

# Smart maps for small cities:

## Completing a housing assessment

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**UNIVERSITY OF GEORGIA**



**Community**  
**MAPPING LAB**

— Dept. of Geography, University of Georgia —



# "DATA IS THE NEW OIL."

From the beginning of recorded time until 2003, we created **5 exabytes** of data.  
(5 billion gigabytes)

In 2011 the same amount was created every two days.

By 2013, it's expected that the time will shrink to 10 minutes.

Every hour, we create enough Internet traffic to fill **7 billion DVDs**.

Side by side, that's that's seven times the height of Everest.

Coined in 2006 by Clive Humby, a British data commercialization entrepreneur, this now famous phrase was embraced by the World Economic Forum in a 2011 report, which considered data to be an economic asset, like oil.

There are nearly as many bits of information in the digital universe as there are stars in our actual universe.

As of August 2012, there were just over **4 million** articles in the English Wikipedia.

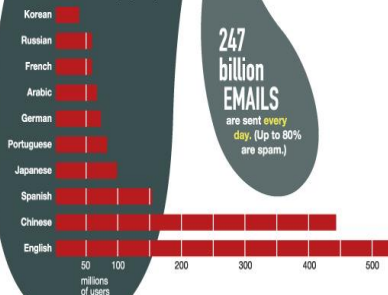
There are **133 million** BLOGS on the web.

**80%** of all humans own a mobile phone of some sort. Out of 5 billion mobiles, 1 billion are smartphones. (In Singapore, 54% of citizens are smartphone users.)

**247 billion** EMAILS are sent every day. (Up to 80% are spam.)

English is the dominant language of the web. But by 2014 it will be **Chinese**, if its current rate of increase continues.

Top languages used on the web (May 2011):



Just as a study of activity on Twitter gave residents, family members, and journalists advance warning of details about the devastating earthquake and tsunami in Japan, **high-frequency traders**, with the help of computer algorithms, use Big Data to follow trends and to act quickly on their findings.

These specialized algorithms make split-second decisions to buy or sell a commodity. New cable being laid under the Atlantic will shave **5 milliseconds** from the current 65 milliseconds it takes for trading instructions to travel between New York City and London.

With new fiber-optic cable, the round-trip time between New York and London will be 59.6 milliseconds.

This 5-millisecond saving is worth many millions of dollars to the trading firms who use the cable (and who will pay millions to do so).

How they save 5 milliseconds

The depth of the Atlantic Ocean varies.

The new cable will lie on areas of the ocean floor that are up to 1,000 feet shallower than the current fastest cable. By taking a different route, the new cable is shorter, meaning that the time it takes for messages to travel along it is shortened.



**60%** of all humans (5.4 billion people) are active texters. In 2010, 193,000 text messages were sent every second.

**10%** of all photos ever taken were taken in 2011.

**50%** of 5-year-old kids in the U.S. are given access to a smartphone.

# Examination and Verification

The Mayor's Office of Data Analytics (MODA) recently submitted a [report on its examination and verification](#) of three City agencies' compliance with the Open Data Law. We encourage you to make use of these results and the [dataset nomination](#) process to help us publish more valuable datasets on the [Open Data Portal](#).

View

More Stories

Search



[Click here to view the NYC OpenData dashboard](#)



Business



City Government



Education



Environment



Health



Housing & Development



Public Safety



Recreation



# Evictions

City Government

View Data

Visualize ▾

Export

API

...

This dataset lists pending, scheduled and executed evictions within the five boroughs, for the year 2017 - Present. The data fields may be sorted by Court Index Number, Docket Number, Eviction Address, Apartment Number, Executed Date, Marshal First Name, Marshal Last Name, Residential or Commercial (property type), Borough, Zip Code and [More](#)

Updated  
November 21, 2019

Data Provided by  
Department of Investigation (DOI)

## About this Dataset

Updated

November 21, 2019

Data Last Updated  
November 21, 2019

Metadata  
October 2019

Date Created

Update



New York City Council

About ▾ Districts ▾ Legislation ▾ Budget Land Use Press & News ▾

Español

# Evictions

NYC residents are affected by evictions every day

Evictions

Building Details

## Residential Evictions

In 2018, tenants in over 19,000 apartments experienced an eviction from their homes. Residents who are evicted are first sued in Housing Court before being formally evicted.

Out of the 230,071 eviction petitions filed by building owners at New York City Housing Court in 2017, only 9% or 20,804 evictions were executed by the City Marshall. This large gap in the evictions filed and executed evictions highlights the importance for access to attorneys in Housing Court.

In August of 2017, the City passed the [Universal Access law](#), which gives free legal help to low income tenants facing eviction. In the first year of its implementation, this law provided free legal services to more than 87,000 New Yorkers, and 21,955 New Yorkers

Residential Evictions 2018



19,970 Evictions

Download Data lat.

Contribute on Github





# Housing Assessment Toolkit

Created by the Center for Housing and Community Research (CHCR).

Based on best practices of GICH communities and service-learning projects led by Kim Skobba, Jerry Shannon, Karen Tinsley, and Jermaine Durham.





# **Why do a housing assessment?**

“There were people that started with us, a three year period, that has had still not done the housing assessment. And I thought, how do you know? How you really know what you're working? If we haven't accumulated the data to know which way to go. And so that was, I don't think you can do anything without that.”

# What are your goals/reasons for doing an assessment?

- What are the things that you *know*?
- What are the things that you *know that you don't know*?
- What are the things that you *think you know but you don't*?
- What are the things that you *don't know that you don't know*?

