



Case Study 1: Place Perception (the local)

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Leveraging Big Data for Future Mobility

Utilizing User Generated Content for Transport Modelling

Friday 15th December 2017 - Technical University of Munich



**PLACE PERCEPTION, ATTRACTIVENESS,
MEANING & RELATIONSHIP TO
ACTIVITY & TRAVEL**

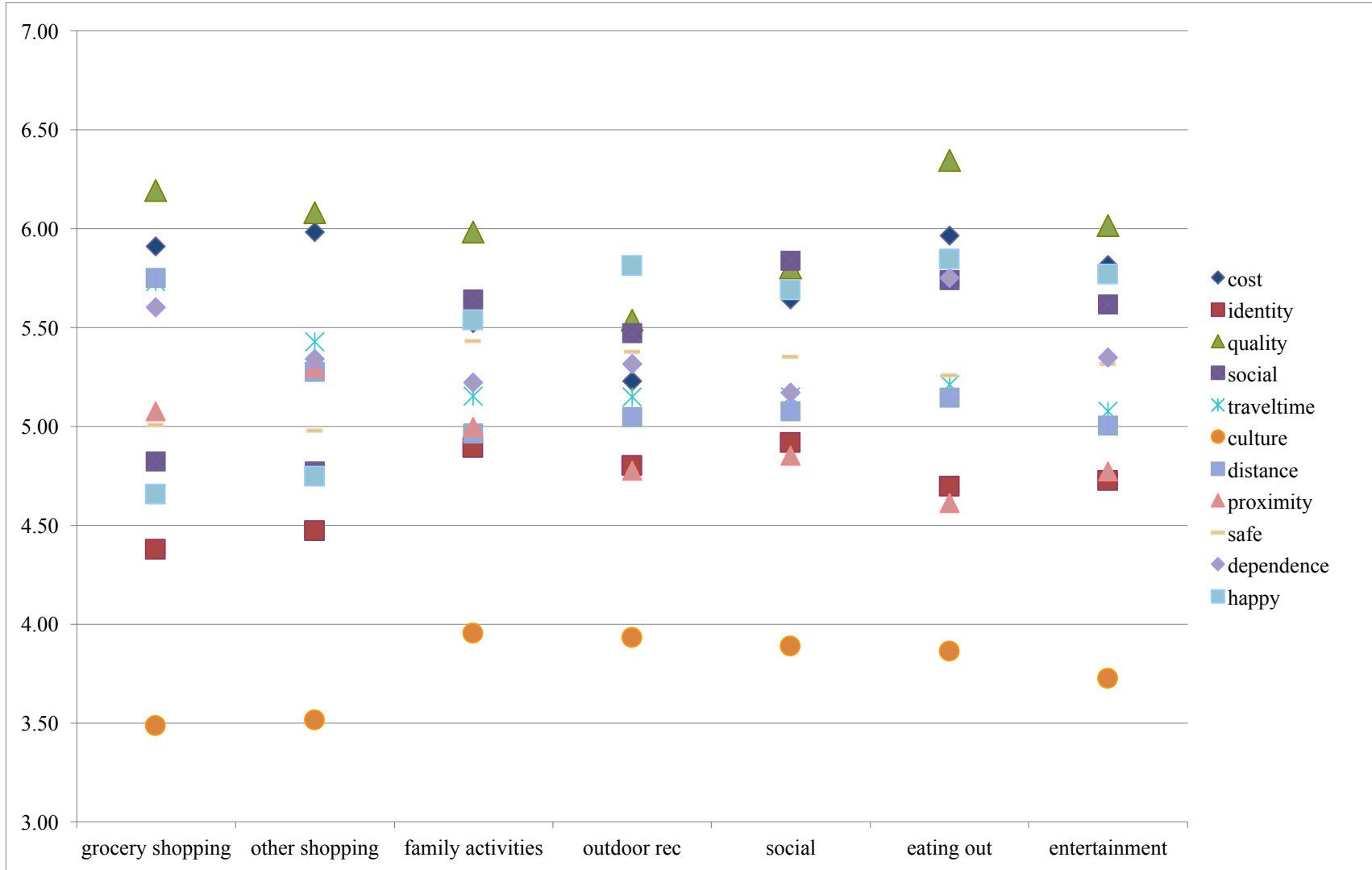
Locations and Activities are Closely
Related and Activity Location Choice
Depends on Different Attributes with
Different Decision Weights

In one of the Geotrans surveys we asked a series of questions about attributes for 7 types of activities: *grocery shopping, other shopping, activities with family, outdoor recreation, social activities, eating out, and entertainment* (Likert 7 categories of strongly disagree to strongly agree)

1. Cost of goods or services at the place- “cost”
2. Whether the place is a good reflection of the type of person I am- “identity”
3. The quality of the products or services offered- “quality”
4. Whether the place has a positive social atmosphere- “social”
5. How much time it will take me to travel to the place- “traveltime”
6. How well the place reflects the Santa Barbara lifestyle- “culture”
7. How close the place is to my home- “distance”
8. The safety of the surrounding area- “safe”
9. If there are other places close by where I can do other activities- “proximity”
10. Whether the place meets all my [fill in the activity type] needs- “dependence”
11. Whether the place makes me feel happy- “happy”

Intangible amenities? Imaginary? Sensed attributes?

Many “soft” or “sensed” (not cost, time, distance) attributes are important for different types of activities



We Need to Find Ways to Measure Previously Unmeasured Aspects (also called emotions by part of the literature)

- @Clearly Definable Locations for Multiple Activities – 2 Shopping Malls
- In a Region Where Respondents Live
- @Institution/Place of Significant Value to the Personal Growth of Respondents

With Kate Deutsch (main), Seo Youn Yoon, and Srinath Ravulaparthi

SENSE OF PLACE AND PLACE HAPPINESS

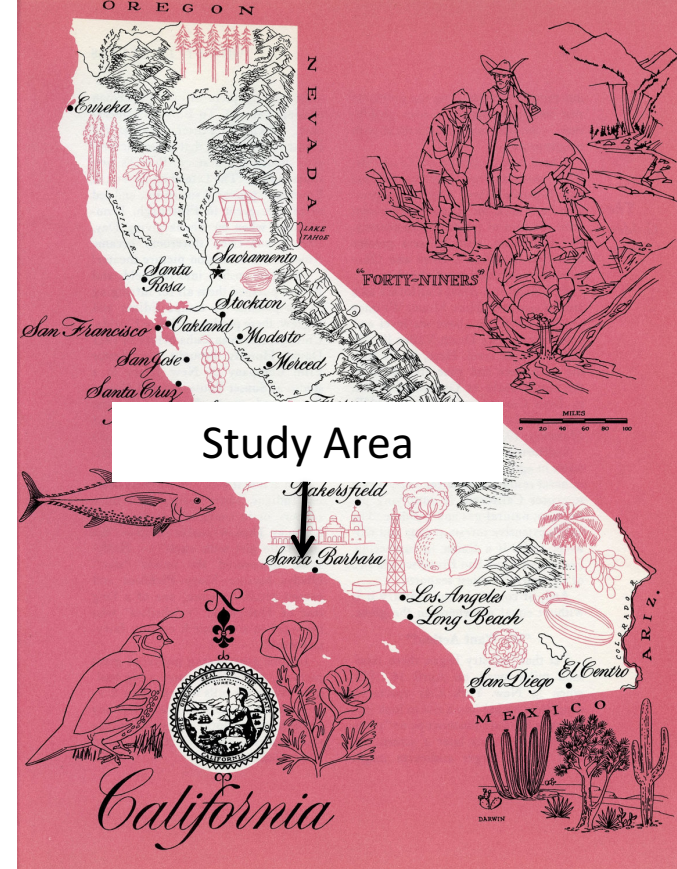
(AN EXAMPLE OF ATTITUDES IN ACTIVITY & TRAVEL BEHAVIOR)

Sense of Place (SOP)

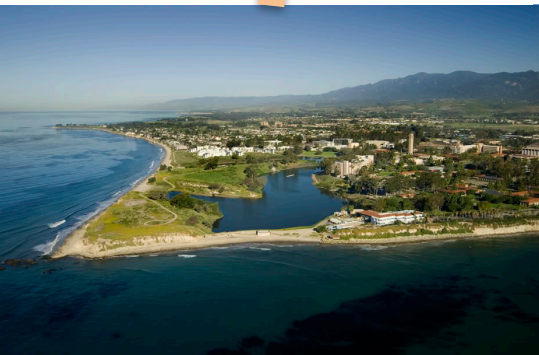
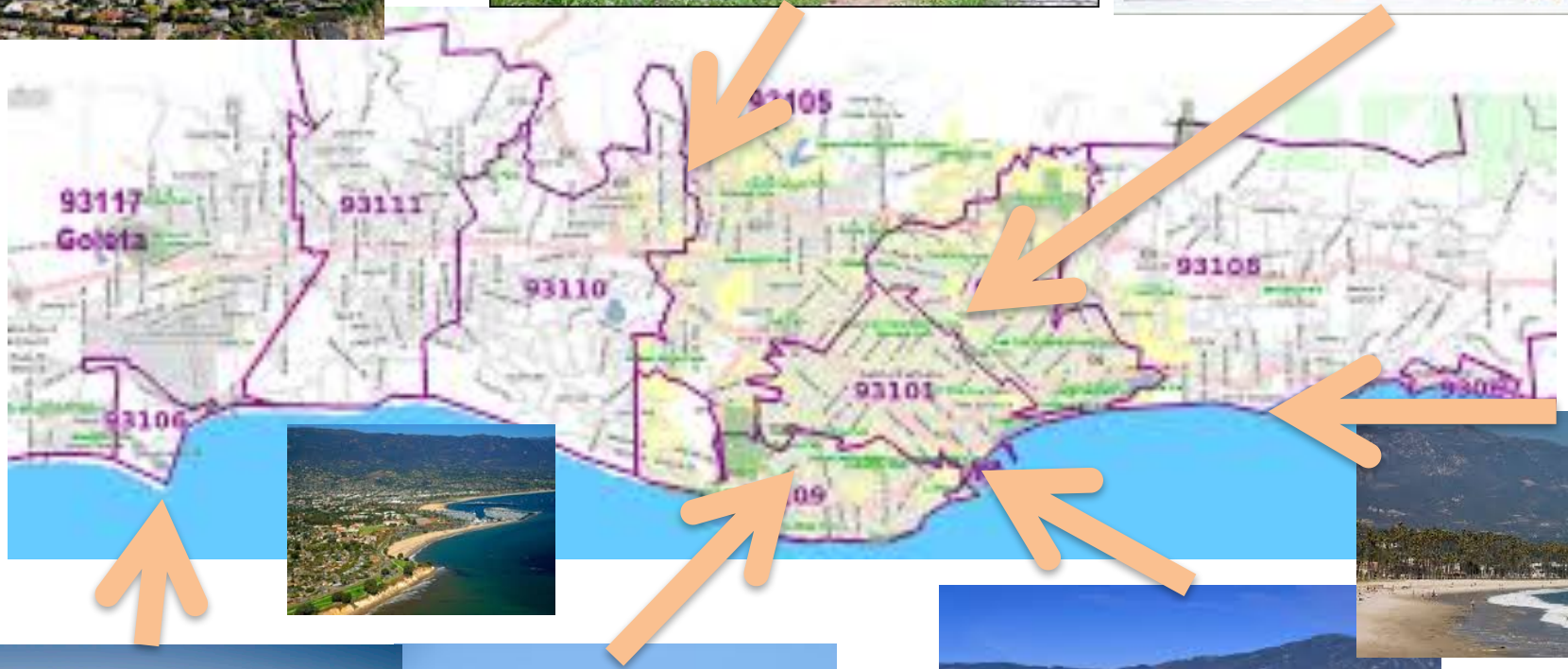
- Initialized by Tuan(1974) as phenomenological entity. He provided the foundation and theoretical framework to describe **the emotional connection between place and people**
- Geographers debated on **quantifiability** and measurement issues (Canter, 1983; Golledge and Stimson,1997)
- Today we have a variety of options in terms of **attitudinal questions-based** measures of Sense of Place mainly from environmental psychology (Jorgensen and Stedman, 2001, 2006; Deutsch and Goulias, 2009, 2010, 2013)
- **Multiple dimensions** of Sense of Place (Altman and Low, 1992; Stokols and Shumaker, 1981; Guest and Lee, 1983; Jorgensen and Stedman, 2001, 2006 ; Brown and Werner, 2009; Deutsch and Goulias, 2009, 2010, 2013)
- We started exploring the connection between **Sense of Place and Travel Behavior** (Deutsch and Goulias, 2009, 2010, 2013)

