

LAND USE COMPARATIVE STUDY
Prepared for the Los Alamos Community

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Northern New Mexico*

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Introduction

This report presents information about how five communities, Los Alamos/White Rock, Santa Fe, Boulder CO, Davis CA, and Livermore CA, have allocated urban lands. The study has assessed typical land uses, such as residential, commercial, industrial, public/community facilities, agriculture, parks and recreation, and open space in each community. In addition to assessing open space, the study has also collected information on trail maintenance, and when available, forest fire fuel mitigation in the City owned open space lands.

The data sources used in the report vary, from zoning data, to existing land use data, to land use assessments from comprehensive community plans. All land use measurements done by the University of California for this study have used Geographic Information System (GIS) data. Summarizing land use polygons is accurate and efficient in GIS, while manual measurements of land use maps would take considerable time and introduce more potential for error. Trail and fuel mitigation information have been provided by city staff.

Some data sources generate gross measurements, meaning public roads are included in the land use categories. Other sources are parcel based, where roads are not included in the assessments. Only one community, Livermore, had already quantified land use acreage, and this information has been added to the report. Durango has not yet digitized its land use maps, so analysis by GIS was impossible. Flagstaff does have GIS data, but was unwilling to provide the information.

Both acreage and percentage measurements are provided in the report. Percentage measurements mitigate the differences between gross and parcel based measurements, and helps make more accurate comparisons among the different communities.

Limitations

The accuracy of the study is influenced by several factors. The information has been obtained through the communities and its accuracy has not been verified by UC Davis. As each community can characterize land differently and to a greater level of detail than that used in this study, land use assumptions were necessary in order to categorize and compare the 9 categories of urban lands used in this report. (Santa Fe for example, has

62 land use categories in its zoning data.) This requirement to combine and simplify land use categories is a possible source of error. To minimize error, all assumptions were done by the same person using similar criteria. Familiarity with a study community by UC Davis, (Los Alamos/White Rock, Davis, and Santa Fe are the most known communities) has helped improve accuracy in categorizing lands.

Each community studied has commercial/research/industrial/educational campuses that impact the community yet are independent of the local jurisdiction. (Examples include the Los Alamos National Laboratory and the University of California at Davis.) These lands are not included in the GIS data sets and as a result, are not reflected in the calculations.

Open Space Land Use Definitions

While most of the land use categories are readily defined, open space classification is often more complex with multiple meanings to different audiences. Some open space land use definitions we have encountered include narrow corridors along freeways, golf courses, agricultural lands, as well as parking lots, in addition to wild and natural lands. In this study, lands to be included as open spaces must meet the following three criteria:

1. The open space must have minimal development and be primarily in a ‘natural’ state. (This criterion excludes golf courses, urban parks, and recreational complexes.)
2. Open space lands must be within or near the City or community limits. (A distance has not been set, yet distances of up to 4 miles have been included in the study.)
3. The open space lands must be owned by a city or town (not under state, federal, or private ownership) and be suitable for public access. (Some open space, such as Santa Fe’s watershed and reservoir, is closed to public use and not included in the data.)

Most of the communities in this study have accessible federal or state lands nearby. However, as these lands are not owned by the city or town, they are not included in the calculations provided in the Land Use Summary. This criterion allows a more realistic assessment of the open space under a local government’s responsibility.

Land Use Categories

- Residential, rural/very low density: Assumes a single family home on an acre or larger parcel.
- Residential, low to medium density: Includes residential development up to 7 dwellings per acre.
- Residential, high density: Every residential land use beyond 7 dwellings per acre.
- Commercial: Includes retail, office, research & development lands.
- Industrial: Combines light and heavy industry

- Community/public: Includes schools, libraries, government facilities, corporation yards, wells, etc.
- Parks and Recreation Facilities: All urban parks, golf courses, equestrian facilities, community centers, etc.
- Agriculture: Land that is zoned for or used to produce food and/or fiber.
- Open Space: Open space lands included in the report have met all of the following criteria:
 1. The open space must have minimal development and be primarily in a 'natural' state.
 2. Open space lands must be within or near the City or community limits.
 3. The open space lands must be owned by the city or town and be suitable for public access.

