Testing associations between physical activity and the built environment

Daniel A. Rodriguez, Ph.D
Department of City and Regional Planning,
University of North Carolina, Chapel Hill

Team

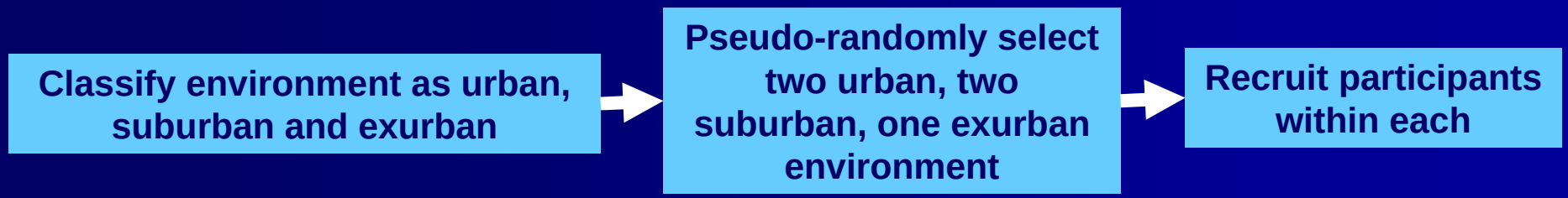
- Transdisciplinary
  - Evenson, Song, Salvesen, Khattak, Rodriguez
    - City and Regional Planning & Epidemiology (UNC)
  - Clifton
    - Civil Engineering & Urban Studies and Planning (UMd)
  - Schneider
    - Toole Design Group
  - Sedo
    - Economics (UMi)

Project aims

- Test relationships between physical activity and built environment measures
- Examine where MVPA takes place
  - Determine potential substitution effects among locations
- Incorporate information on preference and attitudes for PA and the built environment

