Cities, Schools, and Space

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Amherst College

- A research seminar for juniors
- Urban history and education policy
- Potential thesis students encouraged!

Northeast Arc Users Group Annual Conference — Saratoga Springs 11/13/2011
Syllabus

Part One: Cities

Week One: (1/25) Introduction to GIS; Defining Terms
Week Two: (2/1) The Origins of the Urban Crisis
Week Three: (2/8) The Federal Role in Spatial Inequality (Housing)
Week Four: (2/15) The Federal Role in Spatial Inequality, continued (Highways)
Week Five: (2/22) Why do some cities... Fail? (Urban Renewal)
Week Six: (3/1) ......While other cities thrive? (Private Institutions)

Part Two: Schools

Week Seven: (3/8): Spatial Inequality and Schools
Week Eight: (3/15) No Class – Spring Break
Week Nine: (3/22) Court-Ordered Desegregation; Backlash Against Busing
Week Ten: (3/29): Road Trip to Cambridge
Week Eleven: (4/5) Replacing Race with Socio-Economic Considerations
Week Twelve: (4/12) Mapping Educational Opportunity and School Choice
Week Thirteen: (4/19) The Supreme Court Reversal
Week Fourteen: (4/26) Final Project Work
Week Fifteen: (5/3) Presentations and Celebrations

Final Projects Due
Many Research Methodologies

- Archival analysis
- Oral interviews
- GIS: integrated into the course
Course Readings

Copies of all books will be available for purchase at Amherst Books and placed on 2-hour reserve at Frost Library. In addition, a number of shorter documents will be available through the course website.

Colin Gordon, *Mapping Decline: St. Louis and the Fate of the American City* (Penn, 2008)

Richard D. Kahlenberg, *All Together Now: Creating Middle-Class Schools through Public School Choice* (Brookings, 2001)


Margaret Pugh O'Mara, *Cities of Knowledge: Cold War Science and the Search for the Next Silicon Valley* (Princeton, 2005)

<table>
<thead>
<tr>
<th>E-Reserve</th>
<th>Type</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benjamin, Karen. Longview Brochure--Easy to Buy., Submitted.</td>
<td>03/08</td>
<td></td>
</tr>
<tr>
<td>Erickson, Ansley T. &quot;Building Inequality: The Spatial Organization of Schooling in Nashville, Tennessee.&quot; Journal of Urban History (Submitted).</td>
<td>03/08</td>
<td></td>
</tr>
</tbody>
</table>
This article analyzes the impact of the residential security maps created by the Home Owners’ Loan Corporation (HOLC) during the 1930s on residential mortgages in Philadelphia. Researchers have consistently argued that HOLC caused redlining and disinvestment in U.S. cities by sharing its color-coded maps. Geographic information systems and spatial statistical models were used to analyze address-level mortgage data from Philadelphia to determine if areas with worse grades actually had less access to residential mortgage credit as a result. Findings indicate that the grades on HOLC’s map do not explain differences in lending patterns with the exception of interest rates, which were higher in areas colored red. Archival material and journal articles from the 1930s also reveal that lenders were avoiding areas colored red before HOLC made its maps, that HOLC’s maps were not widely distributed, and that lenders had other sources of information about real estate risk levels.

Keywords: redlining; discrimination; Home Owners’ Loan Corporation; Federal Housing Administration; Philadelphia
In America, a child’s address, more than any other factor, often determines what kind of public education he or she will receive.

Black School in Louisa County, Virginia, ca. 1935 (LOC/NAACP)

Cambridge, Massachusetts Latin School, 1916 (CHLS Yearbook)
De Jure Segregation

- Legal segregation of public schools by race banned nationwide in 1954 — separate, not equal
- Unequal educational opportunities still exist for a variety of reasons

Cities, Schools, and Space
De Facto Segregation

• Federal policies that expanded suburbs and facilitated “white flight” and job loss:
  ◦ Mortgage assistance
  ◦ Investment depreciation
  ◦ Highway construction
  ◦ Public housing
  ◦ Urban renewal
Disguised Segregation

- Subtle school segregation can still exist:
  - Shifting school catchment areas
  - Building new schools in white/upper-class areas at the expense of existing facilities
  - Educational tracking of students

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Cambridge, Massachusetts

• A progressive city of 110,000 people

• Home to two major institutions of higher education: Harvard University and the Massachusetts Institute of Technology.

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Cambridge Demographics

- Black and Hispanic populations substantially increased in the late 20th century
- 1965 state law: One school already racially imbalanced (more follow).

