

CoMET and Nova Newsletter

Inside this issue:

Welcome to Newsletter 4	1
Introducing Beijing BMTRC	1
Best Practices: London Underground	2
Metro Competitiveness in terms of CO ₂	3
CoMET and Nova Case Study Update	4



Community of Metros
CoMET



Welcome to Newsletter 4

This, fourth edition, of CoMET and Nova's joint newsletter reflects an extremely busy and exciting six months for both groups.

CoMET has welcomed a new member, with the Beijing Subway joining towards the end of 2008 and having attended their first meeting in Berlin.

In this edition we examine some topics in depth

including an example of best practice in London Underground which has been striving to better meet customer needs through staff training.

Several case studies have recently been completed, as summarised on Page 4 and many aspects of this work, such as that covering CO₂ competitiveness, featured on Page 3, are stimulating further discussion amongst members.

CoMET Welcomes its Second Member from Mainland China

The CoMET benchmarking group is pleased to welcome its second member in mainland China, Beijing Mass Transit Railway Operation Company Limited (BMTRC)

Beijing is China's largest city with a municipal area of 16410 square kilometers and a population of more than 16 million. As the largest metro system in China, the current network is 200 kilometres in length, consisting of 8 lines, 123 stations and employs more than 16,000 people. The first line (line 1) was opened on 1st October, 1969 and there has been rapid expansion since 1999 due to the successful bid to host the 2008 Olympic Games. Current average ridership stands at 3.4 million passenger boardings per day and this will grow as the network continues to expand. In 2008, total passenger boardings for the year reached 1.22 billion.

With a total investment of 8.5 Billion RMB (US\$1.25 Billion), BMTRC has witnessed a series of systematic upgrades in all major sectors of the railway including new trains, power supply, communications, signaling and Automatic Fare Collection systems. As of July 2008, all projects were completed and put into operation.

BMTRC has set an ambitious plan to complete 561 network km by 2015, which will make it the largest metro network in the

world (ahead of New York and London). It is projected that this will enable the transportation of 9 million passengers per day, accounting for more than 50% of the public transport capacity in the city.

Cooperation with CoMET members will be

invaluable for Beijing as it manages the rapid transformation of its network to being one of the largest and busiest networks in the world. This will also be of great interest to other CoMET and Nova systems requiring expansion to meet increasing passenger demand



Best Practice: London Underground focuses on meeting the customer's needs

Here at London Underground (LU) we are facing a huge challenge. Not only are we experiencing increasing levels of customer demand, but we are also in the midst of a massive programme to transform our Tube.

We keep customers at the heart of what we do, and our vision is to transform the Tube into a truly world class metro. We aim to do this by combining a reliable train service with the highest standards of customer care that our customers demand and expect.

We recognize that our people will be key to our success in achieving such high standards. It is not just about **what** service we deliver, it is about **how** we deliver and how effectively we work together. To succeed, everyone in the organization must clearly understand the part they can play in bringing about this transformation.

To engage our train operators, station staff, revenue and service controllers, we are running just over one hundred one-day workshops. These are themed Valuing Time, which is our one core value. Time is something we all need to value if we are to deliver all the improvements we need to.



A holographic Tim O'Toole steps out of a train and into a Valuing Time workshop.

We spent a lot of time designing the format, look and feel of these workshops so that people could really get to discuss the challenges and their role. We kitted-out a special venue to create a real sense of excitement and energy throughout the day, and provide an environment that allows us to deliver an event with a high-level of interaction and staff involvement.

At the start of the day we set out 'LU's story' as we refer to it. This describes where we are headed as a company and the challenges we face ahead, and explains what and why we need to change the way we work together. We use cutting edge technology to get our Managing Director, Tim O'Toole to every event by using holographic projection and with very positive feedback from attendees.



