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REA617
Real Estate & Urban Economics

Lecture 1



Introduction to Urban Economics and Real Estate Markets

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lecture

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Abstract



This lecture introduces the economic logic behind cities and real estate markets. It presents core concepts, and draws policy implications for affordability, sustainability, and inclusive growth.



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1. Overview
 2. Why Cities Form: Agglomeration Forces
 3. Urban Spatial Structure: The Monocentric Benchmark
 4. Housing Demand and Supply Fundamentals
 5. The Real Estate Four-Quadrant Model
 6. Land Use Regulation and Supply Elasticity
 7. Transport, Technology, and Urban Form
 8. Housing Affordability and Inclusion
 9. Cycles, Risk, and Finance
 10. Sustainability ,Green and Smart Cities
 - 11. Case Studies**
 12. Methods and Data

Learning outcomes



By the end of the lecture you will be able to:

1. Know about fundamentals of city growth
2. Understand urban economics role
3. Analysis of Urban economic perspectives
4. Explanation of Sustainability , and Green and Smart Cities

In the United States fewer than 20% of people live outside of a center city and its suburbs. Few of us live in farming or exurban areas. In the developing world, billions of people are moving to cities.

Why? Why don't they remain in the countryside and keep in touch with their family and friends and their social traditions?

Why?



Los Angeles often has nicer weather than Chicago. Given this fact, why are there millions of people living in Chicago?

1. Overview - ✓ Pros of Living in the



City

Job Opportunities – Cities usually have more diverse employment options across industries.

Education & Healthcare – Better access to universities, schools, hospitals, and specialized clinics.

Transportation – Public transport systems (metro, buses, trams) reduce reliance on cars.

Cultural Life – Museums, theaters, concerts, festivals, and nightlife are more accessible.

Networking & Community – Easier to meet people for business, social, or cultural exchange.

Services & Amenities – Shopping malls, restaurants, gyms, and entertainment are nearby.

Diversity – Exposure to people from different backgrounds, cultures, and languages.

1. Overview - ✕ Cons of Living in the

City

Cost of Living – Rent, food, and services are often more expensive.

Noise & Pollution – Traffic, construction, and population density can affect health.

Stress & Fast Pace – The busy environment may feel overwhelming and tiring.

Smaller Living Spaces – Apartments are often smaller and more costly compared to rural homes.

Traffic & Congestion – Even with public transport, cities suffer from overcrowding and traffic jams.

Safety Concerns – Higher crime rates in some areas compared to rural towns.

Less Nature – Limited green spaces and less connection with natural environments.

Social Isolation – Despite being surrounded by people, some find city life lonely.



1. Overview - Similarities Between

Cities



Think of the ten largest metropolitan areas in the world..
Each of these areas have plenty of things in common.



1. Overview - Differences Between Cities

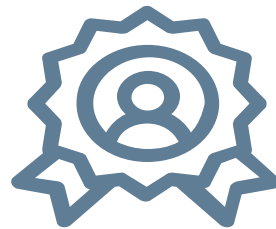
The cities differ along a number of dimensions:
different geography, different weather,
different histories and their growth took place at different times.
They tend to specialize in different industries and occupations.

For example, Houston is home to many fossil fuel companies while Boston has very few



1. Overview- City Growth - economic opportunity

Immigration is a key source of city growth. Those cities that offer greater economic opportunity for immigrants are more likely to attract them. While people differ with respect to what causes them to consider moving to a place, **economic opportunity is a key factor.**



1. Overview - City Growth - Why



Over time, some cities such as Las Vegas and Phoenix and Shenzhen grow while other cities such as Baltimore and Detroit shrink in population size. Why?

What role do local amenities, government policy and local job growth play in determining a city's population growth?

Think of Seattle today with booming Microsoft and Amazon this wasn't always the case in the year 1979 Seattle was kind of a sleepy town.

1. Overview -City Growth -economy booming.

Migration of both domestic citizens and immigrants increases if the local economy is booming.

A city's economy is not a microcosm of the nation.

Each city tends to specialize in a few industries.

If these industries are booming, the city booms. It is not a “law of physics” that a city just keeps growing over time.



1.Overview -City Growth –climate

Another factor that influences population growth is winter and summer temperature. People have revealed a desire to live in warmer winter areas.



1. Overview - City Quality of Life - urban infrastructure

A city is a collection of different vintages of capital including vehicles, buildings and urban infrastructure such as the power grid, road network and sewer system.

A city's population and employment grow if more people and firms decide that this location is the right place for them.

Each person and firm has an opportunity cost. There are other locations where they could locate.



