MODE, MOOD AND TRIP MANAGEMENT: A QUALITATIVE ANALYSIS OF THE EFFECTS OF RTPI ON BUS USER BEHAVIOUR AND ATTITUDES

Michael Carreno, Stephen Stradling & Tom Rye
Transport Research Institute, Napier University, Edinburgh, EH10 5DT, UK

1. ABSTRACT

As part of a wider evaluation of a pilot Real Time Passenger Information (RTPI) system implemented along a Quality Bus Corridor in Edinburgh, UK, a household survey was conducted with residents living alongside the route, 4 months after the system was installed. Respondents were asked, inter alia, to state in an open-ended question the effects of the RTPI system on their behaviour and attitudes towards local bus use. Whilst only a small change in actual bus use was reported, many users reported changes in their attitudes in terms of reduced waiting time, perceived security, stress reduction, satisfaction with bus services and facilitation of journey planning. Analysis of responses supported a typology of three main effects of RTPI on: respondent’s modal choice (Mode Management), respondents’ state of mind whilst waiting for and using bus service (Mood Management) and ease of journey planning (Trip Management). The results are discussed in relation to current understanding of transport choice behavioural change models, suggesting the impact of RTPI is to retain, and to stimulate ‘behavioural intentions’ (to use buses more often) for existing passengers, rather than actual modal change per se.

2. BACKGROUND

Enhancements to local bus services are increasingly seen as an important element in encouraging modal shift as well as addressing problems with traffic congestion and its associated environmental problems. However, ever increasing traffic congestion in many urban areas often restricts the ability of public transport operators to deliver services according to schedules, which in turn can have a negative impact on the quality of service provided to existing or potential users. One solution being deployed in many cities is the provision of electronic information displays at bus stops, which give users an estimate of the waiting time for the next bus or series of buses, on one or more bus routes. These systems commonly referred to as Real Time Passenger Information (RTPI) systems use a variety of technologies whereby bus arrival
times are calculated by a central management computer to track the location of buses in real time.

This information generates predictions of bus arrival times at stops along the route, which are relayed over the network to users at ‘dynamic’ display signs at bus stops. RTPI systems, typically used in conjunction with other measures to increase reliability, reduce journey times and promote the image of services, have been widely utilised (e.g. Infopolis 2, 1998; Real Time Information Group (RTIG) 2007). In the UK for example, by the end of 2006, at least 46\(^{1}\) UK local authorities had operating RTPI systems, RTPI tracking units had been fitted to 17,060 buses (43% of the total UK bus fleet) and an estimated 2.7 billion (51%) of bus passenger journeys per annum occurred on RTPI equipped buses (RTIG, 2007).

3. REVIEW OF LITERATURE

3.1. Evidence of RTPI effects

Despite the substantial investments involved in their implementation, literature detailing the full benefits of RTPI to customers remains scarce (Basford et al., 2003; Dziekan, 2004). Many evaluations of RTPI systems for example, have focussed on aspects such as comprehensibility, legibility and positioning of displays, which relate to design aspects of individual systems being studied (Dziekan & Vermeulen, 2006) and/or operational benefits to justify a business case for the implementation or expansion of RTPI systems (Warman, 2004).

There is little (or consistent) empirical knowledge about the behavioural effects of RTPI in terms of increases in bus patronage. The few sources that report increases of passenger numbers as a direct result of installing RTPI systems provide mixed results (Balcombe et al., 2004). Schwieger (2003), for example estimated increases in patronage resulting from the implementation of ‘advanced traveller information systems’ (of which RTPI is a subset) to between 1 to 3%, whereas others have suggested larger effects. Wilkinson et al., (1998) for example reported a 5.6% rise in patronage on the SUPEROUTE in Bournemouth and in Liverpool the Timechecker system was credited with achieving a 5% increase in patronage over 3 years (Infopolis 2, 1998). More notable effects were reported by Lehtonen & Kulmala (2002) who reported a 15% self-reported increase in bus use following the introduction of RTPI on the Helsinki ELMI system route and Cowell et al. (1998) a 11% increase at a rail/bus interchange in Hepworth, UK.

These discrepancies may be due to the fact that often a combination of measures are introduced (which include RTPI) and it is difficult to ascertain what contribution the deployment of RTPI has to the reported increase (Basford et al. 2003; Dziekan & Vermeulen, 2006).

