



The Analytics of Everywhere

Joseph J. Kerski, PhD GISP

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Blockchain

Autonomous Vehicles

Digital Transformation

Drones

Augmented Reality

Retail 2.0

Smart Cities

IoT

Deep Learning

Smart Grid

Artificial Intelligence

Big Data



Location is Everywhere and Everything

Every twenty-first century dataset contains location



Discover Your Digital Twin

The World is Increasingly Instrumented
Everything can now be measured, analyzed, quantified



Explaining
Relationships

Forecasting
Futures

Redefining
Possibilities

The World is Increasingly Instrumented
Everything can now be measured, analyzed, quantified

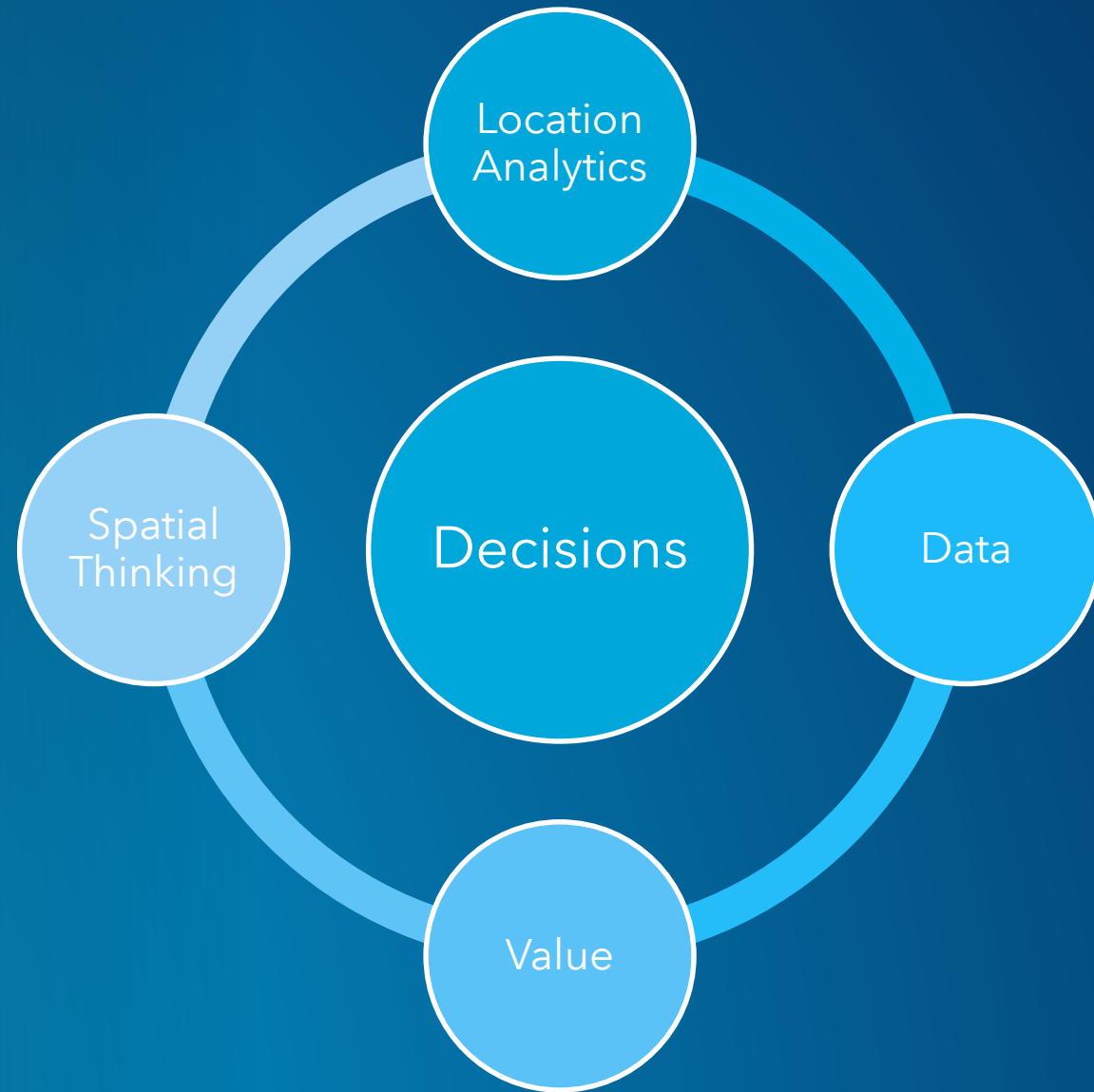
*The
fundamental
purpose of a
business is to
create value
for the
customer and
society.*

*--Peter
Drucker*

**How does the business
measure value?
What is the *value proposition*?**



The elements of spatial decision making



John Deere

<https://www.esri.com/about/newsroom/publications/wherenext/john-deere-market-development-with-location-intelligence/>

 **WERENEXT**

How Data-Driven John Deere Wins the Market

Market Development

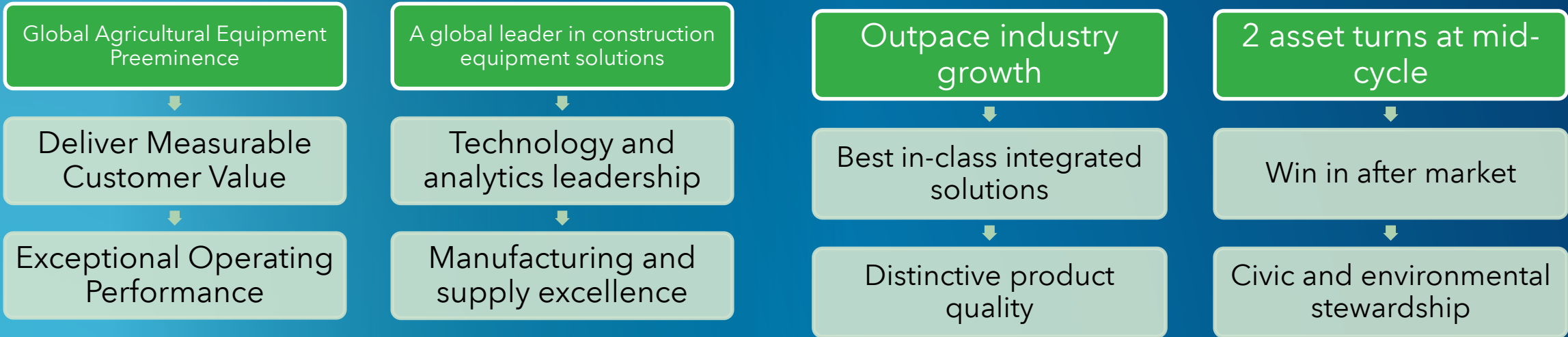
October 08, 2019



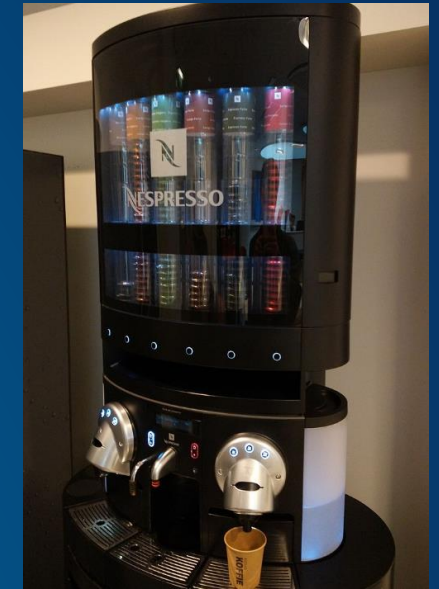
Marianna Kantor,
Frits van der Schaaf



The John Deere Strategy



The Nespresso Strategy



Priorities

Positive Cup Framework

Long term sustainable coffee supplies

Analytics support for farmers

Strategy

Transparent communication to customers

Responsible practices in communities

Implementation

FARMS to analyze farm activities, performance, and impact

Sustainability dashboard to manage sustainability practices and KPIs

Tech support to farmers and partners

Increase efficiencies in coffee production

Progress toward achieving 11 identified UN SDGs

The Lens of Location Analytics

Interconnecting people, place, purpose, time, activity

Simple

“What restaurants
are nearby”

Hard

“What nearby restaurant,
open now, serves wings”

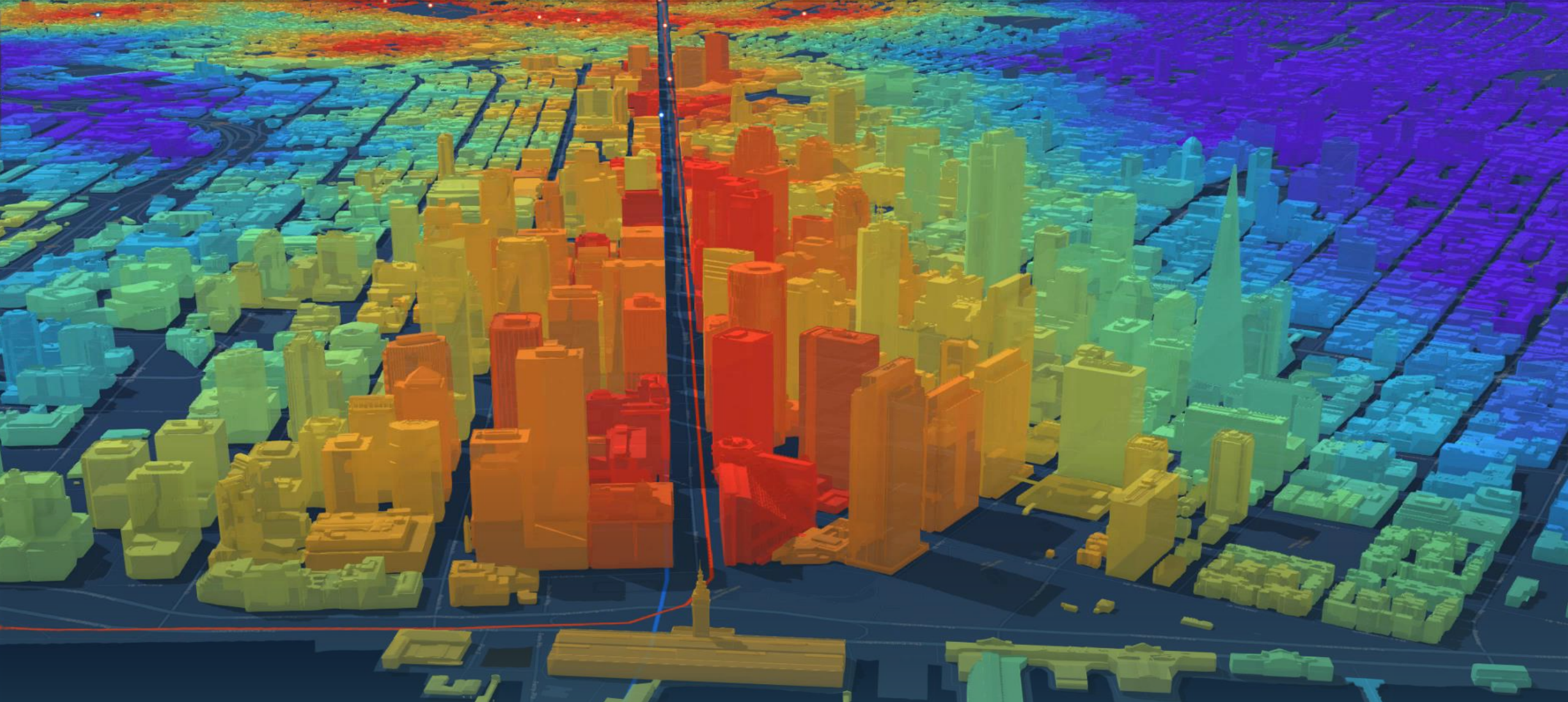
Very Hard

“Where’s the best place to open
a buffalo wings restaurant”



**“Esri’s data-rich maps are the
secret weapon behind many of
today’s most successful brands“**

Fast Company



Location + Time = Context

What people are doing, who they are, what's on their mind

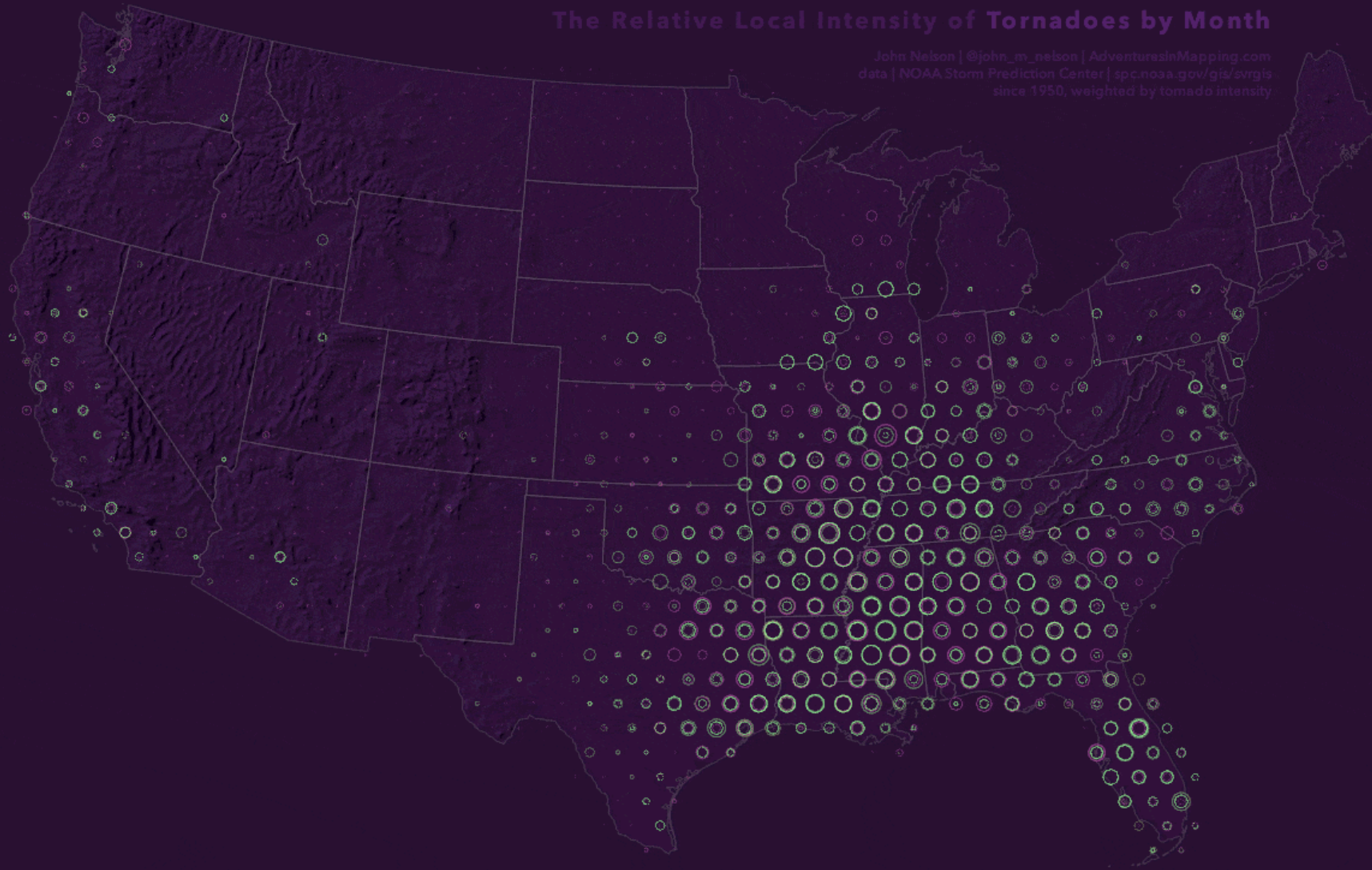


Detect the Signal in the Noise

Patterns of the past, prescriptions for the future

The Relative Local Intensity of Tornadoes by Month

John Nelson | @john_m_nelson | AdventuresInMapping.com
data | NOAA Storm Prediction Center | spc.noaa.gov/gis/svrgis
since 1950, weighted by tornado intensity



JANUARY

FEBRUARY

MARCH

APRIL

MAY

JUNE

JULY

AUGUST

SEPTEMBER

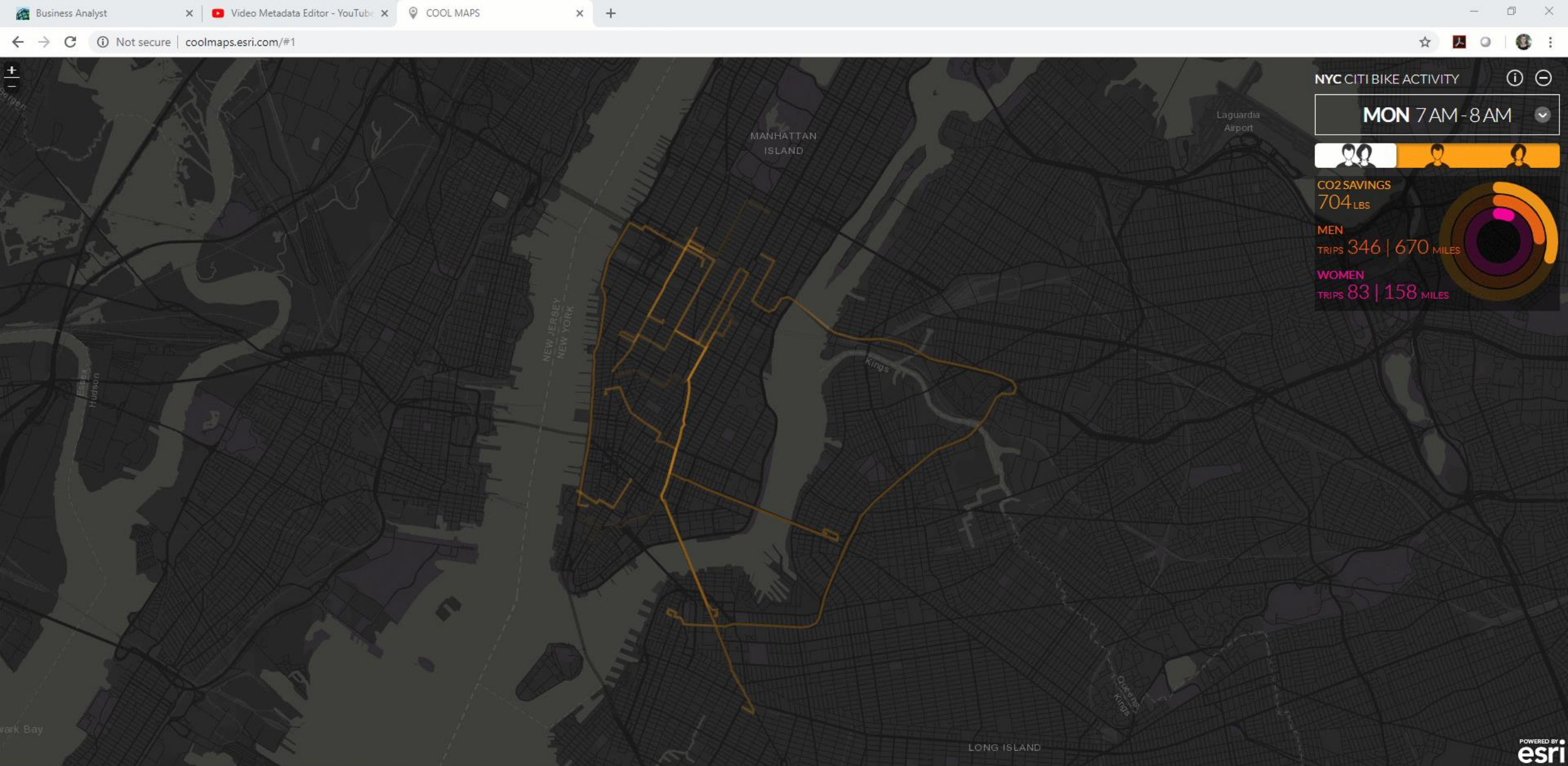
OCTOBER

NOVEMBER

DECEMBER

Detect the Signal in the Noise

Patterns of the past, prescriptions for the future



Big Apple Bicycle Map

MAPPING NEW YORK CITI BIKE RIDES

This map shows New York Citi Bike rides by the hour and computes CO2 emission savings based on comparable vehicle rides from the bicycle pick-up location to the drop-off location.



