ASSESSMENT OF NEEDS IN TRAINING AND EDUCATIONAL GAPS

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Background

- Preliminary research indicates a **lack of dedicated training and education for the Bus Rapid Transit sector** and a **mismatch between the needs of the industry** (operators, authorities, transport planners, etc) and the **supply of education and training**.

- How are the gaps between **education and training supply and demand of knowledge** in industry affecting the delivering of the expected service provision?

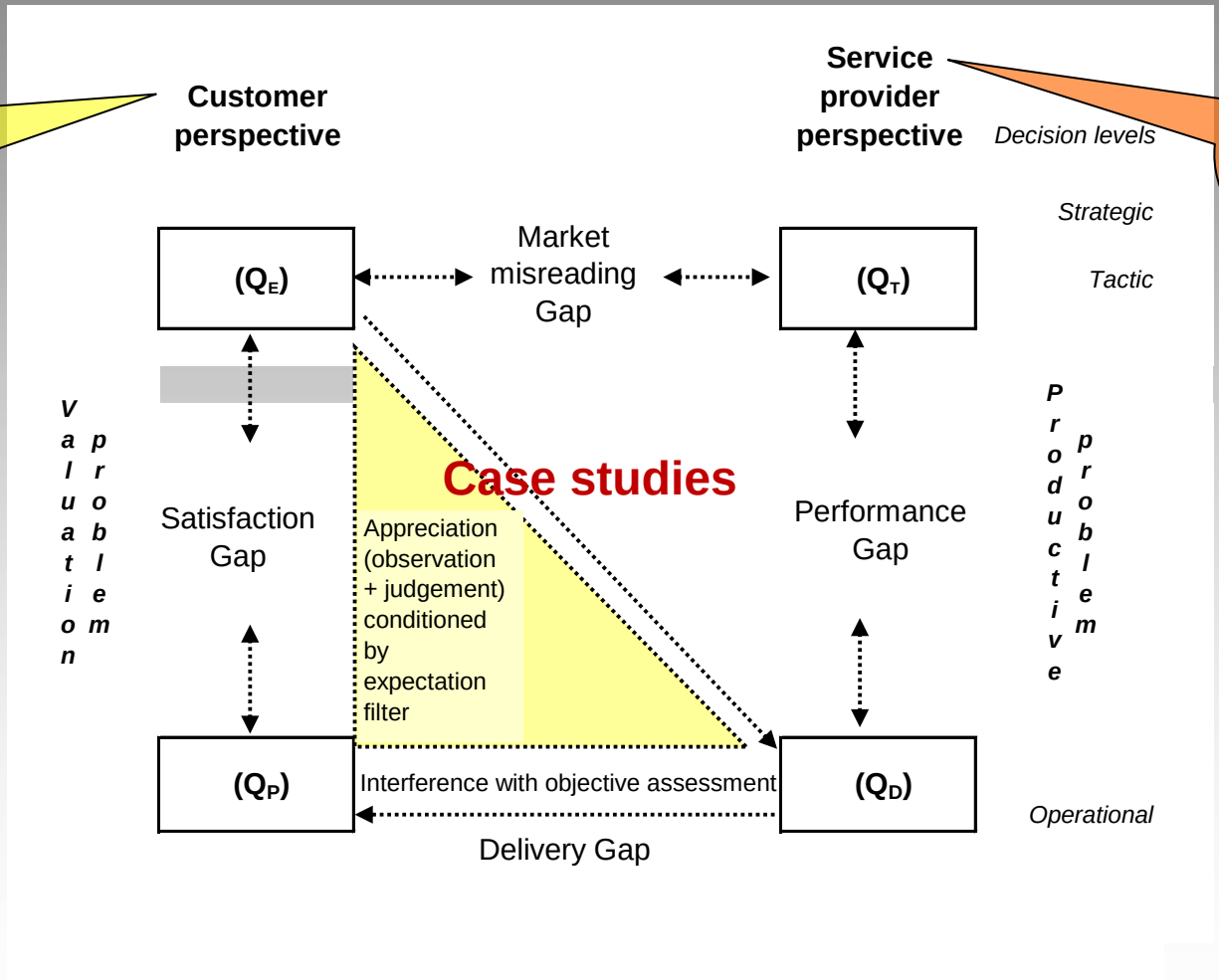
Background

- **Questions to be answered**
  - Current **degree of education** of employees in BRT systems?
  - Detailed knowledge and **competencies required** for the activities developed in the industry?
  - How common and valued is the **practice of training and continuing education** in the industry? What **can industry and academia learn from each other ?**
  - How managers **perceive the need for education and training skills** in the different domains of intervention?
  - Which elements can contribute for a **better coherence between formal education and training curricula** against the actual needs?

Work structure

- **Work Packages**
  - **WP1** - *Setting the assessment framework for education and training*
  - **WP2** - *Stakeholders Surveys*
  - **WP3** - *University Surveys*
  - **WP4** - *Gap assessment*