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Cambridge & Controlled Choice

- The School Committee temporized for more than a decade, while Boston struggled with school bussing.

- In 1981 implemented **Controlled Choice**:
  - Completely open enrollment, *within 10%* of average district-wide minority enrollment.
  - Parents chose top four preferred schools.

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Learning GIS: Basic Skills

- How does Cambridge compare to nearby communities?
  - Census.gov
    - 1990 - 2010
  - NHGIS.org
    - \( \leq 1980 \)
GIS for Week 3 (2/8)

Due date: February 8, 2011 at 2:00 pm.

1. Using Excel, copy the table “Demographics of Elementary Schools in Cambridge, Massachusetts, 2000-2001” from p. 171 of Edward B. Fisk, “Controlled Choice in Cambridge, Massachusetts”. Format the table so that it can be used with ArcMap.

2. Add the layer Cambridge_Schools_2000.shp to your map, and label it.

3. Join the Fisk table to the Cambridge School Districts layer.

4. Symbolize the Schools layer by the percentage of students receiving subsidized lunch, using Quantities — Proportional Symbols.

Table 1
 DEMOGRAPHICS OF ELEMENTARY SCHOOLS IN CAMBRIDGE, MASSACHUSETTS, 2000–2001 (PERCENTAGE)

<table>
<thead>
<tr>
<th></th>
<th>Portion of District Total</th>
<th>Native American</th>
<th>Asian</th>
<th>African American</th>
<th>Hispanic</th>
<th>White</th>
<th>Other Black</th>
<th>Lunch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agassiz</td>
<td>8</td>
<td>1</td>
<td>16</td>
<td>18</td>
<td>9</td>
<td>43</td>
<td>13</td>
<td>30</td>
</tr>
<tr>
<td>Cambridgeport</td>
<td>6</td>
<td>1</td>
<td>8</td>
<td>26</td>
<td>10</td>
<td>50</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>Fitzgerald</td>
<td>5</td>
<td>1</td>
<td>10</td>
<td>22</td>
<td>7</td>
<td>43</td>
<td>17</td>
<td>60</td>
</tr>
<tr>
<td>Graham and Parks</td>
<td>7</td>
<td>1</td>
<td>8</td>
<td>14</td>
<td>6</td>
<td>46</td>
<td>25</td>
<td>31</td>
</tr>
<tr>
<td>Haggerty</td>
<td>5</td>
<td>1</td>
<td>8</td>
<td>26</td>
<td>7</td>
<td>48</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Harrington</td>
<td>10</td>
<td>0</td>
<td>3</td>
<td>21</td>
<td>12</td>
<td>48</td>
<td>15</td>
<td>77</td>
</tr>
<tr>
<td>Kennedy</td>
<td>10</td>
<td>2</td>
<td>3</td>
<td>17</td>
<td>43</td>
<td>32</td>
<td>5</td>
<td>64</td>
</tr>
<tr>
<td>King</td>
<td>5</td>
<td>0</td>
<td>21</td>
<td>31</td>
<td>10</td>
<td>24</td>
<td>14</td>
<td>79</td>
</tr>
<tr>
<td>King Open</td>
<td>6</td>
<td>1</td>
<td>14</td>
<td>26</td>
<td>5</td>
<td>49</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>Longfellow</td>
<td>8</td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>26</td>
<td>35</td>
<td>9</td>
<td>53</td>
</tr>
<tr>
<td>Morse</td>
<td>7</td>
<td>0</td>
<td>26</td>
<td>25</td>
<td>8</td>
<td>35</td>
<td>6</td>
<td>51</td>
</tr>
<tr>
<td>New Academy</td>
<td>5</td>
<td>0</td>
<td>4</td>
<td>39</td>
<td>20</td>
<td>25</td>
<td>13</td>
<td>72</td>
</tr>
<tr>
<td>Peabody</td>
<td>8</td>
<td>1</td>
<td>24</td>
<td>17</td>
<td>4</td>
<td>46</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Tobin</td>
<td>10</td>
<td>0</td>
<td>11</td>
<td>34</td>
<td>10</td>
<td>34</td>
<td>10</td>
<td>48</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>1</td>
<td>11</td>
<td>23</td>
<td>14</td>
<td>40</td>
<td>11</td>
<td>48</td>
</tr>
</tbody>
</table>

Source: Data obtained from Cambridge Public Schools Office of Development Assessment.
5. In a web browser, visit the web address [www.census.gov](http://www.census.gov), and download the table **P87. Poverty Status in 1999 by Age** for Massachusetts, Middlesex County, Census tracts.

