McKinsey & Company

Asian Experiences in Urbanization

How Asian cities are defining the next phase of urbanization
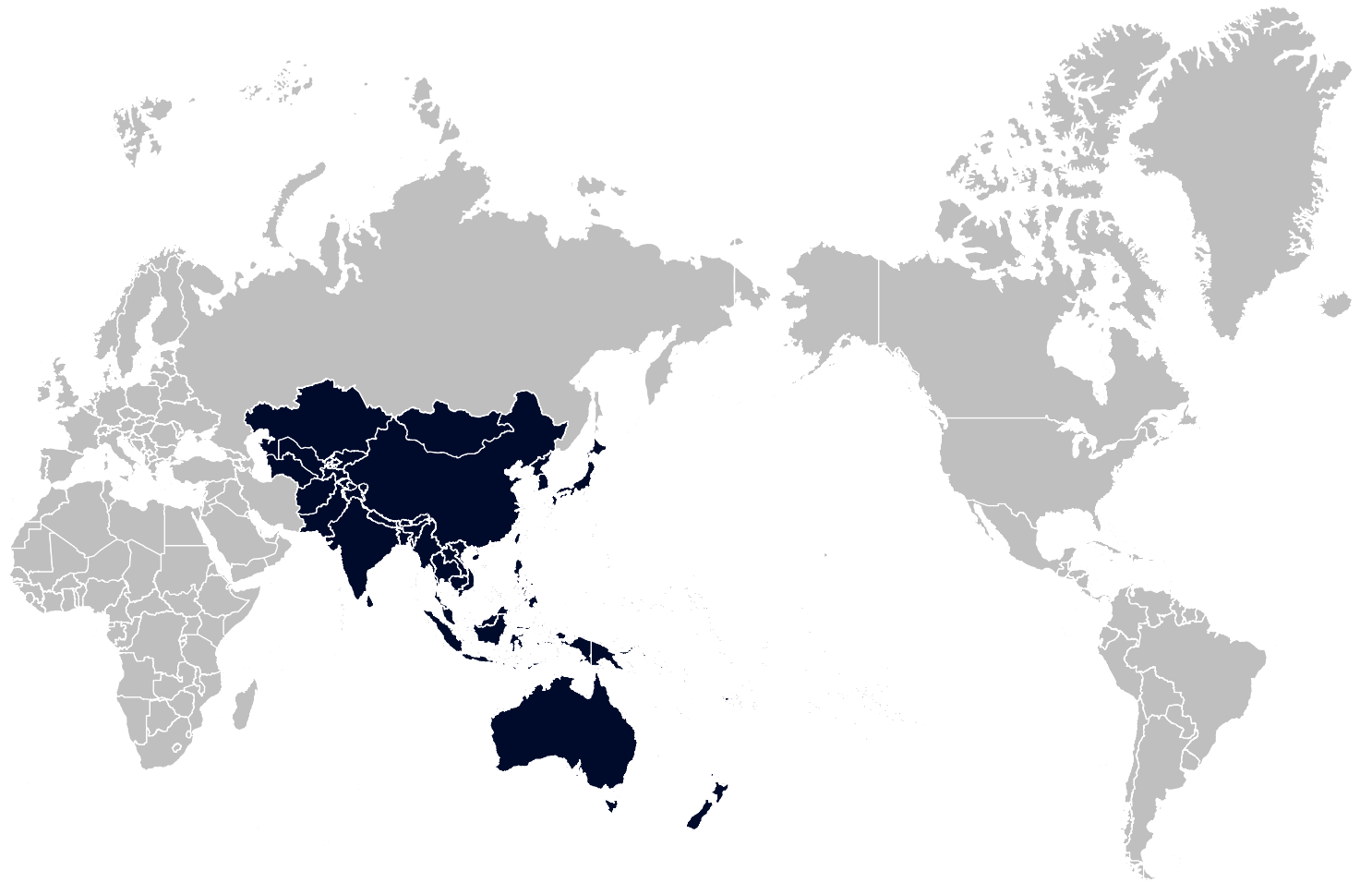
October 2019

Asia is already the world's center

Asia today

~2 billion
people living in urban centers

28% of global consumption

42% of world's GDP (PPP)

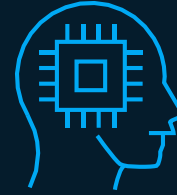Macroeconomic indicators demonstrate Asia's growth to date

Asia by 2040

~3 billion people living in urban centers

40% of global consumption

52% of world's GDP (PPP)

and its potential to be the biggest region on the planet

There are Four Asias

Advanced Asia:
provider of capital and technology

中国 China:
Anchor economy, providing a connectivity and innovation platform

Emerging Asia:
Regionally integrated economies that's cultural diversity

Frontier Asia & India:
Rapidly urbanizing young economy with potential to leapfrog

