

GEG.P502

Tuesday/Friday, 9:00-10:30, 3rd Quarter

Ishikawadai Building No.4, Room B04/05

Project Management and Evaluation for Sustainable Infrastructure

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Outline

This course aims to provide the methods necessary to undertake project evaluation and cost benefit analysis for sustainable infrastructure. The methods comprise of microeconomics background, cost benefit analysis, valuing market and non-market goods, and other technical issues. Case studies of various infrastructures are also provided.

Schedule

1. Introduction to Project Evaluation	30 Sep
2. Foundations of Cost Benefit Analysis	4 Oct
3. Valuing Benefits and Costs in Primary Markets	11 Oct
4. Discounting Benefit and Cost, Existence Value	14 Oct
5. Midterm Examination	21 Oct
6. Valuation of Impacts: Observed Behavior (1)	25 Oct
7. Valuation of Impacts: Observed Behavior (2)	28 Oct
8. Valuation of Impacts: Contingent Valuation	1 Nov
9. Valuation of Impacts: Shadow Prices	4 Nov
10. Presentation (1)	8 Nov
11,12. Presentation (2), (3)	15 Nov
13,14. Presentation (4), (5)	18 Nov
15. Final Examination	22 Nov

*No class on 23 Sep, 7 Oct (official), 18 Oct, 11 Nov

*You may attend the class of Presentation in your term only.

Grade

Midterm Exam	30%
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Presentation	20%
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Exercise or Report	10%
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Final Exam	40%
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Textbook and References

Boardman, A. E., Greenberg, D. H., Vining, A. R. and Weimer, D. L. (2010)

Cost Benefit Analysis: Concepts and Practice (4th Edition)

Prentice Hall College.

Varian, H.R. (2003)

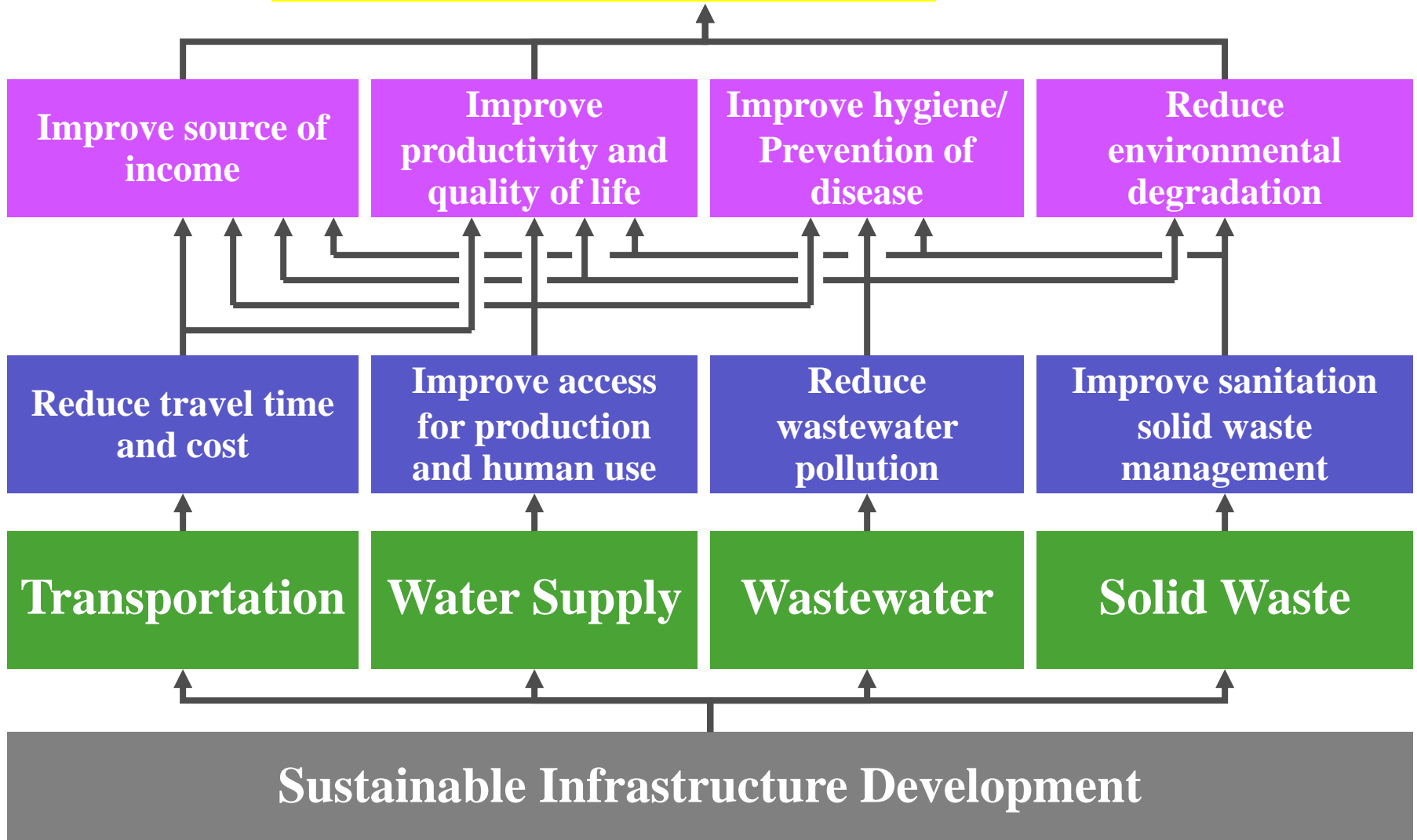
**Intermediate Microeconomics: A Modern Approach 6th Edition, W.W.Norton
& Company.**

