Name: Sun Shengyang

Organization: GIZ

Title/Position: Senior Engineer

Email: shengyang.sun@giz.de

Sun Shengyang is the senior engineer of GIZ. He served as technical consultant in Beijing's transportation demand management project, responsible for the development of transportation greenhouse gas emissions estimating models and transport demand management policies. He worked at the international consulting firm and research institutions, his mainly experience includes travel demand forecasting model, the integrated models of transport and land use, urban transport planning and public transport planning.

Congestion Charge Case Analysis: Ineffectiveness, Barriers, and Lessons

Sun Shengyang
Project Manager, Sustainable Transport, GIZ China
Shengyang.sun@giz.de

What GIZ stands for…

Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH ("German Technical Cooperation")

German state-owned enterprise working on behalf of the German government

International cooperation for sustainable development (transport just one sector)

Operates in more than 130 countries (in China for more than 30 years)

Business volume 2012 2 billion EUR (40 Mio. EUR in China)

Approx. 17,000 staff members (ca. 170 in China)

Picture Credits: Florian Kopp (Brazil), Jolanda Sattler (Morocco), Dirk Ostermeier (Kenya, Vietnam)

GIZ Sustainable Transport in China: What we do…

- Sustainable Transport Programme: Established 2010
- Focus: Contribute to the Development of Low Carbon Transport System
- Key Activities:

Climate Protection: Policies and Measures

Sustainable Urban Transport

Electric Mobility and Alternative Fuels

Freight Transport and Green Logistics

- Cross-cutting issue: Carbon Accounting and Emission Evaluation

Transport Demand Management in Beijing

Objectives:

- Development of effective TDM measures
- Tools for measuring the impacts will be applicable
- Involving further cities

Duration: 01/2011-02/2015

Work Packages:

- Identification and development of effective TDM measures for reducing CO_2 emissions.
- Development of a model for transport related CO_2 emission reduction estimations and a monitoring system
- Dissemination of measures and tools to other Chinese cities

Commissioned by:
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of the Federal Republic of Germany

National Development and Reform Commission

Study Tour: “Congestion Charging and Low Emission Zones in Europe”

Time Frame

- Ten-day study tour in September 2013

Participants

- 9 participants from BMCT, BTRC, BTEC and BEPB headed by deputy director of BMCT

Scope

- Low emission zones in **Berlin**
- Congestion charging in **London**
- Congestion charging and low emission zones in **Milan**

“Confidence is what you have, before you understand the problem.”

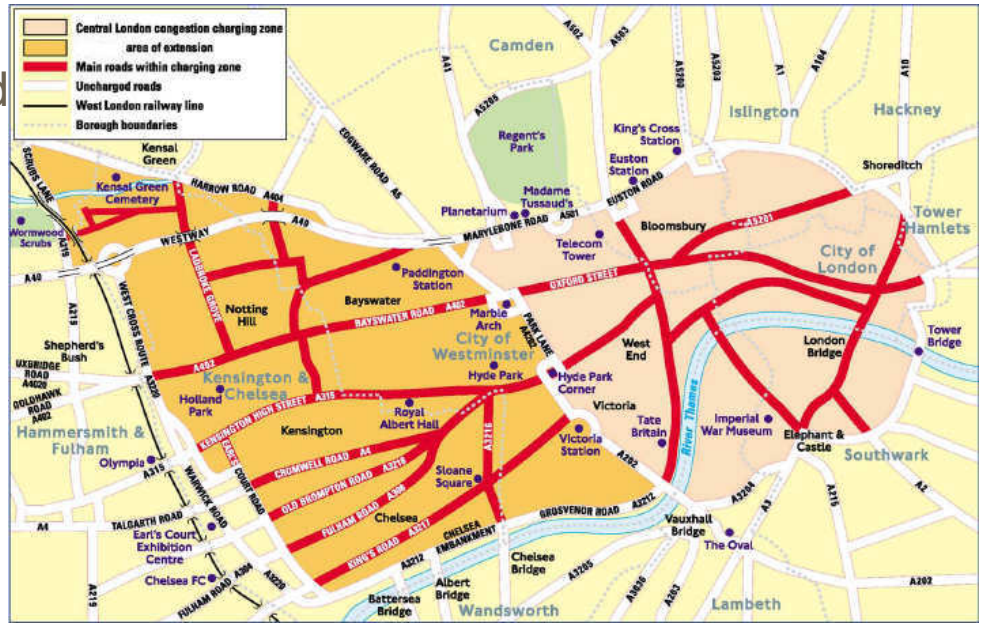
Woody Allen, Director

Projects' defects

- From a political perspective
  - London extension
  - Rejection of proposals in
    - Edinburgh, Manchester and eight other UK cities
    - New York, San Francisco, the Netherlands
- From a transportation perspective
  - There are no failed systems, political risks are so high that projects tend to be thoroughly designed and redundant technology is procured
- From a technical perspective
  - German freight kilometer charges were very much delayed