SEVERITY DANGEROUS
LOCATION WITH HIGHEST ALERTS

164



MAJOR EARTHQUAKES (MAGNITUDE 5.5+)

SOURCE: USGS.GOV

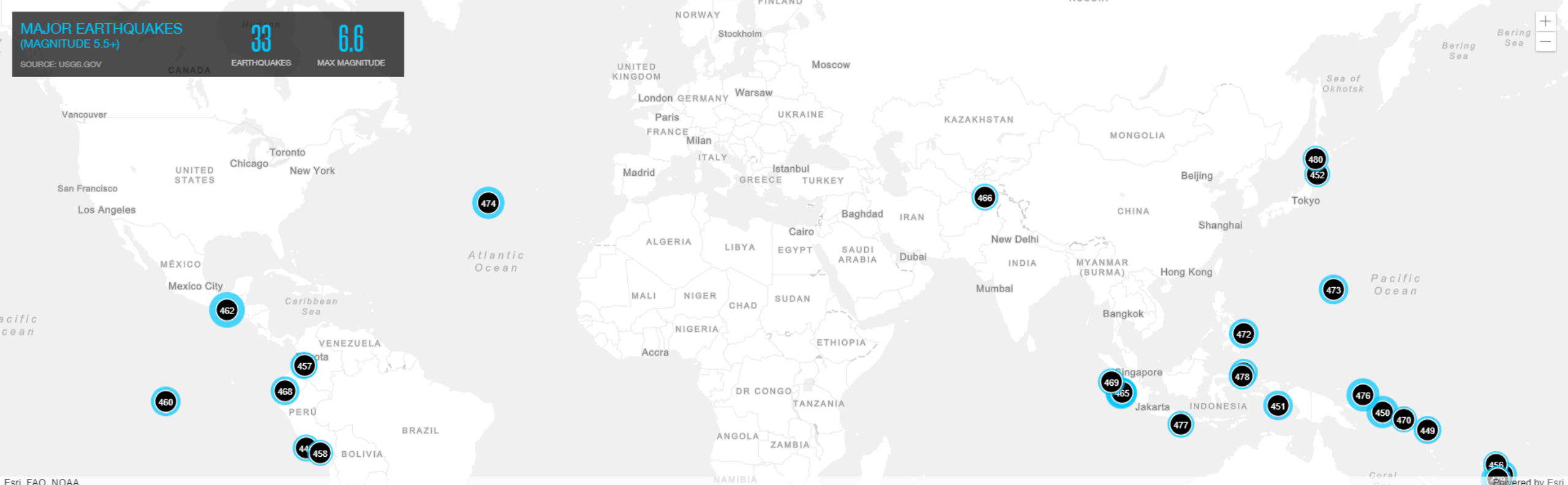
CANADA

EARTHQUAKES

MAX MAGNITUDE

33

6.6



Esri, FAO, NOAA

Powered by Esri

| JAN 25 | JAN 26 | JAN 27 | JAN 28 | JAN 29 | JAN 30 | JAN 31 | FEB 1 | FEB 2 | FEB 3 | FEB 4 | FEB 5 | FEB 6 | FEB 7 | FEB 8 | FEB 9 | FEB 10 | FEB 11 | FEB 12 | FEB 13 | FEB 14 | FEB 15 | FEB 16 | FEB 17 | FEB 18 | FEB 19 | FEB 20 | FEB 21 | FEB 22 |
|---|------------------------------------|--|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|--|----------------------------------|--|---|---|------------------------------------|---|---|---|-------------------------------------|---|---------------------------------------|--|----------------------------------|------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| M 5.5 - 71km N of Claveria, Philippines | M 5.8 - 19km W of Rio Grande, Peru | M 5.8 - 110km ENE of Ndoi Island, Fiji | M 5.5 - 222km SE of Lambasa, Fiji | M 5.5 - 27km S of Orcopampa, Peru | M 5.6 - 63km SSW of Taltal, Chile | M 5.5 - South of the Fiji Islands | M 5.5 - 27km S of Madero, Mexico | M 5.6 - 83km SSW of Taltal, Chile | M 5.5 - 43km NE of Auki, Solomon Islands | M 5.8 - 27km S of Duran, Ecuador | M 5.5 - 49km NE of Auki, Solomon Islands | M 5.7 - 129km NW of Kota Ternate, Indonesia | M 5.9 - 35km NNE of Agnihan, Northern Mariana | M 5.6 - Southern East Pacific Rise | M 5.9 - 41km E of General Luna, Philippines | M 5.6 - 131km NW of Sikabaluan, Indonesia | M 5.6 - 123km S of Krajan Tambakrejo, Indonesia | M 6.2 - Northern Mid-Atlantic Ridge | M 5.6 - 48km NW of Namatanai, Papua New | M 5.6 - 28km SSW of Ndoi Island, Fiji | M 5.6 - 131km W of Kota Ternate, Indonesia | M 5.5 - 24km E of Chitose, Japan | M 5.6 - 19km W of Rio Grande, Peru | M 5.5 - 27km S of Orcopampa, Peru | M 5.5 - 27km S of Orcopampa, Peru | M 5.5 - 27km S of Orcopampa, Peru | M 5.5 - 27km S of Orcopampa, Peru | M 5.5 - 27km S of Orcopampa, Peru |

2019 JAN 25 - FEB 22

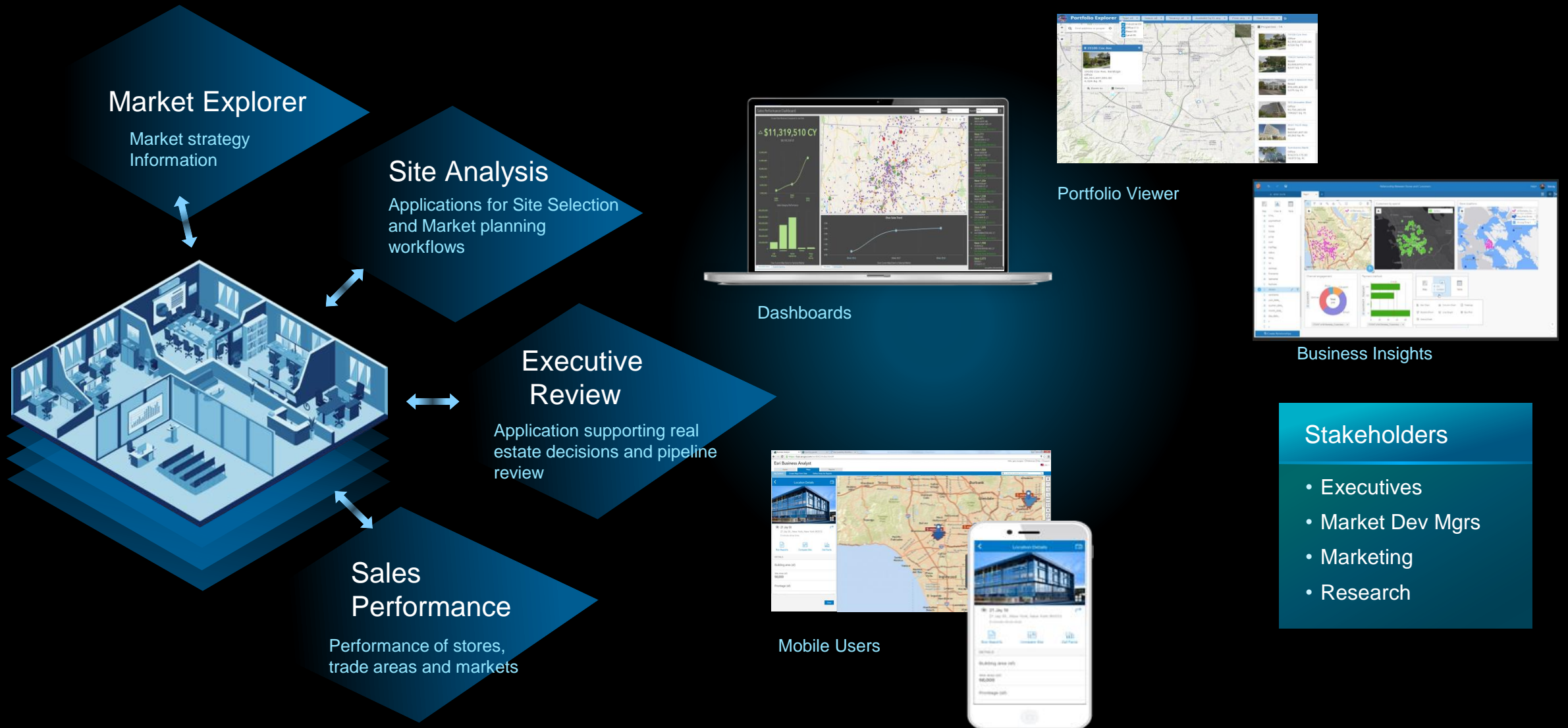


Tick-Tock

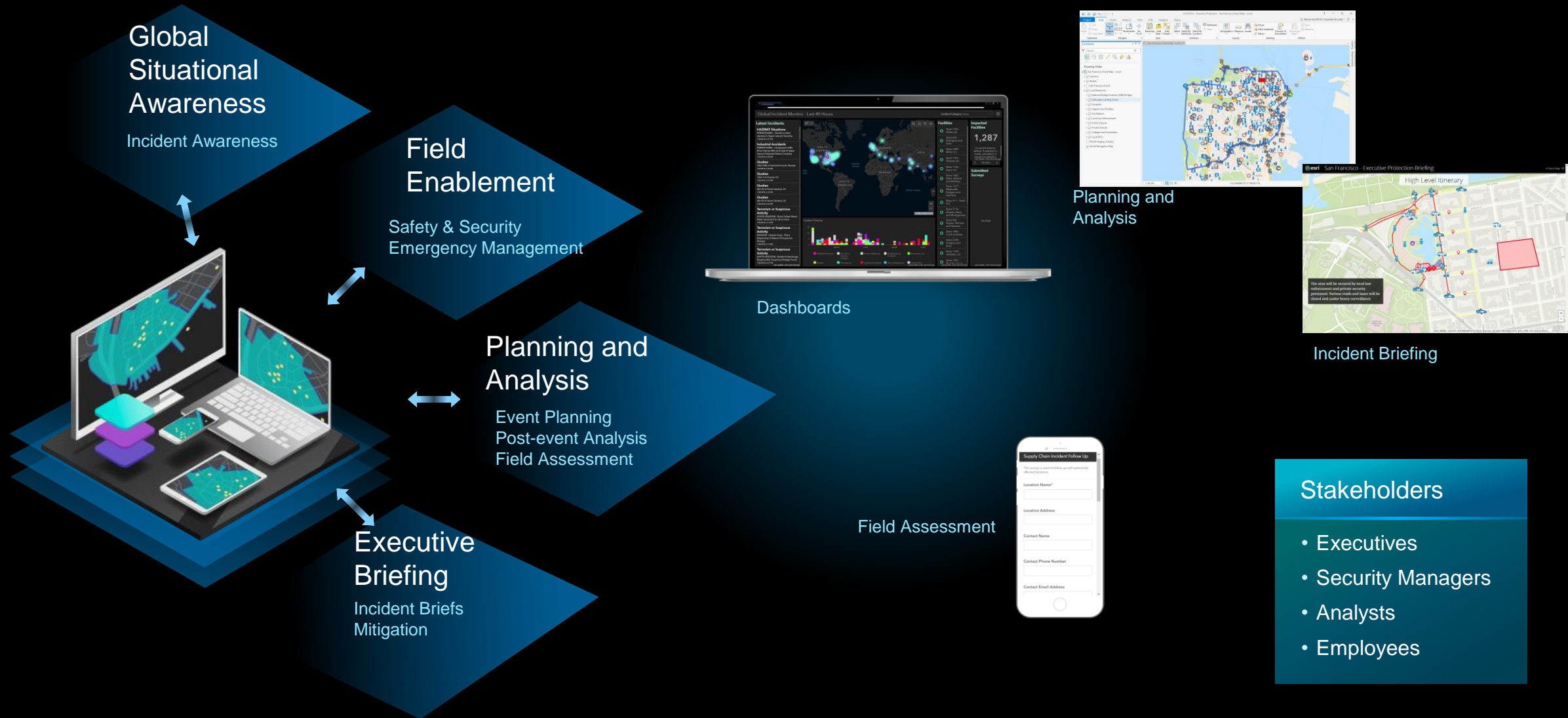
IT'S JUST A MAPPER OF TIME
Dashboard showing the major earthquakes by year, month, day, hour and minute.



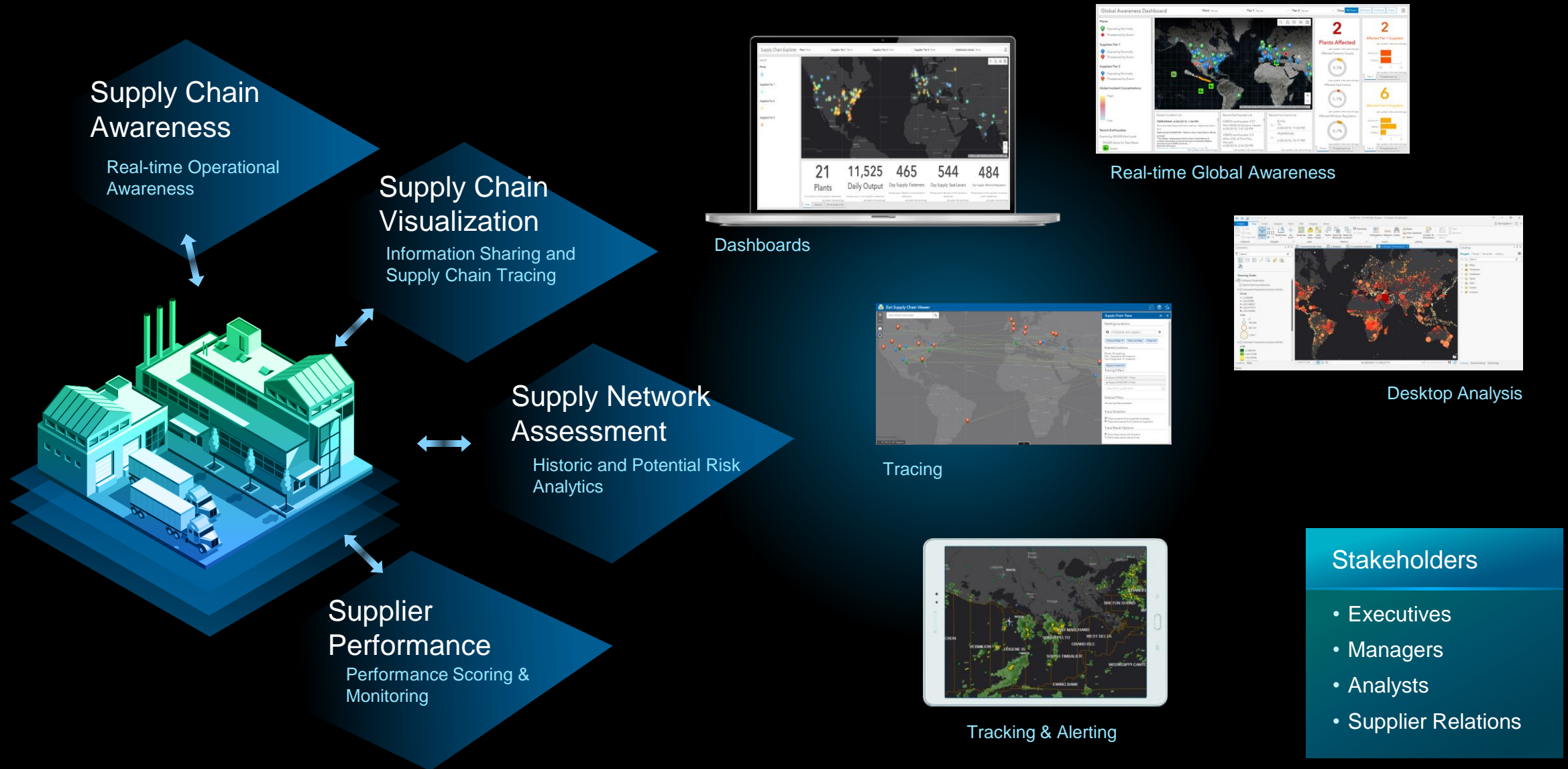
Market Development | Accelerate Business Growth



