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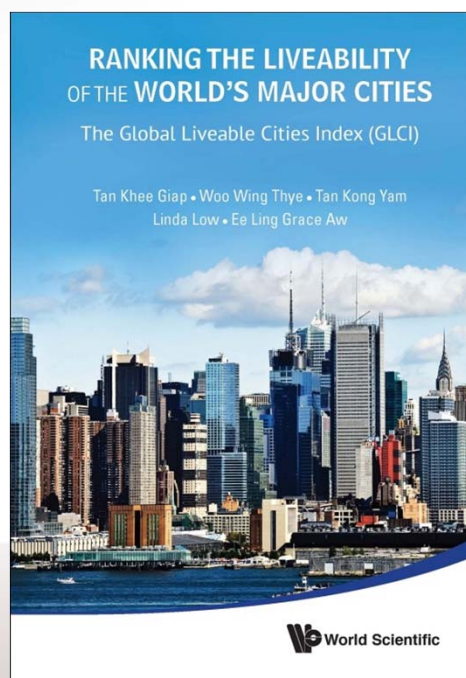
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Research Framework on Global Liveable Cities Index:
A Sustainable, Humanitarian & Socially Inclusive Approach

Dr Tan Khee Giap

Co-Director, Asia Competitiveness Institute (ACI)
Lee Kuan Yew School of Public Policy, National University of Singapore
&
Chairman, Singapore National Committee for Pacific Economic Cooperation

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Research Framework on Global Liveable Cities Index:
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Research Framework on Global Liveable Cities Index:
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Associate Professor Tan Khee Giap	**Co-Director**
Professor Woo Wing Thye	**Adjunct Senior Research Fellow**
Dr Linda Low	**Senior Research Fellow**
Dr Grace Aw Ee Ling	**Adjunct Research Fellow**
Mr Nie Tongxin	**Research Assistant**
Ms Denise Ye Ye	**Research Associate**

Asia Competitiveness Institute, Lee Kuan Yew School of Public Policy,

National University of Singapore

Presentation Outline

- Background, Issues at Stake & Project Objectives
- Rationalising Major Categories of Attributes or Indicators of a Global Liveable City
- A Literature Survey on Existing Published Indices for Liveable Cities
- How Global Liveable Cities (GLC) Index would Differ from other Published Indices or Studies?
- The Research Framework: Ideal versus Practical Indicators for GLC Index
- The Conventional Methodological Approach
- The Constructive "What-If" Simulations and Limitations
- Data Sources, Data Constraints and Data Proxies
- List of 64 Global Cities in GLC Index
- Research Findings
- Agenda and Strategies Going Forward
- List of 200 Global Cities Including 100 Greater China Cities, 30 South East Asian Cities and 20 Middle Eastern Cities

Background, Issues at Stake & Project Objectives

- *An ideal liveable 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 liveable 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 Liveable 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 liveable and vibrant cities in the world.

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Rationalising Major Categories of Attributes or Indicators of a Global Liveable City

The Nature of Man in the Social Sciences and the Humanities:

1. Man as an economic animal;
2. Man as an animal that is sentient of aesthetics, the inter-dependence of species and stewardship of the natural environment and cultural heritage for the future generation;
3. Man as a survivor;
4. Man as a socio-cultural animal; and
5. Man as a political animal.

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Rationalising Major Categories of Attributes or Indicators of a Global Liveable City

Themes that the Degree of Liveability Depends on:

1. Satisfaction with "the freedom from want";
2. Satisfaction with the state of the natural environment and its management;
3. Satisfaction with "the freedom from fear";
4. Satisfaction with the socio-cultural conditions; and
5. Satisfaction with public governance.

We must emphasize that the above sequence of five themes is not in order of perceived priority. And the ordering is not indicative of relative importance of each theme.

