REAL-WORLD SOLUTIONS WITH GEODESIGN

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Geodesign Summit

25 January, 2018

Outline

- My vision for spatial
- B.S. in Geodesign
- Building a geodesign community
- **Julian Herren**
  - SunSmart Program
  - Innovative shade structures
- **Benjamin Friedman**
  - Studio One Eleven
  - Mall urbanization suitability study
- Problems and opportunities
- Future plans
- Questions

Leadership

Collaborations

Health

Computation

Maps

Geodesign

Ecosystem Services

Human Security

Geospatial Intelligence

Sustainability

Global Studies

Data Science

Students

Outcomes

My vision

- The spatial sciences include all of the different ways in which **location** may be used to organize, represent, store, analyze, model and visualize information
- The spatial sciences can be thought of as an **enabling** discipline, much like statistics

Spatial sciences

Poverty
Obesity
Cancer
Climate Change
Food Security
Water Security
Terrorism
Cyber Security
Aging
Dementia
Social Justice

Wicked problems

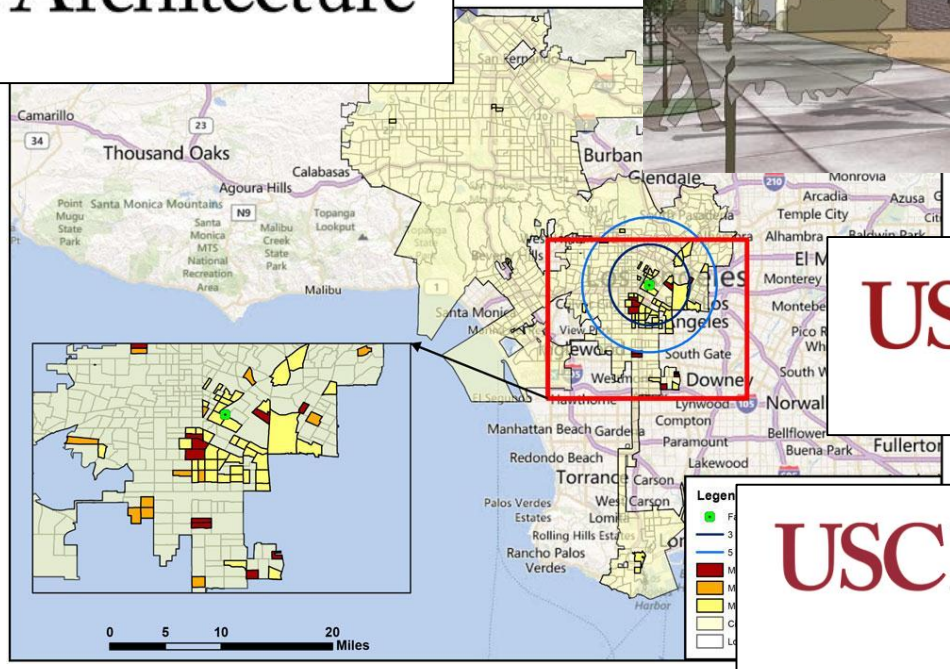
Academic disciplines (use cases)

Agronomy	Economics	Oceanography
Archaeology	Epidemiology	Political Science
Architecture	Geography	Soil Science
Civil Engineering	Geology	Zoology

