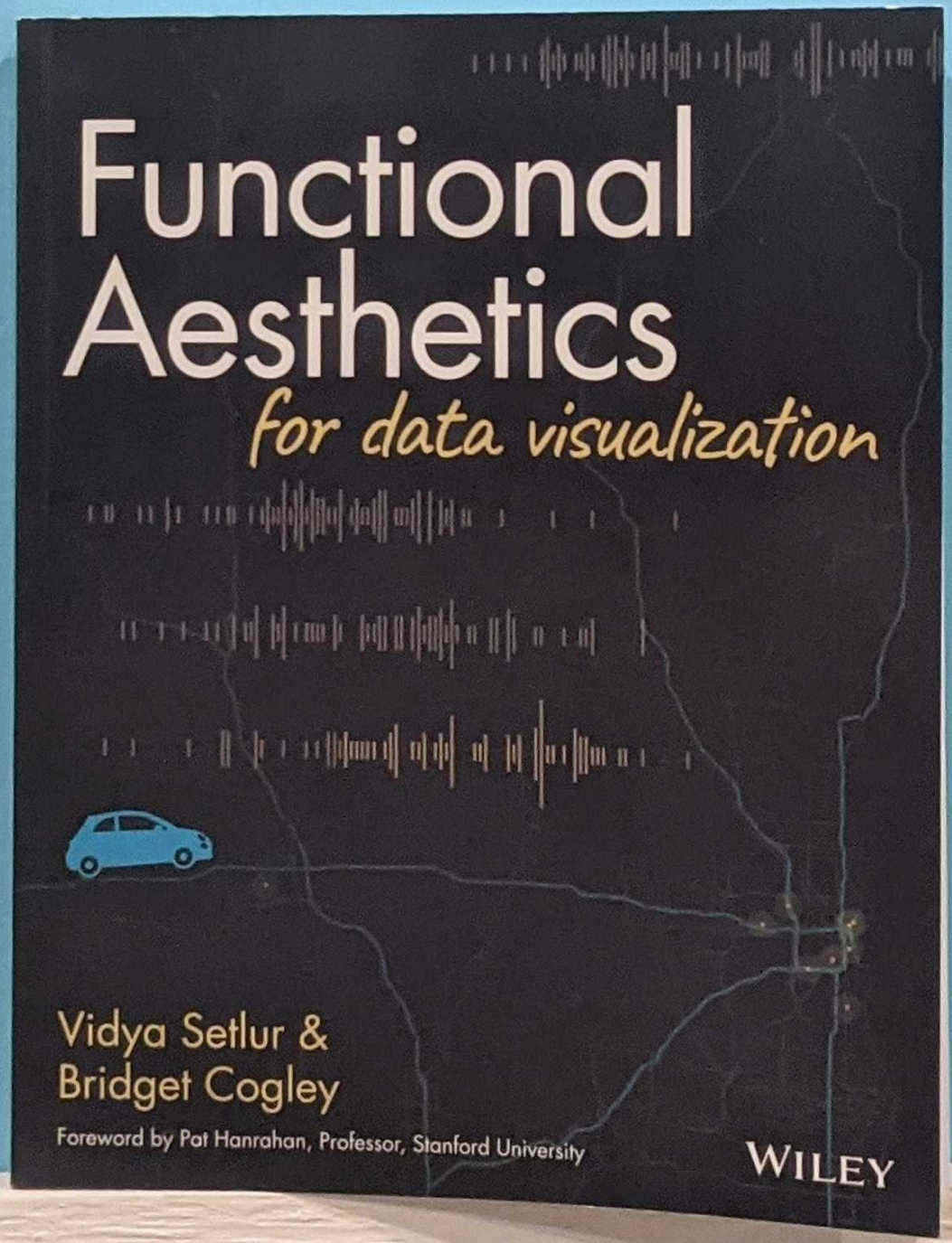
Putting

Functional Aesthetics

to work



Bridget Cogley, CVO @ Versalytix

Why does *beauty* matter?

Functional aesthetics

is the concept of combining perception, semantics, and intent to function together as a whole, creating beauty in meaningful design.

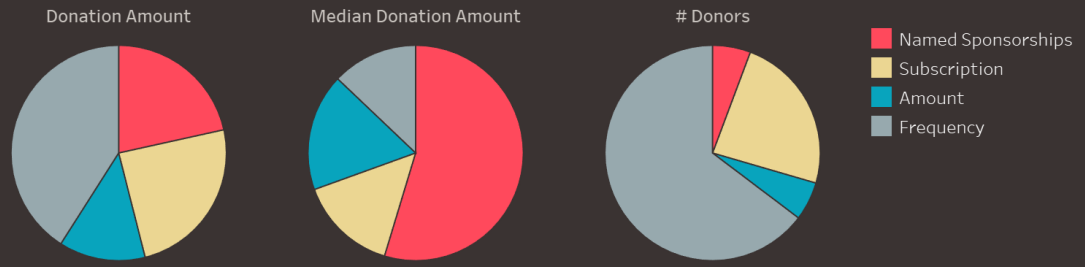
Pictographic

DONATION DRIVE

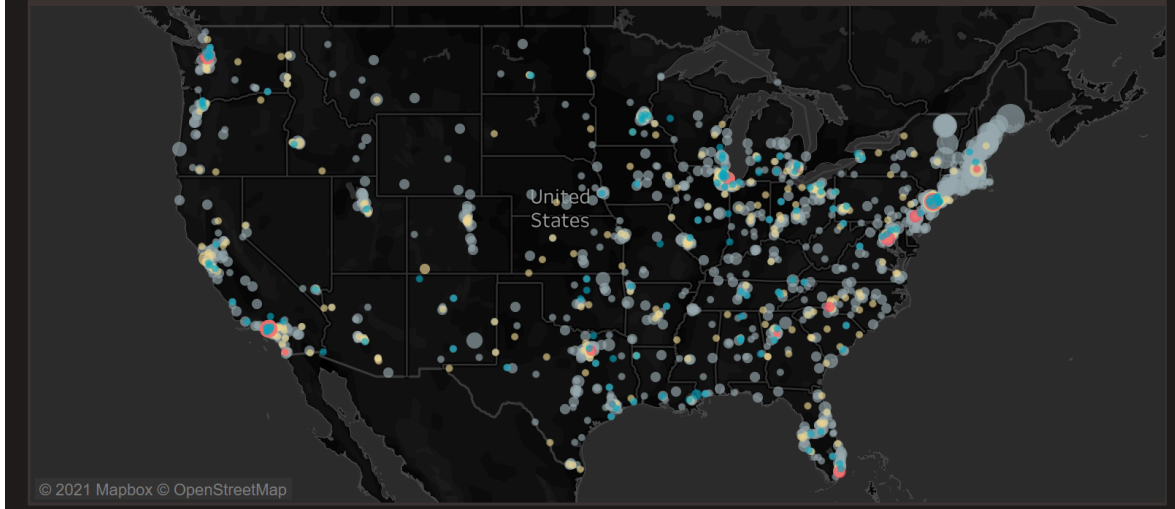
Sample data | Data current to 12/31/2014

Region: (All) | State or Province: (All) | City: (All) | Days since Last Donation: 0 – 1455

CAMPAIGNS



CITIES AND REGIONS



RECOMMENDED OPTIONS

Donor Name	Days since Last Dona..	
Alison Jones	553	Increase # donations
Alison Peters Wooten	288	Increase # donations
Alison Sharp	1119	Increase # donations
Alison Starr	89	Monthly
Alison Stewart	291	Increase # donations
Allan Dickinson	33	Increase # donations
Allan Green	738	Increase # donations
Allan Shields	182	Monthly
Allen Garrett	573	Increase # donations
Allen Nash	194	Increase # donations
Allison Cooke	74	Increase # donations
Allison Gunter	841	Increase # donations
Allison Kirby	239	Tier 3
Allison Peacock	0	Increase # donations
Alvin B Winstead	180	Increase # donations
Alvin Frost	366	Increase # donations
Alvin Hoover	445	Increase # donations
Alvin Mullins	1372	Increase # donations
Amanda Conner	550	Increase Donation Amount
Amanda Gould	1040	Increase # donations
Amanda Hardy Singleton	506	Increase # donations
Amanda Helms	670	Increase # donations
Amanda Huang	873	Increase # donations
Amanda Kay	164	Tier 2

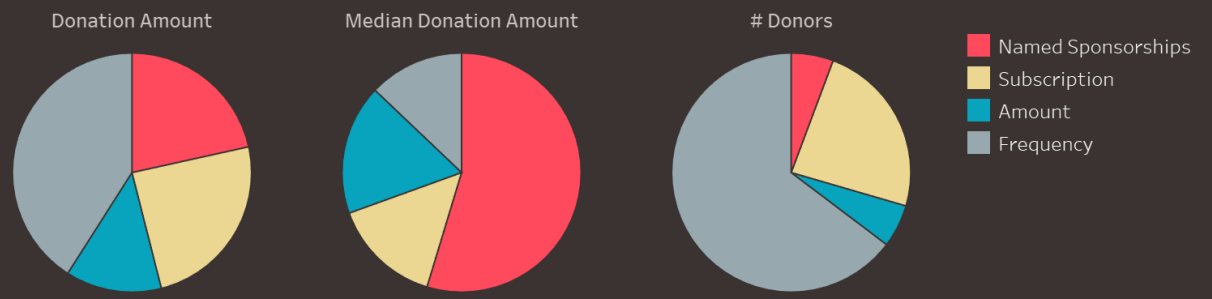
COLLECT DONATION

Pictographic

Learning meaning and fuzzy tasks

Chart choosers

1 to 1 mapping



"compare metrics"

RECOMMENDED OPTIONS

Donor Name	Days since Last Dona..	
Alison Jones	553	Increase # donations
Alison Peters Wooten	288	Increase # donations
Alison Sharp	1119	Increase # donations
Alison Starr	89	Monthly
Alison Stewart	291	Increase # donations
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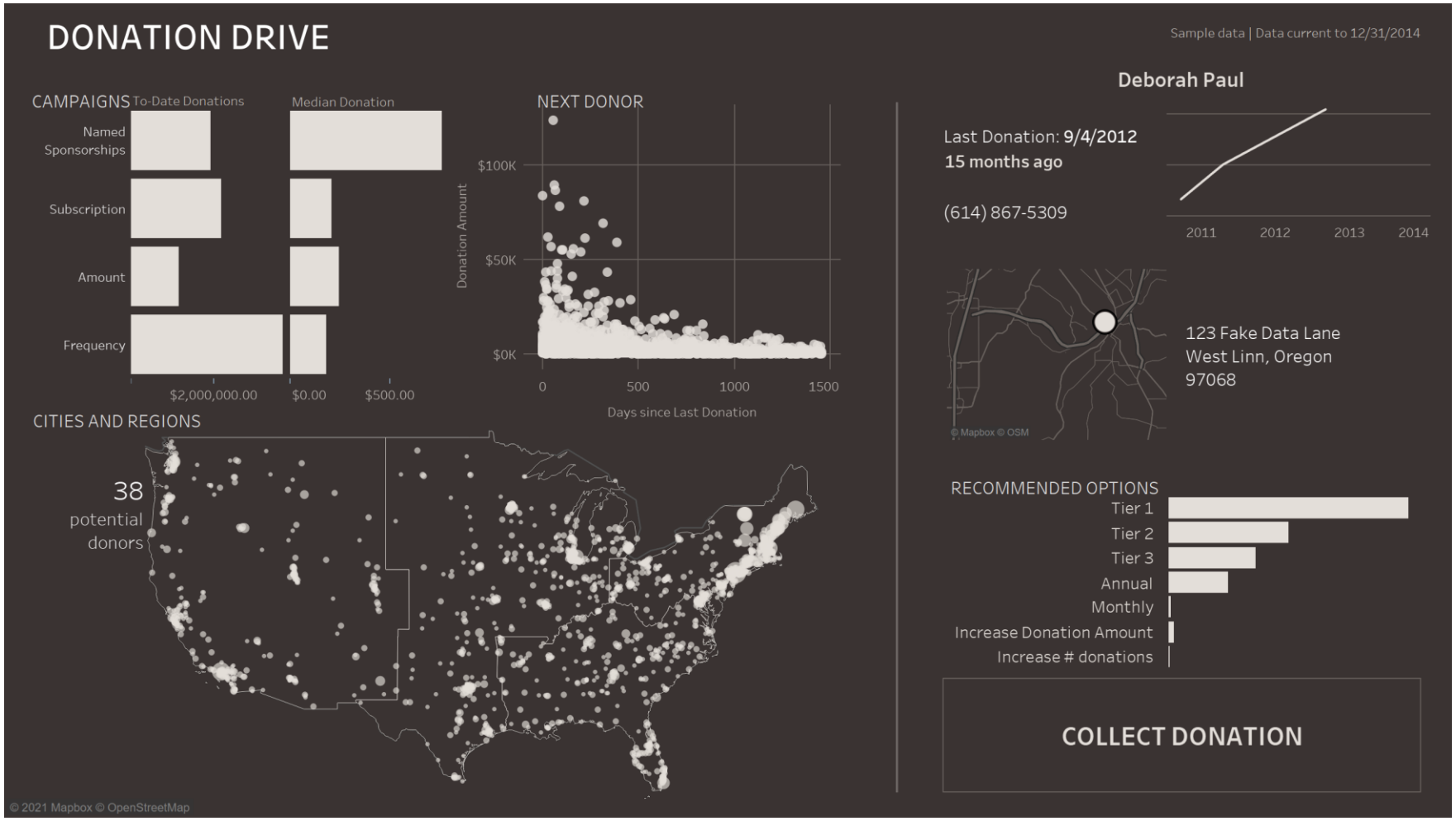
Allen Garrett	573	Increase # donations
Allen Nash	194	Increase # donations
Allison Cooke	74	Increase # donations
Allison Gunter	841	Increase # donations
Allison Kirby	239	Tier 3

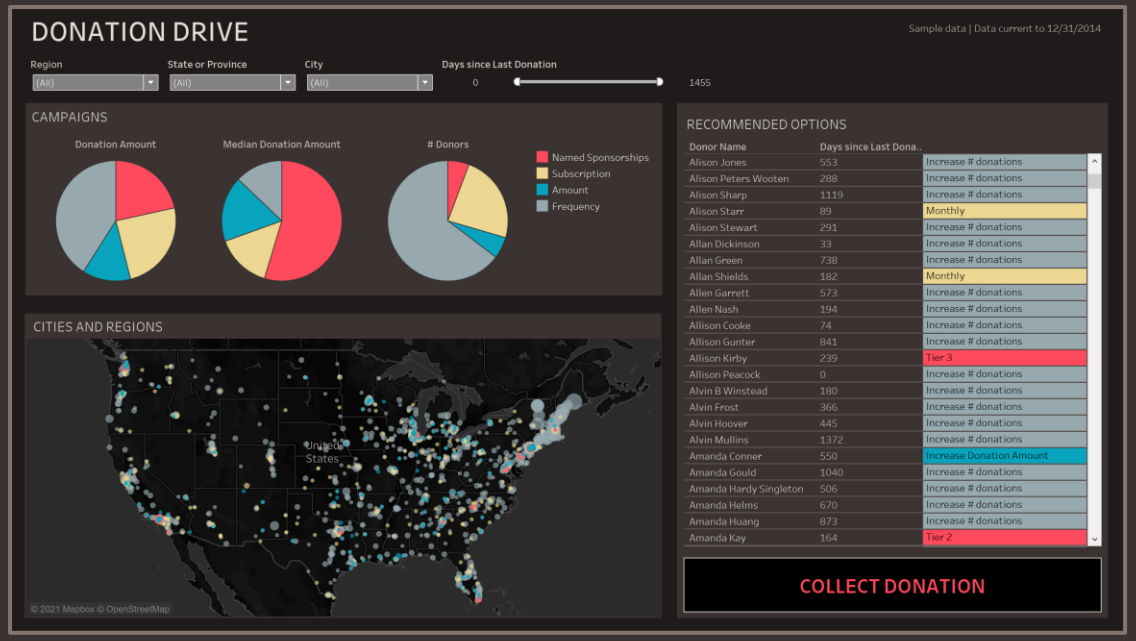
"detail donors"

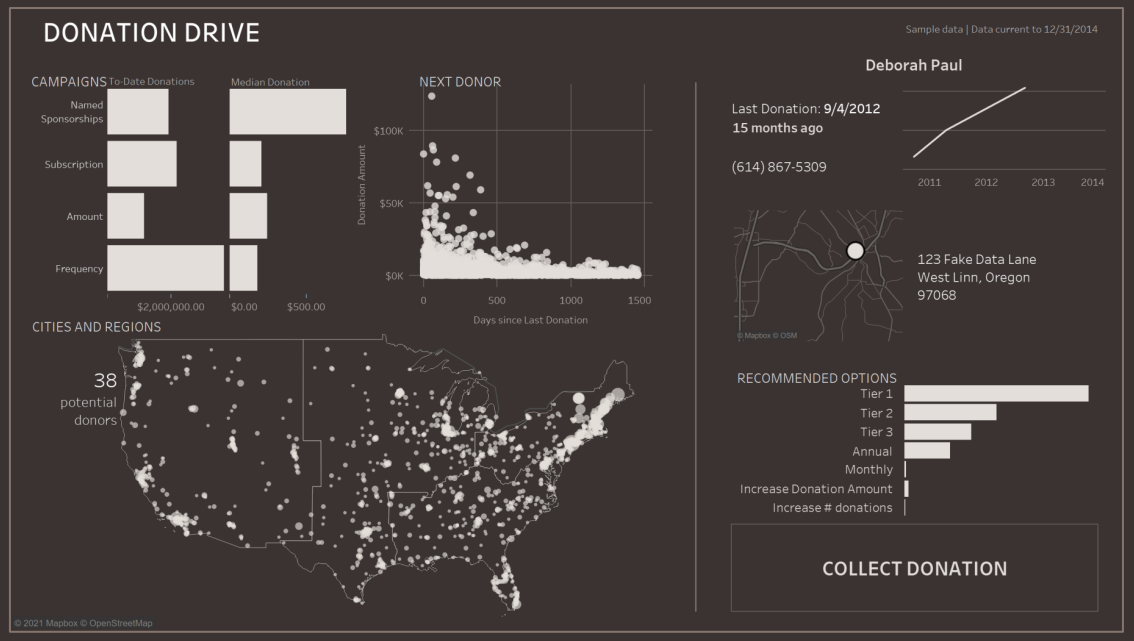
Pictographic

Perceptual

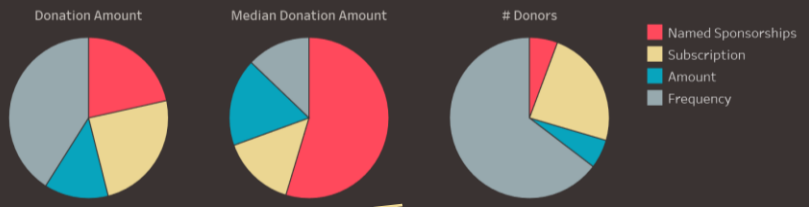

DONATION DRIVE
Sample data | Data current to 12/31/2014
CAMPAIGNS
To-Date Donations
Median Donation
Named Sponsorships
Subscription
Amount
Frequency
$2,000,000.00
$0.00
$500.00
NEXT DONOR
Donation Amount
$100K
$50K
$0K
0
500
1000
1500
Days since Last Donation
Deborah Paul
Last Donation: 9/4/2012
15 months ago
(614) 867-5309
2011
2012
2013
2014
© Mapbox © OSM
123 Fake Data Lane
West Linn, Oregon
97068
CITIES AND REGIONS
38
potential
donors
RECOMMENDED OPTIONS
Tier 1
Tier 2
Tier 3
Annual
Monthly
Increase Donation Amount
Increase # donations
COLLECT DONATION
© 2021 Mapbox © OpenStreetMap

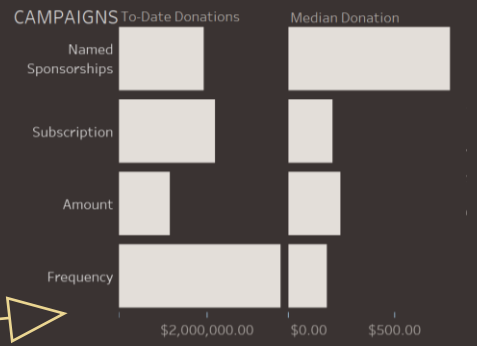
Perceptual


DONATION DRIVE
Sample data | Data current to 12/31/2014
Region
(All)
State or Province
(All)
City
(All)
Days since Last Donation
0
1455
CAMPAIGNS
Donation Amount
Median Donation Amount
Donors
Named Sponsorships
Subscription
Amount
Frequency
CITIES AND REGIONS
United States
© 2021 Mapbox © OpenStreetMap
RECOMMENDED OPTIONS
Donor Name
Days since Last Dona..
Alison Jones 553 Increase # donations
Alison Peters Wooten 288 Increase # donations
Alison Sharp 1119 Increase # donations
Alison Starr 89 Monthly
Alison Stewart 291 Increase # donations
Allan Dickinson 33 Increase # donations
Allan Green 738 Increase # donations
Allan Shields 182 Monthly
Allen Garrett 573 Increase # donations
Allen Nash 194 Increase # donations
Allison Cooke 74 Increase # donations
Allison Gunter 841 Increase # donations
Allison Kirby 239 Tier 3
Allison Peacock 0 Increase # donations
Alvin B Winstead 180 Increase # donations
Alvin Frost 366 Increase # donations
Alvin Hoover 445 Increase # donations
Alvin Mullins 1372 Increase # donations
Amanda Conner 550 Increase Donation Amount
Amanda Gould 1040 Increase # donations
Amanda Hardy Singleton 506 Increase # donations
Amanda Helms 670 Increase # donations
Amanda Huang 873 Increase # donations
Amanda Kay 164 Tier 2
COLLECT DONATION

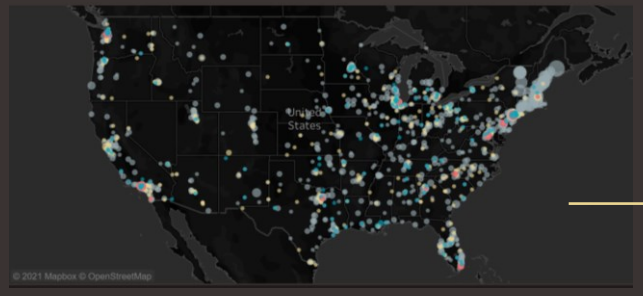

DONATION DRIVE
Sample data | Data current to 12/31/2014
CAMPAIGNS
To-Date Donations
Median Donation
Named Sponsorships
Subscription
Amount
Frequency
$2,000,000.00
$0.00
$500.00
NEXT DONOR
Donation Amount
$100K
$50K
$0K
0
500
1000
1500
Days since Last Donation
CITIES AND REGIONS
38
potential
donors
© 2021 Mapbox © OpenStreetMap
Deborah Paul
Last Donation: 9/4/2012
15 months ago
(614) 867-5309
2011
2012
2013
2014
© Mapbox © OSM
123 Fake Data Lane
West Linn, Oregon
97068
RECOMMENDED OPTIONS
Tier 1
Tier 2
Tier 3
Annual
Monthly
Increase Donation Amount
Increase # donations
COLLECT DONATION

Changed to address task and precision

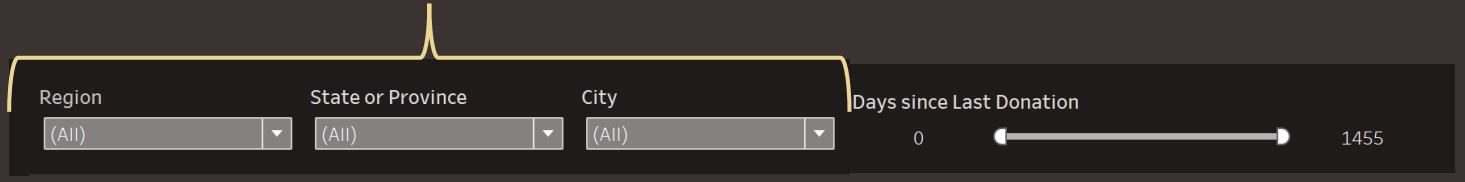




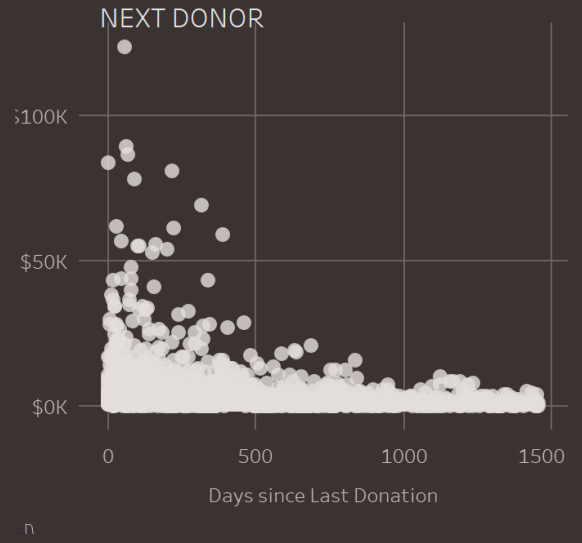
De-emphasized by removing non-data ink



Removed redundancy



Expanded Analysis



Improved fluency allows more clarity

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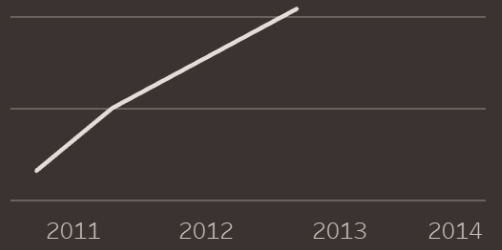
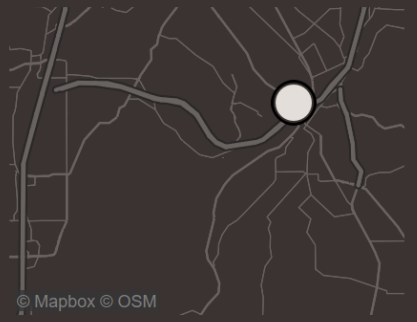
Amanda Hardy Singleton	506	Increase # donations
Amanda Helms	670	Increase # donations
Amanda Huang	873	Increase # donations
Amanda Kay	164	Tier 2