Cities compete for footloose people and firms. If a location fails to offer good quality of life and economic opportunity, real estate prices will decline as aggregate demand declines.

1. Overview - City Quality of Life

City Quality of Life – green city

Yet, if a city grows “too big”, certain quality of life challenges such as crime, congestion, and pollution often grow worse.

A positive over the last 50 years has been local air quality and water quality progress and the rise of green cities.



1. Overview - City Quality of Life - government role

Government intervention is the standard policy prescription for mitigating this Tragedy of the Commons.



Is government up to the job? In the developing world, issues of corruption arise, and issues of state capacity arise.

Who chooses to work for government? What incentives do they face to do their job well? Are there honest elections for holding elected officials accountable? What resources does the state have access to?

1. Overview - How we choose where we want to live?

The spatial choices we make of where we work, where we live, where we shop, where we entertain all embody tradeoffs.

Given that there is no central planner telling us where to go, who is “directing traffic”? The answer of course is **the market price system**.

Spatial wages and spatial real estate prices both across and within geographic areas send us signals and we choose where we want to live our lives. ?



1. Overview -Urban economists' role?

Explore what are the benefits and costs of urban living?

How does one's location play a causal role in determining one's comfort, productivity and happiness?

Given that all 8 billion people on the planet must live somewhere, how do we organize ourselves?



1. Overview - what is urban

economics?

Urban economics studies how economic forces shape the size, structure, performance, and evolution of cities.

It explains :

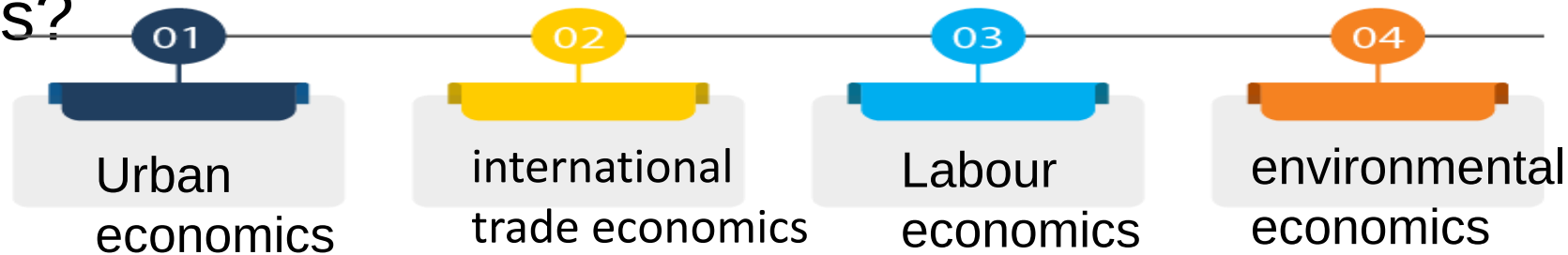
- why households and firm's cluster
- how land and housing markets allocate scarce urban space
- how transportation, regulation, and technology shift urban form.

Real estate economics applies these ideas to assets—land and buildings—linking space markets (rents, vacancy) to investment, prices, and risk.



1. Overview - what is urban economics-

Relations?



Numerous areas of contemporary economics are connected to urban economics. Understanding the causes and effects of booms and recessions is the goal of macroeconomists.

Additionally, they aim to comprehend the factors that influence long-term economic growth. Here, urbanization is a major factor.

Urban economics, international trade economics, labour economics, and, environmental economics, are closely related

1. Overview - what is urban economics goal?

The goal of urban economics is to forecast and explain human behavior. This assignment is difficult!

How many more people will take the bus, for instance, if the cost of public transportation is eliminated? Will there really be a rise in bus usage in affluent Beverly Hills? In this instance, the analyst estimates a demand curve using Big Data and a fundamental concept from economics known as "the law of demand."

An estimate out of sample prediction can be n
we can estimate the demand curve for public t



ical relationship if

1. Overview - what is urban economics? -example

This urban economist might also be asked to forecast the expected number of passengers on a new light rail line, like Los Angeles' East/West Expo line.

The study could also look at how the fast new train would likely affect the prices of real estate in the area around the train stations; if prices increase within a mile of the stations, the city could use land value capture to fund the project.



1. Overview - urban economics & public policy?

All of these instances demonstrate how :

Economics and statistical data analysis work together to support the formulation of public policy.

The urban economist is a useful policy advisor in this regard.



1. Overview - urban economics & public policy - example?

For example, if Los Angeles introduced a \$10 toll on the 405 Freeway at peak weekday hours, how much revenue would this generate and how would road speeds be affected?

