

ACHIEVING PEAK TRAVEL DEMAND REDUCTION THROUGH A TRAVEL BEHAVIOUR PROGRAMME: SINGAPORE EXAMPLE

MEng MIEI Sarah Moraillon
Senior Consultant, Transportation
AECOM, Dublin

Elaine Brick
Associate Director, Transportation
AECOM, Dublin

Abstract

Mindful of the impact of steady population growth on travel demand, the Land Transport Authority of Singapore (LTA) is exploring the use of travel planning to influence voluntary change in travel behaviour among Singapore commuters. The programme, known as Travel Smart Pilot Programme, was launched in October 2012 and uses traditional travel planning tools with a view to reducing travel demand on public transport and road network during peak periods. The programme, managed by AECOM, provides a valuable insight into the potential for travel time shift through travel planning.

Similar to traditional workplace travel planning practice, bespoke plans were prepared for the 12 participating organisations which among them employ over 23,000 people. Measures to introduce/enhance flexible working practices were encouraged and monitored over an 18 month period.

Results from monitoring surveys demonstrate the positive impact of the Pilot Programme on travel time with an overall reduction of 9-12% in peak hour trips recorded. This has been achieved through the uptake of staggered working hours and telecommuting despite a traditional working culture and long working hours in Singapore.

Changes in working practices has presented benefits for employees through improved work/life balance and reduced stress. Employers involved in the programme have also benefitted through improved staff morale and reduced property costs.

The following paper focuses on the Singapore experience of shifting commuter travel time to reduce peak hour congestion and presents opportunities for application of a similar approach internationally.

Introduction

The need for a fundamental shift in travel behaviour has emerged as a major challenge for cities across the world in the 21st century. A steady increase in urbanisation has generated simultaneous growth in travel demand on networks which are struggling to cope with demand.

Like many cities, Singapore is facing the challenge of meeting increasing travel demand in tandem with growing population. Travel demand in Singapore has increased by more than 10% in the past 5 years with a large proportion of this demand in the morning peak period¹. While around 60% of commuters travel on public transport in the morning peak period, recent increases in travel demand has had repercussions for an already crowded public transport system. This is reflected in the recent Public Transport Customer Satisfaction Survey 2012 which shows that Singaporeans' overall satisfaction with public transport has dropped from 90.3% in 2011 to 88.8% in 2012 and 88.5% in 2013.

Responding to forecasts of future public transport demand, the LTA is already in the process of enhancing public transport capacity through major infrastructural investment in new MRT lines and bus service enhancements. While works on the latter are currently underway, major capacity improvements to the rail network will not be in place until late 2015 at the earliest.

Mindful of impact of increasing demand in the interim period, the LTA commissioned AECOM to develop a travel behaviour change programme with the aim of inducing voluntary change in peak hour travel. The Pilot Programme was launched in October 2012 and is the first of its kind in Asia.

International Evidence

Travel plans are tried and tested tools which are generally used to reduce dependency on car travel and encourage a shift towards sustainable modes. They are generally developed for workplaces, schools and households to identify the barriers to sustainable transport use and make these alternatives a more attractive option. Travel plans also provide various incentives to travel behaviour change such as discounted public transport tickets, reserved parking for car poolers or improved facilities for cyclists and pedestrians such as parking and shower facilities in the work place.

The introduction or enhancement of flexible working arrangements (FWA) is regularly referenced within travel plans for workplaces. However, because travel plans have focused more on a shift to sustainable travel modes FWA hasn't formed an integral part of travel planning.

The strength of FWA as a measure in managing travel demand has been demonstrated through a number of international case studies. Most notably, during preparations for the London Olympics in 2012, Transport for London established the Travel Advice for Business (TAB) programme to ensure that the forecasted 20 million trips during the Games could be accommodated on the already busy London Underground and other public transport networks. Areas of high travel demand were identified, with employers within them engaged in the programme. Participating employers were encouraged to:

- Reduce the need for employees to travel during the Games;
- Re-time journeys to travel earlier or later, avoiding busy periods;
- Re-mode, primarily mode shift from public transport to walking and cycling; and
- Re-route trips to less busy routes on road and public transport networks.

