Planning Education and Digital Evolution: Experience at Columbia University

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M.S. Urban Planning

- PAB accredited, 2-year program with 60 points

- Core requirements: 27 (courses, studio, thesis/capstone)

- Electives: 33 points
  - At least 12 points in a concentration
  - Electives may be taken across GSAPP and Columbia

- 4 Concentrations
  - Built environment
  - Community and economic development
  - International planning and development
  - Urban analytics

- Part-time option
  - 2 year FT or 4 year PT experience prior to application
  - Up to 8 consecutive semesters (or 4 years) to complete

Urban analytics: rationales

- Central role of planning in discourse and practice around urban technology and data analytics

    - Inclusion (access)
    - Engagement (process)
    - Social justice (outcome)

- Preparation for emerging roles of planner

    - Expanding capabilities in planning profession
    - Engagement with neighboring and/or other professions

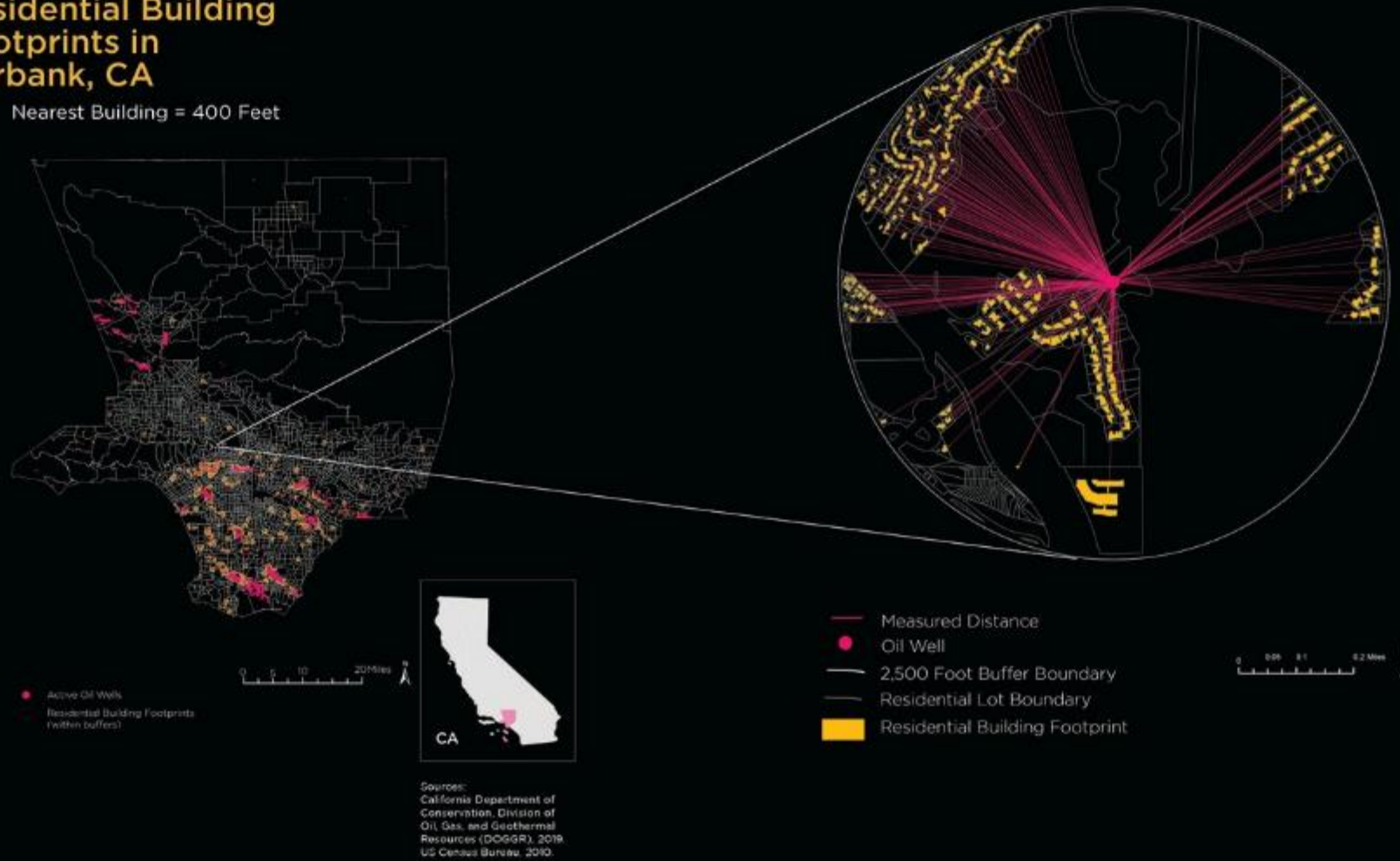# Urban analytics: learning outcomes

- Knowledge

  - Knowledge of planning and policy approaches to digital infrastructures
  - Knowledge of data management practices

- Skill

  - Ability to articulate contextual aspects of data production and limitations of use
  - Ability to develop and evaluate digital infrastructures for urban development

- Value

  - Understanding of equity and ethics in data practices
  - Understanding of governance and participation in information and communication technology

Urban analytics: curriculum offerings

- Spatial and data analytical methods
    - Advanced Spatial Analysis (in addition to required GIS course)
    - Quantitative Methods
    - Data Science Methods for Urban Systems

- Data management, machine learning, and algorithms
    - Introduction to Urban Data and Informatics
    - Urban Informatics II: Sensing People in Place
    - Urban Datascapes
    - Exploring Urban Data with Machine Learning

- Applications in planning and policy
    - Digital Restructuring of Urban Space
    - Environmental Data Analysis in Context of Climate Change
    - Mobility Workshop
    - Prototyping for Urban Policy & Decision Making

Measuring Distance From Oil Well to Residential Building Footprints in Burbank, CA

Nearest Building = 400 Feet

Legend:
- Measured Distance
- Oil Well
- 2,500 Foot Buffer Boundary
- Residential Lot Boundary
- Residential Building Footprint

- Active Oil Wells
- Residential Building Footprints (within buffers)

CA

Sources:
