

An aerial photograph of a dense urban skyline, likely New York City, featuring numerous skyscrapers and buildings. The image is used as a background for the slide.

Mega Cities

The Peelle Company New York, NY, USA - Michael Ryan VP Business Development

Mega Cities defined

The United Nations = Mega Cities have a population of 10 million people or more

Affects the future prosperity and stability of the entire world

New York, London, Tokyo, and Paris economies are individually larger than most countries

Will host up to 70% of the earth's population



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Mega Cities growth

From 1975 to 2015

From 5

3 in the developing world

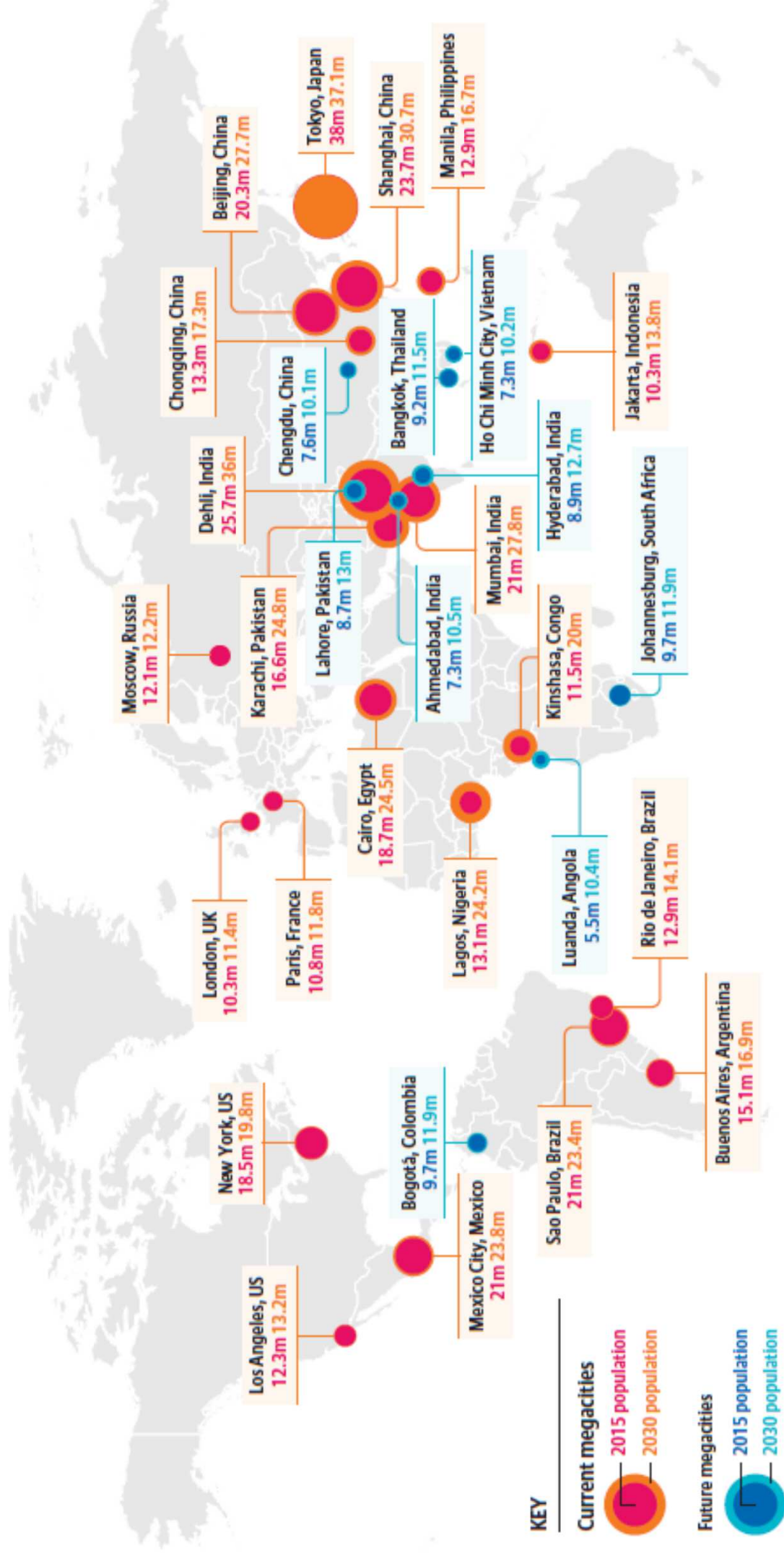
To 26

22 in developing world

By 2030, there will be 41 Mega Cities

10 in Asia and Africa (Delhi, Dhaka and Lagos)

Declining household size, but growing number of households



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The term Mega City is evolving

Ancient Rome would have been considered a Mega City with a population over 1 million

London or Chicago would both qualify today, but neither are 10 million

11 largest “urban population groups” growth
from 162 million in 1994
to 240 million in 2016

Mega Cities are more appealing than in the past

In North America, cities offer a better life style than suburbs

Mega Cities offer more opportunities and quality of life improvements

- Employment

- Energy and Connectivity (Wi-Fi)

- Culture

- Transportation

- Convenience

Mega Cities shift from West to East

New York and Tokyo have traded positions with Mumbai and Shanghai on the Mega Cities list

In other words, developed nations v. developing nations are growing at different paces

New York and Tokyo have relatively modest population increases

Mumbai and Shanghai are growing from 1-5% per year and are expected to do so for many years until they stabilize to a modest growth rate

