
Executive Summary

The fourth meeting of PIARC Technical Committee B3: Sustainable multimodality in urban areas was held in Brussels, Belgium from Tuesday 14 November to Friday 17 November 2017. The trip to Brussels included 14 committee members from Argentina, Austria, Czech Republic, Belgium, France, Japan, South Africa, South Korea, Spain and the United States. The committee is broken up into 9 sub-topics, each with a delegate responsible for researching and documenting findings. The topics being investigated are:

- Accessibility
- Active Modes
- Bus Rapid Transport (BRT)
- Conceptual Framework
- Demand
- High Occupancy Vehicle (HOV)/High Occupancy Toll (HOT)
- Multimodal Interchanges
- Multimodal Level of Service (MMLOS)
- Transit Oriented Design (TOD)

The next meeting will be held in Vienna, Austria in April 2018 in conjunction with the Transport Research Arena (TRA) 2018.

Background

The goal of this strategic theme is to encourage the improvement of access and mobility provided to the travelling public and industry through efficient road network operation and integration with other transport modes.

The Sustainable Multimodality in Urban Areas Technical Committee will compare strategies of urban mobility, identifying transport policies and strategies from developed and developing countries to improve travel choices and accessibility in the context of the acute demands imposed by urban conditions.

This committee will build on the work of the previous cycle while advancing work on the topics listed above. Michael McClean has been nominated as topic coordinator for multimodal level of service.

Work Program

Key timelines were outlined by a PIARC representative during the meeting to ensure the committee meets the deadlines. High level timelines provided below:

- 2017 – Detailed table of contents for final report
- 2018 – Final version of report in one language
- Q2 2019 – Final version of report in three languages
- Q3 2019 – Publication of reports

After the fourth meeting, the Technical Committee lead will provide a mid-cycle update in December 2017 to the World Road Association. The main focus of this meeting is to review progress of the report, review translation plans, quality assurance and control and ensure the committees are addressing all issues and identifying practical solutions within the topic.

Each topic coordinator updated the committee on the status of their investigations during the Brussels meeting. Key information from the presentations is discussed further in the following section.

Meeting outputs

High Occupancy Vehicles (HOV)/High Occupancy Tolls (HOT)

Harlan Miller from the United States presented on numerous case studies for priced lane facilities and provided an overview of federal policy allowing tolls. Case studies presented are outlined further below:

I-35W MnPass, Minneapolis

The first case study presented was on the I-35W MnPass in Minneapolis where they converted an existing shoulder and HOV lane into a 16-mile HOT lane in 2009. The infrastructure includes one lane in each direction separated by a striped buffer, overhead lane signs and in-pavement indicators indicated closed lanes, changeable advisory speed limits. It incorporates a dynamic pricing system that can vary from \$0.25-\$8.00. As of 2013, more than 80% of people were carpooling or using transit along the route.

I-15 Express Lanes, San Diego

This facility has had a two-lane reversible HOT2+ facility since 1998. Opening of a reconstructed facility commenced in 2008. The new design includes a 20-mile corridor with 4 reversible lanes and a moveable barrier that can change number of lanes. Around 75% of the users are within the HOV lanes currently. See below image for further information.



Federal Policy

The FAST Act provides authority to toll and price motor vehicles in the United States to finance construction, promote efficient use of highways, reduce traffic congestion and improve air quality. There are four different programs available:

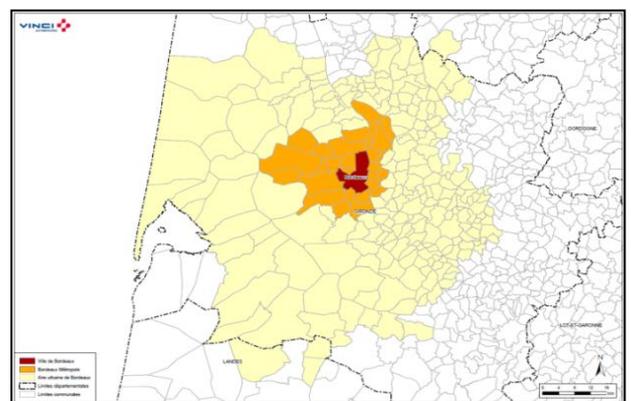
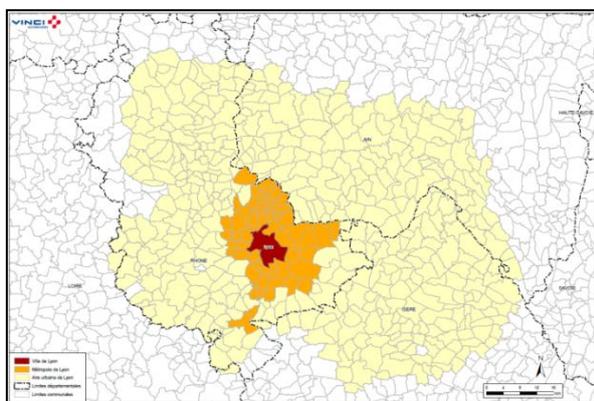
- **Value Pricing Pilot Program (VPPP)** - experimental program designed to assess potential of pricing for reducing congestion. Under this program, tolls may be imposed on existing toll-free highways, bridges and tunnels, as long as pricing is used to manage demand
- **HOV/HOT Lanes** - provides authority for toll-paying vehicles that do not meet occupancy requirements to use HOV lanes
- **General Toll Programs** - permits Federal participation in certain types of toll-financed construction activities including new highways, new lanes to existing highways etc.
- **Interstate System Reconstruction and Rehabilitation Program** - allows up to three Interstates to be tolled, pending requirements and approval

Demand

André Broto from France presented new case studies from 15 medium sized French cities and provided an analysis of historical trends for Toulouse. The analysis of numerous French cities enables comparisons to be made on the average area, radius, population and number of jobs for the city, urban area and commuting area, as outlined in the below table.

Average	City	Urban Area	Commuting Area
Area (km ²)	45	530	3,000
Radius (km)	3.8	13	30
Population	200,000	570,000	800,000
Jobs	130,000	290,000	340,000

The images of Lyon and Bordeaux give a visual indication of the areas of the city (red), urban area (orange) and commuter area (yellow).



A trend analysis of the city of Toulouse indicates that between 1999 and 2011 the number of commuters has increased by:

- 8% for those living between 10-20km from the city centre
- 45% for those living between 20-30km from the city centre
- 70% for those living between 30-80km from the city centre

Overall, France had an increase of 45% between 1994 and 2008 in passenger commuter kilometres travelled. All of the above statistics highlight that commuters are living further from the city and travelling further to work. As the transport network continues to improve and expand this trend is likely to continue.

Multimodal Level of Service (MMLOS)

Michael McClean from Australia gave an overview of the shift in thinking from considering the automobile as the primary mode of transport when designing urban streets. There is an interest from road agencies and jurisdictions in acquiring the ability to estimate and forecast MMLOS. Michael has investigated the use of the following frameworks through research undertaken to date:

- Highway Capacity Manual (HCM)
- Florida's Quality/Level of Service Handbook (FDOT Q/LOS)
- SmartRoads
- Austroads Level of Service Metrics (for Network Operation Planning)

Michael undertook a comparison of the different manuals using four measures to highlight the key differences between the frameworks. The measures focus on whether the framework can be applied nationally, if it can be used to analyse urban streets, whether the LOS measures are comparable across different modes and if LOS scores are averaged across modes. The following table provides a summary of the results:

Measure	HCM	FDOT Q/LOS	SmartRoads	Austrroads
National application	National	State only	National	National
Applicable to urban streets	Yes	Yes	Yes	Yes
Comparable modal LOS	No	No	No	No
Averaging across modes	No	No	No	No

The timing of the adoption of using a MMLoS analysis for urban streets differs across jurisdictions globally. Much of the debate is around whether agencies and communities are willing to accept a lower car level of service in order to reach acceptable level of service measures for other modes.