Deborah Paul

Last Donation: **9/4/2012**
15 months ago

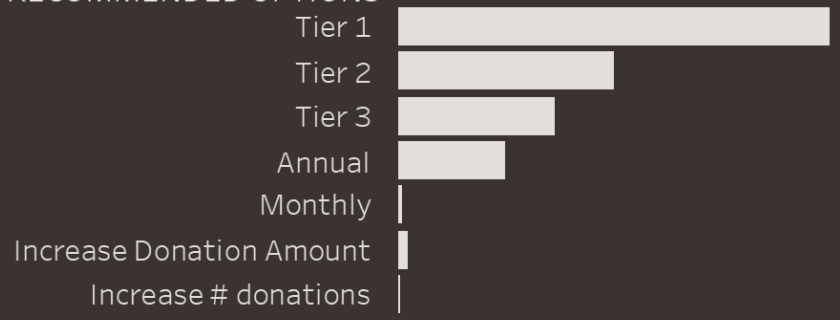
(614) 867-5309

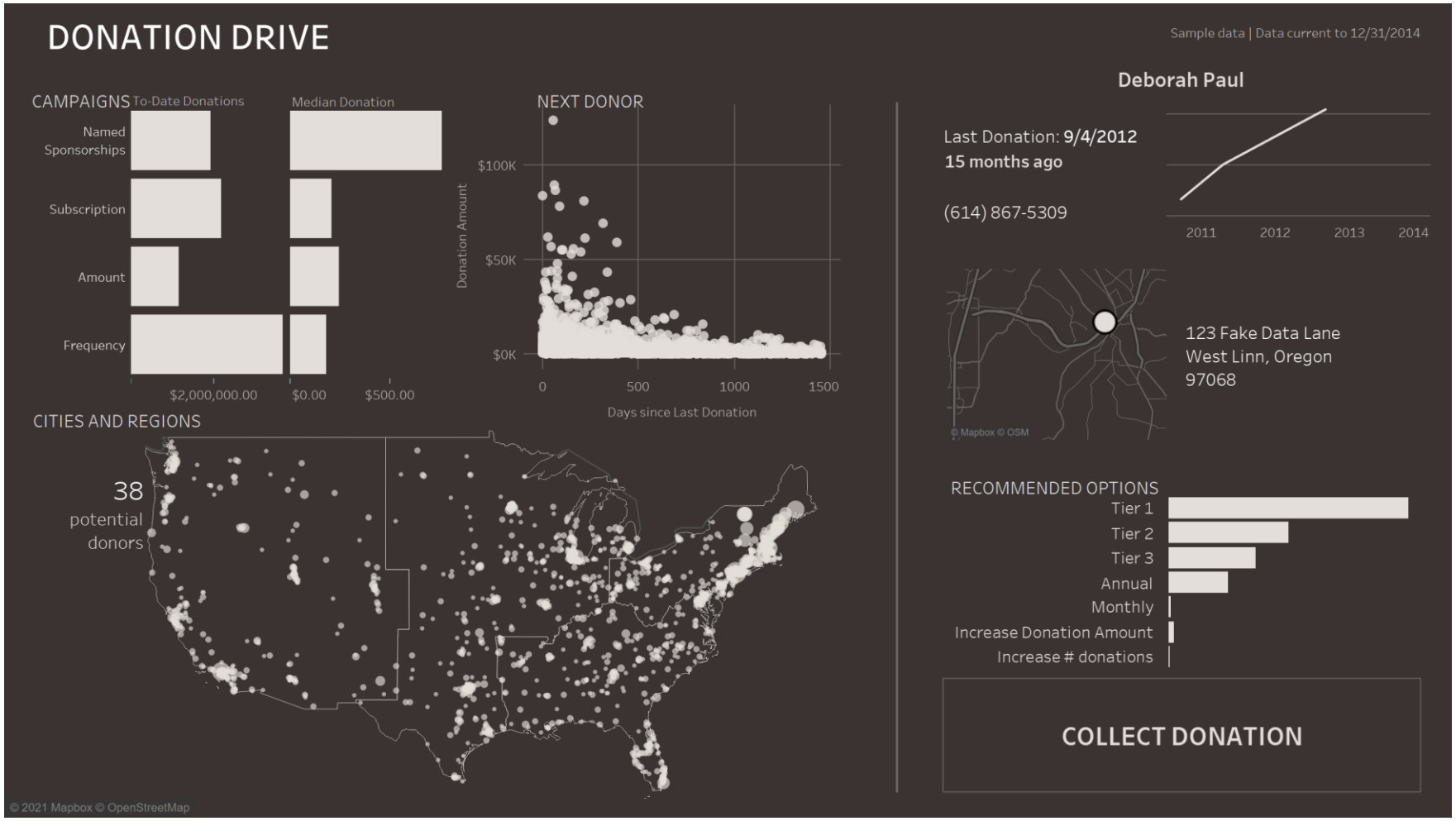




123 Fake Data Lane
West Linn, Oregon
97068

RECOMMENDED OPTIONS




DONATION DRIVE
Sample data | Data current to 12/31/2014
CAMPAIGNS
To-Date Donations
Median Donation
Named Sponsorships
Subscription
Amount
Frequency
$2,000,000.00
$0.00
$500.00
NEXT DONOR
Donation Amount
$100K
$50K
$0K
0
500
1000
1500
Days since Last Donation
Deborah Paul
Last Donation: 9/4/2012
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donors
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Tier 1
Tier 2
Tier 3
Annual
Monthly
Increase Donation Amount
Increase # donations
COLLECT DONATION
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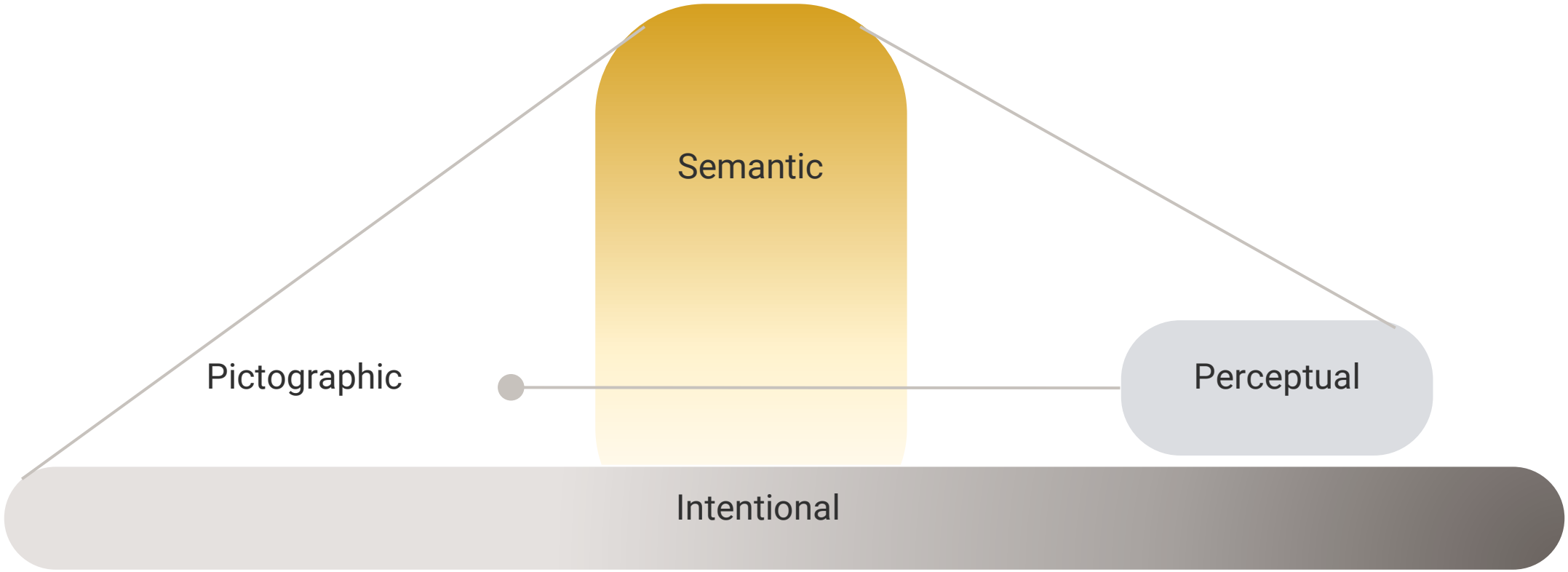
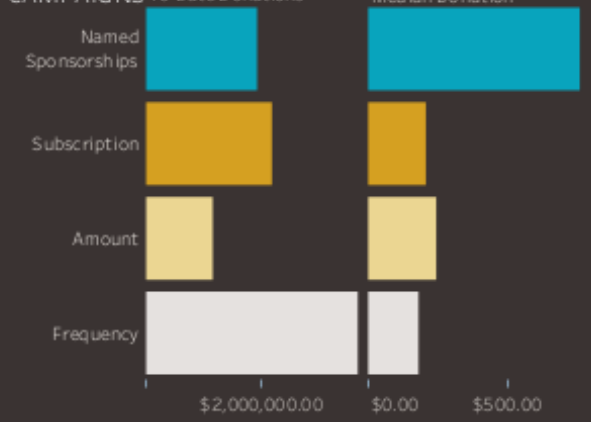
Perceptual


Semantic
Pictographic
Perceptual
Intentional

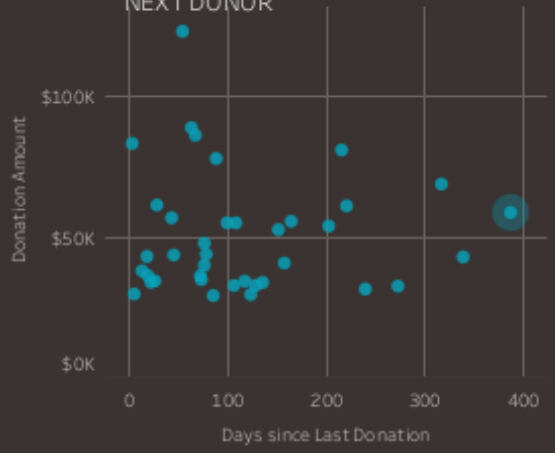
DONATION DRIVE

Sample data | Data current to 12/31/2014

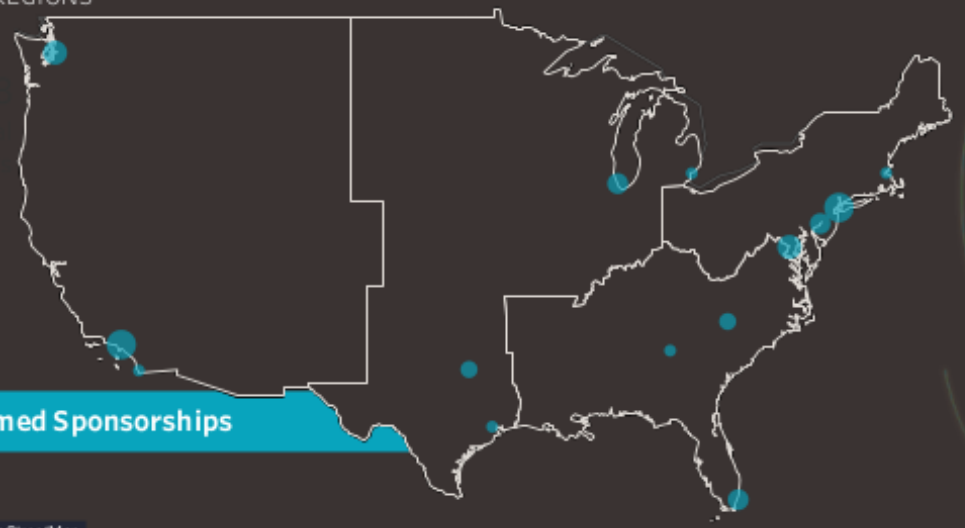
CAMPAIGNS To-Date Donations Median Donation



NEXT DONOR



CITIES AND REGIONS



Named Sponsorships

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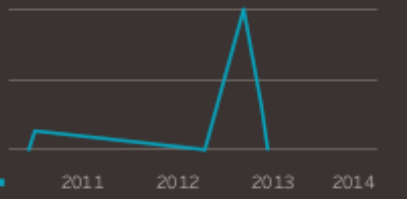
Kim Weiss

Last Donation: **12/10/2012**
12 months ago

(614) 867-5309



123 Fake Data Lane
Miami, Florida
33132

RECOMMENDED OPTIONS

COLLECT DONATION

PART A: PERCEPTION

Say the *color*, not the word

PURPLE YELLOW RED

BLACK RED GREEN

RED YELLOW ORANGE

BLUE PURPLE BLACK

RED GREEN ORANGE

Say the *color*, not the word

PURPLE YELLOW RED

BLACK RED GREEN

RED YELLOW ORANGE

BLUE PURPLE BLACK

RED GREEN ORANGE

The Spice of Life

20
Spices

16
Blends

Instead of doing cinnamon, nutmeg, and all those baking spices, I'll have one spice that's for sweets, and that's pumpkin pie spice.
Sandra Lee

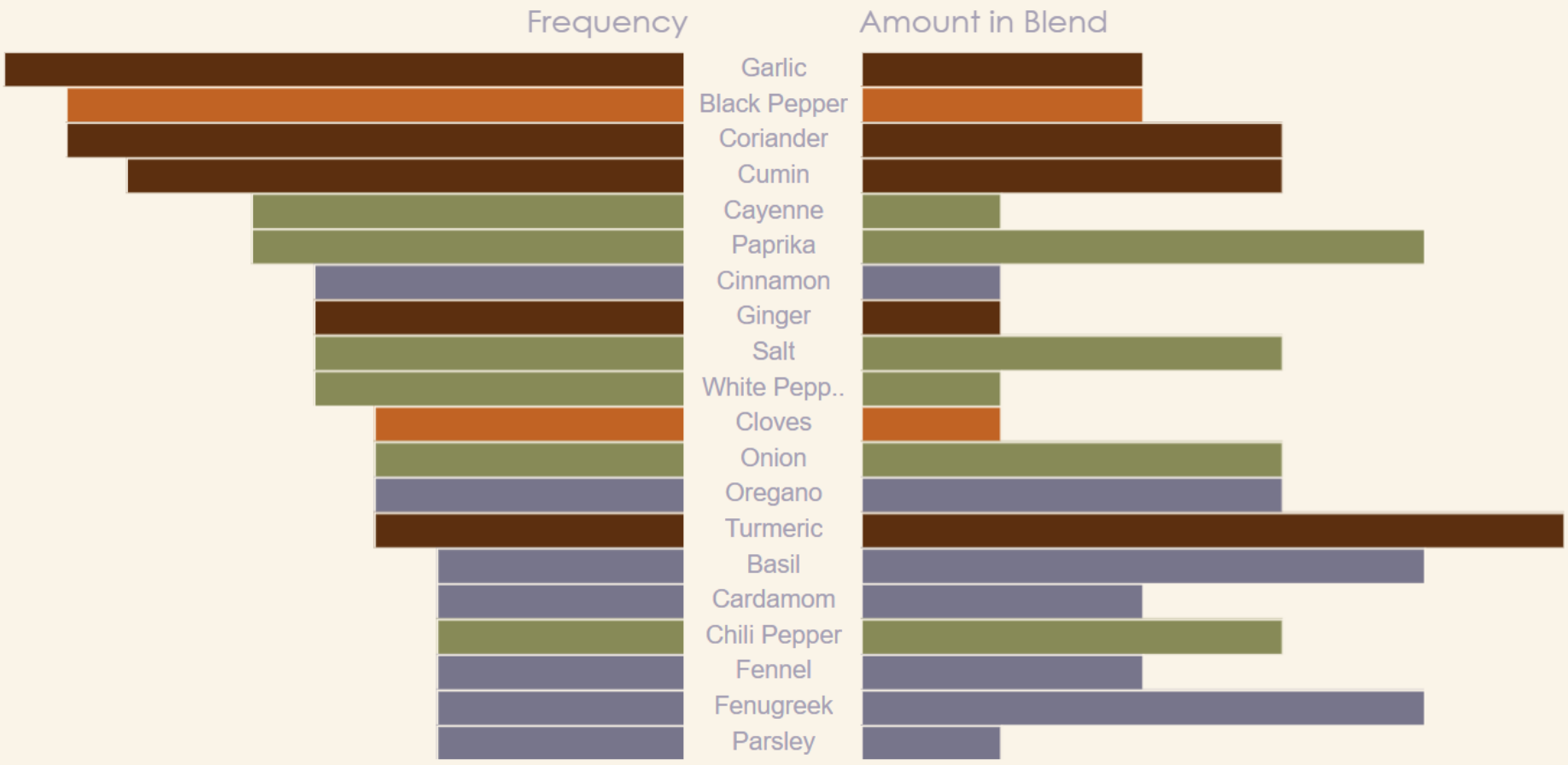
Examining
How Spices Play in Blends

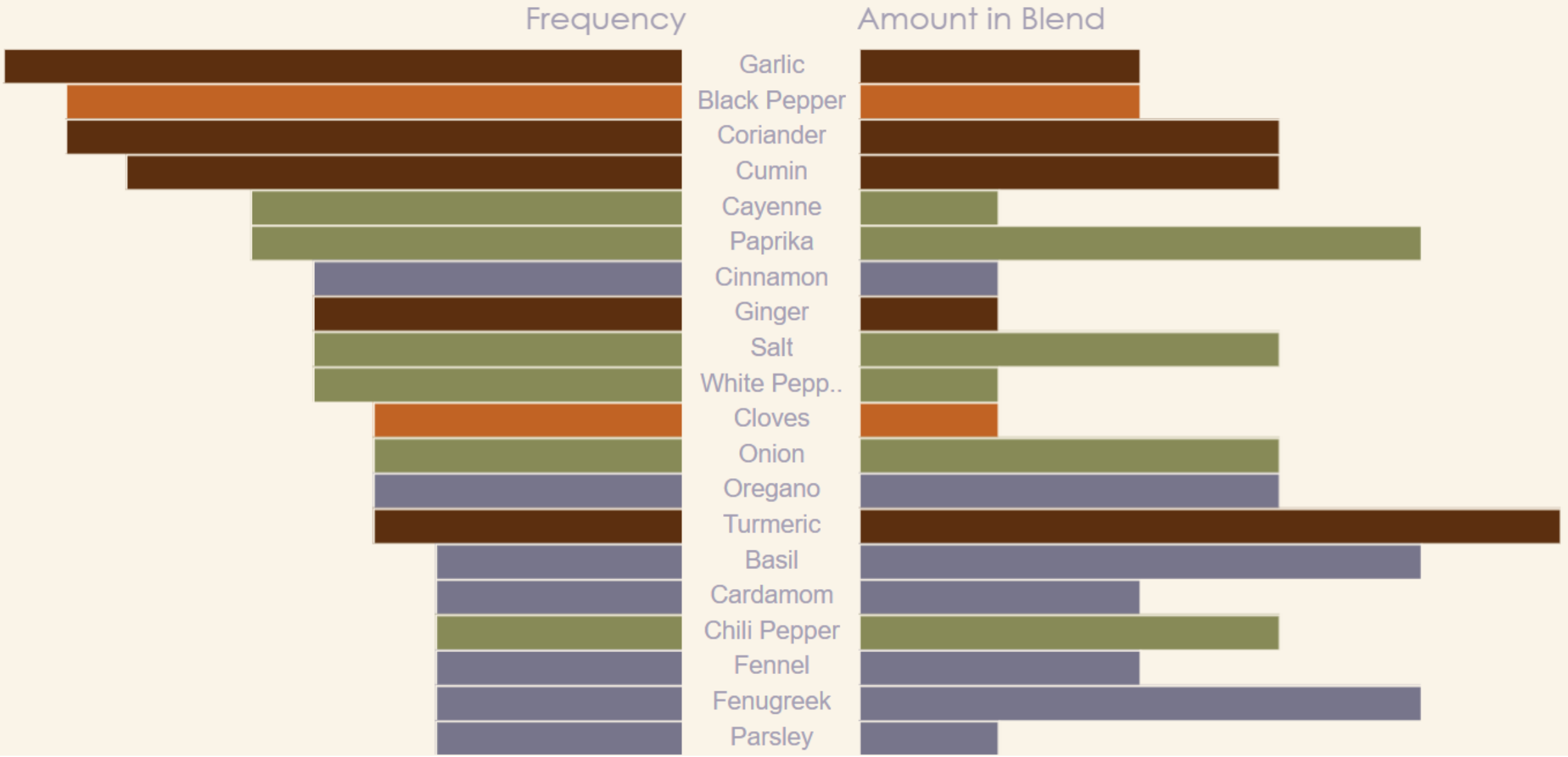
Bridget Winds Cogley

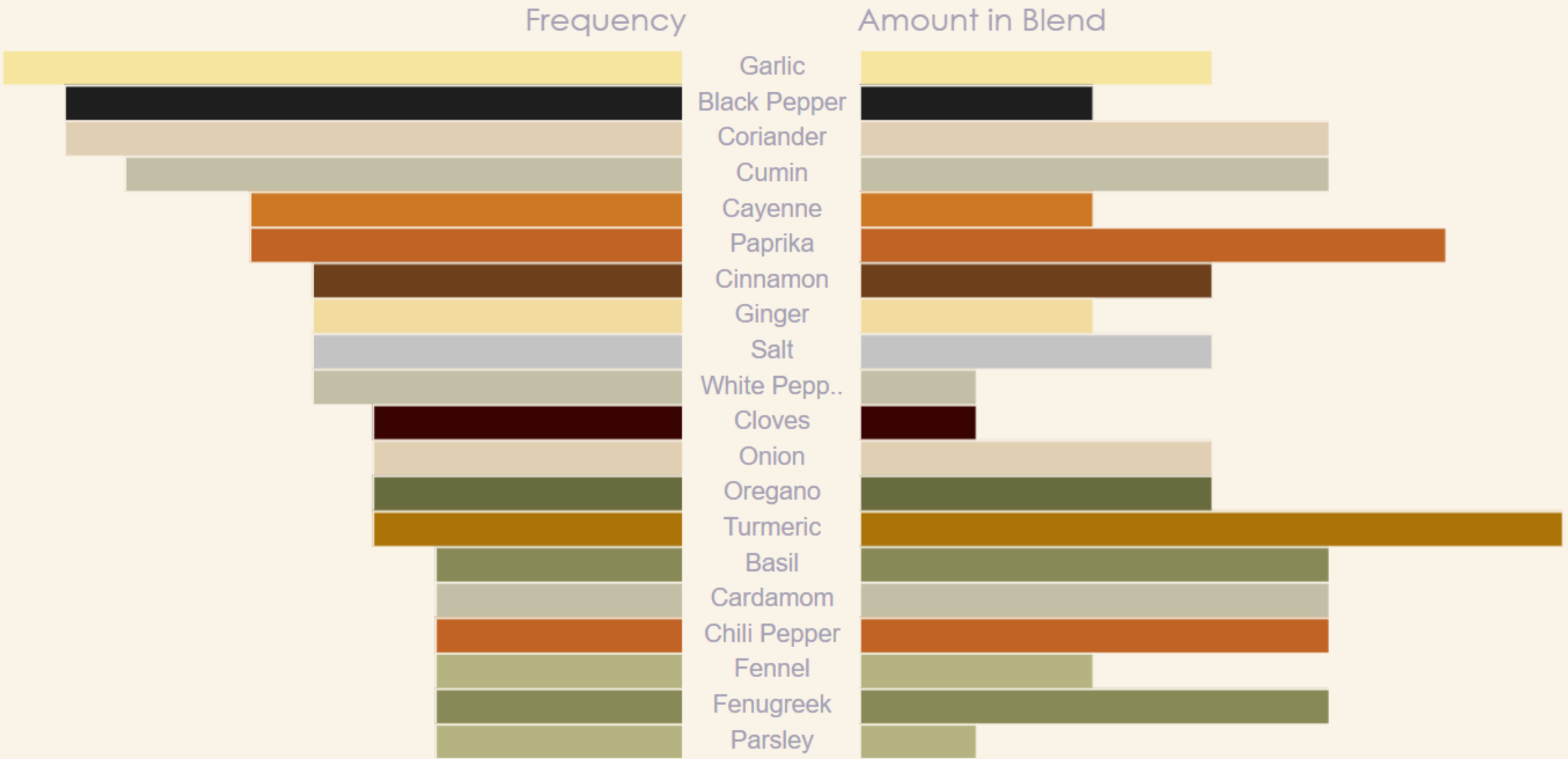
Info

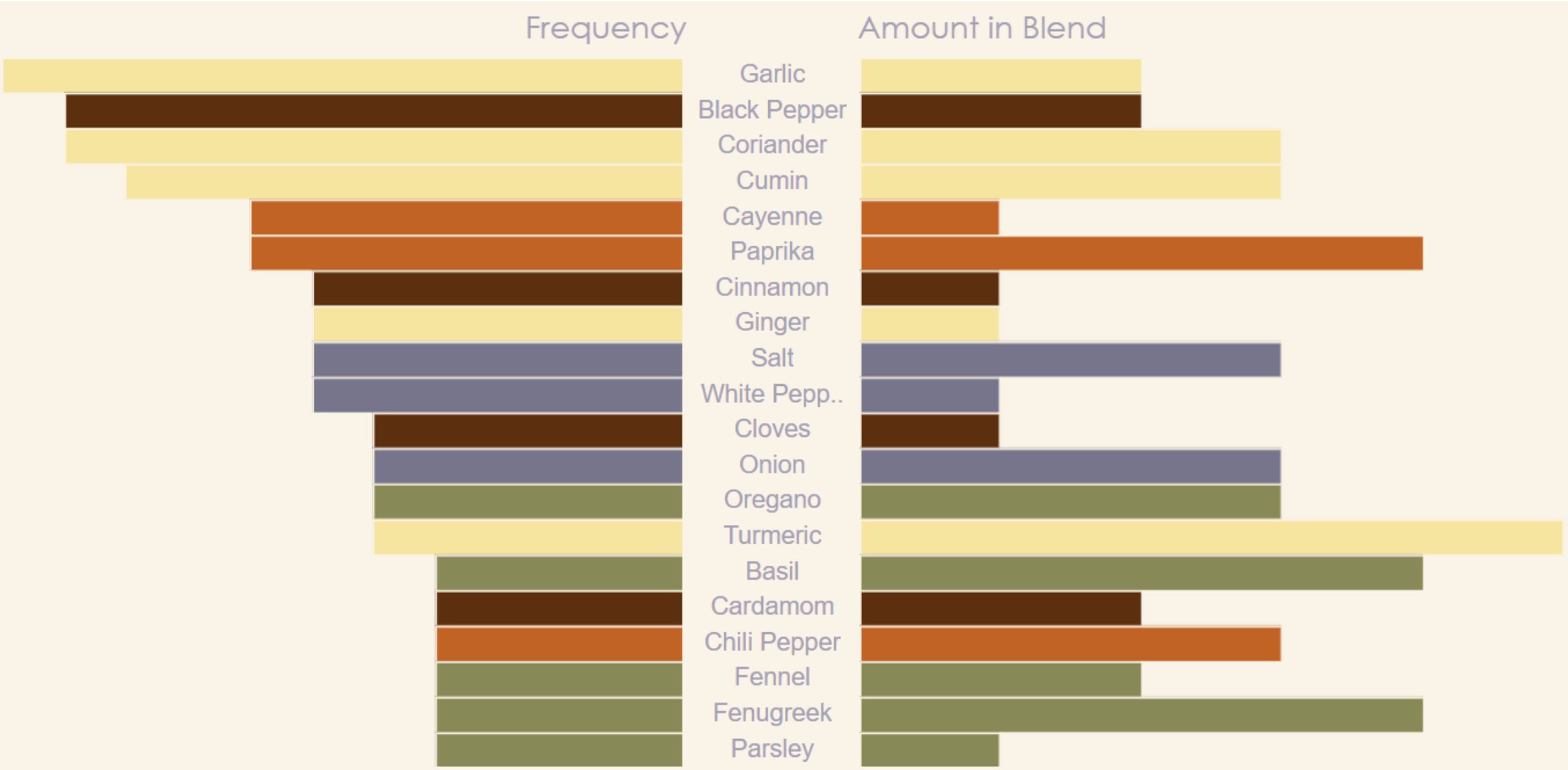
Hot (Spicy)
Bitter
Aromatic
Savory
Sweet

Click me!