Location | Power of Place | Science of Where | Spatial Thinking | Spatial Turn

B.S. in Geodesign

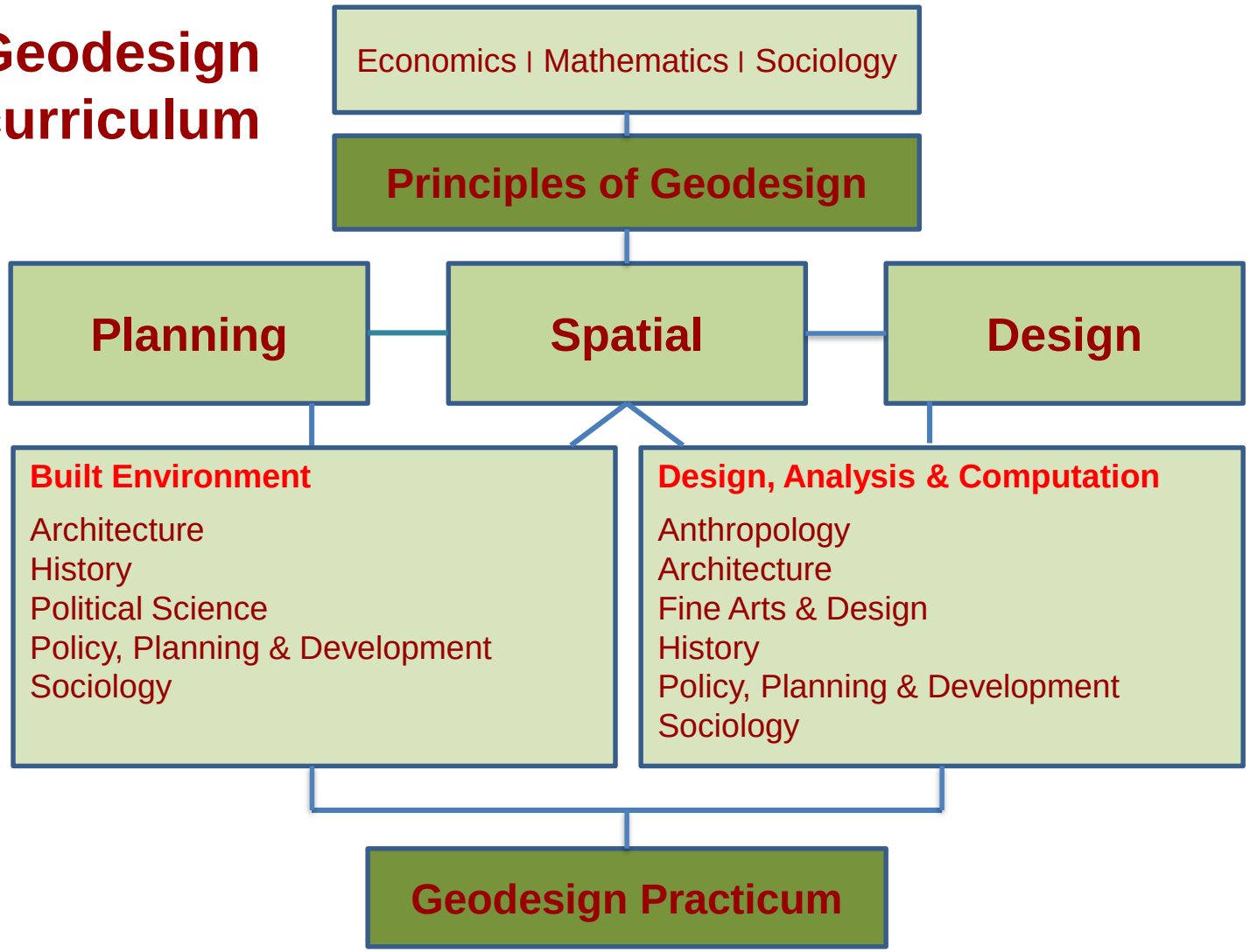
USC School of Architecture



USC Price
Sol Price School of Public Policy

USC Dornsife
Dana and David Dornsife
College of Letters, Arts and Sciences

Geodesign curriculum



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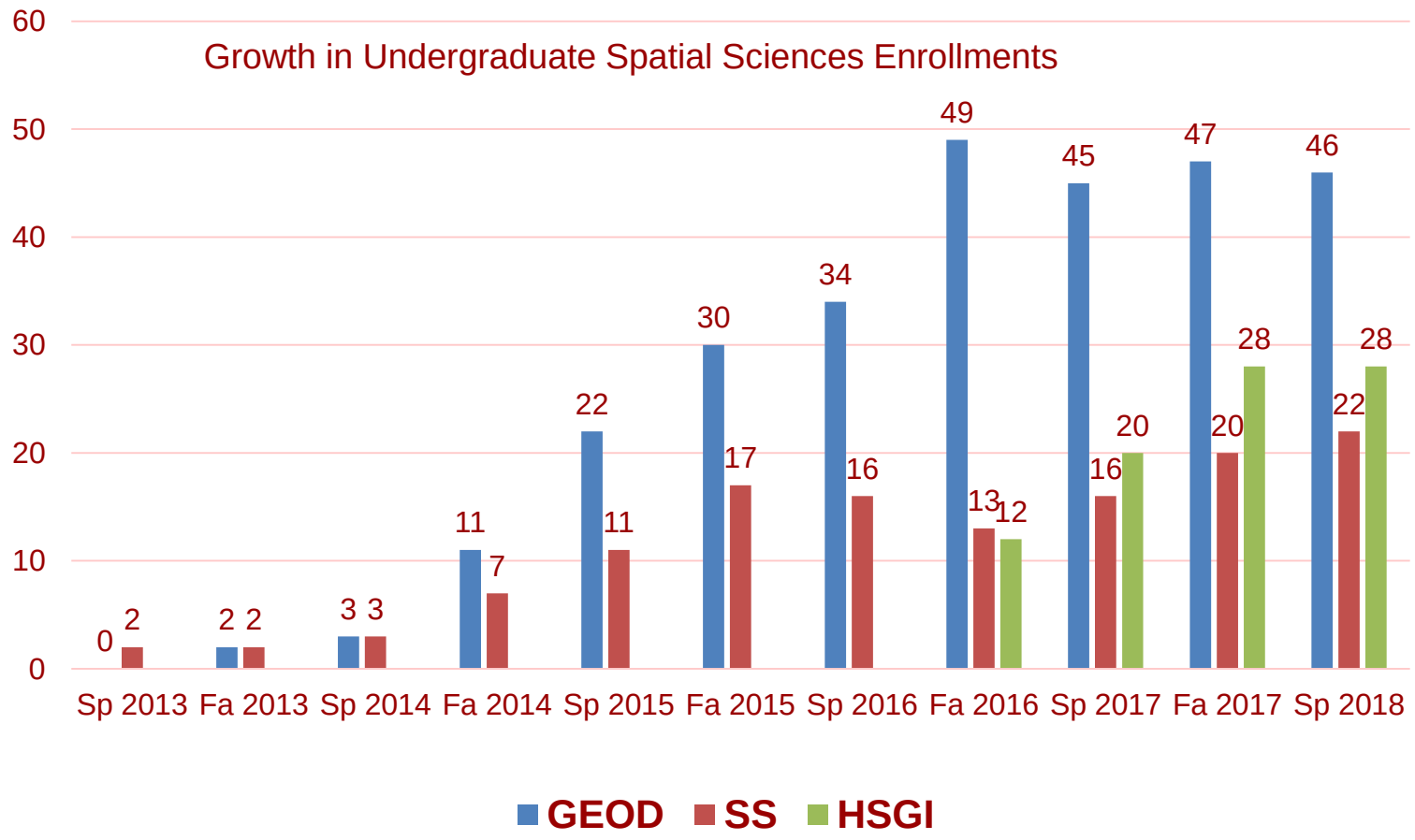
Geodesign core

