An Empirical Study on Ranking of Global Liveable Cities and Policy Simulations*

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Presentation Outlines

- Our track records on ranking indices maintained, publications and international collaborations.
- Background, issues at stake & project objectives.
- A Literature survey on existing published indices for livable cities.
- How Global Livable Cities (GLC) Index would differ from others published indices or studies.
- Rationalizing major categories of attributes or indicators of a global livable City
- The research framework: Ideal versus practical indicators for GLC Index.
- The conventional methodological approach, “what if” simulations and limitations.
- Data sources, data constraints and data proxies.
- List of 64 global cities and their respective population sizes.
- Qualifications and cautions on our preliminary empirical findings.
- Tentative empirical rankings for 64 global cities and 36 Asian Cities.
- Research findings, agenda and strategies going forward.

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Our track records, publications and international collaborations

- Global Policies Research Unit (GPRU) at Lee Kuan Yew School of Public Policy, National University of Singapore, co-founded by Dr Tan Khee Giap and Dr Chen Kang. Missions of GPRU include to promote global understanding on Asia, help shape policy formulations at the highest decision level, enhance good governance in Asia and to improve the social well being for all.

- The main thrust of GPRU is to conduct policy research with special emphasis on Asia including China, India and ASEAN where we do have comparative advantage in terms of research expertise, information accessibilities and networks in comparison to our western counterparts.

- We have forged international collaborations with established academics through llinkages with Institute of Environment Decisions (IED) at Eidgenossische Technischule Hochschule Zurich (ETH), University of Fribourg, Switzerland, University of California at Davis and The Earth Institute, Columbia University.

- GPRU has conducted research projects commissioned by local and regional governments, collaborated with international agencies, international think-tanks and multinational corporations, which resulted in deliverables including policy reports, refereed journal publications and advisory positions as shown in the appendix.

Background, issues at stake & project objectives

- ***An ideal livable city*** would be one that is characterized by vibrant economic growth through the intensity of its economy linkages to a vast hinterland and a specific level of integration to the world economy, yet it could strike a balance in terms of environmental friendliness and sustainability, high quality of life with cultural diversity, security coupled with social-political harmony, which presumably could only be achieved through good governance and effective leadership.
- Perhaps no such ideal city exists, but it should not stop many potential candidates from aspiring or aiming to be an ideal livable city, and in this context the ***facilitative role of the government*** in terms her quality leadership and the execution capability must be paramount.
- We are convinced that a potentially useful and highly visible project such as Global Livable Cities (GLC) Index, is a ***preliminary yet comprehensive attempt*** to investigate globally what are the constituents of, and hence the policy areas that could be identified and improved upon so as to be ranked amongst the top livable and vibrant cities in the world.

A literature survey on existing published indices or studies for livable cities

- In our extensive literature survey, we found at least 21 major ranking indices or studies for nations/ cities in fields related to economic competitiveness, urbanization, quality if life, gross national happiness, crisis management, environment friendliness and sustained development as summarized in Table 1A to 1E .
- Currently we found four following major studies related to livable regions, namely
    a. The World Bank's Worldwide Governance Indicators, 2007
    b. Annual World Competitive Yearbook
    c. Mercer Human Resource's World Wide Quality of Living Survey
    d. Yale & Columbia University's Environmental Sustainability Index, 2001
- The World Bank's 2007 Government Indicators is at best a partial study on efficiency of government, but no attention is being given to role of government in terms of leadership, innovation, policy formulation and execution capability.
- Studies by Annual World Competitive Yearbook generally look at countries rather than cities, and the main focus in economic competitiveness and very little if none is being included on role of government!
- The Mercer HR study which essentially deal with professional human resources, understandably and narrowly focuses on quality of living across cities for expatriates and hence is at best a partial study.
- The Yale and Columbia studies on environment sustainability emphasize on green and the resource-constrained globe is again a partial study across countries.

TABLE 1A: COMPARISON OF EXISTING FRAMEWORKS

Framework / Factors		(1) Global Competitiveness Report	(2) World Competitiveness Yearbook	(3) Eurostat Structural Indicators	(4) Economic Freedom of the World	(5) Quality of Living Survey
Publisher		World Economic Forum	International Institute for Management Development	Eurostat	The Fraser Institute	Mercer Human Resource
Country	*Number*	133	57	42	141	450
	Types	Major Global Economics	Industrialized & Developing Countries	European Regions, Japan & United States	Worldwide	Worldwide
Objectives		Understand the key factors that determine economic growth and analyse why some countries perform better than others by measuring national competitiveness	Analyse and rank the abilities of nations to create and maintain an environment that sustains the competitiveness of enterprises	Facilitate economic policy coordination among member states and provide essential statistics to monitor European Union strategic objectives	Measures the degree to which the policies and institutions of countries are supportive of economic freedom	Needs and concerns of expats on accommodation, economic and social environment
Indicators	*Number*	110	329	79	49	39
	Categories	1. Basic Requirements 2. Efficiency Enhancers 3. Innovation and Sophistication Factors	1. Economic Performance 2. Government Efficiency 3. Business Efficiency 4. Infrastructure	1. General Economic Background 2. Employment 3. Innovation and Research 4. Economic Reform 5. Social Cohesion 6. Environment	1. Size of Government: Expenditure, Taxes and Enterprises 2. Legal Structure and Security of Property Rights 3. Access to Sound Money 4. Freedom to Trade Internationally 5. Regulations of Credit, Labour and Business	1. Rental & housing 2. Schools & education 3. Public & Private Transportation 4. Political & Social environment 5. Recreation & Eco-friendliness
Data Source		International Organisations	Publicly Available Data	International Organisations	Publicly Available Data	Survey Data
		Survey Data	Survey Data	Survey Data	Survey Data	

Source: Adapted from “Part 1: Ranking of 2009 Livable Cities Index”, Final-Year Project no 4751, Nan yang Technological University

TABLE 1B: COMPARISON OF EXISTING FRAMEWORKS

Framework / Factors		(6) Key Indicators for Asia and the Pacific	(7) The 2005 Environment Sustainability Index	(8) Report on Environment Statistics and Climate Change	(9) Developing Urban Indicators for Managing Mega Cities
Publisher		Asian Development Bank	Yale University & Columbia University	United Nations Economic & Social Council	International Federation of Surveyors
Country	Number	48	146	-	15
	Types	Asia Pacific Countries	Worldwide	Africa Region	Worldwide
Objectives		Understand how dynamism can be fostered in Asia SMEs by looking at the actual and expected impacts of the current global economic crisis	Measure and rank the level of environmental stewardship among countries and serve as an environmental decision making tool	Anchor environment statistics as part of official statistics by improving and strengthening basic environmental data	Identifies the risks of urbanization and how cities address these urgent issues
Indicators	Number	174	76	106	27
	Categories	1. People 2. Economy and Output 3. Money, Finance and Prices 4. Globalization 5. Infrastructure 6. Government and Governance 7. Energy and Environment	1. Environment Systems 2. Environment Stresses 3. Human Vulnerability to Environmental Stresses 4. Societal Capacity to Respond to Environmental Challenges 5. Global Stewardship	1. Natural Disasters and Environmental Performance 2. Air 3. Land Use 4. Agriculture 5. Forests & Woodlands 6. Coastal & Marine Resources 7. Fresh Water 8. Biodiversity 9. Energy & Minerals 10. Waste Health & Environment	1. Social Indicators 2. Economic Indicators 3. Ecological Indicators
Data Source		Publicly Available Data	International Organisations	International Organisations Survey Data	International Organisations

Source: Adapted from "Part 1: Ranking of 2009 Livable Cities Index", Final-Year Project no 4751, Nan yang Technological University

TABLE 1C: COMPARISON OF EXISTING FRAMEWORKS

Framework / Factors		(10) Global City Indicators	(11) The Millennium Development Goals Report	(12) Indicators of Sustainable Development: Guidelines & Methodologies	(13) Sustainable Transportation Indicators
Publisher		Global City Indicators Facility	United Nations Department of Economic and Social Affairs	United Nations	Transportation Research Board
Country	*Number*	19	217	-	-
	Types	Worldwide	Worldwide	Worldwide	-
Objectives		Provide an established set of city indicators with a globally standardized methodology that allows for global comparability of city performance and knowledge sharing	Give an overview of the progress towards the 8 goals as well as track improvements to social and economic conditions in the world's poorest countries	Guide nations in review their existing indicators or develop new indicators to measure progress towards nationally defined goals for sustainable development	Identify indicators that can be used for sustainable transportation evaluation as well as for development & application of suitable sustainable transportation indicators worldwide
Indicators	*Number*	22	60	96	30
	Categories	1. City Services 2. Quality of Life	1. Eradicate Extreme Poverty & Hunger 2. Achieve Universal Primary Education 3. Promote Gender Equality & Empower Women 4. Reduce Child Mortality 5. Improve Maternal Health 6. Combat HIV/AIDS, Malaria & Other Diseases 7. Ensure Environmental Sustainability 8. Develop a Global Partnership for Development	1. Poverty 2. Governance 3. Health 4. Education 5. Demographics 6. Natural Hazards 7. Atmospheres 8. Land 9. Oceans, Seas & Coasts 10. Freshwater 11. Biodiversity 12. Economic Development 13. Global Economic Partnership 14. Consumption & Production Pattern	1. Travel Activity 2. Air Pollution Emissions 3. Noise Pollution 4. Traffic Risk 5. Economic Productivity 6. Overall Accessibility 7. Land Use Impacts 8. Equity 9. Transport Policy & Planning
Data Source		International Organisations	Publicly Available Data	International Organisations	-

