# Geography and Civics in Action

## Studying Zoning and Built Environment with WebGIS





Tom Hammond<sup>1</sup>, William Farina<sup>1</sup>, Alec Bodzin<sup>1</sup>, Breena Holland<sup>1</sup>, Ernesto Lopez<sup>2</sup>, James Carrigan<sup>1</sup>, Kate Popejoy<sup>3</sup>, Scott Rutzmoser<sup>1</sup>, Shannon Salter<sup>2</sup> <sup>1</sup>Lehigh University; <sup>2</sup>Building 21 High School, Allentown (PA) School District; <sup>3</sup>PopejoySTEM LLC

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## (Before we begin; will be repeated at end)

- Email
  - salters [at] allentownsd.org
  - hammond [at] lehigh.edu
- Presentation available upon request
- If you want to see any of the curricular materials from this project, visit <u>https://eli.lehigh.edu/sesi</u>

## (Quick refresh on project context)

Socio-Environmental Science Investigations (SESI -- see https://eli.lehigh.edu/sesi)

- Cross-curricular: 9th grade science and social studies, runs consecutively
- Sequence of authentic local geospatial investigations, student data collection throughout
- Projects for students to demonstrate spatial thinking, tool mastery

NSF ITEST grant, 2016-19. Grant team included

- Education researchers (science ed, social studies ed, STEM ed) + doc students
- Earth & Environmental Science faculty, Political Science faculty + doc student
- Social studies & science teachers from Building 21 High School

Setting

- School = Public, urban, competency-based, graduated first class this June
- Students = 2/3 Hispanic or Latinx, 21% ELL, 19% have IEPs, many (~10-20%) categorized as unengaged learners

## Examining the mix of science & social studies

Investigation topics (can be flexibly sequenced):

- Observing: Ecology, built environment
- Trees & ecological services
- Urban Heat Islands
- Zoning
- Built Environment activity
- Transportation
- Carbon sequestration lab

Project topics

- Tree planting
- Culminating project (urban planning for social, environmental, & economic sustainability)



## Examining the mix of science & social studies

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- Observing: Ecology, built environment (sci & SS)
- Trees & ecological services (sci & SS)
- Urban Heat Islands (sci)
- Zoning (SS)
- Built Environment activity (SS)
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- Carbon sequestration lab (sci)

**Project topics** 

- Tree planting (sci)
- Culminating project (urban planning for social, (sci & SS) environmental, & economic sustainability)



## Examining the mix of science & social studies

Previous

This

presentation

presentation

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### **Project topics**

- Tree planting (sci)
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## Zoning investigation

#### School is at nexus of many zones...



## Zoning investigation ...but some are not easily distinguishable to viewer!



## Zoning investigation Waypoints to structure / spread out data collection





Trust Center Contact Esri Report Abuse

## Zoning investigation

#### Student data collection results

#### Contents

0

- Zoning Observations Fall 18 Period 02
- Zoning Observations Fall 18 Period 03
- Zoning Observations Fall 18 Period 06
- Zoning Observations Fall 18 Period 07
- Zoning Observations Fall 18 Period 09
- Zoning Observations Fall 18 Period 10
- Zoning Waypoints
- Allentown Zoning
- Imagery with Labels



	TAN		0	Type of Homes	None
	1. 1			Type of Businesses	School
			0	Type of Street	main-road (yellow line)
	HUN		111 200	Number of Trees	10 to 20
		19 N	a all	Tree Height	6 to 12 meters (3-4 stories)
N Done		C O A.	E C	Tree Diameter	less than 25 cm
Time-	-16 8 1 1 A F	A 200 8	E Cart	Tree Circumference	less than 25 cm
A MARINE		K	-	General Category	Church, School or Government
Sen Tal	E Charles	1103	8	Other Observations	Red little tree
IN ANY I		12/		Attachments:	
BALL			13 S	<u>Photo1.jpg</u>	,
A DECEMBER	1 A 00 h		Real Party	Zoom to Got Direct	tions

USDA FSA | State of New Jersey, Esri, HERE, Garmin, iPC

## Zoning investigation Juxtapose student data against city zoning map



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## Zoning investigation Discussing discrepancies, propose changes



## ...and now to pivot from Zoning to Built Environment

...any questions about the zoning investigation?

...next step in sequence is the Built Environment activity

(Zoning essentially just a stage-setter, getting them to look at their built environment with new / critical eyes)

## Built Environment Evolution in our instructional design: From sandbox...



...to Story Map: Scaffolds the instruction, chunks the analysis for students



## Built Environment Studying data layers: Demographics, education, safety,



etc.

## Built Environment Propose two changes to the city to better meet needs

	My first ward	My second ward
In what ward will you make a change?		
What does this ward need more (or less) of?	Education	Education
	Safety	Safety
	Recreation & leisure	Recreation & leisure
	Medical care	Medical care
What will you add (or subtract) in this ward? (Example: A library, a police station)		
Explain the connection between the NEEDS in this ward and the RESOURCE that you want to add.		

## **Built Environment**

#### Sample final product



## Sequencing for "critical geography" & a curriculum in

- 1. Zoning investigation
- 2. Built Environment activity
- 3. Transportation investigation



4. Culminating project (urban planning for social, environmental, & economic sustainability)

"Geographic reasoning is essential to the development of citizens as informed decision-makers who creatively participate in a diverse, democratic society and in an interdependent world"

- Kenreich, 2008, p. 129

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