Original Article

The roles of perceived effectiveness and problem awareness in the acceptability of road pricing in Bangkok

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Abstract

This study investigated the effect of perceived effectiveness and problem awareness on social and individual scales on the acceptability of an assumed road pricing (RP) scenario in Bangkok. The results indicate that perceived effectiveness and problem awareness on the individual scale are determinants of RP acceptability, and that car users oppose the application of RP since they are not convinced of its effectiveness. The study suggests that when implementing RP, it is important to educate the general public, and especially car users, about the effectiveness of RP schemes in reducing the impact of traffic problems on the individual.

Keywords: acceptability, road pricing, perceived effectiveness, problem awareness, structural equation modeling

1. Introduction

1.1 Background

Implementing public policy that affects large numbers of people always requires careful considerations about how people will think and react. Road pricing (RP) is one such policy known to be very sensitive to public acceptance due to its marked effect on the travel cost for car users (Gärling and Schuitema, 2007). From another perspective, urban RP has proven be an effective approach in relieving traffic congestion (Larsen, 1998; Tretvik, 2003; Transport for London, 2004). However, policy makers in some countries still consider this scheme to be unsuitable and unacceptable from a political perspective (Viegas, 2001) partly because they are concerned that such measures might cause considerable disruption to the activities of people in affected areas, which could lead to a reduction in political support from those communities. Therefore, accurate research on public acceptance is a vital prerequisite for any decision related to RP application.

This study examines the case of Bangkok, Thailand, where area licensing or RP have been considered several times (e.g., Thailand Development Research Institute, 2001; Office of the Commission for the Management of Land Traffic, 1995). However, these have never advanced beyond the stage of feasibility studies, and RP has not yet been practically tested in any area of Thailand. Note that very little research has been performed in this area, especially studying in behavioral and attitudinal perspectives. In a study about an assumed application of the Area License Scheme in Bangkok, Kaneko *et al.* (2001) concluded that the scheme would have a greater effect on lower income groups, while higher income groups might continue using cars. Therefore, the concept of RP and its effects are probably new to most people including policy makers. This lack of knowledge is a definite impediment to implementing RP policies for the mitigation of traffic congestion in Bangkok.

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The literature indicates that perceived effectiveness and problem awareness are among the most important factors affecting attitudes to RP acceptance (Bartley, 1995; Rienstra *et al.*, 1999; Jakobsson *et al.*, 2000; Schuitema, 2003; Gärling and Schuitema, 2007). For example, Bamberg and Rölle (2003) indicated that inclusion of perceived effectiveness as a direct effect on acceptance significantly increased the explained variance from 71% to 81%. They also found that problem awareness was an indirect factor that influenced acceptability. Schade and Schlag (2003) and Gärling *et al.* (in press) obtained similar results in their regression analyses using problem perception and perceived effectiveness as explanatory variables for RP acceptability. Jaensirisak *et al.* (2005) found that charging was more acceptable to nonusers and those who believed in the effectiveness of RP than to those who considered pollution and congestion to be serious problems. Those studies implied significant relationships between perceived effectiveness and problem awareness, and the acceptability of RP. At the same time, their findings showed large differences in acceptability in terms of system features and across different cities (cf., Jaensirisak *et al.*, 2005). It is clear that awareness of the problem has been described mostly in terms of damage to society and to the environment.

In addition to these empirical results from a transportation perspective, the relationship between RP acceptability and problem awareness can be viewed on the basis of the theory of protection motivation by Rogers (1983), which postulates that individuals think about changing their behaviour only when they believe that keeping to this behaviour, driving their cars, would sooner or later lead to severe negative consequences for themselves. Therefore, they are deciding to modify their behaviour of car-use by reducing their car usage demand when they are or feel to be personally affected. From the perspectives of environmental conservation, value-belief-norms theory of Stern *et al.* (1999) also postulated that personal norms to take pro-environmental action are also activated by beliefs that environmental conditions threaten things important to the individual as well as awareness of damage to socials' values. From these theories, problem awareness can be considered at two different scales, self and social problem awareness. For the context of this paper, self problem awareness refers to the perception that traffic congestion and pollution have direct and personal impacts on individual life, and social problem awareness is defined as the perception about those problems that affect whole people in communities. Finally, the basis of Schwartz's (1973, 1977) norm-activation theory suggests that personal moral norms are activated in individuals who are aware of conditions containing threats to others. Acceptability of RP can be seen as a mean for protecting environmental values in communities, such as quality of life, fresh air, and low traffic noise, etc. These values activate personal moral norms to support a method that people perceive about its abilities to mitigate negative externalities caused by car traffic to society and environment. From this point of view, therefore, accept-

ability of RP can be developed from perceived effectiveness about performances of RP.