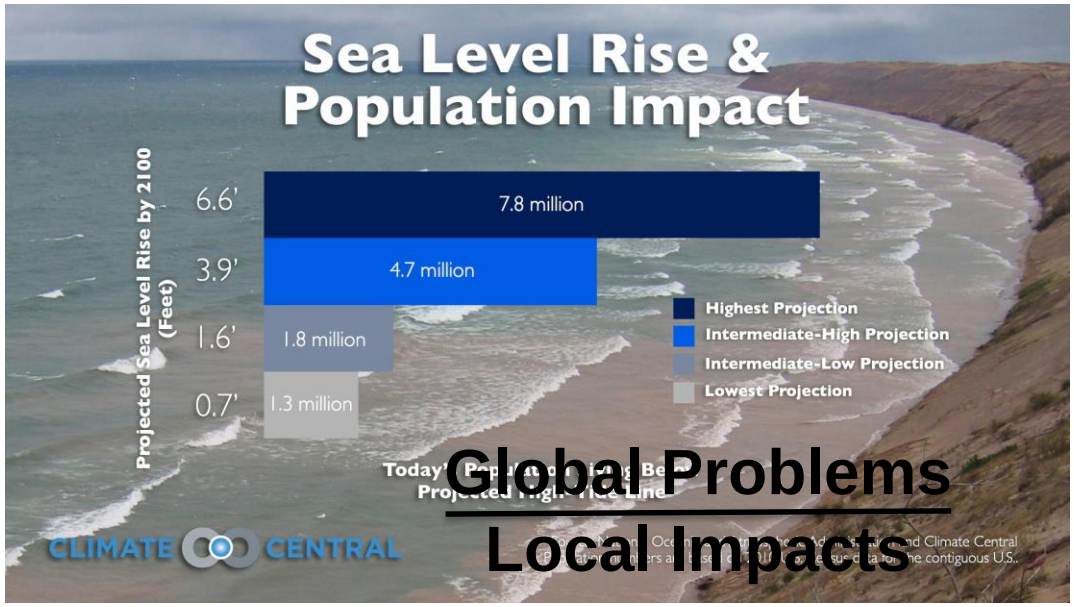
Foundation	SSCI 201 – Principles of Geodesign
Planning	PPD 227 – Urban Planning and Development RED 417 – History of Planning and Development RED 425 – Designing Livable Communities
Spatial	SSCI 301 – Maps and Spatial Reasoning SSCI 382 – Principles of Geographic Information Science SSCI 383 – GIS Modeling and Customization
Design	ARCH 203 – Visualizing and Experiencing the Built Environment ARCH 303 – Principles of Spatial Design I ARCH 303 – Principles of Spatial Design II
Capstone	SSCI 412 – Geodesign Practicum

Student response



Geodesign "value" proposition

- Focus on solutions
- Multidisciplinary character
- Multi-scale approach
- Cross-cutting (by sector)



Global Problems

Local Impacts

Spatial Mismatch Problem

Building a geodesign community

- Study abroad opportunities
- Brown bags
- Networking opportunities
- **Research opportunities**
- **Internship opportunities**

"Age-Friendly LA: A USC Provost's Wicked Problems Practicum"

Dr. Jennifer Swift
Associate Professor (Teaching), Spatial Sciences Institute

Tuesday, April 17, 2018 at 12:30 - 1:30 pm
https://bluejeans.com/217638857

Spatial Sciences Institute

Spring 2018 Brown Bag Speaker Series

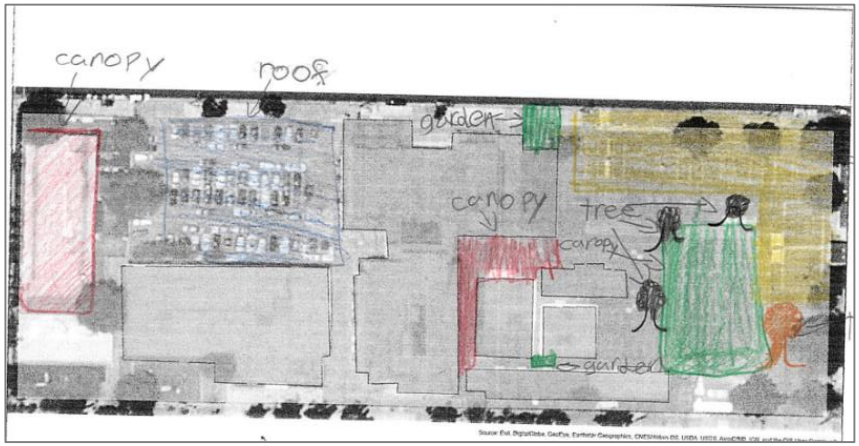
Spatial Sciences Institute Conference Room (AHF B57J)