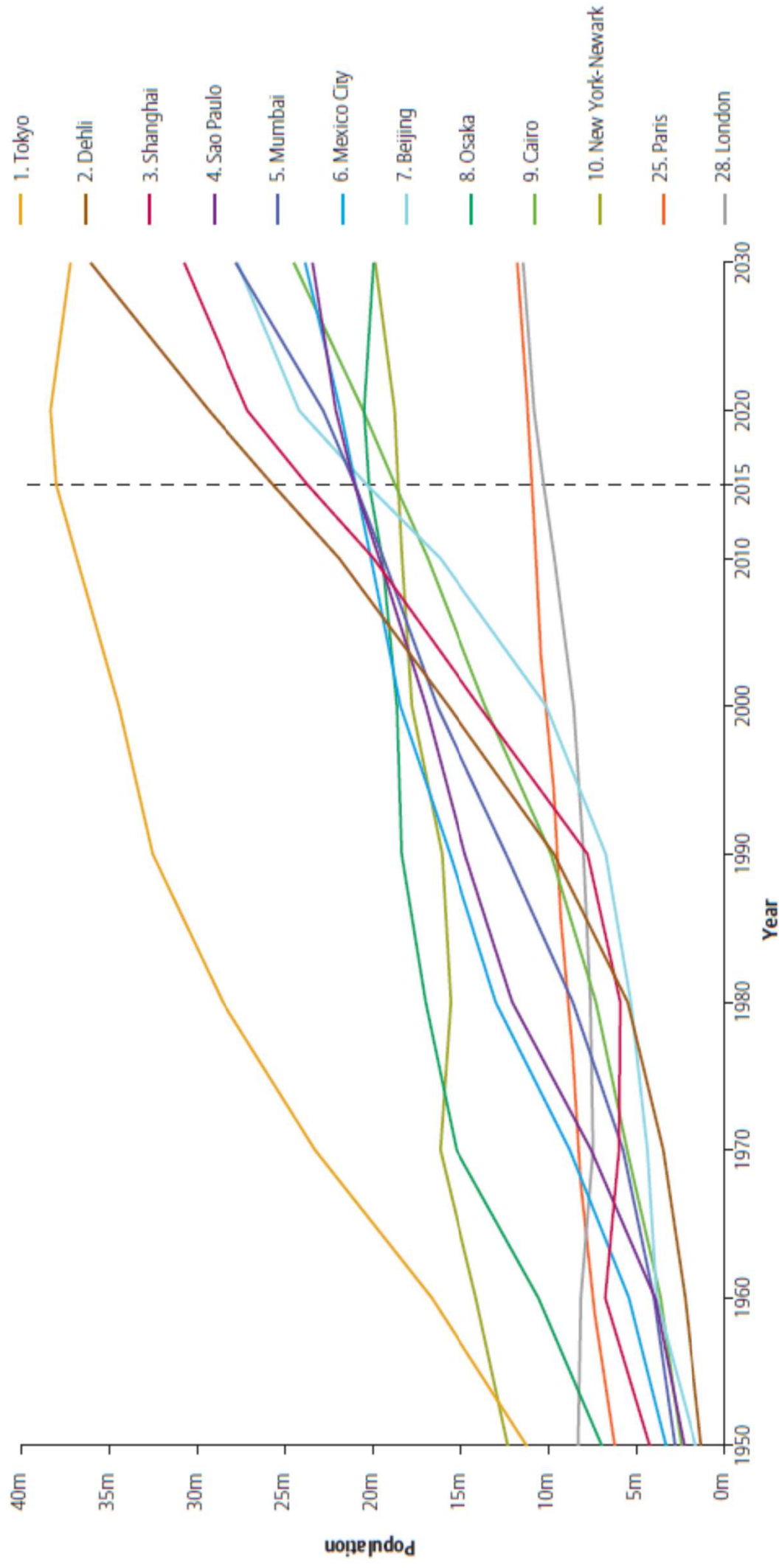
Mega Cities by 2030

2/3^{rds} (66%) of the world's population will live in Mega Cities of the developed countries

82% of North America

80% of Latin America and the Caribbean

73% of Europe



