ETH zürich

Section 8
Market Failures & Behavioral Anomalies I

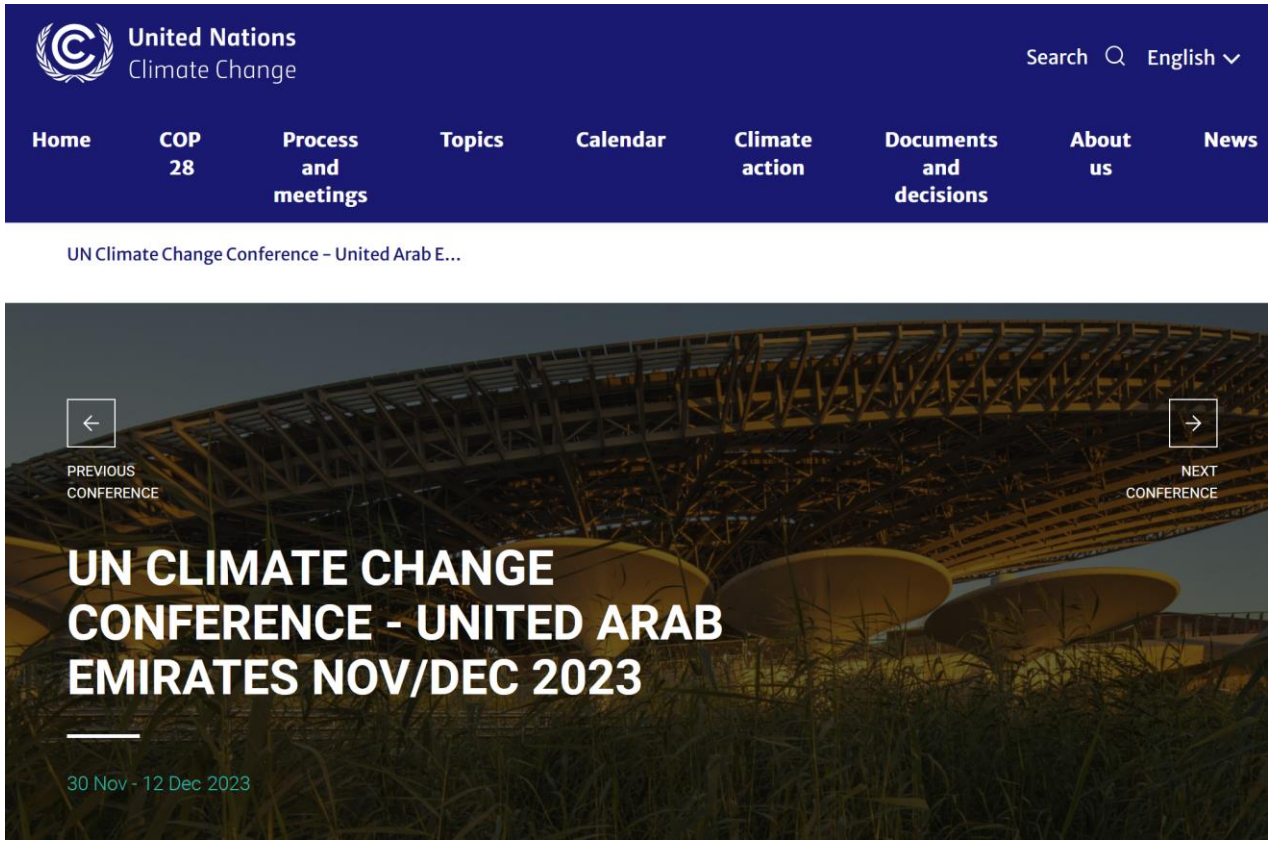
References:

N. Gregory Mankiw and Mark P. Taylor (2023), "*Microeconomics*", Cengage Learning, Chapter 9, 10

The slides of this section are mainly based on the 6th edition of the book by Mankiw and Taylor (2023). In some slides we reproduce figures, sentences and definitions given in the book.

cepe
Centre for Energy Policy and Economics
Swiss Federal Institutes of Technology

Introductory Video: Climate Change



https://www.esa.int/ESA_Multimedia/Videos/2018/01/Change_in_atmosphere

COP27

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03 October 2022 UN Headquarters

Secretary-General's opening remarks at press encounter on Pre-COP27

António Guterres

Ladies and gentlemen of the media, thank you very much for your presence.

We are weeks from the UN Climate Conference -- COP27 – in Egypt.

Starting today, government representatives are meeting in Kinshasa for the critical pre-COP that will set the stage.

https://www.un.org/sg/en/content/sg/speeches/2022-10-03/secretary-generals-opening-remarks-press-encounter-pre-cop27

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7 November 2022 | Climate and Environment

At the opening of the two-day Climate Implementation Summit at COP27 in Sharm el-Sheikh, Egypt, António Guterres called for a historic pact between developed and developing countries to combine capacities, and pivot the world towards reducing carbon emissions, transforming energy systems and avoiding a climate catastrophe.

