



# User Experience and Interface Design for Web Apps

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@AL\_Laframboise

The background features a vibrant blue gradient. On the left side, there are abstract geometric shapes in shades of purple and yellow, some with a textured, mosaic-like appearance. The text 'What is good Design?' is centered in a white, sans-serif font.

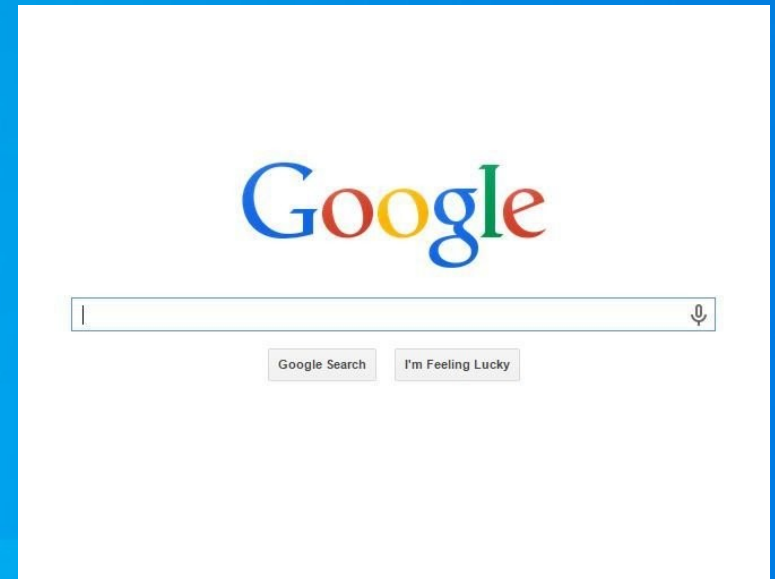
What is good Design?

# Which design is better?

A

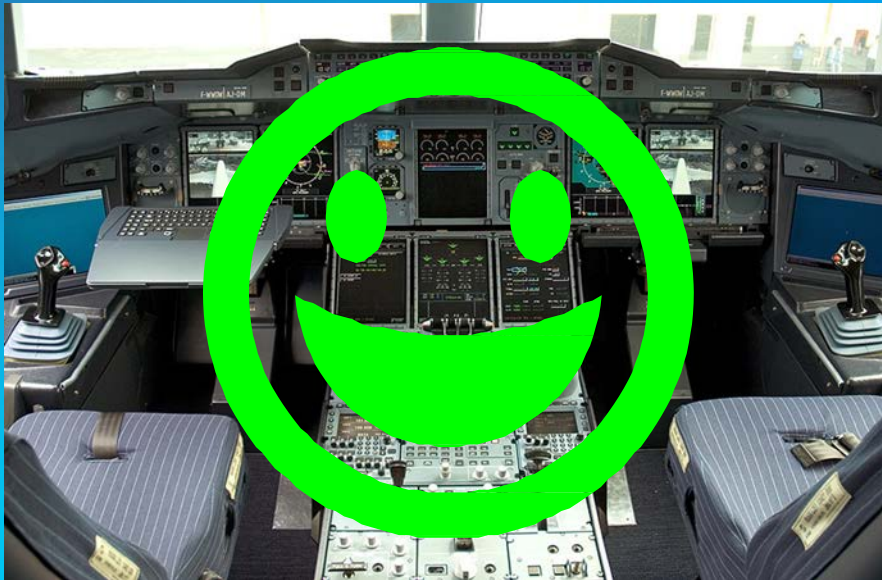


B



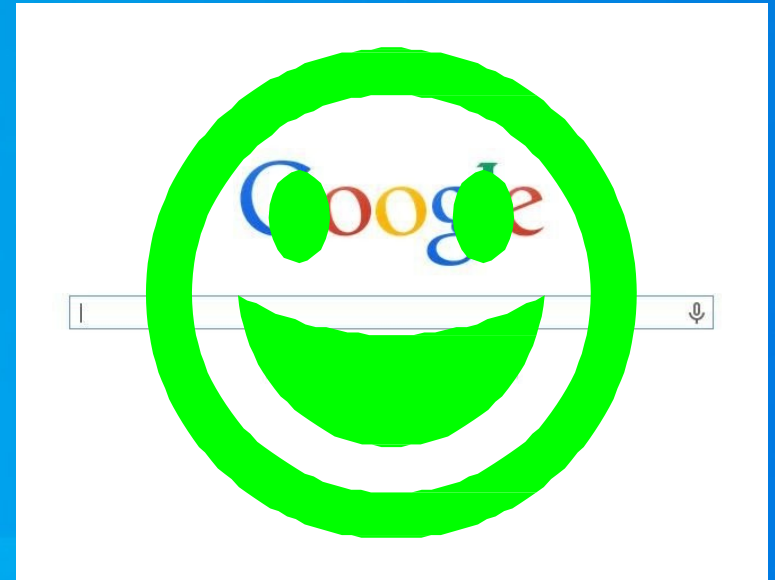
# Which design is better?

A



End-User Needs

B



Business Needs

# Strategy: End-User Needs

- Who are our users?
- What are they trying to accomplish?
- How successful are they doing that?

# Strategy: Business Needs

- Where are we now?
- Where do we want to go?
- How do we get there?
- How do we define success?

# What is good Design?

It has a Purpose

=> Define Strategy

=> Define Success



The background features a vibrant blue gradient. On the left side, there are abstract geometric shapes in shades of purple and yellow. A prominent yellow shape with a grid-like texture is partially visible, along with several purple and blue geometric forms that create a layered, modern aesthetic.

Know your User





External  
Users

- ⦿ impatient
- ⦿ demanding
- ⦿ in a hurry
- ⦿ in control

Make/Save \$

Internal  
Users

- ⦿ skilled
- ⦿ trained
- ⦿ forced



# How to create Better Designs?

A decorative geometric pattern on the left side of the slide, featuring overlapping triangles and polygons in shades of purple, blue, and yellow. The pattern is partially obscured by the text.

Consider the  
Empty State

Enter Address or Zip Code



Find a Store



Enter Address or Zip Code

Find



POWERED BY  
**esri**

# Better Design

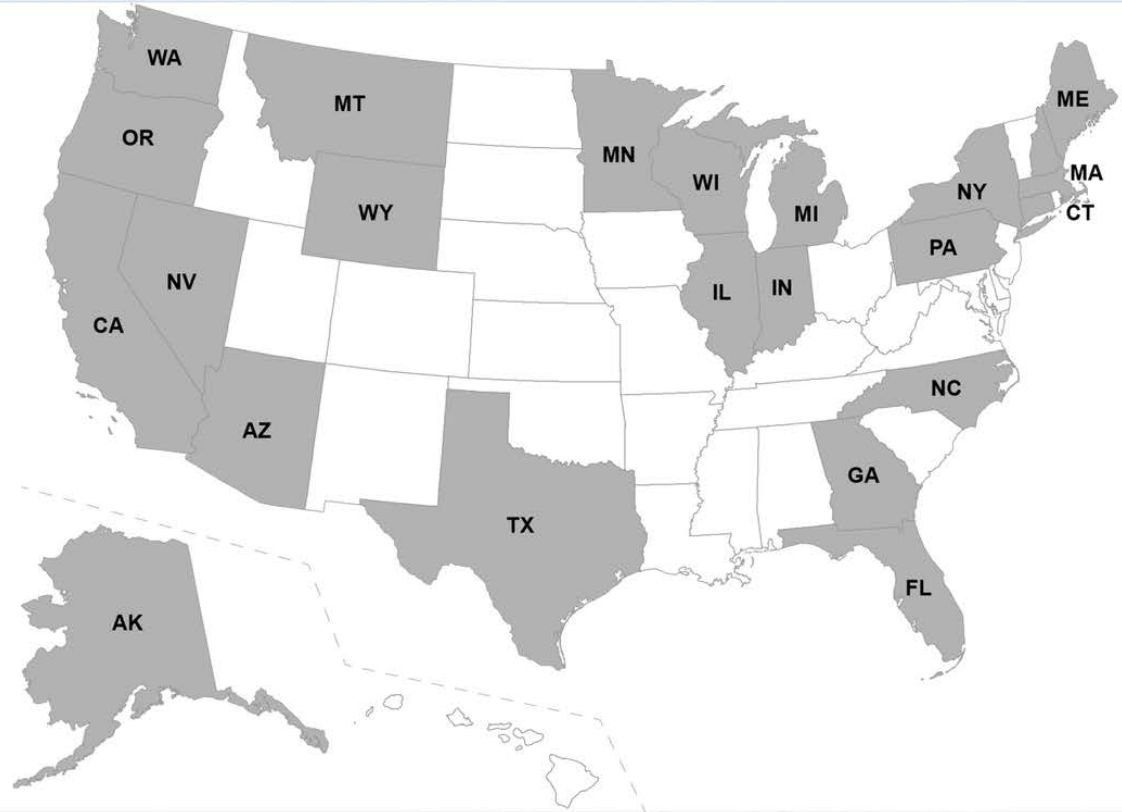
Find a store near you!