California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR), 2019.
US Census Bureau, 2010.

Geographic Information Systems (required course), Fall 2019
Lanier Hagerty, Regina Alcazar, Sanjukta Kashyap Hazarika

Measuring & Mapping Social Vulnerability in Flooding Events

This project aims to better define and evaluate social vulnerability during flooding events through the development and comparison of three methodologies. The first methodology, Hazus Lite, was developed to recreate the social vulnerability aspects of the Hazus model utilized by the Federal Emergency Management Association (FEMA) through a weighted overlay analysis at the census block level. In order to increase the granularity and specificity of this model, method two, the Flooding Vulnerability Index (FVI), built directly off Hazus Lite through the incorporation of additional social and environmental vulnerability indicators through a weighted overlay analysis at the building level. The last method, FVI + Accessibility, built directly off the FVI by adding measures of accessibility through both a service area analysis and a closest-facility network analysis before completing the final weighted overlay analysis at the building level. The findings of the three methods were then compared to the inundation area of 2012's Superstorm Sandy event.

What social and spatial metrics are best used to identify the communities who are most vulnerable during flooding events?

Where in Brooklyn are these communities located?

Methods & Results

1. Hazus Lite

The Hazus Lite SVI is constructed by demographic information from "Shelters Category Weights."

Variables Considered
- Income
- Ethnicity
  - Black
  - Hispanic
  - Native American
  - Asian
- Group Quarters
- Age
  - Under 16 and Over 65

2. Flooding Vulnerability Index (FVI)

From Hazus Lite
- Income
- Ethnicity
  - Black
  - Hispanic
  - Native American
  - Asian
- Group Quarters
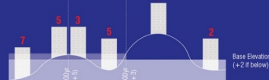
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Modified from Hazus
- Age
  - Modifying range to Under 16 and Over 75

New Demographics Proxys
- Single-Parent Households
- Live alone
- Speaks English "Less than very well"
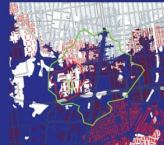
Proximity Index
- Flood Plain & Elevation

The Proximity Index: Buildings were assigned a score based on their location within a Floodplain and their elevation as follows: +5 for buildings within the 100-Year Floodplain, +3 for buildings within the 500-Year Floodplain, and +2 for buildings below the Base Elevation. Scores were cumulative and resulted in a scoring system of 0 to 7.