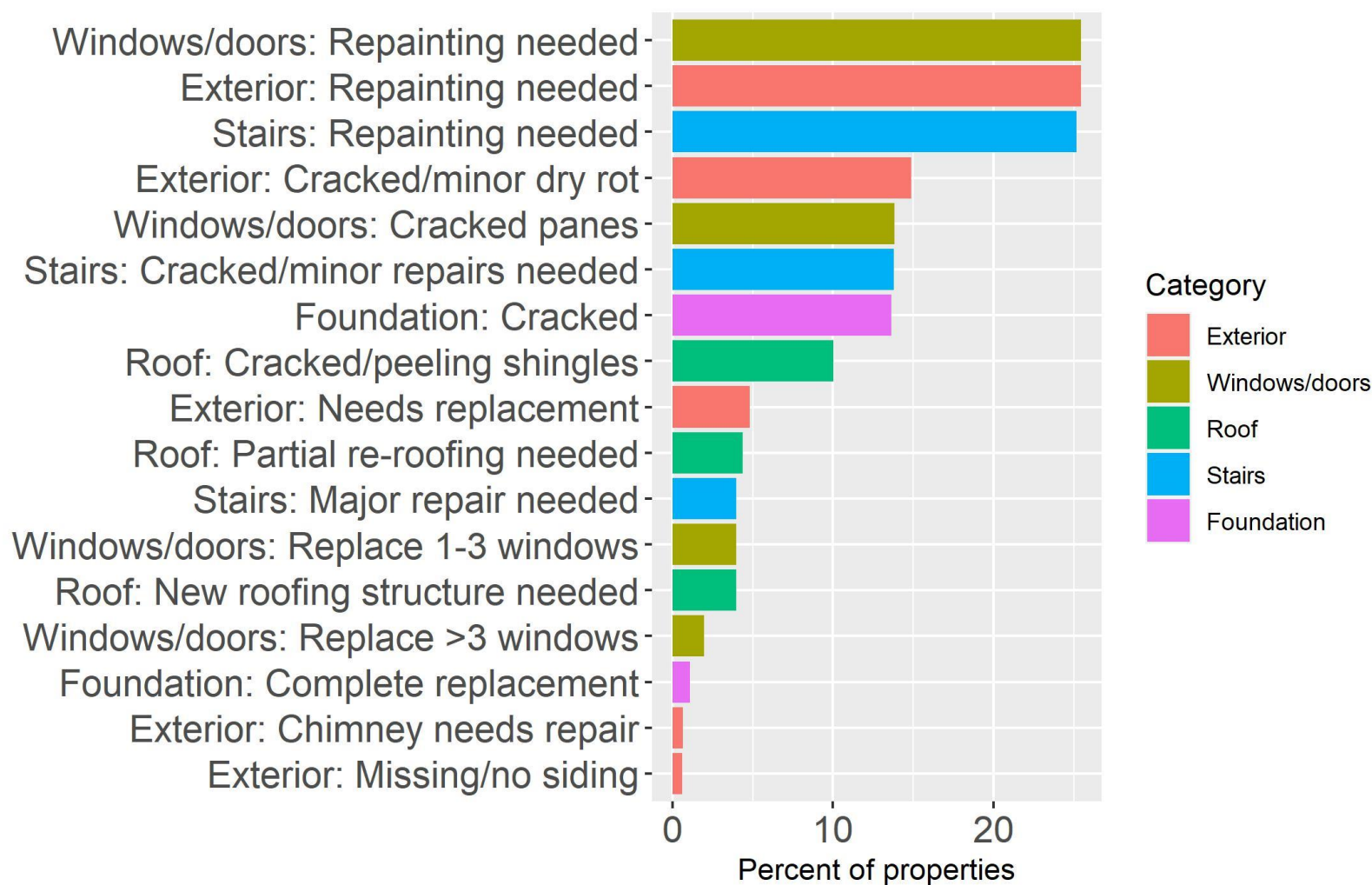


# **What are your reasons for doing an assessment?**

- Grant planning
- Outreach and/or code enforcement with landlords or residents
- Targeting redevelopment efforts
- Generate community awareness and conversation

# Recent results

Four recent communities (5,654 properties)



# Recent results

Four recent communities (5,654 properties)

Rank	Town A	Town B	Town C	Town D
1	Exterior: Repainting needed (38.71%)	Windows/doors: Repainting needed (35.93%)	Stairs: Repainting needed (17.68%)	Exterior: Repainting needed (9.42%)
2	Stairs: Repainting needed (31.47%)	Stairs: Repainting needed (34.78%)	Windows/doors: Repainting needed (16.68%)	Windows/doors: Repainting needed (8.03%)
3	Windows/doors: Repainting needed (30.43%)	Exterior: Repainting needed (33.73%)	Exterior: Repainting needed (13.29%)	Roof: Cracked/peeling shingles (7.85%)
4	Foundation: Cracked (25.63%)	Windows/doors: Cracked panes (24.22%)	Exterior: Cracked/minor dry rot (7.95%)	Stairs: Cracked/minor repairs needed (7.5%)
5	Exterior: Cracked/minor dry rot (21.71%)	Stairs: Cracked/minor repairs needed (20.71%)	Roof: Cracked/peeling shingles (7.95%)	Exterior: Cracked/minor dry rot (6.98%)

# Three Phases of a Housing Assessment:



1

## DEVELOPMENT

Plan your survey  
Collecting existing data  
Engaging the community



2

## IMPLEMENTATION

Digitized data collection  
Tracking progress



3

## ANALYSIS

Analyzing results  
Mapping properties



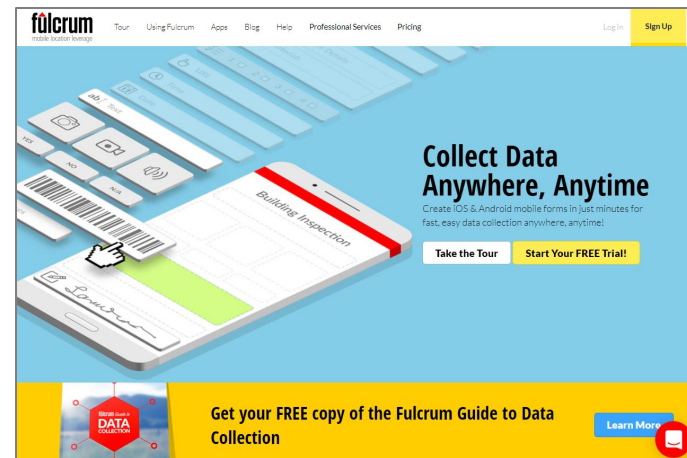
# Why an electronic survey?

