

# Contributing to a better lifestyle by addressing congestion and environmental damages from transportation

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# Challenges from fuels and transportation

Transport fuels are one of the most important sources of global and local pollution.

Transport originates by itself other even more relevant externalities, such as congestion, accidents, road damages.

These costs immediately impact on our lives. The lives of urbanized (70 per cent) share of the population.

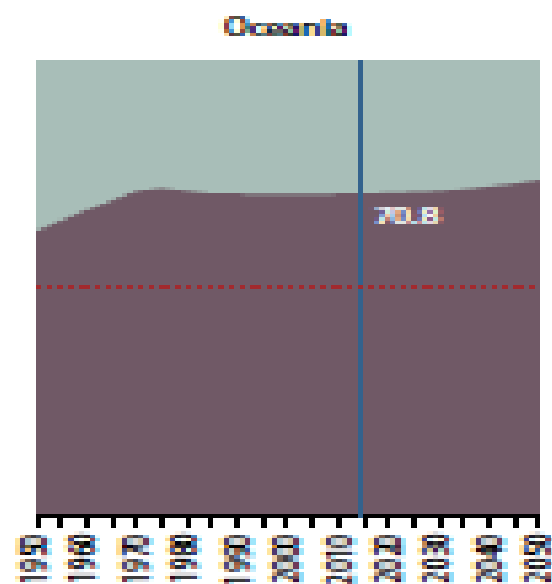
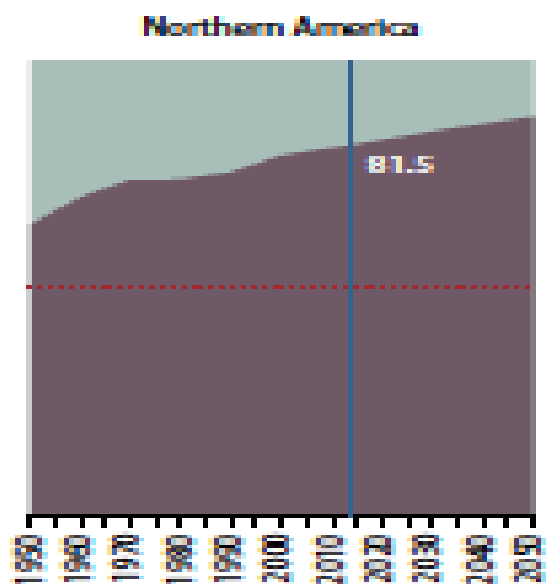
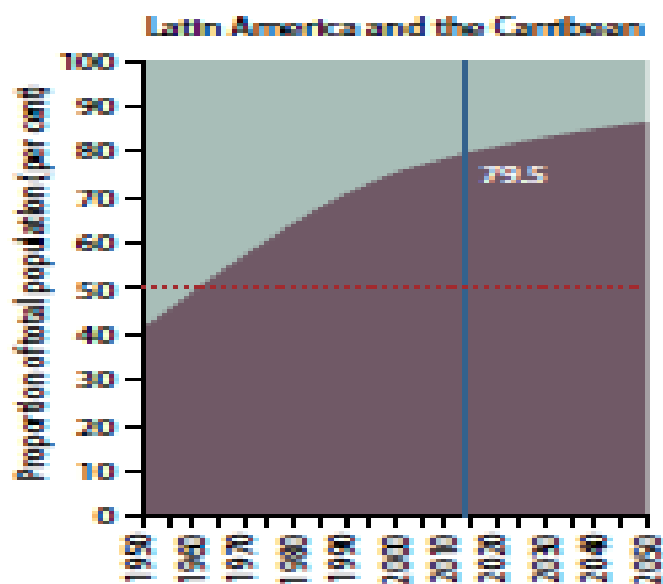
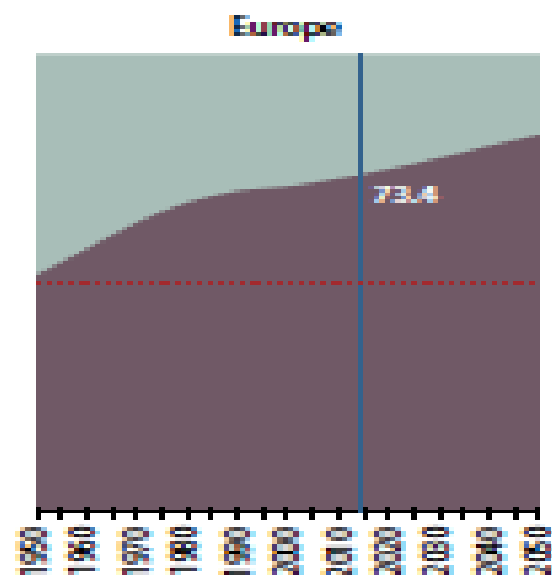
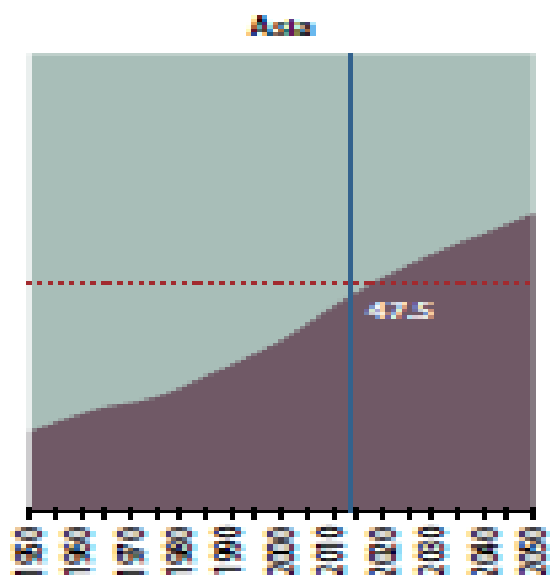
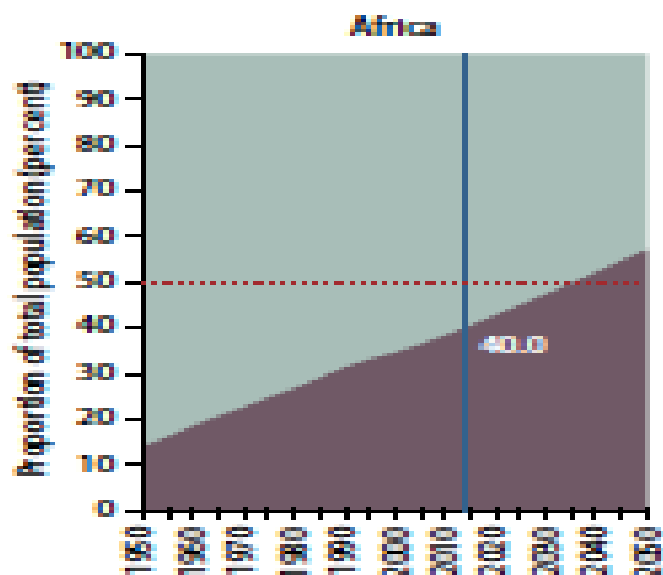
As the world becomes more urbanized, pollution and damages from use of transport fuels and from transport increase.

