Urban Data Pioneers

Data Analysis - Blight and Violent Crime

Office of the City Auditor
Office of Performance, Strategy and Innovation
Urban Data Pioneers - Blight and Violent Crime project team

Description of Project

Why we did this project

This collaborative project began with the formation of an Urban Data Pioneers team to analyze blight and violent crime data. This is an important analysis because if data indicated a relationship between violent crime and blight, an investment in blight remediation would have a double benefit. Communities would be improved from having blight removed and crime reduced.

City employees and community leaders believe there are multiple negative factors associated with blighted properties; however, the City of Tulsa has limited funding for addressing blight. Much of the current activity related to blight takes place in areas where grant funding can be used. Due to this restricted focus, there is a possibility of significant blighted properties that have not been identified. This project was primarily aimed at developing a city-wide inventory of blighted properties. The inventory will provide information for developing strategies to address blight on a broader uniform basis.

Tulsa's Urban Data Pioneers program creates multi-disciplinary learning teams of city employees and non-employees to deeply understand problems that can be informed by data analysis. The Urban Data Pioneers program received international recognition in May 2018 through winning the Cities of Service Engaged Cities Award. Tulsa was in a three-way tie with Bologna, Italy and Cali, Columbia for the first place award. Tulsa received $70,000 to further the cause of engaging citizens in solving problems. The blight and violent crime analysis team was one of the teams heavily involved in winning this award.

How we did this project

The project team completed the following actions:

- **Determine project goal**
  The original project goal was to analyze data to determine whether there is a relationship between blight and violent crime. The team mapped known blighted properties in Tulsa and overlaid violent crime occurrences on the same map. The team noticed areas where there was violent crime but no blight on the map. The team determined the reason is there is not a specific process in some areas of the city for identifying and recording blighted properties. This meant a meaningful analysis of the relationship between blight and violent crime could not be done due to insufficient data. The team began brainstorming ideas for how to create a more complete inventory of blighted properties. **(See Exhibit 1)**

- **Network with New Orleans**
  The team interviewed the Director of New Orleans' Office of Performance and Accountability about their BlightStat project. This provided several good ideas for the team to pursue. **(See Exhibit 2)**

- **Gather data**
  The team decided to go into the field to inventory blighted properties in a specific area where there was a high concentration of violent crime but few blighted properties. A web application was developed to provide an efficient and structured way to input data about blight while working in the field. This initial geo-form asked five questions about the property for team members to complete in gathering blight data. The team realized it would take a long time to complete an inventory of the entire city because there were few people working on data gathering.

- **Recruit assistance**
  The team reached out to several City departments asking for help with identifying and entering data about blighted properties. The Police Department provided substantial assistance since they are interested in the team's research on the relationship between blight and violent crime, which impacts their work. The geo-form and web application were updated to make data entry easier for police officers and other city employees to record information about blighted properties. The web application has not yet been placed on the city's website. Employees access the application by entering the website address directly into their smart phone or other device. This provides them direct access to input data. **(See Exhibit 3)**

- **Accountability and partnering**
  Acting on one of New Orleans' ideas, Tulsa formed a BlightStat group that includes City of Tulsa departments, community organizations and citizens. The primary purpose of BlightStat meetings is to discuss performance measures related to blight and track progress toward goals. At the first BlightStat meeting, the participants shared how blight affects the people they serve. It was clear there is a need both within the City of Tulsa and within the community for more data on blight. BlightStat participants worked to identify gaps in defining, identifying and addressing blighted properties. Action items have been identified, and working groups formed. BlightStat meetings continue to be held regularly. **(See Exhibit 4)**

