Educating the Next Generation of Pedestrian and Bicycle Professionals: Tools and Resources for Instructors

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Pedestrian and Bicycle Information Center

THE UNIVERSITY OF NORTH CAROLINA HIGHWAY SAFETY RESEARCH CENTER

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Purpose

- Provide background on ped/bike education in the US
- Present some available resources for instructors
- Discuss barriers and solutions to teaching ped/bike courses

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A Brief History

- Early 1990s: Few ped/bike courses exist
- ISTEA passed in 1991; established federal role in ped/bike funding

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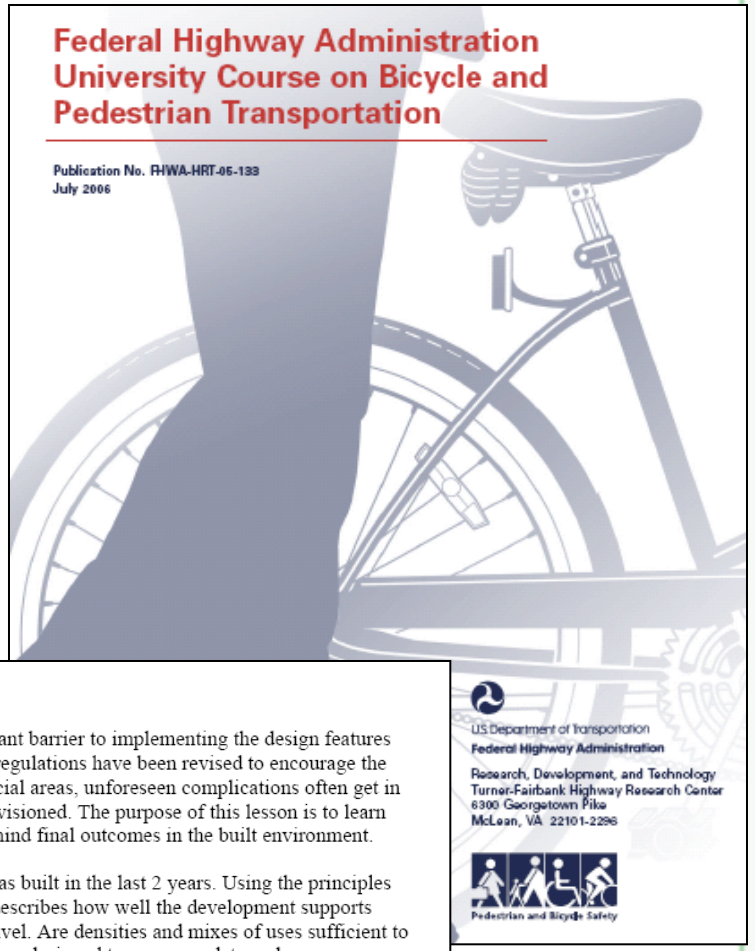
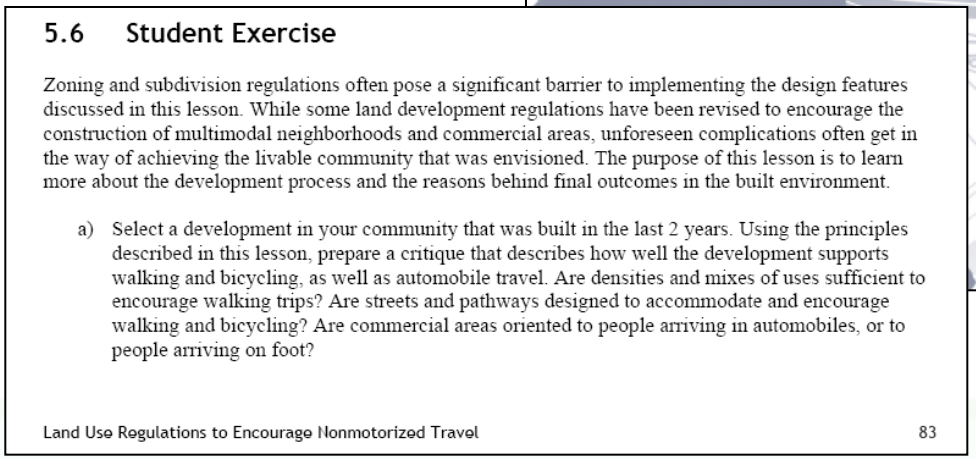
A Brief History

