



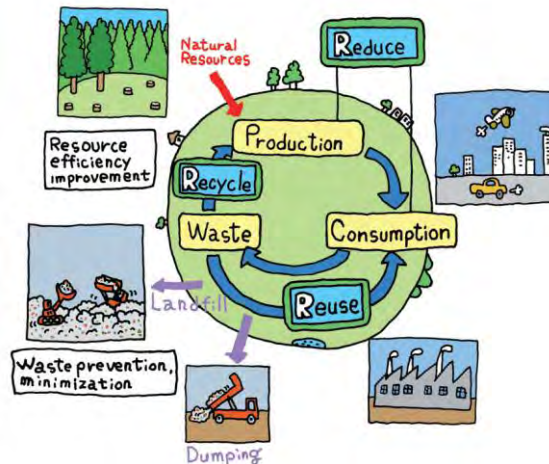
Third HLS ECS, 6-8 March 2012
Siem Reap, Cambodia

***Sustainable, Low-carbon
and Green Cities
- Lessons learnt from UNCRD
programmes on EST, 3Rs and IPLA -***

CRC Mohanty, UNCRD

UNCRD's Environment Programmes

1. Environmentally Sustainable Transport (EST)
2. Reduce, Reuse Recycle (3Rs)
3. International Partnership for Expanding Waste Management Services in Local Authorities (IPLA)



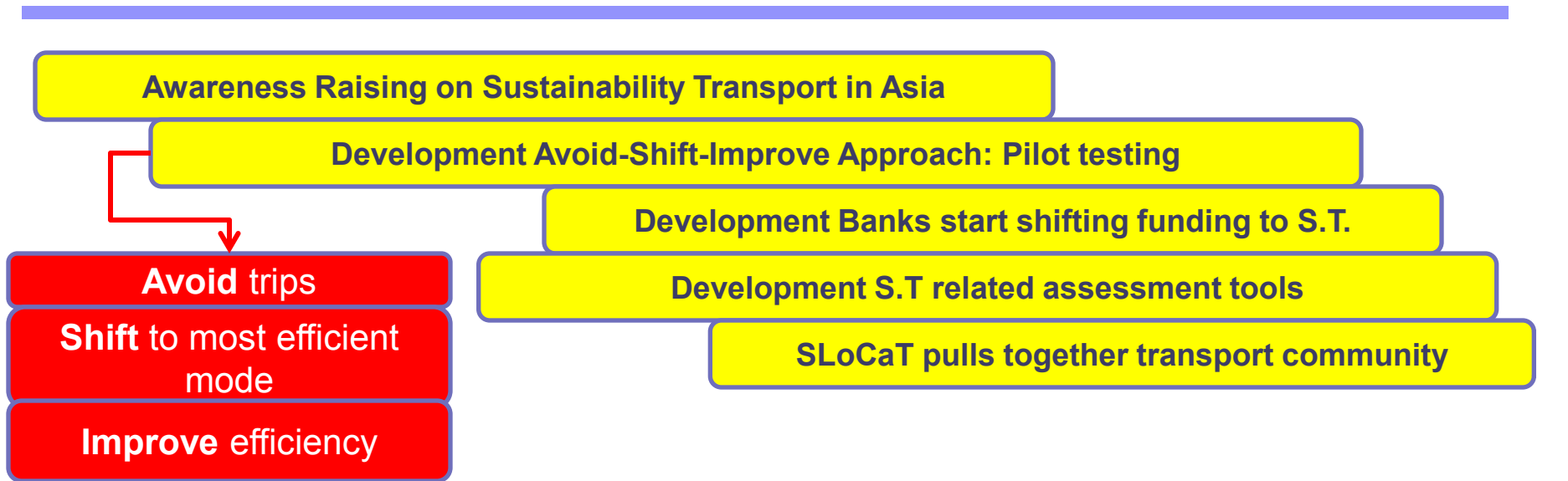
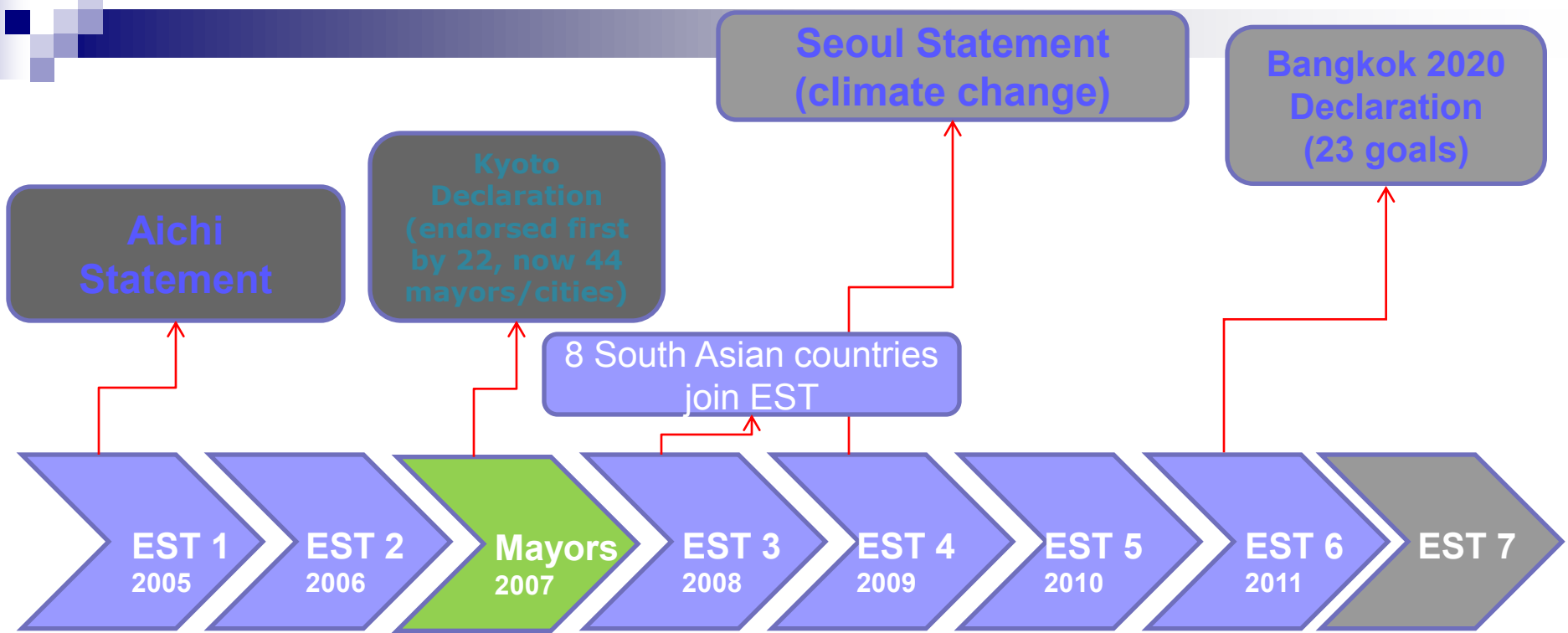
Regional Environmentally Sustainable Transport Forum in Asia under the Asian EST Initiative