Livestream via Bluejeans

SSCI 350: International Geodesign
Constructing a regional plan proposal for the Amstelland region, Amsterdam, the Netherlands, June 2015

SunSmart @ USC – Julian Herren

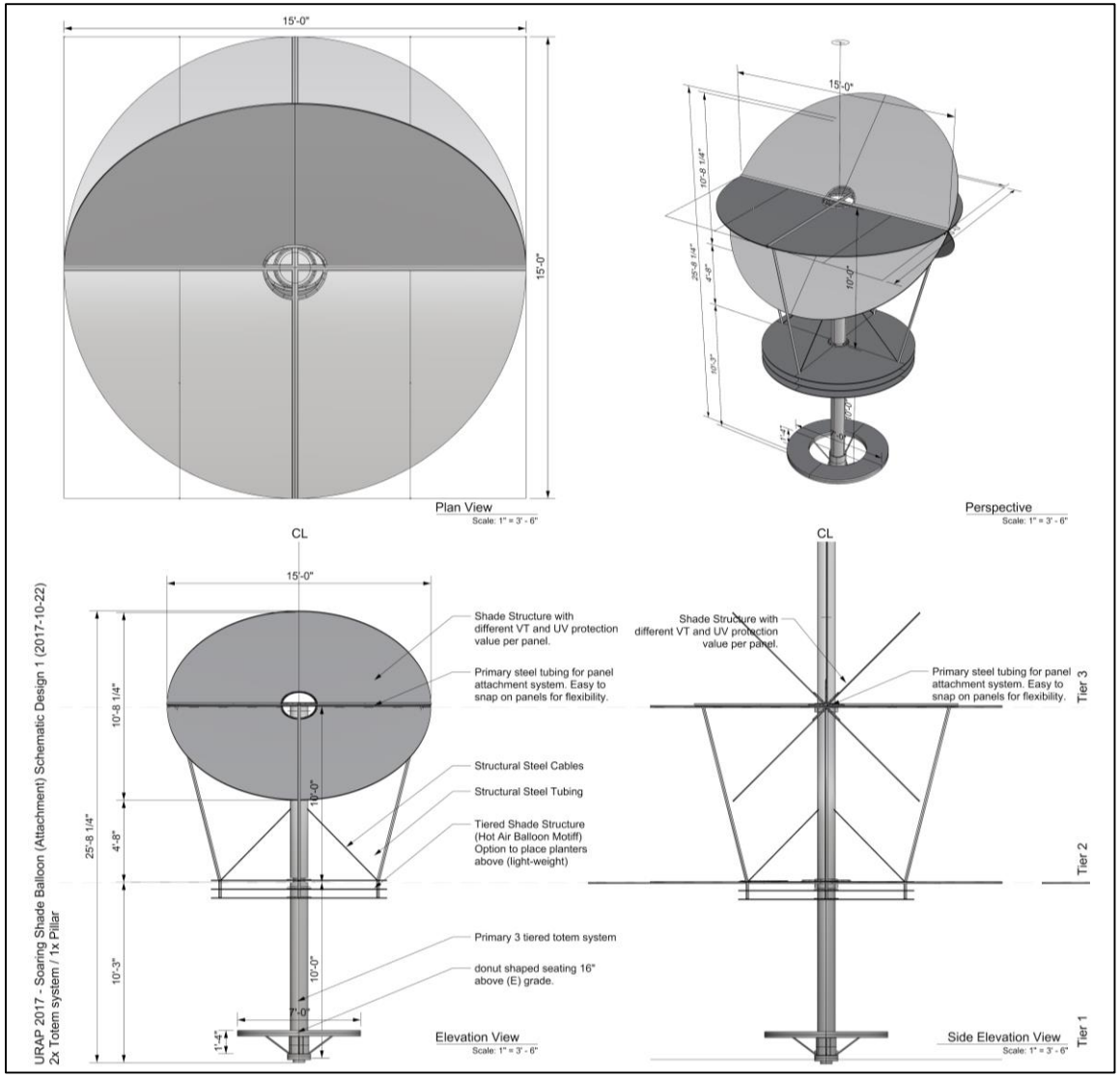
- Collaborative partnership between Spatial Sciences Institute, Keck School of Medicine, and Los Angeles Unified School District
- SunSmart & geodesign
  - Measured UV on school playgrounds
  - Mapped UV exposures
  - Proposed design alternatives
  - Presented and voted on design ideas in elementary school classes