  - **WP5** - *Development of Structures for Knowledge Sharing and Development*

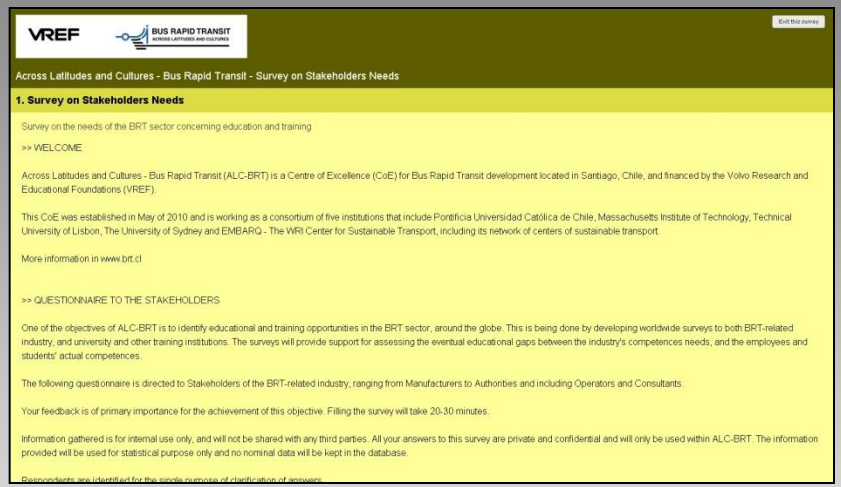
Setting the assessment framework for education and training



Methodology

- Elaboration of **on-line surveys** to the **stakeholders** of the BRT-related industry

- The surveys will provide support for assessing the **educational gaps** between the industry's competences needs, and the employees and students' actual competences.
- The project is now in the phase of **collection of answers** for the surveys
- The success of the data collection relies on the **dissemination of the on-line surveys** to the stakeholders


VREF BUS RAPID TRANSIT ACROSS LATITUDES AND CULTURES

Across Latitudes and Cultures - Bus Rapid Transit - Survey on Stakeholders Needs

1. Survey on Stakeholders Needs

Survey on the needs of the BRT sector concerning education and training

>> WELCOME

Across Latitudes and Cultures - Bus Rapid Transit (ALC-BRT) is a Centre of Excellence (CoE) for Bus Rapid Transit development located in Santiago, Chile, and financed by the Volvo Research and Educational Foundations (VREF).

This CoE was established in May of 2010 and is working as a consortium of five institutions that include Pontificia Universidad Católica de Chile, Massachusetts Institute of Technology, Technical University of Lisbon, The University of Sydney and EMBARQ - The WRI Center for Sustainable Transport, including its network of centers of sustainable transport.