Source: Adapted from "Part 1: Ranking of 2009 Livable Cities Index", Final-Year Project no 4751, Nan yang Technological University

TABLE 1D: COMPARISON OF EXISTING FRAMEWORKS

Framework / Factors		(14) FCM Quality of Life Reporting System	(15) Measuring Progress, Strengthening Governance and Promoting Positive Change	(16) Gross National Happiness Index	(17) Organisation for Economic Co-operation and Development Indicators
Publisher		Federation of Canadian Municipalities	International Institute for Sustainable Development	Center for Bhutan Studies	OECD Publishing
Country	Number	1	-	1	30
	Types	Canada	Winnipeg's First Nations	Bhutan	OECD Countries
Objectives		Provide a method of monitoring quality of life that is of value to Canadian communities and act as a tool to identify issues of quality of life and provide solutions to them	Identify past successes, diagnose critical problems and vulnerabilities so as to develop a set of goals and specific targets	Used as tools of accountability and ministerial planning. Foster vision and common sense of purpose by addressing inadequacy of GDP as a performance measurement	Provide broad information on social dimensions across OECD countries and track the development in social status across time among countries
Indicators	Number	52	34	72	31
	Categories	1. Population Resources 2. Community Affordability 3. Quality of Employment 4. Quality of Housing 5. Community Stress 6. Health of Community 7. Community Safety 8. Community Participation 9. Quality of Environment 10. Social Infrastructure	1. Environment Domain 2. Economic Domain 3. Social Domain 4. Culture Domain	1. Psychological Well-Being 2. Time Use 3. Community Vitality 4. Culture 5. Health 6. Education 7. Environmental Diversity 8. Living Standards 9. Governance	1. General Context 2. Self Sufficiency 3. Equity 4. Health 5. Social Cohesion
Data Source		Publicly Available Data Survey Data	Publicly Available Data	Survey Data	International Organisations

Source: Adapted from "Part 1: Ranking of 2009 Livable Cities Index", Final-Year Project no 4751, Nan yang Technological University

TABLE 1E: COMPARISON OF EXISTING FRAMEWORKS

Framework / Factors		[18] Sustainable Development in the European Union	[19] Sustainable Governance Indicators 2009	[20] World Development Indicators	[21] Urban Indicators for Managing Cities
Publisher		Eurostat	Bertelsmann Stiftung	Development Data Group	Asian Development Bank
Country	Number	33	30	209	18
	Types	European Region	OECD Countries	Worldwide	Asia Pacific
Objectives		Improve the quality of life and well-being for present and future generations in EU by linking economic development, protection of the environment and social justice	Measure OECD governments' capabilities of identifying and implementing reforms in order to ensure sustainable policy outcomes	Measure the progress of development in various nations while providing high quality data for crisis management purposes	Establish a policy-oriented urban indicators database for bench-marking and comparison of performance between cities for the purpose of improving policy formulation
Indicators	Number	140	149	>800	140
	Categories	1. Socio-economic Development 2. Sustainable Consumption & Development 3. Social Inclusion 4. Demographic Changes 5. Public Health 6. Climate Change & Clean Energy 7. Sustainable Transport 8. Natural Resources 9. Global Partnership 10. Good Governance	1. Economic & Policy-Specific Performance 2. Status of Democracy 3. Executive Accountability 4. Executive Capacity	1. World View 2. People 3. Environment 4. Economy 5. States & Markets 6. Global Links	1. Population, Migration & Urbanization 2. Income Disparity, Unemployment & Poverty 3. Health & Education 4. Urban Productivity & Competitiveness 5. Technology & Connectivity 6. Housing 7. Urban Land 8. Municipal Services 9. Urban Environment 10. Urban Transport 11. Cultural 12. Local Government Finance 13. Urban Governance & Management
Data Source		International Organisations Survey Data	Survey Data	International Organisations	International Organisations

Source: Adapted from "Part 1: Ranking of 2009 Livable Cities Index", Final-Year Project no 4751, Nan yang Technological University

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How Global Livable Cities (GLC) Index would differ from others published indices or studies?

Our proposed GLC Index is comparatively pioneering and timely because

1. We are more comprehensive and balanced in terms of wider categories of indicators adopted
2. We are more constructive in terms of methodology used involving “what-if” simulations on identifying both weakest indicators for improvement and reform.
3. Extensive in geographical coverage of cities in particular by including those Asian emerging cities from India and China which are robust engines of growth and acutely in need of balanced development.
4. Our study with special emphasis on good governance and effective leadership are apt and highly desired attributes much needed by emerging cities.
5. As for work in progress, we are embarking on field trips surveys and raw data computations in the stage-two of the proposed study which are precious information hitherto not available.

Rationalizing major categories of attributes or indicators of a livable City

For a comprehensive and balanced approach, we have identified five major categories of attributes as follows:

1. Economic Vibrancy and Competitiveness
2. Environment Friendliness and Sustainability
3. Domestic Security and Stability
4. Quality of Life and Diversity.
5. Good Governance and Effective Leadership .

- Indicators for category 1 are the usual hard economic data related to its openness and pro-business policies which should be readily available in the public domain.
- Indicators in category 2 would involved technical indicators usually covering pollution, green spaces, recycling rate and water quality.
- Indicators in category 3 would typical involve proxies such as crime rate, social harmony, civil unrest, threats to domestic security and stability.
- Indicators for category 4 on quality of life and diversity would entail public services such as affordable health cares, education, public housing, sanitation and transportation as well as income disparity, demography burden and community cohesion.
- Indicators on category 5, being more difficult to quantify, would rely heavily on survey data pertaining to quality of government, policy effectiveness, transparency and accountability, fair and efficient justice system.

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Framework for constructing Global Liveable Cities (GLC) Index

(1) Economic Vibrancy & Competitiveness	(2) Environmental Friendliness & Sustainability	(3) Domestic Security & Stability	(4) Quality of Life & Diversity	(5) Good Governance & Effective Leadership
1.1 Economic Performance	2.1 Pollution	3.1 Crime Rates	4.1 Medical & Healthcare	5.1 Policy Making & Implementation
1.2 Economic Openness	2.2 Depletion of Natural Resources	3.2 Threats to National Stability	4.2 Education	5.2 Government System
1.3 Infrastructure	2.3 Environmental Initiatives	3.3 Civil Unrest	4.3 Housing, Sanitation & Transportation	5.3 Transparency & Accountability
			4.4 Income Equality & Demographic Burden	5.4 Corruption
			4.5 Diversity & Community Cohesion	

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1. Ideal Indicators for Economic Vibrancy & Competitiveness (24 Indicators)

1.1	Economic Performance	1.2	Economic Openness	1.3	Infrastructure
1.1.1	Gross Domestic Product	1.2.1	Foreign Direct Investment	1.3.1	Telephone Lines (Fixed & Mobile)
1.1.2	Real GDP Growth Rate	1.2.2	Trade to GDP Ratio	1.3.2	Computers Ownership
1.1.3	Labour Productivity Per Hour	1.2.3	State Ownership of Enterprises	1.3.3	Level of Internet Access
1.1.4	Household Consumption Expenditure Per Capita	1.2.4	Prevalence of trade barriers		
1.1.5	Unemployment Rate	1.2.5	Number of Trade Embargo		
1.1.6	Resilience of Economy	1.2.6	Number of Free Trade Agreements		
1.1.7	Gross Fixed Capital Formation	1.2.7	Ease of Doing Business		
1.1.8	Growth Rate of Consumer Price Index (CPI)	1.2.8	Prevalence of Foreign Ownership		
1.1.9	Debt to Gross National Income Ratio	1.2.9	Tourism Receipts		
		1.2.10	Economic Freedom		
		1.2.11	Hotel Occupancy Rates		
		1.2.12	International Tourist Arrivals		