Joint Initiative of UNCRD and MOEJ since 2004



Partner/Supporting Organizations





Shared issues & lessons.....

•In case of many developing cities/mega-cities, efforts to introduce/enforce cleaner fuels and vehicle emission standards, may greatly reduce vehicle emissions, but on the other hand the number of vehicles is growing rapidly, which may off set much of the emission control progress!

•Vehicle technology can not deliver the full solution unless there trend of private vehicle usage is reversed



“ Everywhere the race is towards motorization”

Shared issues & lessons.....

- Most cities have gone business-as-usual without adequately addressing the complex inter-linkages among land use mix, public transport planning, travel choices, travel demand management (TDM), environmental externalities, and quality of life (green areas, recreational parks/open spaces, amount of residential space per person, etc.).



Integrated EST Strategy

Integrate transport strategies – result not only in the improvement of human health through reduction of urban air pollution, but also the reduction of GHG emissions, deaths and injuries from road accidents, harmful noise levels, and traffic congestion

(Aichi Statement, 2005)



Avoid – avoid or reduce travel or the need to travel

Shift – shift to more environmentally friendly modes

Improve – improve the energy efficiency of transport modes and vehicle technology

BANGKOK 2020 DECLARATION ~ Sustainable Transport Goals for 2010-2020

At the Fifth Regional EST Forum in August 2010, 22 Asian countries agreed on a voluntary and goodwill declaration, “the Bangkok Declaration for 2020 – Sustainable Transport Goals for 2010-2020”, in order to demonstrate renewed commitment to achieving sustainable transport in Asia over the next decade.



BKKD 2020 Goals	Best practices, including policies, infrastructures, regulations, et	Possible contribution towards sustainable, low carbon, green cities		
		Env Friendly (low carbon)	Resource Efficient (energy/fuel)	Socially Inclusive
1. Formally integrate land-use and transport planning processes and related institutional arrangements at the local, regional, and national levels	<ul style="list-style-type: none"> ■ creation of key public transport corridors ■ integration of public transport with NMT friendly infrastructures ■ establishment of greenbelt/green zones ■ prior consideration of sustainable transport service in urban development plans (housing, education, commercial, entertainment, recreation etc) ■ traffic restrictions for sensitive areas 	<p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p>
2. Achieve mixed-use development and medium-to-high densities along key corridors within cities	<ul style="list-style-type: none"> ■ integration of residential, work, retail and entertainment activities into one area. ■ transit oriented development (TOD), smart growth policies ■ control of urban sprawl ■ safe pedestrian bridges and network 	<p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>
3. Institute policies, programs, and projects supporting Information and Communications Technologies (ICT).	<ul style="list-style-type: none"> ■ wider internet access and broader use of internet services ■ teleconferencing ■ tele-working, tele-shopping 	<p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p>

Co-benefit Impact from Land Use Planning Measures

Economic benefits	Smart growth polices	Transit-oriented development
Congestion reduction	√	√
Consumer spending savings	√	√
Employment creation	√	√
Small-enterprise development	√	√
Traffic accident reduction		
Technology transfer	√	√
Energy security	√	√
Economic productivity		
Environmental benefits		
Greenhouse gas reductions	√	√
Particulate matter reduction	√	√
Sulphur oxides reduction	√	√
Nitrogen oxides reduction	√	√
Carbon monoxide reduction	√	√
VOC reduction	√	√
Noise reduction	√	√
Solid waste reduction	√	√
Water contaminant reduction	√	√
Social benefits		
Health (e.g. obesity reduction)	√	√
Crime reduction	√	√
Gender equity promotion	√	√
Universal access for disabled	√	√
Scholar access improvement	√	√
Convenience and comfort	√	√
Community sociability	√	√
Reduction in severance	√	√



Oyumino (Chiba, Japan) is a smart growth community that interconnects residential and commercial areas with a large network of NMT routes. Photo: Lloyd Wright



Singapore's LRT System developed around purpose-built communities in which residential, shopping, education, public services and workplaces are all co-located. Photo: Lloyd Wright

Smart growth refers to a set of policies that promote more accessible land-use policies. Smart Growth policies include the mixed-use development patterns that allow the close proximity of residential areas to shopping, work and services. **TOD** refers to integrating development and public transport along high density corridors and at key nodal points brings benefits to all. Such planning focuses largest number of destinations (work, residential, public services, schools near public transport stations, and thus encouraging both NMT as well as public transport usage.