London Western Extension

- Central London congestion charging zone was introduced on 17 February 2003
- Western Extension was operated on February 2007 and
- Formally be removed on 4 January 2011



£8 daily charge for driving or parking a vehicle on public roads within the Congestion Charging zone 7.00am to 6.00pm, Monday-Friday

Impact of Western Extension

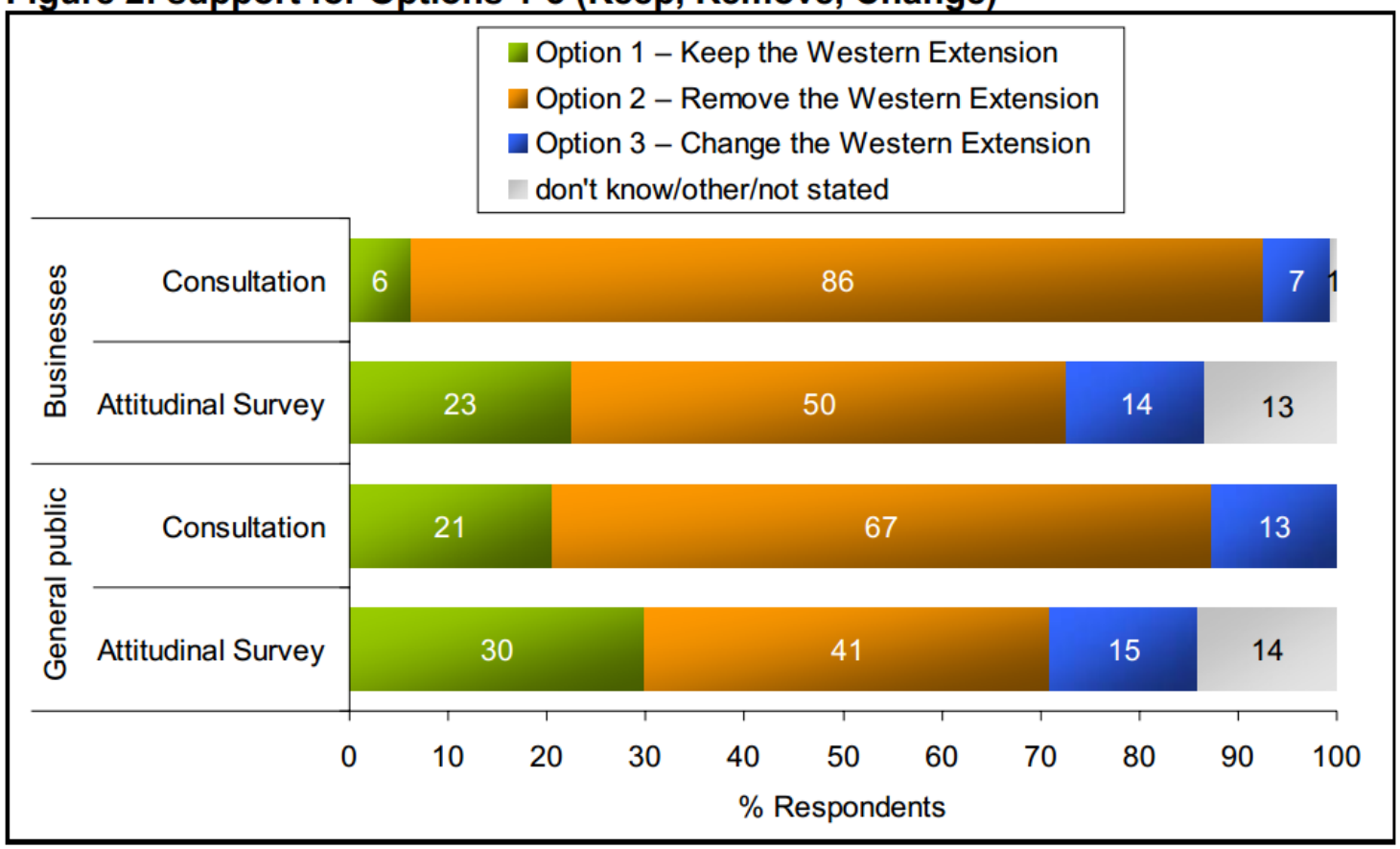
- 30,000 fewer cars entering the area each day, reduce 20% of congestion
- reduce vehicle emissions and encouraged people travelling in the area to use public transport, or to walk or cycle
- But after one year of introduction the scheme, congestion levels are broadly the same as those experienced in previous year
- Reasons explained by Tfl:
  - major development and utility works in the area reduced the road capacity
  - Road space relocated more to the pedestrians and cyclist

Removal of London Western Extension

- Boris Johnson put the removal of the Western Extension in his campaign for the 2008 election.
- *Public consultation:* Majority of people were in favor of removal, but it wasn't as strong as those consultations prior to implemen-tation (e.g. in Edinburgh and Manchester).
- BUT: Companies appreciated the congestion relief, and residents benefited from the 90% discount for their journeys to central London.
- .

