Developing Programs for Sustainable Transportation through Community-Based Social Marketing

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ABSTRACT

Urban transportation has a massive carbon footprint. The link between climate change and transportation is a major area of global concern and research. Campaigns and programs aimed at transportation sustainability during the last few decades have not resulted in desirable behavioural changes. Our current transportation systems are still unsustainable.

Researchers and policy planners are turning to social psychology to bring about behavioural change. Psychology has much to contribute to the design of programs to foster sustainable behaviour since the basis of sustainability is behavioural change. Community-Based Social Marketing (CBSM) is a psychology-based technique that is being used to develop sustainable transportation campaigns. The four-step technique involves identifying the behaviour to be addressed and the barriers to this behaviour, constructing a program to overcome these barriers using psychological knowledge regarding behavioural change, piloting the strategy before implementing the program across the community and evaluating the effectiveness of the program.

Several CBSM-based programs have been developed and tested in local communities in Australia and North America in recent times. This paper critically reviews the global initiatives regarding the application of CBSM with a view to reducing the carbon footprint of urban transportation from these campaigns and initiatives.

Transport is one of the hardest things to change people's behaviour around!

1. Introduction

Urban transportation is a major contributor of greenhouse gas emissions and poses a threat to the sustainability of our environment. Its impact on global carbon footprint and achieving sustainability has become a major area of global concern and research for climate change experts and transportation professionals. The future of our planet is at stake if our transportation systems are not sustainable.

There have been several campaigns and programs to move towards sustainable transportation. Programs aimed at reducing travel demand, increasing walking, cycling and public transport patronage, switching to smaller and fuel efficient cars, alternative fuels, promoting hybrid and electric vehicles etc. have been developed and implemented all over the world since over three

decades. However these programs have not been patronised widely and the impact of these campaigns has not been significant. Our current transportation systems are still unsustainable.

The current travel behaviour change campaigns are principally based on the provision of information about the effects of modal choices and the availability and benefits of modes other than the car. However, research has shown that information-based campaigns, including the use of incentives, are by and large insufficient for stimulating behavioural change of lasting effect. Researchers and policy planners are turning to social psychology to bring about behavioural change. Psychology has much to contribute to the design of programs to foster sustainable behaviour since the basis of sustainability is behavioural change.

Community-Based Social Marketing (CBSM) is a psychology-based technique that is being widely applied to promote environmental programs and have also been attempted to develop some sustainable transportation campaigns. The four-step technique involves identifying the behaviour to be addressed and the barriers to this behaviour, constructing a program to overcome these barriers using psychological knowledge regarding behavioural change, piloting the strategy before implementing the program across the community and evaluating the effectiveness of the program (McKenzie-Mohr and Smith (1999).

Some of the campaigns based on CBSM include wearing cycle helmets, encouraging cycling for work trips, reducing personal car use, encouraging modal changes etc. These have been primarily developed and implemented in Australasia and North America. Most of these have been tested in local communities but there appears to be a higher rate of acceptance and behavioural change than in the information intensive campaigns. This paper critically reviews the global initiatives regarding the application of CBSM to transportation woes, the successes, failures and limitations of the approach and the expected impacts on the carbon footprint of urban transportation from these campaigns and initiatives. Some initial efforts at developing strategies and programs to rapidly move towards sustainable transportation using CBSM are also presented and discussed.

2. Community-Based Social Marketing

2.1 Motivation for CBSM

The current unsustainable behaviour pattern that is principally centred on the car and largely dominated by routine choices does not take sustainability considerations into account. The current campaigns are principally based on the provision of information about the effects of modal choices and the availability and benefits of modes other than the car. However, current research has shown that information-based campaigns, including the use of incentives, are by and large, insufficient for stimulating behavioural change of lasting effect. Sustainable transportation requires an enduring and significant change in traveller behaviour. Although numerous programs have been contrived and promoted to alleviate the ill impacts of transportation thereby reducing carbon footprint, the results have not been satisfactory. Driver behaviour has not been influenced positively.