Such ex-ante prospective analysis should inform policy making.

urban economics concerning how to test urban policy ideas.

By creating a knowledge base concerning what incentive effects actually do to urban life, urban economic analysis informs attempts to **enjoy the benefits of urbanization while curbing the social costs associated with urban growth.**



2. Why Cities Form: Agglomeration Forces

Firms and households gain productivity from proximity through input sharing, labor market pooling, and knowledge spillovers.

Static scale economies lower average costs; dynamic spillovers raise growth via learning-by-doing and innovation. Yet agglomeration faces congestion costs (travel time, crowding), land scarcity, and pollution.

Equilibrium city size occurs where marginal benefits of density equal marginal costs. Empirically, doubling city employment often raises productivity by 3–8% (urban agglomeration elasticity).



3. Urban Spatial Structure: The Monocentric Benchmark

The Alonso–Muth–Mills (AMM) model posits a central business district (CBD) and monocentric commuting. Households trade off housing space, non-housing consumption, and commuting cost; firms trade land against transport access.

Bid–rent curves decline with distance as commuting costs rise.

While modern cities are polycentric, the monocentric model provides clear comparative statics: falling commuting costs flatten bid-rent, expand city size, and lower central densities, all else equal.

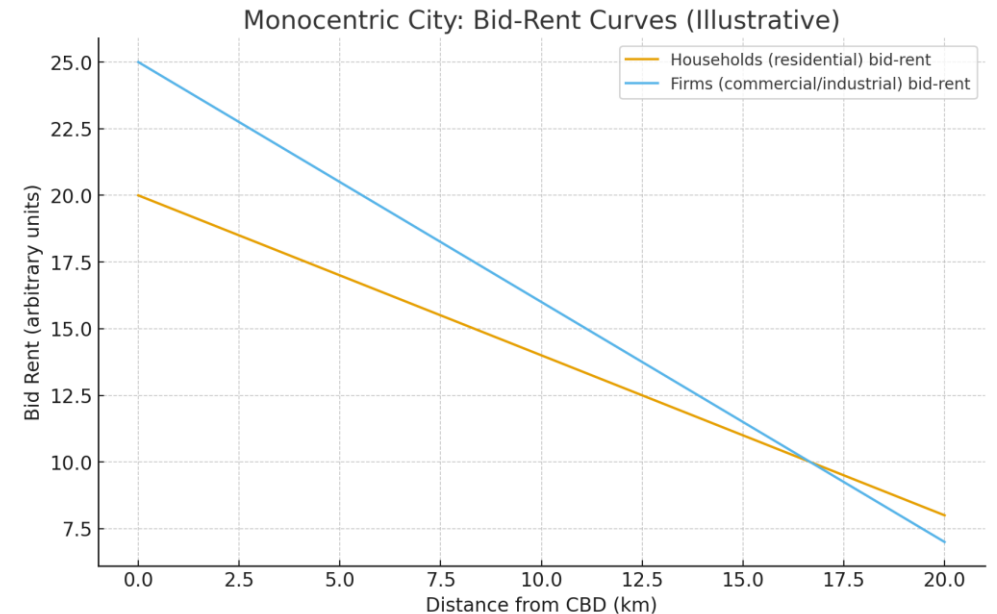


Figure 1. Bid-rent curves for households and firms in a monocentric city

4. Housing Demand and Supply Fundamentals

Demand :depends on incomes, demographics, credit conditions, expectations, and user cost (interest, taxes, maintenance minus expected appreciation).

Supply :depends on construction costs, land availability, topography, and regulations (zoning, height limits, parking, impact fees).

Where supply is inelastic—due to geography or rules—demand shocks translate into price swings rather than new units, raising volatility and affordability pressures.



5. The Real Estate Four-Quadrant Model

1.(Space Market) :Strong economy → higher demand for space → rents rise

2.(Asset Market):Higher rents → higher property prices

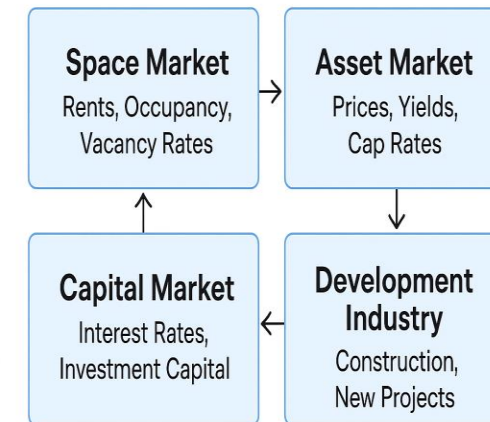
3.(Development Industry). Higher prices → new construction

4. Capital market Developers need financing → provides money.

New supply → feeds back into space market, affecting rents and vacancies.