Results of Consultation and Altitude Survey

Figure 2: support for Options 1-3 (Keep, Remove, Change)

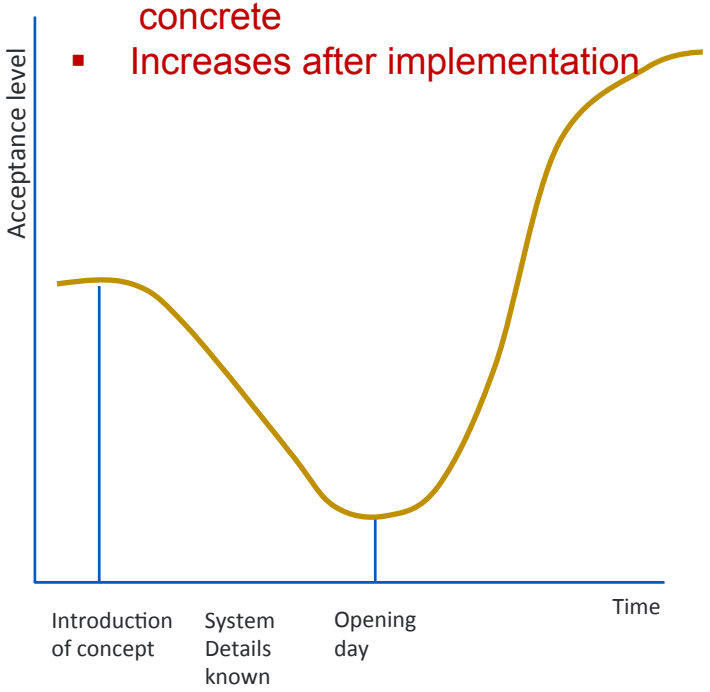


Timing of implementation and acceptance

- Acceptability is not a constant
- Acceptability will be low before introduction
- Use of revenues affects acceptability

	Before	After
Stockholm	21%	67%
Bergen	19%	58%
Oslo	30%	41%
Trondheim	9%	47%
London	39%	54%

- Declines as proposal more concrete
- Increases after implementation



The world's best systems were developed with high levels of political support.

With strong political will, anything is possible.

Enrique Penalosa
Former mayor of Bogota

Lee Myung-bak
Mayor of Seoul

Jaime Lerner
Former mayor of Curitiba

Edinburgh Charging Scheme Policy Objectives

- Pricing objectives were:
  - To improve safety for all road and transport users
  - To reduce the environmental impacts of travel
  - To support the local economy
  - To promote better health and fitness
  - To enhance equity and social inclusion
- Proposals for a scheme were put to a public inquiry, and positively assessed, but a final referendum halted the planned charging scheme
- The revenue would be used for projects which would benefit residents of local authorities in proportion to the trip origins of those paying the congestion charge
- 46% of the revenues were planned to go to transport projects in neighbouring areas with the remainder being directed to transport projects within Edinburgh

Edinburgh Scheme Design

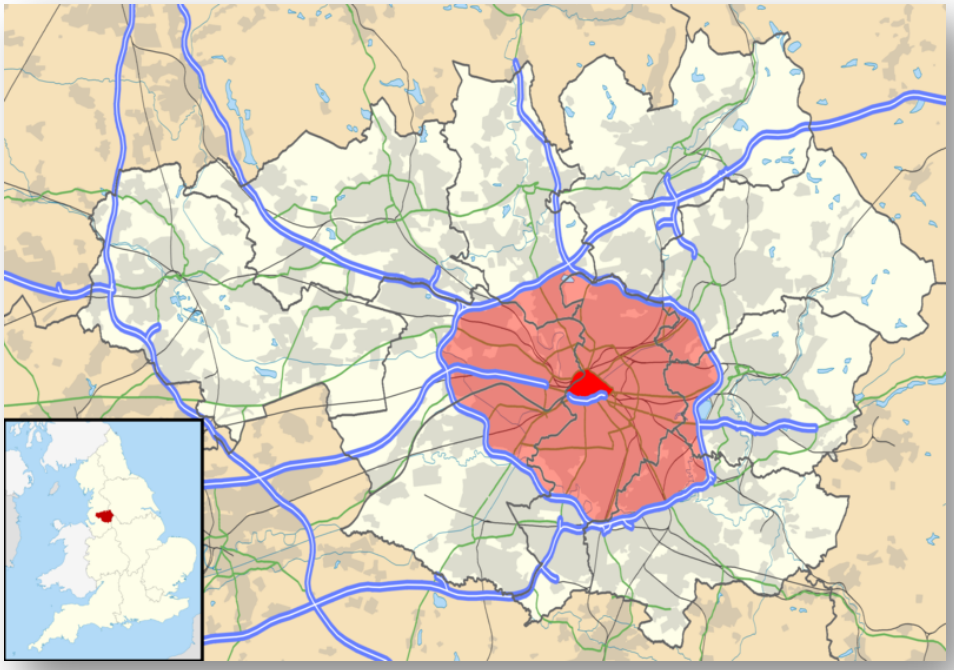
- Double cordon charging
- Automatic Number Plate Recognition system
- €2.40 charge on vehicles inbound to Edinburgh (see picture)
- Monday to Friday
- Inner cordon from 7am-6.30pm
- Outer cordon from 7am-10am
- Several ways to pay
- Non-payment incurs a penalty charge

