

## **Evaluation of Local Authority Perceptions of Barriers to Sustainable Transport in Ireland**

David Browne

Centre for Transport Research and Innovation for People (TRIP)

Department of Civil, Structural and Environmental Engineering

Trinity College Dublin

Dublin 2

Ireland

Tel: +353 1 8963199

Fax: +353 1 6773072

Email: [davidbrowne2@gmail.com](mailto:davidbrowne2@gmail.com)

Brian Caulfield\*

Centre for Transport Research and Innovation for People (TRIP)

Department of Civil, Structural and Environmental Engineering

Trinity College Dublin

Dublin 2

Ireland

Tel: +353 1 8962534

Fax: +353 1 6773072

Email: [brian.caulfield@tcd.ie](mailto:brian.caulfield@tcd.ie)

Margaret O'Mahony

Centre for Transport Research and Innovation for People (TRIP)

Department of Civil, Structural and Environmental Engineering

Trinity College Dublin

Dublin 2

Ireland

Tel: +353 1 8962084

Fax: +353 1 6773072

Email: [margaret.omahony@tcd.ie](mailto:margaret.omahony@tcd.ie)

\* Corresponding author

Submitted: 31<sup>st</sup> July 2010

Word Count: 2,999 + (16 \* 250) = 6,999

Cite as: Browne, D., Caulfield, B, O'Mahony, M, Evaluation of Barriers to Sustainable Transport in Ireland and Potential Policy Options, *90th Annual Meeting of the Transportation Research Board, Washington, D.C., January, 2011*

**ABSTRACT**

The objective of this paper is to review the results of an on-line survey, which was presented to local authorities in Ireland in order to (a) evaluate their perceptions of barriers to sustainable travel and transport within their local jurisdiction and (b) evaluate their perceptions of potential policy measures. It was found that the general perception was that local public transport, cycling and walking facilities were inadequate and that the major barriers to public transport and cycling infrastructure provision were physical, i.e. inadequate economies of scale for public transport services and lack of physical space in urban areas for dedicated cycle paths. In terms of overall barriers to sustainable transport, it was found that the most significant barriers that were identified are (i) lack of alternatives; (ii) resource constraints on local authorities and agencies; and (iii) physical barriers.

The main policy priorities that were identified, in order of priority, include: (i) education and awareness; (ii) investment in cycling and walking infrastructure; (iii) improved public transport services; and (iv) balanced regional development and spatial planning. It was concluded that these results offer a useful insight from a professional perspective into sustainable transport priorities at a local authority level. However, they could be complemented by further research into the perceptions and attitudes of the general public in order to develop more empirical evidence and attract public support for resource allocation priorities and policy implementation. The approach presented in this paper could easily be adapted and applied by policy-makers in other jurisdictions.

## INTRODUCTION

The objective of this paper is to evaluate responses from local authorities in Ireland on their perceptions of local barriers to sustainable transport and potential policy priorities that could be introduced to promote sustainable transport. This survey was carried out as part of a wider project on assessing the barriers to sustainable travel and transport in Ireland.

Ireland has 34 local authorities, which are responsible for a wide range of issues, such as housing, waste management and local transport planning. Local authorities have an important role in delivering sustainable transport by *inter alia* (i) allocating resources according to project and policy priorities; (ii) implementing national legislation and guidelines at a local level through development plans and local area plans (LAPs); and (iii) encouraging sustainable travel through mobility management and traffic calming measures such as reduced speed limits in urban areas and urban design. Thus, it is useful to evaluate what the local perceptions and barriers might be both in terms of determining a bottom-up approach to sustainable transport evaluation and focussing decision-makers on policy priorities within their local jurisdiction.

## LITERATURE REVIEW

Tricker and Hull (1) carried out a similar study as part of the UK DISTILLATE (Design and Implementation Support Tools for Integrated Local Land-use, Transport and Environment) Research Programme. This study involved a questionnaire study, which was completed by officers from transport planning authorities who were involved in the delivery process for sustainable local surface transport solutions (SLTS) (1). It was found that funding, modelling, monitoring and evaluation, strategy option generation and strategic appraisal were the most problematic barriers to the delivery of SLTS (2).

Tricker and Hull (1) identified 79 factors or barriers within the delivery process, with 46% of barriers identified as organisational, 25% as external and 29% as technical in nature. Individual barriers were assigned a rating based on 'level of seriousness for barrier' with a maximum value of 1. Barriers with the highest ratings include (i) lack of funding for operational subsidies; (ii) pressure on staff time and resources in delivery; (iii) resources to develop models; (iv) availability of skilled/technically expert staff; and (v) public acceptability of restraint-based policy instruments (1).

Tricker (3) reviewed over 25 studies, which broadly looked at barriers to sustainable transport solutions and identified the major barriers using a typological classification, including difficulties in achieving integrated delivery and joined-up governance, external limits to action and strategy and technical opportunities in aiding delivery. ECMT (4) identified a number of barriers to the implementation of sustainable urban travel policies, including (i) lack of a national policy framework; (ii) poor strategy formulation; (iii) poorly joined-up government; (iv) inadequate stakeholder involvement and policy acceptance; (v) lack of political commitment; (vi) analysis and data quality; (vii) poorly channelled financial streams; (viii) public transport financing sources; (ix) inappropriate pricing/fiscal framework; and (x) unsupporting legal/regulatory framework (4).

Banister (5) argues that barriers to sustainable transport can be divided into seven main categories, including:

1. Financial or physical resource barriers, e.g. insufficient resources for funding agencies or costs for consumer or industry;
2. Technical barriers, including commercial availability;
3. Institutional and policy barriers, e.g. sectorization of policy-making, opaqueness of responsibility or inertia, lack of accountability or a political champion, etc.;
4. Socio-cultural barriers or failure to attract public acceptability;
5. Legal barriers, e.g. where a particular measure may be *ultra vires* and requires statutory or constitutional change or where legal challenges cause delays in policy implementation;
6. Policy failures, including unanticipated side-effects or unintended consequences; and
7. Physical barriers, e.g. space restrictions in urban areas, area topography, etc.