Reduces error

Saves time

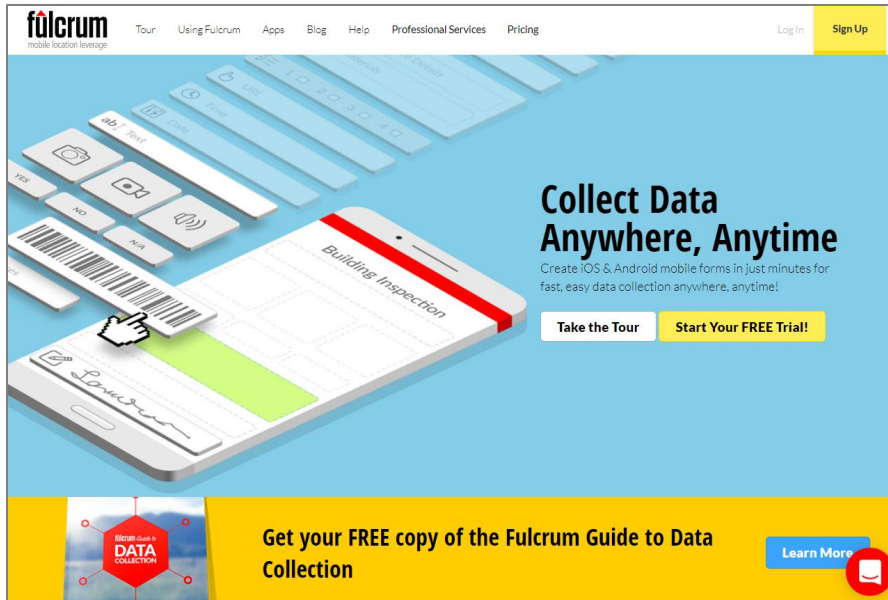
Can add pictures

Makes mapping data easier



“I like the fact that now I can go out and do [the survey] on my own, because it's an app that you can just put on one of these devices and head out and have it done. It was just so much easier.”

# Walk through the Fulcrum app



<https://www.youtube.com/watch?v=DRUhPaTlw-Y>

Commerce-parcel s... ✓  

February 16, 2018

Search by what criteria? \*

Address

Enter the address \*

SELECT

Property address (edit if incorrect)

Parcel number

Is this a new entry or the revision of a previous entry? \*

New entry

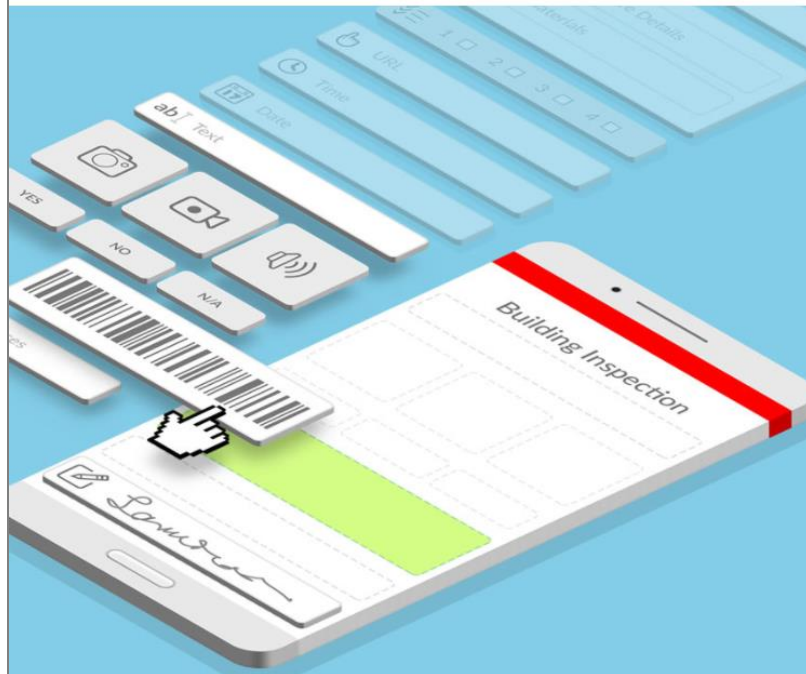
What type of property is this? \*

General property information \*

Number of stories \*

Housing unit characteristics: foundation \*

Housing unit characteristics: exterior \*



## Collect Data Anywhere, Anytime

Create iOS & Android mobile forms in just minutes for fast, easy data collection anywhere, anytime!

[Take the Tour](#)

[Start Your FREE Trial!](#)



Get your **FREE** copy of the Fulcrum Guide to Data Collection

[Learn More](#)



Fulcrum pricing: \$40/user/month  
One user can be linked to up to THREE devices



# Our survey form

Community Housing Survey – Print Version

Reviewed by (Group #/Name)

Date: \_\_/\_\_/\_\_\_\_

Parcel ID (if Known): \_\_\_\_\_

Property Address

Is this a new entry or a revision of a previous entry?

☐ New Entry ☐ Revision of Previous Entry

If multifamily: how many units does this property have: \_\_\_\_\_

Other: please elaborate

\_\_\_\_\_

## General Property Information

☐ Occupied ☐ Unoccupied  
☐ For Sale ☐ Unknown

## Number of Stories:

☐ 1 ☐ 1.5 ☐ 2 ☐ Greater than 2

## Housing Unit Characteristics: foundation

☐ Good Condition (0)  
☐ Cracked/broken but repairable (5)  
☐ Needs Partial Replacement (10)  
☐ Needs Complete Replacement or is missing entirely (20)  
☐ Not visible from car or sidewalk (0)

## Housing Unit Characteristics:

### exterior surfaces/siding

*check more than one if applicable*

☐ Good Condition (0)  
☐ Needs Repainting (3)  
☐ Cracked/minor dry rot in spots but repairable (5)  
☐ Needs replacement (siding missing or deteriorated beyond repair) (10)  
☐ Chimney parts missing/major repairs needed (10)  
☐ No siding on house, needs total replacement (20)  
☐ Not visible from car or sidewalk (0)

## Housing Unit Characteristics:

### Windows/doors (includes jambs/frames)

*check more than one if applicable*

☐ Good Condition (0)  
☐ Needs Repainting (3)  
☐ Cracked/broken panes/minor dry rot but repairable (5)  
☐ 1-3 Windows in need of total replacement (10)  
☐ More than 3 windows in need of total replacement (15)

## Housing Unit Characteristics:

### Stairs, rails, steps, and porches

☐ Good Condition (0)  
☐ Needs Repainting (3)  
☐ Cracked/minor dry rot in spots or portions of railing missing but repairable (5)  
☐ Needs major repair or replacement (15)  
☐ Stairs not present or not visible (0)

## Housing Unit Characteristics: roofing

*check more than one if applicable*

☐ Good Condition (0)  
☐ Gutters in need of repair (5)  
☐ Cracked/broken/curled or missing shingles or shakes, repairable without replacement (5)  
☐ Needs Partial Re-roofing (10)  
☐ Needs complete reroofing (shingles and some or all wood sheathing) (20)  
☐ Roof structure needs replacement (roof is rusted, bowing, wavy, or very uneven) (25)

## Residential lot assessment

*check more than one if applicable*

☐ Satisfactory  
☐ Lawn/weeds overgrown (exceed 12 in length)  
☐ Missing ground cover (grass, pine straw, mulch) on non-paved areas  
☐ Yard Includes dead or hazardous trees  
☐ Inoperable vehicle in driveway or yard  
☐ Major cleanup/junk in yard  
☐ Porch used as storage, filled with junk items  
☐ Graffiti on house, fence, exterior lot

**Other Comments (e.g., unique features of the property, multiple dwellings on a single lot, etc.)**

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---

Reviewed by (Group #/Name)

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Parcel ID (if Known): \_\_\_\_\_

Property Address

Is this a new entry or a revision of a previous entry?