Edinburgh Referendum

- A referendum was held for Edinburgh residents after the outcome of the public inquiry but before contracts were let for implementation of the scheme.
- Despite a public information exercise the scheme was not well understood and there was a strong no campaign supported by city centre retailers and opposition politicians.
- Within Edinburgh 75% voted against the Councils preferred strategy which included congestion charging. There was also opposition from adjacent Councils
- The lesson of the Edinburgh experience is the need to build up consensus on a regional basis with an agreed and clearly committed use of revenue that is seen as both efficient and fair

Manchester Charging Scheme

- The proposals for the congestion charge were two cordons
- Vehicles entering the outer cordon charged £2.00, with a further £1.00 for those entering the inner cordon in the morning peak (07.00 to 09.30)
- A further £1.00 would have been charged on exit of each cordon in the evening(16.00 to 18.30)

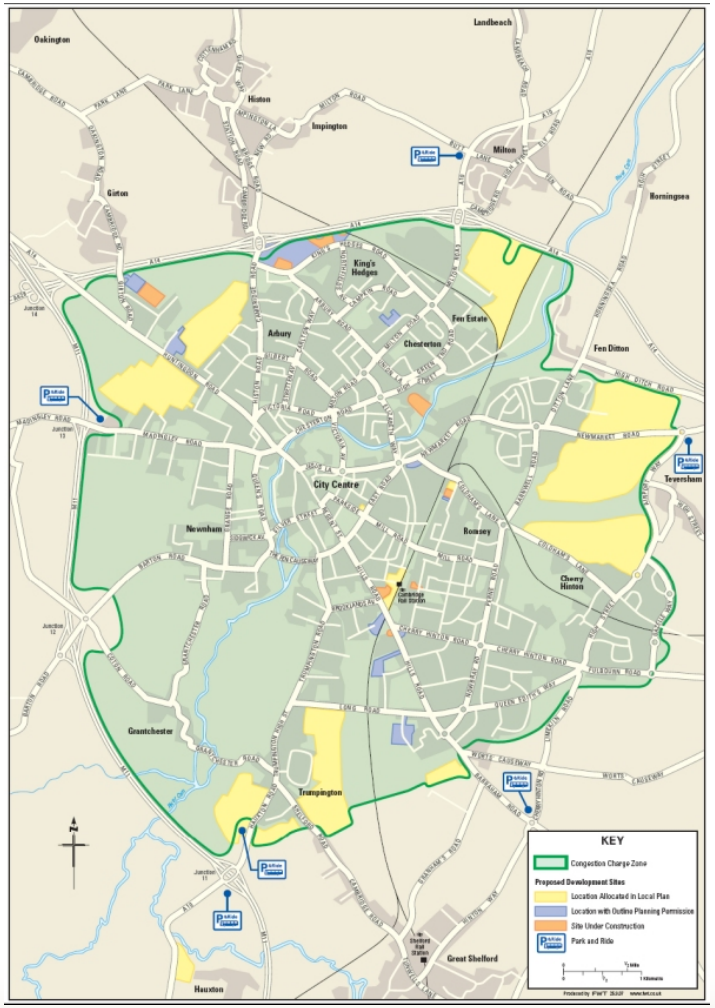


Manchester Referendum

- The charge would only come into place after 80% of transport improvements have been put into place – that is 2013 at the earliest.
- The Manchester congestion charging scheme was rejected in a referendum by 79% on December 12th 2008
- Not implemented because encountered difficulty in reaching local consensus

Cambridge Congestion Charging Scheme

- An area based charging scheme around Cambridge city, approximately 36 km^2
- A charge in operation between 07:30 – 09:30
- A daily charge in the region of £3-5, irrespective of the number of trips or distance travelled
- All travel into, out of or within the charging zone will be subject to the charge



Cambridge Congestion Charging Scheme

- The objective is a traffic reduction of 10%
- Not implemented because encountered difficulty in reaching local consensus
- Lack of public support, especially in its rural areas, for delaying its bid – but 59% of people say they support charging if attractive public transport alternatives were available

Referendum

Referendum

- Stockholm: 53% supported after trial implementation
- Edinburgh: 75% rejected before implementation
- Manchester: 79% rejected before implementation