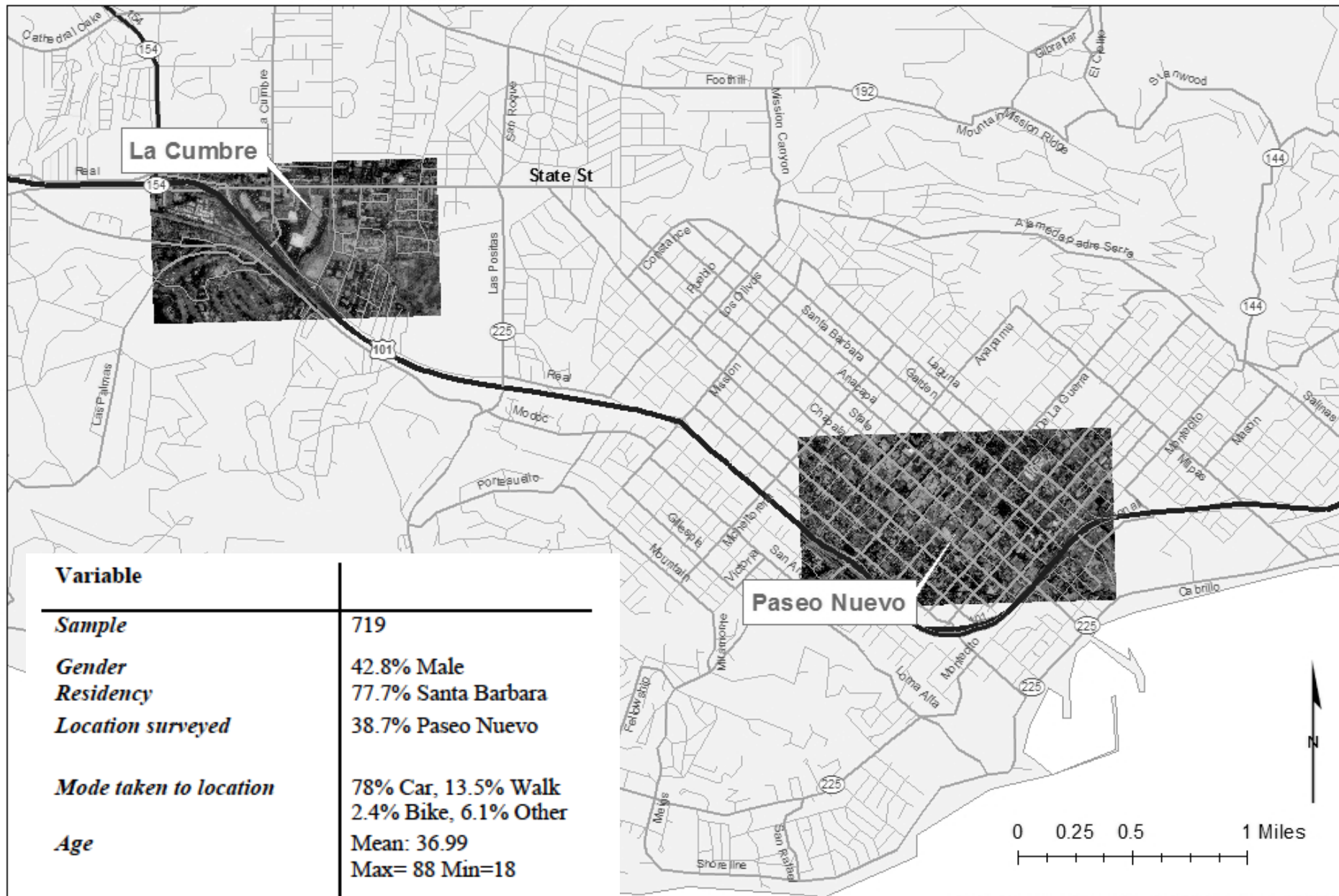
Measuring Place Affect and Cognition

- Theory of Sense of Place
 - Belonging (I am Californian, Parisian, Wildcat?)
 - Attachment (makes me relaxed, proud, happy, sad)
 - Dependence (meets my needs)
 - Identity (reflection of me)
- Theory of Affordances:
 - People perceive the environment in terms of functionally significant properties (e.g., social interaction)
- Place Perception/Satisfaction
 - For each location measure attributes and importance



BACKGROUND ON STUDY AREA (SOUTH SANTA BARBARA COUNTY)





Variable

Sample	719
Gender	42.8% Male
Residency	77.7% Santa Barbara
Location surveyed	38.7% Paseo Nuevo
Mode taken to location	78% Car, 13.5% Walk 2.4% Bike, 6.1% Other
Age	Mean: 36.99 Max= 88 Min=18

Data Sources: Street level: ESRI, imagery: USGS

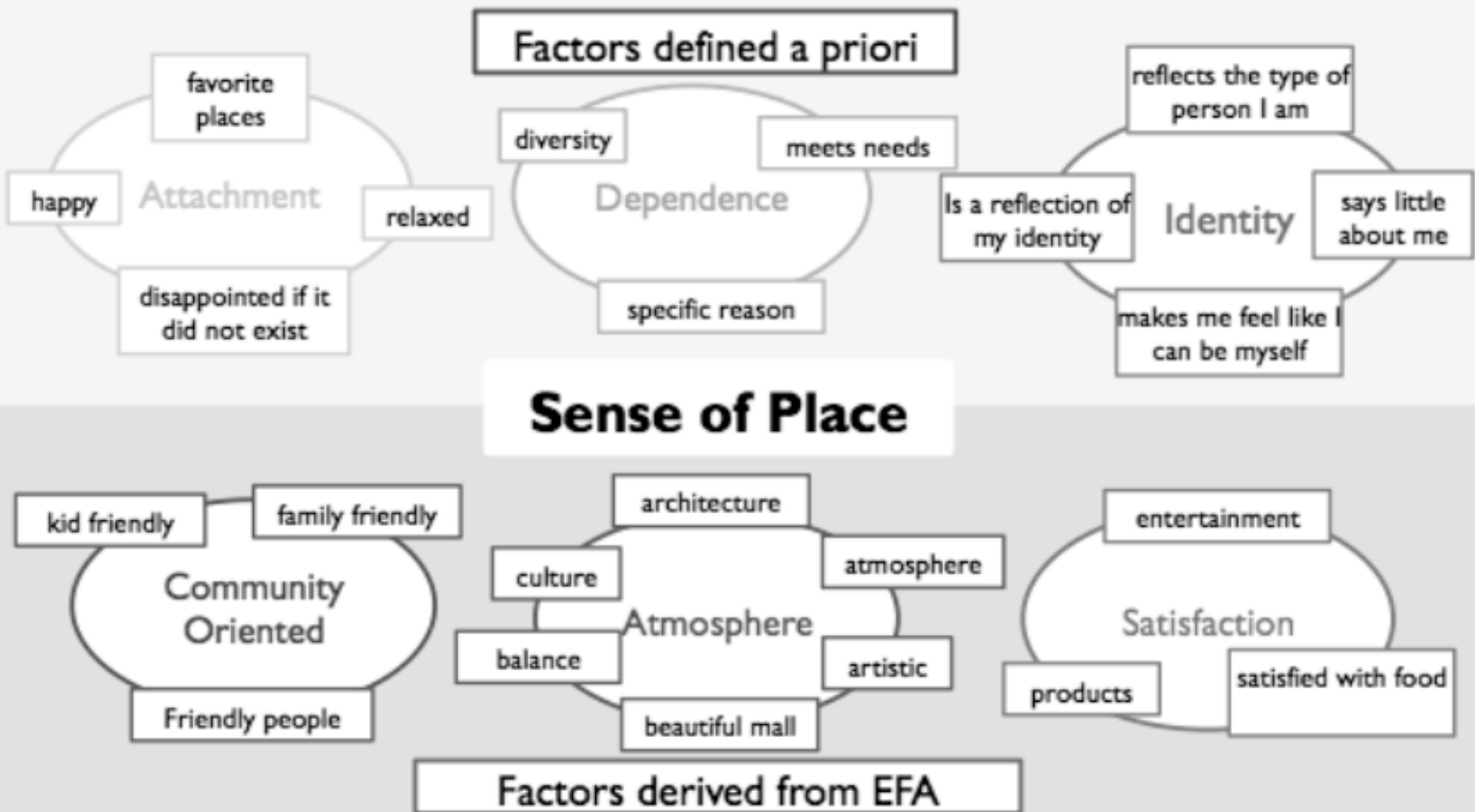


Santa Barbara Shopping Malls two different designs (Deutsch MA & Ph.D.dissertation)¹³