BKKD 2020 Goals	Best practices, including policies, infrastructures, regulations, et	Possible contribution towards sustainable, low carbon, green cities		
		Env Friendly	Resource Efficient	Socially Inclusive
4. Require Non-Motorized Transport (NMT) components in transport master plans in all major cities and prioritize transport infrastructure investments to NMT	<ul style="list-style-type: none"> ■ dedicated and safe pedestrian and bicycle lanes ■ bicycle rental / bike sharing program ■ streets design for pedestrian and cycle safety and convenience ■ bicycle insurance & registration ■ secured bicycle parking facilities in public stations and major buildings ■ pedestrianization (car-free day/zone) ■ fixed % of road infrastructure for NMT 	√	√	√
		√	√	√
		√	√	√
		√	√	√
		√	√	√√
		√	√	√
5. Improve public transport services including high quality and affordable services on dedicated infrastructure along major arterial corridors in the city and connect with feeder services into residential communities	<ul style="list-style-type: none"> ■ bus rapid transit (BRT) ■ rail (MRT) ■ light rail transit (LRT) ■ fare and system integration / smart card ■ universal access or barrier free access to public transport system 	√	√	√
		√	√	√
		√	√	√
		√	√	√
		√	√	√

Co-benefit Impact from Non-motorized Transport (NMT)

Economic benefits	Pedestrian upgrades	Pedicabs	Bicycle rentals	Car-free day
Congestion reduction	√	√	√	√
Consumer spending savings	√	√	√	√
Employment creation	√	√	√	√
Small-enterprise development	√	√	√	√
Traffic accident reduction	√	√	√	√
Technology transfer		√		
Energy security	√	√	√	√
Economic productivity	√	√	√	√

Environmental benefits	Pedestrian upgrades	Pedicabs	Bicycle rentals	Car-free day
Greenhouse gas reductions	√	√	√	√
Particulate matter reduction	√	√	√	√
Sulphur oxides reduction	√	√	√	√
Nitrogen oxides reduction	√	√	√	√
Carbon monoxide reduction	√	√	√	√
VOC reduction	√	√	√	√
Noise reduction	√	√	√	√
Solid waste reduction	√	√	√	√
Water contaminant reduction	√	√	√	√

Social benefits	Pedestrian upgrades	Pedicabs	Bicycle rentals	Car-free day
Health (e.g. obesity reduction)	√		√	√
Crime reduction	√	√	√	√
Gender equity promotion	√	√	√	√
Universal access for disabled	√			√
Scholar access improvement	√	√	√	√
Convenience and comfort	√	√	√	√
Community sociability	√		√	√
Reduction in severance	√			



Each Sunday, Bogotá gives 120 kilometres of road space over to cyclists, skaters, joggers, and families. Photo by Lloyd Wright.



Bicycle rental facility in Seoul, Photo: Lloyd Wright



Delivery service by Pedicab/bicycle taxi in London, Photo: ITDP

Bike Sharing Program of Hangzhou, China

Location	Policy/Program /Initiatives	Description	Policy Approach	Triple Bottom Line Benefits
<p>Hangzhou, China</p> <p>other examples in Asia include Shanghai, Guangzhou, Foshan, Kaohsiung, Taizhou, Wuhan, Zhuzhou (China), Toyama, Kitakyushu (Japan) Changwon Daejeon (Rep. of Korea)</p>	<p>Bike-Sharing Programs</p>	<p>Date started: May 2008</p> <p>Bicycle fleet size: 60,600</p> <p>Number of stations: 2,416</p> <p>Opening time: 06:30am-20:00pm some station are open for 24 hours</p> <p>Fee structure: 1h is free, 1-2h is 1 RMB, 2-3h is 2RMB, over 3h, 3 RMB per hour.</p> <p>Number of employees: 1,000</p> <p>Average day trips: 240,000 trips</p> <p>Operator: Hangzhou Public Transport</p>	<p>Private or city government investment in implementing and managing bike-sharing program</p>	<p>Improvements in outdoor air quality from reduced vehicle emissions and associated health benefits.</p> <p>Reduced GHGs emissions due to reduced car usage.</p> <p>Increased market opportunities for low-carbon transportation.</p> <p>Decreased inner-city traffic congestion and reduced budget on road infrastructure.</p>

Bike Sharing Program of Hangzhou, China

At park



Bike Sharing Program of Hangzhou, China

Alongside main roads



Bike Sharing Program of Hangzhou, China

It is a good example of people- and environment-friendly, resource efficient, and socially inclusive mode of transport.



Governmental policies or incentives for private sectors are critical to develop bike sharing schemes.



Co-benefit Impact from Public Transport

Economic benefits	Bus Rapid Transit	System Integration	Fare - free service
Congestion reduction	√	√	√
Consumer spending savings	√	√	√
Employment creation	√		
Small-enterprise development			
Traffic accident reduction	√	√	√
Technology transfer	√		
Energy security	√	√	√
Economic productivity	√	√	√
Environmental benefits			
Greenhouse gas reductions	√	√	√
Particulate matter reduction	√	√	√
Sulphur oxides reduction	√	√	√
Nitrogen oxides reduction	√	√	√
Carbon monoxide reduction	√	√	√
VOC reduction	√	√	√
Noise reduction	√	√	√
Solid waste reduction	√		√
Water contaminant reduction	√		
Social benefits			
Health (e.g. obesity reduction)		√	
Crime reduction	√	√	√
Gender equity promotion	√	√	√
Universal access for disabled	√	√	√
Scholar access improvement	√	√	√
Convenience and comfort	√	√	√
Community sociability			√
Reduction in severance			



The TransMilenio BRT in Bogotá. Photo courtesy of Volvo Bus Corporation.