Asia is becoming more Asian
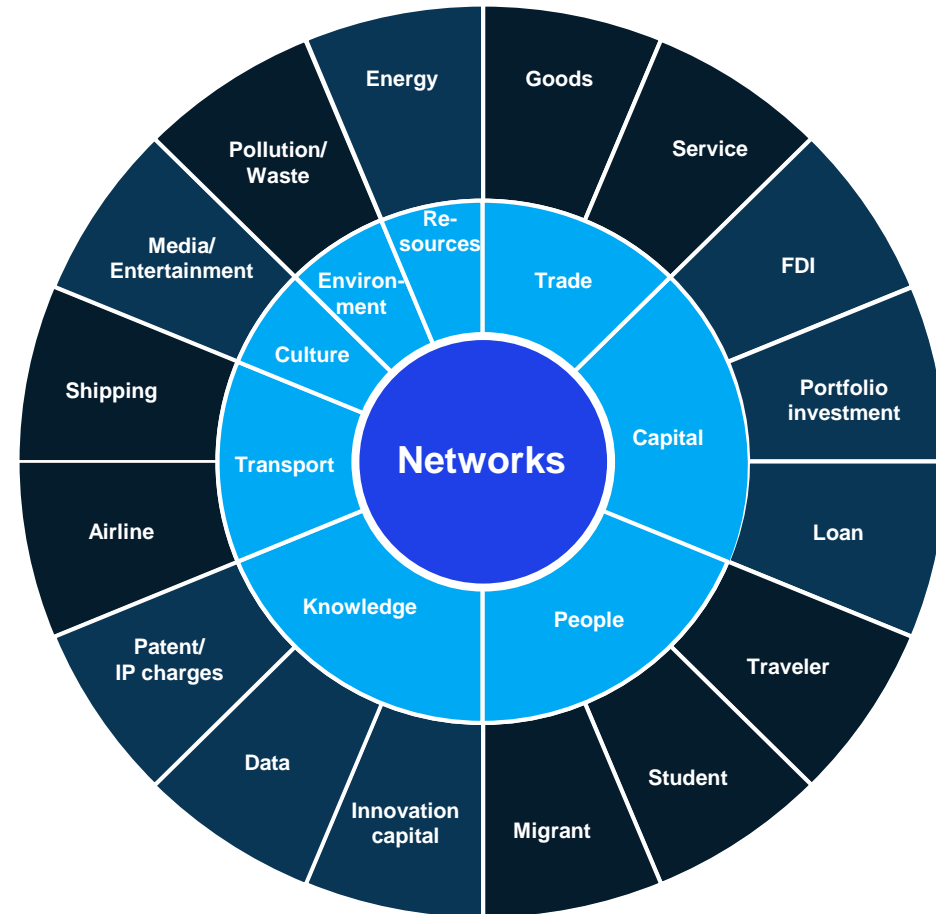
Asian people are on the move forming denser networks

Traveler volume
Million people

| 3.1-5.5 | 5.6–8.0 | 8.1–10.5 | 10.6–13.0 | 13.1–15.5 | >15.6 |

2008

2018
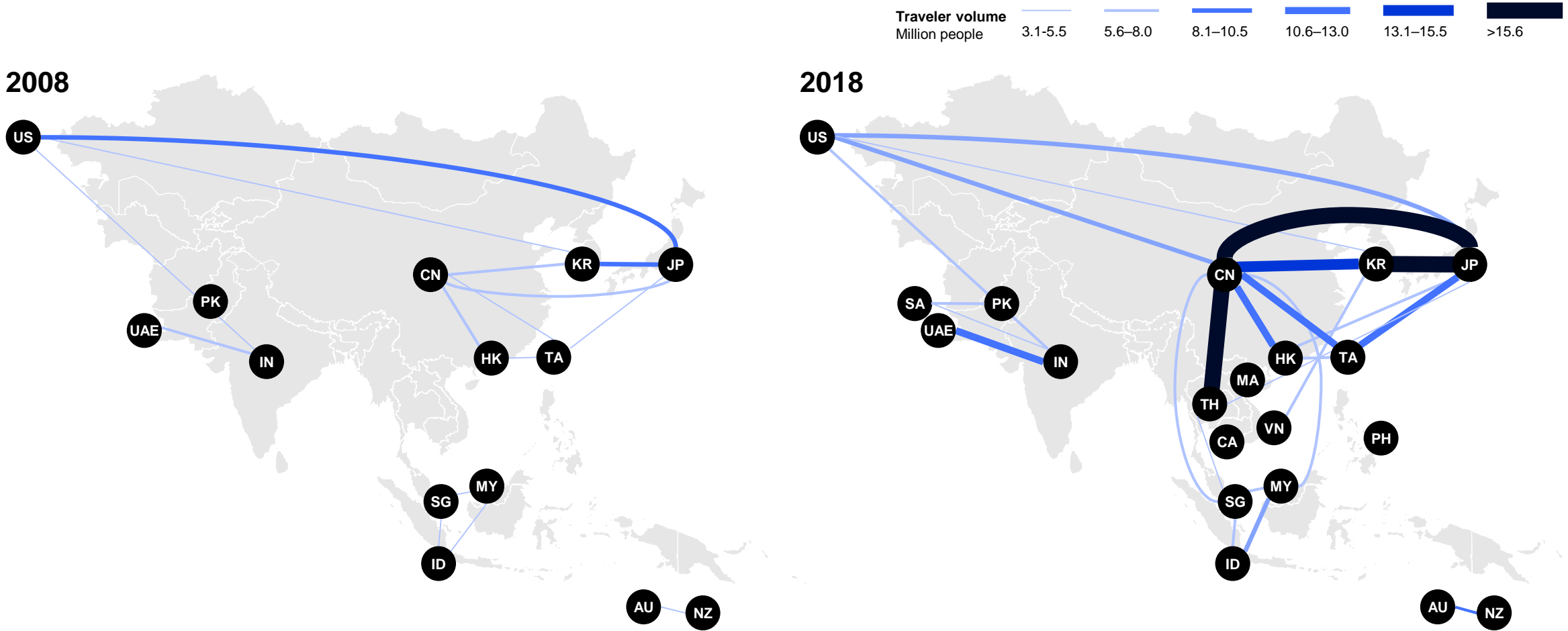
Global traveler: **1.8x**   Asian intraregional traveler: **2.7x**