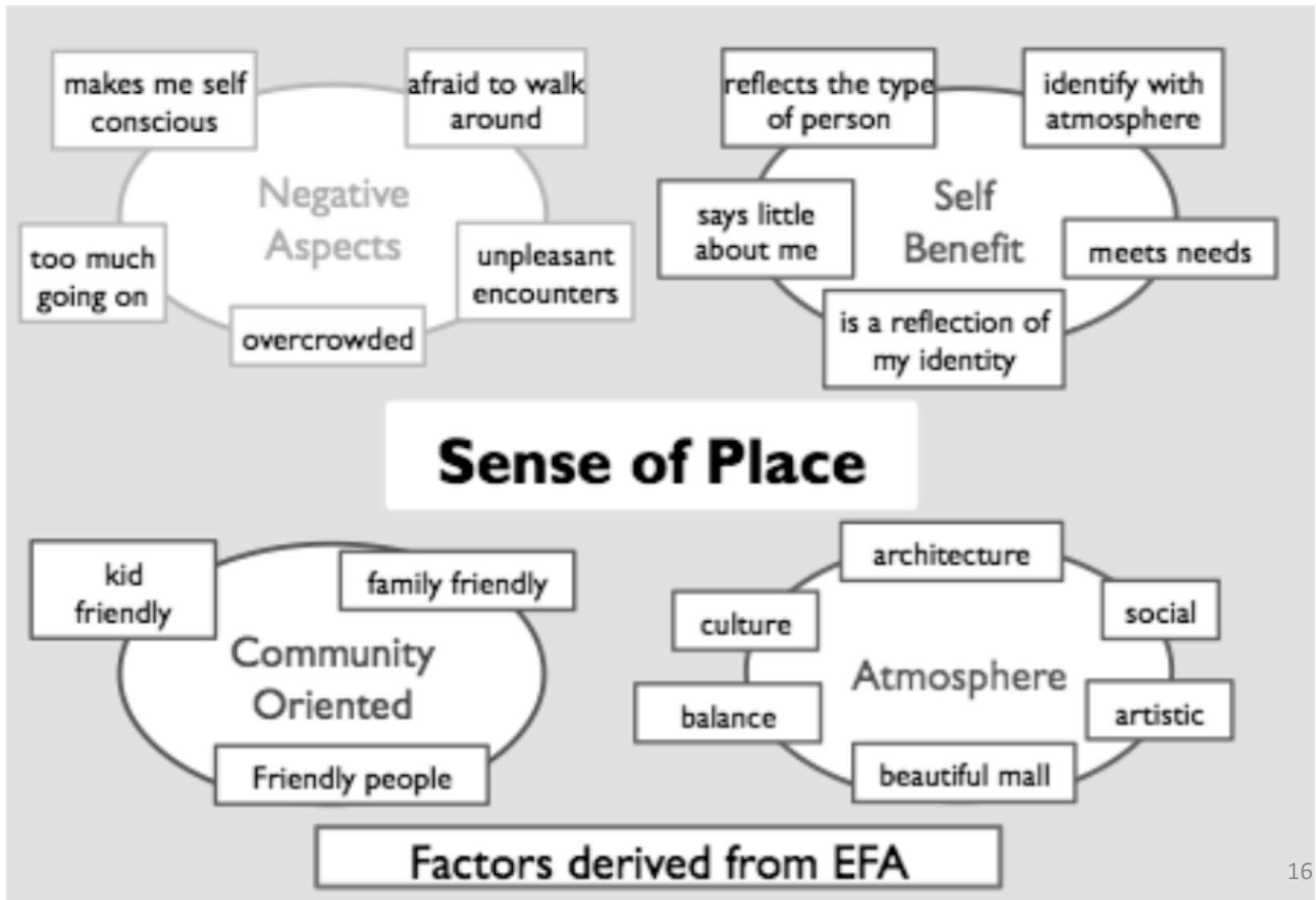
Sat= satisfaction, dep= dependence, id= identity, att= attachment, phy= physical, cul= cultural, soc= social	J/ S	SOP aspect	M1	M2
Makes me feel relaxed.	X	Att	F1	
Makes me feel happy.	X	Att	F1	
I would be disappointed if it did not exist.	X	Att	F1	
Is one of my favorite places in SB.	X	Att	F1	
Meets my needs better than any other location in SB.	X	Dep	F2	F2
Has better diversity in activities than any other place in SB.	X	Dep	F2	
I only come when I have specific reasons in mind.*	X	Dep	F2	
Makes me feel like I can be myself.	X	Id	F3	
Is a good reflection of my identity.	X	Id	F3	F2
Reflects the type of person I am.	X	Id	F3	F2
Says very little about me.*	X	Id	F3	F2
I feel comfortable because I identify with the atmosphere.		Id		F2
Makes me feel too self-conscious.*		Id		F1
I am satisfied with the entertainment options		Sat	F6	
I am satisfied with the food options		Sat	F6	
I am satisfied with the products offered		Sat	F6	
Has stores that lack specific things.*		Sat		
I am satisfied with the parking		Sat		
I am satisfied with the level of services		Sat		
I am satisfied with the amount of people.		Sat		
[location]...is a family friendly place to be.		Soc	F4	F3
[location]...is a kid friendly place to be.		Soc	F4	F3
Has generally friendly people around.		Soc	F4	F3
Has a definite social atmosphere.		Soc		F4
Involves a risk of unpleasant encounters*		Soc		F1
Is always overcrowded.*		Soc		F1
Has too much going on at it.*		Soc		F1
Makes me afraid to walk around.*		Soc		F1
Has visually appealing architecture.		Phy	F5	F4
Is a beautiful mall.		Phy	F5	F4
Has a good balance of decorative features and businesses.		Phy	F5	F4
Has artistic value.		Phy	F5	F4
Peaceful and relaxing atmosphere.		Phy	F5	
Reflects the culture of Santa Barbara (SB).		Cul	F5	F4

*reverse coded, J/S= Jorgensen and Stedman, M1= Model 1 salience, M2= Model 2 salience

Sense of Place Dimensions (environmental psychology)



Deutsch Model



Lessons Learned

- We can ask questions and derive factors but more than just the 3 main SOP factors (dependence, identity, attachment) are needed to capture variance in responses
-
- Strong correlation with scheduling of activities and mode used to arrive at destinations – just shopping or a movie too?
- Interactions with social networks important – with whom?
- Different persons attracted by different features (again depending on activity) – strollers at La Cumbre
- Need to look at different scales to identify the effect of multiple destinations – “downtown”

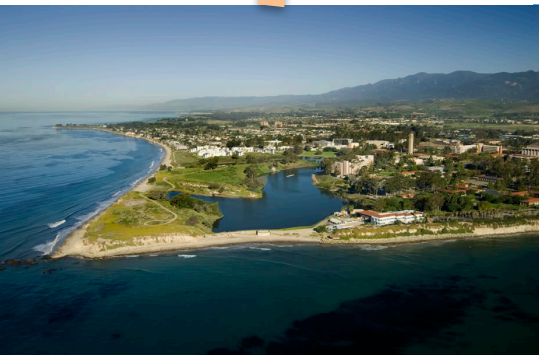
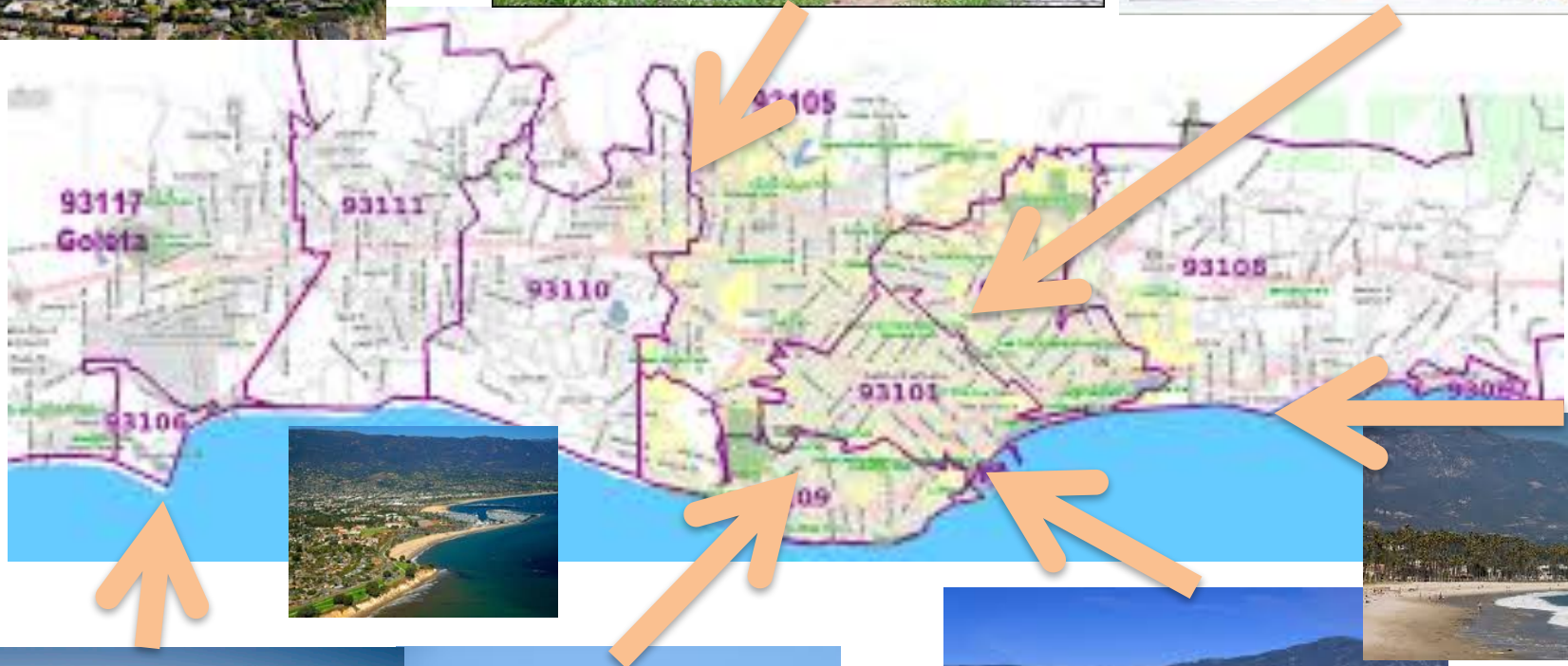
Measure attitudes and satisfaction for an entire city & region

Kate Deutsch Dissertation and Extensions by Lee, Davis, Ravulaparthi, and McBride




We will see later this area to the right is the most attractive and perceived as filled with opportunities





Internet-based Survey




Santa Barbara GeoTRIPS

Survey on the
Geography of TRavel, Interests, Places and Social ties

Part 1. People Part 2. Activities Part 3. About you **Part 4. Santa Barbara** Part 5. Places

Now, we would like to gain an understanding of your views about Santa Barbara.

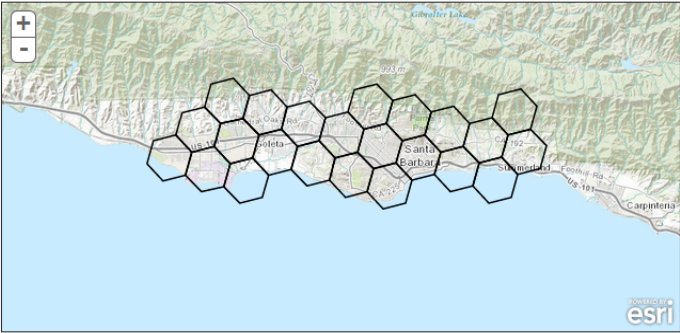
For the following questions about Santa Barbara, please rank each area with a number from -3 to 3.

-3 (strongly disagree)  3 (strongly agree)


Indicate how much you agree or disagree to the statement

I am very familiar with this area of Santa Barbara.

Click [here](#) for help remembering how to use the map.



