Acceptability of road tax reform

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for ITF roundtable on **Decarbonisation and the pricing of road transport, Sept 2022**

issue

Increasing fuel efficiency and the market penetration of electric cars make that car use taxes are slowly disappearing;

This creates issues of tax revenue as well as external cost problems

Distance taxes varied in function of external costs would be the best alternative

How acceptable is this transition in economic terms, neglecting technical and privacy issues?

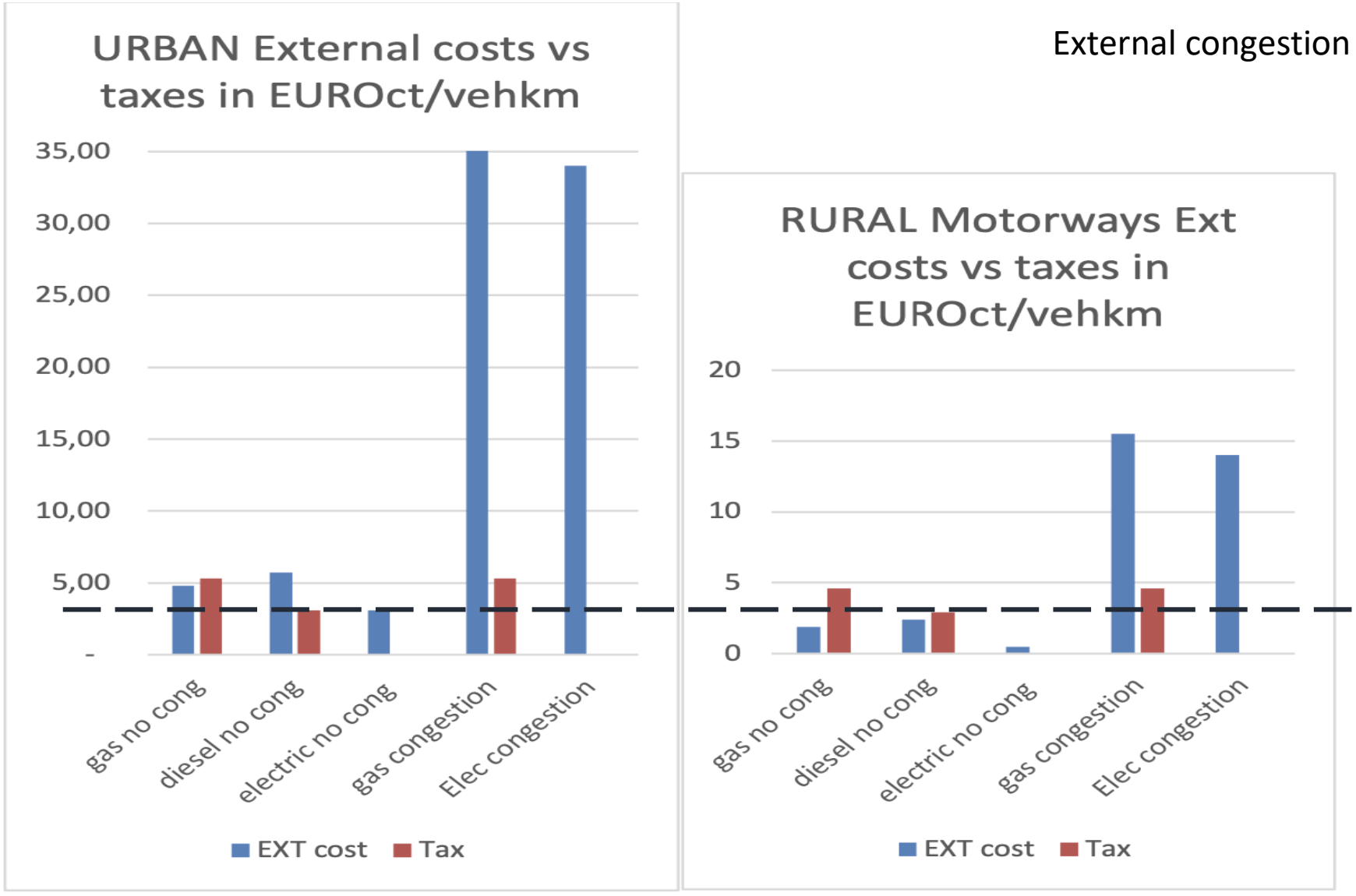
Approach

- Wedge between marginal external costs and current user taxes requires a tax reform
- Focus first on tailoring the tax system to the external costs – 2nd phase is to check tax revenue outcome and correct by increasing taxes on low elasticity consumption
- How do we define acceptability?
- 4 dimensions of differentiated distance taxes and how to make them acceptable:
  - Congestion charges
  - Urban / non-urban differentiation
  - The right level of fuel taxes
  - Optimal timing of the introduction of a distance tax
- Optimal phasing in of distance taxes
- Conclusions

Wedge between marginal external costs and user taxes

- Air pollution and climate damage will become small with EV
- Congestion and some air poll+ accidents remain with EV
- Important difference between urban and rural external costs
- Benefit of reform: equal to ½ (wedge x quantity response)
- Average costs of infrastructure (3 €ct/vkm) but marginal infrastructure costsof cars are close to 0

External congestion costs/2



Note: The external cost data and fuel taxes are based on External cost study of the EC (2019) and rep
average conditions for the EU – cfr. BOX 1