Concept of Sustainable Infrastructure Development

Eco-Efficiency
[value, resource and impact]



Need to evaluate projects
for infrastructure
development



World Fastest Growing City during 1990s



We need to execute **good projects** for developing Sustainable Infrastructure in realizing eco-efficient society.

What is Project?

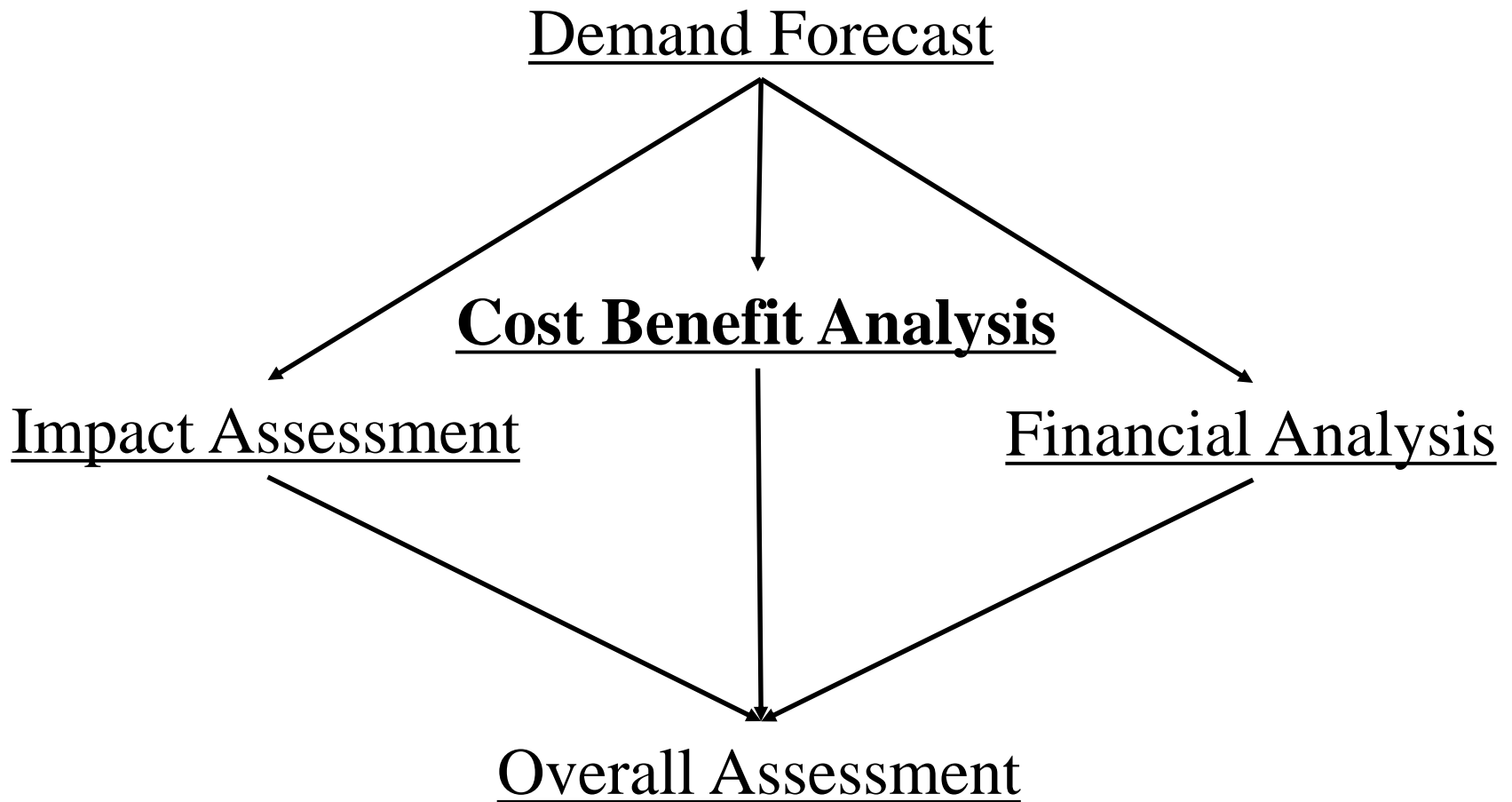


Aims of Project Evaluation

To evaluate the feasibility of infrastructure development/investment project under limited budget.

- to be viable or rejected
- to compare alternatives, priority
- to capture the significant impact
- to support decision-making
- to report the result in a consistent (scientific) form
[Accountability for the public]

Overall Scheme in Infrastructure Project



What is Cost Benefit Analysis?

Cost Benefit Analysis

- Focus on

Society (Households, Firms, Government and what?)

Benefit, Cost, Utility (A person's happiness), Efficiency...

Maximize NSB (*Net Social Benefit*) = B (*Social Benefit*) – C (*Social Cost*)

based on Microeconomics Theory

Financial Analysis

- Focus on Private (Firm)

Profit, Revenue and Expenditure

Financial values on a commercial basis.

Chapter 1 Introduction to Cost-Benefit Analysis

Major Steps in CBA “Highway Example”

1. Specify the set of alternative projects
Road Surface, Routing, Size (Lane), Tolls, Wild Animal Friendliness, Timing
2. Decide whose benefits and costs count
Global, National, Provincial, Local...
3. Catalogue the impacts and select measurement indicators
Time saving, Operation cost saving, Safety Benefit, Toll Revenue, New Users, Alternative Road Benefits, Construction cost, Maintenance cost, etc.
4. Predicts the impacts quantitatively over the life of the projects
Number of vehicle-trips, Vehicle operation cost, number of accidents avoided, number of lives saved, etc.
5. **Monetize all impacts (as much as possible)**
 - Observed Behavior: Direct Estimation & Indirect Market Method (HPM, TCM)
 - Contingent Valuation Method (Stated Preference)
6. Discount benefits and costs to obtain present values
7. Compute the net present value of each alternative
8. Perform sensitivity analysis
9. Make a recommendation