CONTINUE
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Santa Barbara GeoTRIPS

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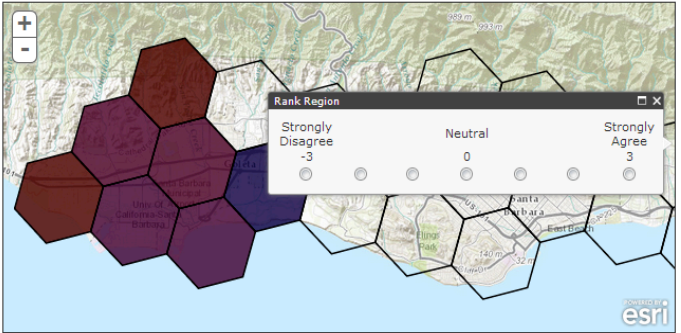
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CONTINUE
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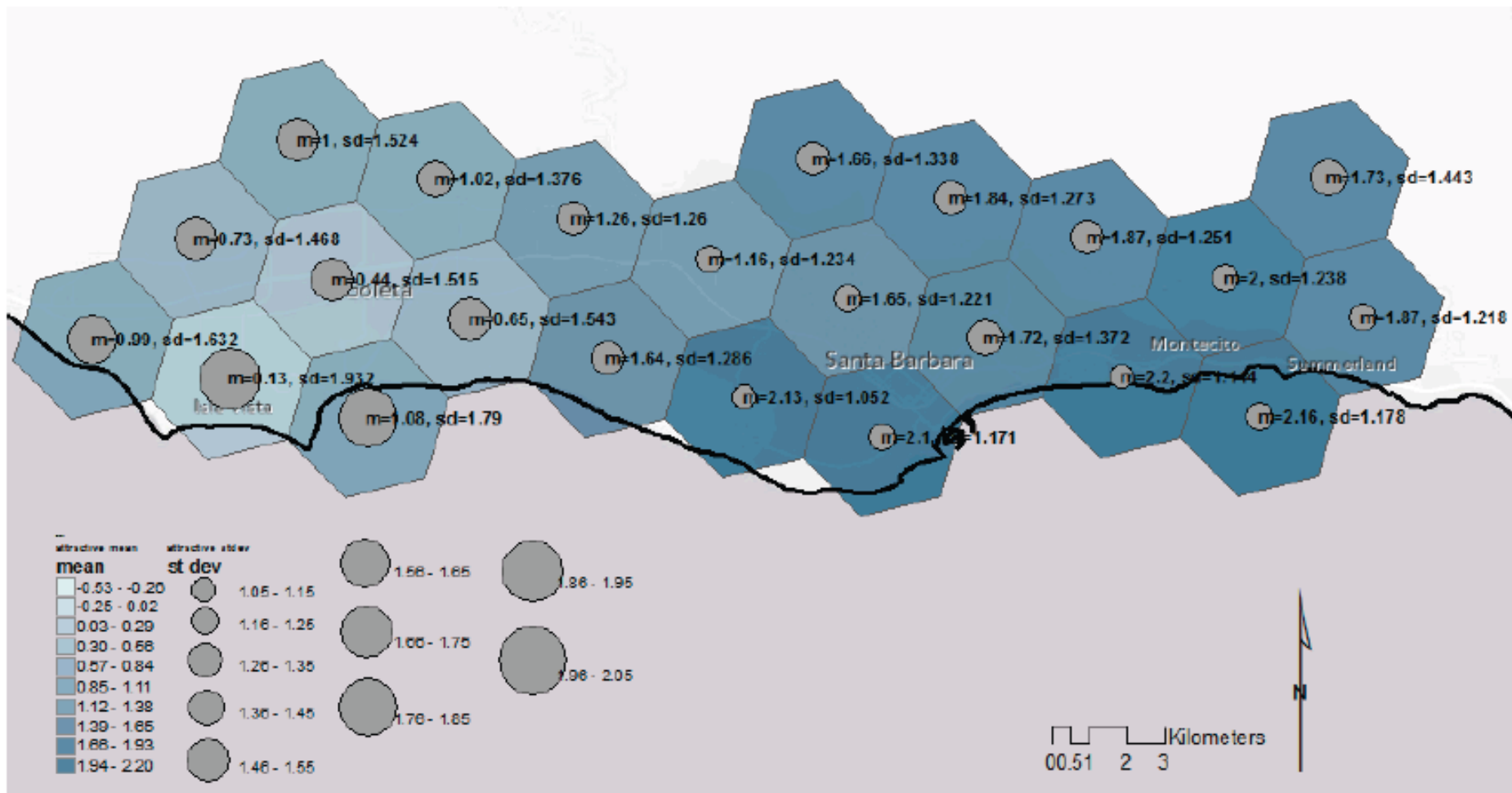
Variable	County Population	Study Area Population	Sample
Gender	Female: 49.8%	Female: 49.4%	Female: 57.6%
Years in house			Mean: 9.67 Standard Deviation: 7.84
Age	Median: 33.6	30-34 years	Median: 49 years
Household income	Median: \$61,896	Median: \$50,000-\$74,999	Median: \$50,000-59,999
	Less than \$10,000 5.00%	0 - \$9,999 6.10%	Less than \$10,000 5.88%
	\$10,000-\$14,99 4.50%	\$10,000-\$24,999 13.06%	\$10,000-\$19,999 4.63%
	\$15,000-\$24,999 9.20%	\$25,000-\$34,999 8.12%	\$20,000-\$29,999 4.99%
	\$25,000-\$34,999 9.10%	\$35,000-\$49,999 11.90%	\$30,000-\$39,999 8.20%
	\$35,000-\$49,999 12.80%	\$50,000-\$74,999 17.80%	\$40,000-\$49,999 8.73%
	\$50,000-\$74,999 18.60%	\$75,000-\$99,999 11.18%	\$50,000-\$59,999 9.27%
	\$75,000-\$99,999 12.10%	\$100,000-\$149,000 15.28%	\$60,000-\$69,999 8.91%
	\$100,000-\$149,999 15.40%	\$150,000-\$199,999 7.93%	\$70,000-\$79,999 13.37%
	\$150,000-\$199,999 6.70%	\$200,000 or more 8.63%	\$80,000-\$89,999 4.81%
	\$200,000 or more 6.70%		\$90,000-\$99,999 4.46%
			\$100,000-\$109,999 5.70%
			\$110,000-\$119,999 2.14%
			\$120,000-\$129,999 2.50%
			\$130,000-\$139,999 1.78%
			\$140,000-\$149,999 2.14%
			\$150,000 or more 12.48%
Households w/ children	33.9%	25.0%	25.1%
Household members	Mean: 2.86 persons	2.57	Mean: 2.69 persons
Size	423,895	84,475	561



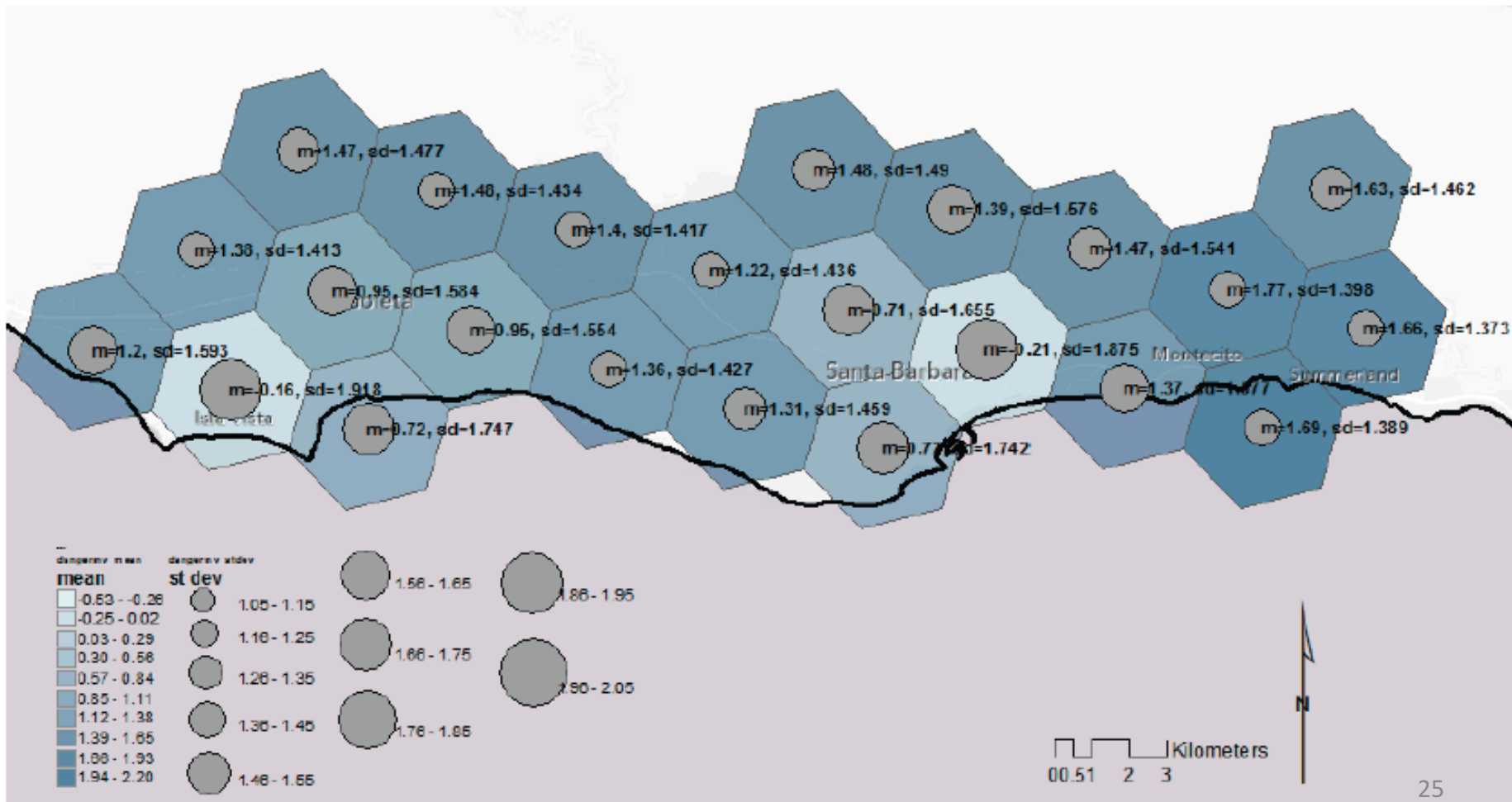
For each hexagon (isotropic tessellation)

- This is an attractive area of Santa Barbara
- This is a dangerous area of Santa Barbara
- This area provides me with a lot of opportunities to do things I like to do
- I am very familiar with this area of Santa Barbara