Frequency
Amount in Blend
Garlic
Black Pepper
Coriander
Cumin
Cayenne
Paprika
Cinnamon
Ginger
Salt
White Pepp..
Cloves
Onion
Oregano
Turmeric
Basil
Cardamom
Chili Pepper
Fennel
Fenugreek
Parsley


Frequency
Amount in Blend
Garlic
Black Pepper
Coriander
Cumin
Cayenne
Paprika
Cinnamon
Ginger
Salt
White Pepp..
Cloves
Onion
Oregano
Turmeric
Basil
Cardamom
Chili Pepper
Fennel
Fenugreek
Parsley


Frequency
Amount in Blend
Garlic
Black Pepper
Coriander
Cumin
Cayenne
Paprika
Cinnamon
Ginger
Salt
White Pepp..
Cloves
Onion
Oregano
Turmeric
Basil
Cardamom
Chili Pepper
Fennel
Fenugreek
Parsley

The Spice of Life

20
Spices

16
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How Spices Play in Blends

Bridget Winds Cogley

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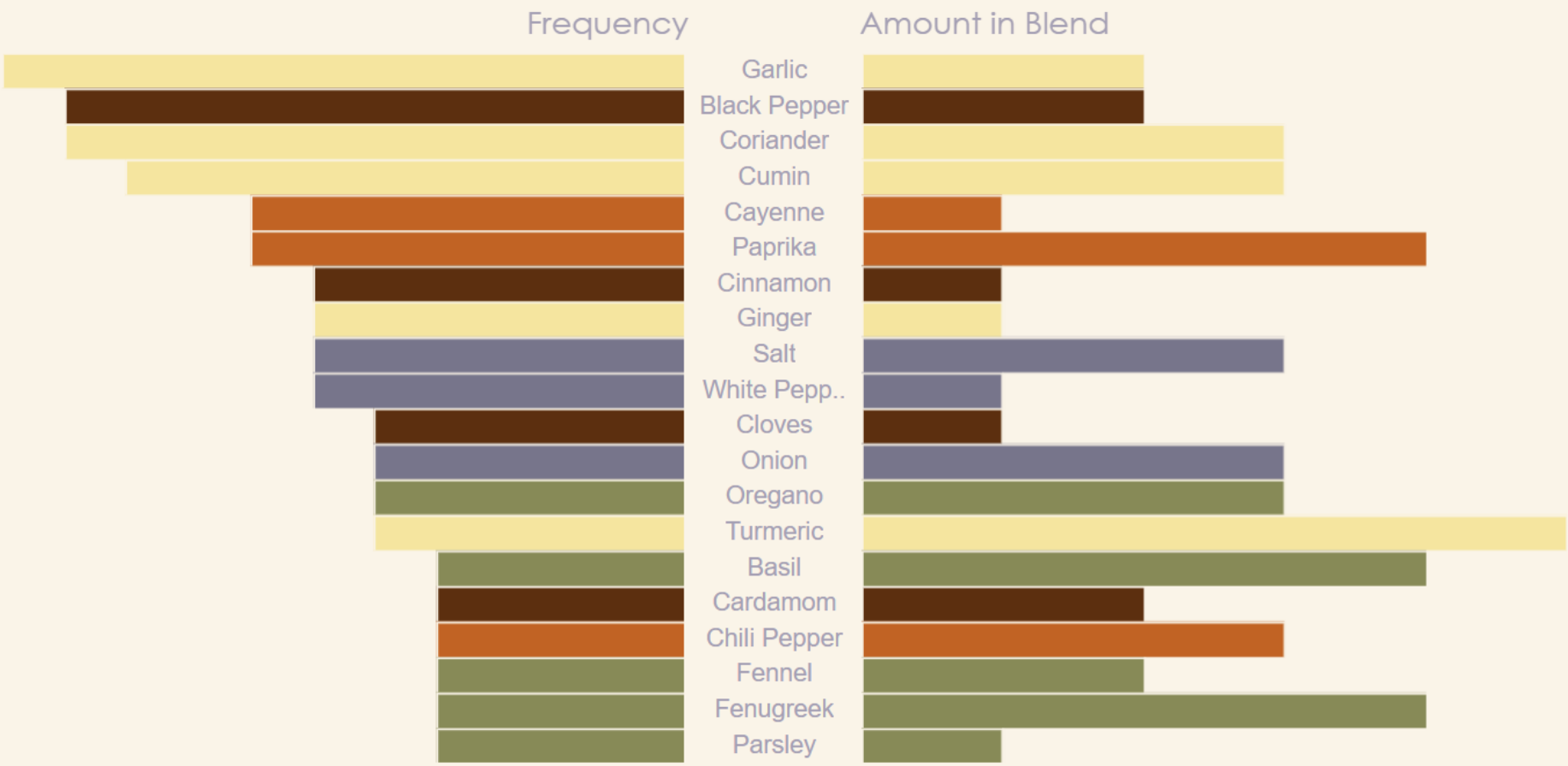
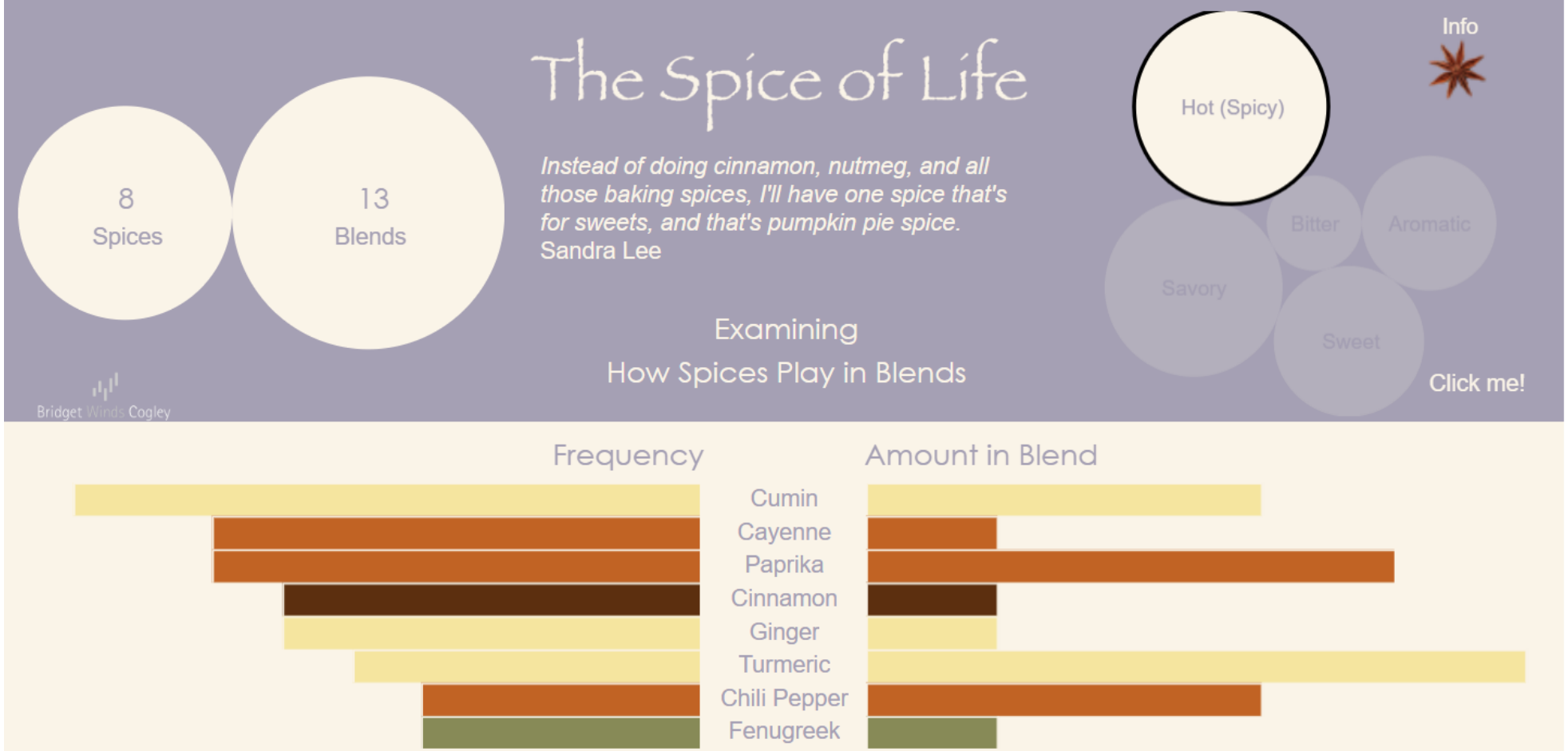
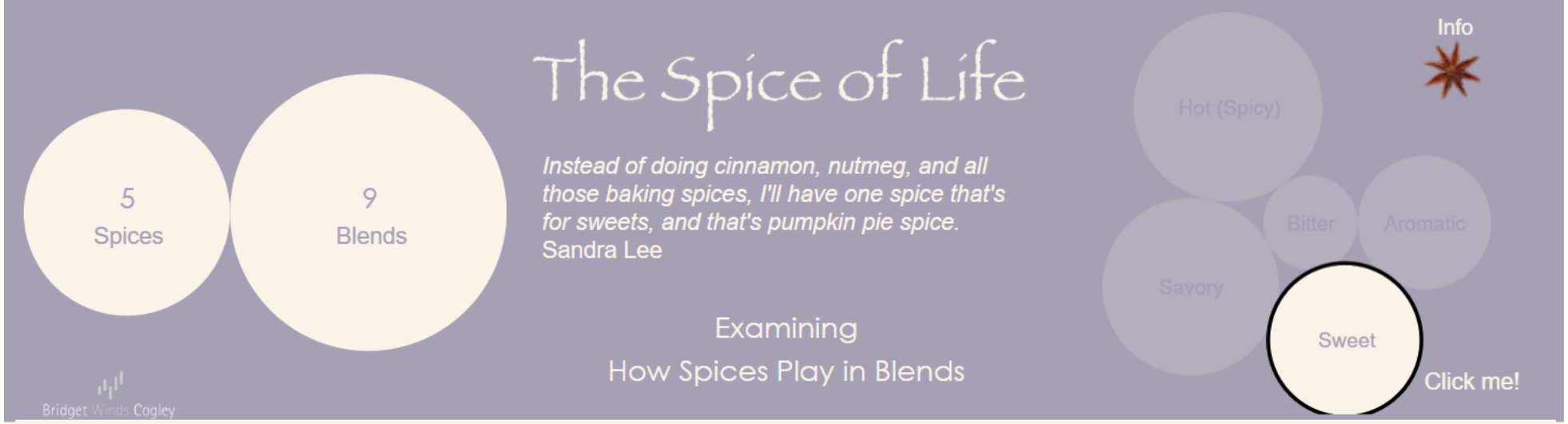
Bitter
Aromatic
Savory
Sweet

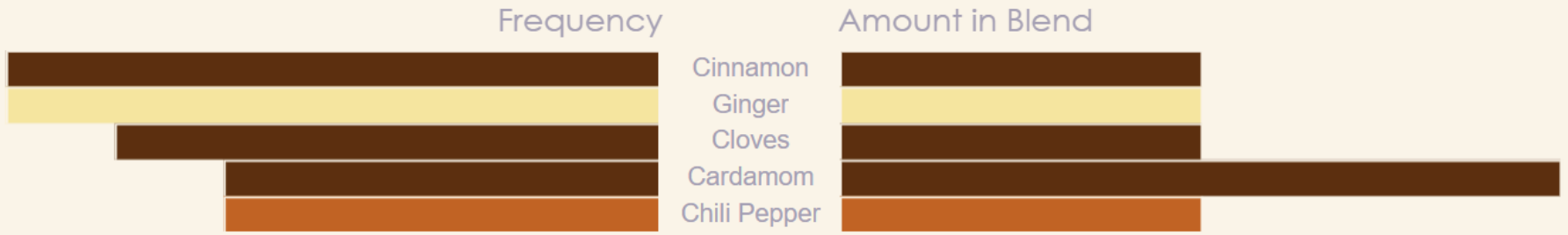
Click me!





Find these visualizations live: https://public.tableau.com/app/profile/bridget



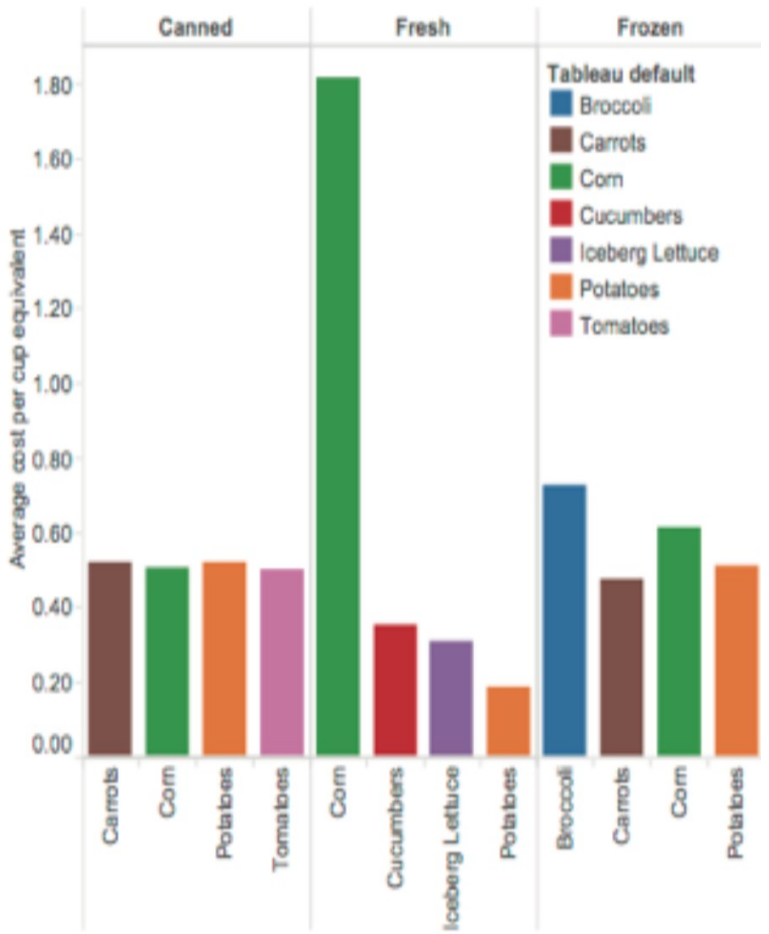


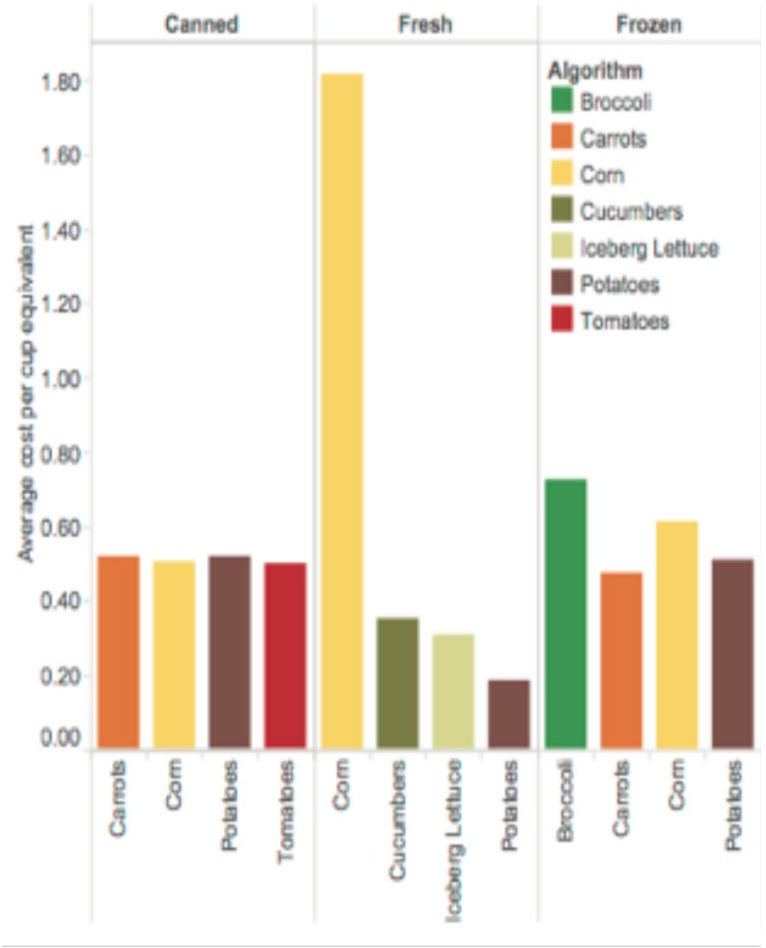
Find these visualizations live: https://public.tableau.com/app/profile/bridget

Semantically resonant colors

Research!

Setlur & Stone.
A Linguistic Approach to Categorical Color Assignment for Data Visualization.
IEEE Vis 2015





Semantically resonant colors

Research!

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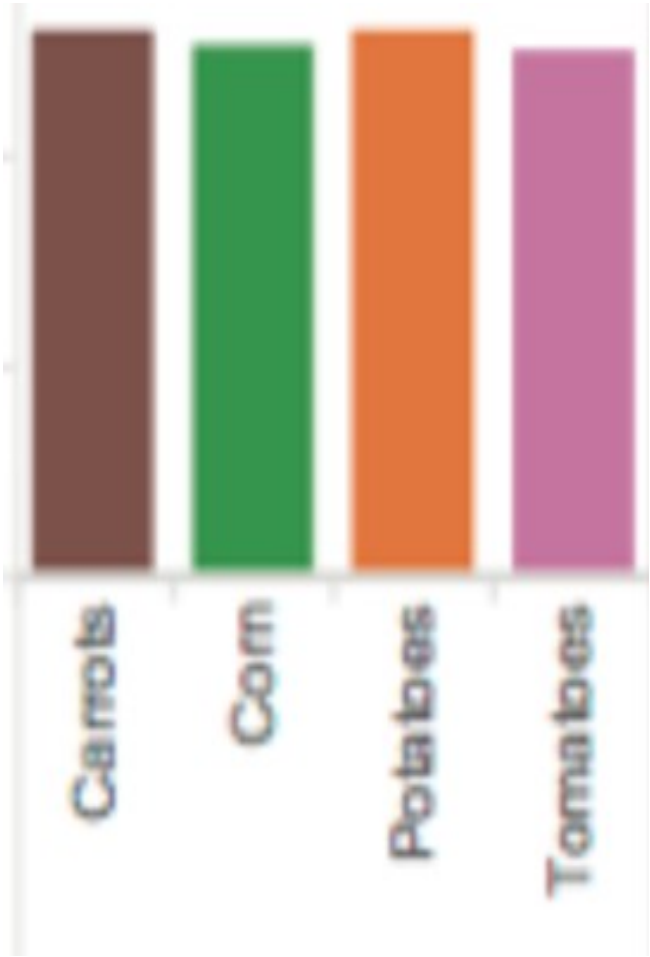

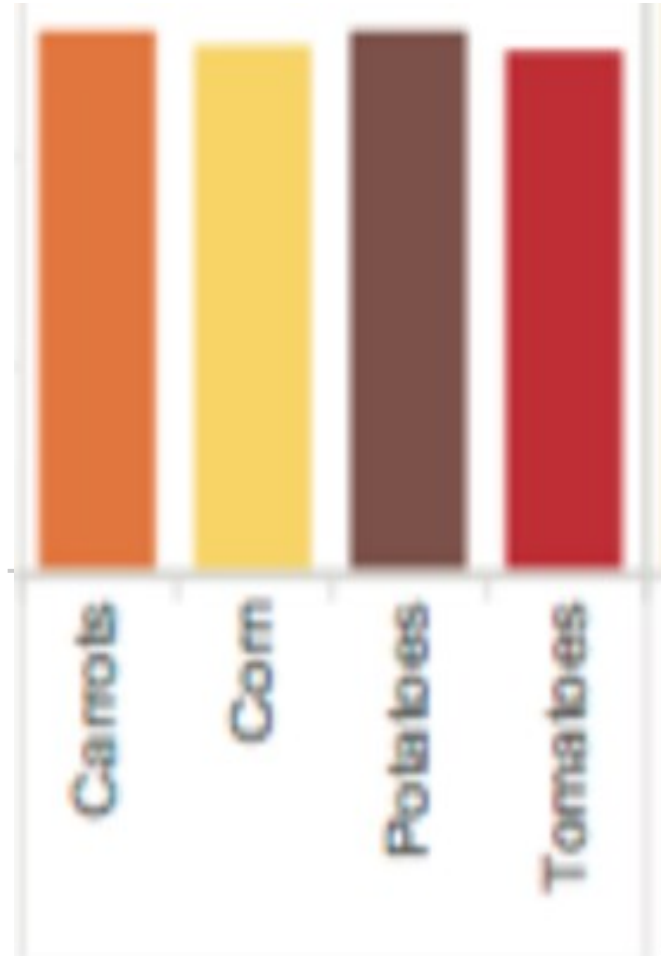

Semantically resonant colors

Research!

Setlur & Stone.
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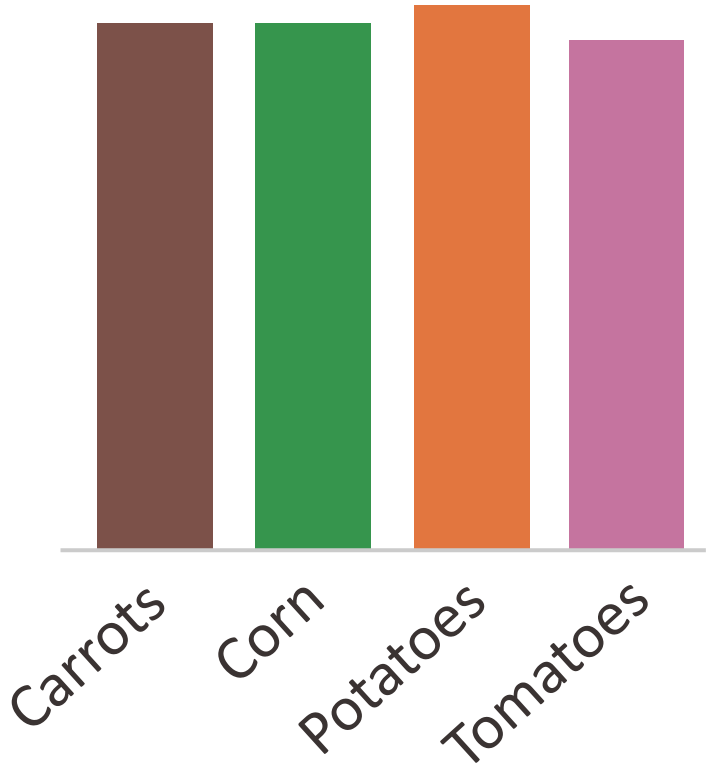
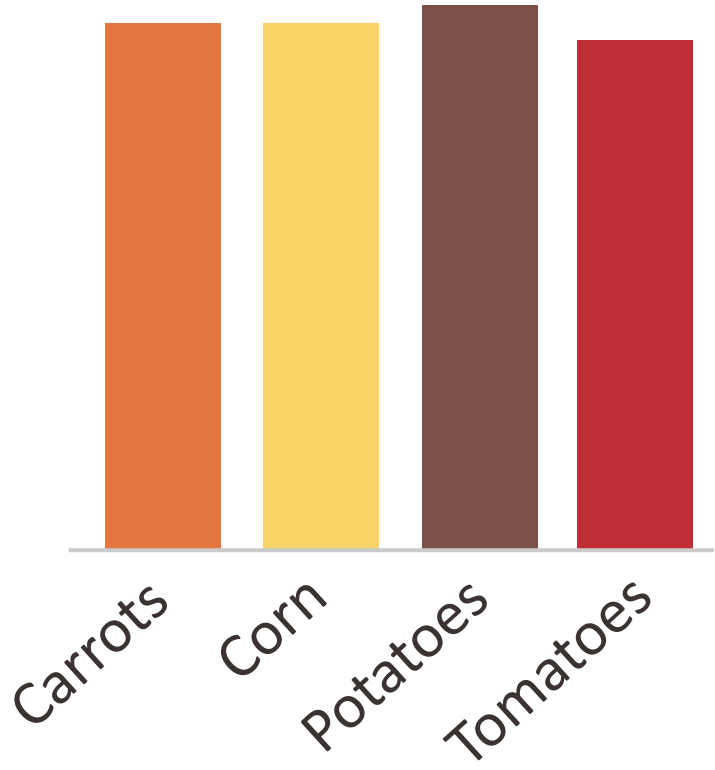
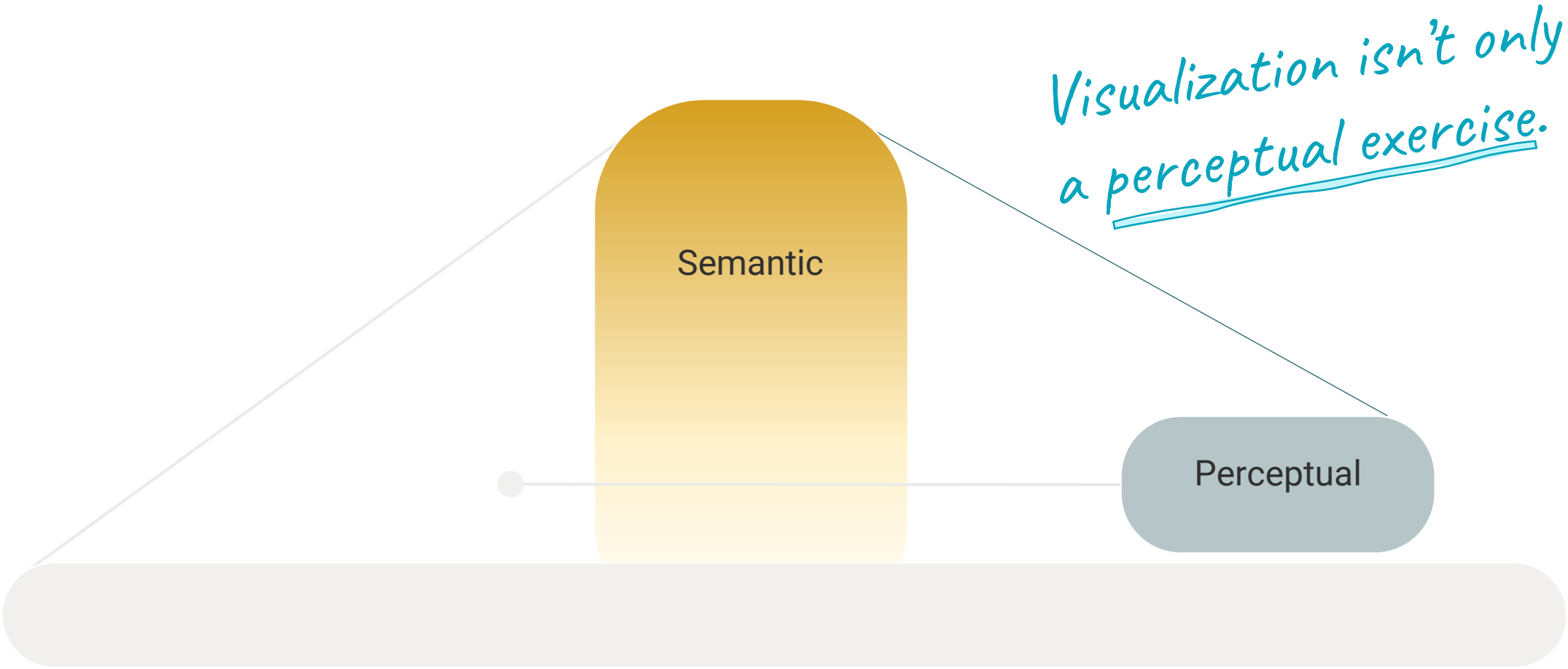
IEEE Vis 2015







Visualization isn't only a perceptual exercise.