System integration (NMT + Public Transport) /Park-and-ride facilities, Lloyd Wright

Bus Rapid Transit (BRT) in Mexico City

Affordable, efficient, and convenient



Bus Rapid Transit (BRT) in Mexico City

Location	Policy/Program/Initiatives	Description	Policy Approach	Triple Bottom Line Benefits
<p>Mexico</p> <p>other successful examples include</p> <p>Curitiba (Brazil)</p> <p>Bogotá (Colombia)</p> <p>Guangzhou (China)</p> <p>Jakarta (Indonesia)</p> <p>Seoul (S. Korea)</p> <p>Ahmedabad (India) and etc.</p>	<p>Mexico City Bus Rapid Transit (BRT)</p>	<p>In 2005, Mexico City opened Metrobus, a BRT corridor along one of the city's busiest streets.</p> <p>Metrobus replaced about 350 standard buses with 97 new articulated BRT vehicles.</p> <p>Vehicles have a maximum capacity of 160 passengers and run at extremely high frequencies, roughly 56 per peak hour.</p> <p>Currently, the BRT is carrying roughly 600,000 passengers per day. There is a trust fund that manages, invests, and distributes all fare revenues.</p> <p>Given the program's success, the Mayor of Mexico City is actively considering building 10 more Metrobus corridors.</p>	<p>Mexico has issued a series of regulations supporting public transport planning.</p> <p>City Gov't supported the planning, coordination, & management as well as the financing of the construction and maintenance of the corridor infrastructure.</p>	<p>Reduced commute time from 1.5 hours to 1 hour for the route</p> <p>Reduced passenger exposure to CO, benzene, and PM 2.5 by up to 50 percent, as compared with previous bus service in the corridor.</p> <p>Reduction of CO2 by 35,000 tons annually.</p> <p>Increased market opportunities for rapid transit buslines.</p>

Guangzhou BRT – a cost effective option

“ BRT provides a sophisticated metro-quality transit service at a cost that most cities, even developing cities, can afford ”

- GTZ BRT Sourcebook



Guangzhou BRT System

Main features:

- 29 stations and 23km dedicated busways
- free transfer in the same direction (smart card with discount)
- direct physical connections between BRT and metro stations
- integration between BRT and bicycle parking & bicycle sharing
- the world's longest BRT stations

Impacts:

- saves commuting time (1 hour shorter in daily journey)
- daily passenger ridership : 800,000 boardings per day
- the cost of the BRT system infrastructure has been estimated to be equivalent to building around 800 meters of underground metro.

Learning Objectives:

- BRT is one of the most cost-effective transit systems for cities to provide fast, comfortable and high quality public transport service
- Integration with rail-based metro has proven to be an indispensable feature of the BRT and the mass transit network of the city

BKKD 2020 Goals	Best practices, including policies, infrastructures, regulations, et	Possible contribution towards sustainable, low carbon, green cities		
		Env Friendly	Resource Efficient	Socially Inclusive
6. Reduce the urban transport mode share of private motorized vehicles through Transportation Demand Management (TDM) measures	<ul style="list-style-type: none"> ■ land use development controls ■ public transport and NMT improvement and integration ■ car sharing / car pooling ■ parking pricing and management ■ regulatory controls (odd/even systems) ■ congestion charging ■ removal of fossil-fuel subsidies ■ vehicle/fuel/carbon taxes ■ alternative work schedule (flextime, compressed workweek, etc) ■ promotion of park & ride / bike & ride 	<p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p>
7. Achieve significant shifts to more sustainable modes of inter-city passenger and goods transport	<ul style="list-style-type: none"> ■ high-speed intercity passenger rail ■ rail and waterway freight transport 	<p>√</p> <p>√</p>	<p>√</p> <p>√</p>	<p>√</p> <p>√</p>
8. Cleaner Fuels & Vehicle Technologies	<ul style="list-style-type: none"> ■ CNG, biodiesel, bioethanol ■ hybrid electric, hydrogen (fuelcell tech.) ■ fiscal incentives for cleaner fuels ■ public procurement for green vehicles and fuels 	<p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>

Co-benefit Impact from Transport Demand Management (TDM)

TDM generally refers to policies and measures:

- to reduce the total volume of traffic
- to promote effective shifts towards more sustainable modes of transport.

Economic benefits	Vehicle use restrictions	Fuel taxes	Parking levies
Congestion reduction	√	√	√
Consumer spending savings	√		
Employment creation			
Small-enterprise development	√	√	√
Traffic accident reduction			
Technology transfer	√	√	√
Energy security	√	√	√
Economic productivity			
Environmental benefits			
Greenhouse gas reductions	√	√	√
Particulate matter reduction	√	√	√
Sulphur oxides reduction	√	√	√
Nitrogen oxides reduction	√	√	√
Carbon monoxide reduction	√	√	√
VOC reduction	√	√	√
Noise reduction	√	√	√
Solid waste reduction	√	√	√
Water contaminant reduction	√	√	√
Social benefits			
Health (e.g. obesity reduction)	√	√	
Crime reduction	√	√	√
Gender equity promotion		√	√
Universal access for disabled	√	√	√
Scholar access improvement			
Convenience and comfort	√	√	√
Community sociability	√		√
Reduction in severance			



(City of Seoul)

