Web based graduate education in public transportation

A report of the

Center for Urban Transportation Studies
University of Wisconsin – Milwaukee

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Web based graduate education in public transportation

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The objective of this project is to develop educational materials about public transit that can be used at the university level for courses in transportation planning, engineering and management. A series of course modules covering transit planning and operations were developed based on existing course materials used by faculty in the Great Cities University Consortium and are prepared to be used in an on-line format as well as a classroom setting.


Education, on-line courses New starts, transit technology, transit route analysis, transit demand, transit operations, Performance evaluation, public transportation, mass transit

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Other material was developed and assembled as part of work being conducted by the Great Cities University consortium under the lead of the University of Alabama at Birmingham using funds provided by the Federal Transit Administration of the U.S. Department of Transportation.

The opinions expressed are the product of independent university work and not necessarily those of the sponsoring agencies or of the agencies supplying data for the project.

The illustration on the cover is by Jackie Eastwood as part of the La Crosse Area Regional Transportation plan.
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## Introduction:

### Course Objectives and Learning Outcomes

**Course material:** (each of these sections is separately numbered)

1. **Background Information**
   - Differences Between Highway and Transit Planning
   - Transit Benefits
   - Understanding Transit Demand
   - A Profile of Public Transit Riders (from APTA)
   - Transit Capacity and Level of Service
   - Glossary of Transit Planning Terms

2. **Transit Planning for New Starts**
   - New Starts/Alternatives Analysis/Major Investments
   - Transit Technology Alternatives
   - Environmental Impact Assessment
   - Environmental Justice and Transportation Planning
   - Transit and Land Use
   - A Transportation Modeling Primer

3. **Transit Planning for Operations**
   - Transit Operations Decisions
   - Transit Performance Measurement
   - Use of Performance Data
   - Transit and Geographic Information Systems – Case Studies
   - Transit Planning Examples

4. **Transit Route Location and Analysis**
   - Alternatives: Strategies for Transit System Change
   - Transit Route Location

5. **Analysis Procedures for Operations**
   - Demand Analysis for Transit Operations
   - Basic Fleet Size Relationships
   - Transit Scheduling
   - Transit Demand Analysis
   - Transit Cost Analysis

6. **The Belle Transit Crisis**
Introduction:

University based education about the fundamentals of public transit in the transportation system is very limited. Few universities have any expertise in the subject and there is limited information readily available in the form of textbooks or on-line materials that can be used for courses or parts of courses. Faculty at most universities are limited and often there is no one available who has any background in transit research, planning or operations. It is rare to find people who teach at universities who have an understanding of such critical issues as: transit operations, routing and scheduling considerations, effects of labor constraints, transit demand, transit finance etc. Very often students graduate with advanced degrees in transportation planning, transportation and traffic engineering or transportation policy without a clear understanding how public transit systems function and how they are uniquely different than other forms of transportation.

Objectives:

The objective of this project was to develop educational materials about public transit that can be used at the university level for courses in transportation planning, engineering and management. A series of course modules covering transit planning and operations will be developed based on existing course materials used by faculty in the Great Cities University Consortium and will be prepared to be used in an on-line format as well as a classroom setting.

This report presents a printed version of that work. The web material can be found at:

http://www.uwm.edu/Dept/CUTS/utp/

Organization

The material developed is presented in a group of sections with several topics for each. Normally this includes a text description of the topic followed by an associated power point presentation. Each section has a separate page numberings system and a table of contents is given at the beginning of each section. Most of the sections have a set of questions or assignments at their beginning. An overall project, the Belle Crisis, which deals with many operations issues, is given at the end of the report.

In some cases the project requires specific software is used, this is available on the web site. Copies of these and the actual power point presentations are available on request from the author at beimborn@uwm.edu
Web site snapshot (partial)

Understanding Transit:

Basic course material on Public Transportation

University of Wisconsin-Milwaukee
Center for Urban Transportation Studies

The objective of this project is to disseminate educational materials about public transit that can be used at the university level for courses in transportation planning, engineering and management.

Course learning objectives and outline

Acknowledgements

Topics

Introduction and Background Information

- Introduction to this section (Read this First!)

- Differences Between Highway and Transit Planning power point

- Transit Benefits
- Transit Benefits power point slides

Vehicular Transits
Course objectives and learning outcomes

This section provides a description of the course objectives and learning outcomes. It is done in a format that follows ABET (Accrediting Board for Engineering and Technology) guidelines.

Suggested Course Description: 3 cr. Senior Graduate level. Transit Systems: 3 cr. Procedures for the analysis and planning of public transportation systems. Major investment studies, transit operations decisions, use of performance indicators, transit relationships, cost and demand analysis.

Prerequisites by Topic:

- Understanding of fundamentals of planning and transportation systems.
- Written and Graphical skills
- Mathematical preparation to understand basic algebraic relationships and financial analysis
- Computer preparation including office software. (understanding of geographical information systems is desired)

Course Objectives:

Broad Objectives

- The objective of this course is to create an understanding of public transport by students interested in professional careers in transportation.
- Students should be able to understand differences between public transit planning, design and operations and procedures used for other modes.
- Students should be able to understand the New starts process for planning of major fixed guideway transit systems.
- Students should be familiar with procedures used for transit operating decisions, and for the planning of major new systems or extensions.

Learning Outcomes: At the completion of the material, students should have an understanding of:

- Differences between highway and transit
- Characteristics of transit use and benefits of transit.
- The transit project development process including the development of alternatives analysis and major investment studies
- Use of performance indicators for transit planning and management.
- Alternative technologies for public transportation
- Principles of route location and design
- Procedures to estimate transit demand
- Cost analysis procedures.
Topics Covered:

1:  Background Information
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   • Understanding Transit Demand
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   • Transit Capacity and Level of Service
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   • Transit Technology Alternatives
   • Environmental Impact Assessment
   • Environmental Justice and Transportation Planning
   • Transit and Land Use
   • A Transportation Modeling Primer

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   • Transit Operations Decisions
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