Research design

- Cross-sectional, correlational
- Stratified clustered design

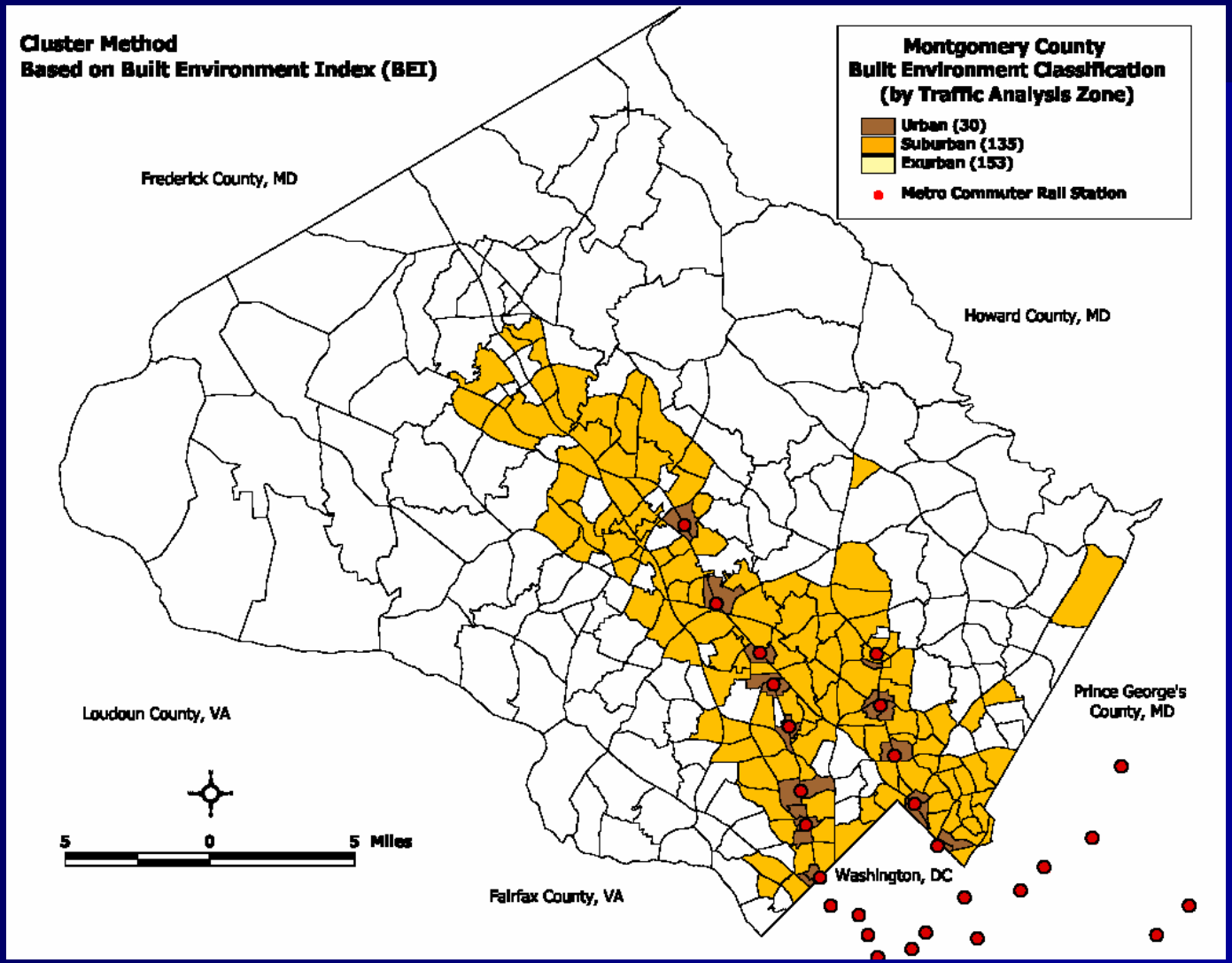


  - Ensure representation of various urban environments
  - Over-sample urban and suburban