"Humanity has a choice: cooperate or perish. It is either a Climate Solidarity Pact – or a Collective Suicide Pact," the UN Secretary-General told over 100 world leaders reunited for the first official plenary of the UN Climate Change Conference.

https://news.un.org/en/story/2022/11/1130247

Cop26: world on track for disastrous heating of more than 2.4C, says key report

Research from world's top climate analysis coalition contrasts sharply with last week's optimism

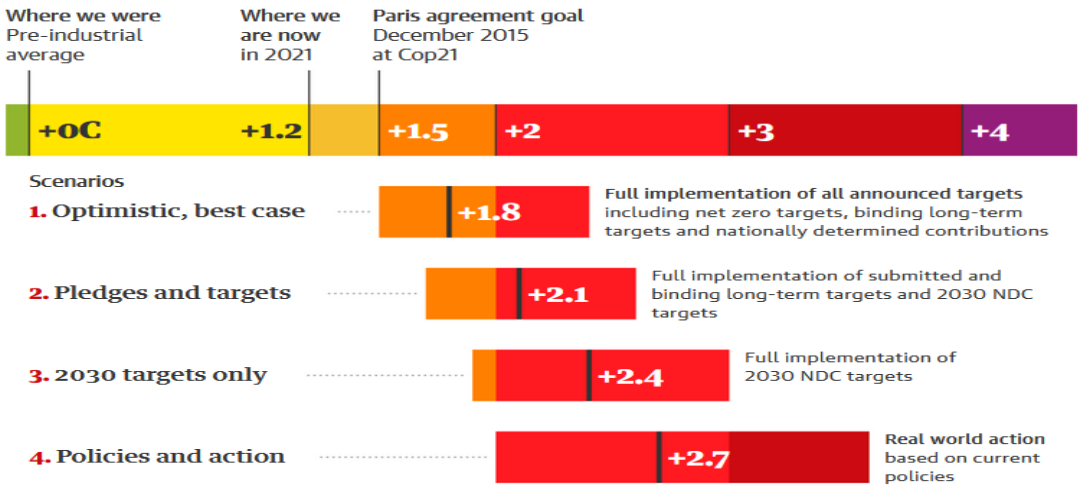
Follow all the latest from Cop26 – live

A boy walks through a dried up field in eastern Iraq, which suffered a blistering summer heatwave and drought this year. Photograph: Ahmad Al-Rubaye/AFP/Getty Images

The 197 parties to the 2015 Paris agreement were asked to come to Glasgow with two aims: a long-term goal of reaching global net zero emissions around mid-century; and shorter-term national plans, known as nationally determined contributions (NDCs), pegging emissions reductions to 2030. Scientists say greenhouse gas emissions must fall by about 45% this decade for global temperatures to stay within 1.5C of pre-industrial levels.

Countries responsible for about 90% of global emissions have signed up to net zero goals, mostly by around 2050 for developed countries, rising to 2060 for China and 2070 for India, but the NDCs for actions in the next decade do not match up. The climate responds to the cumulative carbon in the atmosphere, so if emissions are high enough in the next two decades the world could surpass the 1.5C limit even if carbon reaches net zero later.

Global temperatures are likely to rise more than 2C above pre-industrial levels by 2100, with even the most optimistic scenario passing the Paris agreement's 1.5C goal



Guardian graphic. Source: Climate Action Tracker, Warming Projections Global Update - November 2021

https://www.theguardian.com/environment/2021/nov/09/cop26-sets-course-for-disastrous-heating-of-more-than-24c-says-key-report

Market Failure and behavioral anomalies: A Justification for Government Intervention

There are at least seven reasons for the **imperfect functioning of the market**:

Efficiency
- Public goods and common resources;
- Externalities;
- Imperfect competition;
- Incomplete information;

Equity
- Income and wealth inequalities;

Efficiency Equity Macro-economics
- Unemployment and inflation
- Behavioral anomalies

Contents

A. Public Goods and Common Resources

B. Externalities

C. Imperfect Competitions

D. Asymmetric Information

E. Redistribution and Merit Goods

F. Behavioral anomalies

A. Public Goods and Common Resources

Public Goods and Common Resources

When thinking about the various goods in the economy, it is useful to group them according to two characteristics:

- **Excludable** refers to the property of a good whereby a person can be prevented from using it when they do not pay for it.
- **Rival** the property of a good whereby one person's use diminishes other people's use.

Types of Goods: Public

Excludable? \ Rival?	Yes	No
Yes	**Private Goods** · Ice-cream cones · Clothing · Congested toll roads	· · ·
No	· · ·	**Public Goods** · National defense · Lighthouse · Street and roadway lighting

Bolivia: Huayna Potosí 6088 m

Public Goods

- "Free" goods (public and common resources) provide a special challenge for economic analysis.
- In presence of public goods, the market system will not supply any or enough of these special goods.
- Free rider problem
- In such cases, government policy can potentially remedy the resulting market failure and raise economic well-being.