☐ New Entry ☐ Revision of Previous Entry

If multifamily: how many units does this property have: \_\_\_\_\_

Other: please elaborate

\_\_\_\_\_

General Property Information

☐ Occupied ☐ Unoccupied  
☐ For Sale ☐ Unknown

Number of Stories:

☐ 1 ☐ 1.5 ☐ 2 ☐ Greater than 2

**Housing Unit Characteristics: foundation**

- ☐ Good Condition (0)  
☐ Cracked/broken but reparable (5)  
☐ Needs Partial Replacement (10)  
☐ Needs Complete Replacement or is missing entirely (20)  
☐ Not visible from car or sidewalk (0)

**Housing Unit Characteristics:**

**exterior surfaces/siding**

*check more than one if applicable*

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☐ Needs Repainting (3)  
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**Residential lot assessment**

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- ☐ Major cleanup/junk in yard
- ☐ Porch used as storage, filled with junk items
- ☐ Graffiti on house, fence, exterior lot

**Other Comments (e.g., unique features of the property, multiple dwellings on a single lot, etc.)**

# Creating a community plan for your housing assessment

## *GICH Housing Toolkit*

Before starting survey data collection, most communities will find it helpful to create a plan for how and where and how you collect data as well as how members of the community will be involved. For this reason, we recommend that communities submit responses to the following questions before beginning data collection.

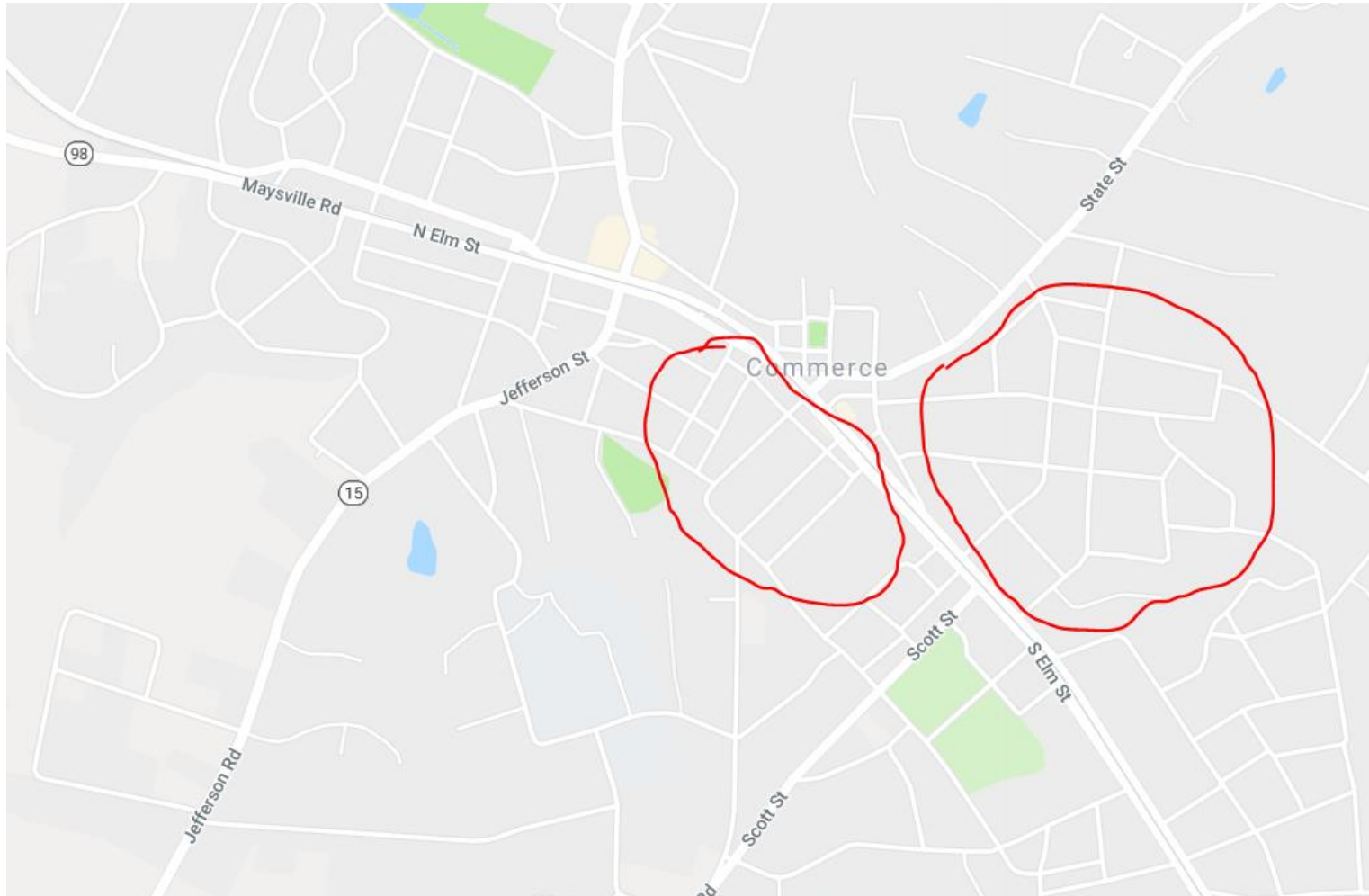
1. **What are your reasons** for doing a community housing assessment? How will you be using the data you collect? What are you trying to identify?
2. **Where** will you be doing this assessment? For your entire community or just a section of it? Print off a map of your community from Google Maps and circle the area(s) where you anticipate collecting data.
3. How will you be **publicizing** the housing assessment and **involving community members** prior to starting the assessment? Past communities have used public meetings, booths at community events, postcards, newspaper notices, and community pages on social media to spread word about the assessment and explain how you will use the data you collect.
4. **Who** will be doing the assessment? Many communities make use of city staff, interns, college students, or volunteers from local organizations. Which of these are good options for your community? How will you divide up and structure their time?
5. In addition to these responses, we request that you work with your local GIS office or county tax assessor to obtain a shapefile (geographic data format) of parcels for your community. We will use this data to match the data you collect to existing parcel records. We suggest that these data include property owner and homestead status to identify rental properties and major property owners. Are there **additional variables** you'd like to include for your analysis? These could include zoning, age of structure, or similar data you already have available.