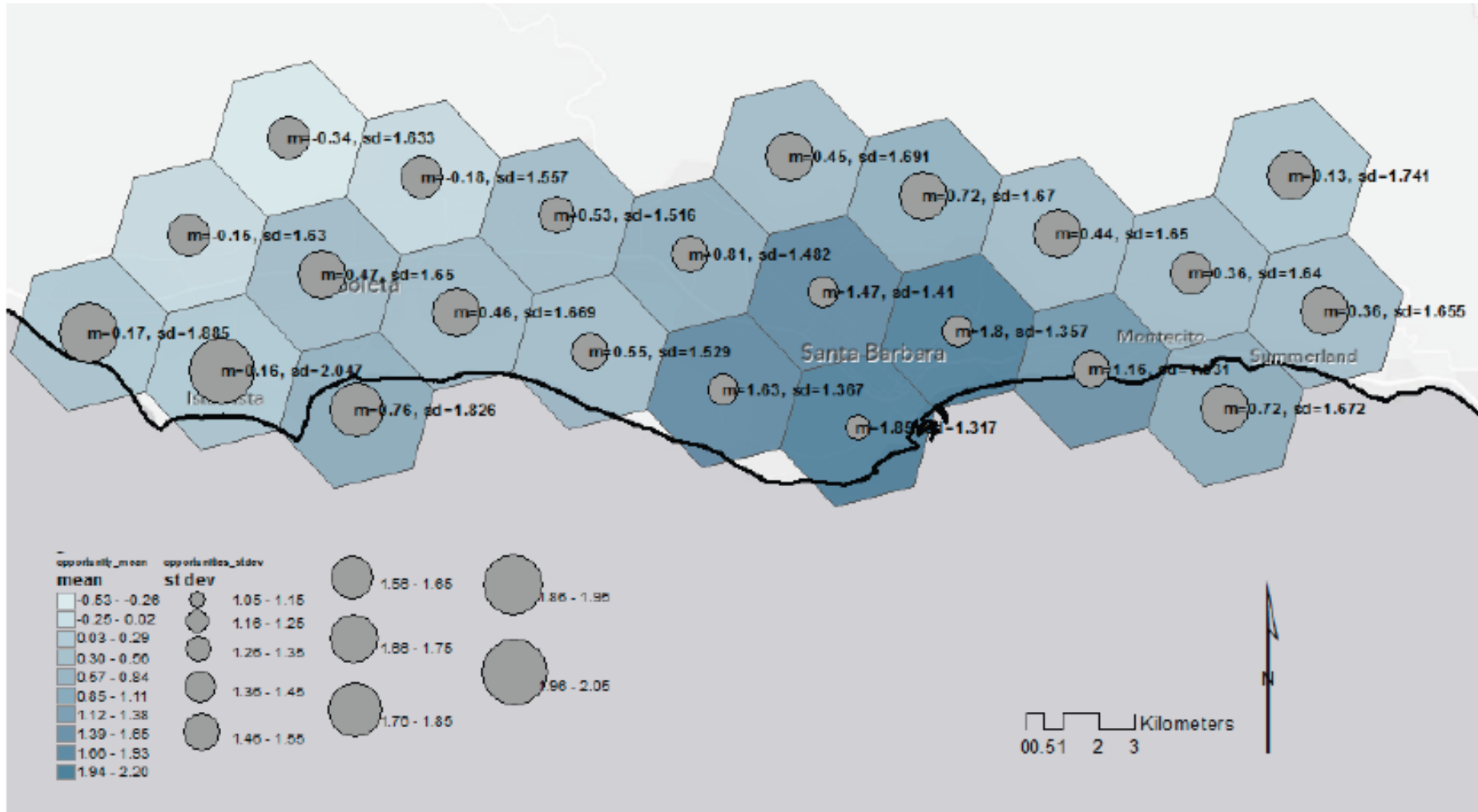
Attractiveness



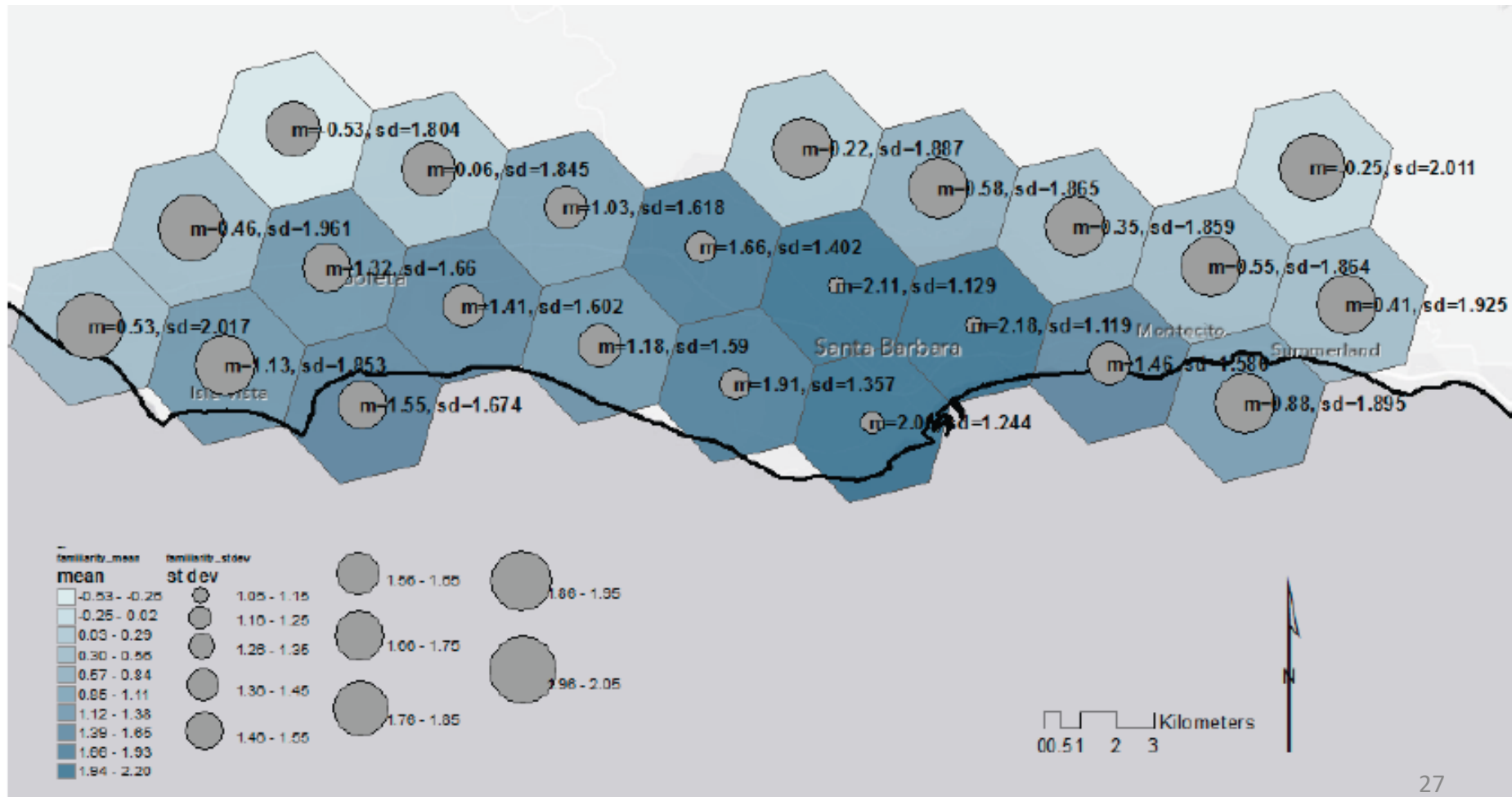
Danger



Opportunities

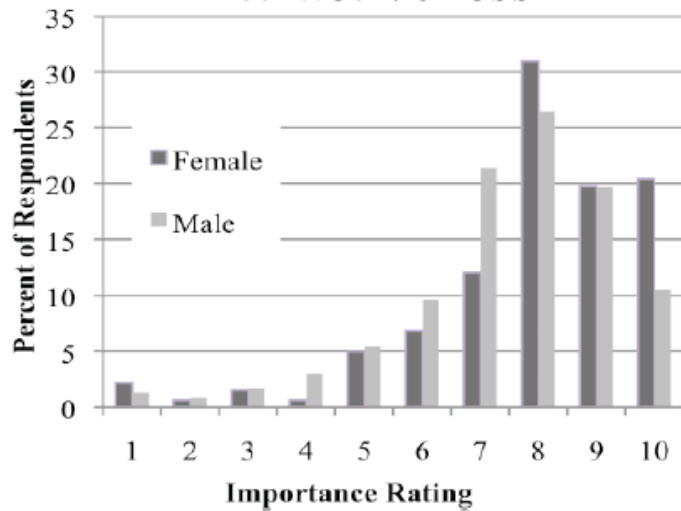


Familiarity

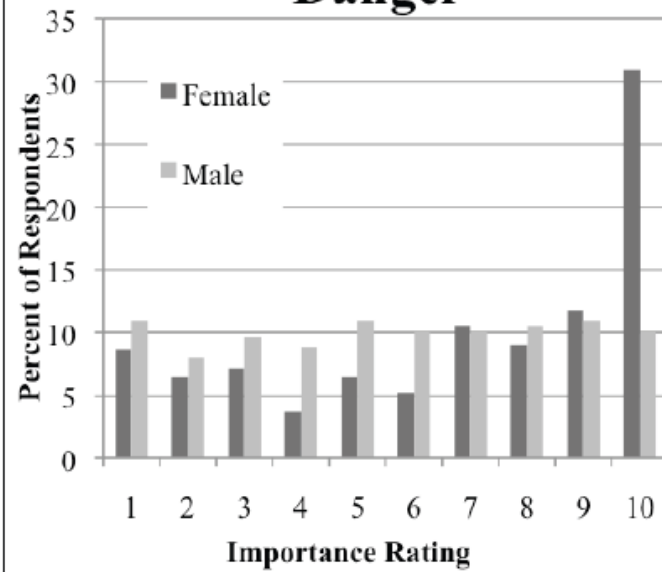


Stated Importance

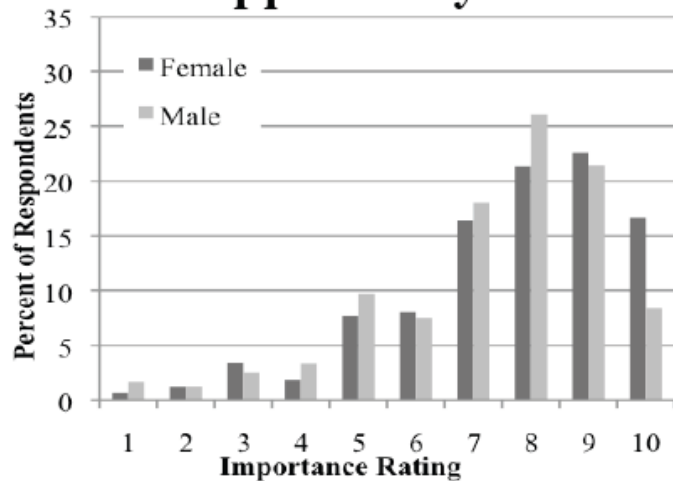
Attractiveness



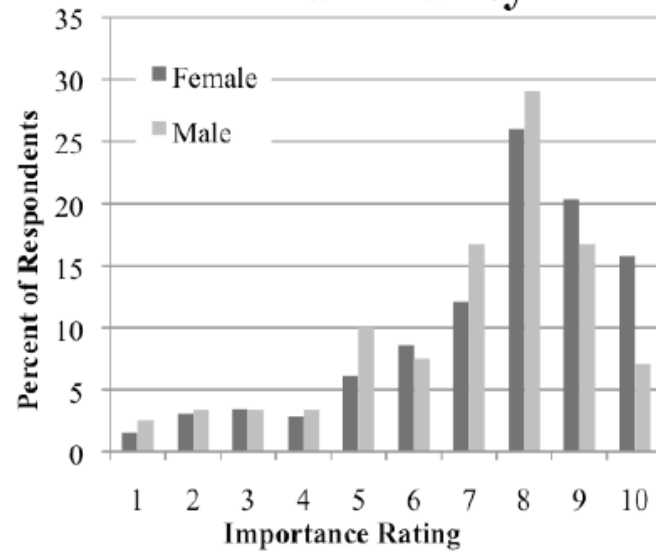
Danger



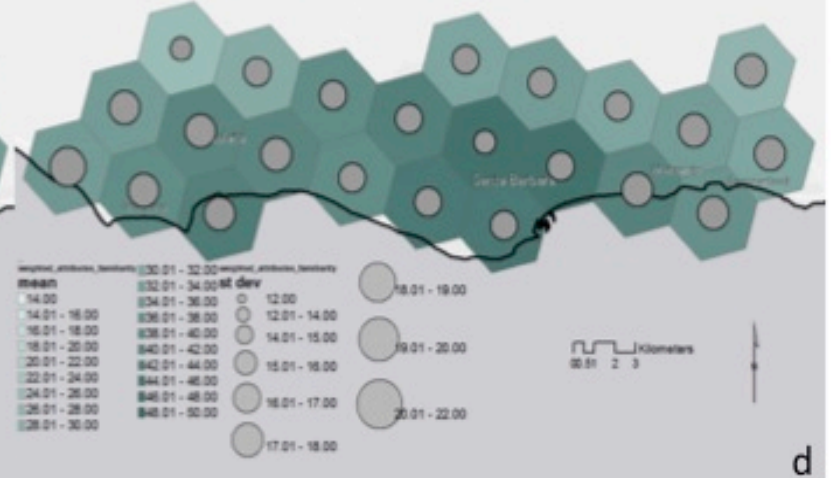
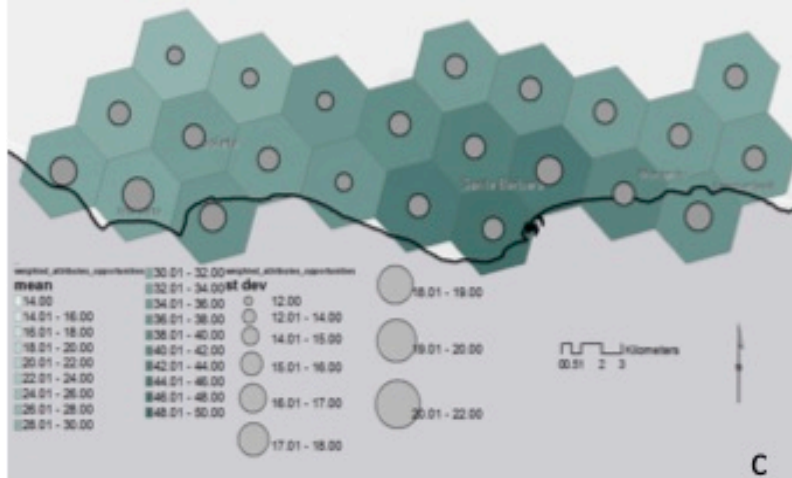