Free Rider Problem

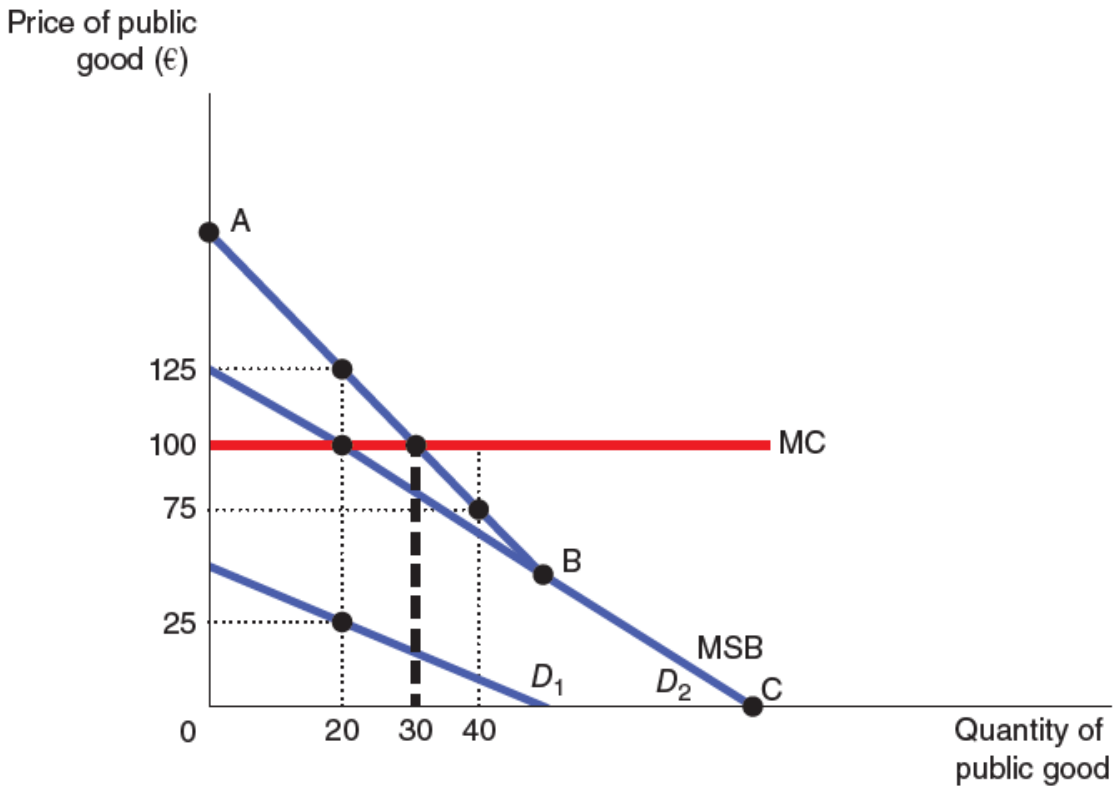
- **Free Rider:** a person who receives the benefit of a good but avoids paying for it.
- The free rider problem prevents private markets from supplying public goods.
- **Solving the Free Rider Problem**
  - The government can decide to provide or support the supply of the public good if the total benefits exceed the costs.
  - The government can make everyone better off by providing the public good and paying for it with tax revenue or/and introducing a fixed fee only for the users (local good).

Demand for Public Good

- **Aggregate demand reflects the marginal social benefit (MSB)** of a public good
- Aggregate demand is the sum of individual demand functions and is obtained by the **vertical summation** of the value each places on the marginal unit of the public good supplied

- Aggregate demand ➔ line A-B-C

- **Optimum**: Intersection of marginal costs and marginal social benefits (MSB)



Source: Mankiw & Taylor (2023), "Microeconomics"

Types of Goods: Mixed

Excludable? \ Rival?	Yes	No
Yes	**Private Goods** · Ice-cream cones · Clothing · Congested toll roads	**Mixed public goods** · Fire protection · Cable TV · Uncongested toll highways
No	· · ·	**Public Goods** · National defense · Lighthouse · Street and roadway lighting

Mixed Public Goods

Non-rival but excludable (highways, national parks, bridges, theater etc.)

