenditures from providing public services & infrastructure (including education, public

Table 5. Per Capita Property Taxes as County Revenues Compared to Expenditures

PER CAPITA PROPERTY TAXES AS COUNTY REVENUES COMPARED TO EXPENDITURES	
Per capita property taxes	1,140.19
Per capita Expenditures	
Education services	1,557.96
Public health services & hospitals	293.31
Construction, maintenance & operation of roads	295.8
Police & fire protection	296.3
Sewerage & solid waste management	98.85
Capital outlay for public works	651.77
Per capita expenditure, total	3,193.99
Per capita expenditure, without education	1,636.03

Source: Table 51, *Compendium of Government Finances: 2002. Issues October 2005. 2002 Census of Gov'ts. V4, #5.* <http://www.census.gov/prod/2005pubs/gc024x5.pdf>

health, roads, public safety, treatment of sewage) was \$3,194 (also in 2002 dollars), nearly triple the potential revenue from property taxes. Even when education is excluded, expenditures still exceed revenues from property taxes by about \$500 per capita.

The finding that costs exceed revenues in San Luis Obispo is not atypical for developments built on agricultural land. Esseks and Sorenson (1999) also find infrastructure costs exceed revenues from developments built on agricultural land in Northeastern Illinois. In scatter development sites, homes do not generate enough taxes to educate the children who live there. They also fail to pay the full cost of maintaining the roads that lead to and through their subdivisions. The costs of infrastructure and services for these agricultural subdivisions are essentially being subsidized and paid by other taxpayers in the adjoining municipality.

2. TRANSPORTATION AND TRAVEL-RELATED COSTS

Sprawled developments are associated with excessive commuting and increased traffic congestion. For instance, daily vehicle miles traveled per capita is higher in sprawl areas than in compact development. Table 6 reproduced from Burchell et al (2005) compares projections of travel related costs under a sprawl growth scenario versus compact growth. Total travel costs are \$24 million more under the sprawl growth scenario than compact growth over a 25-year period.

Table 6. Travel costs for sprawl versus compact growth scenario

DIFFERENCE IN TRANSPORTATION MILES AND COSTS UNDER COMPACT GROWTH SCENARIO UNITED STATES, 2000-2025						
	PRIVATELY OWNED VEHICLE MILES	TRANSIT MILES	TOTAL TRAVEL MILES	COST OF PRIVATELY OWNED VEHICLE MILES	COST OF TRANSIT MILES	TOTAL TRAVEL COSTS
Sprawl Growth Scenario	1,193,526,000	34,842,000	1,228,368,000	\$938,861,000	\$47,746,000	\$986,608,000
Compact Growth Scenario	1,137,329,000	41,479,000	1,178,809,000	\$905,281,000	\$57,256,000	\$962,537,000
Difference	56,197,000 fewer	6,637,000 more	49,559,000 fewer	\$33,581,000 less	\$9,510,000 more	\$24,071,000 less

Source: Burchell et al, 2005

In addition, due to excessive commuting, air pollution and ozone levels are greater in more sprawled areas. In turn more pollution produces negative impacts on public health, leading to greater social costs.

3. SOCIAL COSTS RELATED TO SAFETY, HEALTH, WORKER PRODUCTIVITY, AND QUALITY OF LIFE

Social costs associated with sprawled areas manifest themselves as the negative effects of sprawl on society as a whole, and are difficult to monetize. For instance, sprawl areas experience longer wait times for police, fire and medical response. Esseys et al (1999) find on average, police response times were as much as 600 percent longer; ambulance response was 50 percent longer; and fire response was 33 percent longer compared to less sprawled areas. It is difficult to quantify both the private cost and cost to society for having had to wait longer for emergency services.

Another social cost associated with sprawl is rising obesity. Zhao and Kaestner (2009) estimate that if the average metropolitan area had not experienced the decline in the proportion of population living in dense areas over the last 30 years, the rate of obesity would have been reduced by approximately 13 percent. Sprawled areas generally offer fewer opportunities for physical exercise and walkable neighborhoods.