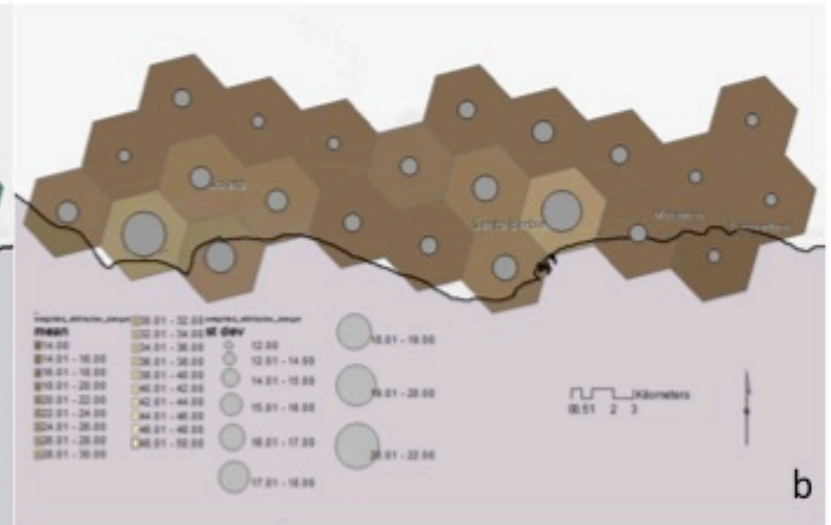
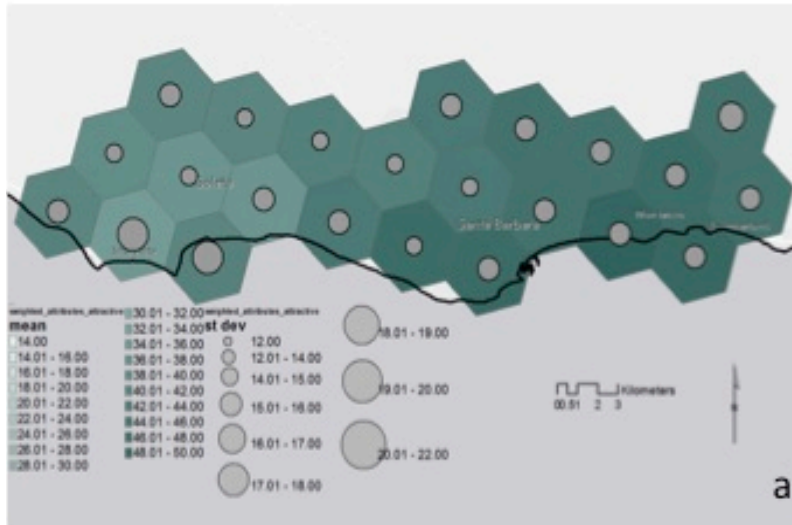
Opportunity



Familiarity

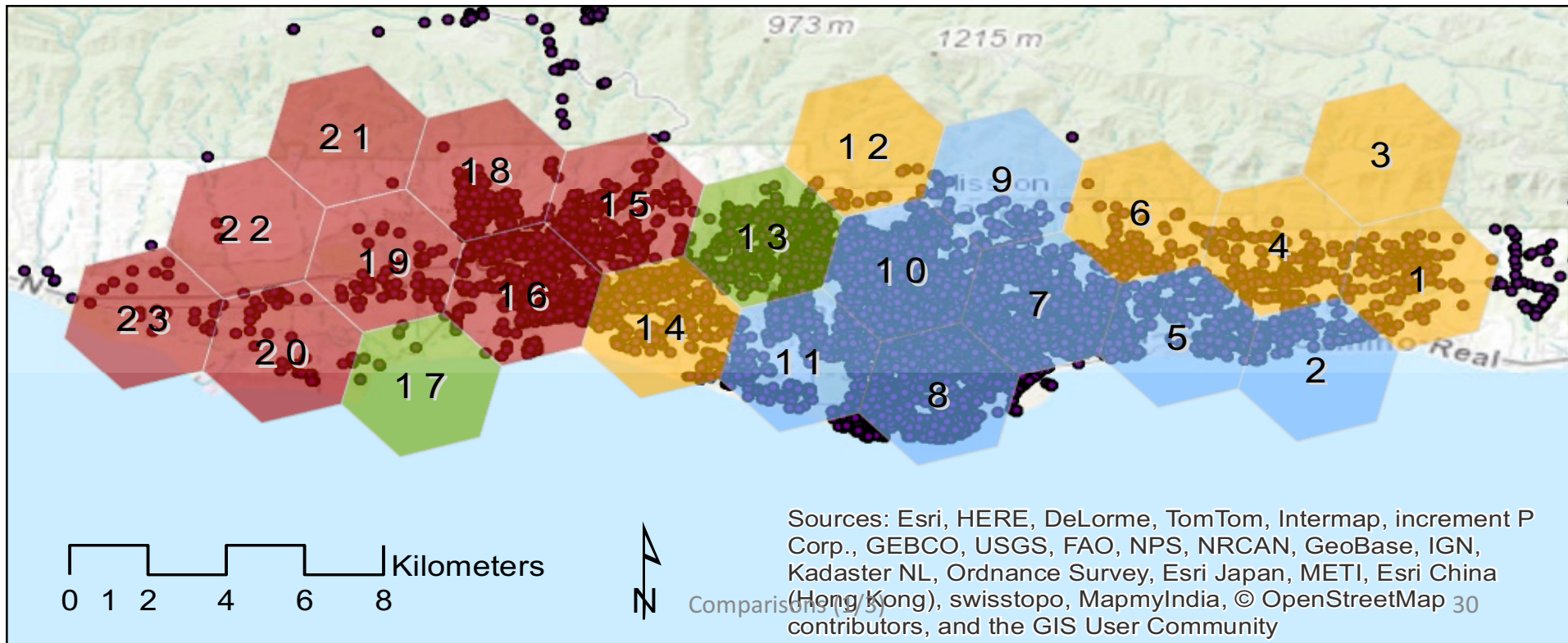
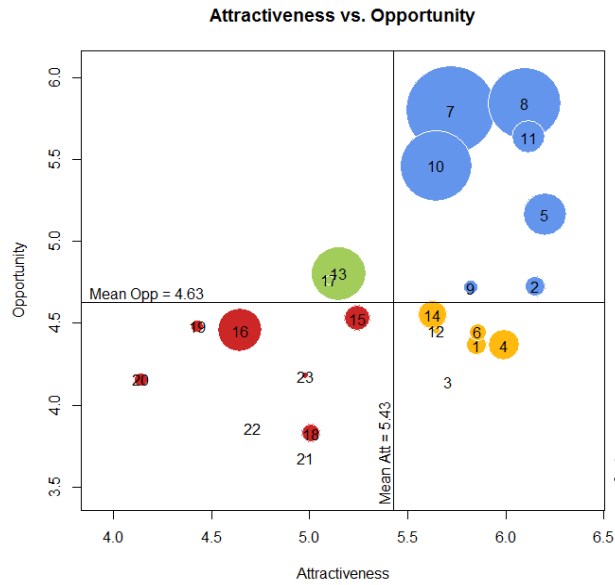


Weighted Attitudes by Importance

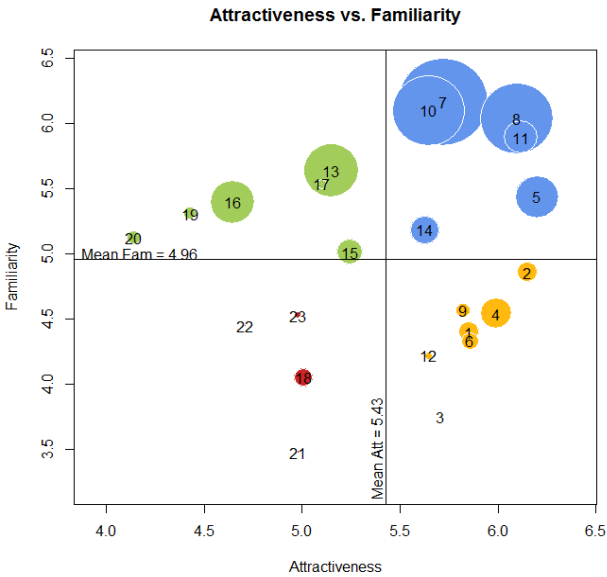


Attractiveness & Opportunity

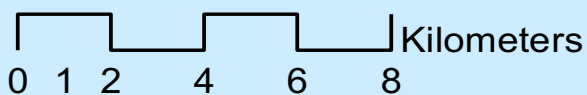
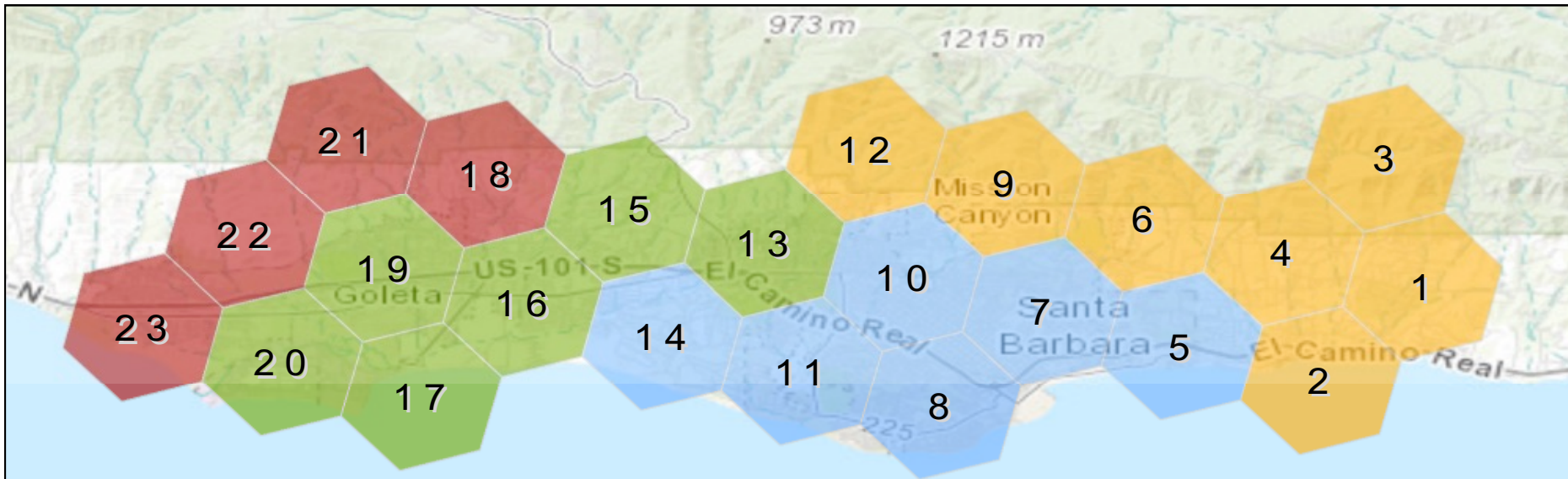
Size of circles shows the number of business establishments