6. Zoom your map to Cambridge, and make sure that its census tracts use the symbology **Quantities — Graduated colors**, and a set of distinguishable poverty classes.

7. How do the schools with a larger percentage of students receiving subsidized lunch compare with the higher-poverty areas of Cambridge?
Georeferencing Historical Maps
Interstate 695: The “Inner Belt” through east Cambridge

- 1967 map of properties affected
- Stopped in 1971
<table>
<thead>
<tr>
<th>Parcel</th>
<th>Owner</th>
<th>Census_Name</th>
<th>Address</th>
<th>Home</th>
<th>Relation</th>
<th>Sex</th>
<th>ColorRace</th>
<th>Age</th>
<th>Birthplace</th>
<th>FatherBP</th>
<th>MotherBP</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>89-95</td>
<td>Gopal Dumas</td>
<td>Thomas Cardullo</td>
<td>216 Washington St R</td>
<td>Head</td>
<td>M</td>
<td>W</td>
<td>35</td>
<td>Italy</td>
<td>Italy</td>
<td>Italy</td>
<td>Italian</td>
<td></td>
</tr>
<tr>
<td>89-97</td>
<td>Theophilus Smith &amp; Ellen Smith</td>
<td>Theophilus Smith</td>
<td>216 Washington St R</td>
<td>Head</td>
<td>M</td>
<td>W</td>
<td>35</td>
<td>Italy</td>
<td>Italy</td>
<td>Italy</td>
<td>Italian</td>
<td></td>
</tr>
<tr>
<td>89-98</td>
<td>Theophilus Smith</td>
<td>Theophilus Smith</td>
<td>216 Washington St R</td>
<td>Head</td>
<td>M</td>
<td>W</td>
<td>35</td>
<td>Italy</td>
<td>Italy</td>
<td>Italy</td>
<td>Italian</td>
<td></td>
</tr>
</tbody>
</table>

**Compare families to the 1930 census!**
What Influences Urban Renewal?

- Union
- Dissolve
- Area Calc

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Possible Inputs to Urban Renewal

• Data from the 1960 census:
  ◦ Older Housing (Before 1940)
  ◦ Housing Value
  ◦ Owner-Occupied Housing
  ◦ Negro Population

• Data requirements:
  ◦ Not cross-correlated: use Excel’s CORREL
  ◦ Spatially auto-correlated: use ArcGIS’ Moran’s I

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Geostatistical Analysis

\[ Urban\text{RenewalArea} = 0.13 \text{ Negro} - 0.08 \text{ OwnerOccupied} + 0.05 \text{ Before1940} - 0.03 \text{ HousingValue} + 0.18 \]

± 0.05  ± 0.05  ± 0.05  ± 0.05  ± 0.49

Standard Residual
- Blue: < -2.0
- Green: -2.0 to -1.0
- Yellow: -1.0 to 1.0
- Brown: 1.0 to 2.0
- Red: > 2.0
20-30 page paper that must include some GIS, and preferably addresses these questions:

- How did race, property, and educational opportunity become entangled in Cambridge?
- Why and how did this community respond?
Student Final Projects

- MIT, Cambridge, and Urban Development: Examining a Town-Gown Relationship
- The Blinding Powers of Race: An Examination of the Effects of Racial Violence and Local Politics on Cambridge’s Pursuit for a Quality Education in Its Secondary Institutions
- Cities, Higher Education Institutions, and Space (and Space): NASA in Kendall Square, Cambridge
Student Project: The Merger of Cambridge Rindge and Latin High Schools — Emily Pawlowski
Student Project:
Erasing the Lines: The Story of School Choice and Housing in the American City
— Daniel Alter
Responding to the Inner Belt Hwy.

