

Why 'building it' doesn't always mean they will come - Understanding reactions to behaviour change measures

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Abstract

The vast majority of government-led strategies to prepare Australia for a more resilient and prosperous future revolve around two broad approaches: measures of supply and demand. Government action such as infrastructure projects, technological innovations and policy development through pricing and regulation, fall either distinctly into one or between both of these.

This paper argues that to help overcome public inertia concerning such 'top-down' government measures and to improve their implementation, a 'joined-up' approach, linking traditional approaches with voluntary measures that empower the public to make better-informed decisions beneficial to themselves, their community and the environment should be followed. Whilst still government-led, these measures can be described as 'bottom-up' as the onus is on the individual and community to carry out the action (often chosen by themselves), not the government itself. It firstly documents examples and research that describe why single-focus approaches sometimes do not realise the full potential of their intended outcomes. It then describes examples of recent voluntary measures in a range of fields including transport, energy and water.

Four common themes of successful voluntary measures are identified, as follows:

1. Create opportunities of engagement and contact that have a strong, personal human element;
2. Design content that localises issues and appeals to participants' 'heads, hands and hearts';
3. Provide ongoing support through a variety of passive and active touch-points that create moments of cognitive dissonance and accountability; and
4. Show proof that desired behaviours are normal by comparing actions of similar participants and using social hierarchies to spread positive behaviours.

A case study of the 2009/10 *Living Smart Households* program is provided as an example of the way in which a program can employ combinations from the three approaches of supply, demand and voluntary measures and achieve high-reach, high-impact results in a range of fields including the reduction of personal car trips in the order of five per cent. The paper concludes by discussing the benefits of 'joined-up' approaches, highlighting the progress various government agencies in Australia and abroad are making, and reflecting on the opportunities and challenges of designing such approaches.

1. Background

The vast majority of government-led strategies revolve around two broad approaches: measures of supply and demand. Government action such as infrastructure projects, technological innovations and policy development through pricing and regulation, fall either distinctly into one or between both of these.

While many such projects and policies are vital to maintaining the fabric of 21st century cities and towns, these two approaches to government-led action are often large-scale, long-term and complex. Since, by their nature, they are delivered 'top-down', they are often incompatible with the public's immediate circumstances, short-term demands and perceived needs. For example, a new light rail corridor may come with the promise of substantial improvements in an area's congestion problems, but the local community may not value these benefits when faced with the short term costs of road closures and construction, leading to vocal opposition.

While there has been a realisation for some years that building does not always generate demand (e.g. Bain, 2009), this paper argues that to help overcome public inertia concerning top-down government measures and improve their implementation, a 'joined-up' approach with voluntary measures that empower the public to make better-informed decisions beneficial to themselves, their community and the environment should be followed. Whilst still government-led, these measures can be described as 'bottom-up' as the onus is on the individual and community to carry out the action, not the government itself (see Figure 1).

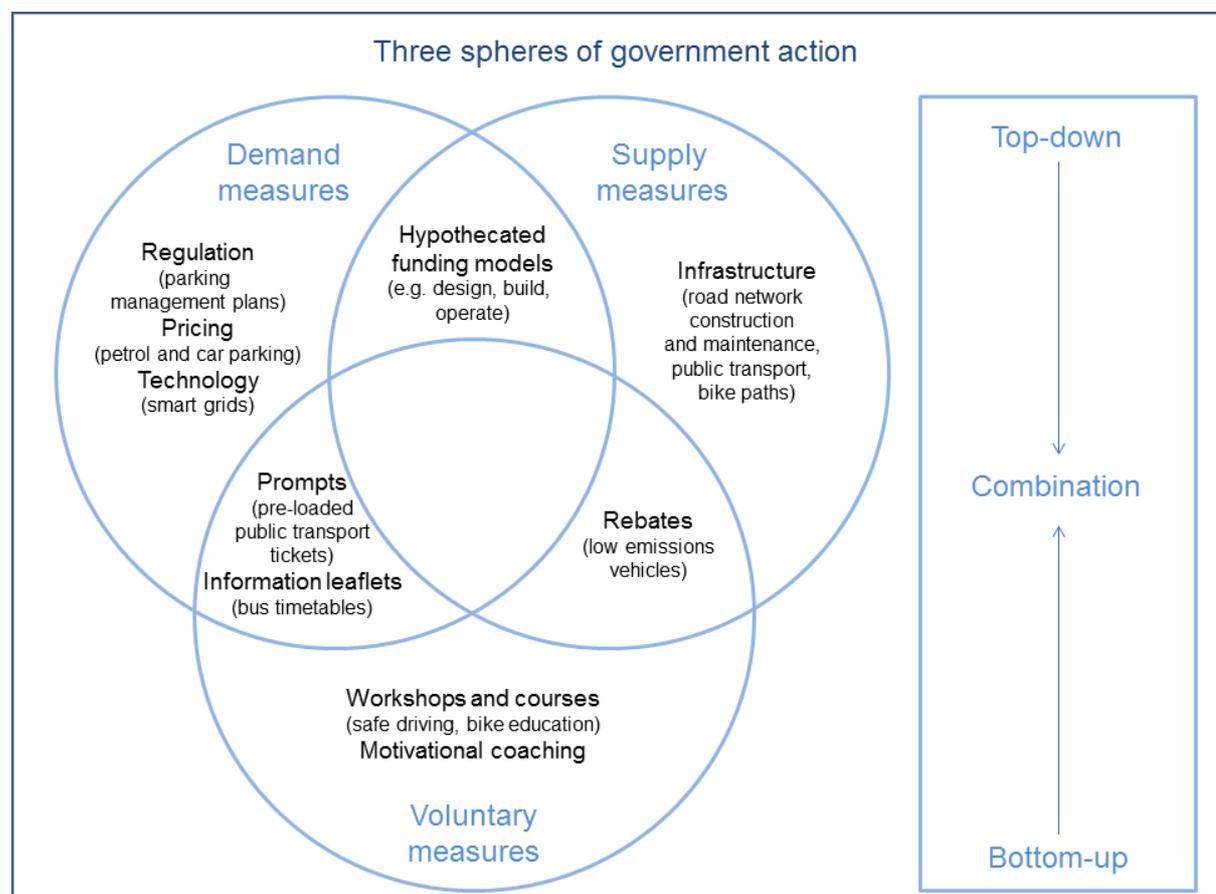


Figure 1: Relationship between supply, demand and voluntary measures showing transport-related examples within and linkages between each sphere