Enter Address or Zip Code

Find



Retailer has over 1000 locations nationwide.





# Use Task-focused Workflows





### 1 Find Your Service Area

State, County, Zip, Place

OR USE

#### Map Selection Tools

ADD ZONES

REMOVE ZONES

### 2 Define Your Service Options



### 3 What Date is this Effective?

7/17/2014

### 4 All Done?

SUBMIT

### Select Your Transportation Types

Ambulance (A)
  Cab (C)
  Paralfit (P)
  Stretcher (S)
  Demand Response (E)

### Define Services Per Zone

OPEN / CLOSE ALL
  CLEAR ALL
  ZOOM ALL

Zip	P/D	P	D	Options
▶ 10211 C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✕ 🔍
▶ 10012 C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✕ 🔍
▶ 10009 C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✕ 🔍
▶ 10003 C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✕ 🔍
▶ 10002 C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✕ 🔍

P/D: Pickup & Dropoff

P: Pickup Only

D: Dropoff Only

ESRI User [Return to MTM >](#)

Zip codes here (15):

+ Add All - Remove All

- 10203 (Bank Of New York Brm) + -
- 10212 (Business Reply) + -
- 10256 (Deutsche Bank) + -
- 10257 (Bank Of New York) + -
- 10258 (European American Bank) + -
- 10259 (New York City) + -

POWERED BY Esri, HERE, DeLorme, MapmyIndia, ...



A decorative graphic on the left side of the slide, consisting of overlapping geometric shapes in shades of purple, blue, and yellow. The shapes include triangles and polygons, some with a grid-like texture.

# Utilize UI Patterns

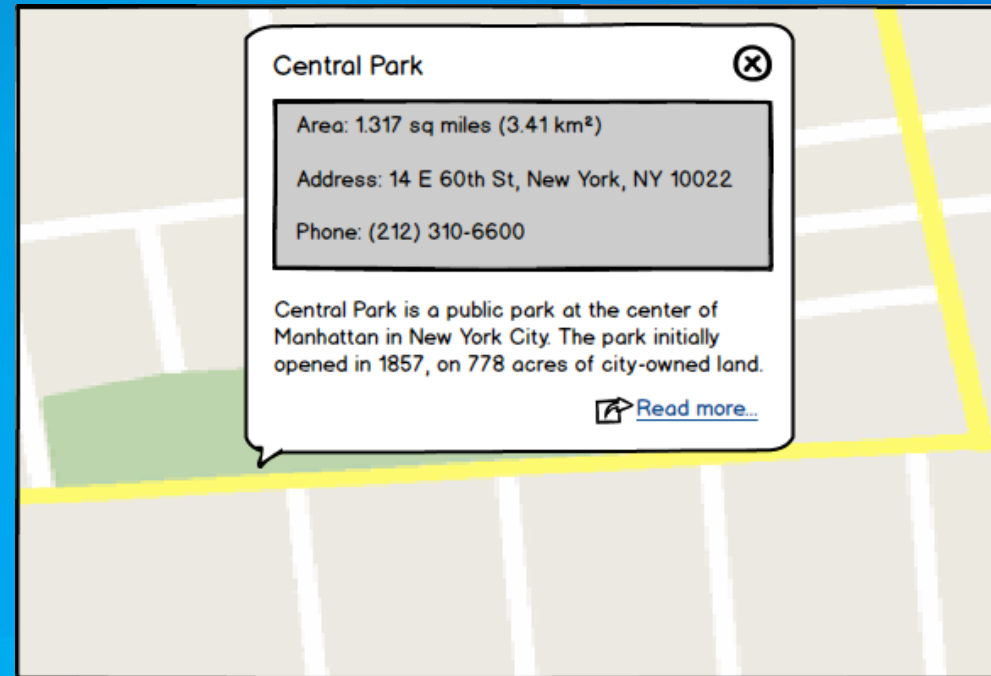
# What are UI Patterns?

- Solutions to common design problems
- Help to avoid re-inventing the wheel
- Defined as Problem / Context / Solution

# Pattern: Info Window

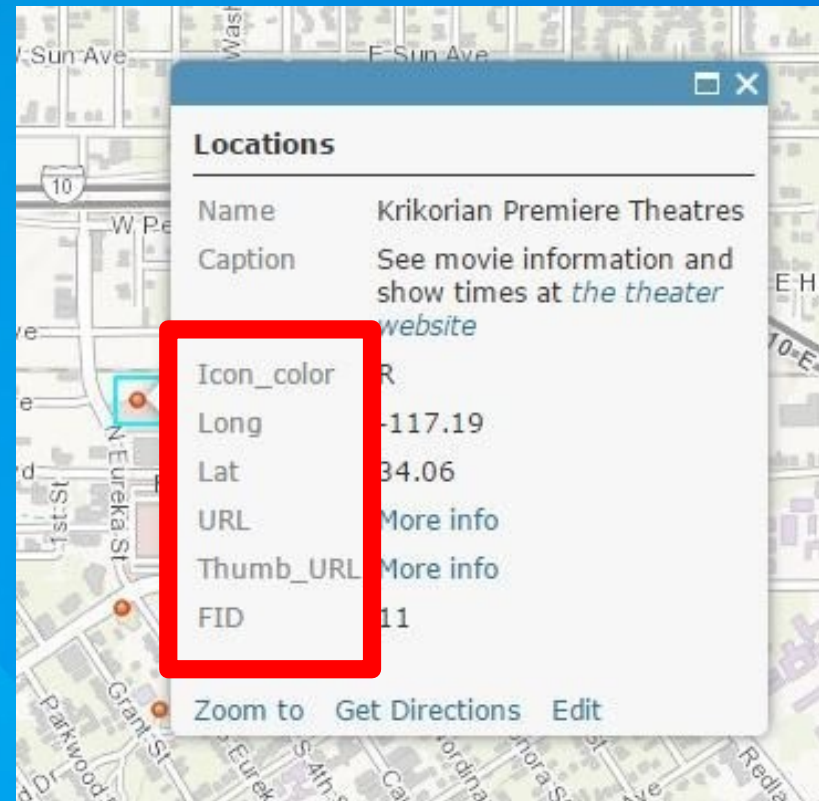
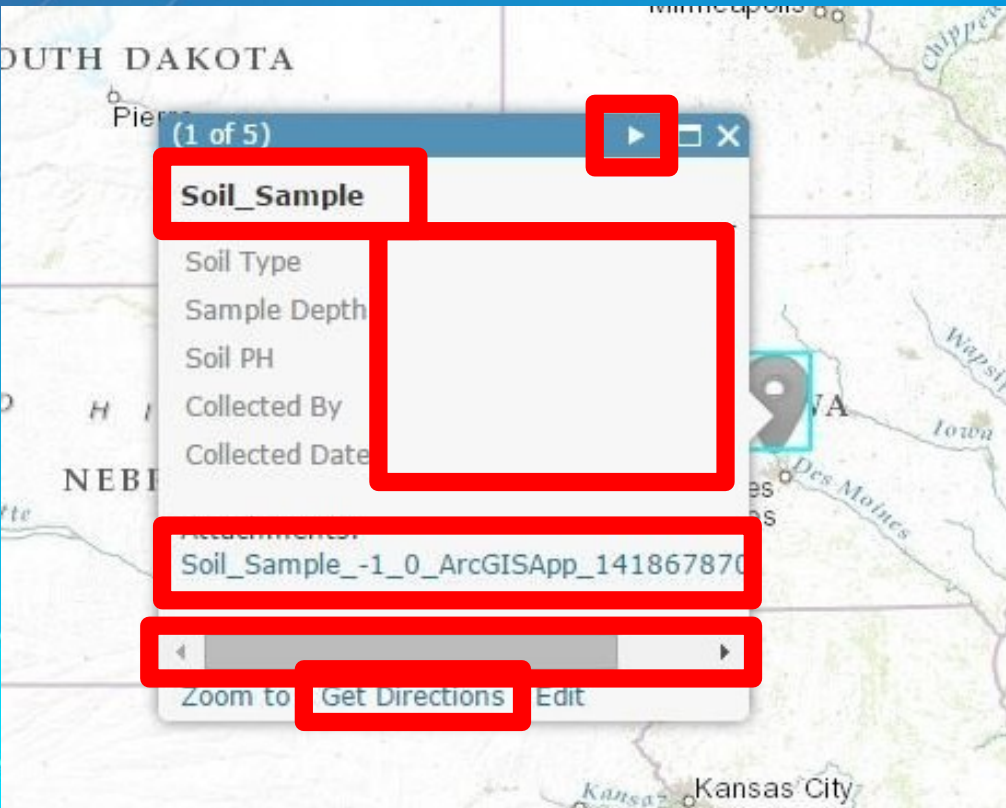
What problem does it solve?