Researchers and policy planners are turning to social psychology to bring about behavioural change. Practitioners of environmental psychology examine how human behavior and well-being are affected by the biophysical environment (Stokols and Altman, 1987). CBSM is a field of study within environmental psychology. The term "environment" in this context is defined very broadly. In addition to the natural world, it includes social settings, built environments, learning environments and informational environments.

2.2 Steps in CBSM

2.2.1 Identify the behaviour to be addressed

The foremost challenge is to identify which behaviour needs to be changed. This requires a clear definition of the problem and a complete understanding of the objectives of the program. Next, the community profile must be defined. This will enable a better understanding of the community, which can be used to map the basic demographic information, their needs and motivations, and the community's capacity, including the internal and external resources to help meet the goals of the program. This information is used to identify the target audience and the target stakeholder groups that are most likely to help in achieving the goals. What is to be changed? Which groups are likely to have the biggest impact?

Through this process and working with the target audience, the behavioural objective of the social marketing strategy can be derived. The desired behaviour should be specific, measurable, achievable and realistic.

2.2.2 Identify the barriers to a behaviour

Barriers should be identified by first reviewing local relevant articles and reports on the issue at hand. Next, focus groups should be formed to delve into the attitudes and behaviors of community residents regarding the activity. A phone survey should then be conducted with a random sample of residents.

2.2.3 Construct a program to overcome these barriers

Once an effective way has been found to overcome each barrier, determine whether people simply need to be informed of the project's existence or whether people require demonstrations or personal assistance to move through the barrier. Use of noticeable, self-explanatory prompts will help in this regard. Then, implement a small-scale pilot program within the target area in order to work out the "bugs" before employing the program on a larger scale.

2.2.4 Implement the program across the community

Utilizing the knowledge gained from the pilot program, use a discretional amount of local advertising and media sources to inform people about the program.

2.2.5 Evaluate the effectiveness of the program

Include the local media, concerned citizens, and a random collection of cooperating companies in the evaluation process. Seek to include feedback that reinforces the changes that people have made.

3. Current Research into the Applications of CBSM to Transportation

Hazel Baslington (2008) has investigated the cultural determinants of children's travel and has presented a new perspective *travel socialization* theory. This states that children learn about travel modes in the same way as other aspects of culture through agents of socialization: the family, school, media, and peer groups. A theoretical implication of travel socialization is that our thinking and attitudes toward transport modes are embedded in childhood. A policy implication is that *car dependency* should be viewed as a *social problem* and tackled from a social policy rather than just a *travel demand* management approach.

Transport is currently responsible for around one-quarter of the total anthropogenic CO_2 emissions in the United Kingdom, and this proportion is projected to increase. The transport sector will undoubtedly need to play a significant role in achieving carbon reductions if the government is to meet its ambitious long-term goal of a 60% reduction by 2050. Tight et al (2007) have examined current carbon use by households for personal land-based transport and considers how feasible it would be to change that use over the period up to 2050 in the United Kingdom. They provide a unique insight into how much and in what way households and individuals may be willing to adapt their transport behavior to achieve carbon reductions. A computer-based transport carbon calculator has been developed to investigate the CO_2 emissions of individual households from various modes based on travel diary information. This formed the focus of a series of interactive interviews in which participants were asked to consider how their future low carbon transport strategy could look. Views of households on various abatement measures were explored, including technological change in vehicle design or fuel source and behavioral change through, for instance, traffic restraint and investment in public transport. Overall, a 40% reduction in carbon emissions was seen to be feasible through a combination of behavioral change measures and a realistically achievable degree of technological improvement, falling well short of the UK government's goal of a 60% reduction. Through changes in behavior alone, the households involved could only achieve around a 20% cut in carbon emissions — seemingly a threshold beyond which further reductions will be difficult and may necessitate significant lifestyle change.

