

臺北市智慧運輸發展策略論壇

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首都智慧運輸願景 及策略綱要

For Taipei City on Smart Mobility Management

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首都智慧運輸願景及策略綱要

For Taipei City on Smart Mobility Management

by Dr. Bert J. Lim 林建山博士

- 一. 首都智慧行動願景與策略架構取向
- 二. 智慧城市發展與智慧行動建置
- 三. 首都智慧運輸的統理與監理
- 四. 臺北城市職能區分與特色配置智慧化
- 五. 整合型大眾運輸之智慧化策略
- 六. 整合型大眾運輸之智慧化管理
- 七. 智慧大眾運輸的支援體系與推動障礙



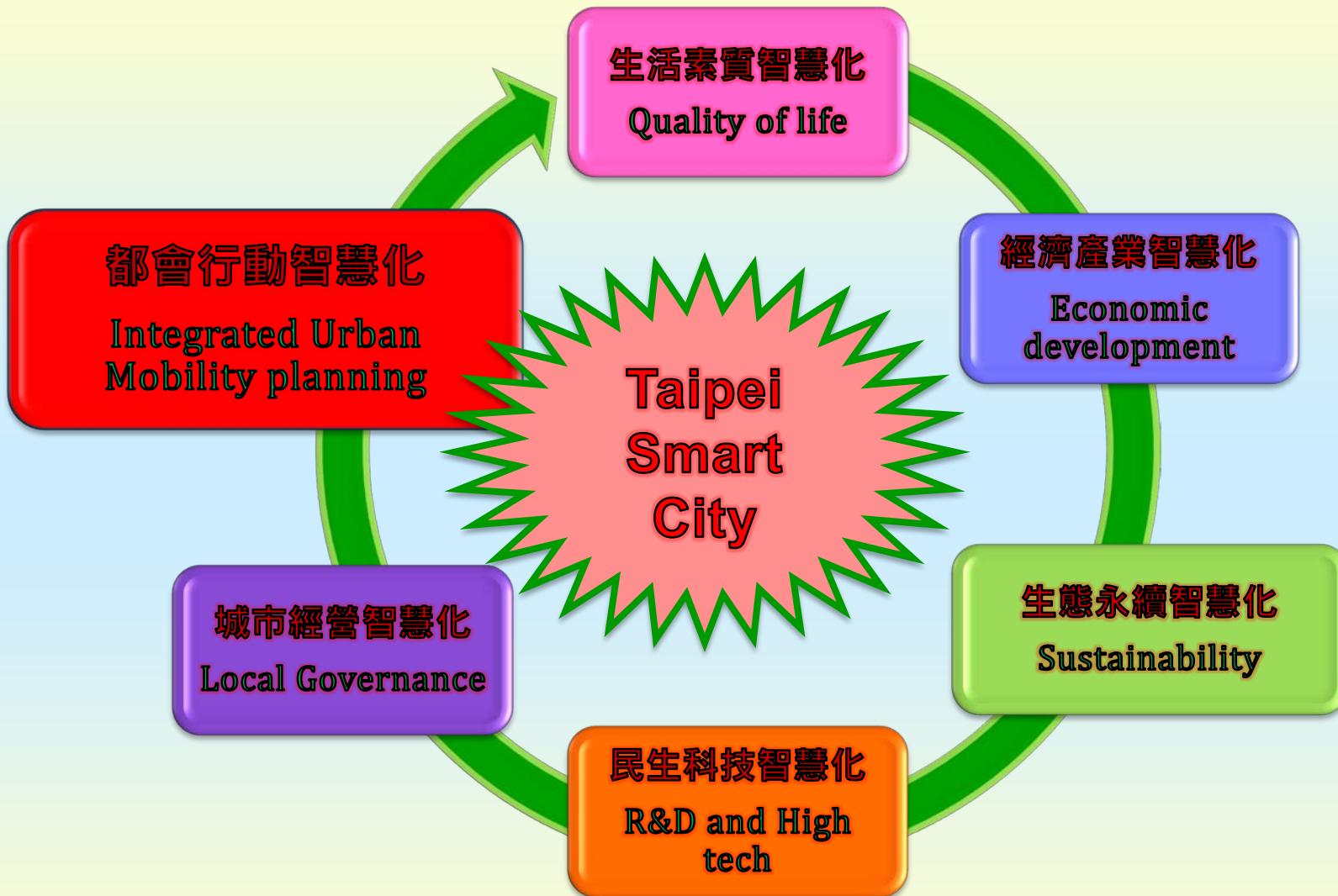
首都智慧行動願景
與策略的架構取向

Searching for a Smart Sustainable City



"A smart sustainable city is an innovative city that uses information and communication technologies (**ICTs**) and other means to improve quality of **life**, **efficiency** of urban **operation** and **services**, and **competitiveness**, while ensuring that it meets the needs of present and future generations **with respect to economic, social and environmental aspects.**"

首都臺北智慧城市



The transformation process towards a Smart City, which improves quality of life through **sustainable economic development** based on innovation and research and led by the local government in a process of integrated planning

資料來源：環球經濟社20160328 林建山博士Dr. Bert J. Lim研究彙整作圖 臺北市

Dr. Bert J. Lim 2016@ALL RIGHTS RESERVED

智慧城市之智慧行動 Smart Mobility Approach

Involving NEW MOBILITY SERVICES and IoT

ITS



基礎建設最佳化使用
Optimizing existing infrastructure

交通運輸管理精進
Improving transport management



New Smart Mobility IoT

架構都會經濟願景與策略的政策取向 確立規劃設想的原點

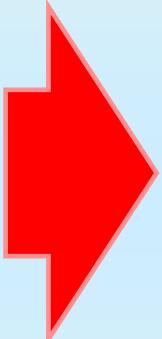
近期規劃

長程規劃

[過去+現在]

問題導向

壅塞/事故/意外/汙染



[現在+未來]

