



Swiss Transport Research Conference 2006

Land use effects of road pricing – a literature review

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Why road pricing?

- Increasing traffic volumes in agglomerations
- Budget constraints
- Successful introductions of road pricing elsewhere
- Technical feasibility proved
- Increased acceptance

Road pricing

Spatial effects

Methodologies

Conclusion

Status in Switzerland

- Heavy vehicle fee is implemented
- Federal administration is open for trials with private cars
- No legal authorisation so far, but exceptions - possible
- Research programme is underway

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Types of road pricing

Gained eligibility for paying

Passage pricing	Object pricing	Using bridges, tunnels or particular sections of a road
	Cordon pricing	Crossing the cordon limit in or out
Motorway pricing	Time dependent	Using a motorway for the paid period
	Distance or route dependent	Using a motorway section
Area pricing	Area licensing	Using all streets within priced area during the paid period
	Area charging	Distance dependent fee for use of all streets within charged area
	Differentiated area charging	Distance or route dependent, differentiated by street type within charged area
Value pricing		Using separated lines on motorways

Source : adjusted from Rapp (2004)

Reactions to road pricing

Short-term adjustments:

- transport mode
- route choice
- departure time
- trip frequency/trip chaining

Long-term adjustments:

- car ownership
- public transport pass ownership
- destination choice
- location choice

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Cheap propaganda or reality?

Source : <http://www.no-congestion-charge.com>

**YOU LIKE
THIS SHOP?**

**WANT IT TO
BE HERE IN
2 YEARS TIME?**

*** THE COUNCIL PREDICT A DROP OF 4%
IN SALES DUE TO CONGESTION CHARGING.**

IN LONDON THERE WAS A 17% DROP

**THAT WOULD MAKE THIS SHOP
AND MANY OTHERS
NOT WORTH OPENING.**



**VOTE NO TO
CONGESTION
CHARGES**

www.no-congestion-charge.com

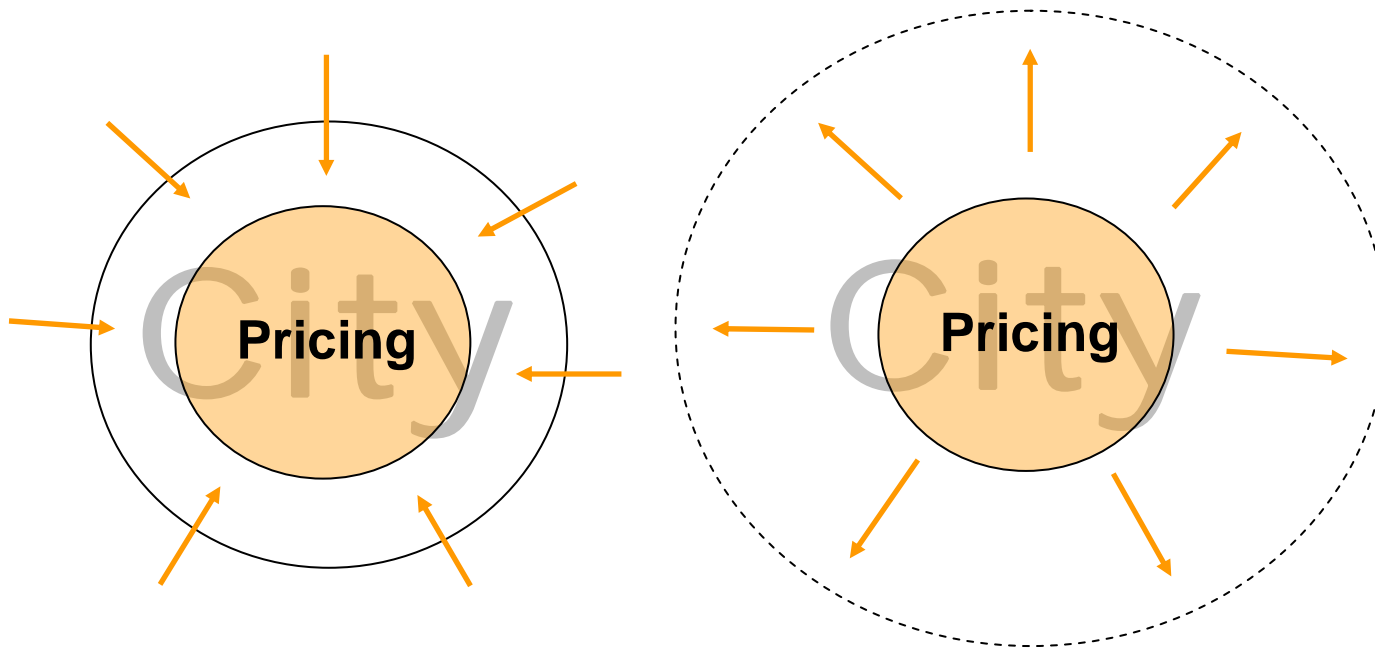
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Overall spatial effect at urban scale



Concentration or deconcentration ?

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Arguments and spatial effects

- Low cost of transport argument
- Geographic concentration argument
- Rent seeking argument

- Different sensitivity of firms and households
- If cost burden is high, relocation might be considered
- Spatial effect of road pricing might be hidden by other factors in the urban economy

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How to find out?

Empirical analytical studies (ex-ante)

Empirical analytical studies (ex-post)

Applied modelling studies

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Empirical-analytical studies (ex-ante)

Two stated preference surveys (Tillema et al. 2006) **Road pricing**

- 5% would move because of road pricing

- 13.5% would change job

- but majority of them stated that they will change location anyway

- Higher sensitivity to travel costs than to equally high housing costs

- Travel time is less important

=> Preference for higher housing costs and longer travel times in order to avoid higher travel costs

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Empirical-analytical studies (ex-post)

No detailed study reported in the literature

Congestion charging zone in London (since 2003)

- rents are stable
- Marginal economic activity changes
- data inconsistency
- revenue loss in retail sector, but no location changes so far
- isolated effect of congestion charging unclear
(RICS 2004, 2005; TfL 2004, 2005)

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Applied modelling approaches

General equilibrium modelling

Land use – transport modelling

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Land use - transport modelling

- Several international applications at urban level
- Various models and cities

Examples: Austin (DRAM-EMPAL/TransCAD), Bilbao (MEPLAN), Brussels (TRANUS), Dortmund (IRPUD), Edinburgh (DELTA/START), Helsinki (MEPLAN), Inverness (TRANUS), London (LASER, LTM/LRM), Naples (MEPLAN), Newcastle (CITIES), Oslo (TRAM), Venice (MEPLAN)

Results:

- Spatial effects of road pricing are marginal
- Design of the charging scheme is crucial
- PROPOLIS: slight increase of population and decrease of employment in charged area (Lautsi et al. 2004)

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Conclusions

- (Spatial) effects of road pricing are complex
- Empirical data sources are scarce
- Problem of isolating road pricing effects
- All available evidences are pointing to rather marginal spatial impacts

- Detailed study of spatial effects requires consideration of spatial structures and conditions
- Spatial effects vary among time and space as well as agents (households, firms)

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