

URBAN RENEWAL AS A HOUSING PROVISION POLICY AND MATHEMATICAL MODELING FOR URBAN RENEWAL PROJECTS IN TURKEY

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1. GOALS AND FRAME OF THIS WORK



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GOALS

This work has three main goals:

- i. Forming a Basic Business Program Model for Every Urban Renewal Project
- ii. Performing Risk Assessment of Urban Renewal Projects
- iii. Developing a Mathematical Model for Risk Management and Uncertainty Avoidance



1. GOALS AND FRAME OF THIS WORK

FRAME:

- This work involves only the urban renewal projects applied in Turkey that are subject to Municipal Law, article of “urban renewal”.
- No other similar activity or project is intended or referred thereunto.



2. DEFINITIONS AND CORE CONCEPTS



2. DEFINITIONS AND CORE CONCEPTS

WHAT IS URBAN RENEWAL?

- With the decision and authority of a governing municipality, re-arranging land use, function and ownership features of a socially, economically or structurally decayed part of a certain city .
- More Thoroughly;
- With public (municipal) decision and authority, modifying the ownership, land use plan and functions of economically and structurally disabled part of a city, such as slum zones or brown fields, for the purpose of obtaining a desired, well organized neighborhood.
- Comment: Intention of upgrading the physical environment
- Source: municipal law, legal base of urban renewal



2. DEFINITIONS AND CORE CONCEPTS

UNDER WHAT CONDITIONS, SHALL URBAN RENEWAL A BE EXERCISED?

- For a given urban decay area,
- If the desired change or redevelopment could not be achieved by classical methods or current market mechanism
- And thus, renewal is seen necessary by the local political authority (municipality) and action course of eminent domain is fiscally tough, only then urban renewal is the proper instrument.



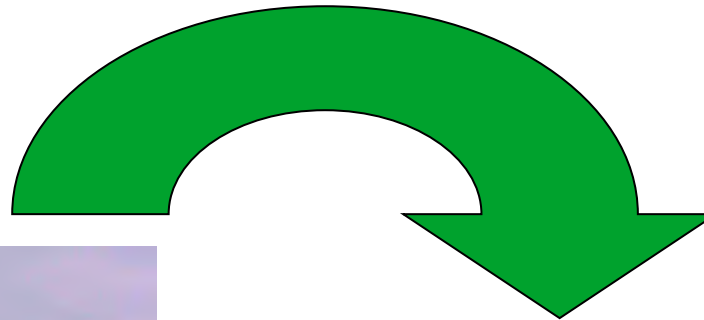
2. DEFINITIONS AND CORE CONCEPTS

GOAL OF URBAN RENEWAL

- Obtaining a better living environment that is / includes;
 - Safe and Secure
 - Higher Quality
 - More Greenery
 - Energy Efficient, Sustainable
 - Better Architectural Features
- More Functional Properties
- Increase in Value of Properties
- Wholesome Approach

2. DEFINITIONS AND CORE CONCEPTS

GOAL OF URBAN RENEWAL





3. LEGAL DIMENSION OF URBAN RENEWAL IN TURKEY



3. LEGAL DIMENSION OF URBAN RENEWAL IN TURKEY

- Municipal Act and Its Article Number 73 is the legal base of urban renewal in Turkey
- Above this, the city council decrees are the literally the laws for a given project at its place
- A new entire law has been prepared and awaiting approval by the parliament



3. LEGAL DIMENSION OF URBAN RENEWAL IN TURKEY

Municipal Act, Summary of Article 73

- Municipalities are the authorities to apply urban renewal
- Minimum area shall be 5 hectares (50.000 m²)
- Negotiation with the owners or right holders is essential
- Compulsory purchase (eminent domain) is the last option
- Municipalities are responsible for the completion of the new buildings
- Cooperation with the state housing administration (TOKI) is possible if seen necessary by the municipality