Land Use Summary

The greatest land use percentage spread occurs in the category of open space. Boulder's open space represents about 24.4% of its urbanized land. Livermore is the lowest, with open space representing 2% of all urbanized land. Commercial and industrial lands have the next highest spread, with 28.7% of Livermore's urbanized lands dedicated to commercial/industrial uses. At 3.5%, Los Alamos/White Rock has the lowest percentage of commercial/industrial lands. The third greatest spread is in community facilities. Davis has the lowest percentage of 2%; while Los Alamos has the highest at 19.5%.

For a complete summary see the attached Land Use Summary table on the last page of this report.

Open Space Data Considerations

Santa Fe has about 3,189 acres of public open space. Of this amount, the largest single block of 2,403 acres, the North West Quadrangle, has recently been closed indefinitely due to public misuse. Most of the remaining accessible open space under city ownership is along Canyon Road towards the reservoir. (The reservoir and surrounding watershed is not available for public use and not included in the data.)

All the open space and mountain park acres listed for Boulder are owned by the City of Boulder. Open space lands in other ownerships are not included, even though they may be located within or nearby urban development. Most of Boulder's open space, roughly 75%, falls within a two mile zone from the edge of urban development.

While Los Alamos has about 3,900 acres of open space within the townsite planning areas, there is considerably more open space owned and managed by other jurisdictions nearby. The following acreage estimates are very approximate and are based on public accessible lands that are within a 4 mile distance from the outer edge of the Los Alamos and White Rock townsites. (D.O.E. lands are not included as the publicly accessible areas are not defined on our database.)

Bandelier: 800 acres
Forest Service: 43,000 acres

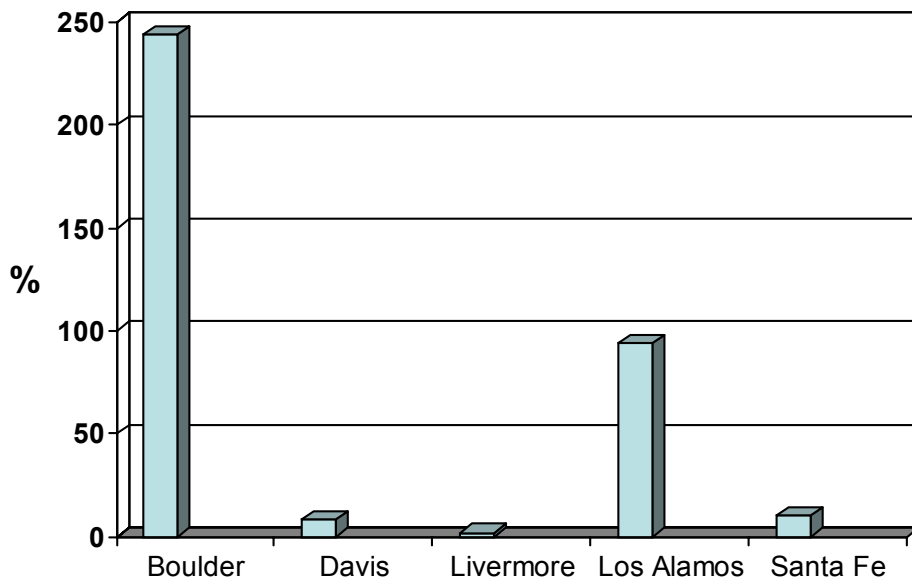
Four transfer sites have been included in the Los Alamos open space land use data, pending other classifications by the community. The sites are Airport East, Airport West, DP Road West, and WR State Road 4. Based on information available to us, we have estimated that these sites represent up to 194 acres.

Examples Using the Information

The following charts illustrate several analyses that are possible with the data.

