Land Use, Market and Feasibility Analysis and Cash Flow

Real Estate Market Analysis and
Urban Land Economics

Lecture

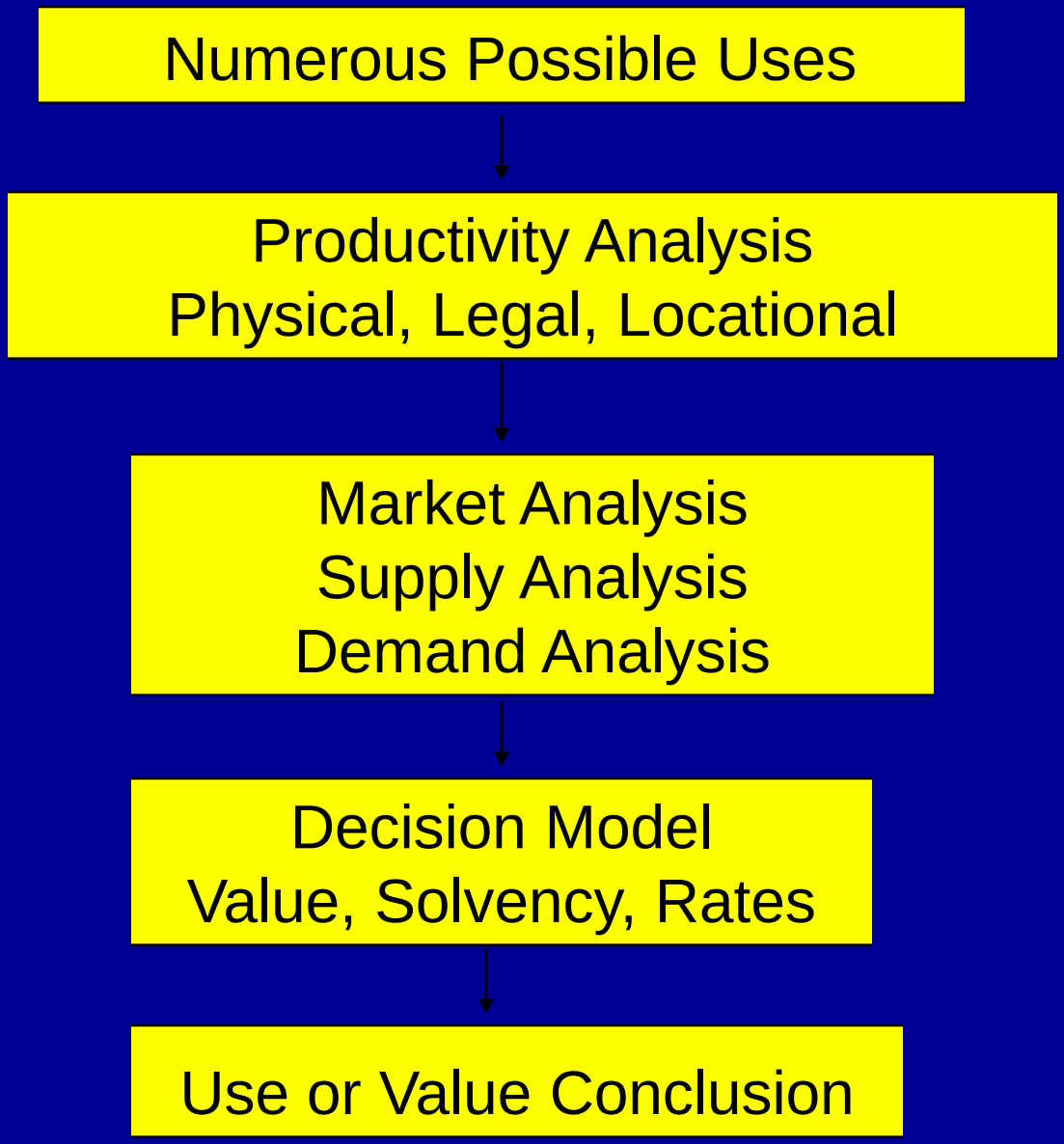
Market Analysis

Objectives

The Student will know how to:

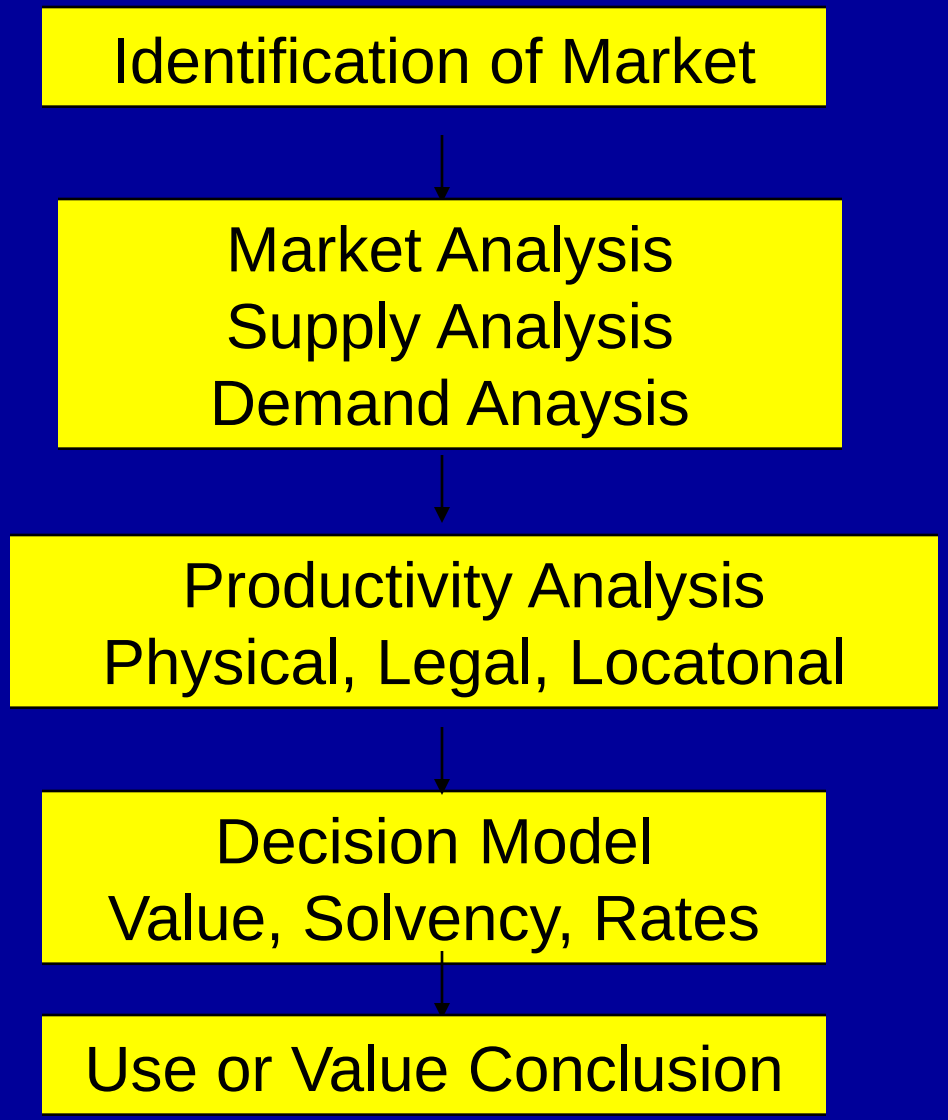
- Make the link of land use to product delineation as a basis of supply, which in turn is related to user demand to form a foundation for specifying asset capacity and the estimation of potential cash flow
- Introduce market analysis as it applies to spatially delineated markets as defined by Situs.
- Develop demand analysis
- Develop supply analysis as a Function of Situs
- Conduct the analysis of market interaction; absorption and capture analysis
- Use market value and cost to develop cash flow proforma projections

A Site in Search of Use or Market



Source: Grissom and Diaz 1991

A Use or Market in Search of a site



Source: Grissom and Diaz 1991

Real Estate as an Investment Alternative: An Asset Class

Source: Grissom and Diaz 1991

Nature of Real Estate Practice and Decisions

As per Fanning, Grissom and Pearson (1991), in Practice the Real Estate Business is driven by specifics and tactical operations with a focus on:

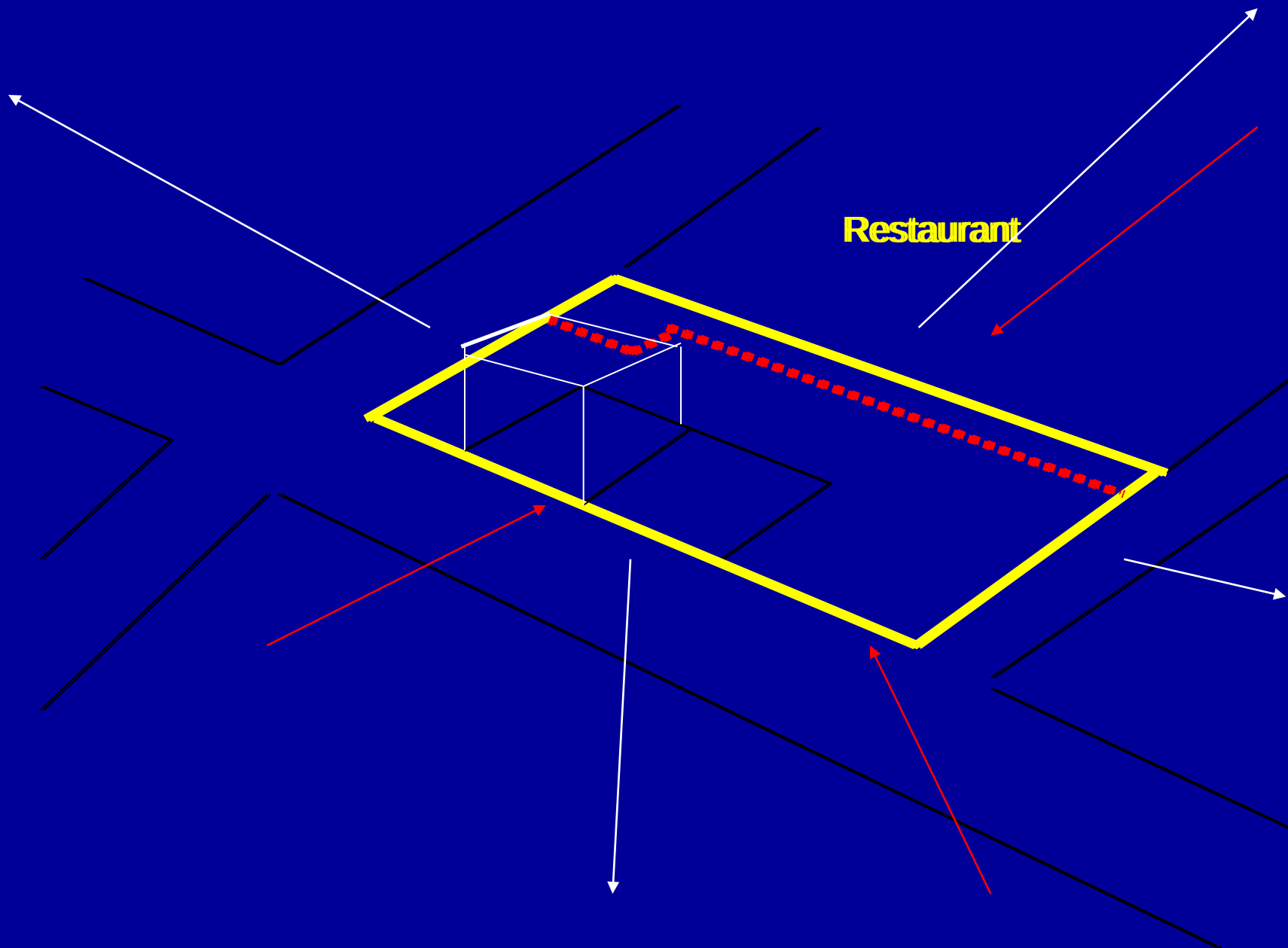
- The uniqueness of the property
- The agents (parties) in the transactions
- Use for a site
- Number of uses in area
- Association between uses
- The expected uses
- The link of these criterion to the economic measures