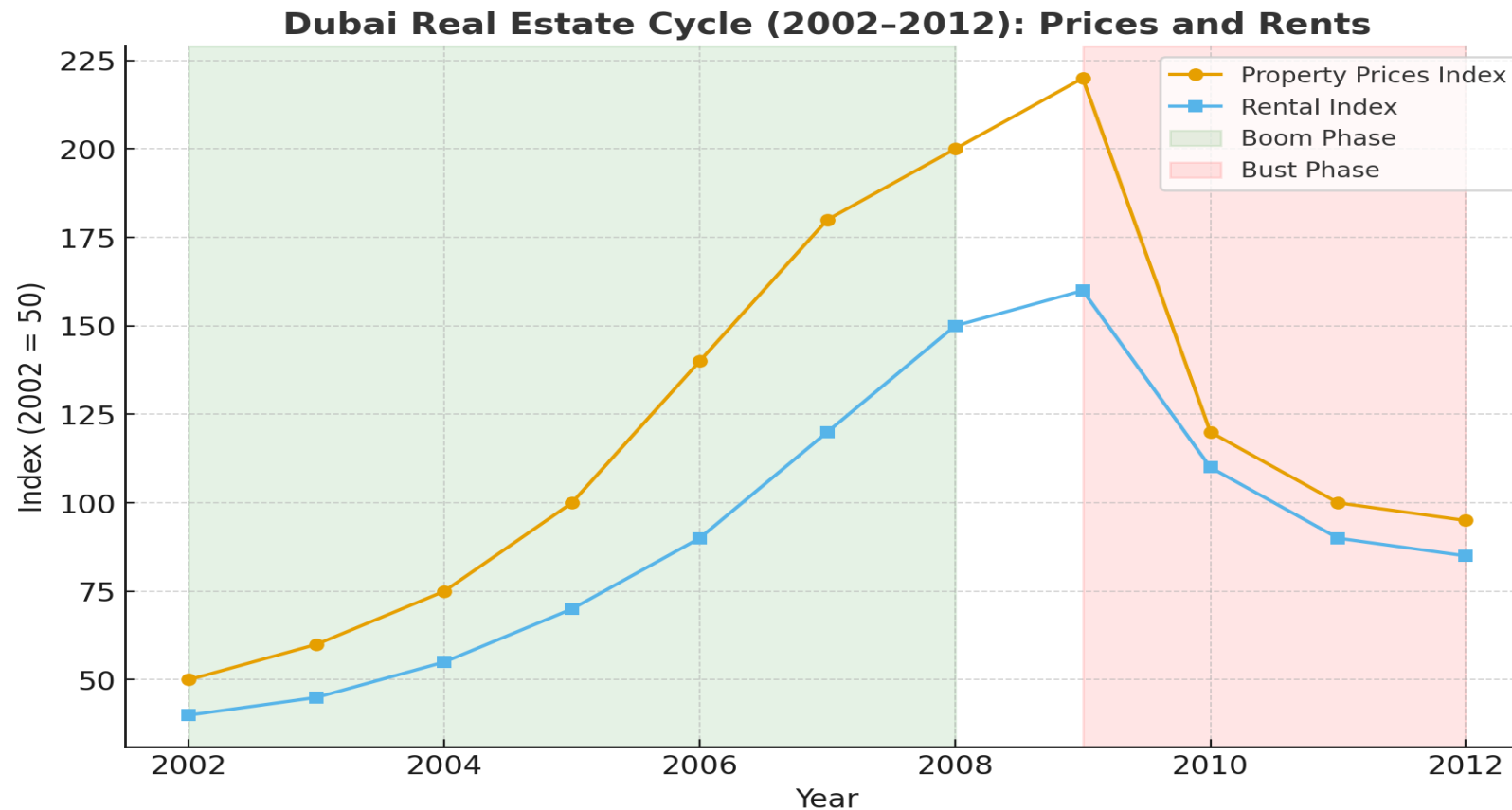
This creates **cycles** of boom and bust.

Real Estate Four-Quadrant Model



Interactions among these quadrants explain real estate cycles

5. The Real Estate Four-Quadrant Model – Case study



Here's the **timeline graph** showing Dubai's real estate cycle:

📈 **2002–2008 boom:** sharp rise in both property prices and rents.

📉 **2009–2012 bust:** steep decline due to oversupply and global financial crisis.