In this context, the objective of this study was to examine the effect of social and self problem awareness as well as perceived effectiveness on the acceptability of an assumed RP scenario in Bangkok. We also investigated how other socioeconomic factors such as age, gender, education, income, car use, and car ownership affect attitudes toward RP. The determination of factors that are important in people's acceptability of such a RP scheme is fundamental in deciding the way ahead for implementing such a system.

1.2 Hypotheses and model specification

In accordance with the literature reviewed and the study objective, we assumed that the acceptability of RP in Bangkok would be determined by perceived effectiveness and problem awareness. We divided problem awareness into the separate components of social problem awareness and self problem awareness. Studies such as Bartley (1995), Harrington *et al.* (2001), and Schade and Schlag (2003) found that socioeconomic factors affect acceptability to some extent. Therefore, to see how this applied in Bangkok, we studied socioeconomic factors and travel mode (i.e., car use or non-car use) to evaluate their effects on acceptability, effectiveness, and problem awareness. Based on those hypotheses, the study proposed the causal model shown in Figure 1.

2. Methodology

2.1 The study area and the assumed road pricing scheme

For the study area, we selected Bang Rak, a well-known business district of Bangkok, Thailand. It is located in the center of the city center and covers an area of 5.54 km^2. With a registered population of approximately 62,000, it was planned as a major commercial zone. This area suffers many
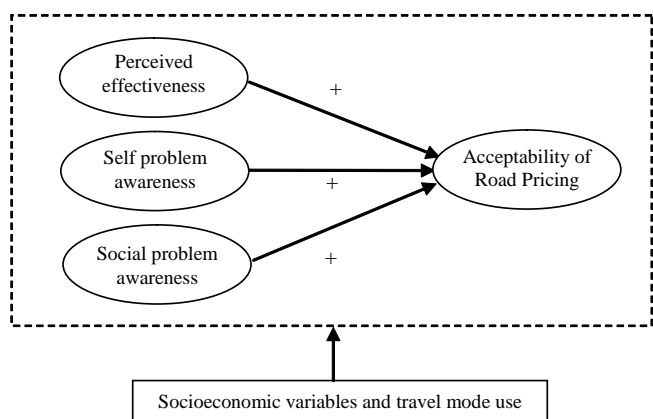

Figure 1. Causal model of determinants for the acceptability of road pricing.
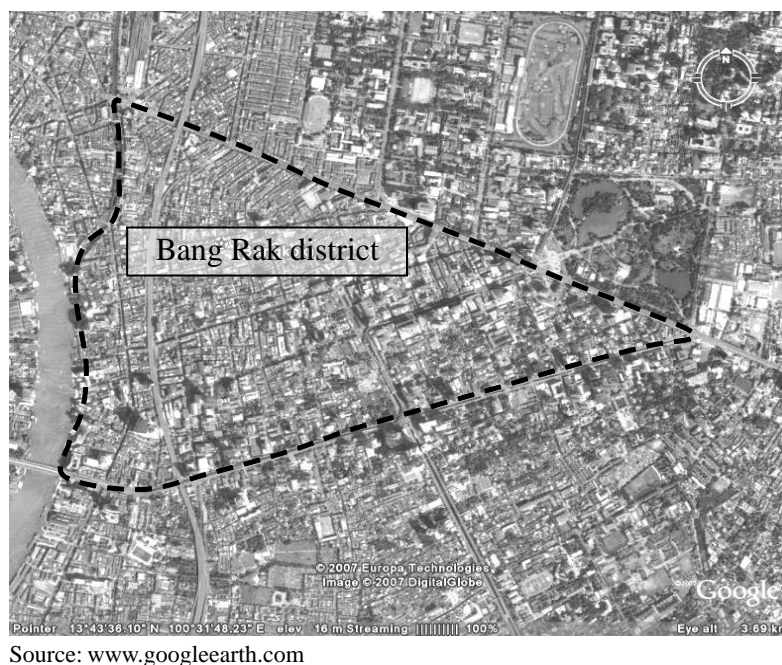
Source: www.googleearth.com

Figure 2. The study area.

serious traffic problems due to a continuous high traffic volume. One reason we chose this area was the availability of many modes of transportation. This would make it possible for people to change to other modes if a RP scheme were actually implemented. The boundary of focused area was shown in Figure 2.