Too much information on the map.  
Needs user interaction to disclose.



<http://www.designingmapinterfaces.com/patterns/info-window/>

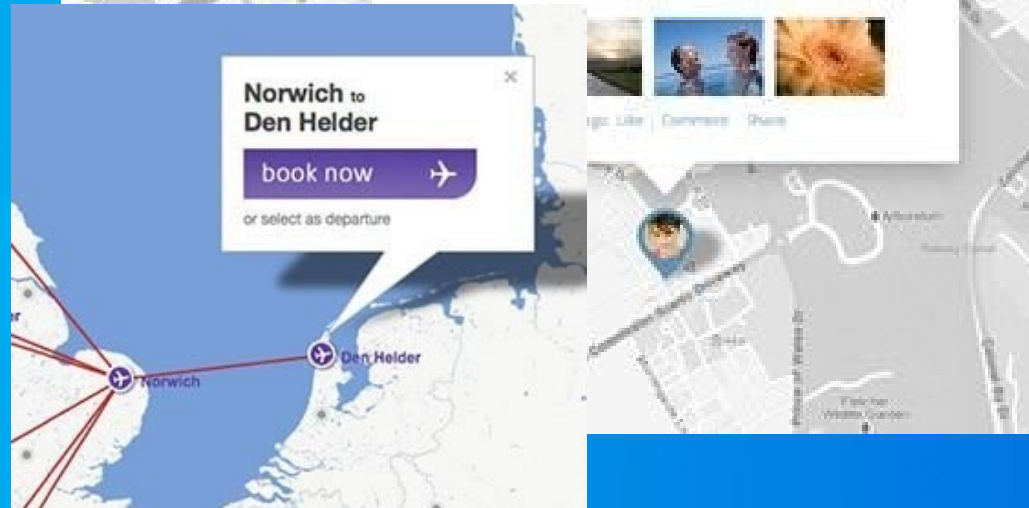
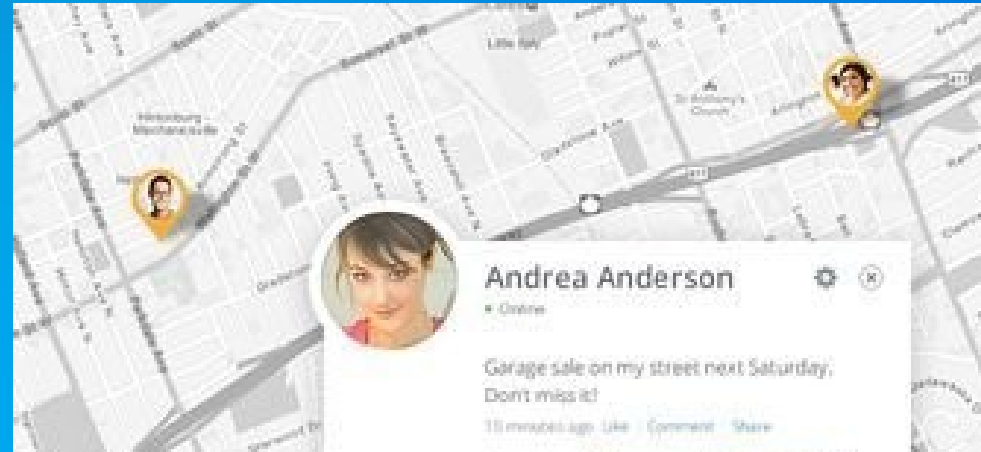
# Pattern: Info Window



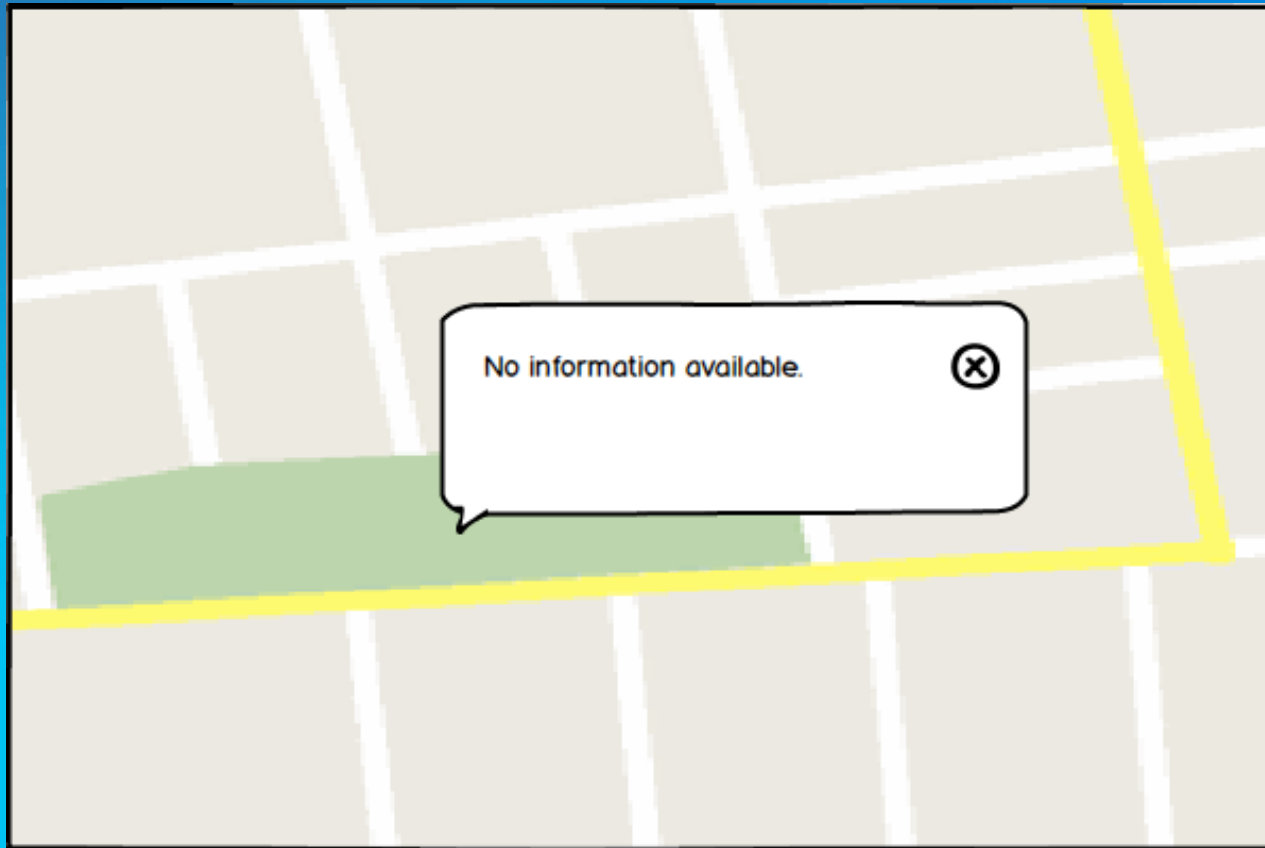
# Pattern: Info Window

What's the solution?