Corporate Security | Minimize Business Risk and Disruption



Digital Supply Network Initiative | Fulfill Market Demand Fast



Geospatial Strategy and Vision for Businesses

Starts with a Department or Business Need

Market
Development



Risk
Management



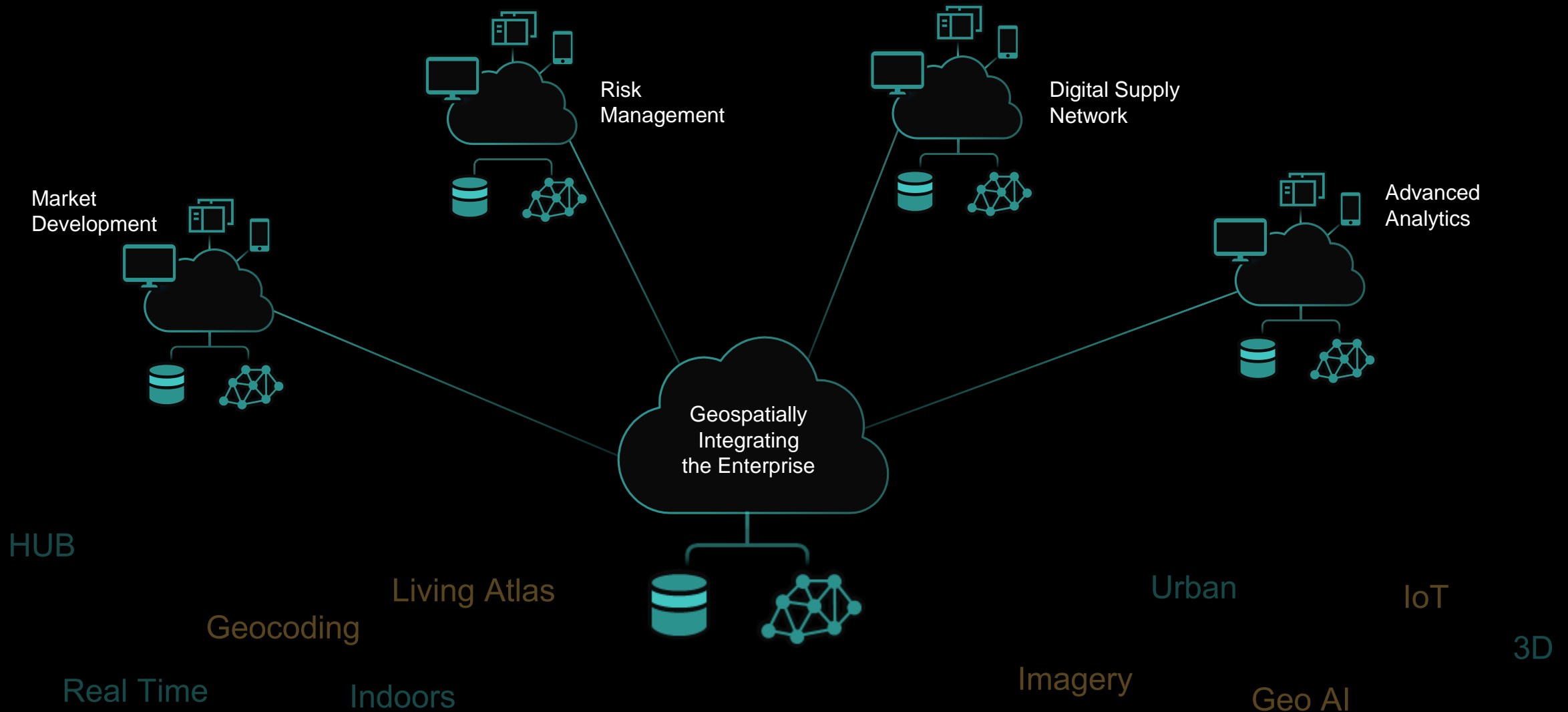
Digital Supply
Network



Advanced
Analytics

Geospatial Strategy and Vision for Businesses

Expands across the Organization into an Enterprise Platform



Tahirah Mahan Thomas

CBRE

Commercial Real Estate

<https://www.esri.com/about/newsroom/publications/wherenext/the-world-leader-in-commercial-real-estate-tells-a-new-story/>

 **WERENEXT**

The World Leader in Commercial Real Estate Tells a New Story

WhereNext Profiles

January 07, 2020



Keith Balaniz

Forbes:

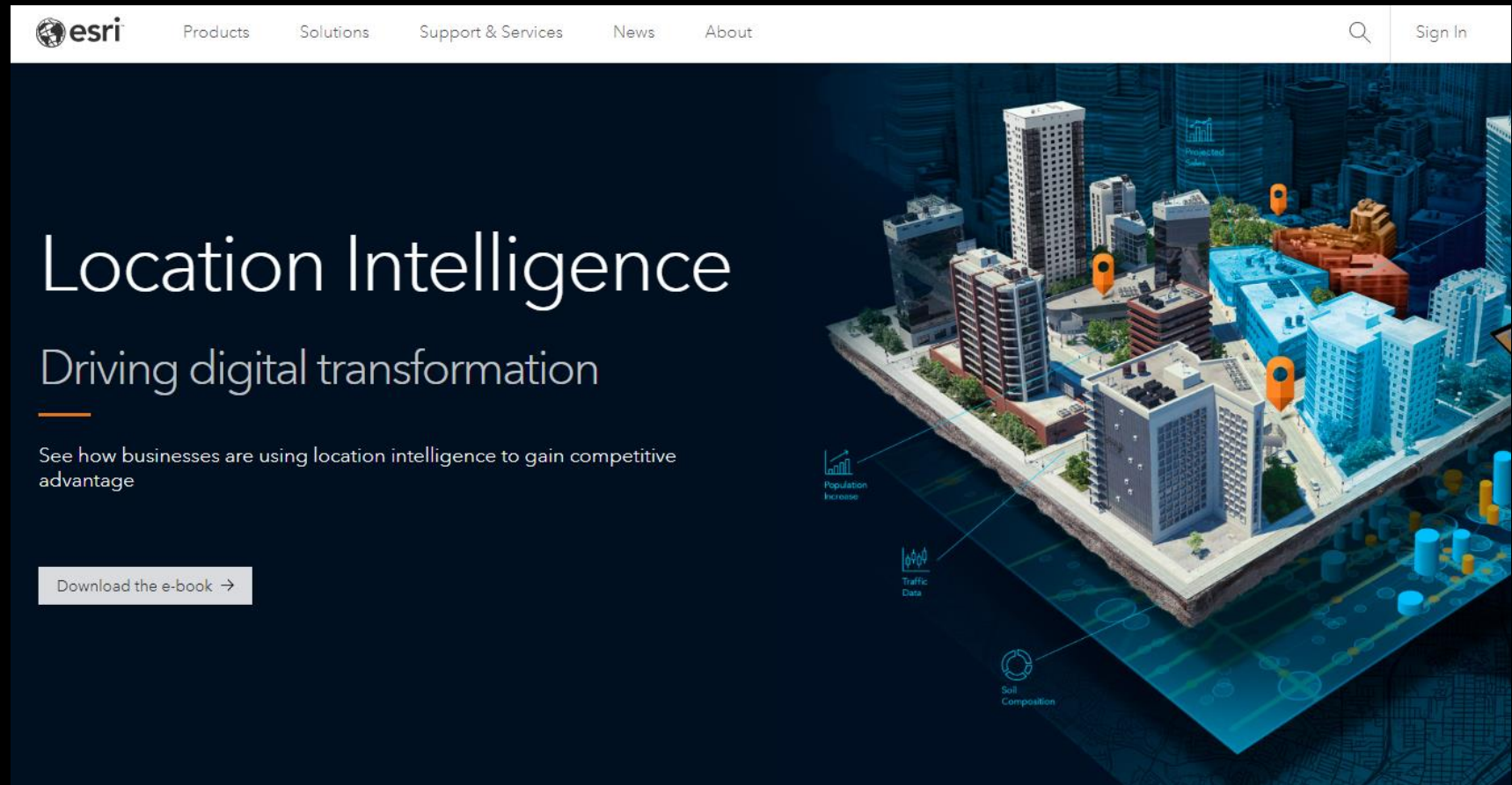
What you need to know about Location Intelligence in 2020

Esri:

Location Intelligence

Esri Case study:

Fruit of the Loom



The screenshot shows the Esri website's landing page for Location Intelligence. The page features a dark blue background with a 3D cityscape illustration. The Esri logo is in the top left, and navigation links for Products, Solutions, Support & Services, News, and About are in the top center. A search icon and 'Sign In' link are in the top right. The main heading is 'Location Intelligence' in large white text, followed by the sub-heading 'Driving digital transformation'. Below this, a paragraph reads 'See how businesses are using location intelligence to gain competitive advantage'. A button labeled 'Download the e-book ->' is positioned below the text. On the right side, there are three data visualization icons: 'Population Increase' (a bar chart), 'Traffic Data' (a road map with traffic flow), and 'Soil Composition' (a circular diagram).

esri Products Solutions Support & Services News About

Search Sign In

Location Intelligence

Driving digital transformation

See how businesses are using location intelligence to gain competitive advantage

[Download the e-book ->](#)

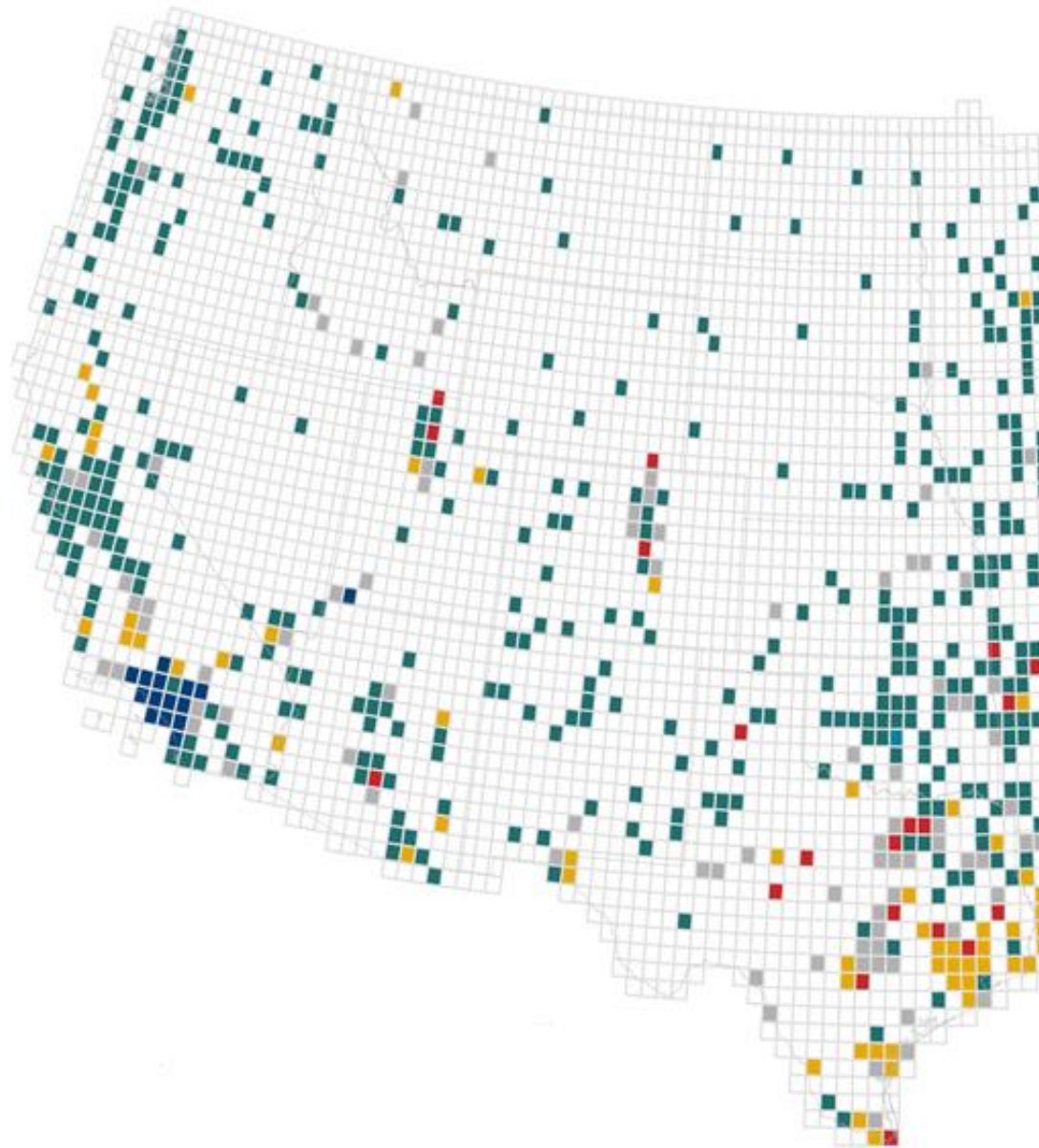
Population Increase

Traffic Data

Soil Composition

Dominant Chicken Chain

■ CHICK-FIL-A
 ■ BOJANGLES®
 ■ POPEYES
 ■ POLLO TROPICAL
 ■ KFC
 ■ RAISING CANE'S
 ■ EL POLLO LOCO
 ■ ZAXBY'S
 ■ NEUTRAL



Demographic & Tapestry Report

Chan's House
1 mile

Chick-fil-A Strategy & Analytics

| Summary | Census 2010 | 2016 | 2021 |
|-------------------------------|-------------|--------|--------|
| Population | 19,990 | 22,177 | 23,815 |
| Households | 11,065 | 12,170 | 13,027 |
| Families | 3,172 | 3,465 | 3,690 |
| Average Household Size | 1.75 | 1.77 | 1.78 |
| Owner Occupied Housing Units | 4,603 | 4,269 | 4,449 |
| Renter Occupied Housing Units | 6,462 | 7,901 | 8,578 |
| Median Age | 33.7 | 34.1 | 34.3 |

Food Away from Home - 2016

- Food Away from Home
- Breakfast at Fast Food Restaurants
- Lunch at Fast Food Restaurants
- Dinner at Fast Food Restaurants

2016 Civilian Population 16+ in Labor Force

- Civilian Employed
- Civilian Unemployed

2016 Employed Population 16+ by Occupation

- White Collar
 - Management/Business/Financial
 - Professional
 - Sales
 - Administrative Support
- Services
- Blue Collar
 - Farming/Forestry/Fishing
 - Construction/Extraction
 - Installation/Maintenance/Repair
 - Production
 - Transportation/Material Moving

2016 Population 25+ by Educational Attainment

- 2016 Education: < 9th Grade
- 2016 Education: High School/No Diploma
- 2016 Education: High School Diploma
- 2016 Education: GED
- 2016 Education: Some College/No Degree
- 2016 Education: Associate's Degree
- 2016 Education: Bachelor's Degree
- 2016 Education: Grad/Professional Degree

Households by Income

- Household
- <\$15,000
- \$15,000-\$24,999
- \$25,000-\$34,999
- \$35,000-\$49,999
- \$50,000-\$74,999
- \$75,000-\$99,999
- \$100,000-\$149,999
- \$150,000-\$199,999
- \$200,000+
- Median Household Income
- Average Household Income

Owner Occupied Housing Units by Value

- Median Value
- Average Value



Demographic & Tapestry Report

Chan's House
1 mile

Chick-fil-A Strategy & Analytics

| Housing Units by Occupancy Status and Tenure | Census 2010 | | 2016 | | 2021 | |
|--|-------------|---------|--------|---------|--------|---------|
| | Number | Percent | Number | Percent | Number | Percent |
| Total Housing Units | 12,192 | 100.0% | 13,309 | 100.0% | 14,255 | 100.0% |
| Occupied | 11,065 | 90.8% | 12,170 | 91.4% | 13,027 | 91.4% |
| Owner | 4,603 | 37.8% | 4,269 | 32.1% | 4,449 | 31.2% |
| Renter | 6,462 | 53.0% | 7,901 | 59.4% | 8,578 | 60.2% |
| Vacant | 1,127 | 9.2% | 1,139 | 8.6% | 1,228 | 8.6% |

Political Affiliation - 2016

| | Count | Index |
|---|-------|-------|
| Political party affiliated with: Democratic | 5,833 | 144 |
| Political party affiliated with: Republican | 3,029 | 79 |
| Political party affiliated with: Independent/none | 4,050 | 114 |
| Political outlook: very conservative | 1,015 | 49 |
| Political outlook: somewhat conservative | 2,325 | 75 |
| Political outlook: middle of the road | 3,905 | 98 |
| Political outlook: somewhat liberal | 3,658 | 197 |
| Political outlook: very liberal | 2,584 | 252 |

Population by Age

| Age Group | Census 2010 | | 2016 | | 2021 | |
|-----------|-------------|---------|--------|---------|--------|---------|
| | Number | Percent | Number | Percent | Number | Percent |
| 0 - 4 | 1,133 | 5.7% | 1,152 | 5.2% | 1,243 | 5.2% |
| 5 - 9 | 786 | 3.9% | 920 | 4.1% | 922 | 3.9% |
| 10 - 14 | 564 | 2.8% | 713 | 3.2% | 756 | 3.2% |
| 15 - 19 | 465 | 2.3% | 668 | 3.0% | 695 | 2.9% |
| 20 - 24 | 1,794 | 9.0% | 1,849 | 8.3% | 1,836 | 7.7% |
| 25 - 34 | 5,904 | 29.5% | 6,336 | 28.6% | 6,953 | 29.2% |
| 35 - 44 | 4,000 | 20.0% | 4,040 | 18.2% | 4,385 | 18.4% |
| 45 - 54 | 2,548 | 12.7% | 2,860 | 12.9% | 2,881 | 12.1% |
| 55 - 64 | 1,775 | 8.9% | 2,074 | 9.4% | 2,181 | 9.2% |
| 65 - 74 | 607 | 3.0% | 1,063 | 4.8% | 1,355 | 5.7% |
| 75 - 84 | 264 | 1.3% | 332 | 1.5% | 419 | 1.8% |
| 85+ | 149 | 0.7% | 170 | 0.8% | 188 | 0.8% |