As noted above, RP schemes in Bangkok have not reached beyond the stage of feasibility studies (Thailand Development Research Institute, 2001; Office of the Commission for the Management of Land Traffic, 1995). Therefore, to test how people would respond to RP, a pricing scheme was developed based on those in the feasibility studies, incorporating modifications to make it suitable for the actual conditions of the study area. This meant a two-tiered rate based on time and traffic density. The result was a charge of 60 Baht (approximately 1.8 USD) for entering the affected area during peak hours (06:00-09:00 and 16:00-20:00 h), and 30 Baht (approximately 0.9 USD) during off-peak hours, effective only on weekdays. A map of the affected area was developed along with instructions on how to pay for entering the affected area.

2.2 The survey

A pilot survey was first conducted to test for any possible mistakes in the questionnaire form. Then after the questionnaire had been revised, the actual survey took place from mid-January to the end of February 2007. Survey assistants were hired to distribute questionnaire forms to different types of travelers in major office places, shopping centers, and other public areas of Bangruk. To ensure a random sampling, each assistant was told to attempt to ask the first

respondent that he or she met in the survey area. The subjects were clearly briefed on all aspects of the proposed RP scheme before being asked to answer the questionnaire. Respondents completed the questionnaires in the field with the help of the assistants when required. They were classified into groups: car users and public transit users. Altogether, 1000 questionnaires were distributed. Of these, 877 were usable once the incomplete ones were excluded. Table 1 shows descriptive statistics of our sample.

Table 1 shows that the car ownership rate was quite high, which implies that most of the respondents use a car regularly; however, the rate of car use (53.4%) for those entering Bang Rak was much lower than the car ownership rate. The statistics also indicate that the average age as 29 years. Most respondents were of working age and more males than females were surveyed. Most of respondents were well educated with 86% holding at least a bachelor degree. Most respondents were considered to be in the low to middle income group (income <30,000 Baht). This sample is not representative of the overall Bangkok population, but for testing the RP scheme, this sample can be considered representative of travelers in such a business district.

2.3 Attitudinal measurements

The questionnaire used for this research comprised several parts. For this paper, we used only those parts containing the following measures.

2.3.1 Acceptability

The acceptability of RP implementation was investi-

Table 1. Descriptive statistics of the sample (N = 877)

Age (average, years)		28.9±7.27 (%)
Gender (male)		479 (54.6)
Education	Lower than bachelor degree	125 (14.3)
	Bachelor degree and higher	752 (85.7)
Annual income (Baht)	<10,000	190 (21.7)
	10,000–20,000	305 (34.8)
	20,001–30,000	286 (32.6)
	30,001–40,000	58 (6.6)
	>40,000	38 (4.3)
Car ownership	Non-car owners	81 (9.2)
	Car owners	796 (90.8)
Mode use	Private car	468 (53.4)
	Public transport	409 (46.6)

Note: One Baht is equivalent to 0.029 USD as of 2007.

gated using three observed variables. (*1*) *Satisfaction toward implementing RP* was measured with the question "How would you feel if this measure were actually implemented in Bang Rak?" using a four-point scale (-2 = very unsatisfied, -1 = rather unsatisfied, 1 = rather satisfied, and 2 = very satisfied). (*2*) *Agreement with implementing the RP* was evaluated with the question "Would you agree with this measure if it were actually implemented in Bang Rak?" (*3*) *Intention to support RP implementation* was measured by asking respondents "Would you support this measure if it were actually implemented in Bang Rak?" Ratings for both items (2) and (3) were obtained on four-point scales (-2 = not at all, -1 = possibly no, 1 = possibly yes, and 2 = yes, strongly). The composite measure was formed by averaging across the three observed variables (Cronbach's alpha = 0.89).

