Harvard Prevention Research Center on Nutrition and Physical Activity

Neighborhood and School Environments and Accelerometer Estimates of Youth Physical Activity

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Background and Theory

- Prior studies of youth physical activity and environment
- Ecosocial Theory
  - What explains population patterns of health behaviors
  - Interplay between environment-individual over time, within space
  - Type, setting and attributes of activity

Study Sample

- Planet Health Study (1995-1997)
- 10 Neighborhoods with a Middle School in 4 communities in Massachusetts
- Survey data in 1995 and 1997
- 2 million person-minutes of TriTrac-R3D activity monitor data from 256 students collected in 1997

School and Neighborhood Environments

- Neighborhood Accessibility

  (e.g., Population Density, Streets and Design)

- Pedestrian Accessibility

  (e.g., sidewalk completeness)

- Active Schools

  (e.g., size of school building, facilities for sport, density of youth in surrounding area)

Illustration of Methods

- Active Schools

Illustration of Methods

- Active Schools
  - Census Data

Illustration of Methods

- Active Schools
  - Census Data
  - Orthophotos

Illustration of Methods

- Active Schools
  - Census Data
  - Orthophotos
  - Site visits

Middle School A , Urban Area

Middle School A, Urban Area

Middle School A, Urban Area

Middle School A, Urban Area

Middle School A, Urban Area

Middle School A, Urban Area

Middle School B, Suburban Area

Middle School B, Suburban Area

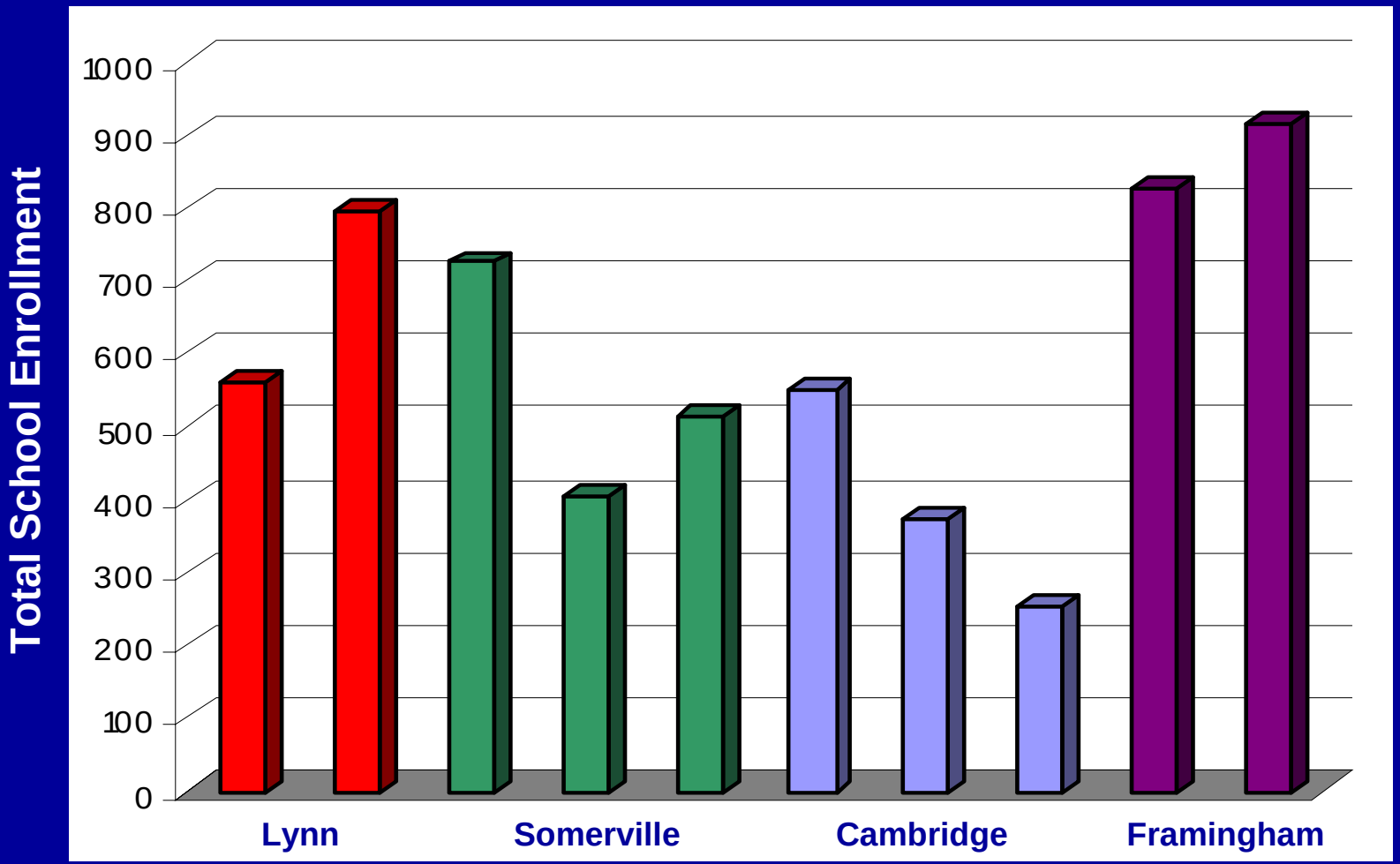
Middle School B, Suburban Area

Middle School B, Suburban Area

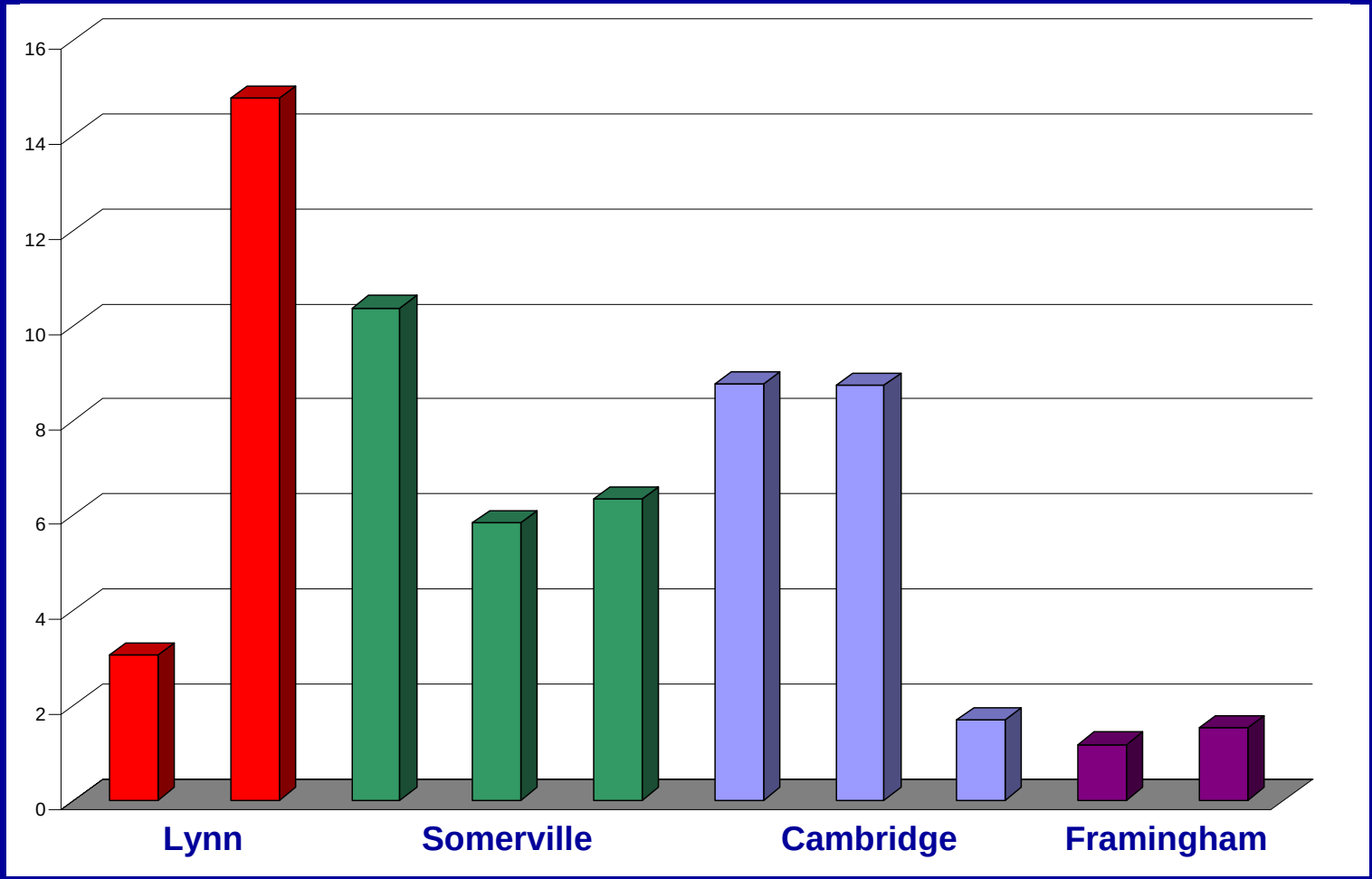
Middle School B, Suburban Area

Middle School B, Suburban Area

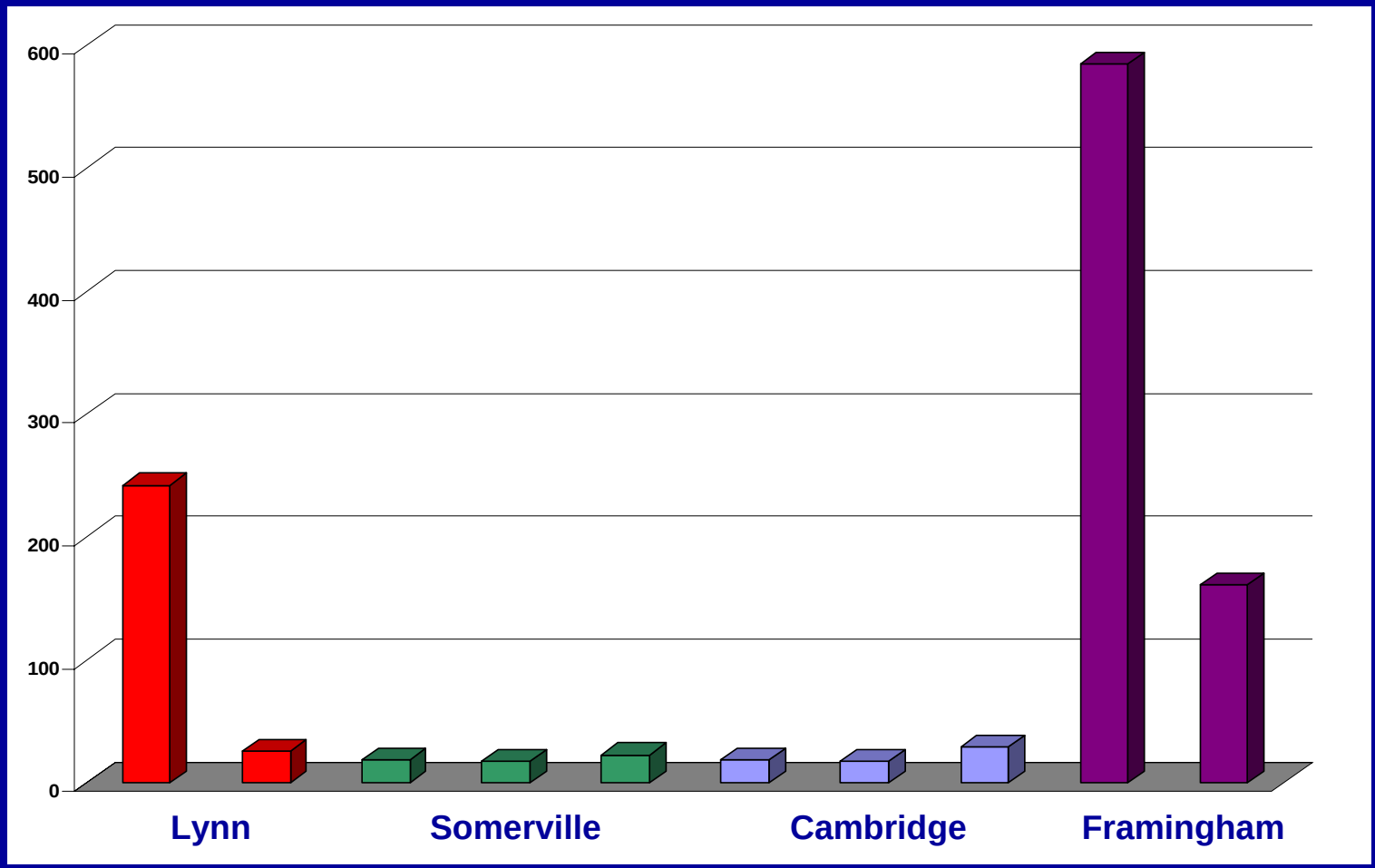
Enrollment


Total School Enrollment
1000
900
800
700
600
500
400
300
200
100
0
Lynn
Somerville
Cambridge
Framingham