- 1999: HSRC develops FHWA's *University Course on Bicycle and Pedestrian Design*
  - *Instructor Workbook*
  - *Student Workbook*
- 1999-2002: Several courses come on-line

A Brief History

- 2004-2006: TTI updates and distributes FHWA's *University Course*





5.6 Student Exercise

Zoning and subdivision regulations often pose a significant barrier to implementing the design features discussed in this lesson. While some land development regulations have been revised to encourage the construction of multimodal neighborhoods and commercial areas, unforeseen complications often get in the way of achieving the livable community that was envisioned. The purpose of this lesson is to learn more about the development process and the reasons behind final outcomes in the built environment.

a) Select a development in your community that was built in the last 2 years. Using the principles described in this lesson, prepare a critique that describes how well the development supports walking and bicycling, as well as automobile travel. Are densities and mixes of uses sufficient to encourage walking trips? Are streets and pathways designed to accommodate and encourage walking and bicycling? Are commercial areas oriented to people arriving in automobiles, or to people arriving on foot?

Land Use Regulations to Encourage Nonmotorized Travel 83

Source: http://www.walkinginfo.org/training/university-courses/fhwa.cfm

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Ranking of topics by: educators (2009) practitioners (2004)

Rankings of topics by: educators
(June 22, 2009)
n = 43

Top 20 of 34 topics shown here

Slide courtesy of Rod Turochy, Auburn University

Topic	2009	2004
Geometric Design of Highways	1	1
Traffic Flow Characteristics	2	5
Description of Transportation Systems	3	2
Driver Behavior	4	-
Highway Capacity Studies	5	3
Traffic Safety	6	7
Traffic Control Devices (also Traffic Signals)	7	9
Intersection Design	8	8
Transportation Planning	9	6
Land Use/Transportation Interaction	10	4
Traffic Impact Assessment	11	-
Intelligent Transportation Systems	12	10
Transportation Systems Management	13	11
Statistics Applied to Transportation	14	18
Mass Transit (also Public Transportation)	15	14
Evaluation Techniques	16	15
Human Powered Transportation (Ped / Bike)	**17**	**27**
Operational Characteristics of Modes	18	13
Economics of Transportation	19	12
Vehicle Operating Characteristics	20	17

A Brief History

- 2008-2009: Portland State conducts study of 86 university transportation educators
  - 59% (of 134 courses) included ped/bike topics
  - 52% of civil engineering courses only included 1-2 hours of ped/bike topics
  - 43% of respondents were interested in course materials on pedestrian and bicycle topics
    - Top request: Powerpoint and lecture materials

Source: http://www.ibpi.usp.pdx.edu/media/Curriculum_Survey_Report.pdf

A Brief History

- 2008-Present: Started Networking!
  - PW/PB Seattle workshop in 2008
  - PBIC shares piloted course materials in 2009
  - PBIC joins ITE Education sub-committee in 2009 to help draft core competencies for transportation **engineers**, integrating ped/bike
  - TRB workshop in 2010
  - PW/PB Chattanooga session in 2010
  - TRB joint sub-committee in 2011?

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Where are we now?

- 2010: Many courses being taught!
  - Contact list and materials (syllabus): http://www.walkinginfo.org/university_contact
- More are being considered/developed
- Email sandt@hsrc.unc.edu to be added

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Course Material Requests

- North Dakota State University
- University of Tennessee Knoxville
- Pennsylvania State University
- University of South Florida
- Oregon State University
- Augsburg College
- Lafayette College
- University of Texas at Arlington
- University of Michigan
- University of Nebraska-Lincoln
- Ohio State University
- University of Colorado Denver
- Morgan State University
- Temple University
- University of Iowa
- University of Illinois at Chicago
- University of Vermont
- Howard University
- West Virginia University
- UCLA
- University of Utah
- *Several countries: Costa Rica, Canada, Mexico, Indonesia, and Brazil*

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PBIC's Role

- Continue to facilitate discussion/sharing
  - Host list of contacts and course materials
- Serve as a resource for instructors
  - Updating PBIC course materials for 2011
  - Developing assignment bank
  - Condensing lectures for engineering programs
- **www.walkinginfo.org/university**