Web link:





# Where are you doing your assessment?



# Collecting existing data

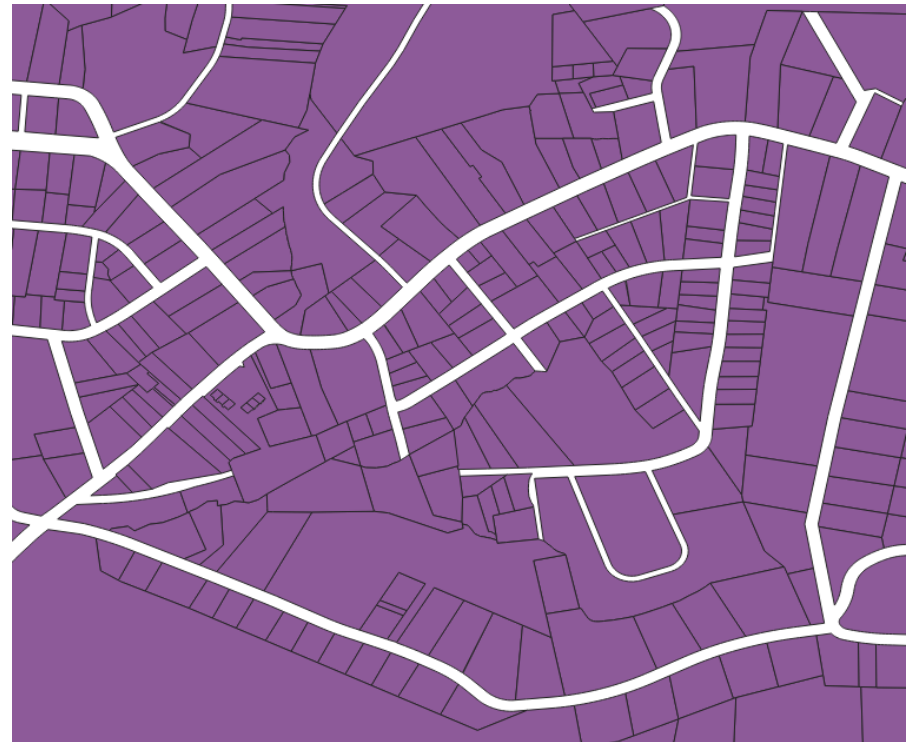
Collecting parcel data

Geographic data usually stored in a “shapefile”

Start with the county tax assessor

What data do you want?

Parcel number, owner  
name/address,  
homestead status, etc.



# **Where are you doing your assessment?**

- Past assessments range between 200-3,000 parcels
- Plan for 1-3 minutes per parcel (plus walking and conversation with residents)
- Balance between focusing on needs and neighborhood equity

# Plan your survey

*When* will you survey?

Each property can take 5-10 minutes

*Who* will do the survey?

City staff, college interns, volunteers

Smaller group = greater reliability



# Who will be doing the assessment?

Community volunteers  
City staff  
College interns

Plan time for training  
together and making sure  
everyone is on the same  
page.



# Engaging the community

More than just community meetings

Who are the key contacts and partners?

How will you spread the word?

How will residents benefit?

Publicity: Social media, postcards, t-shirts

# Beyond the “usual suspects”

Who hasn't been part of this process already but should be?



# **Publicity: How to share with the community**

- Public meetings
- Outreach to/at community institutions
- Booths at community events
- Postcards
- Newspaper notices
- Posts on community Facebook pages

# Data needed prior to assessment

Collecting parcel data

Geographic data stored in a *shapefile*

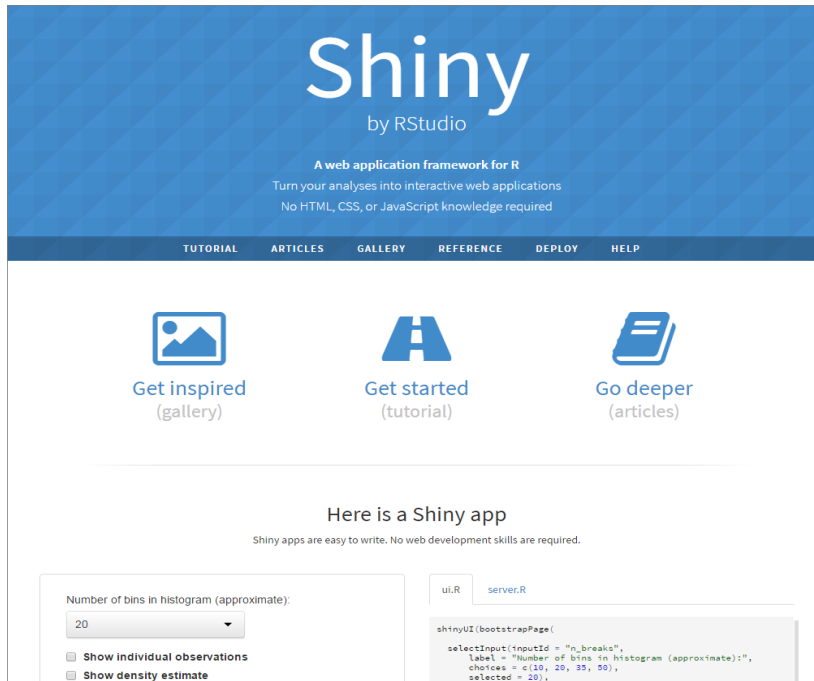
Start with the county tax assessor

What data do you want?