3. FVI + Accessibility
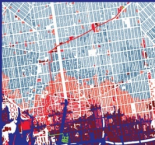
Access to Immediate Surroundings
Every day resources and community
(Service area analysis ½ mile - 15 min)

Access to Key Facilities
Hospitals, Schools & Community
Centers .(Network analysis)

Service Area Index: The residential building outlined in green above has a 1/2 mile accessibility, which we are considering a 15 minute walk, which is reduced by 81% when the 100 year floodplain polygon is incorporated as a barrier within the service area accessibility analysis. This statistic was calculated for every residential building in Brooklyn and was included as a layer within the weighted overlay analysis for the FVI + Accessibility method.

Network Analysis: The above routing analysis shows the change in accessibility to hospitals from residential buildings. In this example, the closest facility changes from one which ~ 1/4 mile away to one which is ~2.5 miles away (a 924.7% increase in distance). The same analysis was performed for schools and community centers, and the percent change statistic for both was included as a layer within the weighted overlay analysis for the FVI + Accessibility method.
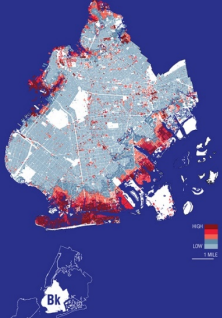
Zooming in
## The most impacted neighborhoods within Superstorm Sandy

A Redhook:
This snapshot displays the acute vulnerability of Red Hook based on low elevation and coastal proximity, creating conditions for extreme flood inundation. Though NYCHA properties are highlighted by the white square, vulnerability extends to the general building stock.
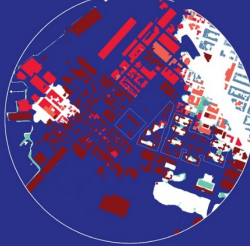
B Sheepshead Bay:
Using the NTA boundaries, this coastal community contains the highest count of vulnerable residential units in Brooklyn, where high vulnerability is categorized as a FVI in the 80th percentile.

C Canarsie:
Here we can see that the Sandy Inundation extends beyond the flood plain effecting less vulnerable buildings. This shows our reliance on coastal and tidal flooding for our FVI and the need to incorporate inland flooding scenarios.