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2. Ideal Indicators for Environmental Friendliness & Sustainability (32 Indicators)

2.1 Pollution	2.2 Depletion of Natural Resources	2.3 Environmental Initiatives
2.1.1 Greenhouse gases emissions	2.2.1 Rate of Deforestation	2.3.1 Participation in Selected International Environmental Agreements
2.1.2 Sulphur Dioxide emission	2.2.2 Electricity Generated from Renewable Sources	2.3.2 Stringency of Environmental Regulations
2.1.3 CO2 emissions in 2006	2.2.3 Consumption of Oil	2.3.3 Grants to Conservation Efforts in Plants & Animal Species
2.1.4 CFC Emission	2.2.4 Ecological footprint Per Capita	2.3.4 Funding for Research & Development of Renewable Energy
2.1.5 Biochemical Oxygen Demand (BOD) Emission	2.2.5 Threatened Species	2.3.5 Reforestation Rate
2.1.6 Quality of the Natural Environment	2.2.6 Unaccounted Water	2.3.6 Number of Environmental Non-Government Organization
2.1.7 Industrial Waste Discharge into Water Sources		2.3.7 Terrestrial Protected Area
2.1.8 Industrial Waste Buried in Landfills		2.3.8 Protected Marine Area
2.1.9 Water Pollution		2.3.9 Enforcement of Environmental Regulation
2.1.10 Recycling Rate		2.2.10 Waste Management

3. Ideal Indicators for Domestic Security and Stability (19 Indicators)

3.1 Crime Rates	3.2 Threats to National Stability	3.3 Civil Unrest
3.1.1 Number of Burglary Cases	3.1.1 Direct Military Threats	3.3.1 Risk of Disruptive Political Transition
3.1.2 Number of Homicides Cases	3.1.2 Vulnerability To Fallout From Socio-Political Instability in Other Countries	3.3.2 Severity of Political Violence
3.1.3 Number of Fraud Cases	3.1.3 Vulnerability To Policy Changes By Governments in Other Countries	3.3.3 Conflicts of ethnic, religious, regional nature …
3.1.4 Number of Drug Offences (New)	3.1.4 Business Cost of Terrorism	3.3.4 Number of Racial Riots
3.1.5 Business Cost of Crime And Violence	3.1.5 Threat of Terrorism	3.3.5 Number of Strikes/Labour Activism
3.1.6 Reliability of Police Services	3.1.6 Fatalities of Terrorists Attacks	3.3.6 Violent social conflicts
	3.2.7 Natural Disaster Death Toll	

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4. Ideal Indicators for Quality of Life & Diversity (36 Indicators)

4.1	Medical & Healthcare	4.2	Education	4.3	Housing, Sanitation & Transportation	4.4	Income Equality & Demographic Burden	4.5	Diversity & Community Cohesion
4.1.1	Infant Mortality Rate	4.2.1	Quality of Education System	4.3.1	Government Expenditure on Housing and on Community Amenities	4.4.1	GINI Index	4.5.1	Percentage of Foreigners/Percentage of immigrants
4.1.2	Life Expectancy	4.2.2	Adult Literacy Rate	4.3.2	Percentage of Urban Population Living In Slums	4.4.2	Number of Hours Worked Per Year	4.5.2	Number of Religions
4.1.3	Government Health Expenditure Per Capita	4.2.3	Tertiary Enrolment Rate	4.3.3	Percentage of Population using improved sanitation	4.4.3	Human Poverty Index	4.5.3	Number of Races
4.1.4	Population With Access to Primary Health Care Facilities	4.2.4	Government Expenditure on Education	4.3.4	Population using an improved water source	4.4.4	Child Dependency Ratio	4.5.4	Number of Languages
4.1.5	Number of Hospital Beds	4.2.5	Higher Education Achievement	4.3.5	Quality of Ground Transport Network	4.4.5	Old Age Dependency Ratio	4.5.5	Attitudes Towards Foreign Visitors
4.1.6	Density of Physicians			4.3.6	Affordability of Housing			4.5.6	Community Cohesion Index
				4.3.7	Number of Taxis & Cabs			4.5.7	Religious And Racial Tolerance
				4.3.8	Coverage of Public Bus Service			4.5.8	Integration Policy
				4.3.9	Quality of Passenger Rail & Subways				
				4.3.10	Quality of Roads				
				4.3.11	Quality of Railroad Infrastructure				
				4.3.12	Quality of Electricity Supply				

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5. Ideal Indicators for Good Governance & Effective Leadership (24 Indicators)

5.1	Policy Making & Implementation	5.2	Government System	5.3	Transparency & Accountability	5.4	Corruption
5.1.1	Public Acceptance of Policies Made	5.2.1	Electoral Process & Pluralism	5.3.1	Transparency of public action	5.4.1	Control of Corruption
5.1.2	Quality of Public Administration	5.2.2	Functioning of government system	5.3.2	Transparency of economic policy	5.4.2	Corruption Perceptions Index
5.1.3	Government Effectiveness	5.2.3	Political Participation	5.3.3	Voice and Accountability	5.4.3	Average Annual Wage of Civil Servants
5.1.4	Government Consumption Expenditure	5.2.4	Effectiveness of Judicial System	5.3.4	Freedom of Press		
5.1.5	Collected Total Tax Revenues	5.2.5	Effectiveness of Tax Collection Agency				
5.1.6	Regulatory Quality	5.2.6	Quality of E-Government				
		5.2.7	Political Stability No Violence				
		5.2.8	Rule of Law				
		5.2.9	Representation of Minorities				

1. Practical Indicators for Economic Vibrancy & Competitiveness (23 Indicators)					
1.1 Economic Performance		**1.2 Economic Openness**		**1.3 Infrastructure**	
1.1.1	Gross Domestic Product	1.2.1	Foreign Direct Investment	1.3.1	Telephone Lines (Fixed & Mobile)
1.1.2	Real GDP Growth Rate	1.2.2	Trade to GDP Ratio	1.3.2	Computers Ownership
1.1.3	Labour Productivity Per Hour	1.2.3	State Ownership of Enterprises	1.3.3	Level of Internet Access
1.1.4	Household Consumption Expenditure Per Capita	1.2.4	Prevalence of trade barriers		
1.1.5	Unemployment Rate	1.2.5	Number of Free Trade Agreements		
1.1.6	Resilience of Economy	1.2.6	Ease of Doing Business		
1.1.7	Gross Fixed Capital Formation	1.2.7	Prevalence of Foreign Ownership		
1.1.8	Growth Rate of Consumer Price Index (CPI)	1.2.8	Tourism Receipts		
1.1.9	Debt to Gross National Income Ratio	1.2.9	Economic Freedom		
		1.2.10	Hotel Occupancy Rates		
		1.2.11	International Tourist Arrivals		

2. Practical Indicators for Environmental Friendliness & Sustainability (15 Indicators)					
2.1 Pollution		**2.2 Depletion of Natural Resources**		**2.3 Environmental Initiatives**	
2.1.1	Greenhouse gas emissions	2.2.1	Electricity Generated from Renewable Sources	2.3.1	Participation in Selected International Environmental Agreements
2.1.2	Sulphur Dioxide Emission	2.2.2	Consumption of Oil	2.3.2	Stringency of Environmental Regulations
2.1.3	CO2 emissions in 2006	2.2.3	Threatened Species	2.3.3	Terrestrial Protected Area
2.1.4	Quality of the Natural Environment			2.3.4	Protected Marine Area
2.1.5	Water Pollution			2.3.5	Enforcement of Environmental Regulation
2.1.6	Nitrogen Oxide Emission				
2.1.7	Particulate Matter Concentration				

3. Practical Indicators for Domestic Security and Stability (10 Indicators)					
3.1 Crime Rates		**3.2 Threats to National Stability**		**3.3 Civil Unrest**	
3.1.1	Number of Homicides Cases	3.2.1	Business Costs of Terrorism	3.3.1	Severity of Political Violence
3.1.2	Number of Drug Offences (New)	3.2.2	Fatalities of Terrorist Attacks	3.3.2	Conflicts of ethnic, religious, regional nature ...
3.1.3	Business Cost of Crime And Violence	3.2.3	Natural Disaster Death Toll	3.3.3	Violent social conflicts
3.1.4	Reliability of Police Services				