5. The Real Estate Four-Quadrant Model – Case study

Example in Action: Dubai (2002–2012)

Space Market: Rents doubled during the boom, then collapsed with vacancies of 40%.

Asset Market: Prices rose by ~79% (2005–08), then fell ~50%.

Development: Mega-projects launched, then many were halted after the crash.

Capital Market: Easy financing before 2008, then credit freeze and bailout.

5. The Real Estate Four-Quadrant Model – Case study

Outcome and Lessons

The Four-Quadrant Model explains how **interactions among the markets amplified the cycle**:

- Rising rents (space market) drove up values (asset market).

- Higher asset values encouraged more construction (development industry).

- Capital inflows (capital market) fueled the boom.

- When demand collapsed, all four quadrants turned downward, creating a sharp crash.

Key Lesson: **Real estate cycles are highly interconnected.** A shock in one quadrant (e.g., capital markets during the global financial crisis) quickly spreads across all quadrants.

6. Land Use Regulation and Supply Elasticity

Zoning, height and floor-area ratio limits, parking minimums, greenbelts, and growth boundaries affect the cost and feasibility of development.

Evidence shows tighter regulation associates with higher prices, longer permitting, and lower elasticity. Streamlining approvals, legalizing infill and missing-middle housing, and aligning infrastructure finance with growth can improve affordability while managing externalities.

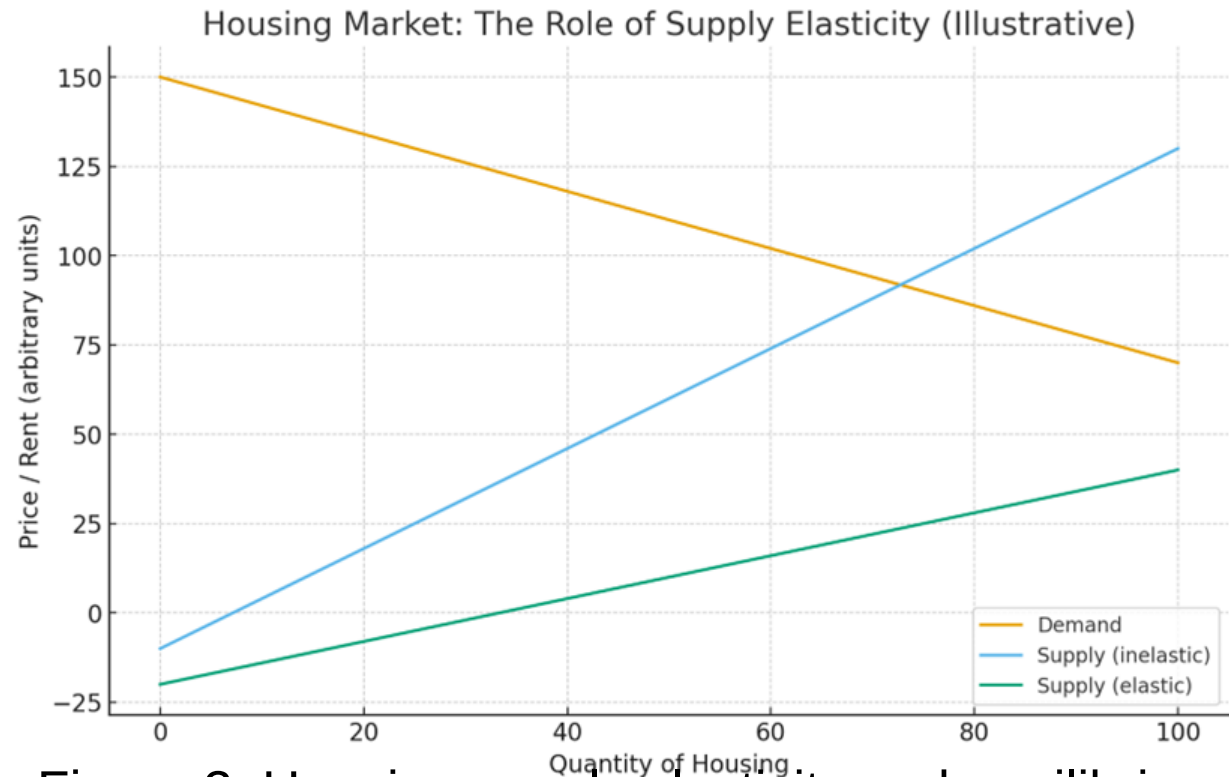


Figure 2. Housing supply elasticity and equilibrium outcomes

7. Transport, Technology, and Urban Form

Transport technologies (rail, highways, ride-hailing) reshape where households and firms locate.