Manhattan

Queens
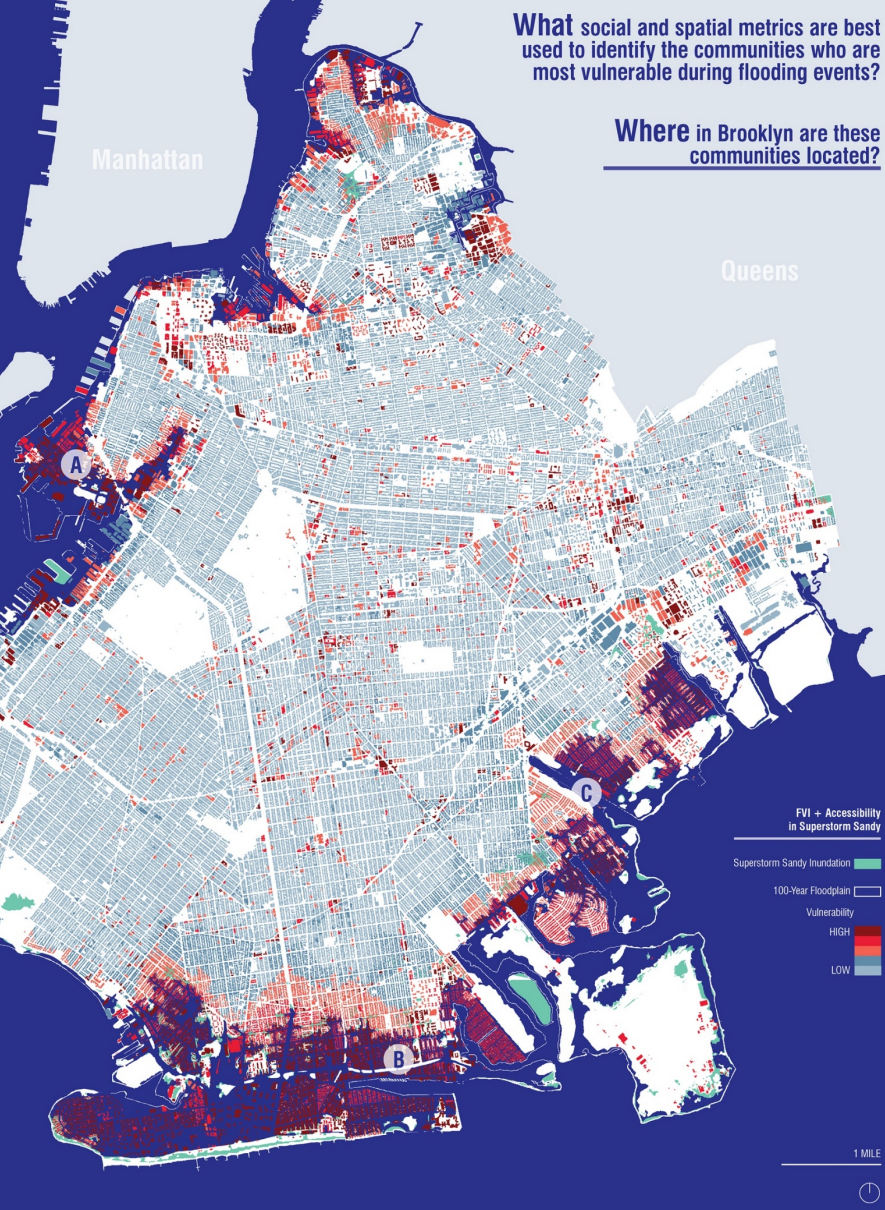
**FVI + Accessibility
in Superstorm Sandy**

Superstorm Sandy Inundation

100-Year Floodplain