2.3.2 Problem awareness

The respondents were asked about their awareness as to the seriousness of traffic problems in the study area including traffic congestion, air pollution from motor vehicles, and traffic noise. In this study, we measured problem awareness on two scales: self (individual) and society. For the social scale, traffic problem awareness was measured on a four-point scale (-2 = not at all a problem, -1 = a minor general problem, 1 = a major general problem, and 2 = a very serious general problem) using questions like "How do you rate the traffic congestion in Bang Rak?" Taking an average of the three questions corresponding to three traffic problems, we obtained a composite measure having a Cronbach's alpha of 0.71. For the individual scale, the respondents were asked whether they were personally affected by each of the traffic problems. Here, the measure for self problem awareness was the sum of the traffic problems that the respondents thought personally affected them (Cronbach's alpha = 0.67).

2.3.3 Perceived effectiveness

Attitude toward the effectiveness of the RP scheme was evaluated with "How effective do you think such a RP measure would be in reducing traffic congestion in Bang Rak?" Responses were provided on a four-point rating scale with -2 = ineffective, -1 = not very effective, 1 = somewhat effective, and 2 = effective.

3. Results

3.1 Comparisons of acceptability regarding road pricing across different groups

To investigate the difference in acceptability among different groups of respondents in terms of socioeconomic factors and mode use to access the area, analyses of variance (ANOVAs) were performed on acceptability. The results presented in Table 2 show significant differences in acceptability between the two education levels (F = 5.84, p<0.05). This indicates that those with a high level of education were not likely to accept RP. Moreover, significant differences were observed in acceptability according to income level (F = 3.65, p<0.01). However, the variation in mean scores across income levels implies that it is difficult to come to any firm conclusion about the impact of this factor on acceptability. Still it is obvious that the respondents in the income range of 20,001-30,000 Baht and 30,001-40,000 Baht were the most strongly opposed to RP.

From the perspective of travel mode used to access the area, the mean scores show that car users were against the pricing scheme while public transport users somewhat agreed with the pricing. The difference between two groups was significant (F = 44.37, p<0.01). The results were similar in terms of car ownership; the attitude toward RP of those with a car was significantly different than those without (F = 4.99,

Table 2. Mean scores and F-test for the acceptability of road pricing by groups of respondents

Factors		Mean	SD	ANOVA F-value
Age		-0.117	1.05	0.89
Gender	Male	0.115	1.09	<0.01
	Female	-0.119	1.01	
Education level	Lower than bachelor degree	0.09	1.07	5.84[*]
	Bachelor degree and higher	-0.15	1.05	
Annual income (Baht)	<10,000	-0.11	1.06	3.65[**]
	10,000–20,000	0.02	1.04	
	20,001–30,000	-0.30	1.04	
	30,001–40,000	-0.06	1.11	
	>40,000	0.04	0.99	
Car ownership	Non-car owners	0.13	1.04	4.99[*]
	Car owners	-0.14	1.05	
Mode use	Public transport	0.13	1.04	44.37[**]
	Private car	-0.33	1.02	

Note: *, ** and *** show that the variable's coefficients were statistically accepted at 0.05, 0.01 and 0.001 level of significance respectively.

p<0.05). Specifically, non-car owners were likely to accept RP while car owners on average were not. Table 2 also shows that objection to the scheme from those using cars (mean score = -0.33) was notably stronger than from those who owned a car (mean score = -0.14). Therefore, a research question was developed to determine whether any relationship existed between the differences related to car use and the causal model hypothesized in Section 1.

3.2 Test of the structural equations model

The structural model of relationships among attitudinal and socioeconomic variables was analyzed using LISREL 8.53 (Jöreskog and Sörbom, 1993). To achieve the best fit for the model, estimates of error covariance were included between *Self* and *Social problem awareness*. The results are shown in Table 3 and Figure 3. The overall goodness of fit of the model was acceptable according to the criteria of Kline (1998) and Hu and Bentler (1999): χ^2 (df = 6; *n* = 877) = 3.68, χ^2/df = 0.61, RMSEA = 0.00, RMR = 0.009, GFI = 0.99, AGFI = 0.99, and CFI = 1.00). In addition, as shown in Table 3, 30% of the variance in acceptability was attributable to socioeconomic and attitudinal variables.