4. Practical Indicators for Quality of Life & Diversity (24 Indicators)									
4.1 Medical & Healthcare		**4.2 Education**		**4.3 Housing, Sanitation & Transportation**		**4.4 Income Equality & Demographic Burden**		**4.5 Diversity & Community Cohesion**	
4.1.1	Infant Mortality Rate	4.2.1	Quality of Education System	4.3.1	Percentage of Urban Population Living In Slums	4.4.1	GINI Index	4.5.1	Percentage of Foreigners/Percentage of immigrants
4.1.2	Life Expectancy	4.2.2	Tertiary Enrolment Rate	4.3.2	Percentage of Population using improved sanitation	4.4.2	Number of Hours Worked Per Year	4.5.2	Number of Religions
4.1.3	Government Health Expenditure Per Capita	4.2.3	Government Expenditure on Education	4.3.3	Population using an improved water source	4.4.3	Human Poverty index	4.5.3	Attitudes Towards Foreign Visitors
4.1.4	Number of Hospital Beds	4.2.4	Higher Education Achievement	4.3.4	Quality of Ground Transport Network	4.4.4	Child Dependency Ratio		
4.1.5	Density of Physicians			4.3.5	Quality of Roads	4.4.5	Old Age Dependency Ratio		
				4.3.6	Quality of Railroad Infrastructure				
				4.3.7	Quality of Electricity Supply				

5. Practical Indicators for Good Governance & Effective Leadership (13 Indicators)							
5.1 Policy Making & Implementation		**5.2 Government System**		**5.3 Transparency & Accountability**		**5.4 Corruption**	
5.1.1	Government Effectiveness	5.2.1	Functioning of government system	5.3.1	Transparency of economic policy	5.4.1	Control of Corruption
5.1.2	Government Consumption Expenditure	5.2.2	Effectiveness of Judicial System	5.3.2	Voice and Accountability	5.4.2	Corruption Perceptions Index
5.1.3	Collected Total Tax Revenues	5.2.3	Quality of E-Government				
5.1.4	Regulatory Quality	5.2.4	Political Stability No Violence				
		5.2.5	Rule of Law				

The research framework: Ideal versus practical indicators for Global Livable Cities (GLC) Index

- The proposed ideal indicators for GLC Index denote a quantitative attempt to identify and rank cities globally according to a set of defined concepts which would best reflect livability of a city.
- Main functions of indicators are to assess conditions and trends relating to goals and targets, to compare across places and situations and to provide early warning information so as to anticipate and prepare for potential future events.
- Being a variable, an indicators is an operational representation of an attribute such as quality, characteristics or property of a system defined in terms of a specific measurement or observation procedure.
- Thus the search for idea indicators usually give rise to a large number of potential candidates, but due to data non-availability and cost constrains, it would be reduced to a set of practical indicators devised to reduce large quantity of data down to its simplest form, retaining essential meaning for the questions being asked for the data.
- However, there selection of relevant indicators are always a subject of intense debate, and their inclusion and appropriateness are subjected to review and being questioned from time to time whenever suggestions for new indicators may become important due to changes in conditions and trends.

Data sources, data constraints and data proxies

- Indicators adopted would primarily base largely on publicly available data sourced from International Financial Statistics, International Monetary Fund. ASEAN Secretariat, Bank for International Settlements, Political & Economic Risk Consultancy, Governance Metrics International & World Development Indicators as stated in the Global Livable Cities Index Report.

- Constructing ranking indices for cities or at local level are more challenging than at country level due to acute difficulties on data availability and their quality or accuracy, and compromise may have to be made where national data are sometimes being used to proxy local conditions.

- At times one may not want to forsake certain highly relevant indicators, however, given it non-availability in many of the cities for example, average value may have to be adopted where we neither penalize or reward the cities concerned. Such practice may continue for some cities until such time that data becomes available.

- In order to improve our set of practical indicators further, and with committed financial resources, we would also be embarking on generating our own raw data through field trips and survey studies on the global cities covered by the projects.

The conventional methodological approach in ranking exercise

- The basis for the ranking is the standardized value (STD). We first compute the N global cities average for each indicator following which the standard deviation (S) is calculated using the formula:

$$S = \sqrt{\sum (X - \overline{X})^2 / N}$$

- Following which STD is computed by subtracting the N global cities average from a city's original value and then dividing the result by the standard deviation as follow:

$$STDvalue = (X - \overline{X}) / S$$

- Ranks by each indicator are obtained by ranking the STD values. Sub-factor rankings are the average ranks of all indicators which make up the sub-factor. Taking the average for each sub-factor enables us to "lock" the weight of sub-factors independently of the number of indicators they contain.

- Category rankings are the average ranks of the sub-factors within each category. The overall ranking for the N global cities is found by the average ranks of the 5 categories.

Constructive "What-If" simulations and limitations

- Pure ranking beauty contest exercise by itself is not meaningful if not dangerous and wrong, as rightly pointed out by Nobel laureate Professor Paul Kurgan. Choice of indicators are bound to be subjective and often there are good proxies of situations and conditions out here to be rigorously identified.
- In order to be constructive, we would conduct simulation exercises not only to identify a cluster of weak indicators in each of the cities under studied, but also to examine how these cities can overcome these weaknesses through facilitative role of the government. Performance of City Report on "what-if" simulation would be evaluated and made available through Center for Livable Cities.
- We therefore conduct policy simulations by identifying 20% weakest indicators as measured amongst the lowest STD values across all X indicators, then "improve" them to the N global cities' average and re-examine their ranking performance.
- Given that implementing reforms involved time lag and their improvement in terms of ranking may not be readily reflected, and in order to enable cities to keep tract and maintain their good performances, we would also identify 20% strongest indicators in each of the cities under studied.
- The major limitation of "what-If" simulation is that it is a static evaluation where improvements are made and assessed on one city while holding N cities unchanged or ceteris paribus

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List of 64 global cities and respective population sizes

z	Name of Cities	Name of Country	City Population
1	Abu Dhabi	UAE	897,000
2	Ahmadabad	India	5,950,000
3	Amman	Jordan	1,919,000
4	Amsterdam	Netherland	1,950,000
5	Auckland	New Zealand	1,340,000
6	Bangalore	India	5,840,000
7	Bangkok	Thailand	9,100,000
8	Barcelona	Spain	4,300,000
9	Beijing	China	12,460,000
10	Berlin	Germany	3,432,000
11	Boston	USA	5,750,000
12	Buenos Aires	Argentina	11,655,000
13	Cairo	Egypt	7,764,000
14	Chennai	India	4,600,000
15	Chicago	USA	2,853,000
16	Chongqing	China	5,087,000

	Name of Cities	Name of Country	City Population
17	Copenhagen	Denmark	1,410,000
18	Damascus	Syria	2,700,000
19	Delhi	India	12,100,000
20	Geneva	Switzerland	Not Available
21	Guangzhou	China	6,458,000
22	Hanoi	Vietnam	2,700,000
23	Helsinki	Finland	1,110,000
24	Ho Chi Minh City	Vietnam	7,100,000
25	Hong Kong	China, Hong Kong SAR	7,055,000
26	Inchon	Korea	2,630,000
27	Istanbul	Turkey	9,560,000
28	Jakarta	Indonesia	10,100,000
29	Jerusalem	Israel	764,000
30	Karachi	Pakistan	15,500,000
31	Kuala Lumpur	Malaysia	4,875,000
32	L.A	USA	3,834,000

List of 64 global cities and respective population sizes (cont'd)

	Name of Cities	Name of Country	City Population
33	London	United Kingdom	7,557,000
34	Luxembourg	Luxembourg	Not Available
35	Madrid	Spain	3,213,000
36	Manila	Philippines	11,550,000
37	Melbourne	Australia	3,635,000
38	Mexico City	Mexico	8,841,000
39	Moscow	Russia	10,524,000
40	Mumbai	India	13,900,000
41	Nanjing	China	4,150,000
42	New York	USA	8,364,000
43	Osaka-Kobe	Japan	2,647,000
44	Paris	France	2,113,000
45	Philadelphia	USA	6,000,000
46	Phnom Penh	Cambodia	1,480,000
47	Prague	Czech	1,370,000
48	Pane	India	3,337,000

	Name of Cities	Name of Country	City Population
49	Riyadh	Saudi Arabia	4,950,000
50	Rome	Italy	2,732,000
51	Sao Paulo	Brazil	11,038,000
52	Seoul	Republic of Korea	11,153,000
53	Shanghai	China	14,900,000
54	Shenzhen	China	4,320,000
55	Singapore	Singapore	4,988,000
56	Stockholm	Sweden	2,000,000
57	Sydney	Australia	4,400,000
58	Taipei	Taiwan	2,620,000
59	Tianjin	China	7,500,000
60	Tokyo	Japan	8,653,000
61	Vancouver	Canada	2,375,000
62	Washington DC	USA	8,250,000
63	Yokohama	Japan	3,655,000
64	Zurich	Switzerland	1,160,000

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List of 36 Asian cities and respective population sizes

