WCTR 2016 Shanghai
Key Findings and Future Research Needs

Reports from
Topic Area Managers
and WCTR-Y Chair

Moderation and Conclusions:
Manfred Boltze, WCTRS Scientific Committee Chair
TA Manager: Mark Hansen, Anming Zhang

Session Tracks, Number of Papers, and Session Track Organizers:

A1  Air Transport and Airports        44 papers        Martin Dresner
A2  Maritime Transport and Ports      42 papers        Eddy van de Voorde
A3  Rail Transport                   33 papers        John Preston, Marin Marinov
A4  Road Transport - General         40 papers        Robin Lindsey

Total: 159 Papers, including 13 posters
A.1 – Air Transport and Airports  44 papers
Airline Economics: pricing, fleet planning, networks, traveler choice, macroeconomic factors
Multimodal Issues: high speed rail, ocean shipping, logistics
Airports: finance, performance, capacity, terminals
Human Factors: crews, travelers, air traffic managers
Air Traffic Management: delays, airspace, flight schedules
External Impacts: noise, emissions, tourism, societal

A.2 – Maritime Transport and Ports  42 papers
Port Capacity, Competitiveness, and Efficiency: investment, congestion, port choice, terminal operations, innovation, forecasting
Shipping Fleet: bulkers, container ships, fuel efficiency
Safety: performance, regulation, hazards, cruise ships
Networks: routing choice, short-sea shipping, liner shipping, cruise ships
A.3 – Rail Transport  
**High Speed Rail:** economics, planning, construction  
**Engineering:** subgrades, metros, propulsion, maintenance  
**Operations:** train control, adverse weather, depots  
**Planning and Management:** congestion, capacity, impacts and costs of new systems, competition and mergers, shipper preferences

A.4 – Road Transport  
**Sub-varieties:** taxis, coaches, buses, bicycles, pedestrians  
**Performance and Safety:** travel time, reliability, crash risk  
**Urban Form:** representation, street space allocation, functional classification  
**Parking and Infrastructure:** parking facility performance, geometric design, pavement management
Missing or Limited Research
Automated Vehicles
Unmanned Air Vehicles
Inland Waterways and Canals
Shared Right-of-Way for Freight and Passenger Rail
Papers with Pretty Pictures
… and so many others …

Join our Special Interest Groups!
SIG A1 Air Transport and Airports (Martin Dresner)
SIG A2 Maritime Transport and Ports (Eddy Van de Voorde; Enrico Musso)
SIG A3 Rail Transport (John Preston; Marin Marinov)
SIG A4 Road Transport – General (Robin Lindsey)

For more information visit: www.wctrs-society.com
TA B: Freight Transport and Logistics

**TA Manager:** Michael Browne, Johan Woxenius

**Session Tracks, Number of Papers, and Session Track Organizers:**

- **B1** Logistics and Supply Chain Management 14 papers Seraphim Kapros, Gunnar Stefansson
- **B2** Freight Transport Operations, Sustainability and Performance 17 papers Jacek Zak
- **B3** Intermodal Freight Transport 16 papers Johan Woxenius, Cathy Macharis, Allan Woodburn
- **B4** Urban Goods Movement 47 papers Michael Browne, Toshinori Nemoto
- **B5** Freight Transport Modelling 23 papers Lori Tavasszy, Hanno Friedrich
- **B6** Humanitarian Logistics in Disasters 10 papers Eiichi Taniguchi

**Total:** 127 Papers, including 13 posters
TA B: Freight Transport and Logistics

B.1 – Logistics & Supply Chain Management  
14 papers
Modeling: Inventory, Distance optimization, Return flows
Organization: Collaboration, Performance, Loosely coupled systems
Decision frameworks – network design: 3D printing, Network integration, Hybrid systems, Reverse logistics

B.2 – Freight Transport Operations  
17 papers
Performance: Outsourcing, Procurement, Evaluation
Data: Forecasting, Data mining, Application to pricing
Cases: Freight management systems, Wagonload, Air cargo

B.3 – Intermodal Freight Transport  
16 papers
ICT, terminals and operations: Decision, support systems, High capacity transport, Terminal design
Costs, competitiveness and modal choice: Hinterland transport, Decision making
Regional case studies: Scenarios, Statistical analysis
TA B: Freight Transport and Logistics

B.4 – Urban Goods Movement 47 papers
Land use: Logistics sprawl, Urban planning, Case studies
Stakeholders: Perceptions, Multiple viewpoints,
Surveys and tools: Gamification, GPS data, Simulation
Sustainability: Consolidation, EVs, research approaches

B.5 – Freight Transport Modelling 23 papers
Freight generation and supply chains: Advances and gaps
Dynamic models: Multi-agent modeling, System dynamics
Freight network analysis: Operational costs and externalities, Network design
Special session: research needs - freight modeling for sustainable logistics.

