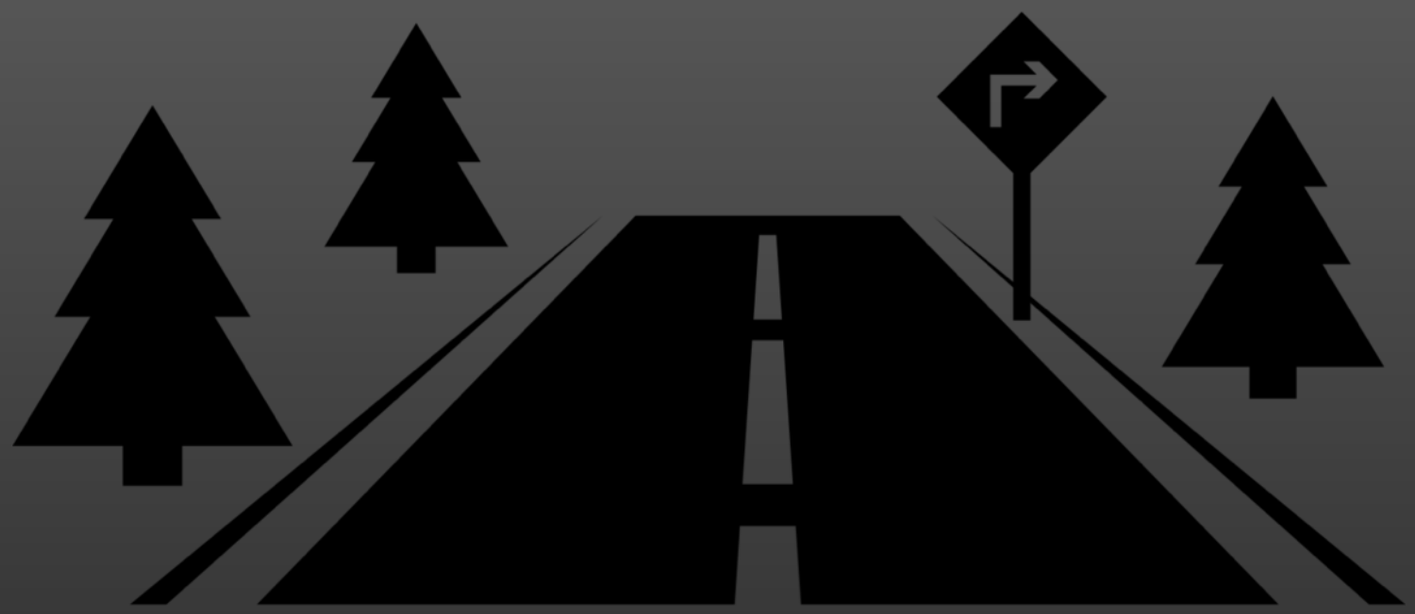


Building Open Source Projects in Government Esri Ecosystems

Lyzi Diamond
FOSS4G 2014 | Portland, OR | September 10, 2014

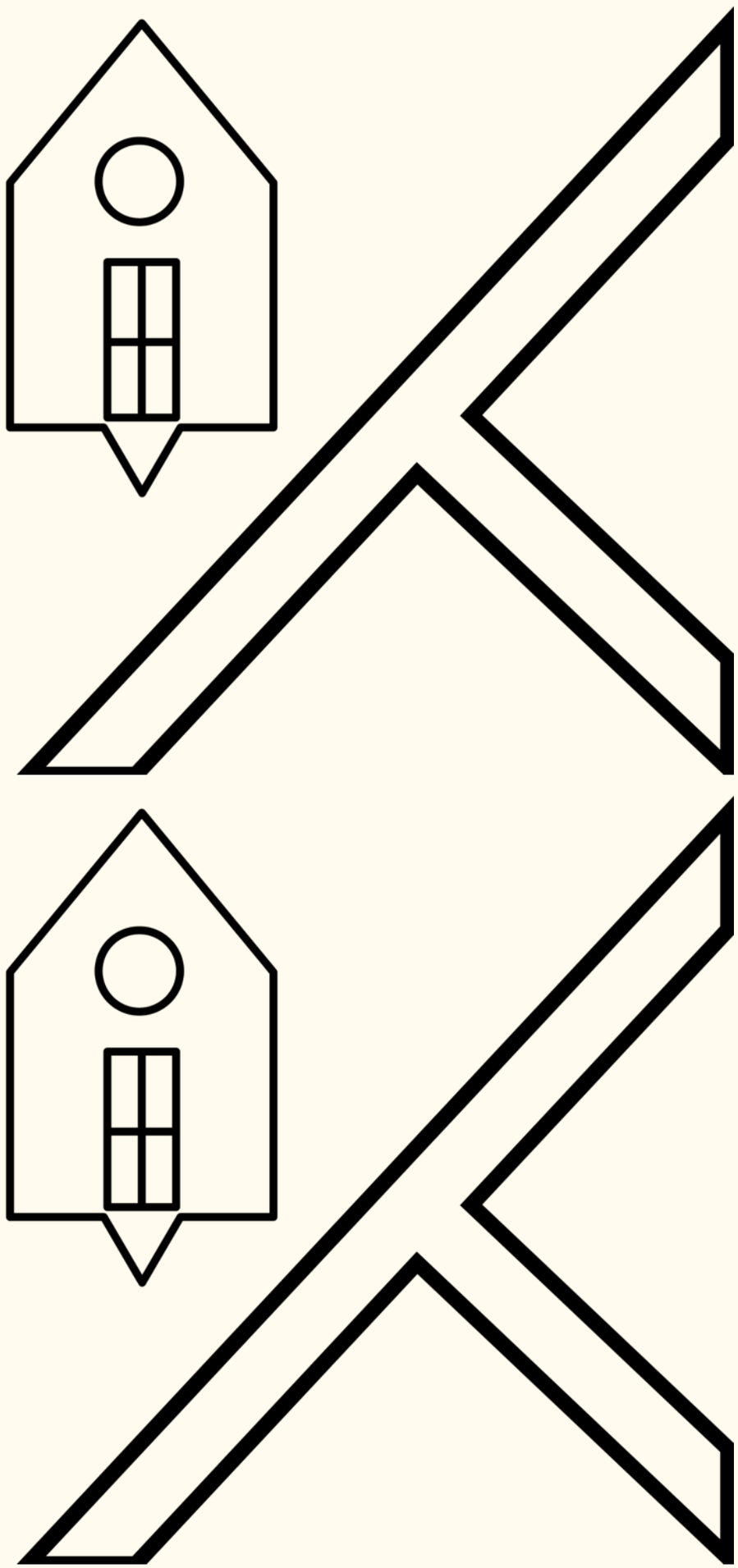
Road designed by Juan Pablo Bravo from the thenounproject.com

This talk is about building open source web applications with government GIS data.

Trail View Hiker designed by Luis Prado from the thenounproject.com

Every day at Code for America, we work with local governments on applications that:

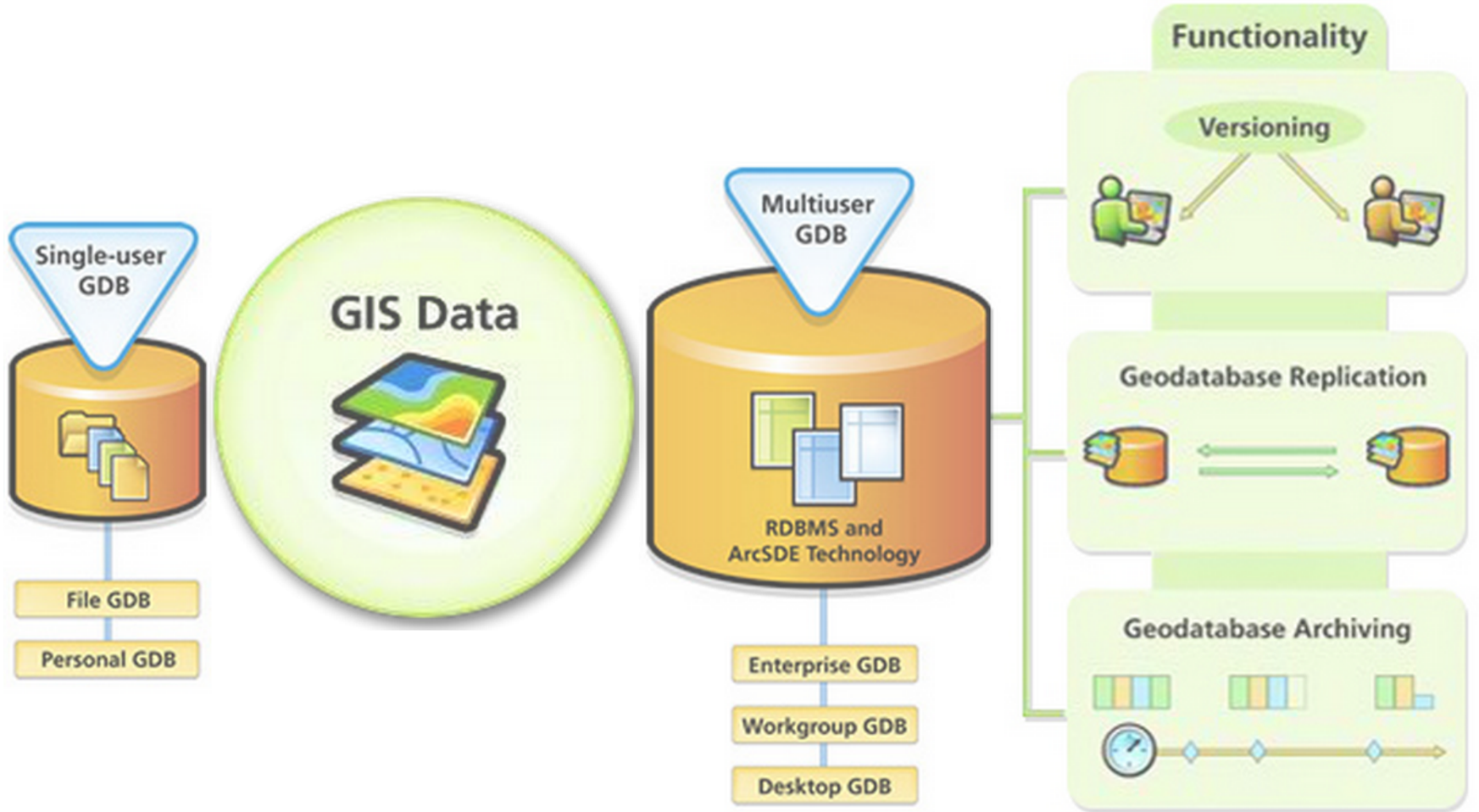
- use open data from a variety of sources;
- are typically constituent-facing web applications;
- are manageable by the city;
- attack government problems with small, technological solutions;
- encourage the civic technology community to stay active; and
- are designed to stay updated and sustained.



Esri is clearly the dominant vendor in enterprise GIS. Civic technologists just need to learn how to play nice with it.

Address designed by Richard Cordero from the thenounproject.com

So let's talk about how we can build an open-source web application inside of an Esri technology stack.



STEP ONE:

Understand the ecosystem infrastructure.

DISCLAIMER:

I am neither a backend developer nor a sysadmin.
I just like GIS and maps and open source.
Take everything I say with a grain of salt.

ArcGIS for Server
or
ArcGIS Online

Web applications

==

web access to data.

(Plus: open.)

Desktop

Web

Device

Web GIS

Portal

Server

Online Content and Services

Apps

Portal

GIS Servers

Ready-to-Use Content

The main idea:

Use what you have.

DO LESS.

STEP TWO:

Identify the data you need for your project.

NOTE: Is the data you want protected?
NOTE: Does the data you want have information that can't be shared in bulk?
NOTE: Who owns the data?
NOTE: How is the data stored?

STEP THREE:

Enable access to the data.

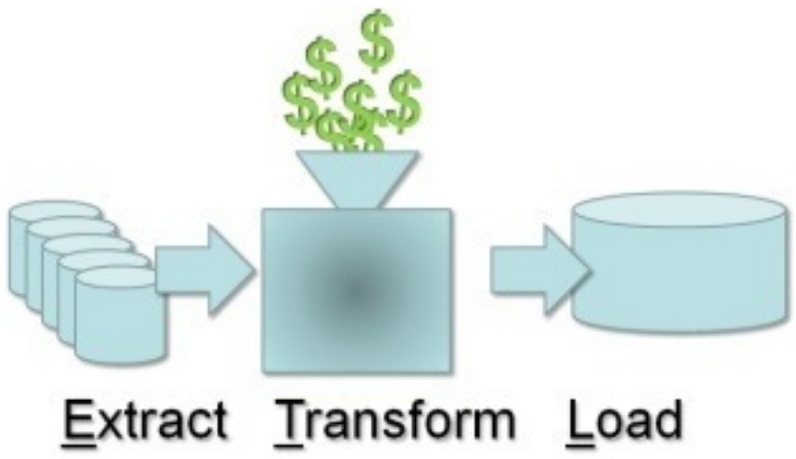
esri Understanding our world.

