



14th World Conference on
Transport Research

10-15 July 2016 → Shanghai, China



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 A: Transport Modes - General



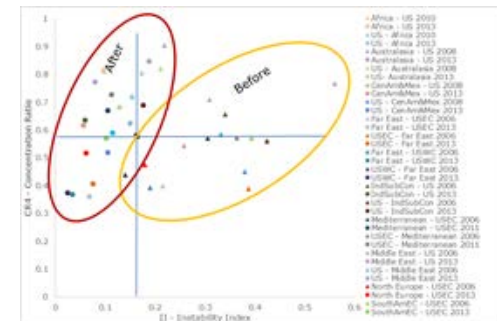
TA Manager: Mark Hansen, Anming Zhang

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

Networks: routing choice, short-sea shipping, liner shipping, cruise ships



TA A: Transport Modes - General



A.3 – Rail Transport 33 papers

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 40 papers

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



Table 2 Logistic Regression Model Results

Parameters	Estimate	Std. Error	Z value	P value
Intercept	-3.25	1.31	-2.48	0.01
Log(Volume)	0.80	0.16	5.10	0.00
Speed	0.03	0.02	1.90	0.06
Type	0.66	0.28	2.36	0.02
Configuration	-1.12	0.27	-4.15	0.00
P_BHWP	0.05	0.02	2.60	0.01
P_Transportation	-0.72	0.13	-5.41	0.00
Model Performance				
AIC			456.51	
Training Area Under Curve (AUC)			0.833	
Validation AUC			0.797	

TA A: Transport Modes - General



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



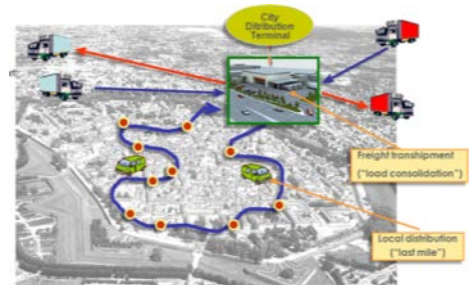
B.5 – Freight Transport Modelling 23 papers

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



TA B: Freight Transport and Logistics



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



TA C: Traffic Management, Operations and Control



TA Manager: Hideki Nakamura

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

C1	Traffic Theory and Modelling	36 papers	Qiang Meng
C2	Highway Design and Capacity / Traffic Control and Management	12 papers 47 papers	Hideki Nakamura Zong Tian
C3	Intelligent Transport Systems	22 papers	Edward Chung, Henry Liu
C4	Traffic Safety Analysis and Policy	58 papers	Geetam Tiwari
C5	Infrastructure Management	5 papers	Rabi Mishalani, Claus Doll

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

36 papers

- 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



C.2 – Highway Design and /Traffic Control and Management

59 papers

- 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



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



TA C: Traffic Management, Operations and Control



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:

D1	Data Collection and Processing Methods	40 papers	Patrick Bonnel
D2	Travel Behavior and Choice Modelling	36 papers	Chandra Bhat
D3	Travel Behavior Analysis and Demand Modelling Approaches	53 papers	Bhargab Maitra
D4	ICT, Activities, Time Use and Travel Demand	11 papers	Eran Ben-Elia