1.1 Co-ordinating supply and voluntary measures – an example

A recent example of the combination of top-down and bottom-up government measures occurred when the Southern Suburbs Railway was built in Perth, Western Australia. The rail line took ten years to plan and four years to construct at an infrastructure cost of \$1.184 billion (Longhurst, 2008). Public demand overshot the daily projected boardings of 50,000 within 6 months of project completion. Total boardings in May 2012 were almost 2 million making it the most travelled rail line in Perth (Public Transport Authority, 2012).

In conjunction with the rail line extension, the WA Department of Transport delivered a demand management program in the City of Mandurah entitled *Living Smart Households*. The demonstration project aimed to test the effectiveness of a variety of voluntary measures on participants' travel, energy, water and waste behaviours to reduce: pressure on public infrastructure, including congestion; greenhouse gas emissions; and household bills (see Section 5 for more details).

The travel component of the project within the City of Mandurah cost approximately \$1.1 million to deliver to 10,000 households. Table 1 shows independent analysis of a series of travel surveys of 'main mode trips' completed by a number of Mandurah households and extrapolated over a year. It illustrates a shift in travel behaviours associated with the rail line and the implementation of the *Living Smart Households* program. It shows the program helped to achieve a 31.4% uptake in public transport use in addition to the 59.9% increase achieved due to the introduction of the rail line (WA Department of Transport, 2012).

	2007 before rail (n=580)	2008 after rail (n=553)	Relative change before / after rail	2010 after Living Smart Households (n=660)	Relative change with rail and Living Smart Households
Modes	Trips/pn/ pa	Trips/pn/ pa	Change %	Trips/pn/ pa	Change %
Walk	76	82	8.4%	97	18.3%
Cycle	23	24	4.9%	25	4.2%
Motorcycle	6	8	34.0%	4	-50.0%
Car driver	608	601	-1.1%	570	-5.2%
Car passenger	261	245	-6.0%	251	2.4%
All public transport	22	35	59.9%	46	31.4%
TOTAL	995	995		993	

Table 1: Change in trips per person per year in Mandurah after rail line introduction and after *Living Smart Households*

This example shows the delivery of a behaviour change program (voluntary measure) in conjunction with public transport system investments (supply measure) optimises patronage, improves cost recovery and reduces local traffic congestion. It demonstrates that an investment in *Living Smart Households* of less than 0.2% of the capital budget of the rail line can increase public transport patronage by an extra 50%.

Benefits for the program were also experienced with the rail line acting as a major incentive for the participants to travel by public transport, illustrated by the 31% increase in patronage compared to the average 15% increase achieved since the WA *TravelSmart Household* program inception in 1997.

1.2 Structure of this paper

This paper will firstly document examples and research that describe why single-focus approaches (supply, demand or voluntary only) sometimes do not reach their full potential of positive outcomes. It then describes examples of recent voluntary measures and identifies four key strategies which have contributed to their success.

The *Living Smart Households* program is then used as a case study of how these strategies can form an comprehensive combination between bottom-up and top-down measures. The paper concludes by exploring the implications for policy and how governments of all levels can deliver solutions that intersect the supply, demand and voluntary spheres and subsequently benefit from a more empowered and better-informed citizenry.

2. Reasons for limited effects of single-focus measures

It is well known that providing new infrastructure does not always result in desired effects, such as reducing congestion or increasing the use of environmentally friendly transport modes. For example, simply providing new or more frequent bus routes may not result in an immediate uptake by the

community. This lack of desired outcomes can occur despite a large investment in the forecasting and planning stages (see Bain, 2009 for examples). In other words, “building it” doesn’t necessarily mean “they will come”. In addition, *Braess’s Paradox* describes the phenomenon that additional roadway capacity can actually reduce a transport network’s overall efficiency (Youn, Gastner and Jeong 2008).

Similarly, technological and policy solutions alone can result in sub-optimal outcomes and even suffer from rebound effects. For example, a number of studies into the impacts of improving vehicular fuel efficiency uncovered unintended rebound effects anywhere from 4.7% (Small and Van Dender, 2005) to 87% (West, 2004). That is, people drive further with the knowledge that it costs them less to do so.

The example outlined in Section 1.1 also experienced a rebound effect with the introduction of the new rail line. While public transport trips taken by the average person surveyed increased by 13, car as driver trips only decreased by seven. Interestingly, daily kilometres by car per person increased by 4% (see Table 2 below). There are a number of possible reasons for this with one hypothesis suggesting some commute trips converted from car to public transport led to a car being made available to other members of the household and/or for other trip purposes.

The Living Smart Households program helped to address this rebound effect with a 5% decrease in car trips along with the aforementioned 31% additional increase in public transport usage. Daily car kilometres per person also decreased by around 4%.