Race and Ethnicity

| Race/Ethnicity | Census 2010 | | 2016 | | 2021 | |
|----------------------------|-------------|---------|--------|---------|--------|---------|
| | Number | Percent | Number | Percent | Number | Percent |
| White Alone | 15,402 | 77.0% | 16,461 | 74.2% | 17,289 | 72.6% |
| Black Alone | 3,163 | 15.8% | 3,828 | 17.3% | 4,177 | 17.5% |
| American Indian Alone | 51 | 0.3% | 50 | 0.2% | 52 | 0.2% |
| Asian Alone | 553 | 2.8% | 779 | 3.5% | 1,044 | 4.4% |
| Pacific Islander Alone | 6 | 0.0% | 11 | 0.0% | 13 | 0.1% |
| Some Other Race Alone | 347 | 1.7% | 437 | 2.0% | 488 | 2.0% |
| Two or More Races | 468 | 2.3% | 611 | 2.8% | 752 | 3.2% |
| Hispanic Origin (Any Race) | 967 | 4.8% | 1,096 | 4.9% | 1,212 | 5.1% |

| Rank | Tapestry Segment | 2016 Households | | 2016 U.S. Households | |
|----------|-------------------------|-----------------|---------|----------------------|------------|
| | | Number | Percent | Cumulative | Cumulative |
| 1 | Metro Renters (3B) | 73.7% | 73.7% | 1.5% | 1.5% |
| 2 | Laptops and Lattes (3A) | 15.2% | 88.9% | 1.1% | 2.6% |
| 3 | Urban Chic (2A) | 5.1% | 94.0% | 1.3% | 3.9% |
| 4 | Set to Impress (11D) | 4.1% | 98.1% | 1.4% | 5.3% |
| 5 | Emerald City (8B) | 1.9% | 100.0% | 1.4% | 6.7% |
| Subtotal | | 100.0% | | 6.7% | |



Political Affiliation - 2016

| | | |
|---|--------------|------------|
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Population by Age

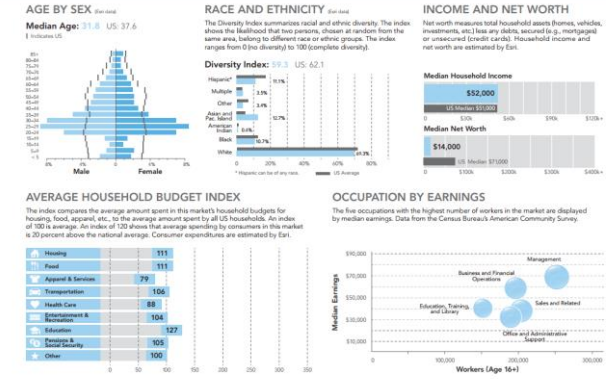
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| 10 - 14 | 564 | 2.8% | 713 | 3.2% | 756 | 3.2% |
| 15 - 19 | 465 | 2.3% | 668 | 3.0% | 695 | 2.9% |
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| 25 - 34 | 5,904 | 29.5% | 6,336 | 28.6% | 6,953 | 29.2% |
| 35 - 44 | 4,000 | 20.0% | 4,040 | 18.2% | 4,385 | 18.4% |
| 45 - 54 | 2,548 | 12.7% | 2,860 | 12.9% | 2,881 | 12.1% |
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| 65 - 74 | 607 | 3.0% | 1,063 | 4.8% | 1,355 | 5.7% |
| 75 - 84 | 264 | 1.3% | 332 | 1.5% | 419 | 1.8% |
| 85+ | 149 | 0.7% | 170 | 0.8% | 188 | 0.8% |

Race and Ethnicity

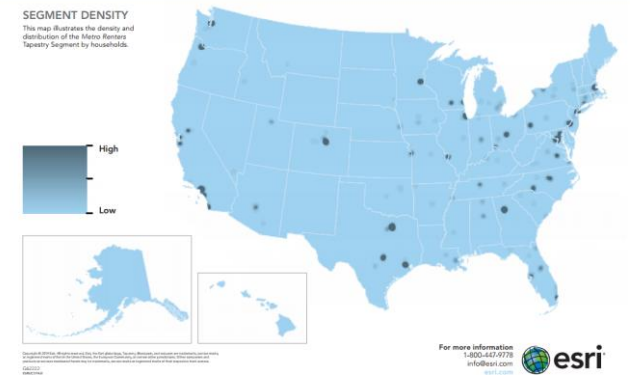
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| Black Alone | 3,163 | 15.8% | 3,828 | 17.3% | 4,177 | 17.5% |
| American Indian Alone | 51 | 0.3% | 50 | 0.2% | 52 | 0.2% |
| Asian Alone | 553 | 2.8% | 779 | 3.5% | 1,044 | 4.4% |
| Pacific Islander Alone | 6 | 0.0% | 11 | 0.0% | 13 | 0.1% |
| Some Other Race Alone | 347 | 1.7% | 437 | 2.0% | 488 | 2.0% |
| Two or More Races | 468 | 2.3% | 611 | 2.8% | 752 | 3.2% |
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| Rank | Tapestry Segment | 2016 Households Cumulative | | 2016 U.S. Households Cumulative | | Index |
|------|-------------------------|----------------------------|---------|---------------------------------|---------|-------|
| | | Percent | Percent | Percent | Percent | |
| 1 | Metro Renters (3B) | 73.7% | 73.7% | 1.5% | 1.5% | 4885 |
| 2 | Laptops and Lattes (3A) | 15.2% | 88.9% | 1.1% | 2.6% | 1,444 |
| 3 | Urban Chic (2A) | 5.1% | 94.0% | 1.3% | 3.9% | 390 |
| 4 | Set to Impress (11D) | 4.1% | 98.1% | 1.4% | 5.3% | 297 |
| 5 | Emerald City (8B) | 1.9% | 100.0% | 1.4% | 6.7% | 131 |
| | Subtotal | 100.0% | | 6.7% | | |

3B LifeMode Group: Uptown Individuals Metro Renters



3B LifeMode Group: Uptown Individuals Metro Renters



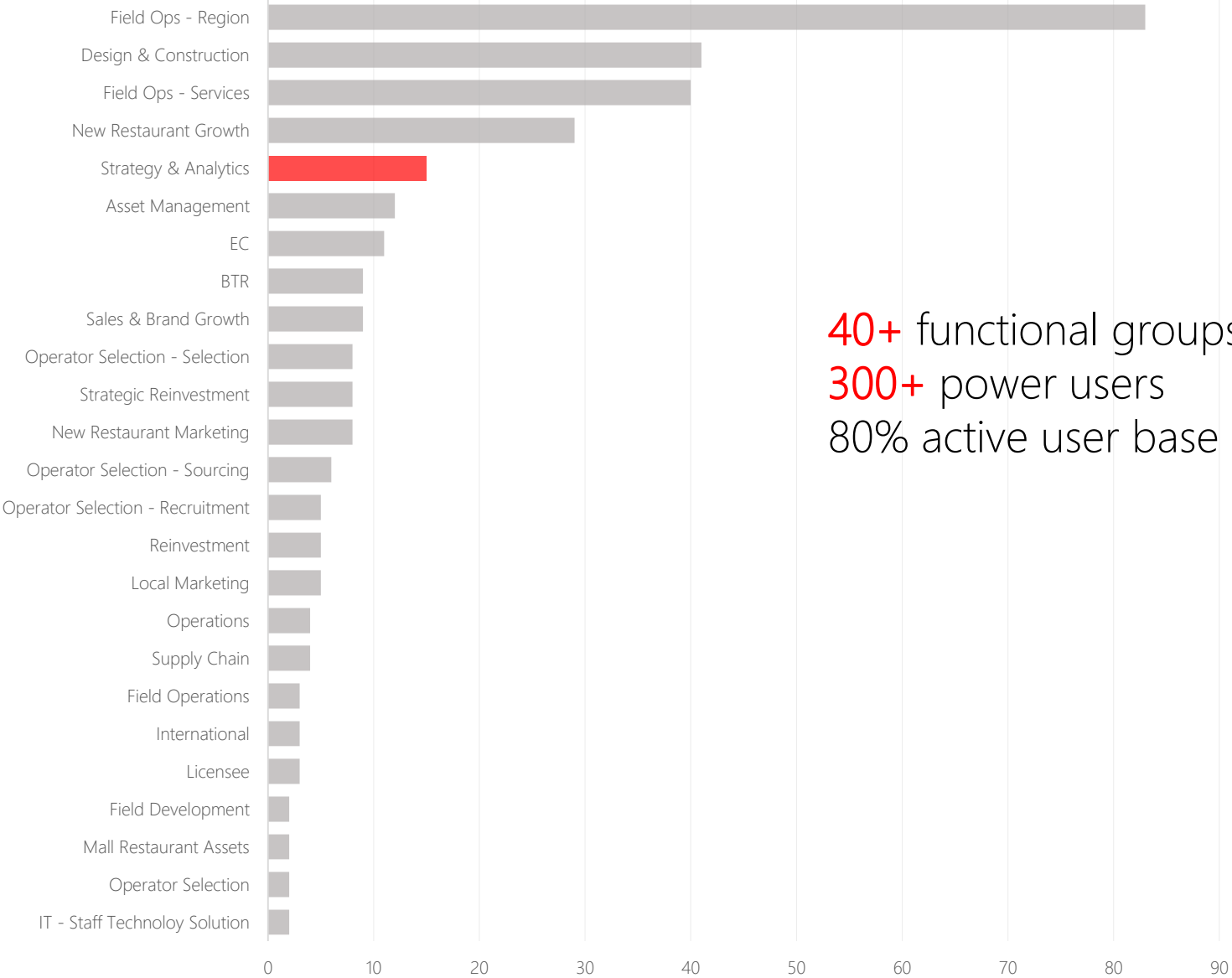
Lifestyle, Lifestage and Location

The fabric of American neighborhoods





Pinpoint Users by Functional Groups



40+ functional groups
 300+ power users
 80% active user base





Opening hearts – and kitchens – for Hurricane Florence relief

GREG ROSSINO SEP 19, 2018

How Chick-fil-A is supporting hurricane relief efforts

Hurricane Florence’s impact continues to be felt across the Carolinas and Virginia with tens of thousands of people displaced and hundreds of thousands still without power.

For Donavon Carless, local Owner/Operator of the [Triangle Town Center Chick-fil-A](#) in Raleigh, N.C., Sunday was a chance for him and his team to serve a few of those in need – making 500 sandwiches and 1,200 nuggets for coastal evacuees at three local shelters in coordination with the [American Red Cross](#).

“We knew the one thing we could do to help was to give evacuees a hot sandwich,” Carless said. “The response from the Team Members was overwhelming – they all wanted to pitch in and volunteer to help.”



Driving Growth

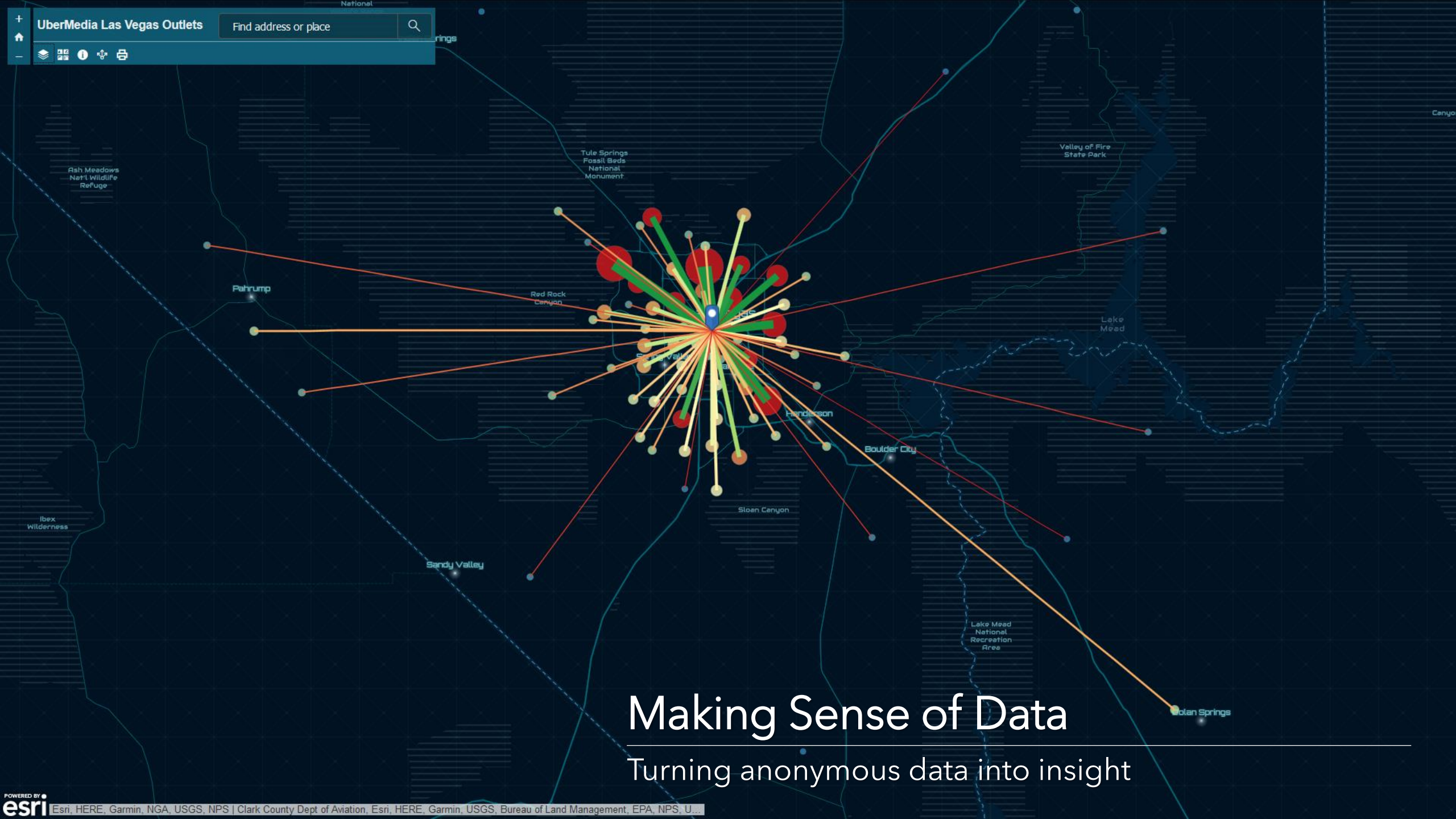
“Where is the best growth opportunity”

Mitigating Risk

“What factors impact my strategy and where”

Fulfilling Promises

“How do I exceed customer expectations”