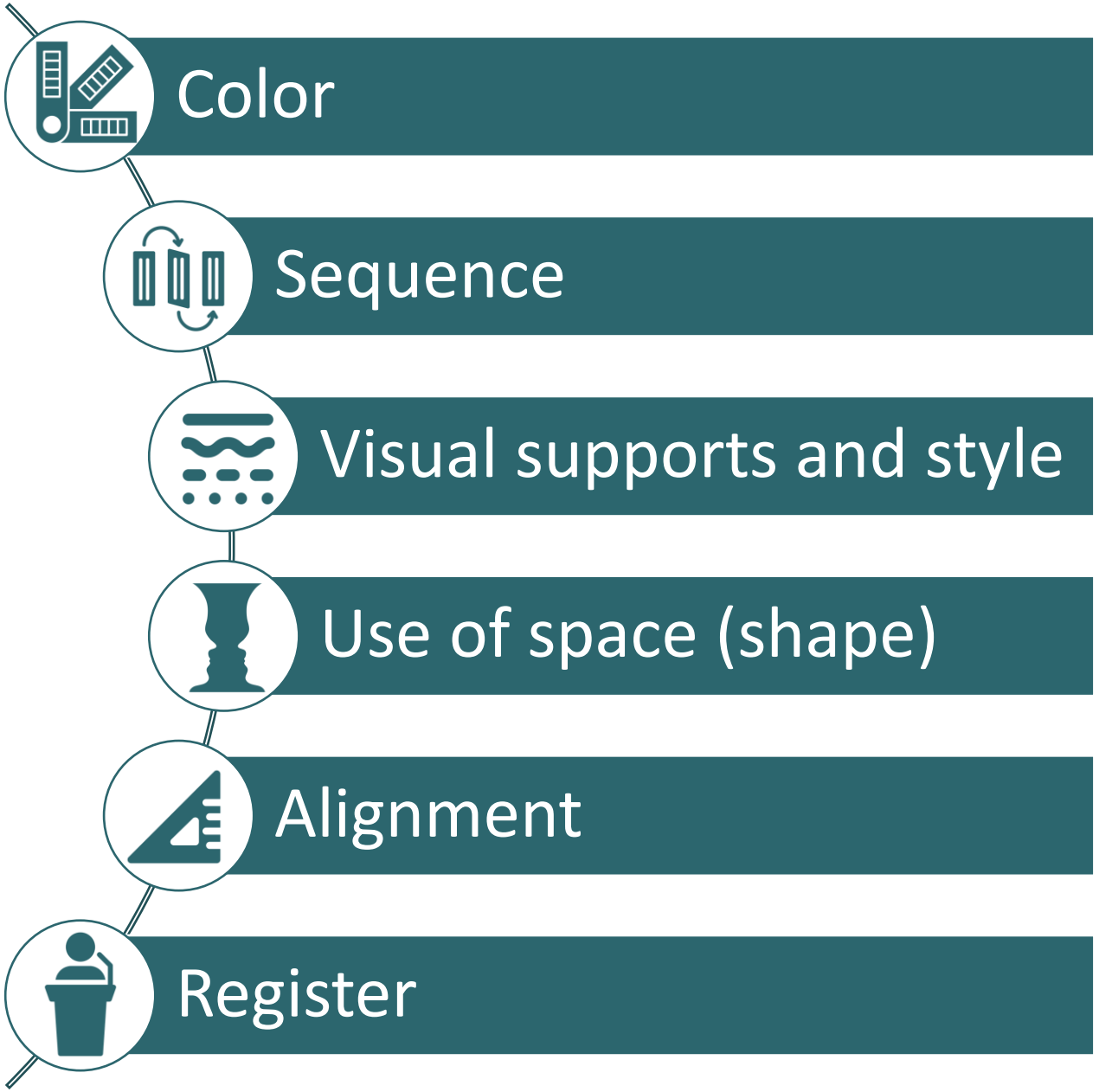
PART B: SEMANTICS

We seek
& create
meaning

Comics provide inspiration

Creating Cohesion

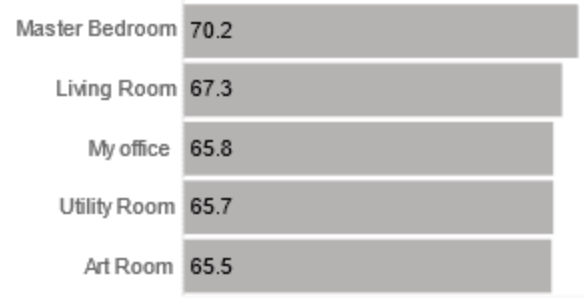
The secret to making meaning sticky



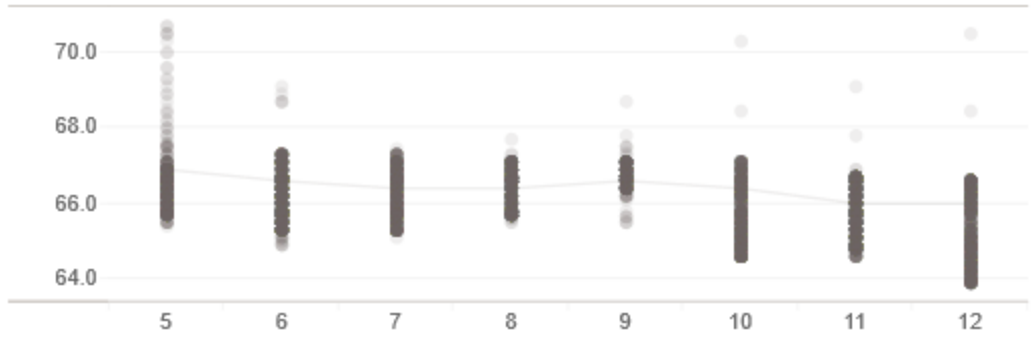
Color

HOUSEHOLD COMFORT ANALYSIS

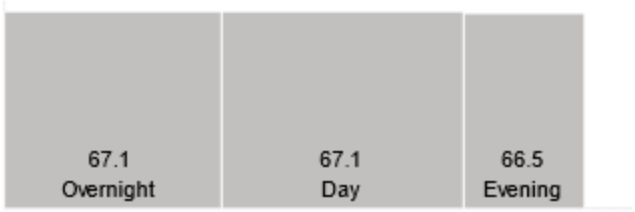
Median Temp by Room



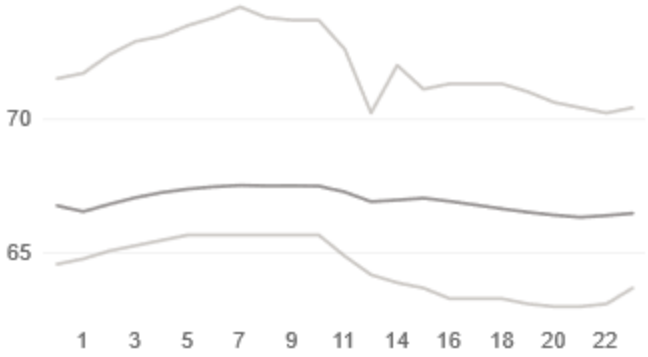
Temps by Day



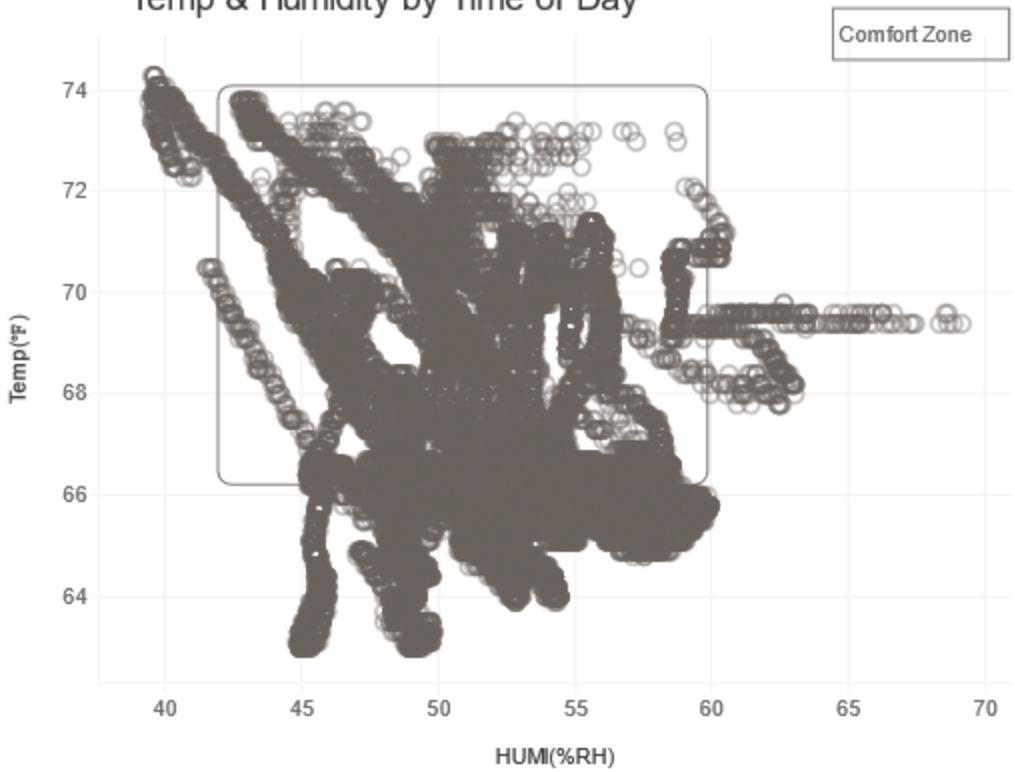
Time of Day



Hourly Temp

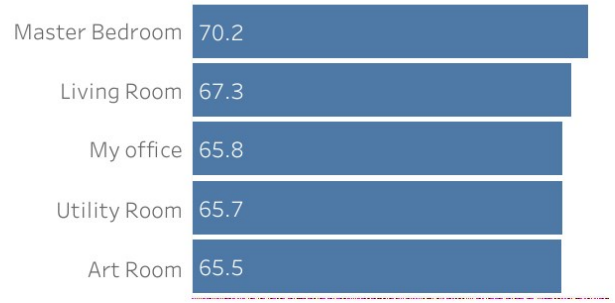


Temp & Humidity by Time of Day

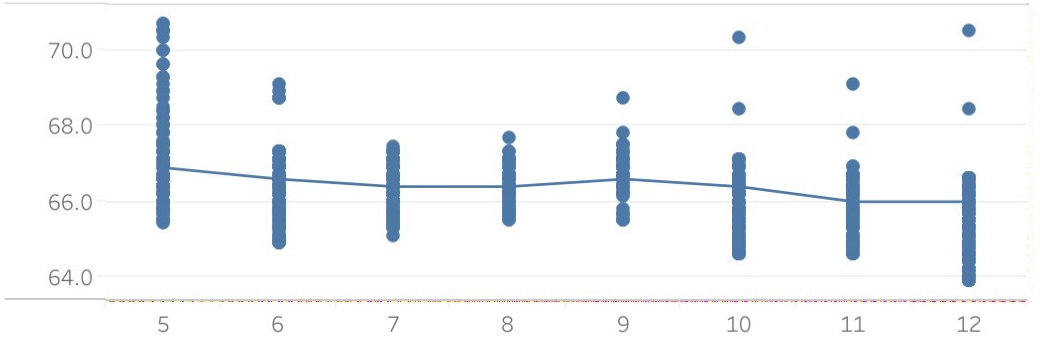


HOUSEHOLD COMFORT ANALYSIS

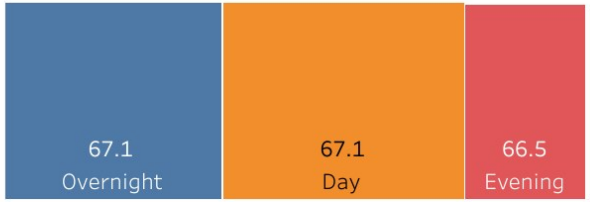
Median Temp by Room



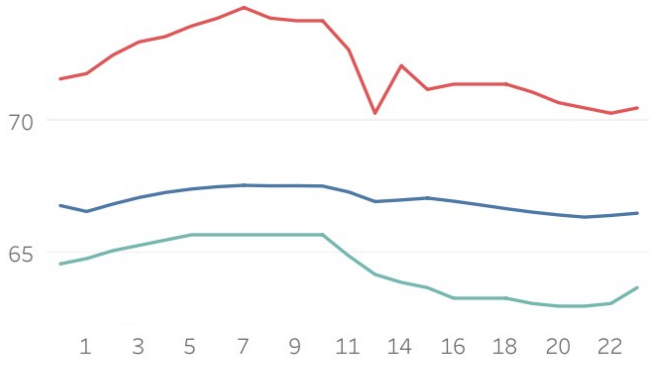
Temps by Day



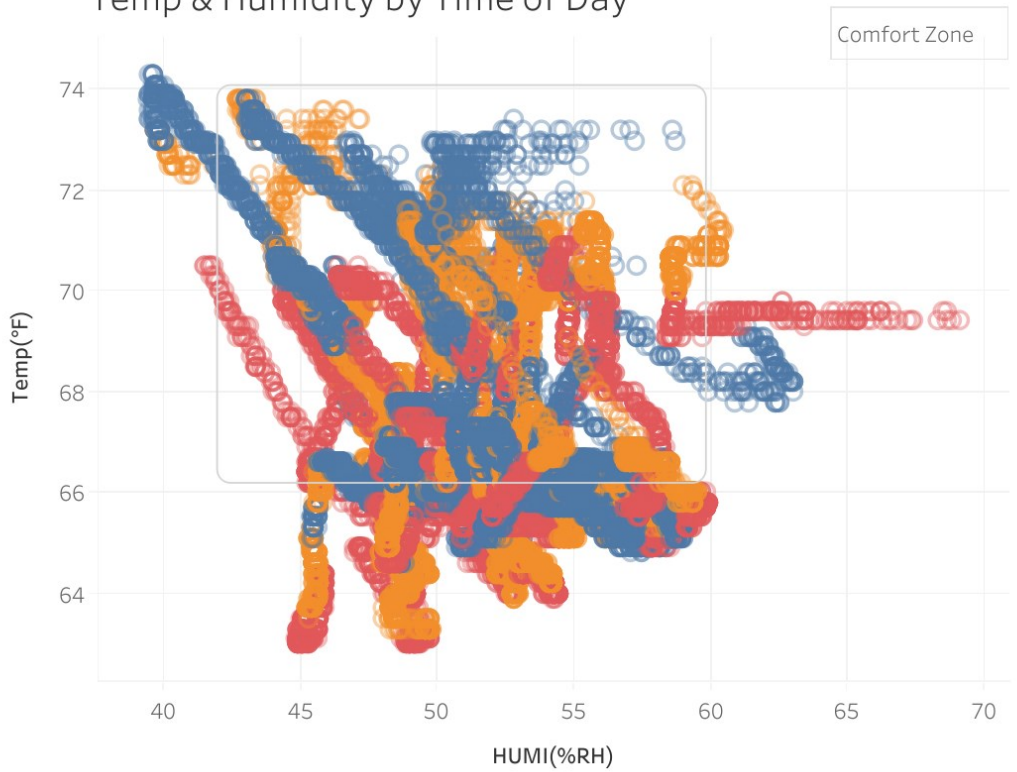
Time of Day



Hourly Temp



Temp & Humidity by Time of Day

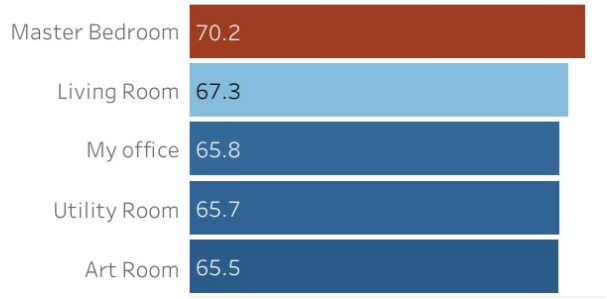


Color

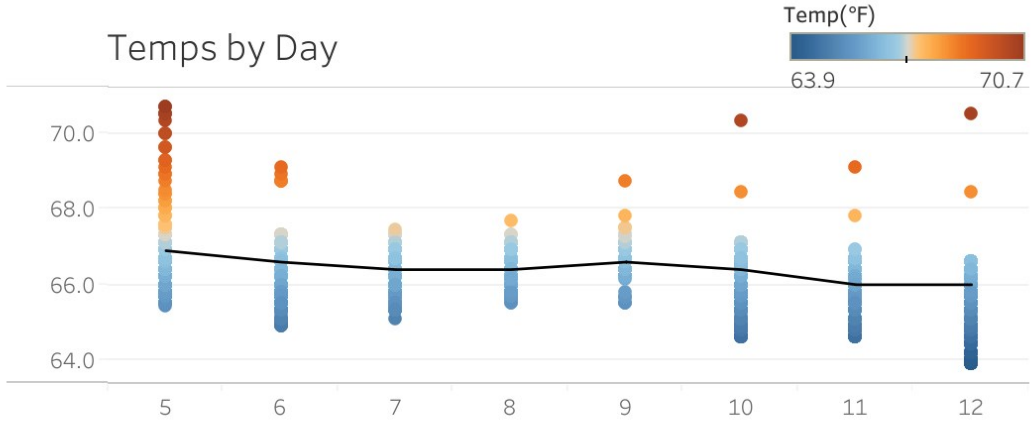
HOUSEHOLD COMFORT ANALYSIS

Color

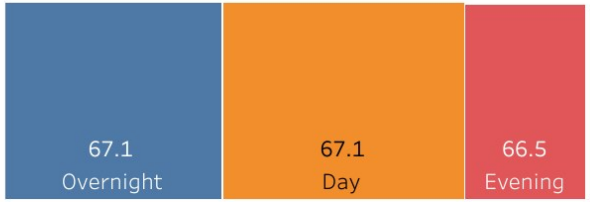
Median Temp by Room



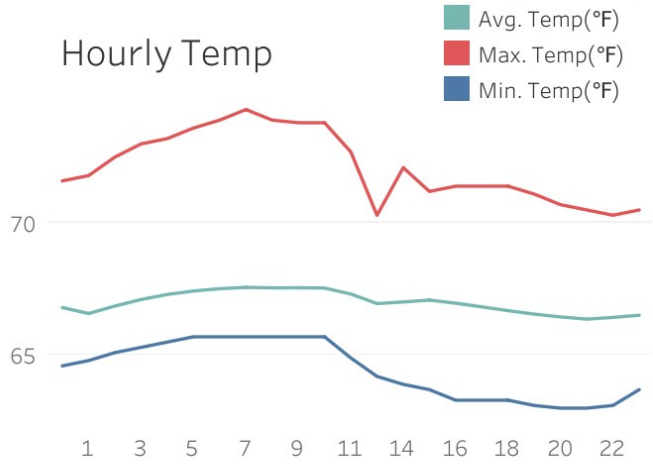
Temps by Day



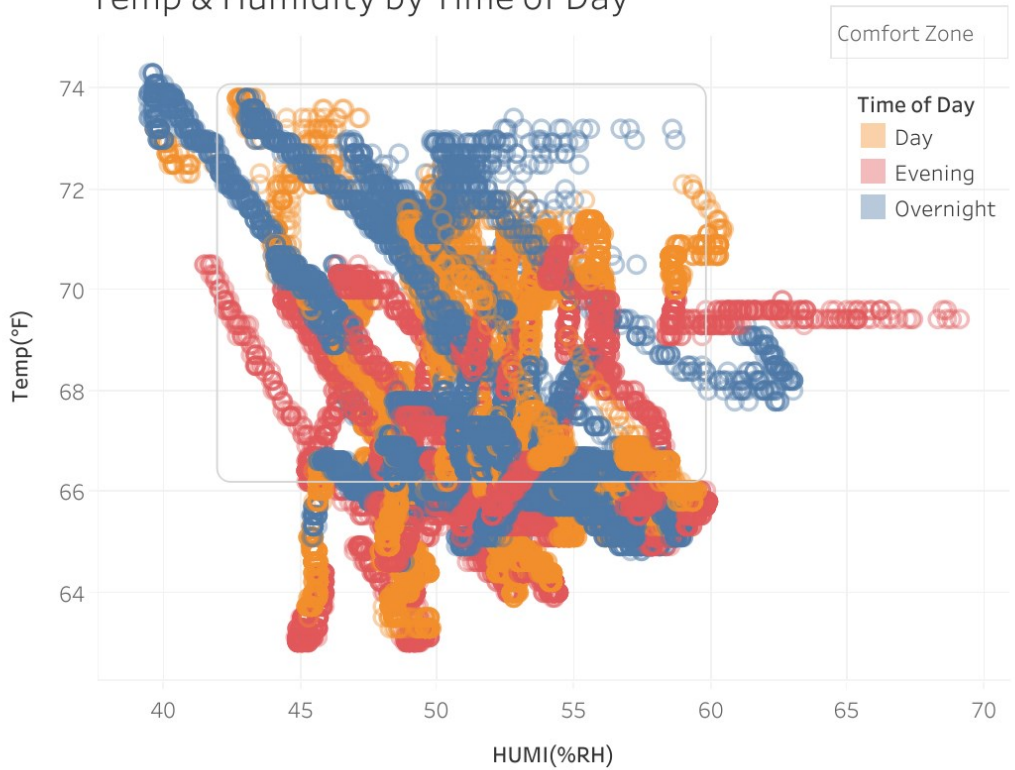
Time of Day



Hourly Temp

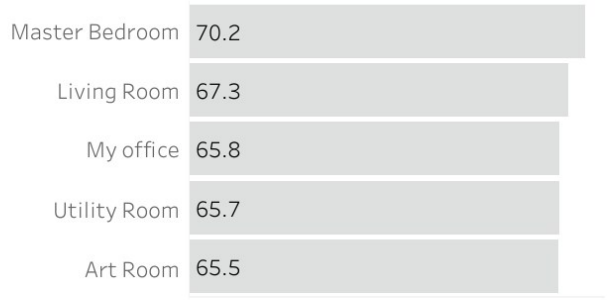


Temp & Humidity by Time of Day

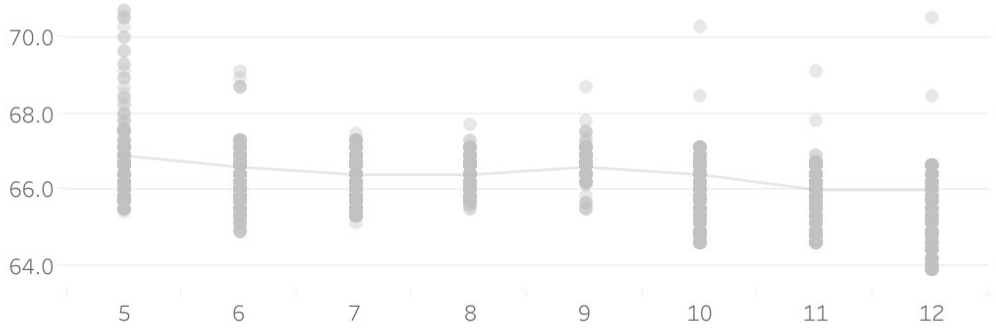


HOUSEHOLD COMFORT ANALYSIS

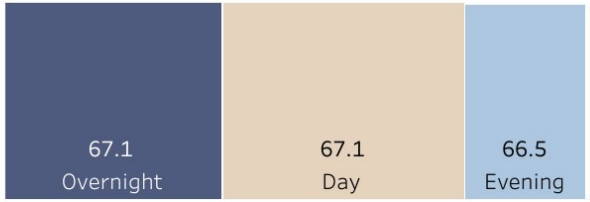
Median Temp by Room



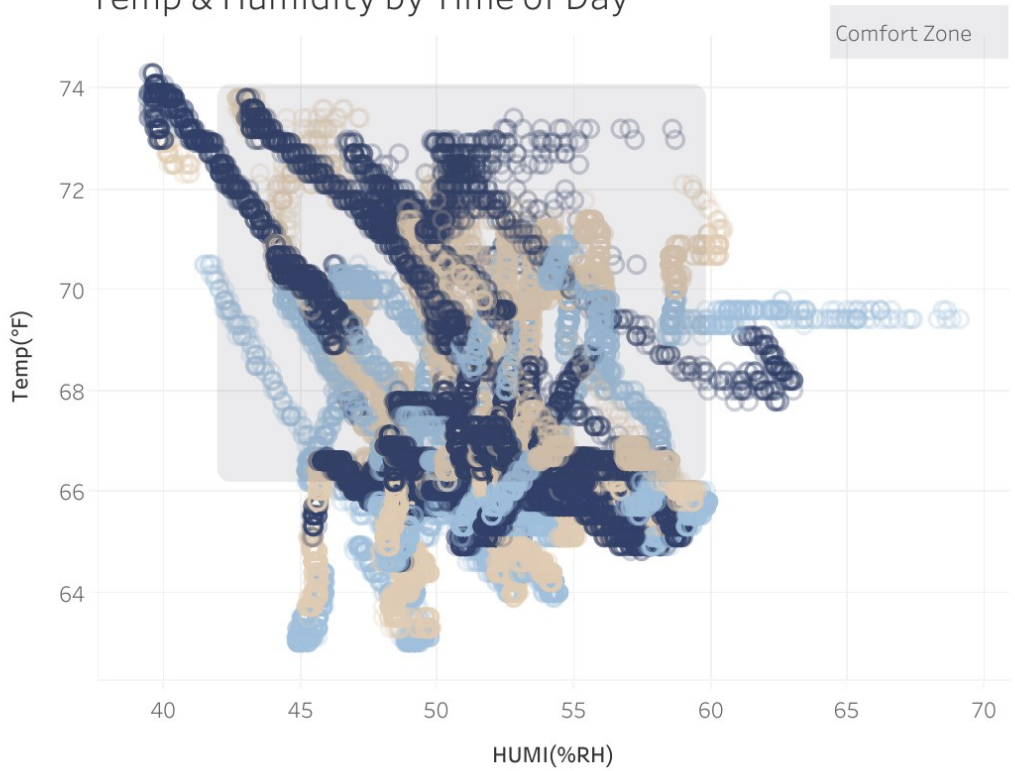
Temps by Day



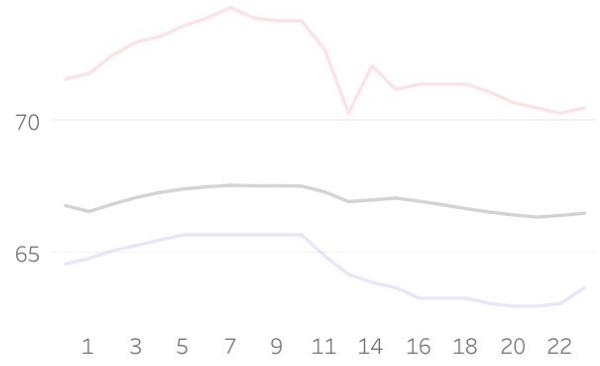
Time of Day



Temp & Humidity by Time of Day



Hourly Temp



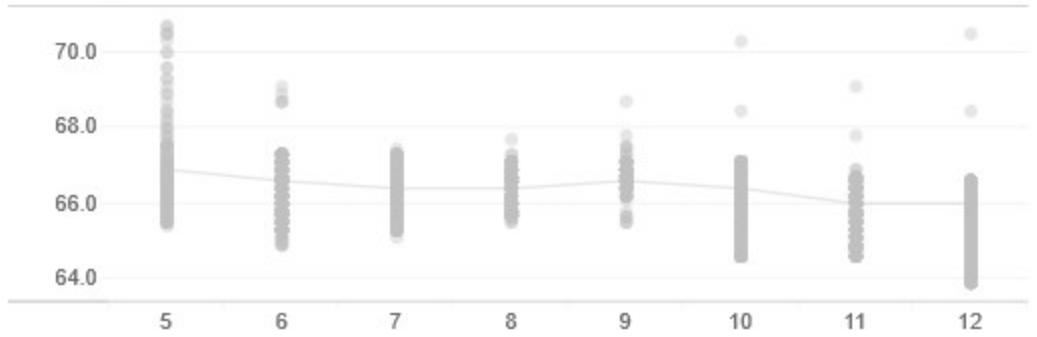
Color

Color

HOUSEHOLD COMFORT ANALYSIS

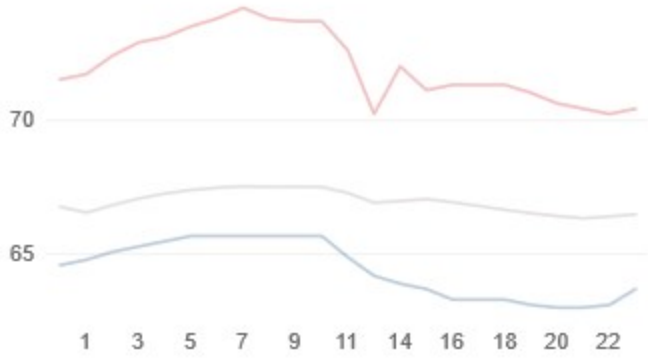
Median Temp by Room

Temps by Day

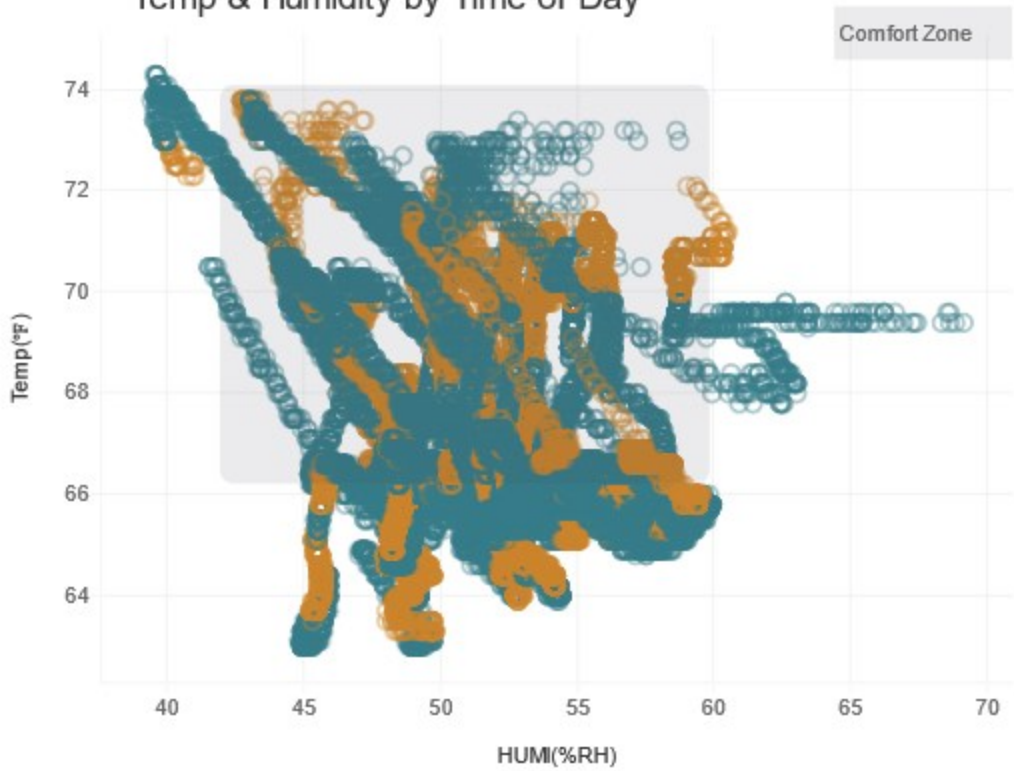


Time of Day

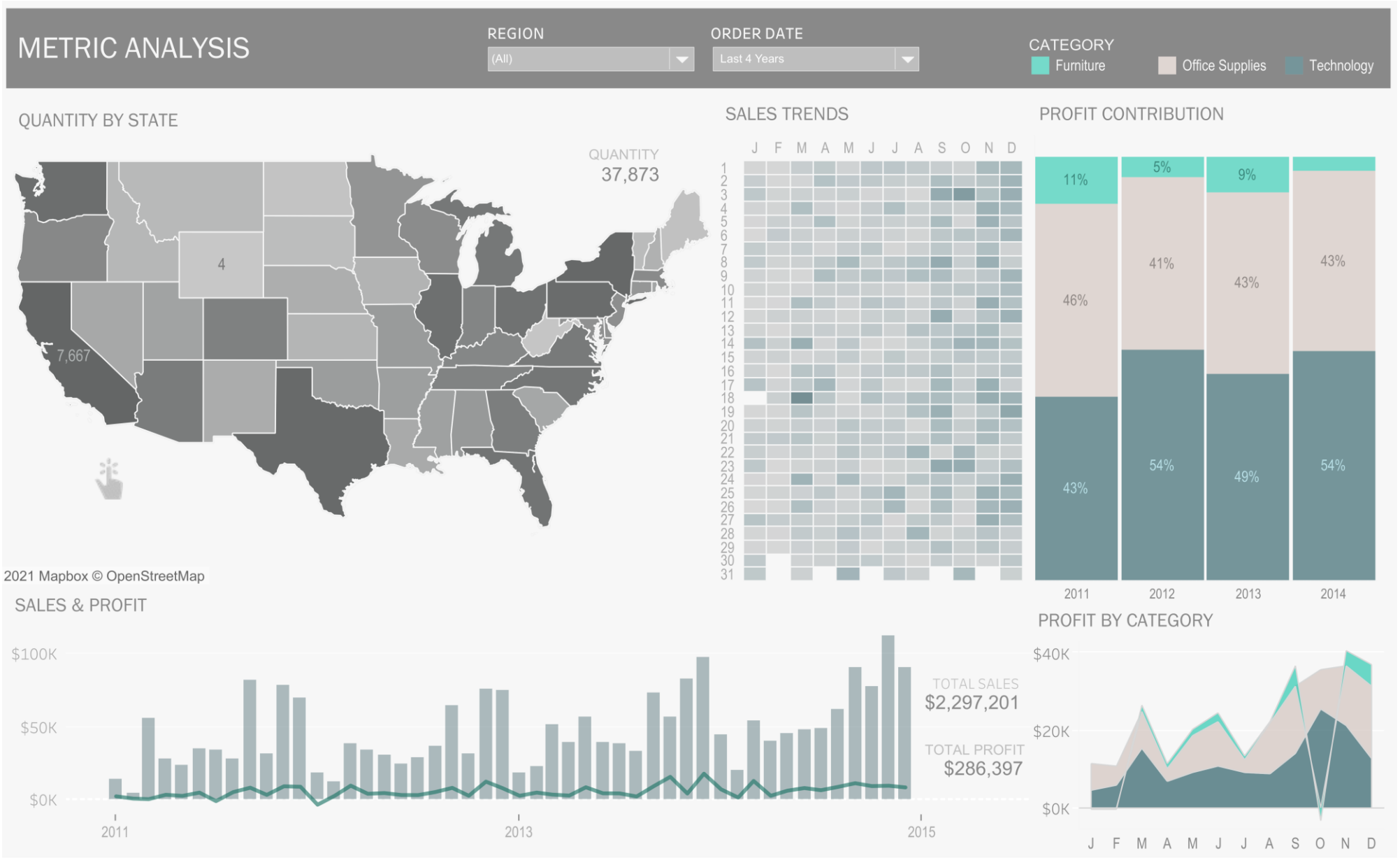
Hourly Temp



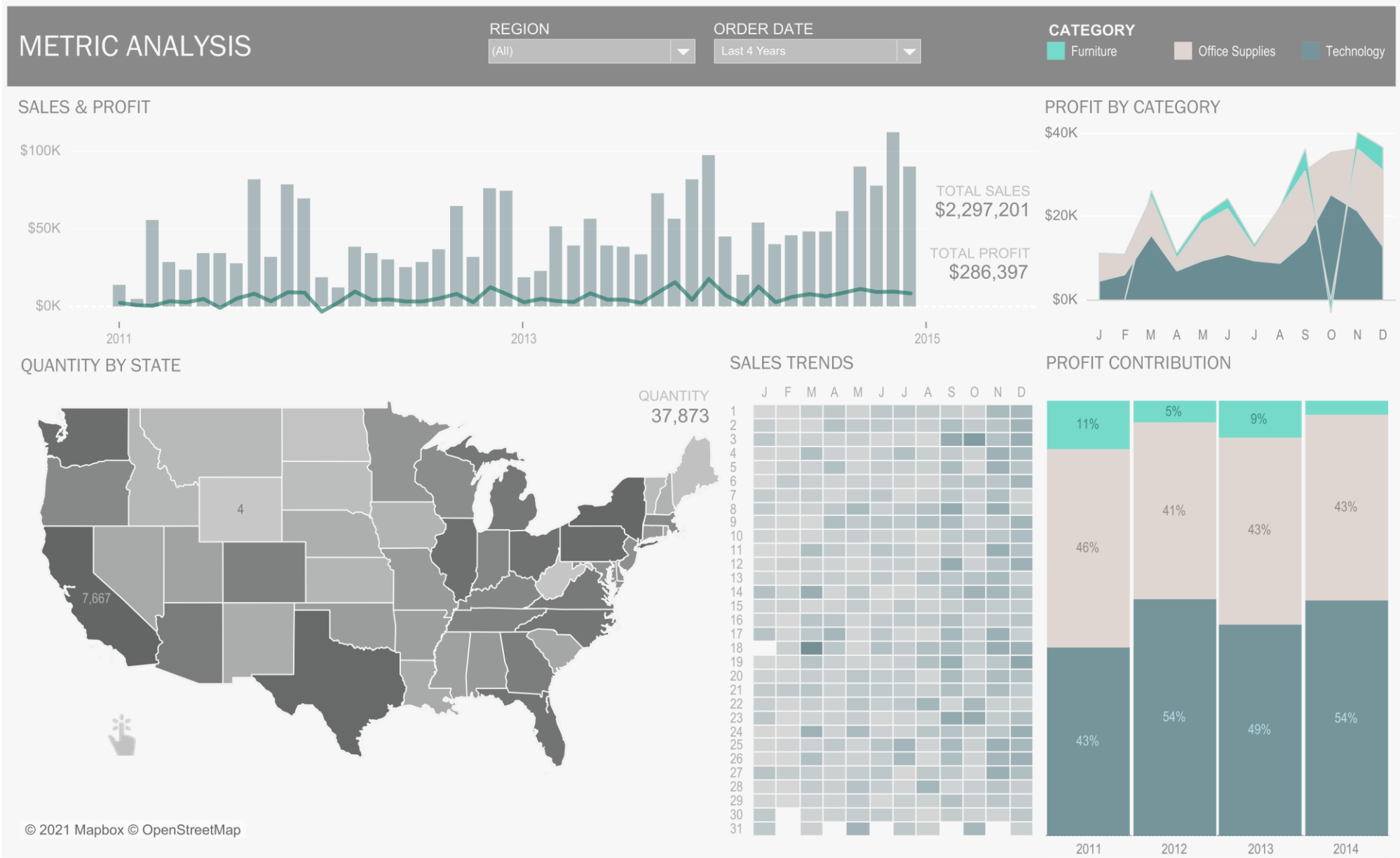