Measure	2007 before rail	2008 after rail	Relative change before / after rail	2010 after Living Smart Households	Relative change with rail and Living Smart Households
Total private cars	11,520	11,520	-	11,600	-
Daily car kilometres per person	19.6	20.4	4.1%	19.6	-3.9%
Daily car kilometres (everyday mobility)	28.6	30.1	5.2%	28.9	-4.0%
Total kilometres per year (in millions)	112 m	118m	5.4%	114m	-3.4%

Table 2: Change in car usage in Mandurah after rail line introduction and after *Living Smart Households*

To counter rebound effects and increase the likelihood of improved outcomes, governments and authorities have increasingly accompanied new infrastructure, technology and policy solutions with community engagement campaigns that encourage the public to play a stronger role in creating more efficient, greener and healthier communities.

To date, this has largely been in the form of broad scale education campaigns (McKenzie-Mohr, 2000), which continue to proliferate due to the relative ease of distributing leaflets or airing radio or television advertisements. Such campaigns follow in the footsteps of health promotion strategies addressing topics from dangerous driving to disease prevention by engaging the community through mass media channels (Abrams and Maibach, 2008), describing problems and associated behaviours in terms of gains and losses to encourage a shift in habits (Prochaska and Velicer, 1997; Rosenstock, Strecher and Becker, 1988).

While these campaigns have had some success in areas such as health (Delaney et al., 2004; Fisher et al., 1994) they appear to have had significantly less success in encouraging pro-environmental behaviours (McKenzie-Mohr, 2000). One reason is that such communication campaigns are often based on an ‘information-deficit’ model (Sturgis & Allum, 2004), i.e. people know less than experts and once they are given enough information about an issue, they will act appropriately.

Similarly, while these approaches have proven to be effective at raising awareness of an issue and even shifting attitudes – which, in and of itself, is an important part of community engagement – it has repeatedly not translated through to supporting behaviours. This is because it has been shown that there is only a very weak correlation between knowledge, attitudes, intentions and behaviours (Bamberg & Moser, 2007; Hines, Hungerford & Tomera, 1987).

Another reason is that people behave according to *subjective rationality* rather than economic rationality (Ampt, 2003). For example when, in the US, an energy company ran a campaign

advertising the fact the cost of leaving on lights was considerable, low income people tended to ignore the advertising more than those of middle and higher incomes – because ‘they didn’t want to look poor’ (Lutzenhiser, 1993).

Research conducted for the WA Department of Transport (Socialdata 2000) supports the concept of subjective rationality by revealing that households’ behaviours are often sub-optimal, and cost households unnecessary money, time and effort. This supports earlier findings in home energy use reported extensively by Shipworth (2000). In the field of travel behaviour, a study using in-depth travel surveys in Perth suggest that half of all car trips are replaceable with alternative modes and that information failure, false perceptions and engrained attitudes cause around 30% of trips to be made by an inefficient mode (Socialdata, 2000).

In addition, surveys about climate change show that pro-environmental attitudes are insufficient to trigger pro-environmental behaviours. On average, residents in supposedly “green-conscious” inner-city areas of Australian cities consume more resources than more “mainstream” suburbs on the urban fringe, primarily because of higher disposable income levels (Dey et al., 2007). Similarly, 72% of respondents in a nationwide Canadian survey self reported a gap between their intentions and their actions (Huddart et al., 2009).

The above examples tell us that information alone is not enough.

The same is true of pricing incentives. It is common to assume that a financial incentive (or disincentive) will change behaviour. There are several reasons why this is not always the case.

- People do not know how much travel costs (e.g. the operating costs of car travel)
- Cultural and social values are often more important in determining behaviours than cost (Lutzenhiser, 1993)
- Financial strategies are ineffective as people would have taken the action anyway
- Financial incentives of the same level produce radically different behaviours – even to the extent of both increasing and decreasing behaviours they are intended to encourage (Stern, 1993).

In addition, there are personal characteristics, which are important in changing behaviour. Actual and perceived barriers, and a lack of time, motivation, capital and ability, all represent initial hurdles to convincing households to accept that the promised benefits of a new habit are worth the required effort can be a challenge.

From a government perspective, this means that promoting pro-environment behaviours is not like promoting a new product. Billboard or newspaper advertisements will not lure people onto public transport in the way it might into a department store. This has been recognised in several countries (Australia, the United Kingdom and New Zealand) where policy papers have been written expounding this point of view. (Commonwealth of Australia, 2007; United Kingdom Science and Technology Select Committee, 2011; New Zealand Government, 2006)

3. An alternative – bottom-up approaches

Fortunately, efforts to address some of these issues have become more prevalent in recent years. With their roots in demand management, community-based social marketing, community development and social psychology, such approaches have historically included IndiMark (e.g. Broeg et al., 2002), Travel Blending, (e.g. Ampt, 1999). The innovative approaches pursued in recent years which are the subject of this paper aim to empower households to make better-informed decisions by employing a rich combination of the one or more of the following techniques:

5. *‘Let’s get personal’* – employ various customised contact methods
6. *‘Keep it close to home’* – develop content that localises issues and appeals to participants’ heads, hands and hearts’
7. *‘We’ll be in touch’* – provide ongoing support through a variety of passive and active touch-points that develop relationships, trust and accountability;
8. *‘Keeping up with the Jones’s’* – show proof that desired behaviours are normal by comparing actions of similar participants and using social hierarchies to spread behaviours

When delivered to households as part of a suburb-wide engagement program with the core operating principles of continuous improvement, innovation and a focus on “helping people to help themselves”, participants are better placed to realise that the benefits of a sustainable lifestyle far outweigh any initial barriers, and comprehend the importance of their role in achieving a more sustainable future.

The importance of communication built around the needs of an individual, and the quality of the relationship between the service provider and this individual is well known in marketing and sales research literature (Berry, 2002). In this context, customer trust (Swan, Trawick, & Silva, 1985), satisfaction (Crosby & Stephens, 1987) and an impression of expertise (Taylor and Woodside, 1981) are vital to a continued exchange.