GeoServices REST Specification

With ArcGIS Online, you can **publish hosted, publicly-accessible layers**, which enables **API access.**

http://bit.ly/esri-publish

Open data portals, too.



STEP FOUR:

Extract, transform, load

(celebrate)

ArcGIS REST Services Directory

Home > **services**

JSON | SOAP

Folder: /

Current Version: 10.2

View Footprints In: ArcGIS.com Map

Folders:

- Canvas
- Demographics
- Elevation
- Ocean
- Reference
- Specialty
- Utilities

Extract.

GeoJSON

GeoJSON is a format for encoding a variety of geographic data structures.

```
{
  "type": "Feature",
  "geometry": {
    "type": "Point",
    "coordinates": [125.6, 10.1]
  },
  "properties": {
    "name": "Dinagat Islands"
  }
}
```

GeoJSON supports the following geometry types: `Point`, `LineString`, `Polygon`, `MultiPoint`, `MultiLineString`, and `MultiPolygon`. Lists of geometries are represented by a `GeometryCollection`. Geometries with additional properties are `Feature` objects. And lists of features are represented by a `FeatureCollection`.

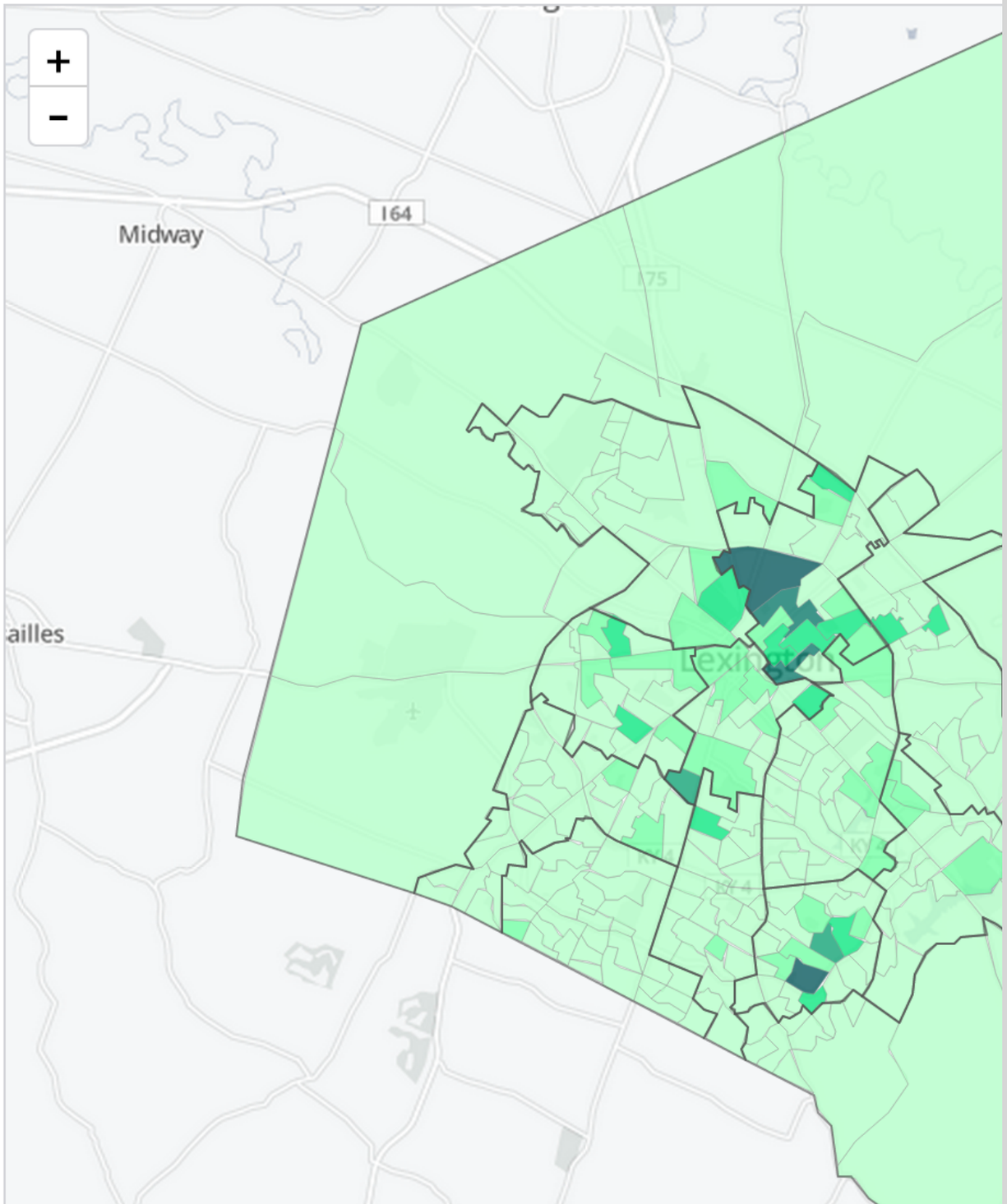
Learn More

See the full specification for more detail.

Transform.

Lexington Housing Dashbo

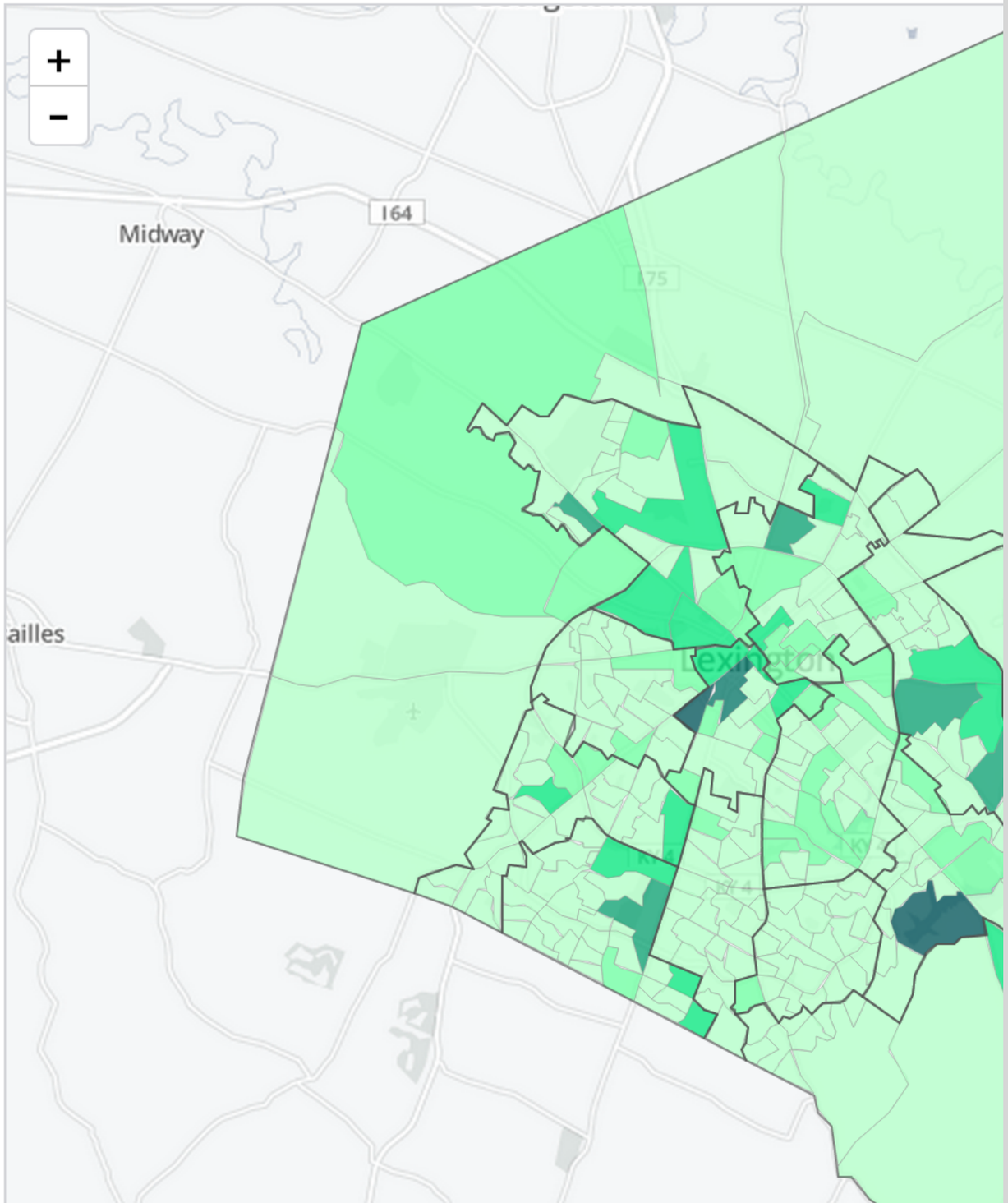
Explore neighborhood housing trends in you



Load.