Sprawl has also been linked to urban decline in city centers. Growth at the urban fringe is thought to depress incentives to redevelop land closer to city centers, leading to decay of downtown areas. The tax base thus shifts from existing urban centers to pay for new capital facilities at the urban fringe.

Another cost of sprawl is in the loss of agglomeration economies. The term “agglomeration economies” is used in urban economics to characterize the benefits workers and firms obtain when they locate near each other. Ever since Alfred Marshall in the late 1800s, economists have observed and estimated that economic and worker productivity rises with population density (Ciccone and Hall 1996; Glaeser and Mare 2001; Bacolod et al 2009).

Finally, sprawl has been associated with less community cohesion, civic engagement, and less social interaction. The empirical evidence on the effect of density or sprawl on social capital and interaction is mixed, however (Brueckner and Largey 2006; Glaeser and Gottlieb 2006).

KEY FINDING #4: The proposed amendments would reduce the cost of providing public infrastructure and services. The costs of public road construction and maintenance, urban scale and waste-water systems in rural areas, and provision of other public services (e.g. schools, emergency, and safety) are reduced by minimizing the distance and dispersion of public good provision. First, by limiting cluster subdivisions to properties within 2 road miles of URLs, public goods and services do not have to be extended as far from the County's various urban cores. Simulation exercises by Speir and Stevenson (2000) show that the costs of providing services increase by 3 percent from a doubling in distance. The proposed amendments also reduce tract dispersion by requiring physical contiguity of lots, reducing the costs in public good provision associated with tract dispersion. Speir and Stevenson (2000) also show that service provision costs increase by 6 percent from a doubling in tract dispersion.

The studies reviewed above and in particular Burchell et al (2005) demonstrate that dispersed large lots at low densities result in significantly greater public service costs than smaller lots closer together. In light of this finding, there are several features of the proposed amendments that can reduce the costs of providing public infrastructure and services.

First, under the proposed move in location of major agricultural clusters from 5 straight miles to 2 road miles from URLs, public infrastructure and services do not have to be extended as far from the County's various urban cores. Hypothetical simulation exercises by Speir and Stevenson (2000) further show that service provision costs increase by 3 percent from a doubling in distance (0.25 to 0.5 miles).

Second, the proposed amendments reduce tract dispersion by requiring physical contiguity of lots, reducing the costs in public good provision associated with tract dispersion. Speir and Stevenson (2000) also show that service provision costs increase by 6 percent from a doubling in tract dispersion (1 to 2).

KEY FINDING #5: The proposed amendments will have little to no impact on the overall economy. Despite enhancing agricultural productivity, the proposed amendments will have little to no impact on the overall economy. This is due to the fact that agriculture comprises a relatively small sector of San Luis Obispo's current economy (in terms of value-added product or GDP). Through the proposed changes to the Agricultural Cluster Subdivision Program, the County gives rural landowners similar development opportunities as the current ordinance, but influences that development in such a way that the new developments conserve resources shared by agricultural and non-agricultural residents, and minimizes the cost to government and society at large. However, in the long-run the social and economic costs of rural sprawl may outweigh any short-term economic benefits. Nonetheless, the proposed amendments are beneficial compared to the existing ordinance

The proposed amendments to the existing agricultural cluster are expected to have a positive (though not significant) net impact on the agricultural economy. These benefits arise mainly from more productive land available for agricultural use, enhancing agricultural productivity. However, given that the agricultural economy itself does not account for a significant portion of the County's economy (less than 5 percent), the proposed amendments will have little to no significant impact on the overall economy through its effect on agriculture.



A recent report recommending an economic strategy for the County prepared for the Economic Vitality Corporation of San Luis Obispo identified industry clusters that drive long-term employment (and economic) growth in the County. "Specialized manufacturing" grew the fastest since 1995 (105 percent increase in employment) and "Building Design and Construction" grew the fastest since 2003 (22 percent increase in jobs). The same report and subsequent meetings with local business leaders also recognized that "Recreation & Accommodation" and "Wine & Agriculture" combined to create an economic synergy that create wealth as visitors are drawn to the region.