需求導向

秩序/安全/便捷/潔淨/人文

■ 布局戰略圖 Strategic Road Mapping

↔ 議題設定 Agenda Setting

智慧運輸之願景

效能

資源共享經濟性

效率

準時及時。無落差

安全秩序

低社會成本+高利潤

動態調節

供需均衡無壅塞

綠色經濟性

省能無碳低污染

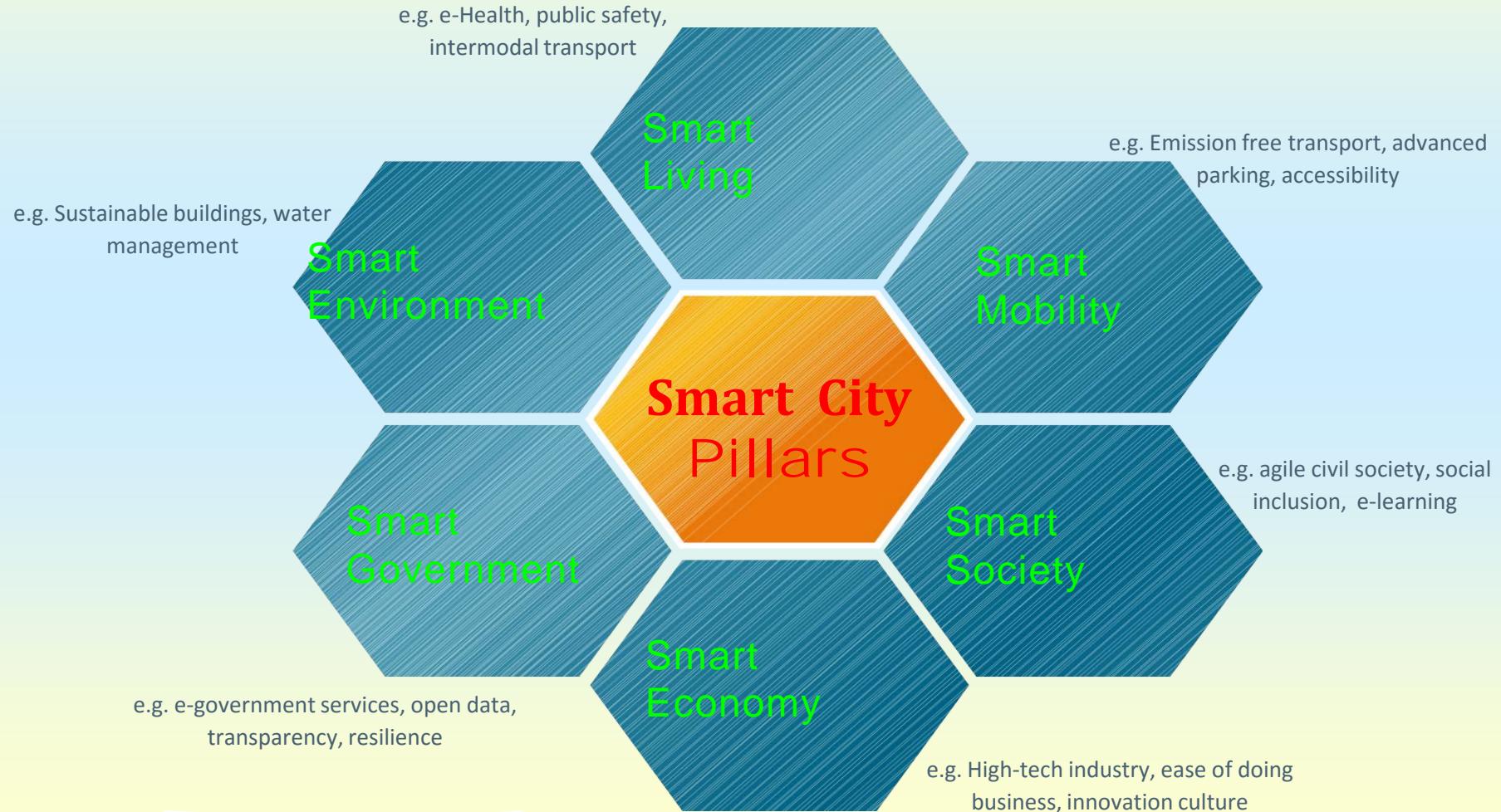


智慧城市發展與智 慧行動建置

Smart City Concepts

Smart City Concepts go beyond technologies and need to integrate also social and political aspects

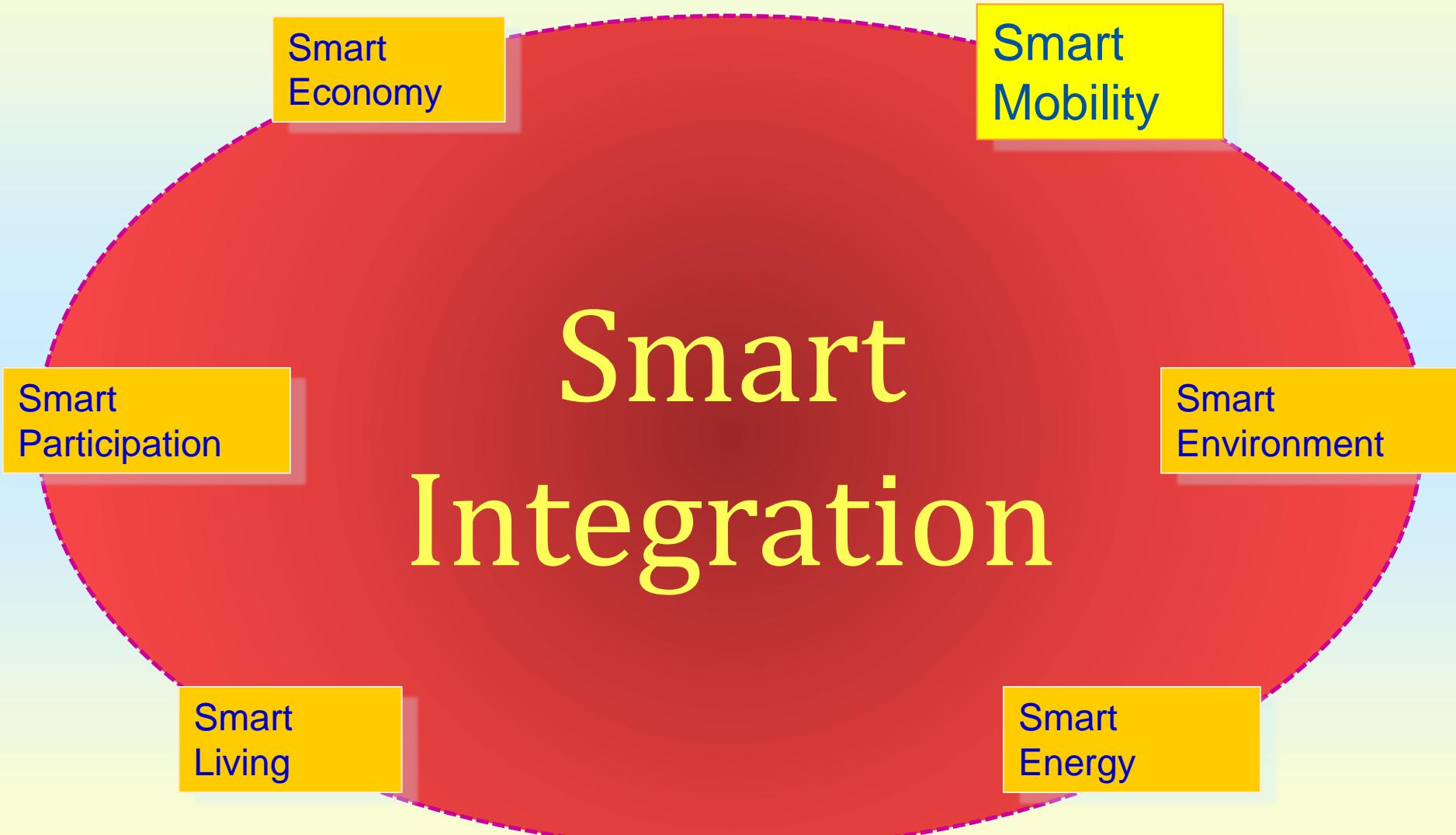
A city can be defined as 'smart' when social capital, traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic development and a high quality of life



智慧城市三大重要意涵

1. **Digital city:** it regards the use of ICT to support the creation of a wired, ubiquitous, interconnected network of citizens and organizations, sharing data and information and joining online services, supported by public policies such as e-government and e-democracy ;
2. **Green city:** it regards an ecological vision of the urban space, based on the concept of sustainable development. Green policies in city regard both reducing the city footprint on the environment, reducing pollution waste and energy consumption, and preserving or creating public green areas like parks and gardens ;
3. **Knowledge city:** it regards the policies aiming at enforcing and valuing data, information and knowledge available and produced in city, especially through its cultural institutions, but also produced and used by companies, innovative districts, technological parks.

