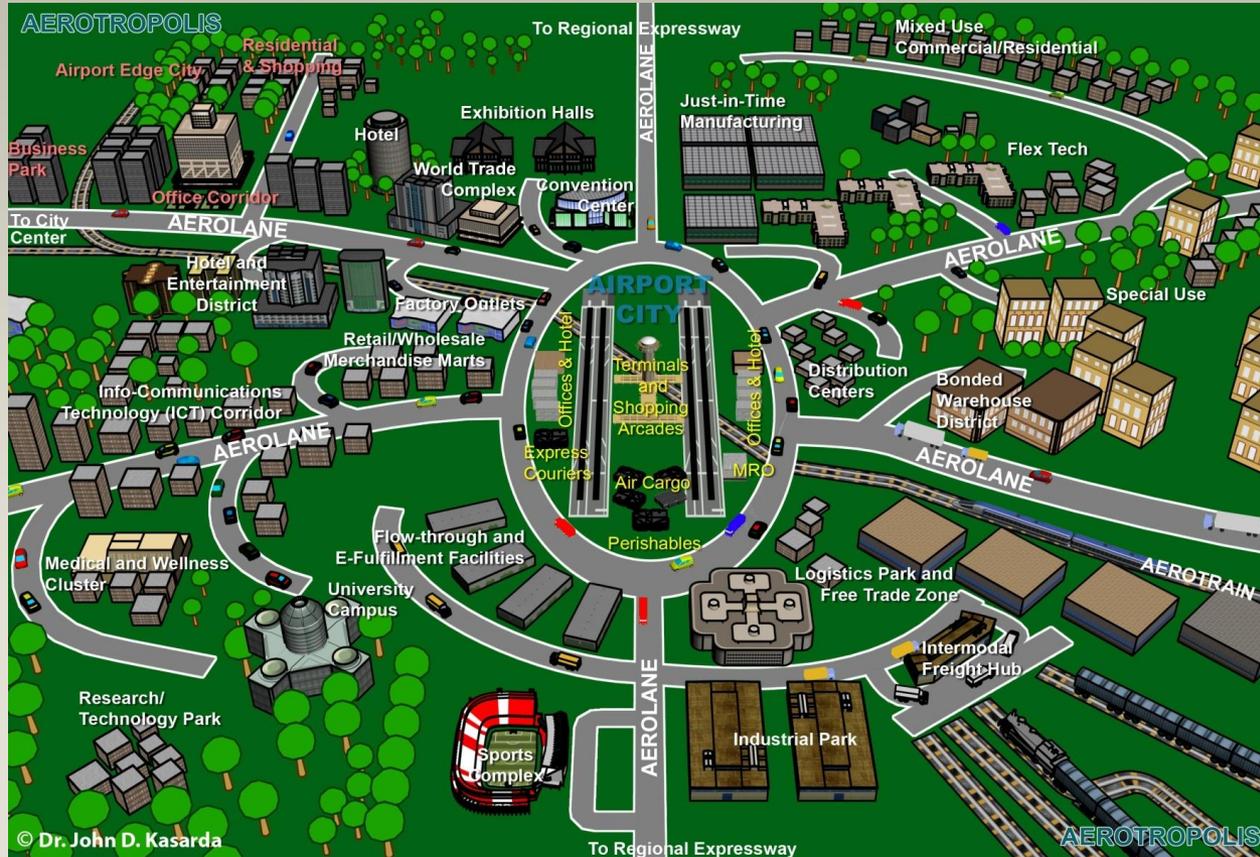


The Aerotropolis Strategy: Fostering Thailand's Competitiveness



What is an Aerotropolis?



An aerotropolis can be defined as a ...

“a multimodal freight and passenger transportation complex which supports efficient, cost-effective, sustainable development in a defined region of economic significance centered around a major airport.”

United States Congress H.R.658: Aerotropolis Act of 2011

But it is more than a transport complex: It is a strategy...

That is, an aerotropolis is a constellation of physical, institutional, and economic **interventions** which improve local and global accessibility and reduce ground-based, transport times and costs to leverage aviation-enabled trade in goods and services for business competitiveness, job creation and prosperity.

The Aerotropolis Model



- In essence, it is a strategic approach to enhancing urban and national competitiveness through improved multi-modal transport access and planned, coordinated aviation-linked commercial development, making the airport, surrounding areas, and the entire metropolitan region more economically efficient, attractive, and sustainable.
- Offers businesses located near or with good access to the airport with speedy connectivity to their suppliers, customers, and enterprise partners nationally and worldwide.
- Contains the full set of commercial facilities that support airlines and aviation-linked businesses as well as tens of millions of air travelers who pass through the airport annually.
- An Airport City developed at and immediately around the airport serves as the multimodal, multi-functional commercial nexus of the Aerotropolis anchoring aviation-enabled trade in goods and services, driving it throughout the region.

Aerotropolis Forms



1. Functional Form
 - Non-Spatial
2. Physical Form
 - Spatially Observable Development
3. Connections/Linkages
 - Air Routes
 - Highways
 - Rail Networks
 - Links to Ports



Aerotropolis Functional Form



- Consists of 3 analytically distinct but functionally interdependent stakeholders



- Each with specific, but not necessarily consistent, interests
- No single party controls the others

Key Stakeholder Interests



- **Airlines**

- Minimizing airport-related costs
 - Often disagree with air infrastructure and terminal upgrades
- Maximizing profits by minimizing competition
 - “Fortress” hubs
 - No Open Skies

- **Airports**

- Maximize return on assets
- Service debt
- Prestige and status via size/growth and quality awards

- **Region**

- Surrounding governments
 - Create jobs, attract investment, and improve tax base
 - Limit noise, congestion, and other environmental disamenities
- Landowners and developers
 - Maximize land values and profits



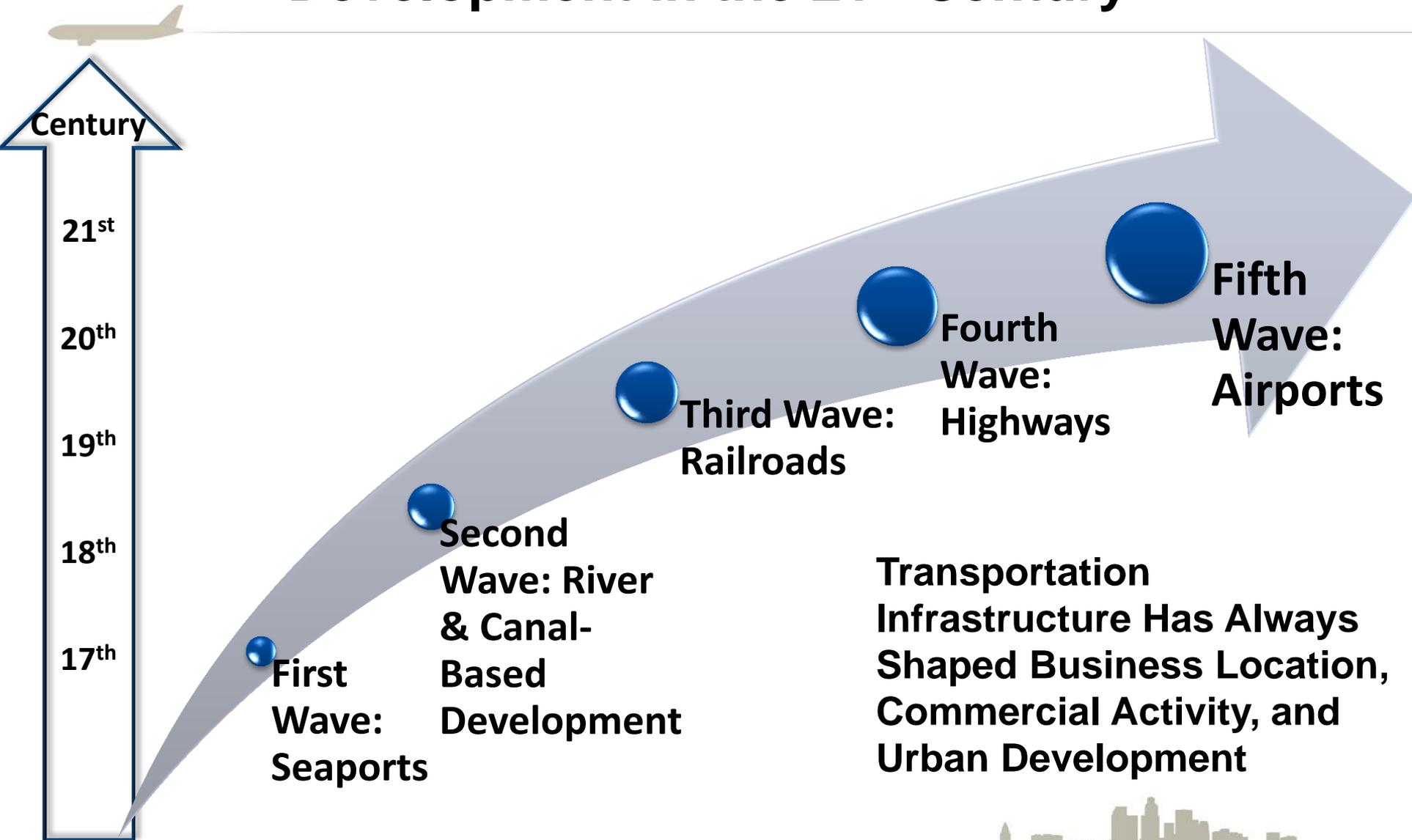
Aerotropolis Physical Form



Reflects:

- Needs and tensions of stakeholders
- Airport and airport-area land availability
- Surface transportation infrastructure & air routes
- Commercial real estate investment for
 1. Travelers (terminal retail: airside and landside)
 2. Air transport service providers (airlines, forwarders)
 3. Intensive air transport users (hotels, offices, logistics)
 4. Unrelated to air (big box retail, factory outlets)
- The fifth wave of transit-oriented development

