How do Industries Choose a Location?
Firms’ Location Analysis

A. Von Thunen: Agriculture land
1. Assumptions:
   • Sole market center
   • Flat, featureless, homogeneous land
   • No transportation advantage
   • Equal fertility
   • Max profits, given demand and costs
2. High intensity, high priced, heavier transportation costs corps will near the market center.

B. Weber: Business location
• Transportation costs
• Production costs
• Trade-off

C. Isard:
1. Costs
   • Input (raw material)
   • Output (market)
   • Labor, utility, tax, capital availability
2. Revenues
   • Market control through location
   • Beach example
   • Supermarket example
3. Personal factors
4. Life style
5. Climate: explain about 80% of the variation in city growth

D. Think about:
• computer company
• car company
• research company
• dairy product
• cement making company
How Urban Areas are Arranged?

Urban Structure

A. Central Place Theory:
   • A rural area support a town
   • Towns are centers of goods and services
   • A strong relationship between town size and area served
   • There are different levels of services
   • City hierarchy
   • Hexagonal model (not important)
   • City grows based on various human needs
     o Fifth avenue, Macy, K-mark
     o Safeway
     o 7-11 Grocery
   • Identify investment opportunities
     o Demand: several levels
     o Supply: several levels

B. Rank Size Relations
   • \( M = R \times S \)
     o \( M \) = population of the largest city
     o \( r \) = rank of the city
     o \( s \) = population of the city
   • Might not confirm to empirical observations
   • It is just a simple idea
CLASSICAL CENTRAL PLACE THEORY

(a)

(b)

(c)

(d)
Two possible central-place patterns with square areas
### Exhibit 23-1 Characteristics of Shopping Centers

<table>
<thead>
<tr>
<th>Type</th>
<th>Leading Tenant (Basis for Classification)</th>
<th>Typical GLA (square feet)</th>
<th>General GLA Range (Square feet)</th>
<th>Usual Minimum Site Area (Acres)</th>
<th>Minimum Patron Support Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Neighborhood)</td>
<td>Supermarket or drugstore</td>
<td>50,000</td>
<td>30,000-100,000</td>
<td>3</td>
<td>2,500-40,000 people</td>
</tr>
<tr>
<td>(Community)</td>
<td>Variety, discount, or junior department store</td>
<td>150,000</td>
<td>100,000-300,000</td>
<td>10 or more</td>
<td>40,000-150,000 people</td>
</tr>
<tr>
<td>(Regional)</td>
<td>One or more full-line department stores of at least 100,000 sq. feet GLA</td>
<td>400,000</td>
<td>300,000-1 million or more</td>
<td>30-50 or more</td>
<td>150,000 or more people</td>
</tr>
<tr>
<td>(Superregional)</td>
<td>Three or more full-line (sometimes freestanding) department stores of at least 100,000 sq. feet GLA</td>
<td>1 million</td>
<td>1 million</td>
<td>750,000-2 million</td>
<td>1 million or more people in primary tertiary trade area</td>
</tr>
</tbody>
</table>

How do Cities Grow?
Urban Analysis

1. Concentric Circle Theory (1920):
   i. The structure:
      A. CBD.
         The most valuable land
      B. Zone of Transition
         Could not justify space in CBD
      C. Workers Home
         Older houses. Lower income
      D. Middle to High Income Units
      E. Commuter Zone
   ii. Each zone tends to extend its area by invading the next outer zone.
   iii. Filtering effect.
   iv. Continuous migration
   v. Slum area (Zone B)

2. Axial (transportation arteries) Theory
   A. It is not "distance" but "commuting time" to CBD is important.
   B. Development tended to cluster around existing transportation.

3. Sector Theory
   A. Explain residential areas around CBD
   B. Various groups in the social order tended to be segregate into rather definite areas
      according to the self-perceived social status.
   C. Higher priced homes near parks, amenities, and away from CBD.
   D. Lower priced units were located near CBD
   E. New buildings at periphery
      "Hollow Shell Effect"
      "Decay Area"

4. Multiple Nuclei Theory
   A. Homogeneous income groups cluster together
   B. Certain services are demanded.
   C. Mini CBDs develops
      1. Agglomerations
      2. Specializations
      3. Desire to escape certain negative externalities
REAL ESTATE THEORIES

Concentric circle theory

1 = CBD
2 = zone at transition
3 = zone for worker homes
4 = zone for middle- and high- income units
5 = commuter zone
1 = CBD
2 = zone of transition
3 = zone for worker homes
4 = zone for middle and high income units
5 = commuter zone

Arial theory
Darkly shaded areas = high-income sectors

Sector theory
1 = CBD activities
2 = zone of transition, warehousing, etc.
3 = zone for worker homes
4 = zone for middle- and high-income workers
5 = commuter zone

Multiple nuclei theory
How Rent is Determined?
Bid Rent Curve

1. Demand View:
   • City is a flat plain
   • Residential use
   • A CBD
   • Cost of building is constant
   • Population is at same income level
   • Trade-off: site rent for transportation costs.