Temp & Humidity by Time of Day



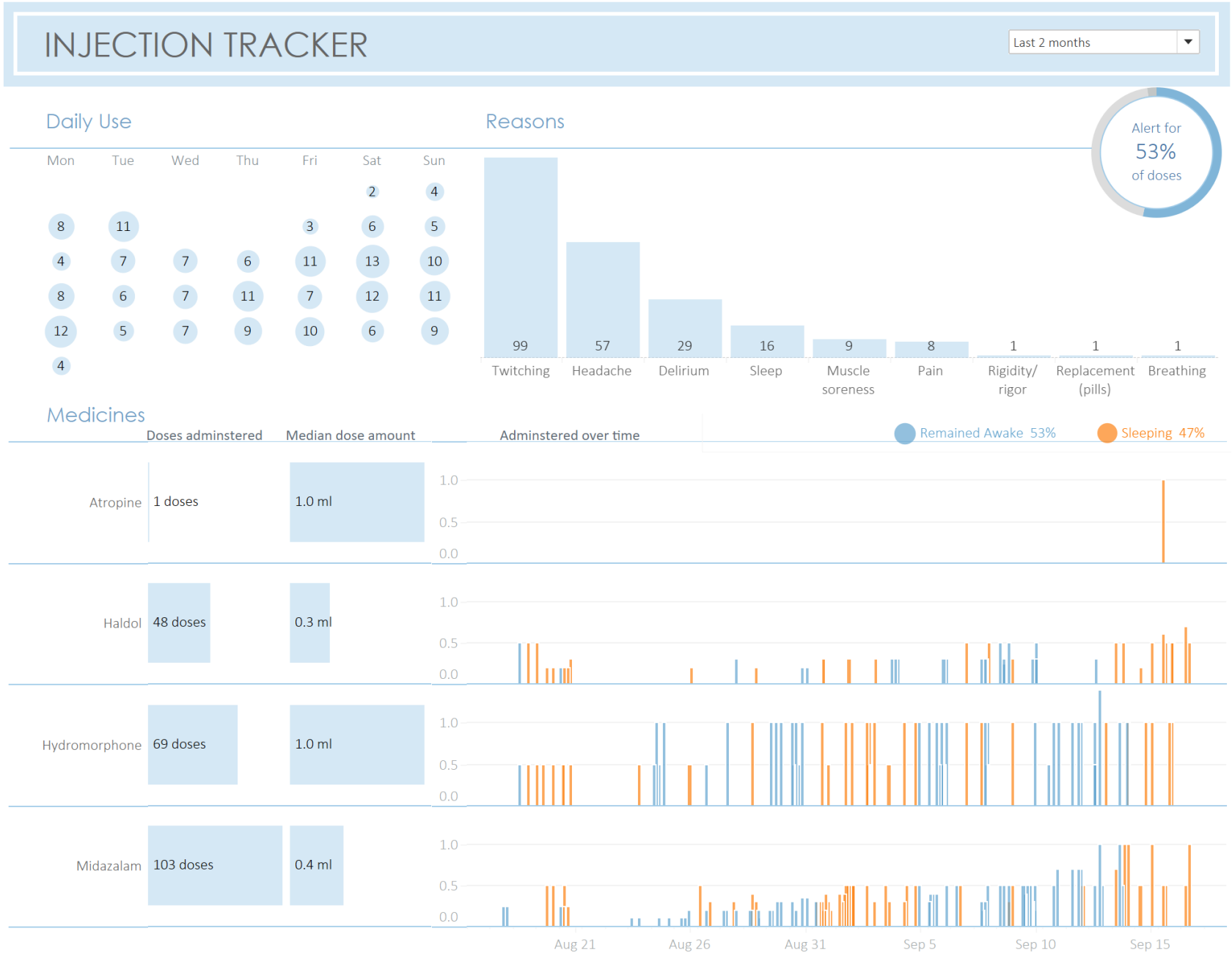
Sequence


METRIC ANALYSIS
REGION
(All)
ORDER DATE
Last 4 Years
CATEGORY
Furniture
Office Supplies
Technology
QUANTITY BY STATE
QUANTITY
37,873
4
7,667
2021 Mapbox © OpenStreetMap
SALES TRENDS
J F M A M J J A S O N D
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
PROFIT CONTRIBUTION
11%
46%
43%
5%
41%
54%
9%
43%
49%
43%
54%
2011
2012
2013
2014
SALES & PROFIT
$100K
$50K
$0K
2011
2013
2015
TOTAL SALES
$2,297,201
TOTAL PROFIT
$286,397
PROFIT BY CATEGORY
$40K
$20K
$0K
J F M A M J J A S O N D

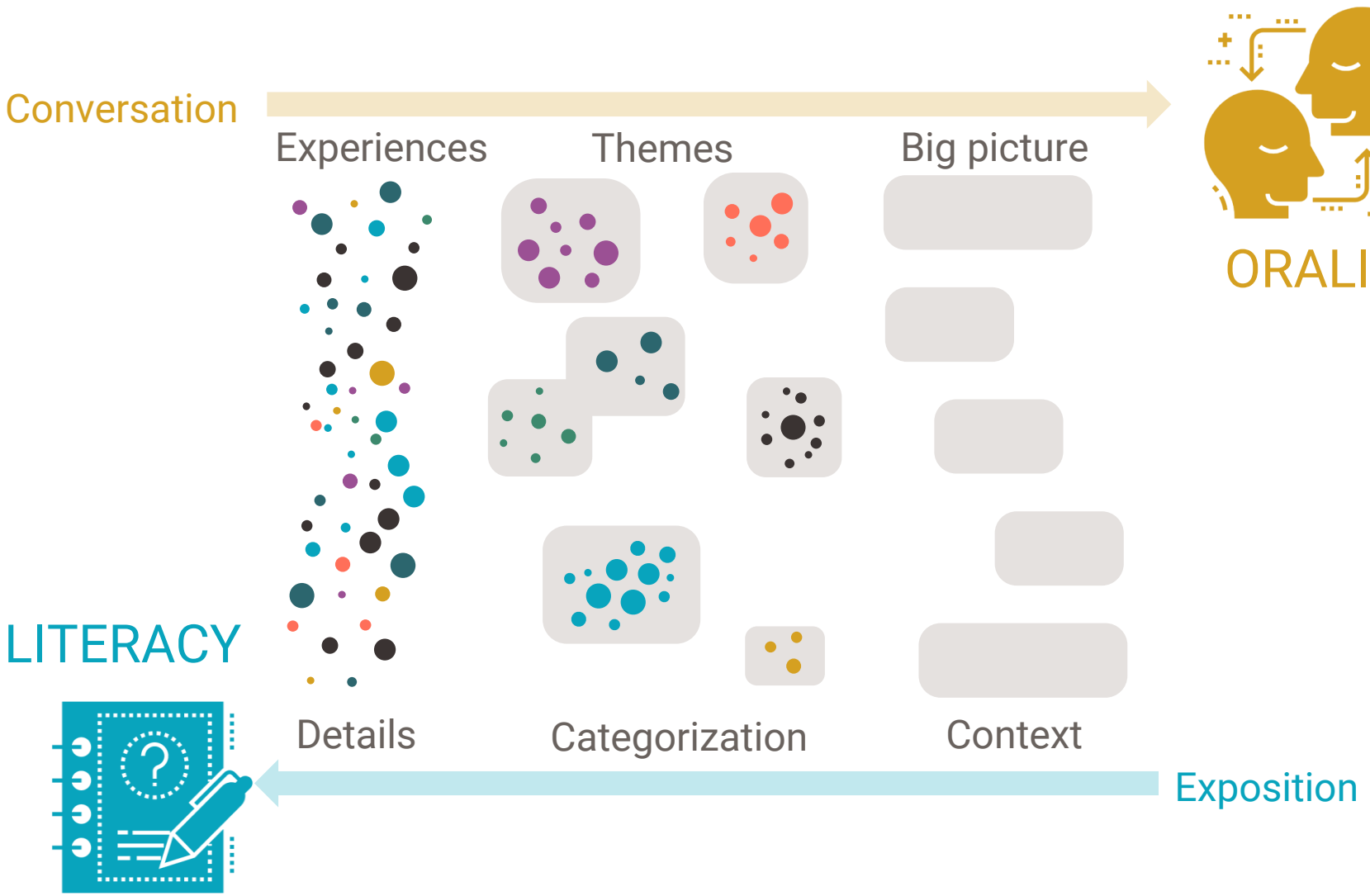
Sequence


METRIC ANALYSIS
REGION
(All)
ORDER DATE
Last 4 Years
CATEGORY
Furniture
Office Supplies
Technology
SALES & PROFIT
$100K
$50K
$0K
2011
2013
2015
TOTAL SALES
$2,297,201
TOTAL PROFIT
$286,397
PROFIT BY CATEGORY
$40K
$20K
$0K
J F M A M J J A S O N D
QUANTITY BY STATE
QUANTITY
37,873
4
7,667
© 2021 Mapbox © OpenStreetMap
SALES TRENDS
J F M A M J J A S O N D
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
PROFIT CONTRIBUTION
11%
46%
43%
5%
41%
54%
9%
43%
49%
43%
54%
2011
2012
2013
2014

Sequence


INJECTION TRACKER
Last 2 months
Daily Use
Mon Tue Wed Thu Fri Sat Sun
2 4
8 11 3 6 5
4 7 7 6 11 13 10
8 6 7 11 7 12 11
12 5 7 9 10 6 9
4
Reasons
Alert for 53% of doses
99 Twitching
57 Headache
29 Delirium
16 Sleep
9 Muscle soreness
8 Pain
1 Rigidity/ rigor
1 Replacement (pills)
1 Breathing
Medicines
Doses adminstered
Median dose amount
Adminstered over time
Remained Awake 53%
Sleeping 47%
Atropine 1 doses 1.0 ml
Haldol 48 doses 0.3 ml
Hydromorphone 69 doses 1.0 ml
Midazalam 103 doses 0.4 ml
1.0
0.5
0.0
Aug 21
Aug 26
Aug 31
Sep 5
Sep 10
Sep 15

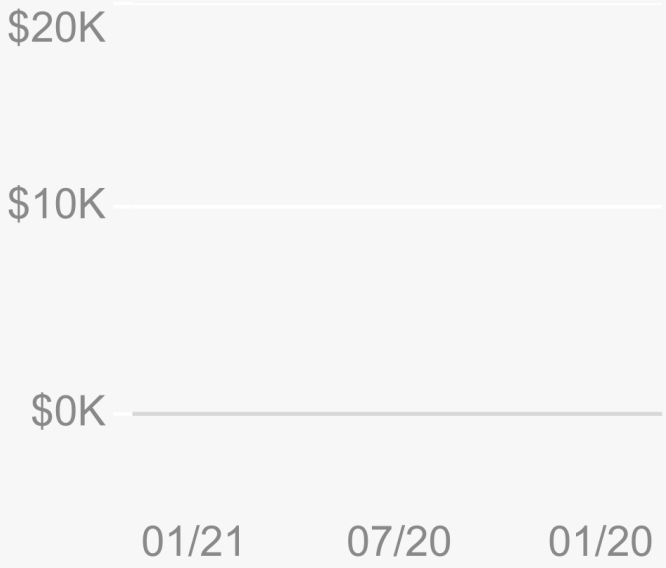
Sequence


Conversation
Experiences
Themes
Big picture
ORALITY
LITERACY
Details
Categorization
Context
Exposition

