

# Transportation Workshop: Bus Rapid Transit in the Milwaukee Region

Urban Planning 692/Architecture 790—3 Credits—Fall 2016 (Graduate Level)

Mondays from 5:30 to 8:10 p.m., AUP Room 183

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Office Hours: M: 1-3 pm, Tu: 10-noon (AUP 334)

## Course Description

Bus Rapid Transit (BRT) systems have become a new transit phenomenon in the United States and abroad. They differ from traditional bus service because they are on dedicated rights-of-way (bus-only lanes, tunnels, or elevated lanes), consolidate passenger access at stations approximately every half mile, allow level boarding at multiple doors, and provide faster service than local buses. These systems also differ from light-rail transit because they do not have rails, are less expensive, and have greater route flexibility. BRT stations may also have the potential to attract transit-oriented development.

During the last year, Milwaukee County conducted the East-West Corridor BRT Feasibility Study, recommending BRT in a 9-mile corridor between Downtown Milwaukee and the Milwaukee Regional Medical Center. In addition, the Southeastern Wisconsin Regional Planning Commission recommended BRT as a rapid transit option in its Vision 2050 Regional Transportation and Land Use Plan.

This course is a hands-on workshop that will produce professional products useful to government agencies, elected officials, and the general public, complementing existing BRT initiatives. Final products will include a professional report, presentation slides, and visual displays (e.g., field data analysis results, maps, roadway cross-sections, and corridor and station illustrations) that will communicate a clear concept of how BRT could work in the Milwaukee region. These final products will draw upon input from a meeting with practitioners and be presented at a public meeting. Your class will work as a team throughout the semester, and this may include dividing certain tasks between groups.

The focus of the analysis, report, and presentations will be established during the first two weeks of class. The final emphasis will be a combination of the following three focus areas:

- 1) Develop clear and persuasive analyses, messages, and images to communicate the benefits and potential strategies to address challenges of implementing BRT in the East-West Corridor. Subtopics could include addressing issues with traffic congestion, reductions in automobile parking, delivery vehicle accommodations, pedestrian crossing safety, pedestrian and bicycle access to stations, a potential transit plaza on Wisconsin Avenue, and gathering input about BRT opportunities and concerns from a subset of community members. It would also involve summarizing how BRT projects in other regions have addressed these problems.
- 2) Create a vision for the next phases of BRT development in the Milwaukee region. Subtopics could include analysis of development potential around stations (interview developers; research existing land uses and zoning to determine the amount and mix of development that could be created), potential for exclusive lanes in proposed BRT corridors (considering roadway widths and on-street parking needs), equity benefits and challenges (BRT travel time savings versus local service coverage). This focus area would also include gathering input about BRT opportunities and concerns from a subset of community members.
- 3) Describe how BRT service will actually be implemented in the East-West Corridor. Subtopics could include detailed roadway cross-section measurements (including potential variations in BRT design in different parts of the corridor), service hours and frequency, funding for capital costs, funding for operations, and other operational considerations.

I am looking forward to a great term with all of you!

Bob

## Course Objectives

By completing this course, students should be able to:

- Describe elements of a BRT system.
- Review previous plans in the Milwaukee region that have recommended BRT.
- Assess benefits of BRT systems and identify obstacles to developing BRT in Milwaukee.
- Explain the decision-making process that individual travelers use to choose a specific mode (e.g., transit, automobile, or bicycling) for routine travel.
- Understand different metrics that can be used to evaluate transit system performance.
- Work effectively with group members to analyze and illustrate the concept of BRT.
- Communicate a vision for a potential BRT system in Milwaukee to agency staff, elected officials, and the general public.

## Readings and Class Participation

Readings will be available under “Content” on the class D2L website (<http://d2l.uwm.edu/>). All students are expected to read all the assigned readings BEFORE class and to actively participate in the discussion of readings.

Active participation in class is an important component of this course. Classes will involve course instructor presentations, professional guest lectures, and group work sessions. It will be important for all students to:

- Arrive on time and stay for the duration of class.
- Turn off phones and other mobile devices for the duration of class.
- Turn off laptops unless instructed otherwise and refrain from accessing the internet on any other device during class.

Behaviors that detract from class learning will be penalized in the class participation grade.

## Format

The class is organized as a workshop. Lectures will be given in the first half of the semester to introduce the basic concepts and tools associated with BRT. As class products are developed, the instructor will discuss progress with the full class and specific teams.

The course will include a midterm exam and three main task assignments. These are described below.