More information in www.brt.cl

>> QUESTIONNAIRE TO THE STAKEHOLDERS

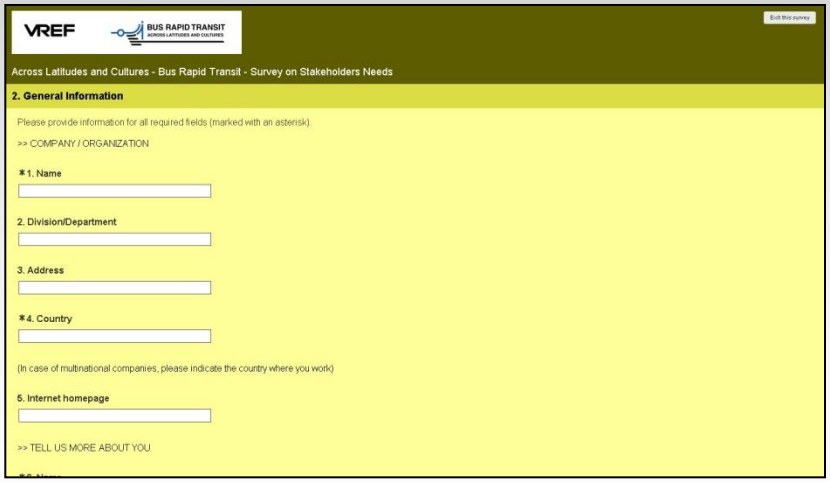
One of the objectives of ALC-BRT is to identify educational and training opportunities in the BRT sector, around the globe. This is being done by developing worldwide surveys to both BRT-related industry, and university and other training institutions. The surveys will provide support for assessing the eventual educational gaps between the industry's competences needs, and the employees and students' actual competences.

The following questionnaire is directed to Stakeholders of the BRT-related industry, ranging from Manufacturers to Authorities and including Operators and Consultants.

Your feedback is of primary importance for the achievement of this objective. Filling the survey will take 20-30 minutes.

Information gathered is for internal use only, and will not be shared with any third parties. All your answers to this survey are private and confidential and will only be used within ALC-BRT. The information provided will be used for statistical purpose only and no nominal data will be kept in the database.

Respondents are identified for the single purpose of clarification of answers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Across Latitudes and Cultures - Bus Rapid Transit - Survey on Stakeholders Needs

2. General Information

Please provide information for all required fields (marked with an asterisk).

>> COMPANY / ORGANIZATION

*1. Name

2. Division/Department

3. Address

*4. Country

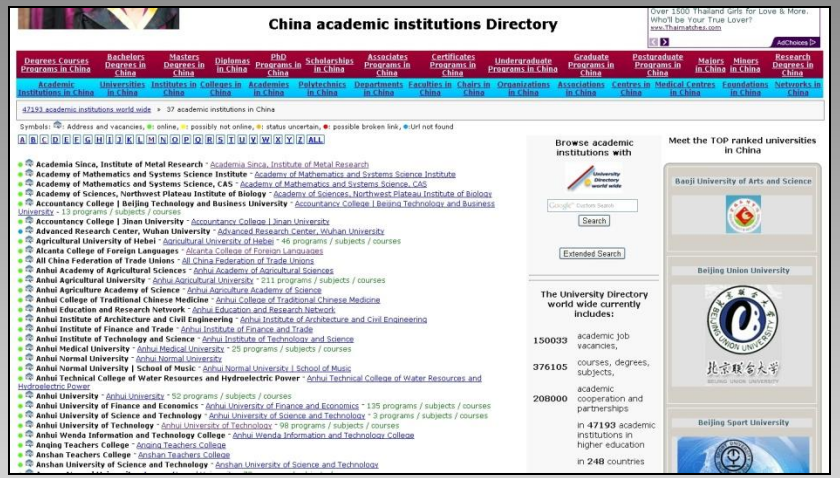
(In case of multinational companies, please indicate the country where you work)