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Rationalising Major Categories of Attributes or Indicators of a Global Liveable City

Theme 1: The Degree of Satisfaction with the Freedom from Want

- The term "freedom from want" is from the 1941 speech by U.S. President Franklin Roosevelt who identified four kinds of freedom as the inherent rights of people: freedom from want, freedom from fear, freedom from worship and freedom to speak.

- "Freedom from want" captures the right to a decent livelihood. More broadly, this theme emphasizes people's craving for creature comforts (material abundance). The degree that this craving is satisfied is, in large part, determined by the income level and the growth rate of income: two issues that are central to the field of economics.

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Theme 2: The Degree of Satisfaction with the State of the Natural Environment and Its Management

- This theme captures not only the desire of people for responsible stewardship of the environment for the welfare of future generations but also the aesthetic appreciation of nature by people.

- Furthermore, biological survival of the human species requires that the selfish gene in the human species restrains itself adequately because of its understanding of systemic sustainability (the inter-connectedness of life across species).

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Theme 3: The Degree of Satisfaction with the Freedom from Fear

- This theme captures the natural right of people to live in safety through the maintenance of law and order, the alleviation of natural disasters, and the prevention of wars by the state.

- The absence of such psychological pressures in a city increases its liveability in the same way that an improvement in the economic prospects of a city increases its liveability.

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Theme 4: The Degree of Satisfaction with the Socio-Cultural Conditions

- For a city, this theme stresses
  - (a) the social comfort of living there (e.g., degree of income inequality, social harmony, and social mobility);
  - (b) the physical ease of living there (e.g., adequacy of mass transit, healthcare, and education);
  - (c) the cultural richness of living there (e.g., amount of social diversity, acceptance of different religious beliefs, and access to museums and cultural performances).

- This theme subsumes Franklin Roosevelt's third natural right, "the freedom to worship".

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Theme 5: The Degree of Satisfaction with Public Governance

- This theme covers the effectiveness of the government in providing public services (e.g., extent of corruption and quality of judiciary system); the responsiveness of the government (e.g., degree of transparency and accountability); and the openness to political participation (e.g., existence of organized opposition, and regular elections that are free and fair).

- This theme subsumes Franklin Roosevelt's fourth natural right, "the freedom to speak".

Rationalising Major Categories of Attributes or Indicators of a Global Liveable City

We shall adopt a terminology for our five themes that is closer to the terms used by the major studies on the topic:

1. Use "Economic Vibrancy and Competitiveness" and "Freedom from Want" interchangeably;

2. Use "Environmental Friendliness and Sustainability" and "The State of the Natural Environment and Its Management" interchangeably;

3. Use "Domestic Security and Stability" and "Freedom from Fear" interchangeably;

4. Use "Socio-Cultural Conditions" in the sense we have defined above;

5. "Public Governance" in the sense we have defined above.

Rationalising Major Categories of Attributes or Indicators of a Global Liveable City

Indicators for the five categories:

- 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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A Literature Survey on Existing Published Indices or Studies for Liveable 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 of 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 liveable 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 is on economic competitiveness and very little if not none is being included on role of government.

- The Mercer HR study which essentially deals 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.

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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	

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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

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

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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 idenitfy 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

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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. Socioeconomic 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

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

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How Global Liveable Cities (GLC) Index would Differ from other Published Indices or Studies?

Our proposed GLC Index is comparatively pioneering and timely because

1. We adopt the perspective of an average resident in the city, who, unlike a member of the elite, has to be concerned about stretching his/her budget, and is interested in issues like the average quality of education, the adequacy of the mass transit system, and the cost of healthcare.

2. We are more comprehensive and balanced in terms of wider categories of indicators adopted.

3. We are more constructive in terms of methodology used involving "what-if" simulations on identifying the weakest indicators for improvement and reform.

4. Extensive in geographical coverage of cities in particular by including those Asian emerging cities from India and China.

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.

Framework for constructing Global Liveable Cities (GLC) Index

(1) Economic Vibrancy & Competitiveness	(2) Environmental Friendliness & Sustainability	(3) Domestic Security & Stability	(4) Socio-Cultural Conditions	(5) Public Governance
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	

The Research Framework: Ideal versus Practical Indicators for Global Liveable 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 liveability 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 ideal 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, the selection of relevant indicators is 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.