Present drop in price of oil provides an unique opportunity for reform.

# Pertinence of these issues to Latin America

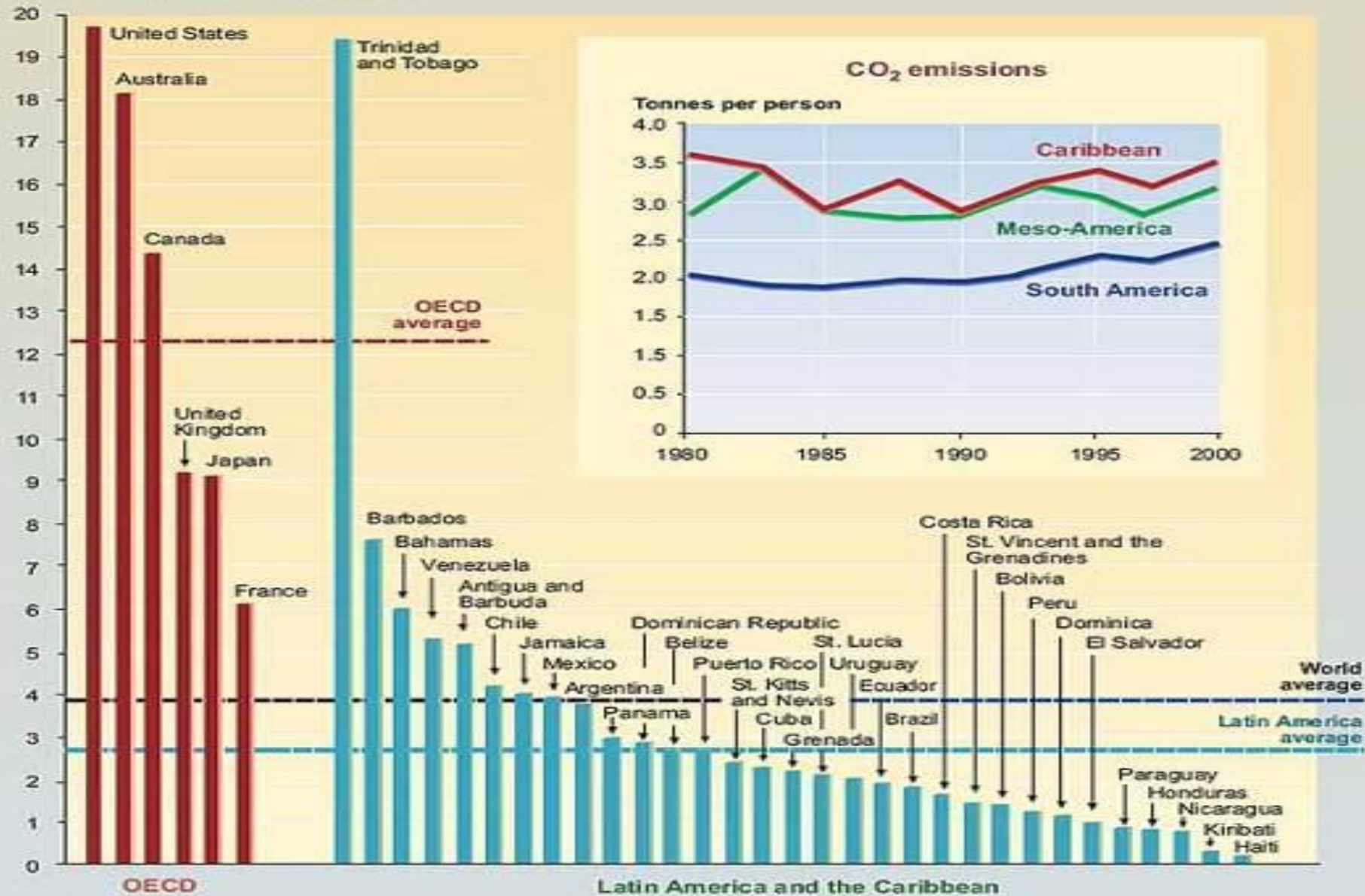
- Highest and still growing urbanization rate.
- Dependence on oil import in most countries, particularly the small ones.
- Generally underpriced fuels lead to:
  - Relatively high levels of polluting emissions
  - and high energy consumption.

## Urban and rural population as proportion of total population, by major areas, 1950–2050



# CO<sub>2</sub> emissions per person in Latin America and the Caribbean compared to world and OECD average emissions

Tonnes per person (estimate for 2001)