	Name of Cities	Name of Country	City Population
1	Abu Dhabi	UAE	897,000
2	Ahmadabad	India	5,950,000
3	Amman	Jordan	1,919,000
4	Auckland	New Zealand	1,340,000
5	Bangalore	India	5,840,000
6	Bangkok	Thailand	9,100,000
7	Beijing	China	12,460,000
8	Chennai	India	4,600,000
9	Chongqing	China	5,087,000
10	Damascus	Syria	2,700,000
11	Delhi	India	12,100,000
12	Guangzhou	China	6,458,000
13	Ho Chi Minh City	Vietnam	7,100,000
14	Hong Kong	China, Hong Kong SAR	7,055,000
15	Inchon	Korea	2,630,000
16	Istanbul	Turkey	9,560,000
17	Jakarta	Indonesia	10,100,000
18	Karachi	Pakistan	15,500,000
19	Kuala Lumpur	Malaysia	4,875,000
20	Manila	Philippines	11,550,000

	Name of Cities	Name of Country	City Population
21	Melbourne	Australia	3,635,000
22	Mumbai	India	13,900,000
23	Nanjing	China	4,150,000
24	Osaka-Kobe	Japan	2,647,000
25	Phnom Penh	Cambodia	1,480,000
26	Pane	India	3,337,000
27	Riyadh	Saudi Arabia	4,950,000
28	Seoul	Republic of Korea	11,153,000
29	Shanghai	China	14,900,000
30	Shenzhen	China	4,320,000
31	Singapore	Singapore	4,988,000
32	Sydney	Australia	4,400,000
33	Taipei	Taiwan	2,620,000
34	Tianjin	China	7,500,000
35	Tokyo	Japan	8,653,000
36	Yokohama	Japan	3,655,000

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Tentative empirical overall ranking for 64 global cities

Name of Cities	Region	Overall Livability	
		Score	Rank
Geneva	Europe	3.40	1
Zurich	Europe	4.60	2
Singapore	Asean	5.60	3
Copenhagen	Europe	7.00	4
Helsinki	Europe	7.00	4
Luxembourg	Europe	7.80	6
Stockholm	Europe	8.20	7
Berlin	Europe	11.20	8
Hong Kong	Asia	11.20	8
Auckland	Oceania	11.60	10
Melbourne	Oceania	11.60	10
Sydney	Oceania	12.00	12
Paris	Europe	12.40	13
Vancouver	North America	16.20	14
Amsterdam	Europe	16.80	15
Osaka-Kobe	Asia	17.80	16
New York	North America	18.20	17
Tokyo	Asia	18.60	18
L.A	North America	18.80	19
Philadelphia	North America	21.40	20
Yokohama	Asia	21.40	20

Name of Cities	Region	Overall Livability	
		Score	Rank
Boston	North America	21.60	22
London	Europe	21.60	22
Chicago	North America	22.40	24
Washington DC	North America	22.80	25
Barcelona	Europe	23.20	26
Taipei	Asia	24.00	27
Prague	Europe	25.80	28
Seoul	Asia	26.20	29
Madrid	Europe	27.00	30
Inchon	Asia	27.40	31
Abu Dhabi	Mid east	32.00	32
Kuala Lumpur	Asean	32.00	32
Rome	Europe	34.00	34
Amman	Mid east	36.60	35
Jerusalem	Asia	37.00	36
Sao Paulo	South America	43.40	37
Riyadh	Mid east	44.00	38
Shanghai	Asia	45.00	39
Nanjing	Asia	45.20	40
Bangkok	Asean	45.80	41
Shenzhen	Asia	45.80	41

Name of Cities	Region	Overall Livability	
		Score	Rank
Ahmadabad	Asia	46.00	43
Cairo	Mid east	46.00	43
Tianjin	Asia	47.40	45
Beijing	Asia	47.80	46
Chennai	Asia	48.20	47
Guangzhou	Asia	48.20	47
Pane	Asia	48.20	47
Mexico City	North America	48.40	50
Damascus	Mid east	48.60	51
Chongqing	Asia	48.80	52
Hanoi	Asean	48.80	52
Ho Chi Minh City	Asean	48.80	52
Bangalore	Asia	49.00	55
Mumbai	Asia	49.00	55
Delhi	Asia	50.20	57
Buenos Aires	South America	50.60	58
Istanbul	Mid east	52.20	59
Karachi	Mid east	53.00	60
Phnom Penh	Asean	53.80	61
Moscow	Europe	55.20	62
Manila	Asean	56.60	63
Jakarta	Asean	57.40	64

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Economic vibrancy & competitiveness ranking for 64 global cities

Name of Cities	Region	Economic Vibrancy & Competitiveness	
		Score	Rank
Luxembourg	Europe	16.13	1
Copenhagen	Europe	17.78	2
Geneva	Europe	18.43	3
Hong Kong	Asia	18.87	4
Singapore	Asean	19.78	5
Melbourne	Oceania	20.57	6
Helsinki	Europe	20.96	7
Sydney	Oceania	20.96	7
Zurich	Europe	21.35	9
Amsterdam	Europe	22.65	10
Stockholm	Europe	23.22	11
London	Europe	23.30	12
Auckland	Oceania	23.91	13
Paris	Europe	24.87	14
Berlin	Europe	25.17	15
New York	North America	26.43	16
Barcelona	Europe	26.48	17
L.A	North America	26.87	18
Prague	Europe	26.91	19
Philadelphia	North America	27.39	20
Boston	North America	27.48	21

Name of Cities	Region	Economic Vibrancy & Competitiveness	
		Score	Rank
Vancouver	North America	27.91	22
Kuala Lumpur	Asean	28.74	23
Osaka-Kobe	Asia	29.09	24
Taipei	Asia	29.09	24
Jerusalem	Asia	29.30	26
Washington DC	North America	29.43	27
Abu Dhabi	Mid east	29.61	28
Inchon	Asia	29.65	29
Seoul	Asia	30.00	30
Tokyo	Asia	30.35	31
Yokohama	Asia	30.48	32
Rome	Europe	30.91	33
Chicago	North America	31.22	34
Riyadh	Mid east	31.26	35
Nanjing	Asia	31.43	36
Madrid	Europe	31.70	37
Cairo	Mid east	32.48	38
Shenzhen	Asia	32.65	39
Tianjin	Asia	32.87	40
Guangzhou	Asia	33.65	41
Bangkok	Asean	33.91	42

Name of Cities	Region	Economic Vibrancy & Competitiveness	
		Score	Rank
Chongqing	Asia	34.39	43
Phnom Penh	Asean	34.65	44
Shanghai	Asia	34.83	45
Karachi	Mid east	34.83	45
Beijing	Asia	35.04	47
Amman	Mid east	36.04	48
Damascus	Mid east	36.09	49
Istanbul	Mid east	36.09	49
Hanoi	Asean	36.17	51
Ho Chi Minh City	Asean	36.17	51
Mexico City	North America	37.87	53
Jakarta	Asean	39.09	54
Ahmadabad	Asia	39.96	55
Pane	Asia	40.09	56
Bangalore	Asia	40.57	57
Chennai	Asia	41.48	58
Delhi	Asia	41.57	59
Mumbai	Asia	41.78	60
Manila	Asean	42.22	61
Moscow	Europe	42.78	62
Sao Paulo	South America	43.13	63
Buenos Aires	South America	44.09	64

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Environmental friendliness & sustainability ranking for 64 global cities

Name of Cities	Region	Environmental Friendliness & Sustainability	
		Score	Rank
Stockholm	Europe	8.47	1
Geneva	Europe	11.73	2
Zurich	Europe	11.73	2
Luxembourg	Europe	13.47	4
Berlin	Europe	14.60	5
Auckland	Oceania	16.93	6
Paris	Europe	17.00	7
Helsinki	Europe	18.27	8
London	Europe	19.67	9
Barcelona	Europe	20.60	10
Madrid	Europe	20.93	11
Sao Paulo	South America	21.47	12
Tokyo	Asia	22.47	13
Singapore	Asean	22.53	14
Copenhagen	Europe	23.00	15
Osaka-Kobe	Asia	23.73	16
Melbourne	Oceania	24.07	17
Sydney	Oceania	24.27	18
Prague	Europe	25.40	19
New York	North America	25.93	20
L.A	North America	26.20	21