China is driving the development of intra-regional trade in Asia

Trade volume
$ billion

| 11–25 | 22–50 | 51–100 | 101–250 | 251–500 | >501 |

2000

2017

Global trade: **2.8x**

Asian intraregional trade : **4.0x**

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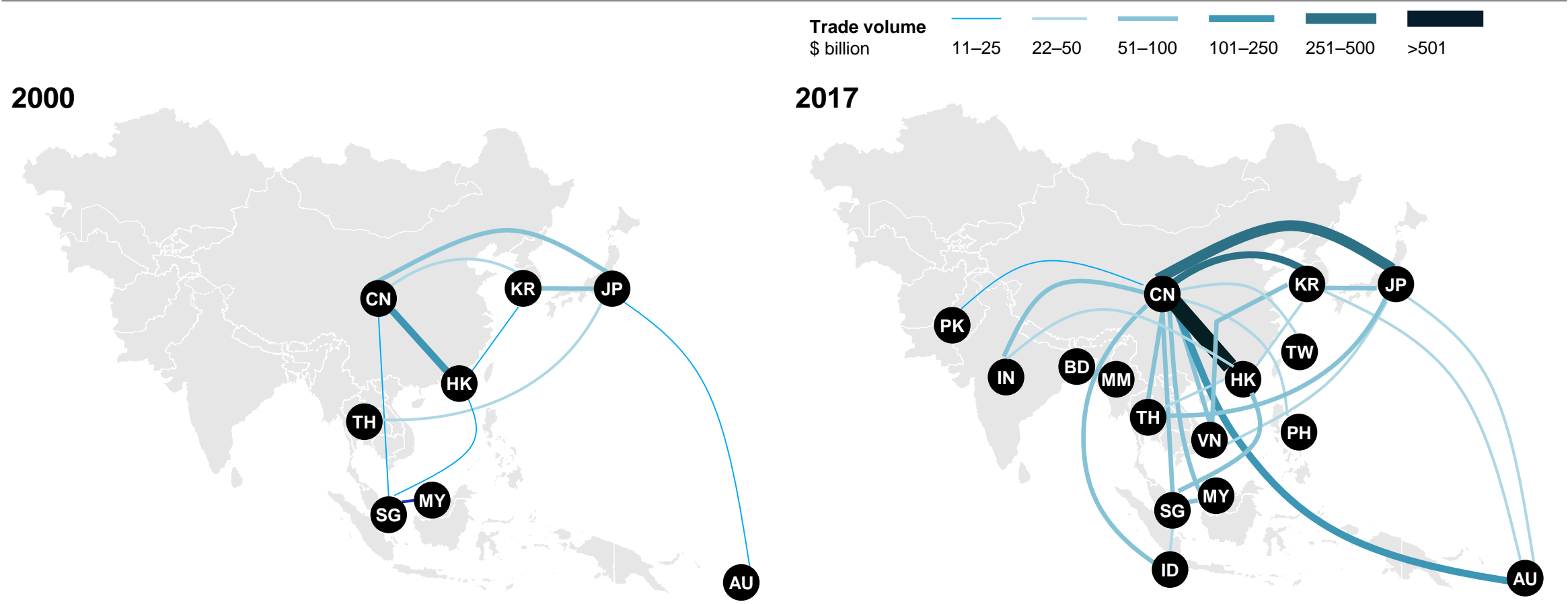
Asian cities are flourishing...

293

cities in Asia

Will drive **35%** of

the world's GDP by 2025

...investing and innovating

Industrialization

368

cities in Asia

Attract **$604 Bn** of manufacturing and infrastructure greenfield FDI

Innovation

20

cities in Asia

Home to about **1/3** of the world's unicorns

Culture & mobility

167

cities in Asia

Drive **2.3 Bn** airline travelers annually

Shanghai 1987

Shanghai 2013

The 50 fastest-rising cities on Asia's industrialization network

Metrics analyzed to calculate the CAGR of each city

Manufacturing greenfield investment (depicted)

Infrastructure greenfield investment

Investment and net exports

Working age population

Greenfield investment manufacturing
2017, $ billion

<2.5   2.6-4.5   4.6-6.5   6.6–8.5   >8.6

Overall index CAGR

Low   High

A new era of mega-cluster growth is dawning

Jingjinji

Changchun-Harbin

Liao central-south

Huhehaote

Shandong Byland

Taiyuan

Central

Hefei

Guanzhong

Nanjing

Yangzi mid-lower

Shanghai

Chengdu

Hangzhou

Chongqing

Nanchang

Changzhutan

Coast West

Kunming

Shenzhen

Nanning

Guangzhou (includes Foshan)

Last Modified 6/16/2019 6:26 PM China Standard Time

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Seoul, South Korea – Cheonggyecheon Stream Restoration

Before

An aging elevated freeway and concrete deck Cheonggyecheon stream

After

The restoration created a 3.6-mile continuous east-west green corridor for pedestrians, bicyclists, and wildlife

Leading firms in Asia's innovation network

India

OLA
Mobility

Flipkart
E-commerce

Paytm
Payments

China

DiDi
Mobility

Alibaba Group 阿里巴巴集团   JD.COM 京东
E-commerce

支付宝 ALIPAY   微信支付 WeChat Pay
Payments

OVO
Payment.Points.