Dziekan & Vermeulen (2006) suggest that the effects of RTPI displays at bus stops are of a more psychological nature, changing users’ perceptions of, and attitudes towards bus services. More recently, Dziekan & Kottenhoff (2007) proposes a framework for the evaluation of at-stop RTPI systems, based on seven main positive effects (including the impact on ridership mentioned

\(^{1}\)Numbers as per RTIG (2007)

A brief summary of available evidence to support these effects is presented in Table 1. As noted earlier evidence to support these effects is limited, which Dziekan & Kottenhoff, 2007 suggest is due to most evaluations not taking all factors into consideration. As such it is not clear how these effects are interrelated to each other (if they are) and how they ultimately relate to actual behavioural change.

3.2. Theoretical background

It is increasingly acknowledged that for many individuals behavioural change (including mode shift) is not a one-step process and that for behavioural change to be realised individuals must pass through a series of sequential stages, whereby changes in key attitudes and perceptions about the new behaviour (constructs) must first occur (MAX-SUCCESS, 2008; Bamberg, 2008- see Fig 1).

Fig 1: MaxSEM (Max Self-Regulation Model) of behavioural change process

MaxSEM assumes a ‘goal directed approach in that individual’s desire to reach a pro-environmental goal (reduce car use) is the central motivational source of behavioural intentions regarding modal choices. The model assigns great importance to emotional/affective processes and self-evaluation standards, i.e. ultimately the desire to achieve an environmental goal is determined by the affective evaluation of knowledge about environmental problems (via activation of personal norms and the emotions anticipated with goal achievement).
MaxSEM assumes four key stages to which individuals must pass through in order for long-term behavioural change to occur. For stage-progression to occur, critical threshold criteria must be satisfied (shaded in Fig 1), e.g. pre-contemplators must have a goal (motivational intention to want to change behaviour) before they enter the next stage (Contemplation), etc.

Interventions (which would include RTPI) may trigger specific MaxSEM constructs and facilitate individual movement between stages leading ultimately to behavioural change. Accordingly for many people, any changes in mode behaviour are unlikely be realized for ‘some’ time after the implementation of any mode shift measure, if at all. This may negate any ridership effects at the time of early post-evaluations typically performed (Harrison et al., 1998; Schweiger, 2003). Further, more subtle non-overt behavioural change effects (changes in attitudes and perceptions that would facilitate the behavioural change process) would not be measured due to the typical evaluation methods used.

4. RESEARCH OBJECTIVES

In 2004 a trial RTPI system was introduced along a Quality Bus Corridor (QBC) in Edinburgh, UK, which provided an opportunity to utilise MaxSEM’s assumptions regarding behavioural change by examining the impact of RTPI on a sample of Edinburgh residents’ attitudes and perceptions towards using bus services and their susceptibility and willingness for mode shift.

The study will also allow Dziekan & Kottenhoff’s (2007) suggested effect framework to be evaluated in terms of validating the individual effects suggested and to explore the links between the suggested effect factors.
### Table 1: Summary of evidence to support Dziekan & Kottenhoff’s (2007) effect framework

<table>
<thead>
<tr>
<th>Effect</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived wait time</td>
<td>Several authors have examined the impact of RTPI on users’ perceptions of waiting time and generally found users underestimated the actual time they spent waiting for buses when RTPI was present, e.g. Nijkamp <em>et al.</em>, 1996; Schweiger, 2003.</td>
</tr>
<tr>
<td>Positive psychological effects</td>
<td>Other authors have found that RTPI can produce positive changes in users’ perceptions whilst waiting for and using bus services. These changes include ‘increased feelings of security’, (e.g. Science Applications Corporation, 2003); ‘reduced anxiety’ (Cowell <em>et al.</em>, 1988); ‘increased level of comfort’ (Lehtonen &amp; Kulmala, 2002); ‘stress reduction’ (Smith <em>et al.</em>, 1994) and ‘reduced frustration’ (Nakagawa <em>et al.</em>, 1999).</td>
</tr>
<tr>
<td>Adjusted travel behaviour</td>
<td>Dziekan &amp; Kottenhoff suggest these effects include ‘more efficient travelling’, e.g. selecting alternative modes (Mishalani &amp; McCord, 2006), or bus routes (Hickman &amp; Wilson, 1995); ‘Utilisation of wait time’ (perform other activities if buses are not due, e.g. shopping (Mishalani &amp; Mc Cord, 2000; Cauldfield &amp; O’ Mahony, 2004); and ‘Other adjustment strategies’ such as letting a crowded bus pass if another was due soon (Cowell <em>et al.</em>, 1988).</td>
</tr>
<tr>
<td>Mode choice effects</td>
<td>Results in modal shift following the introduction of RTPI (summarised earlier).</td>
</tr>
<tr>
<td>Higher customer satisfaction</td>
<td>Most evaluations of RTPI have found high levels of satisfaction with RTPI systems, which in turn can enhance customer satisfaction with bus services overall (e.g. Horbury, 1999; Schweiger, 2003; Cauldfield &amp; O’ Mahoney, 2004).</td>
</tr>
<tr>
<td>Better image</td>
<td>A key barrier to increasing bus patronage is held to be the image of bus services (e.g. Stradling <em>et al.</em>, 2007). Dziekan &amp; Kottenhoff suggest that RTPI results in a general increase in the attractiveness of bus services which helps to promote the image of bus services.</td>
</tr>
<tr>
<td>Increased willingness to pay</td>
<td>Several authors have attempted to quantify the value attached to RTPI in monetary terms, and generally found that customers were willing to pay (a modest amount) more to the actual fare if RTPI was present (e.g. Smith <em>et al.</em>, 1999; Khattak <em>et al.</em>, 2003).</td>
</tr>
</tbody>
</table>