The Fifth Wave of the Transit-Oriented Development in the 21st Century



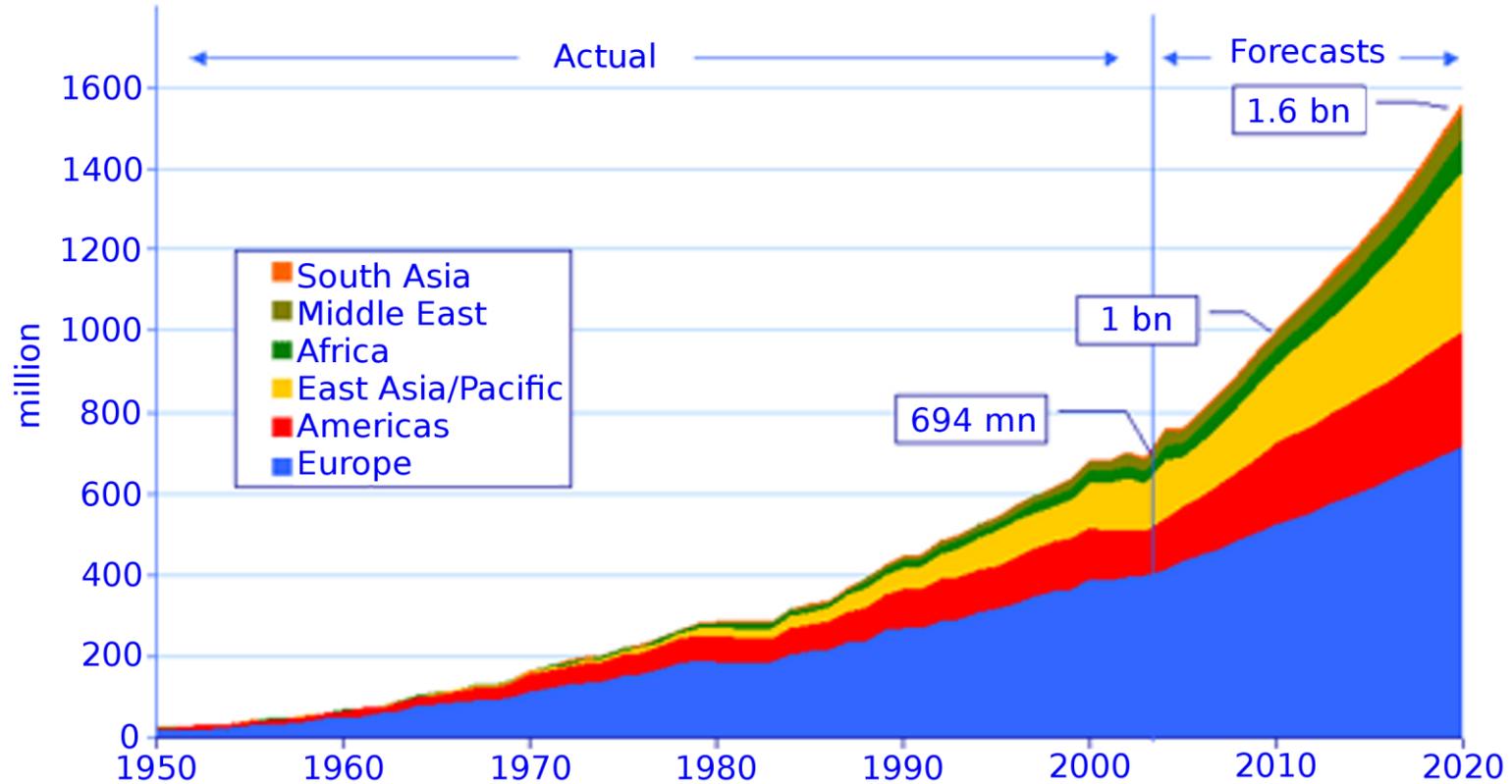
Basic Drivers of the FIFTH WAVE



- **Large jet aircraft** (along with IT advances)
- **Globalization** (producers & consumers)
- **Speed** (time-based competition)
- **Agility** (customization & flexible response)
- **Connectivity** (worldwide enterprise networks)
- **Perishability** (pharma, fish, flowers, fashions)
- **Tourism** (especially international)

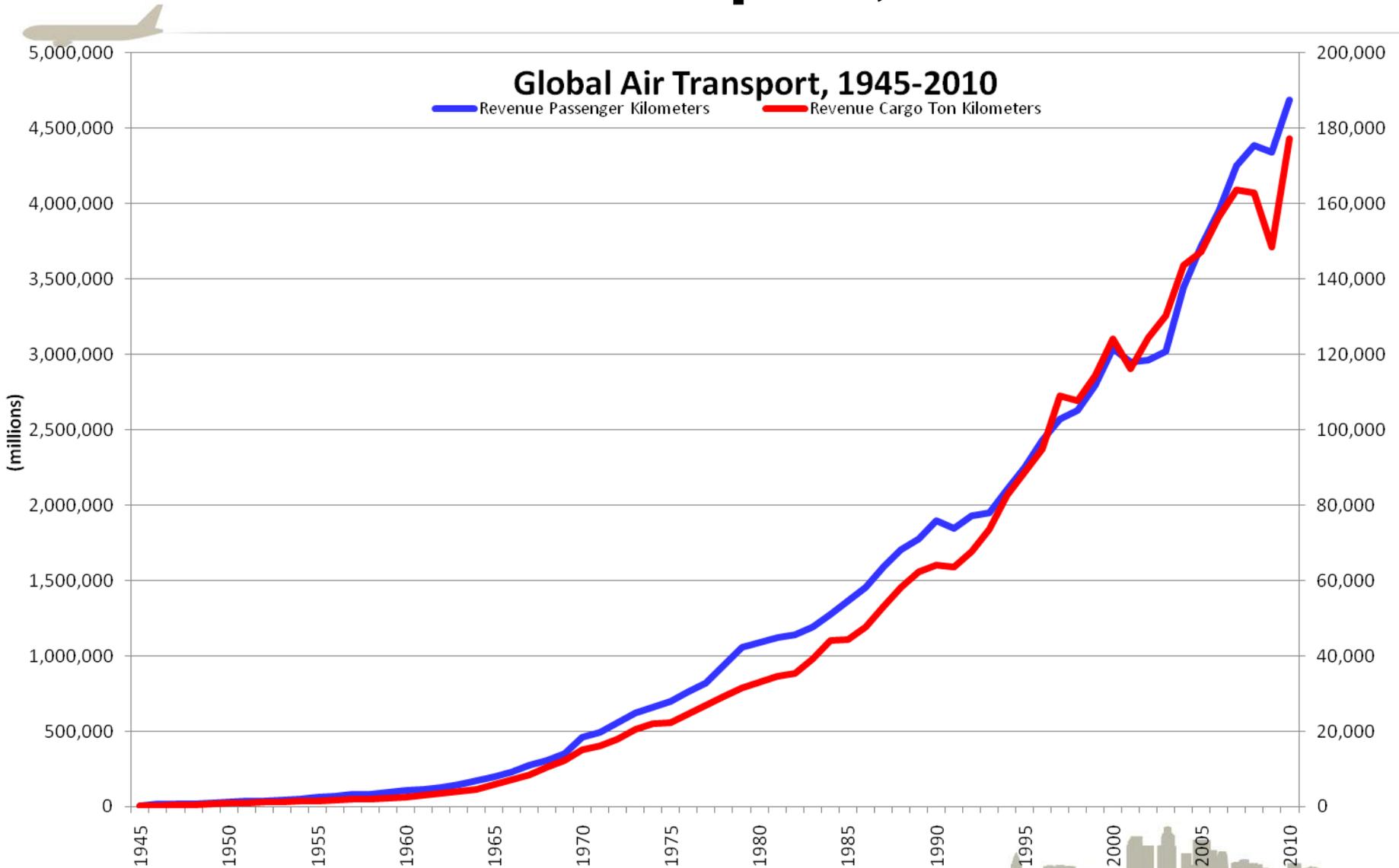
See: John D. Kasarda and Greg Lindsay *Aerotropolis: The Way We'll Live Next* (2011)

Tourist Arrivals by World Region



Source: Tourism 2020 Vision, World Tourism Organization, <http://www.unwto.org/facts/eng/vision.htm>

Global Air Transport, 1945-2010

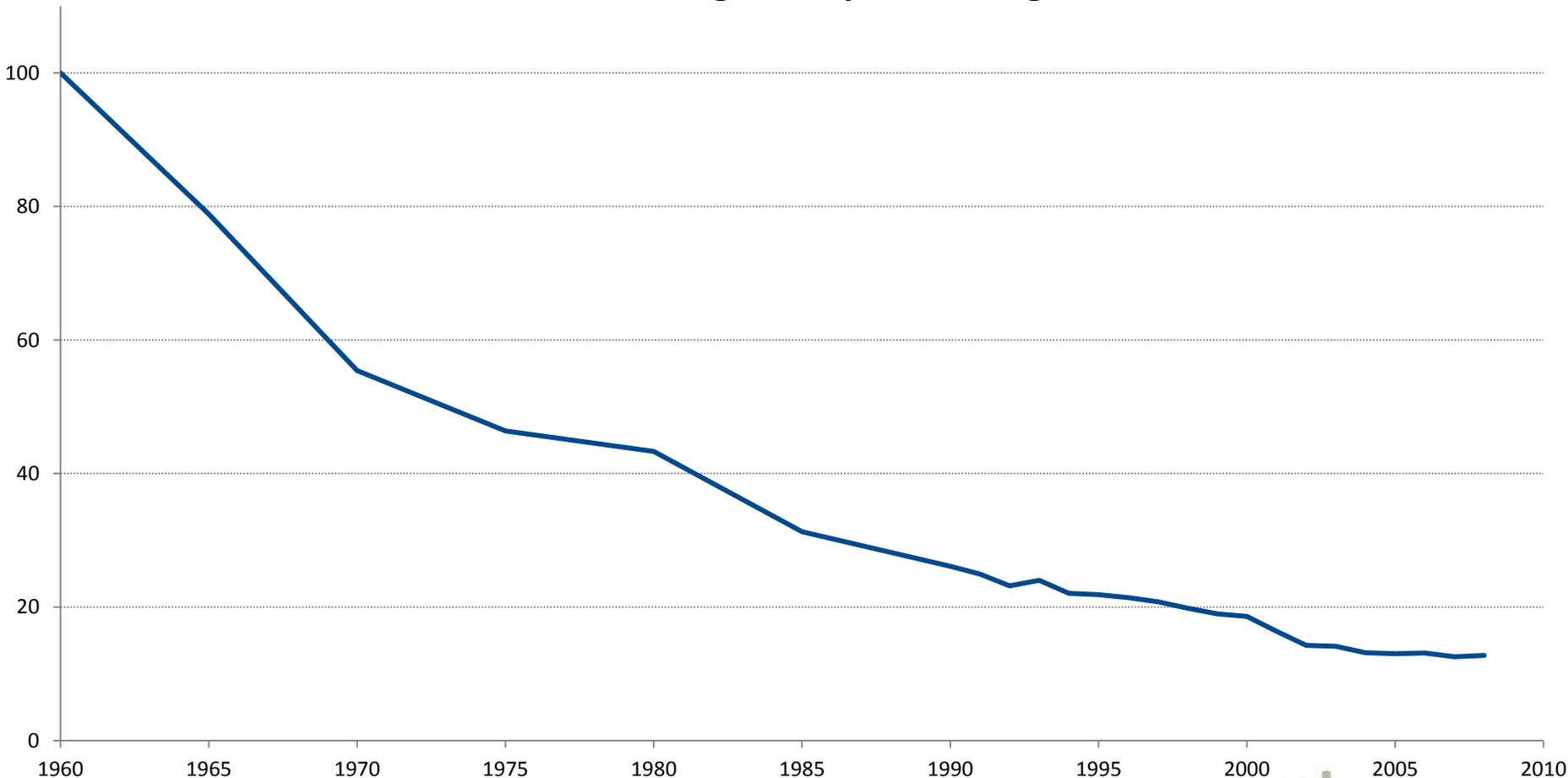


Source: Air Transport Association

The declining real costs of air transport make it affordable to more people



Index of Average Cost per Passenger Mile



Rising income levels, the changing geography of prosperity and global economic integration are fuel in air transport growth