Figure 3 shows that the path coefficient from "perceived effectiveness" ($\beta = 0.48$, *t* = 16.85) to the acceptability of RP was significant, supporting the hypothesis that perceived effectiveness of the RP scheme has a positive effect on acceptability of that scheme. In addition, our hypothesis regarding problem awareness also partially held true for this sample. In particular, problem awareness on the self scale was found to be significant for acceptability ($\beta = 0.11$, *t* = 3.75). However, on the social scale, the result showed that

social problem awareness had no statistically significant effect on the acceptability. These findings imply that awareness of impact of traffic problems on each individual was more likely to make people in Bangkok accept RP rather than awareness of negative impacts on society. In addition, as shown via coefficients, the influence of perceived effectiveness was much stronger than that of self problem awareness, and appeared to be the strongest variable in affecting the acceptability in this model.

For the effects of other observed variables, the factors of using and owning a car had negative significant effects on the perceived effectiveness of the RP scheme ($\beta = -0.07$, *t* = -2.17 and $\beta = -0.08$, *t* = -2.17 respectively). These imply that unlike those who neither used nor owned cars, car users and car owners believed that RP would not be effective in reducing traffic problems such as traffic congestion. These results agreed with and supported the outcome of the comparison in
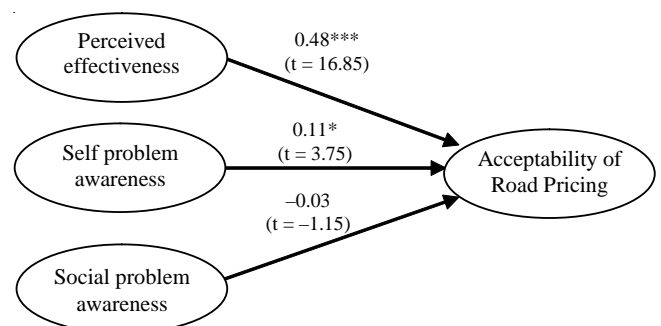

Figure 3. Standardized values of coefficient estimation using a structural equation model.

Table 3. Standardized coefficient estimates and t-value of socioeconomic variables on attitudinal variables (N = 877)

	Age	Gender	Education	Income	Car ownership	Car use	R^2
Social problem awareness	0.03(0.63)	-0.03(-0.81)	0.02(0.50)	0.14*(2.97)	0.02(0.43)	-0.07(-1.87)	0.03
Self problem awareness	-0.05(-1.30)	0.01(0.40)	0.02(0.43)	0.10*(2.11)	-0.002(-0.05)	-0.02(-0.60)	0.01
Perceived effectiveness	0.06(1.44)	-0.01(-0.30)	0.03(0.73)	-0.06(-1.25)	-0.08*(-2.17)	-0.07*(-2.17)	0.02
Acceptability of RP	0.01(0.28)	-0.02(-0.64)	-0.07*(-2.42)	0.06(1.64)	0.03 (1.09)	-0.20***(-6.15)	0.30

Note: - *Gender* (0: female, 1 male), *Car ownership* (0: not having, 1: having), *Mode use* (0: public transport use, 1: car use), *Education level* (0: lower than a bachelor degree, 1: bachelor degree or higher).
- *Income* variable was assigned a value based on income levels: 5,000 for 'less than 10,000,' 15,000 for '10,000-20,000,' 25,000 for '20,001-30,000,' 35,000 for '30,001-40,000,' and 45,000 for 'greater than 40,000.'
- *, ** and *** show that the variable's coefficients were statistically accepted at 0.05, 0.01 and 0.001 level of significance respectively.

Section 3.1 in which car users and car owners opposed the pricing scheme whereas public transport users and those who did not own cars agreed with the pricing to some extent. In addition, Table 3 also indicated that car use had a direct significant effect on the acceptability (β = -0.20, t = -6.15) whereas the effect car ownership was not as pronounced. It can be inferred from the result that the factor of car use was more important to the acceptability of RP than the factor of car ownership. This again agrees with the result in Section 3.1 in which the difference in acceptability between car users and non-car users was larger than between car owners and non-car owners. However, as Table 3 shows, *Car use* and *Car ownership* did not show significant effects on problem awareness. This means that car users and car owners were not very concerned about the impacts of traffic problems on themselves or on society as a whole.