### 5. CASE STUDY INFORMATION

In November 2004 the trial RTPI system was installed on the A7/A701/A900 Quality Bus corridor (QBC) which runs approximately north-south through the City of Edinburgh. The system provided information on the estimated arrival times of buses (on certain routes) at individual bus stops, the information being displayed on signs adjacent to the bus stops (see Fig 2).
The system also included the following three components to improve bus services; [1] A continuous display to the bus driver, showing whether they are running early or late according to the schedule (see Fig 3); [2] Provision of information to the bus operator’s (Lothian Buses) control room to enable proactive operational control of services, and; [3] Traffic signal pre-emption linked to the Edinburgh ‘Urban Traffic Control system’ (UTC). At the time of our survey, only the first of the above components had been fully implemented, the second was partially implemented, and the third was temporary suspended for technical reasons.

6. METHODOLOGY

As part of a research project for the City of Edinburgh Council and the Scottish Executive (now Scottish Government), Edinburgh Napier University’s Transport Research Institute, operated as a subcontractor to Colin Buchanan and Partners, carried out a household survey in 6 Edinburgh postcode areas alongside a pilot Real Time Passenger Information (RTPI) system implemented along a QBC about respondents’ use of and views on public transport in general and real time information in particular.

This paper presents a supplementary analysis of the main questionnaire responses, specifically to an open-ended question aiming to examine respondents’ perceptions of the RTPI system in terms of their travel behaviours and attitudes to using bus services on the route and in Edinburgh generally; i.e. Q.41: “If your travel behaviour or attitudes towards using local bus services has changed in any way since the introduction of the RTPI system, please tell us how and whether the introduction of RTPI has played a part in this change”.

© PTRC and Contributors 2009
7. RESULTS

From the total of 983 returned questionnaires in the main after survey, 237 respondents answered Question 41 (24% response rate). 168 of these were female (71%) and 69 male (29%). Over a quarter of the sample were aged between 25 to 34 years, one fifth aged between 35 to 44 and one fifth 55 to 64 years, with lower percentages in the youngest (17 to 24) and older groups (55 to 64 and 65+). Over half the sample were classified as ‘frequent bus users’ (53% using buses at least 2-3 times per week) and slightly less ‘infrequent users’ (47%, once per week or less).

Data was analysed using a content analysis approach (e.g. Patton, 2002), whereby each response to Question 41, was analysed for key words and phrases which related to the impact of RTPI on individuals attitudes to using local bus services, and behaviours resulting directly to the RTPI system.

Initial inspection of comments allowed the data to be classified into three main categories; namely; Mode Management (Comments related to change in respondents' behaviours, including walking and other mode use when using bus services), Mood Management (Comments related to changes in respondents' mood when waiting for or using the RTPI system) and Trip Management (Comments related to general journey planning issues, time management issues, choice of bus services and bus stops to use, and how time is spent waiting for bus services). Approximately 40% of respondents made comments in each of these categories, with many making comments on two, or all categories. A further subset of comments was made directly in relation to increases in bus use resulting from the introduction of RTPI (see below).