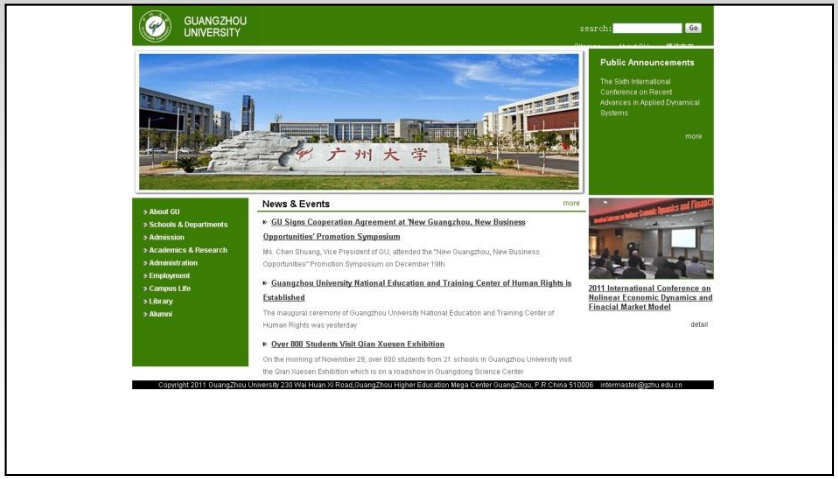
5. Internet homepage

>> TELL US MORE ABOUT YOU

Methodology

- **Data collection** on the websites of the **universities** with BRT-related courses
- The data collection will identify the **existence of BRT-related knowledge areas** in the universities' departments and courses, and courses' syllabus
- The project is now in the phase of **data collection** at the websites





Methodology

- The **survey to stakeholders** was submitted to companies, within the domains of activity highlighted in red (in the table on the right)
- In each of these domains of activity, some areas of competence were identified

Table 1 – Domains of activity and respective areas of competence in the BRT-related industry

Authorities / Regulators	**Manufacturers (design, integration and supply industry)**
Demand forecasting	Car body design and construction
Contract and concessions management	Wheels, running gear and braking
Control, supervision	Interiors, auxiliaries, HVAC
Public service, social and political issues	Traction and power supply
Consultants	**Maintenance Managers**
Planning, design and implementation	Maintenance / Depot
Education	Parking lots
Dissemination, marketing	Human Resources management
Public relations	**Operators**
Fare Collection System	Passenger
Cards and equipment supply	Resources management
Tickets sale	Technician and commercial exploitation
Collection and transfer of raised money	Intermodality
Infrastructure Managers	**Procurement**
Pavement, bridges, tunnels	Market analysis
Terminals, stations, stops	Contract management
Bicycle lanes, sidewalks, squares	Administrative procedures
Information Technology, Signalling and Traffic Control	**Multidiscplinary issues**
Signalling	Security and safety
Bus positioning and communication	Risk analysis
Data transmission and processing	Human factors
	Reliability, availability, maintenance and safety
	Quality management
	Computer technology and networking

Source: Authors

Methodology

- A set of academic areas, which covers the areas of competence, was defined in order to circumscribe and harmonize the data collection and analysis. These academic areas were identified as follows:
  - Engineering (Multidisciplinary, generalist),
  - Engineering (Automotive),
  - Engineering (Civil),
  - Engineering (Communication),
  - Engineering (Computer/Software),
  - Engineering (Electrical/Electronics),
  - Engineering (Industrial),
  - Engineering (Materials),
  - Engineering (Power),
  - Engineering (System),
  - Engineering (Transportation),
  - Economics,
  - Law,
  - Social Sciences,
  - Marketing,
  - Political Sciences,
  - Architecture, and
  - Urban Planning

Methodology

Table 4 – Supply of education and training for the areas of competence

Academic areas / Areas of competence	EMG[1]	EAU[2]	ECI[3]	ECO[4]	ECS[5]	EEE[6]	EIN[7]	EMA[8]	EPO[9]	ESY[10]	ETR[11]	ECN[12]	LAW[13]	SSC[14]	MAK[15]	PSC[16]	ARC[17]	URP[18]
Demand forecasting	•		•								•	•			•	•		•
Contract and concessions management												•	•			•		•
Control, supervision	•											•	•	•		•	•	•
Public service, social and political issues												•	•	•		•		
Planning, design and implementation	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Education											•			•		•		
Dissemination, marketing														•	•	•		
Public relations														•	•	•		
Cards and equipment supply				•	•	•	•	•										
Tickets sale				•	•	•				•		•			•	•		
Collection and																		