Potential barriers, which may undermine the public or institutional acceptance of a proposed policy include: (i) incomplete information and lack of awareness of alternative options; (ii) perceived lack of effectiveness and efficiency; (iii) means of revenue allocation, e.g. hypothecation of revenue for public transport investment or reduction income tax may increase public acceptability; and (iv) perception that the method is inequitable. Thus, it is imperative that the public (i) understand the objective of a projected measure, the background, the aims and how the measures are implemented in practice and (ii) are satisfied as to its fairness and effectiveness.

Key criteria to ensuring policy implementation and acceptability include equity, fairness, efficiency, timing, reliability, flexibility, transparency, necessity and consistency. Banister (5) concluded that the achievement of successful policy implementation requires leadership and a commitment to change, particularly where there are many potentially conflicting interests, extreme complexities and uncertain outcomes.

Key steps to ensure that sustainable transport policies are acceptable, effective, and equitable include:

1. A long-term policy framework, which integrates spatial planning, transport investment and housing policy;
2. Appropriate national, regional and local governance and institutional structures;
3. Clear, consistent and transparent policy signals;
4. Empirical research in order to determine the likely outcomes of potential transport policies;
5. Communication, public participation, stakeholder consultation, education and awareness-raising in order to ensure public acceptability of measures; and
6. Temporary or permanent exemptions, where necessary, for certain commercial operators and lower socio-economic groups, whilst ensuring fairness and equity for all network users.

Banister and Marshall (6) undertook an empirical investigation of barriers to policy measures and found that resource barriers occurred most frequently, followed by institutional/policy and socio-cultural barriers. Hull and Tricker (2) found that the most important external challenge was inadequate operational subsidies, followed by market regulation of transport operations, public acceptability of restraint-based instruments, contradictions between national policy objectives and short-termism in

political decision-making. Other relevant studies include Atkins (7); Vigar and Stead (8); Rietveld and Stough (9); Foxon et al. (10) and Tricker and Hull (1).

Tricker and Hull (1) offer a framework for the assessment of barriers in the delivery process for sustainable transport policy, including (i) barrier identification; (ii) barrier analysis, e.g. identification of organisational obstacles within local authorities, funding and implementation mechanisms and parameters/constraints defined by external factors; and (iii) identification of levels in the policy process, e.g. strategy development, scheme design and operation.

## **METHODOLOGY**

As part of this analysis, surveys were sent to representatives of the Local Authority Sustainable Travel Officer Network in the 34 local authorities in Ireland in order to evaluate their assessment of barriers to sustainable travel and transport and policy priorities within their local jurisdiction. 22 responses were received, which illustrates a response rate of almost 65%.

Respondents were asked to give an opinion on a series of questions relating to 'level of importance' of barriers to sustainable transport and potential policies. Responses were then weighted in order to determine the rating average, e.g. a response of 'not important' was given a rating of 1, a response of 'somewhat important' was given a rating of 2, a response of 'important' was given a rating of 3 and a response of 'very important' was given a rating of 4. The total sum of the weighted responses was then divided by the total number of responses, i.e. N=22, in order to determine the rating average. Rating averages range from 1 to 4, where 1 is deemed not important and 4 is deemed very important. Thus, the higher the rating average, the more significant the barrier perception among local authority respondents.

## **RESULTS**

Survey recipients were asked whether local public transport services were adequate in their area and it was found that 100% of respondents indicated that local public transport services were inadequate. Table 1 indicates that the primary barrier to public transport provision in local authority areas was perceived to be low urban density or insufficient economies of scale, followed by a lack of incentives for potential market entrants. The most insignificant barrier was perceived to be restrictions on competition by private operators. Figure 1 shows rating averages for local authority perceptions of barriers to public transport provision.

**TABLE 1 Local authority perceptions of barriers to public transport provision**

Barrier	Not important	Somewhat important	Important	Very important	No opinion	Rating average
Restrictions on competition by private operators	6	7	7	2	0	2.23
Insufficient priority given to public transport by local authorities	3	10	4	5	0	2.50
Lack of demand for public transport	2	4	11	5	0	2.86
Lack of incentives for potential market entrants	2	3	9	6	1	3.05
Low urban density or insufficient economies of scale	1	3	6	12	0	3.32