2. Demand and Supply View
   • Construction cost is higher for more expensive land
   • Development is denser in CBD
   • Job opportunities are in CBD, where firms can afford to pay rents

3. Prisoner's dilemma:
   • Poor people cannot pay high rent
   • Poor people cannot pay transportation cost
   • Job opportunities are in CBD and they have to stay in CBD
   • Solution: increase the density of room
   • Poorest people live on the most expensive land and cannot escape
   • Slum formation

4. Link to Concentric and Axial theories

5. Link to Sector and Multi-nuclei theories

6. Link to land use patterns
Metropolitan Bid Rent Curves

Distance from CBD

Site rent per unit of land (\$)

Metropolitan bid rent curve

Neighborhood Curves

CBD E A D B

Distance from CBD
The office industry has a relatively steep bid-rent function because the travel cost of people exceeds the travel cost of freight. The office industry outbids manufacturers for land near the city center. Central land is occupied by the activity with the most to gain from proximity (decreased transportation costs).
How do Land Uses Change over Time

Neighborhood Life Cycle

1. Growth:
   - New buildings
   - Many vacant lots
   - Not much infrastructure
   - Younger families

2. Maturity:
   - No more vacant lots
   - Matured landscape

3. Decline:
   - Aged properties
   - Deferred maintenance
   - Old design and material
   - Family with older persons

4. Renewed growth or late decline
   - Change use,
   - Renewal, or
   - Slum.
   - Zone of uncertainty

5. Timing is important in real estate decision making.
   (Professors know everything, but they always miss the timing of the market.)

6. Indicators of phases:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Growth</th>
<th>Maturity</th>
<th>Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Investment return</td>
<td>good</td>
<td>average</td>
<td>NA</td>
</tr>
<tr>
<td>2. Competition</td>
<td>high</td>
<td>average</td>
<td>low</td>
</tr>
<tr>
<td>3. Vacancy</td>
<td>low</td>
<td>lower</td>
<td>high</td>
</tr>
<tr>
<td>4. Maintenance</td>
<td>low</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>5. Situs quality</td>
<td>average</td>
<td>best</td>
<td>NA</td>
</tr>
<tr>
<td>6. Turnover</td>
<td>low</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>7. Family cycle</td>
<td>young</td>
<td>mature</td>
<td>old - mature</td>
</tr>
</tbody>
</table>
How do Surrounding Land Uses affect Value?
The Situs Analysis

1. Establishment:
   Courthouse, Hospital, Shopping Center, Office Building, University, School, Park,
   Entertainment Center, Industry Park, Government Offices.

2. Linkage:
   • A relationship between establishments that results people to move.
   • One-way street, Road condition, Traffic lights.
   • 4 gas-stations example
   • Segregations: Highway, River, Railroad, Type of Uses (read light district).

3. Association:
   • Close proximity of automobile dealers
   • Close proximity of fast-food services
   • Anchor tenants
   • Bookstore – University
   • Courthouse – Lawyer’s offices
   • Airport – Transportation companies

4. Environment:
   • Physical: type of uses
   • Social: groups by status
   • Economic: number of competitors
   • Use: establishment and linkage
   • Institutional: policies and regulations
Tools for Analyzing Regional and Urban Growth

I. Export Base Multiplier
- Project the number of new jobs that will be generated by certain types of new industries.
- Industries are divided into basic and non-basic categories.
- The industries that support the goods and services outside the region are basic industries.
- The rest are non-basic industries.
- Expert base multiplier is simply the ratio of the number of jobs (of basic and non-basic industries) and the number of jobs of basic industries.
- Quick and crude approach, with some build-in problems
- Can be done based on chamber of commerce estimates
- Classification of basic industry is difficult or impossible

II. Location Quotient
- A region’s percentage of jobs in one industry divided by the percentage of jobs in the same industry in the U.S.
- A Location Quotient greater than one indicates a concentration of this type of industry in the region.
- Industries with high location Quotients will have a greater impact on the movement of the regional economy.
- Could be used as a crude way to classify basic and non-basic industries.
- Can be done based on chamber of commerce estimates and government data