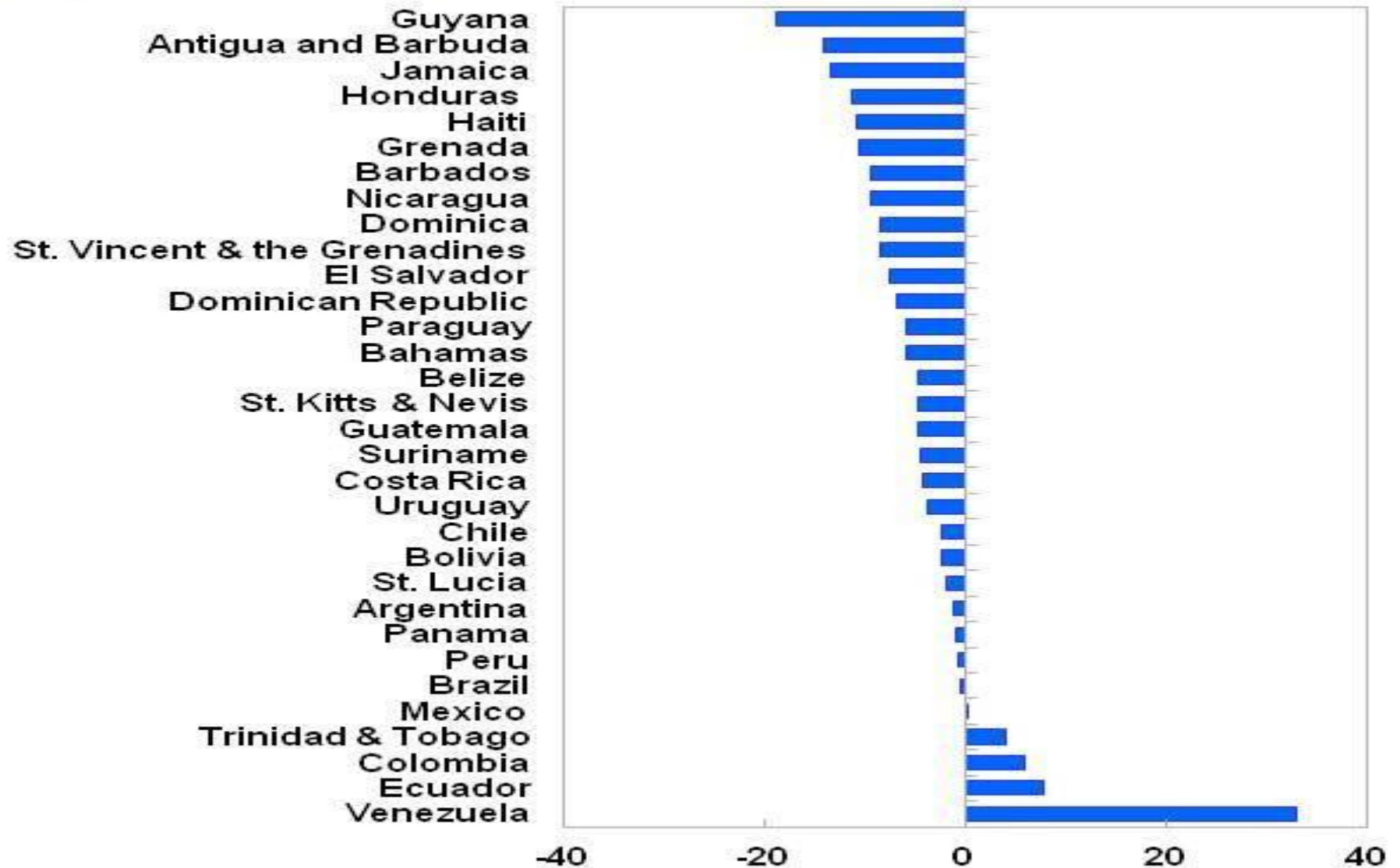
Sources: World Bank 2004; Carbon Dioxide Information Analysis Center 2004;

WRI, Earth Trends, Climate and atmosphere, Trinidad and Tobago: [http://earthtrends.wri.org/pdf\\_library/country\\_profiles/CI\\_cou\\_780.pdf](http://earthtrends.wri.org/pdf_library/country_profiles/CI_cou_780.pdf)

Latin America Environment Programme (LAEP) Annual

# Net Oil Exports, 2014

(in percent of GDP)



Sources: IMF, *World Economic Outlook*; and IMF staff calculations.

# Price of a liter of gasoline.

(US dollars. January 2015)

Argentina	1.34
Bolivia	0.52
Brasil	0.97
Chile	1.22
Colombia	0.74
Ecuador	0.44
Paraguay	1.12
Perú	1.13
Uruguay	1.49
Venezuela	0.02
<u>México</u>	0.9
Costa Rica	1.22
Honduras	1.11
Nicaragua	1.14
Cuba	1.34
Panamá	0.94

# Fixing fuel taxation is crucial

Fuels have to be priced at the full social cost: production cost plus externalities related to the **use of the fuel** itself.

Externalities associated with **the use of vehicles** (rather than with fuel consumption), including external congestion costs, external accident costs, noise, etc. are very important.