Name of Cities	Region	Environmental Friendliness & Sustainability	
		Score	Rank
Vancouver	North America	26.33	22
Chicago	North America	26.40	23
Amsterdam	Europe	26.87	24
Rome	Europe	27.00	25
Yokohama	Asia	27.47	26
Kuala Lumpur	Asean	27.60	27
Amman	Mid east	29.13	28
Seoul	Asia	29.67	29
Taipei	Asia	29.73	30
Jerusalem	Asia	29.93	31
Philadelphia	North America	30.93	32
Boston	North America	30.93	32
Washington DC	North America	30.93	32
Bangkok	Asean	30.93	32
Hong Kong	Asia	31.93	36
Inchon	Asia	31.93	36
Buenos Aires	South America	32.67	38
Mexico City	North America	32.93	39
Hanoi	Asean	33.93	40
Ho Chi Minh City	Asean	33.93	40
Karachi	Mid east	34.40	42

Name of Cities	Region	Environmental Friendliness & Sustainability	
		Score	Rank
Mumbai	Asia	34.47	43
Manila	Asean	34.93	44
Riyadh	Mid east	35.60	45
Abu Dhabi	Mid east	35.73	46
Ahmadabad	Asia	36.20	47
Bangalore	Asia	36.20	47
Shanghai	Asia	36.27	49
Nanjing	Asia	36.87	50
Shenzhen	Asia	36.87	50
Delhi	Asia	36.93	52
Phnom Penh	Asean	37.00	53
Moscow	Europe	37.00	53
Chennai	Asia	37.27	55
Istanbul	Mid east	37.73	56
Cairo	Mid east	38.40	57
Pane	Asia	38.40	57
Damascus	Mid east	42.27	59
Guangzhou	Asia	43.07	60
Beijing	Asia	43.27	61
Tianjin	Asia	43.80	62
Chongqing	Asia	44.20	63
Jakarta	Asean	44.93	64

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Domestic security & stability ranking for 64 global cities

Name of Cities	Region	Domestic Security & Stability	
		Score	Rank
Singapore	Asean	4.90	1
Hong Kong	Asia	10.70	2
Copenhagen	Europe	12.90	3
Auckland	Oceania	13.00	4
Helsinki	Europe	15.10	5
Paris	Europe	16.40	6
Berlin	Europe	17.60	7
Taipei	Asia	17.70	8
Luxembourg	Europe	18.10	9
Geneva	Europe	19.10	10
Zurich	Europe	19.10	10
Vancouver	North America	20.40	12
Melbourne	Oceania	20.70	13
Sydney	Oceania	20.70	13
Tokyo	Asia	22.50	15
Osaka-Kobe	Asia	22.50	15
Yokohama	Asia	22.50	15
Stockholm	Europe	23.20	18
Prague	Europe	23.20	18
Seoul	Asia	23.40	20
Inchon	Asia	23.40	20

Name of Cities	Region	Domestic Security & Stability	
		Score	Rank
Amsterdam	Europe	25.30	22
Cairo	Mid east	25.50	23
Abu Dhabi	Mid east	27.10	24
Amman	Mid east	27.80	25
New York	North America	28.00	26
L.A	North America	28.00	26
Chicago	North America	28.00	26
Philadelphia	North America	28.00	26
Boston	North America	28.00	26
Washington DC	North America	28.00	26
Damascus	Mid east	29.90	32
Barcelona	Europe	30.00	33
Madrid	Europe	30.00	33
London	Europe	30.30	35
Rome	Europe	30.60	36
Hanoi	Asean	31.50	37
Ho Chi Minh City	Asean	31.50	37
Kuala Lumpur	Asean	32.60	39
Sao Paulo	South America	33.20	40
Shanghai	Asia	33.40	41
Nanjing	Asia	33.40	41

Name of Cities	Region	Domestic Security & Stability	
		Score	Rank
Shenzhen	Asia	33.40	41
Guangzhou	Asia	33.40	41
Beijing	Asia	33.40	41
Tianjin	Asia	33.40	41
Chongqing	Asia	33.40	41
Buenos Aires	South America	33.90	48
Jakarta	Asean	34.80	49
Riyadh	Mid east	37.70	50
Phnom Penh	Asean	39.20	51
Mumbai	Asia	40.30	52
Ahmadabad	Asia	40.30	52
Bangalore	Asia	40.30	52
Delhi	Asia	40.30	52
Chennai	Asia	40.30	52
Pane	Asia	40.30	52
Istanbul	Mid east	42.30	58
Karachi	Mid east	42.70	59
Moscow	Europe	42.70	59
Bangkok	Asean	43.00	61
Jerusalem	Asia	43.80	62
Mexico City	North America	47.40	63
Manila	Asean	49.90	64

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Quality of life & diversity ranking for 64 global cities

Name of Cities	Region	Quality of Life & Diversity	
		Score	Rank
Geneva	Europe	14.21	1
Zurich	Europe	14.21	1
Stockholm	Europe	15.67	3
Copenhagen	Europe	16.54	4
Singapore	Asean	16.83	5
Helsinki	Europe	17.17	6
Vancouver	North America	18.50	7
Amsterdam	Europe	18.83	8
Paris	Europe	18.96	9
Hong Kong	Asia	19.63	10
Berlin	Europe	20.54	11
Tokyo	Asia	21.79	12
Osaka-Kobe	Asia	21.79	12
Yokohama	Asia	21.79	12
Luxembourg	Europe	22.21	15
Melbourne	Oceania	22.46	16
Sydney	Oceania	22.46	16
New York	North America	22.83	18
L.A	North America	22.83	18
Chicago	North America	22.83	18
Philadelphia	North America	22.83	18

Name of Cities	Region	Quality of Life & Diversity	
		Score	Rank
Boston	North America	22.83	18
Washington DC	North America	22.83	18
Abu Dhabi	Mid east	23.54	24
Seoul	Asia	23.67	25
Inchon	Asia	23.67	25
Madrid	Europe	24.29	27
Jerusalem	Asia	24.29	27
Barcelona	Europe	24.46	29
Auckland	Oceania	24.54	30
Prague	Europe	25.92	31
London	Europe	26.04	32
Taipei	Asia	26.08	33
Kuala Lumpur	Asean	27.13	34
Amman	Mid east	29.21	35
Rome	Europe	32.17	36
Riyadh	Mid east	33.00	37
Moscow	Europe	35.63	38
Bangkok	Asean	37.04	39
Damascus	Mid east	37.08	40
Beijing	Asia	37.42	41
Shanghai	Asia	38.29	42

Name of Cities	Region	Quality of Life & Diversity	
		Score	Rank
Buenos Aires	South America	39.25	43
Mexico City	North America	39.29	44
Ahmadabad	Asia	39.71	45
Chennai	Asia	39.71	45
Pane	Asia	39.71	45
Tianjin	Asia	39.75	48
Nanjing	Asia	39.79	49
Shenzhen	Asia	39.79	49
Guangzhou	Asia	39.79	49
Chongqing	Asia	40.08	52
Cairo	Mid east	40.21	53
Istanbul	Mid east	40.29	54
Hanoi	Asean	42.96	55
Ho Chi Minh City	Asean	42.96	55
Delhi	Asia	43.58	57
Bangalore	Asia	43.75	58
Mumbai	Asia	43.96	59
Manila	Asean	44.54	60
Sao Paulo	South America	44.92	61
Karachi	Mid east	46.54	62
Phnom Penh	Asean	47.13	63
Jakarta	Asean	48.75	64

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Good governance & effective leadership ranking for 64 global cities

Name of Cities	Region	Good Governance & Effective Leadership	
		Score	Rank
Geneva	Europe	12.38	1
Zurich	Europe	12.38	1
Singapore	Asean	13.69	3
Hong Kong	Asia	14.77	4
Auckland	Oceania	15.15	5
Melbourne	Oceania	16.15	6
Sydney	Oceania	16.15	6
Stockholm	Europe	16.62	8
Helsinki	Europe	16.77	9
Luxembourg	Europe	17.00	10
Copenhagen	Europe	18.08	11
New York	North America	18.08	11
L.A	North America	18.08	11
Chicago	North America	18.08	11
Philadelphia	North America	18.08	11
Boston	North America	18.08	11
Washington DC	North America	18.08	11
Vancouver	North America	18.15	18
Berlin	Europe	18.15	18
Amsterdam	Europe	19.77	20
London	Europe	19.77	20

Name of Cities	Region	Good Governance & Effective Leadership	
		Score	Rank
Tokyo	Asia	23.15	22
Osaka-Kobe	Asia	23.15	22
Yokohama	Asia	23.15	22
Taipei	Asia	26.54	25
Paris	Europe	27.00	26
Seoul	Asia	29.69	27
Inchon	Asia	29.69	27
Madrid	Europe	29.69	27
Barcelona	Europe	29.69	27
Ahmadabad	Asia	31.15	31
Chennai	Asia	31.15	31
Pane	Asia	31.15	31
Delhi	Asia	31.15	31
Bangalore	Asia	31.15	31
Mumbai	Asia	31.15	31
Kuala Lumpur	Asean	31.23	37
Abu Dhabi	Mid east	33.62	38
Jerusalem	Asia	34.62	39
Rome	Europe	35.62	40
Sao Paulo	South America	36.08	41
Prague	Europe	36.38	42