BKKD 2020 Goals	Best practices, including policies, infrastructures, regulations, et	Possible contribution towards sustainable, low carbon, green cities		
		Env Friendly	Resource Efficient	Socially Inclusive
9. Progressive Emission and fuel quality standards	<ul style="list-style-type: none"> ■ vehicle standards ■ vehicle emission standards ■ fuel quality standards ■ fuel economy standards 	<ul style="list-style-type: none"> √ √ √ √ 	<ul style="list-style-type: none"> √ 	
10. Inspection & Maintenance (I/M)	<ul style="list-style-type: none"> ■ establishment of a regular vehicle inspection and maintenance regime ■ Phase out of old vehicles from the vehicle fleet 	<ul style="list-style-type: none"> √ √ 	<ul style="list-style-type: none"> √ √ 	<ul style="list-style-type: none"> √ (job creation)
11. Intelligent Transportation System (ITS)	<ul style="list-style-type: none"> ■ automatic toll collection ■ speed limit enforcement ■ stop line control ■ dedicated bus lane control ■ traffic management ■ parking management ■ real-time information for public transport ■ navigation ■ information provision for assisting safety driving ■ develop green transport through GPS systems, ITS, green logistics. 	<ul style="list-style-type: none"> √ √ √ 	<ul style="list-style-type: none"> √ √ √ √ √ √ √ √ 	<ul style="list-style-type: none"> √ √ √

BKKD 2020 Goals	Best practices, including policies, infrastructures, regulations, et	Possible contribution towards sustainable, low carbon, green cities		
		Env Friendly	Resource Efficient	Socially Inclusive
12. Achieve freight transport efficiency, including road, rail, air, and water, through policies, programs, projects	<ul style="list-style-type: none"> ■ fuel-reducing technologies for trucks ■ drop-and-hook to reduce empty miles ■ introduction of milk run system ■ consolidation centers/freight centers/ freight village ■ logistics information platform ■ freight company consortium ■ switch to rail ■ cargo bikes ■ satellite tracking to reduce truck idling and speeding ■ fuel economy standards for trucks 	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	
13. Adopt a zero-fatality policy with respect to road, rail, and waterway safety	<ul style="list-style-type: none"> ■ introduction of various traffic calming measures, including speed humps, pedestrian refuges, curb extensions, roundabouts and etc. ■ better enforcement on seatbelt, helmet, speeding, and alcohol ■ national road safety program and campaign ■ Mandatory vehicle insurance program 			✓ ✓ ✓ ✓

BKKD 2020 Goals	Best practices, including policies, infrastructures, regulations, et	Possible contribution towards sustainable, low carbon, green cities		
		Env Friendly	Resource Efficient	Socially Inclusive
14. Public health as integral part of transport policy, planning, and development	<ul style="list-style-type: none"> ■ ambient air quality monitoring ■ stricter emission standards and regulations ■ non-smoking policy in public transport and stations 	<p style="text-align: center;">√</p> <p style="text-align: center;">√</p> <p style="text-align: center;">√</p>		<p style="text-align: center;">√</p> <p style="text-align: center;">√</p> <p style="text-align: center;">√</p>
15. Air quality and noise standards (Progressive, health-based, cost-effective, and enforceable)	<ul style="list-style-type: none"> ■ green car sharing ■ clean fuels and vehicles ■ congestion pricing ■ low emission zone ■ buffer zones, planting vegetation, and installing noise insulation ■ import regulations for used cars 	<p style="text-align: center;">√</p> <p style="text-align: center;">√</p> <p style="text-align: center;">√</p> <p style="text-align: center;">√</p> <p style="text-align: center;">√</p> <p style="text-align: center;">√</p>	<p style="text-align: center;">√</p> <p style="text-align: center;">√</p>	<p style="text-align: center;">√</p> <p style="text-align: center;">√</p> <p style="text-align: center;">√</p>
17. Climate Change Mitigation and Energy Security	<ul style="list-style-type: none"> ■ carbon Taxes ■ development of the national inventory for GHG emissions in the transport sector ■ national vision and mater plan for climate mitigation in the transport sector 	<p style="text-align: center;">√</p> <p style="text-align: center;">√</p> <p style="text-align: center;">√</p>	<p style="text-align: center;">√</p>	

BKKD 2020 Goals	Best practices, including policies, infrastructures, regulations, et	Possible contribution towards sustainable, low carbon, green cities		
		Env Friendly	Resource Efficient	Socially Inclusive
18. Innovative financing mechanisms for sustainable transport infrastructure and operation	<ul style="list-style-type: none"> ■ clean development mechanism ■ public private partnership ■ cooperation with donors, including regional development banks, e.g., ADB ■ develop transport NAMAs ■ revenue from fuel tax, vehicle taxes, parking charges, and road pricing. 	 √ √ √		 √
19. Widespread distribution of information and awareness	<ul style="list-style-type: none"> ■ incentives or free rides on public transport (e.g., in Seoul, Corvallis city (US)) ■ bicycle rides & events ■ car free days & events ■ advocacy through a Bicycle User Group ■ working with media (drawing, 3d-models, photos of before and after, site visits, press release, public events, etc) ■ driver education / eco-driving ■ labeling of environmental performance of vehicles ■ Information to raise people's awareness of alternative means of transport 	 √ √ √ √ √ √ √	 √ √ √ √ √ √ √ √	 √ √ √ √ √ √ √

BKKD 2020 Goals	Best practices, including policies, infrastructures, regulations, et	Possible contribution towards sustainable, low carbon, green cities		
		Env Friendly	Resource Efficient	Socially Inclusive
<p>20. Develop dedicated and funded institutions that address sustainable transport-land use policies and implementation, including research and development on environmentally sustainable transport, and promote good governance</p>	<ul style="list-style-type: none"> ■ formulation of national EST strategy ■ creation of national EST committee ■ dedicated EST officials at the Ministries of Transport, Environment and Health ■ establishment of unit at national and local government level dedicated to NMT ■ establishment of a dedicated research institution for green transport ■ environment impact assessment (EIA) as a required condition for building transport infrastructures prior to environmental clearance ■ build capacity of institutions to foster greener transport and to ensure close cooperation with other key sectors 	<p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p></p> <p>√</p> <p></p> <p>√</p> <p></p>

Regional 3R Forum in Asia

Goal: To achieve **low carbon and sound material cycle societies in Asia** through facilitating bilateral and multilateral cooperation for increasing **resource and energy efficiency** through the 3Rs, and for promoting **environmentally sound management of wastes** in the region; to set in motion a **regional mechanism** to address 3R issues, needs and priorities in Asian countries, including emerging issues of concern in waste management.