UberMedia Las Vegas Outlets

Find address or place

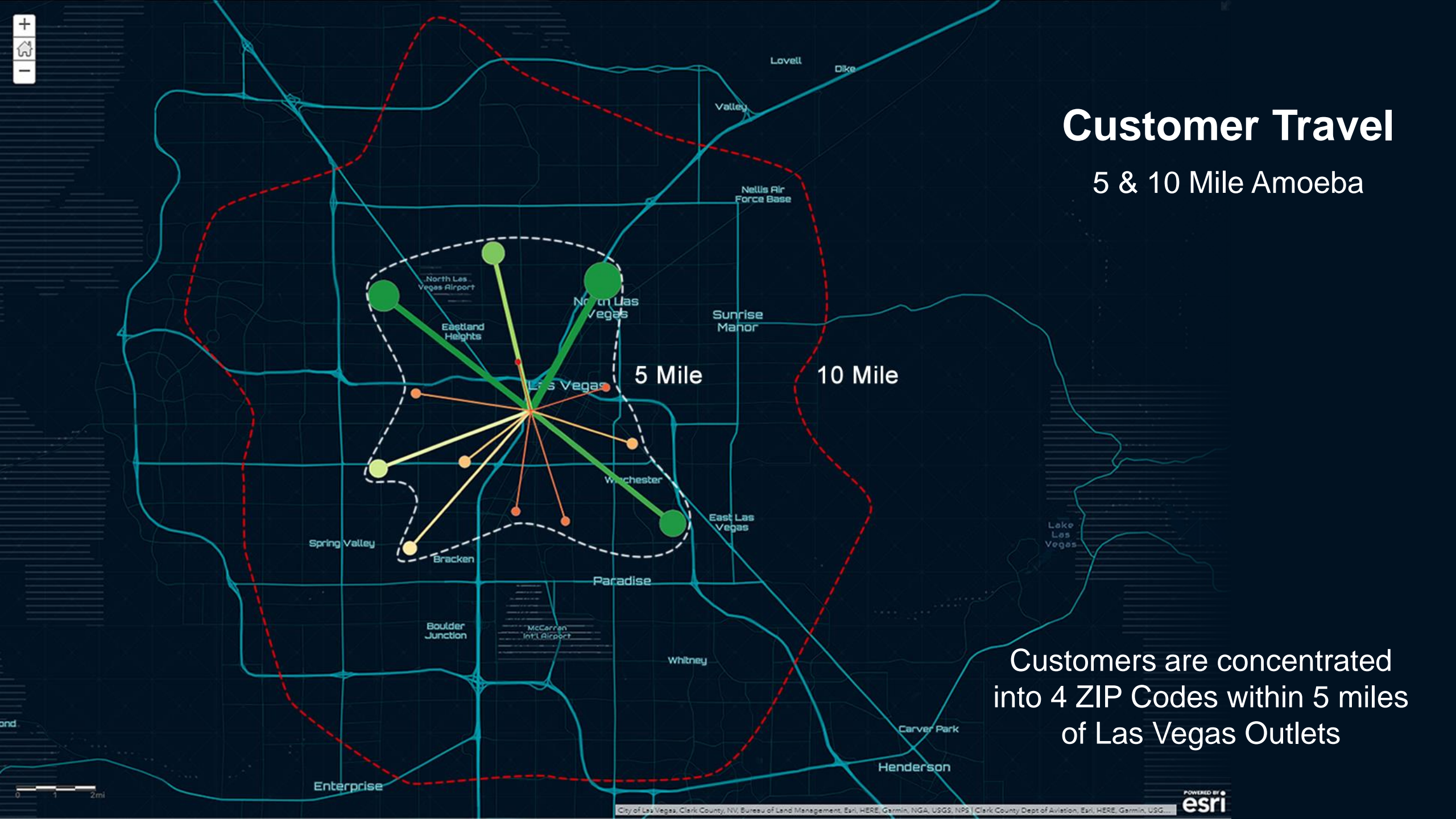


Making Sense of Data

Turning anonymous data into insight

Customer Travel

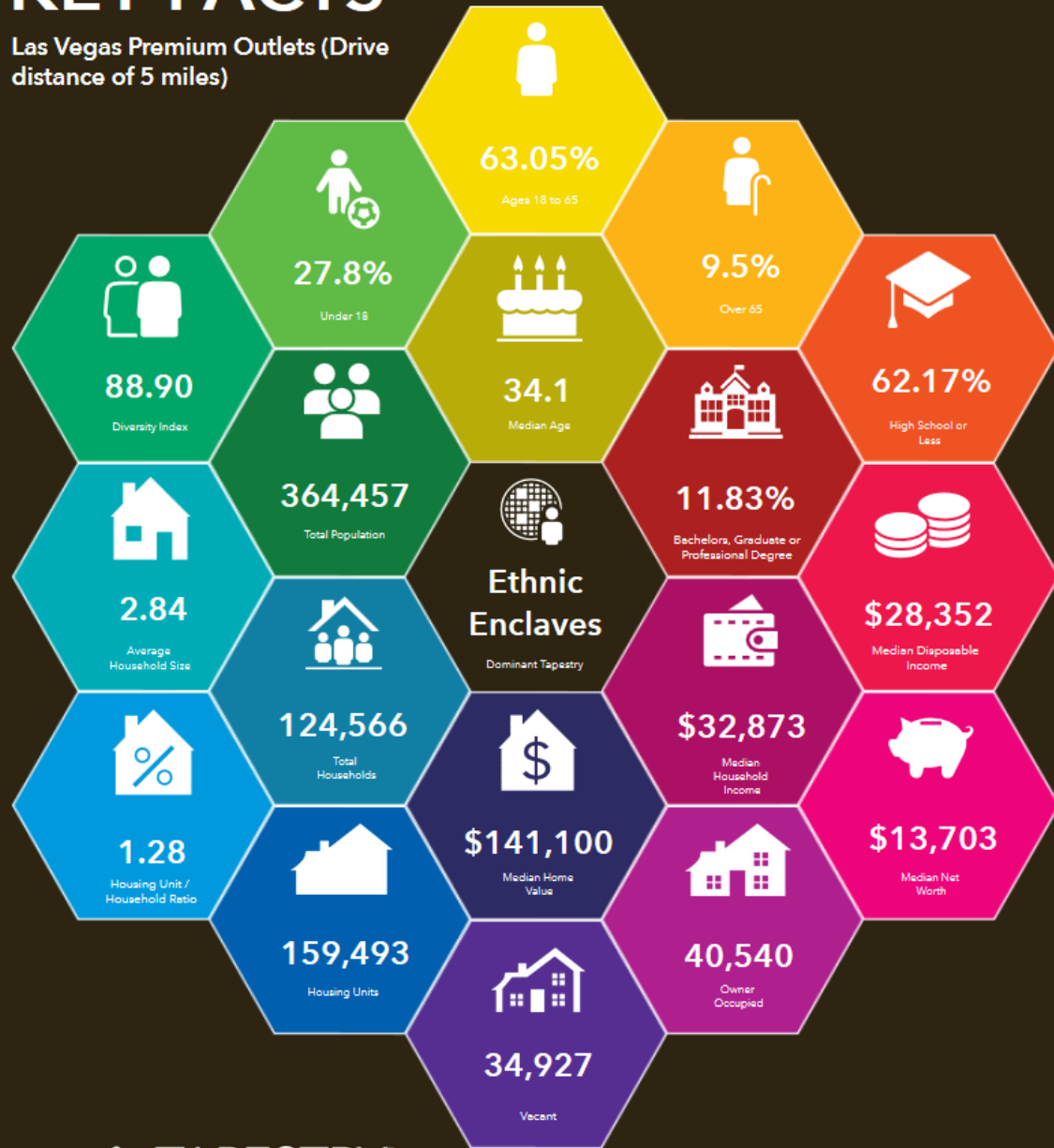
5 & 10 Mile Amoeba



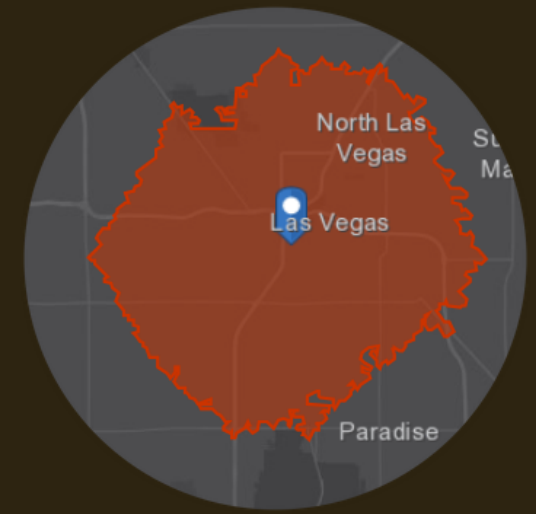
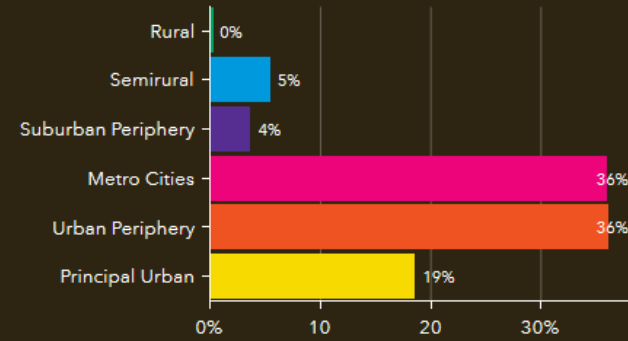
Customers are concentrated into 4 ZIP Codes within 5 miles of Las Vegas Outlets

KEY FACTS

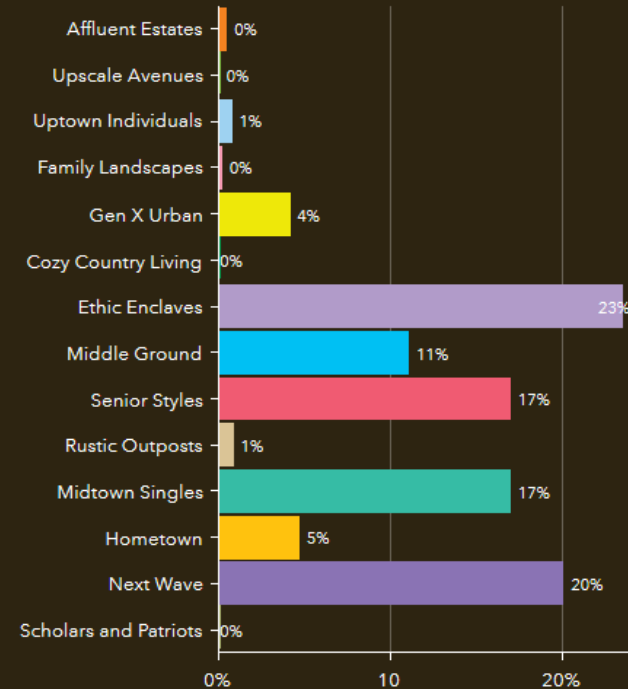
Las Vegas Premium Outlets (Drive distance of 5 miles)



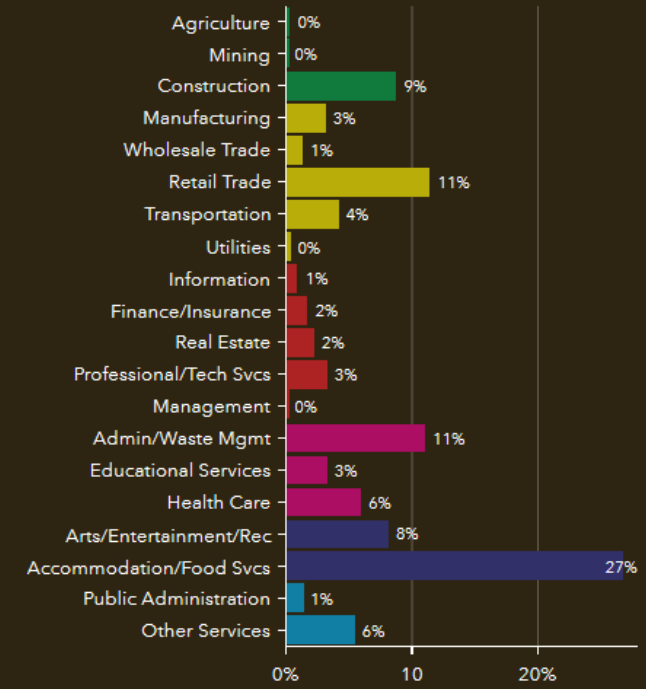
Urbanization Groups



Lifemodes



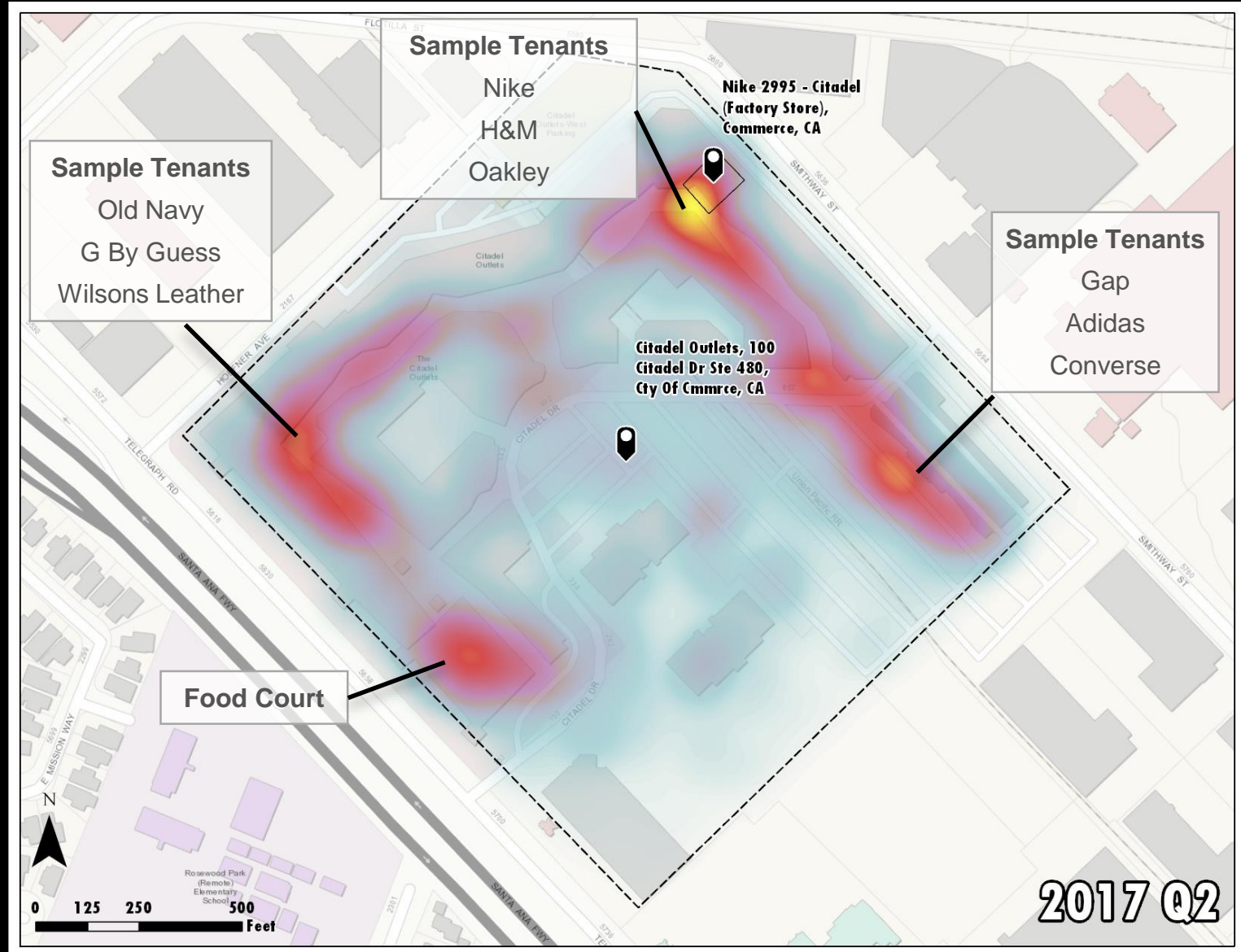
Labor Force by Industry



Citadel Outlets 2017 Q2

| Location | Estimated |
|-----------------|-----------|
| Citadel Outlets | 492,102 |
| Nike Citadel | 39,315 |

- Area near Nike is hottest at Citadel Outlets in Q2.



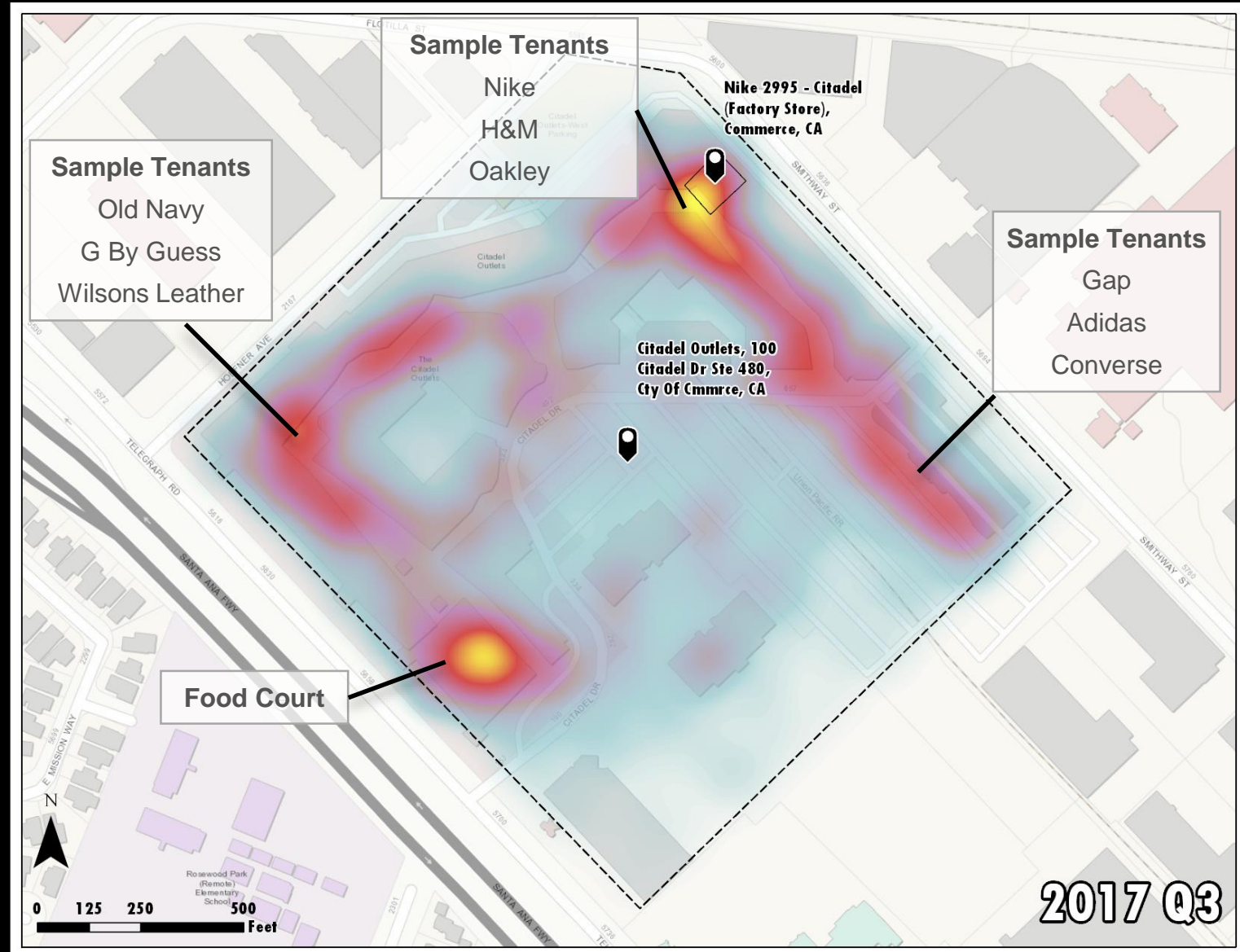
Q2: April 1 - June 30, 2017

Citadel Outlets

2017 Q3

| Location | Estimated | % Diff from last quarter |
|-----------------|-----------|--------------------------|
| Citadel Outlets | 507,692 | 3.2% |
| Nike Citadel | 40,084 | 2.0% |

- Heat at Nike grows even more, which is supported by foot traffic numbers.
- Citadel Outlet's growth from last quarter looks to be attributed to the Nike area and food court.



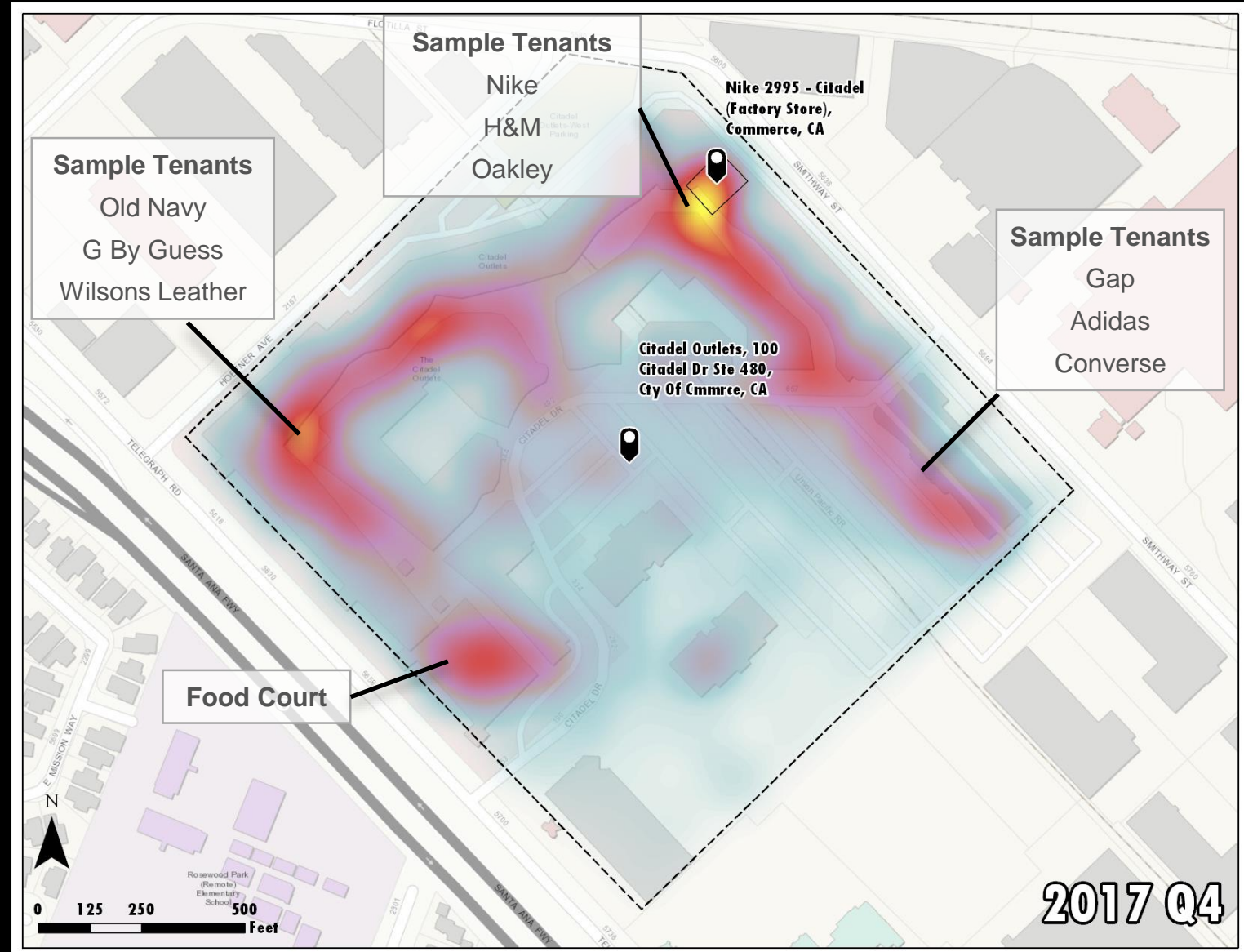
Q3: July 1 - September 30, 2017

Citadel Outlets

2017 Q4

| Location | Estimated | % Diff from last quarter |
|-----------------|-----------|--------------------------|
| Citadel Outlets | 624,898 | 23.1% |
| Nike Citadel | 51,961 | 29.6% |

- Holiday shopping expectedly increased foot traffic for both Nike and Citadel Outlets.
- Visually, the Old Navy area looks to have grown in heat from Q3. The area east of Old Navy, where Toys R Us is located, has also grown in heat.