DO NOT have a referendum before the implementation

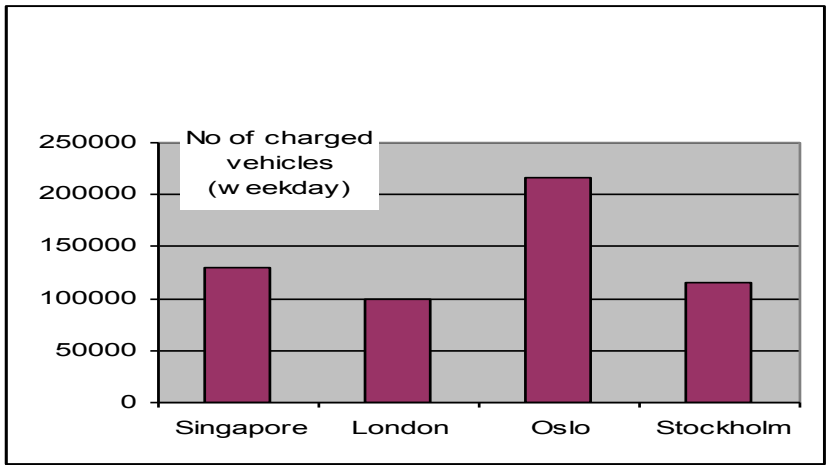
The Netherlands

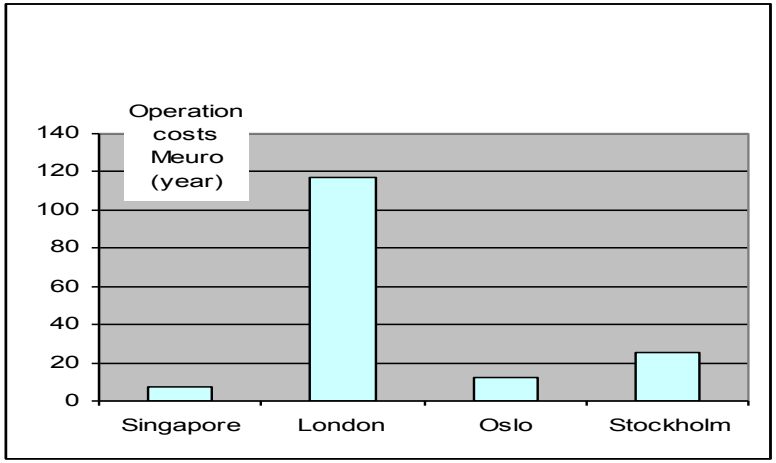
- Over the past two decades several charging systems have been proposed:
  - Rekeningrijden (cordons around major cities)
  - Kilometer charges
- Any charging policy needs new legislation in the Netherlands, this process takes more than one election cycle, and the plan does not survive
- Kilometer charging was an immense technological challenge and financial risk for the treasury department

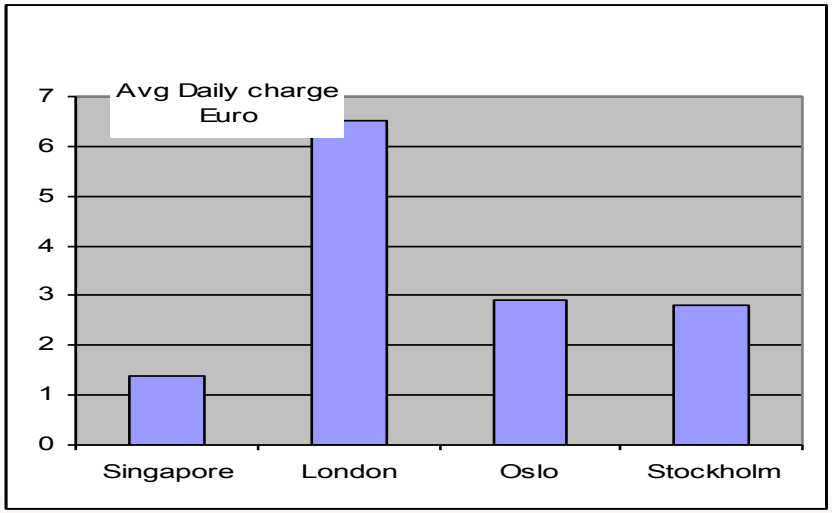
Denmark

- First adopted a strategy for kilometer charges and would follow the Netherlands, then the Netherlands backed out.
- Copenhagen would then have congestion charges based on GPS technology, which was then deemed too expensive with respect to benefits.
- After new elections the proposal for congestion charging was cancelled.