There seems to be consensus that there is no one-size-fits-all methodology and jurisdictions should tailor existing methodologies to local land use goals and infrastructure to ensure it can be successfully applied.

Accessibility

Dudley Mbambo (South Africa) and Ok Namkung (South Korea) presented their research to date on accessibility. They highlighted traditional transport planning processes and the focus on improving mobility and reducing/eliminating congestion. The traditional process does not take into account the inequalities that may exist in a society which may be perpetuated by the transport system.

How do we approach transport planning differently to focus more on people? This is where the concept of 'sufficient level' of accessibility becomes a focus. Both Dudley and Ok discussed the idea that public resource allocation should prioritise people who are below the sufficient level. People above the sufficient level should finance any further improvements to their level of accessibility. Dudley and Ok then went on to compare the definitions for universal access, accessible design, barrier free design and inclusive design. The underlying principle consistent across all of the definitions is to transform social exclusion into social inclusion.

Ok presented a case study on the inconvenience of using the Seoul subway system for people with limited mobility. The purpose of the work was to help people with limited mobility to use the subway with ease by providing a legible subway transfer map. Before (left) and after (right) photos below provides a great representation of the changes to traveller information.



Transit Oriented Design (TOD)

Thomas Macoun from Austria presented the basic principles of multimodality and how it influences TOD. He believes that TOD is a major solution to the serious and growing problems of climate change and global energy security by creating dense, walkable communities that greatly reduce the need for driving and energy consumption. This type of living arrangement can reduce driving by up to 85%.

Thomas stated that mobility is not increasing and that the average number of trips is constant. There are only changes in forms of mobility from one mode of transport to another. He then went on to say that there is no time saving by increasing speed. Commuter travel time per day is relatively constant (about 60 to 70 minutes per day). Therefore, increasing speed only leads to increasing trip distances.

Thomas also highlighted that one of the major issues of current planning practice is that the environment is being designed corresponding to the most important transport mode at the time, rather than future proofing.

Learnings for Australia and/or New Zealand

Thomas Vincent from the Belgian Road Research Centre (BRRC) presented on cycling in Belgium and recent investigations from the Netherlands. The case study presented in the Netherlands in particular outlined that the return on investment for cycling infrastructure is the highest when comparing alternative transport modes using a Social Cost Benefit Analysis (SCBA).

The results outlined that investing in cycling infrastructure will return €0.31 per km more than car infrastructure and €0.5 per km more when compared with public transport infrastructure.

This SCBA calculation takes into consideration safety, noise, emissions, subsidies/tax, life expectancy, productivity and network impacts.

The investigation also outlined that cycling infrastructure leads to less casualties, congestion and CO2 emissions and higher work productivity and life expectancy.

Dissemination

All presentations made by Technical Committee B.3 members and staff from BRRC from the Brussels meeting will be made available upon request.

Benefits from other associated activities

In conjunction with the plenary meeting the committee was invited to tour the Belgian Road Research Centre (BRRC) laboratory in Wavre, Belgium. Numerous staff members from the BRRC provided presentations on the work they have undertaken recently including:

- Methodology for the evaluation of infrastructure projects
- Guidelines for pedestrian and cycling facilities in Brussels
- Observation and analysis of user behaviour in redevelopment projects at Keym, Dumon and Porte de Flandre
- Pavement condition surveying and management
- Pedestrian and cyclist comfort. This included a demonstration of the wheelchair measuring device developed by the BRRC, see below image



The committee was also invited to tour the site of the Schuman-Josaphat Railway Tunnel. The tunnel is a new direct link between the Brussels-Schuman station and the Halle-Vilvoorde railway line and is 1.25km long. This new link connects the European Quarter directly to the north of Brussels; being the airport and the main cities in the country. The total cost was around €365 million.

Conclusions and recommendations

The topic coordinators will continue to progress their research and documenting findings in preparation for the next meeting held in Vienna, Austria in April 2018.

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