Productivity Analysis

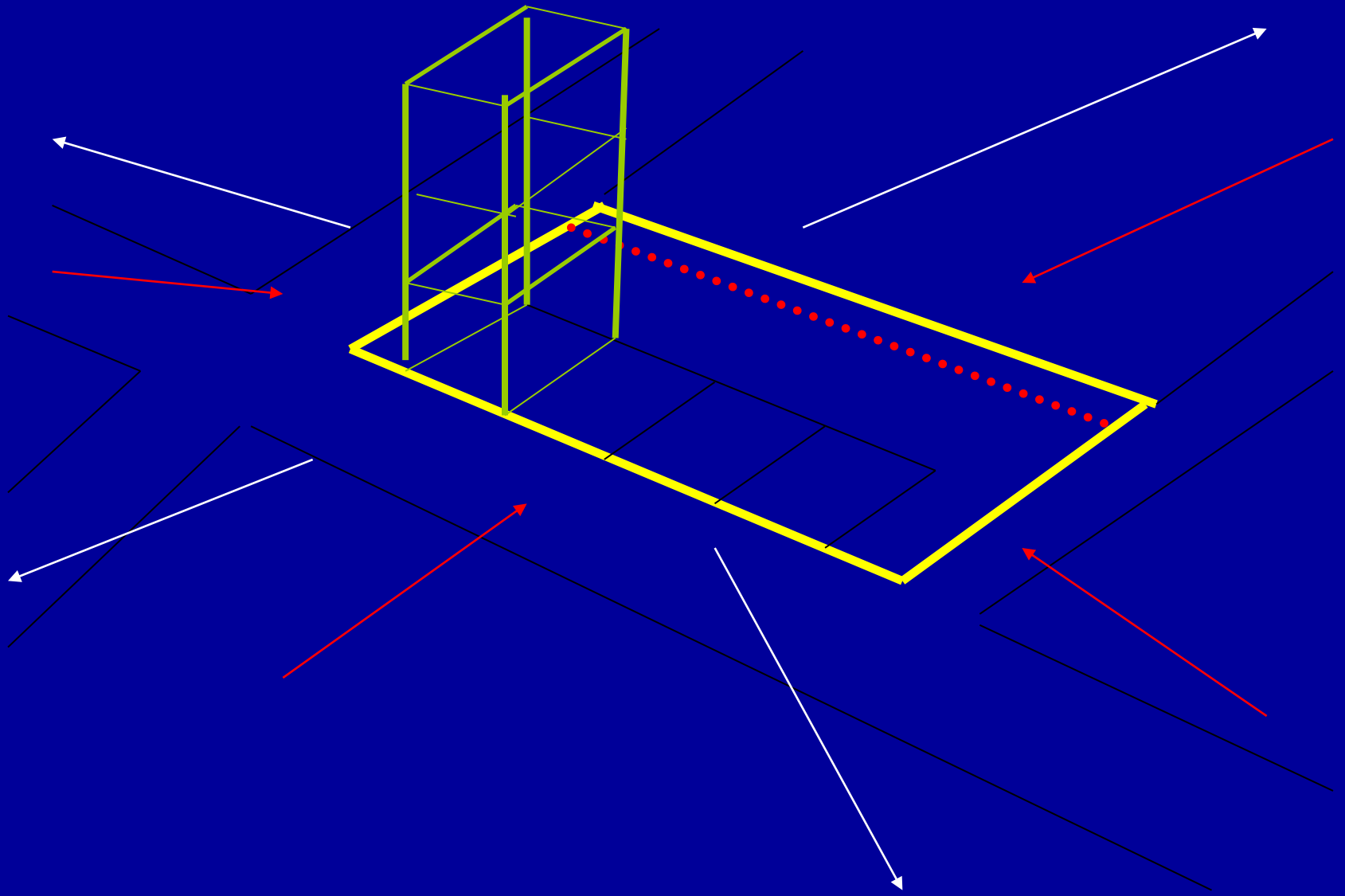
Concept and Tool:

- Productivity Analysis considers and evaluates a property's capacity to deliver services and satisfactions to meet the requirements of human needs for space, house economic activities and supply satisfactions and amenities.
- It defines and links the needs of economic and social activities with the use of space

The Building Envelope: Physical-Legal



The Building Envelope: Physical-Legal



Location: Situs Analysis

Rationale for and key components of Situs analysis assist practical application because:

- The concept of a site is economic. The site is not just the physical parcel of land, but its economic situation.
- This requires *in situ* analysis. Appropriately done, situs analysis enables the internalization of external factors influencing value, profit and return.
- Situs can be approached as a decision theory model and an applied approach to be used in the analysis of given parcels of property relating product to the market.

Situs Theory

Broadly defined, Situs is the total urban environment in which a specific urban land use on a specific land parcel functions and interacts at a specific time.

- The total urban environment means the whole of urban activities and relationships that can impact specific functions. It involves factors external to the site, externalities, that influence the economic performance of a parcel and its use.

Situs Theory

- Situs theory rest on the assumption that land uses are interdependent and economic activities are interrelated (basis of externalities and endogenous factors).
- Despite Interrelations, a key idea is that a land use of a given parcel and the locus of the parcel are separate.
- A site can be physically fixed but economically flexible in terms of its use. Flexibility is considered with proximity and accessibility as inferior goods of loci.

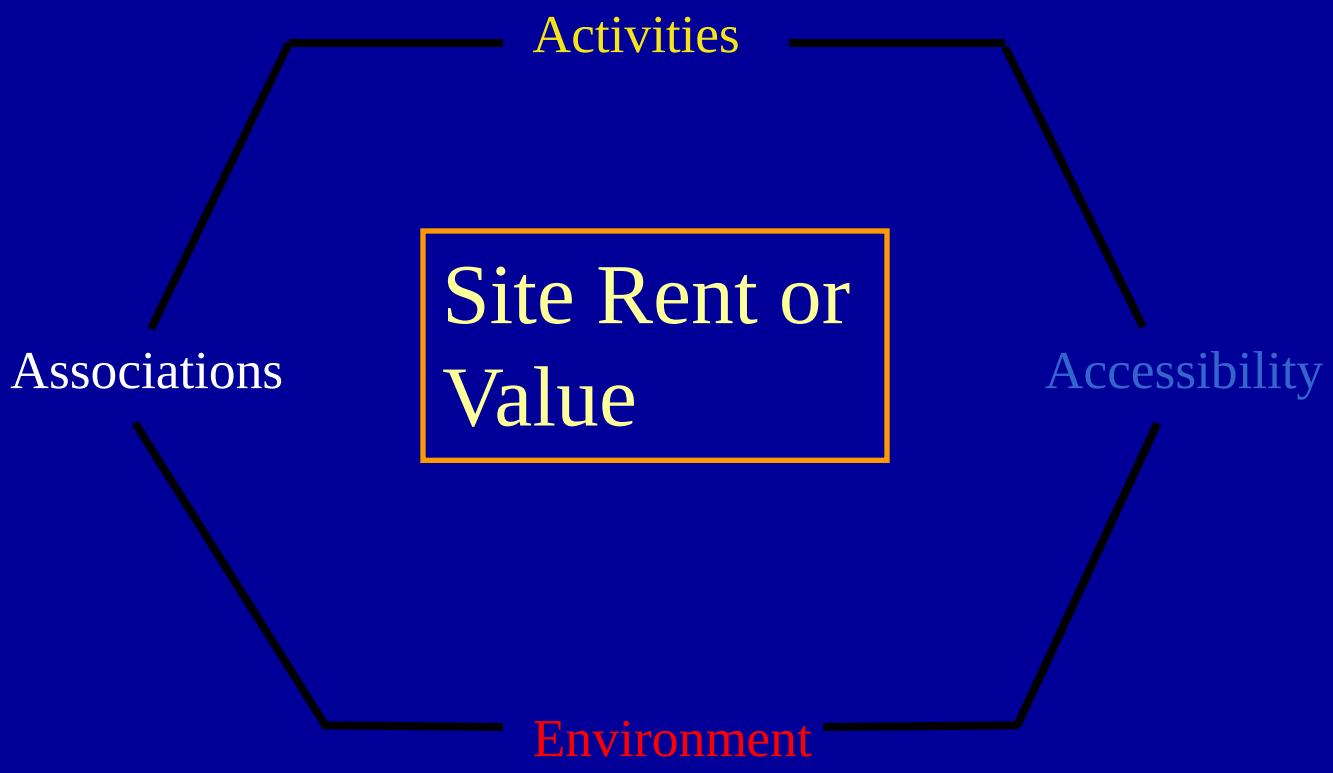
Situs as a Process

Situs as a process is comprised of four steps that involve the gathering, classification, and analysis of information for location analysis.

The steps are:

1. Identify the key activities in the area.
2. Study the nature of the associations between these activities
3. Analyze the accessibility of the site to the surrounding area
4. Identify and evaluate the environmental impact of the total area on the site use

Situs Theory/Process



Situs as a Process

Activities:

Activity analysis can range from a simple survey of existing land uses to a major economic base study. The objective is:

- identify and delineate the key activities in a given area. Quantify by frequency (prob-ability) or magnitude of use.
- The activities that characterize a neighborhood are those that attract people to a specific location or market.
- Primary activities often define the character of a neighborhood and the basis of the neighborhood's economy.

Situs as a Process

Associations

Associations characterize the nature of the relationships among the various activities in the subject neighborhood boundaries. The nature of the relationship among any set of land uses is determined by their economic function.

Land uses will tend to cluster, to group in order to exploit the benefits of positive externalities.