—Yinan Zhang

### Proximity Analysis

- **Tract-based**
- **Two characteristics stands out!**

<table>
<thead>
<tr>
<th></th>
<th>Lee</th>
<th>River-Elm</th>
<th>Brookline-Elm</th>
<th>Portland-Albany</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Population</strong></td>
<td>17516</td>
<td>24526</td>
<td>21864</td>
<td>15666</td>
</tr>
<tr>
<td>White</td>
<td>87%</td>
<td>91%</td>
<td>92%</td>
<td>94%</td>
</tr>
<tr>
<td>Negro</td>
<td>11%</td>
<td>8%</td>
<td>7%</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total Housing</strong></td>
<td>6831</td>
<td>7749</td>
<td>6474</td>
<td>4298</td>
</tr>
<tr>
<td>Owner-occupied, White</td>
<td>13%</td>
<td>15%</td>
<td>17%</td>
<td>15%</td>
</tr>
<tr>
<td>Owner-occupied, Non-white</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Renter-occupied, White</td>
<td>77%</td>
<td>77%</td>
<td>76%</td>
<td>79%</td>
</tr>
<tr>
<td>Renter-occupied, Non-white</td>
<td>8%</td>
<td>7%</td>
<td>6%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Responding to the Inner Belt Hwy.
—Yinan Zhang

- Final Alternatives:
  - MIT doesn’t want the highway adjacent to their campus.
  - The Brookline-Elm neighborhoods don’t want it, either!
- End result: neither is built!
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— Josie Fisher

• During the 1960s and 1970s:
  
  Six new or reconstructed schools
  
  But many schools in worse condition!

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What Influenced School Building?

— Josie Fisher

• Parcel Analysis
  ▪ Distribute census info by housing type on parcels

<table>
<thead>
<tr>
<th>School District</th>
<th>Minority Reported</th>
<th>Minority from Census Analysis</th>
<th>Difference from Census Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putnam-Gore St.</td>
<td>0</td>
<td>3</td>
<td>100.00%</td>
</tr>
<tr>
<td>Thorndike</td>
<td>0</td>
<td>8</td>
<td>96.05%</td>
</tr>
<tr>
<td>Haggerty</td>
<td>5</td>
<td>4</td>
<td>-26.35%</td>
</tr>
<tr>
<td>Harrington</td>
<td>47</td>
<td>59</td>
<td>19.54%</td>
</tr>
<tr>
<td>Fitzgerald</td>
<td>77</td>
<td>90</td>
<td>14.26%</td>
</tr>
<tr>
<td>Longfellow</td>
<td>65</td>
<td>77</td>
<td>15.34%</td>
</tr>
<tr>
<td>Agassiz</td>
<td>31</td>
<td>30</td>
<td>-3.63%</td>
</tr>
<tr>
<td>Peabody</td>
<td>80</td>
<td>48</td>
<td>-65.68%</td>
</tr>
<tr>
<td>Russell</td>
<td>85</td>
<td>125</td>
<td>32.15%</td>
</tr>
<tr>
<td>Morse</td>
<td>95</td>
<td>105</td>
<td>9.19%</td>
</tr>
<tr>
<td>Fletcher</td>
<td>72</td>
<td>126</td>
<td>43.16%</td>
</tr>
<tr>
<td>Lincoln</td>
<td>50</td>
<td>64</td>
<td>21.76%</td>
</tr>
<tr>
<td>Roberts</td>
<td>191</td>
<td>74</td>
<td>-157.95%</td>
</tr>
<tr>
<td>Webster</td>
<td>152</td>
<td>110</td>
<td>-38.59%</td>
</tr>
<tr>
<td>Houghton</td>
<td>273</td>
<td>299</td>
<td>8.78%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1224</strong></td>
<td><strong>1222</strong></td>
<td><strong>-0.14%</strong></td>
</tr>
</tbody>
</table>

School District | Average Income |
----------------|----------------|
Russell         | $14,339.69     |
Peabody         | $12,250.89     |
Agassiz         | $10,520.23     |
Haggerty        | $8,881.98      |
Lincoln         | $8,714.56      |
Longfellow      | $8,337.93      |
Fitzgerald      | $8,211.01      |
Webster         | $7,613.17      |
Morse           | $7,460.60      |
Putnam-Gore St. | $7,314.95      |
Roberts         | $7,252.42      |
Fletcher        | $7,239.24      |
Harrington      | $6,960.14      |
Houghton        | $6,959.93      |
Thorndike       | $6,871.54      |

Cities, Schools, and Space
Current Work

• New Discovery: Some block-level data — basic demographics and housing — available for earlier decades.

• Active digitization project, led by JF and YZ.
Future Research...

- Block-level data reveals why one School Committee member made an accusation of *de jure* segregation.


- Russell boundary in place since <= 1946.
Thanks!

- Cambridge GIS! Jeff Amero, et al.
- Cambridge Assessor
- Cambridge Historical Society
- MIT Archives
- National Historical GIS @ U. Minn
- Mellon Foundation