Q4: October 1 - December 31, 2017

Citadel Outlets

2018 Q1

| Location | Estimated | % Diff from last quarter |
|-----------------|-----------|--------------------------|
| Citadel Outlets | 478,779 | -23.4% |
| Nike Citadel | 48,107 | -7.4% |

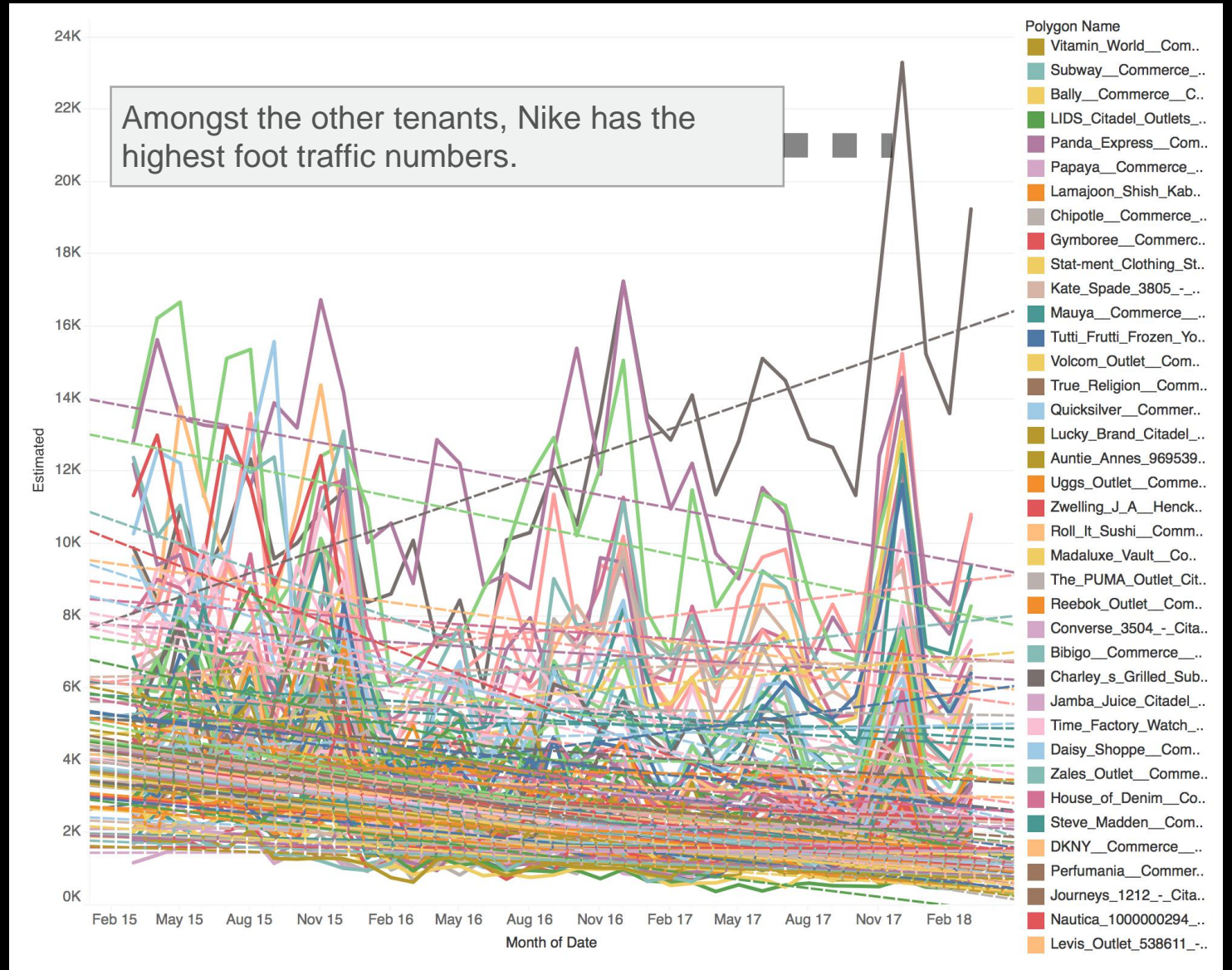


- As expected, both Citadel and Nike saw their post holiday foot traffic drop.
- Nike's drop is much smaller than Citadel Outlets as a whole.
- Nike area remains the most attractive or concentrated area within the center.

Q1: January 1 - March 31, 2018

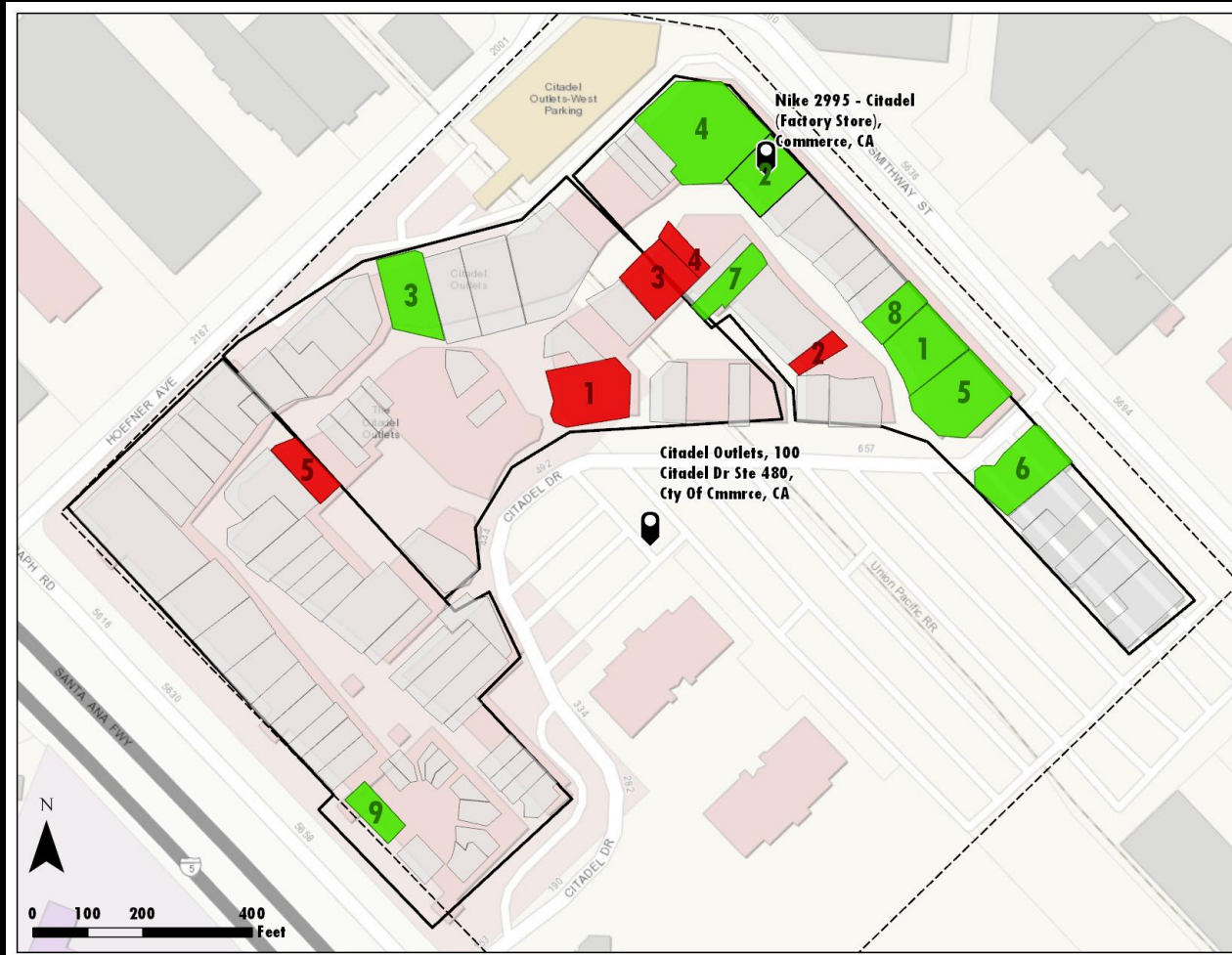
Citadel Outlets

Winners and Losers



Citadel Outlets

Winners and Losers



Winners (9 of 91)

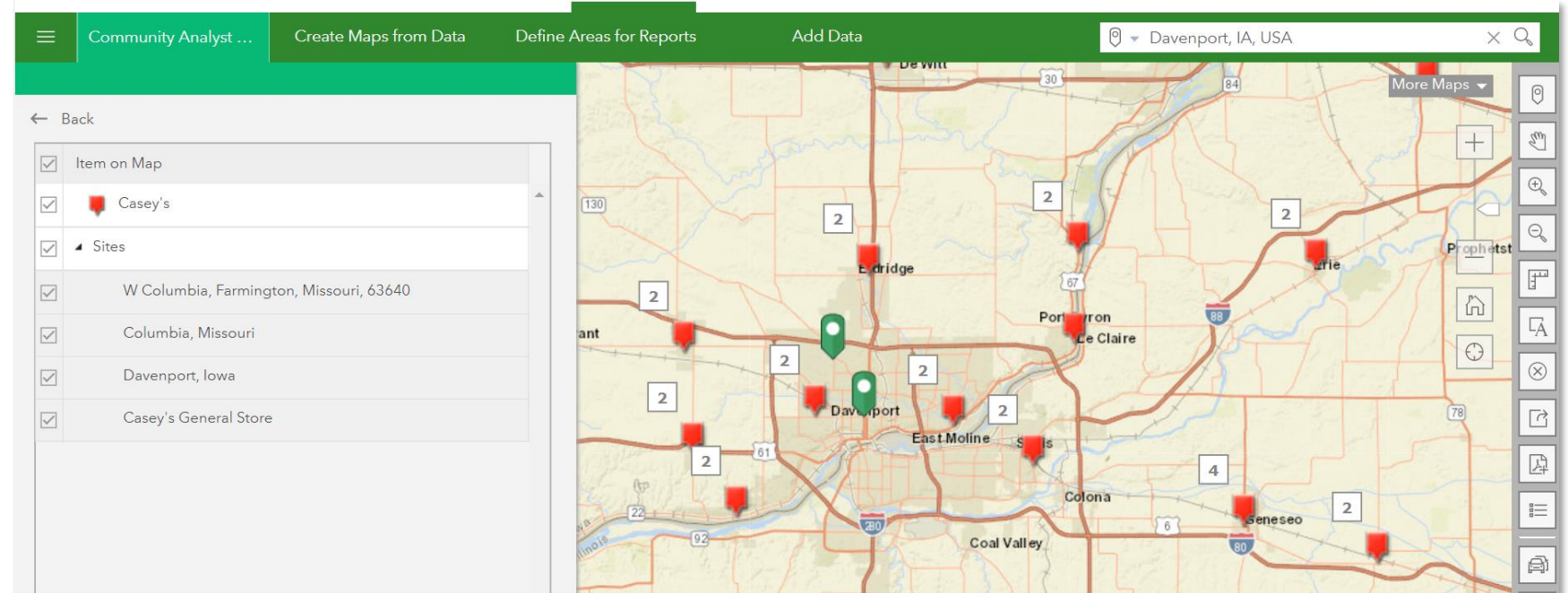
| R | Store | Change over 3 years |
|---|-------------------------|---------------------|
| 1 | Adidas Outlet Store | 126% |
| 2 | Nike Factory Store | 105% |
| 3 | Guess | 52% |
| 4 | H&M | 43% |
| 5 | Gap | 43% |
| 6 | AEO Factory | 17% |
| 7 | Cosmetics Company Store | 7% |
| 8 | Converse | 5% |
| 9 | Papaya | 4% |

Losers (Top 5)

| R | Store | Change over 3 years |
|---|----------------|---------------------|
| 1 | Calvin Klein | -91% |
| 2 | Fossil | -86% |
| 3 | Michael Kors | -81% |
| 4 | Lacoste | -81% |
| 5 | U.S. Polo Assn | -71% |

What is CA/Business Analyst Web?

- CA and Business Analyst Web (BAW) is a Web-based **application** that allows people to view and analyze demographic and third-party sources of data to better understand the overall community in question and make better policy decisions.
- CA/BAW contains--(1) data; (2) maps; and (3) tools.



Why teach and do research with CA/Business Analyst Web?

- 1. No GIS prerequisite skills necessary (helpful but not required). Thus provides an excellent toolkit for colleagues in your own discipline who are not currently using GIS, **and** for colleagues in other disciplines (in particular, sociology, business, and health).
- 2. Included in Esri free school software bundle, and in university enterprise wide licenses.
- 3. Run entirely online; nothing beyond a web browser needed.
- 4. Offers the ability to quickly and easily analyze data: Creating choropleth maps, charts, graphs, and infographics; creating buffers and routes, more; with intriguing analysis tools that exist in no other product.
- 5. Offers the ability to move data **from** ArcGIS Online and **to** ArcGIS Online.
- 6. Wide variety and volume of data – 1000s of businesses, consumer behavior, and detailed **one-stop** demographic data. For **multiple** countries.
- 7. Excellent for teaching **and** research.

Accessing CA/Business Analyst Web

- You obtain access through your ArcGIS Online account: www.arcgis.com

In that account, your organization administrator needs to make sure you have access to CA or Business Analyst Web.

You need a Level 2 membership as Administrator, Publisher, or User. The Publisher or Administrator role is required to be able to create new projects - in the User role, many functionalities in the app will be accessible to you only if others in your organization have shared project(s) with you.

Home Gallery Map Scene Groups My Content My Organization

Manage Product Licenses for Acme Inc.

MY ORGANIZATION ArcGIS Pro **Additional Products**

| Product | Business Analyst web app | Drone2Map for ArcGIS |
|-----------|--------------------------|----------------------|
| Licenses | 5 | 5 |
| Available | 4 | 3 |

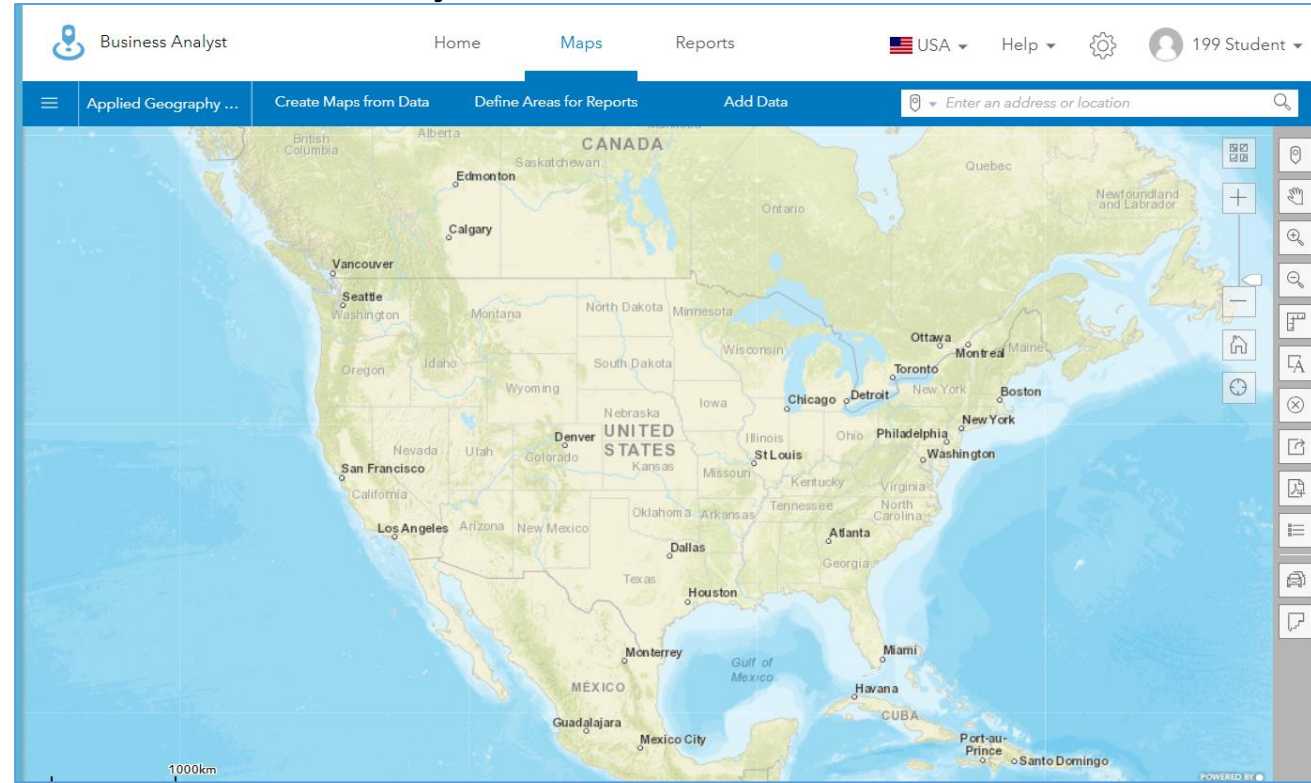
Members [SELECT ALL](#) Search by Name

Click to select a member.