Table 3 also shows that *Income* had a positive and significant effect on social and self problem awareness (β = 0.14, t = 2.97 and β = 0.10, t = 2.11, respectively). This means that those having higher incomes were more likely to be aware that negative effects of traffic problems have a great effect society and individuals. The findings also show that *Education* had negative significant effect on acceptability (β = -0.07, t = -2.42). This implies that people who have at least a bachelor degree were less likely to accept RP measures. *Age* and *Gender* did not show any effects on attitudinal variables.

4. Discussion and Suggestions

This study used a structural equation model to investigate the effect of perceived effectiveness, social and self problem awareness, and socioeconomic factors on the acceptability of an assumed RP scenario in Bangkok. The results confirmed the hypothesis that perceived effectiveness is a determinant of RP acceptability as suggested by Gärling *et al.* (in press), Bamberg and Rölle (2003), and Schade and Schlag (2003). The study also found that unlike previous research, the situation in Bangkok was not one of social problem awareness but of self problem awareness having

significant effects on the acceptability of RP.

First, the positive influence of perceived effectiveness toward acceptability implies that people would accept RP if they believe such pricing policies would help reduce traffic congestion. These results are consistent with expectations of theoretical framework. Thus, it is very important to implement social campaigns to explain what RP is and how it is effective. This is because RP, as well as many other coercive travel demand management measures, have never been tried in Bangkok, probably resulting in a lack of knowledge about RP on the part of the public and even by policy makers (Bhattacharjee *et al.*, 1997; Rujopakarn, 2003). Such a campaign would not be readily accepted by car users, as our findings indicated that those who drive into the city center do not seem to believe that RP would be effective in solving transportation problems. Therefore, this should be taken into account in the design of a special public campaign directed at car users.

Second, with respect to traffic problem awareness in Bangkok, self problem awareness significantly affects RP acceptability while social problem awareness does not. This signifies that people in Bangkok will have a tendency to accept RP policy if they feel traffic problems influence them directly, rather than society as a whole. This means that public campaigns to increase acceptance of RP in Bangkok should include messages of how such traffic problems have a serious impact on the individual, as well as how RP is effective in solving such problems.

The results in this study have contributed to the general knowledge regarding the variables of RP acceptance in different countries. Fujii *et al.* (2004) compared developed countries like Sweden and Japan with the less-developed country of Taiwan. They found that some psychological factors play important roles in the acceptance of RP in all three countries while socioeconomic factors such as income had an indirect effect on the acceptance of RP in Taiwan but not in Japan and Sweden. Those results, combined with the findings of this study, indicate that some factors may transcend cultures, while others may be important only in some countries. A further study of such effects across

countries, or between developed and developing countries would provide a major contribution to research in this field.

As a first step, in this study we investigated the effects of perceived effectiveness and problem awareness on acceptability, and our results showed that these factors were important to some extent in determining the attitudes of Bangkok people toward RP. However, other studies (e.g., Jakobsson *et al.*, 2000; Bamberg and Rölle, 2003; Schade and Schlag, 2003; Schade and Baum, 2007) have indicated that other variables also have significant affects on acceptability. These include perceived fairness, infringement of freedom, social norms, personal outcome expectations, and behavioral intention. Therefore, follow-up studies on this topic for Bangkok should consider the effects of those other variables on RP acceptance. Explicit testing of these other psychological factors will give a better understanding of people's attitudes, and would be of great help in designing more effective public campaigns and more acceptable RP schemes for Bangkok.

Acknowledgments

References

Bamberg, S. and Rölle, D. 2003. Determinants of people's acceptability of pricing measures—Replicating and extension of a causal model. In: Schade, J., Schlag, B. (Eds.). Acceptability of transport pricing strategies, Elsevier, Oxford, UK, p. 235-248.

Bartley, B. 1995. Mobility impacts, reactions and opinions. Traffic demand management options in Europe: The MIRO Project. Traffic Engineering and Control 36, 596-603.

Bhattacharjee, D., Haider, S.W., Tanaboriboon, Y. and Sinha, K.C. 1997. Commuters' attitudes towards travel demand management in Bangkok. Transport Policy 4, 161-170.

Fujii, S., Gärling, T., Jakobsson, C. and Jou, R.C. 2004. A cross-country study of fairness and infringement on freedom as determinants of car owners' acceptance of road pricing. Transportation 31, 285-295.

Gärling, T. and Schuitema, G. 2007. Travel demand management targeting reduced private car use: effectiveness, public acceptability and political feasibility. Journal of Social Issues 63, 139-153.