Smart City : The systemic approach to city sustainability



Smart Society : Smart City to Smart Corridor

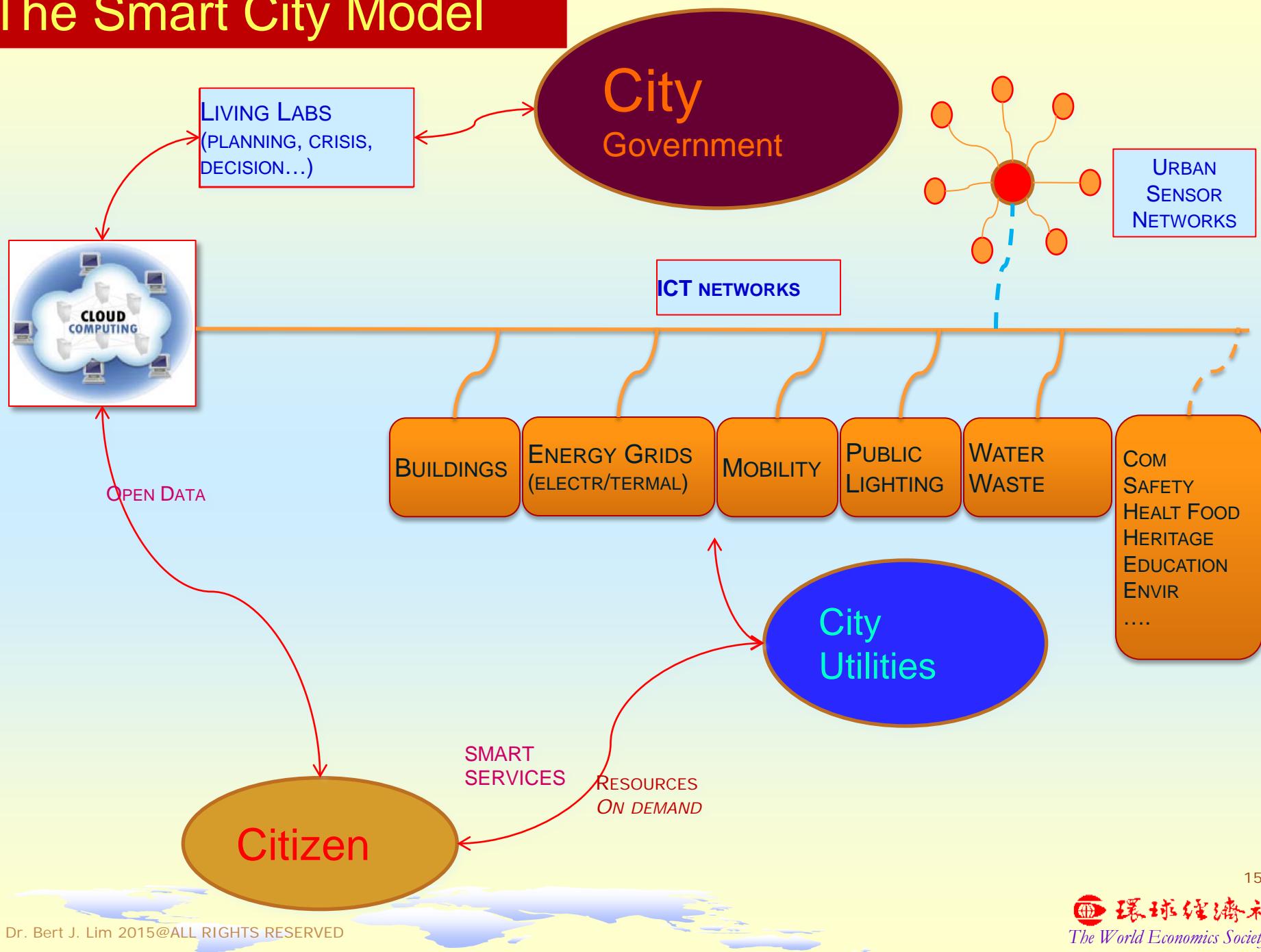


Smart Economy : Internet of Sectors

3

首都智慧運輸的統
理與監理

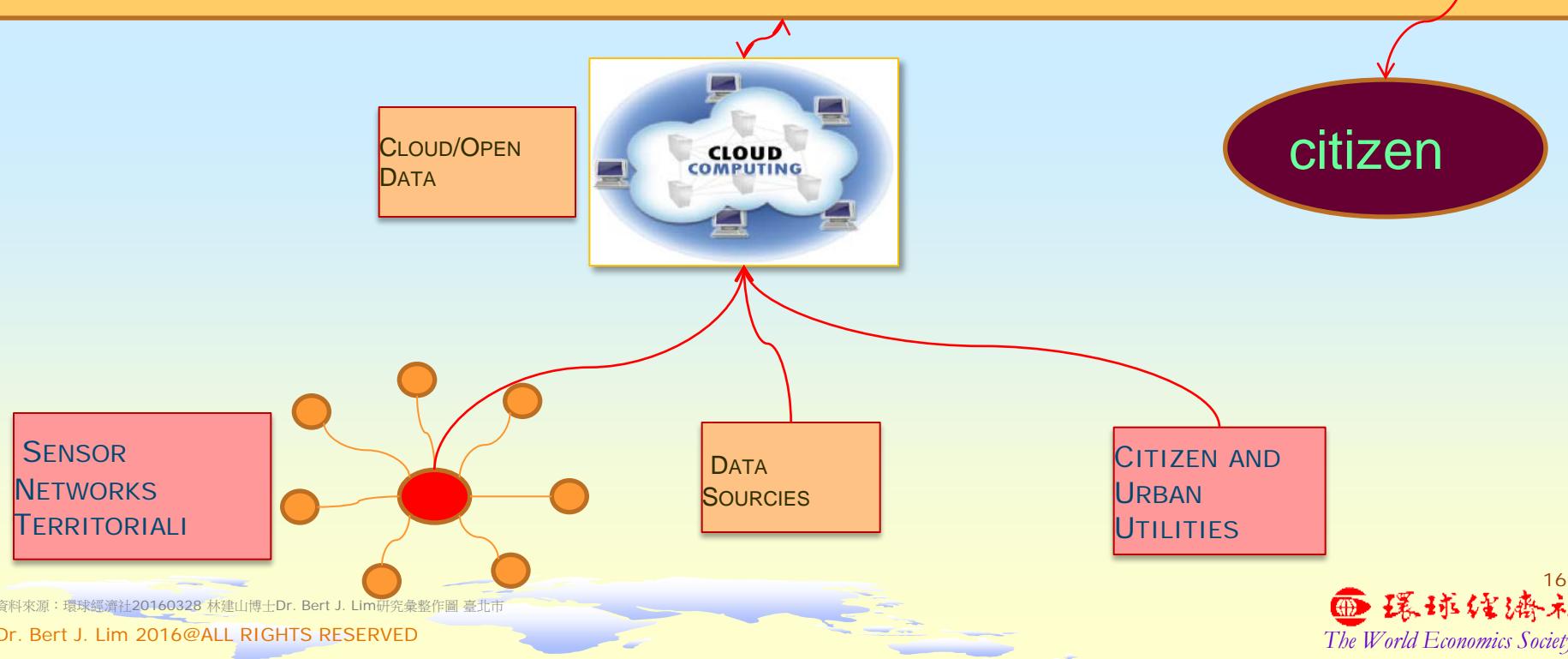
The Smart City Model



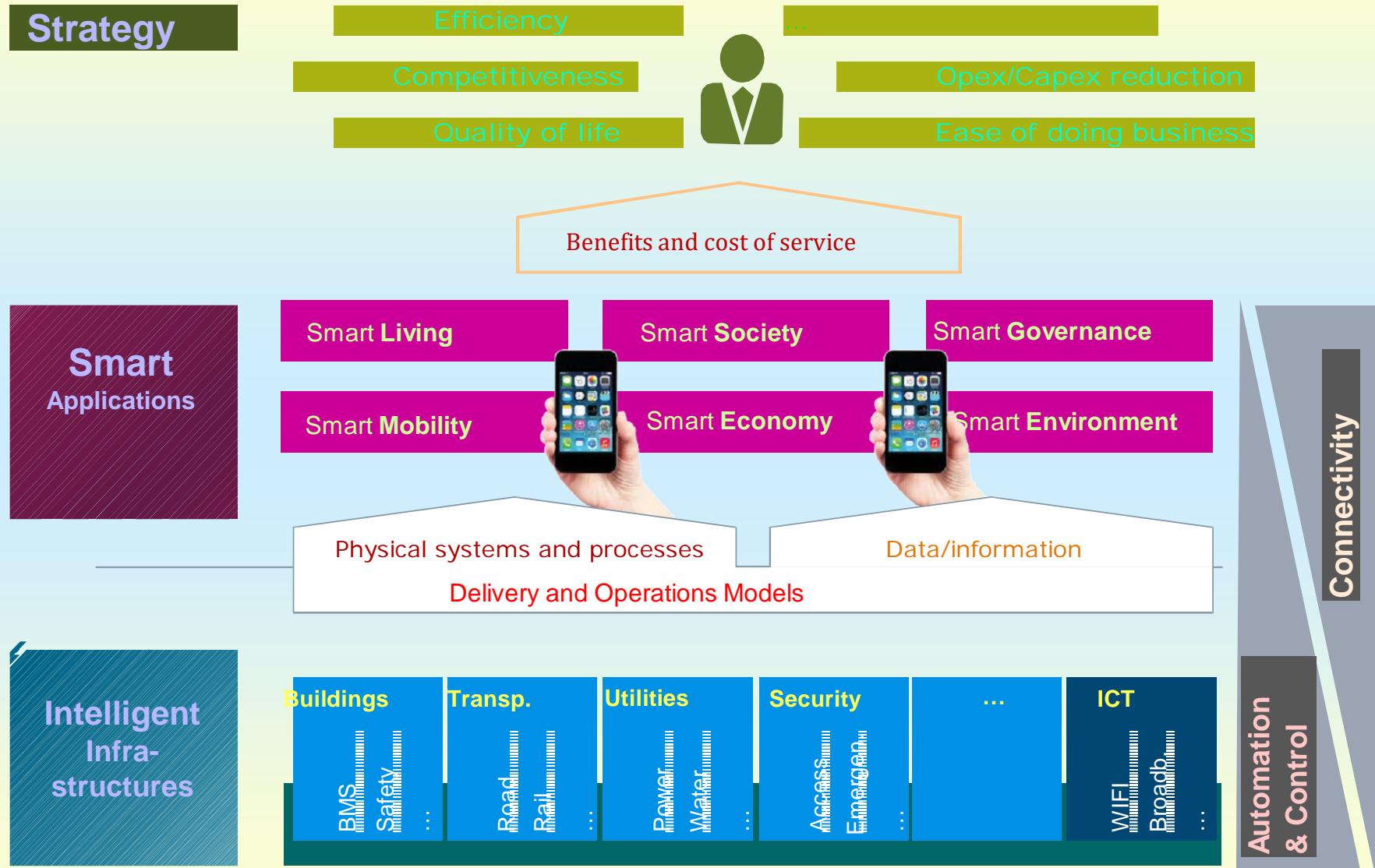
The Smart City Model

Urban Center
(city control, planning, crisis management)