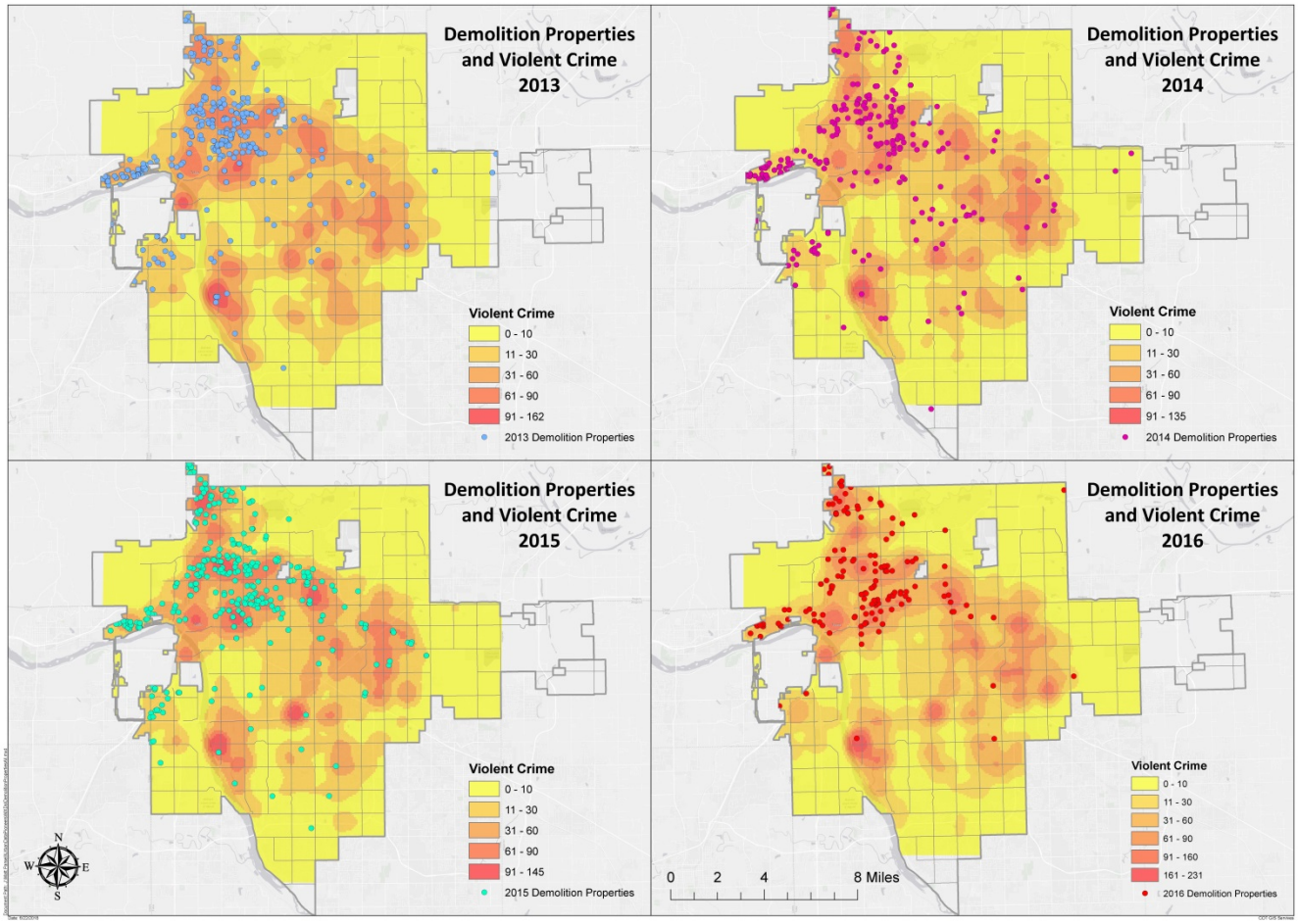
Next Steps

The team is working on a campaign to recruit citizens to add to the blight inventory using the web application.

Potential future analysis/actions that could be supported by blight data:

1. Use data to score blighted properties and prioritize Working in Neighborhoods employees' work based on the scores.
2. Develop criteria for an algorithm that will indicate when intervention is needed to prevent blight or stop it from getting worse.
3. Establish criteria for City of Tulsa investment in blight mitigation and the nature of the investment.
4. Lobby for changes in state laws to streamline how blight is addressed.
5. Increase funding or prioritize existing funds to address blight.

Exhibit 1
Demolition Properties and Violent Crime Maps - 2013-2016



Concentration of red on these maps indicates higher violent crime. The colored dots indicate the location of blighted properties in a condition so poor that they would require demolition. The Urban Data Pioneers team expected to see blight concentration in high violent crime areas. When this was not always the case, the team began to research why. The primary reason turned out to be an incomplete inventory of blighted properties.

Exhibit 2

Summary of interview with Performance and Accountability Director about New Orleans BlightStat

BlightStat is driven by performance measures. Several city departments participate with the Blight-Stat initiative, as well as citizens. Blight Stat meetings are recurring and iterative, focusing on performance measures. New Orleans integrated data from several sources to develop performance measures. Data analysis began using Excel as a tool, and then moved to using scripts written in R programming language.