The programme, which involved 200,000 organisations, was a significant success with an estimated 42% of London businesses allowing their employees to work from home during the Games (London Chamber of Commerce and Industry, 2012). This ensured that spare

¹ Singapore Land Transport Statistics in Brief, 2013

capacity on the network resulted in smooth access to and between Olympic venues. Since the transport success of the Games, a survey of 600 employers in central London has indicated that the introduction of FWA has been one of the greatest legacies of the Games. Eighty five percent of employers surveyed after the Games plan to keep FWA in place which will have ongoing benefits for the transport network.

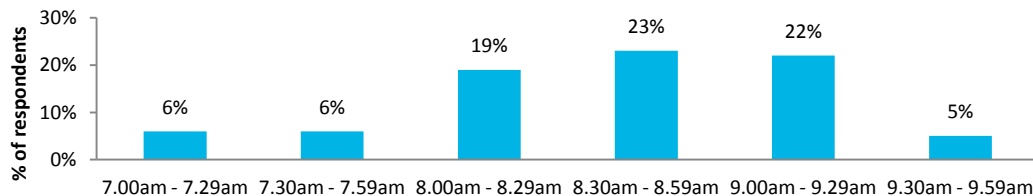
Since the Games, Transport for London (TfL) has continued its partnership with the 'Anywhere Working' consortium alongside UK's Department for Transport (DfT), Microsoft, Regus and Vodafone to promote flexible working practices. In addition, TfL is planning a long-term engagement strategy to promote flexible working to businesses across London.

Singapore Travel Smart Pilot Programme: Delivery Approach

Participation in the Travel Smart Pilot Programme was limited to twelve organisations who were invited to participate on the basis of size, industry type, sector and geographical location. The programme had been initially intended to reduce or shift travel demand from the morning peak period; and encourage the use of sustainable travel modes, especially walking and cycling. However, market research conducted prior to the Pilot Programme launch with a representative sample of Singapore commuters suggesting that the dominance of public transport as a commuting mode in Singapore (a mode share of 68%) left limited additional scope for promotion of sustainable travel modes. In addition, the results indicated limited willingness to shift to walking/cycling as travel distances are perceived as too far. These factors meant that the primary opportunity to reduce peak hour travel demand on public transport was by influencing workplace policies that affect time of arrival/departure times.

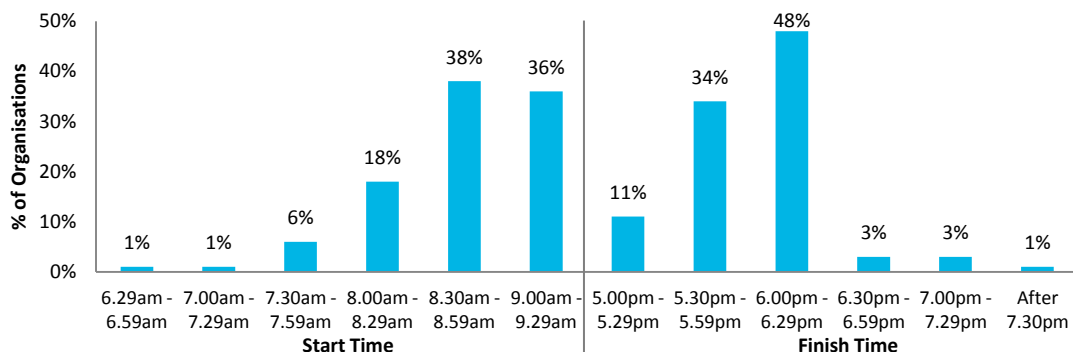
The market research results also highlighted the implicit link between travel patterns and workplace employment policies. Among the commuters surveyed, 45% start work between 8:30am and 9:30am (see Figure 1).

Figure 1. Commuters' Work Start Time



Comparing these figures with the start times of businesses in the city demonstrates a direct correlation with most organisations commencing work between 8:30am and 9:30am (72%) and finishing work between 5:30pm and 6:30pm (81%) (Figure 2). This restricted timeframe creates an intense peak in travel demand on both the road and public transport network. This relationship, one which is evident in many cities across the world, implies there is an opportunity to ease the peak hour congestion through the promotion of FWA.