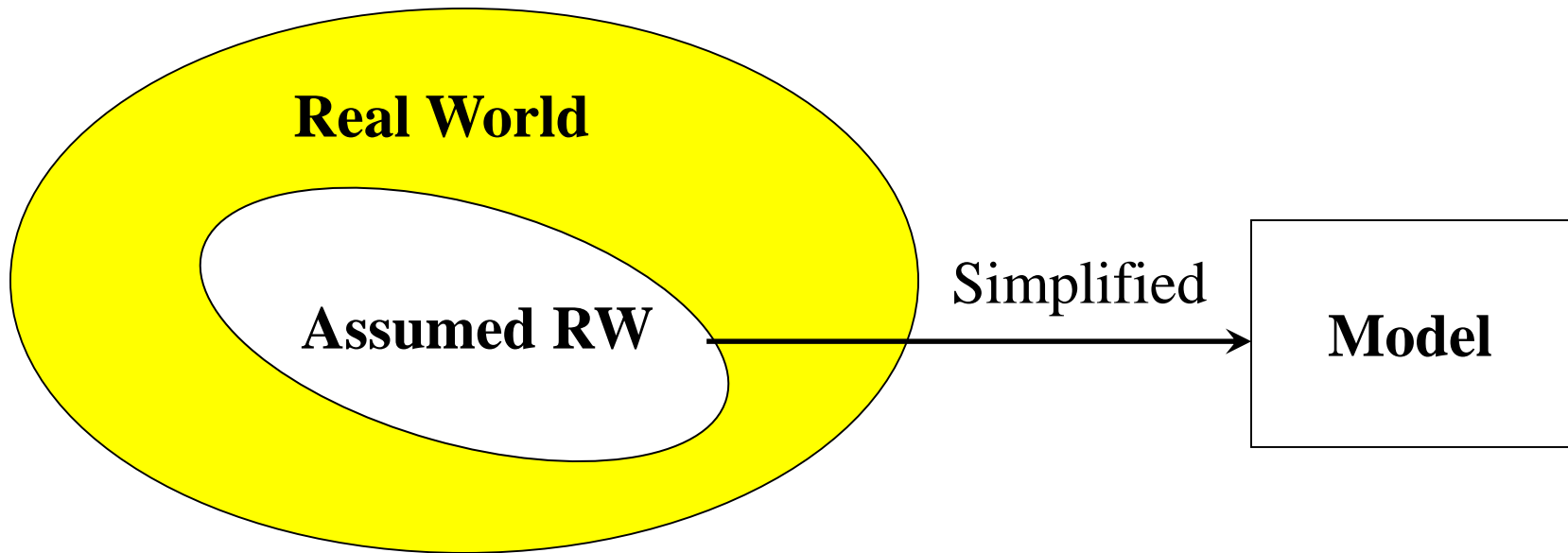
Effect and its Indicator of Transport Projects

Effect	Indicator
User Benefit (Efficiency)	Time saving, Cost saving
Other transport system	Network, Pricing, Intermodality
Safety	Accident
Environmental impact	Air Pollution, Greenhouse Gas
Wider economic impact	Employment, Production...
Other policy impacts beyond the transport system	Relevant policies, Consistency, Conflict
Financial viability	Cash flow, Profit and Loss

Model: Market Mechanism

Model: simplified representation of reality

> elimination of irrelevant detail



Basics of Microeconomics Model

Consumer Producer
Demand Side ↔ Supply Side

Principle of behavior of agents (people)

