Land Use 2008 Baseline

Utah Land Use

As Utah's population continues to expand, the number of developed acres across the State also expands. This analysis looks at developed land throughout the state in an effort to determine broad patterns of land use. The main focus of this analysis follows previous baseline studies by looking at residential, commercial, and agricultural lands. The analysis also projects land use to 2030.


Houses in Daybreak.

Sources and Assumptions

The two primary data sources for the analysis came from the Utah Division of Water Resources "Water-Related Land Use" map layer, and the Utah Department of Transportation (UDOT) Statewide Travel Model.

The Water-Related Land Use layer uses GIS, field surveys, and remote sensing technology to determine land use across the state. Agricultural and developed lands were extracted from this data. Because the data were compiled over the course of several years, some regions have data from as recently as 2007, while data from other regions were from as far back as 2003. To rectify this, regions with data prior to 2005 were manually updated using aerial photography from 2006 to ensure that major developments were included. These updated developments were then subtracted from the agricultural lands data. In the updated map layer, the oldest data is from 2004 from the Sevier River Basin (a region that is growing relatively slowly), all other data is post-2005 and as recent as 2007. Developed areas include all areas that are not in a natural or agricultural use. Developed land includes such large landscape features as Kennecott Copper mines and tailings, sewer ponds, and golf courses; however, many small disturbances such as oil drilling pads may not be captured.

The Statewide Travel Model was created by UDOT in cooperation with Wilbur Smith Associates. The model divides the State into Traffic Analysis Zones (TAZ), small areas designed for traffic analysis. Each TAZ contains data, such as population and employment projections that are designed to assist transportation planners in anticipating infrastructure needs. Metropolitan Planning Organizations (MPOs) such as the Wasatch Front Regional Council (WFRC) have been using TAZ in their regional planning efforts for many years, however, this is the first time that such an analysis has taken place on a statewide basis. Because of this impressive effort, it is possible to analyze population and employment data across the state, and then make projections out to 2030. Because the most recent data for these zones are from 2005, that is the year that was analyzed as the baseline year. The 2003

Land Use Highlights

- Over 1244 square miles of developed land statewide.*
- Over 4,321 square miles of agricultural lands.
- Average of 3.2 people per developed acre statewide.*
- Estimated to add up to 898 sq. miles of developed land by 2030. †
- Estimated more than 310 sq. miles of agricultural lands consumed by 2030 to development.

* "Developed Land" includes commercial and industrial uses, this means that the average density for residential areas would be significantly higher than 3.2 people per acre.
† Assuming people per developed acre remains the same.

baseline used data from 2000, and so 2005 still follows the five-year pattern.

Classification

Using population and employment data from the Statewide Travel Model, clipped to only include developed areas, population was subtracted from total employment. Areas that had more employment than population were classified as Commercial, and those that had less employment than population were classified as Residential. If an area had equal employment and population it was assumed to be residential.

The residential zones were classified as Urban, Suburban, or Exurban.

Urban = more than 10 people per acre

Suburban = between 3 and 10 people per acre

Exurban/Rural = fewer than 3 people per acre

The Commercial zones were classified as Dispersed and Concentrated.

Concentrated = more than 10 jobs per acre

Dispersed = fewer than 10 jobs per acre.

Agricultural Zones were based on remotely sensed data from the Division of Water Resources and is typically irrigated crop or pasture land, and does not include rangelands.

These classifications are keeping with the same assumptions and methodology used in the 2003 baseline, however, the data are much less coarse, which may result in more jobs or people per acre in some of the larger traffic analysis zones on the periphery that were clipped to development. Because the geography of analysis was a Traffic Analysis Zone (TAZ) and not parcel level, some errors are inherent to the data. For instance, the TAZ was analyzed by numbers, not by land area. This means that even if industrial activities occupy the bulk of the land *area* in the TAZ, it may still be labeled residential if the *population* in the zone is greater than the number of jobs.

Baseline Land Use

From the most current data, it is estimated that there are over 1244 square miles of developed land in the state of Utah. Over three times that amount of land is in agricultural uses, over 4231 square miles. Overall, the more rural counties had a much higher amount of land in agricultural uses and a much lower amount of developed land; however, Cache and Utah Counties both had significantly more land in agriculture than in development. San Juan County had the highest agriculture to developed land ratio. Only three counties, Salt Lake, Davis, and Weber had more developed land than agricultural lands. Piute County had the least amount of developed land, and Salt Lake County had the most developed land.