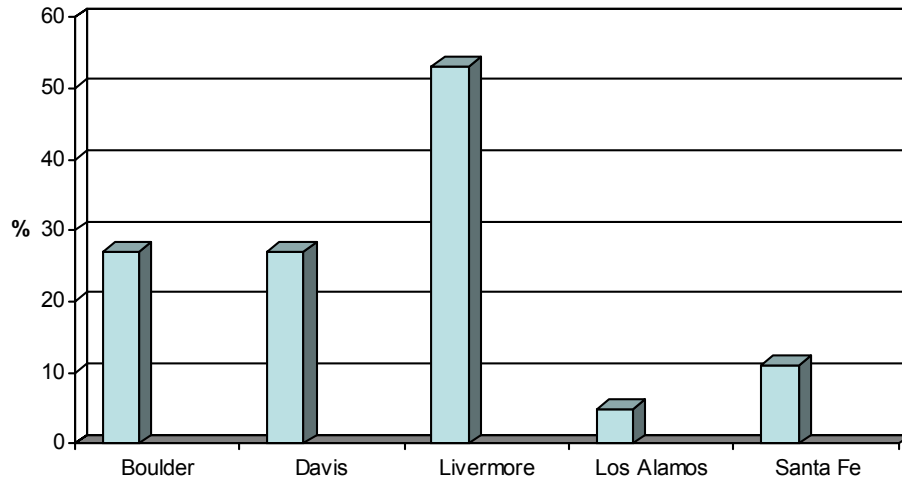
Open space acreage percentages vary considerably in the study communities. The following table compares open space as a % of all urbanized land within each community. (Urbanized land is land used for or planned to be used for urban development and does not include open space.)

TABLE 1: OPEN SPACE AS A % OF URBANIZED LAND



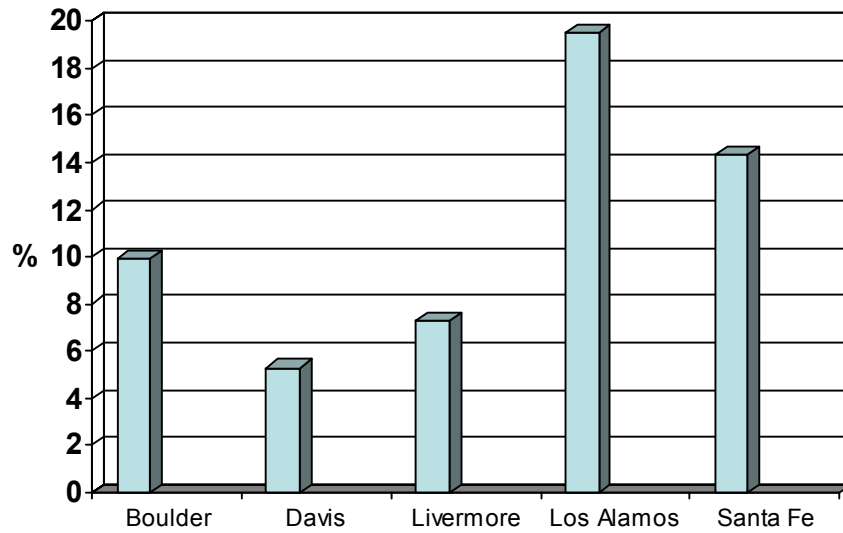
Communities also have different mixes of urban lands. Some lands, such as commercial and industrial, can provide jobs and create revenue. Residential lands require public services which may or may not be fully compensated by the residential uses. The follow chart compares commercial/industrial lands as a percentage of residential land.

TABLE 2: COMMERCIAL/INDUSTRIAL LANDS AS A % OF RESIDENTIAL LANDS



Community facilities, meaning fire stations, schools, libraries, government offices, service facilities etc. occupy a greater percentage of urbanized land in the New Mexico communities than they do in the other study cities.