Background and aspirations

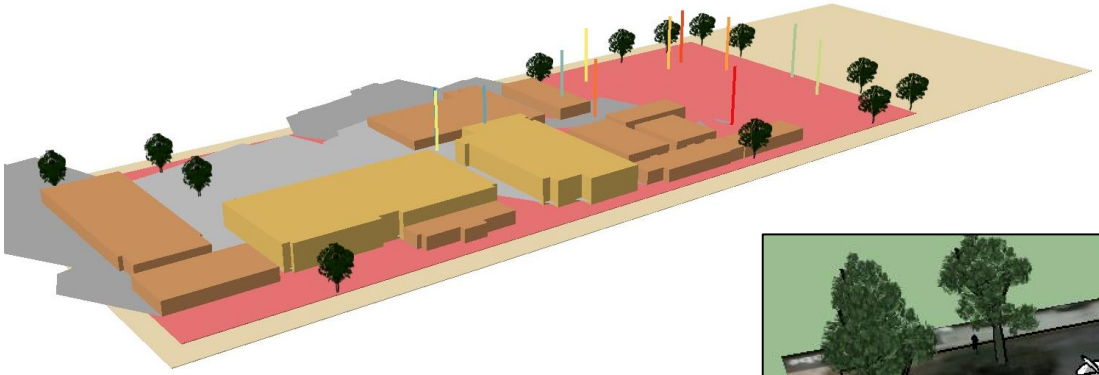
- Geodesign Senior
  - Will graduate in December, 2018
- Interned for Stantec in Santa Barbara, CA this past summer
  - Only employee with GIS knowledge
- Future plans
  - Work for Stantec as GIS Analyst in Santa Barbara, CA
  - Work in real estate development in Ventura, CA
  - Complete M.S. degree

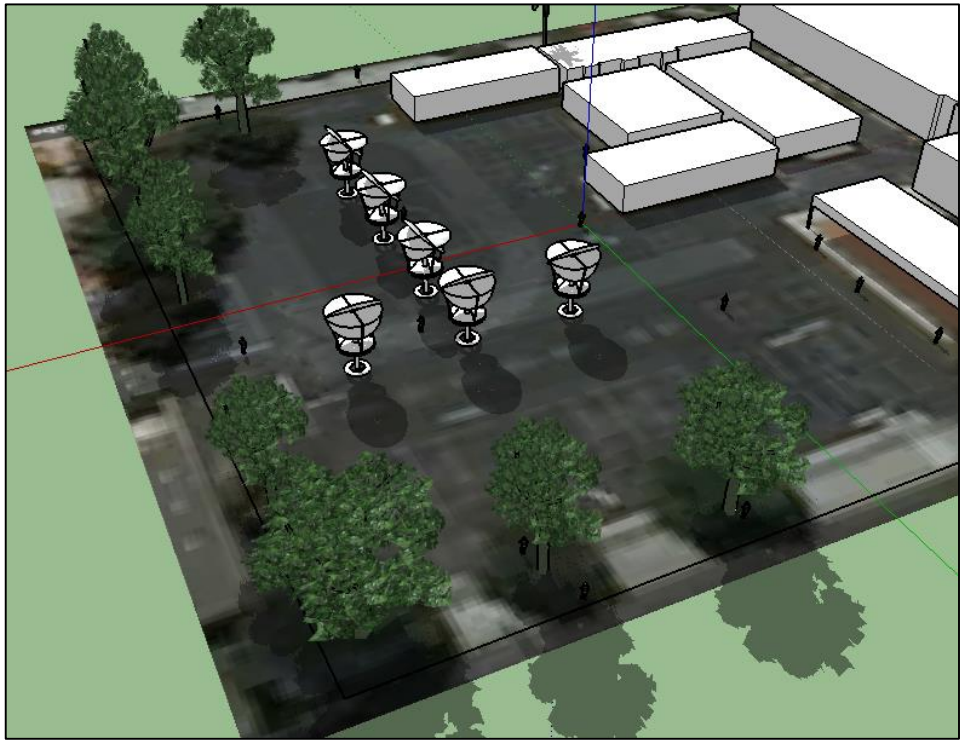
Shade structures



- Tiered system
- Rotunda canopy
- Rotating canopy
- Louvered flaps
- Network configuration
- Componentry