Southeast Asia

Grab
gojek
Mobility

Lazada
Shopee
BukaLaPak
E-commerce

GO PAY
POWERED BY GOJEK
Payment

Intraregional flows of capital are forming innovation networks

Multi-local innovation is occurring across Asia

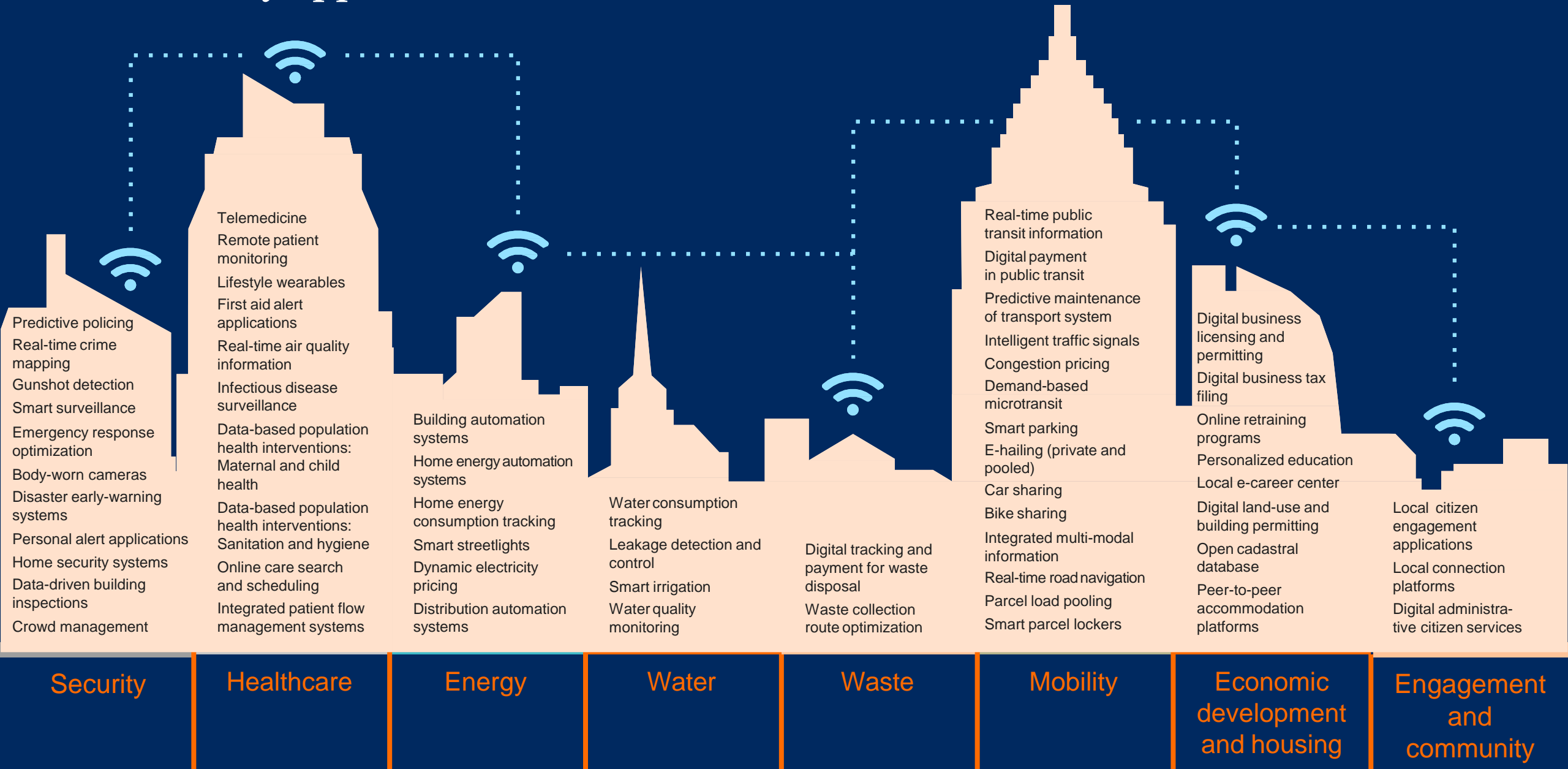# Which brings us to smart cities

Adoption and change

Applications

Connected devices

Infrastructure

~60 smart city applications most relevant until 2025

Security
- Predictive policing
- Real-time crime mapping
- Gunshot detection
- Smart surveillance
- Emergency response optimization
- Body-worn cameras
- Disaster early-warning systems
- Personal alert applications
- Home security systems
- Data-driven building inspections
- Crowd management

Healthcare
- Telemedicine
- Remote patient monitoring
- Lifestyle wearables
- First aid alert applications
- Real-time air quality information
- Infectious disease surveillance
- Data-based population health interventions: Maternal and child health
- Data-based population health interventions: Sanitation and hygiene
- Online care search and scheduling
- Integrated patient flow management systems

Energy
- Building automation systems
- Home energy automation systems
- Home energy consumption tracking
- Smart streetlights
- Dynamic electricity pricing
- Distribution automation systems

Water
- Water consumption tracking
- Leakage detection and control
- Smart irrigation
- Water quality monitoring

Waste
- Digital tracking and payment for waste disposal
- Waste collection route optimization

Mobility
- Real-time public transit information
- Digital payment in public transit
- Predictive maintenance of transport system
- Intelligent traffic signals
- Congestion pricing
- Demand-based microtransit
- Smart parking
- E-hailing (private and pooled)
- Car sharing
- Bike sharing
- Integrated multi-modal information
- Real-time road navigation
- Parcel load pooling
- Smart parcel lockers