Situs Process: Associations - Agglomeration

- This clustering is called the economics of agglomeration. This is a grouping of key activities that increases the draw power of an area, the services of goods available and the free-rider benefits derived from proximity.
- Agglomeration increases economic choice. Agglomeration economics allows the capture of non-market priced benefits of location (benefits which are not directly priced or taxed).

Situs: Categories of Land Use Associations

- Dominant use/subordinate use:

  Subordinate uses serve the function/operation of the dominant activity.
- Dominant use/ancillary use:

  The ancillary activity serves the clients and employees of the dominant uses.
- Co-dominant uses (or dominant uses) /satellite uses:

  the activities serve the same functions or client/users, but can vary in size. The satellite uses compete with the dominant uses, but the agglomeration benefits increases choices and enhances draw.

Situs Process: Accessibility

Accessibility

Accessibility addresses the degree of convenience or inconvenience involved in moving people, goods and services between different loci of activity. It is:

- the measure of movement convenience; level of difficulty is represented as economic friction.
- Friction is measured in terms of time cost, monetary cost and aggravation.
- Accessibility is akin to negative transportation cost; the more accessible a site to major activities and complementary land uses, the lower the cost to access and higher potential return in income (rents) and market value.

Situs Process: Accessibility

Accessibility at two levels:

- **Macro-level Accessibility**
- **Micro-level Accessibility**

Situs Process: Accessibility

Macro: flow from one area to another within the city. Measured as a trade-off between transportation costs (TC) and the specific features and amenities of the site:

- Like gravity model; TC modified by draw of dominant use or use mix
- frequency of inward/outward movements
- Urban use mix and hierarchy (city)

Key predictive Macro tool: Zone of Conflux

- Activity pull; strong draw (people/activities/uses)
- Infrastructure pattern promotes an assemblage (inward) movement

Situs Process: Accessibility

Micro: the objective of most real estate accessibility analysis is micro-level – access to immediate area and site; direct access vs. circuity travel; ingress-egress.

Micro-level accessibility is concerned with linkage relationships:

- Movement between linked establishments –measure with volume, number of reoccurring & frequency of trips: traffic volume
- Issues of proximity – nearness (time/distance); ingress-egress
- Measures: money/time cost (opportunity cost) adjusted by route, route orientation, mode (public/private, method), congestion

Situs Process: Accessibility

- Micro: Nature of linkage relationships on movement patterns:
- Assembling movement - movement characterized by convergence on a focal point
- Dispersion movement - spreads out from a focal point
- Random movement pattern - goods, services or people are dispersed among various locations along a route.

Key predictive Micro tool: Trapping Points

- A Micro - Zone of Conflux
- Strong pull - by good infrastructure, and design features

Situs: Environment

The environment component of situs accounts for the context in which site uses, their associations and accessibility interact. The context can be categorized as:

- Physical environment
- Legal environment
- Political environment
- Land use environment
- Social-Cultural environment
- Technical Environment
- Economic environment
- Institutional environment

Urban Structure

Dynamic, Behavioral or Psychological Dimensions

Dynamic Attributes are concerned with behavioral responses of people involved in producing real estate and delivering real estate related activities.

On-site Dynamic Attributes:

- Functional Layout:
- Personal Response Factors
- Hazardous Conditions
- Design Implications

Off-site Dynamic Attributes:

- Transportation Access
- Exposure of site and Structure
- Tributary Area Analysis
- Personal Response Factors

Market Analysis as Strategic Organization

- The consumer or space user (specifying the demand function) is the drive wheel within the process or system.

-as a tangible/life style product, the needs, taste and preferences of the ultimate users (or defined investment group) must be identified.

-this requires the entrepreneurial skills of recognizing and exploiting trends in consumer needs and preferences and/or

-the creative skills of innovation, problem solving and timely delivery.

Market Analysis as Strategic Organization

Given that the objective is to reduce or manage uncertainty while optimizing return and profit, then the:

Personal skills to strengthen are:

- To acquire or exercise the abilities of observation, creativity and analytical interpretation and
- Opportunistic behavior and a forward looking mentality/perspective, based on an organized process which:

1. identifies the constraints and context of the situations and
2. then focus on manageable portions controlled and manipulated with reasonable effort.

Spatial Market Analysis
(Basic constraints and context of real estate)

Spatial constraints and Market Structure:

The spatial context and limited data force the recognition of imperfect competition and at best an oligopolistic structure in specifying decision models.

In general Real Estate markets reflect an Oligopolistic market for all property types

In Atlanta, a monopolistic competitive structure can be identified for Single Family Residential Markets

Applied Spatial Market Analysis

Segment Spatial units into:

- Primary
- Secondary
- Tertiary sectors

Spatial breakdown assist in supply and demand analysis;

- Primary focus on key activities that characterize the nature of neighborhood
- Identify nature of associations between activities – assist in specifying competition
- Investigate demographics

Applied Spatial Market Analysis

- the key concern of market analysis is to reduce aggregate data (population, income) into factors/measures that are relevant to a specific site, neighborhood, client or target market information.

- Linking the product attributes to the target market needs and preferences is the focus of *merchandizing analysis*.

Applied Spatial Market Analysis

Linking attributes to targeted demand potential enables a focus on primary data, even if aggregated/secondary data is all that is available.

- Productivity analysis helps delineate the array of competitive possibilities for any given parcel of real estate.
- Market segmentation by area and locational attributes
- Market segmentation by property type and physical attributes
- Market segmentation by legal/regulatory attributes
- Market segmentation by design/amenity attributes
- Market segmentation by probable users and demographic attributes

Applied Spatial Market Analysis

Specific delineation techniques

Retail (applies to all property types)

- Ring Studies: Insights to Demand measures (see NINIS, NISRA)
- Reilly's Law of Retail Gravitation: Demand and Supply
- Applebaum customer spotting technique
- Nelson Retail Location technique

Applied Spatial Market Analysis

Office

- City core versus suburban location
- Single tenant vs. Multi-tenant
- Quality rating or requirements (A,B,C,D)
- Credit rating of tenants
- Dunn and Bradstreet (prestige/risk)

Class or quality of office space - based on:

1. Quality of construction
2. Condition
3. Design/Architectural appeal
4. age built
5. Location

Applied Spatial Market Analysis

- **Demand Analysis for Merchandizing Analytics**

  An Example:
- boundaries are established with the delineation of the market area,
- the context from which to seek demographic characteristics.
- For example assume the trade area comprises three census tracts.

Demand Analysis for Merchandizing Analytics

Census Tracts	Population	Income per Capita	Income in Area	Pop/Income Percentage
20.1	3500	£ 4,500	£15,750,000	41.18%/29.85%
20.2	3000	£ 5,000	£15,000,000	35.29%/28.44%
22.0	2000	£11,000	£22,000,000	23.53%/41.71%
Total Area Income Estimate			£52,750,000	100%

60% of income in area/city is spent on retail, Based on *Sales Management: Survey of Buyer Power,* See in Pullen Libarary or WEB. This can be adjusted within a given city and its many neighborhoods based upon the differences between the average income for the metroplex and a given market trade area.

Demand Analysis for Merchandizing Analytics

	Consumer Profile Example:	
1	75% of the families earned annually:	£ 20,000 to £45,000
2	Family Mean Income:	£ 30,000
3	Income per capita: Bi-modal;	£4,750 £ 1,000
4	Average level of education achieved	15.7 years
5	Percentage attending school over 16 years:	22.9%
6	State employees:	49%
7	Percentage of renters living in 2 to 9 unit dwellings:	49%
8	Percentage of population renters	75%
9	Average monthly rent:	£ 450.00

Demand Analysis for Merchandizing Analytics

	Consumer Profile Example:	
10	Percentage in single-unit, Detached garage dwellings:	23%
11	Percentage of owner-occupants that have been there 20 years or more:	49%
12	Percentage of renter-occupants that have been there 1 year or less:	67%
13	Percentage pop. That walk to work	83%
14	Percentage of renters that are Husband-wife families	22%
15	Percentage of population in the18-24 year range	56-77%
16	Population growth rate Growth potential	-2% (pop decline 517) low/tran-sitional

Retail and Other Income Allocations For County

Retail and Consumption Categories	The County Percentage of Disposable Income	Dollar Expenditure per Good Grouping
Total Retail Sales	54.03%	£7,085,637,000
Food	8.01%	£1,050,552,000
Eat& Drink Places	4.96%	£650,381,000
General Mdse	4.52%	£592,347,000
Furniture/Furnish/Appl	2.47%	£323,970,000
Automotive	18.84%	£2,470,556,000
Drug	1.91%	£ 250,000,000
Other	13.33%	£ 1,747,831,000
Housing	30.00%	£ 3,933,957,000
Saving and transportation	15.97%	£ 2,093,596,000

Supply Analysis

- Supply analysis within spatially defined markets can be based on:

  - observation,

  - public information and

  - involvement in community activities.

- Process focus is the:

  -timing of the quantity and staging of competitive units as they come on line,

  -address timing and measures via risk management guidelines.

Supply Analysis

Model combining the measure, timing and risks of accounting for competitive supply is considered with the equation:

$$Sf = \pi s Vs + UC + \pi p P + d(t) + e$$

πs	=	probabilities; πs is the percentage of units available
πp	=	πp is the percentage experienced of proposed units actually constructed and marketed for use over time

Vacant units may not immediately be available for tenant occupancy.

Vs	=	Vacant units
UC	=	units under construction
P	=	Proposed units
d	=	units being demolished in time (t)
e	=	error term, possible spread in data developed over time

Market and Merchandizing Analysis

Market Surveys of trade areas show that the proportion of consumers patronizing

- 1. a given center or shopping area varies with distance from center
- 2. classification of shopping area varies with the breadth and depth of merchandise offered
- The distance that consumers travel to centers vary for different types of product purchases
- The draw of any given shopping area is influenced by proximity of competing shopping areas

Market Area Specification and Gravity

The survey findings identify primary variables quantifiable by parameters defining gravity models. Gravity models allow the following mathematical market insights:

- Reilly Model of Consumer shopping movements between sites/centers:

  Allows the calculation of the comparative proportion of consumer business located between two (or more) centers or shopping areas that are drawn to a designated center (relative to competition).

Market Area Specification and Gravity

Reilly Competitive Capture Model:

$$\frac{Ba}{Bb} = \left(\frac{Pa}{Pb}\right) * \left(\frac{Db}{Da}\right)^2$$

Ba = proportion of intermediate consumer business attracted to Center A

Bb = proportion of intermediate consumer business attracted to Center B

Da = distance from interim customer to A

Db = distance from interim customer to B

Market Area Specification and Gravity

Reilly's Law of Retail Gravitation: Converse's adaptation:

- Breaking Point between competitive locations; communities or shopping centers where A signifies the subject or location of concern and B is the competition. Note that even though A is the focus of the analysis, the boundary delineation begins with the loss of distance from the competition (B).