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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				

Data Sources, Data Constraints and Data Proxies

- Indicators adopted would primarily based 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 Liveable 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 nor 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.

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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.

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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 Krugman. 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.

- 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 track 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.

List of 64 Global Cities in GLC Index

	Name of Cities	Name of Country or Economy		Name of Cities	Name of Country or Economy
1	Abu Dhabi	UAE	17	Copenhagen	Denmark
2	Ahmedabad	India	18	Damascus	Syria
3	Amman	Jordan	19	Delhi	India
4	Amsterdam	Netherland	20	Geneva	Switzerland
5	Auckland	New Zealand	21	Guangzhou	China
6	Bangalore	India	22	Hanoi	Vietnam
7	Bangkok	Thailand	23	Helsinki	Finland
8	Barcelona	Spain	24	Ho Chi Minh City	Vietnam
9	Beijing	China	25	Hong Kong	China, Hong Kong SAR
10	Berlin	Germany	26	Incheon	Korea
11	Boston	USA	27	Istanbul	Turkey
12	Buenos Aires	Argentina	28	Jakarta	Indonesia
13	Cairo	Egypt	29	Jerusalem	Israel
14	Chennai	India	30	Karachi	Pakistan
15	Chicago	USA	31	Kuala Lumpur	Malaysia
16	Chongqing	China	32	L.A	USA

List of 64 Global Cities in GLC Index (cont'd)

	Name of Cities	Name of Country or Economy		Name of Cities	Name of Country or Economy
33	London	United Kingdom	49	Riyadh	Saudi Arabia
34	Luxembourg	Luxembourg	50	Rome	Italy
35	Madrid	Spain	51	Sao Paulo	Brazil
36	Manila	Philippines	52	Seoul	Republic of Korea
37	Melbourne	Australia	53	Shanghai	China
38	Mexico City	Mexico	54	Shenzhen	China
39	Moscow	Russia	55	Singapore	Singapore
40	Mumbai	India	56	Stockholm	Sweden
41	Nanjing	China	57	Sydney	Australia
42	New York	USA	58	Taipei	Chinese Taipei
43	Osaka-Kobe	Japan	59	Tianjin	China
44	Paris	France	60	Tokyo	Japan
45	Philadelphia	USA	61	Vancouver	Canada
46	Phnom Penh	Cambodia	62	Washington DC	USA
47	Prague	Czech	63	Yokohama	Japan
48	Pune	India	64	Zurich	Switzerland

Research Findings

- 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

Name of Cities	Region	Overall Livability	
		Score	Rank
Tokyo	Asia	18.60	18
L.A	North America	18.80	19
Philadelphia	North America	21.40	20
Yokohama	Asia	21.40	20
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
Incheon	Asia	27.40	31
Abu Dhabi	Mid east	32.00	32
Kuala Lumpur	Asean	32.00	32
Rome	Europe	34.00	34

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Research Findings

Name of Cities	Region	Overall Livability	
		Score	Rank
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
Ahmedabad	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
Pune	Asia	48.20	47

Name of Cities	Region	Overall Livability	
		Score	Rank
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

- 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.

Agenda and Strategies Going Forward

- To live a life to the fullest, the lifestyle has to be in accordance with the multi-dimensional human nature.

- GDP should not be the only KPI for local government.

- ACI plans to extend ACI's Global Liveable Cities Index where by 200 cities of different sizes cutting across major continents including Europe, Americas, Asia and Middle East. International and emerging cities will be ranked and simulated to see how each city can further improve its liveability.

- 100 Greater China Cities, 30 South East Asian cities and 20 Middle Eastern cities will be separately ranked and simulated as these are rapidly growing cities which needed identification on weakness and reform measures most.