### ***Midterm Exam (Week 8, 10/31/16)***

A midterm exam will be given to gauge student comprehensive of key BRT concepts based on international practice as well as specific BRT issues in the Milwaukee region. It will draw from lectures as well as readings.

### ***Task 1: Background Report (Due Week 9, 11/7/16)***

The Background Report will include a summary of key issues that the class will address related to BRT in Milwaukee. It will summarize the field data collection, public input data collection, and analysis approaches being used by the class to explore these issues. It will also provide examples of how other regions are addressing these issues. Note that this report does not need to include final results or recommendations. Information in the report from other sources (including pictures) must be cited appropriately. The report itself should be approximately 10 to 15 pages of text (not including pictures, figures, and appendices). With pictures, figures, and appendices, the report may be 25 to 40 pages. This Background Report will be revised to become the first part of the Final Report.

Qualities of a good report:

- Well-written text.
- Good organization, including a table of contents and section headings.
- A clear statement of the purpose of the report and the intended audience (the intended audience is local urban planning professionals: planners, engineers, designers, advocates).
- Graphics, including pictures, figures, and/or tables to illustrate key points.
- Supporting appendices, if applicable, to provide background information that is too detailed for the text.
- Correct references of sources used in the report.
- A discussion section describing lessons that Milwaukee can learn from other communities.
- A conclusion that includes next steps for the Final Report (Task 3).

**Task 2: Practitioner Workshop Presentation (Due Week 11, 11/21/16).**

Present the information in the background report (field data collection, public input data collection, analysis approaches, and lessons from other regions) to local practitioners. This presentation should include some preliminary findings and possible recommendations for the practitioners to consider. The practitioners will provide feedback that will help guide final product development. The deliverable for this task will be a set of PowerPoint slides and other physical graphics (e.g., posters with photographs or illustrations) to present information. Each student must help deliver part of the presentation. The Practitioner Workshop Presentation may be revised to become part of the Final Workshop Presentation.

Qualities of a good presentation:

- Good organization, including an overview slide near the beginning and a conclusion slide at the end. The conclusion should include next steps toward the Final Report (Task 3).
- Use very few words of text. Instead, your words should communicate the information and be complemented by attractive, informative graphics (e.g., illustrations, charts, tables, and pictures).
- Correct references of sources used to provide information in the presentation.
- Clear summary of class data collection and analysis process to date.
- Clear summary of findings and possible options for moving BRT forward, which may be presented with questions for the practitioners.

**Task 3: Final Public Workshop Presentation and Summary Report (Due Week 14, 12/12/16).**

Present the findings and recommendations from the semester to local practitioners, the public, and the media. These final products should have the qualities of a good report and a good presentation summarized in Task 1 and Task 2. The report itself should be approximately 20 to 30 pages of text (not including pictures, figures, and appendices). With pictures, figures, and appendices, the report may be 50 to 80 pages.

These final documents will be produced with professional quality. Both the PowerPoint slides and the Final Report should be ready to be posted on the SARUP website so that they can be shared with professionals, elected officials, and local media.

**Teamwork**

Operating like a professional planning, engineering, or design firm, most course work will be done as a full class group or in smaller teams. While certain students may lead specific efforts, all group members must participate and contribute throughout the course. To work effectively, there must be regular communication between class members. Some weeks will include class time for group meetings, so use

this time to coordinate your efforts and make sure you know what each person will do and when it will be done. First communicate between class members about any concerns, but please do not hesitate to share any team issues with the instructor early in the process.

Note that each student will evaluate the other students' contributions to the team at the end of each task. This assessment will be anonymous. If particular students are evaluated as contributing to substantially more or less than their share of the work, their overall grade will be adjusted up or down from the rest of the group members.

### **Conduct and Ethics**

Cite your sources. If you get information from a printed, online, video or other source, cite it. If you cite a reference word for word, put those words in quotes. Don't use someone else's work as if it was your own without citing it. Citing sources, even if it takes extra time, enhances your professional credibility.

"Plagiarism includes: 1) Directly quoting the words of others without using quotation marks or indented format to identify them; or, 2) Using sources of information (published or unpublished) without identifying them; or, 3) Paraphrasing materials or ideas of others without identifying the sources."  
–University of Wisconsin-Milwaukee Graduate School, "Academic Misconduct," Website, Available online: <http://www4.uwm.edu/dos/conduct/academic-misconduct.cfm>, August 2016.

Additional University policies are available from: <http://www4.uwm.edu/secu/SyllabusLinks.pdf>.