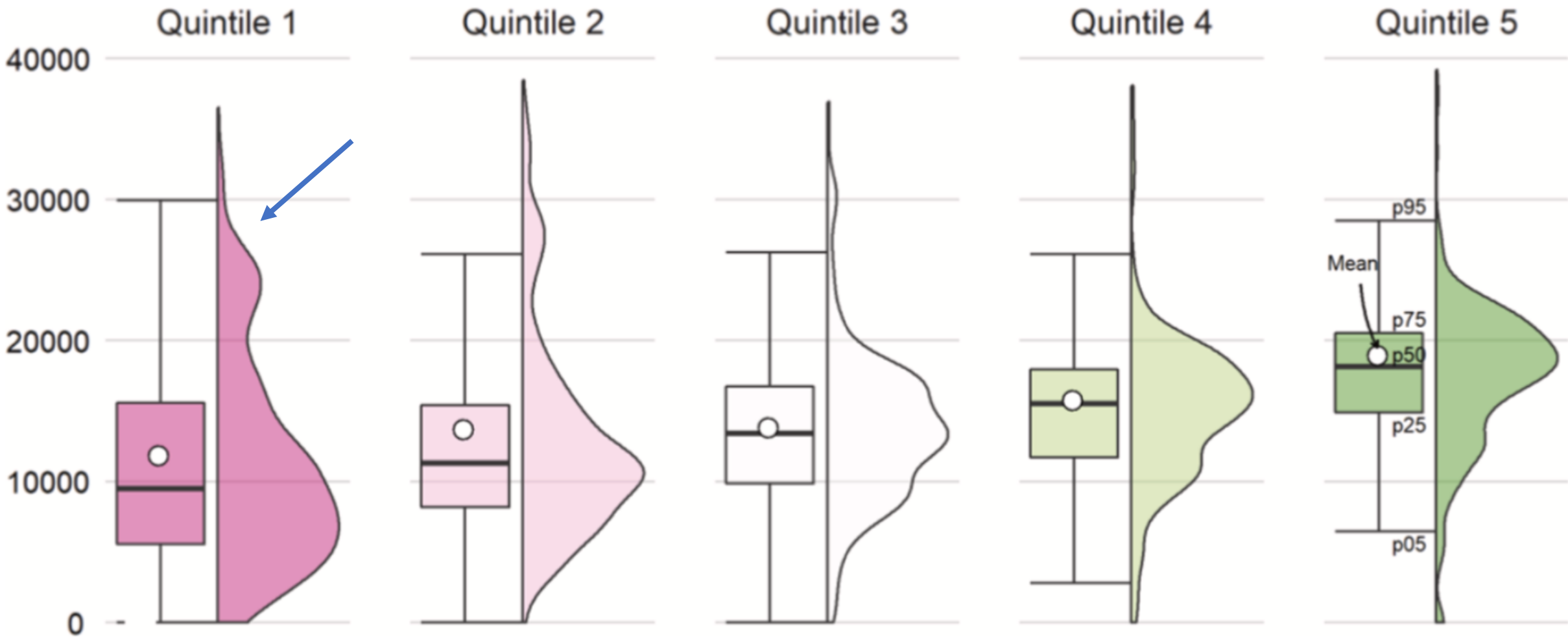
Definition of acceptability

- We look for political acceptability
- Our approach: Pareto improvements for a large majority of populaton
- Most individuals need to be better off in terms of utility
- Avoid modelling of political process that depends on institutions and quality of politicians
- Pareto improvements according to economics (revealed preference of behaviour) – perception (surveys) may be different, need to close this gap..

Tax reform accounting per individual

- Budget neutral reform in the aggregate
- Utility accounting (incuding external costs, time gains and consumer surplusses) is wider than the pure tax accounting that is used in many public debates
- Car drivers as well as non car drivers are affected
  - Less gasoline taxes may imply more income taxes etc..
- Many more sources of differentiation than income

Figure 3 Density of annual mileage by income group in Flanders region in Belgium



Source: Heyndrickx, Vanheukelom and Proost, 2021

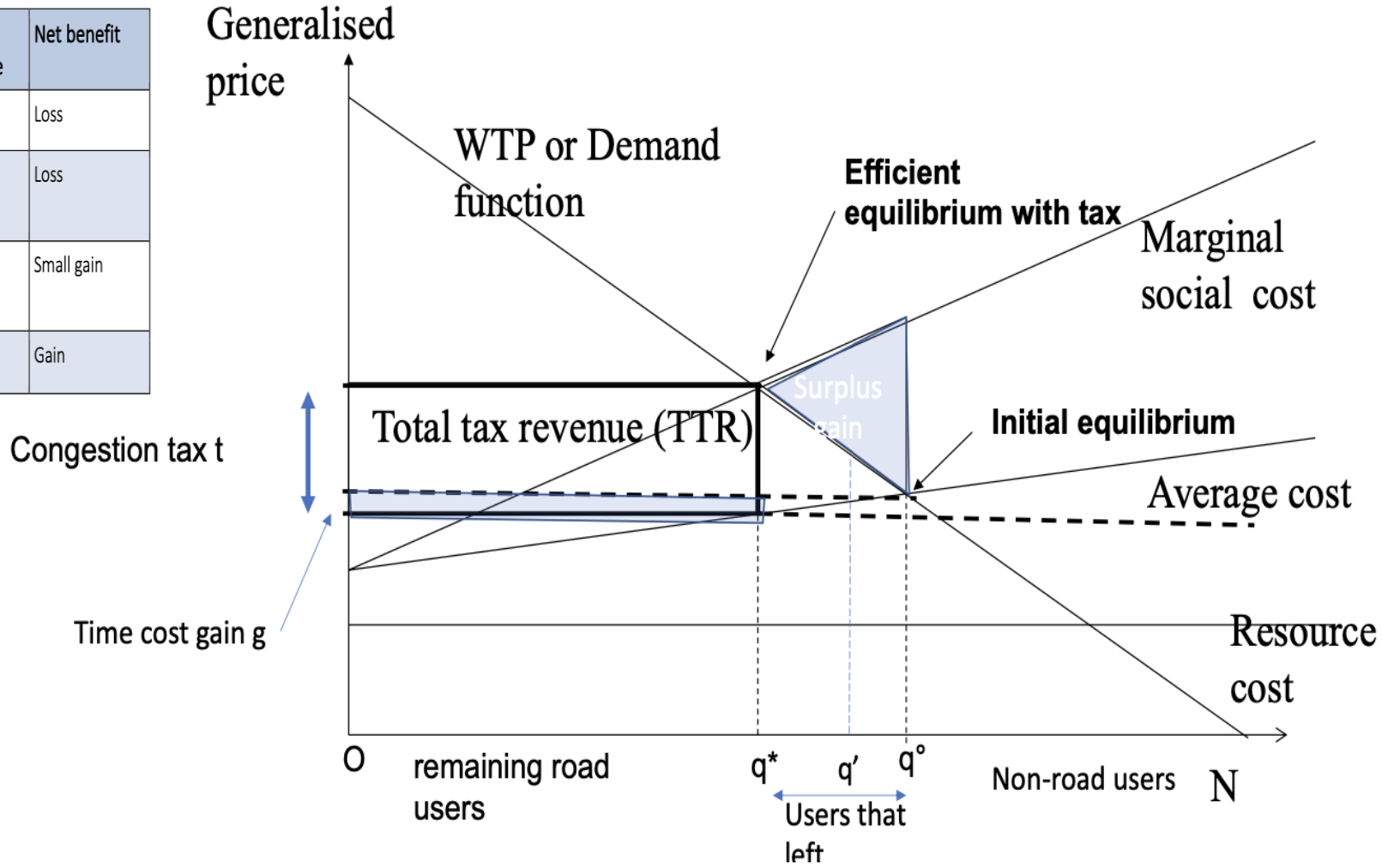
Different options for distance taxes and their acceptability