Singapore, London, Stockholm and Oslo: Different scheme characteristics





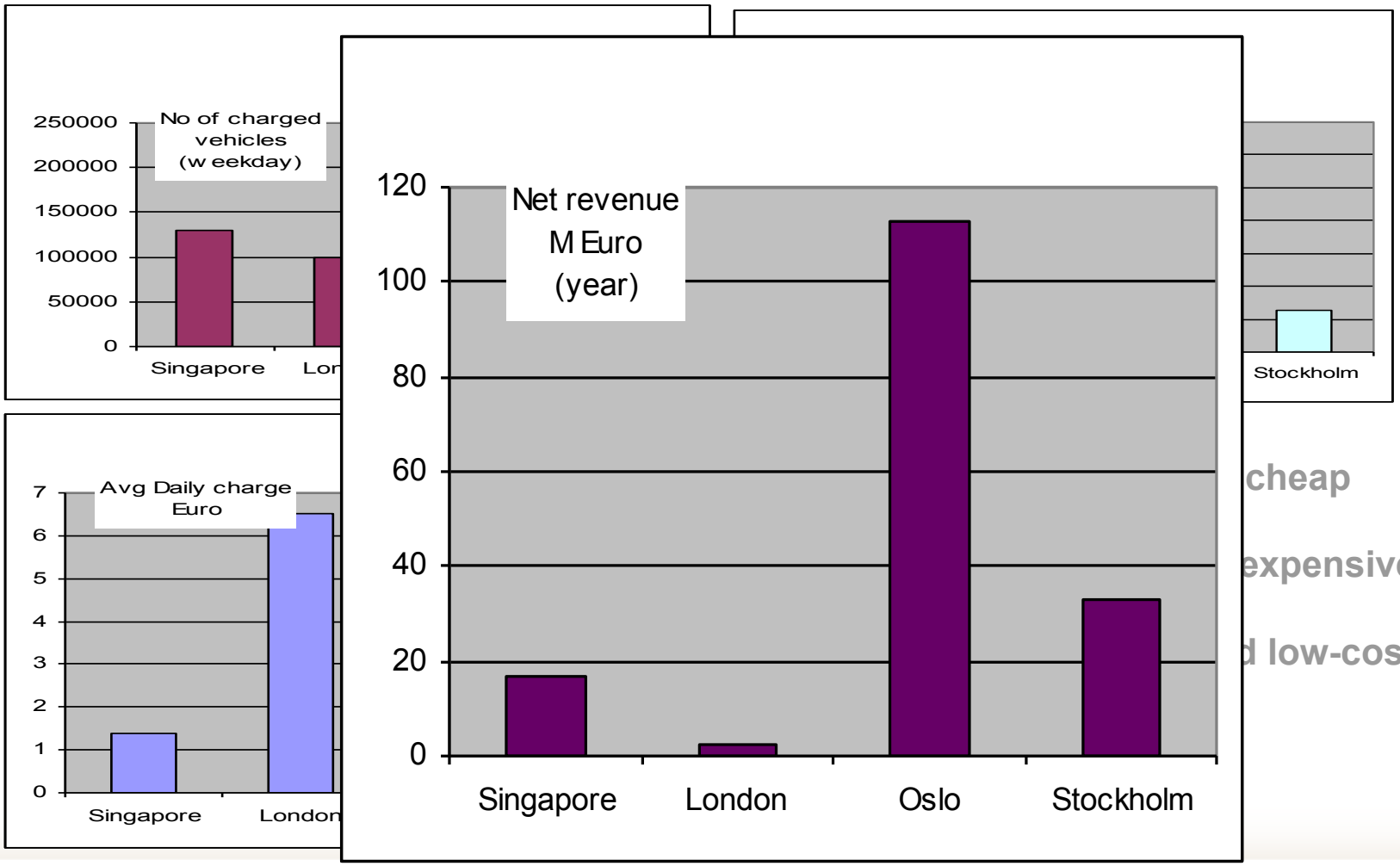


Oslo: comprehensive and cheap

London: high-charge and expensive

Singapore: low-charge and low-cost

Singapore, London, Stockholm and Oslo: Different scheme characteristics affect revenue generation



Key design questions

- Who should be charged?
- How should they be charged?
- Where should they be charged?
- When should they be charged?
- How much should they be charged?
- How should the revenue be used?

- Modal Substitution
- Time of Travel
- Travel Route
- Location Choices

Push and Pull Effects

Measures with push-effects
Area-wide parking management, parking space restrictions in zoning ordinances, car limited zones, permanent or time-of-day car bans, congestion management, speed reductions, road pricing...

Measures with pull-effects
Priority for buses and trams, high service frequency, passenger friendly stops and surroundings, more comfort, park-and-ride, bike-and-ride..., area-wide cycle-networks, attractive pedestrian connections...

Measures with push- and pull-effects
Redistribution of carriageway space to provide cycle lanes, broader sidewalks, planting strips, bus lanes..., redistribution of time-cycles at traffic lights in favour of public transport and non-motorized modes, public-awareness-concepts, citizens' participation and marketing, enforcement and penalizing...

Source: Müller, P., Schleicher-Jester, F., Schmidt, M.-P. & Topp, H.H. (1992): Konzepte flächenhafter Verkehrsberuhigung in 16 Städten", Grüne Reihe des Fachgebiets Verkehrswesen der Universität Kaiserslautern No. 24.