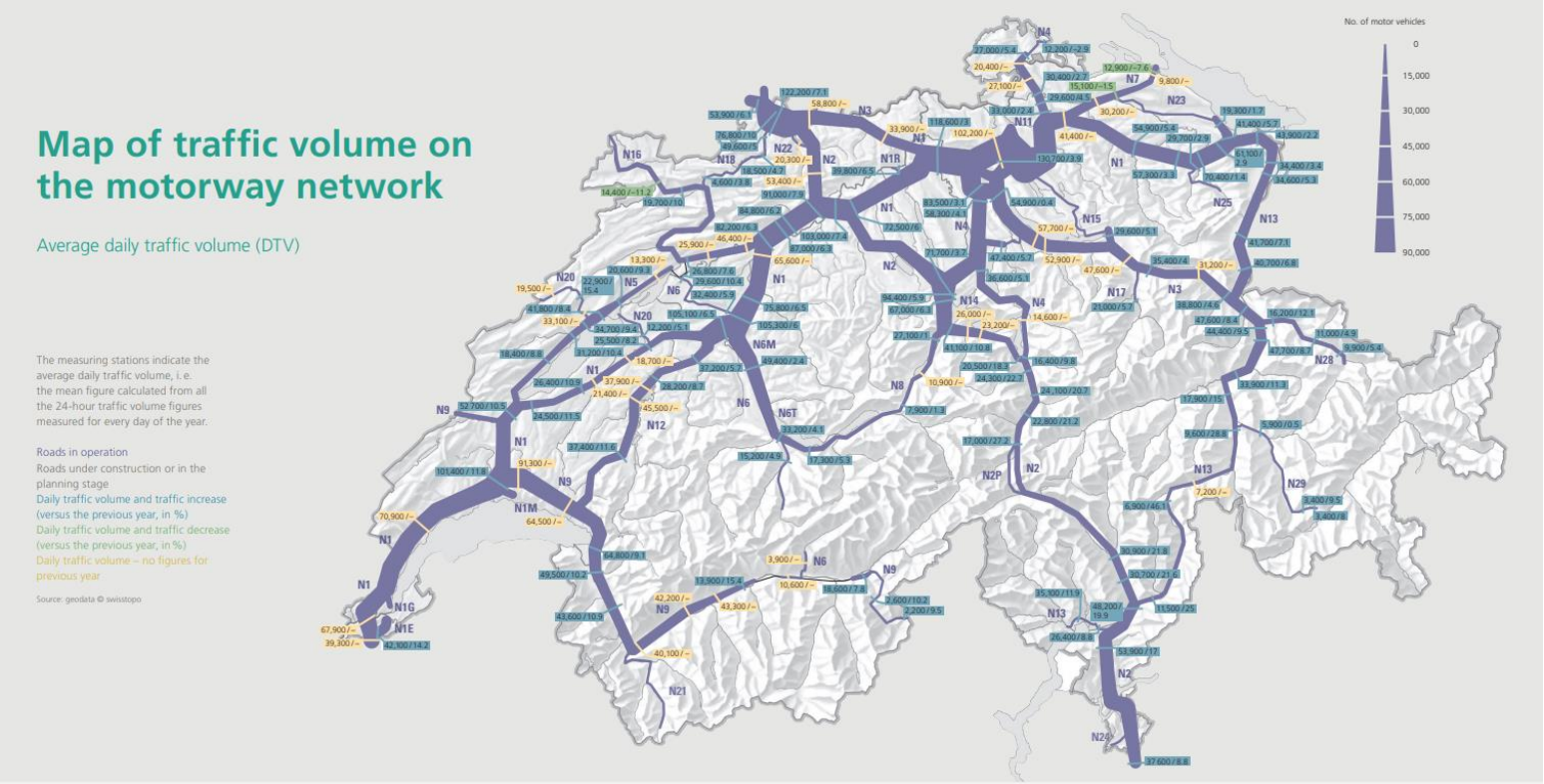
Mixed Public Goods

Non-rival but excludable (highways, streets, parks, bridges, theater etc.)

Mixed Public good

Private good

Daily Traffic in Switzerland 2021



Source: Swiss Federal Roads Office (FEDRO), 2022 report

Mixed Public Goods: How to Finance

- Mixed public goods: **Tax revenue** or introducing a **fixed fee** only for the users.

- Mixed public goods that become private goods (congestion):