List of 100 Greater China Cities (Primarily based on Gross Regional Product, adjusted to include all the capitals)

	Name of Cities	Name of Economy			Name of Cities	Name of Economy
1	Shanghai	Shanghai		17	Ningbo	Zhejiang
2	Beijing	Beijing		18	Shenyang	Liaoning
3	Hong Kong	Hong Kong		19	Changsha	Hunan
4	Guangzhou	Guangdong		20	Tangshan	Hebei
5	Shenzhen	Guangdong		21	TaiPei	Taiwan
6	Tianjin	Tianjin		22	Zhengzhou	Henan
7	Suzhou	Jiangsu		23	Yantai	Shandong
8	Chongqing	Chongqing		24	Dongguan	Guangdong
9	Hangzhou	Zhejiang		25	Jinan	Shandong
10	Chengdu	Sichuan		26	Quanzhou	Fujian
11	Wuxi	Jiangsu		27	Harbin	Heilongjiang
12	Wuhan	Hubei		28	Shijiazhuang	Hebei
13	Qingdao	Shandong		29	Nantong	Jiangsu
14	Foshan	Guangdong		30	Changchun	Jilin
15	Dalian	Liaoning		31	Kaohsiung	Taiwan
16	Nanjing	Jiangsu		32	Xi'an	Shaanxi

Lee Kuan Yew
School of Public Policy
ASIA COMPETITIVENESS INSTITUTE

NUS
National University
of Singapore

List of 100 Greater China Cities (cont'd)

	Name of Cities	Name of Economy		Name of Cities	Name of Economy
33	Daqing	Heilongjiang	49	Linyi	Shandong
34	Fuzhou	Fujian	50	Luoyang	Henan
35	Hefei	Anhui	51	Nanchang	Jiangxi
36	Changzhou	Jiangsu	52	Jiaxing	Zhejiang
37	Xuzhou	Jiangsu	53	Dongying	Shandong
38	Weifang	Shandong	54	Yangzhou	Jiangsu
39	Wenzhou	Zhejiang	55	Cangzhou	Hebei
40	Shaoxing	Zhejiang	56	Xiamen	Fujian
41	Zibo	Shandong	57	Kunming	Yunnan
42	Taichung	Taiwan	58	Jinhua	Zhejiang
43	Ordos	Inner Mongolia	59	Baoding	Hebei
44	Baotou	Inner Mongolia	60	Taizhou, Jiangsu	Jiangsu
45	Jining	Shandong	61	Anshan	Liaoning
46	Taizhou	Zhejiang	62	Macau	Macau
47	Handan	Hebei	63	Zhenjiang	Jiangsu
48	Yancheng	Jiangsu	64	Tai'an	Shandong

List of 100 Greater China Cities (cont'd)

	Name of Cities	Name of Economy
65	Yulin	Shaanxi
66	Nanning	Guangxi
67	Jilin City	Jilin
68	Nanyang	Henan
69	Zhongshan	Guangdong
70	Hohhot	Inner Mongolia
71	Yichang	Hubei
72	Xiangyang	Hubei
73	Weihai	Shandong
74	Huizhou	Guangdong
75	Taiyuan	Shanxi
76	Dezhou	Shandong
77	Liaocheng	Shandong
78	Yueyang	Hunan
79	Jiangmen	Guangdong
80	Binzhou	Shandong
81	Changde	Hunan
82	Zhangzhou	Fujian

	Name of Cities	Name of Economy
83	Maoming	Guangdong
84	Hengyang	Hunan
85	Zhanjiang	Guangdong
86	Urümqi	Xinjiang
87	Huaian	Jiangsu
88	Wuhu	Anhui
89	Langfang	Hebei
90	Xuchang	Henan
91	Liuzhou	Guangxi
92	Zhuzhou	Hunan
93	Zaozhuang	Shandong
94	Heze	Shandong
95	Guiyang	Guizhou
96	Lanzhou	Gansu
97	Yinchuan	Ningxia
98	Xining	Qinghai
99	Haikou	Hainan
100	Lasa	Tibet