"Confidence is what you have, **because** you understand the problem."

Woody Allen, Director

Lessons learned – success to a charging system

- Strong political will is key to success
- Have the plans ready and seize a political window of opportunity
- Effective public communications regarding policy objectives, charging scheme and how to use the revenues
- Congestion charge was introduced as part of the comprehensive transport improvement measures or funding package
- Commitment to alternative transport service improvement
- Effective traffic management and enforcement
- Resonable technological solutions and solid business model

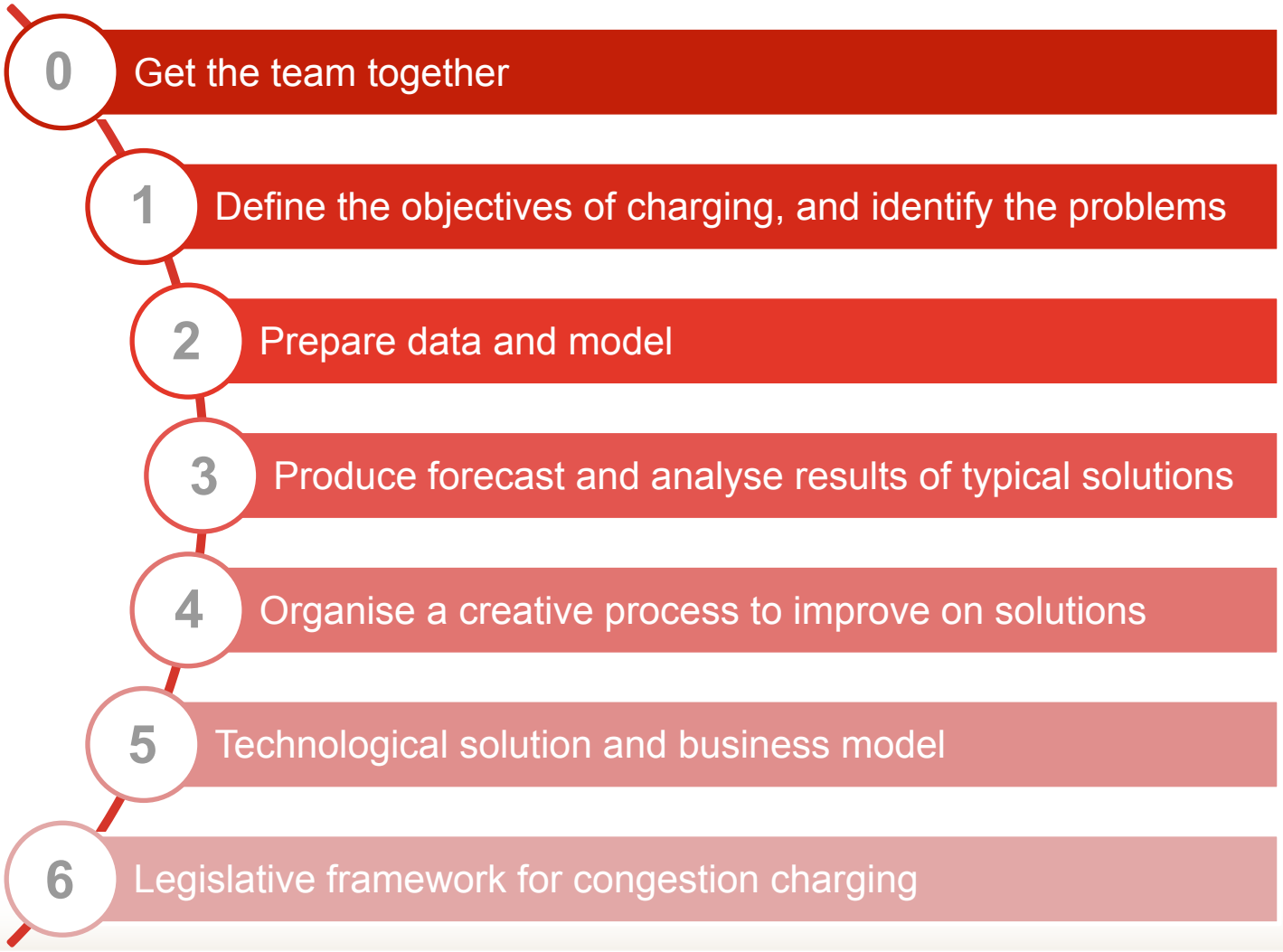
Some Preliminary Recommendations -1

- Clearly define the objective. These objectives can be described as a reduction in traffic congestion index and traffic flows, (relative) improvements in travel times and travel speed, reduction in CO2 emissions, etc.
- Define a working group to include people from BCMT, Police and Environment Protection Bureau, policy development team and technology team
- Beijing has a technical system in place that can be used for charging policies
- The policy development process should be as transparent as possible
- Revenue use. important to communicate how revenues of the congestion charging scheme will be spend