Chart 15: Real GDP in 2010 and 2030

2009 prices and market exchange rates (USD bn)



Sources: IMF, Standard Chartered Research

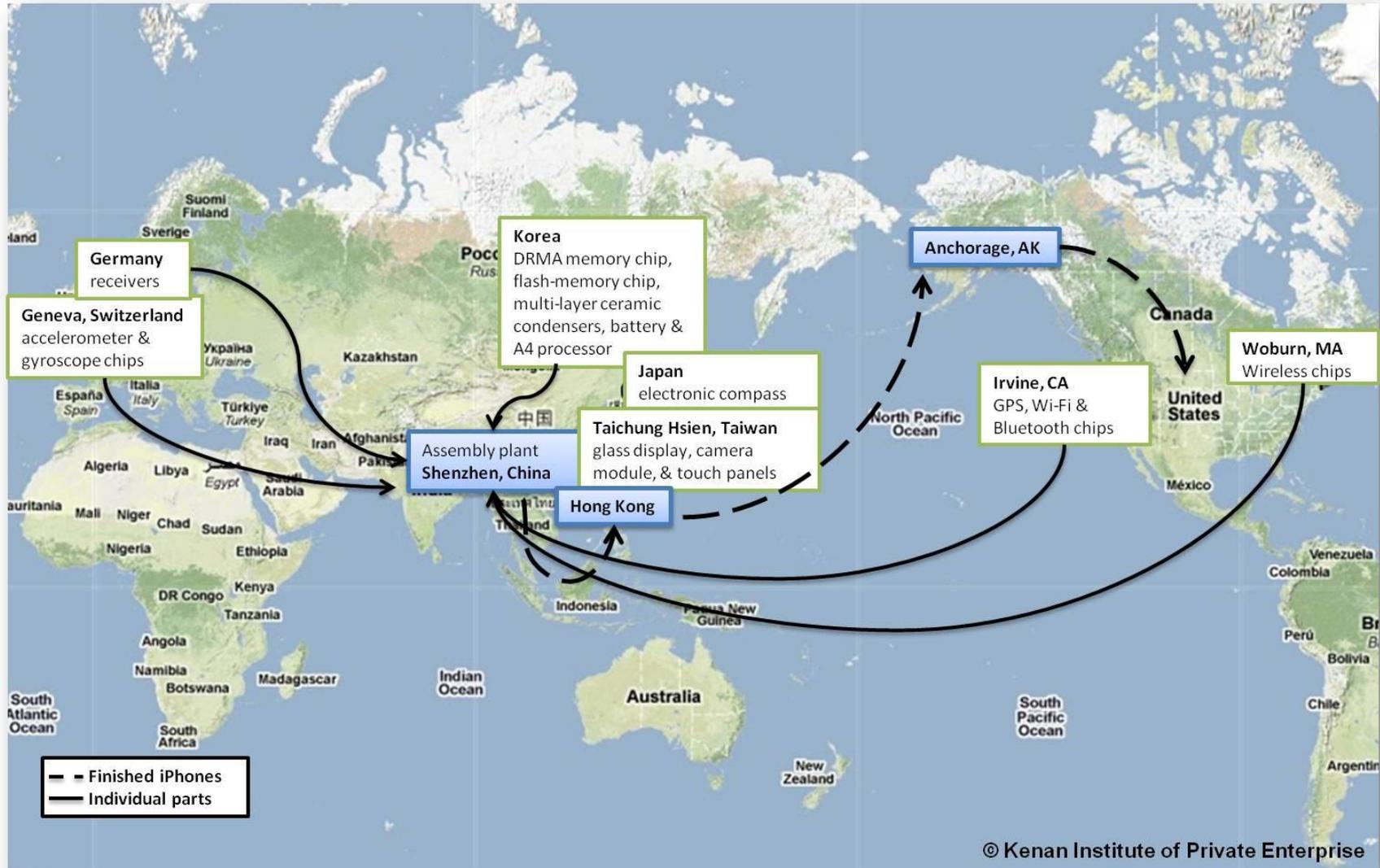
The 21st Century will be an Aviation-Based Economy



- Between 2010 and 2030, world-wide commercial passenger traffic will likely increase from 4.9 billion to approximately 13 billion (over 36 million pax/day); Asia the fastest growing
- For Thailand, Int'l. tourism and business travel will lead the way
- In the same period (2010 to 2030), world air cargo traffic is expected to triple (again, Asia the fastest growing)
- Air logistics and the new economy are inextricably interwoven
- Over one-third of the value of world trade already moves by air (versus just 1% by weight)
- Almost all high-tech supply chains are connected by air cargo (the *physical Internet*). So are fresh fish, cut flowers, biomedicals, etc.

Source: John D. Kasarda and Greg Lindsay, *Aerotropolis: The Way We'll Live Next* (2011)

Global Supply Chain – Apple iPhone 5



Aviation's Global Physical Internet (54,317 Routes)



©2009 Jpatokal, Creative Commons, Wikimedia.org

Source: Airline Route Mapper

As the Routers of the Physical Internet Hub Airports Have Become Business Magnets and Regional Economic Accelerators



- Providing accessibility, speed and agility to global supply chains and perishables
- Connecting a region's businesses to their customers and enterprise partners worldwide, especially producer services such as finance, consulting, corporate law, advertising, auditing & insurance
- Attracting tourists and serving commercial needs of tens of millions of air passengers and airport-area visitors annually

An aerial, grayscale photograph of an airport terminal and tarmac. The terminal is a long, multi-story building with a curved roof. Several aircraft are parked at gates or on the tarmac. In the background, a city skyline is visible under a hazy sky. The text is overlaid on the image.

New Airport-Anchored Urban Forms Are Evolving

Airport Cities and The Aerotropolis

Rise of the Airport City



- Airports today: much more than aviation infrastructures
- They are multimodal, multifunctional enterprises generating considerable commercial development within and well beyond their boundaries
- All commercial functions of a modern metropolitan center are locating on and immediately around major airport sites – transforming them from “city airports” to “airport cities”



The Airport City



- **Airside**

- Shopping mall concepts merged into passenger terminals
 - Retail (including streetscapes & upscale boutiques)
 - Restaurants (increasingly higher-end and themed)
 - Leisure (spas, fitness, recreation, cinemas, etc...)
 - Culture (museums, regional art, musicians, chapels)
- Logistics and Air Cargo



- **Landside**

- Hotels and entertainment
- Office & retail complexes
- Convention & exhibition centers
- Free trade zones
- Time-sensitive goods processing



Airport City's Business Impact



1

- Daily consumer population at major airports is larger than that of many mid-sized cities, and with higher incomes

2

- Numerous airports achieve greater percentage of revenues from non-aeronautical sources than aeronautical sources

3

- Rapid commercial development around many major airports makes them leading urban growth generators, as airport areas become significant employment, shopping, trading and business destinations in their own right

4

- Airport area develops a “brand image” attracting even non-aviation linked businesses such as factory outlets & big box retail

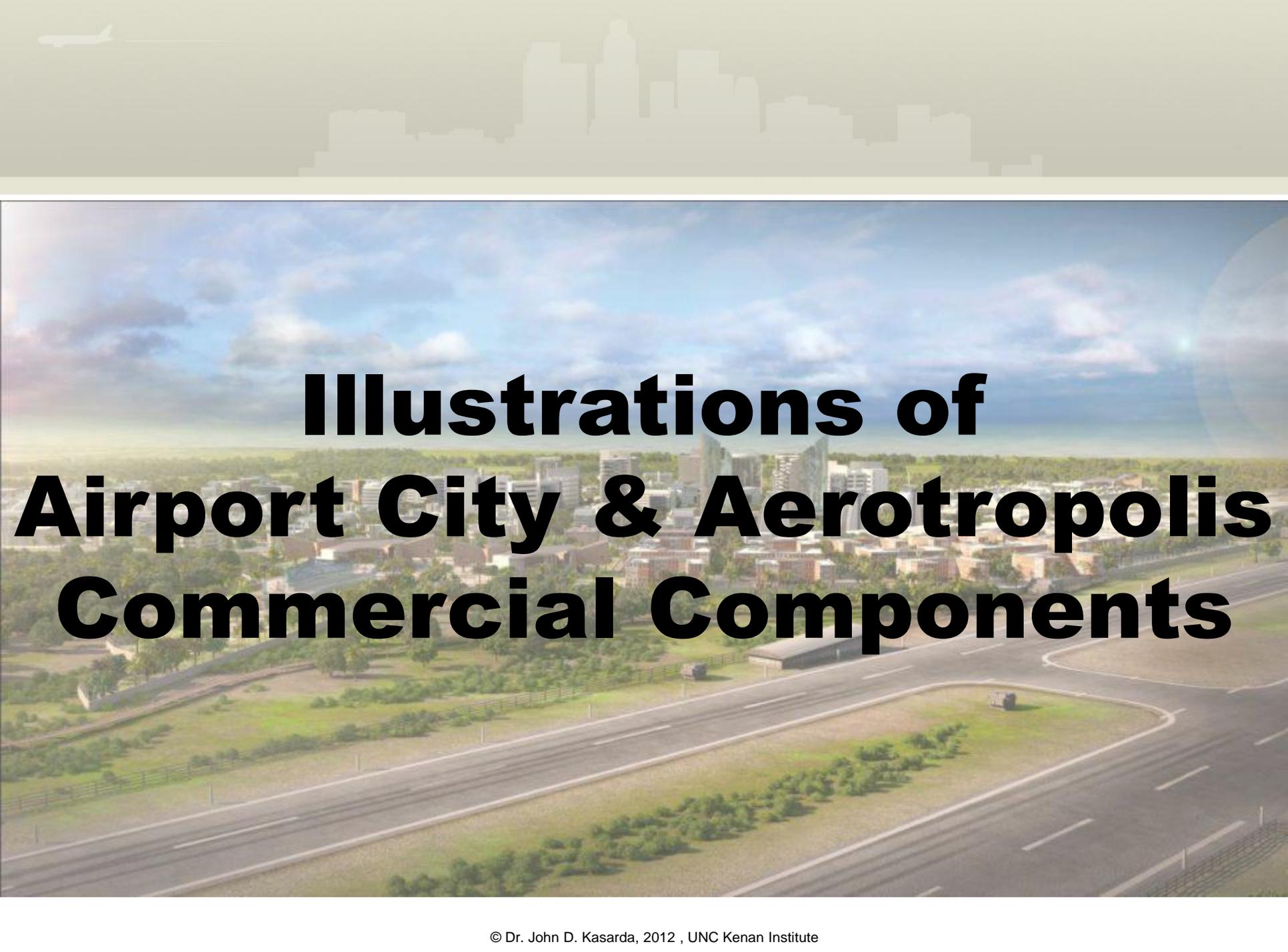
The Rise of the Aerotropolis



Spines, nodes, and clusters of aviation-linked business and residential complexes are forming along airport transportation corridors up to 25 km from some airports with significant economic impact measured up to 75 km.