- Necessary: Parcel number, address, homestead status
- Helpful to have: owner name/address, zoning, political districts



# Visualizing results



The image shows the Shiny by RStudio website. The header is blue with the word "Shiny" in large white font, followed by "by RStudio" in smaller white font. Below this, it says "A web application framework for R" and "Turn your analyses into interactive web applications. No HTML, CSS, or JavaScript knowledge required." A navigation bar contains links: TUTORIAL, ARTICLES, GALLERY, REFERENCE, DEPLOY, and HELP. The main content area has three columns: "Get inspired (gallery)" with a landscape icon, "Get started (tutorial)" with a blue 'A' icon, and "Go deeper (articles)" with a document icon. Below these, it says "Here is a Shiny app" and "Shiny apps are easy to write. No web development skills are required." There are two tabs: "ui.R" and "server.R". The "ui.R" tab is active, showing a Shiny UI with a label "Number of bins in histogram (approximate):", a dropdown menu set to "20", and two checkboxes: "Show individual observations" and "Show density estimate". The "server.R" tab shows R code for a Shiny app.

Shiny  
by RStudio

A web application framework for R  
Turn your analyses into interactive web applications  
No HTML, CSS, or JavaScript knowledge required

TUTORIAL ARTICLES GALLERY REFERENCE DEPLOY HELP

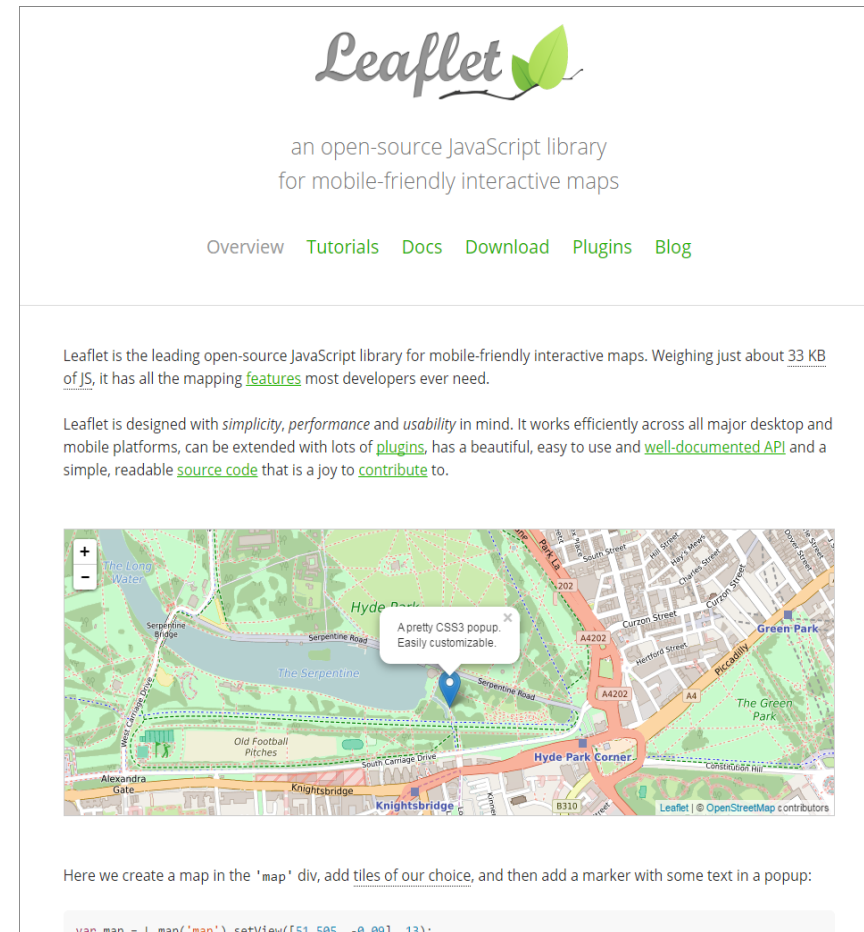
Get inspired (gallery) Get started (tutorial) Go deeper (articles)

Here is a Shiny app  
Shiny apps are easy to write. No web development skills are required.

Number of bins in histogram (approximate):  
20  
☐ Show individual observations  
☐ Show density estimate

ui.R server.R

```
shinyUI(bootstrapPage(  
  selectInput(inputId = "n_breaks",  
    label = "Number of bins in histogram (approximate):",  
    choices = c(10, 20, 30, 50),  
    selected = 20),
```



The image shows the Leaflet website. The header features the Leaflet logo, which is the word "Leaflet" in a cursive font with a green leaf icon. Below the logo, it says "an open-source JavaScript library for mobile-friendly interactive maps". A navigation bar contains links: Overview, Tutorials, Docs, Download, Plugins, and Blog. The main content area has two paragraphs of text. The first paragraph says "Leaflet is the leading open-source JavaScript library for mobile-friendly interactive maps. Weighing just about 33 KB of JS, it has all the mapping features most developers ever need." The second paragraph says "Leaflet is designed with simplicity, performance and usability in mind. It works efficiently across all major desktop and mobile platforms, can be extended with lots of plugins, has a beautiful, easy to use and well-documented API and a simple, readable source code that is a joy to contribute to." Below the text is a map of Hyde Park in London, showing the Serpentine, the Serpentine Bridge, and the Hyde Park Corner. A blue location pin is placed on the map, and a white popup box with a close button (X) is displayed above it, containing the text "A pretty CSS3 popup. Easily customizable." Below the map, there is a paragraph of text: "Here we create a map in the 'map' div, add tiles of our choice, and then add a marker with some text in a popup:" followed by a code block showing the Leaflet map creation code.

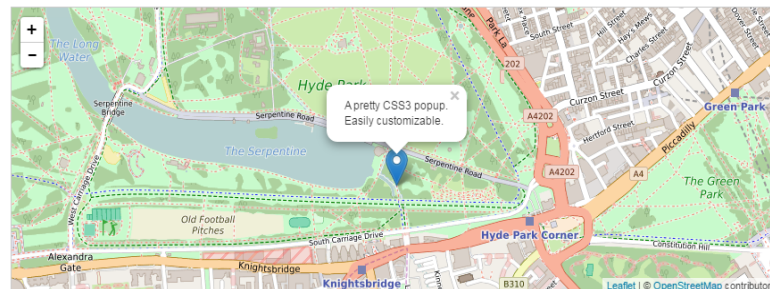
Leaflet

an open-source JavaScript library  
for mobile-friendly interactive maps

Overview Tutorials Docs Download Plugins Blog

Leaflet is the leading open-source JavaScript library for mobile-friendly interactive maps. Weighing just about 33 KB of JS, it has all the mapping features most developers ever need.