➢ **Tax revenue** or introducing a **fixed fee** only for the users

+ **time differentiated prices**

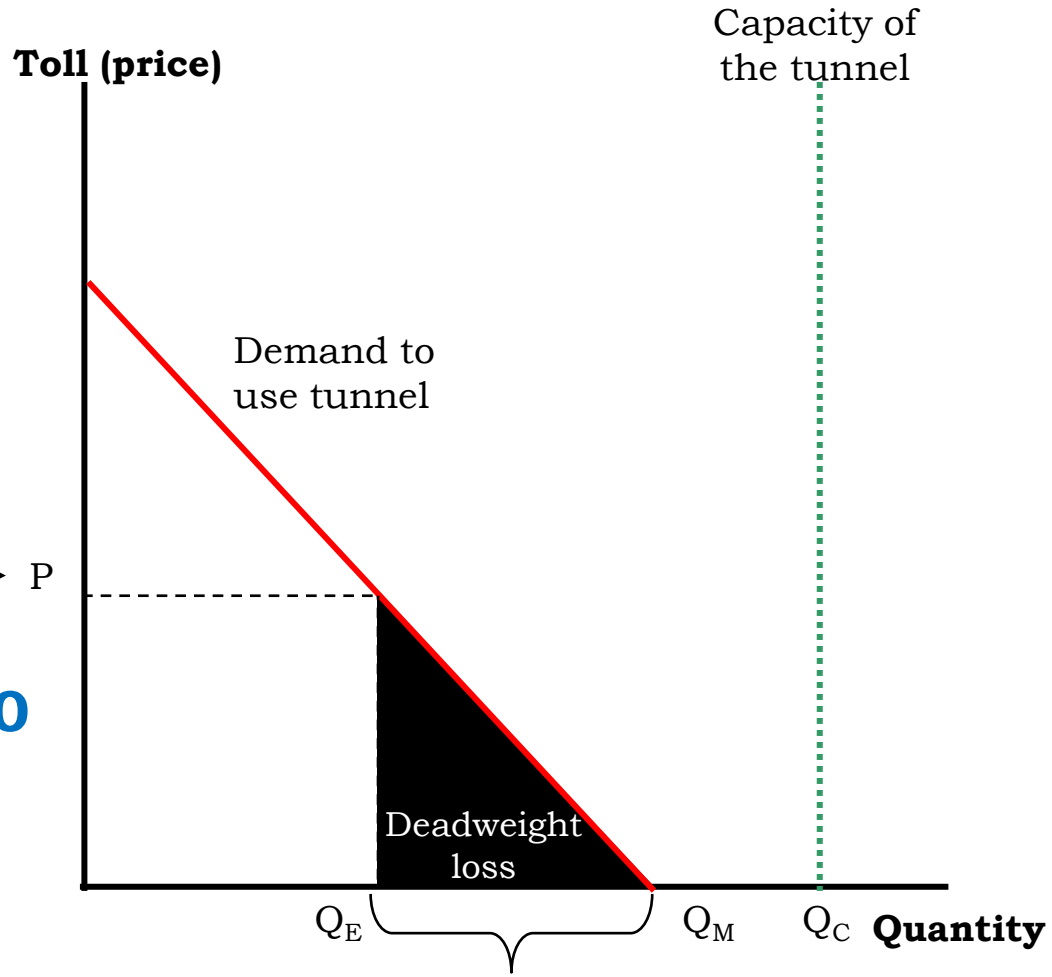
➢ Road pricing/Congestion charging

Mixed Public Goods

Pricing strategy 1: → P

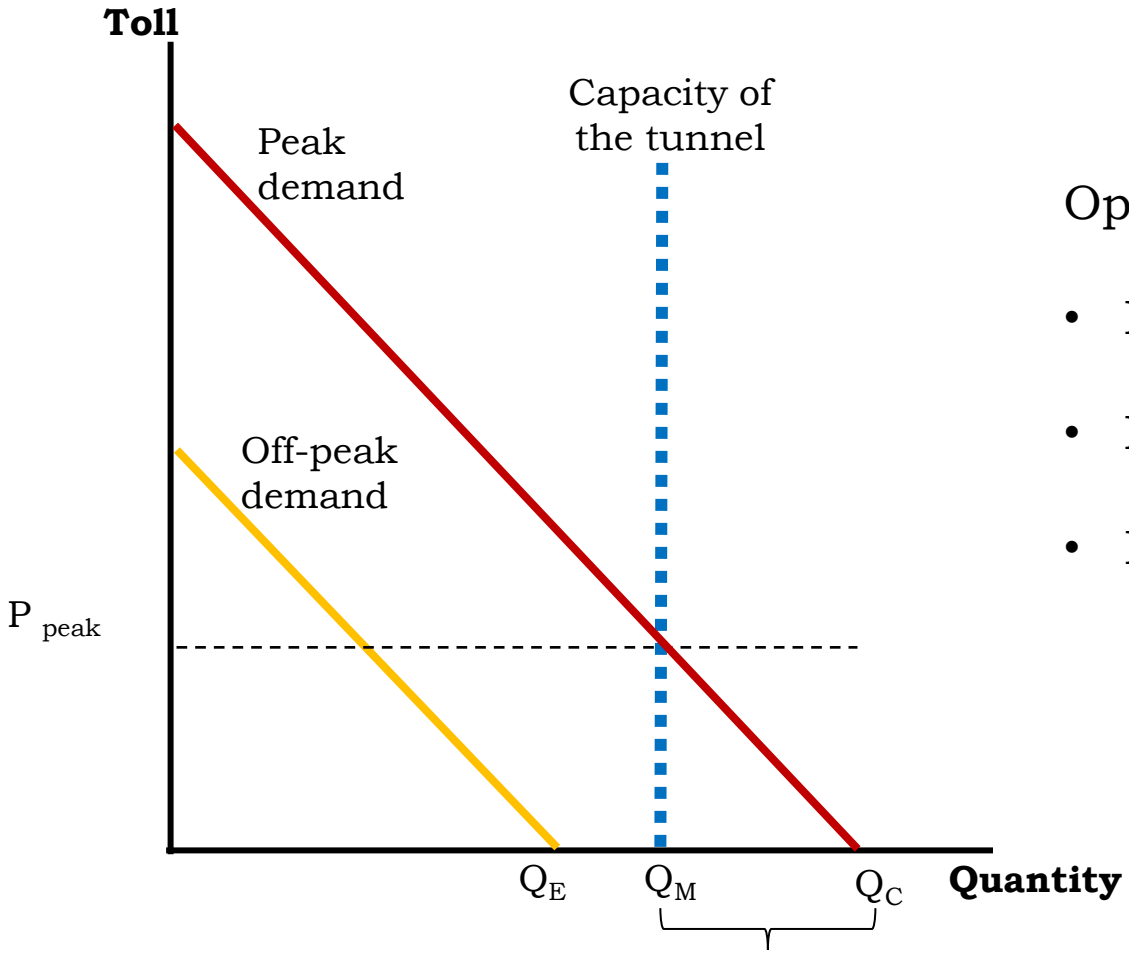
Pricing strategy 2: Price = 0

↳ to finance the tunnel it is necessary to introduce a fixed fee



Imposing a toll produces a deadweight loss because MC = 0 and P > MC

Road Pricing and Mixed Public Good

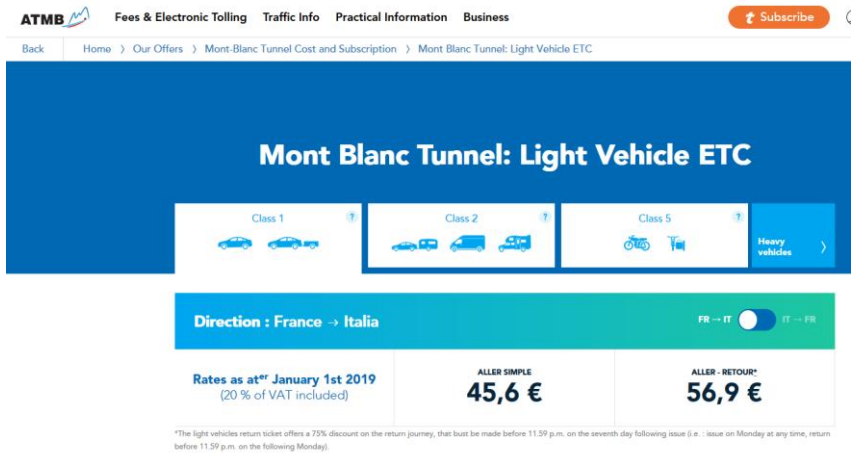


Congestion during peak time

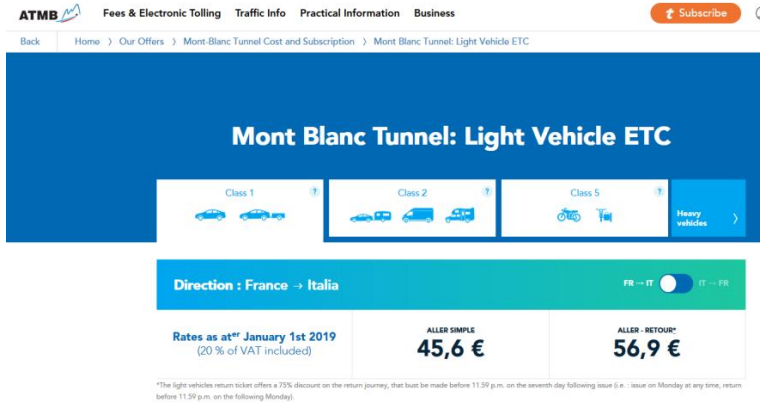