Projections to 2030

While making precise projections on land use and development patterns over twenty years into the future may not be possible, it is possible to show illustrations of what the future may look like based on trends and population projections. Using the projections from the Statewide Travel Model, the entire state was analyzed to see which areas may show the most growth by 2030.

With a current figure of over 796,650 acres of developed land in the state (including commercial), it is estimated that there are an average of 3.2 people per developed acre in this state. At that rate 575,000 acres, or nearly 900 square miles of new land would need to be developed to keep up with population projections for 2030. That would increase the amount of land developed in the state by nearly 75%. This estimate, however, probably represents the high-end in many areas of the State. Many of the developed areas will use in-fill practices, newer developments are likely to be denser in design, and many of the current large-scale industrial land uses such as Kennecott Copper Mines are unlikely to be replicated at the same scale elsewhere in the state during the next twenty years. Furthermore, many newly developed areas will utilize existing infrastructure, public buildings, and commercial areas.

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This will mean that overall the population per developed acre should increase, leading to less land consumption.

In order to illustrate what the state may look like in 2030 based on population projections from the Statewide Travel Model, growth was modeled for each individual TAZ based on projected population at the average density per developed acre by county. Using this methodology, 493,000 acres were added to the current developed land proportionally to the zones that are projected to see the most growth. This adds nearly 82,000 fewer acres than would be added if growth were to continue to consume the same amount of land as in the past, a 16% decrease overall. This decrease in projected land consumption is most pronounced in more urban counties that are likely to increase densities as available land becomes increasingly scarce and in areas that have been historically rural with extremely low densities that are likely to increase to more closely match the statewide average as growth continues.* The resulting developed land projection was then mapped and analyzed based on the projections for the year 2030 from the Statewide Travel Model. Each zone was then classified using the previously mentioned classification scheme to show projected residential and commercial zones.

While the mapped projections and corresponding analysis of development types and agricultural land consumption are likely representations of 2030, it is also useful to consider what 2030 would look like if population densities remain stable. Considering that trends over the past twenty years in Salt Lake, Cache, and Washington Counties show that the population per developed acre (PPDA) has remained relatively stable (see Appendix I), this is not outside the realm of possibility. Even though *housing densities* may have been increasing overall, *household sizes* have been decreasing. This means that while houses may be getting closer together, each unit will hold a smaller percentage of the population and more houses will need to be built. In order to show what projected land consumption would be if population per acre densities remain stable, numerical projections in Chart 1 show land consumption values for both the mapped values (assumes density increase from 3.2 to 3.4 PPDA, county values are estimates) and assuming continued population per acre values (Appendix II outlines the current population per developed acre for each county as well as the projected population per acre values in the mapped analysis).

Development in Cache County.

Agricultural Land Consumption to 2030

The areas that were mapped as developed in 2030 were subtracted from the current agricultural lands layer get an idea where agricultural lands may be converted to development. Bear in mind that when analyzing agricultural land consumption, the maps use the more conservative, higher density, numbers assuming that future growth will likely show an increase in density as land and home values increase. Actual consumption of agricultural lands may occur on a larger scale if the population-per-acre densities remain stable.

Technical Assistance

A special thanks to UDOT, AGRC, Division of Water Resources, and Wilbur Smith Associates for technical assistance and data preparation

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*Only Cache and Davis Counties are mapped at a slightly lower population per acre density than would be projected assuming the population per acre density from 2006 remained stable. Actual land consumption assuming a stable population per acre density would be *slightly* less than what is mapped. In Cache County the population per acre dropped from 3.4 in 1986 to 3.3 in 2006, and is mapped at 3.12 in 2030.(See Appendix I for more information).