- Office buildings and technology parks
- Logistics and distribution centers
- Industrial estates and light manufacturing
- Retail centers and wholesale merchandise marts
- Information and communications technology complexes
- Bioscience and medical facilities
- Higher education campuses
- Hotel, convention, tourism and entertainment complexes
- Large mixed-use residential developments
- Airport “Edge Cities” (e.g., Amsterdam, Zuidas; Las Colinas, Texas; New Songdo IDB)

Just as you have Central Cities and the greater Metropolis, you now have Airport Cities and the greater Aerotropolis.

An aerial rendering of a city development, likely an airport city or aerotropolis. The scene shows a multi-lane highway in the foreground, with a mix of modern high-rise buildings and lower commercial structures in the middle ground. The background features a city skyline under a blue sky with scattered clouds. The text is overlaid in the center of the image.

Illustrations of Airport City & Aerotropolis Commercial Components

Civic Plaza: Indianapolis Terminal (21st Century Central Square)



Hotel & Meeting: Dallas-Ft. Worth Grand Hyatt (21st Century Virtual Corporate Headquarters)



Frankfurt Airport's "The Squire" (21st Century Multimodal Office Hub)



Airrail Center is now "The Squire" – photo courtesy of <http://www.thesquire.com/en/>

Amsterdam Schiphol Airport City (Multimodal Urban Core)



Washington Dulles Aerotropolis Corridor

(Strings & Clusters of High-Tech & Consulting Firms)



New Songdo City, Incheon, South Korea (Planned Airport Edge-City in the Aerotropolis Age)



Courtesy: Gale International

Three Brief



Airport City / Aerotropolis Cases

- Amsterdam Schiphol
- Paris Charles de Gaulle
- Hong Kong



Case: Amsterdam Schiphol Aerotropolis



Amsterdam Schiphol Airport Area

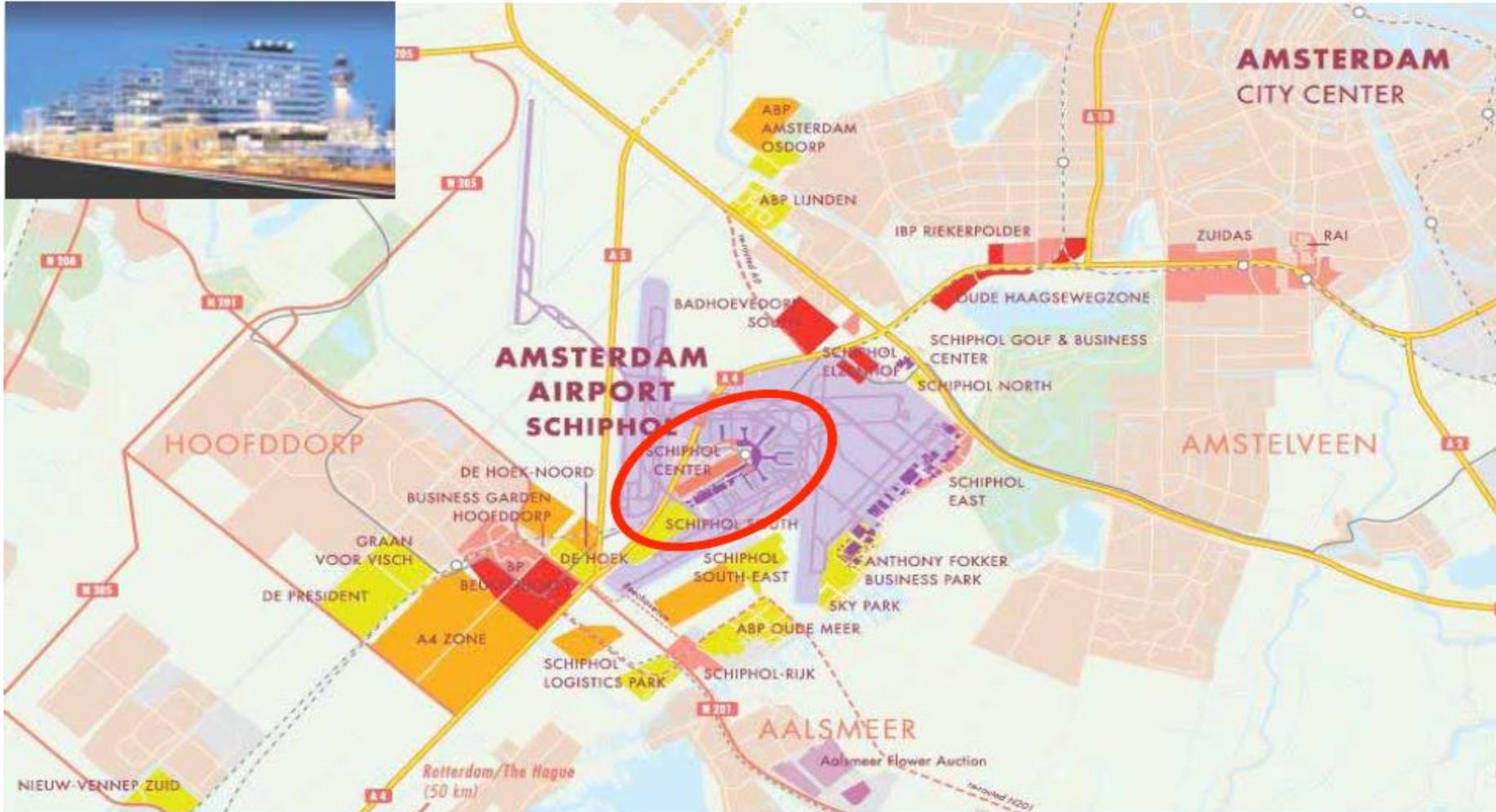
A nighttime photograph of the Amsterdam Schiphol Airport terminal building, a large, modern structure with many lit windows. To the right, the iconic control tower is illuminated, showing its distinctive tiered structure and observation deck. The sky is dark, and the overall scene is lit by the warm glow of the building's interior lights and the tower's lights.

- **Multimodal Hub (air, passenger rail and highway access)**
- **From City Airport to Airport City**
 - **Shopping Arcades**
 - **Internet Cafes**
 - **Theme Restaurants**
 - **Art Gallery, Spas, Casino**
- **Office Buildings (inside fence)**
 - **Microsoft**
 - **Ernst & Young**
 - **Solomon Brothers International**
 - **Unilever**
 - **Heineken Export Group**
- **2 First-Class Hotels and Exhibition Facilities (inside fence)**
- **Cargo City (inside fence)**
- **61,000 Workers Inside the Airport Fence Daily**
- **Outside Fence: More than Triple What Is Inside Fence (FloraHolland Aalsmeer flower auction, ABN AMRO, ING, banks, etc.)**
- **Amsterdam Zuidas (27 million sq. ft.: 43% office, 42% housing, and 15% other commercial facilities 6 minutes from Schiphol's terminal)**

