Improve the accuracy and precision of property appraisal valuations

§sas
THE POWER TO KNOW®

Business Impact

We needed unbiased support to analyze our volumes of data, and SAS was the obvious choice.

Marcus Kinrade, Wake County Revenue Director

Challenges

- **Overextended resources.** Maintaining accurate measures of every factor on every property is time consuming and cumbersome.

- **Time-consuming and expensive valuations.** The reevaluation process can be lengthy, so many communities only reassess property values every four or more years.

- **Appraiser bias.** Values are influenced by appraiser bias as assessor's offices apply tweaks to ensure that houses are valued according to perceptions.

- **Infrequent appraisals.** Appraisals become less accurate over time. Many property owners may be in disbelief when reappraisals are performed and the value of properties change.

- **Settling disputes.** Local governments lose many disputes with property owners and, therefore, experience a decrease in collected revenue.

The Issue

Property valuation is a critical function for communities that levy a property tax. Properties need to be assessed fairly so owners are paying their fair share – not too much and not too little – of the total property tax.

In most states, property tax is the greatest source of revenue for a city or county. For taxpayers, it is one of the biggest expenses of owning a property. In all communities, but especially those going through economic expansion or recession, the value of properties changes over time. It can be a shock to property owners when a new assessment is performed and the value of their property dramatically changes.

Local governments are challenged to do more with less, be more responsive to citizens, act in a timelier manner and improve transparency. This is especially true in property assessment because it is one of the few contacts that a government has with all property owners.

Our Approach

Property valuation analytics from SAS help an assessor's office quickly and accurately appraise its residential properties. Our solution enables:

Daily reconsideration of every sale. Thousands of decision trees are run daily using data from property sales. From these decision trees, the algorithms extract the value of every factor for every property.

Factor ranking by importance. The algorithms identify the factors that are most influential in the value of properties.

Reappraisal of all properties. The machine-learning algorithm calculates the value of every property in the community. This allows the assessor's office to understand market trends for homes, neighborhoods or the entire community.

Mapping of all sales. Sales are displayed on a color-coded map, which indicates how close the calculated value matches the true sales price.

Identification of comparable neighborhoods. For every neighborhood, the algorithms identify the five most similar neighborhoods with houses comparable to the subject neighborhood.

The SAS® Difference

With machine-learning algorithms from SAS, the task of appraising properties becomes easier, faster, more accurate and less subjective. An assessor's office can reappraise every property daily, based on the tremendous amount of data collected for every sold property. Perhaps most importantly, the intelligence of the model enables the assessor's office to know the true value of every factor considered for a property, in accordance with other factors present in the property.

- **Advanced regression tree analysis by machine learning** that results in highly refined and objective information.
- **Compatible with all computer-aided mass appraisal systems (CAMA),** the SAS® property valuation model helps an assessor's office quickly and confidently build its report of factors that influence value.
- **Tremendous compute power of SAS** ensures that information for hundreds of thousands of properties can be quickly recalculated daily without disrupting other activities.
- **Clear graphics and reports** provide easy interpretation of information created by the model, including the coefficient of dispersion (COD) and price-related differential (PRD) for every sold property. Reports and graphics also show value trends for every property within a neighborhood and the entire community, including comparable neighborhoods.

Case Study

Situation

The Wake County Revenue Department is responsible for appraising properties for property tax purposes in 15 municipalities, plus unincorporated areas. More than 3,000 parcels are sold each month. Each jurisdiction is a unique area with its own supply and demand trends.

Solution

Wake County turned to SAS to identify changing market trends every day for every property. SAS built cloud-based models for Wake County that consider hundreds of factors and daily property sales to offer timely, objective, highly accurate market forecasts.

Results

The solution enables the assessor's office to:

Review factors that influence value. The information from every sale informs the machine-learning model to create a detailed breakout of values for every factor considered for residential properties. Because factors are interdependent, the model identifies them in order of importance and assesses the value of dependent factors.

Compare neighborhoods. Information collected on every sale is used to identify the five most similar neighborhoods for every neighborhood. Wake County then uses comparable houses in other communities when a comparable home does not exist for a house in its own neighborhood.

Refresh appraisals. Every day the model reruns the information for every residential property that has sold. Running through a thousand or more decision trees daily, it refines its calculations to intelligently identify the most accurate consideration of factors and produces updated appraisals daily.

What if you could ...

Reappraise daily

Reappraise every residential property in your community every day, within minutes?

Identify the most relevant factors

Generate an accurate, daily report that provides detailed insights into the value of every appraisal factor as it relates to other factors?

Compare neighborhoods

Know the five most similar neighborhoods for every neighborhood in your community?

Better defend appraisals

Have objective valuations when defending a disputed appraisal?

Keep pace with market changes

Be more up-to-date on the market trends for your community?

You can. SAS gives you THE POWER TO KNOW®.

SAS Facts

SAS solutions are used in all 50 US states.

SAS helps customers at more than 83,000 sites improve performance and deliver value by making better decisions faster.

SAS has experience with public sector organizations in more than 100 countries.

SAS has expertise in artificial intelligence, offering accurate and fast results to solve problems and improve operations in a variety of sectors.

To contact your local SAS office, please visit: sas.com/offices

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