Vulnerability
HIGH
LOW

1 MILE

Advanced Spatial Analysis, Spring 2018
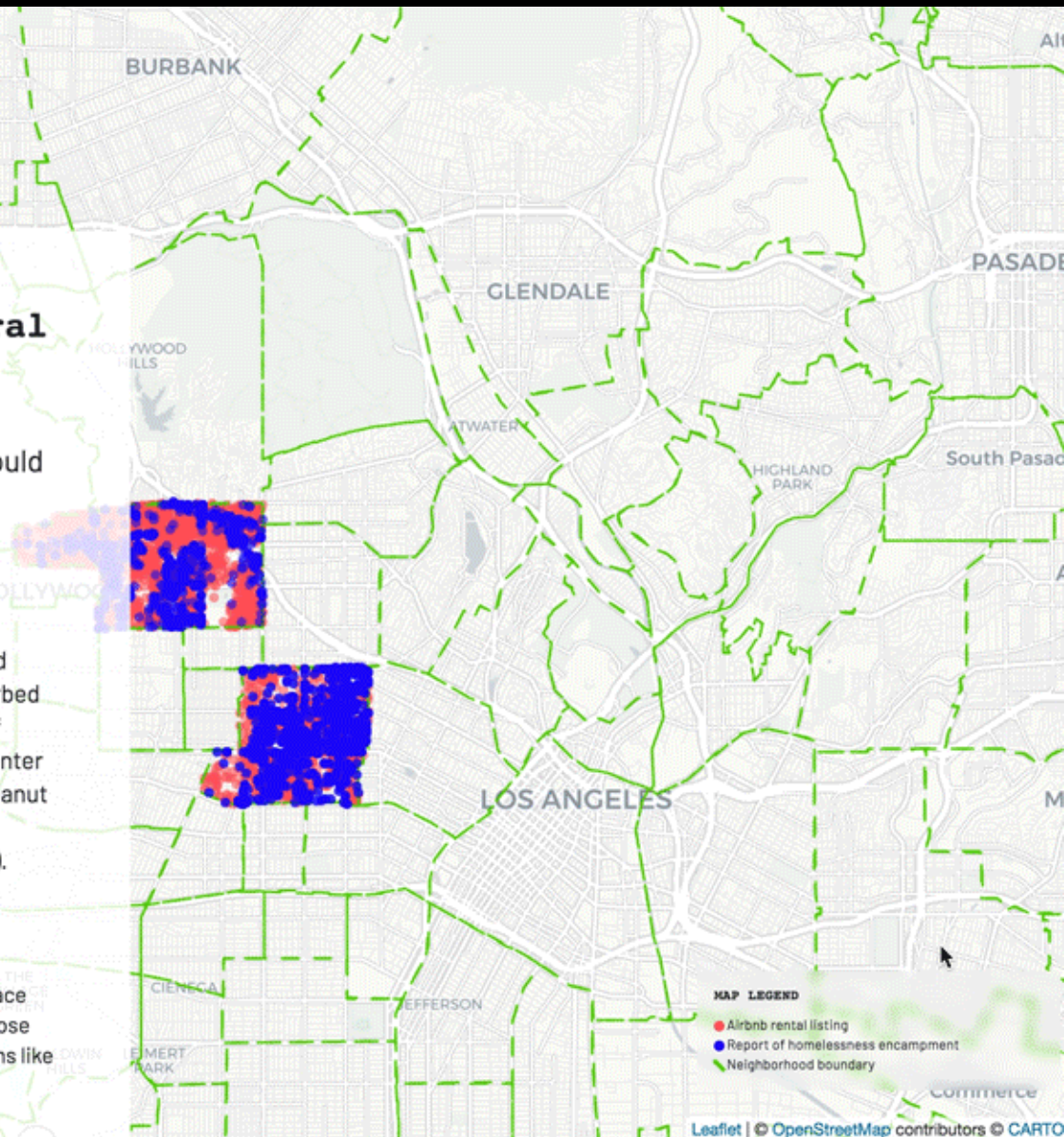Sean Nelsen, Anna Stokes, Pauline Claramunt