Chart 1

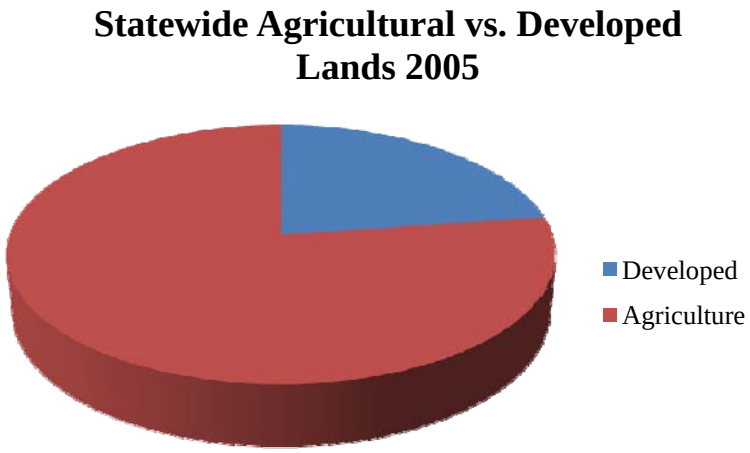
County	Developed Land 2005	Agricultural Land 2005	Projected 2030 Developed (Assuming continued PPA*)	Projected 2030 Developed (Mapped values†)	Projected Agricultural Land 2030 (Mapped values†)
All values in square miles					
BEAVER	15.4	68.9	31.9	18.00	68.0
BOX ELDER	66.0	680.3	101.0	79.00	669.0
CACHE	50.0	278.5	86.1	91.00	241.0
CARBON	18.7	23.5	25.9	23.00	22.0
DAGGETT	8.7	22.4	10.6	9.00	22.0
DAVIS	90.8	38.4	123.7	125.00	12.0
DUCHESNE	20.0	227.9	27.6	24.00	225.0
EMERY	13.7	100.0	17.2	15.00	99.0
GARFIELD	9.8	83.7	14.0	11.00	83.0
GRAND	11.8	13.2	15.5	13.00	13.0
IRON	40.3	169.3	81.3	62.00	160.0
JUAB	9.4	175.4	18.2	12.00	174.0
KANE	12.7	31.7	21.1	15.00	31.0
MILLARD	30.5	414.7	45.4	34.00	412.0
MORGAN	7.8	27.1	21.3	18.00	21.0
PIUTE	2.9	45.6	3.6	3.00	45.0
RICH	11.5	158.7	15.4	12.00	159.0
SALT LAKE	283.1	53.3	417.3	344.00	25.0
SAN JUAN	11.9	280.0	13.5	13.00	280.0
SANPETE	31.1	261.3	43.5	35.00	258.0
SEVIER	17.6	116.0	22.2	20.00	114.0
SUMMIT	45.9	73.5	103.7	74.00	65.0
TOOELE	79.9	164.1	176.1	107.00	144.0
UINTAH	29.8	190.2	43.7	40.00	182.0
UTAH	139.0	309.8	265.2	251.00	235.0
WASATCH	18.9	36.0	43.8	23.00	33.0
WASHINGTON	66.4	77.2	204.7	148.00	52.0
WAYNE	5.4	33.5	7.2	6.00	33.0
WEBER	95.9	77.8	142.5	135.00	46.0
Statewide	**1244.00**	**4232.00**	**2142.5**	**2015.00**	**3922.00**