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PBIC Course Materials Available

- Syllabus and detailed reading list
- Presentation materials with detailed speaker notes for other instructors to use or modify as necessary
- Assignments/labs and grading keys to facilitate grading by a teaching assistant
- Additional instructions/guidance for teaching
- *Expected instructor time commitment: 15 hrs/wk*
- **All materials in MS Office**

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PBIC Course Development

- 3-credit hour course for masters's students
- Designed to critically discuss the ped and bike planning process
- Primarily intended for City and Regional Planning Program students but beneficial to other disciplines as well
- Adaptable for students of disciplines or shorter credit hour courses

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PBIC Course Development

- Developed core competencies
- Drew from existing courses:
  - FHWA
  - PBIC professional training
  - Berkeley (Bob Schneider, 2008)
  - Portland State (Mia Birk, 2007)
  - U Washington (David Levinger, 2008)

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Course Format

- Comprehensive reading list
- Lectures
- Labs
- Guest speakers
- Expert panel and networking

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Key Elements of the Course

- History of Non-Motorized Transportation
- Measuring the Benefits of Non-Motorized Transportation
- **Health, Physical Activity, and the Built Environment**
- Land Use/Connectivity Issues, Access, and Mobility
- Pedestrian and Bicycle Facility and Public Space Design Fundamentals
- Developing and Evaluating Pedestrian/Bicycle Master Plans
- Connection with Land Use and Transportation Plans, TDM, Policies
- **International Approaches to Pedestrian and Bicycle Planning and Facility Design**
- Public Participation, Coalition Building, and Partner Buy-in
- Data Collection Needs, Sources, Methods, and Measures
- Pedestrian and Bicycle Facility Analysis Tools
- **Safety and Crash Data Analysis**
- Demand Estimation and Analysis
- Research Issues in Pedestrian and Bicycle Planning
- Programming, Promotion, and Advocacy
- Funding, Implementation, and Institutionalization

Course Projects

- Examine the built environment
- Become familiar with data collection methods
- Compare and evaluate two sets of plans
- Individual research project

www.pedbikeimages.org / Dan Burden

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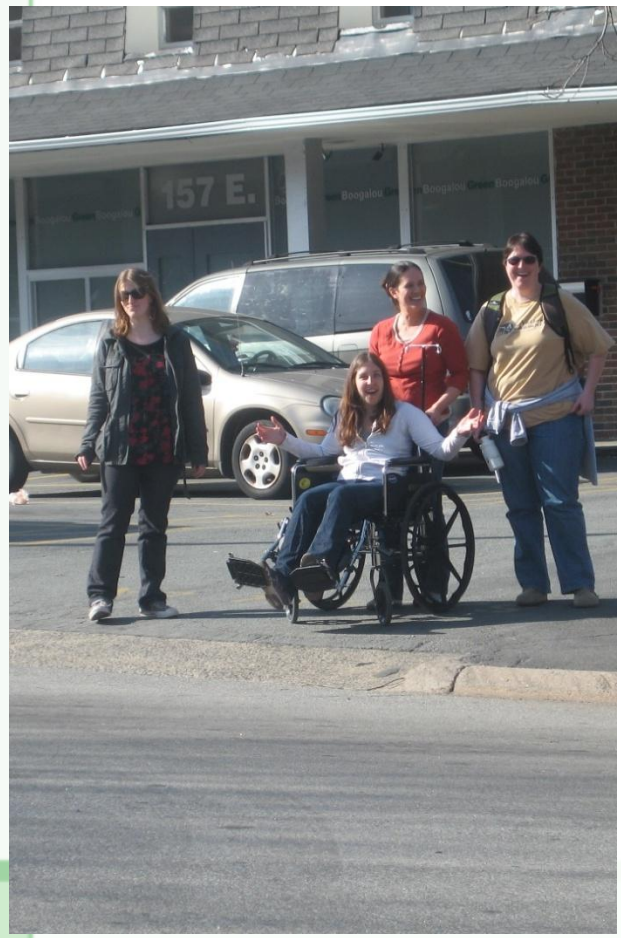
Wheelchair Lab



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Bicycle and Pedestrian Planning Course

Semester, Year

Faculty advisor: Name and email
Instructor: Name and email
TA: Name and email
Course date/time: TBD
Room: TBD
Office Hours: TBD
Course Web site: TBD

COURSE OVERVIEW

Current transportation thought, design, and practices are being reevaluated as we strive towards healthy, mobile, and sustainable cities and regions. Integration of pedestrian and bicycle planning into transportation planning is essential in creating a sustainable system to achieve these goals.