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Mega Cities

10 million people or more

Giga Cities

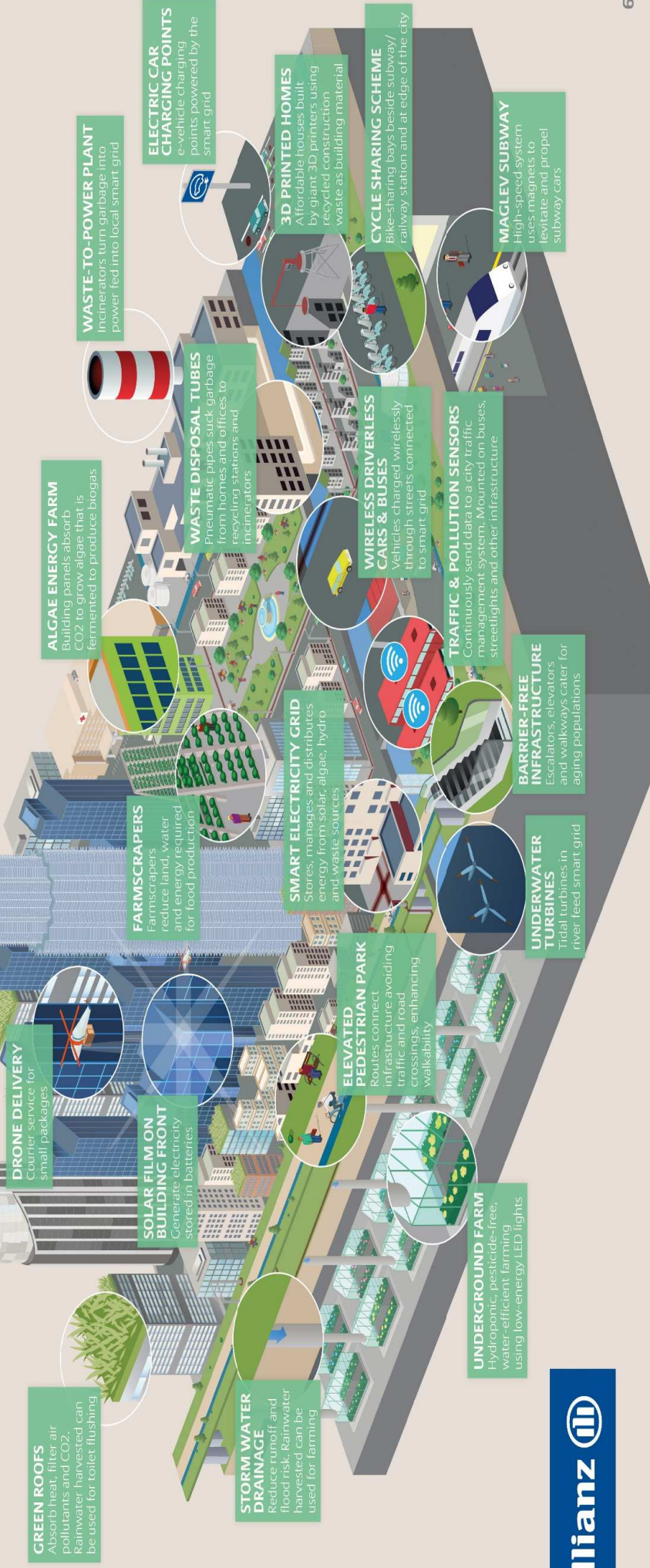
A larger category of city, more than 50 million people
Soon to be a reality in China