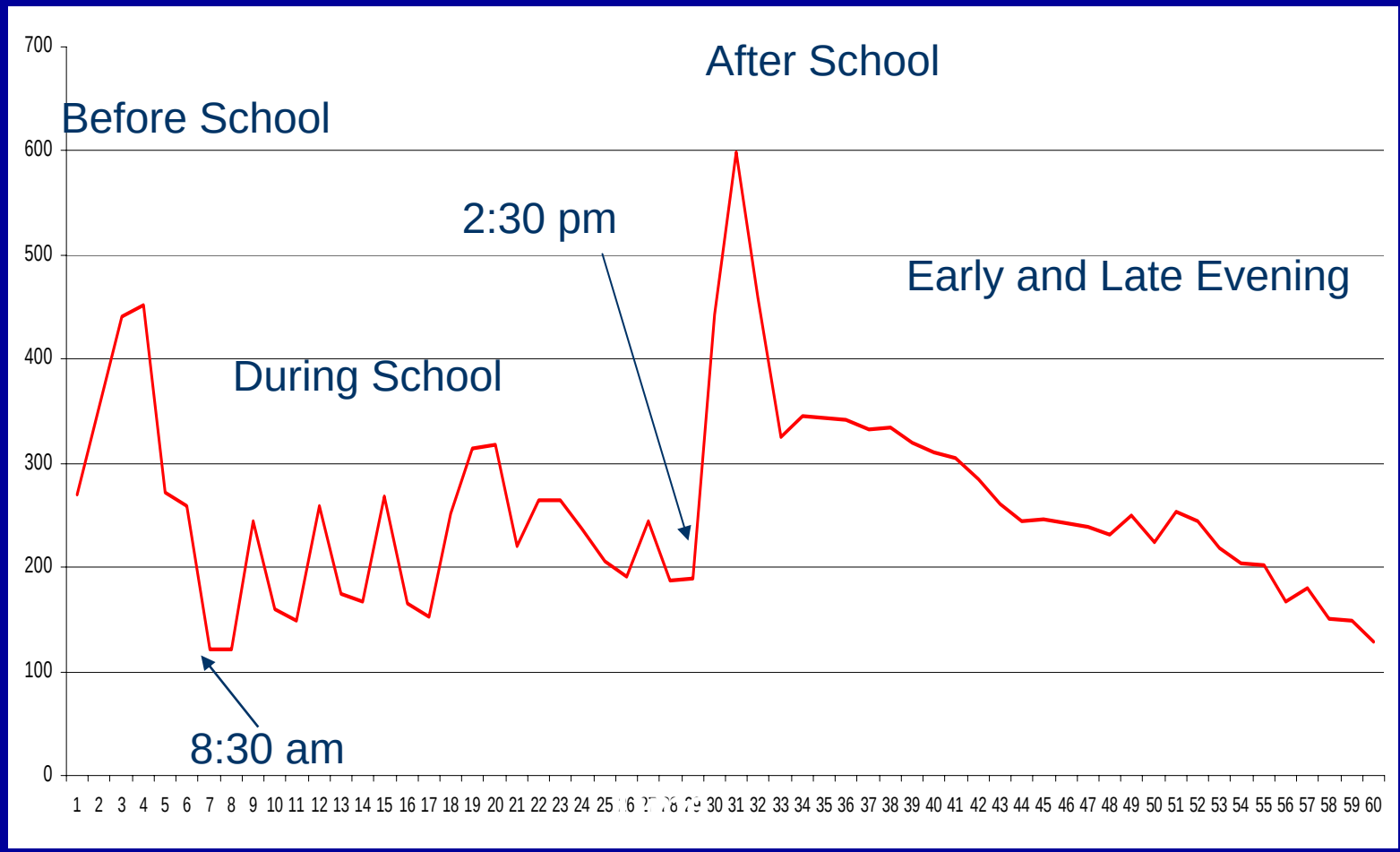
Youth Density
(800m buffer)



Median Block Size
(800m buffer)



Mean Vector Magnitude by Quarter Hour on Weekdays



Regression Model

- Physical Activity Outcome- Log Mean Vector Magnitude
- Covariates: age, sex, BMI, race and ethnicity, day of week, quarter-hour indicators
- Time and Space
  - Overall, Weekday, Weekend
  - Period of Day

Regression Coefficient Estimates Before School Period

7am-8:30am, N=2112

	Log Mean Vector Magnitude[a]
	Estimate (SE)
Enrollment	0.09 (0.02)*
Youth density	1.31 (1.25)
Block size	0.03 (0.01)*

[a] Model accounts for student clustering within schools and covariates include age, sex, race/ethnicity, BMI, day of week, and time of day

* $p<0.05$

Discussion

- Certain environmental variables may be associated with physical activity in youth
- School environments may be important in shaping the physical activity “profile” in youth
- Importance of accelerometers

Next Steps

- Modeling strategies (environmental variables and physical activity variables)
- Environmental variables
- Questionnaire data