4. SOCIO-ECONOMIC DIMENSION OF URBAN RENEWAL

4. SOCIO-ECONOMIC DIMENSION OF URBAN RENEWAL



GENTRIFICATION AND URBAN RENEWAL

- Gentrification is removal of lower income people from an area due to upgraded environment and rising prices. (Glass, 1964)
- The owners or right holders of a renewal area, shall own some part of the project so that they would not feel excluded
- Property provision based on land ownership or legal status is necessary to apply such sharing
- Homo Economicus Theory (Mill) suggests that people somehow follow their benefits and take their action courses accordingly.
- In urban renewal projects, it is the primary concern to measure peoples realistic expectations and provide them with a just and fair program
- Theory says, people cannot afford to live in such a new and expensive neighborhood even if they are granted new homes
- We propose, as observed in many exercises in Turkey, let them have the chance, they make use of their property as they wish



4. SOCIO-ECONOMIC DIMENSION OF URBAN RENEWAL

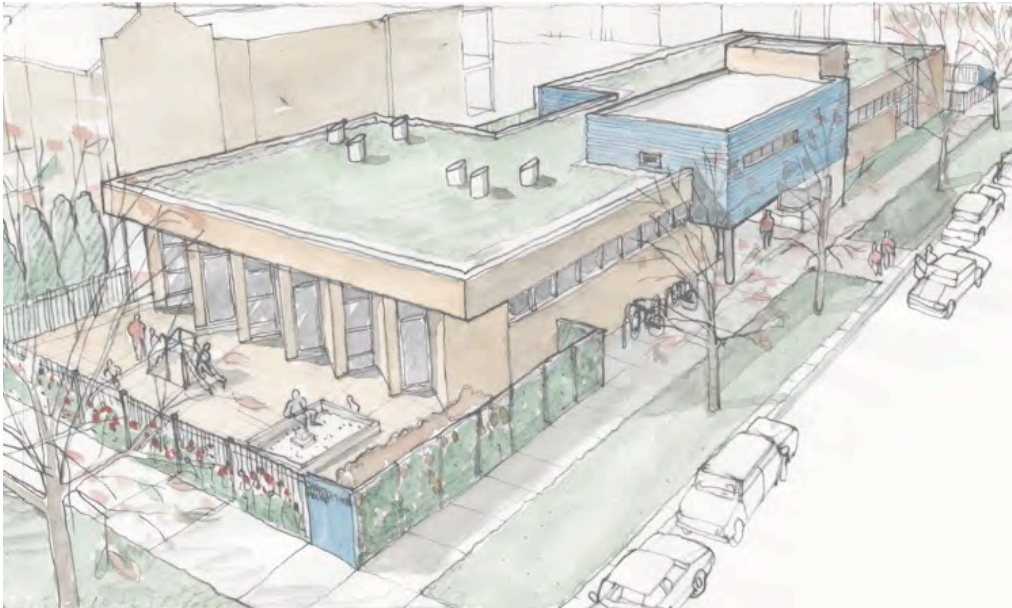
RENT AS A KEY FOR URBAN RENEWAL

- As seen in the United States, poverty is not the key but wealth is, for urban renewal
- A place filled with only lower income people raises new socio-economic collapses in the future and yet becomes an urban decay once again
- Rent is necessary for sustainable urban renewal mechanism
- Increase in value, rent, is a measure of how well the site has been renewed
- Without rent, projects can also be financed according to social cost and benefit theory but it would erode the public resources which is already limited