Work tasks and tools



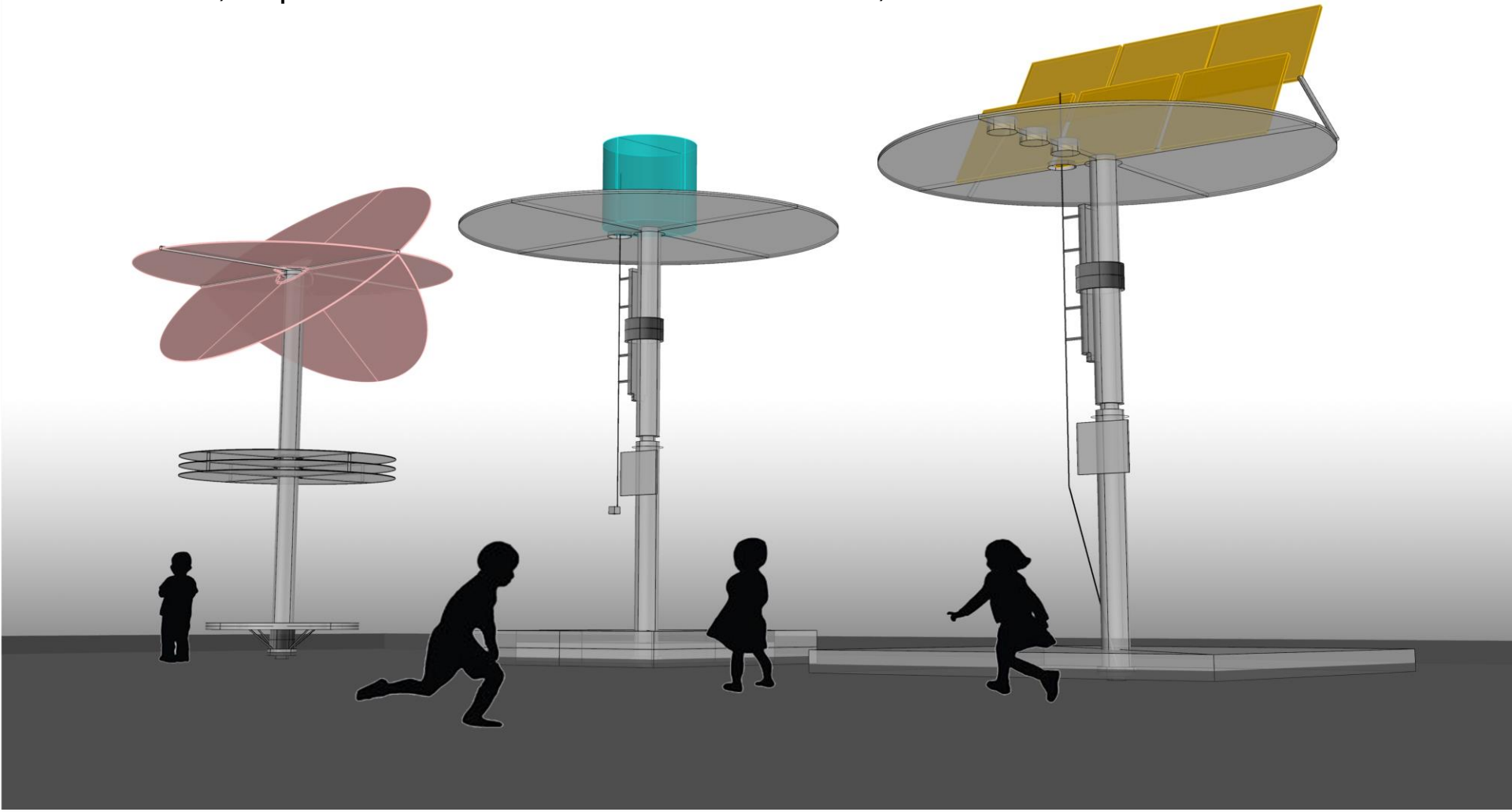


- Tools
  - ArcGIS Pro
  - ArcMap
  - GeoPlanner
  - Rhino
  - SketchUp
- Spatial interpolation of UV radiation
- 3D shade analysis
- Shade structure design

Outcomes

- Unique research opportunity to apply the geodesign framework
- Greater understanding of how to approach a design project
- Opportunity to utilize various skills learned throughout my time at USC
- General goal of improving the livability and academic environment for young children

Acknowledgements
USC Undergraduate Research Associates Program, National Institutes of Health, National Cancer Institute, Department of Health and Human Services, and the Center for Disease Control



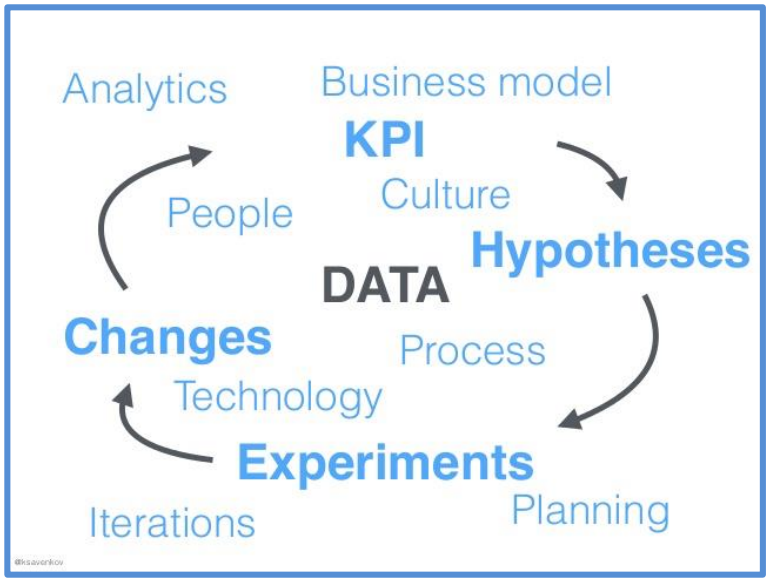
Benny Friedman – Geodesign internship

- Interned at Studio One Eleven, a Long Beach, CA architecture, urbanism and landscape design practice as part of their urban design team
- Summer Projects
  - Climate action plans
  - **Urban mall retrofits**
- Current Projects
  - Activity studies
  - Data processing tasks