Economic development and housing
- Digital business licensing and permitting
- Digital business tax filing
- Online retraining programs
- Personalized education
- Local e-career center
- Digital land-use and building permitting
- Open cadastral database
- Peer-to-peer accommodation platforms

Engagement and community
- Local citizen engagement applications
- Local connection platforms
- Digital administrative citizen services

Smart cities deliver improved quality of life

This could mean…
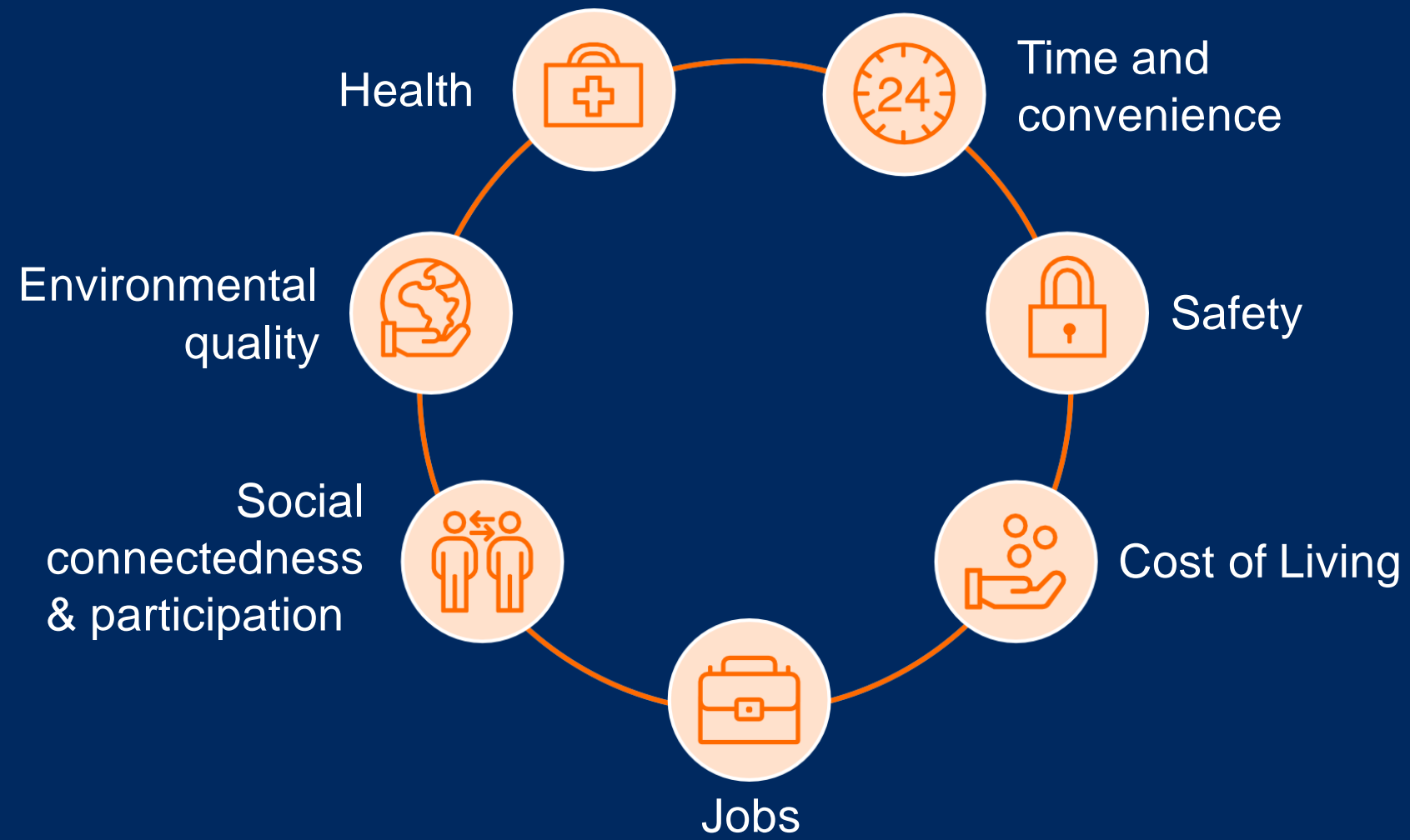
30 - 300
Lives saved per year

10,000 - 50,000
Crime incidents prevented per year

15 - 30
Minutes shaved off the daily commute

25 - 80
Liters of water saved per person per day

Health

Time and convenience

Environmental quality

Safety

Social connectedness & participation

Cost of Living

Jobs

What is the world's smartest city?