7.1. Self-reported change in bus usage

Only 9 respondents (3-4% of total) made comments indicating they had begun using local buses (or used buses more often) as a direct result of the RTPI system. For example, “Due to the introduction of RTPI my use of that route has increased considerably and I use buses generally a bit more” (Male, aged 78), “It (RTPI) encourages me to use buses more often, and I do” (Female, aged 32) and “Yes it has made travelling by bus easier and less painful and I have made more bus trips than I usually do” (Female, aged 50).

7.2. Mode Management comments were divided into three further subcategories, namely;

Route selection management: In addition to actual changes in respondent’s use of buses, several respondents commented on how the introduction of RTPI had affected their use of buses in other ways. These included choosing which bus to take, depending on what the sign says; and changing bus en-route. For example, “Gives you options about which bus to take, one all the way, or one so far and then change, and help me decide the best option for my journey” (Female, aged 63). Related to the second point, “If I find I have missed my usual bus (no. 16) to work, I can get any bus to Princes St. and
continue my journey from there with a bigger selection of buses to catch” (Female, aged 42).

Walking management: In contrast to changes in bus use many respondents commented on how their walking behaviours had changed due to the introduction of RTPI. For most respondents, this related to making an informed choice between walking and waiting for the bus. For example; “You can see clearly when the next bus is coming, therefore you can decide if you would be better walking” (Female, aged 26); “I used to always wait for the bus that stopped nearest my house. With the introduction of RTPI, if it shows my normal bus is not due for a while, I might take another bus that drops me in my area and walk home” (Male, aged 27). However, for a few respondents, RTPI meant less walking, e.g. “As I know the exact information about bus times, it saves me walking on a further 2 stops to get a better choice of buses from another route” (Female, aged 45); “I will wait for the bus rather than walk” (Female, aged 32).

Taxi management: Several respondents also described changes to their use of taxis. These were largely related to the choice between taxi and bus. For example: “It is now easier to work out if it’s worth waiting for the bus or finding an alternative means of transport, i.e. Take a taxi” (Male, aged 23); “With the new RTPI system you know exactly when the bus will arrive and whether it is worth waiting, or taking a cab or walking” (Female, aged 54); “If a bus is not due for more than 10 minutes, I’ll choose to walk or take a cab, instead of waiting” (Female, aged 30).

7.3. Mood management comments were divided into six further subcategories, namely;

Stress management: The greatest effect of RTPI on respondents’ mood appeared to be reduction of stress levels, primarily when waiting for buses though also whilst travelling by bus. Some 24 respondents mentioned a reduction in stress in their comments. For example; “Stress of not knowing if the bus is going to come or not is removed” (Female, aged 46); “Knowing when your bus is due removes the stress of waiting” (Male, aged 46).

Confidence management: For other respondents, RTPI served to increase their confidence or reduce worry when using bus services. For example; “I have more confidence in the punctuality of the buses since the RTPI system was introduced” (Male, aged 48); “I like the certainty that RTPI gives in waiting for a bus. I have spent too much time in my life staring in the distance wondering if the next red bus is my ride home” (Female, aged 37); “It gives you more confidence in the system and removes worry about when the next bus might come” (Female, aged 73).

Safety management: For others RTPI affected respondents’ perceptions of safety when waiting for and using bus services). For example, “I feel much safer knowing how long I have to wait” (Female, aged 54); “I don’t have to hang around unnecessarily and feel a lot safer not having to do so”, (Female, aged 41); “It helps me, it makes bus travel more safe and secure” (Female, aged 29).
Bus image management: It also appeared that for many respondents, RTPI had helped increase their satisfaction with Edinburgh buses more generally. For example; “This is a big improvement to the bus experience” (Female, aged 45); “The best thing that happened to public transport” (Male, aged 47); “RTPI improves bus services greatly” (Female, aged 37); “Wow, what an improvement” (Male, aged 26).

Waiting time management: For some people the positive moods changes were translated into a perceived reduction in waiting time. For example, “It’s so much more enjoyable now, the wait for buses seems a lot less” (Male, 32); “The buses seem to come much quicker” (Female, ages 24); “I feel less stressed knowing how much time I have to wait and the time seems to pass much more quickly” (Female, aged 46).