Leaflet is designed with *simplicity, performance and usability* in mind. It works efficiently across all major desktop and mobile platforms, can be extended with lots of [plugins](#), has a beautiful, easy to use and [well-documented API](#) and a simple, readable [source code](#) that is a joy to [contribute](#) to.



Here we create a map in the 'map' div, add [tiles](#) of our choice, and then add a marker with some text in a popup:

```
var map = L.map('map').setView([51.505, -0.09], 13);
```

## Map of data coverage

The map on the right shows data already collected. Red dots are surveyed properties, and grey dots are those yet to be surveyed. The orange lines show ward boundaries. Mouse over them to see the ward numbers.

Show unsurveyed parcels?

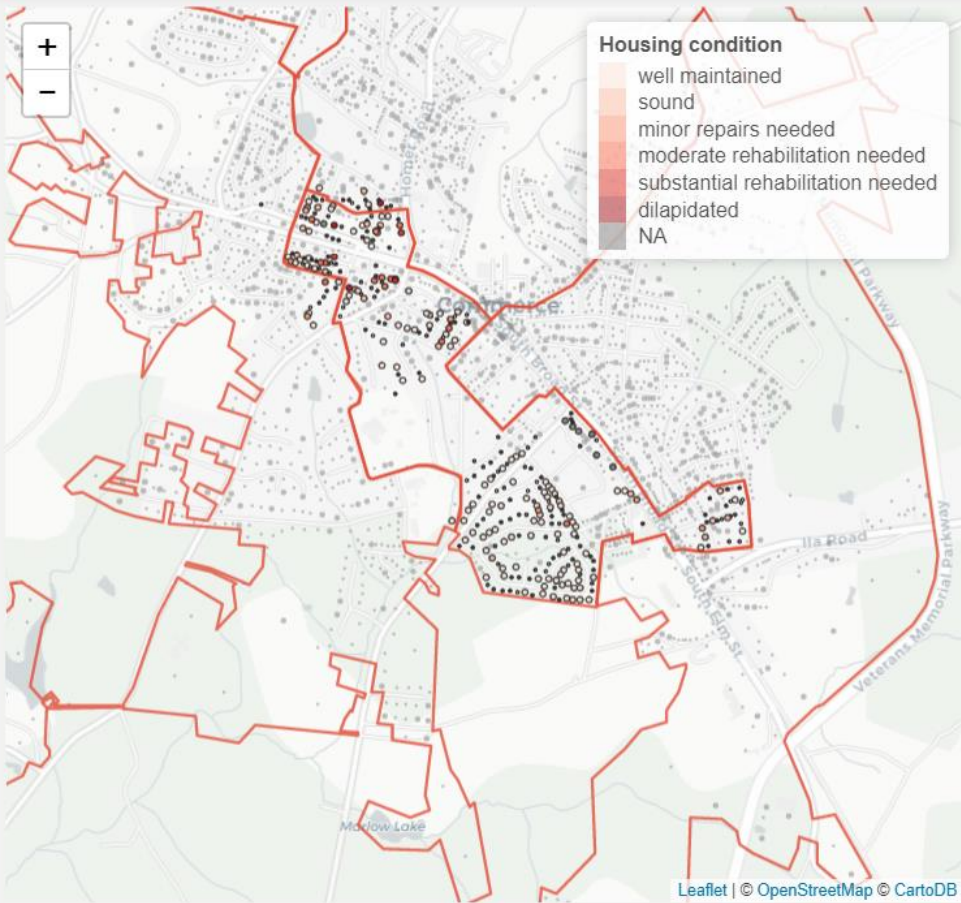
- ☒ Yes
- ☐ No

Choose the base map

- ☒ Road map (Carto)
- ☐ Satellite imagery (ESRI)

Download the raw data

Download



Click on a point on the map to see the property information below.

**Parcel ID:** C15 092  
**Parcel address:** 41 ANDY COURT  
**Property type:** Single family home, no garage  
**Property status:** Occupied  
**Property conditions:** Moderate rehabilitation needed