50 city
snapshot

Digital natives' attitudes are different

Consumer attitudes toward car ownership are changing

In contrast to before, owning a car is no longer a status symbol

60%

I can live without a car and I can rent when I need a car

40%

Shared mobility solutions are penetrating rapidly

E-hailing or car-sharing penetration

30%

17-minute decrease in commuting time

67%

The rise of the sharing economy

Percentage of online consumer willing to participate in sharing communities[1]
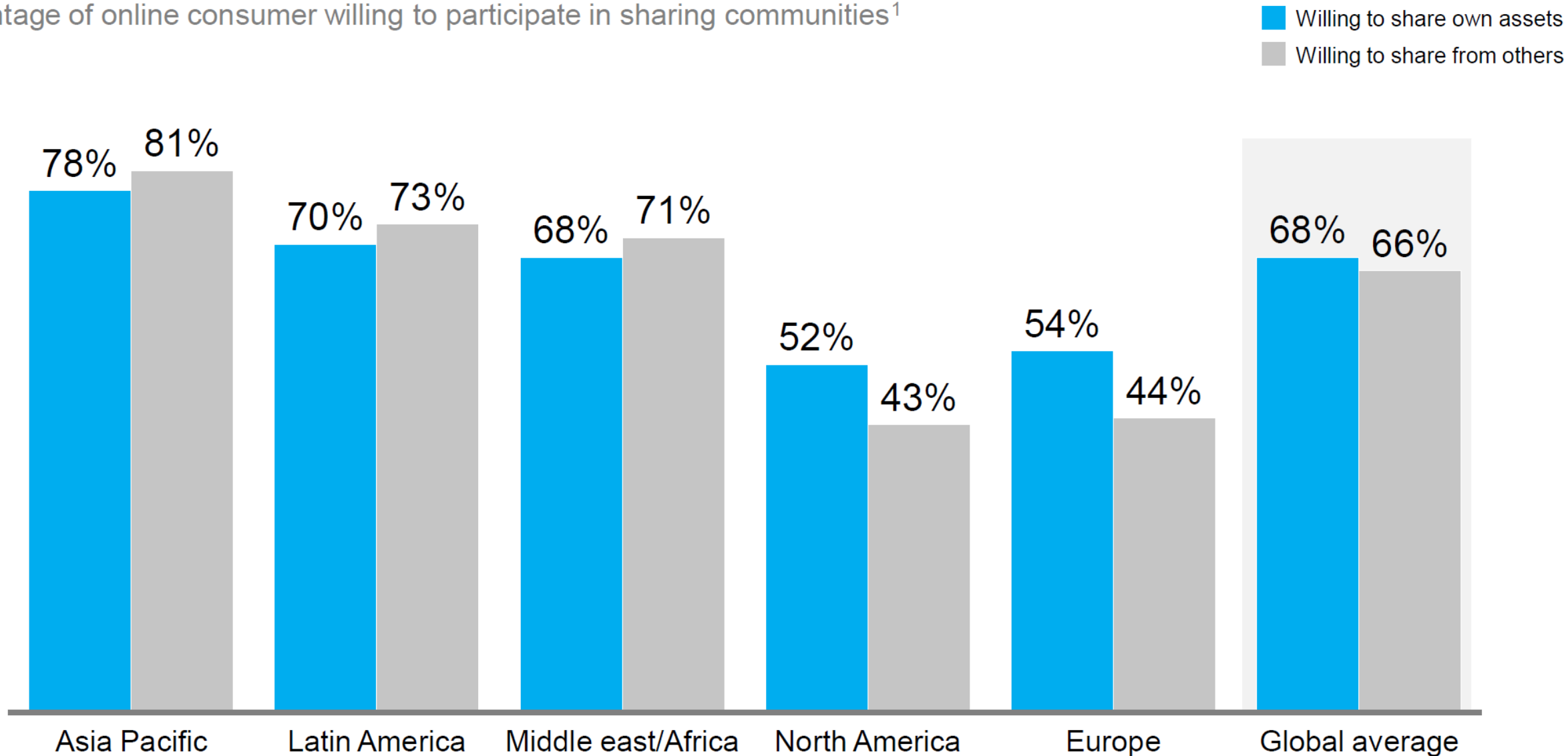
■ Willing to share own assets
■ Willing to share from others

	Asia Pacific	Latin America	Middle east/Africa	North America	Europe	Global average
Willing to share own assets	78%	70%	68%	52%	54%	68%
Willing to share from others	81%	73%	71%	43%	44%	66%

15 days to assemble a high rise

Methodology
- Pre-assembled panels (3.9 by 15.6 meters), including flooring, ceiling, and embedded shafts for water, electricity, lighting, ventilation, and drainage
- Trucks bring panels to site, where they are hoisted, fixed, and bolted

Key facts
- 93% of construction completed off-site
- Cost: $1,000–1,200 per square meter
- 1% construction waste