III. Shift Share Analysis
- It consists of two analyses: industry mix analysis and competition analysis
- Industry mix analysis: similar to the location quotient analysis, which identifies the important industries in the region.
- Competition analysis: This can be accomplished in two steps.
- The region’s growth rate in each industry is compared to the growth rate in the same industry in the U.S. (Which are the important industries in the region.)
- The growth rate in one industry is compared to the growth rates of all other industries in the same region. (Which are the growing industries in the region.)
- The best is to have competitive edge on the growth industries
- Again, this is still a very preliminary analysis

IV. Input/Output Analysis
- Is a matrix approach
- The rows and columns have identical headings representing the major industries in the region
- Show how an addition dollar of spending in any one industry affect the sales (growth) of all the other industries
- Very detailed analysis and intuitively appealing
• Data collection might be a problem
• Need to use past data to predict future. Economical structure might not be the same between past and future.
• Past data cannot be obtained immediately. The will limit the usefulness of the tool
Market Area Analysis

I. Conceptual Model of the Market Analysis and Marketability Analysis Process

MARKET (MACROMARKET) ANALYSIS

1. Determine national and international trends and monetary and fiscal policy impacts on real estate
2. Select the target MSAs
3. Delineate market and trading area for intended uses
4. Perform supply and demand analysis
   • For MSA
   • For selected market area
   • For specified neighborhood and use
   5. Project future rent schedules, prices, and space needs

MARKETABILITY (MICROMARKET) ANALYSIS

6. Neighborhood analysis
7. Site analysis
8. Preliminary merchandising and management strategy
9. Competitive surveys
10. Estimates of market absorption rates, gross possible income and vacancy rates
11. Revenue forecasts for alternative economic scenarios over projected ownership

Input data to investor's return-risk analysis
II. Defining Geographic Market Boundaries*

You Choose Your Market Area!
Select one of the following:
- A circle around a street intersection
- A ZIP Code
- An SMAs or MSA
- A Census tract
- A County
- Or aggregate census tracts, ZIP Codes or counties together to form your trade area.

* Natural Barrier, Man-made Environment, highways, Social-economics status, or Tradition.
III. REAL ESTATE MARKET ANALYSIS FOR AN INVESTMENT

I. Delineation of the market area
   A. Metropolitan area
      1. Name of standard metropolitan statistical area (SMSA)
      2. Identification of entire area
         a. County or counties
         b. Principal incorporated and unincorporated urbanized areas (10,000 or more population)
      3. Geography
         a. Size (land area)
         b. Major topographical features
      4. Climate
         a. Rainfall
         b. Temperature changes (monthly, seasonal)
         c. Relative humidity
      5. General urban structure; location of facilities
         a. Significant geographic sub-markets in SMSA
         b. Employment areas
         c. Shopping areas (central-business-district, regional, and community shopping centers)
         d. Principal transportation facilities (air, highway, rail, water)
         e. Educational facilities
         f. Community facilities (religious, cultural, recreational)
      6. Direction of city growth
      7. Commuting patterns (journey to work)
      8. Any major community developments and/or special features or characteristics germane to the market analysis

II. Demographic analysis
   A. Population
      1. Most recent estimate for total population
      2. Past trends in population growth
      3. Estimated future population
         a. 1990, 1995, 2000 totals and average annual rate of growth
         b. Changes in population due to
            (1) Net natural increase
            (2) Migration
      4. Distribution by age groups
         b. Most recent estimates
   B. Households
      1. Most recent estimates for household formations
      2. Past trends in household formations
      3. Estimated future total households and average annual rate of growth
      4. Current trends in household size (increasing, decreasing)

III. Economy of the market area (Demand Side Analysis)
   A. Economic history and characteristics
      1. General description
      2. Major economic activities and developments
         a. Before 1980
         b. Recent and present
   B. Employment, total and nonagricultural
      1. Current estimates
      2. Past trends
      3. Distribution by industry groups
a. For each period, past and present  
b. Numerical and as percent of all employment  
4. Estimated future employment  
a. Total  
b. By industry groups  
5. Trends in labor participation rate  
6. Trends in female employment  
C. Unemployment  
1. Current level  
2. Past trends  
D. Economic-base analysis  
1. Metropolitan area compared with national and state employment data  
2. Discussion of principal employers  
   a. Primary industries (manufacturing, construction, mining)  
   b. Secondary industries (TCU), trade, FIRE, services, governments)  
   c. Location and accessibility  
3. Payroll data (census of manufacturers, trade, services, governments)  
E. Income data  
1. Personal income by major sources  
   a. By type: wage and salary, proprietors  
   b. By industry: farm, nonfarm, government  
2. Per capita personal income  
3. Family-income distribution  
   a. All families  
   b. Owner households  
   c. Renter households  
   d. Households with female heads  
4. Projections for growth in personal income  