Market Area Specification and Gravity

Converse Breaking Point and MA Boundary:

$$\text{Breaking Point time B to A} = \frac{\text{Distance or Driving time from A to B (Dab)*}}{1 + \sqrt{\frac{\text{Center A Size (Pa)}}{\text{Center B Size (Pb)}}}}$$

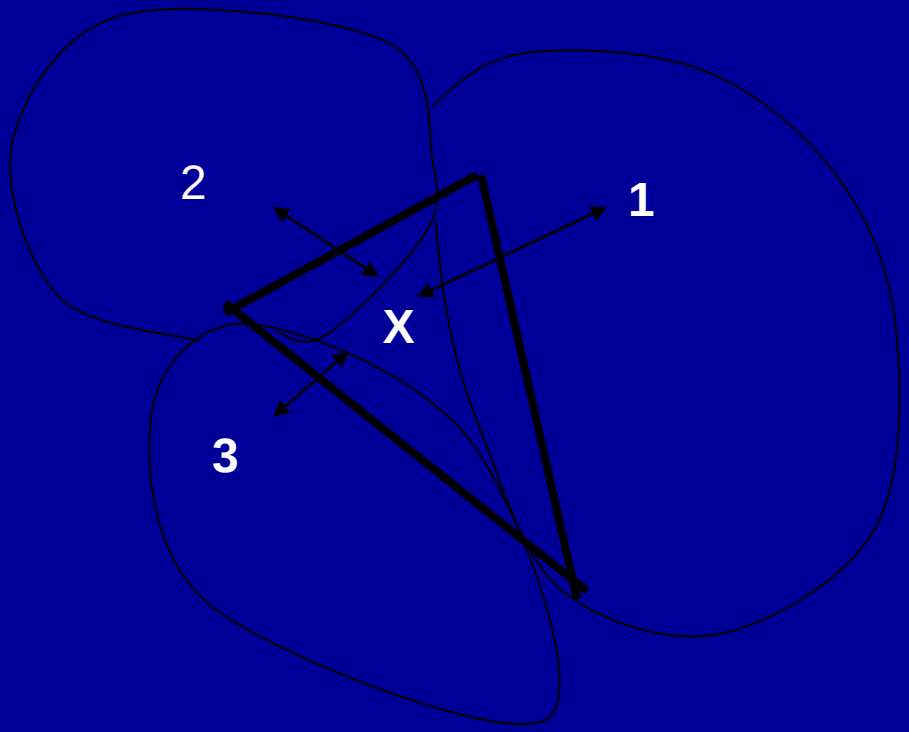
* measured from B

Gravity Model: Market Area Calculation

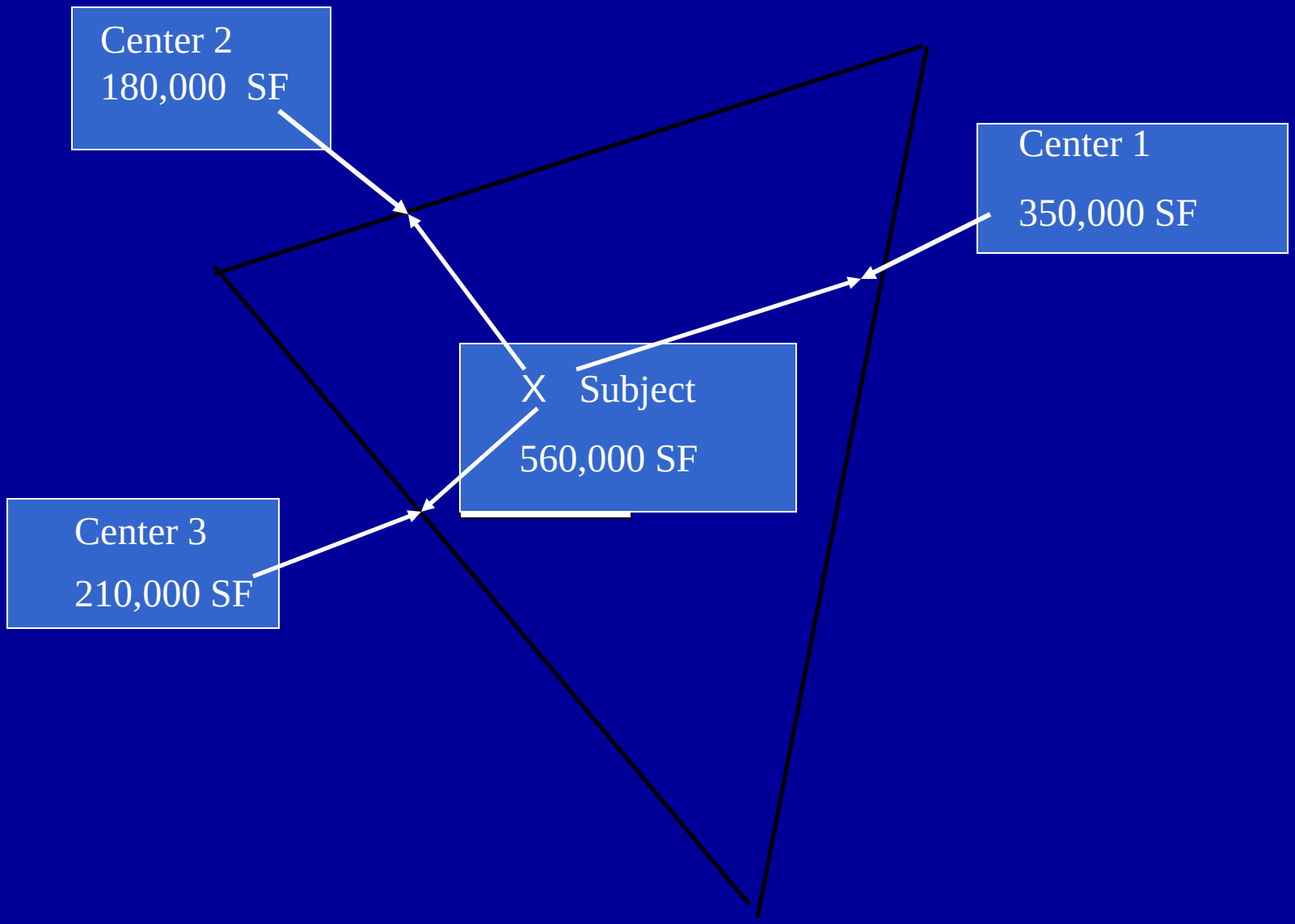
	Centre Size	Total Drive time	Drive Market Between B & A	Time Split Subject
1	350000	42	18.5437	23.4562
2	180000	34	12.3017	21.6982
3	210000	28	10.6342	17.3657
Subject =A	560000	0	0	0
Total	130000			

Competitive Centers Trade Areas: (1, 2, & 3)
to consider impact on Proposed Center X

Interaction



Gravity Model: Reilley



Gravity Model: Market Area Calculation

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Basis of Real Estate Value

Strategic Implications of Bid Rent Curves:

- There is a hierarchy of Land Use Markets based on Pricing and Site rents – Uses dominate market segments
- Despite hierarchies, prices paid by separate uses are interdependent
- Situs theory: Relationship of the total urban environment as it relates to a specific land use on a specific parcel of land as they function in time

Market Areas and Situs

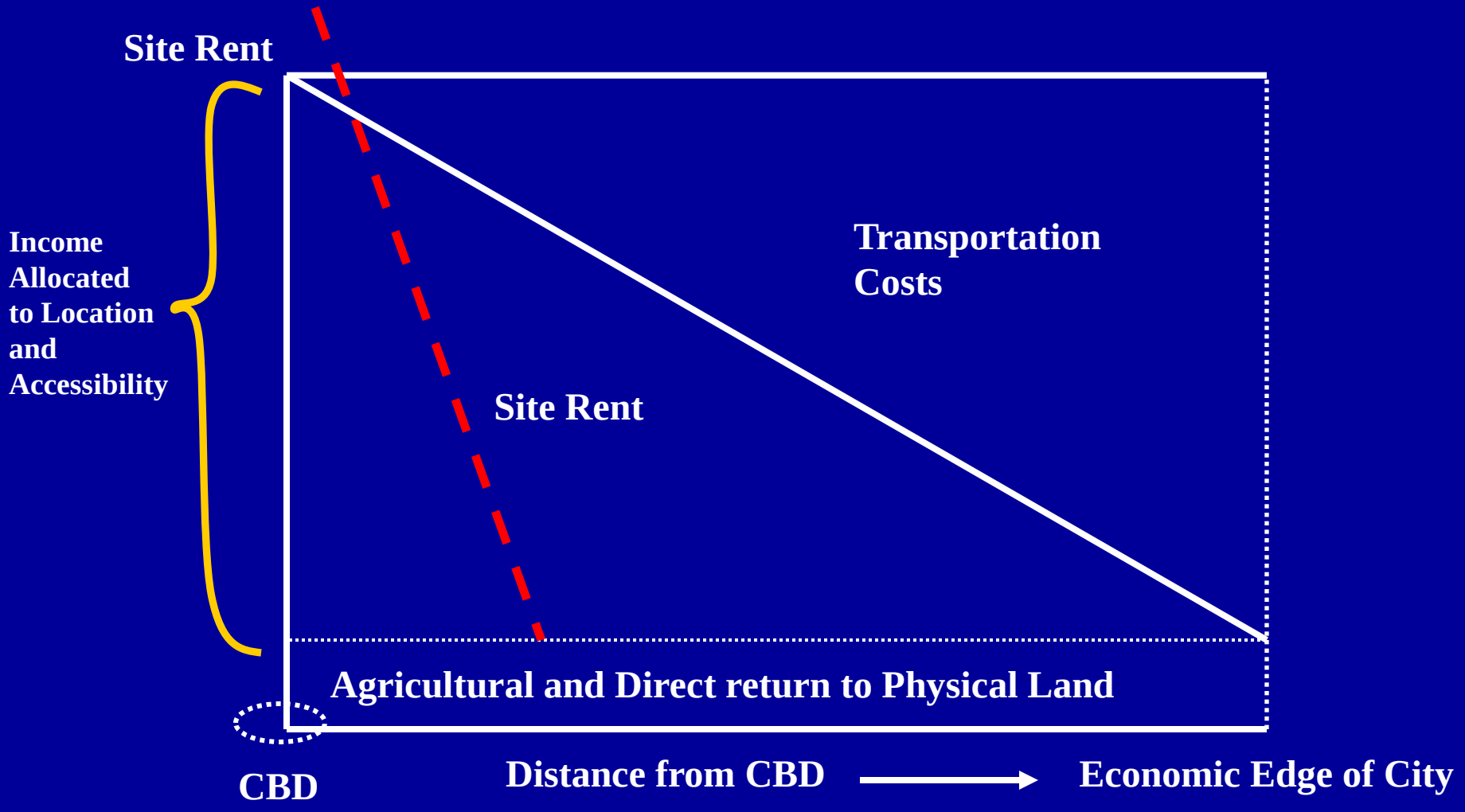
- Gravity Model Analysis shows the relationships of location, activity cluster size (mass) and pull to access and distance in terms of spatial market analysis.