Lexington Housing Dashbo

Explore neighborhood housing trends in you



Repeat.

CITYGRAM

http://seattlegram.herokuapp.com

Subscribe to your city.

Get updates on the topics and areas you care about in Seattle.

Get started

1. Select a topic.

Choose one to start, and you can add more later.

911 Fire Dispatches | Code Violations | Building Permits | Electrical Permits | Land Use Permits

EXAMPLE #1: Citygram and Spyglass

1. Select a topic.

Choose one to start, and you can add more later.

911 Fire Dispatches

Code Violations

Building Permits

Electrical Permits

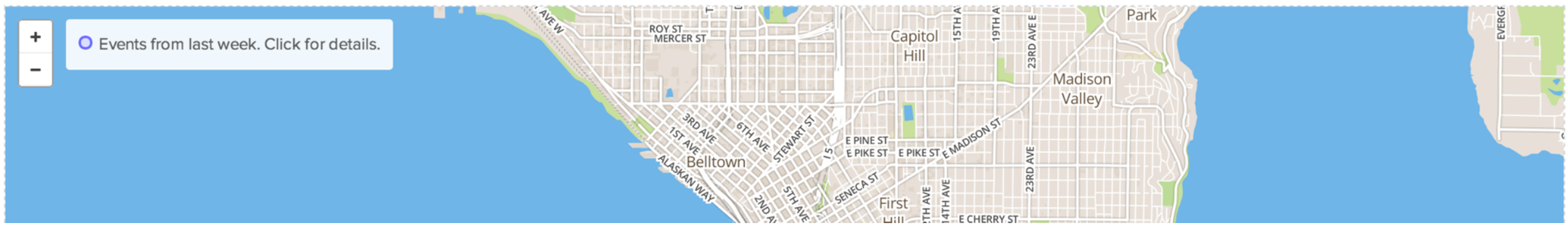
Land Use Permits

2. What's your address?

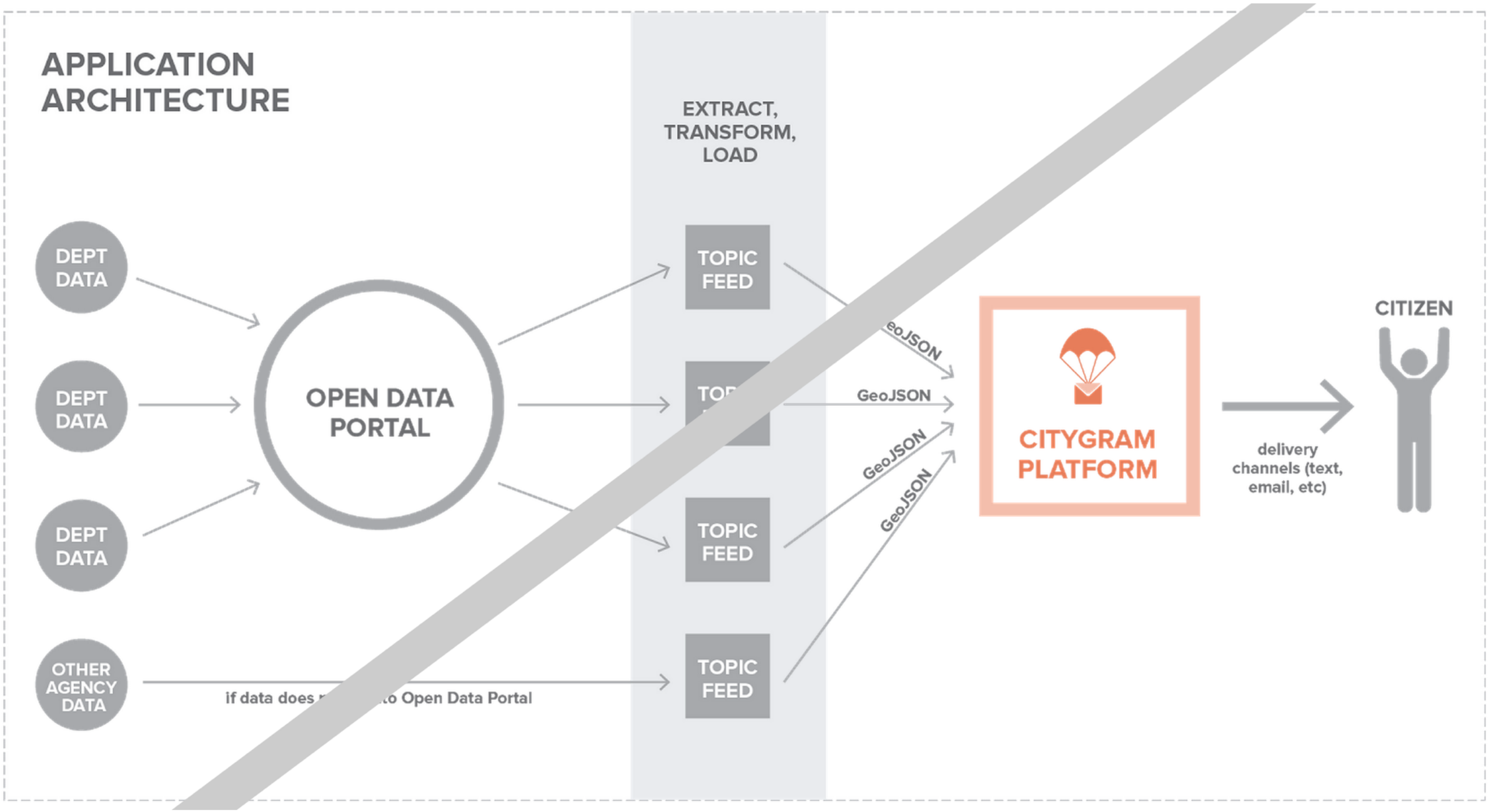
Your home, your work, or wherever's important to you.