Visual Supports & Style

TITLE ALL CAPS FRANKLIN 18

TITLE 1 FRANKLIN 11



KPI NAME ARIAL 8

Number Arial 11

ACBABD

71A79E

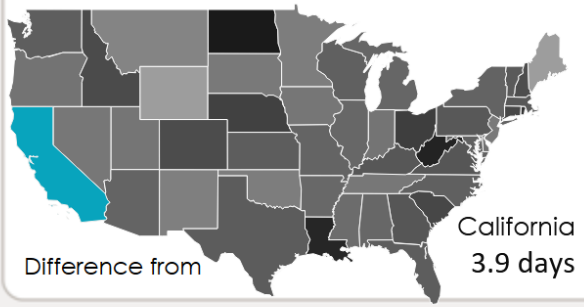
898989

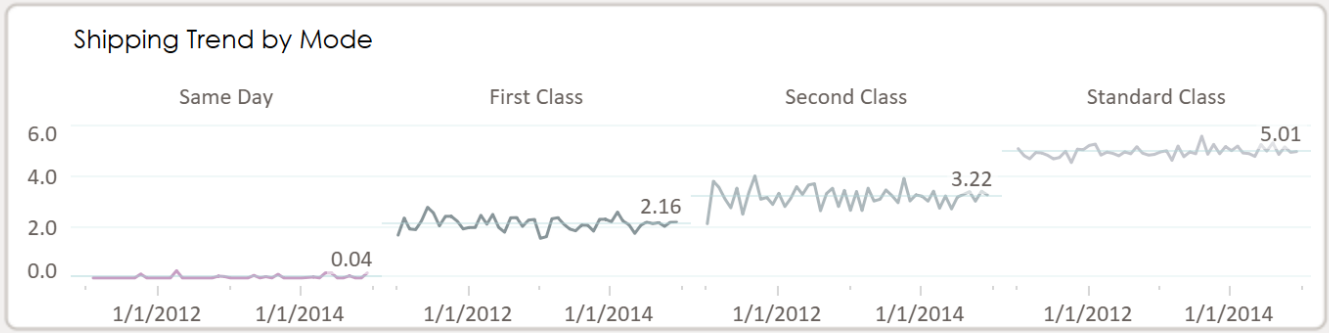
Visual Supports & Style

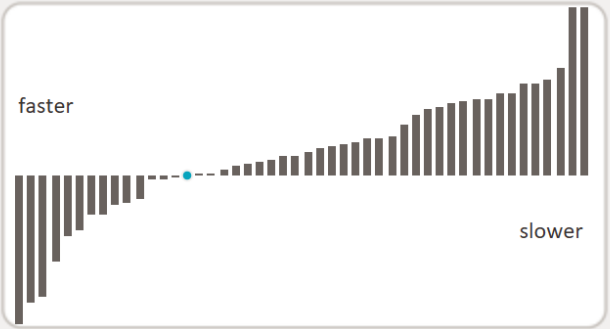
SUPERSTORE LOGISTICS

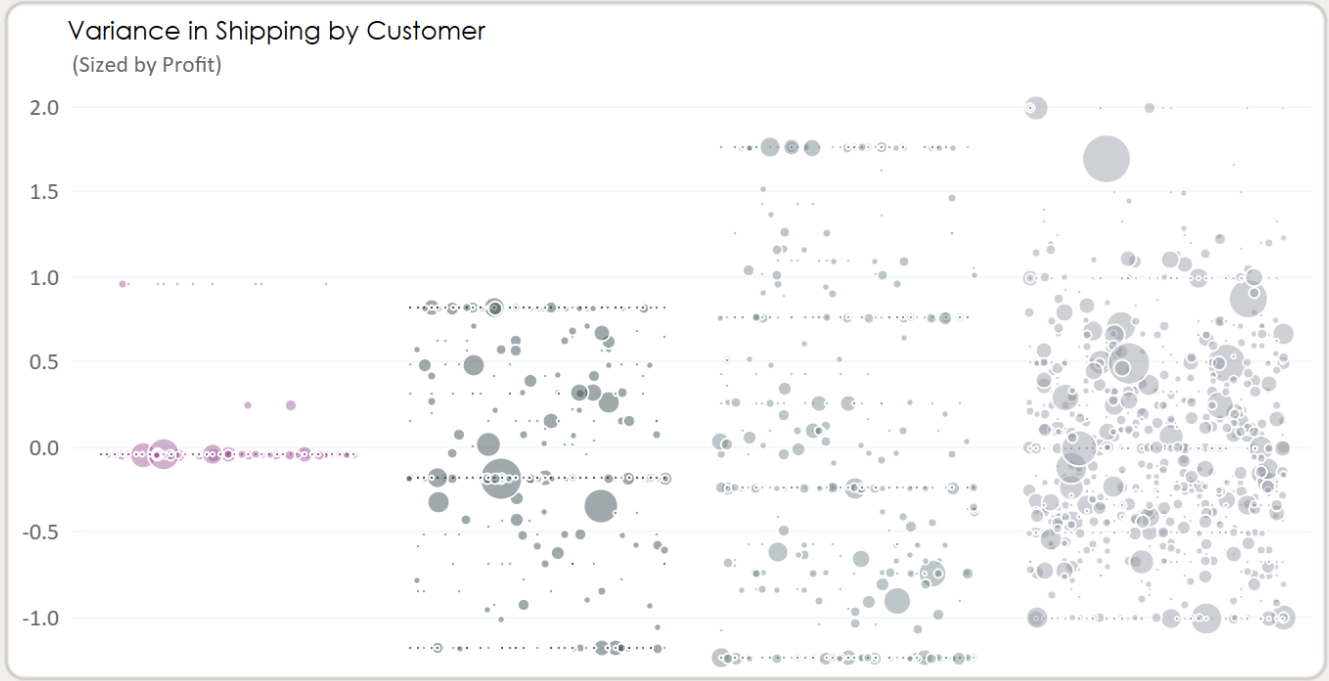
State Level Shipping

1/4/2011 — 12/31/2014



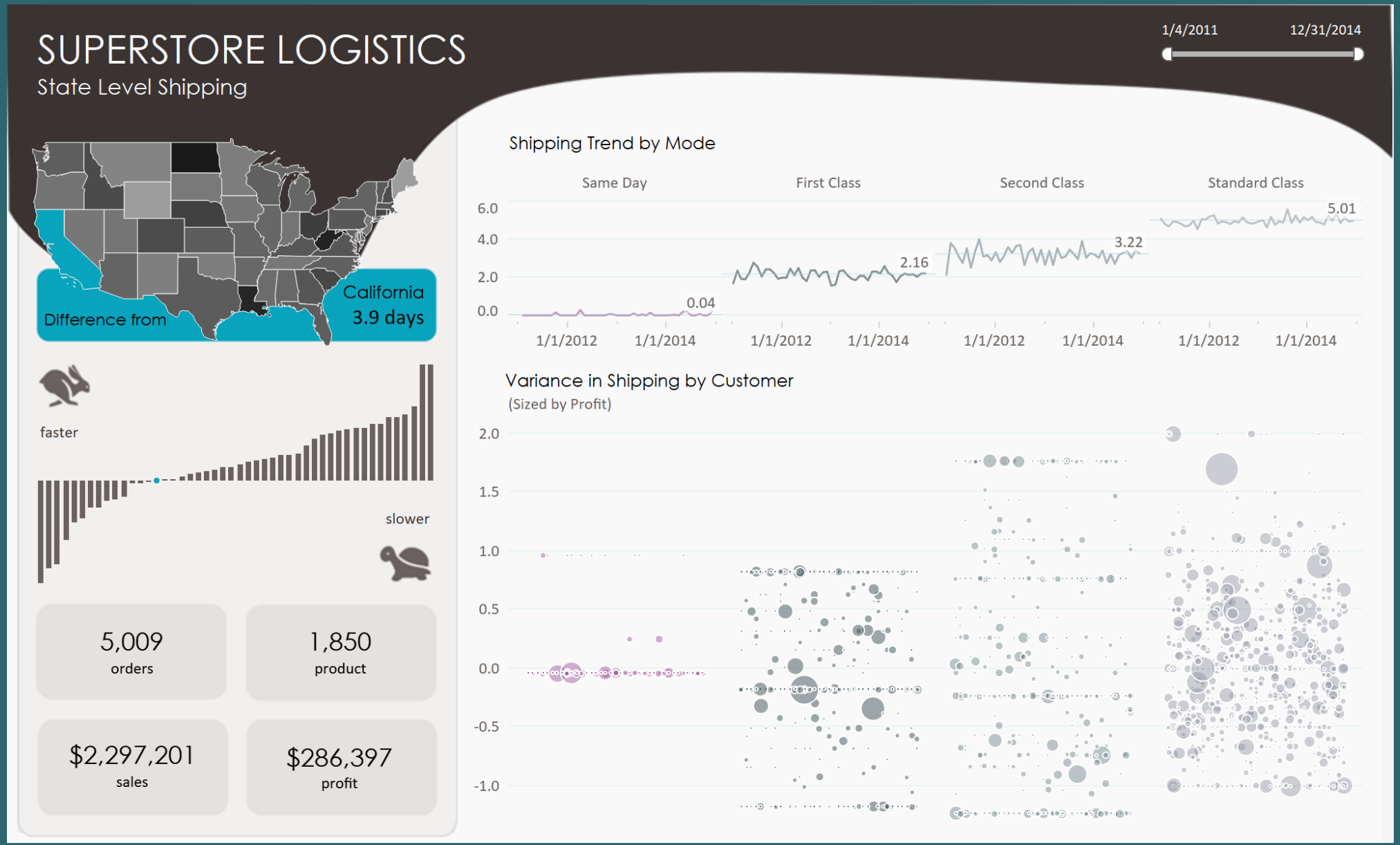




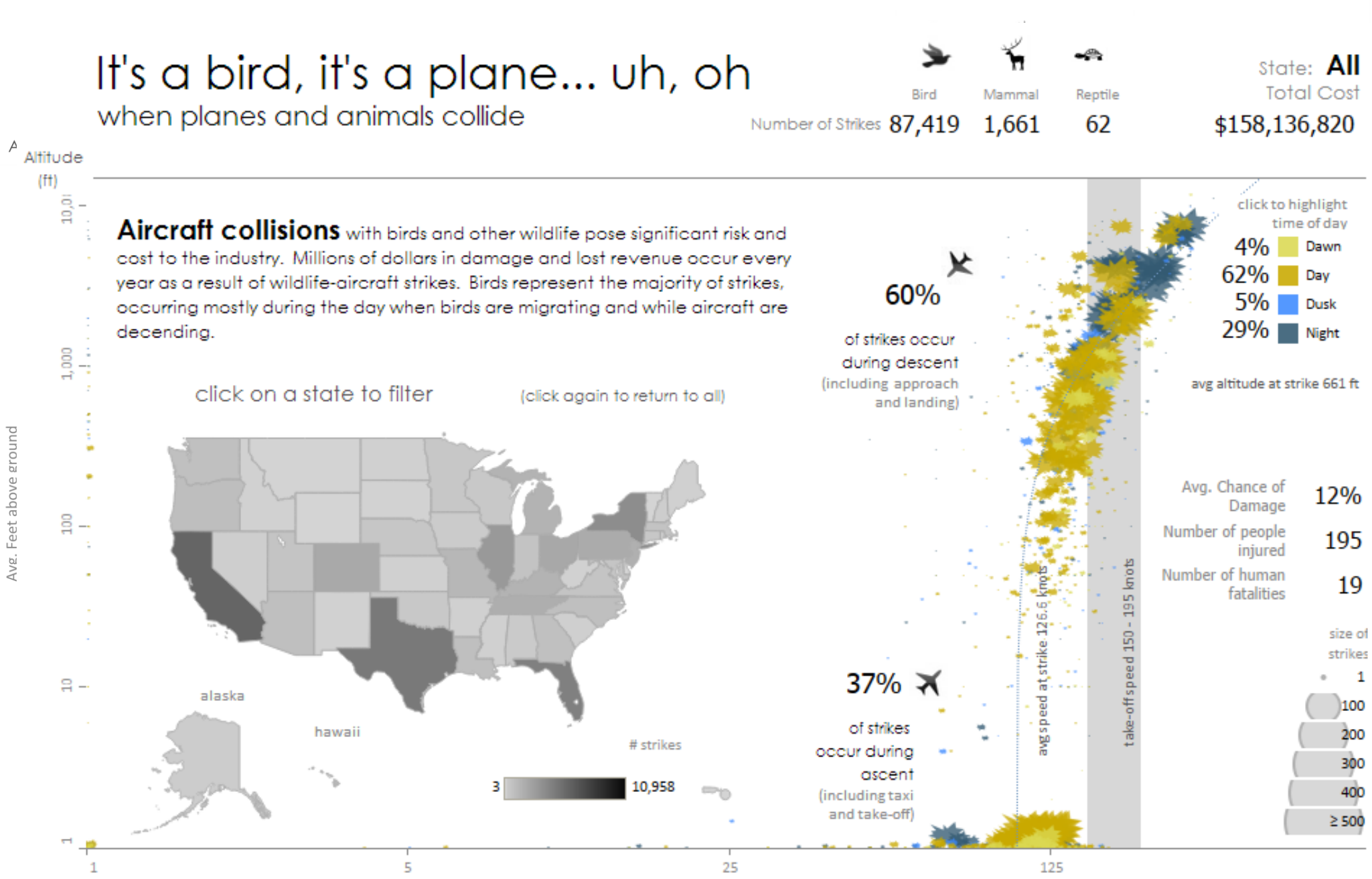


5,009 orders	1,850 product
$2,297,201 sales	$286,397 profit

Visual Supports & Style



Use of Space (Shape)



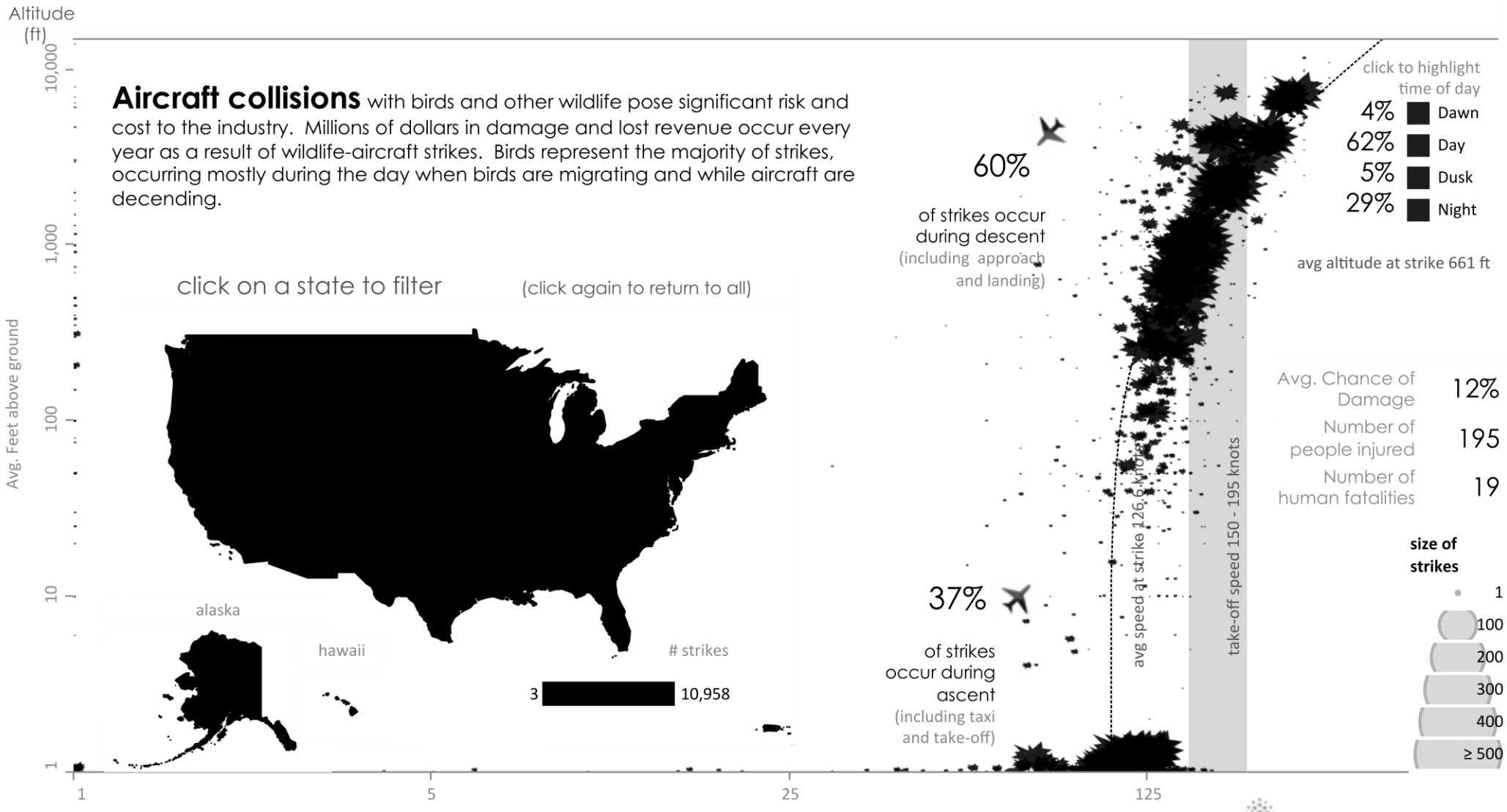
Use of Space (Shape)

It's a bird, it's a plane... uh, oh

when planes and animals collide

Number of Strikes	Bird	Mammal	Reptile
	87,419	1,661	62

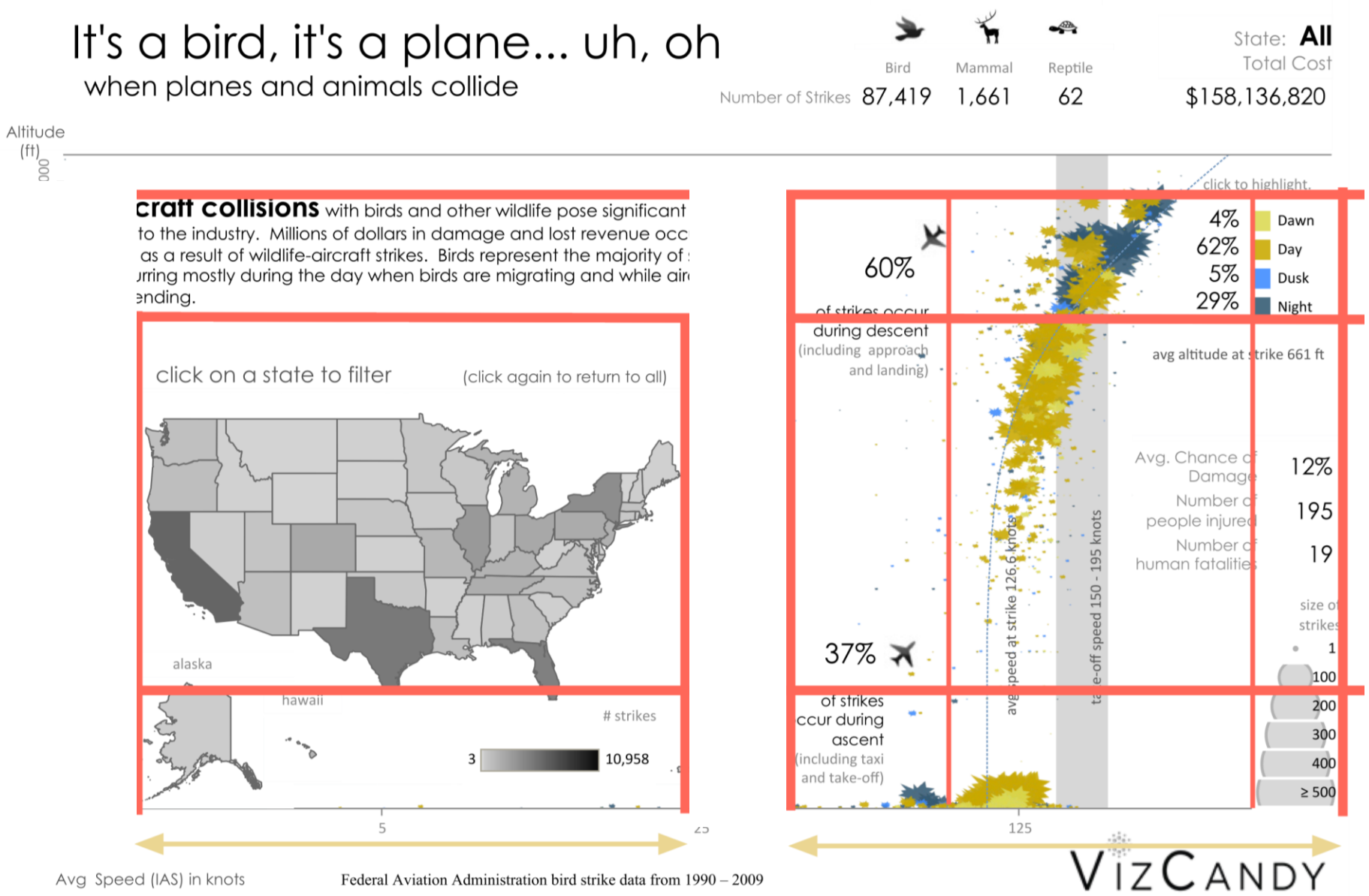
State: **All**
Total Cost
$158,136,820



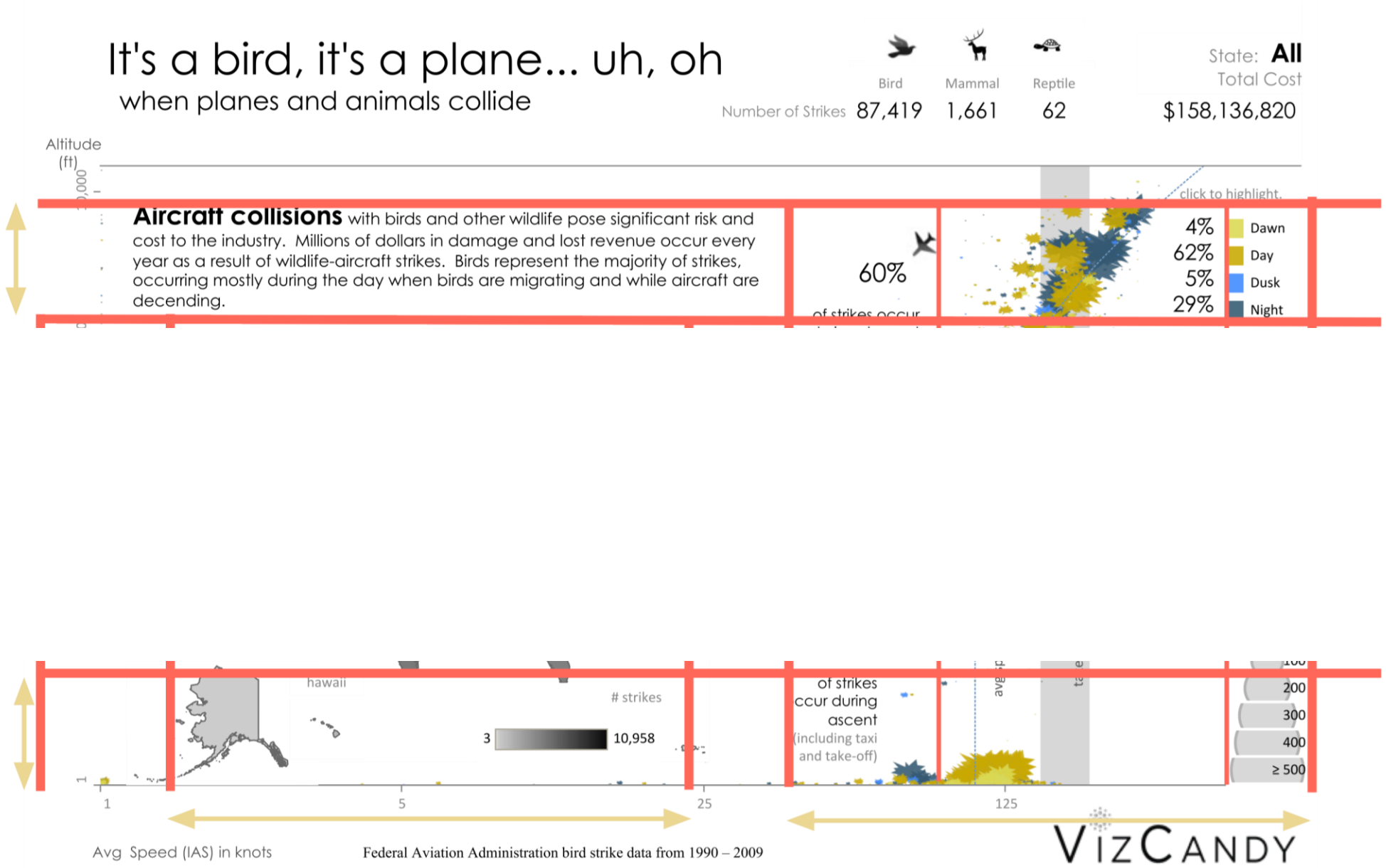
Federal Aviation Administration bird strike data from 1990 – 2009

VizCandy

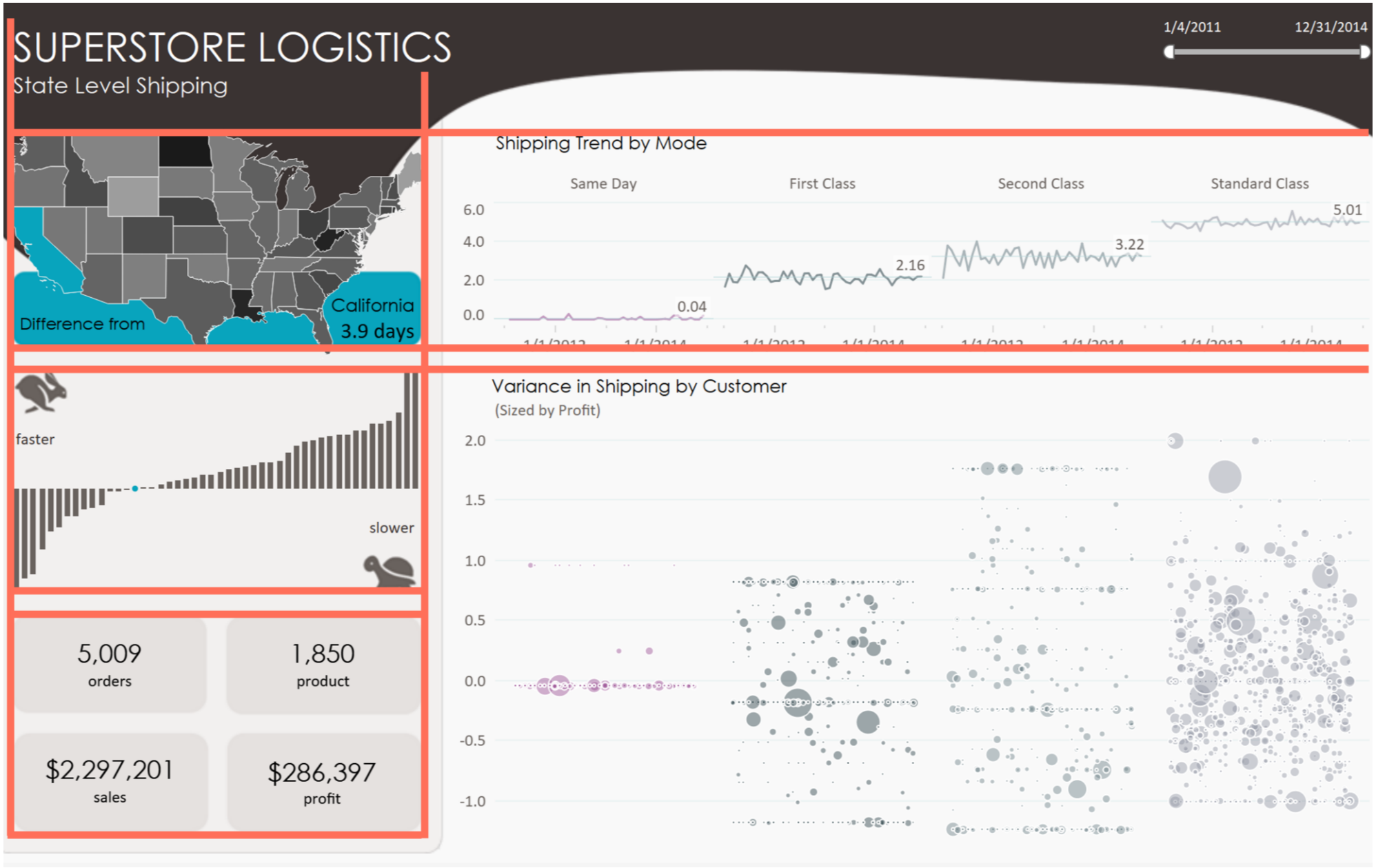
Alignment


It's a bird, it's a plane... uh, oh
when planes and animals collide
Bird
Mammal
Reptile
Number of Strikes
87,419
1,661
62
State: All
Total Cost
$158,136,820
Altitude (ft)
craft collisions with birds and other wildlife pose significant
to the industry. Millions of dollars in damage and lost revenue occ
as a result of wildlife-aircraft strikes. Birds represent the majority of
urring mostly during the day when birds are migrating and while air
ending.
click on a state to filter
(click again to return to all)
alaska
hawaii
strikes
3
10,958
5
Avg Speed (IAS) in knots
click to highlight
60%
of strikes occur during descent (including approach and landing)
37%
of strikes occur during ascent (including taxi and take-off)
4%
62%
5%
29%
Dawn
Day
Dusk
Night
avg altitude at strike 661 ft
Avg. Chance of Damage
12%
Number of people injured
195
Number of human fatalities
19
size of strikes
1
100
200
300
400
≥ 500
avg speed at strike 126.6 knots
take-off speed 150 - 195 knots
125
Federal Aviation Administration bird strike data from 1990 – 2009
VizCandy

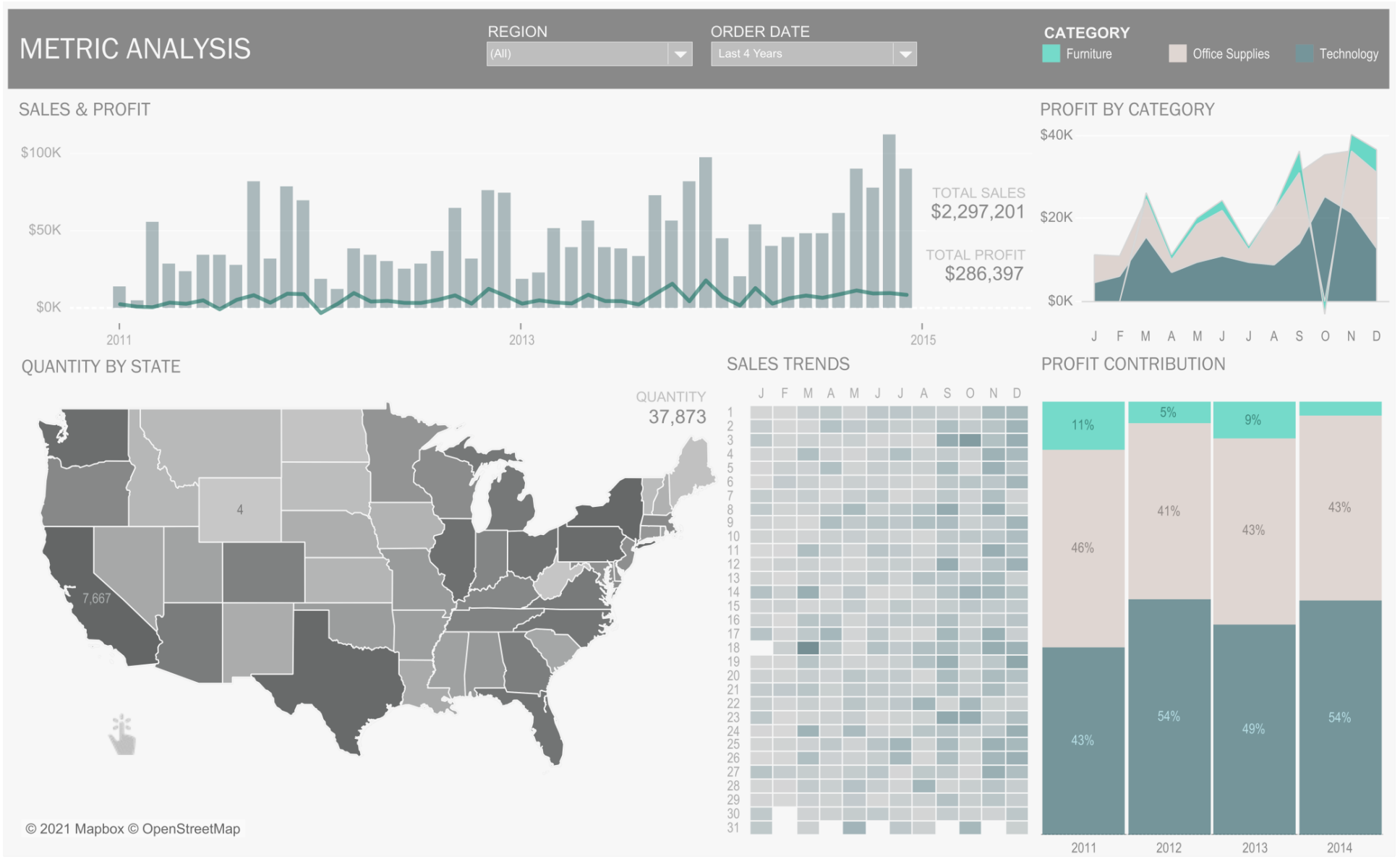
Alignment


It's a bird, it's a plane... uh, oh
when planes and animals collide
Bird
Mammal
Reptile
Number of Strikes 87,419 1,661 62
State: All
Total Cost
$158,136,820
Altitude (ft)
Aircraft collisions with birds and other wildlife pose significant risk and cost to the industry. Millions of dollars in damage and lost revenue occur every year as a result of wildlife-aircraft strikes. Birds represent the majority of strikes, occurring mostly during the day when birds are migrating and while aircraft are decending.
60%
of strikes occur
click to highlight.
4%
62%
5%
29%
Dawn
Day
Dusk
Night
hawaii
strikes
3
10,958
of strikes occur during ascent (including taxi and take-off)
200
300
400
≥ 500
1
5
25
125
Avg Speed (IAS) in knots
Federal Aviation Administration bird strike data from 1990 – 2009
VIZCANDY