IV. Construction and real estate activity (Supply Side Analysis)  
A. Building and construction industry  
1. Residential building by type (single family, multifamily, rental, or sales)  
   a. Historical and recent trends (past 10 years)  
   b. Building permits: monthly for current and previous year  
   c. Conversions and demolitions  
2. Nonresidential construction  
   a. Commercial  
   b. Industrial  
   c. Institutional  
3. High-rise building activity (minimum height of five stories above ground)  
   a. Residential  
   b. Commercial (offices, stores, hotels and motels, multiple-use)  
   c. Other (governmental, schools, hospitals)  
4. Heavy engineering construction  
B. Demand-and-supply analysis for properties other than residential  
1. General demand factors in metropolitan area  
   a. Number of potential new employees  
   b. Number of potential new tenants or owner users  
   c. Movement of firms in and out of the area  
   d. Recent trends in replacement ratios  
2. Existing inventory, by property type  
   a. Price: sale or rental rates  
   b. Quantity: net leasable square footage  
   c. Year built: before 1980, 1980-present, new  
   d. Competitive status  
   e. Vacancy factors
3. Projected production, by property type
   a. Price: sale or rental rates
   b. Quantity: net leasable space
   c. Probable conditions (financing, marketing, absorption rates)

C. Housing inventory, by type (single-family, multifamily)
   1. Most recent estimates
   2. Past trends including 1980 census
      a. Index of housing values and rents
   3. Principal characteristics
      a. Tenure of occupancy
      b. Value of houses and monthly contract rent
      c. Type of structure
      d. Year built
      e. Vacancy ratios: percent of total units (total, homeowner, rental)

D. Residential sales and rental markets
   1. General market conditions
   2. Major subdivision activity
      a. Current
      b. Past trends
   3. Trends in sales prices or monthly rentals
      a. Existing units
      b. New units
      c. Sales prices or monthly rentals adjusted to square-foot basis
   4. Unsold inventory of new sales housing
      a. Price ranges
      b. Number of months unsold
      c. Absorption rates
      d. Environmental ratings
      e. Competitive status with other sales properties
   5. New rental housing
      a. Date of completion
      b. Type of units and rental ranges
      c. Marketing experience to date
      d. Absorption rates
      e. Environmental ratings
      f. Competitive status with existing rental housing
   6. Residential units under construction
      a. Volume
      b. Types of units
      c. Probable environmental ratings
      d. Probable marketing schedules

E. Other housing markets
   1. Public and governmental subsidized housing
      a. Identification and location
      b. Existing and planned
   2. Specialized submarkets for housing demand and supply
      a. College or university housing
      b. Housing for the elderly
      c. Military housing

F. Real estate loans and mortgage markets
   1. Sources and availability of funds
   2. FHA, VA, FNMA, GNMA
   3. Interest rates and terms of mortgages
   4. Recordings of mortgages and/or deeds of trust
   5. Foreclosures
      a. Overall trend
b. Conventional, FHA, other

V. Political and legal aspects (Legal Environment Analysis)
A. Land-use planning
   1. Regional
   2. County (counties)
   3. Incorporated cities in SMSA
B. Zoning
   1. Review of present zoning ordinances for county (counties) and cities
   2. Zoning history and present attitudes of zoning authority
   3. Identify raw land presently zoned for land use of subject property
C. Ordinances, codes, regulations
   1. Subdivisions
      a. Submission procedures
      b. Requirements for improvements
   2. Building codes
   3. Health and public safety
   4. Allocation of land for schools, recreational areas, open space
D. Municipal services
   1. Public safety
      a. Fire
      b. Police
   2. Hospital and health care
   3. Utilities
E. Ecological
   1. Environmental impact studies
   2. Limited growth policies
   3. Floodplains and flood control
   4. Solid-waste disposal
F. Property taxation
   1. Tax rate per $1,000 valuation
   2. Assessment ratio as percent of market value
   3. Special assessment districts

VI. Sources of information
A. Types of data
   1. Population
   2. Employment
   3. Personal income
   4. Planning
   5. Building
   6. Zoning
   7. Other pertinent
B. Sources of data
   1. Secondary data sources
      a. Census of population
      b. Census of construction
      c. Census of housing
      d. Bureau of Labor Statistics
      e. National Planning Association
      f. Local planning agencies
   2. Primary data sources
      a. Real estate brokers
      b. Appraisers
      c. Construction firms
      d. Mail questionnaires