Creating more livable, sustainable & engaging cities

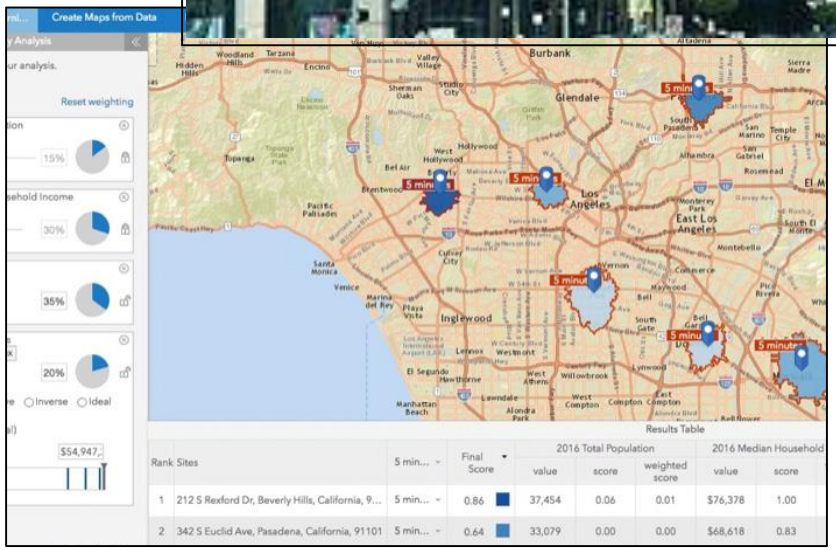
Background and interests

- Geodesign major (junior)
- Human Security & Geospatial Intelligence minor
- Primarily work on projects for social good
  - **Carbon offset credits**
  - Social Network for Teens who have lost a parent
- **Really excited about:**
  - **Bringing more data and analytics into urban planning**
  - Bringing more science into geodesign



Mall urbanization suitability study

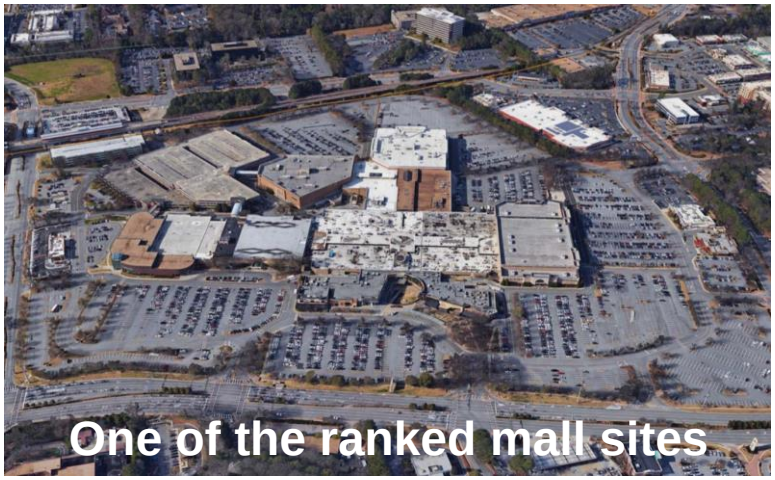
- Analyzed 50 malls for urbanization readiness
- Created metrics to assess good urbanization characteristics
  - Ratio of high-paying jobs to numbers of residents
  - Total population within a 10 minute drive
  - Medium household income within a 10 minute drive
- Used Business Analyst to source the data



Mall urbanization suitability study (cont.)

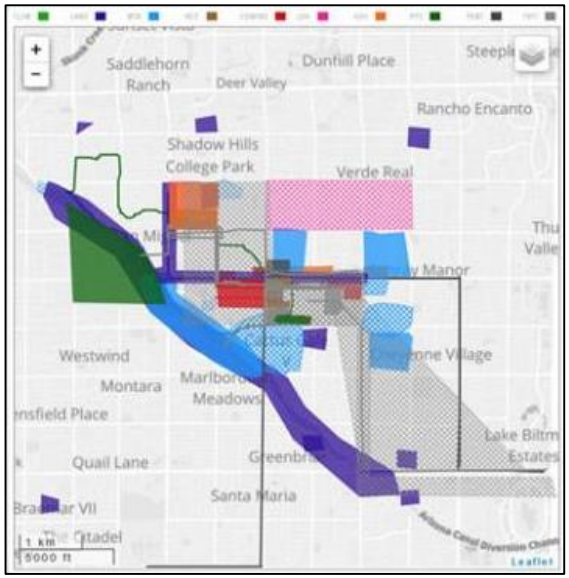
- Completed a multi-criteria analysis with the Definite decision support software tools
- The outcomes included:
  - A ranked list of what malls would be most successful reimaged as a mixed use downtown
  - My approach produced a very similar result to that of the design team but in a much shorter time
  - The client ended up hiring Studio One Eleven to retrofit some of the malls in the ranked list


The Bloc – TOD in Los Angeles


One of the ranked mall sites

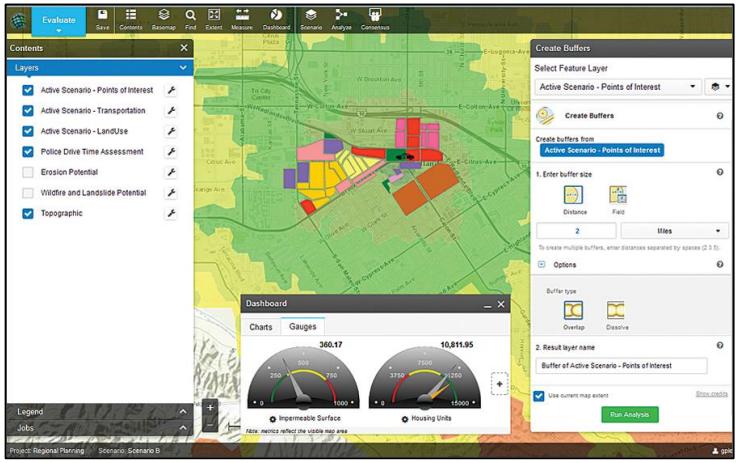
Looking forward …

- My journey so far …
  - Urban design classes
  - Planning & real estate classes
  - Spatial science classes
  - The ideas and tools introduced in these classes was leveraged to support my work with Studio One Eleven
- **Next steps …**
  - **Digging into the importance of data driven iteration and evaluation for urban design**
  - **Learning more about geospatial modeling and customization**