Quality relationships are even more important when the service is complex, customized, and continuous (Lovelock, 1983), or there is uncertainty around the topic (Ghingold and Maier, 1986). In a sustainability setting it is clear that among other things, trusted services will provide regular personal contact, personal service touches, expertise and periodic needs assessments (Crosby et al., 1990) to truly meet the needs of households.

4. Key characteristics of bottom-up approaches

4.1 'Let's get personal'

The most successful behaviour change programs tend to give participants a unique personal experience. This can be in the form of face-to-face contact, personalised feedback or a series of conversations that build knowledge, capacity and relationship over time.

4.1.1 Getting in touch

The personal approach begins with the way people are informed about a program. Programs which result in the greatest participation often use personal approaches – sometimes starting with a letter before a personal visit or phone call.

Garner (2005) provides a simplified analysis of this 'personalisation' effect. In his study, a group of participants were sent a survey affixed with a hand-written message on a Post-it note. Three other groups received the survey with either no Post-it note, the same message written on the survey cover page without the Post-it note or lastly a blank Post-it note and no message. The group that received the personalised Post-it note completed their survey more often (76% compared to 36% in the control group), more promptly and to a higher quality. Garner concluded that "the results suggest that the Post-it leads the request to be interpreted as a solicitation for a personal favour, facilitating a normative compliance response." (2005, p. 230). In other words, the personalisation had the effect of making people feel committed to respond. Even far less conspicuous modifications, such as the use of a postage stamp as opposed to franking, can contribute to higher survey response rates (Shiono and Klebanoff 1991).

Several TravelSmart programs in Australia have built in personalisation with hand delivery of selected materials, including by bike. This not only provided a "face" to the program, but models the desired travel behaviours.

The WA *Living Smart Households* program goes a step further by supplementing personal delivery of materials with regular feedback letters outlining the household's energy and water use consumption levels and a series of tailored "coaching" conversations that focus on helping the household identify their own solutions to sustainability challenges in and around the home (see Section 4.3 for more details).

4.1.2 First contact

Many individualised programs follow up an initial letter with one or a series of phone calls. However, *TravelSmart* programs conducted in South Australia and Queensland have shown the value of a multi-method approach. All households in the target suburbs were sent initial letters. Then, those with known phone numbers were called. Finally, those households without known phone numbers were visited. While more cost intensive, these highly personalised door-to-door recruitment methods have been shown to have about twice the uptake of phone-only methods (Tideman et al., 2005).

'Conversationalists' recruiting door-to-door report the ability to mould the initial conversation to better suit the household based on observed factors. This approach enforces the value of word-of-mouth engagement and verbal commitment from the household (Ampt 2003).

4.1.3 *Helping people to take the first steps*

A number of programs focus on assisting with taking the first steps by encouraging people to work out when they will actually implement a change and getting them to think through the implications and processes (e.g. it might not be possible to use the bus immediately because it is school holidays – so that the participant might talk through the way of using it on the first day back at work). An example of this is described in detail in Ampt (2012).

4.2 **Keep it close to home**

Two further important characteristics of bottom-up approaches are providing customised content, in the form of localised information and approaches that appeal to different aspects of people's lives and values.

4.2.1 *Providing relevant and customised information*

Broad-reach programs are usually based on two assumptions, both of which have flaws. McKenzie-Mohr (2011) describes these two approaches as “attitude-behaviour” and “economic self-interest.” “Attitude-behaviour” campaigns assume that increasing public knowledge of, or fostering positive attitudes about, an issue will influence behaviours while the “economic self-interest” model assumes the public is in a constant state of analysis as to which option will be most beneficial to them financially.

However, both approaches have been largely unsuccessful in shifting habits, as they, in part, expect people to behave in a rational, predictable manner, informed by choice and benefits. There is, in fact, a large variety of situations and ways of thinking that may skew this traditional *rational choice theory* as described in Ariely (2008).

One approach that has been shown to have a much greater effect on behaviour change is the provision of information customised to each member of a target group.

Midden et al. (1983) conducted a study that separated Dutch families into four conditions and provided each with varying levels of information and feedback on their energy use. “For electricity use, households who had either received comparative feedback, individual feedback or rewards tended to save more than the control group did [while] providing households with information alone was not effective at all” (in Abrahamse et al., 2005). In other words personally informing households had a much greater effect than mass dissemination of non-tailored information (Chong and Druckman, 2007; Hillsdon et al., 2005).

‘Personally informing’ members of the public of their options to adopt more pro-environmental behaviours can be accomplished in many ways. The WA-based *TravelSmart Household* program has done this by providing localised tools and guides (WA Department of Transport 2012) which give information on local active and sustainable transport infrastructure and services alongside tips on how the community can best use them to their advantage, including:

- A comprehensive *Local TravelSmart Guide* (map) with sustainable and active transport routes alongside local attractions, such as corner delis and pocket parks,
- Leaflets with localised information, such as the details of neighbourhood walking groups, and
- Pocket-sized bus timetables tailored to a participating household's environment with timetables for the bus stop closest to their home and return timetables for the closest sub-regional destinations, such as shopping centres and train stations.

TravelSmart Households in the West in South Australia took this last approach further by providing Personal Journey Plans with precise times for catching a bus, information on how to alight the bus, and a free public transport ticket suitable to the purpose and person. These tools used minimal text, simple language and visual cues to increase the likelihood of their use by a wider segment of the population (Tideman et al., 2005).

4.2.2 *Avoid information overload*

Importantly, the tools described above were only provided when people specifically requested them (i.e. they were to address a specific issue that someone had raised) which meant that the household knew the materials were coming and had already discussed a way that they would be used.