New Orleans started with post office records. Using the publicly available information that indicates a property where no mail is delivered, New Orleans identified 43,000 potentially blighted properties. The postal service publishes data on their website that includes addresses that have a "No Stat" status, indicating no mail is delivered there.

New Orleans drove cars with attached cameras. New Orleans partnered with University of New Orleans. The project objective was to statistically estimate the number of blighted properties within the initial 43,000 properties identified. New Orleans bought cameras that were mounted to cars. The cameras were geocoded to record property locations, and they take pictures of properties as the car is moving.

New Orleans created an app for citizen use. When a citizen accesses the app, the app randomly shows the citizen one of the photos taken by the car cameras. Citizens then rate how bad they think the property in the photo is. The rating is based on specific questions about the property that are listed in the side bar on the app. The property address is not provided for the rating because New Orleans believes the location may bias citizen scoring. The ratings results allow statistical projections on severity of blight.

New Orleans worked with a Harvard graduate student to develop deep learning. Deep learning is a machine-learning technique. The project objective was to train a computer to detect blight by analyzing an image. The analysis uses the photos taken with the car cameras.

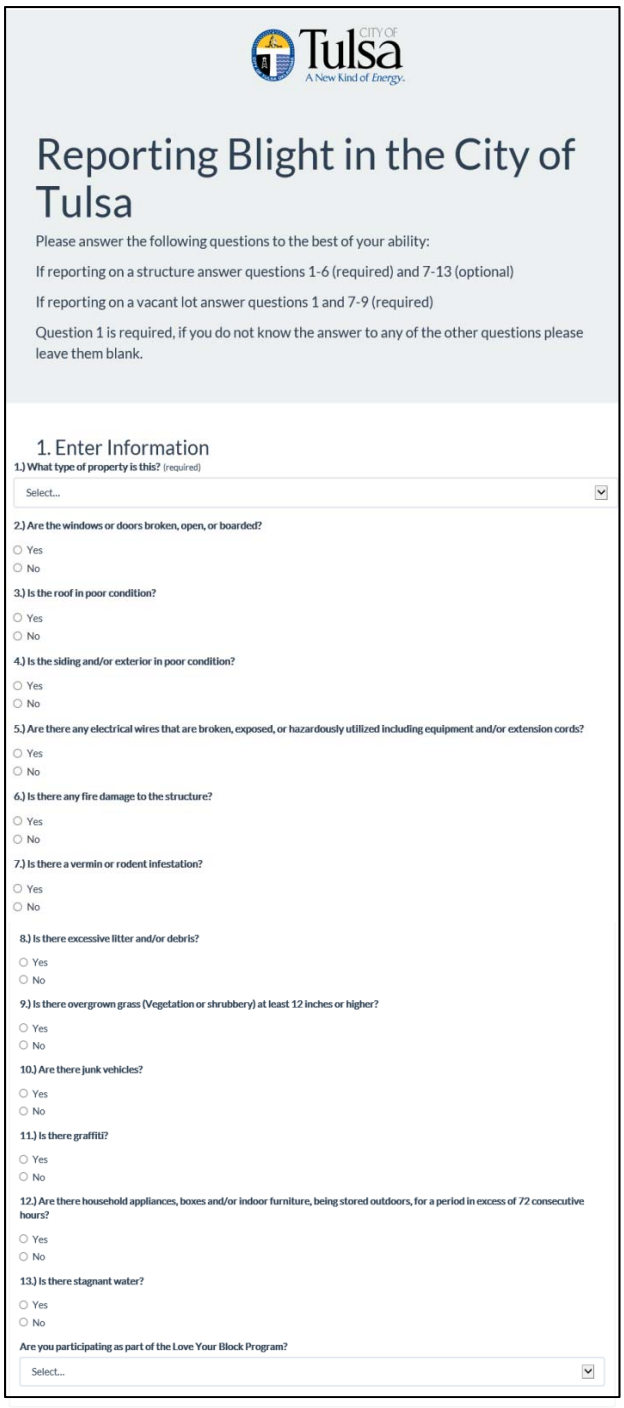
New Orleans did a project to measure backlogs and identify bottlenecks in their blight resolution process. Their blight resolution process took a long time because of all the legally required steps to clear a blighted property. New Orleans analyzed 500 completed cases to identify the decisions that resulted in a particular outcome. New Orleans created a scorecard for staff to complete. The resulting score helps staff prioritize cases, determine the appropriate decision-maker(s), and process cases faster. The scorecards also provide data for further analysis and refinement of the process.