Modelling

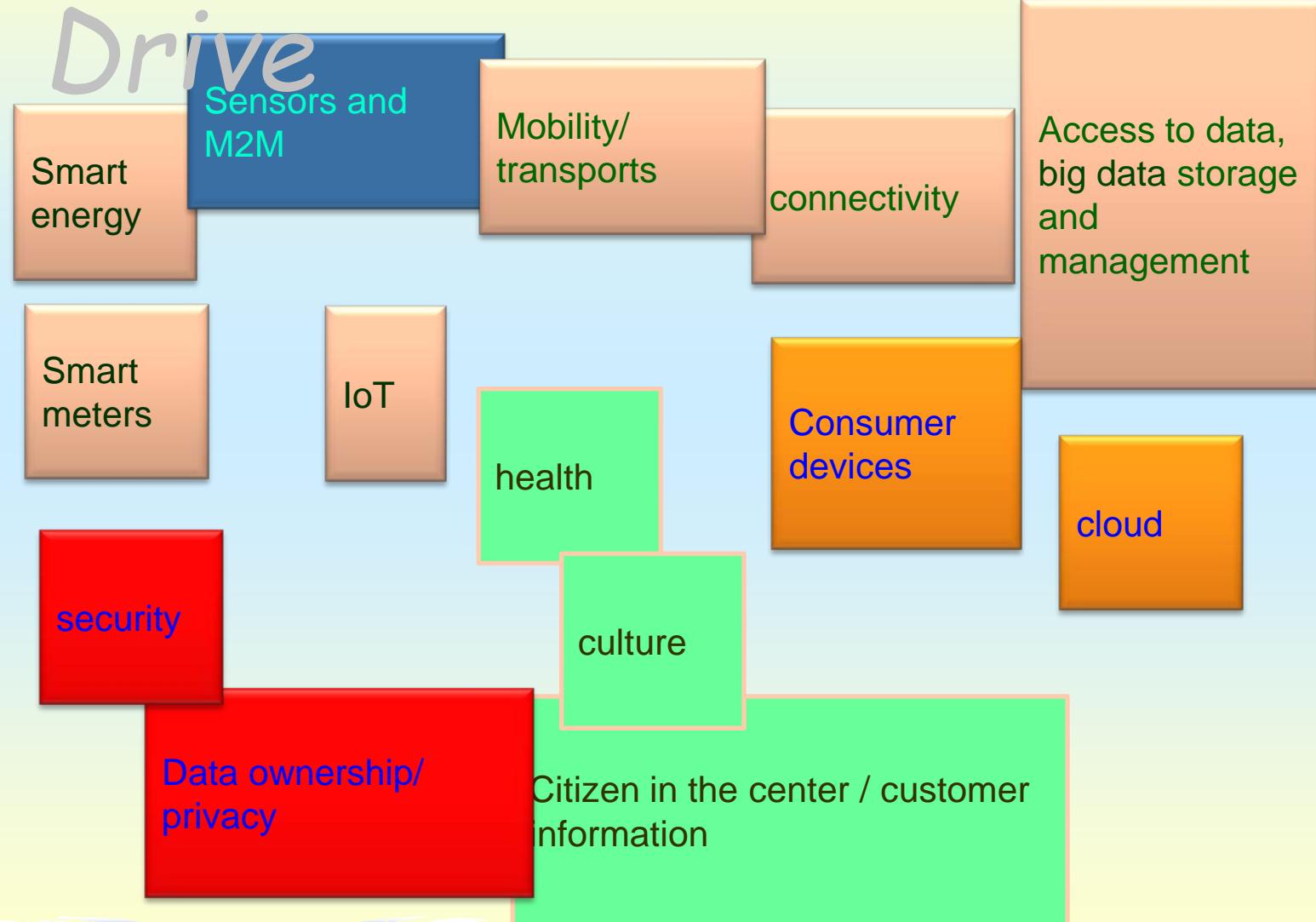


Smart City : based on Intelligent Infrastructures



Smart City : Marketizations Dual Driving Forces

GREEN ECONOMY

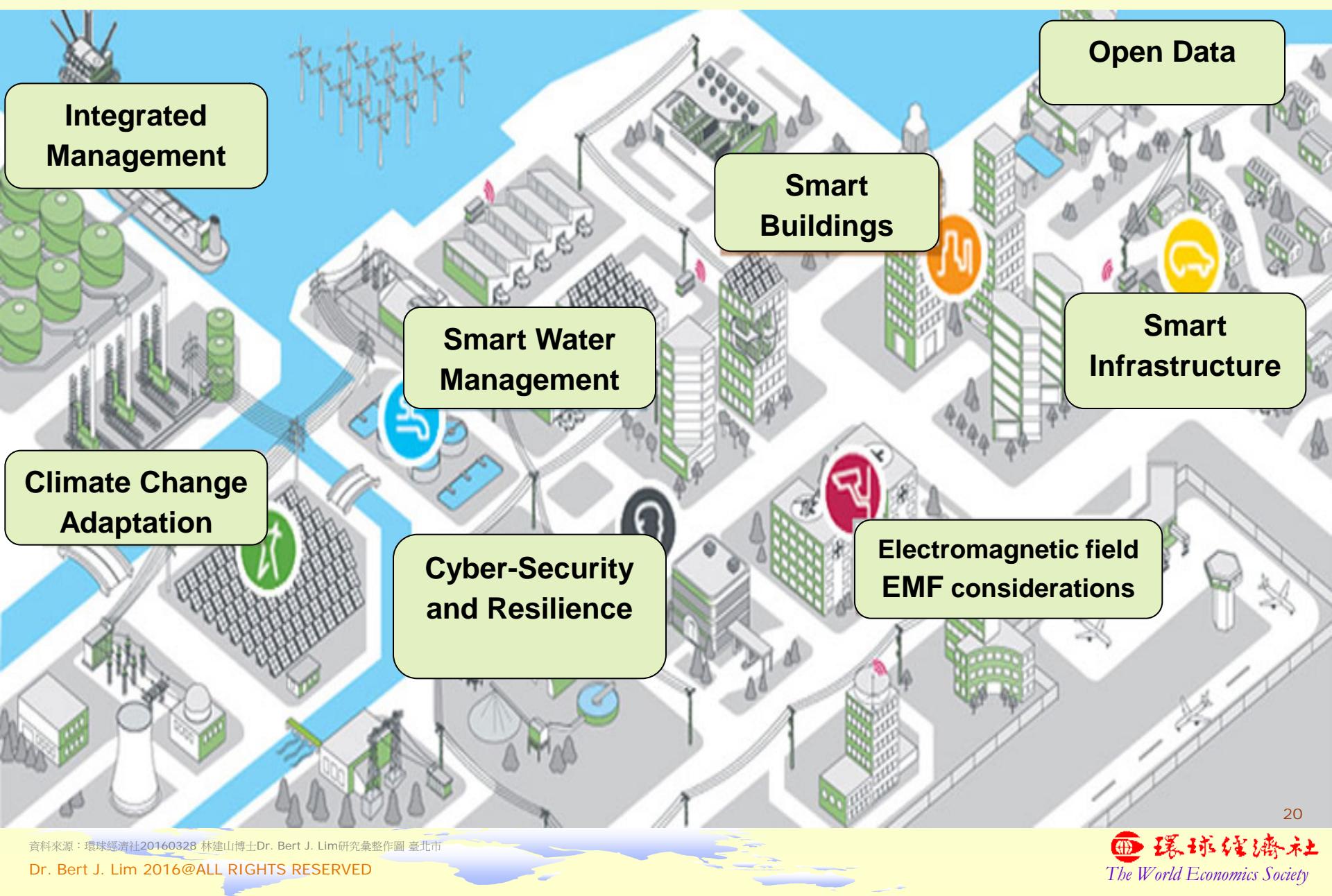


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臺北城市職能區
分區與特色配置智慧化

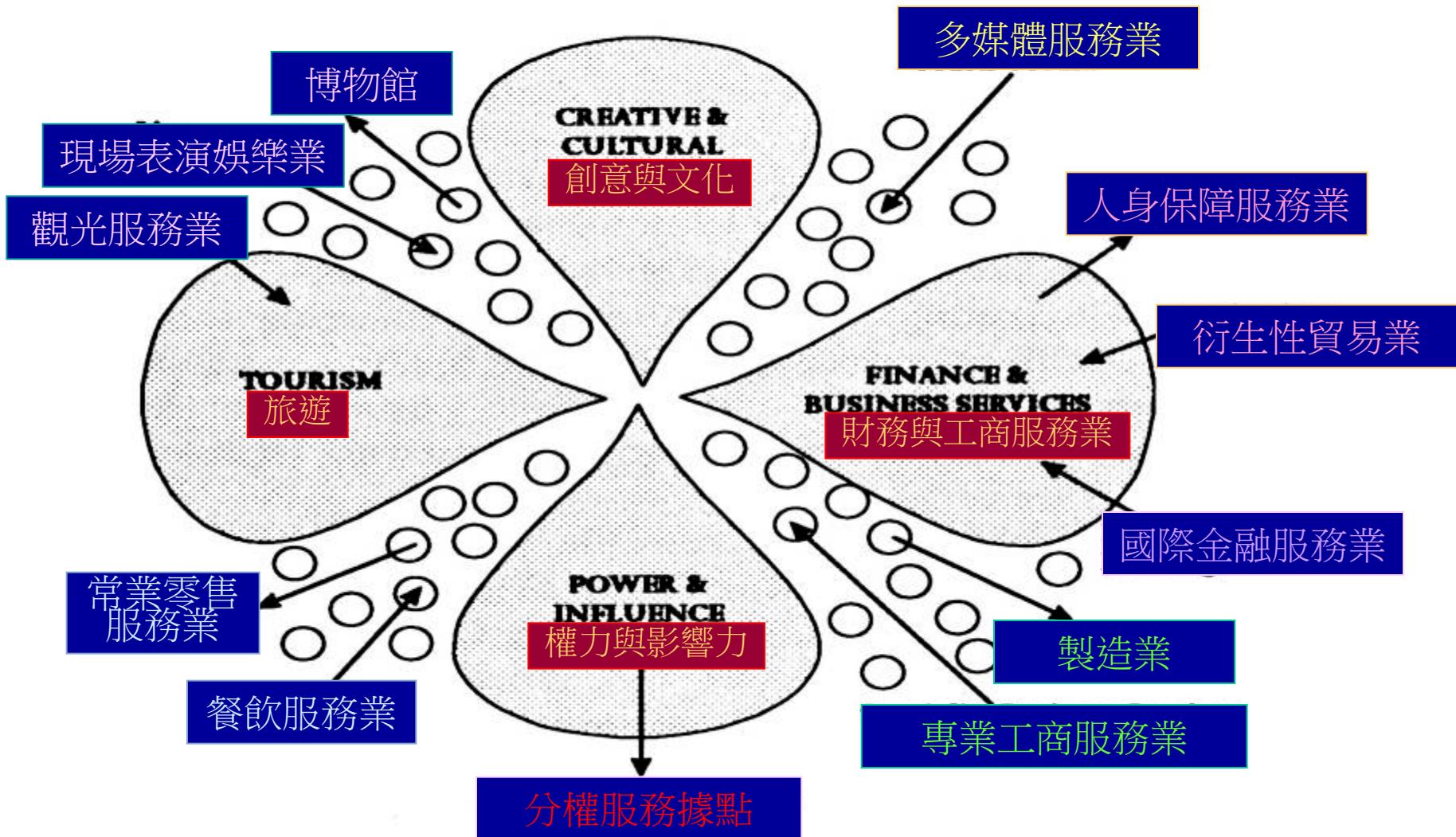
Smart City : Spatial Technology Applications



Smart City : Smart Mobility Functioning



ARINDAM



臺北市特色區位之商業發展策略



大臺北101創意商區為例

主要是以臺北市信義區中Taipei 101（全球第三高）為中心，加上周圍中興信義店、新光信義新天地A11館、新光信義新天地A8館、新光信義新天地A9館、新光信義新天地A4館、紐約紐約購物中心、Neo19及SOGO101店，所形成的商圈，結合台北世貿中心（世貿展覽館、國際會議中心、國際貿易大樓）及國際級旅館（如：台北君悅大飯店Grand Hyatt Taipei），加以規劃形塑為一巨型國際化優質商區。