As noted in Section 4, developing agricultural land under the current ordinance spurs sprawl, to which there are significant costs. The resulting sprawl from rural development is minimized under the proposed amendments compared to the current ordinance. Nonetheless, in the long-run, the social and economic costs of this form of rural sprawl may still outweigh any short-term economic benefits.

Meanwhile, the literature reviewed and cost-benefit analysis of SLO County revenues and costs indicate new developments fail to pay for the public service and infrastructure costs they generate.

Changes to the agricultural cluster ordinance allow the local government to strike a balance of policies that support local communities, stimulates the local economy, and develops a sustainable plan for the physical growth.

5. CONCLUSION



The proposed amendments to the County's agricultural cluster ordinance will strengthen policies that guide a comprehensive and sustainable plan for accommodating population growth while minimizing the impact on agricultural productivity. The amendments improve the consistency of the County land use ordinances, Agriculture Element of the General Plan, and the 2008 strategic growth principles of the land use element. The proposed amendments allow for the continued advantages of agricultural clustering, including providing rural landowners opportunities for obtaining returns to development on a portion of their land, while preserving rural character, more efficient use of water, land and air resources, and supporting agricultural productivity.

In summary, here are the report's key findings:

1. The proposed amendments are expected to have a positive (though not significant) net impact on the agricultural economy.

These benefits arise mainly from the potential of more economically productive land available for agricultural use instead of being converted to residential and other non-agricultural uses. In particular, the amendment to limit agricultural cluster subdivisions to properties within 2 road miles of Identified urban reserve lines (URLs) results in a 92 percent reduction in the amount of agricultural land that could potentially be converted to residential use. The amendments removing the residential density bonus and requiring physically contiguous parcels also minimize the fragmentation of agricultural land, enhancing agricultural productivity. Finally, the amendments would reduce the potential loss in agricultural

productivity associated with urban scale water and waste-water systems located in rural areas. In potentially preserving a greater amount of contiguous agricultural acreage, the proposed amendments could serve to enhance agricultural productivity.

In addition, studies have shown that as land values increase, it becomes more difficult for farmers to resist the pressures of development because agriculture is no longer as economically profitable. In increasing the returns to agriculture relative to development, the proposed amendments have the potential to enhance the agricultural economy.

Lastly, underwriting guidelines for agricultural lending and discussions with industry experts show that agricultural loans are based on the value of a farmer's crops, not the development potential of the land. Thus, the proposed amendments will have no effect on year-to-year agricultural financing.

2. The proposed amendments have the potential to increase marketability of homes in agricultural cluster subdivisions. Several studies suggest homeownership in a cluster development under the proposed amendments is financially advantageous to a homeowner. A 1990 study comparing market appreciation of homes in clustered developments versus conventional subdivisions in New England rural communities finds that cluster development properties maintain and often exceeded conventional counterparts in sale-price appreciation over a 20-year period. The proposed amendments require physical contiguity of parcels, resulting in more clustered housing compared to the current ordinance. In addition, several studies find that rural properties closer in distance to urban centers are worth more, and properties located in the urban/rural fringe are worth more than its non-fringe counterparts. The amendment to locate the cluster within 2 road miles from the urban boundary bring clusters closer and perhaps within the urban/rural fringe, translating to higher property values.

3. Rural development is costly. Sprawl indices from the academic literature and a review of historic subdivision activity indicate rural development in San Luis Obispo has followed a pattern of urban sprawl. Given that a majority of new parcels created in the agriculture land

use category over the past 20 years have been a direct result of cluster subdivision, the current ordinance can be said to have contributed to the County's urban spatial expansion. Meanwhile, studies show that urban sprawl is very costly. Nationwide projections by Burchell et al (2002) show that more compact development from 2000 to 2025 can save local governments: 11 percent, or \$110 billion from road-building costs over 25 years; 6 percent, or \$12.6 billion from water and sewer costs over 25 years; and 3 percent or \$4 billion from annual operations and service delivery. In addition, studies show that worker productivity and local and regional economic performance are associated with, and may even be improved by, more compact development patterns, vibrant urban centers, and efficient public transportation systems.