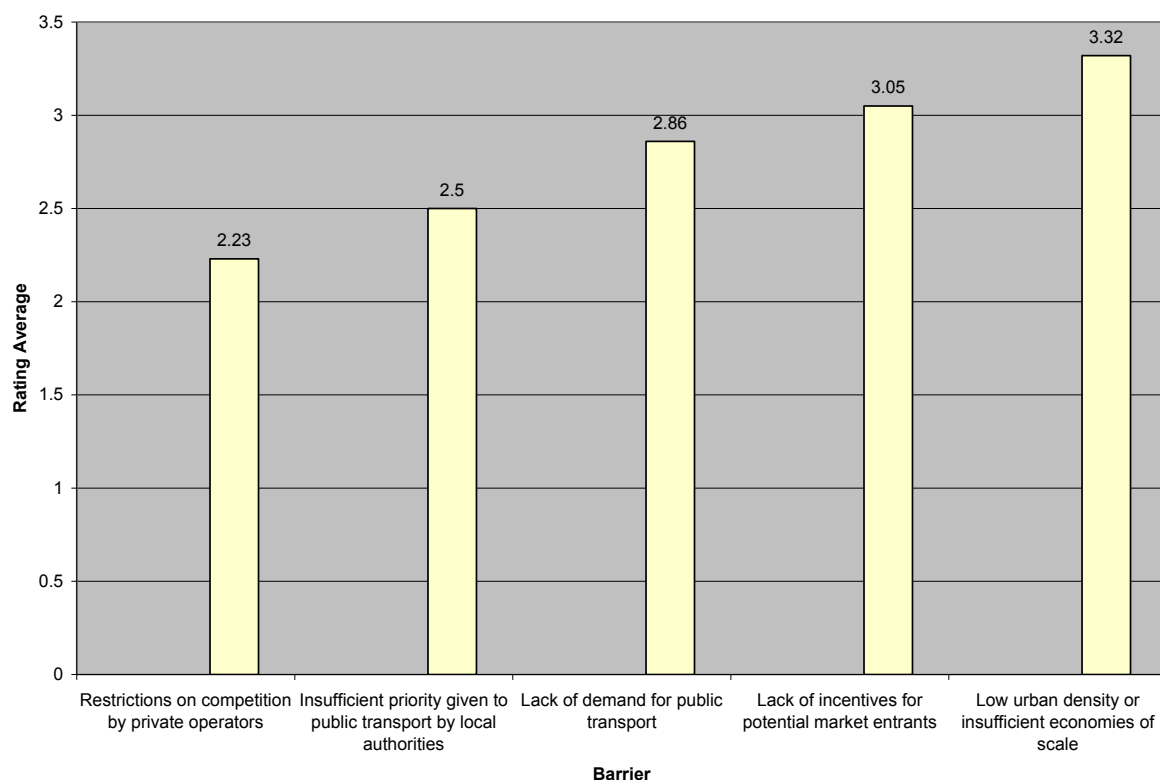
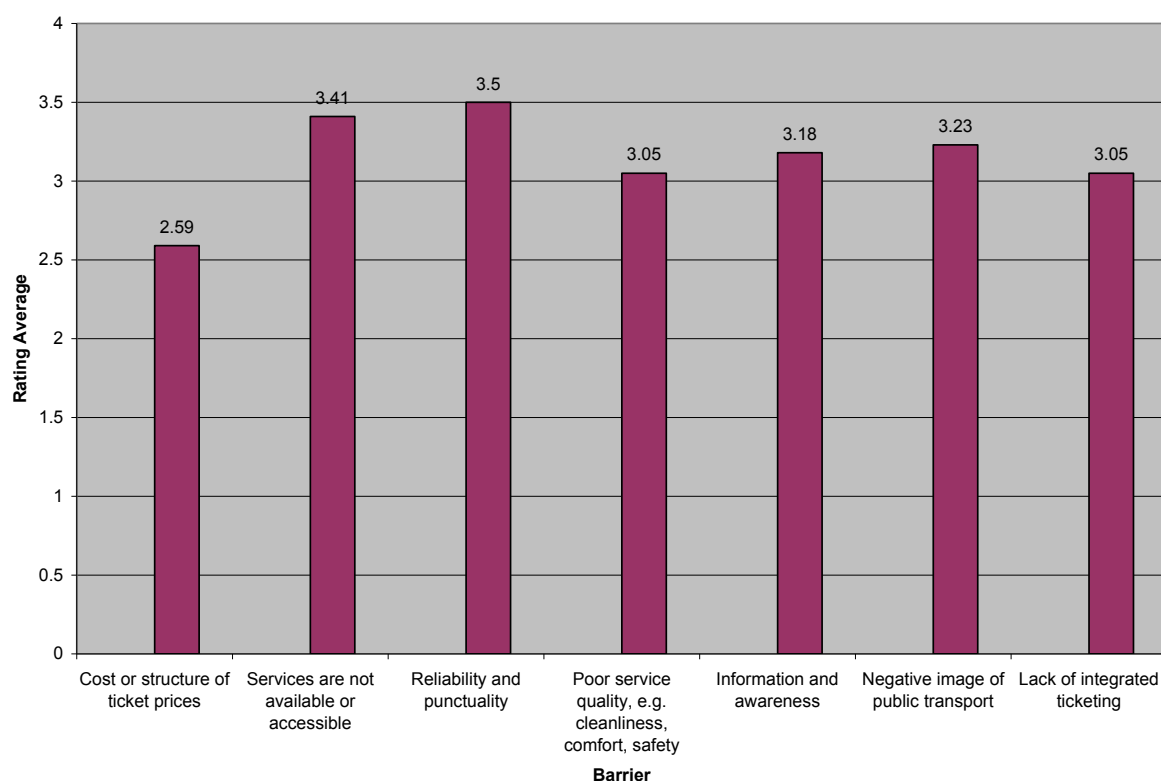
**FIGURE 1 Local authority perceptions of barriers to public transport provision**

Table 2 collates responses from local authorities on barriers to public transport use and indicates that perceptions of unreliability and lack of punctuality were perceived to be the primary barriers, followed by unavailable or inaccessible services. The most insignificant barrier was perceived to be cost or structure of ticket prices. Figure 2 shows rating averages for local authority perceptions of barriers to public transport use or demand.

**TABLE 2 Local authority perceptions of barriers to public transport use**

Barrier	Not Important	Somewhat Important	Important	Very Important	No Opinion	Rating Average
Cost or structure of ticket prices	3	9	5	4	1	2.59
Services are not available or accessible	0	3	7	12	0	3.41
Reliability and punctuality	0	5	2	14	1	3.50
Poor service quality, e.g. cleanliness, comfort, safety	2	5	6	8	1	3.05
Information and awareness	1	4	7	10	0	3.18
Negative image of public transport	1	4	7	9	1	3.23
Lack of integrated ticketing	4	2	6	9	1	3.05

**FIGURE 2 Local authority perceptions of barriers to public transport use**

With regards to local authority perceptions of the adequacy of cycling and walking facilities in their jurisdiction, it was found that 86.4% of respondents indicated that local cycling and walking facilities were inadequate, with 13.6% of respondents indicating that they were adequate. Table 3 collates local authority perceptions of barriers to cycling and walking and indicates that a lack of suitable road space, followed by the perception that cycling and walking are unsafe and the cost of developing a cycle network are the primary barriers. The most insignificant barrier

was perceived to be a lack of fiscal incentives for potential cyclists and pedestrians. Figure 3 shows rating averages for local authority perceptions of barriers to cycling and walking.