"During the CoMET Annual Meeting in October 2008, I took the opportunity to show Andrew McCusker, the Operations Director of MTR Hong Kong, one of the Valuing Time workshops. It was a chance to share our experiences and ideas - it also confirmed that communicating and engaging our staff is a key priority for both organisations."

Howard Collins

We then hand the day over to a number of specially-selected and trained frontline managers who facilitate smaller groups to explore the challenges and think about what this means to individuals and teams within operations. It has been amazing to watch these managers in action; they are fully committed to this. Their enthusiasm shows that they are clearly getting a huge amount out of this, and they are acting as great role models for others. We recognize that it is our frontline managers that are the key to building trust within our teams



Staff arrive at LUL's Valuing Time workshop venue.

and driving the culture change that will create the extra capacity needed to deliver our vision.

Our facilitators use interactive exercises to help people translate the five behaviours that underpin Valuing Time into specific, tangible actions. These behaviours focus on the areas in which we need to improve – that is, being active, accountable, fair and consistent, direct and collaborative.

Of course, we've had to do a lot of preparation across the business before running these events. Prior to the workshops we needed to develop our leadership and management capability. We started this in April 2007, and in total, well over 1000 leaders and managers have undertaken 360 assessments to help them identify their strengths and areas in which they require further development. As the programme and new way of working has cascaded through the organisation, leaders and managers have also been directly involved in designing and delivering this programme for their own teams.



Our employees tell us that they are seeing and feeling the effects of this change, and that is clear from the record scores we are receiving in our annual employee survey. Over the last 2 years, our employee engagement index has increased by 9 points, moving from 74 to 83.

We are also getting great feedback from managers that have been through the programme. When talking about the programme, one duty manager commented that *'the whole experience is going to help me reinvent myself as a manager'*.

At the same Customer service satisfaction is reaching record levels, so we know we are on the right path.

There is still a lot to do, and this is just the start of a new way of working together. Our next challenge is to maintain our momentum!

Howard Collins

**Chief Operating Officer,
London Underground**

Metro Competitiveness in terms of CO₂—Key Findings and Messages

Metros are key to the development of sustainable cities. They enable dense development and, being electrically powered, generate few local emissions. Therefore, when combined with the decarbonisation of electricity supply by adoption of renewable and nuclear power, metros will play a key role in reducing the overall CO₂ emissions of cities.

With many governments, both local and national, committing to, or considering, stringent targets for the reduction of Greenhouse Gas (GHG) emissions, many CoMET and Nova metros are sensibly questioning how much CO₂ they are really generating; in the near future, many policy makers might take into account the CO₂ efficiency of metros and other transport modes before committing public funds.

With asset replacement cycles which are many times longer than those of the bus industry or private cars, metros must ask themselves how the procurement decisions they are making today will stand up to comparison with technological developments in other modes. Is there a danger that the trains being ordered today will be forced to compete with fuel-cell bus fleets in twenty years?

The Competitiveness Case Study sought to establish a robust understanding of metros' current competitive position, provide a basis for ongoing metro strategy, and publicise key messages for metros to take to their stakeholders.

Current and Future Competitiveness

In terms of CO₂ emissions per passenger kilometre, many metros are already less competitive than new buses. The plans for deployment of hybrid and fuel-cell bus fleets in some cities may see significant reductions in bus emissions within the next two decades.

Similarly, changes in technology and policy, both national and supra-national (e.g., through the European Union) should see the average car generate less CO₂ per passenger kilometre than many metros currently do.

It should, however, be noted that fuel-cells only represent a reduction in emissions if nuclear or renewable sources are available for hydrogen electrolysis.

Energy Supply and CO₂ Measurement

Metros use a huge amount of electricity, powering trains, air-conditioning, escalators and other vital equipment. However,

reliance on electricity, rather than internal combustion, means that metros can reduce their carbon emissions by altering their electricity supply. Indeed, metros which benefit from local nuclear or hydro-electric generation (e.g., Paris and Sao Paulo) generate virtually no CO₂ emissions.