- Show useful information
- Include contextual actions (e.g. buttons, links)
- Avoid displaying default column names
- Avoid meaningless data like ID's or Lat/Long



# Anti-Pattern: Empty Info Window



<http://www.designingmapinterfaces.com/patterns/empty-info-window/>

# Anti-Pattern: Empty Info Window

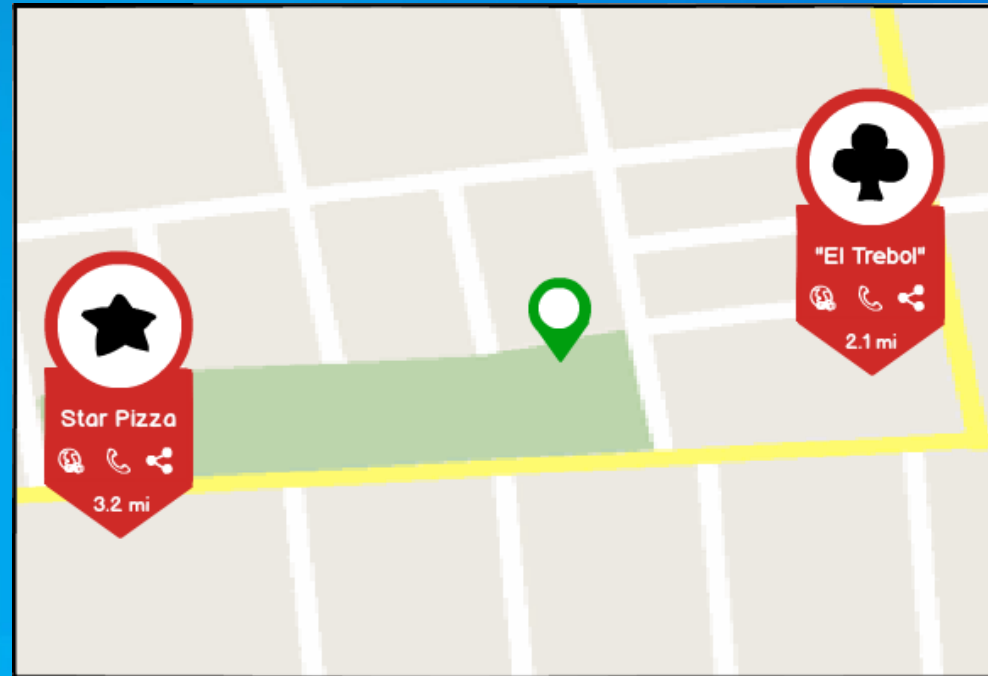




# Pattern: Rich Marker

What problem does it solve?

Required to make a decision but clicking each feature to popup an InfoWindow is too cumbersome.

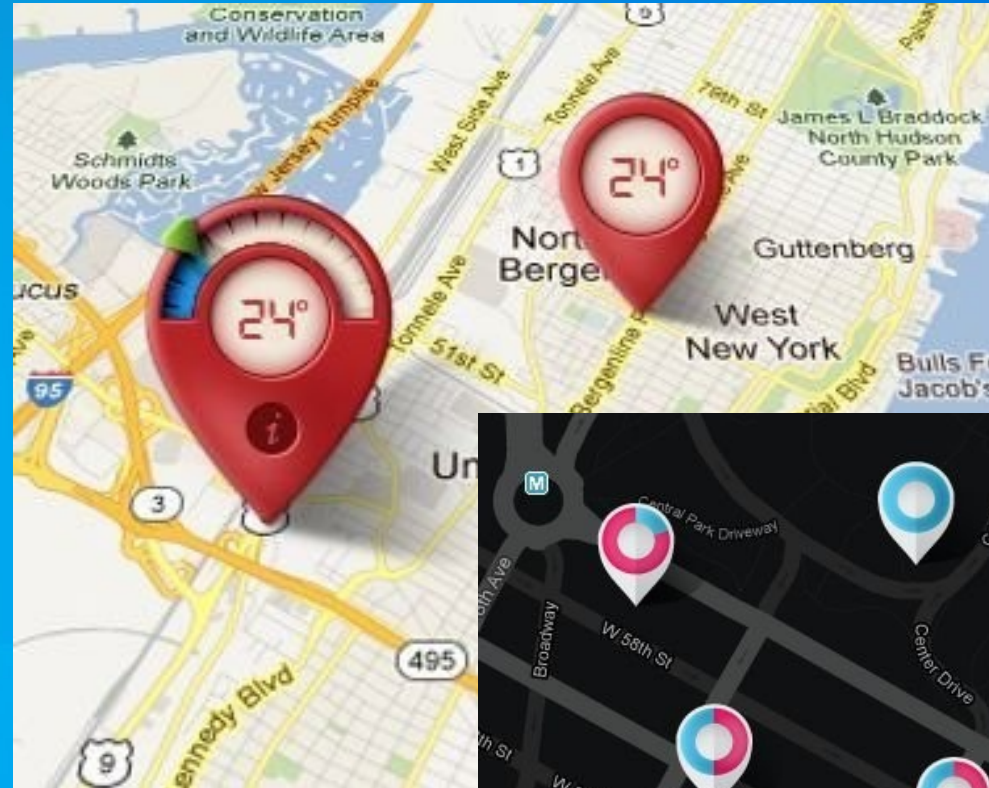


<http://www.designingmapinterfaces.com/patterns/rich-marker/>

# Pattern: Rich Marker

What's the solution?

- Show key metric or performance indicator
- Use when the content of the markers is important to make a decision and needs to be seen at a glance
- Must be related to task
- Result set is limited



# Utilize UI Patterns

<http://www.designingmapinterfaces.com/>

<https://www.pinterest.com/michaelgaigg/map-ui-pattern>

# Invest in Cartography



# Find your Representative

Here you can enter your zipcode or search on the map to find out who represents you in Congress and more.

## BY LOCATION

Find your representative by location. Enter your zipcode or select a state to begin the search.