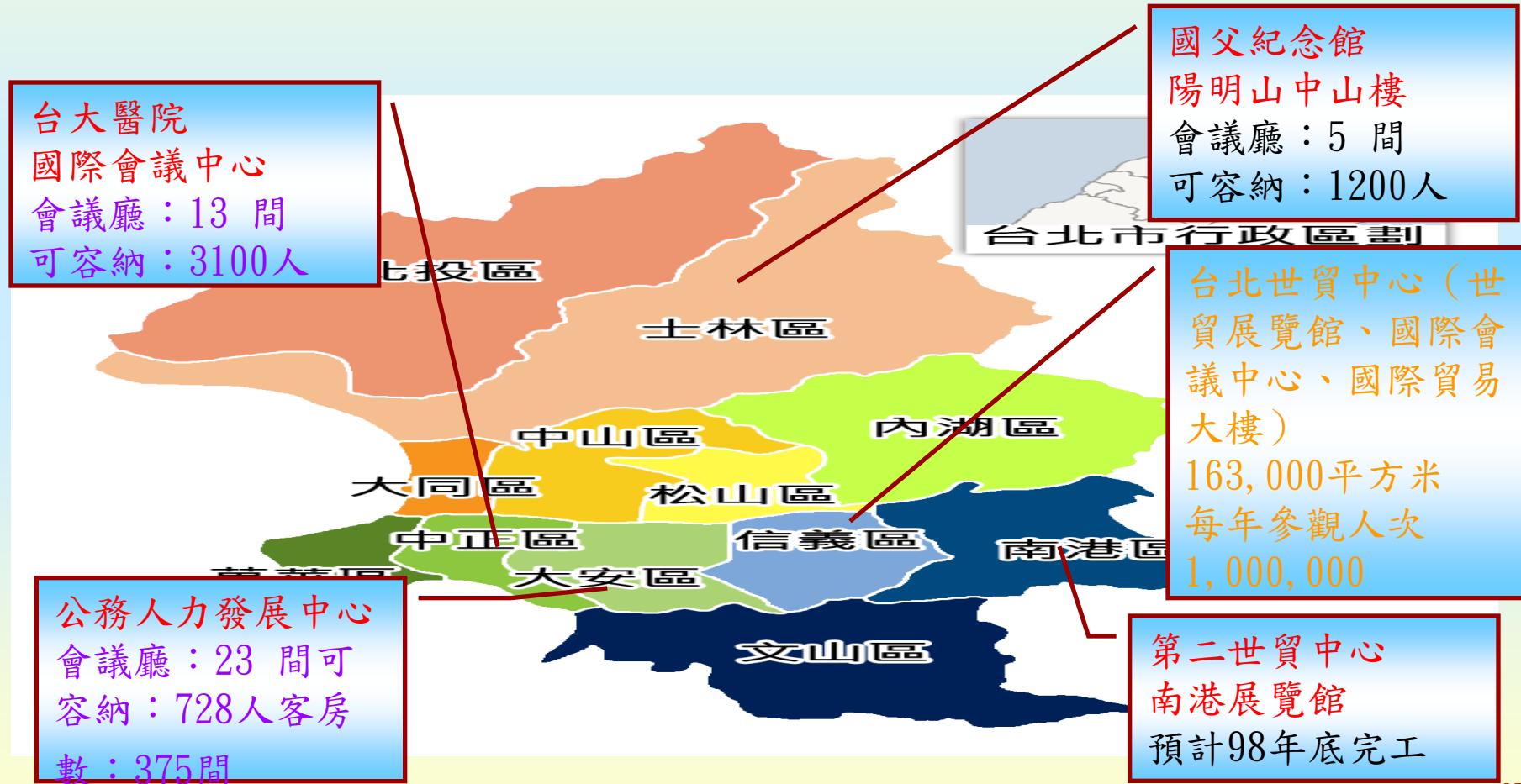


高密集知識新臺北國際會展特區為例

主要是以臺北市信義區及南港區作為規劃重心。

包含台北世貿中心（世貿展覽館、國際會議中心、國際貿易大樓）及第二世貿中心南港展覽館。

臺北市擁有「全球第二大電腦資訊展」的競爭優勢，此一重點規劃區域，應以「知識」作為特色及賣點。



5G

整合型太眾運輸之
智慧化策略

都會政策性整合型大眾運輸之智慧化

智慧城市的基本政策意涵

智慧化發展

智慧化營運

智慧化管理

- 規劃
- 投資
- 建設
- 永續維運條件
- 復正
- 加值升級

- 動線聯網
- 供需調適
- 均衡配置
- 內向外向調和
- 應變彈性
- 市場機制
- 成本效益性

- 智慧化監理
- 秩序維護
- 例外管理
- 異常處置
- 災防救濟
- 社會利潤最大化

台北市大眾運輸系統智慧化發展

社群聚落移動布局 Zoning Characterizing

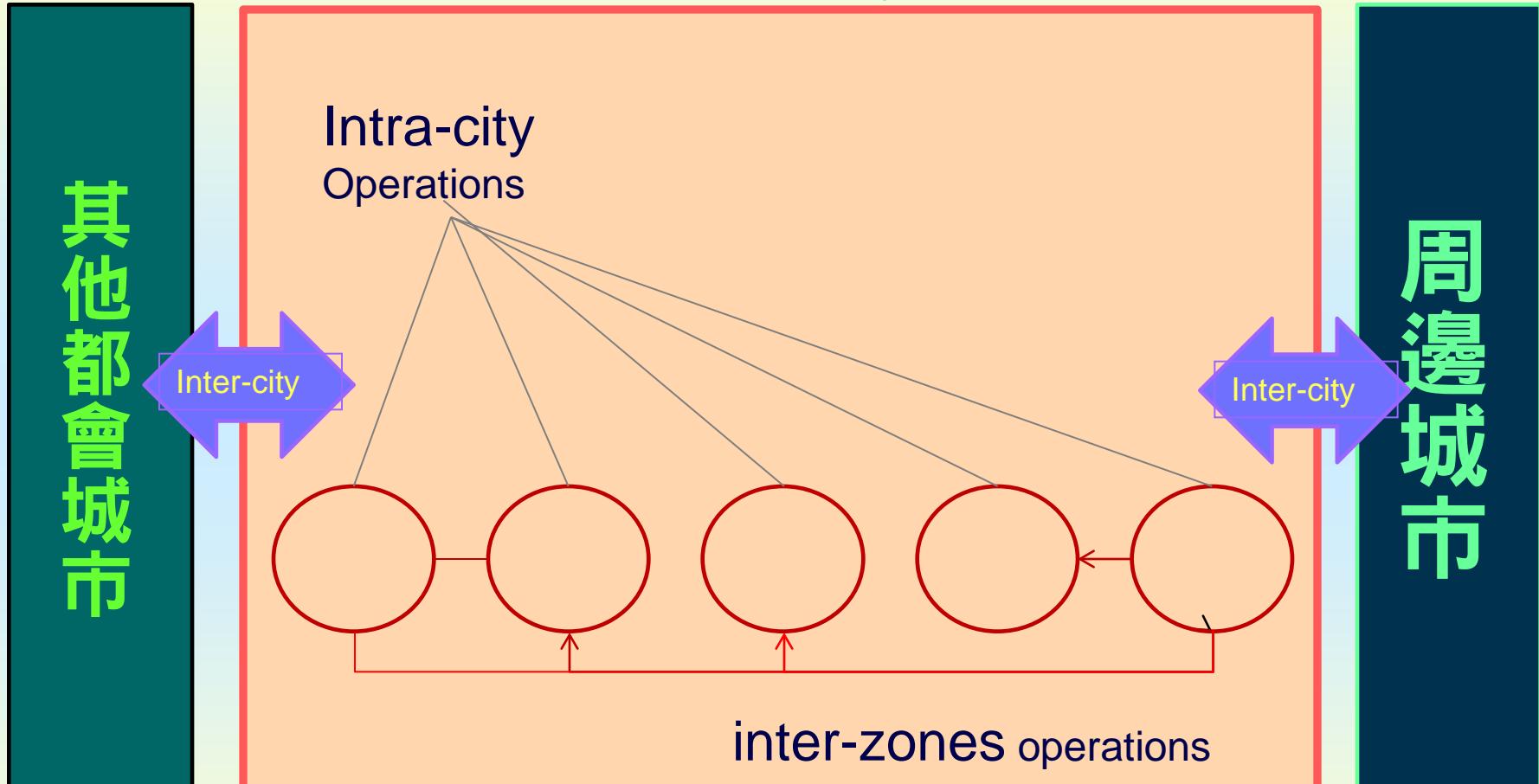
動態互聯網定義 Inter-connecting

骨幹服務系統配置 Backbone-Services

- 城市職能區位群聚布局分析
- 住民與日夜間旅次動向之運輸需求分析
(流量/頻率/時間/方向)
- 日週月年運輸需求之週期性
(大數據)
- 實體聯網之系統化
- 虛擬聯網之系統化
- 多運具組合之適配性
- 城際骨幹動脈
- 城內骨幹架構
- 分區支幹之流線型態
- 網絡密度

都會大眾運輸智慧化營運

Inner-city



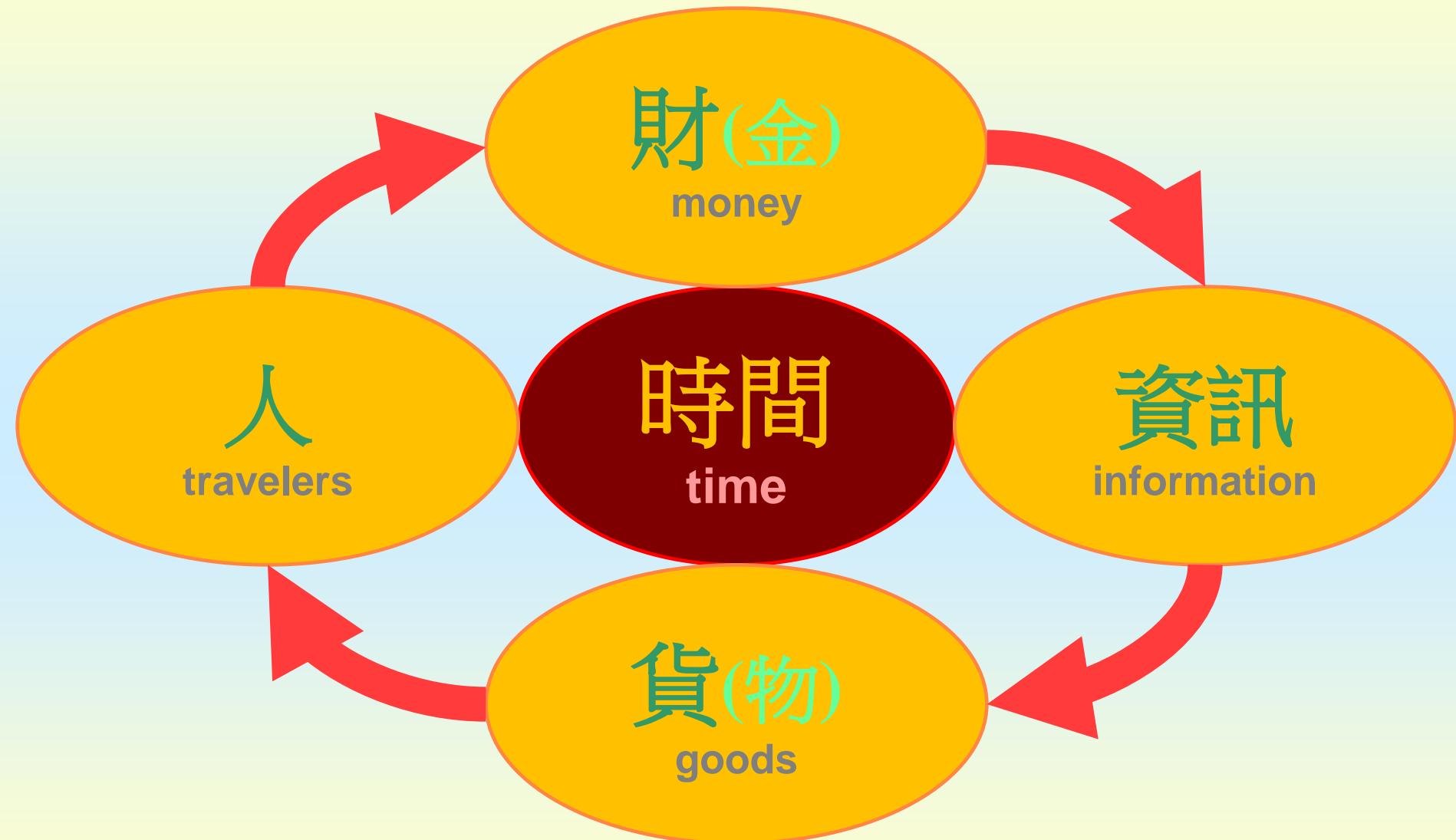
骨幹動脈

定制聯網

效能載具

複合模式

都會大眾運輸智慧化營運



周延 — 便捷 — 秩序 — 安全 — 通暢 — 優雅(文明)

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h

整合型大眾運輸之
智慧化管理

都會智慧運輸之智慧化管理

複合載具管理

時間均衡管理

準時/及時

管理客體

- 路/線/道/軌/網
- 旅次載具
- 旅次人

環境界面管理

汙染/人文/友善

流量流向管理

智慧城市智慧運輸建置之完整架構 : 瑞士之例 1/4

Table 1 Smart mobility taxonomy, ICT intensity and targets

	Intensity of ICT adopted	Benefits in Smart Mobility					