- This information can be linked to and associated with the bid rent map. This allows a consideration of the general spatial patterns of specific land uses and their interrelationships:

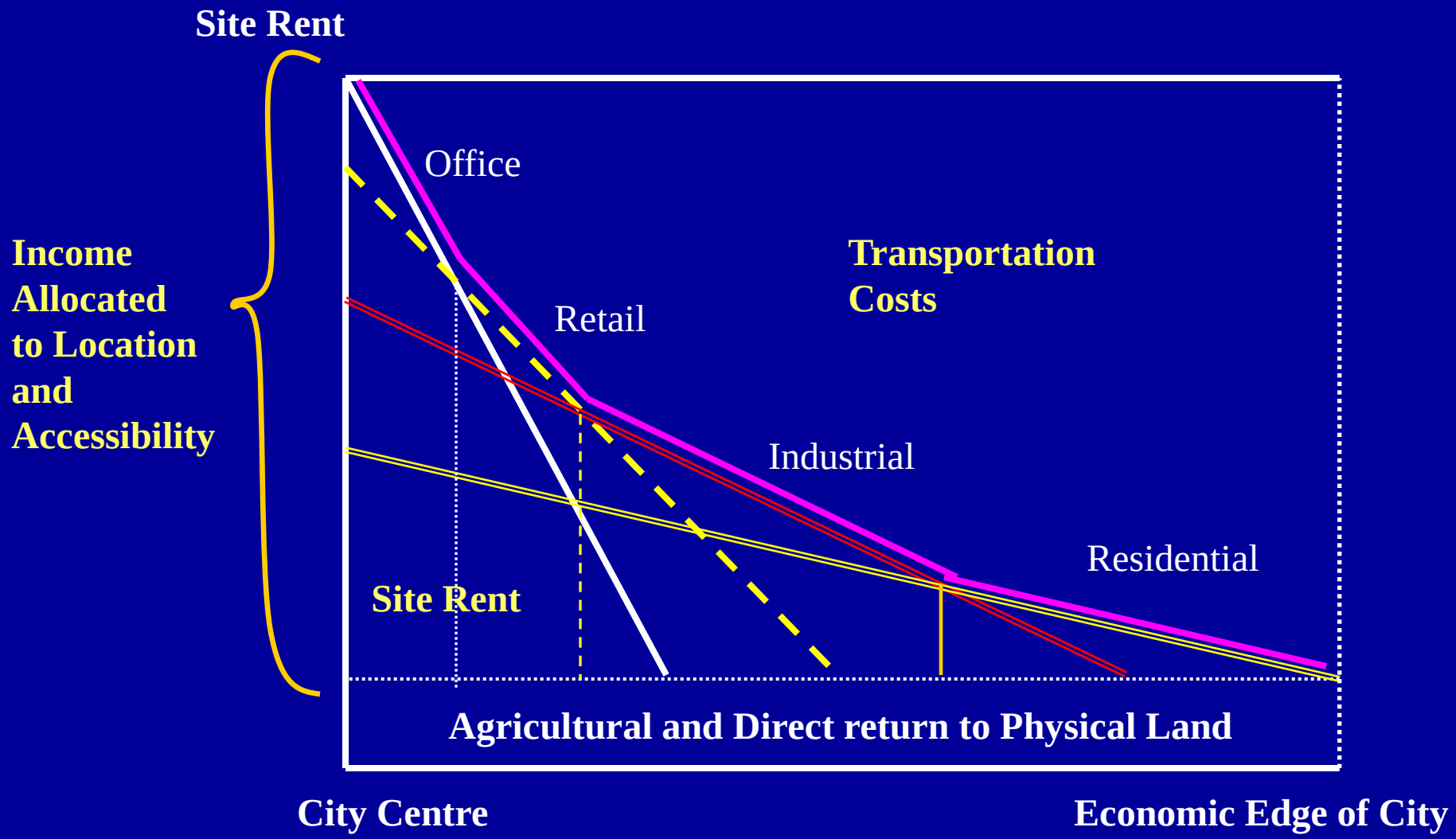
  - across the total urban environment and

  -specific segments of the urban complex

Basis of Real Estate Value: Basic Bid Rent Curve Model – defining Land Use Patterns by Trade-off Location and Accessibility

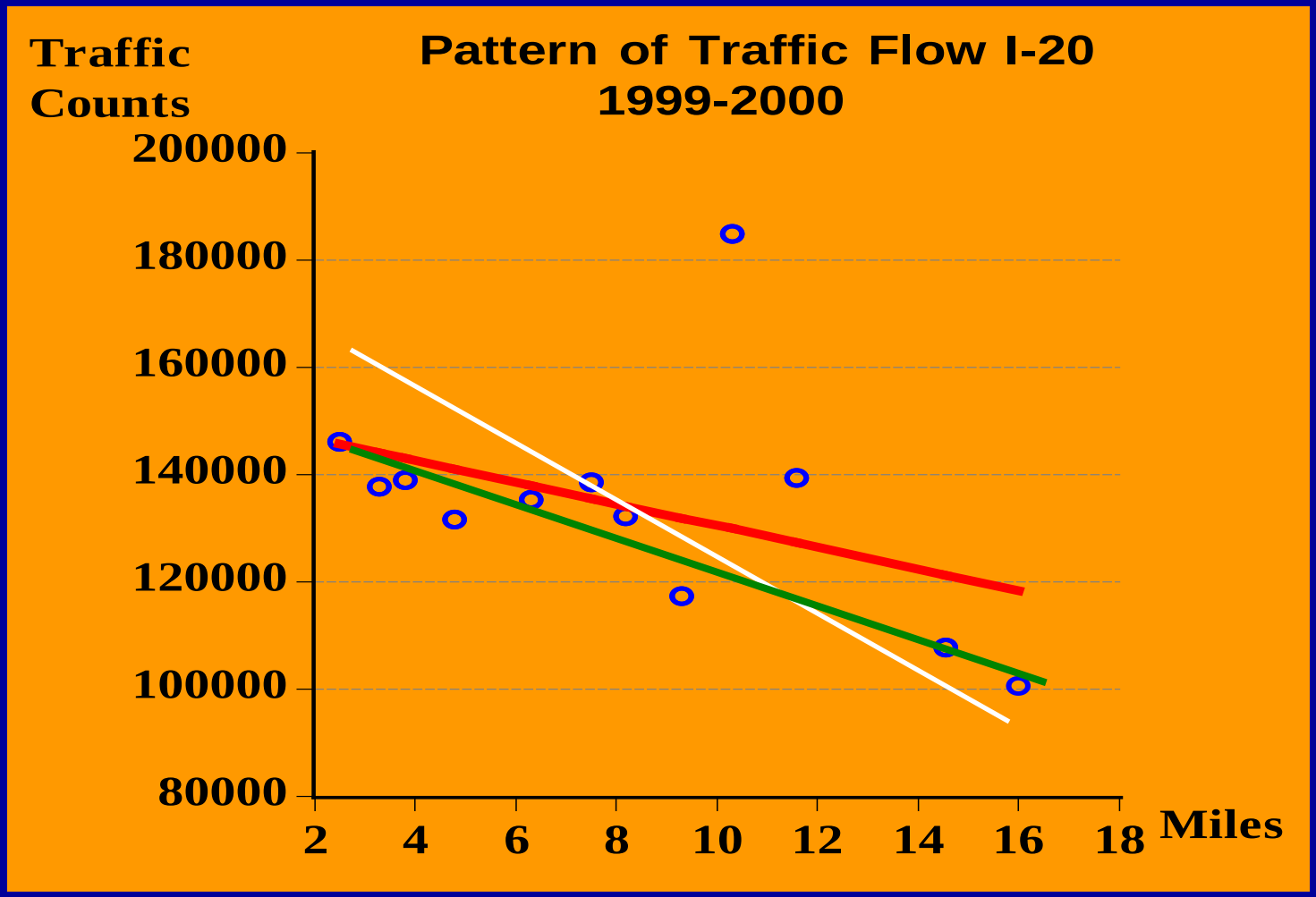


Basis of Real Estate Value: Basic Bid Rent Curve: Patterns of Trade-off of Site Rent and Accessibility Vary with Land Use