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Megacity solutions

Megacities must adapt and innovate to meet the challenges residents face. Here are some solutions that could make megacities greener, more efficient and more pleasant places to live.



Mega Cities and Elevator solutions

How does the elevator industry drive solutions with these innovative technologies in mind?

How do we ensure that Mega City planners include Vertical Transportation in their designs?

The elevator industry needs to offer advanced technological solutions that pace other building systems.

Why do planner focus on Mega Cities?

Social unrest often originates in Mega Cities

Key instruments of social and economic development

There's more business for elevator contractors

New market opportunities in developed and developing worlds

These new opportunities are transferred to markets outside of Mega Cities

Mega Cities can help solve problems?

Mega Cities offer opportunities required for their sustainability

Population growth drives housing construction and environmental protection

Infrastructure improvements/upgrades in communications and transportation

Employment; building for the future keeps people employed

Mega Cities trickledown

Determines how we will live outside of Mega Cities

Urban development direction and planning

Transport, energy, culture, and economies

The elevator industry needs to offer solutions which pace construction development that efficiently and safely move the population and goods

Who lives in Mega Cities?

People moving in are younger

Cities will include the *working young* and *retired old*

Cities are aging more slowly than the counties they are located

We need to plan for an aging population

Life expectancy is increasing at that same time as population, people will spend more time in retirement