4.2.3 *Appealing to people's heads, hands and hearts*

Research has shown that different people tend to respond in different ways to different messages (Straker, 2010). These have been categorised as follows:

- **heads** – some people use logical thinking to change (e.g. upon reading the details, facts and benefits of a new behaviour, they will see the logic in changing and do so)
- **hands** – some people change best when they have had a try (e.g. finding out that riding a bike to school is a good experience)
- **heart** – some people change because it makes them feel good or accepted (e.g. 'I feel so good just knowing I'm getting fitter')

The examples below show the ways in which these approaches can be employed.

In several programs in Western Australia where people were encouraged to use less energy and water (e.g. *Living Smart Households*; *H₂OmeSmart*), utility consumption levels were measured via periodic meter readings before the intervention commenced and at various stages throughout a year-long program including up to six phone 'coaching calls'. Personalised feedback letters were created with the use of consumption data and comparisons to similar residents in the same neighbourhood, and sent in the mail a short time before each coaching call. For those people who prefer to react to logic (heads) this is an ideal approach.

However, reading information or talking to someone about their lifestyle will not be enough to trigger a response for some people. They will respond better to a hands-on demonstration or role-modelling of a particular action. For example, an in-home audit in which the participant can explore problem areas and possible solutions with a professional provides a rich experience and a strong impetus to change. More than 50% of those taking part in the Perth Solar City *Living Smart Households* program requested an in-home sustainability audit with 82% rating the service quite or very useful and 84% quite or very interesting (WA Department of Transport, 2011). Similarly, surveys of Ride to Work Day participants showed more than one in four (27%) of first-time cycling commuters were still doing so five months after the event (Rose and Marfurt, 2007).

Finally, if it is necessary to include broad-reach materials or leaflets in a program, it can be useful to include all three approaches. Encouraging action through the following approaches will appeal to the broadest sections of the community:

- heads: facts, statistics (e.g. through graphs and tables)
- hands: practical how-to instructions, or interactive prompts (e.g. pre-loaded public transport tickets), and
- hearts: highlighting a sense of belonging or moral imperative (e.g. "join thousands of others in your community"; "leave a legacy for future generations")

A comprehensive voluntary behaviour change program will incorporate all three styles of learning into its methodology. As Straker (2010) points out, "in gaining full commitment, you need not just logical agreement but also emotional buy-in and practical action. Closure may initially be gained in one dimension, but for sustained commitment this has to extend to all three. Commitment may thus be viewed as a triple-closure process" (p. 241).

4.3 'Let's stay in touch'

The two broad methods discussed above (personal contact and customised content) will likely have added success when participants are provided with ongoing support over a period of time. Evaluation of results from short term interventions indicate behaviours rarely shift significantly from one-off program contact such as car emissions inspections (Tedeschi et al., 1982) and passive education seminars (Zelezny, 1999). It should be said that one-off interventions are more successful when participants also commit to undertaking more of the desired action (e.g. Rose et al., 2003); a technique described in Section 4.3.2 below.

It is becoming more common for successful programs to deliver ongoing support and feedback through touch-points of varying intensity, mode and style. This is particularly true for programs that address multiple behaviours and actions that are repetitive, such as travel choices.

It appears that programs are most successful when they build trusted relationships with participants and feature the common elements of cognitive dissonance, accountability and the ability for participants to explain their progress in their own words.

4.3.1 Cognitive dissonance

One method of developing a unifying thread for conversations over time is to use the concept of cognitive dissonance. In 1957, Leon Festinger developed the *Theory of Cognitive Dissonance*, which has had a significant influence on the field of social psychology ever since. The theory, in its simplest terms, proposes that a person who has conflicting attitudes, beliefs, values or behaviours is said to be in a state of 'psychological dissonance.' Festinger argued that this can be resolved in three ways:

- a) lowering the importance of one of the discordant factors,
- b) adding consonant elements, or
- c) changing one of the dissonant factors.

As an example, if someone is concerned about damage to the environment but is shown to be driving more than most people in their area they can reduce this dissonance by a) no longer caring so much in the environment b) justify their behaviour with reasoning such as "I lead a busy life" or "it's too dangerous to walk or cycle in my neighbourhood" or c) reducing the amount they drive.

This approach has been used in voluntary behaviour change programs in terms of the final example: 'changing one of the dissonant factors'. This is often done (e.g. Ampt 2003) by asking a probing question such as "when were you last in the car and wished that you weren't?" in order to ask participants to consider, identify and investigate conflicting values. Once a conflict is established, several approaches can be employed to encourage and support travel behaviour change. These include direct coaching (e.g. immediately offering alternatives for change) or 'helping people to help themselves', which is based on the community development approach (Ife, 2002). The latter approach, used in *TravelSmart* programs in Adelaide and the Gold Coast (Tideman et al., 2005, (Department of Transport and Main Roads, 2012), is implemented by first asking people if they have thought of a solution – and facilitating a change based on the participant's initial ideas.

4.3.2 Accountability – keeping one's word

A major benefit of longer-term campaigns with various interactions is the ability to embed program accountability methods to follow up on participant commitment made in earlier stages. Prendergast et al (2008) describe this as the norm of social commitment "which requires us to stand by agreements and fulfil our obligations. Once an individual expresses beliefs or commitments publicly, they exhibit a strong tendency to act in a way that is consistent with these commitments."

A community-wide intervention to improve pedestrian safety (Boyce and Geller 2000) asked residents to sign promise cards to make better use of crosswalks. As a result of formalising a social commitment in the presence of a respected other, incidents in which drivers gave way to pedestrians at crosswalks increased by 21%, which increased by another 9% over the following year.

This technique has been successfully employed with regard to travel behaviours, such as encouraging alternatives to single occupant car trips (Cooper 2007; Tools of Change 2012) and cycling to work (Rose et al., 2003).