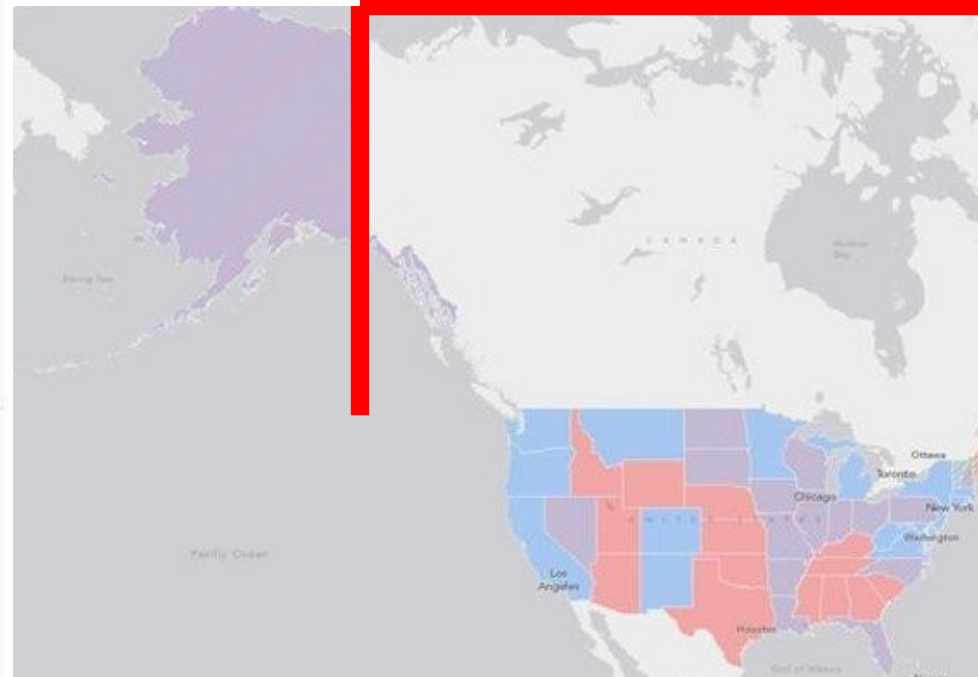
or  ▼ or

OR

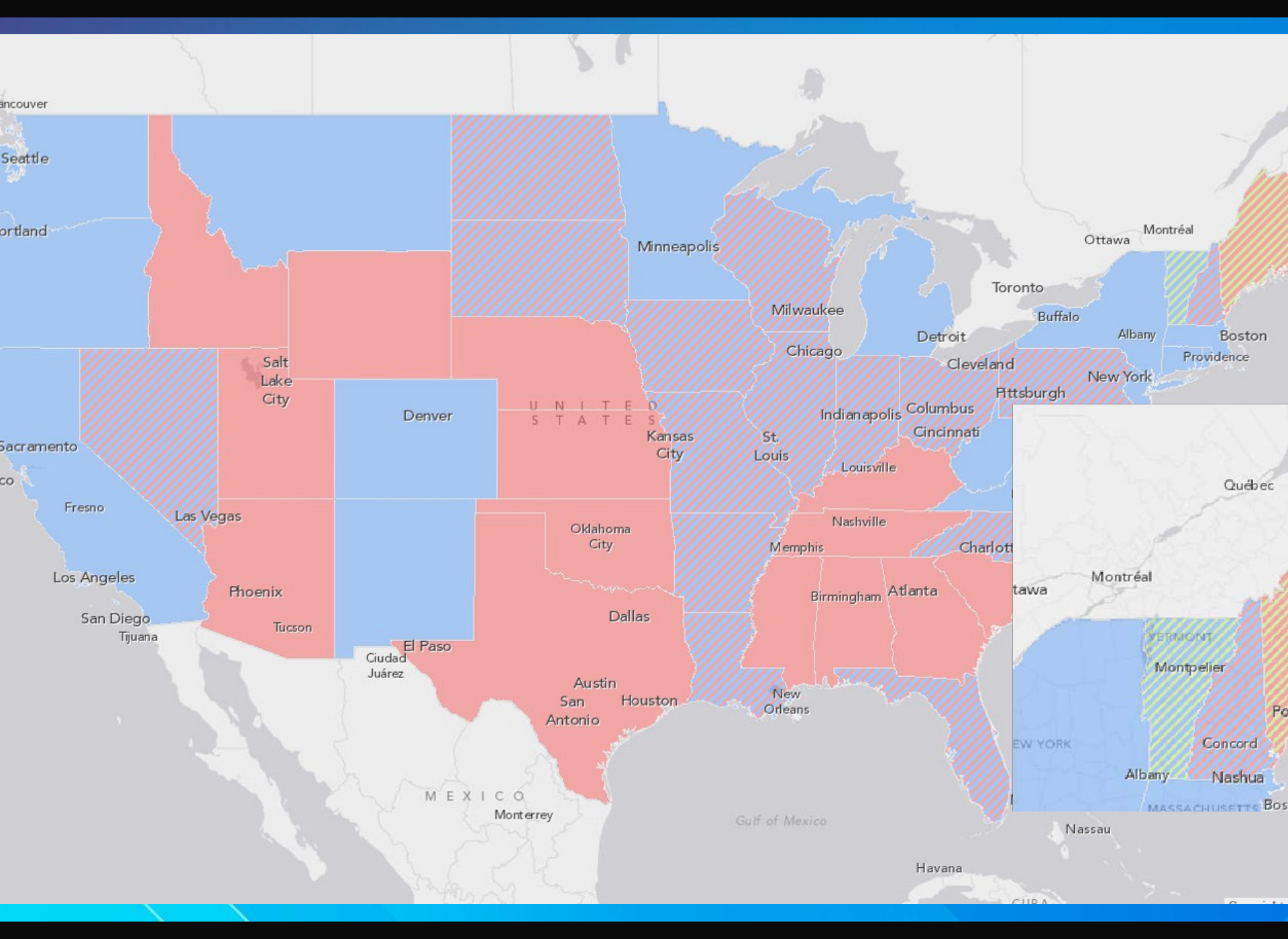
## BY NAME

If you know the name of the representative you are looking for enter the name of the senator or representative below.

🔍  ▼







# How to improve Cartography

- Follow well established domain conventions & cartographic rules
- Avoid simultaneous contrast and color movement
- Choose your colors wisely



# Find your Representative

Here you can enter your zipcode or search on the map to find out who represents you in Congress and more.

## BY LOCATION

Find your representative by location. Enter your zipcode or select a state to begin the search.

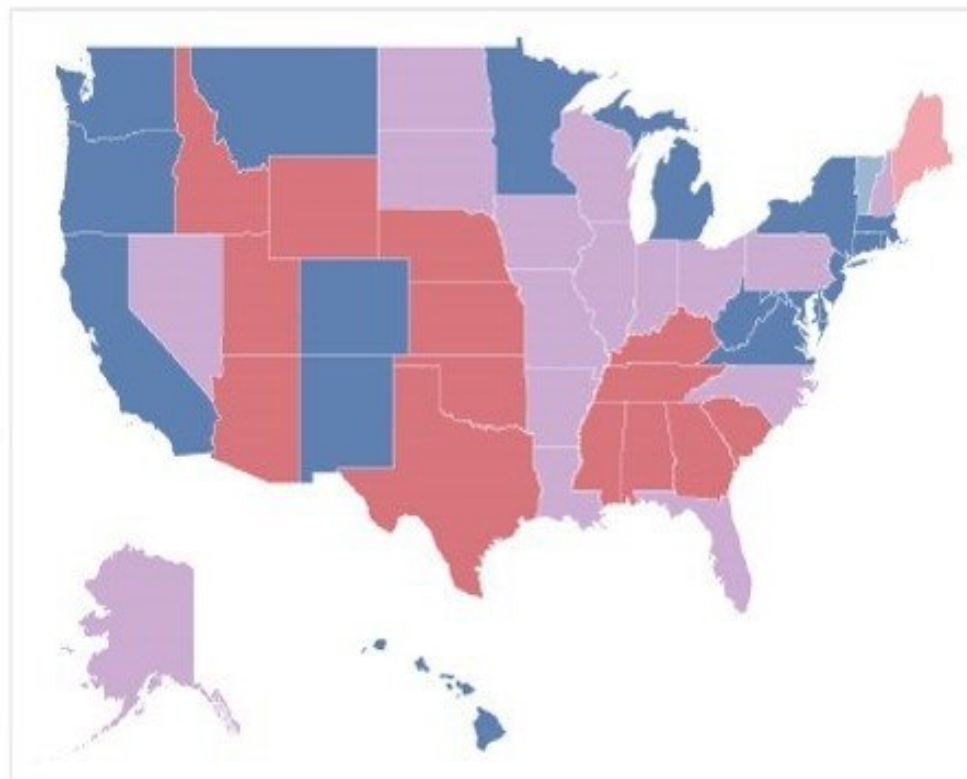
or  ▼ or

OR

## BY NAME

If you know the name of the representative you are looking for enter the name of the senator or representative below.

🔍  ▼





Know your Data

or better

Know what your User  
knows about your Data



### Know Your Farmer, Know Your Food Compass Map

This map shows efforts supported by USDA and other federal partners as well as related information on local and regional food systems for the years 2009-2012.

To learn about specific projects or what's going on in a particular area, use the slide bar to zoom to that location, and select the pin symbols on the map. Note: Most projects are only accurate to the zip code level. If there are multiple projects in the same zip code, they will show up on the same pin. You can scroll through them using arrows at the top of the pop-up box.

#### Map Legend-Data Layers

##### Projects by Compass Theme

- Careers
- Farm to Institution
- Infrastructure
- Stewardship
- Healthy Food Access
- Knowledge
- Marketing and Promotion
- Meat, Poultry, and Fish