Optimal pricing policy:

- $P_{peak} = MC_{peak}$
- $P_{off\text{-}peak} = MC_{off\text{-}peak} = 0$
- Fixed fee to have access to the tunnel

Case study: different pricing policy used to cross tunnel: Gotthard tunnel and Mont Blanc tunnel



Which is the correct pricing policy?



Case: Average Charges per Inbound Crossing

Case: Trondheim

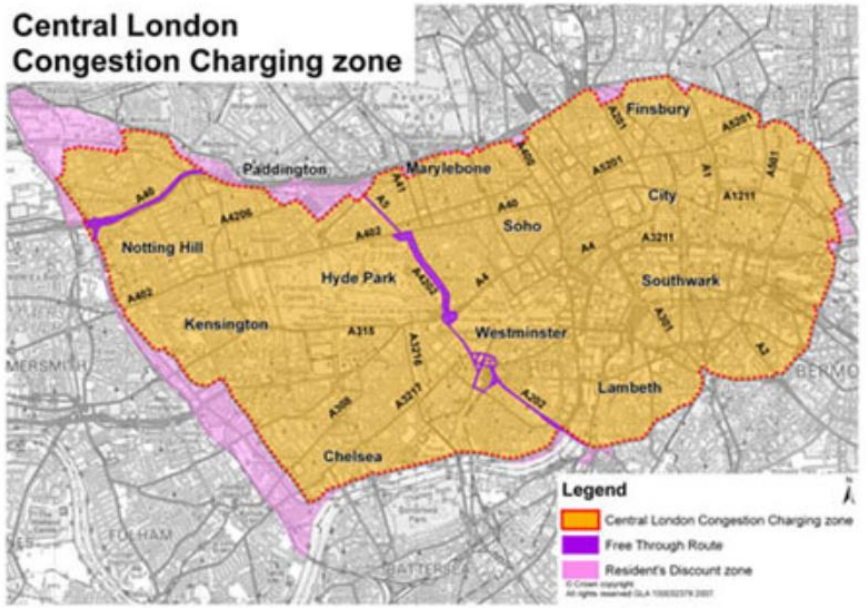
	Rush hour, 7-9 and 15-17	No rush hour, 6-18	Weekdays, 18-6 and weekends
Light vehicles / Passenger cars	1.4-3 €	1-1.5 €	No charge
Heavy vehicles (>3.5 tonnes)	3.3-7.2 €	2.6-4.1 €	No charge