In Western Australia, the norm of social commitment has been leveraged successfully in recent approaches that target not only travel, but also water, energy and waste behaviours. The 2010/11 *Living Smart Households* program featured up to six 'eco-coaching' conversations over approximately 12 months. The initial call used the conversation approach, based on cognitive dissonance techniques (see Section 4.3.1). However in that initial call and in all remaining calls people's existing behaviour and commitments were recorded in a matrix with the following categories:

1. Existing behaviours (people already reported doing these);
2. Agreed (actions people agreed to do during the conversation);
3. Achieved (actions people reported having carried out during the program);
4. Refused (actions people were unable or unwilling to do); and,
5. Not applicable (actions that were not relevant to that household – e.g. reducing car use if they did not own a car).

Through an exploratory conversation a household identified a behaviour they wanted to change. Once an action had been 'agreed' there were two steps in the conversation: talking through the way in which the person or household would carry it out, and then getting them to articulate the change they plan to make, often defined as a social contract. Given this context, the accountability is not overridden with an overbearing sense of pressure, or guilt, but rather the social norm of keeping one's word.

The authors have personally witnessed that language such as “we’ll see how you’re going” has proven much more successful in obtaining commitment than such formal terms as “follow-up”, “check-in” or “track”.

4.3.3 *Word of mouth*

Another key component of long-term voluntary behaviour change programs is the ability of participants to engage in an ongoing story of change. Where people are actually solving a problem or inconsistency with respect to their own values, it is easier for participants to articulate the benefits of the change in their own words, especially when they have ample opportunity to do so through a wide array of touch points. For many people it is easier to describe a change in behaviour in terms such as ‘since I’ve been walking I’ve lost 3 kilos’ than to use the terms of policy makers ‘since I’ve been walking I’ve reduced my greenhouse gas emissions by 1.5 tonnes per annum’.

This improves participants’ understanding of why they are making a change, improves the likelihood of communicating the benefits through inter-personal communication networks (Leonard-Barton, 1981) and gives participants better ownership of the change.

4.4 **Keeping up with the Jones’s**

Successful bottom-up measures, including voluntary behaviour change programs, will pay close attention to social and cultural cues as they shape the inherent differences between identities of various communities. Cues can be made visible through two main processes: ‘normalisation’ – making a behaviour the norm (e.g. Lubell et al., 2007), and Rogers’s *Diffusion of Innovations Theory* (1962) – leveraging social structures to enable the spread of a behaviour.

4.4.1 *‘Safety in numbers’ – the power of social norms*

The concept of social norms hinges on the *Theory of Planned Behaviour* (Ajzen 1985), which states that our intentions are in part determined by our “normative beliefs”, that is, what we believe is normal to do in a certain situation. Being social creatures, we are adept at identifying what is normal by observing others, and often model our behaviour on what most others are doing.

People and groups tend to internalise norms by accepting them as reasonable and proper standards for behaviour within a group. Hence, it can be argued that if people start to think that ‘everyone is walking more these days’ or ‘most people don’t use their car every day’ then the norm becomes a social “fact” (Dunning 2004), and thus, a part of the group’s operational structure. It can also be argued that conversation-based coaching can leverage norming to influence behaviour as the ‘conversationalist’ can address and counter the rationale surrounding the root cause.

Since the 1990’s, Cialdini (1990, 1991, 2003, 2004, 2005, 2006, 2007) along with colleagues such as Schultz (2007) and Nolan (2008) were able to break down the effect of norms. They separate norms into “descriptive” – what we think most people do, and “injunctive” – what we think people will think of us if we do it. We know naturally that certain actions will influence others’ opinions of us, depending on what the observer believes our intentions for that action are. Our self-image influences our behaviour and we are likely to act not only in accordance with this, but in a way that we think similar others would approve.

While there are more passive, broad-reach alternatives that use descriptive social norms to influence behaviour, such as comparative feedback on utility bills (e.g. Schultz et al., 2007; Ayres et al., 2009), they generally have less impact on behaviours than approaches that focus on community development (Ampt 2003). The former are also vulnerable to unintended consequences with people’s political views, social networks (Costa and Kahn 2010) and current behaviours (Schultz et al., 2007), causing some of the target population to have the opposite reaction to the desired effect of highlighting the social norm. Injunctive norms can lessen these effects, such as the smiling face icon (☺) used within the utility customer engagement platform *OPower* and encouraging words for a household using less than the average amount of energy in their neighbourhood (see Schultz et al., 2007).

Communicating social norms in travel behaviour change programs has been achieved by relating stories to participants. An example of a descriptive norm in a phrase may be “many people in your suburb are riding their bikes to work these days.” Using this type of language also allows people to accept or reject the suggested action without feeling as if it was imposed on them. An injunctive norm

takes this a step further by making such a behaviour socially desirable, possibly through a monthly Ride to Work breakfast paid for by the employer.

4.4.2 'Someone told me about it' – social diffusion in action

Just as observing what is “normal” in a community is a power predictor for behaviour, witnessing a similar or trusted other carry out or endorse a particular behaviour can convince many to adopt it. If an intervention uses a marketing approach to tell stories of trusted others, it is important to use a variety of personalities that have the potential to engage people down different lines of association, such as voting preference (Kahn 2010). Social diffusion techniques in local travel behaviour programs have sometimes used quotes from well-known personalities promoting various actions and invitation letters addressed from a local mayor (e.g. Socialdata 2009). In other methods, the participant is able to work out who they know that has made a change, i.e. identify their own person of trust (e.g. Tideman et al., 2005).

5. Case study – an integration of voluntary, supply and demand measures

This section uses the 2009/10 *Living Smart Households* program, of which the authors were involved in the design and delivery, as an example of the way in which a program can employ combinations from the three approaches of supply, demand and voluntary measures described in Section 1.