4. SOCIO-ECONOMIC DIMENSION OF URBAN RENEWAL



NO INCREASE IN VALUE



4. SOCIO-ECONOMIC DIMENSION OF URBAN RENEWAL



NO INCREASE IN VALUE

- Urban Decay Repeated



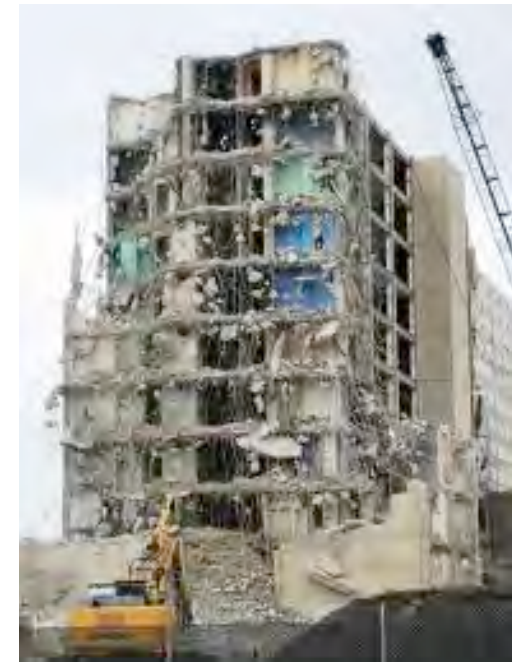
- Cabrini Green, Chicago



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- Cabrini Green, Chicago

4. SOCIO-ECONOMIC DIMENSION OF URBAN RENEWAL



INCREASE IN VALUE





5. POLITICAL DIMENSION OF URBAN RENEWAL PROJECTS



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Political Projects

- Urban renewal projects, in nature, are political projects
- The law allows the municipal councils, which consist of political party members, to declare a place as “urban renewal site”
- Political feasibility is many times the decision factor .
- If social cost and benefit analysis allows a financially less proven project, the city may still pursue it.
- Generally, no city starts up a financially high but socially less accepted project.
- For this reason, it is an assurance for urban renewal projects that no harm to owners or legal settlers would be done for the sake of rent.



6. ADMINISTRATIVE DIMENSION AND PROJECT MANAGEMENT OF URBAN RENEWAL PROJECTS



6. ADMINISTRATIVE DIMENSION AND PROJECT MANAGEMENT OF URBAN RENEWAL PROJECTS

TOKİ (State Housing Administration) Inclusion

- Those Municipalities who plead, may also develop urban renewal projects in cooperation with TOKİ
- This decision requires political power due to TOKİ's contexture
- TOKİ's contribution is mainly financial rather than project management
- With or without TOKİ, decision making and project management processes belong to the city
- TOKİ, as a risk partner, may somehow relieve the political pressure on the city if things go wrong



6. ADMINISTRATIVE DIMENSION AND PROJECT MANAGEMENT OF URBAN RENEWAL PROJECTS

URBAN RENEWAL PROJECT MANAGEMENT

- All municipalities need a well organized, specific business plan for each and every different urban renewal project
- In Turkey, most of the urban renewal projects start with a site decision of the city council
- The second decision is generally about the housing provision standards for the owners or right holders
- In between, there is generally no strategic plan and things happen somehow during the process
- Therefore, many projects undergo unforeseeable difficulties and eventually failure