Exhibit 2 - continued

New Orleans does market value analysis on all areas with blighted property. New Orleans grouped properties into clusters based on census blocks, and analyzed the clusters. The clusters are ranked into market types ranging from very strong to very weak. This data is useful for deciding whether to invest city funds and/or leverage with private investors. Clusters rated very strong do not require public investment because these clusters have attributes that are attractive to private investors. Clusters rated very weak will not yield a return on investment. The clusters rated in the middle are considered for investing city funds to make them attractive to private investors.

Exhibit 3

City of Tulsa's web application – Form for reporting blighted properties



Reporting Blight in the City of Tulsa

Please answer the following questions to the best of your ability:

If reporting on a structure answer questions 1-6 (required) and 7-13 (optional)

If reporting on a vacant lot answer questions 1 and 7-9 (required)

Question 1 is required, if you do not know the answer to any of the other questions please leave them blank.

1. Enter Information

1.) What type of property is this? (required)

Select...

2.) Are the windows or doors broken, open, or boarded?

Yes
No

3.) Is the roof in poor condition?

Yes
No

4.) Is the siding and/or exterior in poor condition?

Yes
No

5.) Are there any electrical wires that are broken, exposed, or hazardously utilized including equipment and/or extension cords?

Yes
No

6.) Is there any fire damage to the structure?

Yes
No

7.) Is there a vermin or rodent infestation?

Yes
No

8.) Is there excessive litter and/or debris?

Yes
No

9.) Is there overgrown grass (Vegetation or shrubbery) at least 12 inches or higher?

Yes
No

10.) Are there junk vehicles?

Yes
No

11.) Is there graffiti?

Yes
No

12.) Are there household appliances, boxes and/or indoor furniture, being stored outdoors, for a period in excess of 72 consecutive hours?

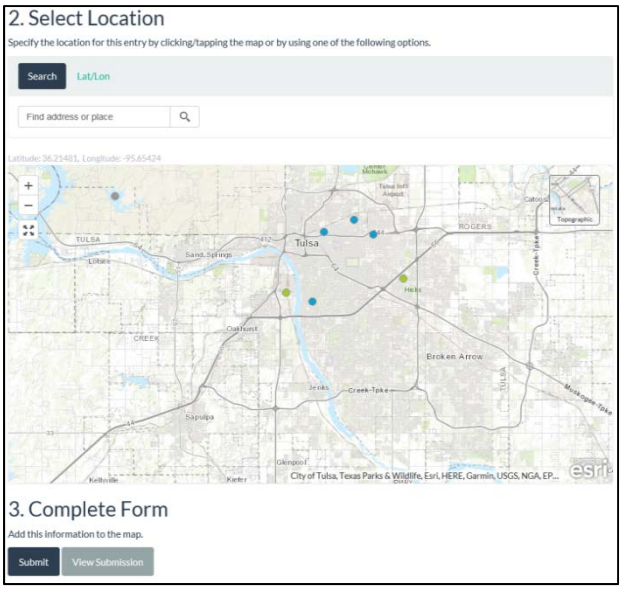
Yes
No

13.) Is there stagnant water?

Yes
No

Are you participating as part of the Love Your Block Program?

Select...



City employees can access this form to enter information about blighted properties. They answer 13 questions by checking "yes" or "no." They indicate the property's location by either entering the address or dropping a pin on the map provided. To complete the form, they click on the submit button.

Exhibit 4
Tulsa's BlightStat

Organizations and City of Tulsa departments involved with BlightStat:

- Growing Together
- Habitat for Humanity
- North Tulsa Community Coalition
- OU-Tulsa Community Health and Environmental Design
- Rebuilding Together Tulsa
- Smart Growth Tulsa
- Tulsa Fire Department
- Tulsa Health Department
- Tulsa Housing Authority
- Tulsa Police Department
- Tulsa Working in Neighborhoods Department

Current working groups:

- Defining Blight
- Collecting Data
- Strategically Addressing Blight