Methodology

- The competences are acquired in the different academic areas previously defined. **Each of these areas of competence demands competences** from either one academic area or multiple academic areas. The analysis of this match between areas of competence and academic areas is depicted in the table on the right.
- This matrix shows the **relevance of the academic areas** for the different domains of activity and the **respective areas of competence**

Table 4 – Supply of education and training for the areas of competence

Areas of competence \ Academic areas	EMG[1]	EAU[2]	ECI[3]	ECO[4]	ECS[5]	EEE[6]	EIN[7]	EMA[8]	EPO[9]	ESY[10]	ETR[11]	ECN[12]	LAW[13]	SSC[14]	MAK[15]	PSC[16]	ARC[17]	URP[18]
Demand forecasting	•		•								•	•			•	•		•
Contract and concessions management												•	•			•		•
Control, supervision	•											•	•	•		•	•	•
Public service, social and political issues												•	•	•		•		
Planning, design and implementation	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Education											•			•		•		
Dissemination, marketing														•	•	•		
Public relations														•	•	•		
Cards and equipment supply				•	•	•	•	•										
Tickets sale				•	•	•				•		•			•	•		
Collection and transfer of raised money				•	•	•				•		•	•			•		
Pavement, bridges, tunnels	•		•							•	•	•					•	•
Terminals, stations, stops	•		•							•	•	•					•	•
Bicycle lanes, sidewalks, squares	•		•							•	•						•	•
Signalling	•		•	•	•	•	•	•		•	•						•	•
Bus positioning and communication		•		•	•	•				•	•							
Data transmission and processing	•	•	•	•	•	•				•								
Car body design and construction	•	•					•	•			•							

Case studies

- **BRT**
  - Segregated busway
  - Typically pre-board fare payment / verification
  - Higher quality stations
  - Clean vehicle technology
  - Marketing identity

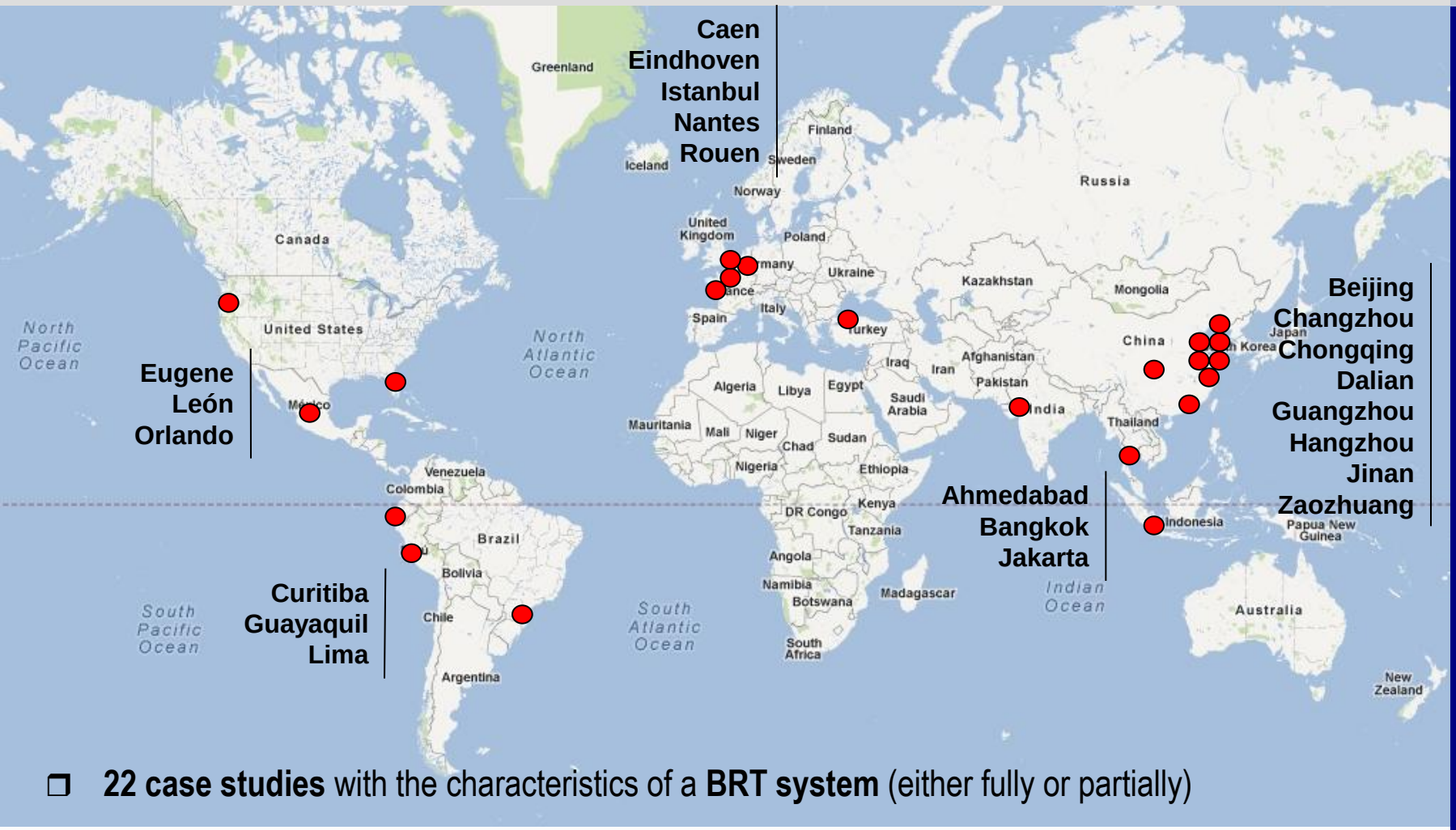
- The case studies were chosen after their compliance with the features defined for a **BRT system** *(ITDP - Bus Rapid Transit Planning Guide, 2007)*