Koreatown: A Multifaceted Cultural Enclave

"Koreatown is a bit of a misnomer. In truth, if we're sticking to ethnic assignations, the neighborhood should be called Korea-Mexico-town"'" —Roy Choi, Chef

K-Town has the highest density of Homelessness in the City of Los Angeles. The passage of the Hart-Celler Act of 1965 resulted in a demographic shift across the country, encouraging an influx of immigrants that changed the cultural landscape of Los Angeles and catalyzed the growth of "The best Koreatown outside of Korea" (Curbed LA, 2019). Encompassing approximately 3 square miles just west of Downtown LA and south of Hollywood, the area was once the epicenter of Golden Age Hollywood, home to the Ambassador Hotel, the Cocoanut Grove and the Brown Derb. Today, Korean and Latinx populations contribute to Koreatown's rich cultural diversity (Discover LA, 2019).

Rental types

A transient traveler has many considerations for selecting a rental: the amenities offered, the general aesthetic of the living environment, and space needed. This affects the choice among the four rental type options. For those without any other choice in the City of Los Angeles, more affordable options like tents, vehicles, and shelters housed 36,165 people in 2019 (LAHSA).

MAP LEGEND
- Airbnb rental listing
- Report of homelessness encampment
- Neighborhood boundary

Leaflet | © OpenStreetMap contributors © CARTO

Introduction to Urban Data and Informatics, Fall 2019 (Ri Le, Regina Alcarza)
