

Flexible Trip Generation

Introduction

This record of evidence forms part of the work undertaken by UKERC's Technology and Policy Assessment team relating to its project on policy strategy for carbon emissions reduction in the passenger transport sector. The material was produced alongside the project's main report and since it supports that report, it was judged appropriate to make this material available to a wider audience. The main report itself '*What Policies are Effective at Reducing Carbon Emissions from Surface Passenger Transport?*', and the supporting evidence can be found at:

<http://www.ukerc.ac.uk/ResearchProgrammes/TechnologyandPolicyAssessment/TPAProjects.aspx>

Explanation of Content

Evidence on this policy measure has been collected by the TPA team on the basis that it has, or may have, the potential to result in carbon dioxide emissions reductions in the passenger transport sector. This evidence document begins with a summarised description of the policy measure. The evidence itself follows the summary and is presented in table form.

Each piece of evidence has been assigned a separate row and tabulated using four columns:

- Year of publication, arranged chronologically, beginning with the most recent year
- Name of author, including where applicable additional cited authors (and year); and a Reference ID number.
- Type of evidence:
 - Evidence containing quantitative information is denoted by the letter 'Q'
 - Qualitative evidence is denoted by the letter 'C' for 'comment'
- The evidence itself

The evidence was originally gathered and assessed using several sub-headings. The purpose of this was primarily internal i.e. to facilitate the handling of evidence and the production of the main report. These sub-headings have been retained here as follows:

- Policy Measures and Carbon Savings
- Other potential CO₂ Impacts i.e. outside of the immediate policy influence
- Other Benefits e.g. air quality improvement or traffic congestion reduction
- Policy Costs and/or Revenues i.e. to local or national government
- Business and Consumer Costs
- Unintended Consequences e.g. rebound effect
- Reasons/Arguments for Carbon Savings Achievement or Failure
- Policy Suitability for the UK

A list of references follows the evidence tables. Note that the Reference ID numbers are allocated by Reference Manager, the referencing software used by the TPA team.

Any charts, figures and tables referenced in the evidence are not reproduced here but can be found in the original publication or evidence material.

Where no relevant evidence was found for a particular sub-heading, this has been noted.

Policy Description

The evidence recorded here covers policies promoting or facilitating measures such as flexible working hours/flexitime, alternative work schedules, compressed work week, staggered shifts etc.

Evidence Tables

Carbon Savings and Policy Measures

Year	Author	Type	Evidence
2002	BTRE (ref 11429)	Q	The Canadian Productivity Commission (1994) cited evidence of a reduction in peak hour travel by over 50 % in Ottawa after introduction of ‘flexitime’ to government offices—mainly due to an increase in early arrivals. If this reduction could be sustained, then there would be greenhouse gains in proportion to the fuel saved.

Other CO2 Impacts

Year	Author	Type	Evidence
			No specific evidence found.

Other Benefits

Year	Author	Type	Evidence
2008	VTPI/TDM (ref 11487)	C	Flexitime benefits include reduced congestion, support for Ridesharing and Public Transit use, and benefits to employees. Flexitime allows commuters to match their work schedules with travel schedules, which can increase the efficiency of these modes. CWW reduces commute travel, although total vehicle travel may be modest if employees take additional trips during non-work days or move farther from worksites.
2008	VTPI/TDM (ref 11487) and citing CTS, 1994	Q	Schedule flexibility is valued by many employees and can increase productivity and job satisfaction. Flexitime and CWW help employees meet other household scheduling requirements, reduce commuting time and stress, reduce fears about being tardy, use rideshare and transit for commuting, and work when they are most productive. One survey found that 68% of employees would like to have flexible work hours, and 53% would participate in a CWW (citing CTS, 1994). Since Flexitime and CWW are usually implemented as an option, participants are usually better off, or they would not choose it:

Policy Costs and/or Revenues

Year	Author	Type	Evidence
			No specific evidence found.

