# Drivers of Urban Water Use

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## Goal

- To develop water demand models for four common urban land use types based on climate, demographic, and built environmental variables.
- To identify the major drivers of urban water use in Salt Lake City.

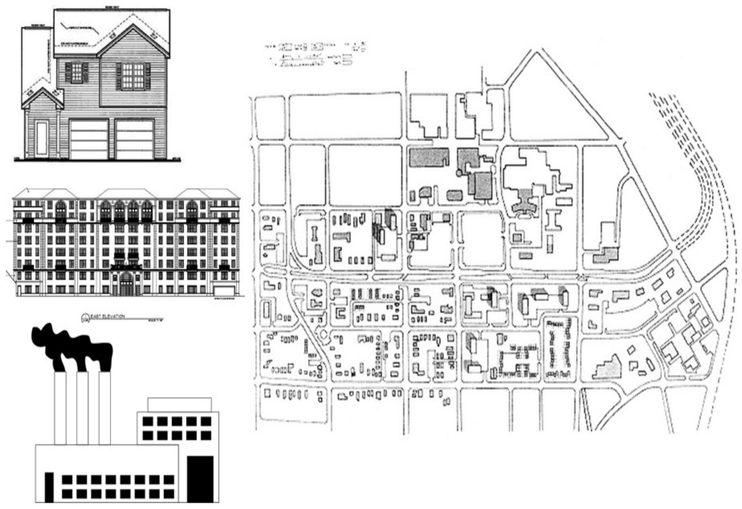

Figure 1. Modeling Urban Land Use Types

## Research Methodology

- We obtained parcel level water use data for Salt Lake City n=64,000.
- We added built environmental and demographic variables to each parcel based on the tax assessor's database. We added climate data from PRISM database, and canopy and turf cover from remote sensing to all parcels.
- Linear regression models showing the effect of variables on annual water use.




Figure 2. Data sources and Unit of Analysis

## Results

- Importance of the Built Environment: lot size, number of bedrooms and kitchens, and year built all significantly affect water use.
- Demographic variables contribute very little for water use in any of the urban land use types.

| Variable | B | St. Error | Sig | Tolerance |
|---|---|---|---|---|
| | | Climate | | |
| Constant | 76932983.68 | 18759873.38 | 0.000 | |
| Temperature Max | -39330.492 | 9765.838 | 0.000 | 0.512 |
| Precipitation | -5491.686 | 1868.073 | 0.003 | 0.512 |
| R2 | | | | 0.04 |
| | | Climate with Built Environment | | |
| Constant | -601816.939 | 53435.701 | 0.000 | |
| Precipitation | -1295.477 | 857.462 | 0.132 | 0.969 |
| Number of Units | 9455.128 | 498.185 | 0.000 | 0.919 |
| Number of Stories | 328361.585 | 81611.416 | 0.00 | 0.976 |
| Year Built | 9742.122 | 2932.757 | 0.001 | 0.921 |
| R2 | | | | 0.627 |
| | | Climate with Built Environment and Demographics | | |
| Constant | -474022.429 | 93357.614 | 0.000 | |
| Precipitation | -1396.561 | 843.402 | 0.099 | 0.968 |
| Number of Units | 11449.890 | 773.416 | 0.000 | 0.368 |
| Number of Stories | 361337.340 | 80829.309 | 0.000 | 0.961 |
| Year Built | 10210.915 | 2886.230 | 0.000 | 0.919 |
| Final Value | -0.101 | 0.030 | 0.001 | 0.367 |
| R2 | | | | 0.634 |

Figure 3. Demand Models for Apartments

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