Telework flattens effective distance for some jobs but not local services.

Land consumption responds to generalized travel cost; durable buildings adjust slowly, creating path dependence. Pricing road use and parking can reduce congestion and free land for higher-value uses.

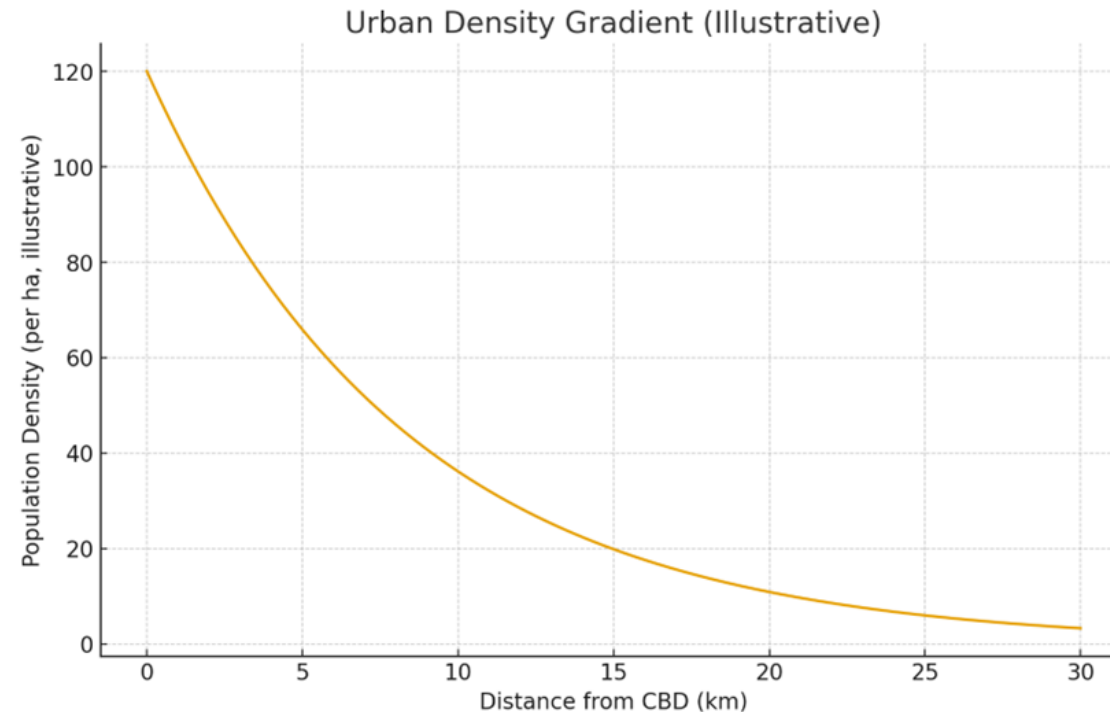


Figure 3. Urban density gradient

8. Housing Affordability and Inclusion

Affordability reflects rent-to-income ratios for lower-income households and price-to-income for buyers. Policy tools include housing vouchers, inclusionary zoning,

low-income housing tax credits, land value capture, and public/limited-equity models. Supply-side reforms and demand-side assistance are complements, not substitutes.



9. Cycles, Risk, and Finance

Real estate cycles arise from credit booms, expectations, and construction lags.

Key indicators include vacancy, absorption, price-to-rent ratios, and cap rates.

Risk spans idiosyncratic (asset quality micro-location) and systemic (credit, macro rates). Climate risk (flood, heat) is increasingly priced via insurance, discount rates, and migration.

Common Risks in Real Estate Investments



10. Sustainability ,Green and Smart Cities

Urban areas generate most emissions but also enable low-carbon living via density and transit. Green building standards, electrification, and district energy cut operational emissions; planning must also address embodied carbon.



10. Sustainability

Sustainability is the ability to meet the needs of the present generation **without compromising the ability of future generations to meet their own needs.**

It is about balancing three interconnected dimensions:

🌍 **Environmental sustainability** – protecting natural resources, ecosystems, and biodiversity (e.g., reducing pollution, conserving energy, managing waste).

💰 **Economic sustainability** – supporting long-term economic growth and development without causing harmful effects (e.g., responsible business practices, green innovation).

☐ **Social sustainability** – ensuring fairness, equity, and quality of life for all (e.g., education, health, social justice, cultural preservation).