- Congestion pricing
- Urban vs non-urban pricing
- Pricing the use of fuels
- When to introduce?

Acceptability of congestion charges

Table 2. Benefits and costs of tax reform for the different users of peak urban roads

	cost	Time gain	Distributed tax revenue	Net benefit
Remaining users (0 to q*)	t	g	TTR/N	Loss
users that left with high valuation (q* to q')	Large surplus loss		TTR/N	Loss
users that left with low valuation (q' to q°)	small surplus loss		TTR/N	Small gain
Non-users of urban peak roads (q° to N)			TTR/N	Gain



Source: De Borger& Proost (2012)

Acceptability of congestion charges (theory)

- Simple diagram shows:
- **Difficult to have drivers accepting If they do not share in toll revenues**
- Information will be important as drivers face ex ante a new equilibrium where they do not know the advantages of the new equilibrium
- One can “compensate” those that do no longer drive by improving PT or cyclepaths but this still leaves remaining drivers with insufficient compensation
- One promising alternative are grandfathered tradeable mobility rights, they do not deliver any tax revenue but this may not be the most important in the reform (De Borger, Glazer, Proost, JUE,2022)

Acceptability of congestion charges (practice)

- Higher acceptance ex-post than ex-ante
  - Would an experiment solve the problem?
  - Yes but there may be a majority against and it may be politically risky (Majundar & Mukand (2004))
  - Status quo bias ? Yes but what underpins this bias?
- Discounts for very frequent users
- Revenues dedicated to environment, PT, ..but not to general tax revenues
- HOT lanes experience in the US, Israel: accepted if invested in new lanes or in parallel PT line

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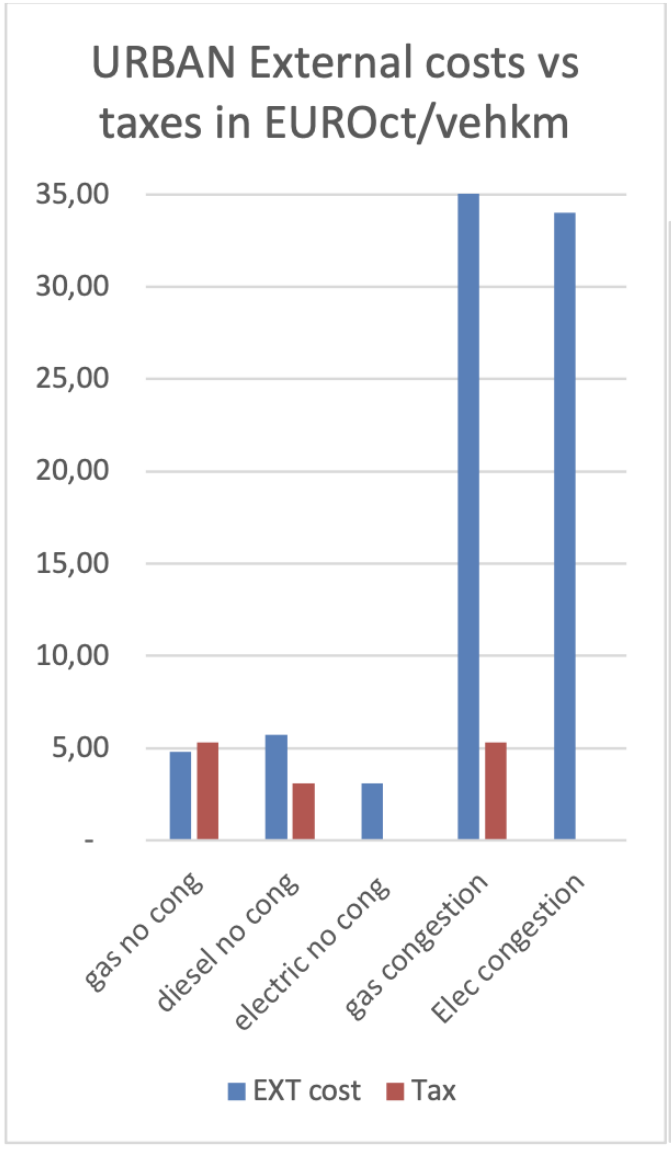