This example further integrated these approaches from the demonstration project outlined in Section 1.1 as it was implemented under the broader Australian Government’s *Perth Solar City* initiative. *Perth Solar City* employed a variety of technological, pricing, infrastructure and communication techniques to understand and overcome barriers to residential energy efficiency. Figure 2 shows the various elements of *Perth Solar City* and how *Living Smart Households* brought all three approaches together.

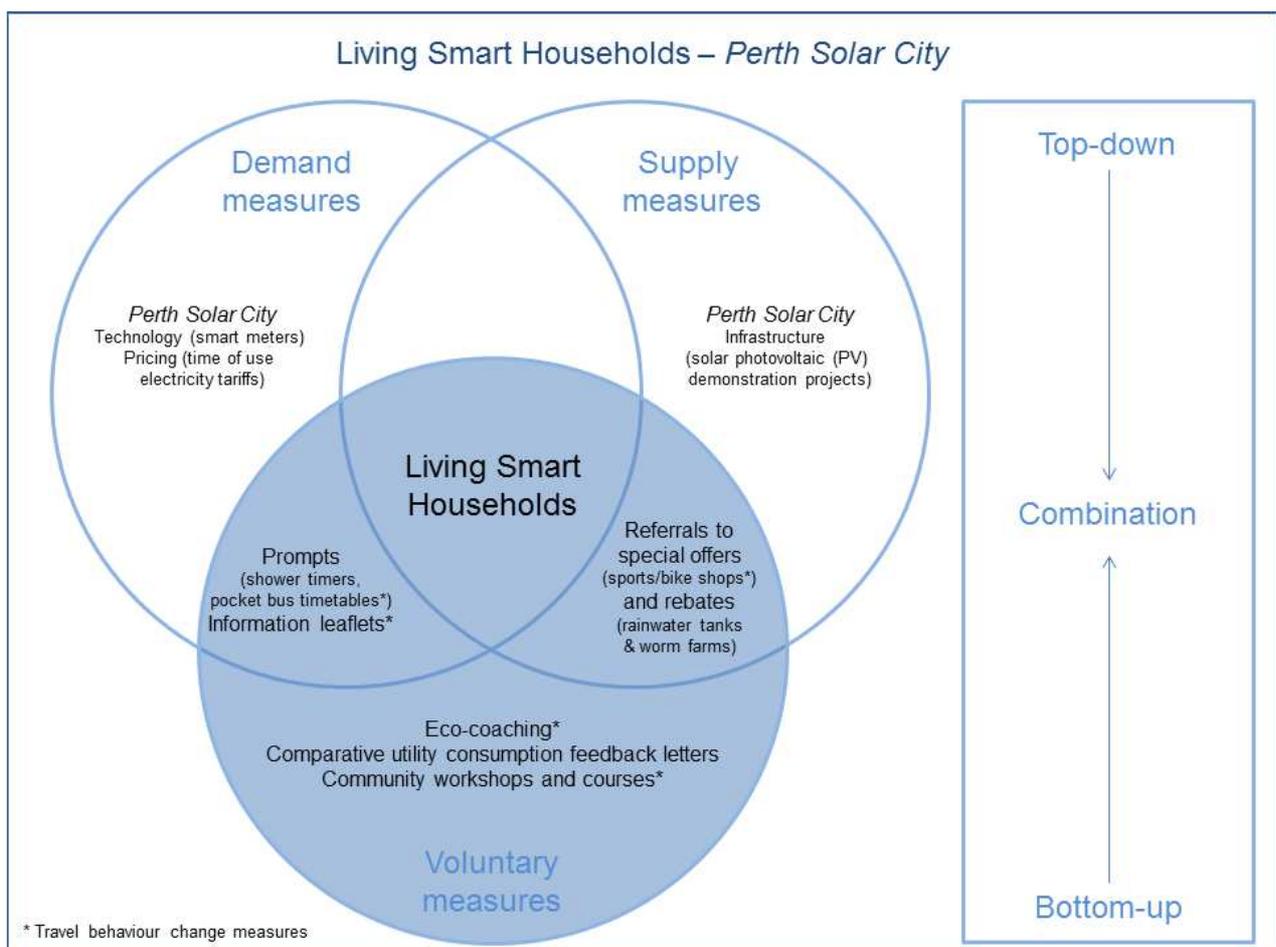


Figure 2: *Living Smart Households*: combining supply and demand management with voluntary behaviour change

Figure 3 outlines *Living Smart Households*' voluntary behaviour change measures, including the innovative elements of:

- Localised information materials that were only delivered to households when requested
- Highly personalised services, including:
 - customised energy and water consumption feedback letters;
 - seven-week, action-oriented sustainability living community courses; and
 - regular eco-coaching phone calls
- Social psychology techniques such as:
 - *cognitive dissonance* – asking participants to reflect on their values versus their actions;
 - the *norm of social commitment* – reminding participants of ongoing contact to follow up on agreements for change;
 - *descriptive social norms* – the use of such statements as “many people we have been speaking to are now ...” and the comparison of people’s energy and water use to a neighbourhood average and a sustainability target;
 - *injunctive social norms* – the use of such statements as “that’s great you’re now doing...” and the use of smiley face icons (☺) depending on the participants consumption compared to a neighbourhood average and sustainability target; and
 - *social diffusion* – the use of such statements as “I was just talking to someone who lives around the corner from you who is now ...”

5.1 Integrating all three approaches

Key elements of the program that integrated all three measures include:

- The provision of demand management prompts such as shower timers, localised information materials and pocket-sized bus timetables; and
- Referral to *Perth Solar City* services outlined in Table 1 below.