4. The proposed amendments would reduce the cost of providing public infrastructure and services. The costs of public road construction and maintenance, urban scale and waste-water systems in rural areas, and provision of other public services (e.g. schools, emergency, and safety) are reduced by minimizing the distance and dispersion of public good provision. First, by limiting cluster subdivisions to properties within 2 road miles of URLs, public goods and services do not have to be extended as far from the County's various urban cores. Simulation exercises by Speir and Stevenson (2000) show that the costs of providing services increase by 3 percent from a doubling in distance. The proposed amendments also reduce tract dispersion by requiring physical contiguity of lots, reducing the costs in public good provision associated with tract dispersion. Speir and Stevenson (2000) also show that service provision costs increase by 6 percent from a doubling in tract dispersion.

5. The proposed amendments will have little to no impact on the overall economy. Despite enhancing agricultural productivity, the proposed amendments will have little to no impact on the overall economy. This is due to the fact that agriculture comprises a relatively small sector of San Luis Obispo's current economy (in terms of value-added product or GDP). Through the proposed changes to the Agricultural Cluster Subdivision Program, the County gives rural landowners similar development opportunities as the current ordinance, but influences that development in such a way that the new developments conserve

resources shared by agricultural and non-agricultural residents, and minimizes the cost to government and society at large. However, in the long-run the social and economic costs of rural sprawl may outweigh any short-term economic benefits. Nonetheless, the proposed amendments are beneficial compared to the existing ordinance.



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lisa wise consulting, inc.

planning

economics

natural resources

Memo

To: Airlin Singewald, San Luis Obispo County Department of Planning and Building

From: Lisa Wise Consulting, Inc.

Date: December 15, 2010

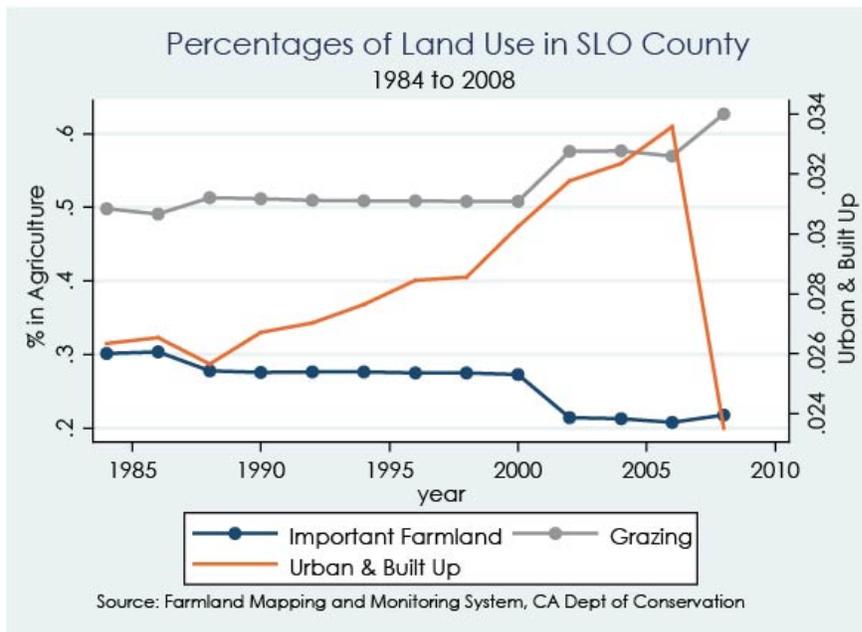
Re: SLO County Ag Cluster 2006-2008 Land Use Data

Why the Carrizo Plain area survey of land use is excluded in the San Luis Obispo County Ag Cluster Economic Study:

585,367 acres in the Carrizo Plain area were added to the San Luis Obispo County Survey of land use between the 2006 to 2008 surveys. From 1984 to 2006, the total land area in the County inventoried by FMMP was just slightly over 1.3 million acres; the addition of the Carrizo Plain area increased the total land area inventoried to almost 1.9 million acres (89%).