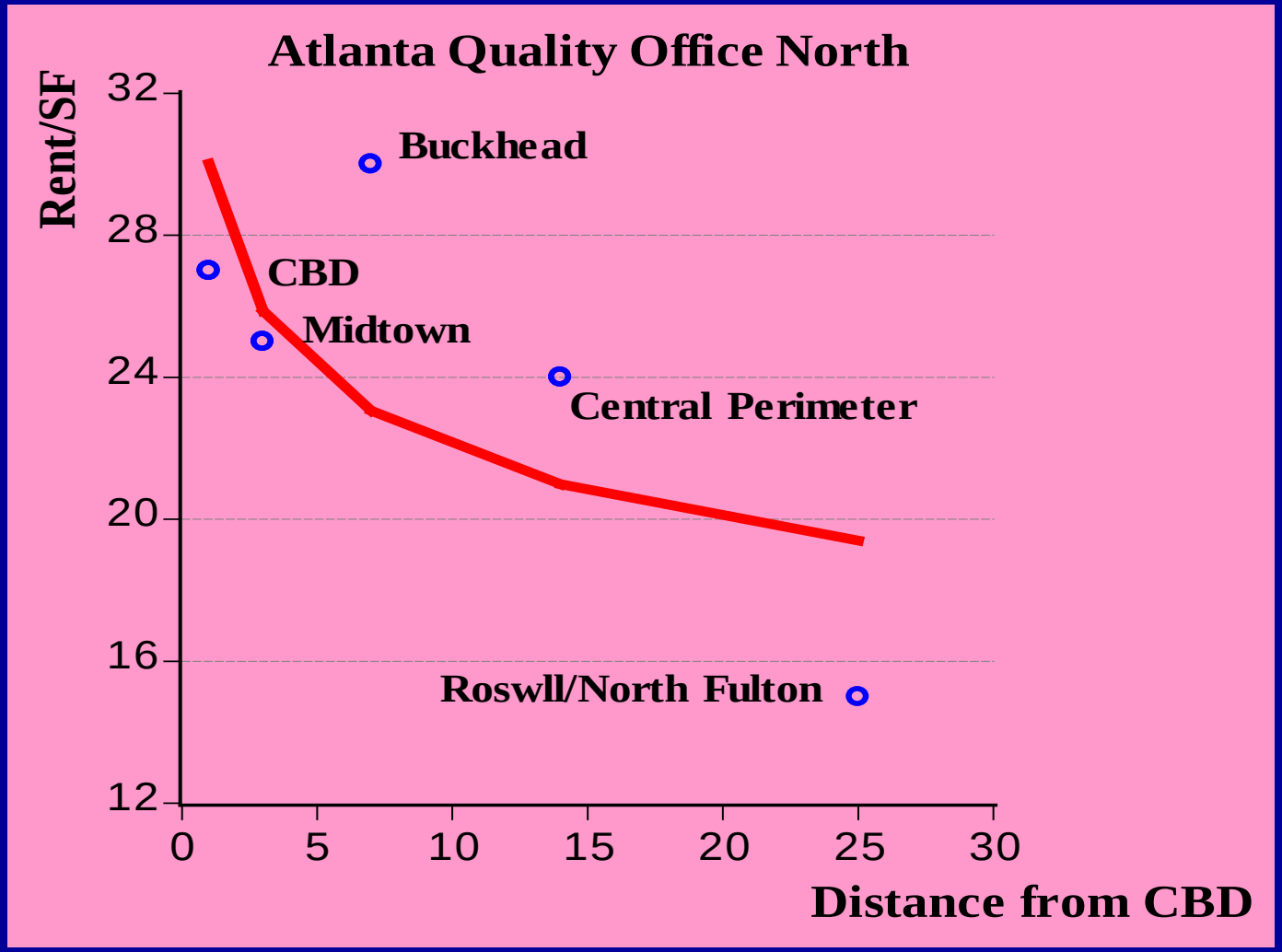


Other Measures of Economic Landscape

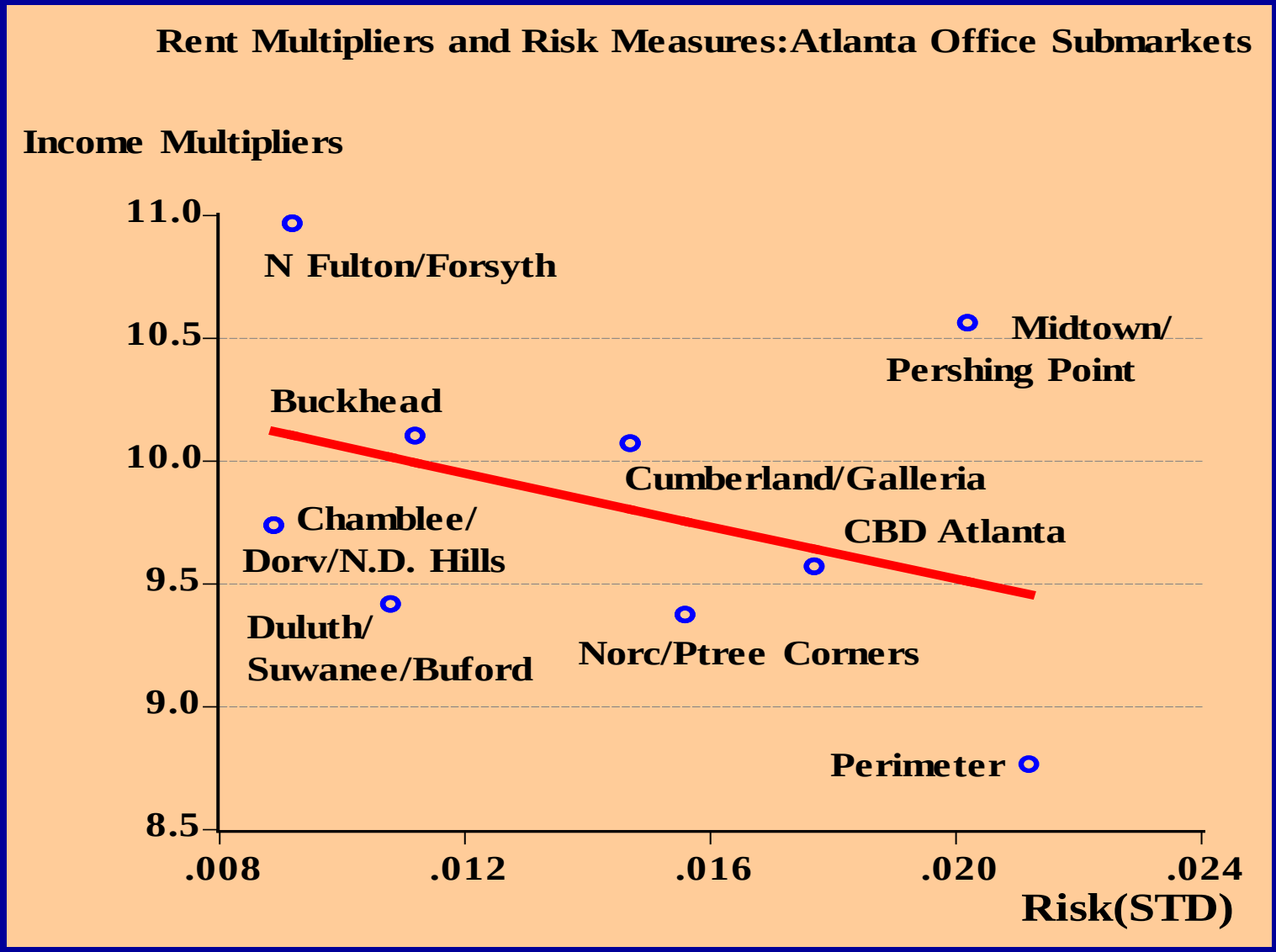
- Density Gradient: Population Per capita per SF
- Transportation Gradient: Comparison of Traffic Flow Counts



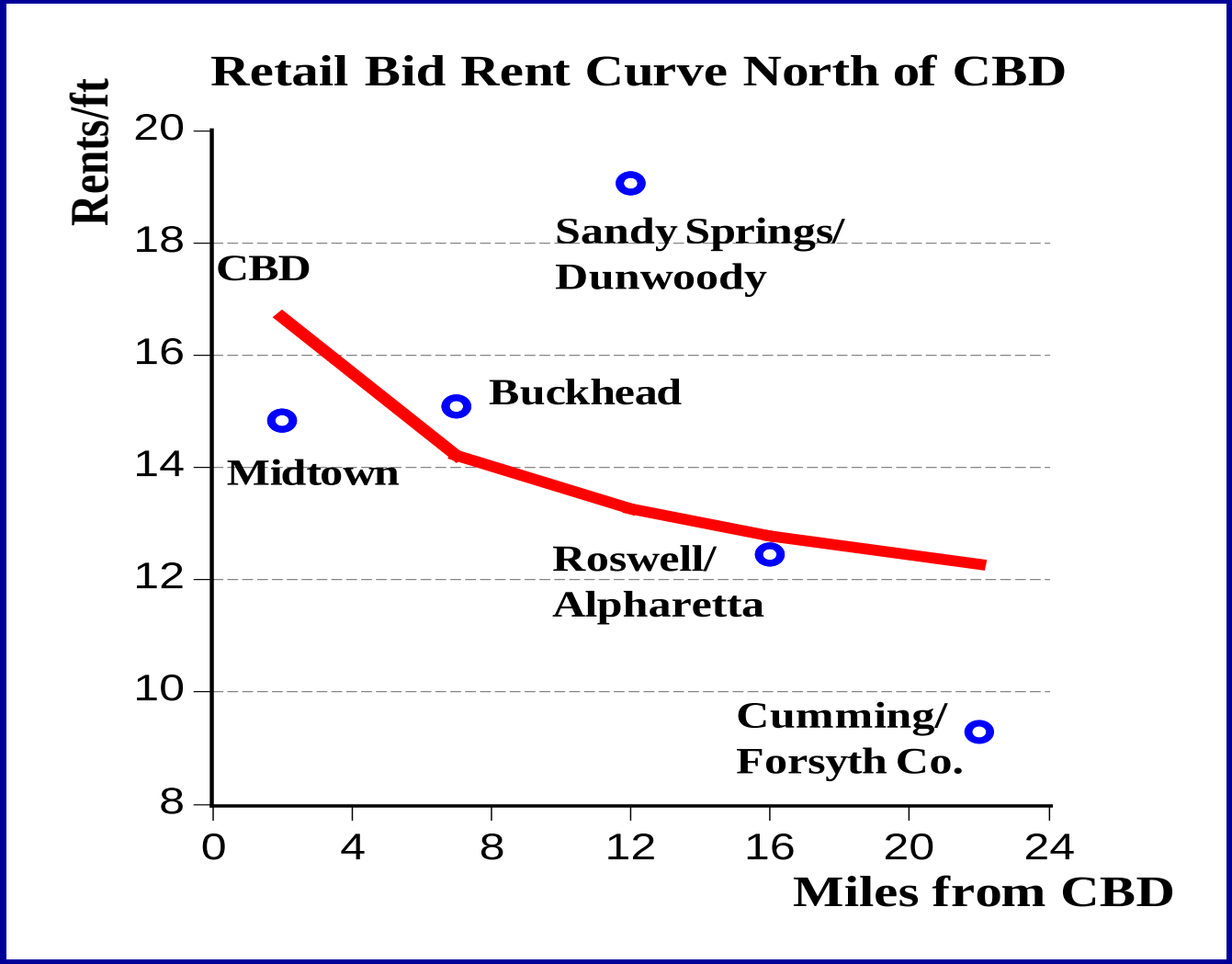
Basis of Real Estate Value: Examples of Atlanta Market Segments