		Reduction of pollution	Reduction of congestion	Increased safety	Reduction noise pollution	Improving transfer speed	Reducing transfer costs
<i>1. Public mobility: vehicles and innovative transport solutions</i>	公共運輸載具之營運機制						
Electric vehicles	L	*			*		
Vehicles EUR 5	L	*			*		
Use of alternative fuels (LPG, methane, hydrogen, bio-diesel, fuel cell)	M	*					*
Vehicles with automated driving	M			*			
Integrated management of public transport vehicles	M	*	*	*	*		*
Collective taxis	L		*	*	*	*	*
Integrated ticketing system	M					*	*
<i>2. Private and commercial mobility: vehicles and innovative transport solutions</i>	私人載具及共享運輸機制						
Electric vehicles	L	*			*		
Vehicles EUR 5	L	*			*		
Use of alternative fuels (LPG, methane, hydrogen, bio-diesel, fuel cell)	L	*					
Vehicles with automated driving	M			*			
Car sharing (with georeferencing and geotagging)	L			*			*
Car pooling	L			*			*
Hire and ridesharing services	M			*			*
Bike sharing (with georeferencing and geotagging)		*	*		*		*

(continued)

資料來源 : Clara Benevolo, Renata Paola Dameri and Beatrice D'Auria, *Smart Mobility in Smart City, Action Taxonomy, ICT Intensity and Public Benefits*. Springer International Publishing Switzerland 2016.