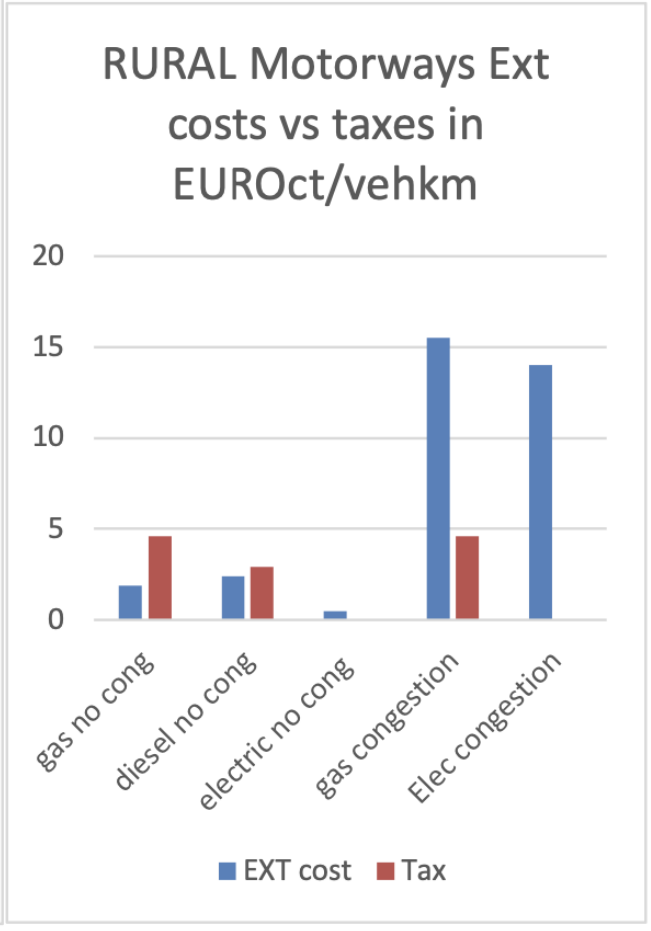

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Urban vs non-urban pricing

- External costs are very different – but gasoline taxes are uniform in most countries for different reasons (tax competition,..)
- Political CONSTRAINT FOR A FEDERAL DIFFERENTIATED DISTANCE TAX: it is difficult to treat areas differently if cost differences are not well understood

- Easiest SOLUTION IS TO DECENTRALISE part of the distance charge setting to the regions, this will also help for congestion charges.
- This reform gives an optimally differentiated distance tax if there are no spillovers (Fung & Proost, 2016)
- If there are spillovers, one ends up with tax exporting and this requires federal constraints on the use of the tax revenues

- This leaves a REVENUE GAP for rural areas: best solved via regional or national income taxes?

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Fuel taxes and fuel differentiation

- GOVERNMENTS ARE SLOW IN ADAPTING THE TAX SYSTEM WHEN NEW TECHNOLOGIES SHOW UP
  - In 90 ties, diesel cars became more performant and more fuel efficient, but they were more polluting (other examples: dual fuelled cars, LPG etc.
  - It took some countries a long time to adapt their tax system
  - EV's are nothing more than another new technology

Table 6. The wrong treatment of diesel cars

Total Share of diesel cars in a Year	Belgium	Netherlands
1990	33%	12%
1995	39%	11%
2005	49.1%	15.7%
2010	60.3%	16.8%
2017	57.8%	16.8%

Fuel taxes on cars

- For the EU, the objective is to reach 0 net emissions in 2050
- To reach this objective one needs
  - Same carbon tax in the whole economy as 1st principle
  - R&D support for learning by doing and pure R&D – this R&D needs subsidies but also a long term commitment to a certain fuel tax level
- 100 €/ ton of carbon puts us at the same level as industry who is committed to reach net 0 via the intertemporal ETS system
- No need to add a carbon tax on top of the fuel tax