Figure 2. Business start and finish times among 100 Singaporean businesses



Findings from the market research provided some valuable information with regards shaping development and implementation of the Travel Smart Pilot Programme. Once organisations had confirmed participation in the programme, the following tasks were undertaken:

- **Travel Smart Awareness:** A campaign to promote Travel Smart Pilot Programme, its objectives and benefits to employees was launched in each organisation;
- **Site and Policy Audit:** In order to understand the Travel Smart measures most appropriate for each organisation, an audit of the facilities that impact on travel and access to the workplace was undertaken. In addition, flexible working policies and health and wellness policies were reviewed to understand how they may influence the travel behaviour of employees; and
- **Survey and Reporting:** A Baseline Survey of travel patterns and attitudes was undertaken in each organisation. Results of the survey are used as the basis for comparison for all further Travel Smart surveys.

Results of the survey, in combination with outputs from the previous two tasks were used to deliver bespoke Action Plans for each organisation. Once the plans were agreed by senior management, it was sought to ensure sufficient resources/funds were made available to deliver the plan.

The development of Travel Smart Action Plans for participating organisations has given a specific focus to the potential of FWA. Each of the Action Plans prepared include FWA recommendations, such as:

- Training and guidelines for managers managing employees who wish to take-up FWA;
- Making FWA available to a wider group of employees;
- Extending FWA policies to allow earlier/later staggered working hours or more than one telecommuting days;
- Promotion of incentives which encourage FWA such as free breakfasts or Sunrise in the City Programme; and
- Where participating organisations do not have FWA in place, opportunities for its launch have been investigated and generally met with enthusiasm.

The organisations delivered their plans in 9-12 months, however, the delivery of some of the proposed measures extended beyond this timeframe.

In addition to piloting workplace travel planning, the Pilot Programme also included an element of Personalised Journey Planning (PJP) with employees. PJP is a more direct engagement tool whereby the existing travel patterns of commuters are analysed and bespoke, personalised plans are prepared to present alternative travel options for the commute to work. PJP was only undertaken with a sample of 900 participants across three organisations with participants chosen on the basis of their current time (AM peak) and mode of travel (public transport or car) to work.

Bespoke packs were prepared for each participant which included:

- Personalised travel plans to respond to specific opportunities to encourage a shift in travel patterns;
- Information on incentives; and
- Merchandise to raise awareness of the Travel Smart brand.

The contents of the packs were presented to and discussed with participants at a Travel Smart event in each workplace. During the consultation, participants proposed Travel Smart goals, i.e. how they felt they might be able to shift travel time/mode in the coming year.

It should be as well noted that a number of additional incentives were provided to all commuters in Singapore to influence a shift in travel behaviour. These include:

- **Pre-Peak Free Travel Trial:** This scheme was implemented from June 2013 and offers free MRT travel to passengers exiting any one of 18 designated stations before
-

07:45 on weekdays. Alternatively, if passengers exit one of the stations later, between 07:45 – 08:00, a 50 cent discount on fares is given;

- **INSINC (Incentives for Singapore Commuters):** This scheme provides credits to commuters travelling outside the peak period, who can win cash rewards or apply for a cash rebate using their off peak travel credits; and
- **Sunrise in the City:** This programme has also contributed to an awareness of the benefits of travelling earlier, by encouraging commuters who may not be able to formally change their work start time to undertake activities (e.g. gym) before work.

Monitoring was a critical component of the Pilot Programme and following the initial baseline survey, two follow-up surveys were undertaken by employees across all participating organisations.

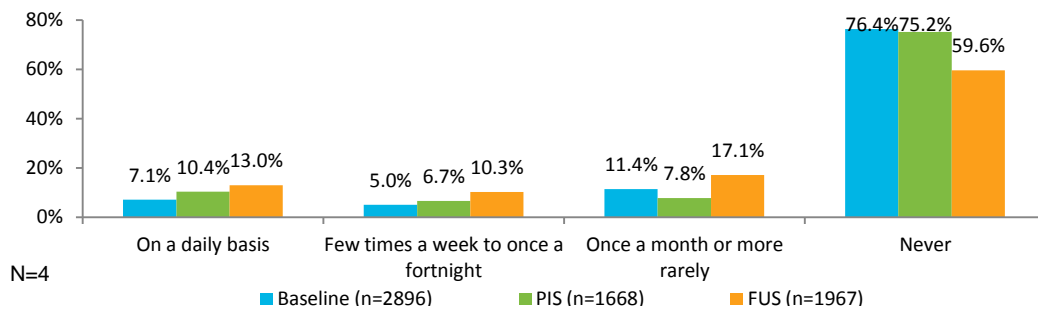
Travel Smart Pilot Programme Impacts

Results from the follow-up surveys undertaken by employees within participating organisations have been used to undertake an overall evaluation of the Pilot Programme. Some of the high level results are outlined in the following sections.