Name of Cities	Region	Good Governance & Effective Leadership	
		Score	Rank
Mexico City	North America	38.31	43
Istanbul	Mid east	39.15	44
Chongqing	Asia	39.23	45
Tianjin	Asia	39.31	46
Amman	Mid east	39.46	47
Shanghai	Asia	39.85	48
Beijing	Asia	39.92	49
Nanjing	Asia	40.15	50
Shenzhen	Asia	40.15	50
Guangzhou	Asia	40.15	50
Riyadh	Mid east	41.92	53
Manila	Asean	42.23	54
Bangkok	Asean	43.92	55
Jakarta	Asean	45.77	56
Karachi	Mid east	46.92	57
Phnom Penh	Asean	48.54	58
Cairo	Mid east	49.15	59
Buenos Aires	South America	49.31	60
Hanoi	Asean	49.69	61
Ho Chi Minh City	Asean	49.69	61
Damascus	Mid east	52.62	63
Moscow	Europe	57.54	64

Tentative empirical overall ranking for 36 Asian cities

Name of Cities	Region	Overall Liveability	
		Overall Score	Rank
Singapore	Asean	1.80	1
Hong Kong	Asia	4.80	2
Auckland	Oceania	5.00	3
Sydney	Oceania	5.20	4
Melbourne	Oceania	5.40	5
Osaka-Kobe	Asia	6.20	6
Tokyo	Asia	7.00	7
Yokohama	Asia	7.80	8
Seoul	Asia	8.20	9
Taipei	Asia	8.60	10
Inchon	Asia	8.80	11
Kuala Lumpur	Asean	12.00	12
Abu Dhabi	Mid east	15.60	13
Amman	Mid east	16.60	14
Nanjing	Asia	19.60	15
Shanghai	Asia	20.20	16
Shenzhen	Asia	20.60	17
Tianjin	Asia	21.20	18

Name of Cities	Region	Overall Liveability	
		Score	Rank
Beijing	Asia	21.60	19
Chongqing	Asia	21.80	20
Guangzhou	Asia	22.00	21
Ahmadabad	Asia	22.20	22
Riyadh	Mid east	22.40	23
Chennai	Asia	23.00	24
Bangkok	Asean	23.20	25
Bangalore	Asia	23.60	26
Mumbai	Asia	23.60	26
Pane	Asia	23.80	28
Delhi	Asia	24.60	29
Ho Chi Minh City	Asean	25.80	30
Damascus	Mid east	26.00	31
Istanbul	Mid east	28.00	32
Karachi	Mid east	28.80	33
Phnom Penh	Asean	29.80	34
Manila	Asean	31.40	35
Jakarta	Asean	32.00	36

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Economic vibrancy & competitiveness ranking for 36 Asian Cities

Name of Cities	Region	Economic Vibrancy & Competitiveness	
		Score	Rank
Hong Kong	Asia	9.74	1
Sydney	Oceania	10.13	2
Singapore	Asean	10.17	3
Melbourne	Oceania	10.22	4
Auckland	Oceania	12.96	5
Taipei	Asia	14.13	6
Kuala Lumpur	Asean	14.48	7
Osaka-Kobe	Asia	14.65	8
Nanjing	Asia	14.91	9
Inchon	Asia	15.09	10
Seoul	Asia	15.22	11
Yokohama	Asia	15.39	12
Tokyo	Asia	15.57	13
Shenzhen	Asia	15.65	14
Tianjin	Asia	15.78	15
Abu Dhabi	Mid east	15.96	16
Guangzhou	Asia	16.22	17
Shanghai	Asia	16.57	18

Name of Cities	Region	Economic Vibrancy & Competitiveness	
		Score	Rank
Chongqing	Asia	16.61	19
Riyadh	Mid east	16.96	20
Beijing	Asia	17.09	21
Bangkok	Asean	17.78	22
Istanbul	Mid east	18.22	23
Karachi	Mid east	18.74	24
Phnom Penh	Asean	19.00	25
Amman	Mid east	19.22	26
Ho Chi Minh City	Asean	19.74	27
Damascus	Mid east	19.96	28
Ahmadabad	Asia	20.43	29
Pane	Asia	20.48	30
Bangalore	Asia	20.96	31
Jakarta	Asean	21.00	32
Mumbai	Asia	21.09	33
Chennai	Asia	21.35	34
Delhi	Asia	21.48	35
Manila	Asean	23.00	36

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Environmental friendliness & sustainability ranking for 36 Asian cities

Name of Cities	Region	Environmental Friendliness & Sustainability	
		Score	Rank
Auckland	Oceania	7.60	1
Singapore	Asean	10.80	2
Melbourne	Oceania	10.93	3
Sydney	Oceania	11.00	4
Tokyo	Asia	11.07	5
Osaka-Kobe	Asia	11.40	6
Seoul	Asia	12.73	7
Amman	Mid east	13.20	8
Kuala Lumpur	Asean	13.27	9
Yokohama	Asia	13.67	10
Inchon	Asia	14.20	11
Bangkok	Asean	14.67	12
Taipei	Asia	14.73	13
Mumbai	Asia	15.40	14
Hong Kong	Asia	15.93	15
Chennai	Asia	16.00	16
Ahmadabad	Asia	16.60	17
Bangalore	Asia	16.60	17

Name of Cities	Region	Environmental Friendliness & Sustainability	
		Score	Rank
Delhi	Asia	16.93	19
Karachi	Mid east	17.07	20
Ho Chi Minh City	Asean	17.13	21
Manila	Asean	17.27	22
Riyadh	Mid east	17.53	23
Pane	Asia	17.87	24
Abu Dhabi	Mid east	17.93	25
Shanghai	Asia	18.07	26
Nanjing	Asia	18.67	27
Shenzhen	Asia	18.67	27
Istanbul	Mid east	18.67	27
Phnom Penh	Asean	19.00	30
Guangzhou	Asia	19.87	31
Beijing	Asia	21.07	32
Damascus	Mid east	21.67	33
Tianjin	Asia	22.73	34
Chongqing	Asia	23.07	35
Jakarta	Asean	23.20	36

Domestic security & stability ranking for 36 Asian cities

Name of Cities	Region	Domestic Security & Stability	
		Score	Rank
Singapore	Asean	3.10	1
Hong Kong	Asia	4.30	2
Auckland	Oceania	7.20	3
Taipei	Asia	7.50	4
Seoul	Asia	9.60	5
Inchon	Asia	9.60	5
Melbourne	Oceania	11.20	7
Sydney	Oceania	11.20	7
Tokyo	Asia	13.00	9
Osaka-Kobe	Asia	13.00	9
Yokohama	Asia	13.00	9
Abu Dhabi	Mid east	13.10	12
Amman	Mid east	13.40	13
Ho Chi Minh City	Asean	14.70	14
Shanghai	Asia	15.30	15
Nanjing	Asia	15.30	15
Shenzhen	Asia	15.30	15
Guangzhou	Asia	15.30	15

Name of Cities	Region	Domestic Security & Stability	
		Score	Rank
Beijing	Asia	15.30	15
Damascus	Mid east	15.30	15
Tianjin	Asia	15.30	15
Chongqing	Asia	15.30	15
Kuala Lumpur	Asean	17.10	23
Jakarta	Asean	19.10	24
Riyadh	Mid east	19.90	25
Phnom Penh	Asean	21.10	26
Mumbai	Asia	22.50	27
Chennai	Asia	22.50	27
Ahmadabad	Asia	22.50	27
Bangalore	Asia	22.50	27
Delhi	Asia	22.50	27
Pane	Asia	22.50	27
Karachi	Mid east	22.70	33
Bangkok	Asean	24.50	34
Istanbul	Mid east	24.50	34
Manila	Asean	28.20	36

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Quality of life & diversity ranking for 36 Asian cities

Name of Cities	Region	Quality of Life & Diversity	
		Score	Rank
Singapore	Asean	8.79	1
Tokyo	Asia	9.33	2
Osaka-Kobe	Asia	9.33	2
Yokohama	Asia	9.33	2
Hong Kong	Asia	9.71	5
Abu Dhabi	Mid east	11.00	6
Seoul	Asia	11.29	7
Inchon	Asia	11.29	7
Melbourne	Oceania	11.33	9
Sydney	Oceania	11.33	9
Taipei	Asia	12.50	11
Kuala Lumpur	Asean	12.50	11
Auckland	Oceania	12.75	13
Amman	Mid east	13.25	14
Riyadh	Mid east	16.17	15
Beijing	Asia	18.42	16
Bangkok	Asean	18.50	17
Damascus	Mid east	18.58	18