6. ADMINISTRATIVE DIMENSION AND PROJECT MANAGEMENT OF URBAN RENEWAL PROJECTS

Business Plan Example of an Urban Renewal Project

1	DECISION MAKING PROCESS TO START UP THE PROJECT	13	TENDER OF 1/1000 DEVELOPMENT PLAN	25	TENDER OF PARCEL PLANNING	37	DEMOLISHING
2	TURNING THE DECISION INTO CITY COUNCIL DECREE AND DECLARING URBAN RENEWAL ZONE	14	FORMING 1/5000 DEVELOPMENT PLAN	26	FORMING THE PARCELS	38	REMOVAL OF MATERIAL
3	APPRAISAL OF EXISTING BUILDINGS AND STRUCTURES, GATHERING DOCUMENTS OF OWNERSHIP	15	APPROVAL OF 1/1000 DEVELOPMENT PLAN BY CITY COUNCIL	27	APPROVAL OF THE NEW PARCELS BY THE CITY	39	FIELD PREPARATION
4	APPROVAL OF APPRAISAL REPORTS BY THE CITY	16	EXHIBITING 1 /5000 DEVELOPMENT PLAN TO PUBLIC	28	APPROVAL OF THE NEW PARCELS AT THE LAND REGISTRY DEPARTMENT	40	DETAILS OF FIELD WORKS, DUMPING, TRANSPORTATION, STORAGE, ETC.
5	CITY COUNCIL DECREE - EXTENSIONS OF THE RENEWAL ZONE	17	ANNOUNCING THE PROJECT TO PUBLIC BY MUNICIPAL INSTRUMENTS	29	FORMING THE INVESTMENT PACKAGES FOR RESIDENTIAL AND COMMERCIAL BUILDINGS	41	INTERNAL TRANSPORTATION PLAN
6	FORMING THE CONCEPT OF THE RENEWAL PROJECT AND THE MATHEMATICAL MODEL	18	STARTING THE SIGN UP PROCESS WITH LANDOWNERS AND PASSING TITLES TO THE CITY	30	DECISIONS OF ARCHITECTURAL DETAILS	42	GETTING STARTED WITH THE CONSTRUCTION WORKS
7	TURNING THE CONCEPT INTO CITY COUNCIL DECREE	19	FORMALITIES AND PAYMENTS OF LANDOWNERS	31	PREPARING TECHNICAL DETAILS OF PUBLIC TENDER FOR CONSTRUCTION	43	TENDER OF GENERAL INFRASTRUCTURE AND PAISAGE WORKS, APPROVAL IOF THE CITY
8	CITY COUNCIL DECREE - EVALUATION OF , PAYMENT PLANS	20	TENDER OF URBAN DESIGN	32	FINALIZATION OF PUBLIC TENDERS, GETTING INTRODUCED WITH DEVELOPERS	44	STARTING WITH THE INFRASTRUCTURE
9	TENDER OF 1/5000 DEVELOPMENT PLAN	21	FORMING CONCEPTUAL UBAN DESIGN	33	PREPARING ARCHITECTURAL DESIGNS	45	FORMING THE SITE MANAGEMENT PLAN AND ITS APPROVAL AT THE LAND REGISTRY DEPARTMENT
10	FORMING 1/5000 DEVELOPMENT PLAN	22	APPROVAL OF CONCEPTUAL URBAN DESIGN	34	PREPARING ENGINEERING DETAILS	46	DRAWING OF LANDOWNERS APARTMENTS
11	APPROVAL OF 1 /5000 DEVELOPMENT PLAN BY CITY COUNCIL	23	DETERMINING THE CORE DUTIES OF PROJECT ASSESSMENT GROUP	35	APPROVAL OF ARCHITECTURAL AND ENGINEERING PROJECTS BY THE CITY	47	COMPLEMENTARY DETAILS
12	EXHIBITING 1 /5000 DEVELOPMENT PLAN TO PUBLIC	24	FORMING THE PROJECT ASSESSMENT GROUP	36	APPRAISAL OF THE NEW PROJECT ACCORDING TO APPROVED DESIGNS		



6. ADMINISTRATIVE DIMENSION AND PROJECT MANAGEMENT OF URBAN RENEWAL PROJECTS

REASON FOR BUSINESS PLAN

- Each and every different urban renewal project requires a cleverly adapted business plan
- This also is a pathway to achieve the goals of any renewal project
- This can help foresee risks and perform risk assessment
- The main objective of this work, mathematical modeling, is a tool to apply risk management
- The business plan therefore sets forth;
 - **Various Risks**
 - **Risk Management**
 - **Mathematical Modeling**
 - **Achieving the Goal**