Different options for distance taxes and their acceptability

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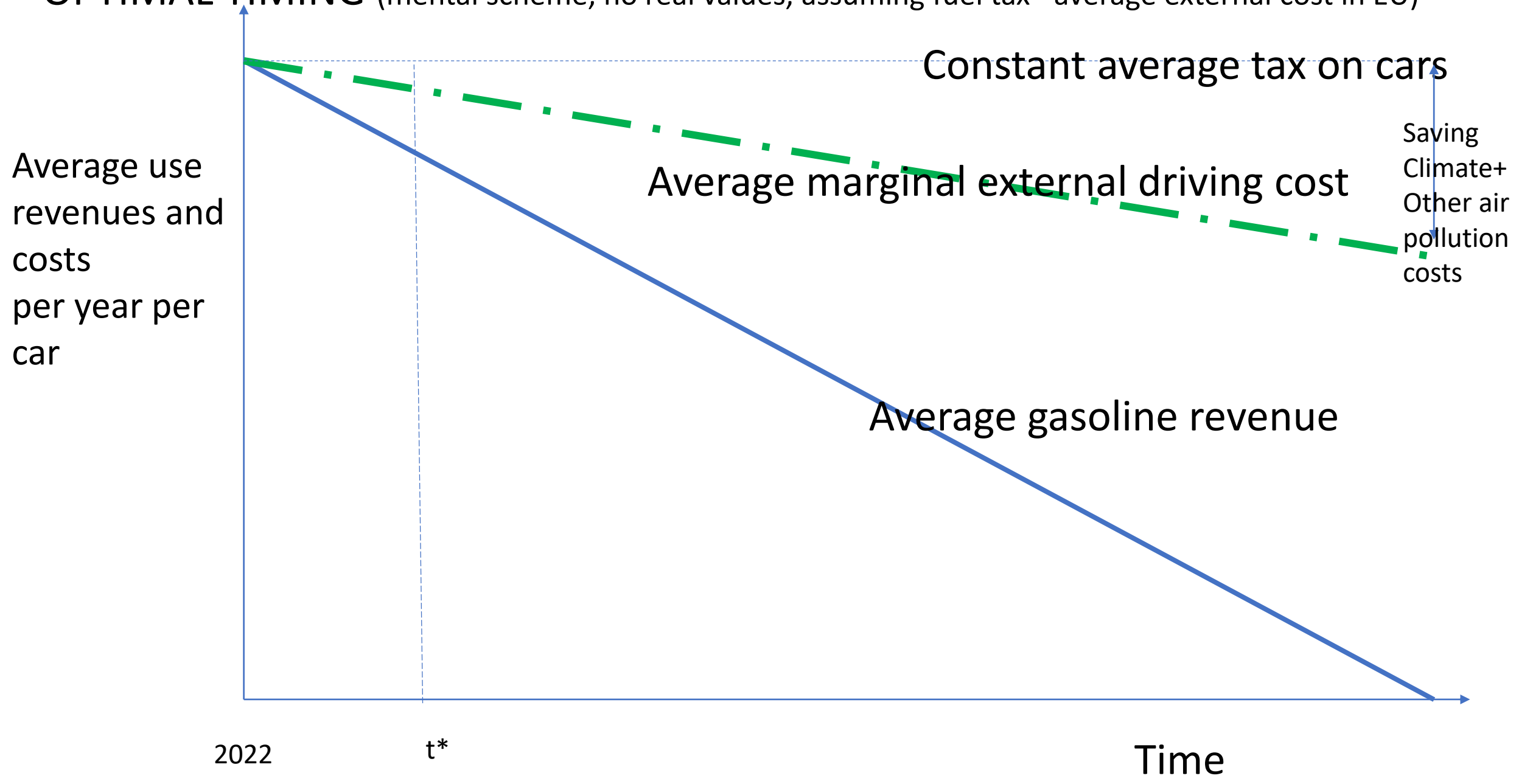
OPTIMAL TIMING (mental scheme, no real values, assuming fuel tax= average external cost in EU)



Delays in tax reform: “kicking the can forward”

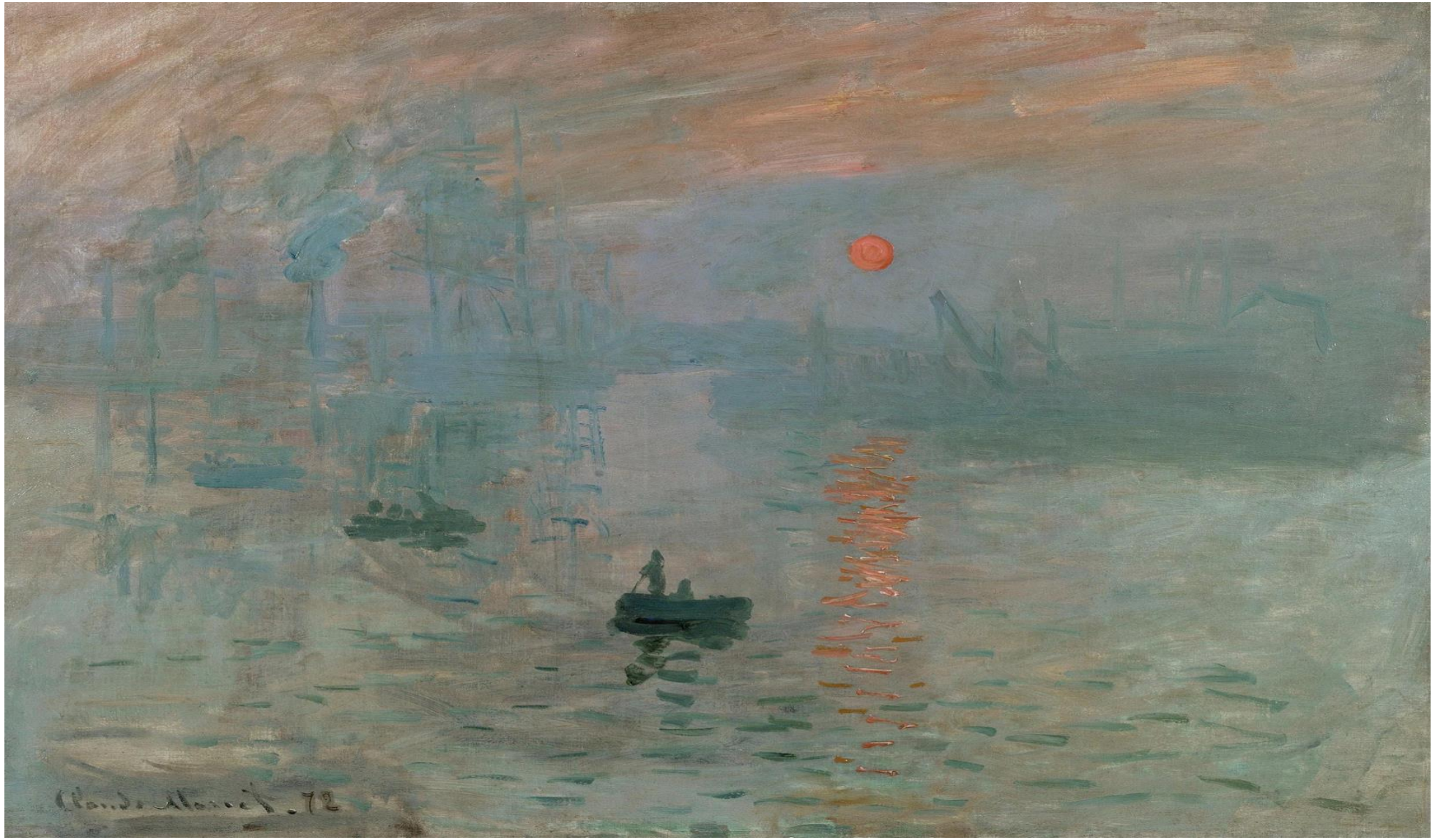
- Tax reforms are politically difficult for several reasons: they are unique, require design efforts and can fail
- Alesina & Drazen (1991) found that macro-economic reforms can be seen as a war of attrition, different groups want to tilt the reform in their favour
  - every group waits until the cost of waiting is higher than the cost of their agreement
  - Applied to EV’s:
    - Alternative for distance taxes is using income tax revenues (US states..)
    - The no-car or low car users, suffer most when distance taxes are delayed as they then have to pay the missing revenues via income taxes, they risk to give in earlier than the car owners