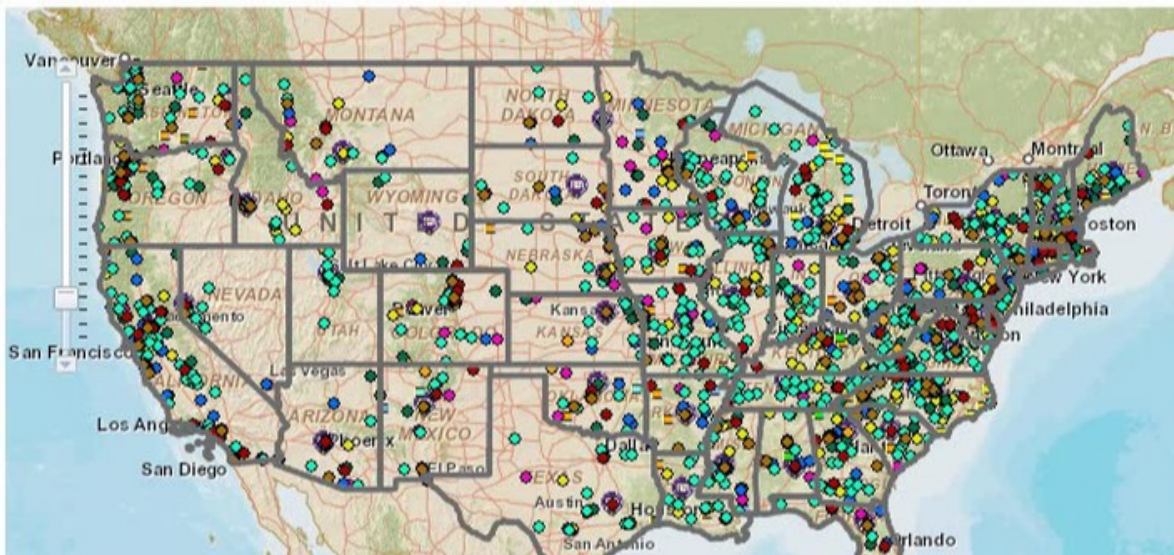
##### Projects by Recipient Type

##### Projects by USDA Program

##### Other Federal Partners

- ARC
- Commerce-EDA
- DOL
- DOT
- EPA
- HHS-ACE

#### Basemaps Search Locate Resources





# Demo

<http://www.usda.gov/wps/portal/usda/usdamedia?navid=kyf-compass-map>

# Optimize

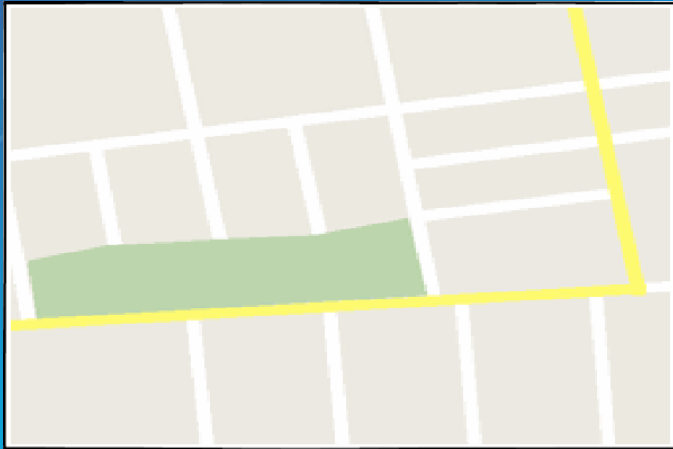
- Visible layers (toggle by theme)
- Cartography (based on 1 select basemap)
- Info windows (customized to features)
- Data display (meaningful grid)



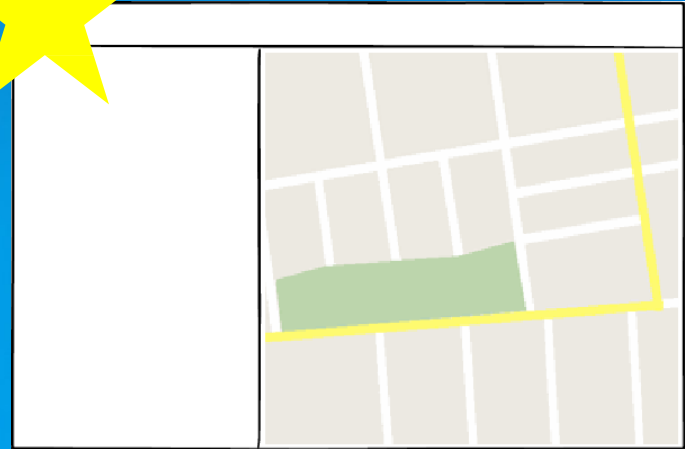
Select the correct  
Layout



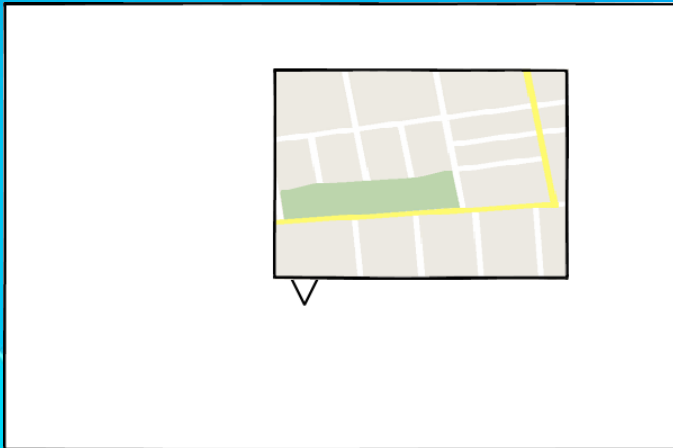
Full Map



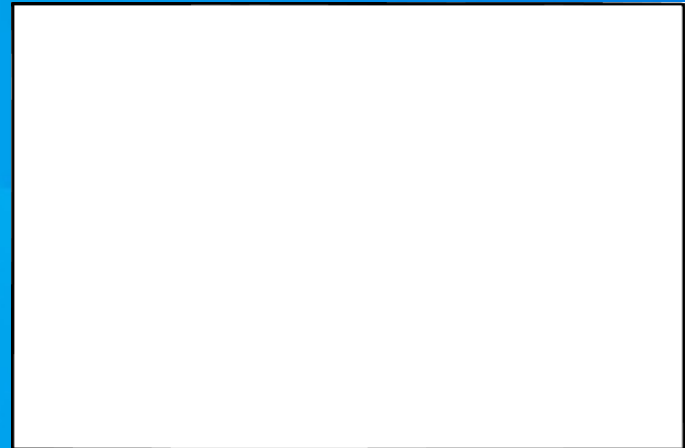
Partial Map



Reference Map



No Map



# Full Map

Map is the focus and the core value

# Partial Map

Workflow driven

The screenshot displays the SPOT Online web application. At the top left is the SPOT Online logo. The top right shows a user greeting: "Welcome Michael Gaigg" with links for "Logout", "About", and "Contact Us".

The main interface is divided into two primary sections: a project list on the left and a map on the right.

**My Projects Table:**

	SPOTID	Mode	Project Category	Status
✓	A140232	Aviation	Statewide Mobility	Draft
✓	A140233	Aviation	Statewide Mobility	Draft
?	A140235	Aviation	Statewide Mobility	Draft
?	B140185	Bicycle & Pedestrian	Division Needs	Draft
✓	H140024	Highway	Regional Impact	Submitted
✓	H140036	Highway	Division Needs	Submitted
?	H140054	Highway	Statewide Mobility	Draft
?	H140055	Highway	Statewide Mobility	Draft
?	H140056	Highway	Statewide Mobility	Draft
?	H140057	Highway	Statewide Mobility	Draft
?	H140064	Highway	Statewide Mobility	Draft
?	H140065	Highway	Statewide Mobility	Draft
?	H140070	Highway	Statewide Mobility	Draft
✓	H140120	Highway	Statewide Mobility	Draft
✓	H140122	Highway	Statewide Mobility	Draft
✓	H140123	Highway	Statewide Mobility	Draft
✓	H140124	Highway	Statewide Mobility	Draft

**Map and Project Detail Popup:**

The map on the right shows a geographical area with roads and water bodies. A popup window for project **A140233** is open, displaying the following information:

- Aviation** (Mode)
- Statewide Mobility** (Project Category)
- 7A8 - Avery County-Morrison Field** (Location)
- \$ 5,000** (Value)
- DRAFT** (Status)
- Project Title:** asdf
- Specific Improvement Type:** 105 - Land Acquisition - Runway Approach
- TIP #:**
- Description:** asdf

Map navigation controls include zoom in (+), zoom out (-), home, identify, and lasso tools. A scale bar at the bottom indicates 0, 0.2, and 0.4 miles.

# Wizard with Map Step

**SPOT Online** Welcome Michael Gaigg [Logout](#) [About](#) [Contact Us](#)

**Create New Project** Cancel

**Map Sketch** (Step 3 of 7)

There are 3 steps required to define the project location. This is STEP 3 of 3.

- Begin by selecting an existing road segment.
- Next, draw a new road segment.
- Lastly, select an existing road segment parallel to the new road segment.