The optimization principle

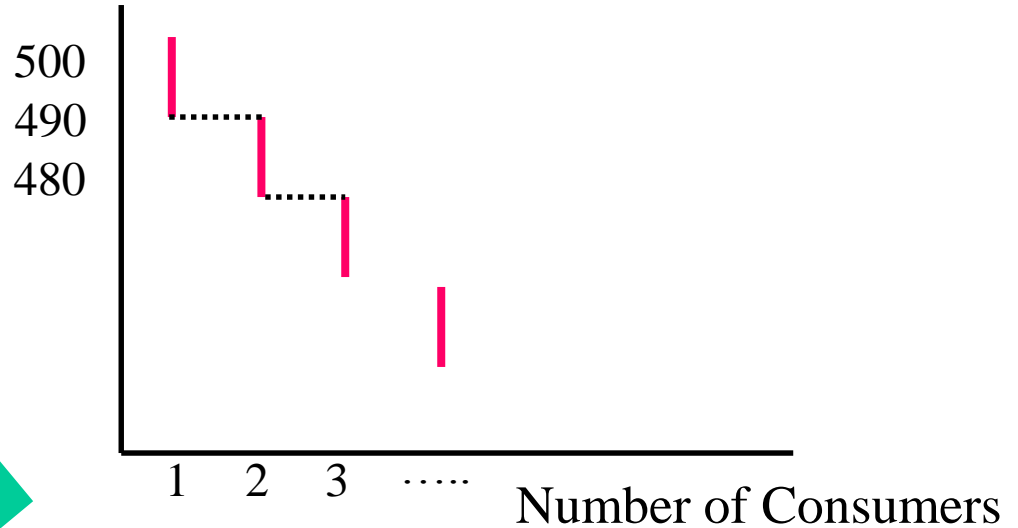
- to choose the **best** pattern of consumption that they can afford
: reasonable to assume that people try to choose things they want rather than things they don't want.

The equilibrium principle

- **Prices** adjust until the amount that people demand of something is equal to the amount that is supplied.

Demand Side

WTP: Willingness to Pay
“Maximum amount
people would pay”