How to avoid delays in distance taxes

- Governments should be aware that there is a problem by publishing the way they substitute for the missing gasoline revenues
- Tell population how much user costs they pay for their car use (cfr; good pension information)
- Start by implementing a new user tax for EV's as they are still a small share of the car stock
  - This will not stop the introduction of EV's in the EU as it is mainly driven by the fuel efficiency standard

Optimal phasing in of distance taxes..

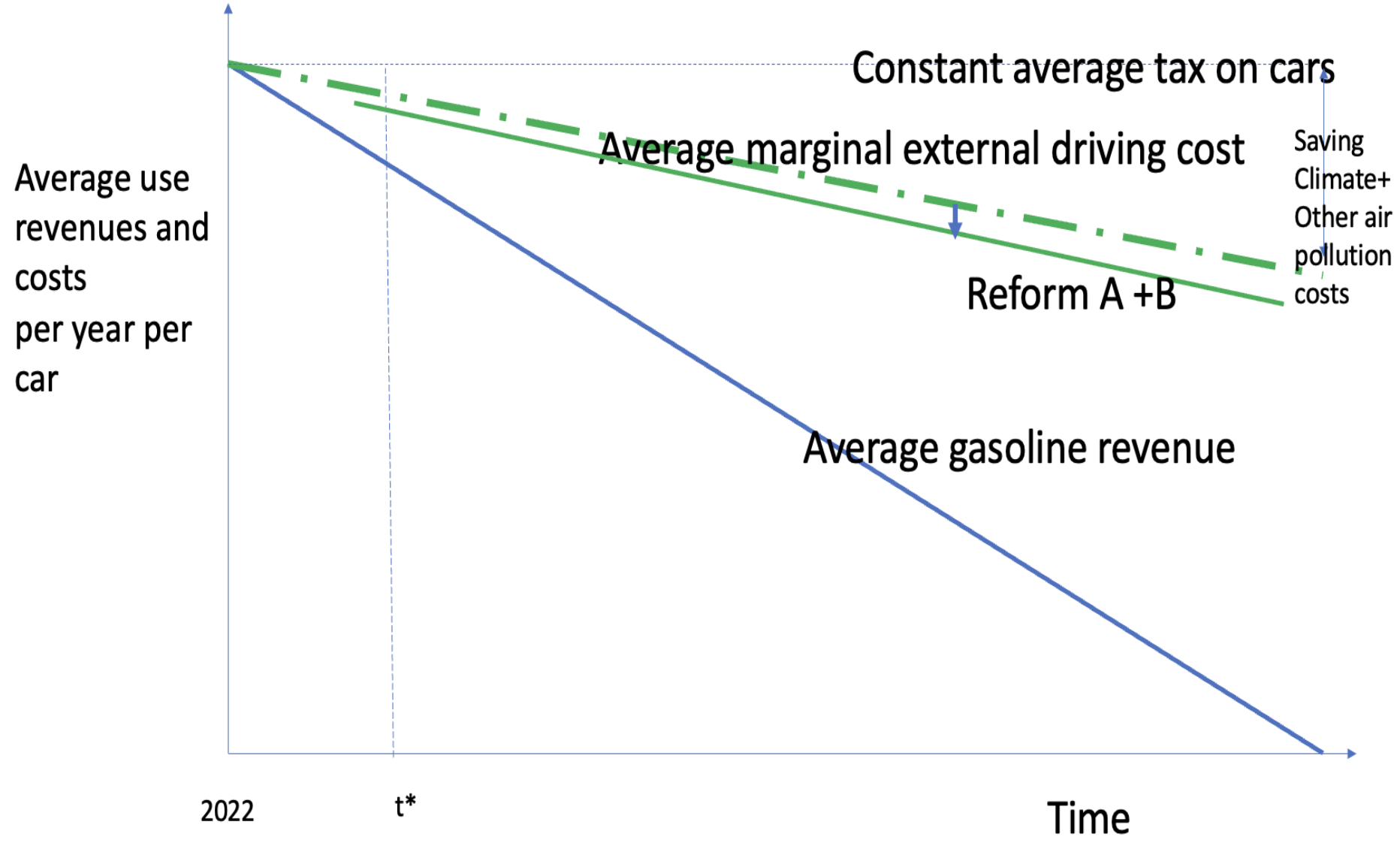
a first vague picture (for EU)



Optimal phasing of distance taxes in 4 steps

Reform A – minimal reform
Charge only the EV and Hybrids -**this forces policy makers to define non carbon and non air pollution part in current fuel tax**

Reform B – distance tax applied to all
Cars for non-carbon and non air poll cars
Replaces part of the fuel tax
(acceptability ok, waiting is costly)