| Name | Username | Licensed for |
|--------------|--------------|------------------------------------|
| John Doe | john_doe | 2 Products |
| Jack Smith | jack_smith | 1 Product |
| Mary Jones | mary_jones | Configure licenses |
| Jane Johnson | jane_johnson | Configure licenses |
| Jack Jones | jack_jones | Configure licenses |

Logging into CA/Business Analyst Web

- You log into BAW using this URL and with your ArcGIS Online organizational account credentials:
<https://bao.arcgis.com>
<https://communityanalyst.arcgis.com>
- If you don't have an ArcGIS Online account, get a free CA/BA Web trial here: <https://www.esri.com/en-us/arcgis/products/arcgis-business-analyst/trial>



What can you do with CA/Business Analyst Web? Selected Activities

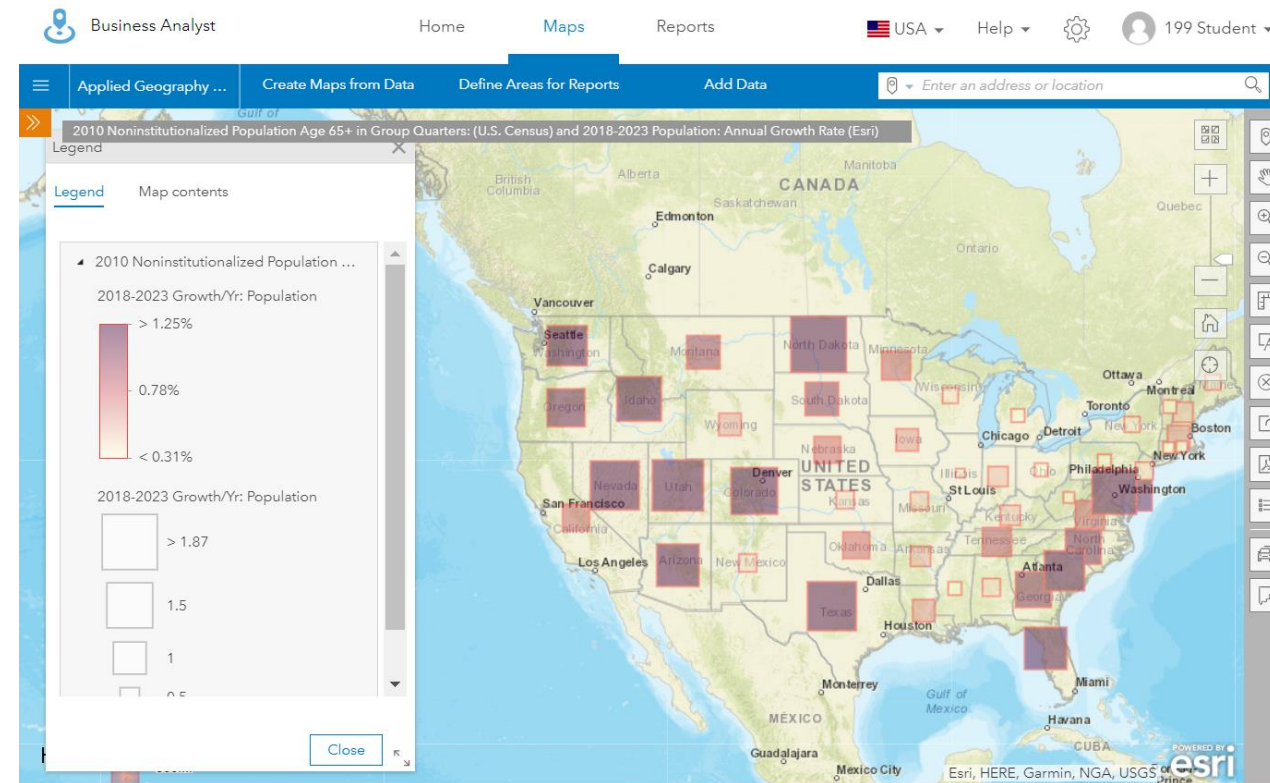
- 1. Analyze demographic data: Color coded maps, filters.
- 2. Illustrate multi-variate analysis.
- 3. Analyze consumer behavior.
- 4. Create reports and infographics.
- 5. Analyze business locations.
- 6. Create drive time buffers.
- 7. Move data back and forth between BAW and ArcGIS Online.

Activity: Create Maps from Data

- 1. Create maps from Data > Color-coded maps > Population, annual growth rate.

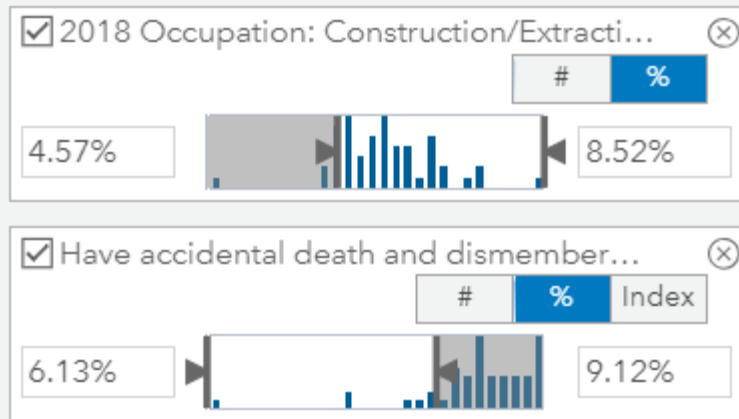
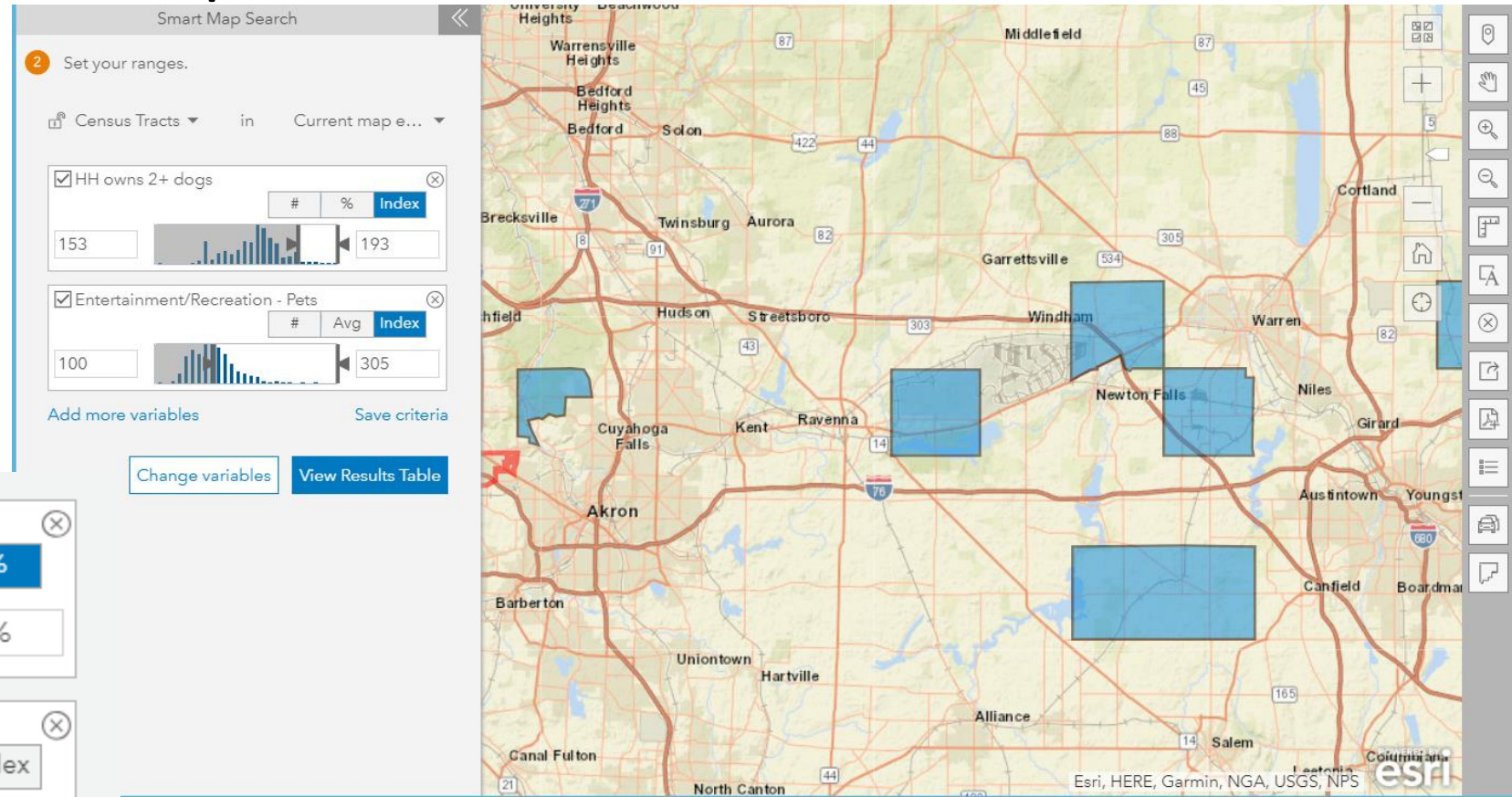
Discuss:

- # vs Index
- Scale and locking scale
- Style, legend, classification method
- Data table, Export
- Add variable: Group Quarters.



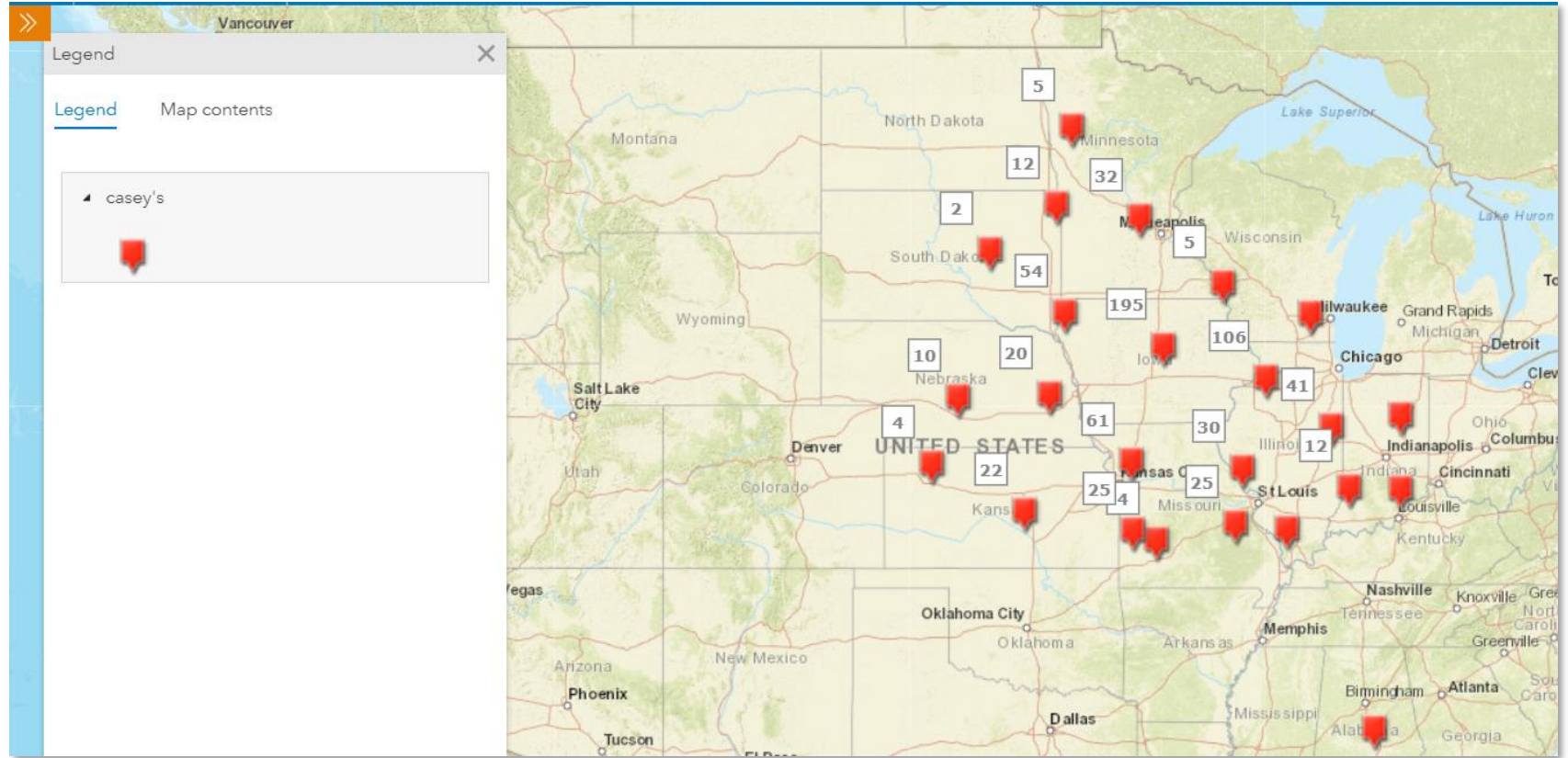
Activity: Smart Map Search

- 1. Pets and pet spending
- 2. Construction and insurance



Activity: Mapping Business Type

- 1. Analyze 2 regional businesses.
- 2. Site suitability analysis in 1 community.
- 3. Create Infographics



KEY FACTS

6,021

Population



Average Household Size

31.7

Median Age

\$50,602

Median Household Income

EDUCATION

9%

No High School Diploma



20%

High School Graduate



30%

Some College



40%

Bachelor's/Grad/Prof Degree

BUSINESS



512

Total Businesses



5,619

Total Employees

EMPLOYMENT



63%

White Collar



17%

Blue Collar



20%

Services

4.0%

Unemployment Rate

INCOME



\$50,602

Median Household Income



\$24,529

Per Capita Income



\$36,981

Median Net Worth

Households By Income

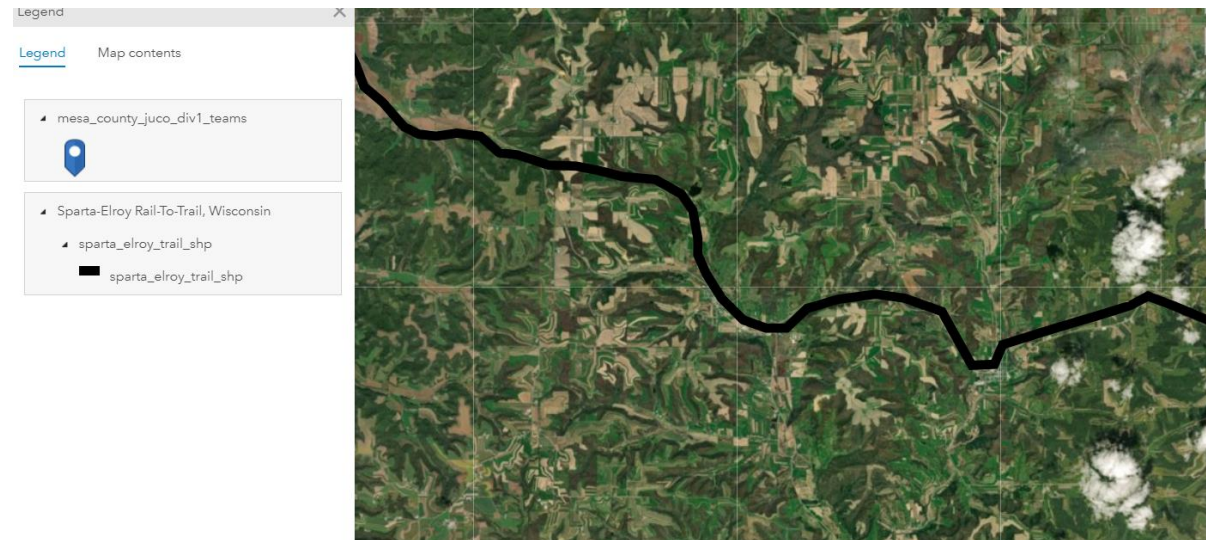
The largest group: \$50,000 - \$74,999 (20.9%)

The smallest group: \$150,000 - \$199,999 (1.7%)

| Indicator ▲ | Value | Difference | |
|-----------------------|-------|------------|-----------------------------------|
| <\$15,000 | 11.4% | -1.4% | <div style="width: 11.4%;"></div> |
| \$15,000 - \$24,999 | 9.0% | -1.1% | <div style="width: 9.0%;"></div> |
| \$25,000 - \$34,999 | 11.5% | +1.8% | <div style="width: 11.5%;"></div> |
| \$35,000 - \$49,999 | 17.3% | +3.5% | <div style="width: 17.3%;"></div> |
| \$50,000 - \$74,999 | 20.9% | +3.0% | <div style="width: 20.9%;"></div> |
| \$75,000 - \$99,999 | 12.9% | +0.1% | <div style="width: 12.9%;"></div> |
| \$100,000 - \$149,999 | 13.3% | 0 | <div style="width: 13.3%;"></div> |
| \$150,000 - \$199,999 | 1.7% | -3.1% | <div style="width: 1.7%;"></div> |
| \$200,000+ | 2.0% | -2.9% | <div style="width: 2.0%;"></div> |

Activity: Add data from ArcGIS Online

- Add data from ArcGIS Online: Sparta Elroy Trail – so that you can use it to determine optimal location for new bike-ski rental and sales shop in the vicinity. Add bike-ski rental shops. Buffer the trail by 5-10-15 miles. Add consumer behavior: purchased bicycle recently.



3 Last but Important CA/BAW points

- 1. In addition to the United States, data and reports are available for more than 135 countries.
- **2. To bring your own data into Business Analyst Web:**
 - (A) Via Excel spreadsheet of addresses or lat-long locations using Maps > Define Areas for Reports > Import File.
 - (B) Import a shapefile polygon and point data via Maps > Define Areas for Reports > Import File.
 - (C) Via a web map from ArcGIS.com, then access your map for analysis within Business Analyst Web Maps via More Maps > Web Maps.
- 3. Community Analyst is the same product as Business Analyst Web. Only the colors and a few terms are different.