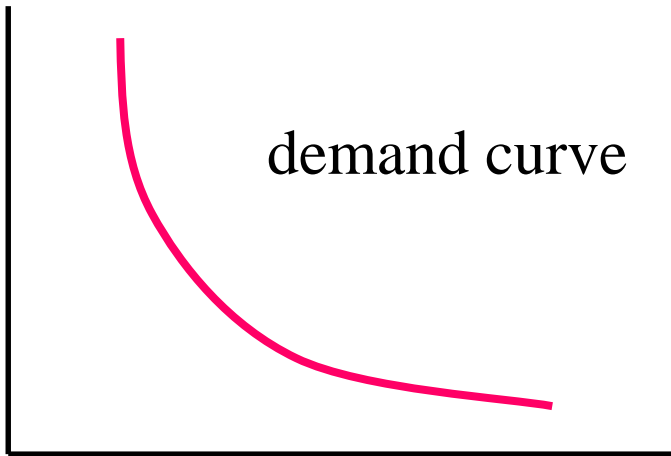


Price: P

demand curve

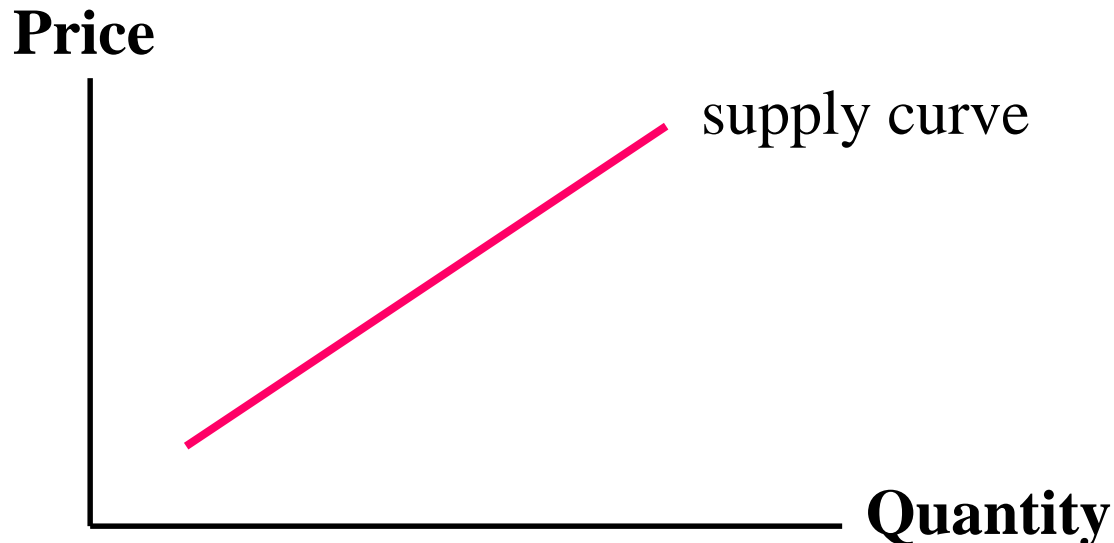
Demand-Supply:
Price-Quantity Graph

Q: Quantity



Supply Side

- Competitive Market - Basic market