### **Grading**

Grades will be given on an A to F scale based on the following components of the class:

- Mid-term Exam (15%)
- Task 1: Background Report (20%)
- Task 2: Practitioner Workshop Presentation (20%)
- Task 3: Final Public Workshop Presentation and Report (35%)
- Individual participation and contribution to class (10%). This includes attendance, contribution to group and class discussions, and possible quizzes on weekly discussion topics and readings.

Assignments are due by 5:00 p.m. before the classes listed above. This class produces professional products. Late work is not an option.

The grading scale will be based on points earned out of 100 possible points in each component area. This scale is:

98 and above = A+  
93 to 97.9 = A  
91 to 92.9 = A-  
88 to 90.9 = B+  
83 to 87.9 = B  
81 to 82.9 = B-  
78 to 80.9 = C+  
73 to 77.9 = C  
(and so on)

In general, it is expected that students will spend approximately three hours in class per week plus an additional six hours per week on readings, assignments, and other preparation.

## Class Topics, Reading List, Task Deliverables, and Discussion Format

### Class 0: Background—Getting Familiar with Bus Rapid Transit

#### Presentations/Videos:

- 0.1. University of Wisconsin-Milwaukee, Bus Rapid Transit Workshop. “All Aboard: Bus Rapid Transit in Milwaukee,” Final Public Workshop presentation, Available online, [http://129.89.74.30:8080/rc/pdf/sarupwebsitedocs/upgallery/UWM\\_BRTCcourse\\_1PublicWorkshopPresentation.pdf](http://129.89.74.30:8080/rc/pdf/sarupwebsitedocs/upgallery/UWM_BRTCcourse_1PublicWorkshopPresentation.pdf), 2015. (Also see other information about last year’s course at: <https://uwm.edu/sarup/uwmilwaukeebusrapidtransitworkshop/>)
- 0.2. Doherty, E. “Ottawa’s Unique Bus Rapid Transit System,” EcopathPlan, YouTube, Available online, <https://www.youtube.com/watch?v=AmE1YLdTv38>, 2013.
- 0.3. CDM Smith. “Stories that Matter: Transforming Cleveland through Bus Rapid Transit,” YouTube, Available online, <https://www.youtube.com/watch?v=0Caa7KjkmTl>, 2015.
- 0.4. City of Chicago TV. “Loop Link Bus Rapid Transit,” YouTube, Available online, <https://www.youtube.com/watch?v=szW49OZu2xE>, 2015.

### Class 1: Course Overview and Introduction to Bus Rapid Transit (9/12/16)

#### Readings:

- 1.1. Institute for Transportation and Development Policy. *The Bus Rapid Transit Standard*, Available online, <https://www.itdp.org/the-brt-standard/>, 2016. (Read pp. 3-11, skim pp. 24-72)
- 1.2. Cervero, R. *Bus Rapid Transit (BRT): An Efficient and Competitive Mode of Public Transport*, University of California, Berkeley Institute of Urban and Regional Development, Working paper 2013-01, Report prepared for European Automobile Manufacturers Association, Available online, <http://iurd.berkeley.edu/wp/2013-01.pdf>, August 2013. (Skim pp. 1-35)
- 1.3. Southeastern Wisconsin Regional Planning Commission (SEWRPC). “Special Issue—Bus Rapid Transit,” *Regional Planning News*, Volume 2, Issue 4, Available online, [http://www.sewrpc.org/SEWRPCFiles/Publications/ENews/ENews-V2\\_4.pdf?utm\\_source=SEWRPC+Regional+Planning+News+Volume+2%2C+Issue+4+-+August+2015&utm\\_campaign=SEWRPC+Newsletter&utm\\_medium=email](http://www.sewrpc.org/SEWRPCFiles/Publications/ENews/ENews-V2_4.pdf?utm_source=SEWRPC+Regional+Planning+News+Volume+2%2C+Issue+4+-+August+2015&utm_campaign=SEWRPC+Newsletter&utm_medium=email), August 2015. (Skim document)

## **Class 2: BRT Proposal for Milwaukee's East-West Corridor (9/19/16)**

### Readings:

2.1. Milwaukee County. *East-West Bus Rapid Transit Feasibility Study*, Public Meeting Displays, Available online, [http://www.eastwestbrt.com/assets/april\\_e-w\\_brt\\_online\\_pim\\_displays.pdf](http://www.eastwestbrt.com/assets/april_e-w_brt_online_pim_displays.pdf), April 2016.