**TABLE 3 Local authority perceptions of barriers to cycling and walking**

<b>Barrier</b>	<b>Not Important</b>	<b>Somewhat Important</b>	<b>Important</b>	<b>Very Important</b>	<b>No Opinion</b>	<b>Rating Average</b>
Cost of developing a cycling and walking network	0	3	9	10	0	3.32
Lack of fiscal incentives for potential cyclists and pedestrians	6	4	8	4	0	2.45
Poor quality of existing cycling and walking infrastructure	1	3	9	9	0	3.18
Perception that cycling and walking are unsafe	1	3	5	13	0	3.36
Lack of facilities offered at the workplace, e.g. showers, lockers, cycle racks, etc.	1	6	9	6	0	2.91
Lack of on-street cycling facilities	1	5	9	7	0	3.00
Speed limits in urban areas are too high	3	7	7	5	0	2.64
Lack of interest or awareness of health/environmental benefits	2	5	9	6	0	2.86
Negative image of cycling and walking	1	8	7	6	0	2.82
Distance is too far to travel	1	7	9	4	1	2.86
Perception of inclement weather	1	4	8	9	0	3.14
Topography	3	5	7	7	0	2.82
Lack of suitable road space	0	1	9	11	0	3.48



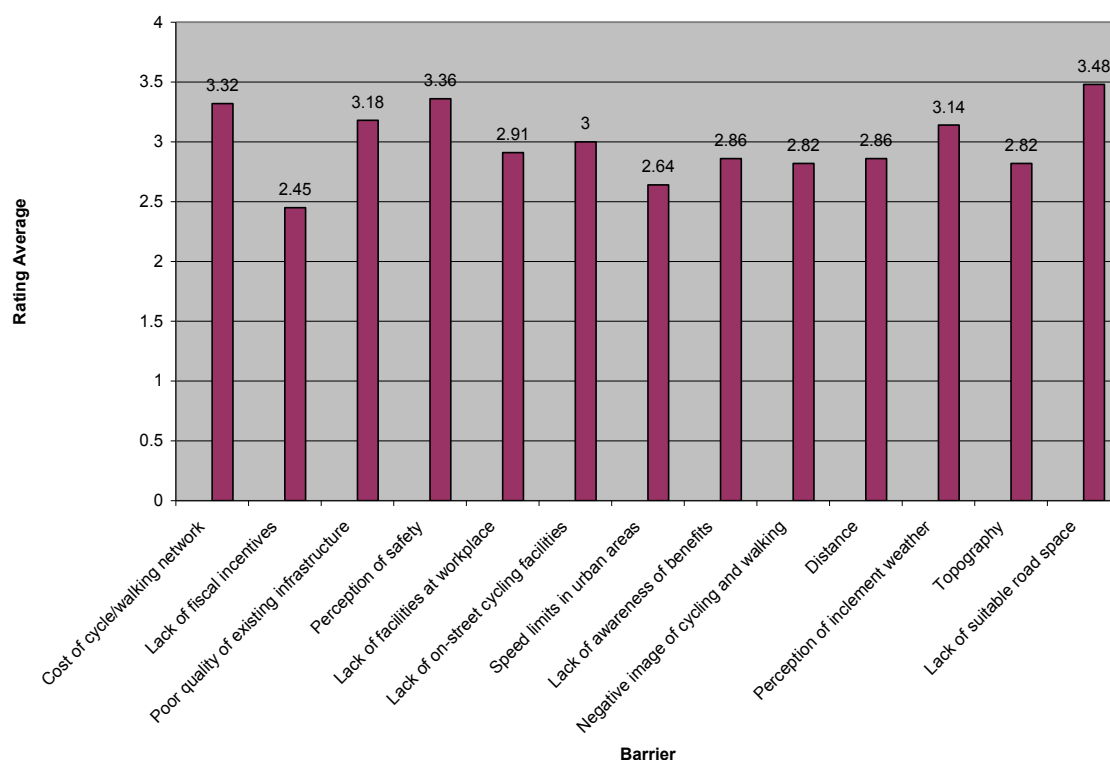
**FIGURE 3 Local authority perceptions of the barriers to cycling and walking**

Table 4 collates local authority responses to barriers to mobility management and indicates that lack of awareness by employers or organisations and lack of interest or pressure from employees are the primary barriers, while lack of detailed technical guidance was perceived to be the least significant barrier. Figure 4 shows rating averages for local authority perceptions of barriers to mobility management.

**TABLE 4 Local authority perceptions of barriers to mobility management**

Barrier	Not Important	Somewhat Important	Important	Very Important	No Opinion	Rating Average
Costs for employer or school	2	8	8	4	0	2.64
Lack of awareness by employers or organisations	1	2	10	9	0	3.23
Resistance by employers to flexible working or telecommuting	1	4	10	6	1	3.09
Perceived administrative burden	2	4	11	4	1	2.91
Lack of interest or pressure from employees	0	3	11	8	0	3.19
Insurance issues, e.g. for home working	3	8	6	1	4	2.77
Lack of statutory requirement for	2	6	9	5	0	2.77

mobility management plans						
Lack of detailed technical guidance	3	6	12	1	0	2.50