This data journalism project investigates the extent of homelessness at three of Los Angeles' most iconic neighborhoods. We present a dichotomy between a fantasmic, imagined Los Angeles with the reality of homelessness in order to show the pervasive extent of housing insecurity across the beautiful City of Angels that is often romanticized in pop culture. To do this, we contrast georeferenced Airbnb rentals with 311 calls of homeless encampments in 2018 to produce this interactive web story.
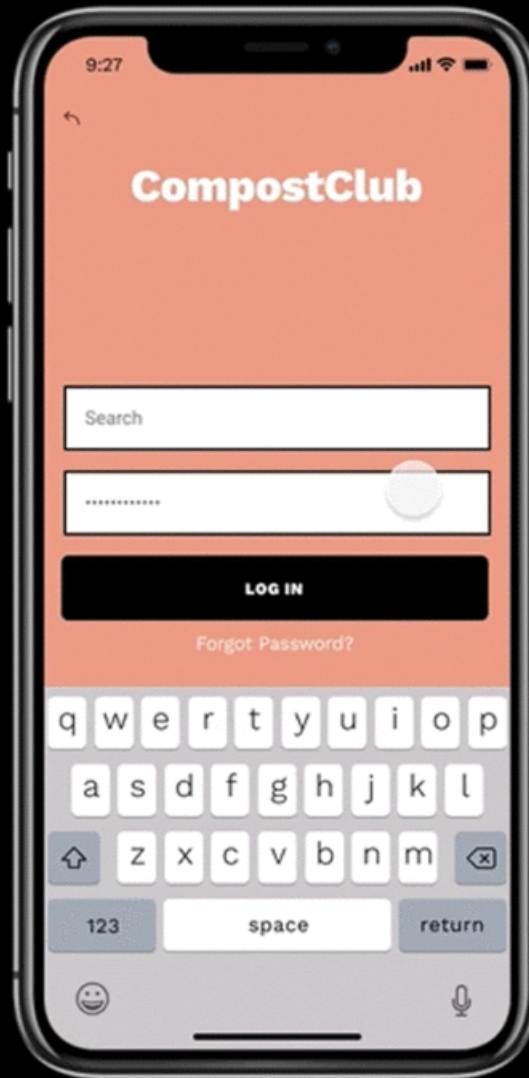
Prototyping for Urban Policy & Decision Making, Fall 2019 (Ri Le, Jacey Chon, Lorraine Liao)
Whether you have composted before or is a novice to composting, we are transforming the landscape to make it easier and rewarding for you to make a difference. We are the first app to reward users who drop off compost at participating farmers' markets. Our app aims to connect and empower climate conscious individuals and increase composting activity in NYC through a composting reward system and a social network.
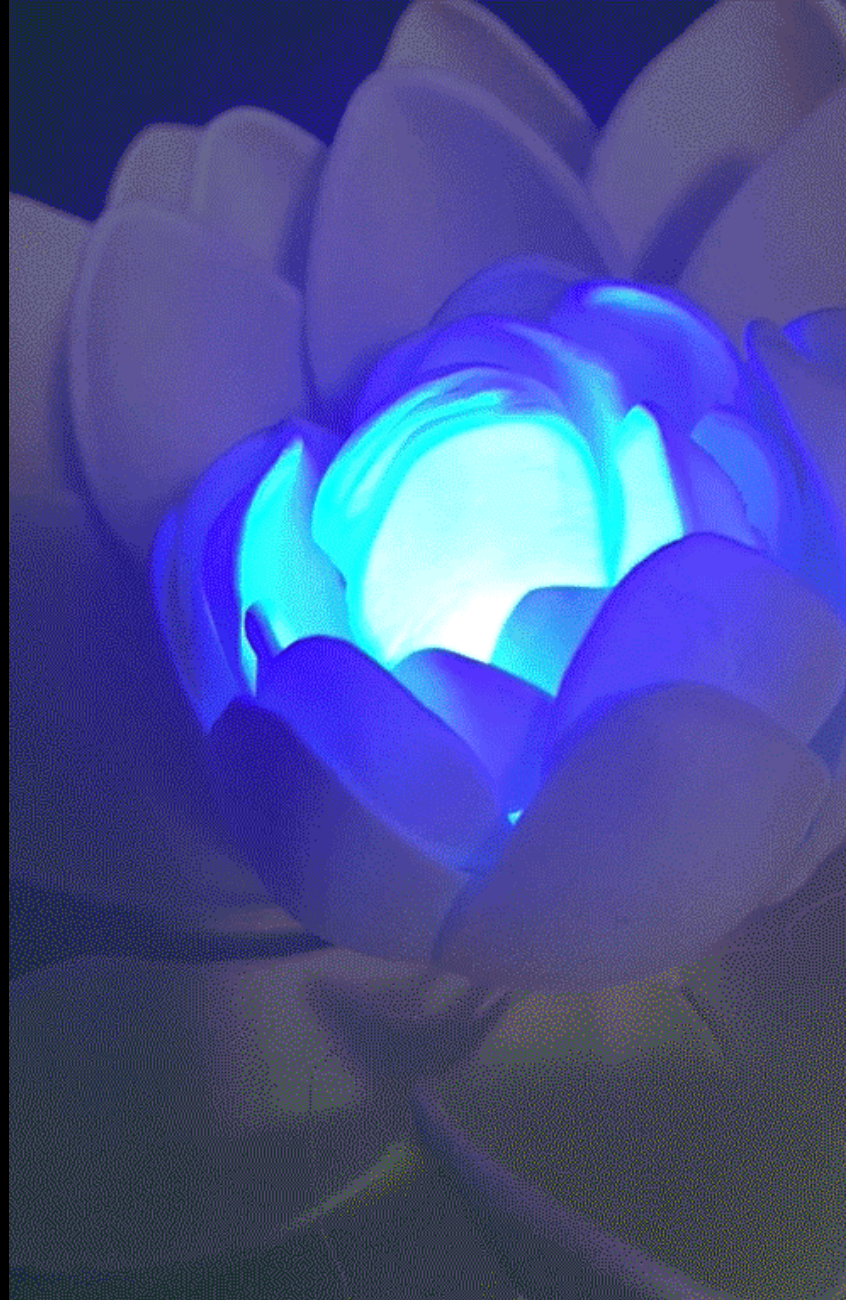
Urban Informatics II, Spring 2019
Shelby Smith, Srujana Bhoopanam
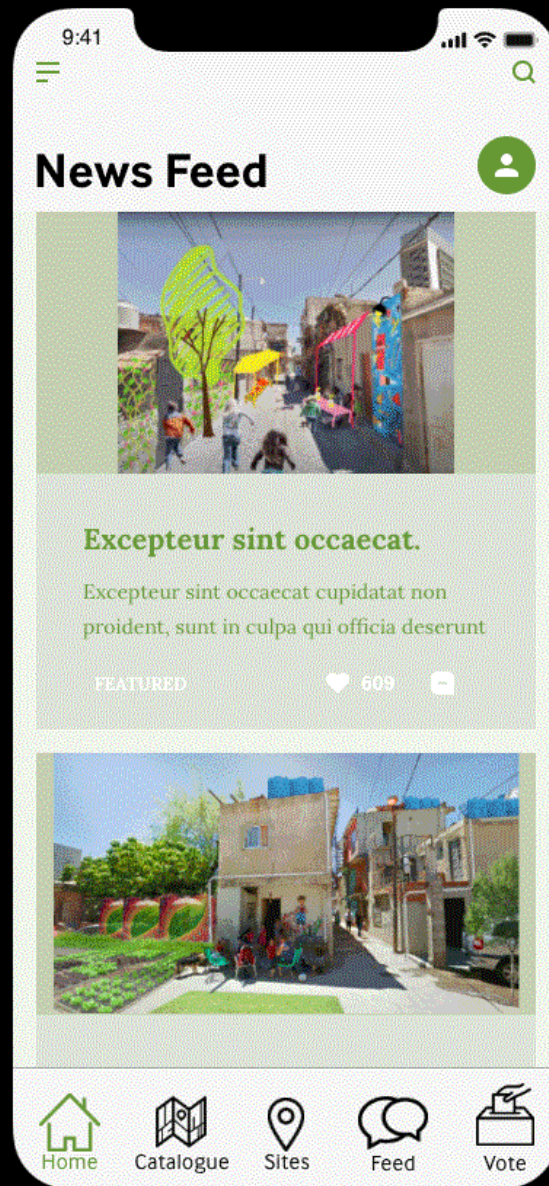
Urban Planning Studio, Spring 2020
Users can log into the Verde B31 app using their social media to utilize and connect with members of their existing social network, or connect as an independent user. All attributes are included in the app. Users can hear what is happening in their neighborhood, see existing examples of green space, explore potential sites for intervention, interact with others, and vote on which sites they want to develop first.

End of Year Show (UP Lounge) 2019

Thank You!

https://www.arch.columbia.edu/programs/urban-planning