Spot Id	Improvement Type	Route
H140289	6 - Widen Existing Roadway and Construct Part on New Location	

**Map Sketch** | Select | intersects |

← Previous Save & Next →



# Reference Map

For navigation and reference purposes

**Kohala Middle**

Principal  
Phone: 889-7119  
Zip Code

**Google**

Paris

17

26 minutes pour atteindre Domicile

**Charles Riccardi**  
Palo Alto, California  
34 | 765 | 23

32 VISITS

12 HOSTS | 56 VISITS | 32 COMMENTS

**Maximo Work Orders**

Description	Amount	Status	Description	Amount
Edg A Elec Upgrade		CLOSE	WOOD ROTTING: DECAJ, CAN SEE THROUGH	\$4
Resurface field basketball court	\$6	CLOSE	BROKEN TILES	\$80
Repair walkway door/Decking	\$2	CAN	Ballast burn out	
LDG A - RPR ROOF	\$6	CLOSE	Light bulb order	
CAMP TREE TRIM	\$2	CLOSE	HEALTH ROOM TOILET	\$10
RPL BOYS RESTROOM FIXTURES	\$1	CLOSE	CILING IS COMING APART AND DEBRIS IS FALLING OVER THE STUDENTS	\$17

# No Map

Task doesn't require a map but utilizes power of GIS





# Toggle between Layouts

# Focus on the Subject

**HIDOE Facilities Dashboard**


Island: All | District: All | Complex: All | School: All

Facilities: 288 | FACTRAK: 3830

**Kohala Middle**

Principal: Alan Brown | Phone: 889-7119

Address: 53-4155 Akoni Pule Highway, Kapaau, Hawaii | Zip Code: 96755 | Website: <http://kohalamiddle.org/>



FACTRAK Planned Projects			FACTRAK Jobs			Maximo Work Orders			
1	Total \$3	Avg \$3	18	Total \$1	Avg \$1	467	Total \$9	Avg \$2	
Number	Description	Amount	Number	Status	Description	Amount	Status	Description	Amount
C0003546	Storage Room	\$30K	P0093406	Construction	Bldg A Elec Upgrade		CLOSE	WOOD ROTTING: DECAY, CAN SEE THROUGH	\$4
			P1600014	NULL	Resurface field basketball court	\$6	CLOSE	BROKEN TILES	\$80
			P1600113	Design	A Repair Walkway Floor/Decking	\$2	CAN	Ballast burn out	
			P1601610	Construction	BLDG A - RPR ROOF	\$6	CLOSE	Light bulb order	
			P1601710	NULL	CAMP TREE TRIM	\$2	CLOSE	HEALTH ROOM TOILET	\$10
			P1601810	NULL	C RPL BOYS RESTROOM FIXTURES	\$1	CLOSE	CILING IS COMING APART AND DEBRIS IS FALLING OVER THE STUDENTS	\$17

Maximo Work Orders: Total \$14 | Avg \$2

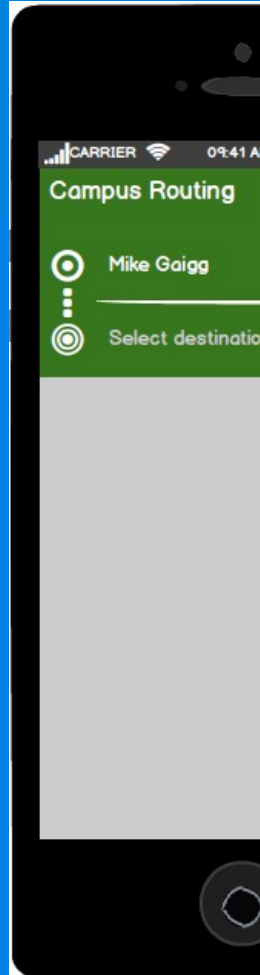
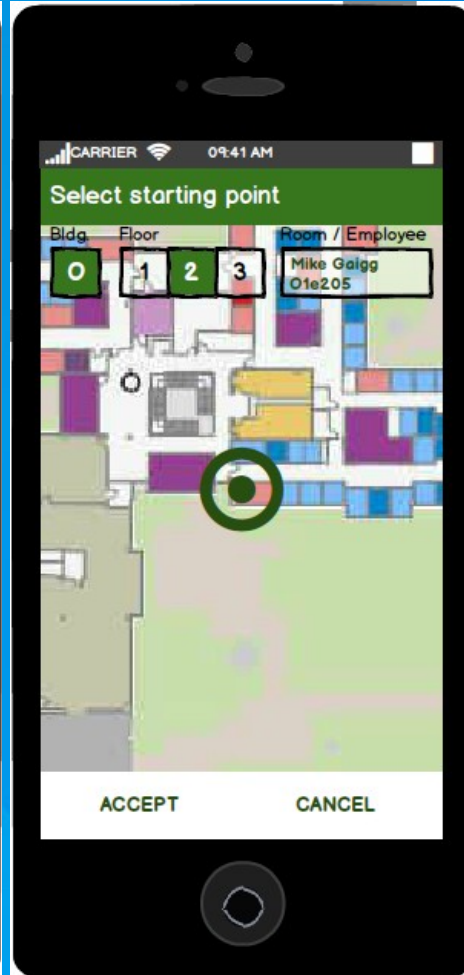
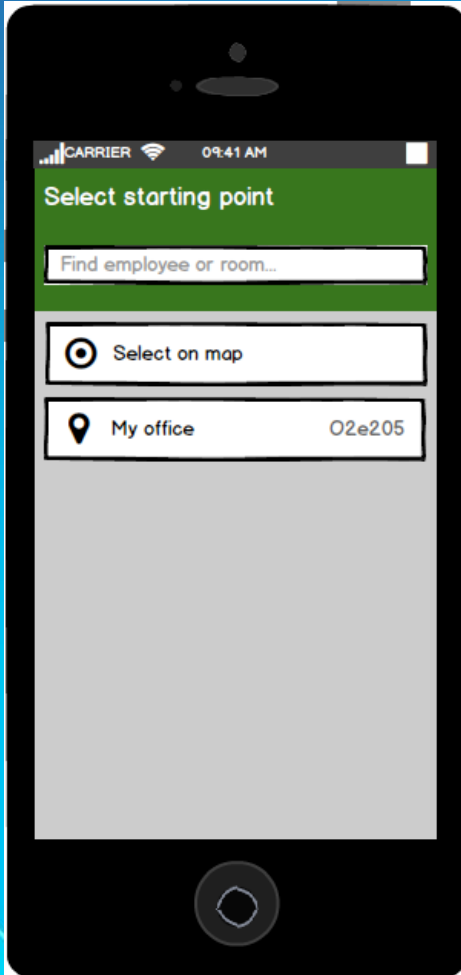
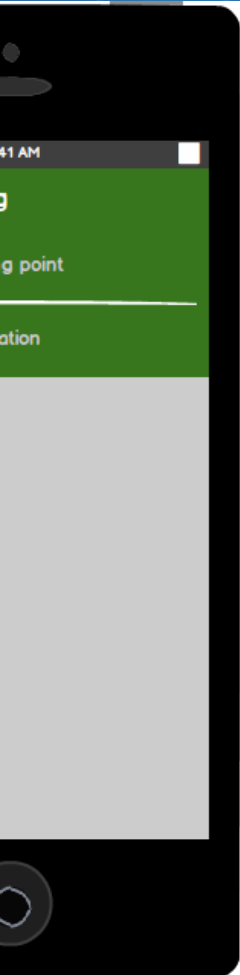
FACTRAK Planned Projects: Total \$3 | Avg \$3