Metros can take two approaches to this opportunity—either passively, allowing changes in national energy policy to gradually decarbonise their electricity supply, or actively, by seeking out supplies from low-carbon generators. In this endeavour, metros may fall foul of emerging policy in some jurisdictions which propose that national grid emissions factors should be the figure used in any emissions calculations. Metros must argue that such a rule unfairly penalises metros:

- Relative to the quantity of electricity used, metros have little real-estate upon which to install renewable generating capacity
- Purchasing “green” electricity in the volumes required by metros should

stimulate the development of additional low-carbon generating capacity.

Reducing Energy Consumption

While the largest reductions in metros' CO₂ emissions will come through changes electricity generation technology, metros should also pursue energy reduction strategies. Not only to reduce CO₂ emissions in the short and medium term, but to guard against the likelihood that decarbonisation of electricity supply, through construction of new nuclear and renewable capacity, must be funded through increased electricity prices.

The Nova Energy Case Study estimated that changes to assets and operating procedures could reduce the volume of grid electricity required by some metros by 40-50%. In addition to the installation of, small-scale, renewable generating capacity on metro properties (e.g., wind turbines at depots and solar panels on station roofs), initiatives include optimising the timetable to maximise the benefits of regenerative braking and increased use of “coasting” in between stations.

City Density

Amongst all these concerns, metros must not allow their stakeholders to overlook the reduction in **overall** CO₂ emissions that metros deliver to cities and regions. Metros, with their unique ability to move huge numbers of people across a city while using little surface real estate, facilitate dense cities.

Figure 1 shows that, without metros, cities sprawl. This, in turn results in far higher CO₂ emissions per inhabitant:

- Used to travelling by car, inhabitants move out into, ever more distant, suburbs—increasing the prevalence of long-distance commuting on choked highways
- Suburban living encourages people to increase the size of their living and working spaces. Buildings are, by far, the largest generators of CO₂ emissions; larger homes means more heating, more air-conditioning, and larger, more energy-intensive, appliances.

In summary, while metros are justly concerned about metro energy use and emissions, they and their stakeholders should not lose sight of the ease with which metros can adapt to using electricity from renewable sources or the benefits they deliver in dense cities.



Figure 1: Selected population densities, green denotes cities with developed metro systems.

Imperial College London

The CoMET and Nova International Metro Benchmarking Groups are facilitated by the Railway and Transport Strategy Centre

Address:
Department of Civil and Environmental Engineering,
Imperial College London,
London, SW7 2AZ,
United Kingdom.

Phone: +44 (0)20 7594 6092
Fax: +44 (0)20 7594 6107
E-mail: rtsc@imperial.ac.uk

CoMET Group President, 2009:
Andrew McCusker (Hong Kong MTR)

Nova Group Chairman, Phase 11:
Mr. Ricardo Sargiotto (Buenos Aires Metrovías)

www.comet-metros.org

www.nova-metros.org

www.rtsc.org.uk

Nova and CoMET Case Study Update

During the course of CoMET 2008 and Nova Phase X, members have collaborated to complete a number of valuable case studies.

To varying degrees, the case studies undertaken by both groups all aimed to identify ways in which metros could adopt best practice to increase efficiency—either through reduced costs or by improving operational reliability.

A continuation of previous work on **Rolling Stock Reliability** looked in more detail at new and ageing fleets—asking how metros can ensure a smooth entry into service for new fleets, or deliver a robust service using ageing fleets. It was shown that some of the most reliable fleets in service are the oldest, while other fleets are having their planned service life extended to 60 years. Additionally, the performance of individual sub-systems was examined, with metros sharing details of successful improvement programs.

Particular emphasis was placed on the reliability and specification of doors. Future work will look at the variation in door systems across fleets may be rationalized.