Atlanta Real Estate in an Asset Pricing Context: Office Markets

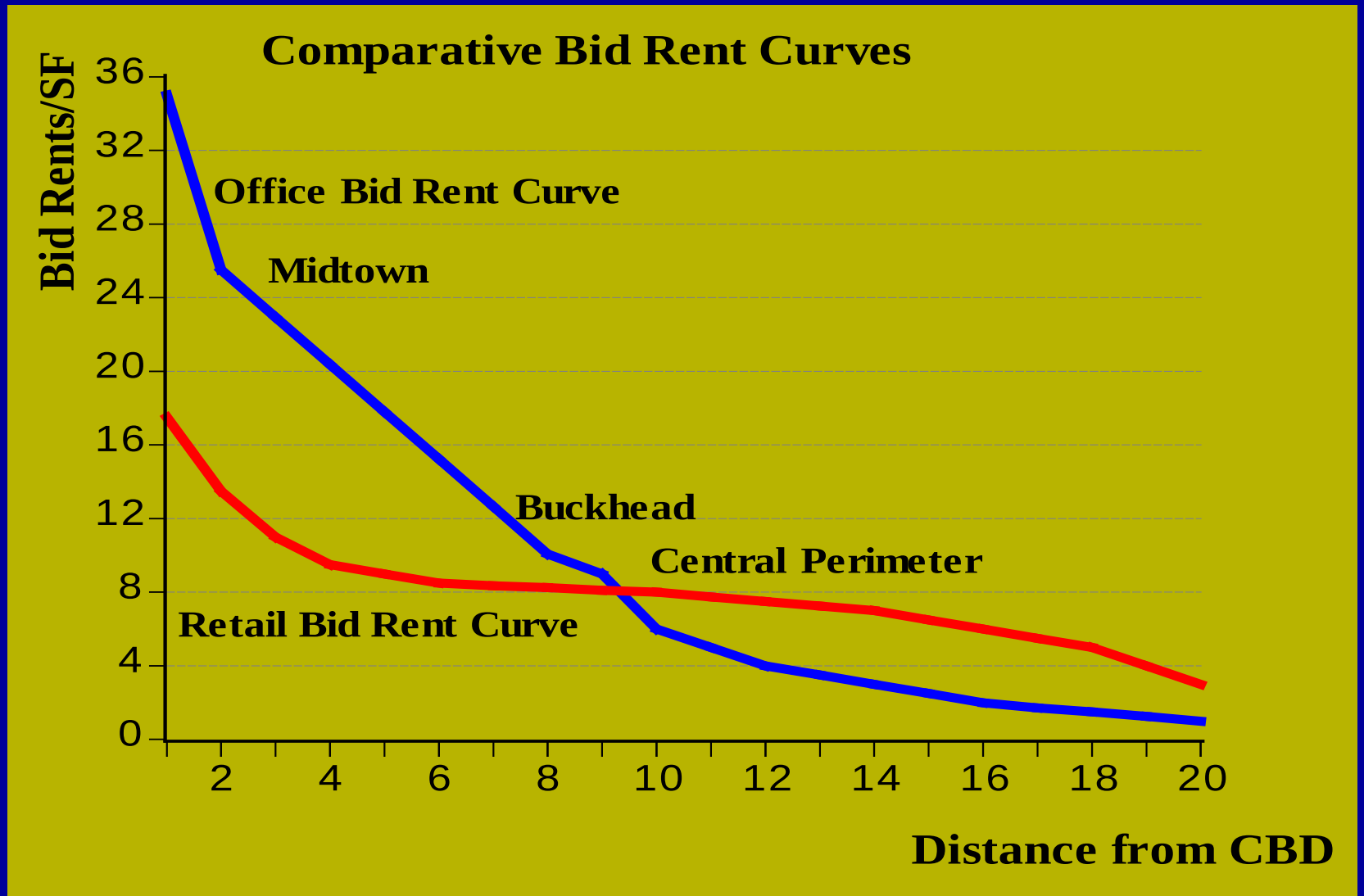


Basis of Real Estate Value: Examples of Atlanta Market Segments



Basis of Real Estate Value: Examples of Atlanta Market Segments

Interrelationships of Land Pricing Patterns:



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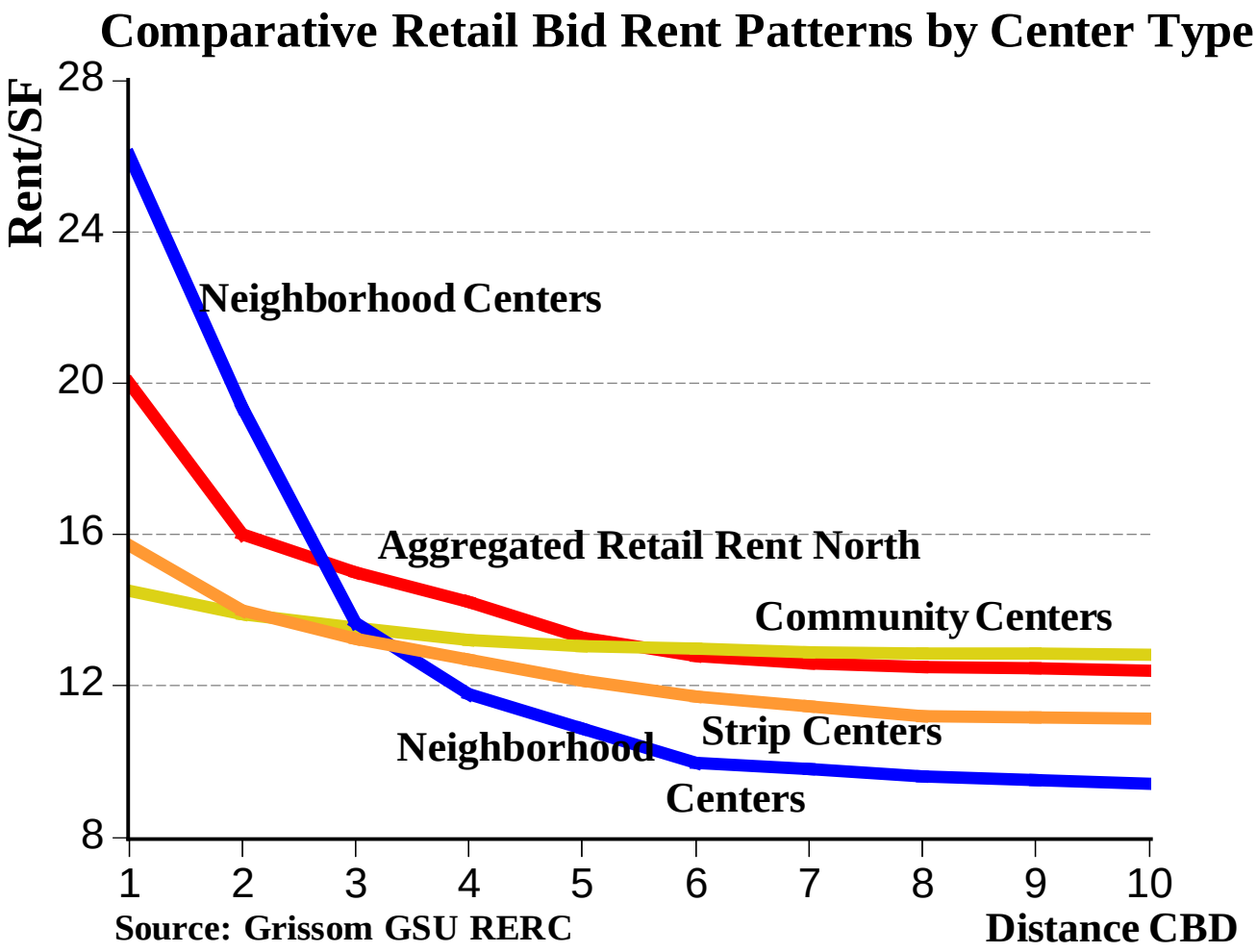
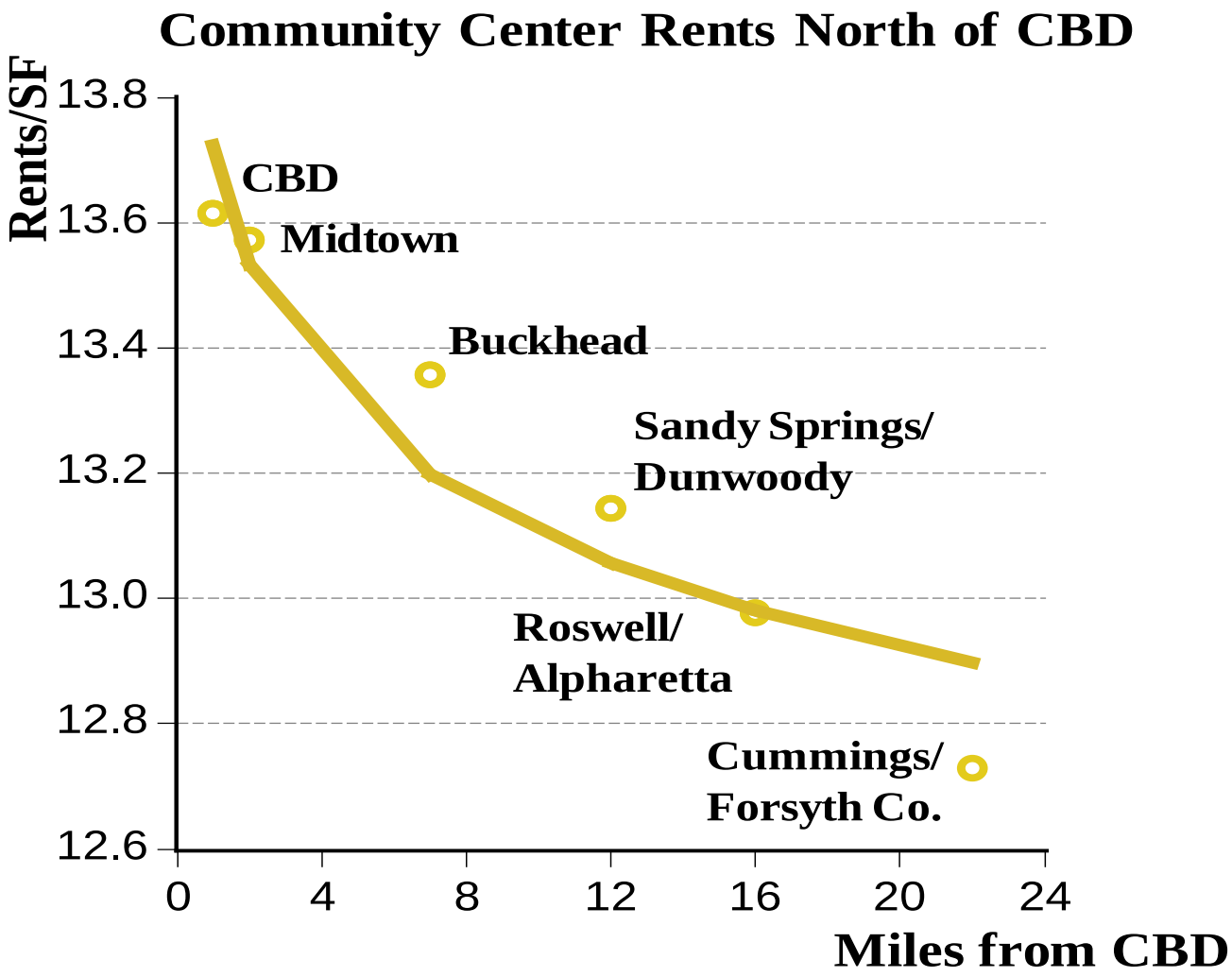
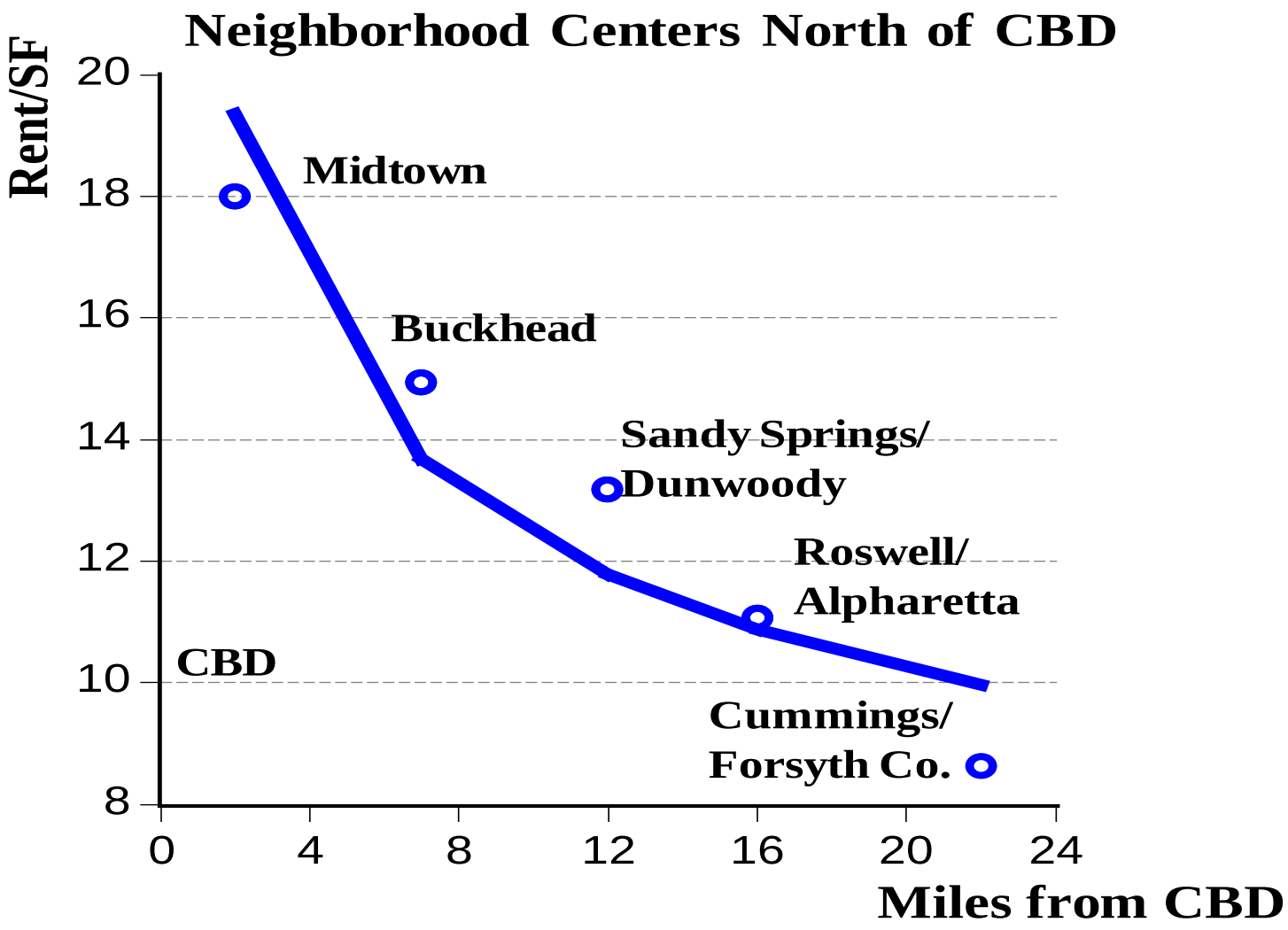