Source: https://urbanaccessregulations.eu/countries-mainmenu-147/norway-mainmenu-197/trondheim-charging-scheme

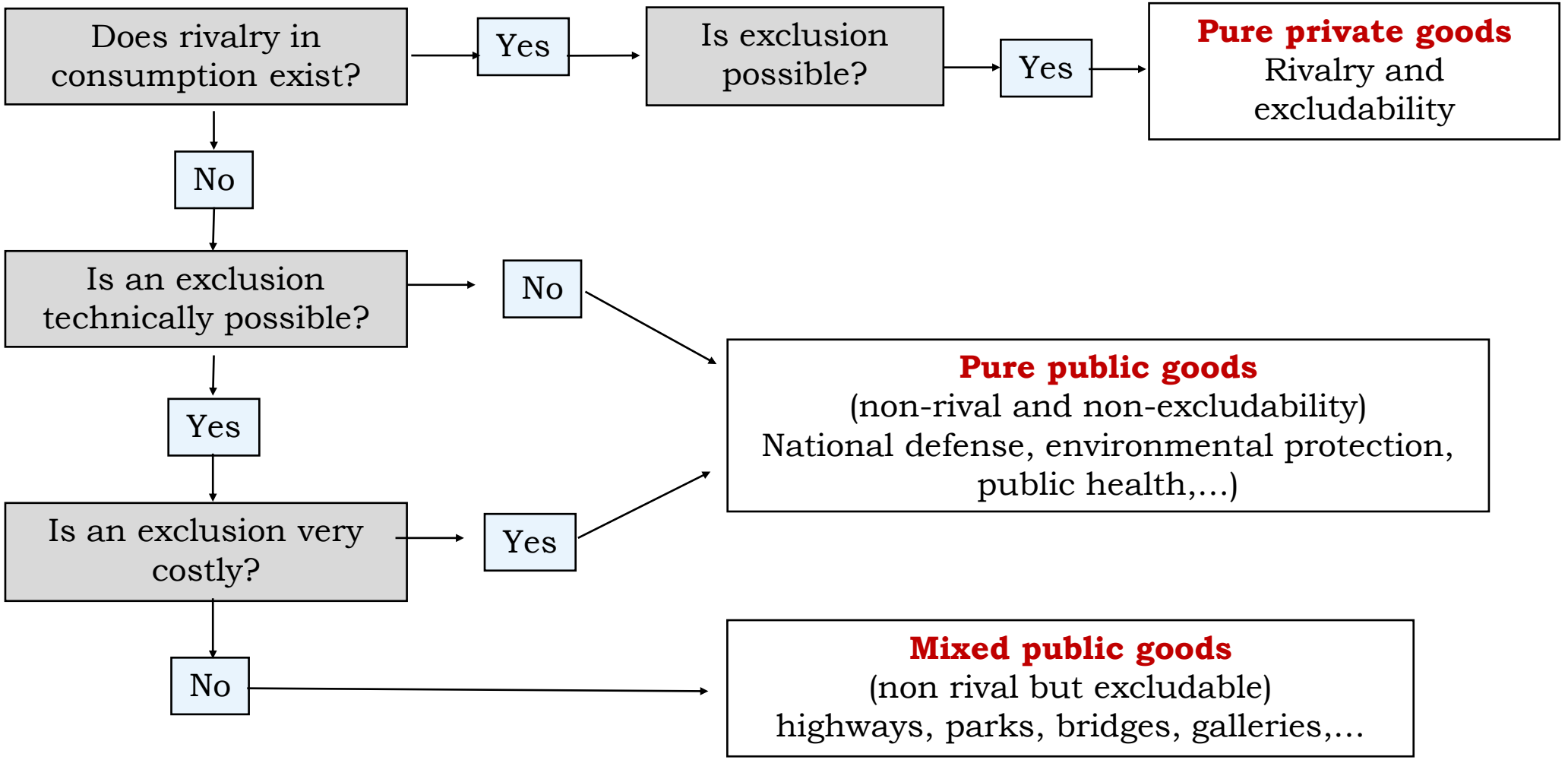
Case: London low emission zone

	Monday-Friday 7-18:00
Light vehicles / Passenger cars	10-12.5 £
Heavy vehicles (>3.5 tonnes)	100 £

http://www.isis-it.net/curacao/index.asp?content=schlondon



Identification Procedure of Public and Private Goods



Types of Goods: Common resources

Excludable? \ Rival?	Yes	No
Yes	**Private Goods** · Ice-cream cones · Clothing · Congested toll roads	**Mixed public goods** · Fire protection · Cable TV · Uncongested toll roads
No	**Common Resources** · Fish in the ocean · The atmosphere · Lake	**Public Goods** · National defense · Lighthouse · Street lighting

Common Resource

- **Common resources** are not excludable. They are available free of charge to anyone who wishes to use them.
- **Common resources** are rival goods because one person's use of the common resource reduces other people's use.