FACTRAK Jobs: Total \$1.6 | Avg \$10

Maximo Work Orders: Total \$9 | Avg \$2

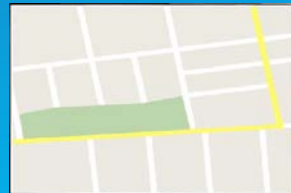
Zoom To

# Focus on the Map

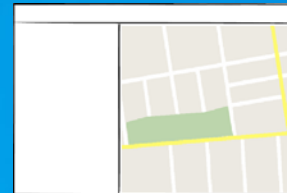


# Layouts Summary

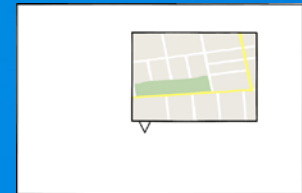
Full



Partial



Reference



Level of Detail

high

high

low to med

Level of Control

high

med to high

none to low

Tools

advanced

in workflows

none/few

Interaction

advanced

advanced ok

limited

Cartography

very important

important

few distractions

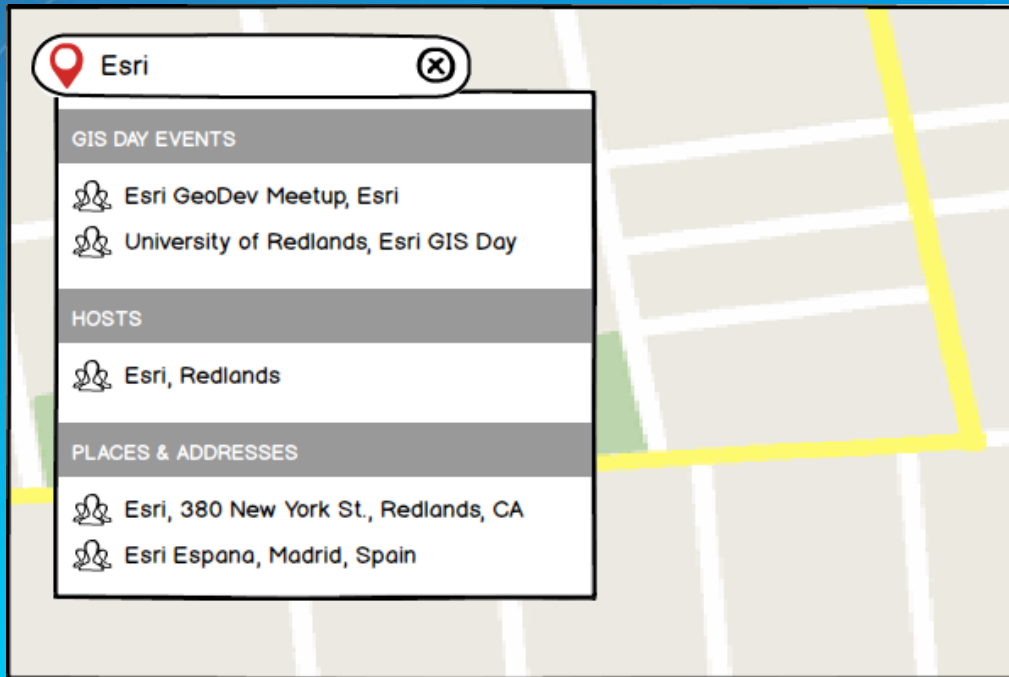
# Provide Navigation



10% of time is spent on navigation  
from one point to another



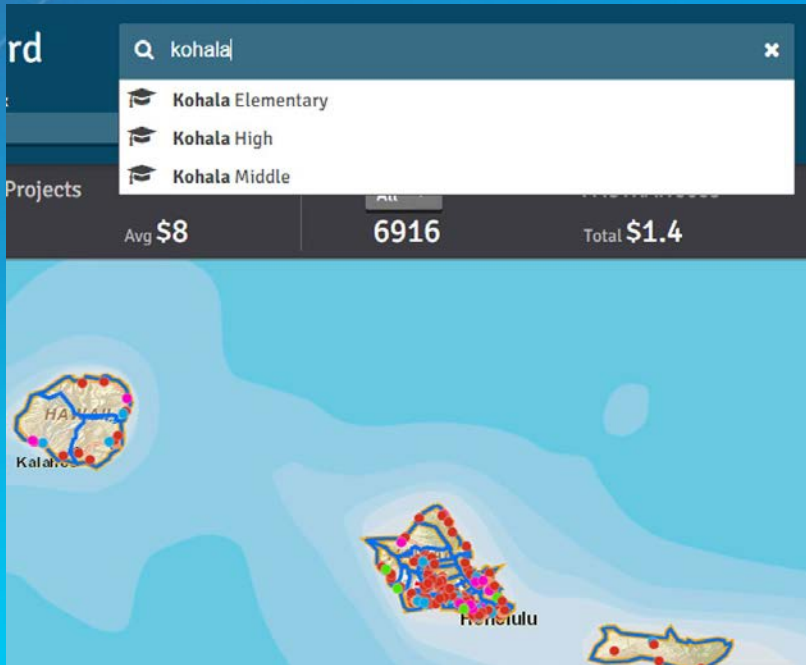
# Unified Search



Problem:

Aggregate different data sources into one disambiguated set of search results.

# Unified Search



## Solution:

- Provide single input field that allow searching multiple sources
- Indicate source or nature
- Show meaningful results
- Remove duplicates and order by relevance

# Browse Geographies

Search: State, county, census tract [Locate]

or [browse list of geographies](#)

State: County: Census tract

- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- Florida

Selected geography: <none selected yet> [Open]

Problem:

Users want to explore places or locations but don't know exactly what they are looking for.

# Browse Geographies

Solution:

- Let users browse hierarchically structured data
- Start simple
- Sort alphabetically
- Show all options if possible

El Paso

Select area by drawing on the map

Alabama  
Alaska  
Arizona  
Arkansas

Hawaii  
Idaho  
Illinois  
Indiana

Montana [change](#) PROGRAMS & PROJECTS

Select area by drawing on the map

Counties in Montana

<a href="#">Beaverhead</a>	<a href="#">Gallatin</a>	<a href="#">Missoula</a>	<a href="#">Silver Bow</a>
<a href="#">Big Horn</a>	<a href="#">Garfield</a>	<a href="#">Musselshell</a>	<a href="#">Stillwater</a>
<a href="#">Blaine</a>	<a href="#">Glacier</a>	<a href="#">Park</a>	<a href="#">Sweet Grass</a>
<a href="#">Broadwater</a>	<a href="#">Golden Valley</a>	<a href="#">Petroleum</a>	<a href="#">Teton</a>
<a href="#">Carbon</a>	<a href="#">Granite</a>	<a href="#">Phillips</a>	<a href="#">Toole</a>
<a href="#">Carter</a>	<a href="#">Hill</a>	<a href="#">Pondera</a>	<a href="#">Treasure</a>
<a href="#">Cascade</a>	<a href="#">Jefferson</a>	<a href="#">Powder River</a>	<a href="#">Valley</a>
<a href="#">Chouteau</a>	<a href="#">Judith Basin</a>	<a href="#">Powell</a>	<a href="#">Wheatland</a>
<a href="#">Custer</a>	<a href="#">Lake</a>	<a href="#">Prairie</a>	<a href="#">Wibaux</a>
<a href="#">Daniels</a>	<a href="#">Lewis and Clark</a>	<a href="#">Ravalli</a>	<a href="#">Yellowstone</a>
<a href="#">Dawson</a>	<a href="#">Liberty</a>	<a href="#">Richland</a>	
<a href="#">Deer Lodge</a>	<a href="#">Lincoln</a>	<a href="#">Roosevelt</a>	
<a href="#">Fallon</a>	<a href="#">Madison</a>	<a href="#">Rosebud</a>	
<a href="#">Fergus</a>	<a href="#">Meagher</a>	<a href="#">Sanders</a>	
<a href="#">Flathead</a>	<a href="#">Mineral</a>	<a href="#">Sheridan</a>	

States

<a href="#">AL</a>	<a href="#">HI</a>	<a href="#">MA</a>	<a href="#">NM</a>	<a href="#">SD</a>
<a href="#">AK</a>	<a href="#">ID</a>	<a href="#">MI</a>	<a href="#">NY</a>	<a href="#">TN</a>
<a href="#">AZ</a>	<a href="#">IL</a>	<a href="#">MN</a>	<a href="#">NC</a>	<a href="#">TX</a>
<a href="#">AR</a>	<a href="#">IN</a>	<a href="#">MS</a>	<a href="#">ND</a>	<a href="#">UT</a>
<a href="#">CA</a>	<a href="#">IA</a>	<a href="#">MO</a>	<a href="#">OH</a>	<a href="#">VT</a>
<a href="#">CO</a>	<a href="#">KS</a>	<a href="#">MT</a>	<a href="#">OK</a>	<a href="#">VA</a>
<a href="#">CT</a>	<a href="#">KY</a>	<a href="#">NE</a>	<a href="#">OR</a>	<a href="#">WA</a>
<a href="#">DE</a>	<a href="#">LA</a>	<a href="#">NV</a>	<a href="#">PA</a>	<a href="#">WV</a>
<a href="#">FL</a>	<a href="#">ME</a>	<a href="#">NH</a>	<a href="#">RI</a>	<a href="#">WI</a>
<a href="#">GA</a>	<a href="#">MD</a>	<a href="#">NJ</a>	<a href="#">SC</a>	<a href="#">WY</a>

Farmers Markets Food Hubs Meat Processors Wholesale Markets Green Scho

# Navigation Patterns

- Location Finder / Geolocate / Unified Search
- Browse Geographies
- Bookmarks / Placemarks
- Home Button
- Overview Map

# Today's Problem