2.2. Milwaukee County. *East-West Bus Rapid Transit Feasibility Study*, Public Meeting Displays, Available online, [http://www.eastwestbrt.com/assets/may\\_e-w\\_brt\\_online\\_pim\\_displays.pdf](http://www.eastwestbrt.com/assets/may_e-w_brt_online_pim_displays.pdf), May 2016.

2.3. Milwaukee County. *East-West Bus Rapid Transit Feasibility Study*, Locally Preferred Alternative Report, [http://www.eastwestbrt.com/assets/eastwestbrt\\_locally\\_preferred\\_alternative\\_report.pdf](http://www.eastwestbrt.com/assets/eastwestbrt_locally_preferred_alternative_report.pdf), August 2016.

(Also see other information about the project at: <http://www.eastwestbrt.com/>)

## **Class 3: Transit Planning and BRT in the Milwaukee Region (9/26/16)**

### Readings:

3.1. Southeastern Wisconsin Regional Planning Commission (SEWRPC). *Recommended Year 2050 Regional Land Use and Transportation System Plan*, Revised Draft, Available online, <http://www.sewrpc.org/SEWRPCFiles/LUTranSysPlanning/pr-055-vol-3-chapter-1-draft-revised.pdf>, 2016. (Read pp. 27, 30-31)

3.2. Peterangelo, J. and R. Henken. *An Analysis of Best Practices for Improving Bus Speeds and their Potential Applicability to Milwaukee*, Prepared by Public Policy Forum, Available online, <http://publicpolicyforum.org/sites/default/files/PickingUpThePace-FullReport.pdf>, 2015. (Read pp. 3-10)

3.3. Ryan, S. "Picking Up Speed: Bus Rapid Transit Coasting Along," *Milwaukee Business Journal*, Available online, <http://www.bizjournals.com/milwaukee/print-edition/2016/06/10/picking-up-speed-bus-rapid-transit-coasting-along.html>, June 10, 2016.

3.4. Ryan, S. "Bus Rapid Transit Route Earns Wauwatosa Approval on Divided Vote," *Milwaukee Business Journal*, Available online, <http://www.bizjournals.com/milwaukee/news/2016/06/22/bus-rapid-transit-route-gets-wauwatosa-approval-on.html>, June 22, 2016.

3.5. Behm, D. "Bus Rapid Transit Route Clears Two Hurdles," *Milwaukee Journal-Sentinel*, <http://archive.jsonline.com/news/bus-rapid-transit-route-clears-two-hurdles-b99761009z1-386680711.html>, July 13, 2016.

3.6. Ryan, S. "BRT Route Endorsed by Milwaukee Aldermen Despite Some Concerns," *Milwaukee Business Journal*, Available online, <http://www.bizjournals.com/milwaukee/news/2016/07/26/brt-route-endorsed-by-milwaukee-aldermen-despite.html>, July 26, 2016.

3.7. Cole, T. "Milwaukee County's BRT Route Plans Move Forward After Final Approval," *Milwaukee Business Journal*, Available online, <http://www.bizjournals.com/milwaukee/news/2016/07/29/milwaukee-county-s-brt-route-plans-move-forward.html>, July 29, 2016.

#### **Class 4: BRT System Planning and Design, Part 1 (10/3/16)**

##### Readings:

4.1. Schneider, R.J. "Theory of Routine Mode Choice Decisions: An Operational Framework to Increase Sustainable Transportation," *Transport Policy*, Volume 25, pp. 128-137, 2013. (Read pp. 129-134) (*This paper is focused on walking and bicycling, but think about its implications for transit.*)

4.2. Boyle, D.K. *Commonsense Approaches for Improving Transit Bus Speeds*, Transit Cooperative Research Program Synthesis 110, Transportation Research Board, Available online, [http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\\_syn\\_110.pdf](http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_syn_110.pdf), 2013. (Read pp. 1-14)

4.3. Hoffman, A. *Advanced Network Planning for Bus Rapid Transit: The "Quickway" Model as a Modal Alternative to "Light Rail Lite"*, US Department of Transportation, Federal Transit Administration, FL-26-7104, Available online, <http://www.nbrti.org/docs/pdf/BRT%20Network%20Planning%20Study%20-%20Final%20Report.pdf>, February 2008. (Read pp. 5-12; 29-45; 73-79)

#### **Class 5: BRT System Planning and Design, Part 2 (10/10/16)**

##### Readings:

5.1. National Association of City Transportation Officials (NACTO). *Transit Street Design Guide*, Available online, <http://nacto.org/publication/transit-street-design-guide/>, 2016. (Skim sections on "Stations & Stops" and "Transit Lanes & Transitways")