Service	Requests	Percentage*
In-home visits including a comprehensive sustainability assessment and the creation of an action plan	2088 households	43%
Solar photovoltaic systems discount quotations	1146 households	24%
Solar hot water system consultation	657 households	13%

* of those participating in the eco-coaching service

Table 1 – Perth Solar City service offerings and Living Smart Households participant uptake

Each of these *Perth Solar City* services was integral to reinforcing behaviour change, since they involved face to face interaction with households and reinforced the personalised nature of the program which further built trust in the program’s messages and the participants’ self-efficacy. The programme is summarised in Figure 3.

5.2 Results

The project achieved a significant uptake of sustainable behaviours. Households reported completing more than 11,800 actions (around 2.5 actions per participating household) to reduce their demand for energy, water, car travel and waste services. Note that the results focus on changes in water and energy because these were the focus of quantification in the project. However, we believe that, from the qualitative responses, it is highly likely that travel behaviour change was similar. The Department of Transport is already planning to include more detailed measurement of travel in future programs.

When analysing those not already reporting to undertake the associated action, *Living Smart Households*’ participants reported significant changes in such behaviour as taking shorter showers (57%), switching off standby power (64%), and making physical changes to households such as installing energy efficient light bulbs (52%), waterwise showerheads (21%) and solar panels (9%). In addition, many participants indicated that they would continue to make further changes due to the positive experience of taking action through participation in the program (Sinclair Knight Merz 2012)

Throughout the program, all actions were recorded against a comprehensive data management and tracking matrix (see Section 4.3.2), which meant detailed calculations based on the self-reporting of actions could be made. These calculations indicate a more than 14,000 unit (kWh) collective daily reduction in electricity use and a 197,000 litre saving in water use each day. Across the households participating in the eco-coaching phase of the program, these changes amount to a saving of 2.9 kWh of energy and 40 litres of water per household per day (Sinclair Knight Merz 2012).

Independent analysis of car use carried out through detailed travel surveys indicates the participating group reduced their usage by an extra 4.3% against the control group (Synovate 2011).



Figure 3: Living Smart Households implementation methodology

Independent analysis of electricity meter readings demonstrates an 8.5% reduction in participating households compared to a control group (Western Power, 2011). Additional analysis taken in the early months of the program measures a 1.7 kWh reduction in electricity use amongst participating households, a figure which validates the self-reported actions at that point in the program. Significantly, participants are likely to share their experiences with others in a way that is likely to spread the sustainability outcomes beyond the participating group. This was evidenced by qualitative participant feedback (Sinclair Knight Merz 2012).

Preliminary water analysis, yet to be independently verified, indicates an average net saving of 3.9% against the control group.

6. Implications for policy and practice

This paper has explored a variety of research and literature in the fields of transport and others. With examples, it has shown that while infrastructure, technology and policy solutions are important, it is highly beneficial to incorporate other tools of change including voluntary behaviour change.

This is especially true when benefits and consequences are hard to distinguish, social pressures, such as a herd mentality, exist, and complex decisions encourage counter-productive outcomes. These outcomes can be improved by approaches, described by Thaler and Sunstein (2008) as *nudges*, which “self-consciously [attempt] to move people in directions that make their lives better” (p.6). They are voluntary so do not impinge on the public’s liberty, but empower the community with support, advice and critical information, meaning their implementation is palatable to all manners of political persuasions.

For example, under the guidance of Conservative Prime Minister David Cameron, the United Kingdom has formed a Behavioural Insights Team (colloquially known as the “Nudge Unit”), which is considering the ways in which voluntary behaviour change approaches can be coupled with established supply and demand measures. It has started a structural rethink in the way behaviour change messages are implemented, including a shift away from short-term, broad scale advertising campaigns towards long-term, individualised marketing interventions (House of Lords, 2011).

At the same time, United States Democrat President Barack Obama has received high-level advice from eminent behavioural economist and law professor Cass Sunstein, who until recently was the Administrator of the White House *Office of Information and Regulatory Affairs*. This paper argues that when “nudges” are coupled with large-scale supply and demand measures, such as infrastructure upgrades and technological innovations, positive social, political and economic outcomes can be amplified.

Programs such as *Living Smart Households* demonstrate that when a wide range of change mechanisms are employed, the public’s capacity to change, access to services and purchasing power are improved, which leads to a more optimal use of scarce resources. In addition, households that arrive at their own solutions are more likely to ‘own’ them in the long term, leading to lasting change to match the objectives of various supply and demand measures. The program also provides a ‘one-stop shop’ for sustainable living solutions, which helps to cut through the large amounts of conflicting and confusing information. This also helps to minimise ‘program fatigue’ which a household would likely experience if offered a travel behaviour change program shortly after a water or energy-based intervention.

However, the complexity of co-ordinating such comprehensive interventions should not be ignored. A variety of challenges exists including, aligning different agency/sector objectives, aligning funding opportunities and budgets, a general absence of Government policy and budgetary systems to support cross-sectoral and intra-agency integration, and Government reporting which is often focused on inputs and outputs rather than outcomes. These hurdles, and others, can lead to a more opportunistic and ad-hoc approach to implementation, rather than strategic.

With growing populations and pressure on existing infrastructure and services, coupled with tightening government budgets at all tiers, Australia stands to benefit from the integration of bottom-up voluntary measures with existing and planned top-down demand and supply measures. In fact, a growing number of agencies are developing strategic approaches that include a combination of supply, demand and voluntary approaches to meet the needs of the future. Projects such as those reported here not only provide evidence that the approach is valid, but also highlight changes that need to be made when travel behaviour change is a component in the program. The options to

further this trend are vast, with cross-portfolio collaboration and public private partnerships representing opportunities for bold leadership and creativity in the way Government achieves its public policy goals and positive outcomes for the community.

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