- **Full BRT**
  - Metro-quality service
  - Integrated network of routes and corridors
  - Closed, high-quality stations
  - Pre-board fare collection / verification
  - Frequent and rapid service
  - Modern, clean vehicles
  - Marketing identity
  - Superior customer service

Case studies

			BRT						Full BRT								
City/Region	Country	BRT System	Segregated busway	Typically pre-board fare payment / verification	Higher quality stations	Clean vehicle technology	Marketing identity	SUM BRT	Metro-quality service	Integrated network of routes and corridors	Closed, high-quality stations	Pre-board fare collection / verification	Frequent and rapid service	Modern, clean vehicles	Marketing identity	Superior customer service	SUM Full BRT
Guangzhou	China	Guangzhou BRT (GBRT)	1	1	1	1	1	5	1	1	1	1	1	1	1	1	8
León	Mexico	Optibus SIT	1	1	1	1	1	5	1	1	1	1	1	1	1	1	8
Ahmedabad	India	Ahmedabad BRTS	1	1	1	1	1	5		1	1	1	1	1	1	1	7
Changzhou	China	Changzhou BRT	1	1	1	1	1	5		1	1	1	1	1	1	1	7
Eindhoven	Netherlands		1	1	1	1	1	5		1	1	1	1	1	1	1	7
Eugene	United States	EmX	1	1	1	1	1	5		1	1	1	1	1	1	1	7
Jakarta	Indonesia	TransJakarta Busway	1	1	1	1	1	5		1	1	1	1	1	1	1	7
Jinan	China	Jinan BRT	1	1	1	1	1	5		1	1	1	1	1	1	1	7
Lima	Peru	Metropolitano	1	1	1	1	1	5	1	1		1	1	1	1	1	7
Zaozhuang	China	Zaozhuang BRT	1	1	1	1	1	5		1	1	1	1	1	1	1	7
Bangkok	Thailand	Bangkok BRT	1	1	1	1	1	5			1	1	1	1	1	1	6
Chongqing	China	Chongqing BRT	1	1	1	1	1	5			1	1	1	1	1	1	6
Curitiba	Brazil	Rede Integrada de Transporte	1	1	1	1	1	5	1	1	1	1	1		1		6
Dalian	China	Dalian BRT	1	1	1	1	1	5		1		1	1	1	1	1	6
Guayaquil	Ecuador	Metrovía	1	1	1	1	1	5		1	1	1	1	1	1		6
Rouen	France	TEOR	1	1	1	1	1	5			1	1	1	1	1	1	6
Beijing	China	Beijing BRT	1	1	1	1	1	5				1	1	1	1	1	5
Caen	France	Twisto TVR	1	1	1	1	1	5			1	1		1	1	1	5
Hangzhou	China	Hangzhou BRT	1	1	1	1	1	5		1	1	1		1	1		5
Istanbul	Turkey		1	1	1	1	1	5	1			1	1	1	1		5
Nantes	France	Bus Way	1	1	1	1	1	5				1	1	1	1	1	5
Orlando	United States	Lynx Lymmo	1	1	1	1	1	5				1		1	1	1	4
Bogota	Colombia	Transmilenio	1	1	1		1	4	1	1	1	1	1		1	1	7
Santiago	Chile	Transantiago	1		1	1	1	4	1	1	1		1	1	1	1	7
São Paulo	Brazil	Expresso Tiradentes	1		1	1	1	4	1	1	1		1	1	1	1	7