Taylor (2007) has reviewed the implementation of programs for voluntary travel behavior change (VTBC) in Australia as an important initiative in the search for more sustainable urban transport systems. He provides a focus on the current research aimed at developing and applying suitable tools for the evaluation of VTBC projects through the identification of the benefits and impacts of VTBC and the development of survey methodologies for measuring small-scale changes in travel behavior. The methodologies require the use of advanced survey techniques and new data collection technology, with the use of GPS by survey respondents being an important innovation. A substantial national program for VTBC is now under way in Australia, with a basic objective of seeking substantial reductions in individuals' use of private vehicles and thus reducing greenhouse gas emissions from transport.

Potter (2007) has undertaken a 'backcasting' analysis exploring strategic approaches for overall systems sustainability in personal transport. Starting from a robust definition of sustainability for the personal transport sector, he examined the impact of combinations of transport technologies and changes in travel behaviour in reducing CO_2 emissions towards a sustainable level. In doing this a simple equation model has been used. This is purposely simple to provide a tool developing understanding by anyone exploring transport's sustainability challenges. It is concluded that technical measures in isolation are likely to be ineffective and politically problematic. Equally,

even substantial modal shift to public transport cannot of itself attain the sustainability target. Trip length in particular needs to be a focus for demand management measures. A combined strategy of both technical improvements and demand management addressing trip length, trip generation and modal share can deliver the necessary improvement, although the implementation of such a package remains politically challenging.

Beginning with a review of a 1990 article on the impact of global warming on the transportation infrastructure, Black and Sato (2007) summarize the changes in our knowledge of climate change and its impact on transport over the past sixteen years. Although most of the basic scientific knowledge has not changed, there has been an increase in our understanding of the potential impacts. It is noted that this field of study has evolved from the pure concern for global warming into a general concern for sustainable transportation and the other factors that make transport non-sustainable: local air quality problems, injuries and fatalities from motor vehicle incidents, petroleum resource depletion and congestion, as well as concerns over what can be done about the various negative externalities of transportation today. It is the field of sustainable transport broadly defined that now dominates nearly all research in transport.

Noland (2007) has investigated recent changes to transport policy within the context of changes from policies of "predict and provide" to an integrated transport policy and the role of new knowledge on induced travel effects. The focus is on UK transport policy, but the implications are discussed in terms of overall relevance to transport policy in other countries. The discussion hinges around how new assessment procedures, including the move toward strategic environmental assessment, are linked to behavioral effects associated with induced travel demand. The linkage of the congestion-reduction objectives of transport policy and the political implications of how behavioral reactions can undermine those objectives via induced travel effects and changes in relative accessibility have been examined. Linkages to changes in accessibility and economic effects as described by simple urban economic theory are discussed with a focus on the implications for transport policy. A review of new assessment procedures in the United Kingdom as implemented in recent years is then critiqued in light of this discussion. The focus is on whether changes to assessment procedures have led to improvements in decision making, especially from an environmental perspective as well as from stated government policy goals. The inherently political nature of this process and the role that theory can provide in revealing these issues and providing more transparency to the links between stated objectives of policy and likely outcomes is recognised.

In his report for UITP, Michael Roth discusses the need for transportation practitioners to take their cues from the field of Social Marketing. An unusual individualized marketing program called IndiMark has been used to develop a new and radical way to promote alternative transportation using social marketing principles. IndiMark has been successfully applied in 12 European countries and in Australia

Sorell (2005) describes the major insight of social marketing as "going out and listening to your customer rather than sitting in a room and trying to figure it out by being smart".

4. Some Applications of CBSM Programs for Changing Travel Behaviour

A number of community-based social marketing experiments have been undertaken. These programs emphasize one-on-one education to persuade individuals to choose green travel alternatives.

4.1 Promoting alternative transportation at a Fortune 500 company.

According to Justin Murrill of Culture Technologies (www.culturetechnologies.com), this CBSM-based approach involved the following steps:

4.1.1. Bench-mark: This involved researching existing commuter programs and the various elements that compose the most successful initiatives.

4.1.2. Budget: Based on the available budget, elements that could be implemented were selected. For example, due to budget restrictions, direct subsidies were replaced with weekly $100 raffles and tax-free purchasing of transit and vanpool vouchers worth ~30% savings.