Attractiveness & Familiarity



Size of circles shows the number of business establishments



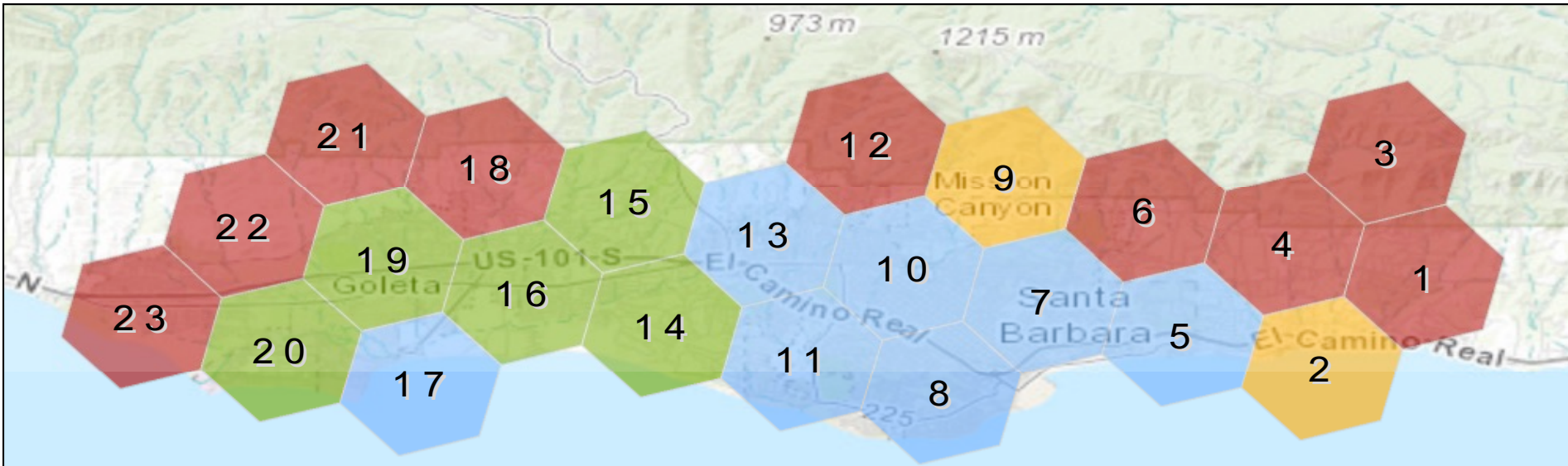
Comparisons (2/3)

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community³¹

Opportunities & Familiarity

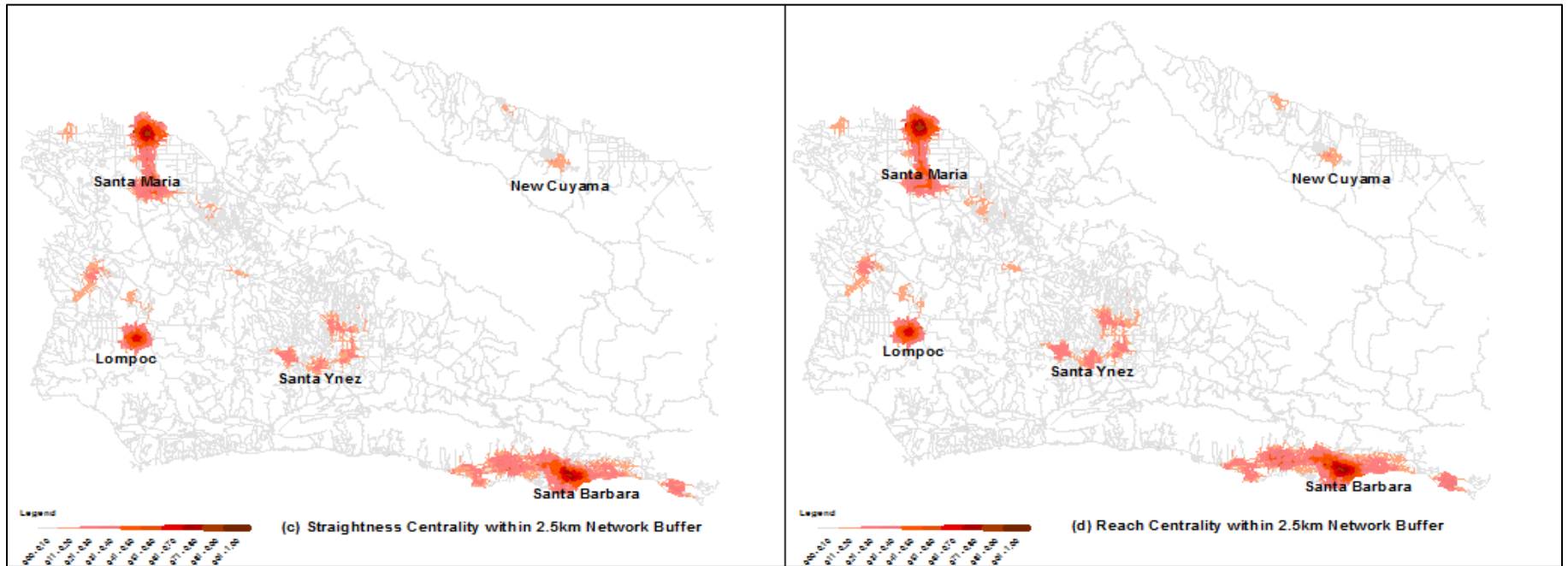


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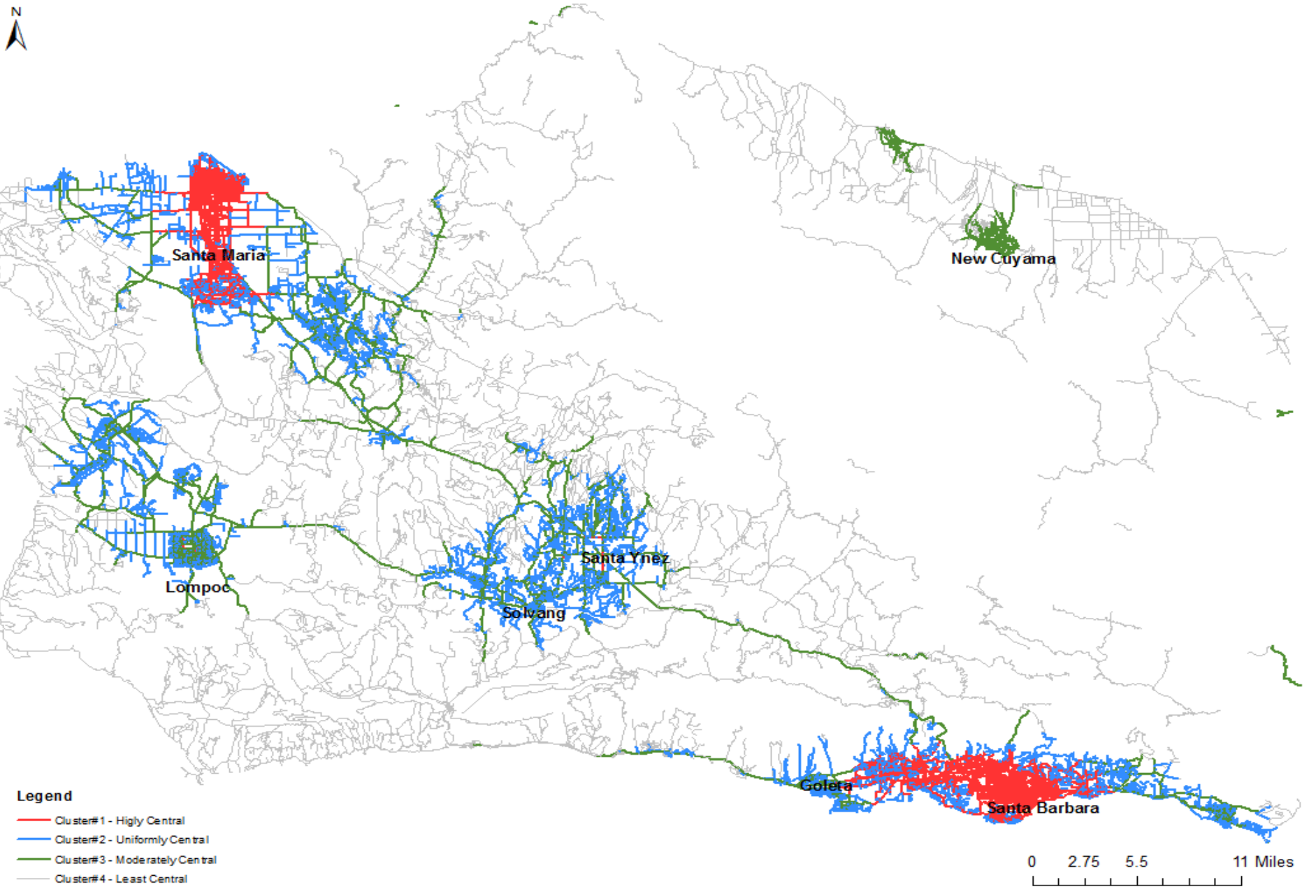


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Link-based Network Centrality vs Perception