List of 30 South East Asian Cities(All the capitals, adjusted to include other important cities in the region)

	Name of Cities	Name of Economy			Name of Cities	Name of Economy
1	Singapore	Singapore		16	Bangkok	Thailand
2	Vientiane	Laos		17	Phuket	Thailand
3	Phnom Penh	Cambodia		18	Chiang Mai	Thailand
4	Bandar Seri Begawan	Brunei		19	Hanoi	Vietnam
5	Jakarta	Indonesia		20	Ho Chi Minh City	Vietnam
6	Surabaya	Indonesia		21	Da Nang	Vietnam
7	Medan	Indonesia		22	Manila	Philippines
8	Denpasar (Bali)	Indonesia		23	Davao City	Philippines
9	Yogyakarta	Indonesia		24	Cebu	Philippines
10	Bandung	Indonesia		25	Bacolod	Philippines
11	Makassar	Indonesia		26	Iloilo City	Philippines
12	Palembang	Indonesia		27	Kuala Lumpur	Malaysia
13	Yangon	Myanmar		28	George Town	Malaysia
14	Naypyidaw	Myanmar		29	Malacca	Malaysia
15	Mandalay	Myanmar		30	Kota Kinabalu	Malaysia

List of 20 Middle Eastern Cities (All the capitals, adjusted to include other important cities in the region)

	Name of Cities	Name of Country or Economy
1	Abu Dhabi	UAE
2	Dubai	UAE
3	Amman	Jordan
4	Beirut	Lebanon
5	Cairo	Egypt
6	Damascus	Syria
7	Jerusalem	Israel
8	Kuwait City	Kuwait
9	Riyadh	Saudi Arabia
10	Jeddah	Saudi Arabia

	Name of Cities	Name of Country or Economy
11	Doha	Qatar
12	Manama	Bahrain
13	Muscat	Oman
14	Tehran	Iran
15	Istanbul	Turkey
16	Ankara	Turkey
17	Sana'a	Yemen
18	Rabat	Morocco
19	Tripoli	Libya
20	Tunis	Tunisia

List of 50 Cities in Europe, North America, South America, Oceania and Other Parts of Asia

	Name of Cities	Name of Country or Economy
1	Ahmedabad	India
2	Amsterdam	Netherland
3	Atlanta	USA
4	Auckland	New Zealand
5	Bangalore	India
6	Barcelona	Spain
7	Berlin	Germany
8	Boston	USA
9	Buenos Aires	Argentina
10	Chennai	India
11	Chicago	USA
12	Copenhagen	Denmark
13	Dallas	USA

	Name of Cities	Name of Country or Economy
14	Delhi	India
15	Geneva	Switzerland
16	Helsinki	Finland
17	Houston	USA
18	Incheon	Korea
19	Karachi	Pakistan
20	L.A	USA
21	London	United Kingdom
22	Luxembourg	Luxembourg
23	Madrid	Spain
24	Melbourne	Australia
25	Mexico City	Mexico
26	Miami	USA

List of 50 Cities in Europe, North America, South America, Oceania and Other Parts of Asia (cont'd)

	Name of Cities	Name of Country or Economy
27	Minneapolis	USA
28	Moscow	Russia
29	Mumbai	India
30	Nagoya	Japan
31	New York	USA
32	Osaka-Kobe	Japan
33	Paris	France
34	Philadelphia	USA
35	Prague	Czech
36	Pune	India
37	Rhine-Ruhr	Germany
38	Rome	Italy

	Name of Cities	Name of Country or Economy
39	San Francisco	USA
40	Sao Paulo	Brazil
41	Seattle	USA
42	Seoul	Republic of Korea
43	Stockholm	Sweden
44	Sydney	Australia
45	Tokyo	Japan
46	Toronto	Canada
47	Vancouver	Canada
48	Washington DC	USA
49	Yokohama	Japan
50	Zurich	Switzerland

Thank you!