4.1.3. Survey: A survey to identify current actions and the barriers/incentives for the desired behavior (alternative transportation) was drafted, piloted and launched. Thousands of employees were surveyed and were offered $1,000 in incentives to submit (1 x $500 and 5 x $100 prizes). The response rate was 40% (~800 employees) and it yielded valuable data.

4.1.4. Focus Groups: Focus groups were proposed on the complex issue of telecommuting but the organization unfortunately decided to not pursue a formal telecommuting program in spite of the vast request by employees.

4.1.5. Pilot: The program was designed based on program budget, employee feedback and employer influences. It was piloted at one building of about 300 employees to ensure program components operated as expected. There were a few hang-ups, so piloting proved useful.

4.1.6. Launch: After making a few tweaks the program was launched site by site, holding events with exhibitors and raffles (free bike) and marketing with paper and electronic communications. The five largest sites were launched approximately 3-4 weeks apart; the 12+ small offices had electronic launches only.

4.1.7. Evaluate Results: The program that existed before this had ~150 participants, costs ~$50,000 per year and eliminated 10,000 miles per month. The new program has 4-5x the participants, costs 2.5x as much and eliminates 7.5x as many miles.

In terms of CBSM practices to change behavior, the following tools were employed:
- *norms* (preferred parking for participants so people walk by it everyday)
- *communications* (flyers, events and electronic communications)
- *incentives* ($100 drawing per week and $300 drawing per quarter; tax-free purchasing of transit and vanpool vouchers; discounts on fuel-efficient vehicles: discount to local bike shops for riding to work; preferred parking)
- *removing external barriers* (immediate ride-matching software; personal assistance starting or finding a vanpool; bike and bus maps)

- *prompts* (weekly emails reminding people to log their rides)

4.2 **TravelSmart** http://www.travelsmart.gov.au/

TravelSmart asks people to think about their travel needs. It encourages the use of alternative transport modes to the car, for example using walking, cycling and public transport. It emphasizes on the reduction of the negative impacts of the car on traffic congestion and air pollution and recognition of the health benefits of incidental exercise such as walking or cycling. It encourages people to choose shops and facilities that are nearest to them to reduce the need to travel and to support local businesses.

TravelSmart is essentially a voluntary program that aims to inform and motivate people for changing their travelling behaviour through personal choice. It does not involve any form of regulations, fees or taxes directed at compelling changes in travel behaviour.

TravelSmart programs by the Australian Commonwealth, State and Territory Governments ask people to make voluntary changes in their travel choices. A diverse range of TravelSmart programs are being implemented by state, territory and local governments around Australia. The Australian Government in collaboration with South Australia, Queensland, Victoria, and the Australian Capital Territory recently funded the project to the tune of approximately $18.3 million. Over a five-year period, this project will see 186,000 households reduce distances travelled in Australia by over three billion car kilometres. Over one million tonnes of greenhouse gas emissions will be saved, which is equivalent to reducing emissions from over 250,000 cars in one year.

TravelSmart has been successfully implemented in Western Australia. It encourages people to make small changes in their travel choices. These small changes can make a big difference. It saves time and money, boosts health and helps the environment by being TravelSmart

The Sustainability Trust, Wellington, Aotearoa New Zealand is also running a program called Getting Around Wellington (GAW), which is based on TravelSmart. Again it is based on voluntary behaviour change theory but draws on CBSM in terms of getting a commitment from the participants, and using local media to pubicise the programme (www.sustaintrust.org.nz)

4.3 **In-motion**

In-Motion is a Seattle neighborhood-based program "to encourage residents to drive less and travel more by bus, carpool, bicycling, and walking." In one 2,800-person neighborhood, marketing efforts were successful in recruiting 280 participants, a ten percent participation rate. These participants reported 33 percent less driving alone, 22 percent more bus trips, 38 percent more walking, 46 percent more carpooling and 76 percent more bicycling. Because of high marketing budgets to recruit participants, these innovative trip reduction programs are not yet economically viable. In-Motion's cost per "vehicle mile reduced" was a whopping $19 per mile. In addition, observed green behavior tends to taper off once program funding is over.