Name of Cities	Region	Quality of Life & Diversity	
		Score	Rank
Shanghai	Asia	18.63	19
Chongqing	Asia	19.17	20
Tianjin	Asia	19.50	21
Nanjing	Asia	19.54	22
Shenzhen	Asia	19.54	22
Guangzhou	Asia	19.54	22
Chennai	Asia	20.04	25
Ahmadabad	Asia	20.04	25
Pane	Asia	20.04	25
Istanbul	Mid east	20.13	28
Delhi	Asia	22.08	29
Bangalore	Asia	22.21	30
Mumbai	Asia	22.38	31
Ho Chi Minh City	Asean	22.67	32
Manila	Asean	23.08	33
Karachi	Mid east	24.92	34
Phnom Penh	Asean	25.63	35
Jakarta	Asean	26.67	36

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Good governance & effective leadership ranking for 36 Asian cities

Name of Cities	Region	Good Governance & Effective Leadership	
		Score	Rank
Hong Kong	Asia	5.85	1
Singapore	Asean	6.38	2
Auckland	Oceania	8.00	3
Melbourne	Oceania	8.23	4
Sydney	Oceania	8.23	4
Tokyo	Asia	9.69	6
Osaka-Kobe	Asia	9.69	6
Yokohama	Asia	9.69	6
Taipei	Asia	9.92	9
Kuala Lumpur	Asean	13.69	10
Seoul	Asia	14.62	11
Inchon	Asia	14.62	11
Chennai	Asia	14.77	13
Ahmadabad	Asia	14.77	13
Pane	Asia	14.77	13
Delhi	Asia	14.77	13
Bangalore	Asia	14.77	13
Mumbai	Asia	14.77	13

Name of Cities	Region	Good Governance & Effective Leadership	
		Score	Rank
Abu Dhabi	Mid east	15.15	19
Chongqing	Asia	19.46	20
Tianjin	Asia	19.54	21
Amman	Mid east	19.62	22
Shanghai	Asia	20.08	23
Beijing	Asia	20.15	24
Nanjing	Asia	20.31	25
Shenzhen	Asia	20.31	25
Guangzhou	Asia	20.31	25
Istanbul	Mid east	20.38	28
Riyadh	Mid east	20.46	29
Manila	Asean	22.77	30
Bangkok	Asean	23.23	31
Jakarta	Asean	24.54	32
Karachi	Mid east	25.38	33
Phnom Penh	Asean	25.38	33
Ho Chi Minh City	Asean	27.08	35
Damascus	Mid east	28.85	36

Qualifications and cautions on our preliminary empirical findings

- In our tentative attempt to construct GLC Index, we have selected to evaluate and rank 64 global cities and 35 Asian cities. To be constructive and sensitive, we would only report the position of the top 35 global cities and in a separate exercise the top 20 Asian cities in our presentation.
- However, performance on City Report on “what-if” simulations would be evaluated and may be made available through Center for Livable Cities at Ministry of National development upon request.
- In this presentation of the GLC Index, we would also like to caution that the empirical findings are highly tentative and we would like to receive further feedbacks and comments including the not juts choice of indicators but also its available sources as well as the survey data useful to generate.
- We are also fully aware that some indicators which are very relevant and useful, but are available only in a few cities amongst 64 global cities covered, were nevertheless not adopted. Such move may have led to disadvantages in terms of ranking performance or vice versa.
- Since this is the first pioneering attempt to research on the GLC index based on the proposed comprehensive and balanced framework, we hope to receive valuable feedback from the project discussant, participants and the public at large.

Research findings, agenda and strategies going forward

On the 64 global cities study:

- Apparently, in terms of the overall ranking of the GLC index, Singapore, Hong Kong Osaka, Tokyo and Yokohama are respectively the five Asian cities which have made it to the top 20 ranking.
- In terms of economic vibrancy and competitiveness, Hong Kong and Singapore ranked 4th and 5th respectively amongst the top 20 global cities
- In terms of environment friendliness and sustainability, Tokyo, Singapore and Osaka are the only three Asian cities which made it to the top 20 position.
- On domestic security and stability, Singapore (4.9) expectedly emerged top with Hong Kong (10.7) came in second position but with a big gap behind in terms of the standardized score.
- Singapore, Tokyo, Hong Kong, Osaka and Yokohama are amongst the top 20 cities when come to quality of life and diversity ranking
- Finally, Singapore and Hong Kong did well respectively in 3rd and 4th position in terms of good governance and effective leadership as the only two Asian cities which made it to the top 20 cities ranking

Research findings, agenda and strategies going forward

On the 36 Asia cities study:

- Apparently, in terms of the overall ranking of the GLC index, Singapore (1.8) is well ahead of others with Hong Kong (4.8) ranked in in second position
- In terms of economic vibrancy and competitiveness, Hong Kong ranked first and overtaken Sydney and Singapore which ranked 2nd and 3rd respectively amongst the 36 Asian cities
- In terms of environment friendliness and sustainability, Auckland scored well by taking the top position followed by Singapore and Melbourne.
- On domestic security and stability, Singapore Hong Kong and Auckland are the top three cities in Asia, again with Singapore pulling well ahead in terms of its standardized score.
- Singapore, Tokyo, Osaka, Yokohama and Hong Kong are the three top cities in Asia when come to quality of life and diversity.
- Finally, Hong Kong, Singapore and Auckland did well expectedly amongst the top three positions in terms of good governance and effective leadership.

Appendix: Recent Projects & Publications on Ranking Indices

- Khee-Giap Tan, Kong-Yam Tan & Kang, Chen (2008), "Relative Competitiveness of 31 Mainland China Provinces, 35 States of India and 10 Economies of Association of South East Asian Nations: Implications for Growth and Development", Competitiveness Review, USA.
- Khee-Giap Tan (2004), "The Institute of Policy Studies (IPS)-NTU ASEAN 9+1 Economic Competitiveness Ranking Indices", ASEAN Economic Bulletin, Vol. 21, No 2, pp 234-38.
- Khee-Giap Tan, Brenda Wong, Gladys Lee & Ivy Tan (2005), "IPS-NTU ASEAN 9 +1 Competitiveness Ranking Indices", published by Marshall Cavendish, jointly funded by Institute of Policy Studies, Singapore and The World Bank (Asia).
- Khee-Giap Tan & Kang, Chen (2006), "The Institute of South East Asian Studies-NTU Ranking on Financial Sector Reforms and Liberalization in ASEAN 10 + 5 Economies (i.e. China, Korea, Japan , Hong Kong and Chinese Taipei)", presented in the inaugural launch by Mr. K Kasavapany, Director, Institute of South East Asian Studies (ISEAS), 10 March, Seminar Room II, ISEAS, Singapore
- Khee-Giap Tan , Kang, Chen & Kong-Yam Tan (2006), "The Institute of Policies Studies-NTU Competitiveness Ranking Indices for ASEAN-10, 34 Greater China Economies and 35 States and Union Territories of India", presented in the inaugural launch by Mr. Lee Yi Shyan, Minister of State, Ministry of Trade & Industry, 18 August, The Conference Room, Institute of Policy Studies, Singapore.
- Kang, Chen, Khee-Giap Tan & Kong-Yam Tan (2005), "The Zaobao-NTU Competitiveness Ranking Indices of 31 Mainland China Provinces, Municipalities and Autonomous Regions", presented in the inaugural launch by Mr. Raymond Lim, Minister at The Prime Minister Office, 3 June 2005, Suntec City Ballroom, Singapore.
- Nilanjan Sen, Khee-Giap Tan, Kong-Yam Tan & Wu Wei (2005), "The Business Times-NTU Competitiveness Ranking and Simulation on 35 States and Union Territories of India", presented in the inaugural launch by Mr. Tharman Shanmugaratnam, Minister for Education, 19 October, The Ballroom, Ritz Carlton Hotel, Singapore.
- Khee-Giap Tan, Kang, Chen, Renate Schubert & Hans Wolfgang Brachinger, "A Report on Global Liveable Cities Index (2009), commissioned by Centre for Liveable Cities, Ministry of National Development & Ministry of Environment and Water Resources, Singapore.
- Khee-Giap Tan & Kang, Chen (2008, 2010), " A Report on Macroeconomic Impacts and Contributions of the Media Sector Development" , commissioned by Media Development Authority, Singapore.
- Khee Giap Tan (2010), "A Longitudinal Study To Track Career Path and Performances of Tertiary educated Chinese and Malay/Muslim Singaporeans, commissioned by Yayasan Mendaki and Ministry of Community Development, Youth and Sports.