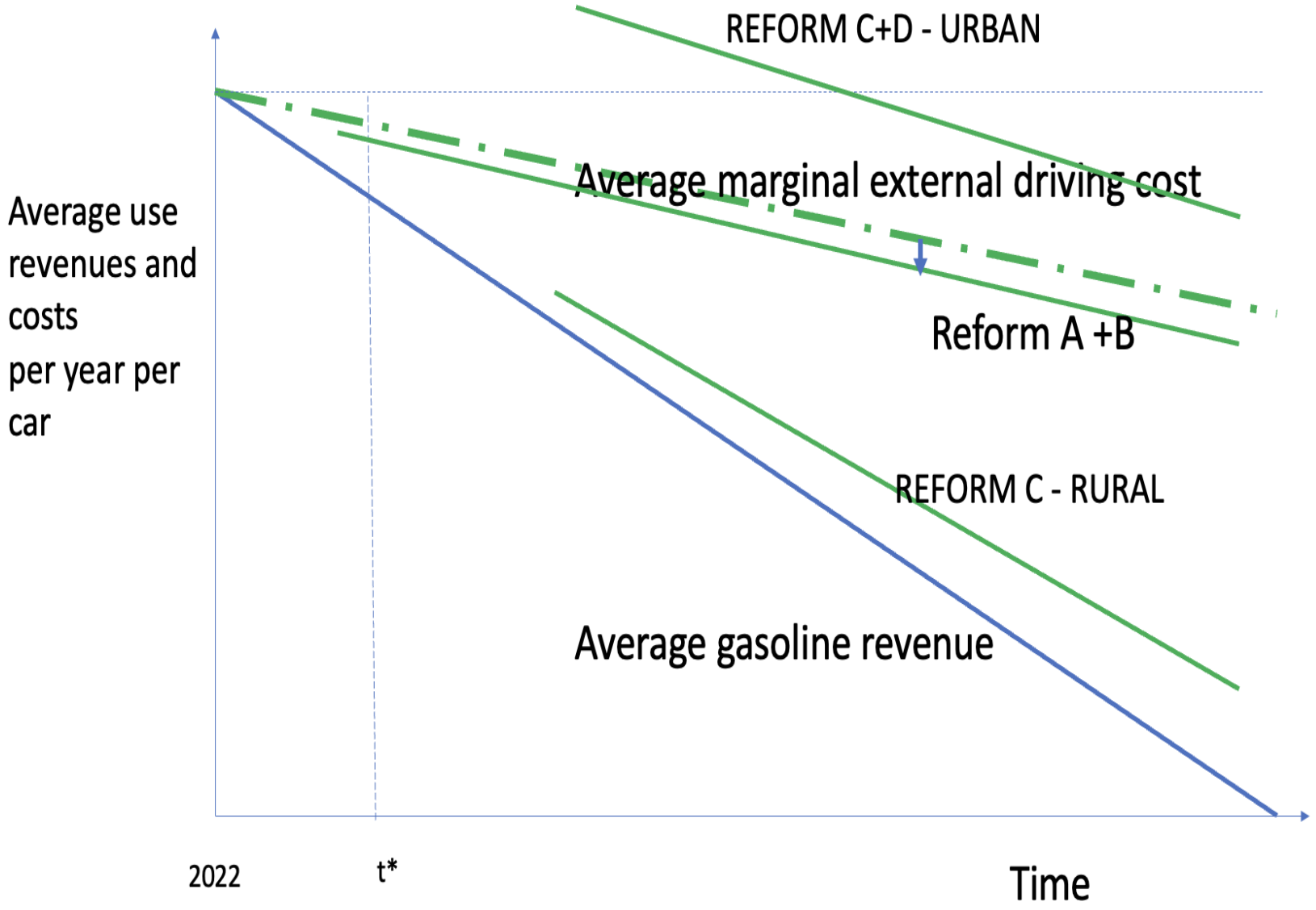
Optimal phasing in of distance taxes

Reform A – minimal
Charge only the EV and Hybrids –

Reform B – distance tax for all Cars

Reform C – regional differentiation and decentralisation of distance tax
Fossil fuel tax at level of carbon tax

Reform D – distance tax differentiated in function of congestion



Summing up

- Distance taxes are an opportunity to improve pricing of road use
  - EV penetration is mainly steered by efficiency standards on manufacturers (in EU)
  - Distance taxes offer opportunities to price according to place and time
- Acceptability means compensating those that pay more with the reform
    - Congestion: tradeable permits or targeted compensation
    - Urban/non-urban differentiation will necessitate the decentralisation of part of the user taxes and this may create cost recovery issues for the rural transport system
    - Governments are very slow to implement important tax reforms, delay is costly and risk is that fossil tax revenue role is taken over fully by income taxes
- Possible phasing in (EU) : EV and Hybrid tax, followed by a early distance tax on all fossil cars with smaller fuel taxes that slowly disappear, next urban/ rural distance tax setting and congestion pricing