- The fact that everyone has free access can determine an over-utilization of the common resource, therefore inefficiency in the use of the common resource

- The over-utilization implies that a person that consumes an additional unit directly harms others -- and itself too – because the benefit of the extra unit will be very low or zero
- This is similar to a negative externality

Tragedy of the Commons

- The over-utilization/consumption can leads to the **depletion** of the common resource, therefore to a situation where everybody loose
- In economics we call this phenomena **The Tragedy of the Commons**
- Local and global common resources

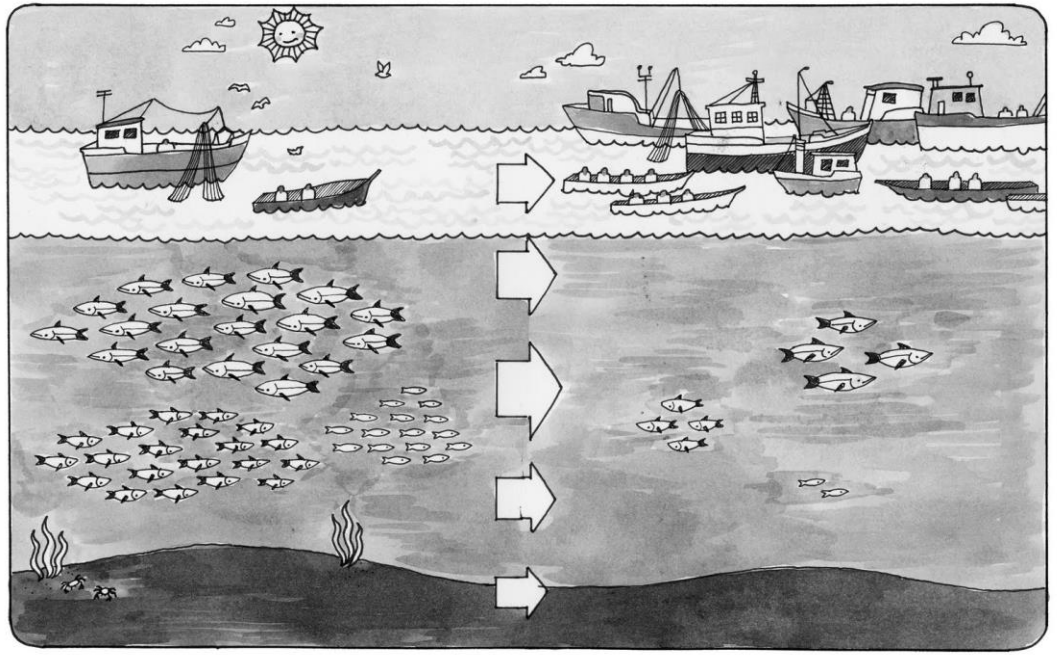
Video: https://www.youtube.com/watch?v=L8gAMFTAt2M

Source: www.unique-southamerica-travel-experience.com

Example Overfishing

If we catch too many fish, we will no longer have sufficient fish stock to ensure fish reproduction and therefore the common fish resource will disappear

Video: https://www.euronews.com/2018/04/09/senegal-s-fishermen-say-european-overfishing-is-crippling-them



Source: http://1.bp.blogspot.com/_06F9s5UC5w0/TJvFb-soxPI/AAAAAAAAAuk/ZZdfD2ymGcM/s1600/overfishing.jpg

Possible solutions

- **Government direct intervention**: Introduction of usage rules and an enforcement system that includes penalties

- **Privatization of the resource by assigning property rights**: transformation of the common resource into a private good and solving the “tragedy” through access restriction imposed by the new owner

- **Self-organisation**: people are capable of designing their own rules and governing themselves

➢ Elinor Ostrom: common resources are well managed when those who benefit from them the most are in close proximity to that resource (local common resources)

The first woman to be awarded the Nobel Prize for Economic Sciences in 2009 for her studies on economic governance, especially of the commons

https://www.youtube.com/watch?v=D1xwV2UDPAg

The atmosphere

The atmosphere protects us, warms us, and provides us with oxygen to breathe.

Increased emissions of greenhouse gases are changing the protective qualities of this envelope, leading to an increase in temperature on our planet (greenhouse effect).

Atmosphere as a common global storage of greenhouse gases

Excessive, unsustainable exploitation that can lead to the disappearance of the common resource, the ***Tragedy of common resources***

Regional contribution to global CO2 emissions