Objectives:

- (a) facilitate **high-level policy dialogues** on 3R issues, challenges, & opportunities;
- (b) facilitate **improved dialogue and cooperation with international organizations and donor communities** for materializing and implementation of 3R projects at local and national level identified through national 3R strategies;
- (c) provide a **strategic and knowledge platform** for sharing experiences and disseminating among Asian countries best practices, tools, technologies, policy instruments on various aspects of the 3Rs;
- (d) provide a platform to develop **multilayered networks of stakeholders** such as governments, academia, scientific and research community, private sector, and NGOs;
- (e) generate international consensus and understanding on the beneficial aspects of the 3Rs in the context of achieving **MDGs, resource and energy efficiency, resource efficient economy, and climate change mitigation**; and to
- (f) provide a platform for **proliferation of national 3R strategies** in developing countries.

Tokyo 3R Statement

- Agreed on 12 November 2009, at the Inaugural Meeting of the Regional 3R Forum in Asia, held in Tokyo.
- Endorsed and welcomed the launching of the **Regional 3R Forum in Asia with an objective to** provide a **strategic and guiding framework** for proliferation of 3Rs and for a socially sound, ecologically sustained and economically feasible alternative to help decision makers and public waste utilities/municipalities that already suffering from the burden of understaffing and budget constraints, to reconsider their overall policy towards waste management.

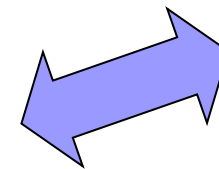


Recommendations of the Singapore Forum on the 3Rs in Achieving a Resource Efficient Society in Asia

- Agreed on 7 October 2011, at the Third Meeting of the Regional 3R Forum in Asia, held in Singapore.
- **A comprehensive set of recommendations**, covering a wide range of sectors and issues relevant to the 3Rs and resource efficiency. It is based on the fundamental understanding that the **3Rs is not just about waste management, but is intrinsically linked with resource efficiency in a wide range of sectors.**

Lessons from the Regional 3R Forum – Key messages to the cities

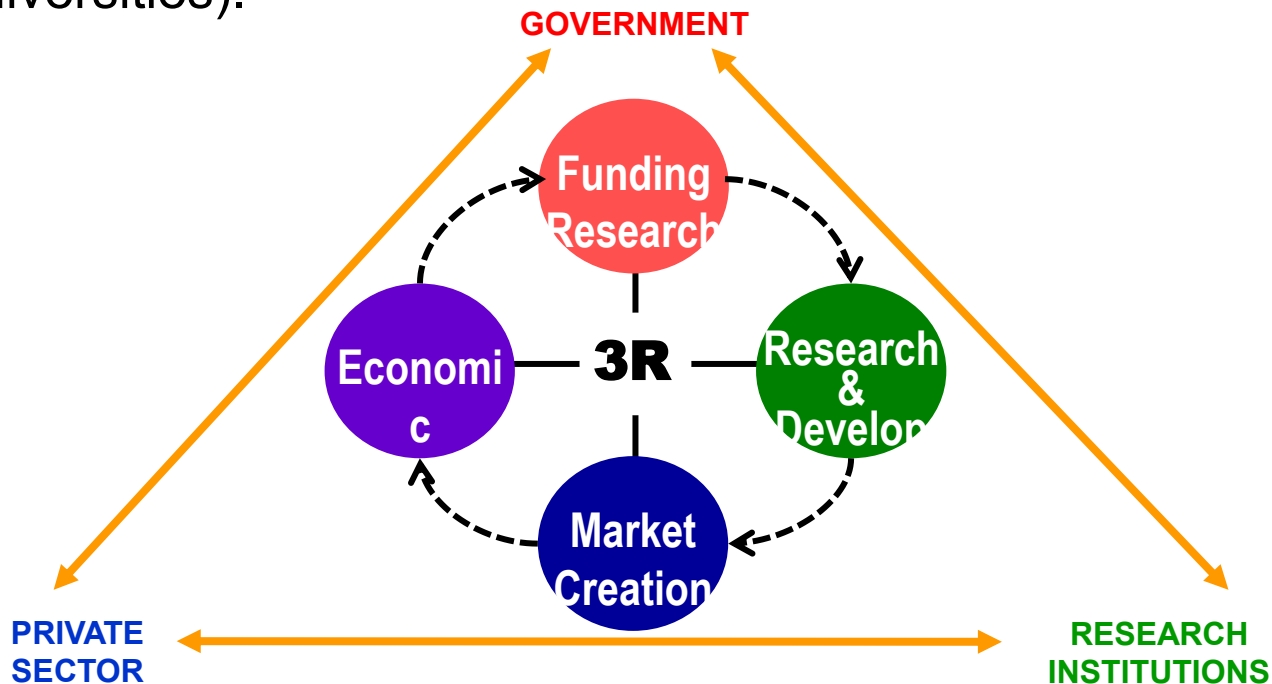
1. Develop meaningful **partnerships** with private sector, informal workers and communities for effective implementation of ISWM and 3Rs.
 - Enhancing Public-Private-Partnership (PPP)



- Share knowledge, technologies, best practices, and models in the area of the 3Rs, ISWM and Resource Efficiency, with the international community.