Amsterdam Schiphol Airport City



Schiphol Aerotropolis Expansion: Both Core and Corridor Growth



Aalsmeer Flower Market



Amsterdam Zuidas: Airport Edge City



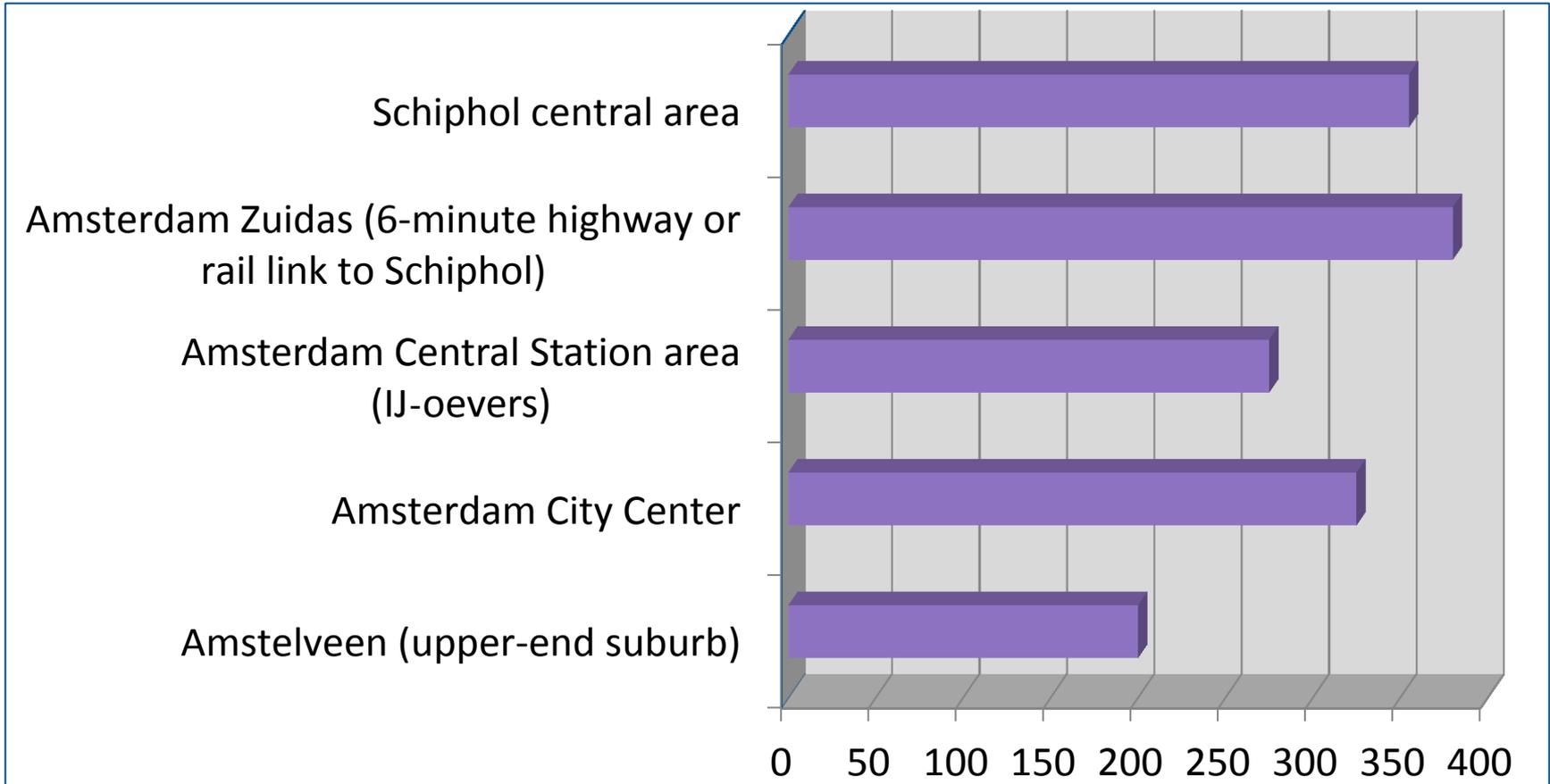
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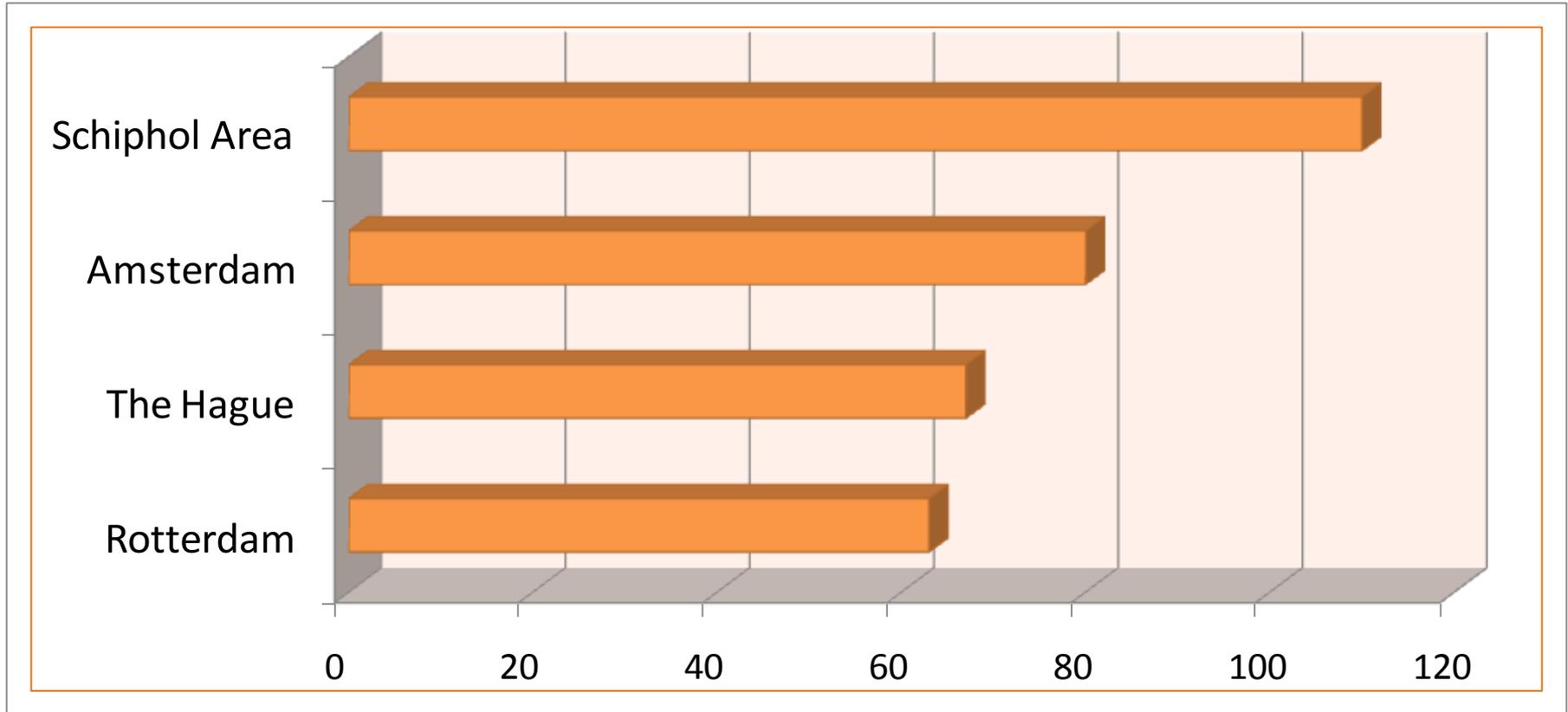
**ABN
AMRO**



Amsterdam Comparative Office Rents – 2011, EU/m²/yr



Netherlands Comparative Industrial Property Rents – 2011, EU/m²/yr



Source: DTZ Zadelhoff and UNC Kenan Institute



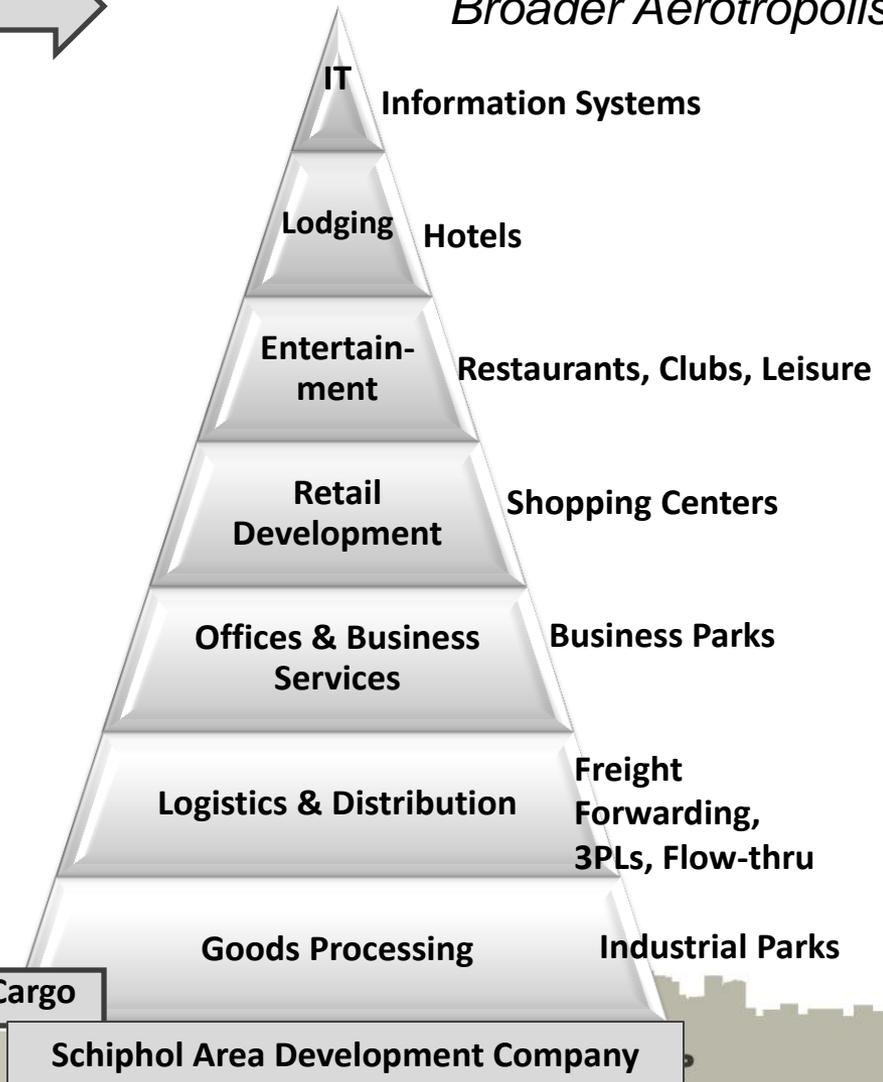
Amsterdam Schiphol Airport City – Aerotropolis Synergies



INSIDE FENCE
Airport City



OUTSIDE FENCE
Broader Aerotropolis



Amsterdam Aerotropolis Development Organizations



Schiphol Real Estate (a division of the Schiphol Group) operates as the airport commercial property developer and commercial facilities manager (60% of Schiphol Airport's profits are from commercial operations)

Schiphol Area Development Company is a public-private sector entity that acquires land and directs development in broader airport region to best and highest use, leveraging the airport

Amsterdam Airport Area Partners (involves Schiphol Real Estate and SADC, plus municipalities, major banks, etc.) to brand and promote the airport region

Schiphol Aerotropolis Partners



- **Schiphol Area Development Company**

- Province of Noord-Holland (18.1%)
- Municipality of Amsterdam (24.3%)
- Municipality of Haarlemmermeer (24.3%)
- Schiphol Group (33.3%)

- **Zuidas Enterprise**

- Municipality of Amsterdam (20%)
- State of the Netherlands (Dutch government) (20%)
- Other 60%:
 - ABN Amro Bank
 - Bank Nederlandse Gemeenten (BNG)
 - Fortis Bank
 - HBOS (Bank of Scotland)
 - ING Real Estate
 - Schiphol Group
 - Rabobank
 - Stichting Pensioenfonds ABP

- **Amsterdam Airport Area partners**

- Amsterdam Port Authority
- City of Amsterdam
- ING Real Estate
- KFN
- KLM Royal Dutch Airlines
- Municipality of Haarlemmermeer
- Province of Noord-Holland
- Schiphol Area Development Company (SADC)
- Schiphol Real Estate
- AM Vastgoed

Paris Charles de Gaulle (Roissypole: CDG's Airport City)



- Business district located in the middle of the CDG platform:
216,000 m² of offices and 68,000 m² of hotels + 3 planned hotels
 - District linked with various terminals of Paris-CDG via light rail & people mover rail
 - Immediate proximity of the future T4
- Phases:
 - 2009 development of Continental Square 1 and 2: 50,000 m²
 - Construction of an office complex (Continental Square 3) in 2012
 - Construction of new 3-star hotel



Paris CDG Sheraton Hotel Above High-Speed Train Station with Light Rail and People Mover Intermodal Access