**FIGURE 4 Local authority perceptions of barriers to mobility management**

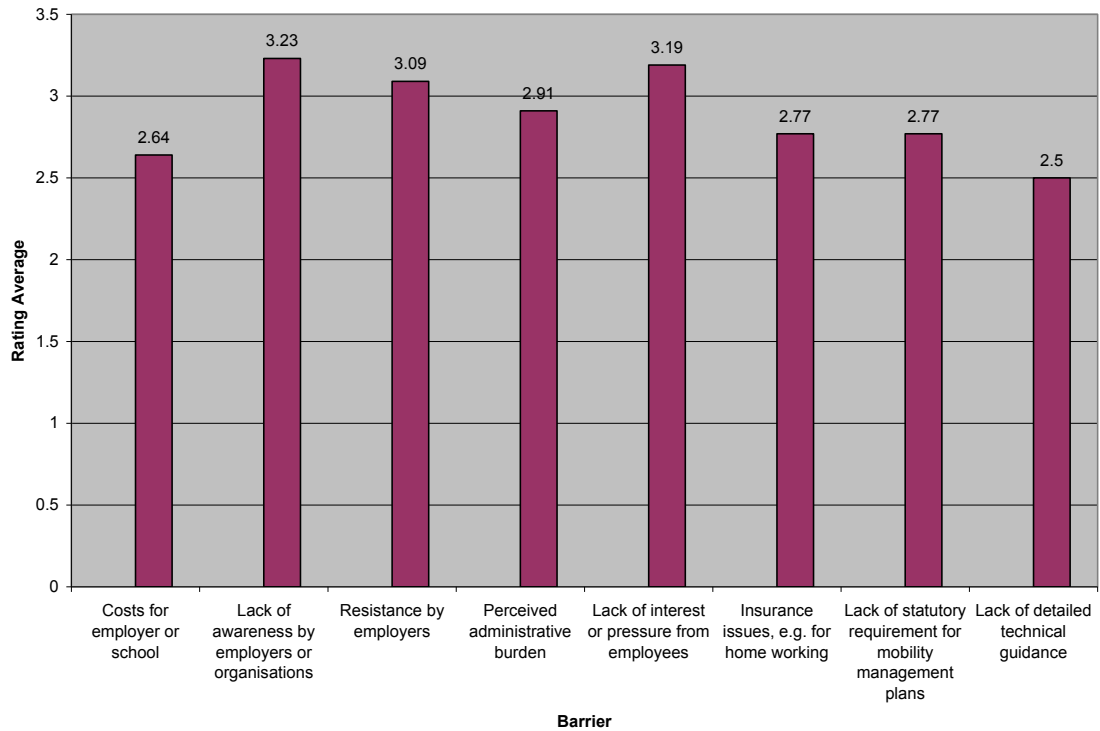


Table 5 collates local authority responses to barriers to sustainable residential development and indicates that difficulties in retrofitting sustainable transport solutions was perceived to be the most important barrier, followed by the legacy of one-off housing and urban sprawl. Relatively low commuting costs were perceived to be the least significant barrier. Figure 5 shows rating averages for local authority perceptions of barriers to sustainable residential development.

**TABLE 5 Local authority perceptions of barriers to sustainable residential development**

Barrier	Not important	Somewhat important	Important	Very important	No opinion	Rating average
Insufficient affordable housing	4	5	9	2	2	2.68
Relatively low commuting cost	2	7	12	1	0	2.55
Lack of local employment opportunities	1	6	9	6	0	2.91
Current spatial planning policy	1	7	8	6	0	2.86
Inadequacies of current planning and development legislation and guidelines	1	6	9	5	1	2.95
Availability of suitable high density housing in urban areas	1	6	8	7	0	2.95
Legacy of one-off housing and urban sprawl	2	2	6	12	0	3.27
Difficulties in retrofitting sustainable transport	0	1	6	15	0	3.64

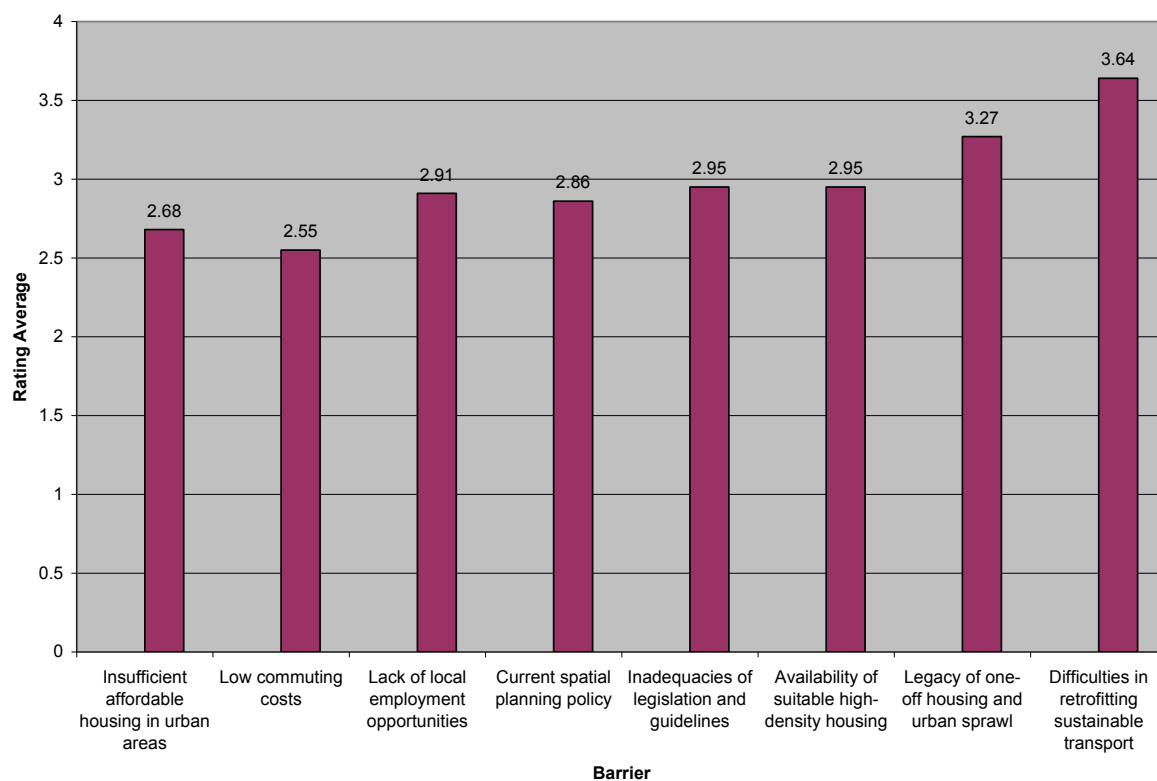
**FIGURE 5 Local authority perceptions of barriers to sustainable residential development**

Table 6 collates local authority responses to barriers to integrated transport and indicates that resource and time constraints on local authorities and a lack of political commitment were perceived to be the most significant barriers. A lack of technical

guidance on policy integration was perceived to be the least significant barrier. Figure 6 shows rating averages for local authority perceptions of barriers to integrated transport.