Your address

Within a 1/4 mile (about a 5 min leisurely stroll)



Citygram: location-based, opt-in text message and email notifications about city services.



Spyglass: ETL layer that pulls data from APIs, conforms data for use in Citygram (to GeoJSON), caches data.

OpenTrails Tools

http://open-trails.herokuapp.com

Create open data for your region's trail system, ready for use across the web.

This tool is incomplete and under active development. Learn More on Github.

Convert data to OpenTrails

This tool **converts Shapefiles to OpenTrails**.

Our converter tool transformers shapefiles into the OpenTrails format, which is a suite of GeoJSON and CSV files. The tool offers helpful feedback if there are problems, and suggestions about how to make the most of OpenTrails data.

Convert Your Data

Validate OpenTrails data

This tool **validates OpenTrails GeoJSON and CSV files**.

Upload your various OpenTrails data, and this tool will evaluate its conformance with the OpenTrails specification. The tool provides helpful feedback about how to update your data to meet the specification, and by extension, the expectations of third party developers and data consumers.

Validate Your Data

EXAMPLE #2: OpenTrails Data Converter

OpenTrails Data

http://opentraildata.org

A home for the OpenTrails Data community.

> Parks and trails are a cornerstone of public health and quality of life. The Open Trail System Specification (OpenTrails) helps citizens get outdoors to enjoy them.

What is OpenTrails?

The Open Trail System Specification (OpenTrails) defines a simple, common format for public trails and associated geographic information. OpenTrails allows public land agencies to publish their trail data and developers to write applications that consume that data in an interoperable way.

How Do I Get Started?

- Preview the Spec

This page was generat
Pages using the Archit
Jason Long.

OpenTrails: A data standard for enabling parks to undertake quality digital user experience design.

OpenTrails Converter

1 Upload segments shapefile
2 Convert to trail_segments.geojson
3 Extract named_trails.csv
4 Create stewards.csv
5 Upload trailheads shapefile
6 Conver to trailheads.geojson

First: Upload your trail segment shapefile.

Choose File No file chosen

Upload

Note: data uploads make take a minute on poor connections.

ZIP up your shapefile

Upload a **zipped** shapefile that describes your trail system. This data should be a 'polyline' shapefile of features that represent the actual paths your trails take.

As you probably know, a "shapefile" is actually a set of several files. To use this converter, we require the following files be included in a single zipped upload:

What we expect from your data

This converter tool makes a number of assumptions about the data you upload. The tool is under active development, and as such currently supports only a narrow range of all trail data.

- This tool expects to receive a shapefile with many features, each representing a segment of trail.