智慧城市智慧運輸建置之完整架構 : 瑞士之例 2/4

Table 1 (continued)

	Intensity of ICT adopted	Benefits in Smart Mobility					
		Reduction of pollution	Reduction of congestion	Increased safety	Reduction noise pollution	Improving transfer speed	Reducing transfer costs
Piedibus	L			*	*	*	
Automotive navigation system		M			*		*
Eco-driving	L		*		*	*	
<i>3. Infrastructure and policies to support mobility</i>		基礎建設及政策措施事項					
<i>Infrastructure, changes and addressing mobility</i>							
Parking	L						
Park and ride	L		*	*		*	
Bicycle lanes	L		*	*	*	*	
Columns recharge electric vehicles	L		*				
Message signs about mobility		M		*			*
Integrated traffic lights		M	*	*			*
Pedestrian zones or auto-free zones	L		*		*	*	
Restricted (or limited) traffic zones	L		*		*	*	
Bus lane or bus only lane	L			*	*		*
Parking guidance system		M	*	*			
Systems for speed control and management		M		*			*
Mobility management based on the level of pollutant emissions	L		*				
<i>Integrated policies to support smart mobility initiatives</i>							
Traffic flows division (private, public, commercial)	L		*	*	*	*	
Integrated ticketing		M					*

(continued)

資料來源 : Clara Benevoli, Renata Paola Dameri and Beatrice D'Auria, *Smart Mobility in Smart City, Action Taxonomy, ICT Intensity and Public Benefits*. Springer International Publishing Switzerland 2016.

智慧城市智慧運輸建置之完整架構 : 瑞士之例 3/4

Table 1 (continued)

	Intensity of ICT adopted		Benefits in Smart Mobility					
			Reduction of pollution	Reduction of congestion	Increased safety	Reduction noise pollution	Improving transfer speed	Reducing transfer costs
tariff integration between public and private transport	M							*
Incentives for the use of less polluting fuels	L		*					
Control of emissions	L		*					
Speed limit sign	L				*			
Economic incentives and/or higher taxation measures (congestion pricing, ecopass, cordon pricing, road pricing, park pricing)	L		*	*				
Tax incentives and/or measures such as higher taxation on polluting fuels	L		*					*
Regulation of access (pedestrian areas, time bands, ZSL, STL)	M			*		*		
Redesign of city times (public schedules, school schedule etc.)	M		*	*	*			
Redesign of the city and its spaces (residential and industrial areas, integrated neighborhoods etc.)	M		*	*	*			*
4. Systems for collecting, storing and processing data, information and knowledge aimed to design, implement and evaluate policies and integrated initiatives of SM 整合性智慧運輸支援系統								
Demand control systems for access to reserved areas (cordón pricing, congestion pricing, electronic tolling, electronic tolling with GPS, pay as you drive)		H	*	*	*		*	
Integrated parking guidance systems	M	H		*	*	*	*	*

資料來源 : Clara Benevolo, Renata Paola Dameri and Beatrice D'Auria, *Smart Mobility in Smart City, Action Taxonomy, ICT Intensity and Public Benefits*. Springer International Publishing Switzerland 2016.

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智慧城市智慧運輸建置之完整架構 : 瑞士之例 4/4

Table 1 (continued)

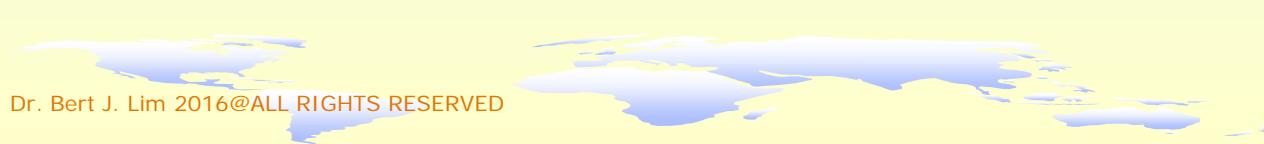
	Intensity of ICT adopted		Benefits in Smart Mobility					
			Reduction of pollution	Reduction of congestion	Increased safety	Reduction noise pollution	Improving transfer speed	Reducing transfer costs
Variable Message Signs (VMS)	M	H		*	*		*	
Urban Traffic Control (UTC)	M	H	*	*			*	*
Video surveillance systems for area and environment security	M	H			*	*		
Integrated systems for mobility management		H		*	*	*	*	*
Traffic data collection systems (section control, variable speed limit control, ramp metering etc.)	M	H		*	*			
Expert systems for the correlation and filtering of events (Automatic Incident Detection—AID)	M	H		*	*		*	
addressing and control systems of urban and suburban traffic (section control, ramp metering, variable speed limit, activation of the emergency lane for congestion)	M			*	*		*	
Systems for the management of fleets and logistic	M	H	*	*			*	*
Systems for managing fleets of vehicles of public transport adapted to UTC (system of planning, monitoring and reporting of public transport service, integrated electronic ticketing system, information system for users of public transport)	M		*	*			*	*

資料來源 : Clara Benevolo, Renata Paola Dameri and Beatrice D'Auria, *Smart Mobility in Smart City, Action Taxonomy, ICT Intensity and Public Benefits*. Springer International Publishing Switzerland 2016.

城市智慧運輸之基礎設施

Intelligent Transport Systems (ITS) are advanced applications to collect, storage and process data, information and knowledge aiming at planning, implementing ad evaluating integrated initiatives and policies of Smart Mobility. They are a large and heterogeneous set of applications, including:

- 運輸需求管控系統Demand control systems for access to reserved areas (cordon pricing, congestion pricing, electronic tolling, with GPS, pay as you drive);
- 整合性停車導引系統Integrated parking guidance systems;
- 可變訊息號誌系統Variable Message Signs (VMS);
- 城區流量管控系統Urban Traffic Control (UTC);
- 視訊監控系統Video surveillance systems for area and environment security;
- 智慧運輸管控整合系統Integrated systems for mobility management;
- 運輸流量數據收蒐集系統Traffic data collection systems;
- 運輸事件關聯性篩選過濾專家系統Expert systems for the correlation and filtering of events; etc.





智慧大眾運輸的支 援體系與推動障礙

臺北市大眾運輸智慧化之障礙

硬體條件障礙

軟體條件障礙

支援體系障礙

□ 智慧化基礎設施

- 系統標準化
- 模組標準化
- 無縫接軌
- 三合一聯繫互動

- 法規限制
- 民間參與障礙
- 安全豫防
- 執法能力

智慧大眾運輸的支援體系 (Behind the Scene)

