

# Infrastructure and Mobility

**Lecturer**

Philippe BOUILLARD (Coordinator)

**Course mnemonic**

URBA-H500

**ECTS credits**

5 credits

**Language(s) of instruction**

English

**Course period**

Second term

**Campus**

Solbosch

## Course content

1. Introduction
2. Exploring mobility and transport
  - > Historical perspective
  - > Recent trends
  - > Travel demand
3. Planning
  - > Mobility planning process
  - > Planning for walking and cycling
  - > Urban freight and city logistics
  - > Built environment and travel behaviour
4. Urban design
  - > Sustainable mobility
  - > Typical cross-sections
  - > Assessment methods
- 4.1 Design for Cycling
  - > Cycling design principles
  - > Cycle track options
  - > Junctions and crossing design
- 4.2 Design for Walking
  - > Walk the walk
  - > Pedestrian needs
  - > Junctions and roundabouts
5. Infrastructure
  - > Infrastructure procurement

## Objectives (and/or specific learning outcomes)

This module aims to analyse the mobility issue in modern cities with an emphasis on civil infrastructure and sustainable planning.

By the end of the module, the student should be able to:

- 1 analyse the interaction between infrastructure and mobility
- 2 analyse the mobility in a sustainable approach
- 3 assess the different transport modes and technologies
- 4 assess and simulate the mobility conditions in modern cities
- 5 design sustainable solutions to improve mobility in terms of spatial planning and infrastructure including soft mobility modes (walking, cycling)
- 6 reflect on future challenges in mobility

## Pre-requisites and co-requisites

### Required knowledge and skills

Sustainable development. Urban Design.

## Teaching method and learning activities

20h lectures: organised to cover the different methods and tools in a flipped class mode (the student has to prepare the topic before joining the class according to the recommended sources)

8h design studio sharing the assignment outcome

12h tutorials: mostly dedicated to invited conferences.

8h field trip: each team of students will have to choose one case-study location (junction/intersection/crossroad) in any location. It will be observed, then analysed and assessed with the tools learned during the module.

12h personal work dedicated to the coursework.

## Contribution to the teaching profile

(This section refers to the programme learning outcomes. Their definition is not the responsibility of the module coordinator who is only referring to them).

Graduates of related programmes (MSc Arch Eng, MSc Civ Eng, MSc Urban Studies, Advanced Master in Transition Urbanism) have in-depth knowledge of

- 1 sustainable design methods and theories with the specificity of their application to complex urban design projects
- 2 conceive and implement design concepts by creatively integrating architectural and engineering sciences with attention to the structural, material and energy performance of buildings and structures, and their architectural value and constructability
- 3 develop an architectural or urban design project based on an analysis and synthesis of the context, programme, structure, material and concept with particular attention to sustainability
- 4 design innovative buildings and structures based on cutting-edge (digital) modelling and analysis methods, and a good understanding of material and structural behaviour
- 5 communicate design concepts and projects effectively using state-of-the-art physical and digital representation

techniques (drawings, images, renderings, and three-dimensional models)

- 6 expand the scale of the design problem not only in space but also in time – a crucial dimension of sustainable design – and comprehend the multi-scalar effects of design interventions.
- 7 critically analyse and reflect on the historical and theoretical context of architectural and urban projects
- 8 an integrative attitude towards using issues of sustainability, ecology and energy as catalysts for creatively rethinking conventional notions of enclosure, tectonics, and programme
- 9 design skills and research capabilities to address spatial and temporal complexity in the development of architectural and urban projects that ensure sustainable functioning of the built environment

## References, bibliography and recommended reading

- D. Banister (Ed), 1995, 'Transport and Urban Development', Routledge
- D. Banister, 2002, 'Transport Planning (2d edition)', Taylor&Francis
- M.C.J. Bliemer et al. (Eds), 2016, 'Handbook on Transport and Urban Planning in the Developed World', Edward Elgar Publishing Ltd
- J. Cidell, D. Prytherch (Eds), 2015, 'Transport, Mobility, and the Production of Urban Space', Routledge, Taylor&Francis
- K. Dziekan et al., 2013, 'Evaluation matters: A practitioners' guide to sound evaluation for urban mobility measures', Waxmann Verlag
- P. Pinho, C. Silva (Eds), 2015, 'Mobility Patterns and Urban Structure', Ashgate
- P. Pucci, M. Colleoni (Eds), 2016, 'Understanding Mobilities for Designing Contemporary Cities', Springer
- J. C. Sutton, 2015, 'Gridlock: Congested cities, contested policies, unsustainable mobility', Routledge
- J. Whitelegg, 2016, 'Mobility', Create space Independent Publishing Platform
- M. G. Woldeamanuel, 2016, 'Concepts in Urban Transportation Planning: The Quest for Mobility, Sustainability and Quality of Life', McFarland&CieD.

## Course notes

Podcast and Université virtuelle

## Other information

### Place(s) of teaching

Solbosch

### Contact(s)

BATir Dept., CP 194/2, C Building, 87 Buyl Ave, 5<sup>th</sup> floor, room SC5-206, E-mail: Philippe.Bouillard@ulb.be

## Evaluation method(s)

Group work, Project and Oral presentation

### Evaluation method(s) (additional information)

The students will have to submit:

Assignment 1: Mobility Plan Analysis

- > Compose your team according to the introductory instructions
- > Propose a selection of 3 city mobility plans among which the coordinator will pick one.
- > Analyse the mobility plan according to instructions
- > Report your analysis – max. 5 pages

Assignment 2: Intersection Analysis & Redesign

- > *Select one typical intersection/junction/crossroad situation (any location)*
- > *Analyse and review the junction*
- > *Make design proposals for improvement (solutions)*
- > *Analyse and assess the intersection*
- > *Report your findings – max. 15 pages*
- > *Make a short (5 mins) presentation during a studio session*

Elective Assignment 3: Urban Mobility by 2050

- > Prospective approach
- > Write a personal essay (max. 5 pages excluding references, tables and figures) describing the possible future of urban mobility by 2050
- > Make it disruptive but keep it scientific by clearly stating your vision, considering objections and arguing with citations.

### Determination of the mark (including the weighting of partial marks)

40% Ass. 1

60% Ass. 2

Bonus Ass. 3

### Main language(s) of evaluation

English

## Programmes

### Programmes proposing this course at the Brussels School of Engineering

MA-IRAR | Master of science in Architecture and Engineering | finalité Professional/unit 2, MA-IRCN | Master of science in Civil Engineering | finalité Professional/unit 2 and MS-URDE | Specialized Master in transition urbanism and regional planning | unit U

### Programmes proposing this course at the faculty of Architecture La Cambre Horta

MS-URDE | Specialized Master in transition urbanism and regional planning | unit U

### Programmes proposing this course at the faculty of Sciences

MA-GEOG | Master in Geography : General | finalité Urban studies (ULB-VUB)/unit 1 and finalité Urban studies (ULB-VUB)/unit 2