B.6 – Humanitarian Logistics in Disasters 10 papers
Modeling: Allocation and decision-making, Location issues
Management Issues: Integrating vehicle planning, Use of ferry transport, Mobility aspects
**Missing Research**

Interaction between public transport and freight transport

Business models, hardware/technical solutions and interaction short-long distance

Incentives for behavior change

... and so many others ...

**Join our Special Interest Groups!**

SIG B1 Logistics and Supply Chain Management (Seraphim Kapros; Gunnar Stefansson)

SIG B2 Freight Transport Operations, Sustainability and Performance (Jacek Zak)

SIG B3 Intermodal Freight Transport (Johan Woxenius)

SIG B4 Urban Goods Movement (Mike Browne; Toshinori Nemoto)

SIG B5 Freight Transport Modeling (Lori Tavasszy; Hanno Friedrich)

SIG B6 Humanitarian Logistics in Disasters (Eiichi Taniguchi)

For more information visit: [www.wctrs-society.com](http://www.wctrs-society.com)
**TA C: Traffic Management, Operations and Control**

**TA Manager:** Hideki Nakamura

**Session Tracks, Number of Papers, and Session Track Organizers:**

<table>
<thead>
<tr>
<th>Session Track</th>
<th>Number of Papers</th>
<th>Organizers</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 Traffic Theory and Modelling</td>
<td>36 papers</td>
<td>Qiang Meng</td>
</tr>
<tr>
<td>C2 Highway Design and Capacity / Traffic Control and Management</td>
<td>12 papers</td>
<td>Hideki Nakamura</td>
</tr>
<tr>
<td></td>
<td>47 papers</td>
<td>Zong Tian</td>
</tr>
<tr>
<td>C3 Intelligent Transport Systems</td>
<td>22 papers</td>
<td>Edward Chung, Henry Liu</td>
</tr>
<tr>
<td>C4 Traffic Safety Analysis and Policy</td>
<td>58 papers</td>
<td>Geetam Tiwari</td>
</tr>
<tr>
<td>C5 Infrastructure Management</td>
<td>5 papers</td>
<td>Rabi Mishalani, Claus Doll</td>
</tr>
</tbody>
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**Total: 180 Papers, including 59 posters**

+ 13 roundtable session papers (C2/C3, C4)
TA C: Traffic Management, Operations and Control

C.1 – Traffic Theory and Modelling
- Macroscopic Fundamental Diagram, Optimization in network design
- Travel time variability/reliability analysis, Application of probe data: PCs, buses
- Traffic simulation models: agent-based, social force model
- Parking behavior modeling: impact on traffic flows

36 papers

C.2 – Highway Design and Traffic Control and Management
- Assessment of geometric element dimensions
- Heterogeneous traffic flow analysis
- Roundabout/intersection capacity analyses/modeling
- Traffic signal control: adaptive, transit signal priority
- Facility design and control strategies for multiple user groups: pedestrians/bikes
- Intermodal traffic management strategies: airport, railway stations

59 papers
TA C: Traffic Management, Operations and Control

C.3 – Intelligent Transport Systems 22 papers
• Application of RFID sensors, Bluetooth, Smartphone (apps)
• ITS application to public transport, fleet management

C.4 – Traffic Safety Analysis and Policy 58 papers
• Crash rate/risk analysis: from various countries
• Safety analysis for road user groups: senior + young drivers, pedestrians, cyclists, motorcycles
• Factors Influencing Traffic Safety: land use, speed limits and enforcement, visibility, road geometry, weather
• Modeling: predicting crash frequency/risk
• Safety assessment measures

C.5 – Infrastructure Management 5 papers
• Road/pavement maintenance
Missing Research
Microscopic car maneuver modelling
Quality of service analysis
Active traffic management
Impact of autonomous driving
Application of simulation technology to safety assessment
Technology on infrastructure inspection
… and so many others …