Other mood management changes: As well as affecting respondents’ mood as above, for some people RTPI affected users’ mood in other ways. These included reduced frustration (“So much less frustrating than before, or waiting at bus stops without RTPI” (Female, aged 34) and a more relaxed trip, e.g. “It lets a person know exactly what is happening and therefore more relaxed waiting at the stop” (Female, aged 53). For other respondents, the introduction of RTPI had served to enhance their overall perceptions (positively) when using bus services, making the journey more pleasant and more bearable. As one said, “Taking the bus to town is more pleasant now that I know exactly how long I’ll have to wait at the stop” (Male, aged 42).

7.4. Trip management comments were divided into four subcategories, namely;

General journey management: Comments on the effects of RTPI on journey management issues generally, for example, “Using RTPI allows me to plan my journey better” (Male, aged 69); “RTPI allows you to assess (plan) your travel route” (Female, aged 31); “Can plan my journey better” (Male, aged 55); “It makes me more aware of what services are available and what my travel options are” (Male, aged 33).

Time management: Some respondents focused specifically on time management issues stating, for example, that “RTPI allows better time management” (Female, aged 50), and “I can plan time better, particularly going to work in the morning” (Female, aged 37); “It makes me more organized time wise” (Male, aged 37).

Bus stop management: Other comments were made in the context of respondents being able to plan their bus journey more efficiently through choices in which bus stops to use. For example; “Will now walk from local stop to next stop where there is RTPI as there are more choices of buses and RTPI information” (Female, aged 47); “My nearest bus stop does not have RTPI. For that reason I almost never use that bus stop and prefer walking to the Lady Road one which has RTPI” (Female, aged 29).

Activity management: The final sub-classification covered by journey management issues, concerned comments made by respondents of how RTPI had allowed them to undertake other types of activities whilst waiting for
buses to arrive. For example; “If up in the town you can tell if you have time to go into just one more shop and not miss your bus” (Female, aged 33); “If I know there is a 20-minute gap before my bus, it allows me to go to the shop, or fill in the time with other activities” (Male, aged 36); “Like it, because you know if you’ve enough time to nip into the shop” (Female, aged 26); “It means you can pop into a shop and still know you have time to catch the bus” (Female, aged 32); “Deciding I’ve got time for a cigarette or not” (Male, aged 50).

8. DISCUSSION

8.1: Effect of RTPI on users' behaviour and attitudes

Whilst only a small number of respondents in the after survey reported increased bus use, the numbers who did are of order of magnitude that is similar to those reported in previous studies (e.g. Wilkinson et al., 1998; Dziekan & Vermeulen, 2006). However, these individuals were already bus users at the time of the survey, suggesting the impact of the RTPI system was to stimulate new trips for existing customers, rather than attract new customers per se3, as suggested by some previous authors (e.g. Wilkinson et al., 1998; Lehtonen & Kulmala, 2002).

It is also plausible that given that the RTPI system had only been in place for 4 months at the time of the after survey, any mode shift effects would not have been fully realised (Schwieger, 2003). Indeed this later explanation is consistent with current understanding of individual mode shift behaviour MAX-SUCCESS, 2008; Bamberg, 2008).

As can be seen in Fig 1 earlier, for those people in the relatively early stage of contemplation (likely to be many infrequent users in this case- they may only have, or use buses for very few journeys, or when without access to cars) key constructs requiring change in advance of behavioural change include ‘perceived behavioural control’ (increased confidence to perform the behaviour, i.e. use buses), ‘positive attitudes towards the alternative behaviour’ (i.e. attitudes towards using buses) leading to the key threshold point of the formation of behavioural intentions.

There was clear evidence obtained that the introduction of RTPI had affected these important constructs for many people, by changing their attitudes towards bus travel (behaviour alternative) and instilling confidence to use buses more often, with many respondents making statements linking these changes in attitudes and perceptions to the formation of future intentions (i.e. use buses more often in the future). For example; “As you have more information, more reliable information, I am willing to use the bus more - even when I have meetings or times to get to places. I am happy to trust the bus and will use them more often” (Female, aged 33); “Calms you down when you arrive at the bus stop and you only have a few minutes to wait for your bus to arrive you would not have the same confidence in the reliability of paper timetables. I will use buses more often due to the above” (Male, aged 42), “It’s
(bus travel) not as bad as I thought. I think I will use them more often in the future” (Female, aged 45), “A big difference. I’m more confident in using buses and will use them more in the future” (Male, aged 34), “RTPI has made a difference for me. I’ve used the bus a few times since it was introduced and see no reason not to use it again more” (Male, aged 35), “Avoids unnecessary waiting and doubt. More likely to travel by bus in the future” (Female, aged 82).