可民間化

智慧科技發展

Advance
smart technology

國際接軌

基礎設施條件

Infrastructure

PPP體制
圓融豐沛

資訊無縫連結

Connectedness

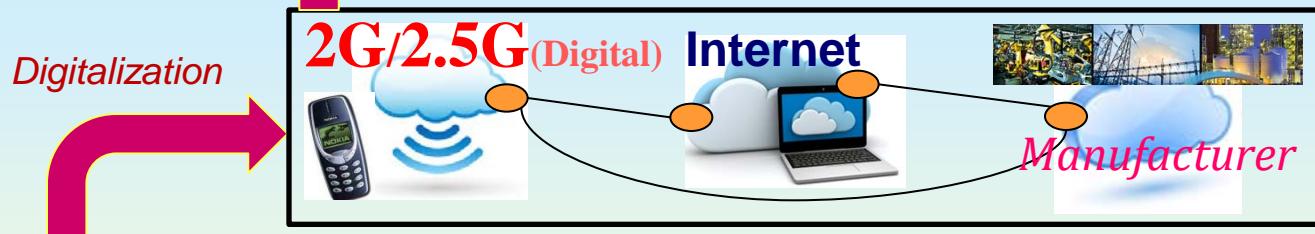
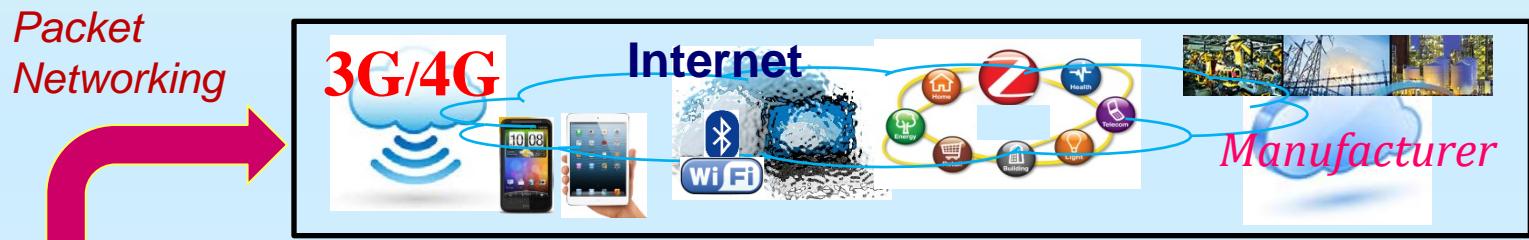
可產業化

智慧系統運用

Advanced smart
services system

可商業化

Wireless Evolution Taiwan : Technologies, Services and Business Models



臺北市智慧大眾運輸的全球接軌問題

美國政經傳動力探索研討會 WES2016 Dr. Bert J. Lim

必須符合

國際
規格

- specs
- standard

國際
規模

- scale

國際
規範

- righteousness
- postulate
- code

全球化國際接軌之系統、標準、規格問題

計畫期程之接軌
五年計畫・二十五年計畫
1996-2000, 2001-2005,
2006-2010, 2011-2015

西元與民國紀元
之錯差
一年差



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Thank You !
for Your Attention



財團法人環球經濟研究基金會

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第二次能源危機期間經濟部外銷服務團團長
第一個人壽保險股份有限公司常務董事
中國文化大學國際貿易學系主任

全國工業總會顧問
全國總經理評選委員會主席
全國傑出大學生評選委員會主任委員
全國立臺傳媒大學生評選處專任監事
行政院行政院長期資本運用工作小組委員
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教授課程：

經濟情勢與政策分析、人力開發與機制設計、世界經濟專題、專案經濟學、公共政策與事業策略抉擇、國家願景規劃與政府創新、願景與政策執行、創新與變革、Corporate Governance統理機制設計與管理、領袖領導力、比較經濟理論、財務設計與財源籌措理論

Vita

DR. BERT J. LIM [1949 -]

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Dr. Bert J. Lim is as an eminent scholar, mentor, columnist and a thinker, an institutionalist economist in applied economics and public policy study. He was born in eastern Taiwan in 1949. Reading up on public policy management at the University of Maryland on College Park and international policy study at the Oxford University, he then received his doctorate in Economics Management from LaSalle University, USA. As a professor of Economics and Policy with a focus on international issues and public affairs , Dr. Lim has been lecturing for more than three decades at universities in Taiwan. He serves concurrently as a chair professor and president of the World Economics Society — the top think tank on policy study for public sectors and private in Taiwan since 1974.

In the last decades, he worked with government agencies in different capacities as a director general, a special consultant, a chief counselor, a senior advisor, or a shepherd on national project. He chaired APEC Issue Four in 2001 Science & Technology Forum and had been the speakers to the OECD Seoul Convention, and the world congress ITS. Currently he shepherds the government programs to scrutinize government re-inventing, to gesture national globalization thrusts, and to develop national intelligent transportation infrastructure, NITI. He is still vividly an inspirational mentor and counselor to Taiwan's national federations of industries, national federations of services and top leading business consortia.

Having done extensive researches and traveling around the continents, Dr. Lim is an appointed Fellow of National Foresight Program for 21st Century. He has won more than a dozen honors and awards, and is the author of 21 books such as Project Economics, Economics for Regulation: Principles on Public Decision Making, Public Policy and Business Strategies Choices, Industrial Policy: Concepts and Issues in Taiwan, Business Forecasting, Searching for Economic Vitalization of the Nation, Business: Facts and Principles of Taiwan's Experience, Modern Services Marketing, Industrial Marketing, Global Marketing Strategies, National ITS Developing Planning and Make Market Marketable: Approaches to Privatization.

As a prolific writer and commentator, Dr. Lim joins editorial boards and committees of various newspapers and journals. He also hosted economic policy programs for Taiwan's major televisions.

Dr. Lim lives with his wife Que-Eng and daughter Suan in Taipei, Taiwan. He is a fair Chinese calligrapher and modern poet. He enjoys daily morning jogging for more than thirty years.



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林建山(DR. BERT J. LIM)，民國三十八(1949)年生，臺灣花蓮生長人氏，經濟管理學哲學博士 (PhD in Economics Management)，現任我國三大財經智庫財團法人環球經濟社社長兼公共政策研究所所長，是活躍於國內外的知名制度經濟學者、政經評論家、專欄作家，專注於公共政策、應用經濟與國際事務，美國聯邦政府韓福瑞獎金中華民國首位得主，美國聯邦智庫經濟評議會(The Conference Board)亞太經濟預測工作委員、中國傅爾布萊特學友會及美國馬里蘭大學在臺校友會理事、蘇聯遠東基金會臺灣地區秘書長，並任教政治大學、輔仁大學、文化大學商學院國際貿易學系主任，國立臺北大學籌備處專任顧問，國立東華大學校務顧問，加拿大公立皇家大學(RRU, Royal Roads University)教授，澳大利亞國立大學(ANU)應用經濟學教授，歷年講授課程有研究方法、經濟預測、政府與政策、創新管理與組織創新、民間化與民間參與、市場分析、全球化議題管理、國際經濟學、應用經濟學、產業政策、競爭研究、危機管理等，並長期從事專案經濟學、公共建設效益評估、財務規劃與BOT政策、民營化政策、勞動經濟學、永續發展政策及相關公共決策規劃研究工作。

林建山博士早年實際參與美國聯邦政府保健總署NIH新建專案規畫管理工作，旋任經濟部外銷服務團團長(1981)，環保署環境評估常任審查委員、勞委會職訓諮詢委員、國科會科學工業園區選址甄審委員、交通部方案財務顧問、僑委會華僑經濟發展委員會委員、外交部國際合作基金經濟發展研究班主任、國防部福利總處諮詢委員、經濟部國貿局與中小企業處顧問及多項政府部會顧問小組委員、全國工業總會顧問、國營事業董事、人壽保險公司常務董事、中華民國勞資關係協進會、環境管理學會、多國企業研究學會、行銷學會理監事及秘書長、行政院民營化政策指導小組工作委員、行政院施政品質評鑑委員、行政院人力評鑑小組委員、行政院中長期資金運用管理小組委員、2001年APEC政策論壇科技議題主席、國家科技計畫土木領域學門審查委員，對政府與民間財經決策參贊甚力且深入。他於開發中國家政府關係良篤，協助其經濟發展政策規畫並兼任多項顧問、諮詢委員，經常赴國際集會專題演講與研究，巡迴講學於東南亞、北美、中南美及西非地區。著作有「知識經濟學」「商情預測」「產業政策與產業管理」「現代服務業行銷學」「臺灣企業原理」「永續政策經濟學」「讓市場真正市場化」等二十一種，獲有國家人力創新傑出學人獎等十餘項榮譽與獎項，並經常著文評論時政議題，文章散見報章雜誌。

林建山博士現與妻徐嘉意女士、女林嗣園小姐定居臺北市。他熱愛晨跑運動，風雨不輟逾三十年，同時也是一位出色的業餘書法家與現代詩人（筆名余素）。



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財團法人環球經濟研究基金會

環球經濟社

環球經濟社創設於1974年，位列臺灣三大學術研究機構，以公共政策為基石，進行經濟、管理、法制、投資、環境資源及產業等科技整合的專業財經研究法人，目前擁有專職專業研究人員二十五人，博士七人，碩士九人等，長期提供專業研究、分析、規劃、評估、諮詢建議及顧問等服務。執行及參贊專案規畫七百餘件，委辦單位逾三千五百五十餘家，成功扮演經濟總顧問及財務總顧問角色。

WES, a top think tank for policy study on Taiwan since 1974, is specialist economics research and general consultancy with more than 30 professional faculties providing the following services:

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