Mega Cities will need to adapt for the population

Mega City Maturity



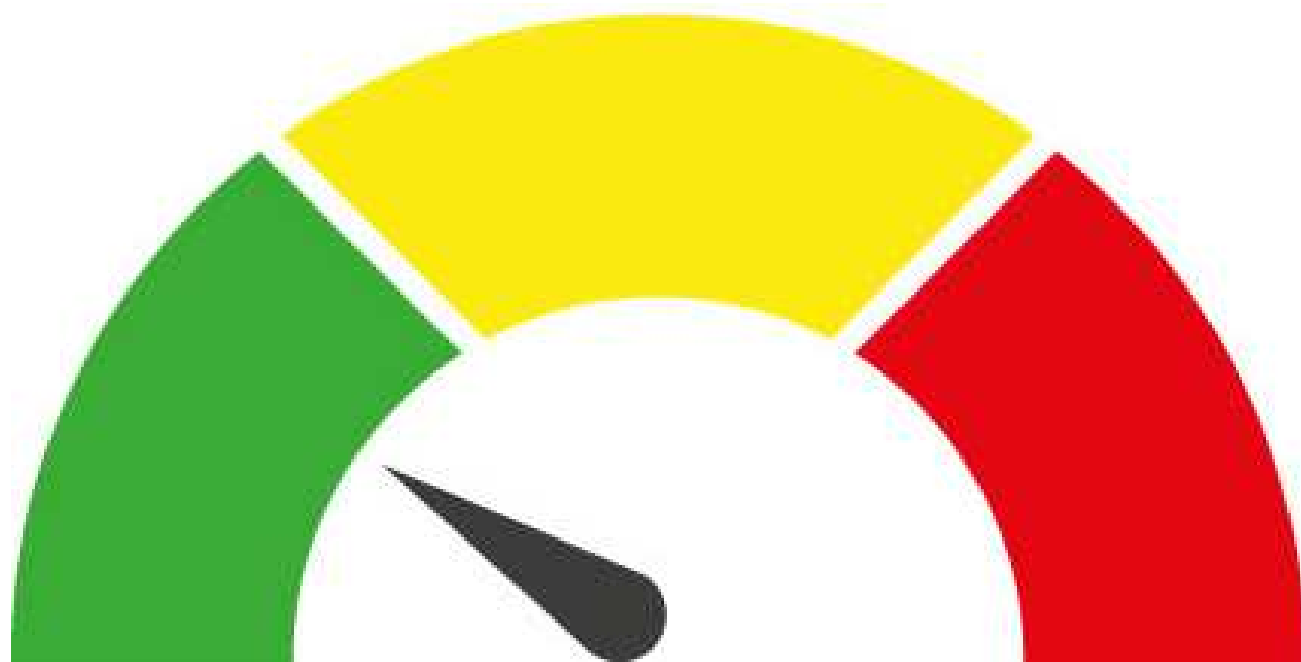
Low Maturity

Fast growing

Youthful and earning

Minimal building standards

Weak infrastructure





Maturity Level

Low

Examples:

Dhaka, Kinshasa, Lagos

- ▶ High growth rate
- ▶ Young population
- ▶ Unplanned slums
- ▶ Limited mass transit
- ▶ Fragmented governance
- ▶ Weak energy, health, education infrastructure
- ▶ Extreme poverty
- ▶ Extreme social segregation
- ▶ Inadequate housing
- ▶ Transport congestion
- ▶ Chronic air, water pollution
- ▶ Poor health outcomes
- ▶ Low education & skills
- ▶ Weak governance, corruption & crime
- ▶ High disaster risk