4.4 **Go Boulder Case Study**

The four steps for implementing CBSM are well illustrated in the "GO Boulder" campaign. Implemented in 1989 by the Boulder City Council, the campaign was an effort to reduce traffic

congestion and air pollution in Boulder, Colorado. The most effective way of achieving this was by causing people to shift from use of single occupant vehicles to alternative forms of transportation such as bicycles, public transit and walking.

The GO Boulder program found that the primary barrier discouraging business people from taking the bus was their concern about getting home if they had to work late or were in an emergency situation.

The organizers of the GO Boulder program determined that it was both necessary and cost effective to build more bikeways and overpasses and under passes for bikes and pedestrians, gradually over a number of years. Additionally, the ECO Pass program was designed to give employees a guaranteed taxi ride back to their house if they had to work late or in the event of an emergency.

GO Boulder informed businesses about their Guaranteed Ride Home program. Additionally, the city has continued to improve its physical infrastructure to be more supportive of alternative transportation methods, with high-profile monthly reminders and opportunities for residents to try these alternative methods.

The project as a whole has been an overwhelming success. The following changes were a direct result of the Go Boulder program:

- Between 1990 and 1994, the city realized a six percent decrease in daily trips from single-occupant vehicles.
- Pedestrian trips increased by 3.5 percent.
- Bicycle trips increased by 2.2 percent.
- Transit trips increased by 1.7 percent.
- Among individual businesses using the ECO Pass, bus ridership increased from 59 percent to 400 percent. (Ridership was measured prior to participation and again six months later.)
- At the University of Colorado, bus ridership went from 300,000 to over one million in the first year.
- Various corporations seeking a location for their company headquarters have been attracted by Boulder's well planned transit system. This has the potential to bring in valuable economic resources to the community of Boulder.

4.5 Active Transportation

Active transportation consists of human-powered forms of travel such as walking and cycling. It supports public health objectives – increased fitness, reduced pollution etc. Suitable transportation and land-use polices can facilitate shift to active transportation. Unfortunately current policies and practices provide little support as they undervalue active transportation

Community-based Social Marketing can be an effective approach at achieving behavioural changes, such as move to active transportation, that people generally support but find difficult to make. It enables people to reconcile their actions with their beliefs and provides integrity and pride. Several Win-Win solutions aimed at removing distortions, increasing travel options and encouraging efficient transport patterns with personal economic benefits have been implemented.

Living Smart is a program offering information on how to reduce greenhouse gas emissions at home and in daily travel. The program works with selected communities to achieve savings for households and large reductions in greenhouse gas emissions.

Community-based social marketing attempts to make psychological knowledge relevant and accessible to those who design environmental or sustainable programs.

5. Conclusion

5.1 Summary

Campaigns have been conducted that try to raise people's awareness of the environmental issues, but these tend to be ineffective as many are already aware of the impacts of automobiles but are faced with other barriers to changing their behavior. The campaigns that are more effective are the ones that

(i) show drivers the benefits that other modes of transportation could give them (like time to read on the bus), or that give them some more urgent or locally based reason to try a new mode (riding BART on Spare the Air days).

(ii) ask for smaller, more manageable behavior changes, either pertaining to certain types of trip (walk for errands like going to the post office) or pertaining to specific days (one car-free day in a week).

Even with a strong argument for people to try another mode, campaigns are likely to be more effective when they do not just advertise and provide reasons for changing, but make change easier by providing a map, or arranging an incentive like a free ride.

For the principles of social marketing to be effective, transit agencies, city governments, and non-profits do not have to completely change the way they do things. People are reluctant to make large changes in their lifestyle.