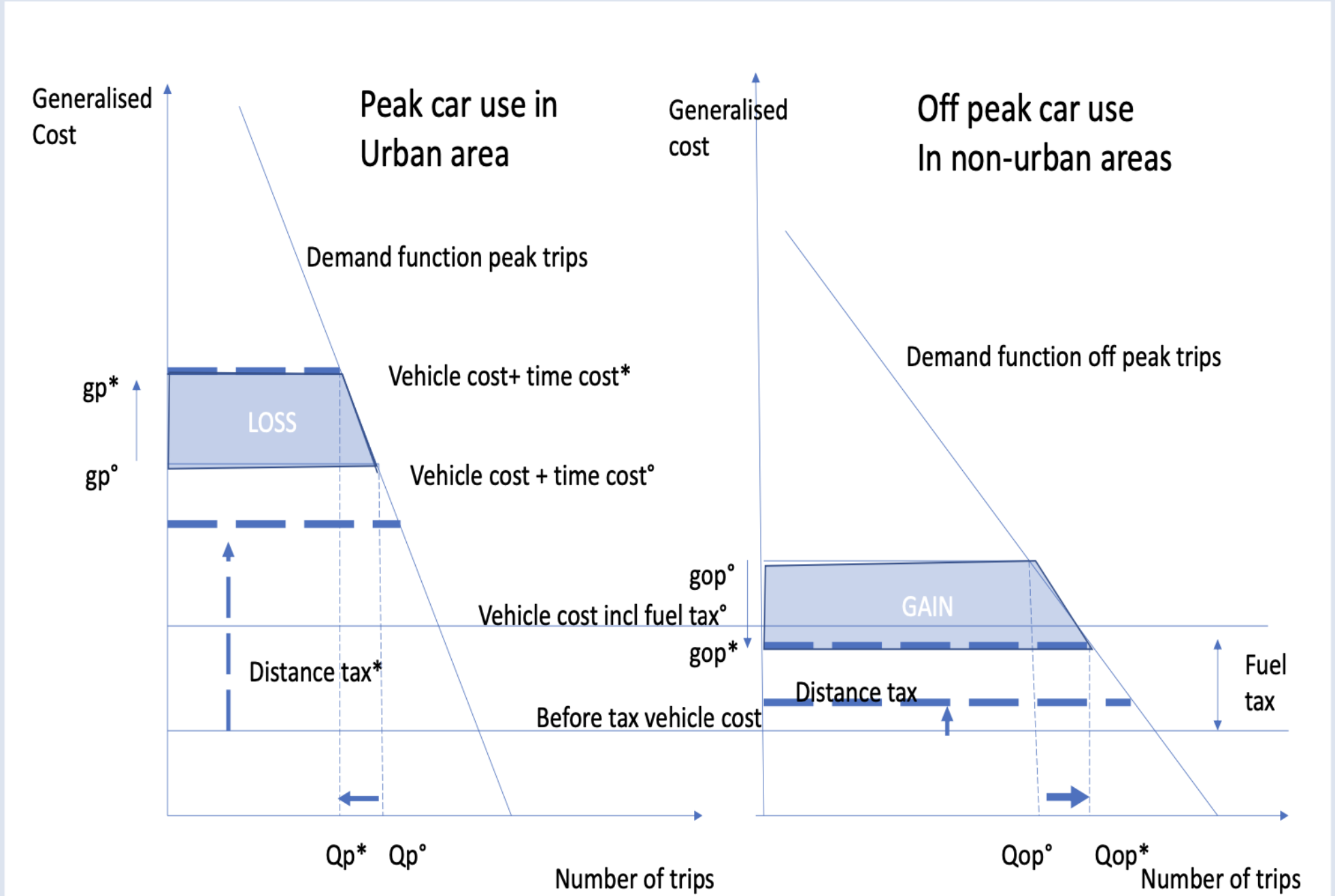
BOX 1. Order of Magnitude of marginal external costs versus fuel tax in EU – estimates for 2016

EUR ct per veh km	Type of vehicle	Air pollution	Climate change	Noise +accidents	Congestion	TOTAL marginal external cost	Fuel tax
Dense traffic metro-politan area	Fuel eff petrol car	0.22	1.57	3.00	0 - 66.3	4.8- 71.1	5.3
	Fuel eff diesel car	1.35	1.38			5.7 -72.0	3.1
	Full electric car	0.08	0			3.1 -69.4	0
Dense traffic rural motorways during day	Fuel eff petrol car	0.13	1.35	0.45	0-28.6	1.9 – 30.5	4.6
	Fuel eff diesel car	0.72	1.24			2.4 – 31,0	2.9
	Full electric car	0.08	0			0.5 – 29.1	0

Table 1. Tax reform and benefit accounting per individual

	Car user	Non car user
Change in Fuel tax paid (1)	Becomes smaller or disappears	
Change in Distance tax paid (2)	Becomes Important	
Change in Other taxes paid (3)	can ↓ *or* ↑	can ↓ *or* ↑
Change in TOTAL TAX paid (4) = (1) +(2)+(3)	can ↓ *or* ↑	can ↓ *or* ↑
Benefit of transport consumption (5)	can ↓ *or* ↑	
Benefit of other consumption (6)	can ↓ *or* ↑	can ↓ *or* ↑
Damage externalities other than congestion (7)	Expected ↓	Expected ↓
Change in TOTAL BENEFIT (8) = (5) +(6)+(7)	can ↓ *or* ↑	Expected ↑

Figure 2. Transport surplus changes for an individual



Carbon tax debate (beyond transportation as we already have a 300 € carbon tax in transport)

- In theory, this is an opportunity to improve the overall tax system
- But this is difficult to sell , a lump sum rebate or spending on climate projects works better;
- Carbon taxes were only introduced in some countries (Sweden, Norway,…) where there was sufficient trust in the government

	REFORM A Distance tax for EV's and plug in hybrids	REFORM B Distance taxes for all cars	REFORM C Urban/rural differentiation	REFORM D Distance tax with Congestion pricing
Gasoline and Diesel taxes	Kept	Kept but in line with climate damage	Kept but in line with climate damage	Kept but in line with climate damage
Estimate?	Equal to average gasoline tax – climate cost	Equal to average non-climate externality	Equal to average non-climate externalities	Equilibrium computation of additional charge for congested areas
Compensation of losers?	Decrease registration tax for EV's and plug in hybrids	Not needed as it merely substitutes an existing tax	Tax revenues are allocated to the regions Interregional transfers may be necessary	Capped charges for frequent users Targeted PT improvements Grandfathered peak mobility rights
Alternative instruments?			Urban externalities can be addressed by LEZ etc.	
Welfare Benefit	Growing	Growing	High	Highest
Acceptability	easiest	possible	Depends on institutional context	Difficult
Total tax revenue	Neutral	Downward shock in tax revenues due to lower tax on gas guzzling cars but stabilizes tax revenues from that moment onwards to the level of the external costs	Neutral	Neutral