**TABLE 6 Local authority perceptions of barriers to integrated transport**

Barrier	Not Important	Somewhat Important	Important	Very Important	No Opinion	Rating Average
Resource and time constraints on local authorities	0	2	5	15	0	3.59
Too many agencies or authorities involved in transport and planning	0	2	12	8	0	3.27
Lack of cooperation between stakeholders or agencies	0	3	8	11	0	3.36
Inertia or resistance to change	0	4	10	8	0	3.18
Political commitment	0	2	8	11	0	3.43
Lack of technical guidance on policy integration	0	11	9	2	0	2.59
Legal or regulatory barriers	1	6	10	5	0	2.86
Lack of information and communication technology (ICT) and intelligent transport systems (ITS)	1	8	7	6	0	2.82
Unavailability of Park and Ride Facilities	1	8	8	5	0	2.77

**FIGURE 6 Local authority perceptions of barriers to integrated transport**

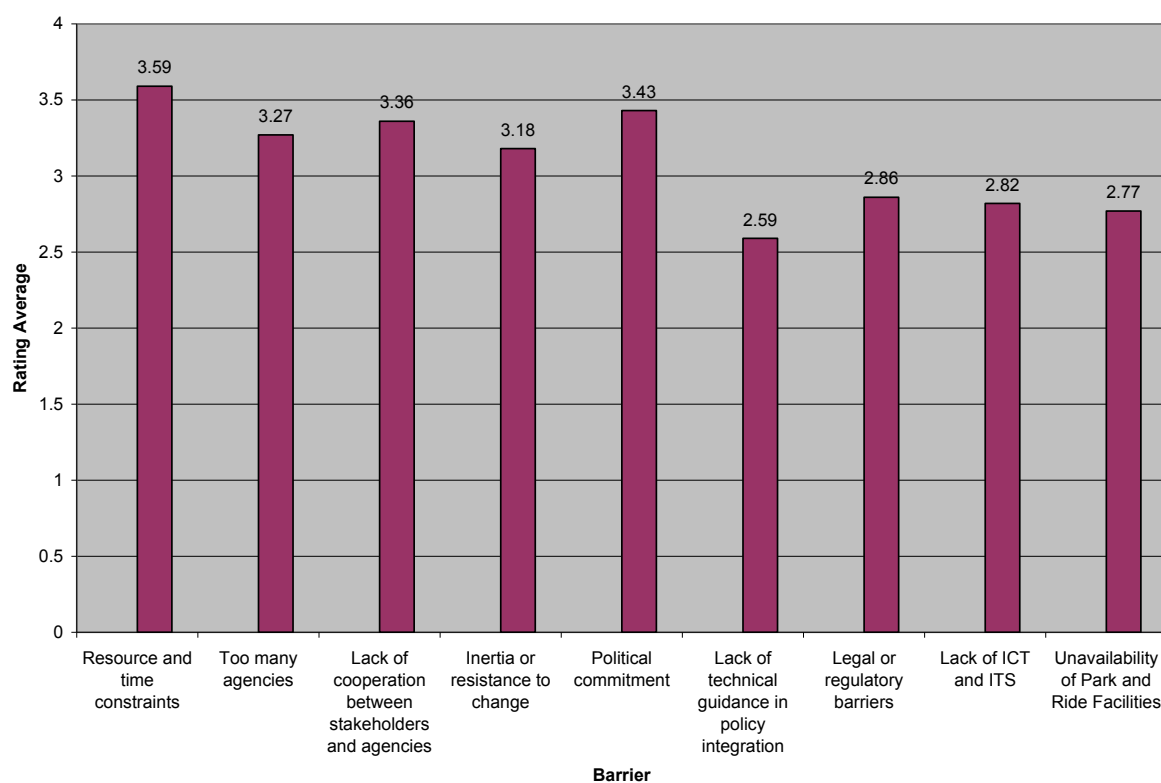
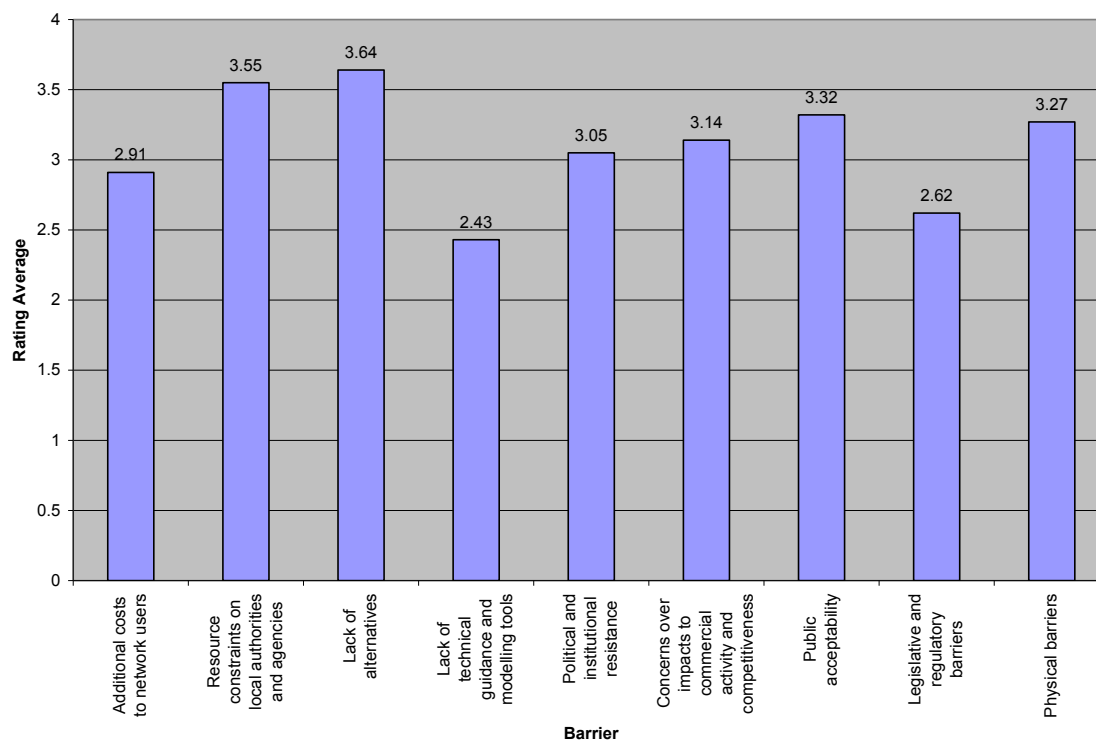


