Health, Transportation, and the Built Environment: Building a Roadmap for Change with Smaller Cities

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Semra Aytur

Kevin Gardner

Shannon Rogers

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HEALTH, TRANSPORTATION & BUILT ENVIRONMENT

Building a Roadmap for Change with Smaller Cities

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Kevin Gardner, P.E., PhD, Shannon Rogers, MS.
University of New Hampshire, Durham, NH
WALKING IN SMALL CITIES AND TOWNS?

- Important culture (i.e. New England).
- Often originally designed to be walkable – before cars.
- May provide services to region.
- Lots of us live there & like it!
SPRAWL IN SMALL AND LARGE CITIES

2000 Population Density

Density by Zip Code
Pop per acre

- 0 - 100
- 100.1 - 500
- 500.1 - 1000
- 1000.1 - 5000
- 5000.1 - 62000
SPRAWL IN SMALL AND LARGE CITIES

2050 Projected Density

Density by Zip Code
Pop per acre

- 0.1 - 100
- 100.1 - 500
- 500.1 - 1000
- 1000.1 - 5000
- 5000.1 - 62000
Managing growth...
Encouraging walkability...
Controlling sprawl...
Preserving communities...

.... Requires working with smaller cities and towns.
OBJECTIVES

- Examine associations between built environment and personal transportation decisions on a neighborhood-scale;

- Examine whether socio-demographic factors (i.e. age, income) influence decision to walk in different neighborhood contexts;

- Examine how the built environment might be manipulated to remove real or perceived barriers to walking within neighborhoods.
STUDY AREA

Manchester
Population = 107k
Median Income = $41k

Portsmouth
Population = 21k
Median Income = $45k
METHODS

1. Interdisciplinary team,
2. Community-based research (collaborative)
3. Paper/internet survey of residents and observation,
INTERDISCIPLINARY & COLLABORATIVE

- University -
  - Civil Engineers
  - Transportation Planners
  - Public Health Specialists
- State - Dept of Environmental Services
- Regional -
  - Planning agencies: transport, economic development
- Municipal -
  - Health Dept, Planning Dept, Parks & Rec
  - Economic Development
- Local – Neighborhood watch, N’hood activists
SURVEY IN 22 NEIGHBORHOODS

2004 surveys distributed
Overall net response rate = 33.9%
TRANSPORT DECISIONS METRICS

- Frequency of walking to destinations
- Sum of places respondents “can” and “do” walk

<table>
<thead>
<tr>
<th>Post Office</th>
<th>Home of a Friend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restaurant</td>
<td>Grocery Store</td>
</tr>
<tr>
<td>Coffee Shop/Café</td>
<td>Bar/Pub</td>
</tr>
<tr>
<td>Shopping Center</td>
<td>Community/Rec Center</td>
</tr>
<tr>
<td>Church</td>
<td>Convenience Store</td>
</tr>
<tr>
<td>School</td>
<td>Natural Space, Park</td>
</tr>
<tr>
<td>Library/Bookstore</td>
<td>Other</td>
</tr>
</tbody>
</table>

Built Upon Method of: Leyden (2003), AJPH 93(9):1546-1551.
Outcomes and Analysis
COLLABORATION OUTCOMES:

- City depts discussed coalescing around one issue (walkability or sustainability) - to avoid duplication and silos.

- There has been a lot of focus on downtown – pleased this study looks more broadly.

- Not all neighborhoods want a sidewalk – requires maintenance & cost.
COLLABORATION OUTCOMES:

- Want to let residents “age in place” rather than moving to Florida.

- Incentives to read with children >> why not also to WALK with children – how to build walking as a social norm.

- Want to find the best pay off for efficiency, health, etc. – not just the squeaky wheel.
Cluster Modeling, Bi-Level Modeling

Neighborhood

Neighborhood

Neighborhood

Neighborhood
Cluster Modeling, Bi-Level Modeling

<<How many places “DO” you walk?>>

» Explanatory Variables (p<0.05)

- Age
- Body Mass Index
- Mentions distance to services
- Maximum time willing to walk
- Household Income
- Frequency you exercise for 15 min

- Sidewalks in the neighborhood
- Intersections
### Cluster Modeling, Stratified

<<How many places “DO” you walk?>>

<table>
<thead>
<tr>
<th></th>
<th>Low Income</th>
<th>High Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td>BMI</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td>Mention dist to services</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td>Max time to walk</td>
<td>-</td>
<td>Pos</td>
</tr>
<tr>
<td>Household Income</td>
<td>-</td>
<td>Pos</td>
</tr>
<tr>
<td>Exercise 15 min</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sidewalks</td>
<td>-</td>
<td>Pos</td>
</tr>
<tr>
<td>Intersections</td>
<td>Pos</td>
<td>Pos</td>
</tr>
</tbody>
</table>
Small cities & towns have unique transportation and planning needs.

Bringing decision makers together to discuss walkability was valuable for everyone.

‘Walkable’ looks different for different people and places >> no blanket solutions.
Thank you

Questions?
87% of municipal governments have less than 10,000 residents.

Brennan & Hoene – For National League of Cities, Research Brief 2003; 1997 Data
US MUNICIPAL GOVERNMENTS BY POPULATION

- Towns with less than 10,000 people: 16% of US pop
- 10,000 to 24,999: 16%
- 25,000 to 49,999: 14%
- 50,000 to 99,000: 14%
- 100,000 to 299,999: 14%
- 300,000 or more: 27%

Brennan & Hoene – For National League of Cities, Research Brief 2003; 1997 Data
Walking and Sidewalks – Ave by Nhood

\[ y = 5.66x + 0.63 \]

\[ R^2 = 0.68 \]

![Graph showing the relationship between the presence of sidewalks and the average number of "do" walks.](image-url)
**Walking, Sidewalks, & Income**

Lower income

\[ y = 1.23x + 2.11 \]

\[ R^2 = 0.090 \]

Higher income

\[ y = 6.25x + 0.64 \]

\[ R^2 = 0.81 \]
## Cluster Modeling, Stratified

<<How many places “DO” you walk?>>

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<tr>
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<th>Manchester</th>
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<tr>
<td></td>
<td>Low In.</td>
<td>High In.</td>
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CLUSTER MODELING, STRATIFIED
<<HOW MANY PLACES “DO” YOU WALK?>>

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<th>Manchester</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low In.</td>
<td>High In.</td>
</tr>
<tr>
<td>Observations</td>
<td>103</td>
<td>272</td>
</tr>
<tr>
<td>Mean</td>
<td>2.27</td>
<td>5.34</td>
</tr>
<tr>
<td>Std Deviation</td>
<td>2.62</td>
<td>3.77</td>
</tr>
</tbody>
</table>
**Cluster Modeling, Stratified**

<<How many places “DO” you walk?>>

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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Younger</td>
<td>Older</td>
</tr>
<tr>
<td>Observations</td>
<td>127</td>
<td>248</td>
</tr>
<tr>
<td>Mean</td>
<td>5.82</td>
<td><strong>3.82</strong></td>
</tr>
<tr>
<td>Std Deviation</td>
<td>3.80</td>
<td>3.54</td>
</tr>
</tbody>
</table>