Characteristics

Challenges & Risks

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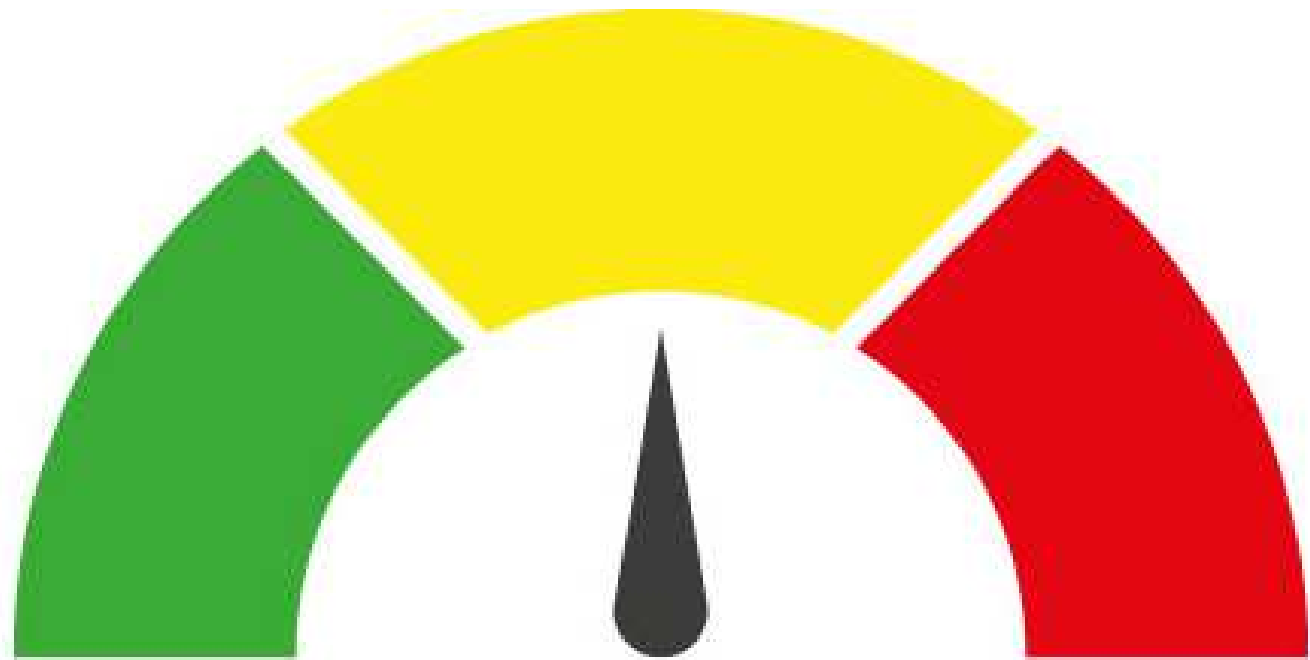
Medium Maturity

Growing at a slower rate

Aging and wealthy

Better governed

Better infrastructure





Maturity Level

Medium

Examples:

Shanghai, Mexico City, Rio de Janeiro

- ▶ Continuing growth
- ▶ Signs of aging population
- ▶ Urban planning evident
- ▶ Expanded mass transit
- ▶ Coordinated governance
- ▶ Improved energy, health, education infrastructure
- ▶ Pockets of poverty
- ▶ Chronic social segregation
- ▶ Unequal access to basic services & infrastructure
- ▶ Inefficient urban sprawl
- ▶ Chronic air pollution & congestion
- ▶ Vulnerable to natural & climate-related disasters