OpenTrails Converter: A tool for converting trail data (shapefiles) to OpenTrails format.

http://lexington-geocoder.herokuapp.com

Lexington Address Service

332

{"type":"Feature","geometry":{"type":"Point","coordinates":
[-84.5227488097614,38.07336776393766]},"properties":{"formatted_address":"**332**
HILLSBORO AVE","parcel_id":"43922200"}}

{"type":"Feature","geometry":{"type":"Point","coordinates":
[-84.46761233620924,38.045286856330335]},"properties":{"formatted_address":"**332**
HILLCREST AVE","parcel_id":"12752150"}}

EXAMPLE #3: Lexington Geocoder

Lexington Geocoder: Uses open parcel data and ElasticSearch to do fuzzy matching on addresses.

You can see many more projects and examples on Code for America's GitHub: http://github.com/codeforamerica

Other considerations:

- Hosting applications
- Changing infrastructure and data storage
- Relationship management

SHAMELESS PLUGS:

Code for America Brigades and Maptime chapters can help!

http://codeforamerica.org/brigade

http://maptime.io

This talk was about building open source web applications with government GIS data.

Trail View Hiker designed by Luis Prado from the thenounproject.com

It is not that difficult, and certainly not impossible.

Trail View Hiker designed by Luis Prado from the thenounproject.com

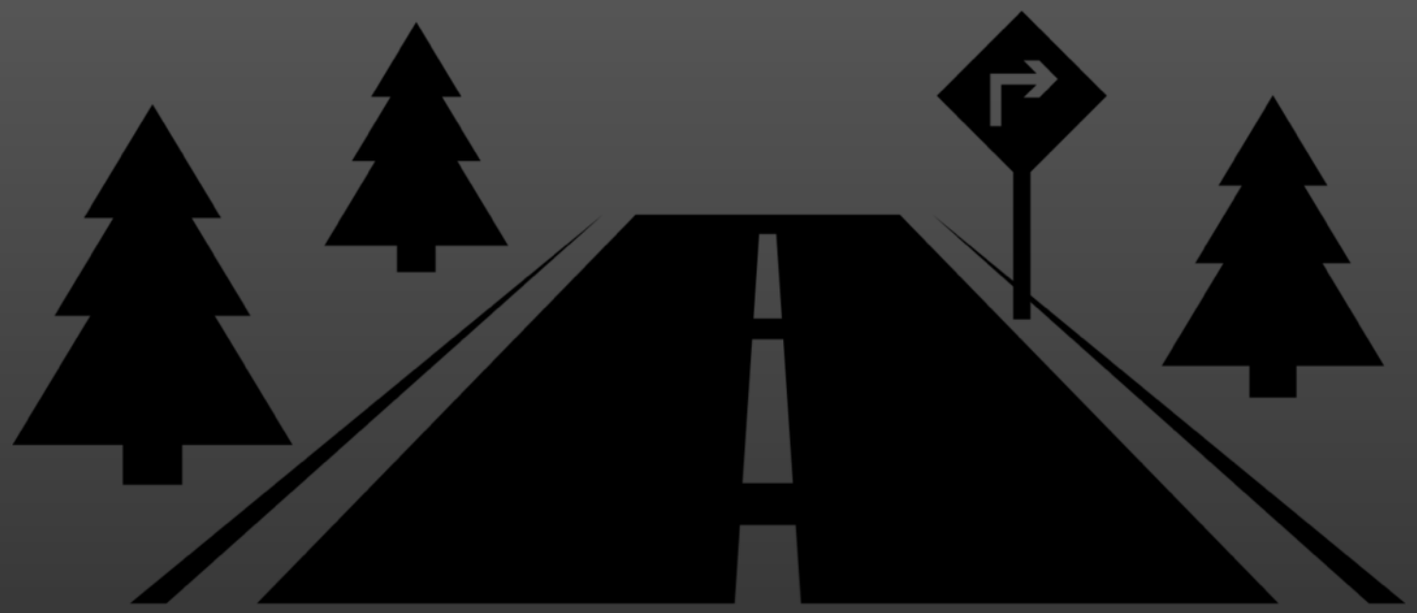
Opening government data is a big deal.

You are a champion.

Keep doing the hard work.

It's worth it.

Trail View Hiker designed by Luis Prado from the thenounproject.com



Thanks!

Lyzi Diamond | **@lyzidiamond** | **lyzi@codeforamerica.org**
Slides: http://bit.ly/lyzi-foss4g

Come to the Maptime party tonight!

Road designed by Juan Pablo Bravo from the thenounproject.com