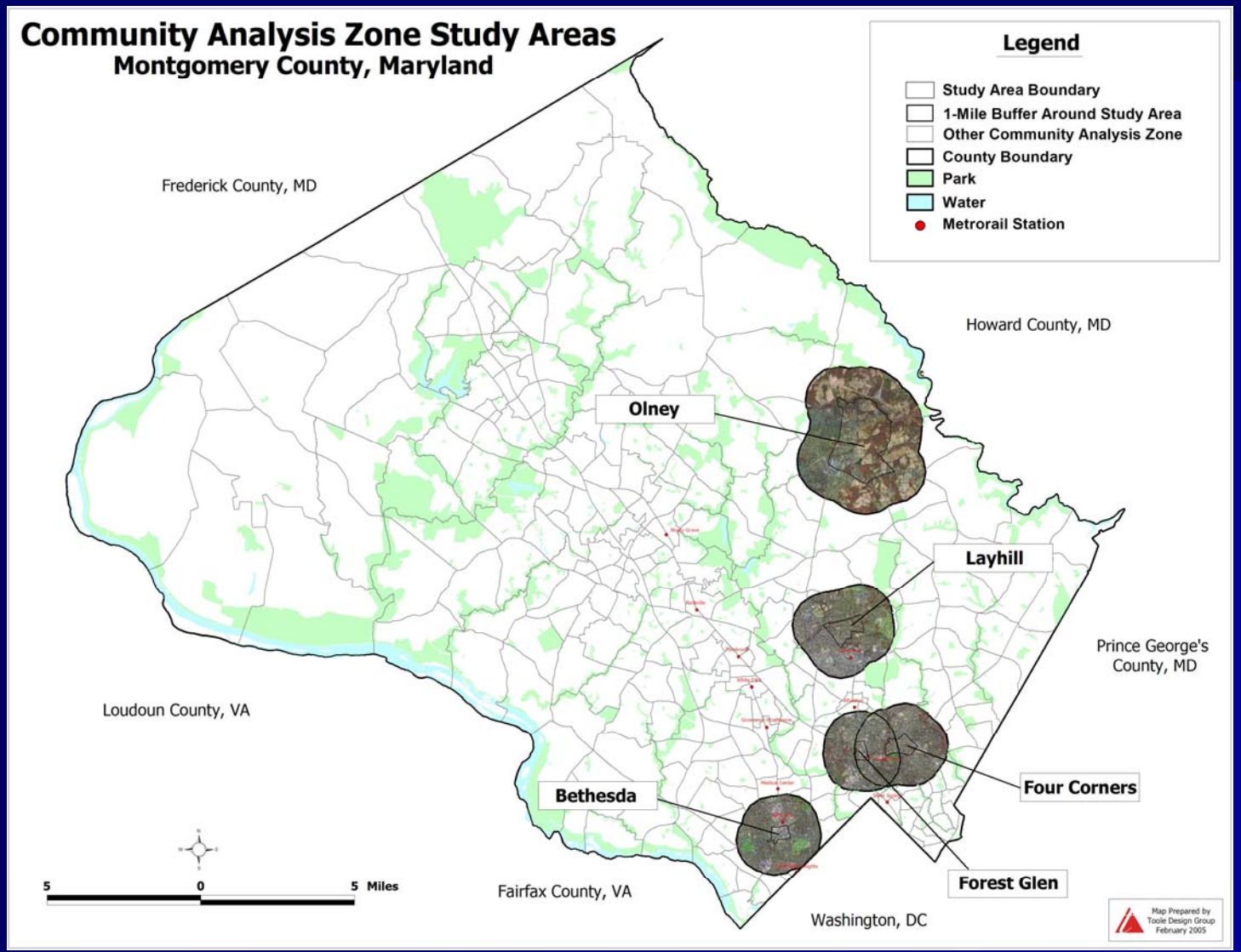
Study area

- Montgomery County, MD
  - Range of urban environments –good planning outcomes
  - Excellent secondary data resources
    - GIS data, traffic, security, etc.
  - Multi-modal transportation system
  - Add value to County's priorities

Study area


Cluster Method
Based on Built Environment Index (BEI)
Montgomery County
Built Environment Classification
(by Traffic Analysis Zone)
Urban (30)
Suburban (135)
Exurban (153)
Metro Commuter Rail Station
Frederick County, MD
Howard County, MD
Loudoun County, VA
Prince George's County, MD
Washington, DC
Fairfax County, VA
5 0 5 Miles

Study area


Community Analysis Zone Study Areas
Montgomery County, Maryland
Legend
Study Area Boundary
1-Mile Buffer Around Study Area
Other Community Analysis Zone
County Boundary
Park
Water
Metrorail Station
Frederick County, MD
Howard County, MD
Olney
Layhill
Prince George's County, MD
Loudoun County, VA
Bethesda
Four Corners
Forest Glen
Fairfax County, VA
Washington, DC
5 0 5 Miles
Map Prepared by Toole Design Group February 2005

Participants

- ~ 400 participants, 80 per zone
  - Approximate population characteristics

Race	
White	65%
Non-white	35%
Sex	
Male	48%
Female	52%
Age	
18-34	20%
35-54	32%
Over 55	35%
Family income	
Less than $24,999	8%
$25,000 to $49,999	16%
More than $50,000	56%

Participants

- ~ 400 participants, 80 per zone
  - Approximate population characteristics
- Recruitment begins March 2005
  - Coordination & assistance with Minnesota Round II project

Methods

Individual interview

- CAPI
- Height + weight

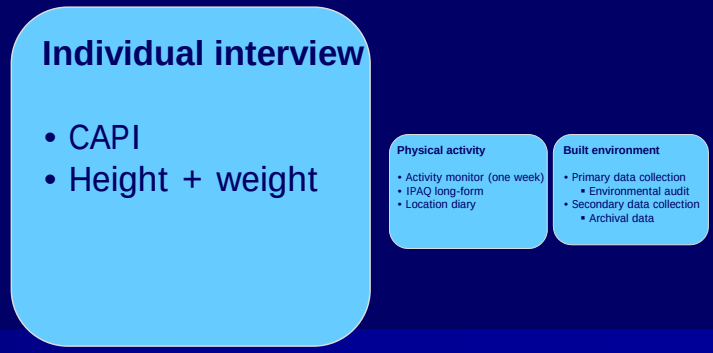
Physical activity

- Activity monitor (one week)
- IPAQ long-form
- Location diary

Built environment

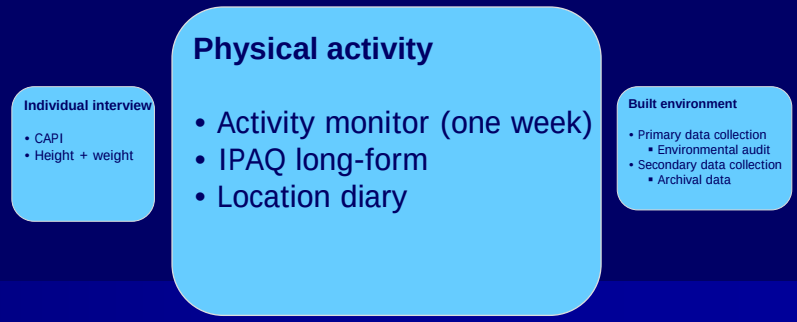
- Primary data collection
  - Environmental audit
- Secondary data collection
  - Archival data

Interview



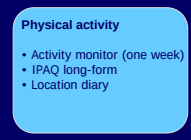
- Survey
  - Comprehensive instrument
  - Pilot-tested in two waves (n_i= 8, 8)
  - Coordinated with Minnesota Round II project
- Height, weight and body fat measurement
  - Stadiometer + bio-impedance analyzer