Civil engineers are at the beginning of the journey

16% feel a strategy isn't needed

28% have a digital strategy
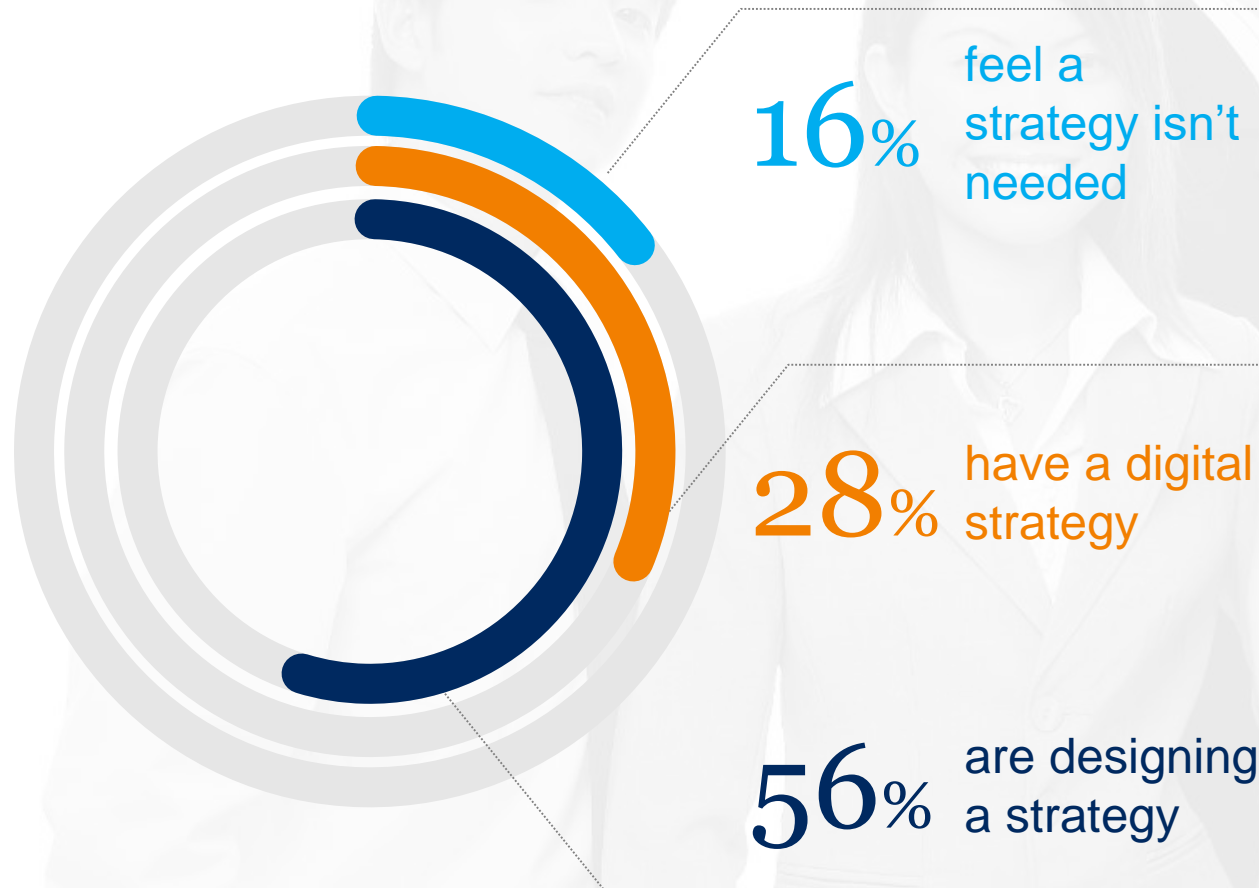
56% are designing a strategy

Civil engineers have made commendable progress, but mainly focusing on…

- Consideration for individual infrastructures
- Almost exclusively efficiency-type opportunities
- Focus on the short term costs/benefits

…if this continues, it's the civil engineering profession may be less significant in the future

- Competitive threats
- Shrinking staff force
- Commoditization
- Shrinking influence

"
We are told radical change is coming, but we still do most things exactly as we always have. For us, so far, 'smart cities' is' 'everything is different, but nothing has changed.'
"

CEO, Infrastructure Service Provider
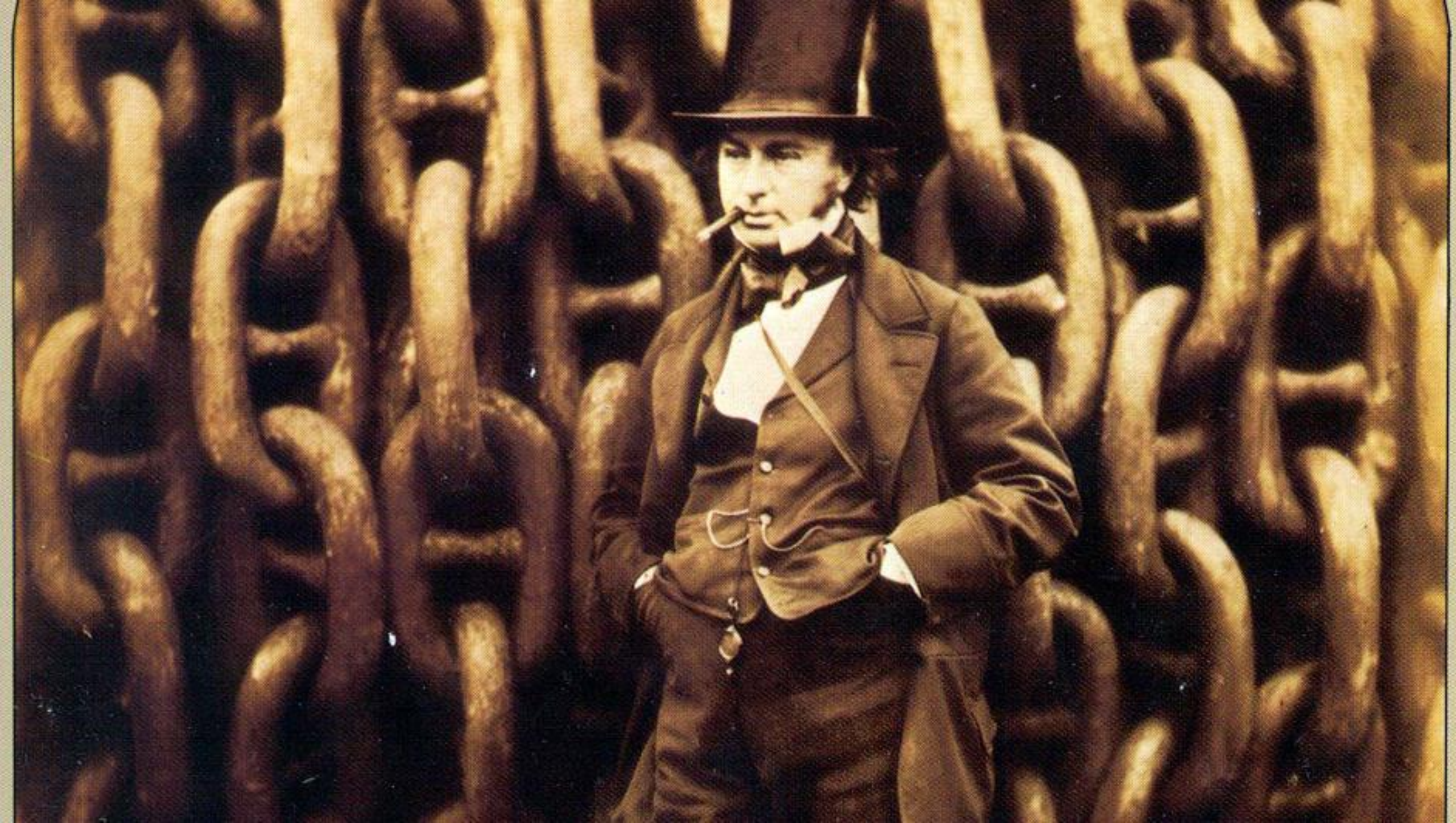
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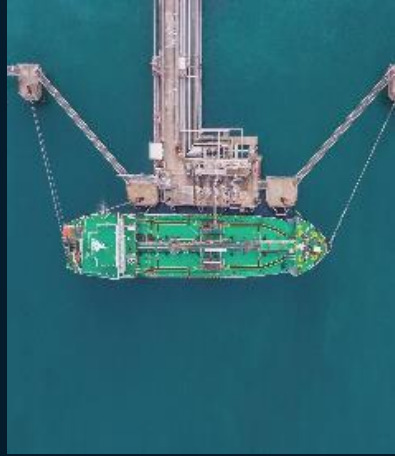
October 2019