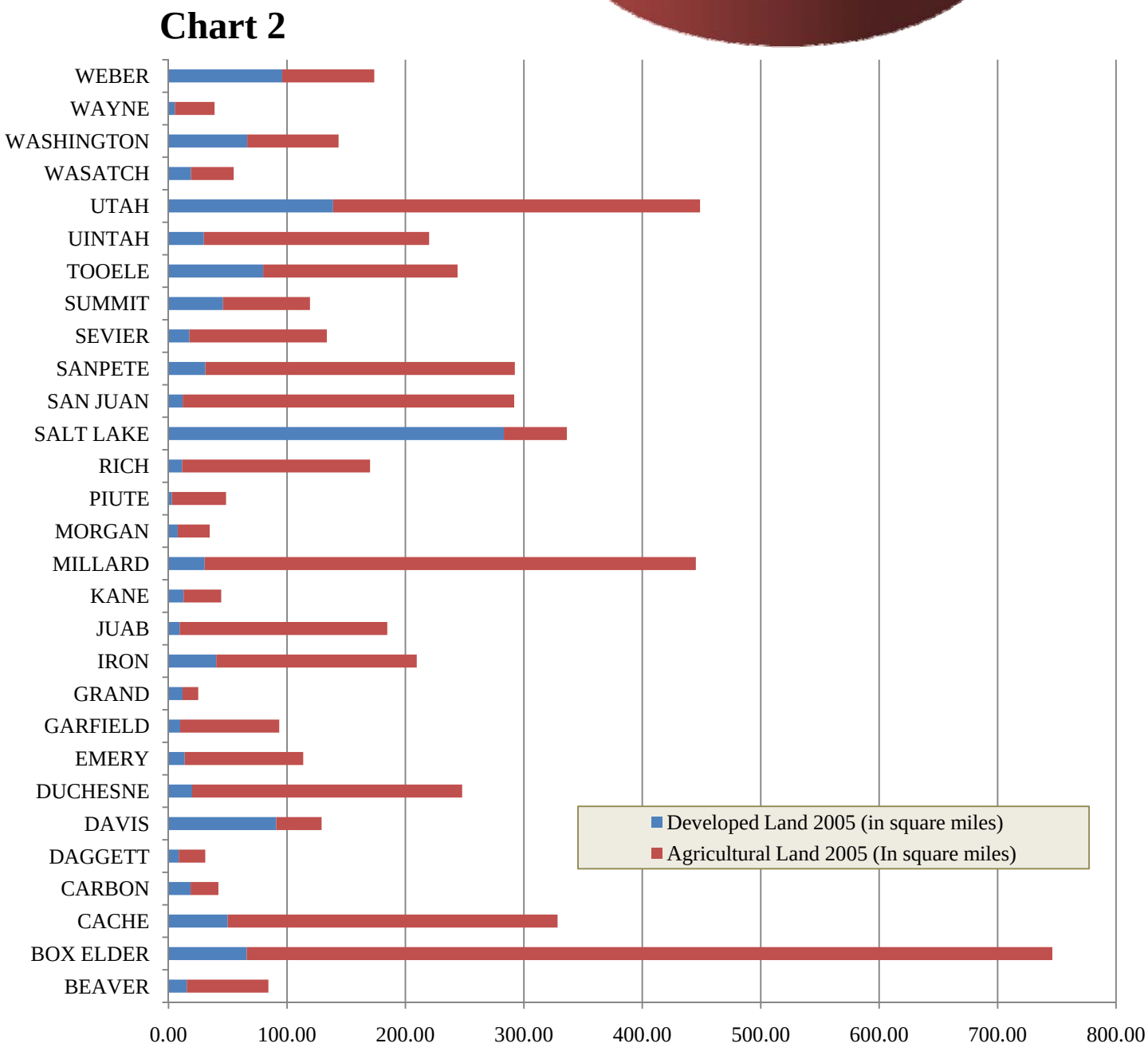
*Assuming a continued statewide development rate of people per developed acre

†See "Projections to 2030" section of the text for more information on the difference between mapped values and numerically projected. Individual county projections are estimates.

Developed Land vs. Agricultural Land

Much of the development in Utah will happen by converting agricultural land uses into residential or commercial uses. This is especially true in the rapidly urbanizing areas on the metropolitan fringe. Available land in close proximity to employment and infrastructure make these areas especially attractive to future growth.





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Estimated Statewide Agricultural vs. Developed Land 2030

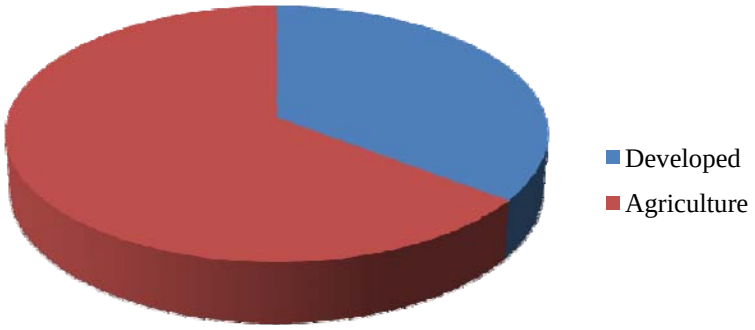

Chart 3