Of any given urban renewal project



7. BRIEF OF SOME URBAN RENEWAL PROJECTS IN TURKEY

7. SOME URBAN RENEWAL PROJECTS IN TURKEY



MAIN SOURCES OF URBAN DECAY IN TURKEY

Slums & Shanty Towns



Brown Fields



Other Types of Chaos

7. SOME URBAN RENEWAL PROJECTS IN TURKEY



Dikmen Valley, Ankara, 1990s



Vadi tabanından konut kuleleri



1. uygulama Bölgesi
(Kuşçesu bakiş)
15 Eylül 1993

7. SOME URBAN RENEWAL PROJECTS IN TURKEY



Dikmen Valley, Ankara, 1990s



7. SOME URBAN RENEWAL PROJECTS IN TURKEY

ANKARA GÜNEYPARK



7. SOME URBAN RENEWAL PROJECTS IN TURKEY

ANKARA GÜNEYPARK – Planning



7. SOME URBAN RENEWAL PROJECTS IN TURKEY

ANKARA GÜNEYPARK – Architectural Works



7. SOME URBAN RENEWAL PROJECTS IN TURKEY

ANKARA GÜNEYPARK – Demolishing



7. SOME URBAN RENEWAL PROJECTS IN TURKEY

ANKARA Mamak



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ANKARA Mamak



7. SOME URBAN RENEWAL PROJECTS IN TURKEY

ANKARA Mamak



7. SOME URBAN RENEWAL PROJECTS IN TURKEY

ANKARA Mamak – Demolishing & Construction



7. SOME URBAN RENEWAL PROJECTS IN TURKEY

BURSA Sıcaksu



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7. SOME URBAN RENEWAL PROJECTS IN TURKEY

BURSA Sıcaksu

DERİCİLER BÖLGESİ KENTSEL DÖNÜŞÜM VE GELİŞİM PROJESİ



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8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA

8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA



- In the heart of downtown Bursa (4th Largest City)



8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA

Problem1: Too many inheritors thus too many shares
No ordinary land use plan or land readjustment helps development

- Area: 18 Hectares (180.000 m² private ownership)
- Approximate Land Value: \$1.000 /m²
- Around 1.250 obsolete houses
- 1.900 known, registered owners
- Ownership further fractured



8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA

Problem2 : Around 20 historical registered buildings that cannot be demolished and have to be protected

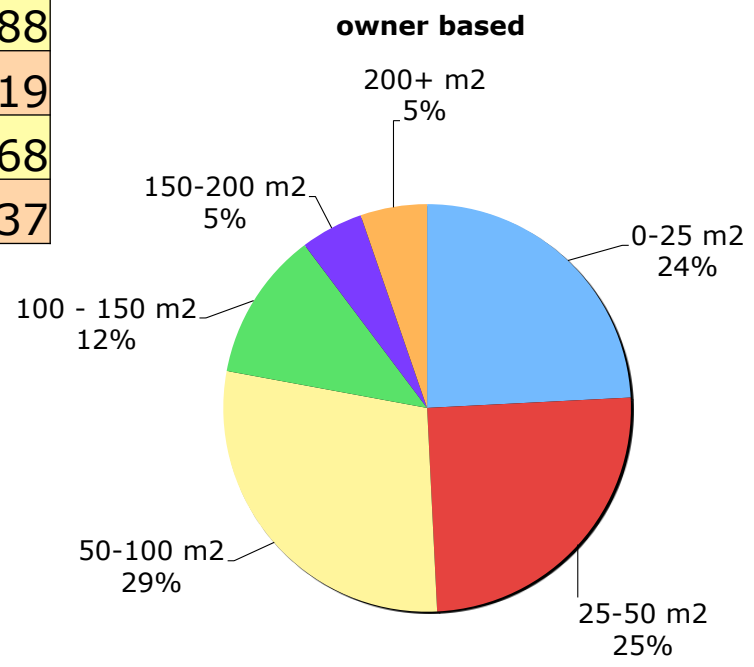


8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA

Ownership Analysis



Ownership Group	Persons	Area m2
0-25 m2	402	6,248
25-50 m2	478	17,597
50-100 m2	548	39,217
100 - 150 m2	226	27,388
150-200 m2	95	16,319
200+ m2	101	34,368
Total	1,850	141,137





8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA Owners' Decision Modeling

Based on market behavior:

- Contractor's Average Share : 50% (a mean value)
- Construction capacity: 3 x (the land size)
- Owners' Expectation : 3 x 50% x (the land size) = 1:1.5

Therefore, suggested housing provision coefficient: 2 : 3

- More physically:

Owners' Land Share	Housing Provision (m ²)
50M ² or less	75
50 - 75M ²	112.5
75 - 100M ²	150
more than 100M ²	repeated same provision



8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA

Summing up All Shareholders Requirements

Landownership groups m2	Number of owners/titles	Housing program in m2	Provisioned number of dwellings	Total number of units
5 - 50	880	75	1	880
50-75	285	112.5	1	285
75-100	214	150	1	214
100 - 175	298	150 + 112.5	2	596
175 - 200	40	2x150	2	80
200 - 275	67	2x150 + 112.5	3	201
275 - 300	10	3x150	3	30
300 - 375	11	3x150 + 112.5	4	44
375 - 400	2	4x150	4	8
400 - 475	3	4x150 + 112.5	5	15
475 - 500	3	5x150	5	15
500 - 575	4	5x150 + 112.5	6	24
575 - 600	1	6x150	6	6
600 - 675	2	6x150 + 112.5	7	14
675 - 700	1	7x150	7	7
700 - 775	1	7x150 + 112.5	8	8
900 - 975	1	9x150 + 112.5	10	10
				2437

Size of New Dwelling m2	Number Required	Total Construction m2
75	940	70,500
112.5	684	76,950
150	855	128,250
	2,479	275,700

8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA Planning



- 1. Using The Total Required Numbers,
- 2. Considering the locations of registered historical buildings



8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA Visualizing

1. Using The Total Required Numbers,
2. Considering the locations of registered historical buildings



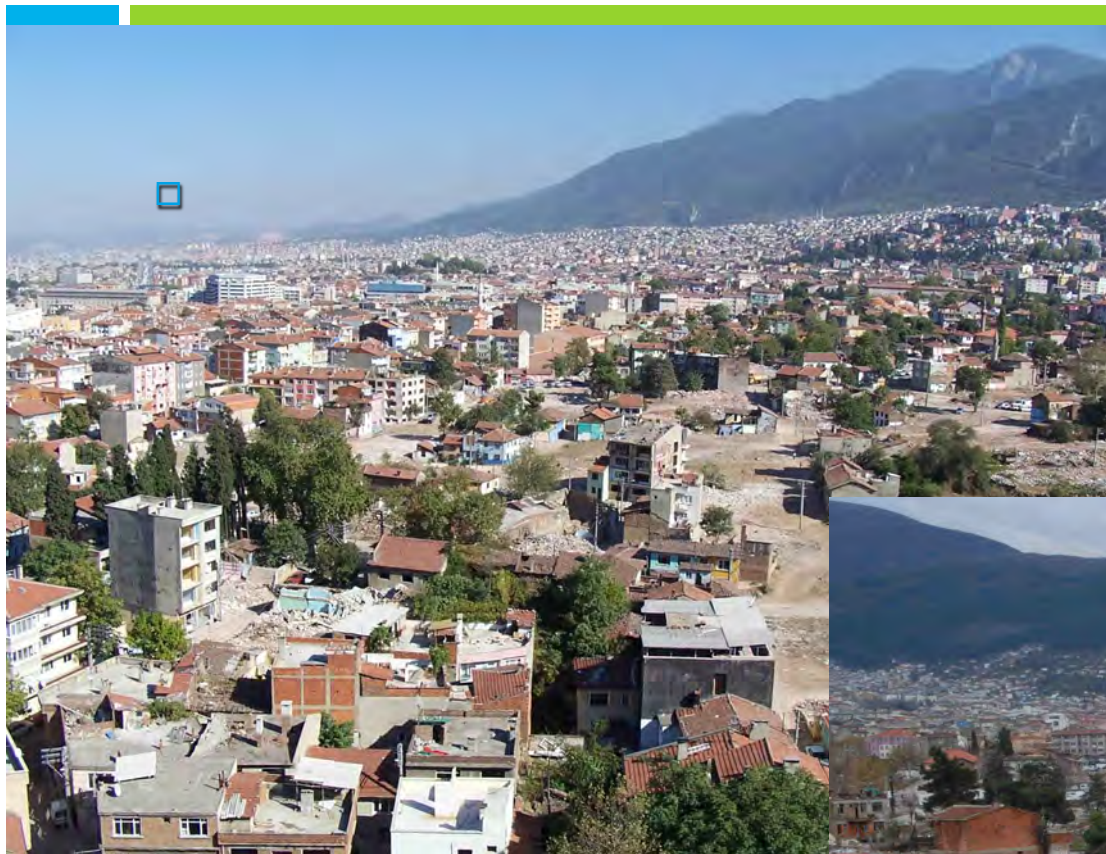
8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA Visualizing