Table 7 collates local authority responses in relation to their overall impression of barriers to sustainable travel and transport in their local areas. It can be seen that a lack of alternatives, e.g. public transport, cycling and walking facilities, was perceived to be the most significant barrier, followed by resource constraints on agencies and local authorities. A lack of technical guidance and modelling tools was perceived to be the least significant barrier. Figure 7 shows rating averages for overall local authority perceptions of barriers to sustainable travel and transport.

**TABLE 7 Local authority perceptions of barriers to sustainable transport and travel demand management**

<b>Barrier</b>	<b>Not Important</b>	<b>Somewhat Important</b>	<b>Important</b>	<b>Very Important</b>	<b>No Opinion</b>	<b>Rating Average</b>
Potential additional costs to network users, e.g. increased parking pricing, workplace parking levies, infrastructure tolls, etc.	3	3	10	5	1	2.91
Resource constraints on agencies and local authorities	0	0	10	12	0	3.55
Lack of alternatives, e.g. public transport, cycling and walking networks	0	0	8	14	0	3.64
Lack of technical guidance and modelling tools	2	10	7	2	0	2.43
Political and institutional resistance	1	5	8	8	0	3.05
Concerns over impacts on local commercial activity or competitiveness	0	6	7	9	0	3.14
Public acceptability	0	2	11	9	0	3.32
Legislative and regulatory barriers	1	9	8	3	0	2.62
Physical barriers, e.g. topography, space, weather	1	2	9	10	0	3.27

**FIGURE 7 Local authority perceptions of barriers to sustainable travel and transport**



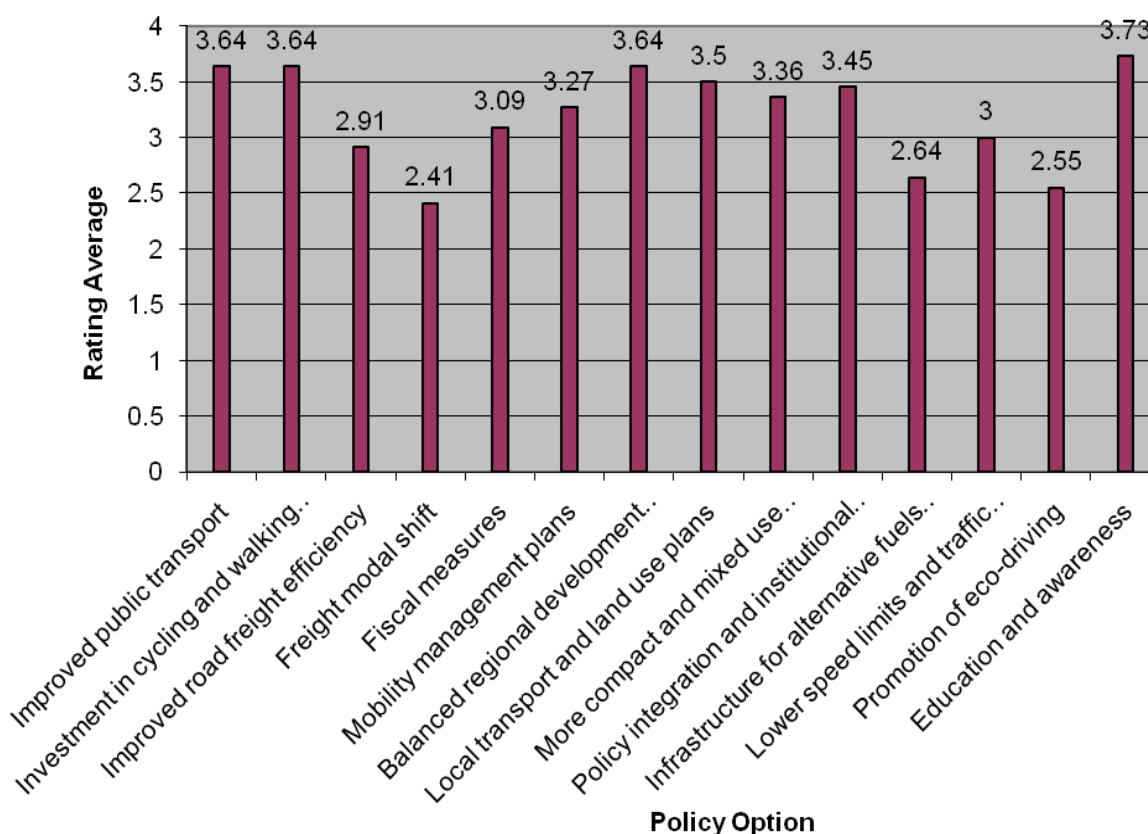
In addition, local authorities were asked whether they felt there was potential for significant modal shift. It was found that 90.9% of respondents felt that there was potential for significant modal shift in their local areas, with 9.1% of respondents indicating that there was not. Table 8 collates local authority perceptions of policy priorities and it can be seen that the main policy priorities that were identified include: (i) education and awareness; (ii) investment in cycling and walking infrastructure; (iii) improved public transport services; and (iv) balanced regional development and spatial planning. Policies, which were judged to be of lesser priority, include (i) freight modal shift from road to rail or inland waterways and (ii) promotion of eco-driving. Figure 8 shows rating averages for local authority perceptions of policy priorities.