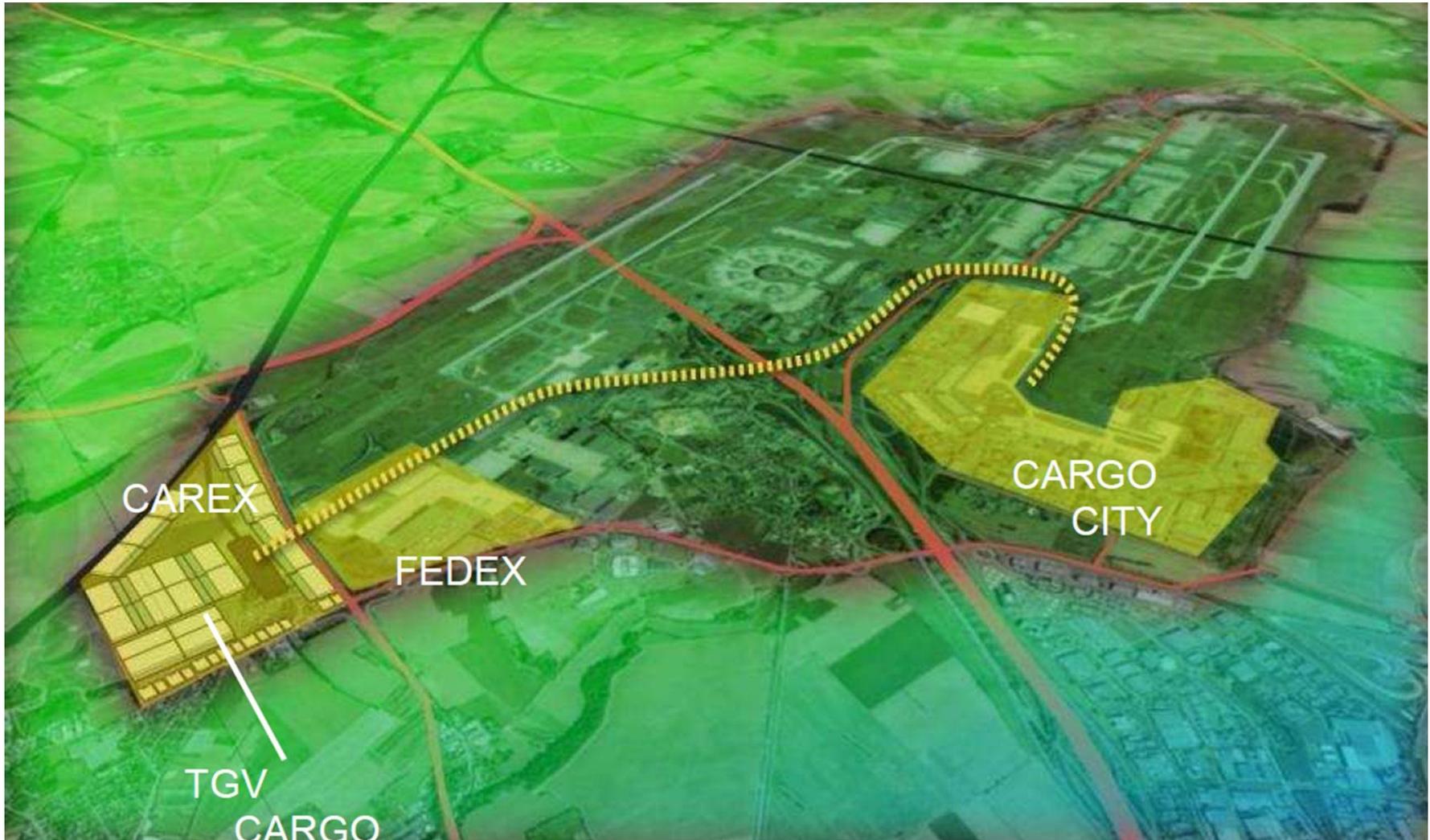
T2 A-B-C-D

Sheraton hotel

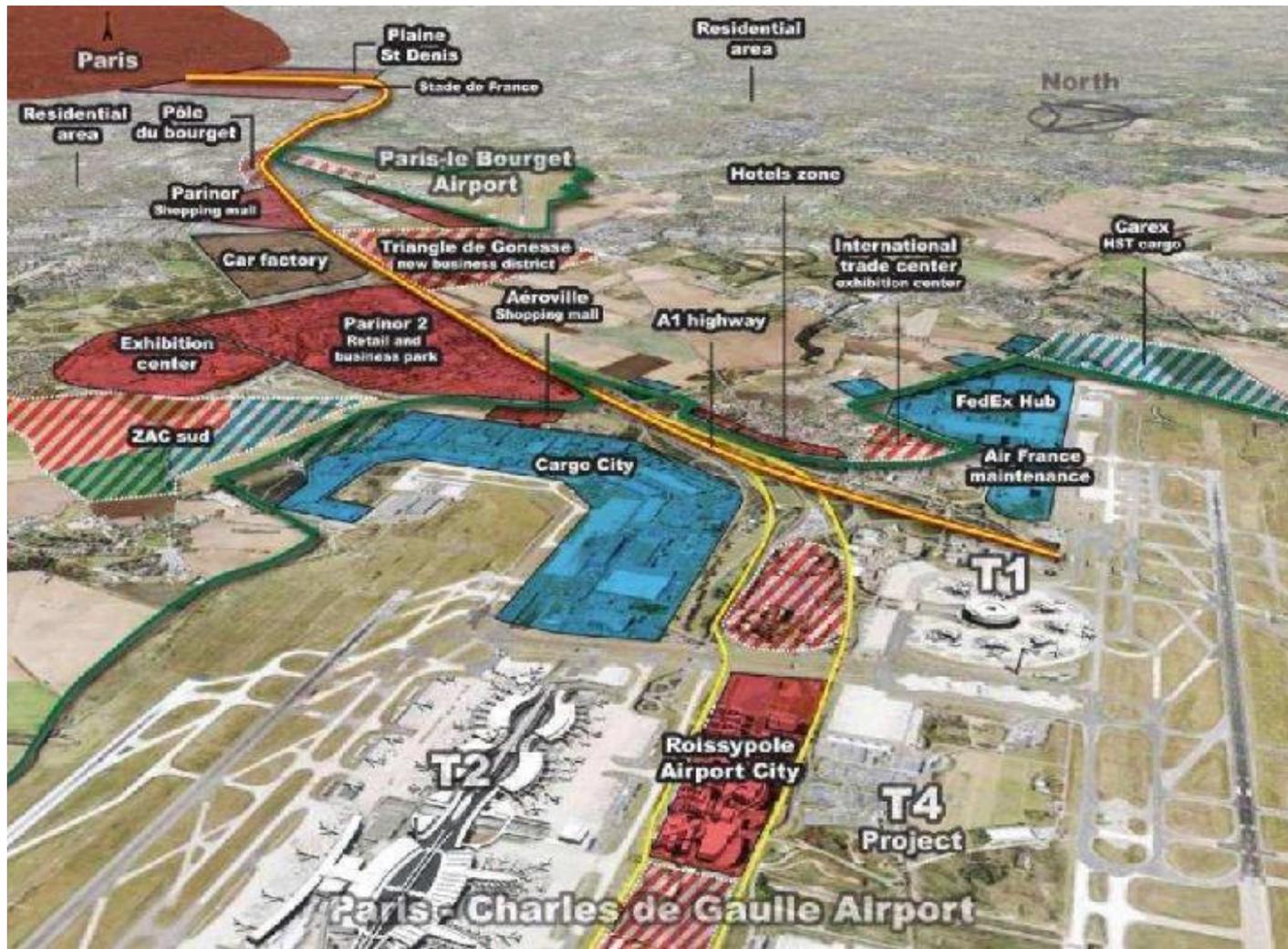


High-speed train station

EuroCAREX High Speed Rail Cargo at Paris CDG



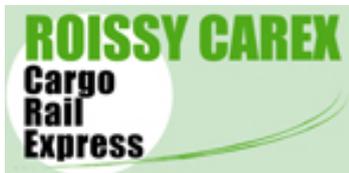
CDG Aerotropolis Corridor to Paris



Paris: Aerotropolis Europe™



Founding Members (12):



Hubstart Paris©



- Developed by Paris Ile de France Regional Development Agency
- 20 public and private founding partners
- Aerotropolis Europe and Hubstart Paris concluded an agreement in January 2011
- <http://www.hubstart-paris.com>

The grid contains the following logos:

- AÉROPORTS DE PARIS**
- Paris: Aerotropolis Europe®**
- AIRFRANCE**
- AStech Paris Region**
- Chambre de commerce et d'industrie de Paris**
- CCI Seine-et-Marne** (Chambre de Commerce et d'Industrie)
- CCI** (Chambre de commerce et d'industrie Versailles Val-d'Oise / Yvelines)
- DOUANES & DROITS INDIRECTS**
- île de France**
- Pays de Roissy - CDG**
- PLAINE DE FRANCE** (Ensemble Public, Planogramme)
- PREFET DE LA RÉGION D'ÎLE-DE-FRANCE**
- OVERSEAS**
- RE** (Région Île-de-France)
- Conseil Général SEINE & MARNE**
- SEINE & MARNE DEVELOPPEMENT**
- seine-saint-denis LE DEPARTEMENT**
- seine-saint-denis ECONOMIC DEVELOPMENT AGENCY North East of Paris Region avenir**
- val d'oïse le département**
- val d'oïse le département Economic Expansion Committee**

Animated by: **ParisRegion** Economic Development Agency

With the technical support from: **DATAGORA** PARIS ROISSY - CDG BUSINESS AREA

Founding Partner Hubstart Paris®

HubstartParis®
 GATE TO BUSINESS, LINK TO THE WORLD



Hong Kong International Airport (HKIA)

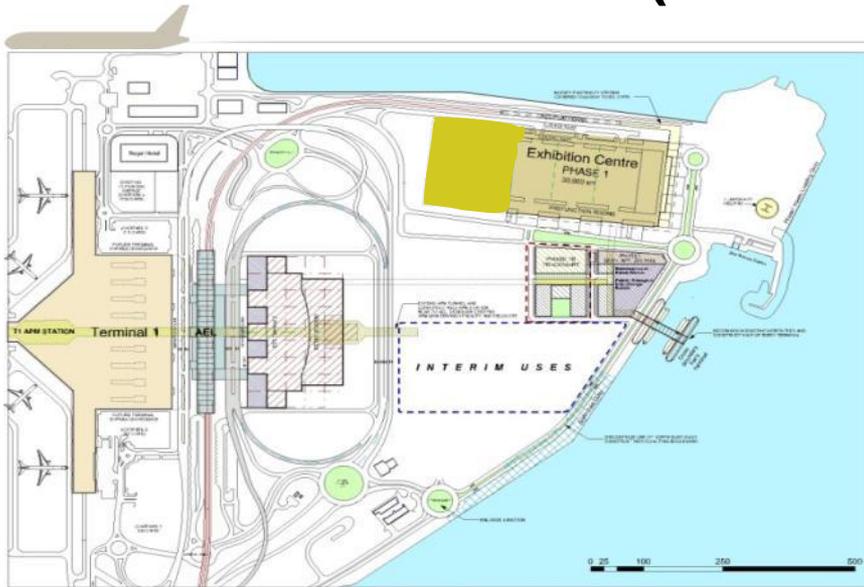


Original Hong Kong SkyCity Master Plan



Source: Skidmore, Owens, and Merrill

Hong Kong SkyCity - Phase 1 (Now completed)



Phase 1



AsiaWorld-Expo Center



SkyPlaza



SkyPier: Cross Boundary Ferry Terminal

HKIA SkyCity

Phase I (completed)