Join our Special Interest Groups!
SIG C1  Traffic Theory and Modelling (Qiang Meng)
SIG C2  Urban Transport Operations (Zong Tian)
SIG C3  Intelligent Transport Systems (Edward Chung)
SIG C4  Traffic Safety Analysis and Policy (Geetam Tiwari)
SIG C5  Infrastructure Management (Rabi Mishalani)

For more information visit: www.wctrs-society.com
TA D: Activity and Transport Demand

**TA Managers:** Doina Olaru, Sergio Jara-Diaz

**Session Tracks, Number of Papers, and Session Track Organizers:**

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<tr>
<th>Session Track</th>
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<th>Papers</th>
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<tbody>
<tr>
<td>D1</td>
<td>Data Collection and Processing Methods</td>
<td>40 papers</td>
<td>Patrick Bonnel</td>
</tr>
<tr>
<td>D2</td>
<td>Travel Behavior and Choice Modelling</td>
<td>36 papers</td>
<td>Chandra Bhat</td>
</tr>
<tr>
<td>D3</td>
<td>Travel Behavior Analysis and Demand Modelling Approaches</td>
<td>53 papers</td>
<td>Bhargab Maitra</td>
</tr>
<tr>
<td>D4</td>
<td>ICT, Activities, Time Use and Travel Demand</td>
<td>11 papers</td>
<td>Eran Ben-Elia</td>
</tr>
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**Total:** 140 Papers, including 28 posters
Key Findings from Session Tracks

- Limited work on ICT and data collection (interspersed across other areas)
- Many submissions across boundaries

Map built on 97 papers, >600,000 words
Missing Research

• Data integration/fusion
• More interest in new ANN, ABM approaches compared to advanced multivariate & DCM
• Insufficient number of presentations in new technologies
• and time use analysis

… and so many others …

Join our Special Interest Groups!

SIG D1  Data Collection and Processing Methods (Patrick Bonnel)
SIG D2  Travel Behaviour and Choice Modeling (Chandra Bhat)
SIG D3  Applications of Travel Behaviour Analysis and Demand Modelling Approaches (Bhargab Maitra)
SIG D4  ICT, Activities, Time Use and Travel Demand (Eran Ben-Elia)

For more information visit: www.wctrs-society.com
TA E: Transport Economics and Finance

**TA Manager:** Charles Raux

**Session Tracks, Number of Papers, and Session Track Organizers:**

- **E1** Transport System Analysis and Economic Evaluation  
  - 47 papers  
  - Fusun Ulengin

- **E2** Transport Pricing  
  - 19 papers  
  - Georgina Santos

- **E3** Transport Economic Regulation  
  - 21 papers  
  - Marco Ponti

**Total: 87 Papers, including 29 posters**
E1 - Transport System Analysis and Economic Evaluation

Evaluation: urban passenger transport, air transport, railways and road infrastructures and projects, logistics systems

Evaluation of transport policies, socio-economic impact of transport: wider economic effects, spillover effects, competitiveness, issue of speed gains, safety

E2 – Transport pricing

Transport pricing in practice: lottery-based congestion management, attitudes and responses to congestion pricing, road and dynamic pricing

E3 – Transport Economic Regulation

Public private partnership assessment: risk, opportunistic behaviour
Railways and public transport regulation
Joint transport investment and property development
Missing Research (or more research needed)

Equity and social/spatial accessibility re transport policy
Impact of transport improvement/pricing/regulation on (economic) activity location (and growth)
Behavioral economics: use of psychological and economic incentives – i.e. social norms and fiscal/pricing incentives – in regulating transport choices

Join our Special Interest Groups!
SIG E1  Transport System Analysis and Economic Evaluation  (Fusun Ulengin)
SIG E3  Transport Economics and Regulation  (Marco Ponti)

For more information visit:  www.wctrs-society.com
### TA F: Transport, Land Use and Sustainability

**TA Managers:** Ruth Steiner, Hiroyuki Iseki

**Session Tracks, Number of Papers, and Session Track Organizers:**

<table>
<thead>
<tr>
<th>Session Track</th>
<th>Title</th>
<th>Number of Papers</th>
<th>Organizers</th>
</tr>
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<tbody>
<tr>
<td>F1a</td>
<td>Land Use and Transport Planning and Policy</td>
<td>28 papers</td>
<td>Jason Cao</td>
</tr>
<tr>
<td>F1b</td>
<td>Land Use, Transport and Environment Interactions and Modelling</td>
<td>32 papers</td>
<td>Masanobu Kii, Kenji Doi</td>
</tr>
<tr>
<td>F2a</td>
<td>Urban Environment, Livability and Non-motorised Transport</td>
<td>22 papers</td>
<td>Eva Heinen</td>
</tr>
<tr>
<td>F2b</td>
<td>Transport and Climate Change</td>
<td>35 papers</td>
<td>Patrick Jochem</td>
</tr>
<tr>
<td>F2c</td>
<td>Sustainability and Environmental Ethics</td>
<td>15 papers</td>
<td>Hirokazu Kato</td>
</tr>
</tbody>
</table>