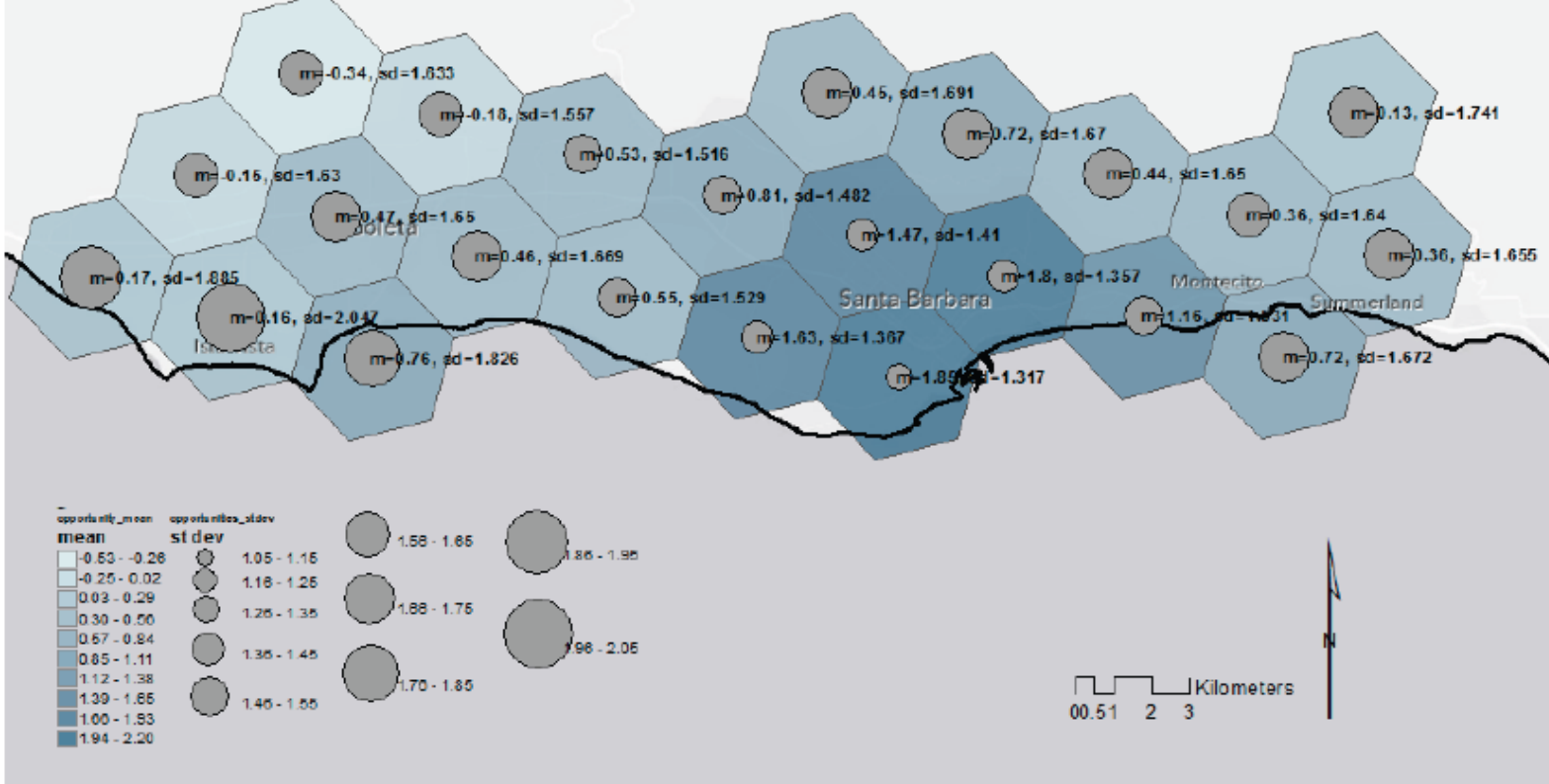


Centrality conceptually identifies Links on a network that belong to shortest paths from any origin to any destination



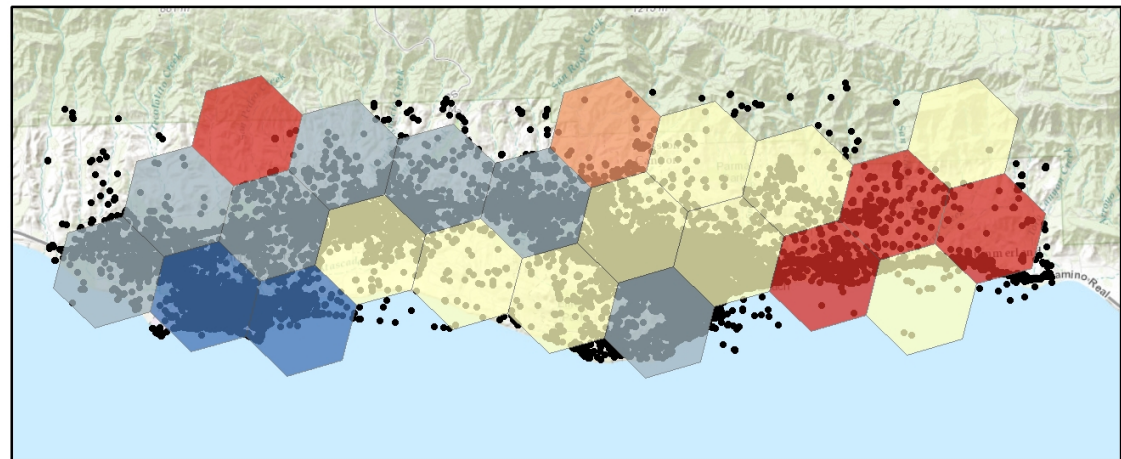


Perception of Opportunities



Tweet Happiness (user-based)

Word	Rank	Average
Laughter	1	8.50
Happiness	2	8.44
Love	3	8.42
Sincere	500	7.10
Social	1,996	6.22
Random	7,121	5.02
Par	7,200	5.00
Emotional	8,752	4.42
Bieber	8,899	4.28
Strike	9,207	3.96
Earthquake	10,187	1.90
Terrorist	10,222	1.30



Average Happiness

5.93 - 6.00

6.01 - 6.10

6.11 - 6.30

6.31 - 6.35

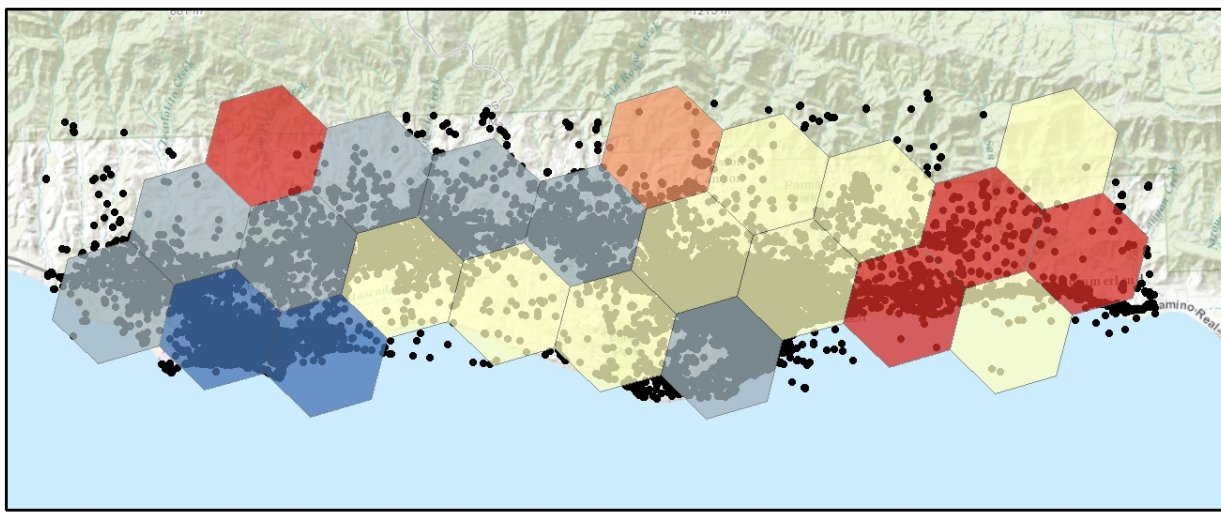
6.36 - 6.46

• Tweet Location



Word list and basic methods from:

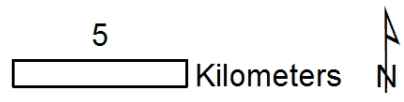
Mitchell, L., M. R. Frank, K. D. Harris, P. S. Dodds, and C. M. Danforth. The Geography of Happiness: Connecting Twitter Sentiment and Expression, Demographics, and Objective Characteristics of Place. PLoS ONE, Vol. 8, No. 5, May 2013.



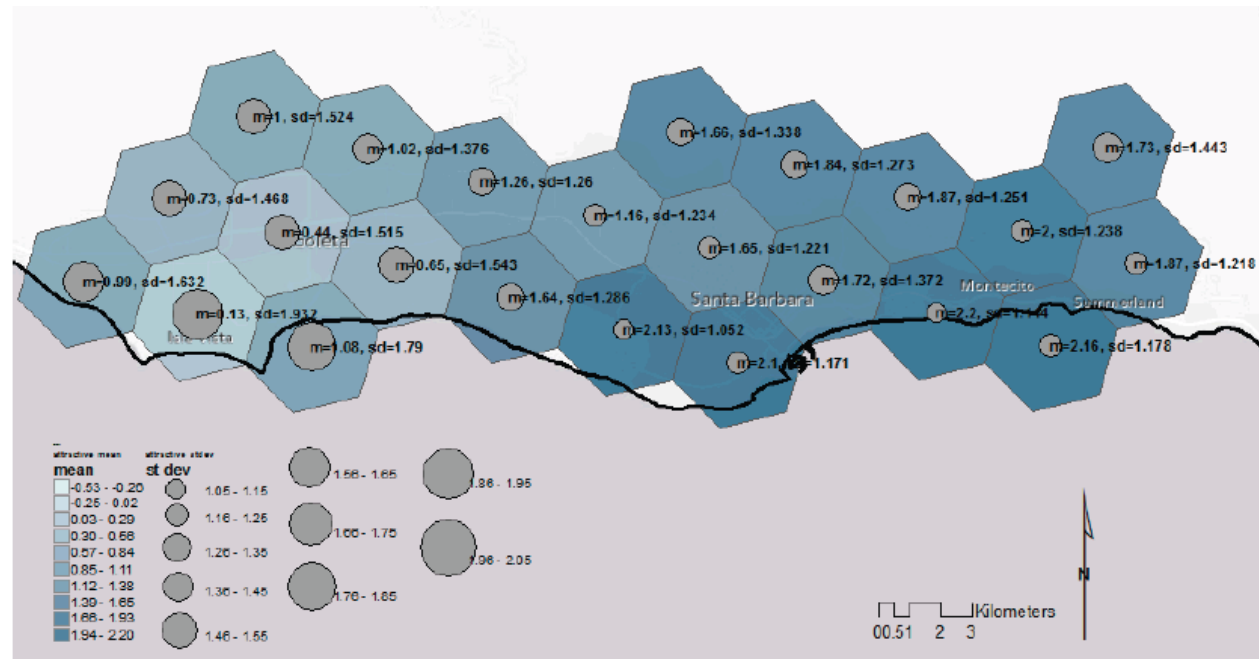
Tweet happiness

Average Happiness

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- 6.11 - 6.30
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- 6.36 - 6.46
- Tweet Location

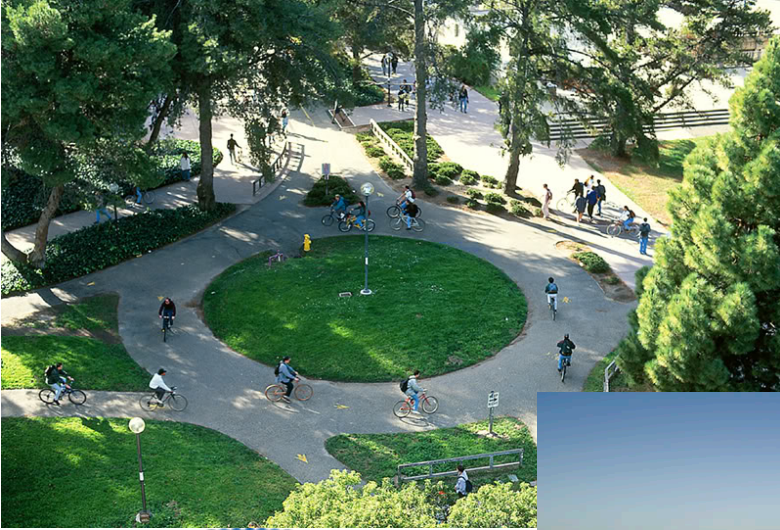


GeoTrips Survey attractiveness



Big (and useful) Data

- Networks are Big Data
- Tweets are Big Data
- Combination with a geospatial survey completes the place perception analysis from three different viewpoints
- Same reference to locations/spaces/places is the linking of all these sources of information
- Building models with stats that combine the data from all sources is another way to link them



Next Simagent