many independent suppliers
- Monopoly
- Oligopoly (Duopoly)
- Control or Regulation (by Government)

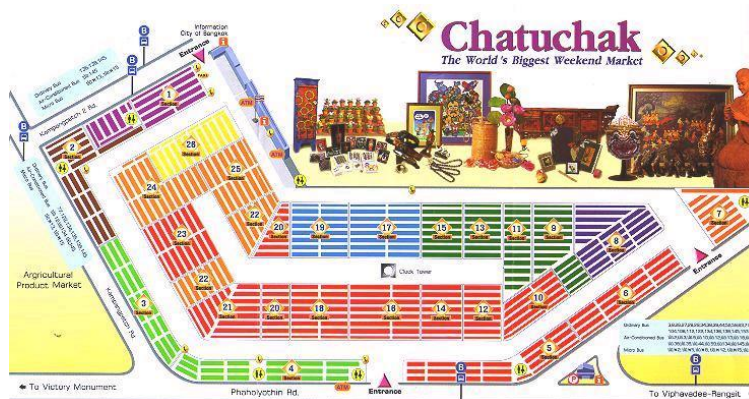
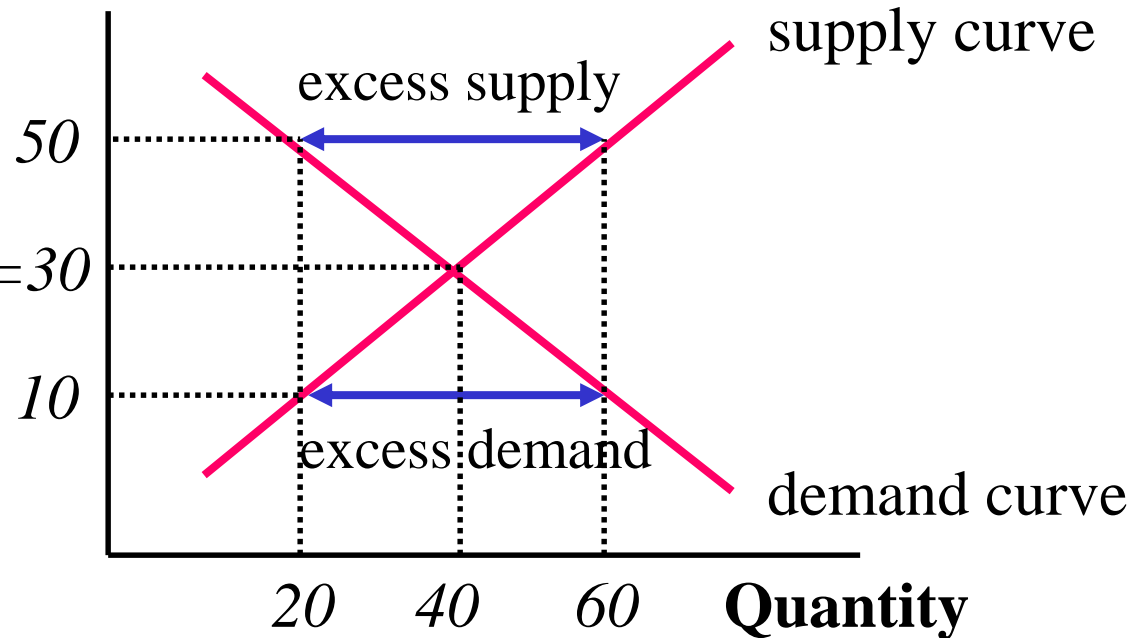