TABLE 3: COMMUNITY FACILITIES AS A % OF URBANIZED LANDS



Other Data Collected

In addition to gathering land use information, questions regarding trail maintenance costs and urban interface fire/fuel mitigation costs were asked of each community. Durango and Flagstaff have relied on volunteers to maintain trails in open space lands. Davis is in the process of developing costs for unimproved trail maintenance. The Regional Park District, not the City of Livermore, manages nearby open space and the wildland trails. Santa Fe has a small crew that maintains open space areas, and the City also retains the youth conservation corps for trail and open space upkeep. However, the City has not developed a budget figure for open space and trail maintenance. Staff did mention that capital costs for new trail development have not included trail maintenance costs, which has been an issue.

Boulder has about 140 miles of designated trails within its 43,000 acre open space system, and has considerable experience in trail maintenance. Because of current budget constraints, a 10 person staff maintains the open space system, including trails and fuel mitigation. From Boulder's experience trail maintenance costs are subject to a host of variables; and a mile of trail could require a couple of volunteers spending 40 hours per year plus \$200 in replacement materials (road base or crusher fines), or a team of 8 to 10 volunteers and spending several thousand dollars per year in replacement materials. Boulder anticipates that its wildland trails will need some degree of intense maintenance every 5 to 10 years. Yet local trail conditions, design and construction ultimately affect maintenance costs. Factors to consider that can affect maintenance costs include:

- Soil types and changes in soil conditions along the trail.
- Topography, with slopes often involving more costs than flat terrain
- Adjacent vegetation and degree of invasive species.
- Weather conditions and drainage, with improper drainage one of the major cost factors.
- Degree of use.
- Multiple users, such as horses, bicycles, and pedestrians.
- Finally, trail design and construction will likely have a greater maintenance cost impact than trail use.

Urban interface fire/fuel mitigation costs are not pressing issues in Davis or Livermore. Boulder's 10 person crew also does fuel mitigation in urban interface zones. Two trucks and a used \$10,000 chipper constitute the major equipment. Staff is paid \$15-\$25/hr plus 20% benefits. Flagstaff provided the most detailed budget information, as follows:

- \$350/ acre for selective thinning
- \$50/acre for prescribed burning.
- Chipping as a replacement for burning would raise the cost to \$100 to \$150/acre.

Application of the Land Use Information

The data does provide interesting comparisons that can inform discussions and generate more questions or require additional research. It is interesting to see that Boulder and Los Alamos/White Rock have considerably greater percentages of open space than the other communities. Some open space differences could be attributed to geography and land use history; others to local quality of life preferences and available open space administered by other jurisdictions. Davis is surrounded by industrial agriculture, and has little existing ‘natural’ open space available. Livermore residents have access to nearby open spaces administered by the State and a regional park district. Boulder and Los Alamos link quality of life to generous open space access. However, the role of open space and quantity of wildlands that contribute to social, economic, and environmental health is not addressed by the data.

Other economic and social indicators may be suggested by the information. As per Table 2, Boulder, Davis, and Livermore have higher ratios of income generating lands to residential lands than does Los Alamos/White Rock or Santa Fe. As residential lands can consume more service costs than they support, smaller percentages of income generating lands could result in local economic, fiscal, and social services impacts.

Finally, cost estimates for trail maintenance and fuel mitigation, may or may not be suitable for conditions in Los Alamos.