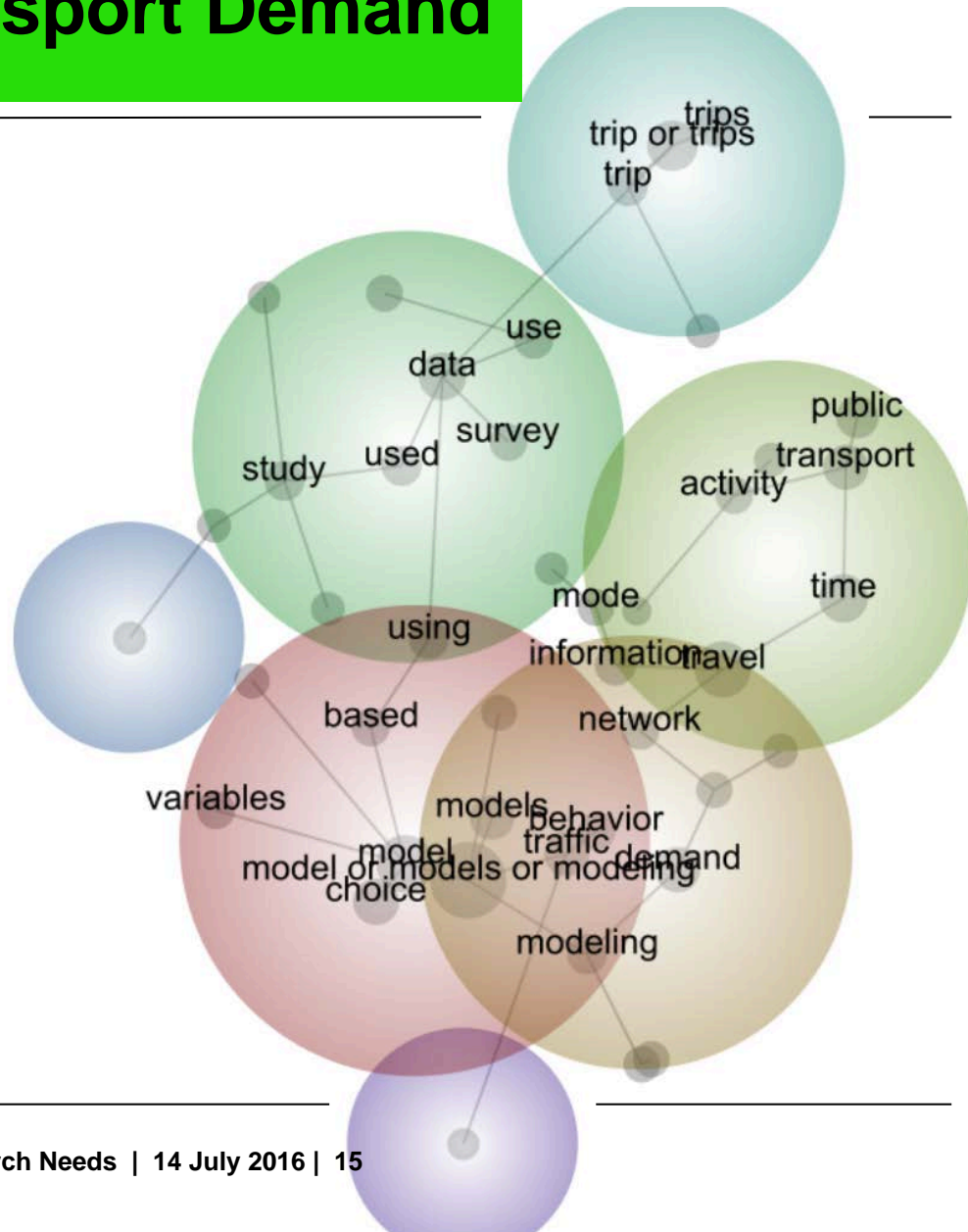
Total: 140 Papers, including 28 posters

TA D: Activity and Transport Demand

Key Findings from Session Tracks

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

Map built on 97 papers,
>600,000 words



TA D: Activity and Transport Demand



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

TA E: Transport Economics and Finance



E1 - Transport System Analysis and Economic Evaluation 47 papers

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 19 papers

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

E3 – Transport Economic Regulation 21 papers

Public private partnership assessment: risk, opportunistic behaviour

Railways and public transport regulation

Joint transport investment and property development

TA E: Transport Economics and Finance



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:

F1a	Land Use and Transport Planning and Policy	28 papers	Jason Cao
F1b	Land Use, Transport and Environment Interactions and Modelling	32 papers	Masanobu Kii, Kenji Doi
F2a	Urban Environment, Livability and Non-motorised Transport	22 papers	Eva Heinen
F2b	Transport and Climate Change	35 papers	Patrick Jochem
F2c	Sustainability and Environmental Ethics	15 papers	Hirokazu Kato

Total: 132 Papers, including 8 posters

TA F: Transport, Land Use and Sustainability



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.



TA F: Transport, Land Use and Sustainability



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

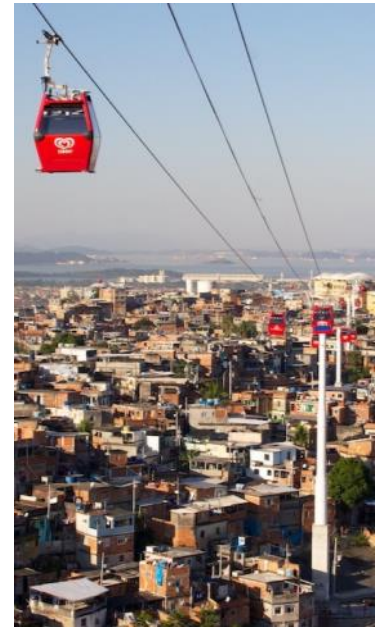


TA F: Transport, Land Use and Sustainability



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:

G1	Governance and Decision-making Processes	25 papers	Greg Marsden, Louise Reardon
G2	National and Regional Transport Planning and Policy	50 papers	Guenter Emberger
G3	Urban Transport Planning and Policy	70 papers	Stephen Ison Maria Attard
G4	Cultural and Social Issues in Transport	39 papers	Karen Lucas
G5	Transport Security	4 papers	Yoram Shiftan
G6	Disaster Resilience in Transport	13 papers	Huapu Lu

Total: 201 Papers, including 31 posters

TA G: Transport Planning and Policy



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**



TA G: Transport Planning and Policy



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 H: Transport in Developing and Emerging Countries



TA Manager: Binyam Reja

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

H1	Institutions, Governance and Capacity Building <small>in Developing Countries</small>	15 papers	Antti Talvitie
H2	Planning, Financing, Socio-economic Impact Evaluation <small>in Developing Countries</small>	23 papers	Binyam Reja
H3	Infrastructure Operation and Traffic Management <small>in Developing Countries</small>	29 papers	Ashish Verma, Vu Anh Tuan
H4	Regional and Interregional Transport <small>in Developing Countries</small>	17 papers	Meng Li, Shinya Hanaoka
H5	Urban Transport <small>in Developing Countries</small>	43 papers	Kazuaki Miyamoto, Verameth Vichiensan

Total: 127 papers presented, including 17 Posters

TA H: Transport in Developing and Emerging Countries



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



TA H: Transport in Developing and Emerging Countries



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



TA H: Transport in Developing and Emerging Countries



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 Huzayyin**

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

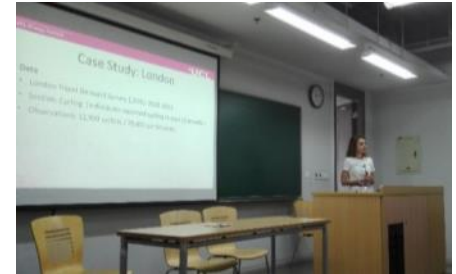
- Seasonality of cycling in London
- New calibration methods for agents' time departure choice
- Satisfaction sensitive model for Transantiago BRT
- Stakeholders involvement in transport planning

→ 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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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!



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WCTR 2016 Shanghai Key Findings and Future Research Needs

Thank you!

Reports from
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Thank you!