5.2. Stamatiadis, N., A. Kirk, C. Wang, and A. Cull. *Guidelines for Road Diet Conversions*, Kentucky Transportation Center, KTC-11-19/SPR415-11-1F, Available online, [http://nacto.org/docs/usdg/guidelines\\_for\\_road\\_diet\\_conversion\\_stamatiadis.pdf](http://nacto.org/docs/usdg/guidelines_for_road_diet_conversion_stamatiadis.pdf), 2011. (Read pp. iv-v)

5.3. Federal Transit Administration. *Characteristics of Bus Rapid Transit for Decision-Making*, U.S. Department of Transportation, Authors: Diaz, R.B. and D. Hinebaugh, Available online, [http://www.fta.dot.gov/documents/CBRT\\_2009.pdf](http://www.fta.dot.gov/documents/CBRT_2009.pdf), 2009. (Skim document. Good reference for detailed guidance on specific system elements.)

5.4. Kittleson & Associates, Inc. *TCRP Report 118: Bus Rapid Transit Practitioner's Guide*, Transit Cooperative Research Program, Transportation Research Board, [http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\\_rpt\\_118.pdf](http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_118.pdf), 2007. (Read pp. 1-20) (Optional. Chapter 3 is on estimating BRT ridership.)

### **Class 6: Potential Benefits and Challenges of BRT in the Milwaukee Region (10/17/16)**

Readings:

6.1. Levinson, D. "Does BRT have Economic Development Effects?" *Streets.mn*. Available online, <http://streets.mn/2013/09/11/does-brt-have-economic-development-effects/>, 2013

6.2. Carrigan, A., R. King, J.M. Velasquez, M. Raifman, and N. Duduta. *Social, Environmental, and Economic Impacts of BRT Systems: Bus Rapid Transit Case Studies from Around the World*, EMBARQ: A Program of the World Resources Institute, Available online, <http://www.wricities.org/sites/default/files/Social-Environmental-Economic-Impacts-BRT-Bus-Rapid-Transit-EMBARQ.pdf>, 2014.

6.3. Taylor, B.D. and E.A. Morris. "Public Transportation Objectives and Rider Demographics: Are Transit's Priorities Poor Public Policy?" *Transportation*, Volume 42, pp. 347-367, 2015.

### **Class 7: BRT Background Analysis (10/24/16)**

Class Discussion: Unfinished topics. Midterm review. Discussion of the elements of a good report. Student work time on outline and overview of Background Report (due Class 9).

### **Class 8: Midterm Exam (10/31/16)**

Midterm Exam: 90 minutes.

### **Class 9: Transit System Costs, Finance, and Advocacy (11/7/16)**

Deliverable: Complete background report.

Readings:

9.1. Henken, R.E., R.J. Horton, and J.K. Schmidt. "Milwaukee County's Transit Crisis: How did we get Here and What do we do Now?" *Public Policy Forum*, Available online, <http://publicpolicyforum.org/sites/default/files/MilwaukeeTransitCrisis.pdf>, May 2008.



### **Class 10: Practitioner Workshop Preparation (11/14/16)**

Deliverable: Draft practitioner workshop materials for Task 2 (including physical documents and draft PPT for Practitioner Workshop presentation) to be shared in class.

Discussion format: The instructor will meet with all students or student teams. All students present their specific contributions the background report. Presentations of the information will be informal and will follow the organization of the report. The instructor, class, and any guests will ask questions and provide feedback during this informal discussion.

### **Class 11: Practitioner Workshop (11/21/16)**

Deliverable: Task 2 PowerPoint due.

Discussion format: Present background report and analysis to practitioners.

### **Class 12: Practitioner Workshop Recap (11/28/16)**

Deliverables: Final Task 2 Report; Summary of workshop feedback and Revision strategies (presented in class; the teams do not need to turn in physical documents).

Discussion format: All students discuss their reactions to the Practitioner Workshop feedback and their ideas for revisions. Additional concepts may be covered by the instructor in response to feedback and suggestions.

### **Class 13: Public Workshop Preparation (Draft Presentation) (12/5/16)**

Deliverable: Draft presentation (presented in class) and draft final report (physical documents).

Discussion format: All students share draft presentation slides and draft final report sections to get feedback from other students and instructor. In-class presentations will be timed.

### **Class 14: Public Workshop (Final Presentation) (12/12/16)**

Deliverables: Final presentation slides, presentation boards, and report.

Discussion format: All groups present to public attendees and get feedback. Revisions to the final report should be made during the week based on this feedback.

**Final Presentation Slides and Report Due prior to the workshop on 12/12/16.**