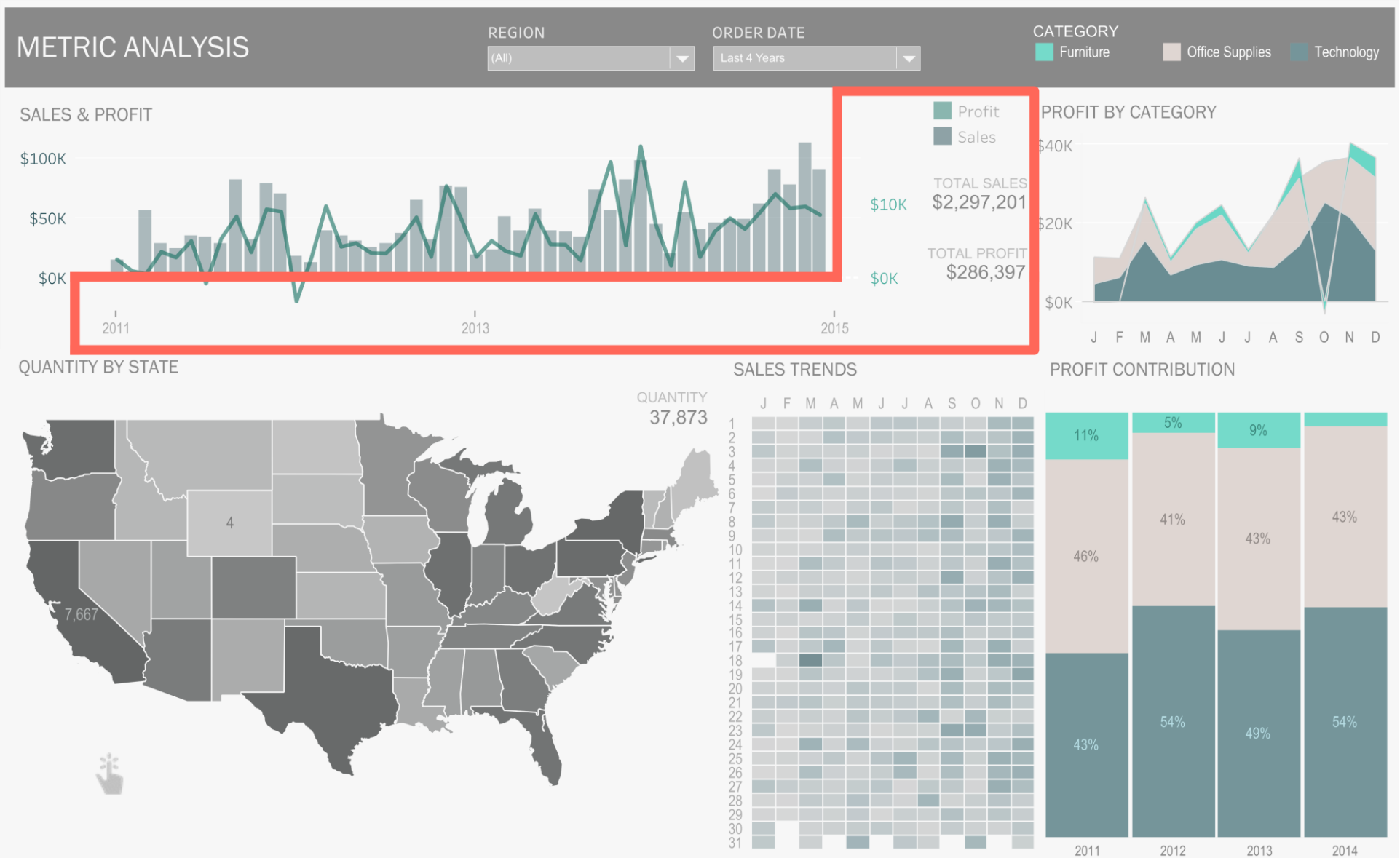
Alignment


SUPERSTORE LOGISTICS
State Level Shipping
1/4/2011
12/31/2014
Difference from
California
3.9 days
Shipping Trend by Mode
Same Day
First Class
Second Class
Standard Class
6.0
4.0
2.0
0.0
0.04
2.16
3.22
5.01
faster
slower
Variance in Shipping by Customer
(Sized by Profit)
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
5,009
orders
1,850
product
$2,297,201
sales
$286,397
profit

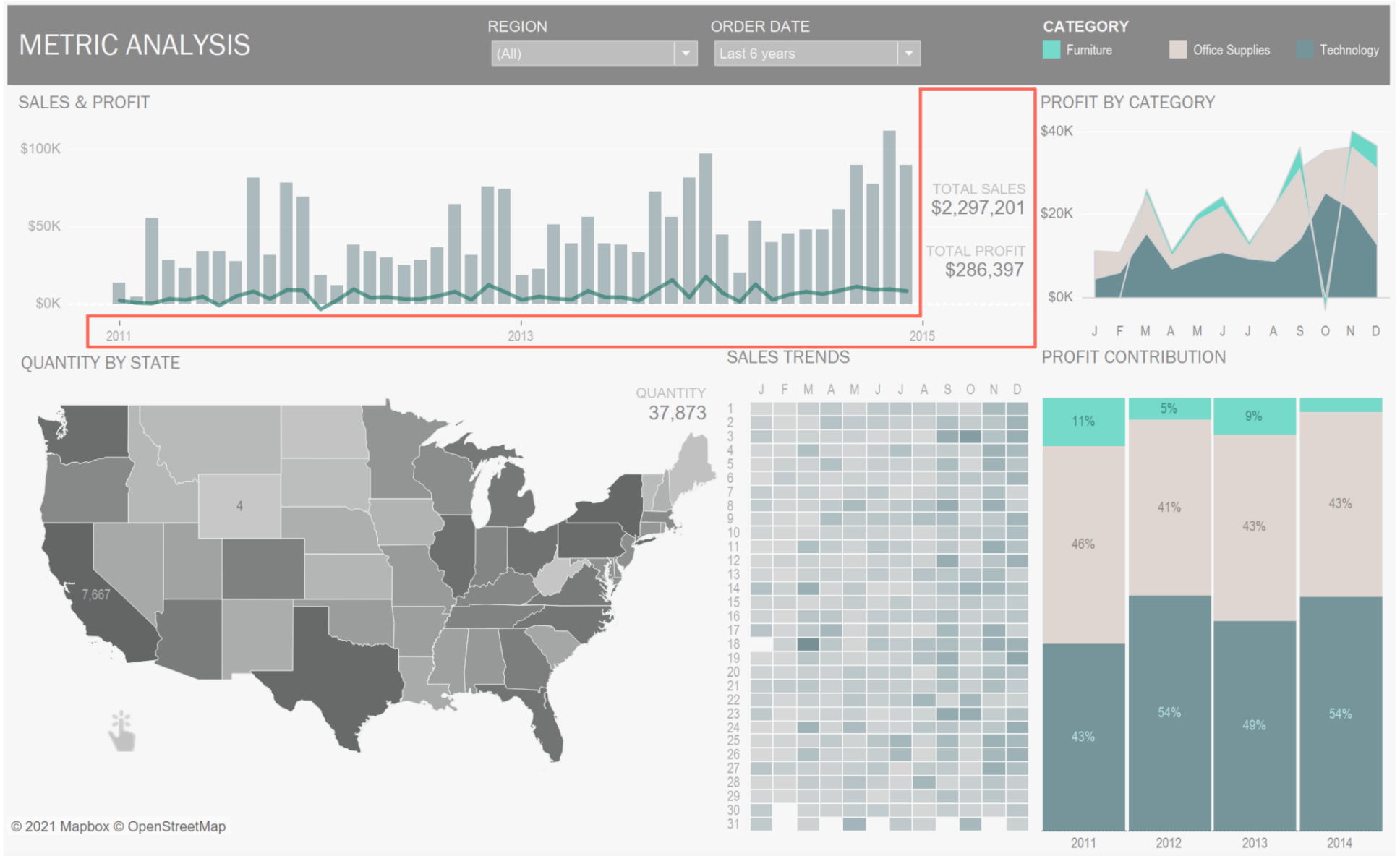
Alignment


METRIC ANALYSIS
REGION
(All)
ORDER DATE
Last 4 Years
CATEGORY
Furniture
Office Supplies
Technology
SALES & PROFIT
$100K
$50K
$0K
2011
2013
2015
TOTAL SALES
$2,297,201
TOTAL PROFIT
$286,397
PROFIT BY CATEGORY
$40K
$20K
$0K
J F M A M J J A S O N D
QUANTITY BY STATE
QUANTITY
37,873
4
7,667
© 2021 Mapbox © OpenStreetMap
SALES TRENDS
J F M A M J J A S O N D
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
PROFIT CONTRIBUTION
11%
46%
43%
5%
41%
54%
9%
43%
49%
43%
54%
2011
2012
2013
2014

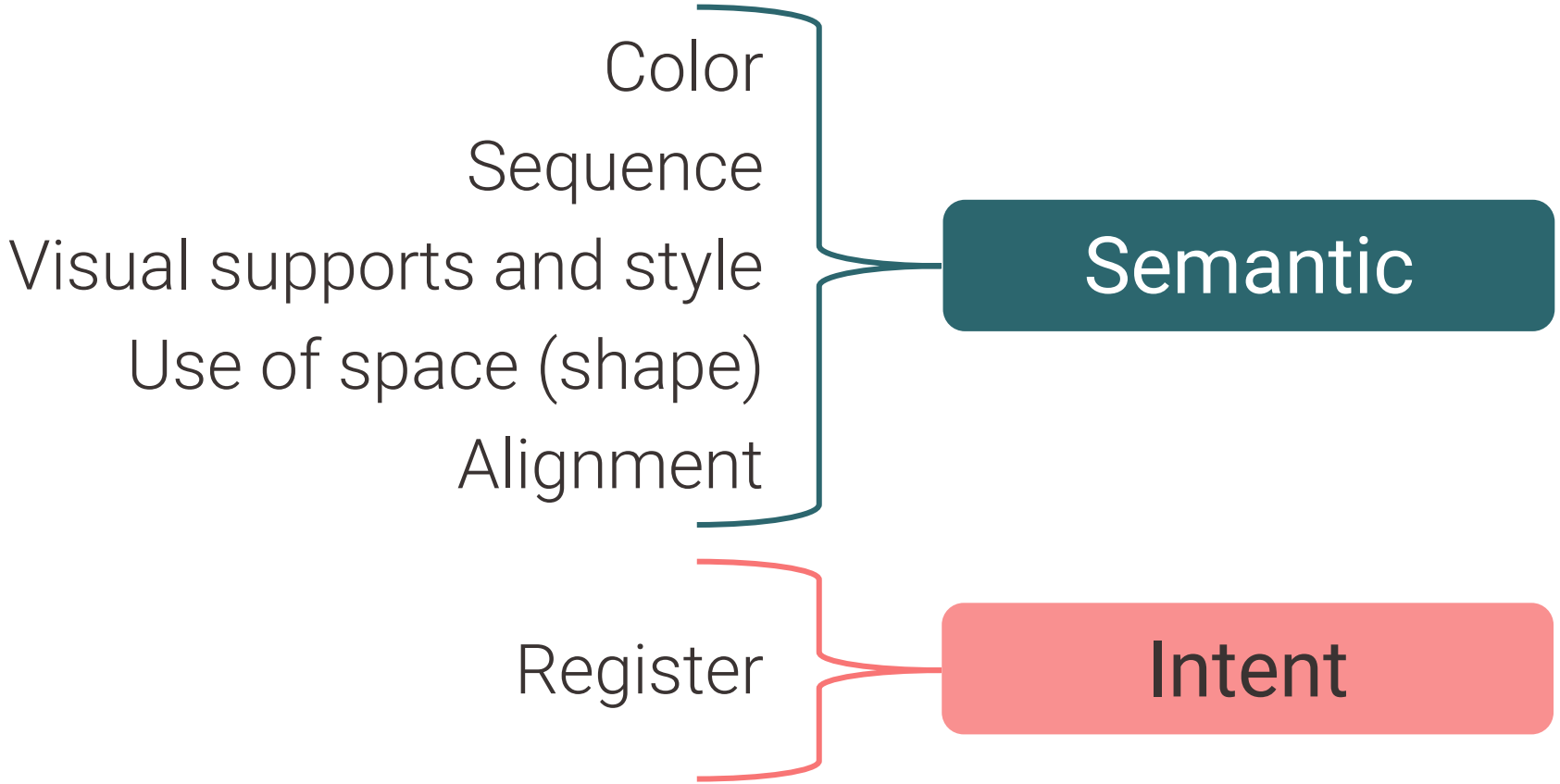
Alignment


METRIC ANALYSIS
REGION
(All)
ORDER DATE
Last 4 Years
CATEGORY
Furniture
Office Supplies
Technology
SALES & PROFIT
$100K
$50K
$0K
2011
2013
2015
Profit
Sales
$10K
$0K
TOTAL SALES
$2,297,201
TOTAL PROFIT
$286,397
PROFIT BY CATEGORY
$40K
$20K
$0K
J F M A M J J A S O N D
QUANTITY BY STATE
QUANTITY
37,873
4
7,667
SALES TRENDS
J F M A M J J A S O N D
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
PROFIT CONTRIBUTION
11%
46%
43%
5%
41%
54%
9%
43%
49%
43%
54%
2011
2012
2013
2014

Alignment


METRIC ANALYSIS
REGION
(All)
ORDER DATE
Last 6 years
CATEGORY
Furniture
Office Supplies
Technology
SALES & PROFIT
$100K
$50K
$0K
2011
2013
2015
TOTAL SALES
$2,297,201
TOTAL PROFIT
$286,397
PROFIT BY CATEGORY
$40K
$20K
$0K
J F M A M J J A S O N D
QUANTITY BY STATE
QUANTITY
37,873
4
7,667
© 2021 Mapbox © OpenStreetMap
SALES TRENDS
J F M A M J J A S O N D
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
PROFIT CONTRIBUTION
11%
46%
43%
5%
41%
54%
9%
43%
49%
43%
54%
2011
2012
2013
2014

Cohesion

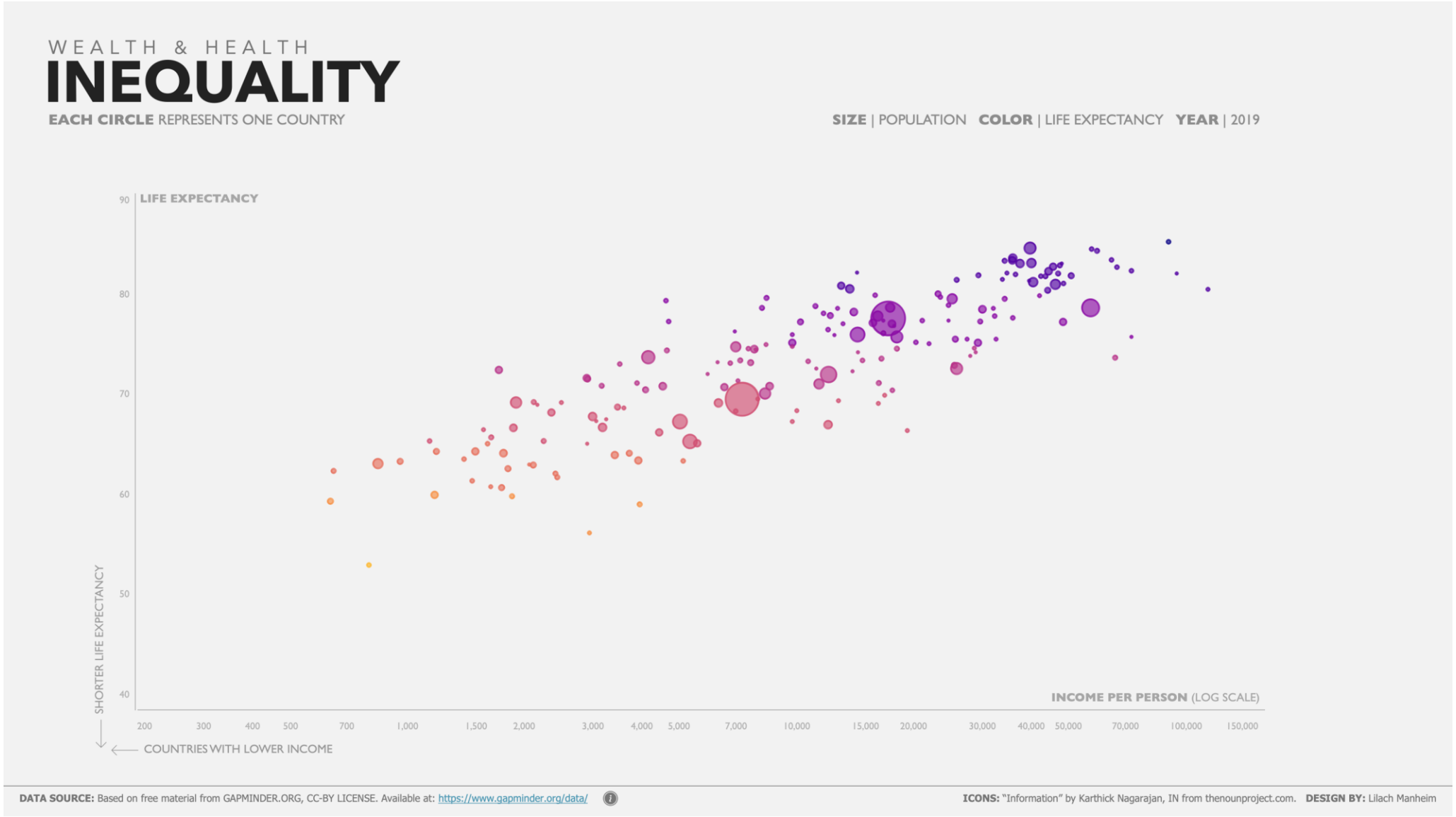

Color
Sequence
Visual supports and style
Use of space (shape)
Alignment
Semantic
Register
Intent

PART C: INTENT

Register

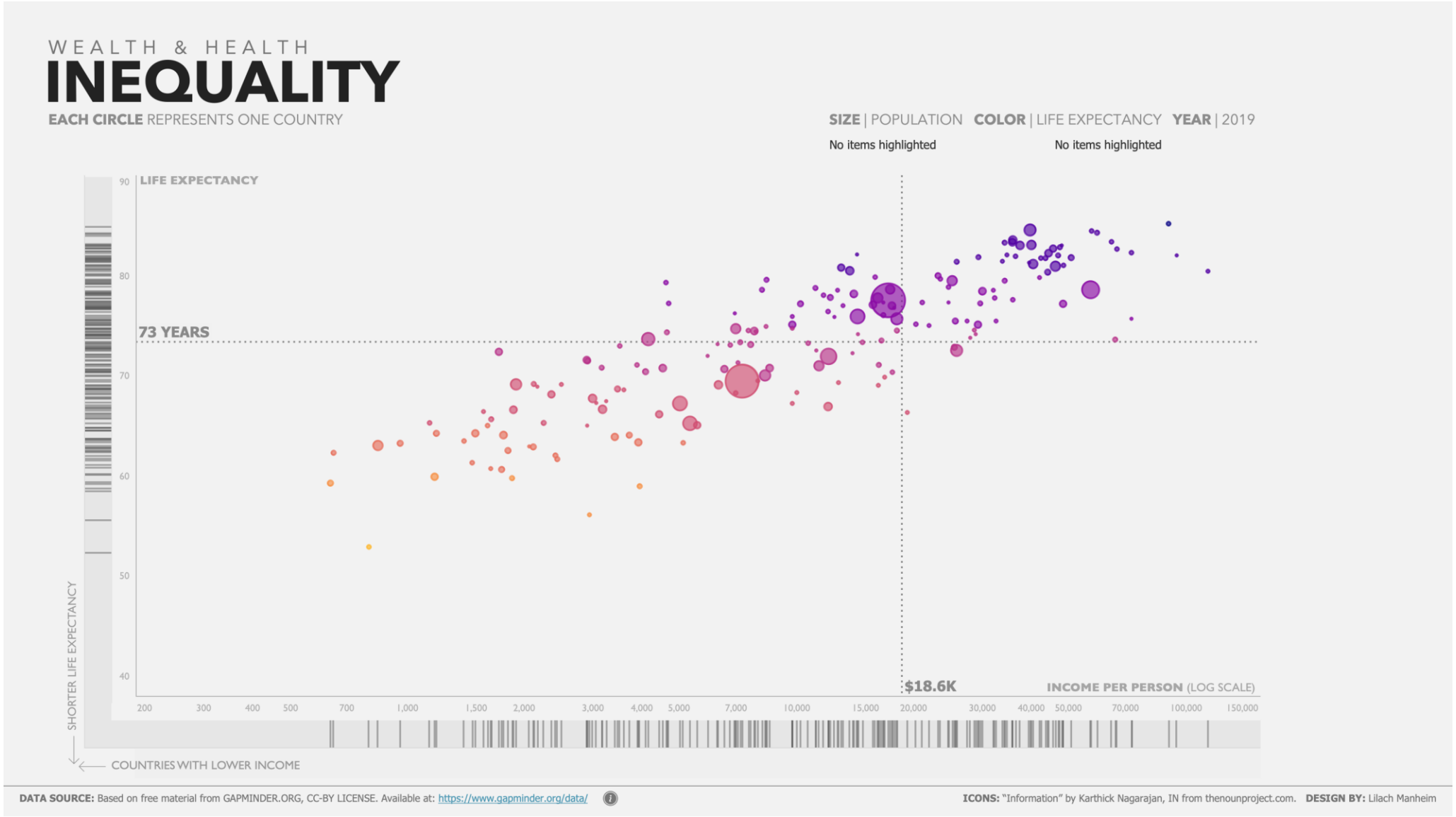
is the degree of formality and familiarity communicated within a visualization or an interaction.

Register



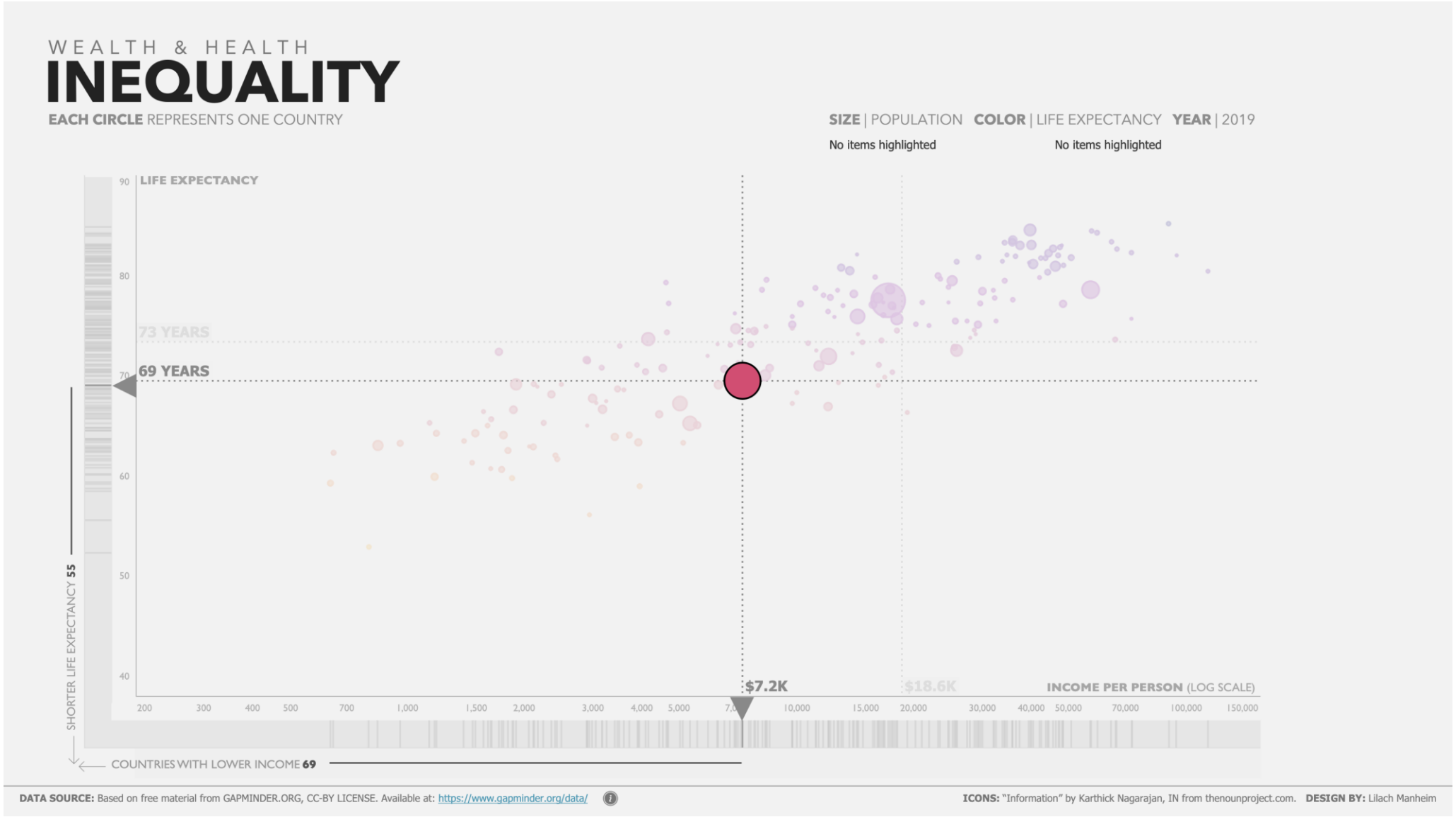
Wealth and Inequality, courtesy of Lilach Manheim-Laurio

Register



Wealth and Inequality Deluxed, courtesy of Lilach Manheim-Laurio

Register

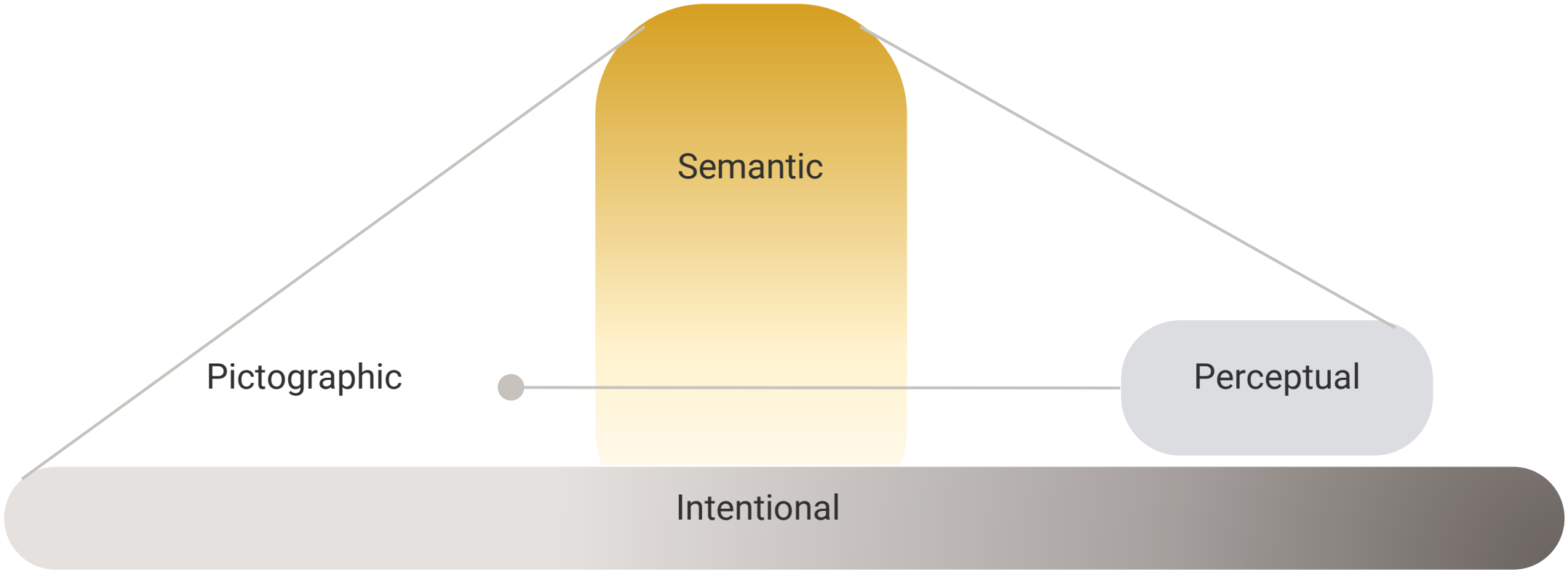


Wealth and Inequality Deluxed, courtesy of Lilach Manheim-Laurio

Color	Start in black and white (or monochrome)
	Assess what color communicates
Sequence	Determine your narrative style (Ch. 6)
	Toggle interactivity to one chart at a time
Visual Supports & Style	Create a Style Tile
	Frame by what works together
Use of Space (Shape)	Stand far back (or take off your glasses)
	Balance white space with other aesthetic parameters
Alignment	Pick a consistent alignment paradigm (data ink, text, or supports)
	Play! This is the poetic part.
Register	Aim for consultative register by clarifying and adding in guardrails
	Test it or sleep on it.