5.2 General Comments

1. Research has shown that CBSM-based programs have been more successful than conventional campaigns and marketing.
2. These programs have been implemented at an employer level or community level. Results have been encouraging.
3. The impact of these campaigns on transportation carbon footprint is still insignificant.
4. There is a need to disseminate these programs at State and national levels.
5. Technological advancements in the areas of alternative and cleaner fuels, in vehicle and engine technology, and traffic operations and intelligent transport systems must continue to deliver substantial modal efficiencies
6. Active transportation must be taken seriously by governments. This should be given due recognition in transportation and urban planning.
7. There must be significant investment in active transport modes.
8. CBSM can play a significant role to encourage active transportation, such as TravelSmart programs.

9. It is unlikely that the problems brought about by automobile use can be solved solely using marketing and promotion. Changes to infrastructure, changes to policy, and changes in technology will all have to contribute as well.
10. Social marketing campaigns are most effective when organizations understand the values of the people they are trying to influence, and when they create messages that speak directly to these values

5.3 Role of CBSM in Reducing Transportation Carbon Footprint

It should be emphasized that social marketing can help to do a better job with the types of campaigns that are already running. The key differences are that social marketing emphasizes personal contacts, one-to-one communication, seeking commitment and offering awards to encourage behavioural changes. The programs are community-based and are more successful than those that tend to provide information only.

By using social marketing to develop campaigns, and by carefully evaluating and sharing results, transportation marketers can increase their contribution to this cause by inspiring individuals to make smarter transportation choices.

It is recognized that implementing the program in a small community will not make significant difference to the overall transportation carbon footprint. It is, therefore, imperative that the programs must be adopted on a larger population and geographical region such as a state or a country. Each community should have a program coordinator whose job would include personally contacting the community participants and seeking their commitment. The program would have already been developed, piloted and implemented successfully at the originating community. Research on which behaviour to target, identifying barriers to behavioural change and developing programs to abolish the barriers can be transferred from the successful implementation community or employer. Some piloting of the program will be necessary to identify any local issues and iron out any problems with program implementation

6. REFERENCES

Baslington, Hazel (2008) Travel Socialization: A Social Theory of Travel Mode Behavior , International Journal of Sustainable Transportation, Volume 2, Issue 2 April 2008 , pages 91 – 114

Black, William R., Noriyuki Sato (2007) From Global Warming to Sustainable Transport 1989-2006 International Journal of Sustainable Transportation, Volume 1, Issue 2 April 2007 , pages 73 – 89

McKenzie-Mohr, Doug and William Smith (1999) Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing, New Society Publishers ISBN 0865714061, 9780865714069, 160 pages

Murrill, Justin http://www.culturetechnologies.com

Noland, Robert B. (2007) Transport Planning and Environmental Assessment: Implications of Induced Travel Effects, International Journal of Sustainable Transportation, Volume 1, Issue 1 , pages 1 - 28

Potter, Stephen (2007) Exploring Approaches Towards a Sustainable Transport System, International Journal of Sustainable Transportation, Volume 1, Issue 2 April 2007 , pages 115 - 131

Roth, Michael (2003) Overcoming Obstacles of Car Culture: Promoting an Alternative to Car Dependence instead of another Travel Mode, 2nd UITP International Marketing Conference Paris, November 2003

Sorell, Miriam Lydia (2005) Transportation Choices: Can Social Marketing Make a Difference Department of Urban Studies and Planning, Massachusetts Institute of Technology, June 2005

Stokols, D. and I. Altman (1987) (Eds.), Handbook of Environmental Psychology. New York: John Wiley & Sons, 41-70.

Taylor, Michael A. P. (2007) Voluntary Travel Behavior Change Programs in Australia: The Carrot Rather Than the Stick in Travel Demand Management, International Journal of Sustainable Transportation, Volume 1, Issue 3 July 2007 , pages 173 - 192

Tight' Miles R., Alison Vicat' Abigail L. Bristow' Alison Pridmore' Anthony D. May (2007) An Exploration of Household Response to Personal Travel Carbon-Reduction Targets, International Journal of Sustainable Transportation, Volume 1, Issue 3 July 2007 , pages 143 – 159

TravelSmart http://www.travelsmart.gov.au/