Pedestrian and bicycle transportation are influenced by micro-scale elements of the built environment, such as sidewalks, bicycle lanes, traffic speeds, and roadway crossings, as well as by macro-scale characteristics, such as community-wide pathway systems and regional land use and street grid patterns. As a result, addressing walking and bicycling issues requires the bridging of many disciplines, including urban planning/design, civil engineering, and others. Thus, this course brings experiences from professionals in many fields (both public and private) and researchers at the local and national level into the classroom to provide diverse perspectives on effective ped/bike planning strategies.

This course is designed to critically discuss the pedestrian and bicycle master plan process. It is divided into several sections that will bring this comprehensive process together. The first part of the course will map out the issues and challenges that necessitate bicycle and pedestrian planning, such as: physical and mental health, social equity, environmental sustainability, and economic development. The course will then discuss user needs including facility design fundamentals, land use and network connectivity, and safety, access, and mobility.

The final portion of the course will focus on creating bicycle and pedestrian master plans. It will include a comprehensive look at the elements of a plan, how to analyze plans and elements, how to best use public participation, and finally how to fund and implement the plan. As a graduate level

CLASS SCHEDULE

Class/Lecture	Topic	Comments
1	Introduction and History of Non-Motorized Transportation	
2	Measuring the Benefits of Non-Motorized Transportation	
3	Health, Physical Activity, and the Built Environment	Assignment #1 available
4	Land Use, Connectivity Issues, Access, and Mobility	
5	Pedestrian Facility Design Fundamentals and Safety Issues: Part 1	
6	Pedestrian Facility Design Fundamentals, Public Space, and American Disabilities Act Issues: Part 2	
7	Wheelchair Lab	
8	Traffic Calming and Bicycle Facility Design Fundamentals	Assignment #1 due
9	Trails and Greenway Design	
10	Developing and Evaluating Pedestrian/Bicycle Master Plans	Assignment #2 available
11	Connecting Pedestrian/Bicycle Plans with Transportation & Land Use Plans & Other Policies	
12	International Approaches to Pedestrian and Bicycle Planning and Facility Design	
13	Public Participation, Coalition Building, and Partner Buy-in	
14	Data Collection Needs, Sources, Methods, and Measures	
15	Field Data Collection Lab/Time for Assignment #2	
16	Pedestrian and Bicycle Facility Analysis Tools	
17	Safety and Crash Data Analysis	Assignment #2 due; Assignment #3 and

Class #5: Pedestrian Facility Design Fundamentals and Safety Issues: Part 1

Required:

- Burden, D., & Lagerwey, P. (1999). Road diets: fixing the big roads. Walkable Communities, Inc.
- Ewing, et al. (Under preparation). Impact of the built environment on walking –a review. Unpublished mimeo.
- Zegeer, C., Sandt, L., Scully, M., Ronkin, M., Cynecki, M., & Lagerwey, P. (2008). Chapter 5. *How to develop a pedestrian safety action plan*. Chapel Hill, NC: Pedestrian and Bicycle Information Center.

Optional:

- Saelens, B., & Handy, S. (2008). Built environment correlates of walking: A review. *Medicine & Science in Sports & Exercise, 40*, 550-566.
- Huang, H., Stewart, R., & Zegeer, C.V. (2004) Summary report: evaluation of lane reduction "road diet" measures and their effects on crashes and injuries. FHWA-HRT-04-082. Federal Highway Administration.
- Duncan, M. J., Spence, J. C. and Mummery, W. K. (2005). Perceived environment and physical activity: A meta-analysis of selected environmental characteristics. *International Journal of Behavioral Nutrition and Physical Activity, 2*(9)

Resources:

- (2004). *Guide for the planning, design, and operation of pedestrian facilities.* Washington, D.C.: American Association of State Highway and Transportation Officials.
- US. Architectural and Transportation Barriers Compliance Board. (2002). *Americans with Disabilities Act Accessibility Guidelines.*
- US. Architectural and Transportation Barriers Compliance Board. (1999). *Accessible Rights-of-Way: A Design Guide.*
- Accessible Public Rights of Way: Planning and Designing for Alterations (2007): http://www.acccess-board.gov/prowac/alterations/guide.htm
- Harkey, D. L, & Charles Z. V. (2004). *PEDSAFE: Pedestrian safety guide and countermeasure selection system* (Chapter 5). Washington, D.C.: Federal Highway Administration.

Before the Plan

- Obtain funding
- Identify the "home" for the PBMP
- Develop plan for internal review
- Formalize public involvement

1. **Slide Summary:** After the function of the plan is determined (the "why" of the planning process), the next steps will be to determine *how* the plan will be developed and implemented. This means determining what kind of work and funding the plan will require, and who will be responsible for providing the money and staff it will entail. Prior to the development of the plan it is essential to develop stakeholder buy-in. This may include setting up a citizen advisory committee, developing a consensus on plan goals, objectives, and content, and, if necessary, hiring a consultant.
2. **Image Source and References:** Image from http://www.pedbikeimages.org/Dan Burden.

PBIC Course at UNC

- Taught in Spring 2009 at UNC-DCRP
- 3 hr credit
- 24 gradate students (over capacity)
- Funded with grant from UNC; further support from PBIC to revise and distribute/market the course
- Scheduled again for Spring 2011
  - 29 students enrolled

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Course Feedback

- I thought the **wheelchair lab** was really useful and fun.
- Syllabus was very thorough; optional listings were great resources.
- **Speakers** such as Lagerwey and Flink brought great practitioner/planner perspectives and emphasis on the public process and project management. Other classes in this department could use more practitioner presentations.
- I think the final (independent) assignment was the most rewarding and I would like to have had more time to focus on research.
- Overall, I really enjoyed the course. It's been one of my favorites so far. I think it has provided me with **tools that I could bring to a job from day one**.
- I think this class was really important/helpful in helping me to think about planning and being a planner. It included a lot of components (outside speakers, research) that are lacking in a lot of classes and the **topics are so current.**

Course Feedback

- The course needed to have **more design** fundamentals up front and time for discussion
- It would be nice to include more discussion of **transit** issues throughout the course
- Do not need to spend as much time covering the “benefits” of walking and biking - we already know these or we would not be taking the course
- The required and optional readings could be quite overwhelming at times. It would be good to **prioritize the lists of readings** in the order of importance so students know what to focus on first
- This course needs to be offered more than once every 2 years

Course updates

- Resource changes
  - MUTCD and HCM
  - Syllabus readings
- New assignments
  - Work with local planners
- Lecture updates
  - Content and flow improvements

Image source: www.pedbikeimages.org/
Dan Burden

Lessons Learned

- Draw from existing courses
- A little funding goes a long way
- Tailor lectures to instructor expertise
- Market the course to students
- Engage students through real world applications/projects

Other Barriers and Solutions

- Recruitment
  - Perceived lack of demand
- Some Solutions
  - Query/engage students
  - Recruit!
  - Offer periodically
  - Integrate materials into standing courses
  - Allow students from other departments

Image courtesy of David Levinger

Other Barriers and Solutions

- Instructor Expertise and Availability
  - Finding professors with appropriate background and interest/availability

- Some Solutions
  - Bring in guest speakers: consultants, local planners, other professors
  - Allow PhD students to teach, if qualified
  - Build from other courses available

Other Barriers and Solutions

- Selecting the material to cover
  - Covering both ped and bike issues
  - Balancing breadth vs depth
  - Defining core competencies

- Some Solutions
  - Tailor to your strengths
  - Use assignments to extend learning opportunities
  - Consider other course content

Be part of the solution!

Instructor Support Materials:

http://www.walkinginfo.org/university

Contact Info:

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919-962-2358

Carl Sundstrom

sundstrom@hsrc.unc.edu

919-843-4963

Photo of UC Davis Campus
Image source: www.pedbikeimages.org/
Laura Sandt

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