1. Using The Total Required Numbers,
2. Considering the locations of registered historical buildings



8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA

Demolishing - 2008



8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA Construction - 2009



8. DOĞANBEY URBAN RENEWAL PROJECT, BURSA Completion - 2010



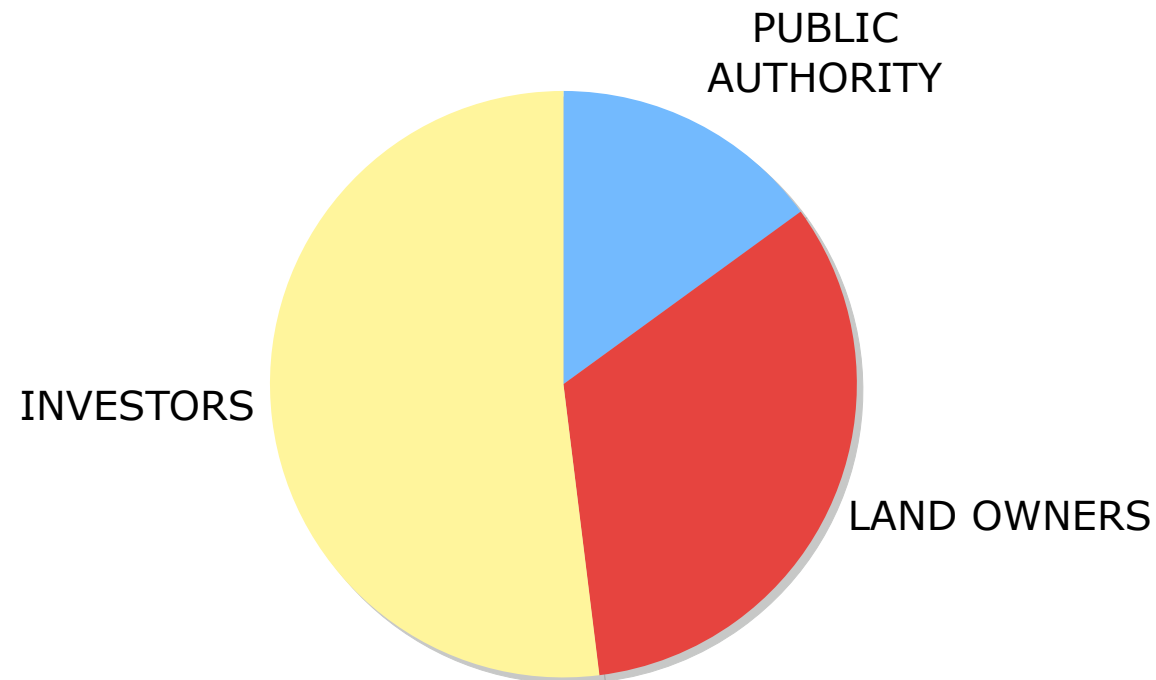


9. MATHEMATICAL MODELING OF URBAN RENEWAL PROJECTS

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□ PILLARS OF URBAN RENEWAL PROJECTS



9. MATHEMATICAL MODELING OF URBAN RENEWAL PROJECTS



PILLARS OF URBAN RENEWAL PROJECTS

- **PUBLIC AUTHORITY (Legally Municipality)** is required to ensure lawfulness, fairness, and public welfare features of the projects
- **INVESTORS**, whether public or private sector, are the driving forces and quality determinants of the projects
- **OWNERS OR RIGHT HOLDERS**, are the uppermost important figures of the projects. Without the majority of their will or consent, there is no point pursuing a project.