LAND USE SUMMARY

LAND USE	Boulder, CO		Davis, CA		Livermore, CA		Los Alamos, NM	Los Alamos, NM	Los Alamos	Santa Fe, NM		
	acres	%	acres	%	acres	%	Townsite	White rock	combined sites	%	acres	%
Residential												
Rural & very low density	2,054		-		293		11	935	946			
low to medium density	7,722		2,526		4,791		1,075	576	1,651		19,349	
high density	676		478		1,460		188	3	191		1,346	
Subtotal Residential	10,452	59.3%	3,004	65.5%	6,544	54.6%	1,263	1,514	2,777	63.5%	20,695	66.8%
Commercial	747	4.2%	711	15.5%	761	6.3%	115	26	141	3.2%	1,576	5.1%
Industrial	2,041	11.6%	114	2.5%	2,683	22.4%	11		11	0.3%	774	2.5%
Community Facilities	1,753	9.9%	245	5.3%	871	7.3%	707	144	851	19.5%	4,415	14.3%
Parks & Recreation	2,638	15.0%	512	11.2%	1,135	9.5%	310	285	595	13.6%	3,502	11.3%
SUBTOTAL URBANIZED LANDS	17,631	100%	4,586	100%	11,994	100%	2,406	1,969	4,375	100%	30,962	100%
Agriculture	25				911						253	
Public Open Space	43,000		350		218		2,656	1,323	4,103		3,189	
TOTAL ACRES	60,656		4,936		13,123		5,062	3,292	8,478		34,404	

Population, Housing, Economic, and Environmental Comparisons

	Boulder	Davis	Livermore	Los Alamos	Santa Fe	Durango	Flagstaff	US Average	
Population	94,673	66,022	75,202	18,343	80,337	13,922	55,137	n/a	Census 2000
Per capita income	\$ 27,262	\$ 22,552	\$ 32,468	\$ 34,646	\$ 22,577	\$ 19,352	\$ 18,637	\$ 21,587	Census 2000
Cost of Living Index	132.8	139.9	167.2	146.8	155.3	113.4	117.4	100	bestplaces.net
Households	46,789	24,278	26,680	7,497	33,274	5,492	19,355	n/a	Census 2000
Housing Units	48,218	24,973	27,188	7,937	36,482	5,819	21,396	n/a	Census 2000
Rental Housing Units	21,425	13,507	7,286	1,603	12,987	2,650	10,002	33%	Census 2000
Median Home Purchase Cost	\$ 219,810	\$ 238,550	\$ 301,940	\$ 274,870	\$ 298,840	\$ 172,160	\$ 153,380	# \$ 196,287	This is the value of the year's most recent home sales data (January to December, 2000). The median home price is the middle value when you arrange all the sales prices of homes from lowest to highest. bestplaces.net
Home Cost Index	188.9	205	259.5	236.3	256.9	148	131.9	100	The overall Cost of Housing Index, which includes home cost, apartment rents, and property tax. Patterned after the Cost of Living index, the national average is 100. An index of 150 would mean a housing cost 50% higher than the national average. bestplaces.net
Property Tax Rate	9%	11%	12%	5%	5%	9%	9%	16%	The property tax rate shown here is the rate per \$1,000 of home value. If the tax rate is \$14.00 and the home value is \$250,000, the property tax would be \$14.00 x (\$250,000/1000), or \$3500. This is the 'effective' tax rate. bestplaces.net
Income Tax Rate (State/Local)	5%	6%	6%	7%	7%	5%	4%	5%	The total of all income taxes for an area, including state, county and local taxes. Federal income taxes are not included. bestplaces.net
Sales Tax Rate	8%	8%	8%	6%	6%	6%	7%	6%	The total of all sales taxes for an area, including state, county and local taxes. bestplaces.net
Future Job Growth	29%	13%	14%	0%	31%	26%	15%	11%	The projected change in resident job availability over the next ten years based on migration patterns, economic growth, and other factors. bestplaces.net
Water Quality Index (100=best)	100	47	32	76	73	58	57	49	A measure of the quality of an area's water supply as rated by the EPA. Higher values are better. The EPA has a complex method of measuring the watershed quality, using 15 indicators such as pollutants, turbidity, sediments, and toxic discharges. bestplaces.net
Air Quality Index (100=best)	35	33	13	95	21	59	18	33	The Air Quality index is based on annual reports from the EPA. Higher values are better. The number of ozone alert days is used as an indicator of air quality, as are the amounts of seven pollutants including particulates, carbon monoxide, sulfur dioxide, lead, and volatile organic chemicals. bestplaces.net