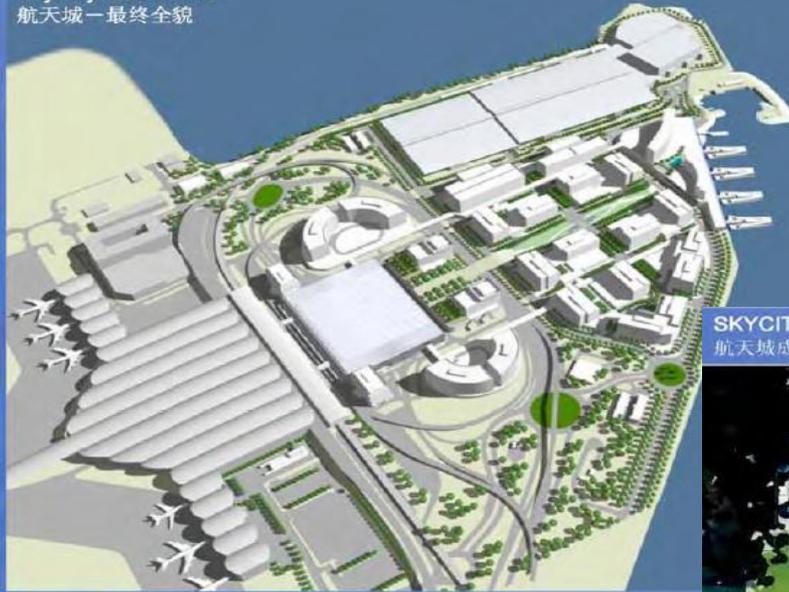
HKIA SkyCity

Phase II (2018-2020)

DEVELOPMENT PHASING CONCEPT
发展时序概念

案例分析: 航天城 Case Study

SkyCity - Ultimate
航天城 - 最终全貌



SKYCITY AS A FRIENDLY URBAN PEDESTRIAN PRECINCT
航天城成为舒适的人行区域

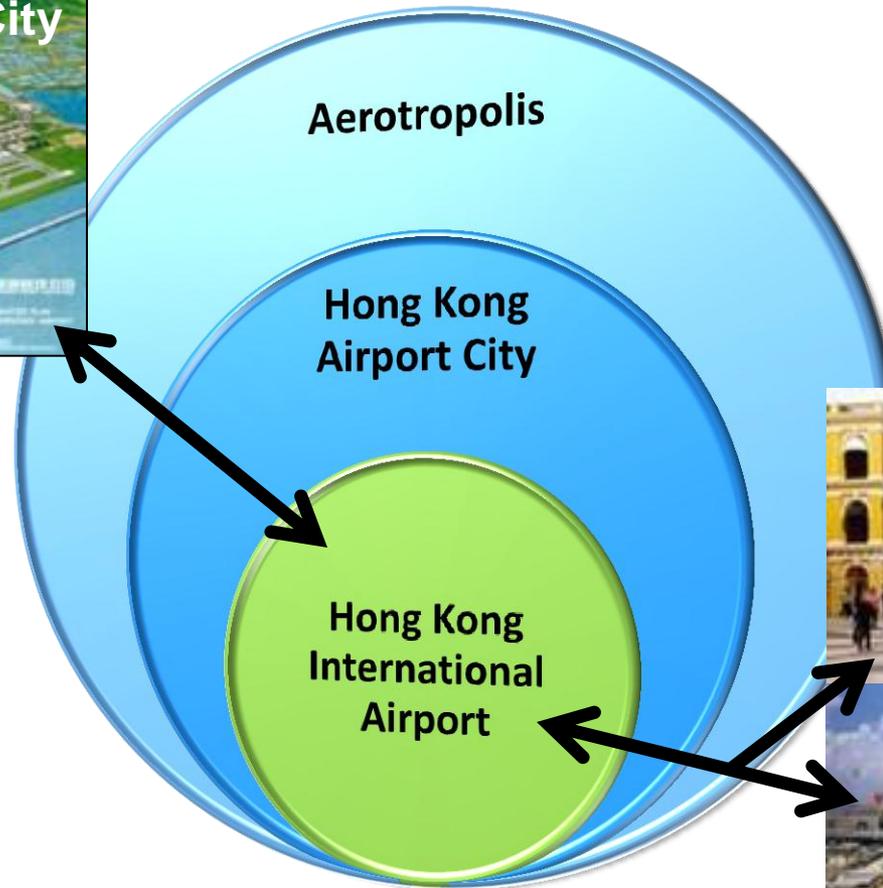
分析: 航天城 Case Study: SkyC



Attracting Business and Leisure Tourists: SkyCity & Hong Kong Disneyland



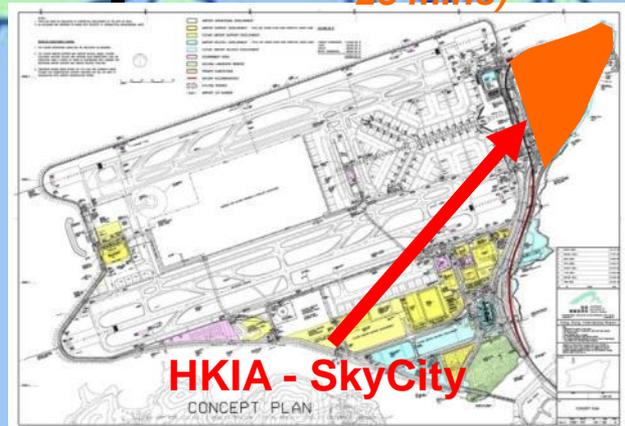
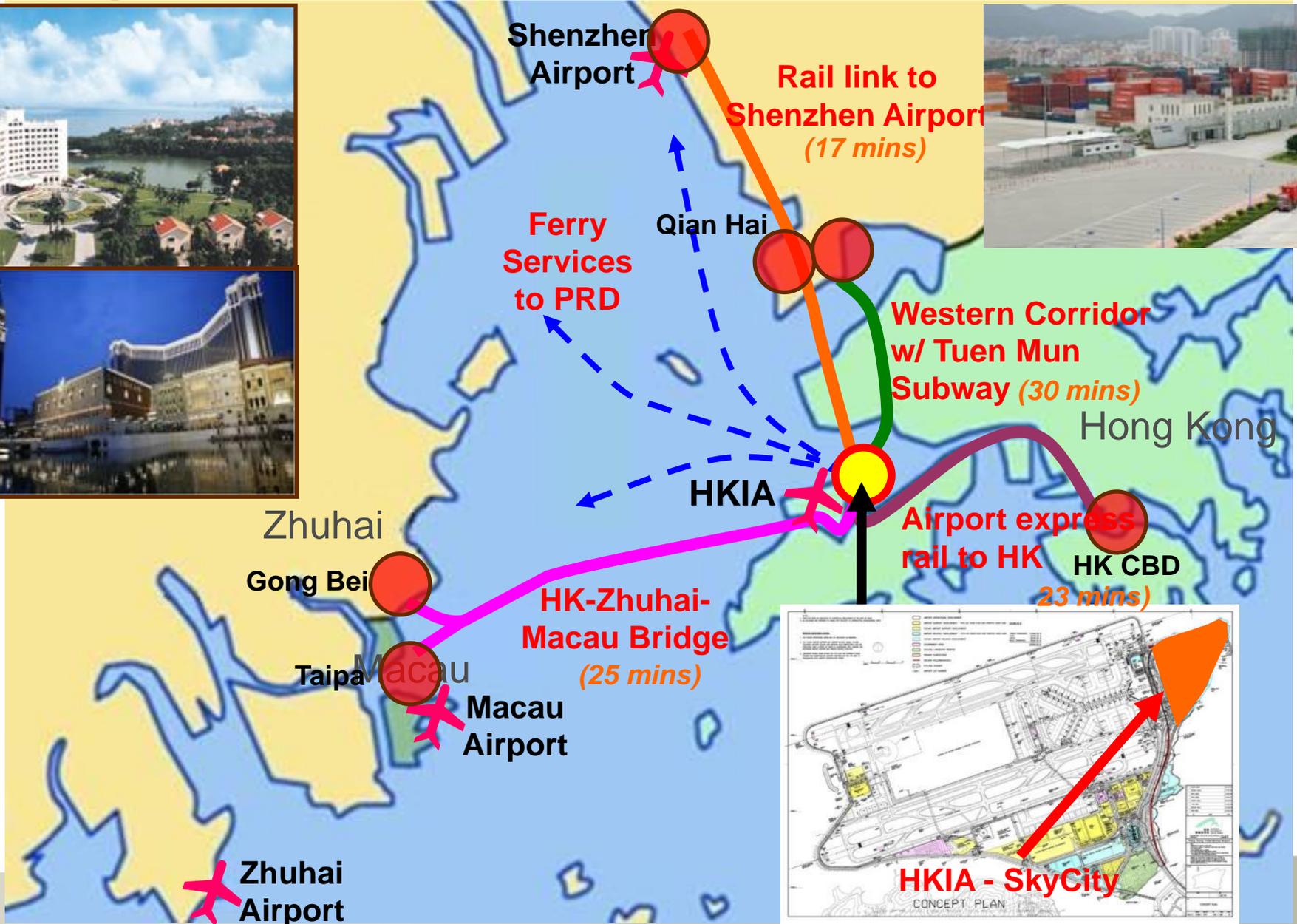
HKIA's Expanding Economic Zones



CONNECTIVITY → ECONOMIC ACTIVITY

Hong Kong's Broader Aerotropolis:

(HKIA: Connecting the "Workshop of the World" to the Markets of the World)



Hong Kong Becomes World's Top Cargo Airport



2010 Airport	2010 Cargo (metric tons)	2009 Airport	2009 Cargo (metric tons)	2008 Airport	2008 Cargo (metric tons)
HONG KONG INTL	4,168,394	MEMPHIS INTL	3,697,054	MEMPHIS INTL	3,695,438
MEMPHIS INTL	3,916,937	HONG KONG INTL	3,385,313	HONG KONG INTL	3,660,901
PUDONG INTL	3,227,914	PUDONG INTL	2,543,394	PUDONG INTL	2,602,916
INCHEON INTL	2,684,500	INCHEON INTL	2,313,001	INCHEON INTL	2,423,717
TED STEVENS ANCHORAGE INTL	2,578,396	PARIS CHARLES DE GAULLE	2,054,515	TED STEVENS ANCHORAGE INTL	2,339,831
PARIS CHARLES DE GAULLE	2,399,067	TED STEVENS ANCHORAGE INTL	1,994,629	PARIS CHARLES DE GAULLE	2,280,050
FRANKFURT/MAIN	2,275,106	LOUISVILLE INTL	1,949,528	FRANKFURT/MAIN	2,111,031
DUBAI INTL	2,270,498	DUBAI INTL	1,927,520	NEW TOKYO INTL (NARITA)	2,100,448
NEW TOKYO INTL (NARITA)	2,167,843	FRANKFURT/MAIN	1,887,686	LOUISVILLE INTL	1,974,276
LOUISVILLE INTL	2,166,226	NEW TOKYO INTL (NARITA)	1,851,972	SINGAPORE CHANGI	1,883,894

Source: Airports Council International (ACI)

Air Cargo Driving Hong Kong's Trade Growth



Hong Kong Air Cargo Value and Total Trade Value, 1992-2010
(in Millions of Hong Kong Dollars)