Gärling, T., Jakobsson, C., Loukopoulos, P. and Fujii, S., in press. Acceptability of road pricing. In: Verhoef, E.T., Van Wee, G.P., Steg, E.M., Bliemer, M.C.J. (Eds.). Pricing in Road Transport: A Multidisciplinary Perspective, Edward Elgar Publishing, Cheltenham, UK.

Harrington, W., Krupnick A. J. and Alberini A. 2001. Overcoming public aversion to congestion pricing. Transportation Research part A 35, 87-105.

Hu, L. and Bentler, P.M. 1999. Cutoff criteria for fit indices in covariance structure analysis: conventional criteria versus new alternatives. Structural Equation Modeling 6, 1-55.

Jaensirisak, S., Wardman, M. and May, A.D. 2005. Explaining variations in public acceptability of road pricing schemes. Journal of Transport Economics and Policy 39, 127-153.

Jakobsson, C., Fujii, S. and Gärling, T. 2000. Determinants of private car user's acceptance of road pricing. Transport Policy 7, 153-158.

Jöreskog, K.G. and Sörbom, D. 1993. LISREL VIII users' reference guide. In: Scientific Software. Mooresville.

Kaneko, Y., Fukuda, A., Srisurapanon, V. and Oda, T. 2001. Estimation of the impact of area license scheme with multi-class user equilibrium model. Journal of the Eastern Asia Society for Transportation Studies 4, 277-291.

Kline, R.B. 1998. Principles and practice of structural equation modeling. Guilford Press, New York, NY, USA.

Larsen, O.I. 1998. The toll ring in Bergen, Norway—The first year of operation. Traffic Engineering and Control 29, 216-222.

Office of the Commission for the Management of Land Traffic. 1995. A study for transportation planning in Bangkok: project on traffic restraint measure and parking planning. Office of the Prime Minister, Bangkok, Thailand.

Rienstra, S. A., Rietveld, P. and Verhoef, E. T. 1999. The social support for policy measures in passenger transport. A statistical analysis for the Netherlands. Transportation Research Part D 4, 181-200.

Rogers, R.W. 1983. Cognitive and physiological process in fear appeals and attitude change: A revised theory of protection motivation. In Cacioppo, I.T. and Petty, R.E. (Eds.), Social Psychophysiology: A source book, Guilford, New York, 153-176.

Rujopakarn, W., 2003. Bangkok transport system development: what went wrong? Journal of the Eastern Asia Society for Transportation Studies 5, 3302-3315.

Schade, J. and Baum, M., 2007. Reactance or acceptance? Reactions towards the introduction of road pricing. Transportation Research Part A 41, 41-48.

Schade, J. and Schlag, B. 2003. Acceptability of urban transport pricing strategies. Transportation Research Part F 6, 45-61.

Schuitema, G. 2003. Pricing policies transport. In: Hendrickx, L., Jager, W., Steg, L. (Eds.). Human decision making and environmental perception, Department of Psychology, University of Groningen, Groningen, The

Netherlands, p. 203-222.

Schwartz, S.H. 1973. Normative explanations of helping behavior: a critique, proposal, and empirical test. Journal of Experimental Social Psychology 9, 349-364.

Schwartz, S.H. 1977. Normative influences on altruism. In: Berkowitz, L. (Ed.). Advances in experimental social psychology 10, New York, NY, USA, p. 221-279.

Stern, P.C., Dietz, T., Abel, T., Guagnano, G.A. and Kalof, L., 1999. A value-belief-norm theory of support for social movements: the case of environmentalism. Human Ecology Review 6, 81-97.

Thailand Development Research Institute. 2001. Transportation master plan preparation for the 9th plan (2002-2006): executive summary and full report. Office of the Commission for the Management of Land Traffic, Office of the Prime Minister, Bangkok, Thailand.

Transport for London. 2004. Central London congestion charging scheme: six months on. Transport for London, London, UK.

Tretvik, T. 2003. Urban road pricing in Norway: public acceptability and travel behaviour. In: Schade, J., Schlag, B. (Eds.). Acceptability of transport pricing Strategies, Elsevier, Oxford, UK, p. 77-92.

Viegas, J.M. 2001. Making urban road pricing acceptable and effective: searching for quality and equity in urban mobility. Transport Policy 8, 289-294.