Business and Consumer Costs

Year	Author	Type	Evidence
2008	VTPI/TDM (ref 11487)	C	<p>Costs of Flextime and/or CWW (Compressed Work Week) include increased admin and management responsibilities and harder evaluation of productivity.</p> <p>Alternative Work Scheduling may reduce staff coverage and interaction, and make meetings difficult to schedule. CWW may reduce productivity (employees become less productive over a long day), reduce hours worked, and may be perceived as wasteful (e.g. if staffing at public agencies is low on Friday).</p> <p>CWW may lead to more dispersed land use.</p>

Unintended Consequences

Year	Author	Type	Evidence
			No specific evidence found.

Reasons/Arguments for Carbon Reduction Achievement and/or Failure

Year	Author	Type	Evidence
2008	VTPI/TDM (ref 11487) citing Picado, 2000	Q	In one case study two-thirds of employees surveyed were allowed to have flexible work schedules, yet less than twenty percent of them actually shifted their commute times to avoid congestion (citing Picado, 2000).
2008	VTPI/TDM (ref 11487) citing Freas and Anderson, 1991; citing Picado, 2000; citing Ewing, 1993; and citing Modarres, 1993	Q	It's also argued that flextime reduces peak period congestion directly, and can make ridesharing and transit use more feasible (citing Freas and Anderson, 1991). Employees with flexible work schedules save an average of 7 minutes per day in commute time (citing Picado, 2000). Staggered shifts can reduce peak-period trips, particularly around large employment centers. Flextime and Telework together can reduce peak-hour vehicle commute trips by 20-50% (citing Ewing, 1993). Flextime is a significant factor in Commute Trip Reduction program effectiveness in reducing peak-period traffic (citing Modarres, 1993).
2008	VTPI/TDM (ref 11487)	Q	Regarding CWW to reduce total vehicle travel: One survey of commuters found that it could reduce

Year	Author	Type	Evidence
	citing CUTR, 1998; citing Apogee, 1994; and citing Sundo and Fujii, 2005		automobile commutes by 7-10%, making it among the most effective commute trip reduction strategies considered (citing CUTR, 1998). Another analysis estimates that CWW can reduce up to 0.6% of VMT and up to 0.5% of vehicle trips in a region (citing Apogee, 1994). Whilst CWW reduces total commute time, it also reduces the time devoted to household activities and sleep (citing Sundo and Fujii, 2005).
2008	VTPI/TDM (ref 11487) citing Ho and Stewart, 1992, and citing Giuliano, 1995	C	However, other research indicates that CWW may provide only modest reductions in total travel, in part because participants make extra trips during non-work days. Compressed Work Weeks may also encourage some employees to move further from worksites or to drive rather than rideshare (citing Ho and Stewart, 1992, and Giuliano, 1995).
2008	VTPI/TDM (ref 11487)	C	Because it does not reduce total mileage, Flexitime probably provides no direct road safety, energy conservation or emission reduction benefits.
2004	Begg (ref 3472) citing CfIT, 2003a	C	More flexible working practices have created a workforce more willing to live further away from its place of employment and average commuting distances have also increased as a result. Commuters in the UK now travel longer distances than those in any other European countries (citing CfIT, 2003a).

Policy suitability for UK

Year	Author	Type	Evidence
			No specific evidence found.

References

Begg, D. & Gray, D. 2004 – 3472 - Transport policy and vehicle emission objectives in the UK: is the marriage between transport and environment policy over?, *Environmental Science & Policy*, vol. 7, no. 3, pp. 155-163.

BTRE 2002 – 11429 – GREENHOUSE POLICY OPTIONS FOR TRANSPORT, Bureau of Transport and Regional Economics, Australia.

Giuliano, G., 1995 – 11672 - The Weakening Transportation-Land Use Connection, *Access*, 6, 3-11. University of California Transportation Center, Berkeley, CA,

Ho, A. & Stewart, J. 1992 – 11671 - Case Study on Impact of 4/40 Compressed Workweek Program on Trip Reduction, *Transportation Research Record* no. 1346, pp. 25-32.

VTPI/TDM 2008 – 11487- Online TDM Encyclopedia, Victoria Transport Policy Institute, Victoria, BC [accessed April 2008]