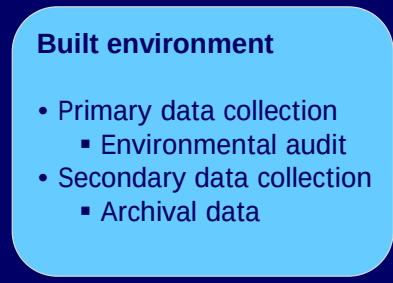
Physical activity



- 7-day activity monitor
- IPAQ long form
- Location diary
  - Where activity and where it does not occur matters
  - Paper-and-pencil
  - Pilot tested in three waves (n_i= 32, 8, 8)
  - Validation of diary Summer 2005
    - Concurrent portable GPS units

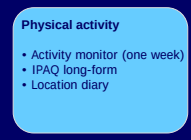
Built environment

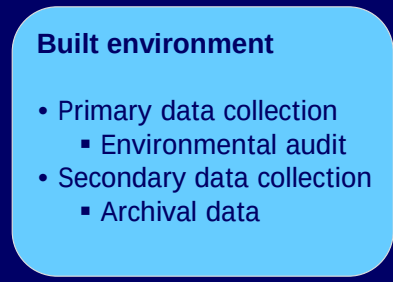




- Primary data: Environmental audit
  - Synthesis of Pikora et. al. (2002) & Boarnet et al. (2004)
  - Pilot-tested in four locations
    - Chapel Hill NC
    - Bel-Air, Dundalk, College Park MD (with PDAs)
  - Reliability of individual audit items
    - Various built environment contexts
    - Modes of audit administration
  - Audit to be implemented in Summer 2005

Built environment





- Secondary data
  - County GIS data
  - Orthophotos
  - Crime data
  - Pedestrian/bicycle reported crashes
  - Location of PA private facilities

Analytical strategy

- Based on consumer choice

OTHER

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  - Each time use has a perceived, non-monetary “cost”

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OTHER

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- Based on consumer choice
  - Each time use has a perceived, non-monetary “cost”
- If BE influences PA, it is through the “cost” of being active at the location
  - $\text{Activity}^{n}_{i} = f(\text{cost}^{n}_{i})$
  - $\text{Activity}^{n}_{i} = f(\text{cost}^{n}_{i}, \text{cost}^{n}_{j}, \text{TT})$

OTHER

Other possibilities

- Potential for add-on for longitudinal data collection
  - Improvements occurring in 3 areas in 2005-6

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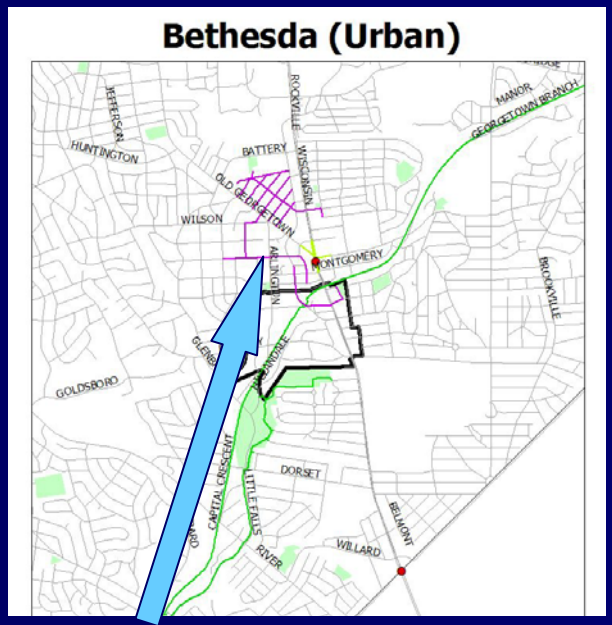
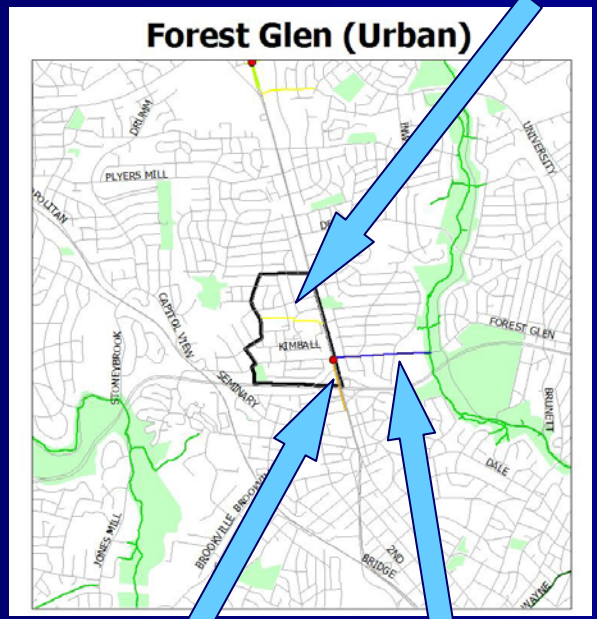