9. MATHEMATICAL MODELING OF URBAN RENEWAL PROJECTS

DETERMINING THE PROBLEM – PROJECT DECISION



SITE WORKS – DATA GATHERING



ANALYZING EXPECTATIONS



FUNCTIONAL AND CONCEPTUAL DESIGN



PROVISION COEFFICIENT MODELING ($1m^2 : X m^2$)



PRELIMINARY FEASIBILITY STUDIES



URBAN DESIGN



CONTRACTS WITH THE OWNERS/RIGHT HOLDERS



TRANSFER OF OWNERSHIP TO THE CITY



LAND USE PLANS AND CONSTRUCTION

9. MATHEMATICAL MODELING OF URBAN RENEWAL PROJECTS



MATHEMATICAL MODEL:

- Risk Analysis
- Dynamic Process
- Risk Assessment
- Positive Bargaining Zone Between Pillars
- Working within the Limits of:
 - Legal
 - Technical
 - Financial
 - Administrative
 - Social

frames in a wholesome, harmonic way

9. MATHEMATICAL MODELING OF URBAN RENEWAL PROJECTS



MATHEMATICAL MODEL:

- A Decision Theory Which Determines Coefficients, Numbers, And Ultimately The Magnitudes Of Projects
- John Stuart Mill's "Homo Economicus"
- Descriptive And Normative Analysis
- Working In A Blurry Environment
- Sensing The Future Needs
- Development Appraisal

9. MATHEMATICAL MODELING OF URBAN RENEWAL PROJECTS



□ Examples of Property Provision Coefficient in Various Projects

ANKARA	GÜNEYPARK	5 : 1
ANKARA	GÜNEYTEPE	4 : 1
ANKARA	DİKMEN IV-V	2.5 : 1 & 4 : 1
ANKARA	YENİ MAMAK	4 : 3 & 4 : 2
ANKARA	ULUS TARİHİ KENT MERKEZİ	ÖZEL DEĞERLEME
İSTANBUL	AYAZMA-TEPEÜSTÜ	2.5 : 1
İSTANBUL	KAYABAŞI	5 : 1
BURSA	DOĞANBEY	2 : 3
BURSA	DERİCİLER-SICAKSU	1 : 1
BURSA	SANTRAL	1 : 1
BURSA	MOLLAARAP	2 : 1
BURSA	YALOVAYOLU	0.94 : 1 & 0.75 : 1
ÇANKIRI	YENİ MERKEZ	2 : 1
SAKARYA	DÖRTYOL SANAYİ	10 : 3
SAKARYA	KÜPÇÜLER	2 : 1

- **The İdea: Each and every project has its own problems, solutions and values so the provision coefficient differs.**

9. MATHEMATICAL MODELING OF URBAN RENEWAL PROJECTS



CAN URBAN RENEWAL BE MATHEMATICALLY RATIONALIZED?

- **Urban Renewal (F) = W_L (Legal) + W_F (Financial) + W_P (Political) + W_T (Technical) + W_S (Social)**

And

- **Estimated Possibility of Risk Factors in Order**

$$W_{\text{Political}} > W_{\text{Financial}} > W_{\text{Legal}} > W_{\text{Administrative}} > W_{\text{Social}}$$



9. MATHEMATICAL MODELING OF URBAN RENEWAL PROJECTS

□ POSSIBLE OBSERVATIONS TO FOLLOW

Project	Social	Politid	Legal	Admi	Techn.	Financia	Performan
Ankara Dikmen							
Ankara Güneypark							
Ankara (North)							
Ankara Yeni Mamak							
Istanbul Ayazma							
Bursa Doğanbey							
Bursa Dericiler							
Çankırı Merkez							
Sakarya Dört Yol							

- The factors, for instance 1 to 5 (1: most challenging , 5: most favored by)
- Performance = Completed, Continuing, Halted



THANK YOU
FOR YOUR ATTENTION