**Total:** 132 Papers, including 8 posters
Key Findings from Session Tracks

• Diversity of topics,
  • Sustainability, health, emissions, active travel and the use of other modes of transport, public transport, travel behavior, safety, finance, energy and environment

• Diversity of approaches,
  • Analysis regarding transport and spatial development.

• Some advances in modelling theories and techniques and applied modelling to practical problems

• Investigated individual behaviour, planning practices and policies.
Key Findings from Session Track

• Diversity of geographic locations –
  • One session included papers from five continents (Asia, Europe, Australia, Africa and NA)
  • Uneven distribution within track
    • China/Asia discovered land use-transport connection?
    • Europeans and Americans focus on climate change
Missing Research/Areas for Future Research

- Land use impacts of climate change
- Impact of shared economy on environment
- Advanced modeling and techniques of land use transport interactions

... and so many others ...

Join our Special Interest Groups!

SIG F1  Transport and Spatial Development (Kenji Doi)
SIG F2  Transport and the Environment (Patrick Jochem; Wei-Shiuen Ng, Hirokazu Kato)

For more information visit: www.wctrs-society.com
TA G: Transport Planning and Policy

**TA Manager:** Stephen Ison

**Session Tracks, Number of Papers, and Session Track Organizers:**

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<tbody>
<tr>
<td>G1</td>
<td>Governance and Decision-making Processes</td>
<td>25 papers</td>
<td>Greg Marsden, Louise Reardon</td>
</tr>
<tr>
<td>G2</td>
<td>National and Regional Transport Planning and Policy</td>
<td>50 papers</td>
<td>Guenter Emberger</td>
</tr>
<tr>
<td>G3</td>
<td>Urban Transport Planning and Policy</td>
<td>70 papers</td>
<td>Stephen Ison, Maria Attard</td>
</tr>
<tr>
<td>G4</td>
<td>Cultural and Social Issues in Transport</td>
<td>39 papers</td>
<td>Karen Lucas</td>
</tr>
<tr>
<td>G5</td>
<td>Transport Security</td>
<td>4 papers</td>
<td>Yoram Shiftan</td>
</tr>
<tr>
<td>G6</td>
<td>Disaster Resilience in Transport</td>
<td>13 papers</td>
<td>Huapu Lu</td>
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**Total:** 201 Papers, including 31 posters
Key Findings from Session Tracks

- Public Transport
  - Rise of Uber
  - Funding, finance and evasion

- Sustainability

- Natural disasters and resilience

- Accessibility

- Equality

- Vulnerability
  - Poverty and elderly
Key Findings from Session Tracks

- Health, housing and education
- Security and personal safety
- Climate change
- Electric vehicles
- Tourism and the role of transport
- Pricing – road pricing and parking charges
- Frameworks, modeling, benchmarking
TA G: Transport Planning and Policy

Missing Research
• All research rich
• Funding and finance
• Impact of new developments – Uber
• Equality
• Vulnerability

Join our Special Interest Groups!
SIG G1 Governance and Decision-making Processes (Greg Marsden)
SIG G2 National and Regional Transport Planning and Policy (Guenter Emberger)
SIG G3 Urban Transport Planning and Policy (Steve Ison; Maria Attard)
SIG G4 Cultural and Social Issues in Transport (Karen Lucas)
SIG G5 Transport Security (Yoram Shiftan)
SIG G6 Disaster Resilience in Transport (Huapu Lu)

For more information visit: www.wctrs-society.com
TA Manager: Binyam Reja

Session Tracks, Number of Papers, and Session Track Organizers:

H1 Institutions, Governance and Capacity Building in Developing Countries  
   15 papers  Antti Talvitie

H2 Planning, Financing, Socio-economic Impact Evaluation in Developing Countries  
   23 papers  Binyam Reja

H3 Infrastructure Operation and Traffic Management in Developing Countries  
   29 papers  Ashish Verma, Vu Anh Tuan