GEODESIGN HUB

Steinitz-led workshop at Arizona State University



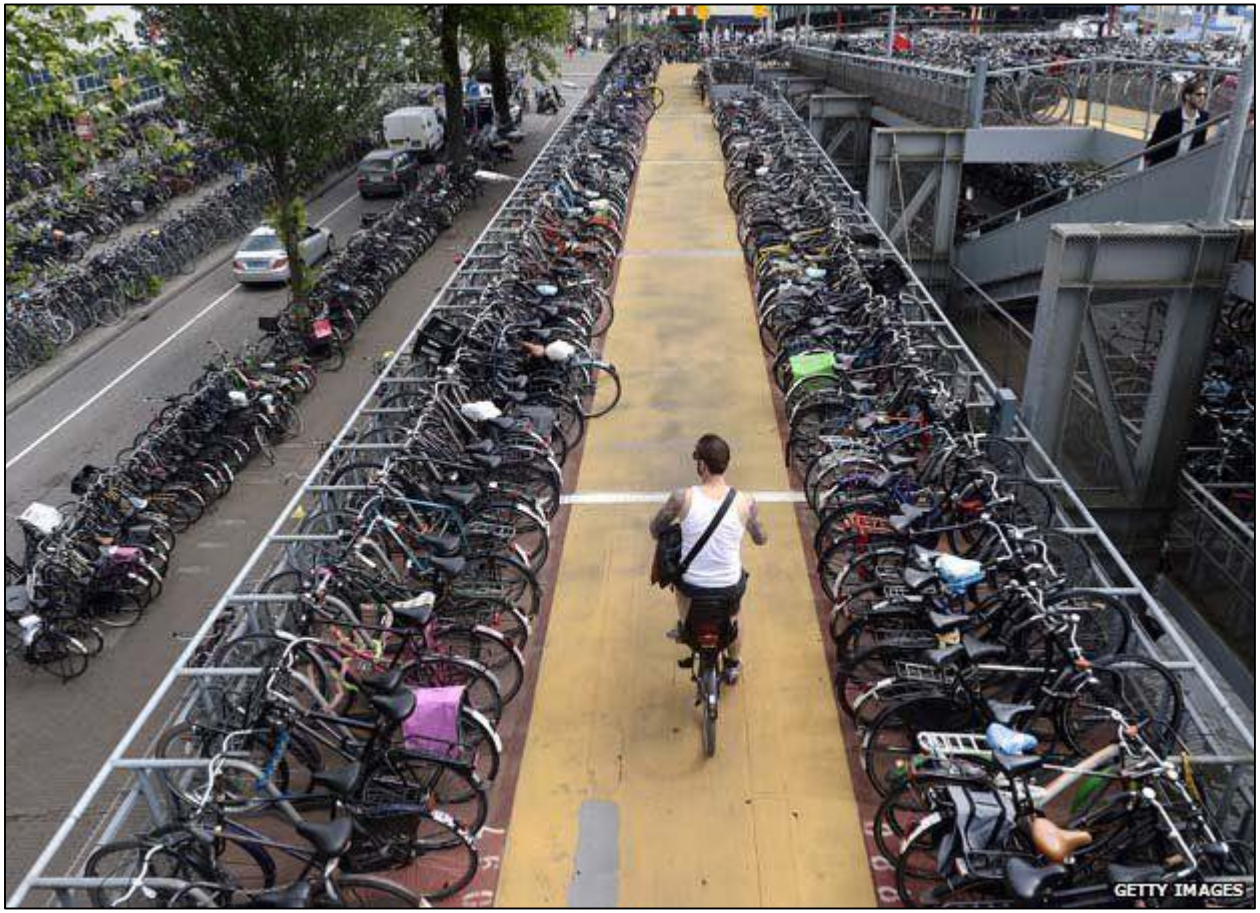
GeoPlanner for ArcGIS

Problems and opportunities | Los Angeles

Problems and opportunities | Beijing

Dreams – Turning problems into opportunities!

What would the City of Los Angeles look like if fitness was the top priority?



Bike park at Amsterdam Central Station

What's next?

Community workshops

- Develop collaborative partnerships between the city, university, & community
- Train and engage students in problem-based learning & urban revitalization efforts
- Create alternative design scenarios
- Demonstrate value of geodesign methods & tools

B.S. in Global Geodesign

- Three partners
  - Free Univ. of Amsterdam
  - Peking University
  - Univ. of Southern California
- Common curriculum
- Virtual and face-to-face collaborations
- Students spend one semester at each of the other two institutions

Taylor Yard G2 Geodesign Workshop

Design team discussing proposed intervention for Taylor Yard site: Coby Cohen (GEOD grad), Brian Sims (Esri), Joanna Wang (Esri intern; GEOD major), Benny Friedman (GEOD major), Danny Kradjian (USC Grad & Real Estate Developer), and Fangwu Wei (ASU Postdoc)

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