<u>Year</u>	<u>Air Cargo</u>	<u>Trade</u>	<u>Air Cargo % of Trade</u>
1992	\$332,654	\$1,880,248	17.7%
1993	\$390,096	\$2,118,847	18.4%
1994	\$447,627	\$2,420,722	18.5%
1995	\$573,530	\$2,835,248	20.2%
1996	\$593,810	\$2,933,499	20.2%
1997	\$654,855	\$3,071,039	21.3%
1998	\$597,002	\$2,776,741	21.5%
1999	\$664,262	\$2,741,718	24.2%
2000	\$862,160	\$3,230,651	26.7%
2001	\$824,081	\$3,049,181	27.0%
2002	\$909,815	\$3,179,936	28.6%
2003	\$1,074,466	\$3,548,206	30.3%
2004	\$1,340,014	\$4,130,237	32.4%
2005	\$1,568,262	\$4,579,642	34.2%
2006	\$1,745,380	\$5,060,831	34.5%
2007	\$1,945,728	\$5,555,524	35.0%
2008	\$2,075,015	\$5,849,435	35.5%
2009	\$1,820,933	\$5,161,445	35.3%
2010	\$2,292,907	\$6,395,859	35.8%

Source: Airport Authority of Hong Kong

Exports from Thailand to United States, By Value, 1990, 2000, 2011



	1990	2000	2011
AIR VALUE	1,390.7	5,028.6	8,678.3
VESSEL VALUE	3,834.5	10,994.0	14,774.8
TOTAL VALUE	5,225.2	16,022.5	23,453.1
GROWTH	<i>1990-2000</i>	<i>2000-2011</i>	<i>1990-2011</i>
AIR VALUE	261.58%	72.58%	524.01%
VESSEL VALUE	186.71%	34.39%	285.31%
TOTAL VALUE	206.64%	46.38%	348.84%

Source: Airports Council International

Critical Points for Thailand



- It's more than about commercially developing Thailand's airports and surrounding areas.
- It's really about Thailand's connectivity and competitiveness.
- Individual firms no longer compete — their supply chains compete. Networks, systems, and extended enterprises compete.
- Network connections offered by major hub airports such as BKK provide system benefits over the sum of point-to-point routes.

Competitive Advantage Rests in the Network



- An expanding hub network
 - Broadens long-haul routes
 - Widens markets
 - Improves production efficiencies
 - Attracts greater investment
 - Drives trade and tourism
 - Creates "economies of speed"
 - Maximizes global accessibility
- Speedy, extensive global connectivity = Competitiveness
- The fastest, best connected places win
- This is the Aerotropolis strategy

Key Implications



1. Airport areas today have become as much places of destination as places of departure. People from around the world converge on airport cities and aerotropolises to conduct business, be entertained, meet, sleep and eat without going more than 20 minutes from the airport
2. Airports are driving 21st Century business location and urban development as much as
 - Highways in the 20th Century
 - Railroads in the 19th Century
 - Seaports and rivers in the 18th Century

Key Implications (continued)



3. Investors and developers who recognize this megatrend can select strategic sites on, near, or with quick transit access to Suvarnabhumi and position their investment to be leveraged by growing air commerce (forming the physical and functional aerotropolis)
4. AOT can guide appropriate commercial development on Suvarnabhumi to reinforce air passenger and air cargo flows while generating major additional revenue streams to meet future airport modernization and infrastructure expansion needs

Key Implications (continued)



5. Thai government ministries (in cooperation with NESDB & AOT) can plan a new Suvarnabhumi Aerotropolis to meet competitive needs of business, boost trade, and foster economic development while generating well-paying jobs, improved quality of life of nearby residents, and long-term sustainable development

6. To accomplish these positive outcomes in an economically efficient, aesthetically pleasing and environmentally sustainable manner requires the Aerotropolis model: an integration of airport planning, urban planning, and business site planning

The Suvarnabhumi Challenge



An Aerotropolis will emerge in some form around Suvarnabhumi International Airport, whether planned or not.

The critical issue is:

Will it form and grow intelligently, achieving the full economic, competitive, and sustainability benefits I noted?

or

In the spontaneous, haphazard, less than efficient, often unsightly, and ultimately unsustainable manner that has characterized development around so many major airports to date?

Seizing The Opportunity



- Prior NESDB and Ministry of Interior Suvarnabhumi Aerotropolis Development Plans were good starts but were shelved when governments changed
- What is now needed is a coordinated “Action Plan” with full AOT, Thai Government, and private-sector involvement transforming the Aerotropolis vision into strategic action
- Delay in creating and implementing this coordinated action plan may forever preclude Thailand from realizing the full competitive potential that Suvarnabhumi International Airport offers

Selected Aerotropolis Development Actions



1. AOT completes Suvarnabhumi's Airport City implementation plans and sets contracts for remaining "inside the fence" commercial development that:
 - Provides explicit guidelines to control type and quality of development
 - Allows flexible parcelization adaptable to different uses and changing markets
 - Establishes a long-term capital improvement plan that synergizes Suvarnabhumi's aviation and commercial growth

Selected Aerotropolis Development Actions



2. Convene all land-use decision-makers within the broad Aerotropolis area (including AOT, Thai ministries, national planners, private developers, and local community officials) for coordinated action.
3. Thai government should reconsider creating an overarching Aerotropolis Development Authority to insure such coordinated action (Suvarnabhumi Act was also shelved).
4. Commence Aerotropolis development actions that will positively impact the residential, environmental, business and aesthetic development of the communities surrounding Suvarnabhumi, beginning with areas around the airport and moving out as far as 25 kilometers.

Selected Aerotropolis Development Actions



5. Suvarnabhumi transportation corridors to downtown Bangkok and to other key metropolitan nodes require special attention on appearance.
6. Where possible, acquire and land-bank open areas near the airport for future airport expansion and aviation-linked commercial use.
7. Implement longer range plans emphasizing eventual transition of existing inconsistent buildings and land uses near Suvarnabhumi Airport to functions and land uses that better leverage the airport and are leveraged by it.
8. Work closely with appropriate Thai ministries and local governments to improve prospects for successful Aerotropolis development and recruitment of investors and firms.

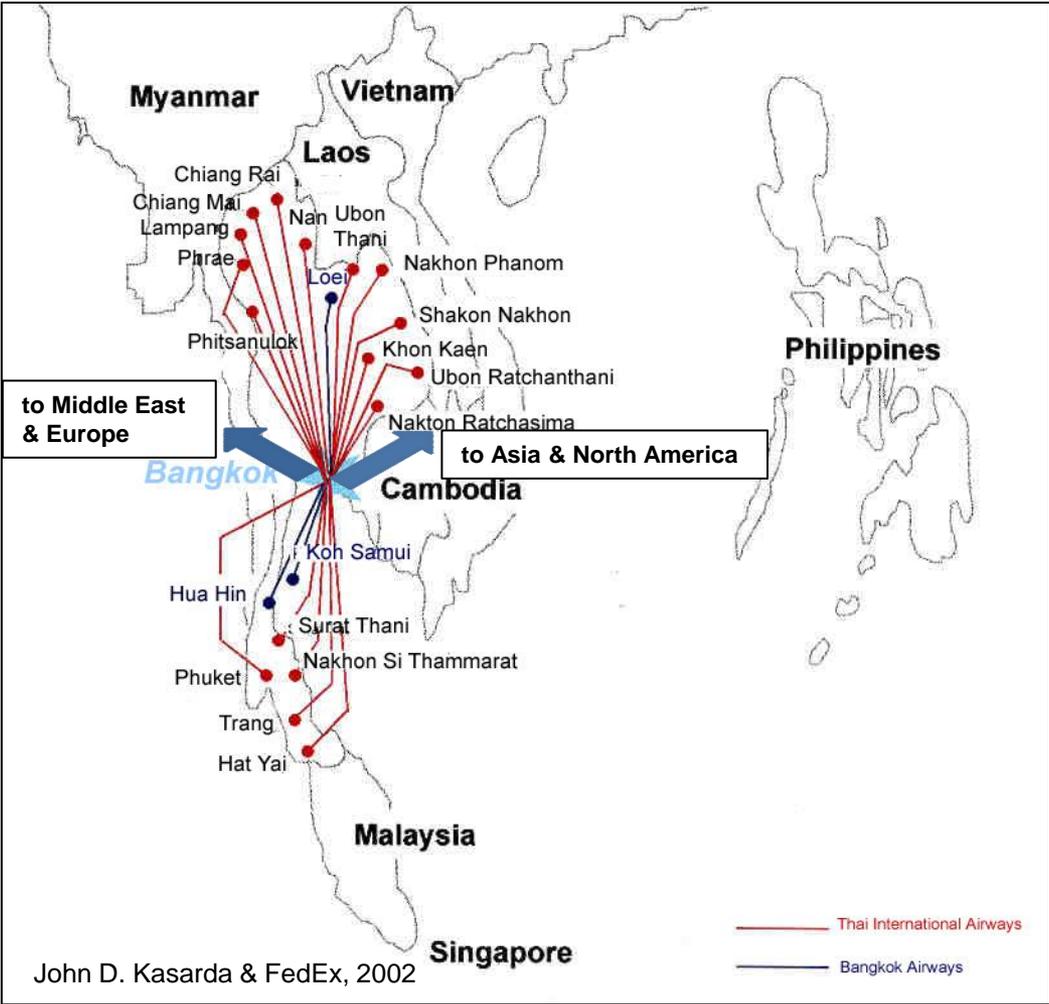
Selected Aerotropolis Development Actions



9. Help educate other Thai leadership and Thai citizens that Suvarnabhumi represents the nation's primary infrastructure asset to compete in the globally networked, speed-driven 21st century. You have a fiduciary and a civic responsibility to do this.

10. Develop a global air link system for Thailand's secondary cities and their provinces fostering backward and forward economic development through speedy connectivity to their global suppliers and customers.

Global Link System with Bangkok Hub Fostering Rapid Product Movement to and from Provinces



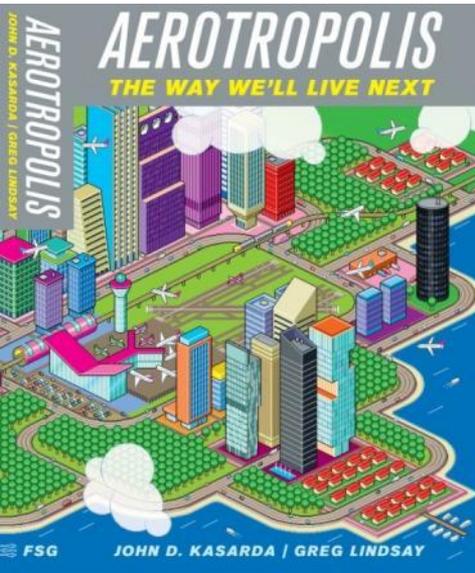
A Potential Suvarnabhumi Aerotropolis Future



The 21st Century Airport, Airport City, and Aerotropolis

Leveraging Speed, Agility, and Connectivity for Competitive Advantage

THANK YOU!



For follow-up questions, contact:

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Aerotropolis Video: See YouTube, Kasarda Aerotropolis

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