An increased awareness and take-up of Flexible Working Arrangements

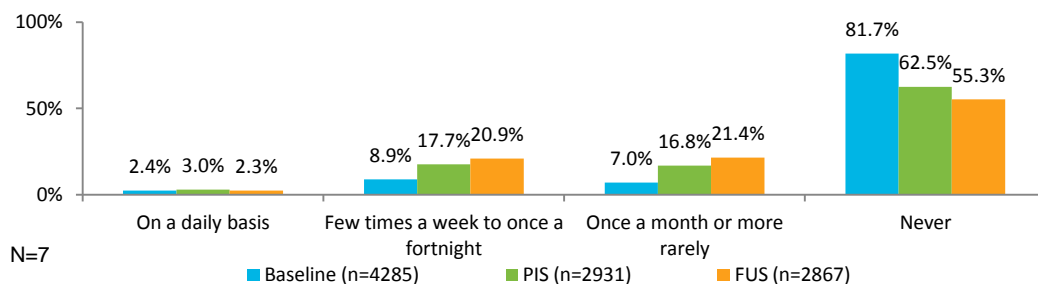
Results have shown an increased level of awareness and uptake of flexible working arrangements. There was a significant increase in the proportion of respondents availing of working staggered hours, from 24% in the Baseline Survey to just over 40% in the final survey.

Figure 3: Frequency of Staggered Working Hours through 3 surveys



Similarly, the proportion of survey respondents availing of telecommuting more than doubled from 18% in the baseline survey to 45% in the final survey. This demonstrates the appeal of FWA which may have been suppressed due to lack of awareness as well as a lack of flexibility within organisations which may have changed following engagement in the programme

Figure 4: Frequency of Telecommuting through 3 surveys



Overall Peak Hour Reduction of 9-12%

The take-up of flexible working policies has enabled commuters to change their travel time or reduce the need to travel.

Overall, since the launch of Travel Smart Pilot Programme, a net reduction of over 9% in AM peak trips has been recorded through the different surveys. This reduction is as a result of respondents shifting their travel to off-peak periods (7% percent reduction in peak trips) or reducing the need to travel by telecommuting (2% reduction in peak trips). Furthermore, 4% of respondents said that since the launch of Travel Smart Pilot Programme they have changed their travel time to undertake activities before starting work (e.g. breakfast or gym). When the overall impact of changes is taken into account, the net overall reduction in peak hour trips is 12%.

There was a significant variation in the extent of peak hour travel changes across organisations. In some organisations where the programme has been fully implemented and benefited from a high level of senior management support, the reported peak trip reduction ranges from 20%-30%.

PJP participants in the Pilot Programme reported a higher level of behaviour change than those who did not receive additional personalised advice. During the baseline survey, 9% were availing of telecommuting and 21% of staggered working hours, regardless of frequency. This increased to 27% availing of telecommuting and 47% availing of staggered working hours at the end of the Pilot Programme. Overall, the programme recorded a reduction of 23% in trips by PJP participants, compared to the average 9% reduction for overall respondents.