These externalities are **more important** than the cost associated with fuels

Parry (IMF) proposes a formula to fully internalize externalities

**The optimal fuel tax/ per liter =**

+ carbon damage/liter

+ (marginal external congestion, accidents, air pollution costs per veh/km)(km/liter) x g

where g = fraction of fuel reduction from reduced vehicle use



# The long route to go in Latin America: optimal versus actual taxes on gasoline (US cents per liter)

	Carbon	Local air pollution	Congestion	Accidents	Total	Actual excise
Mexico	8.3	3.1	14.1	5.7	31.2	8.1
Chile	8.3	4.1	20.5	23.1	56.0	31,8*
Jamaica	8.3	1.2	8.8	17.8	36.1	27.7**
Trinidad & Tobago	8.3	1.2	8.8	35.9	54.2	0.00
Norway	8.3	2.2	83.7	10.2	104.4	144.0

Source IMF: Data Base for Getting Energy Price Right (This Version: February 2014)

\* July 2015 \*\* March 2015

# Fixing fuel taxation is difficult, but it is also partial

When congestion externalities are relatively high compared to other external costs, as is the case in many urban regions, the same fuel tax has to regulate car use with very different levels of external costs.

Either taxes on fuels should be differentiated according the levels of congestion, meaning that they should be higher in the urban than in the other/rural areas,

or

Other instruments should be used, such as taxes on where and when cars and hence roads are used.

# Fiscal options for reducing congestion

They can be a cordon toll, a parking tax, or much better a fine toll adapted to departure times, a travelled distance tax.

Considered with increased interest also in countries, such as China, with cities, are overwhelmed by staggering increase of vehicles in urban centers.

Supplement and/or replace (national) fuel taxes with local instruments impacting on urban planning.

While these instruments are potentially very effective, their implementation can be technically and politically problematic. Collection may be costly and political opposition is strong even with use of new technologies – GPS and electronic gates.

# The Stockholm congestion charge

- There are already a number of examples across the world: Singapore, London, Milano, Oslo, Bergen, Stockholm.
- The last example seems to have been particularly successful, making it worth of analysis.
- The Stockholm charge was introduced 2006 as a seven-month trial.
- Followed by a referendum where a 2/3 majority voted in favor of the charge, leading to the reintroduction of the congestion charge in August 2007.