Market Equilibrium

Price
[Bath]

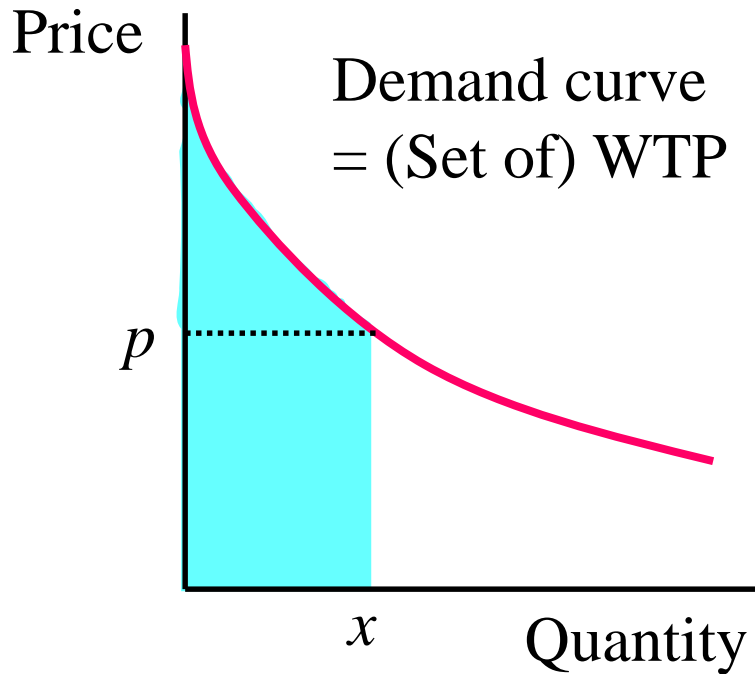
Equilibrium
Price

$*p=30$

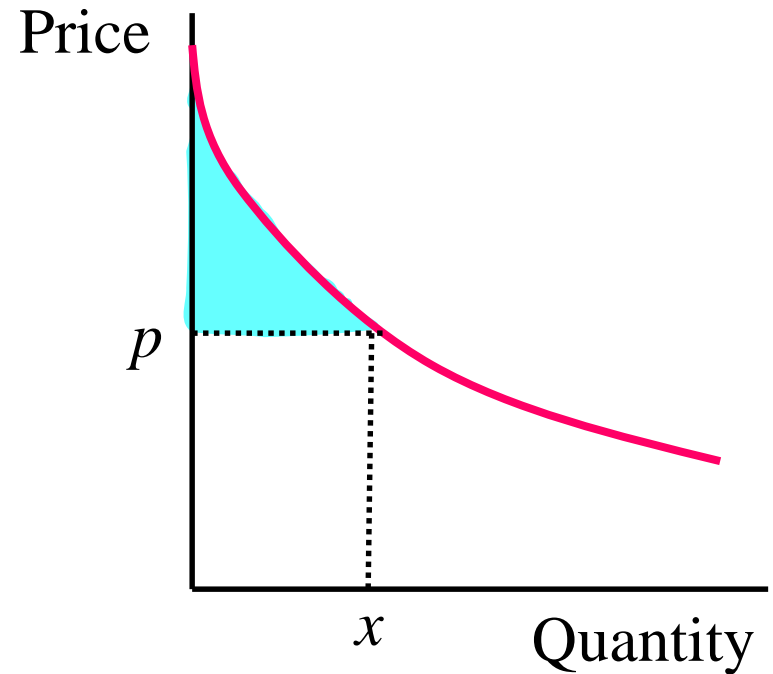


Weekend Market in Bangkok

Consumer's Surplus and Benefit



Gross Surplus



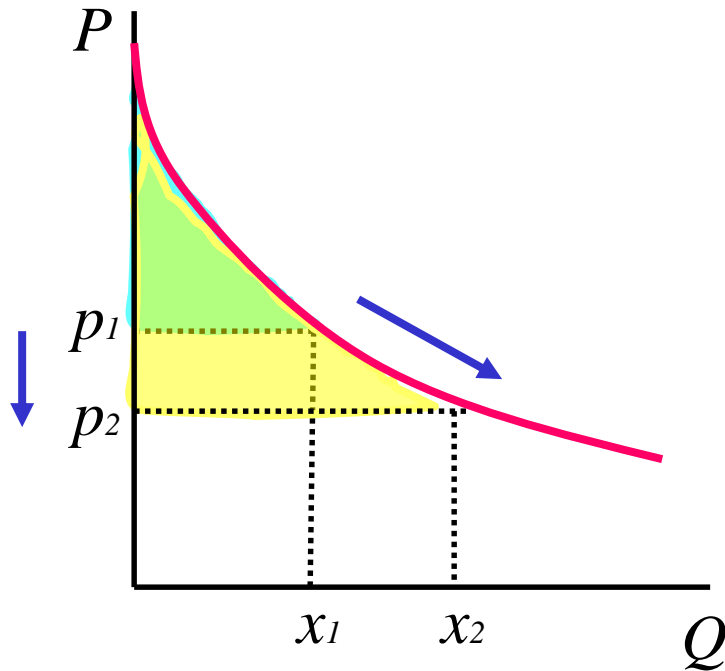
Net Surplus

→ Consumer's surplus