Some Preliminary Recommendations -2

- Appropriately address key public concerns. Apparently 85% recognises the car to be a contributing source of pollution and about 56% answers that the government should restrict the use of the car to combat these environmental problems
- Potential schemes for Beijing
  - A single zone system
  - A multiple zone system
  - Distance based and marginal cost pricing
- Scientific and fact based decision. A good travel demand model to compare and appraise of alternatives and scenarios

Guiding Tasks to Design the Scheme

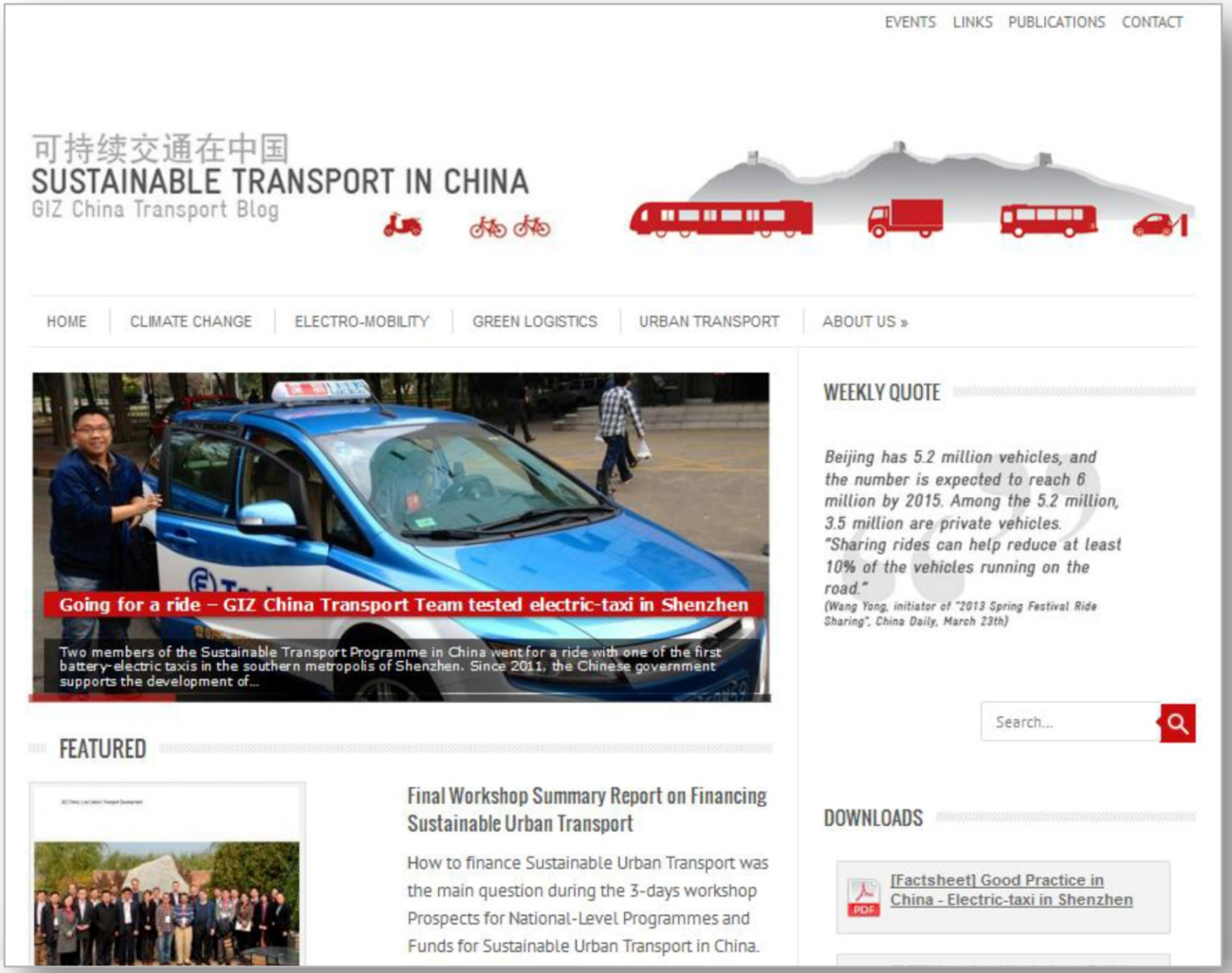


Likely Oppositions

- Congestion charging is not fair
- We need public transportation first
- It will not resolve congestion problems
- It will not resolve air quality problems
- It will damage economy
- The charging zone is wrong
- The charge levels are too high
- The model used is outdated
- The choice of technology is wrong
- Private use of government cars will be exempted from the charging

Sustainable Transport Blog

www.sustainabletransport.org



谢谢！ Thank you very much for your attention!

Sun Shengyang 孙胜阳
Project Manager

GIZ China - Sustainable Transport in China
contact: shengyang.sun@giz.de

可持续交通在中国
SUSTAINABLE TRANSPORT IN CHINA