The **Escalator Case Study** highlighted the dramatic differences in the cost, reliability and maintenance requirements of these vital systems amongst members. A continuation of this study is currently underway which seeks to fully understand the huge variations



One of London Underground's A-Stock trains enters a station. This fleet is the oldest in service with members and continues to deliver reliable service, as detailed in the Rolling Stock case study.

in the installation and whole-life cost of escalators.

Increasing the capacity of metro systems by reducing station dwell times was the motivation for the **Impeded Run Time** case study; investigating best practice in train headways and station dispatch procedures.

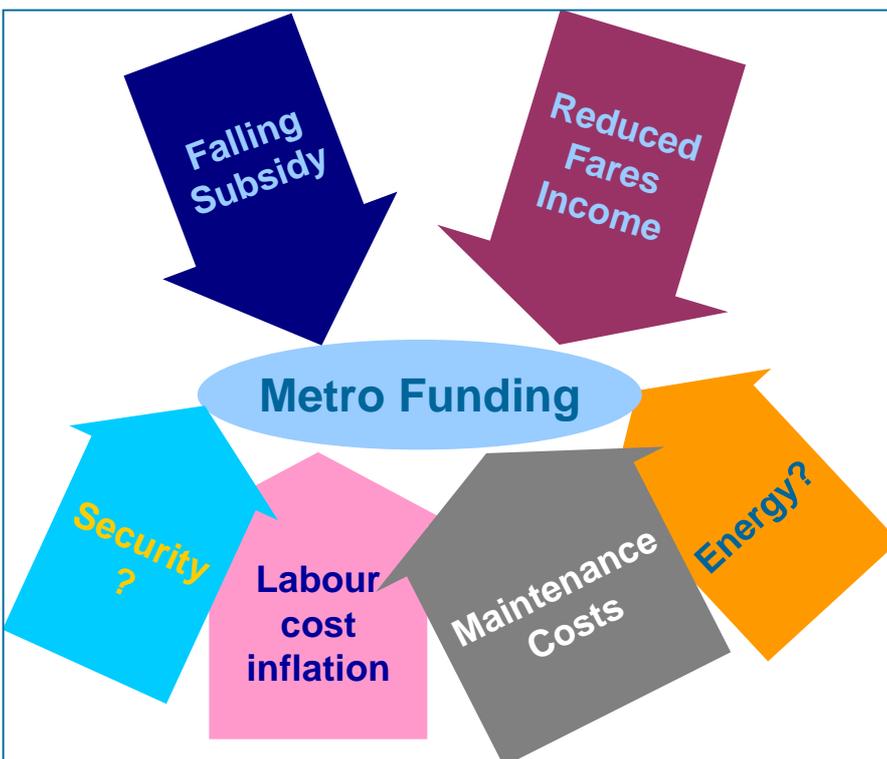
Ensuring that metros are, and remain, competitive with other modes of transport was the overall aim of the **Competitiveness Case Study**. The study looked at competitiveness in terms of both cost, a long-standing concern which is at the forefront of discussions in the current economic climate, and CO₂ emissions, an issue of great importance to some metros, and an emerging problem for others.

Nova's **Energy Case Study** complemented the Competitiveness case study, detailing the sources of electricity generation for many metros and examining steps that may be taken to reduce reliance on grid electricity—both through energy saving initiatives and the installation of local generating capacity.

A case study covering **Non-Fare Revenue** highlighted best practice in maximizing revenue from advertising and other sources.

Cognisant of the differing legal and cultural norms which govern labour amongst member metros, the **Labour Regulation** case study categorises members by degree of labour flexibility and union involvement, before identifying a best practice metro at each level of flexibility—allowing managers to compare productivity on a like-for-like basis and adopt best practices which are consistent with the environment in which they work.

A Nova pilot study into risk management is now being followed up with a larger piece of work, through Phases 11 and 12.



As economic conditions deteriorate across the globe, metros may face many cost pressures. Combating this squeeze was a key aim of the Competitiveness case study.