Positive Impact on Employees

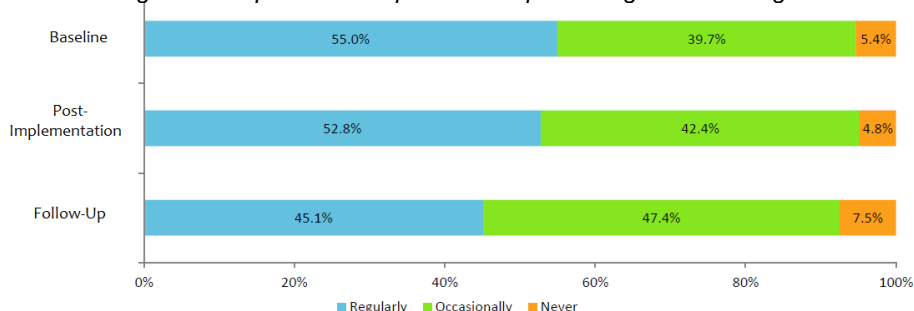
Employees who changed travel time or commenced telecommuting were asked how the change impacted on them. A summary of the feedback is provided in Table 1. As shown, the opportunity to avoid overcrowding is perceived as the main benefit of changing both travel time and mode. The change has resulted in journey time savings as well as reduced stress. Interestingly, employees who changed travel time felt that their productivity increased as a result of doing so.

Table 1: Summary of perceived impacts of change in travel time

Impact of Change in Travel Time	
Able to avoid overcrowding (73%)	Reduced stress (67%)
Save time (71%)	Improved perception of organisation (66%)
Increased productivity (70%)	Reduce costs (55%)

Additional open feedback was significantly positive, with the majority of recorded benefits in relation to the benefits of avoiding overcrowding as well as achieving a better work/life balance. This analysis reflects the changing perception of overcrowding among employees with 55% of employees 'regularly' experiencing overcrowding at the baseline stage of the survey compared to 45% in the final survey, see Figure 5.

Figure 5: Proportion of respondents experiencing overcrowding

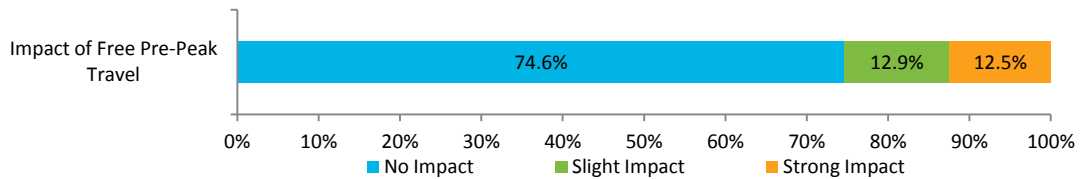


Factors Influencing Behaviour Change

Conscious of the impact of overcrowding, 50% of Baseline Survey respondents demonstrated a willingness to change their working arrangements. Among these respondents, approximately 40% made some change to their travel patterns.

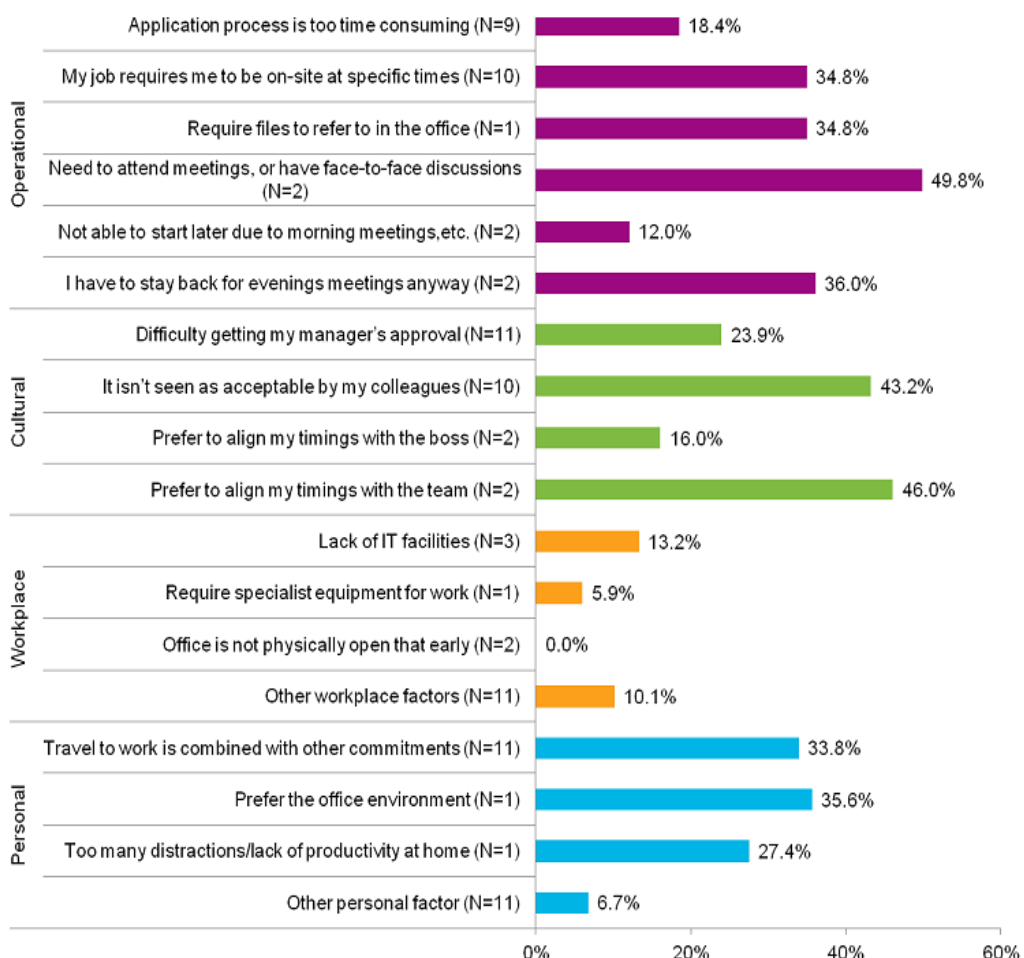
Among those who changed travel behaviour, the most common reason for change was to avoid overcrowding. Unsurprisingly, the enhancement/provision of FWA policies is also a common reason for travel time change as without this in place, change is unlikely to be possible. Personal impacts such as reducing journey time and stress also rate highly as influencing factors for change in both instances. Awareness of the Travel Smart Pilot Programme also featured as an influencing factor for change, while early free travel provided has influenced only a quarter of respondents, see Figure 6.