Case studies D-S survey



- **22 case studies** with the characteristics of a **BRT system** (either fully or partially)

In-progress research

- The **preliminary findings** from the surveys on stakeholders indicate that the educational background of the workforce is predominantly from the **Engineering area (in its various branches)**. In a minor degree, the educational backgrounds also include **Economics, Law, Social Sciences, Marketing, Architecture, Urban Planning, Environmental Engineering,** and **Service Planning.**

- Furthermore, the answers from different stakeholders evidence some **divergence on the necessary educational degree** for the same needed skills. There is also some **overlap in the ways of acquisition of competences**.

Work in progress research

- The **preliminary findings** from the data collection on courses represent the predominance of supply of each academic area in the different countries.

- These findings let us have a glimpse at the **current demand-and-supply relation on education and training** for the BRT sector: the supply on education and training is quite diverse in the different countries.

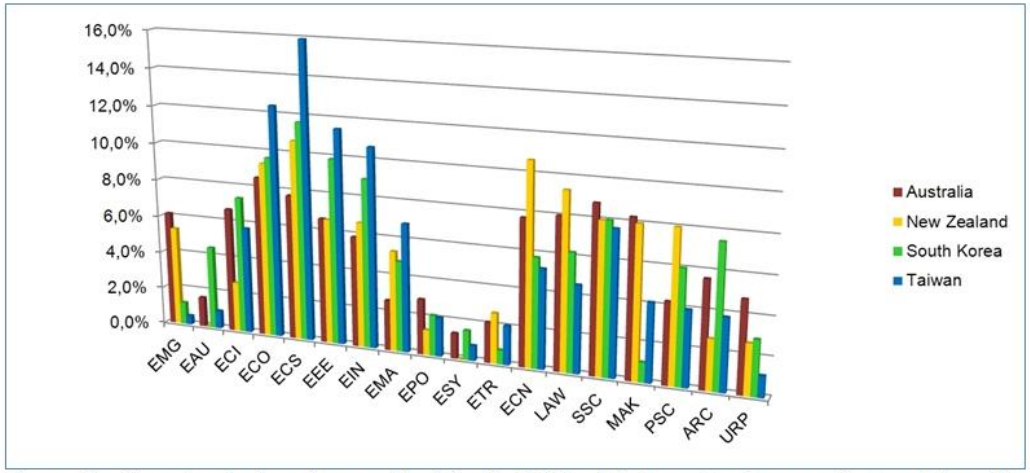


Figure 6 – Supply of education and training in BRT-related academic areas in countries with BRT systems in Asia and Oceania

Source: Authors

Work in progress research

- In order to further develop this study, **achieving a high number of answered surveys** will be of great relevance, since some questions can only be unravelled with information from the agents in BRT-related companies and courses.

Work in progress research

- Case studies on what can the industry and academia learn from each other

- Cases to be analysed with VNA – Value network Analysis
  - MIT
  - ITLS
  - Santiago
  - Nigeria

  - Exploratory analysis made with MIT industry relation, now assembling the VNA analytical model

Thank you for your attention !

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