Thriving in a world led by Asia

1

Be Asia relevant

2

Rethink the operating model

3

Invest to future proof

4

Develop an alliance mindset

Health

What does this look like in a Smart City

Lifestyle wearables

- Promote a healthy lifestyle by **distributing** (either free or subsidized) **wearable devices** that collect activity data and provide feedback to the wearer
- Incentivize exercise

Singapore
National Steps Challenge results showed that 70% of previously inactive participants averaged more than 7,000 steps per day

Real-time air quality information

- Install sensors to detect and monitor the presence of **indoor and/or outdoor air pollution** in real time
- Provide information to citizens in real time so that they can adjust their activities accordingly

Bogota
Reduced bad air quality by 37.5%

Where it can be applied

- MOBILITY
- SECURITY
- SOCIAL INFRASTRUCTURE
- UTILITIES

What this means for Southeast Asia

7-11 million
Disability-adjusted life years (DALYs) reduced,

More
than the South Korean population's total DALYs

Environmental quality

What does this look like in a Smart City

Building management system

Deploy smart systems that **optimize energy and water use** in commercial and public buildings by leveraging sensors, meters and analytics to **automatically monitor and eliminate inefficiencies**

Taipei
Taipei 101 reduces energy consumption by 33 million kwh and potable water consumption by 28 million liters annually

Smart streetlights

- Install **sensor-equipped and connected energy-efficient streetlights** that optimize brightness and reduce maintenance needs

Paris
Achieved a 25% reduction in energy consumption

Where it can be applied

- MOBILITY
- BUILT ENVIRONMENT
- SOCIAL INFRASTRUCTURE
- UTILITIES

What this means for Southeast Asia

260-270K

kilo-ton of GHG emissions saved yearly, as much as produced by Laos

Time and Convenience

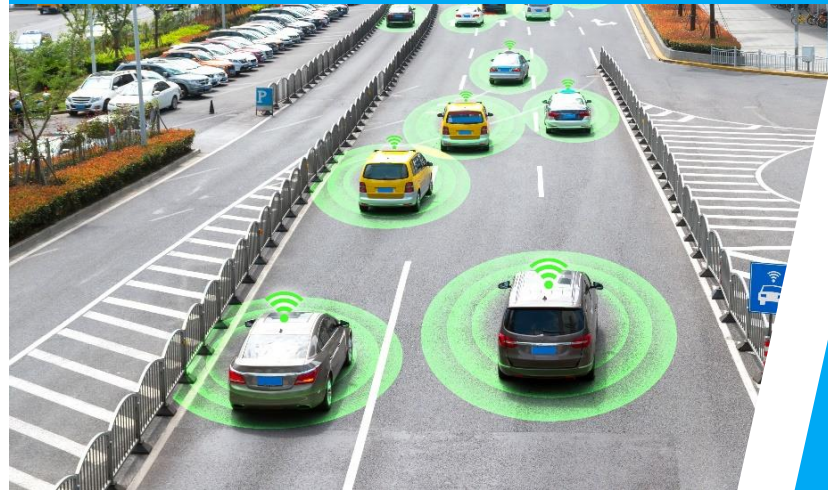What does this look like in a Smart City

Intelligent traffic lights

- Use **sensors and controls** on traffic lights for **dynamic optimization** of timings
- Allow higher average speeds on roads and less frequent stop-and-go conditions.

Pittsburgh
Smart traffic lights reduced travel time by 25%, braking by 30%, and idling by more than 40%

Traffic command and control centres

- Build central facility that **integrates and displays multiple sources of real-time information**
- Monitor traffic and plan accordingly

Moscow
17.5% decrease in road traffic incidents and 23% decrease in traffic since 2015

Where it can be applied

- MOBILITY
- COMMUNITY
- SOCIAL INFRASTRUCTURE

What this means for Southeast Asia

6-8 million
man-years saved in commute time

2x
more than Singapore's FTE population