As individuals progress through to the later stages of change (Preparation/Action), other constructs become more important related to aspects of journey planning (Cognitive planning abilities) including time management, which bus stops to use and whether they had time to schedule other activities before their bus arrived. Again there is strong evidence (see section 7.4) that RTPI had influenced these constructs and progressed people to the final stage, and for a few resulted in increased bus use. For example, “It’s so much easier now with RTPI I can plan with confidence any trips I make (a bit like the car). I’m planning more bus trips very soon” (Female, aged 41); and “I’m so much more confident using buses, I know I will actually get there and on time. I’m planning to travel by bus for a couple of trips planned this month, and if all goes well, will use them again for other trips” (Male, aged 33).

8.2. Effect framework

Taken together the evidence obtained from this evaluation allows Dziekan & Kottenhoff’s (2007) suggested effect framework to be reclassified into three main effects; namely; Mode, Mood and Trip Management.

The three effects are interrelated with each other, of course, and may act in concert. For example, Mood Management effects are related to Trip Management effects: “Using buses is less stressful thanks to RTPI, I can plan my journeys more confidently, and make sure I arrive on time”, (Male, aged 34); “So much easier now, the uncertainty is removed and I can plan my day more easily” (Female, aged 40) and Mode Management effects to Mood management effects: “If I get there (bus stop) and know it’s a long wait, I can always walk, its knowing this information that makes the whole journey more relaxing” (Female, aged 29), or Mood, Mode and Trip Management all together: “Less stressful, more enjoyable, can decide whether to walk or wait, and be confident I’ll get to where I want, when I want to”, (Male, aged 45), “No more doubt about whether I’ll get there on time, if its not due, I can always get a taxi, it makes planning my day a whole lot easier” (Female, aged 46).

We also suggest, in line with current understanding of behavioural change, that for some travellers these effects, either singularly or cumulatively, will impact on future decision to use bus services.

9. CONCLUSIONS

Although, this evaluation failed to reveal any immediate modal shift effects resulting from the impact of RTPI, by linking these findings to current
understanding of theoretical behavioural change they suggest a potential long-term main effect of RTPI systems to significantly encourage increased bus use. However, other complementary measures may be required to entice non-users and ‘further push’ some existing (infrequent users) people along the behavioural change process to actual change. These could include strategies to facilitate ‘goal formation’ for pre-contemplators (Eriksson et al., 2008), similar to the current Transport for London’s imovelondon pledge campaign (http://imovelondon.tfl.gov.uk/), and for contemplators free trial bus tickets allowing people to try out local bus services, which may correct any misperceptions related to attitudes towards and/or their ability to use bus services (perceived behavioural control).

The results from this survey were obtained from an evaluation of RTPI installed on a QBC with many high frequency services. Whether similar or similar strength effects would be obtained on less-well served routes needs to be explored. There are many other factors that determine user’s information needs, such as time of day, day of week, personal characteristics (Balcombe et al. 2004) which were not considered in this research that need to be examined further.

As with many earlier evaluations of RTPI systems, the after survey analysed here was undertaken relatively soon after the system was implemented. Future studies are required that evaluate RTPI after a longer time period in order for the conclusions made in this paper (and others) to be validated and the full effects of RTPI on users attitudes and behaviour to be fully established. The results from this analysis on the effects of RTPI on users’ attitudes and behaviour have provided a useful typology of three interrelated effects, Mode, Mood and Trip Management which can be used to inform these future evaluations.

10. REFERENCES


ACKNOWLEDGEMENTS

The authors would like to thank the City of Edinburgh Council and the Scottish Government for supporting this research.
Notes

1 Based on those local authorities who responded to the RTIG survey, and thus the number of local authorities may be higher.

2 MaxSEM has evolved from the ongoing MAX-SUCCESS EU funded project (www.max-success.eu/) in which the authors are active partners. Work Package B of the project aims to enhance understanding of individuals' modal choice decisions and utilise this knowledge to enhance modal shift to more sustainable transport modes.

3 240 people from the original sample were non-bus users, of whom 98% were aware of the RTPI system, although, made no comments to Q. 41.

4 No comments were made by respondents concerning their 'willingness to pay' for bus services following the introduction of the RTPI system. This may be reflective of the lower importance attached to cost considerations when making local bus mode choice decision (e.g. Stradling et al., 2007).