Characteristics

Challenges & Risks

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High Maturity

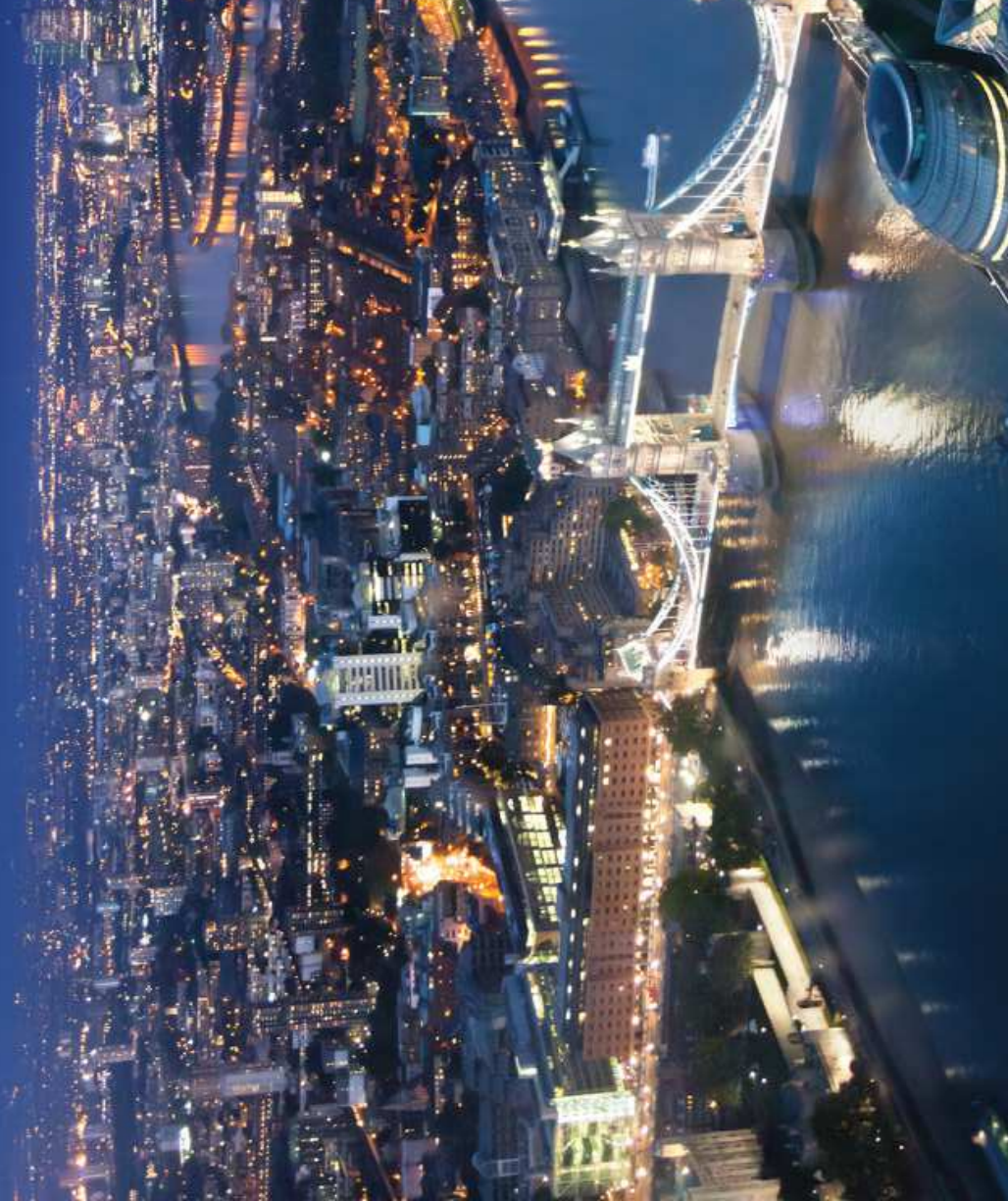
Aging population

Gaps between rich and poor

Infrastructure needs to be modernized

Key strength is wealth





Maturity Level

High

Examples:

London, New York, Tokyo

Characteristics

- ▶ Flat or negative growth
- ▶ Aging population
- ▶ Coordinated urban planning
- ▶ Embedded mass transit
- ▶ Centralized governance
- ▶ Established energy, health, education infrastructure

Challenges & Risks

- ▶ Widening inequalities
- ▶ Aging infrastructure requiring low-carbon, smart alternatives
- ▶ Aging mass transit requiring upgrading, expansion
- ▶ Air pollution requiring traffic controls
- ▶ Energy- inefficient housing
- ▶ Value concentration risks

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Mega Cities of the future

Multiple contained centers

Rooftop Gardens (Singapore)

Repurposed Infrastructure

(New York's High Line Park)

Subway Systems (London)

People will live and work in the same contained centers

Climate improvement

Less commuting

More space for leisure and food production

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The World's Megacities: Population Highlights