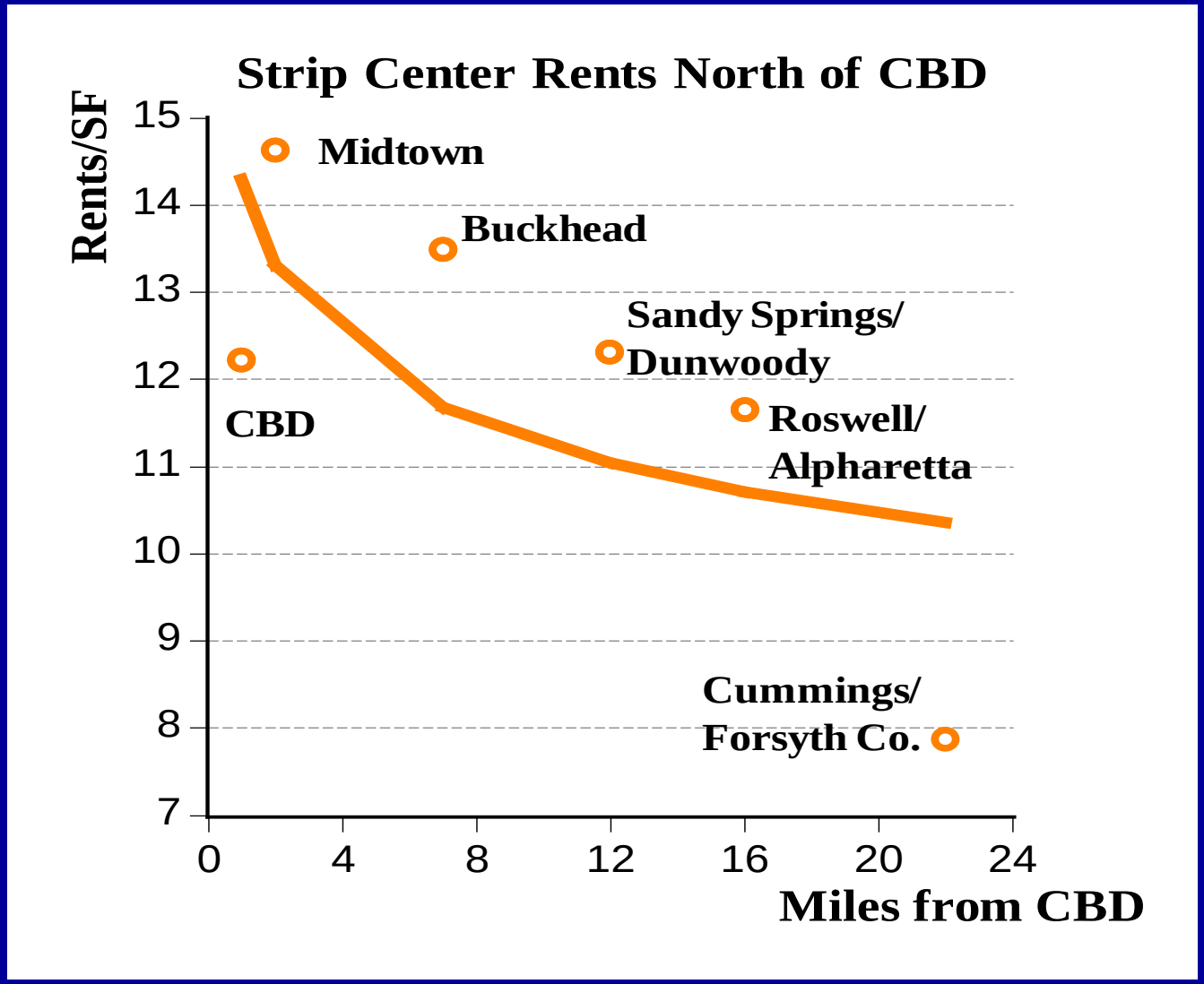
Community Center Retail Bid Rent Curve



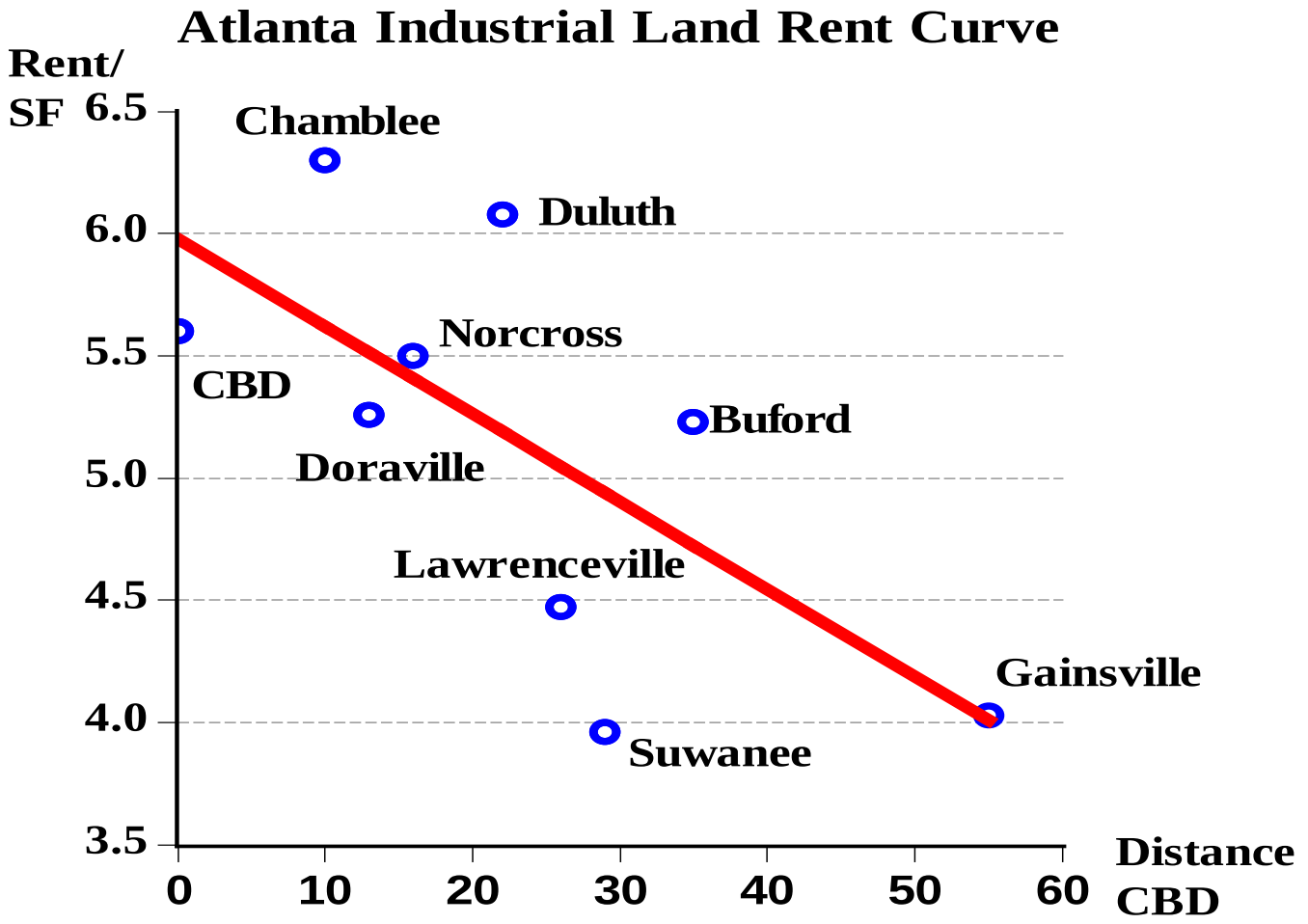
Neighborhood Center Retail Bid Rent Curve



Strip Center Retail Bid Rent Curve



Linear Industrial Bid Rent Pattern



Basis of Real Estate Value: Examples of Atlanta Market Segments