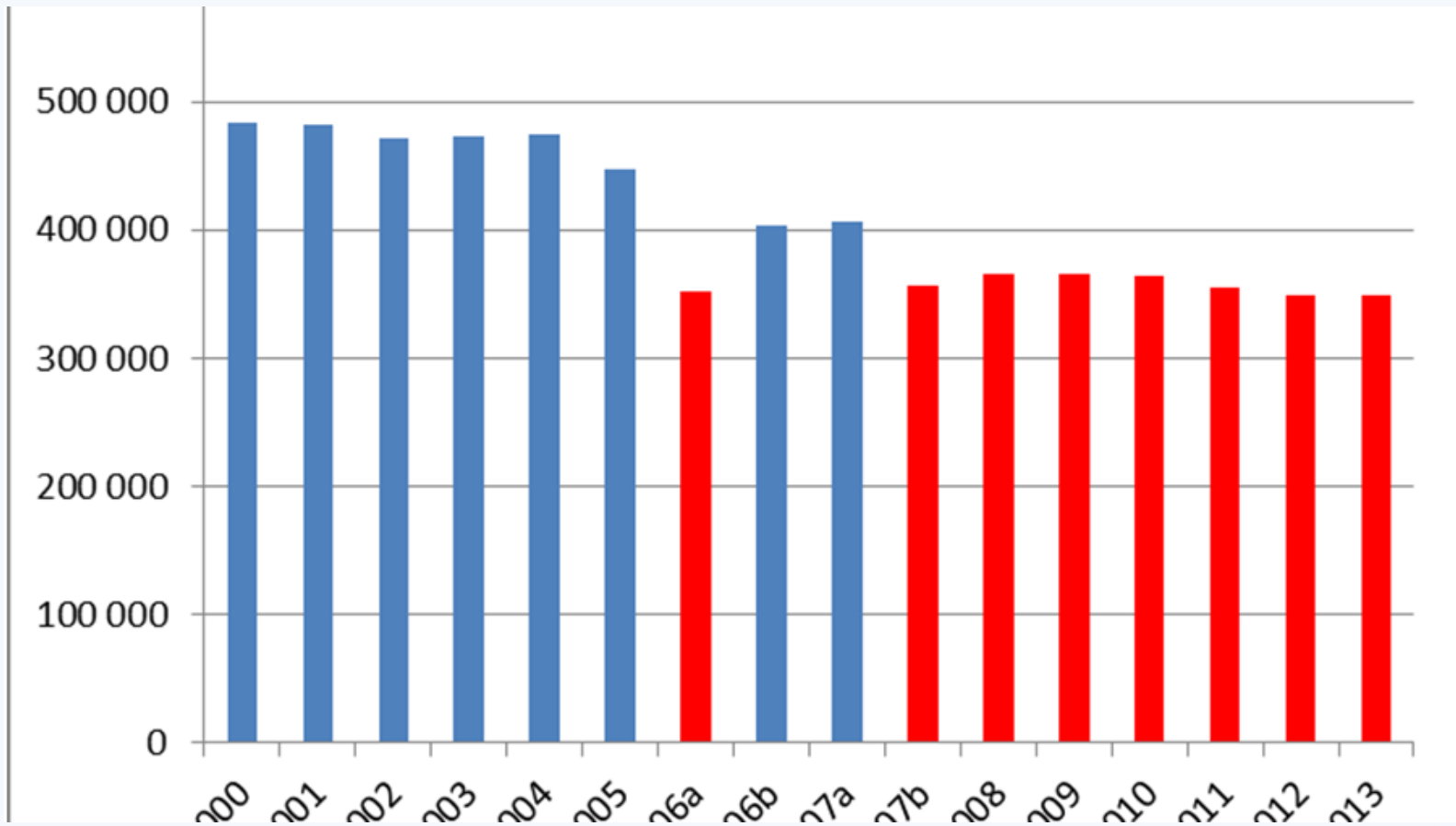
# The Stockholm congestion charge

- The system consists of 18 charging points located at the main bottlenecks on the arterials leading into and out from the inner city. These 18 points form a cordon around the inner city.
- Vehicles are registered automatically by cameras that photograph the number plates; there is no opportunity to pay at the control points. The owner of the car is then sent a monthly invoice for the total charge incurred during a month.
- During the trial, the main means of identification was transponders (“tag-and-beacons” or DSRC, dedicated short-range communication). When the charges were reintroduced, the automatic camera identification, originally intended only as a secondary means of vehicle identification, worked so well that it was decided to abolish the transponders..

# The Stockholm congestion charge

- The cost for passing a control point in any direction is 1-2 dollars depending on the time of day, with a maximum amount per vehicle and day of 6,5 dollars (approximately).
- The cost is the same in both directions, and each passage is charged.
- No congestion charge is levied during nights, weekends, holidays, or in July.

# Stockholm: number of cars passing through the cordons during paying hours



	2006a	2007b	2008	2009	2010	2011	2012	2013
Traffic reduction from charges, compared to 2005	-21.0%	-18.7%	-18.1%	-18.2%	-18.7%	-20.5%	-21.4%	-22.1%
Traffic reduction adjusted for changes in external factors <sup>8</sup>	-21.4%	-20.9%	-20.7%	-21.9%	-21.7%	-22.3%	-	-



# The Stockholm congestion charge: impacts

- Travel times for vehicle traffic declined substantially inside and close to the inner city.
- Travel time reliability increased.
- The reduction of polluting emissions was the largest in the inner city, between 10 and 15 per cent (the reduction differed across different types of emissions).
- Impact on low income drivers was not clear. that other factors, such as distance travelled and amount of toll paid (based on time of day), and number of times crossing the toll cordon, varied more widely within each income categories than between them.

# Conclusions

Congestion charging (and similar instruments) will of course not solve everything.

Normally, a growing urban region will need both congestion charging and transport investments, perhaps both roads and public transport.

Obviously, cities are different as to what investments are the most cost-efficient and the most needed.

Congestion charges can to some extent replace fuel taxes.

They are by their essence a local tax. Collections can be substantial and provide finance for green-investment.