### Structural conditions

#### Foundation:

- Cracked

#### Exterior:

- Cracked/minor dry rot

#### Windows/doors:

- Repainting needed

#### Stairs/rails:

- Repainting needed

#### Roof:

- Partial re-roofing needed

### Lot assessment

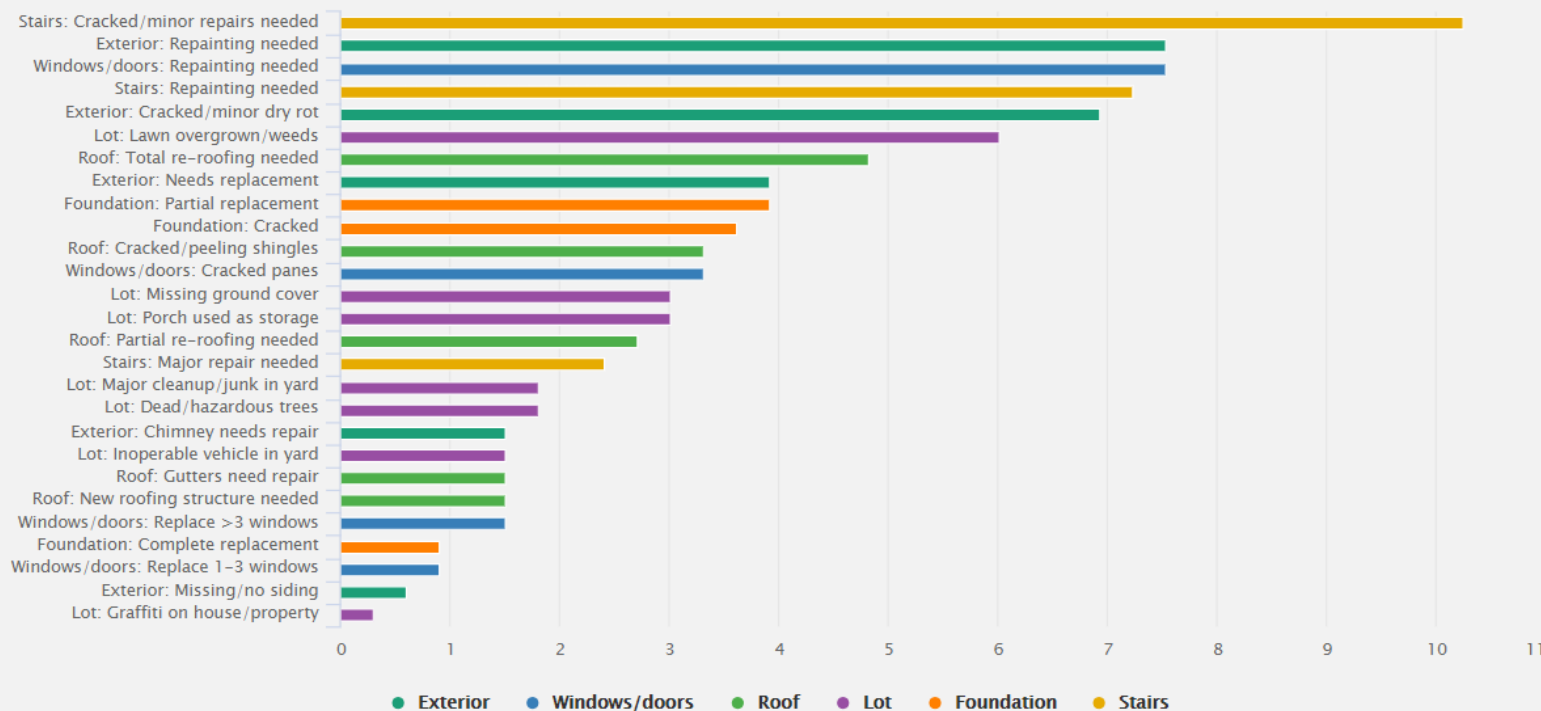
Satisfactory

### Photos

[Picture 1](#)

[Picture 2](#)

This chart shows the most common issues in surveyed properties.



## Select an issue

Select an issue from the menus below. Properties with the issue will be shown in red on the map.

### Category selection

- ☒ Exterior
- ☐ Windows/doors
- ☐ Roof
- ☐ Lot
- ☐ Foundation
- ☐ Stairs

### Issue selection

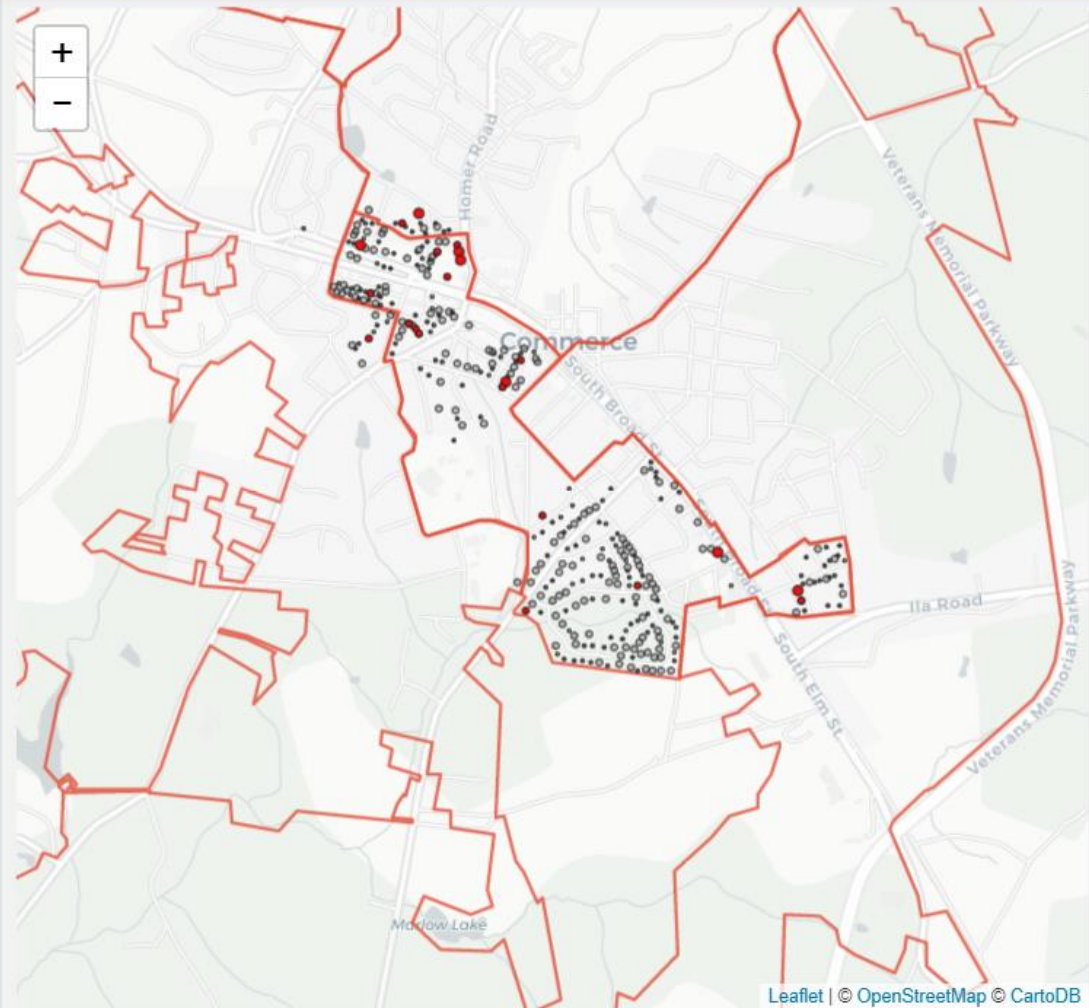
Repainting needed ▼

### Choose the base map

- ☒ Road map (Carto)
- ☐ Satellite imagery (ESRI)

### Download properties with this issue

Download



Click  
here

# Costs

**Working with CHCR: free for current GICH communities (\$500 otherwise)**

- One year of technical assistance
  - Electronic data collection
  - Web based data dashboard to track progress and results
- Use of three tablets (if necessary)
- Three months of Fulcrum access

*Regional commissions may also be able to help with this process*



# Questions?

Jerry Shannon | [jshannon@uga.edu](mailto:jshannon@uga.edu)

706-542-1656

Kim Skobba | [kskobba@uga.edu](mailto:kskobba@uga.edu)



**Financial Planning, Housing  
& Consumer Economics**

*College of Family and Consumer Sciences*

*Housing and Demographics Research Center*

**UNIVERSITY OF GEORGIA**