H4 Regional and Interregional Transport in Developing Countries  
   17 papers  Meng Li, Shinya Hanaoka

H5 Urban Transport in Developing Countries  
   43 papers  Kazuaki Miyamoto, Verameth Vichiensan

Total: 127 papers presented, including 17 Posters
Key Findings from Session Tracks (important issues)

- **H1 Institutions Governance and Decision-making**
  - Political Power Relations, Instability of Decisions
  - Insufficient Hierarchical and Horizontal Coordination
  - Unclear Public and Private Roles

- **H2 Planning, Financing, Socio-economic Evaluation**
  - Importance of Location, Property Rights, and Access
  - PT Quality, Affordability, CO2, Financial Instruments
  - Logistics, Freight Barriers, Import of Scenario Evaluation
  - Importance of rural accessibility, buses and NPT

- **H3 Infrastructure Operation and Traffic Management**
  - Pedestrian safety, safe driving skills, PT safety
  - Traffic operations on roads and streets,
  - Control measures for speed, overloading, safety
Key Findings from Session Tracks

H4 Regional and Interregional Transport (important issues)
- Logistics, Deregulation, Liberalization, and FDI
- Rural transportation in remote regions, incl. NMT
- Distance, Mode choice, Access to terminals in interregional travel

H5 Urban Transport
- Smart cards, Fare integration, PT priority (lanes, BRT)
- Social exclusion, Gender,
- Sharing economy: Bikes, Rides, Taxis, Motorbikes
- Urban transport management: intersections, parking, the Environment, signalized intersection control
- Mode choice, mobility, car-ownership, land-use, residential location
**Missing Research**

1. Reasons for disagreements in private and public roles
2. Uses of PPP instrument and payment options
3. Innovations in dealing with congestion
4. Effectiveness of rural transport facilities in development
5. Performance-based contracting
6. Urban transport subsidies, Informal transport
7. Trade liberalization, FDI, Employment
8. How to use academic research for policy making and transport development in developing countries.

**Join our Special Interest Groups!**

SIG H3 Infrastructure Operation and Traffic Management in Developing Countries (Ashish Verma)

SIG H5 Urban Transport in Developing Countries (Kazuaki Miyamoto; Varamath Vichiensan)
Organisational Overview

WCTR-Y Conference, Shanghai – Sunday, 10th July 2016

WCTR-Y Chair: Lorenza Tomasoni
COVs: Cassia Galvao and Chenfeng Xiong
Co-advisors: Laetitia Dablanc and Antonio Musso
WCTR-Y Leader: Ali Huzayyn

General summary

Theme “Innovations for Mobility and the Environment”

1 full-day, 9 peer-reviewed papers (4 eligible to journals submission)
and…88 attendees!
Topics discussed under general theme

➔ **Modelling and behaviours**
  • Seasonality of cycling in London
  • New calibration methods for agents’ time departure choice
  • Satisfaction sensitive model for Transantiago BRT
  • Stakeholders involvement in transport planning

➔ **New forms of transport**
  • External costs impact on trams and trains use for urban freight

➔ **New approaches, strategies and policies for transport**
  • Port efficiency in Brazil
  • SUMP guidelines in developing countries
  • System engineering methods applied to the Medinah Metro
Key Findings

This session demonstrated that our general theme « Innovation for Mobility and the Environment » is transversal and can be addressed:

• For different transport modes (road, rail, maritime, …);
• By different research approaches (theoretical, applied, analytical, …)
• By different methodologies (descriptive, modelling, qualitative and quantitative, …)

→ Importance of broadening the scope and vision of researchers and policy-makers.

The educational scope of the initiative was very much appreciated also.
Join us and apply for WCTR-Y Ed.3

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wctrs-conference.com/wctr-y-conference.asp
Conclusions

A Summary of the Summaries? (1153 papers, 28 Special Sessions)

General observations:
New technologies leading to rapid changes.
Shared economy as a driving factor.
Environmental aspects integrated in a more comprehensive consideration of human health aspects.
More attention for social aspects and inclusion.
Increasing need to control demand.
Dynamic, adaptive, situation-responsive management
Advances in modelling (multi-agent, gamification, social force, …)
Increasing need for interdisciplinary research.

Still many gaps and many needs for further research!
WCTR 2016 Shanghai
Key Findings and Future Research Needs

Thank you!
Reports from
Topic Area Managers
and WCTR-Y Chair

Thank you!