10. Sustainability - sustainable city

A **sustainable city** (sometimes called an *eco-city* or *green city*) is an urban area that is **planned, built, and managed to balance environmental, social, and economic sustainability** while ensuring a high quality of life for its residents.

🌍 Key Characteristics of a Sustainable City

Environmental sustainability

Uses renewable energy (solar, wind, geothermal).

Promotes green buildings and energy efficiency.

Protects biodiversity with parks, urban forests, and green belts.

Encourages waste recycling and circular economy.



10. Sustainability - sustainable city

🌐 Key Characteristics of a Sustainable City

Social sustainability

Provides affordable housing and public services.

Ensures inclusive, safe, and accessible public spaces.

Promotes equity, cultural heritage, and community engagement

Economic sustainability

Supports green jobs and innovation.

Encourages efficient public transport and reduces car dependency.

Builds resilient infrastructure that lowers long-term costs.



10. Sustainability - Green cities

Green cities are **urban areas designed and managed with sustainability, environmental health, and quality of life in mind**. They integrate eco-friendly practices into planning, infrastructure, and community life.

Key features of green cities include:

- 🌿 **Green spaces** (parks, urban forests, vertical gardens) to improve air quality and provide recreation.
- 🚌 **Sustainable transportation** (public transit, cycling lanes, electric vehicles) to reduce emissions.
- ☐ **Energy-efficient buildings** using renewable energy (solar, wind, geothermal).
- 💧 **Water conservation** systems (rainwater harvesting, wastewater recycling).
- ♻️ **Waste management** through recycling, composting, and circular economy practices.
- 🌍 **Low carbon footprint** policies and climate-resilient urban planning.

10. Sustainability - sustainable city - example

□ Examples of Sustainable Cities

Copenhagen, Denmark – aims to be carbon-neutral by 2025, with extensive cycling infrastructure.

Singapore – integrates green buildings, water recycling, and urban farming.

Vancouver, Canada – uses renewable energy and has strict green building codes.

Stockholm, Sweden – focuses on clean transport and waste-to-energy systems.



10. Sustainability -Traditional City vs. Sustainable City

Traditional City

-  Car-dependent, traffic congestion
-  Relies on fossil fuels
-  Few green spaces
-  Limited recycling, high waste
-  High carbon footprint, air pollution

Sustainable City

-  Public transport, cycling, electric vehicles
-  Powered by renewable energy (solar, wind)
-  Parks, green roofs, vertical gardens
-  Recycling, composting, circular economy
-  Low carbon footprint, clean air, resilient infrastructure

10. Sustainability – smart city

🔑 Key Features of a Smart City

Digital Infrastructure – High-speed internet, IoT (Internet of Things), and 5G networks.

Smart Mobility – Intelligent traffic systems, smart parking, electric and autonomous vehicles, integrated public transport apps.

Smart Energy – Smart grids, renewable energy integration, real-time energy monitoring.

Smart Governance – E-services, e-government platforms, and citizen participation via apps.

Smart Environment – Sensors for monitoring air quality, water management, and waste collection.

Smart Living – Smart healthcare, education technology, and safe public spaces.

Smart Economy – Digital entrepreneurship, innovation hubs, and smart finance.

10. Sustainability –smart city

Main Components of a Smart City



10. Sustainability , Smart Cities- example

Examples of Smart Cities

Barcelona, Spain – Smart lighting, digital citizen services, smart water meters.

Singapore – Nationwide sensors, smart mobility, real-time urban planning.

Dubai, UAE – Smart Dubai initiative: blockchain-based government, AI-driven services.

Amsterdam, Netherlands – Open data platforms, smart mobility, sustainable energy projects.

In short:

A smart city uses **technology + data + sustainability** to make urban life **more efficient, inclusive, and eco-friendly**.

10. Sustainability ,Grear and Smart Cities

🔧 Key Smart City Tools

Internet of Things (IoT) Sensors

Monitor traffic, air quality, noise, waste bins, streetlights, and water use

Big Data & Analytics

Collect and analyze data from sensors, apps, and services for better planning and real-time management.

Smart Grids & Smart Meters

Enable efficient electricity distribution, renewable energy integration, and household energy tracking.