An aerial, top-down view of a city grid, likely New York City, rendered in a monochromatic teal color. The buildings are represented as rectangular blocks of varying heights, creating a textured, three-dimensional effect. The streets form a clear grid pattern. The overall image has a soft, slightly blurred quality, giving it a modern, digital feel.

“Without data, you’re just another person with an opinion.”

W. Edwards Deming



The Analytics of Everywhere

Joseph J. Kerski, PhD GISP

Education Manager

jkerski@esri.com

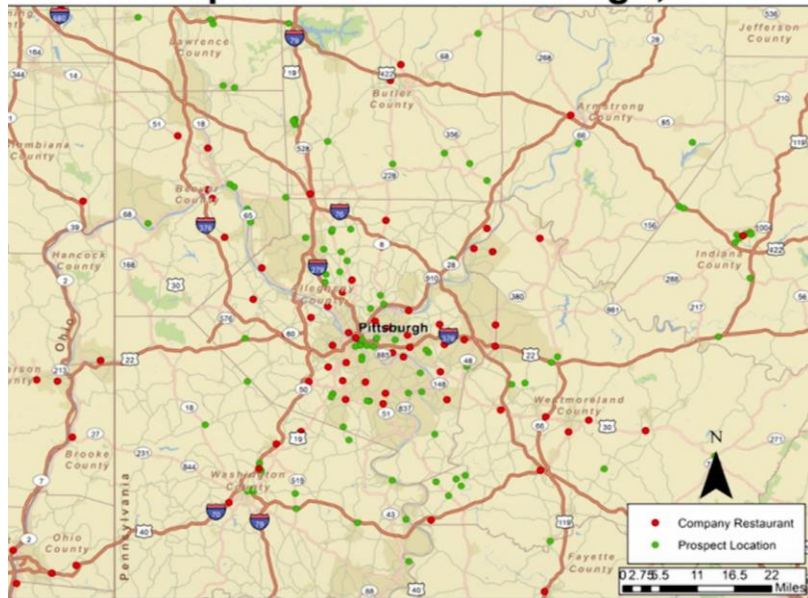
Search for Geospatial in Supply Chain Texts

- **Operations and Supply Chain Management: The Core (Jacobs & Chase)**
- **Supply Chain Management (Lambert)**
- **Supply Chain Management (Chopra & Meindl)**
- **Purchasing & Supply Management (Johnson & Flynn)**
- **Supply Chain Logistics Management (Bowersox et al.)**
- **Supply Chain Game Changers (Burnette et al.)**
- **Intro. To Operations & Supply Chain (Bozarth & Handfield)**
- **Operations Management (Wisner)**

Geospatial BI in Practice (Strategy/Marketing/CIS)

Wendy's Fast Food

Market Optimization - Pittsburgh, PA

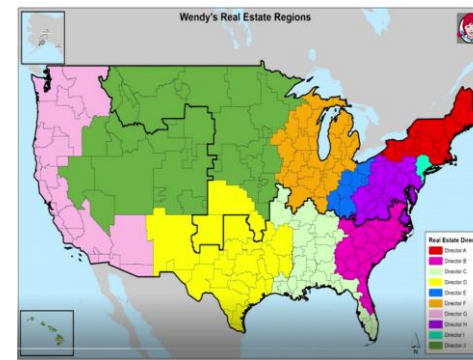


Urbanicity

Differentiation of areas based on density and concentrations of population and employment

Data

- U.S. Block Groups
- U.S. Urban Boundaries
- Esri Demographics
- InfoUSA Business Data



Source: ESRI and Wendy's

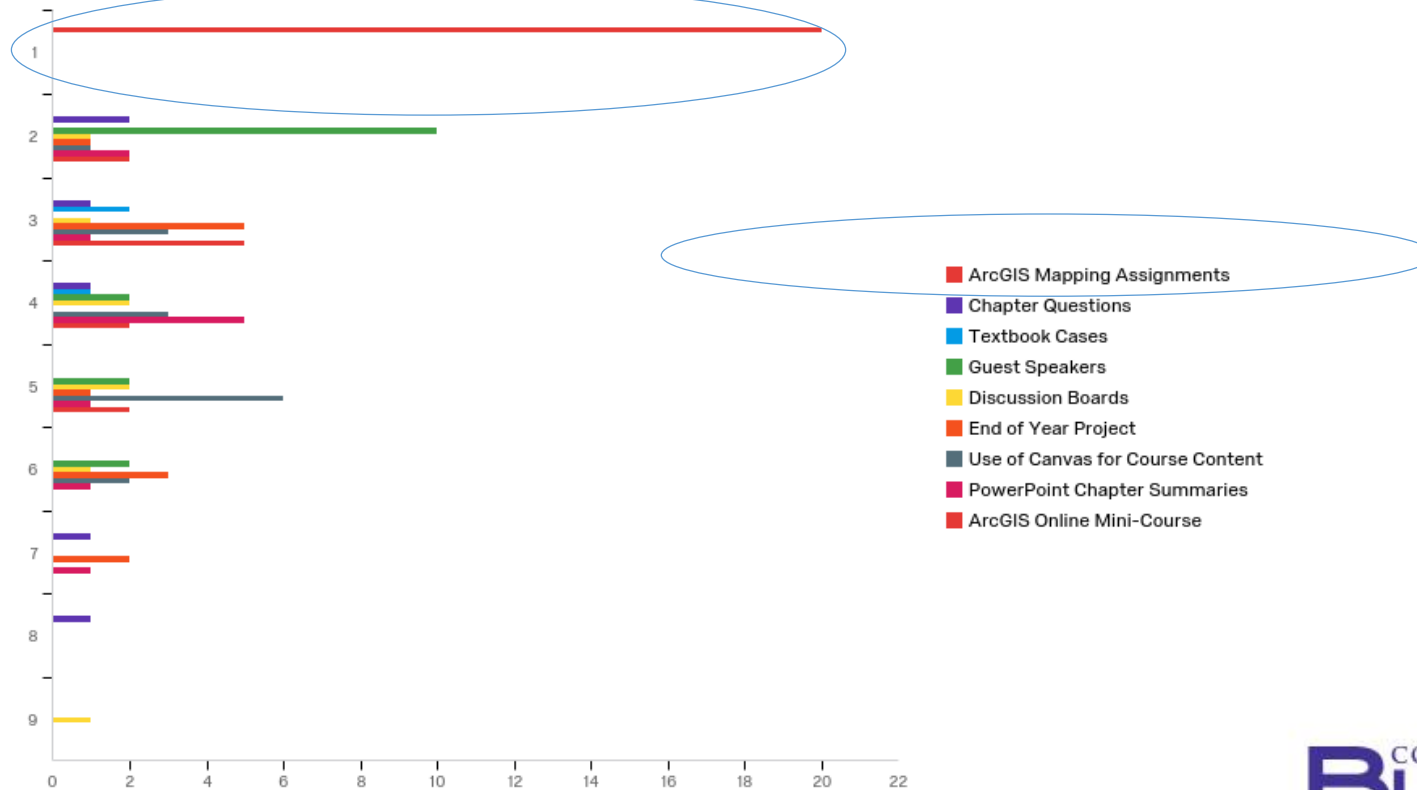
“GIS” Not Mentioned in SCM Textbooks

- **Benefits of GIS in Supply Chain management -**
 - **1) Demonstrated improvement in logistics efficiency**
 - **2) Enhance students’ interests in SCM**
 - **3) Build students’ critical thinking skills**
 - **4) Expand SCM teaching methodologies**
 - **4) New methods to visualize complex SCM problems**

Geospatial BI in Teaching

Student interest in GIS?

Drag the following items into your preferred category and rank them.



Modules Integrate with Existing SCM Topics

Module 7.0 – DISTRIBUTION AND LOGISTICS: GIS RELATIONSHIPS

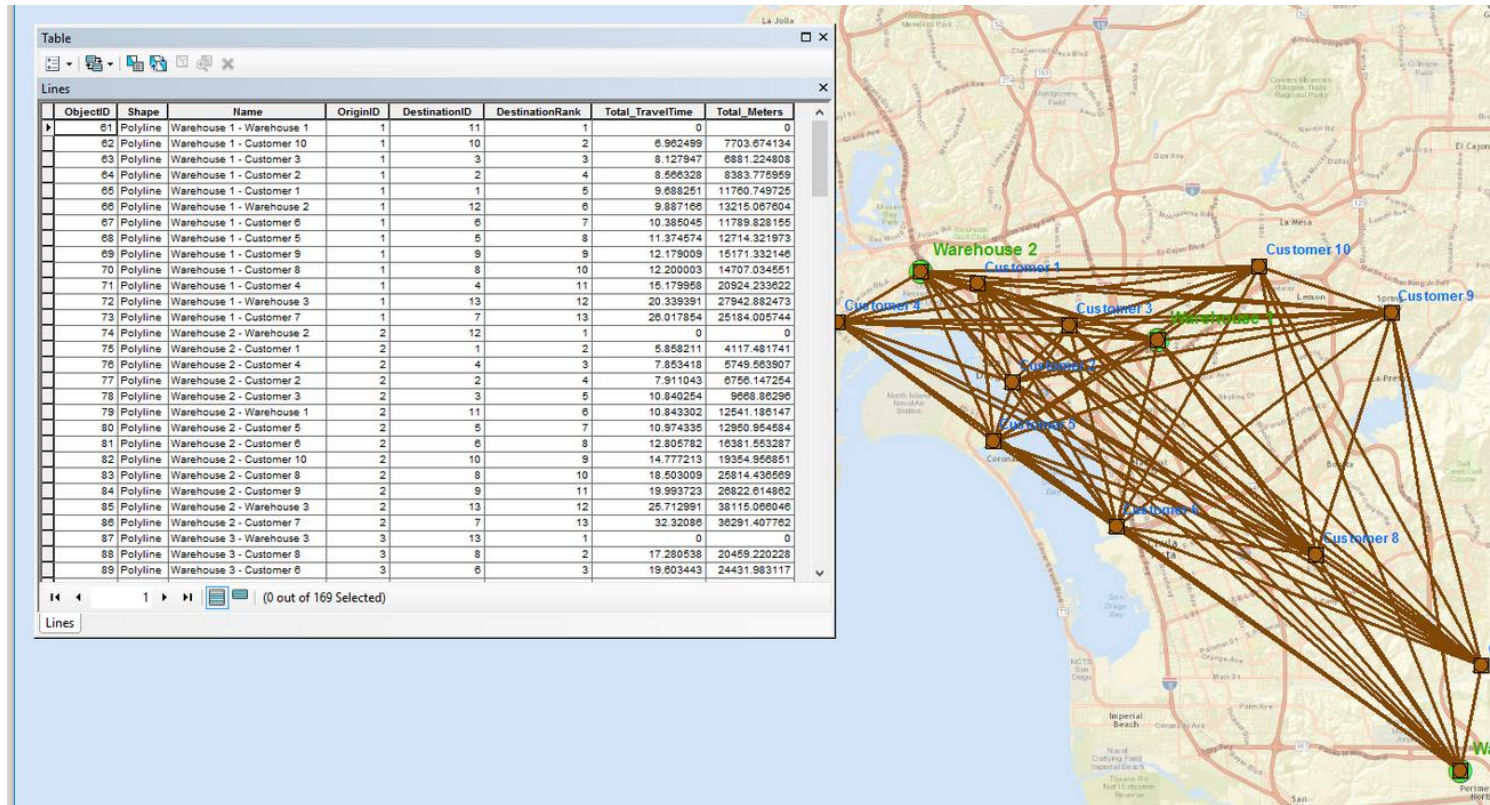
Background: This module was developed to capture some of the essence of traditional logistics terms and integrate them with GIS concepts. Specifically, this Module focuses on the importance of GIS concepts as they relate to **logistics** and **distribution**. Later modules provide more detailed GIS tools that help to accomplish these goals.

APICS defines Logistics as “the art and science of obtaining, producing, and distributing material and product to the proper place and in the proper quantities.” (APICS, 2016) Similarly, **CSCMP defines Logistics** as “that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin to the point of consumption in order to meet customers’ requirements.” (CSCMP Supply Chain Management, <http://cscmp.org>)

- **OD Matrix**
- **Location – Allocation**
- **Service Area**
- **DC Location Decisions**
- **Remote Sensing & GIS**
- **Disaster Relief & GIS**

Geospatial BI in Teaching

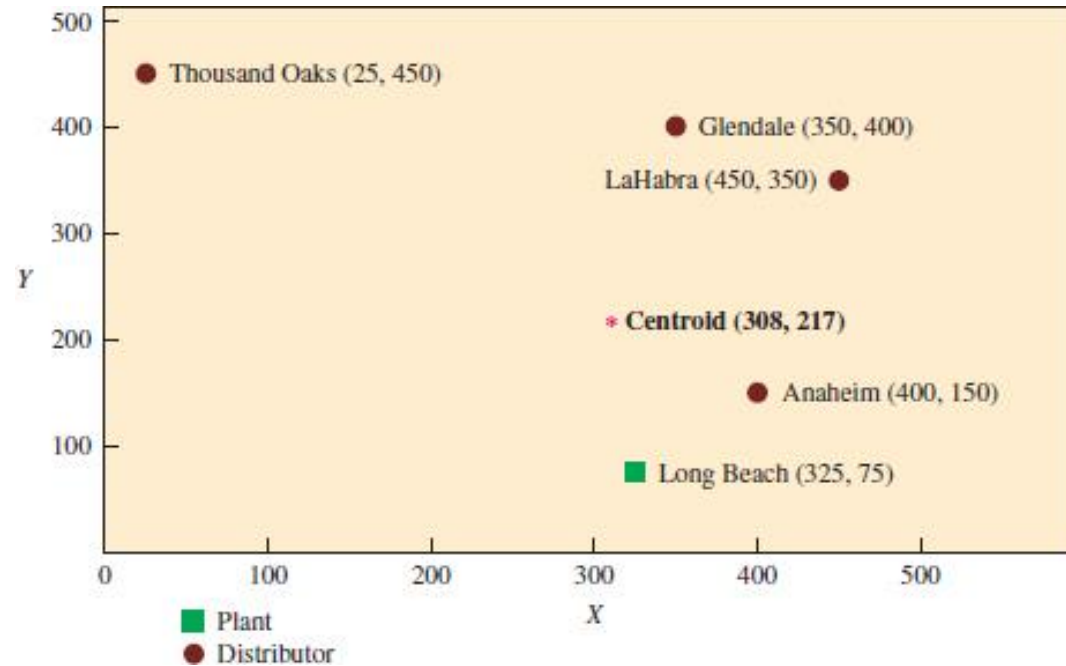
GIS-based OD - Matrix



Geospatial BI in Teaching

Location Allocation & DC Location

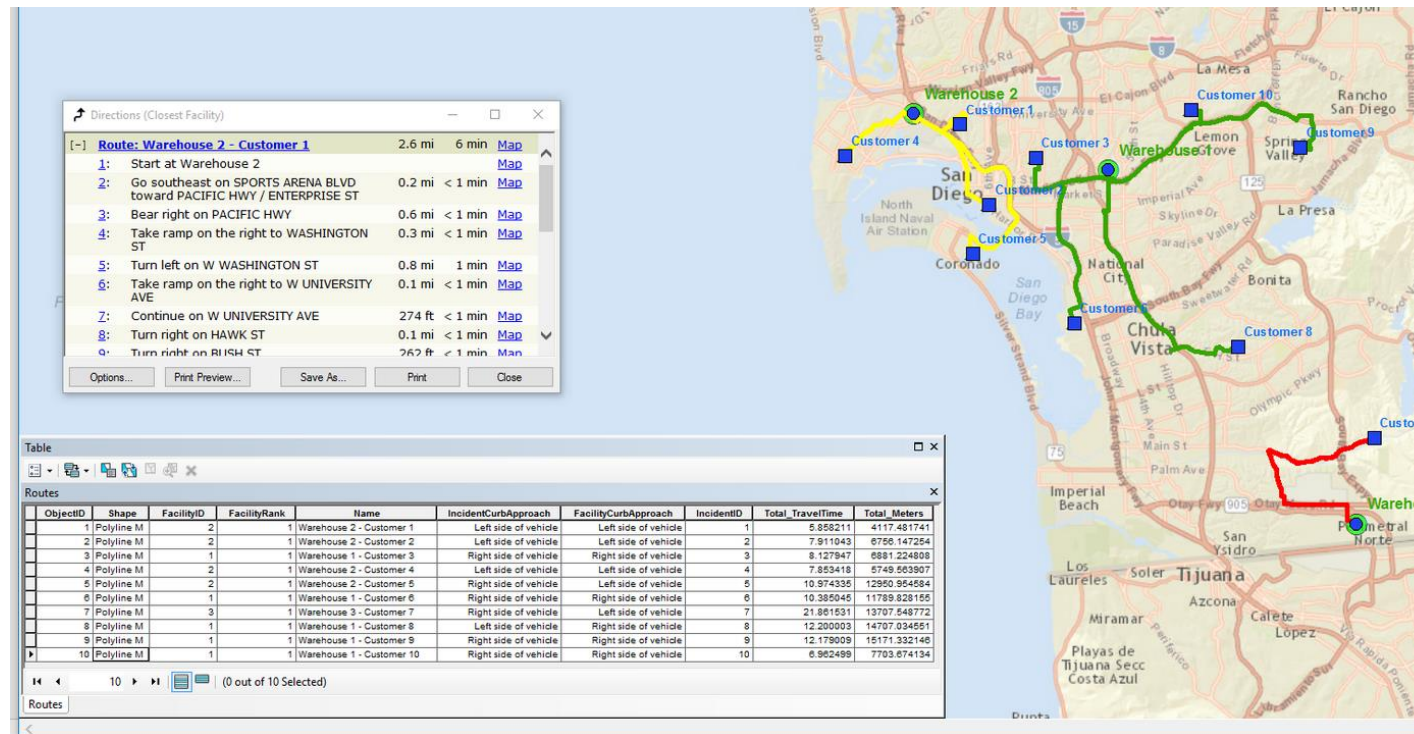
- Centroid method uses crude spreadsheets



| LOCATIONS | GALLONS OF GASOLINE PER MONTH (000,000) |
|---------------|---|
| Long Beach | 1,500 |
| Anaheim | 250 |
| LaHabra | 450 |
| Glendale | 350 |
| Thousand Oaks | 450 |

Geospatial BI in Teaching

Student Submission - Location Allocation



Geospatial BI in Teaching

Student Submissions – Service Area Analysis