As can be seen in the figure below, the addition of the Carrizo Plain area results in a slight uptick in the proportion of land devoted to agriculture between 2006-2008, and a substantial decline in the fraction devoted to urban uses.

Table 1. Percentages of Land Use in SLO County, 1984 - 2008



However, the change in land use between 2006-2008 shown in the figure does not necessarily reflect a true change in the pattern of land use in the County. Table 1 of the Economic Study draft is adjusted to reflect a relatively constant total area of land inventoried between 1984-2008. As can

be seen from Table 1 in the draft, the overall pattern of decline in land devoted to agriculture and increase in urban and grazing uses continues to 2008 when the Carrizo Plain area is excluded.

A more careful study is needed to fully understand the determinants of land use changes in the County. Such a study would involve developing and estimating a statistically robust econometric model that takes into account several variables: quality of land, land use profitability, and prevailing local economic conditions, among other things. Between 2006-2008, the economic recession clearly affected the profitability of various land uses in the County.

For a more concrete example of a study on the determinants of land use changes, see the first-order Markov chain model estimated in the following paper from the US Dept of Agriculture Economic Research Service:

http://foragforum.rti.org/documents/lubowski_landuse-paper.pdf

Thus, LWC excluded the Carrizo Plain area in Table 1 of the Economic Study and kept constant the total area of land inventoried between 1984-2008. Allowing for the additional land inventoried would require a more thorough investigation of the determinants of land use changes in the County, which is outside the scope of the Economic Study.

Memo

To: Airlin Singewald, San Luis Obispo County Department of Planning and Building

From: Lisa Wise Consulting, Inc.

Date: December 15, 2010

Re: SLO County Ag Cluster and Economic Impacts of Paso Robles' Wine Industry

Why the Ag Cluster Economic Study did not compare or include findings from the economic impact of Paso Robles' wine industry at: http://www.pasowine.com/media/economic_impact.php

The goal of an economic multiplier analysis is to trace the effects of changes in final demand on economic activity in a particular region over some period of time. Input-output models to derive economic multiplier impacts, of the type used in the Paso Robles wine study, have been shown to produce unstable estimates, across various model specifications, over time as new data becomes available, and other conditions.

Empirical economists have struggled with the question of whether the multiplier is robust to richer and more realistic input-output structures. The main concern is that the feedback effects of the economic impact can be "too large" and "inflated," and may not hold in practice. Analytical contributions in this area of economics have shown that estimates of the multiplier generally tend to be biased, and that sufficient conditions must be established to avoid this statistical bias. A number of caveats to input-output analysis particularly applies to the estimate of the economic impact of Paso's wine industry. For instance, one could result in a large estimate of economic impact because of:

1. an actual small multiplier (estimated coefficient) but a large amount of exports of wine. If Paso wine production is consumed outside the state (per the defined geographic region in this study), it would mechanically lead to an inflated estimate of the economic impact.
2. alternatively, minimal exports of wine from Paso and a large estimated coefficient/multiplier.

Thus, under either scenarios of an actual small multiplier/coefficient (but large wine exports) or large coefficient (but small exports), you would get a large inflated estimate of the multiplier.

In addition, simple algebra tells us one cannot divide by zero. Without going further into the technical details of estimating multiplier coefficients, one essentially has to assume a POSITIVE multiplier simply to invert input/output matrices. Thus, a major issue in input/output economic impact studies is that one is essentially assuming one's finding (there is a non-zero multiplier or feedback) for empirical tractability.

The most reliable and standard measure of economic activity is GDP, the FINAL value-added product. This is why LWC focus our analysis on local GDP.