■ Government – Private – Research network

- Promote recycling of waste from one industry as a resource for another (industrial symbiosis), through, for example, supporting the establishment of eco-industrial parks, science parks, and research/university networks.
- Encourage joint R&D, knowledge sharing, technology transfer among various actors (e.g., between private sector and universities).



Eco-Industrial Parks

- Dalian Industrial Zone, People's Republic of China

- Spreading to 220 sq. km
- Programmatic Cleaner Production
- post-EMS development

- Kitakyushu Ecotown, Japan

- Comprehensive Environmental Industrial Complex
- Hibiki Recycling Area
- Practical Research Area with an Eco-Town Center

- Naroda Industrial Estate, India

- Common ETP
- CP strategy adoption

- Map Ta Phut Industrial Park, Thailand

- Product exchange
- Integrated resource recovery system
- Community enhancement office

- Calabarzon & Bataan Industrial Estates, Philippines

- Intra- & inter-estate product exchange
- Integrated resource recovery system
- Programmatic EMS
- Green supply chain
- Common ETP



Lessons from the Regional 3R Forum – Key messages to the cities

2. Reduce MSW and aim for “Zero Waste”

- Introduce economic instruments that provide incentives to reduce the waste (e.g., volume-based collection fee system, landfill taxes, and deposit-refund schemes).
- Utilize organic waste as a valuable resource, with an objective to reduce landfill requirement; resource efficiency and energy recovery; and reduction of GHG emissions.
- Cities should set clear indicators or quantifiable measurements that reflect the performance of their areas with regard to solid waste management.



Lessons from the Regional 3R Forum – Key messages to the cities

3. Increase reuse and recycle of resources

- Promoting reuse and recycling of resources to displace virgin inputs for manufacture of a product, leads to **resource savings**.
- Citizens need to **separate waste at the source** in order to facilitate separate collection of waste streams.
- Recycling businesses should be promoted as it is a substantial **job provider** to various sections of society and helps reducing social disparities.
- When introducing recycling systems/technologies, assess **economic and technical feasibilities, adaptability, and market demand** of a particular recycled material or product to be made from waste.
- Improve the working conditions and livelihood security of workers in the **informal waste sector**.



Lessons from the Regional 3R Forum – Key messages to the cities

4. Effectively manage **specific types of waste streams** such as organic waste, e-waste, construction and demolition waste, and end-of-life vehicles.
- Policies should address special waste streams such as those mentioned above. Specific acts and regulations with strong enforcement mechanisms to govern end-use should be adopted.
 - Urgent attention to be given to waste such as non-biodegradable waste to put the appropriate technology in place to manage them and derive economic value.
 - Special attention should be given to waste management in slums and other low-income areas and disaster-prone regions.



Lessons from the Regional 3R Forum – Key messages to the cities

5. Recognize the risks to the waste sector from **climate change** and also capitalize on opportunities arising from climate change for the sector.
 - Important to implement mitigation and adaptation measures to **combat risks due to floods and proliferation of disease vectors.**
 - Several **methane gas capture projects** in dumpsites have been initiated and proved successful.
 - Waste sector offers opportunities to avoid GHG emissions that could be monetized in the form of **carbon credits or Certified Emission Reductions (CERs).**
 - Although waste minimization, recycling and re-use are not eligible activities under the CDM, they provide opportunities to reduce GHG emissions through the conservation of raw materials, improved energy and resource efficiency and fossil fuel avoidance approaches.

Composting to Convert Organic Waste to Resource and Generate Carbon Credits, Dhaka, Bangladesh

- Community involvement and public private cooperation.
- Communities received door-to-door collection service and shared the cost of waste collection by paying a monthly fee based on their affordability.
- Private stakeholder had joint venture partners that included Waste Concern and its financial partners (banking institutions).
- Total investment required for the project was Euro 12 million
- Mode of finance was 38% equity, 45% soft loan and 17% loan from a local bank in Bangladesh.
- Private fertilizer company was involved to ensure the sale of compost by carrying out enrichment of the compost with nutrients and its subsequent distribution in the market.
- 75% of the total revenue of the project came from sale of compost.
- Project was successfully registered as a Clean Development Mechanism (CDM) project under UNFCCC.
- New methodology for accounting emission reduction was developed by Waste Concern and its partners and was subsequently approved by UNFCCC.
- Remaining 25% of the project revenue came from community contributions in the form of user fee and sale of carbon credits.



Image Courtesy:
<http://www.wasteconcern.org/PictureGallery/bulta.htm>

Methane Capture in Gorai Dump, Mumbai

- Closure of 25-year-old dumping ground and development of landfill gas recovery at the Gorai creek in Borivli has earned the BMC, the city authority of Mumbai, India US\$ 5.7 million by trading of an estimated 31,000 CERs a year
- The Asian Development Bank (ADB) has been purchasing the carbon credits from the civic body as per market prices when the trading takes place
- **City's Gorai dumping ground closure and landfill gas project** can be seen as a forerunner in dumpsite methane capture projects.



International Partnership for Expanding Waste Management Services of Local Authorities (IPLA)

“Partnership to foster Partnerships”



International Partnership for Expanding Waste Management Services of Local Authorities (IPLA)

= UN CSD (Commission on Sustainable Development)-
registered partnership on waste management which address
various needs of local authorities (LAs) in achieving
sustainable waste management.