**TABLE 8 Local authority perceptions of policies to promote sustainable travel and transport**

Barrier	Not Important	Somewhat Important	Important	Very Important	No Opinion	Rating Average
Improved public transport services, e.g. additional frequency, reliability	0	1	6	15	0	3.64
Investment in cycling and walking infrastructure	0	2	4	16	0	3.64
Improved road freight efficiency	0	8	8	6	0	2.91
Modal shift of freight from road to rail or inland waterways	5	7	6	4	0	2.41
Fiscal measures, e.g. on-street parking changes, workplace parking levies, congestion charges, etc.	2	3	8	9	0	3.09
Mobility management	0	1	14	7	0	3.27

plans for employers and public sector						
Balanced regional development and spatial planning	0	1	6	15	0	3.64
Developing local transport and land use plans	0	3	5	14	0	3.50
More compact and mixed use urban development	0	3	8	11	0	3.36
Policy integration and institutional cooperation	0	2	8	12	0	3.45
Developing infrastructure for alternative fuels and technologies, e.g. charging points for electric vehicles	3	5	11	3	0	2.64
Lower speed limits and traffic calming	1	5	9	7	0	3.00
Promotion of eco-driving	3	8	7	4	0	2.55
Education and awareness	1	0	3	18	0	3.73

**FIGURE 8 Local authority perceptions of policy measure priorities**



**DISCUSSION**

It was found that the most significant barriers to the delivery of sustainable transport at a local level are a lack of alternatives, e.g. public transport, cycling and walking facilities, followed by resource constraints on agencies and local authorities. This correlates with, for example, the findings of Banister and Marshall (6) who found that resource barriers occurred most frequently, followed by institutional/policy and socio-cultural barriers. It should be noted, however, that the results presented here represent the individual views of professionals working within local authorities and who are familiar with sustainable transport concepts. It is possible that some of the aggregate responses may vary depending on the study group, e.g. a particular focus group or industry representatives, etc.

For example, with regards to barriers to cycling and walking, it was found that a lack of suitable road space, followed by the perception that cycling and walking are unsafe and the cost of developing a cycle network are the primary barriers. However, it is probable that public responses might indicate that perceptions of safety or distance are the primary barriers.

It is argued that the approach presented in this paper is a useful means of identifying and evaluating perceptions of barriers to sustainable transport as well as potential policy prescriptions from a local authority perspective. This is important in order to (a) guide national policy development and (b) focus on local and regional policy priorities. It is also a useful framework for local authorities to focus on key goals and objectives where resources are limited or where significant barriers are external in nature rather than following an ad-hoc approach to delivering sustainable transport. In addition, this approach can be used to complement cost-effectiveness analysis (CEA) or as an input to multi-criteria decision analysis (MCDA) in order to identify policy priorities.

This approach can also be used to infer causal relationships between barrier identification and policy implementation based on the stage model of implementation, although, in reality, transport policy is more likely to involve a less systematic approach based on a merging of incremental multiple actions along a continuum, with interdependence and feedback between stakeholders (11) (12).

## ACKNOWLEDGMENTS

The authors would like to thank the Irish Environmental Protection Agency (EPA) and Department of Transport for their support.

## REFERENCES

1. Tricker, R.C., Hull, A.D. An assessment of the barriers to the delivery of sustainable local surface transport solutions. 2005. In *European Transport Conference (ETC) Proceedings*
2. Hull, A.D., Tricker, R.C. Assessing barriers to sustainable UK urban transport solutions. 2004. *Proceedings of the Institution of Civil Engineers, Engineering Sustainability* 158
3. Tricker, R.C. *Review of available evidence on the barriers in the delivery of sustainable transport solutions*. 2005, University of the West of England (UWE)



4. European Conference of Ministers of Transport (ECMT). *Assessment and decision-making for sustainable transport*. 2004. OECD, London
5. Banister, D. Overcoming barriers to the implementation of sustainable transport. 2005. In: Rietveld, P., Stough, R.R. (Ed.), *Barriers to Sustainable Transport: Institutions, Regulation and Sustainability*, Spon Press
6. Banister, D., Marshall, S. *Encouraging transport alternatives: good practice in reducing travel*. 2000. Stationery Office: London
7. Atkins. *Local transport plans – policy evaluation: part 1 – final report*, DfT, London
8. Vigar, G., Stead, D., 2003. *Local transport planning under labour*. In: Docherty, I. and Shaw, J. (Ed.), *A New Deal for Transport?* Blackwell, Oxford
9. Rietveld, P., Stough, R., 2004. Institutions, regulations and sustainable transport: a cross-national perspective. *Transport Reviews*, 24, 2004, pp.707-719
10. Foxon, T. Makuch, Z., Mata, M., Pearson, P. *Towards a sustainable innovation policy – Institutional structures, stakeholder participation and mixed of policy instruments*. 2004. Paper for 'Greening of Policies – Interlinkages and Policy Integration' conference, 3-4 December 2004, Berlin
11. Schofield, J. Time for a revival? Public policy implementation: a review of the literature and an agenda for further research. *International Journal of Management Reviews*, 3, 2001, pp.245-263
12. Hill, M., Hupe, P. The multi-layer problem in implementation research. *Public Management Review*, 5, 2003, pp.471-490