Megacity	Country	2015 population in millions	2030 population in millions	2030 population growth	2010 population age distribution (%)			2010 population density per km ²	2015-2020 average annual population growth rate (%)
					0-14	15-64	65+		
Tokyo	Japan	38.00	37.19	(-0.81)	12	69	19	4,400	0.17
Delhi	India	25.70	36.06	(10.36)	25	71	4	12,100	2.65
Shanghai	China	23.74	30.75	(7.01)	9	80	11	6,100	2.67
São Paulo	Brazil	21.07	23.44	(2.37)	22	71	7	7,500	0.98
Mumbai	India	21.04	27.80	(6.76)	22	72	6	32,400	1.64
Mexico City	Mexico	21.00	23.86	(2.86)	25	68	7	9,700	0.81
Beijing	China	20.38	27.71	(7.33)	9	80	11	5,500	3.43
Osaka	Japan	20.24	19.98	(-0.26)	13	67	20	5,400	0.28
Cairo	Egypt	18.77	24.50	(5.73)	26	69	5	8,900	1.83
New York-Newark	US	18.59	19.89	(1.3)	19	68	13	1,800	0.21
Dhaka	Bangladesh	17.60	27.37	(9.77)	30	65	5	43,500	3.52
Karachi	Pakistan	16.62	24.84	(8.22)	37	60	3	23,400	2.92
Buenos Aires	Argentina	15.18	16.96	(1.78)	23	65	12	5,300	0.92
Kolkata	India	14.86	19.09	(4.23)	26	69	5	12,200	1.13
Istanbul	Turkey	14.16	16.69	(2.53)	24	70	6	9,800	1.28
Chongqing	China	13.33	17.38	(4.05)	15	72	13	7,700	2.67
Lagos	Nigeria	13.12	24.24	(11.12)	32	65	3	14,500	4.17
Manila	Philippines	12.95	16.76	(3.81)	31	66	3	15,300	1.48
Rio de Janeiro	Brazil	12.90	14.17	(1.27)	21	70	9	5,800	0.65
Guangzhou	China	12.46	17.57	(5.11)	11	82	7	6,000	3.94
Los Angeles	US	12.31	13.26	(0.95)	21	68	11	2,400	0.23
Moscow	Russia	12.17	12.20	(0.03)	12	74	14	3,500	0.50
Kinshasa	DRC	11.59	20.00	(8.41)	46	51	3	19,900	3.95
Tianjin	China	11.21	14.66	(3.45)	11	78	11	5,400	2.68
Paris	France	10.84	11.80	(0.96)	20	68	12	3,800	0.77
Shenzhen	China	10.75	12.67	(1.92)	8	91	1	6,900	0.98
Jakarta	Indonesia	10.32	13.81	(3.49)	24	73	3	9,500	1.81
London	UK	10.31	11.46	(1.15)	18	68	14	5,900	1.01
Bangalore	India	10.09	14.76	(4.67)	23	73	4	8,400	3.20

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What do Mega Cities mean for the Elevator Industry?

The opportunity is real and it's large

Mega Cities will be congested, contained centers

Limited space means more vertical transportation

Millions of people and tons of goods will need to be moved

- Elevators

- Escalators

- Freight/Goods Lifts (production and warehouse close to centers)

- Auto Lifts/Parking Garages (for the vehicles we retain)



The Future of the Mega City construction

It's easier to build Mega Cities with new infrastructure than to rebuild an existing one

Infrastructure spending helps the economy

A strong economy ensures employment

Product Innovation, quality, which offer minimal downtime will win

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Mega Cities Elevator winners

Improve service and relationships to retain your existing customer base

Products that save space and energy (MRL)

Digitalization (cloud, remote monitoring, PM, e-Commerce, security, etc.)

New building designs = multi directional elevators, linking to other transportation modes, other

Faster speeds for taller buildings = NYC office workers spend 16.6 years waiting for elevators, and 5.9 years in the elevators

Mega Cities Elevator features

Security and access based on key fob, biometric chip, other

Pre-programmed/Destination Dispatch

Faster Speeds and those which save space and energy

Vertical and Horizontal travel, mating with other transportation modes

Production => warehouse => delivery



How do you prepare for Mega Cities?

Strategic planning for the future

- Research and Development
- Service and Maintenance
- How should the Population/Goods be transported

Coordination with building/transport modes

Join the local planning department

Establish a physical presence in future Mega Cities

Model/JV with other building trades



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