From single consumer's surplus to all the consumer's surplus
aggregate measure

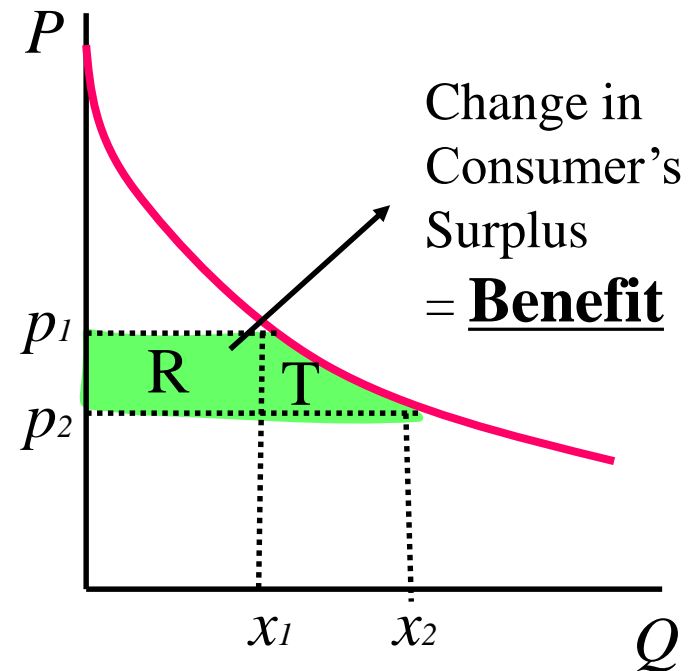
Interpreting the Change in Consumer's Surplus

Impacts on the results from some policy change or project



Price change

e.g. fare of public transport



R: Benefit to pay less

T: Benefit to increase consumption