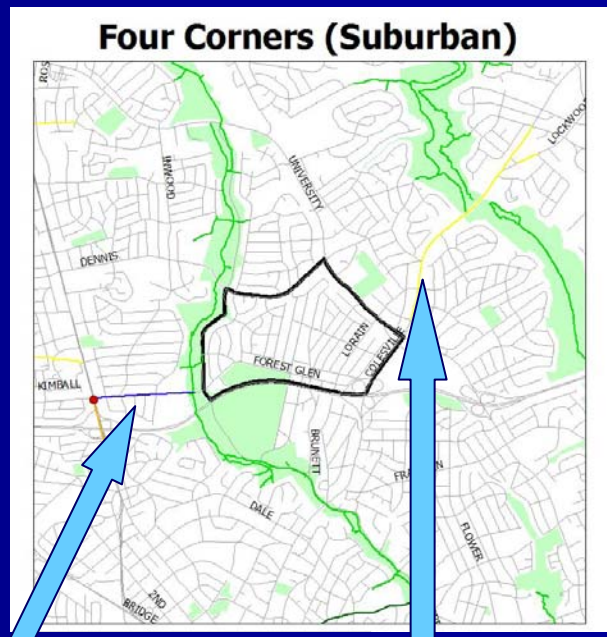
Bike/Sidewalk improvements

New sidewalk



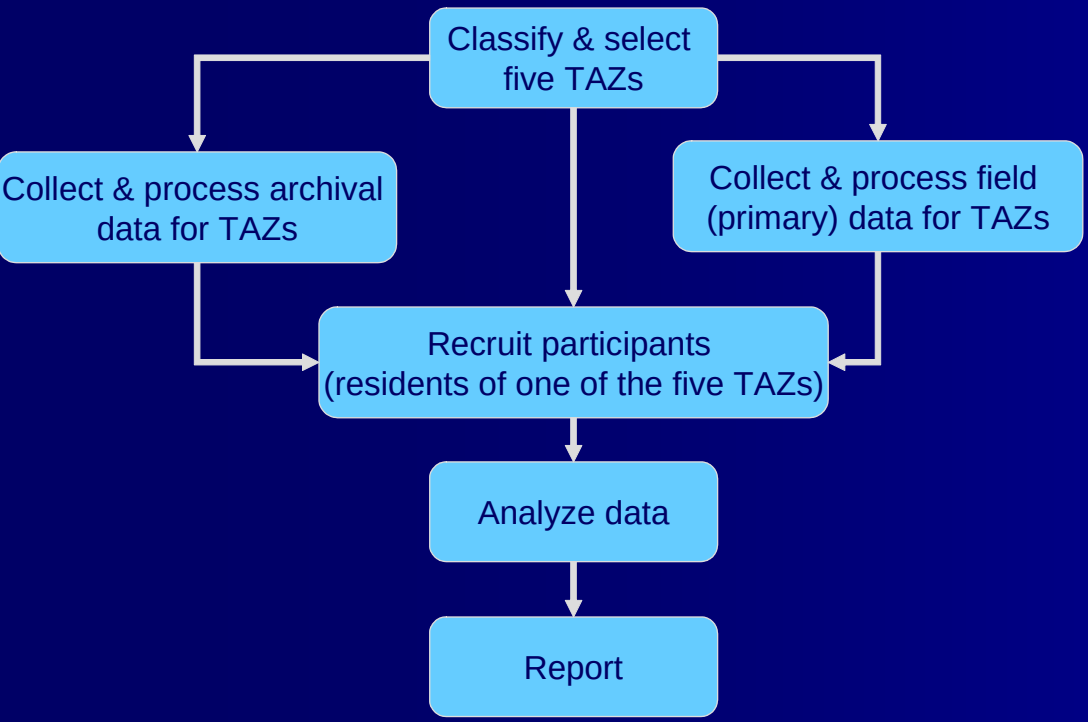
Pedestrian bridge

Bicycle path



New sidewalk

When? 3-year project



Jan-April 2004

April-May 2004, Entire 2005

March 2005-March 2006

Sept 2005-June 2006

November 2006

http://planningandactivity.unc.edu