Assessing

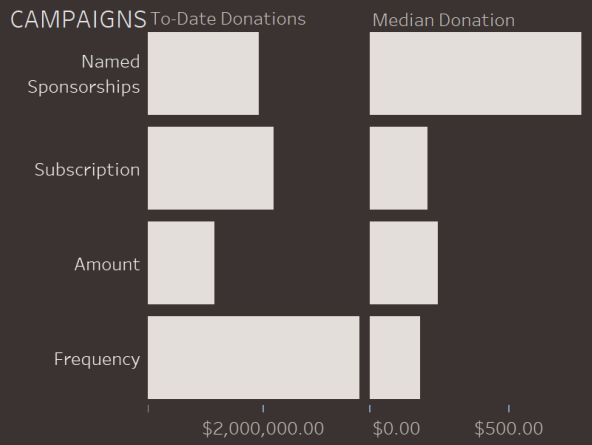
FUNCTIONAL AESTHETICS


Semantic
Pictographic
Perceptual
Intentional

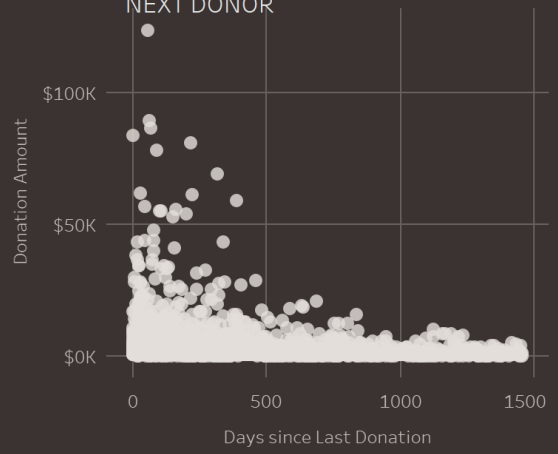
DONATION DRIVE

Sample data | Data current to 12/31/2014

CAMPAIGNS

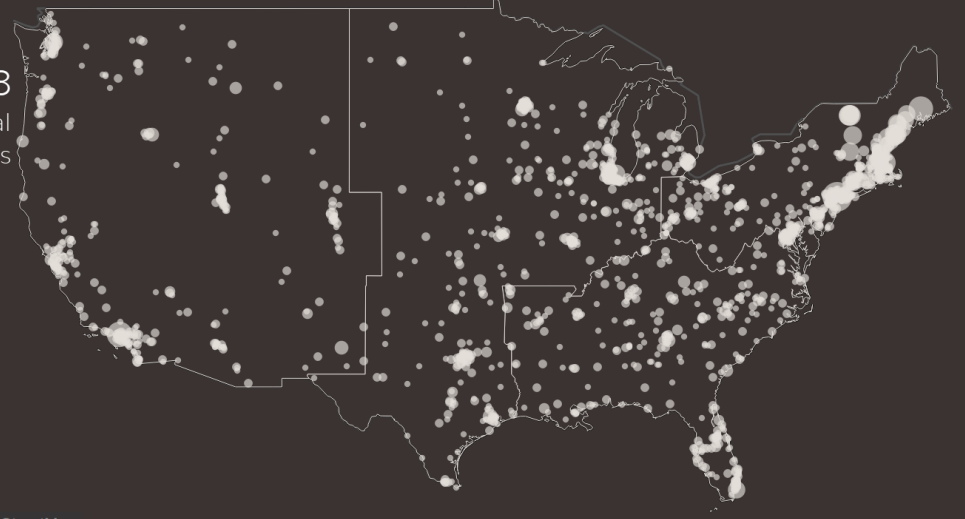


NEXT DONOR



CITIES AND REGIONS

38 potential donors



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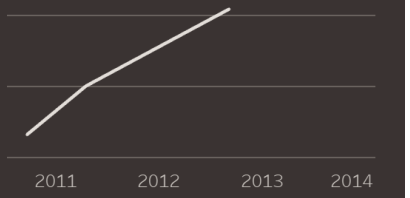
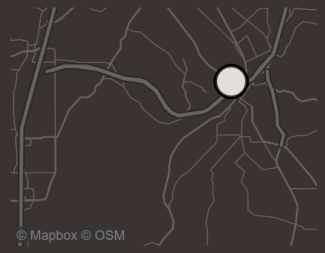
Deborah Paul

Last Donation: **9/4/2012**
15 months ago

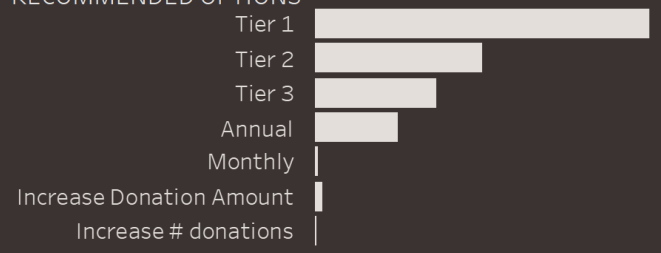
(614) 867-5309





123 Fake Data Lane
West Linn, Oregon
97068

RECOMMENDED OPTIONS

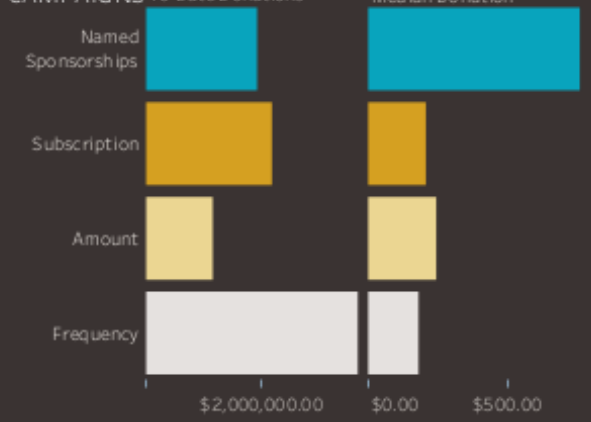


COLLECT DONATION

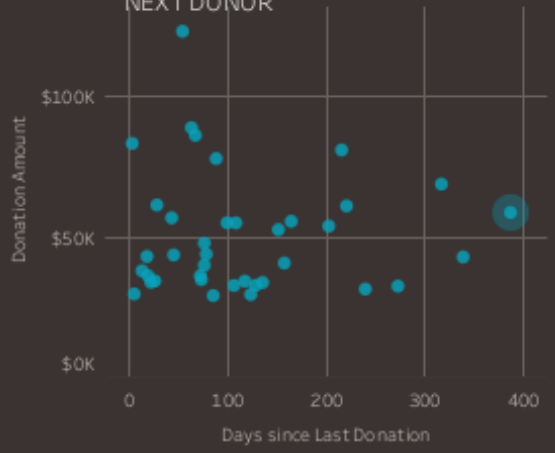
DONATION DRIVE

Sample data | Data current to 12/31/2014

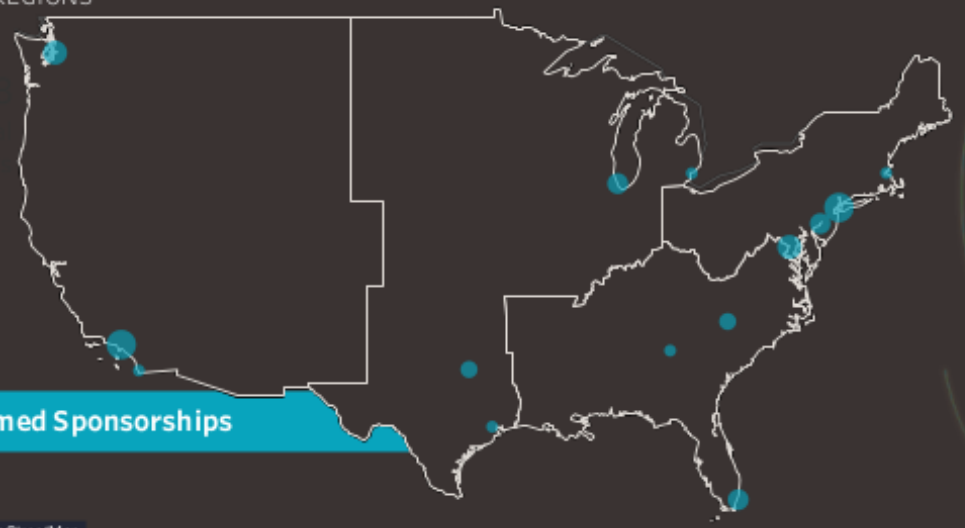
CAMPAIGNS To-Date Donations Median Donation



NEXT DONOR



CITIES AND REGIONS



Named Sponsorships

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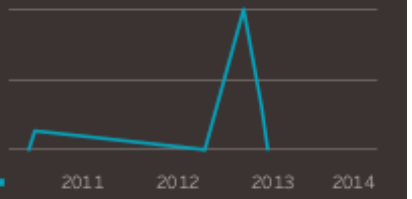
Kim Weiss

Last Donation: **12/10/2012**
12 months ago

(614) 867-5309



123 Fake Data Lane
Miami, Florida
33132

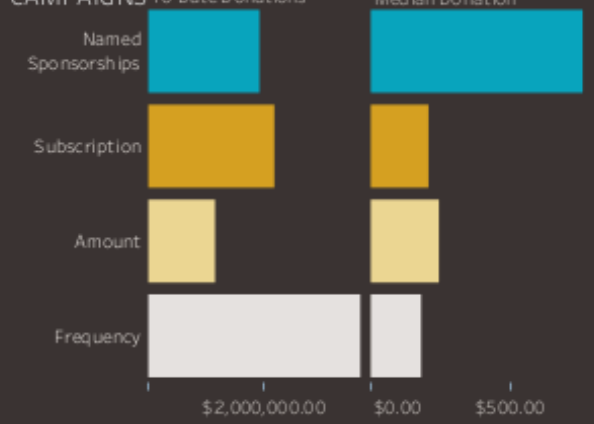
RECOMMENDED OPTIONS

COLLECT DONATION

DONATION DRIVE

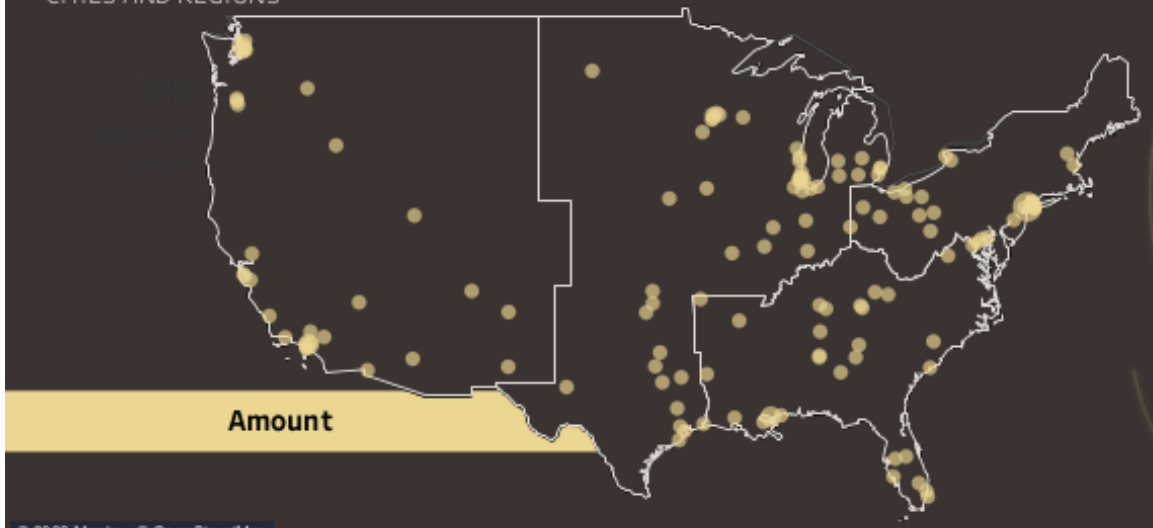
Sample data | Data current to 12/31/2014

CAMPAIGNS To-Date Donations Median Donation



NEXT DONOR

CITIES AND REGIONS



Debbie Dillon

Last Donation: 7/4/2010
3 years ago

(614) 867-5309

123 Fake Data Lane
Roswell, Georgia
30076

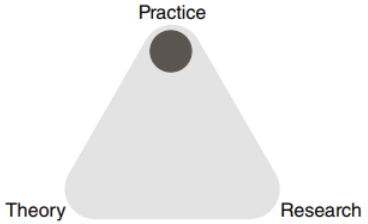
RECOMMENDED OPTIONS

Increase Donation Amount

COLLECT DONATION

Individual Evaluation

108-point checklist

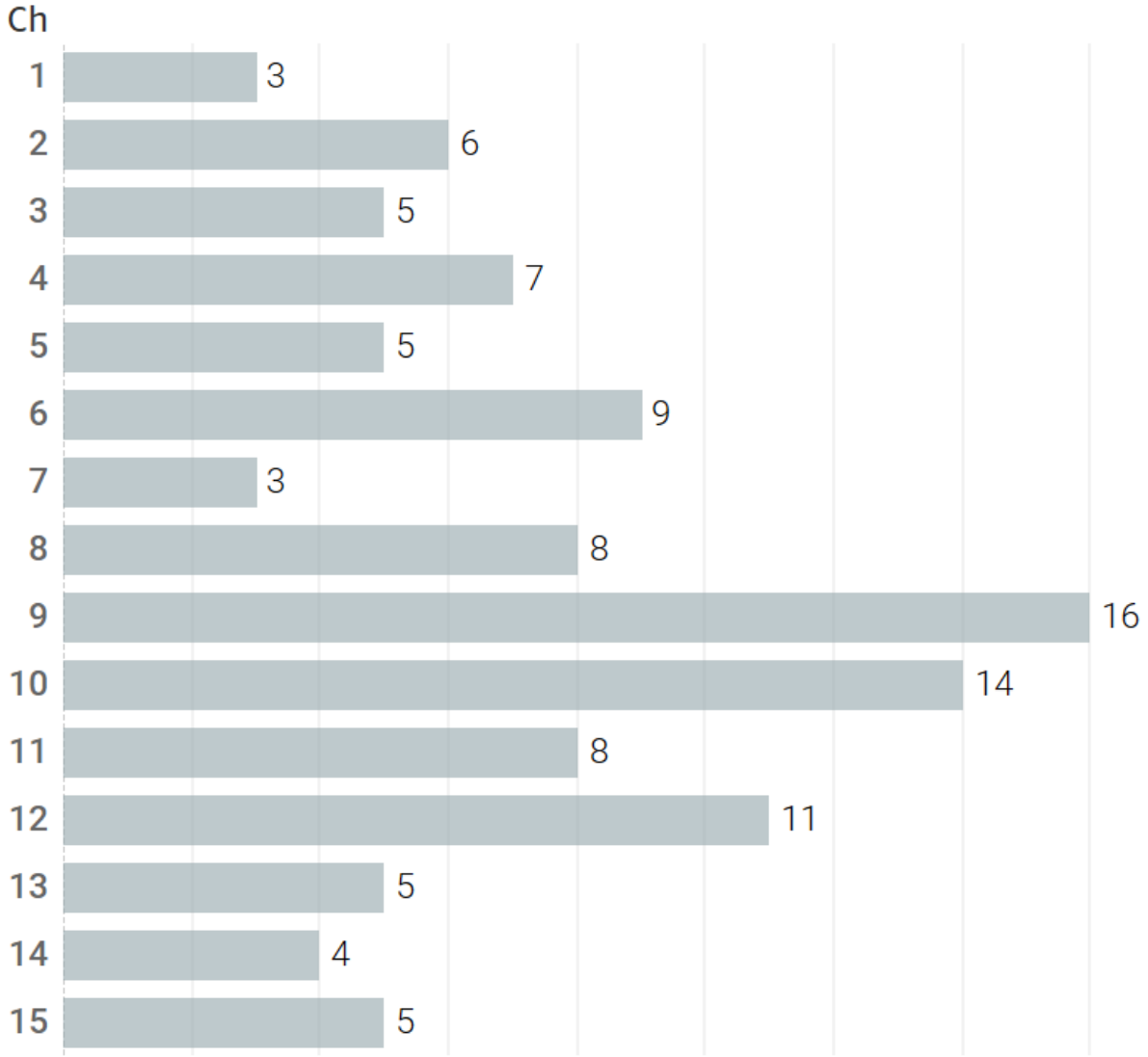
Ch	Focus	Question	Answers
			**Domain experts such as sociologists, psychologists, and other social sciences pioneered a number of methods we use today.**
	Perceptual refinement	Do the charts make sense as a composition?	✗ ✓
		Are there clear strategies to deemphasize items not in focus (e.g., gridlines pushed back or deemphasized)?	✗ ✓

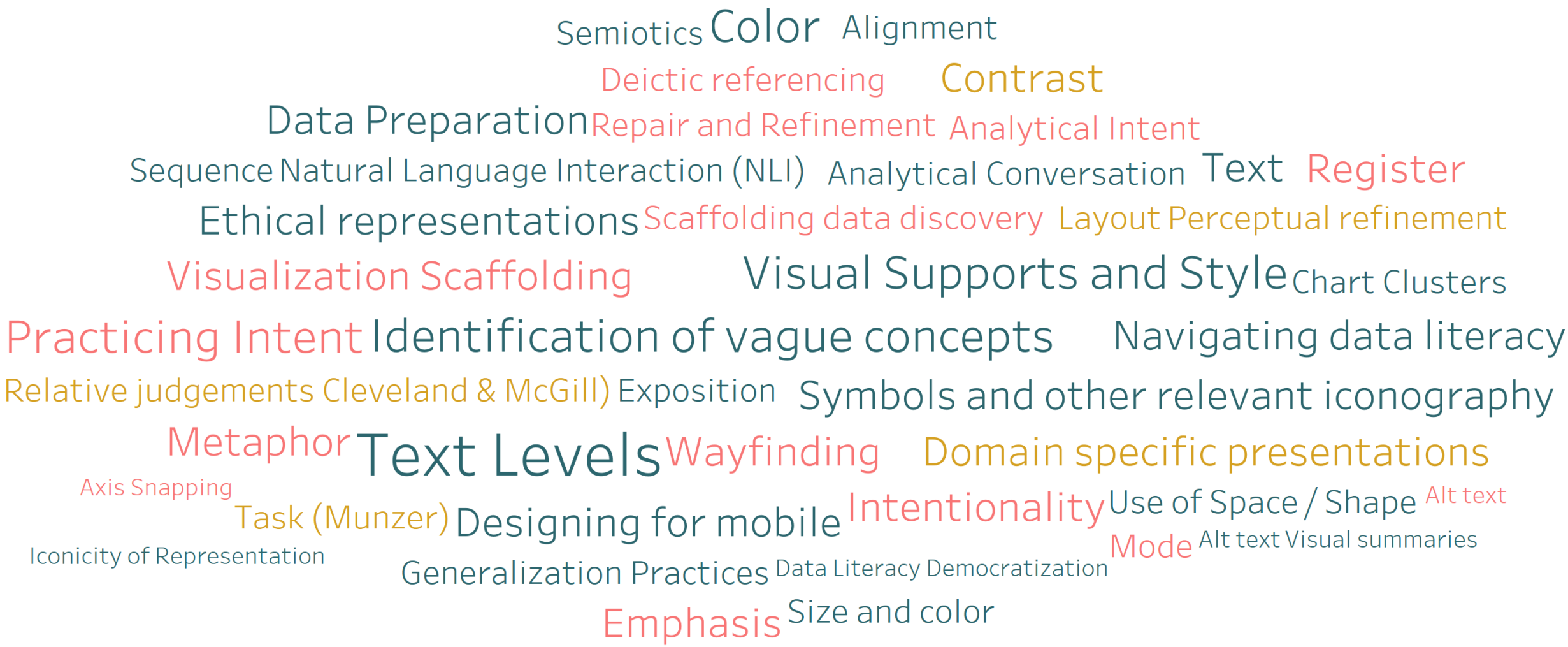
Semantics

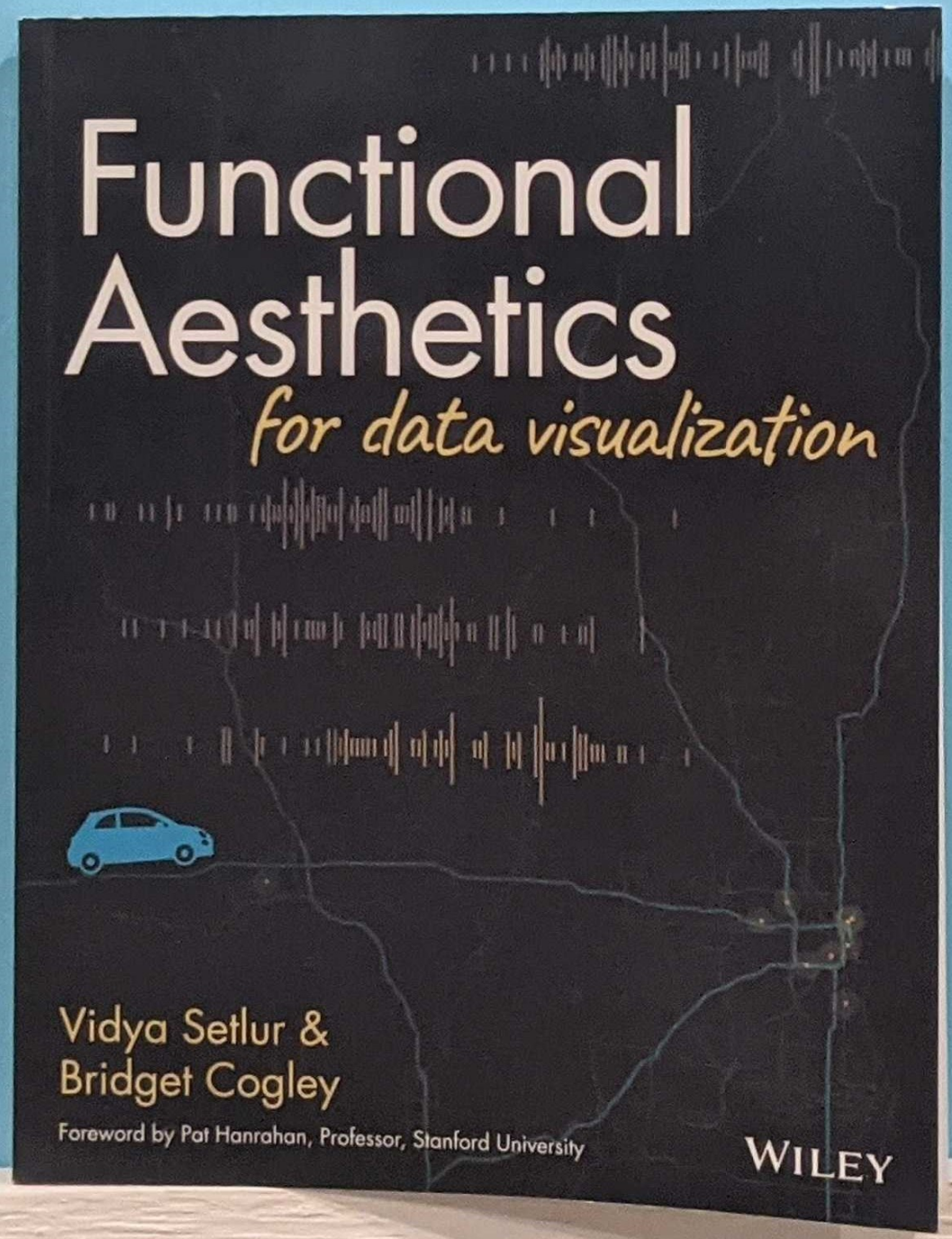
4	Symbols and other relevant iconography	Are icons used? (If not, what opportunities exist to add icons to clarify meaning?)	✗ ✓
		Are they semantically resonant of the information they repre-sent (e.g., showing an action like "click here" or some attribute of the data)?	✗ ✓
			Using symbols is one common way of applying semantics to help make sense of the world.

Individual Evaluation

108-point checklist




Semiotics
Color
Alignment
Deictic referencing
Contrast
Data Preparation
Repair and Refinement
Analytical Intent
Sequence
Natural Language Interaction (NLI)
Analytical Conversation
Text
Register
Ethical representations
Scaffolding data discovery
Layout
Perceptual refinement
Visualization Scaffolding
Visual Supports and Style
Chart Clusters
Practicing Intent
Identification of vague concepts
Navigating data literacy
Relative judgements Cleveland & McGill)
Exposition
Symbols and other relevant iconography
Metaphor
Text Levels
Wayfinding
Domain specific presentations
Axis Snapping
Task (Munzer)
Designing for mobile
Intentionality
Use of Space / Shape
Alt text
Mode
Alt text
Visual summaries
Iconicity of Representation
Generalization Practices
Data Literacy Democratization
Emphasis
Size and color

On Sale Now

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https://www.linkedin.com/groups/14124017/