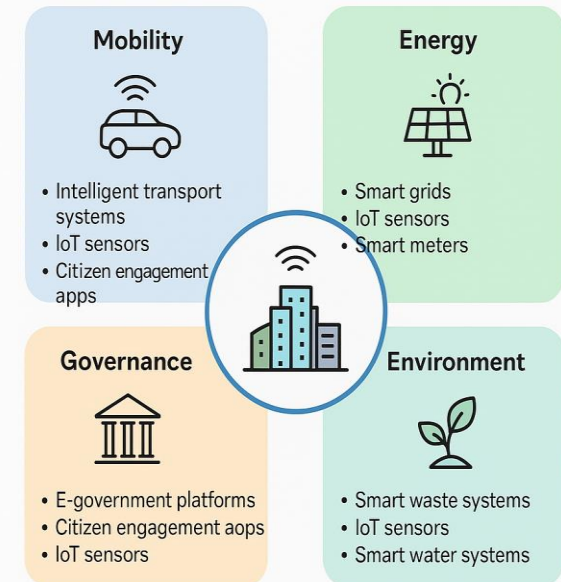
Geographic Information Systems (GIS) & Digital Twins

Map urban systems, simulate city development, and support urban planning.

Intelligent Transport Systems (ITS)

Real-time traffic monitoring, adaptive traffic lights, smart parking, and public transport apps.

SMART CITY TOOLS



10. Sustainability ,Grear and Smart Cities

Key Smart City Tools

E-Government Platforms

Online portals and mobile apps for citizen services, payments, and feedback.

Smart Waste & Water Systems

Sensors for waste collection optimization, leak detection, and water recycling.

Artificial Intelligence (AI) & Machine Learning

Predict demand (e.g., energy, transport), detect anomalies, and support automation.

Blockchain

Secure digital transactions, land registration, and transparent governance.

Citizen Engagement Apps

Mobile platforms for reporting issues, participating in decision-making, and accessing real-time updates.

11. Case Studies - Berlin

Berlin (Rent Regulation): A citywide rent cap (2020–2021) temporarily slowed advertised rents but reduced listings; after judicial reversal, rents rebounded.



11. Case Studies - Houston

Houston (Minimal Zoning): Lacks conventional zoning; relies on deed restrictions and development rules, enabling abundant supply but raising coordination and flood-risk concerns.



11. Case Studies - Singapore

Singapore (Public Housing): The HDB delivers large-scale, well-located housing with long leases, integrated transport, and ethnic quotas to foster inclusion.



11. Case Studies - Barcelona

Barcelona (Tourism & Housing): Tourism-driven demand and limited central supply increased pressure on rentals; policies target short-stay regulation and new affordable



11. Case Studies - Dubai

Dubai (Polycentric Growth): Master-planned clusters and transport investments diversified employment centers; foreign ownership zones enabled large-scale development.



12. Methods and Data

Urban and real estate economics combine theory with quasi-experimental and structural estimation.

Data include transaction registries, property tax rolls, listings, remote-sensing (night lights, building footprints), and mobility data.

Identification strategies use policy discontinuities, instruments (e.g., geology for supply elasticity), and spatial differencing to handle sorting and equilibrium effects.



Conclusion

Guidelines:

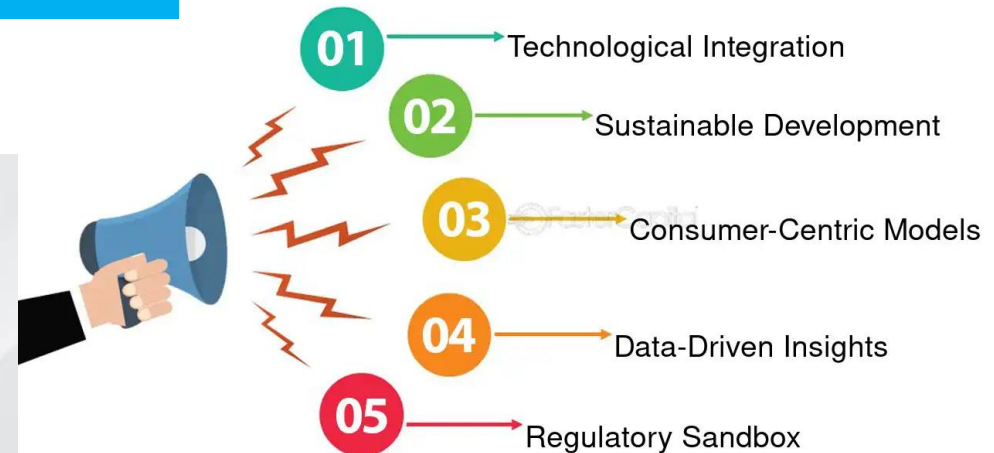
target externalities (congestion, emissions) with prices; expand by-right capacity where infrastructure exists; pair upzoning with affordability contributions; streamline approvals with clear design standards; align fiscal tools (land value capture) with growth; and monitor outcomes with transparent, open data.



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Evolution of Real Estate Economics





Thank You