Figure 6: Impact of Free Pre-Peak Travel



However, even when employees are considering a change to travel patterns, workplace culture can prevent them for doing so. For example, those who did not change their travel patterns were asked what they perceived as the barriers to changing travel time. A summary of results is presented in Figure 7.

Figure 7: Perceived barriers to travel time change



The most common perceived barrier is the need to attend meetings in the office (50%), which could be described as an operational barrier. The second most common barrier is a preference to align the working day with the team (46%), which could be described as a cultural barrier in the workplace. Other common factors include:

- It isn't seen as acceptable by colleagues (43%);
- I have to stay back for evening meetings anyway (36%);
- I prefer to work in the office environment (36%);
- My job requires me to be onsite (35%);
- I need access to files in the office (35%); and
- My travel to work is combined with other commitments (34%).

As outlined above, 7 of the 8 most common perceived barriers relate to the workplace and reaffirm the importance of organisational support for flexible working in influencing a change in travel time.

Conclusion

The experience of workplace travel planning in Singapore is quite different to approaches taken elsewhere in the world which to date have generally focused on mode shift. Travel Smart Pilot Programme aims to induce a travel time shift with the objective of spreading peak hour travel demand.

Travel Smart Pilot Programme has been effective and has achieved a reduction of 9-12% in peak trips. This result indicates the strong potential for proactive business engagement to influence peak hour travel demand in other cities across the world.

The PJP approach presents the best opportunity to influence travel behaviour change. Personalised engagement means that participants are more likely to be aware of the policies and incentives promoting change and are therefore better informed and inclined to change.

Among other approaches, it is likely that the most important factor influencing change is the scale of Travel Smart delivery within the organisation including factors such as: availability and promotion of FWA, promotion of incentives, support from management.

References

- Cairns, S., Sloman, L., Newson, C., Anable, J., Kirkbride, A. and Goodwin, P. 2005. Making Smarter Choices Work, (London: Department for Transport).
- London Chamber of Commerce and Industry (2012). The final hurdle: securing a business legacy.
- Schreffler, E.N. 1986. Transportation management organisations: an emerging public/private partnership, *Transportation Planning and Technology*, 10 (4), 257-266.
- Transport for London. (2013). London 2012 Olympic and Paralympic Games. The transport legacy - one year on.
- Vanson Bourne (2012). Flexible Working During London Olympics. On behalf of British Telecom.
-