Mission Statement

*“to share knowledge, communicate across national boundaries
and work to spread best practice in order to accelerate the
uptake of waste related infrastructure and services at various
stages of waste management such as avoidance, prevention,
minimization, segregation, collection, transport, recycling,
recovery, reuse treatment and disposal.”*



Core Members (as of January 2012)



Overall Coordination Support



Sub-Regional Secretariat for Northern Latin America



Global Secretariat



Sub-Regional Secretariat for the region covering Australia and New Zealand



Regional Secretariat for Africa, Asia and Latin America



Sub-Regional Secretariat for Mashreq and Maghreb Countries



Sub-Regional Secretariat for South Asia



REGIONAL ENVIRONMENTAL CENTER

Sub-Regional Secretariat for Central and Eastern Europe



Sub-Regional Secretariat for the Pacific SIDS



Sub-Regional Secretariat for the Caribbean SIDS



Sub-Regional Secretariat for Southern Latin America

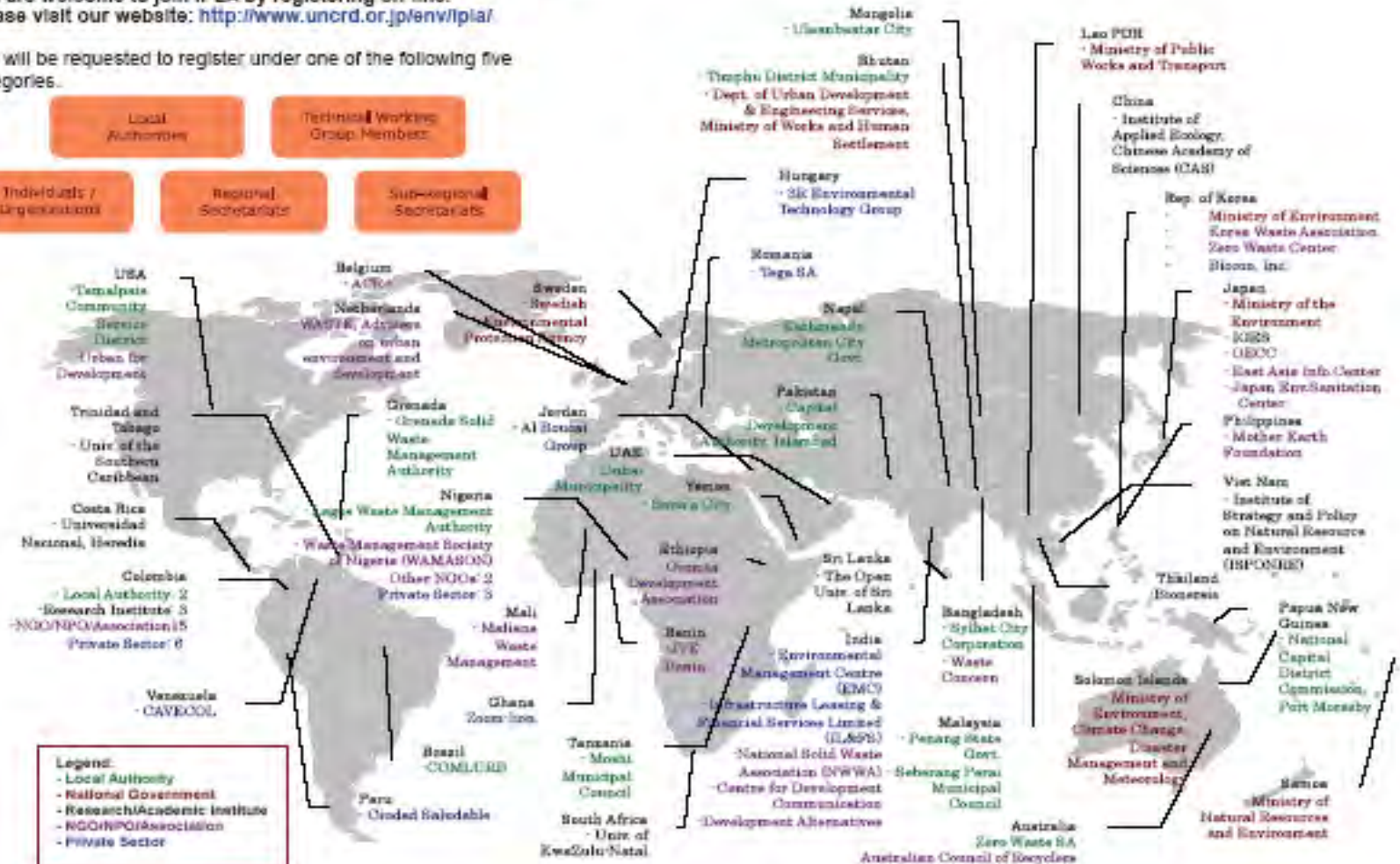
Official partners round the world

(About 130 members from 48 countries - as of Jan. 2012)

Registration for IPLA Membership

You are welcome to join IPLA by registering on-line.
Please visit our website: <http://www.uncrd.or.jp/en/w/ipla/>

You will be requested to register under one of the following five categories.





International Partnership for Expanding Waste Management Services of Local Authorities (IPLA)

Key Features

- **IPLA's** core objective is to address "partnerships" as the basis for sustainable waste management, in particular **fostering partnerships** between Local Authorities (LAs), private sectors and other key stakeholders in local level waste management.
- It aims to create a **dynamic interface** between the local authorities and private sector, thereby facilitating public-private partnerships and creating conducive investment climate for expanding waste management services of local/municipal authorities.
- **IPLA's** operational modalities will rely on **decentralized network** of activities addressing municipal waste management. For example, regional/sub-regional/national secretariats will take the lead role in operations.
- **IPLA's** knowledge management component exclusively targets **empowerment/capacity development of LAs and municipalities** by facilitating better access to tools, technologies, investment opportunities, and international financial mechanisms in the area of municipal waste management.
- **IPLA** activities provides an opportunity to further complement city/municipality level efforts for **improved urban management** towards realizing liveable cities (beautiful, clean, safe, efficient).

In summary, IPLA is a partnership with an objective to foster partnerships with an ultimate purpose of expanding waste management services of local authorities.