

# The “5 Ps” – A Greater Role for Travel Behaviour Change Programs in the Land Use Development Process

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## 1 Overview

Travel behaviour change programs promote multimodal travel alternatives to the single occupant vehicle (SOV) in order to reverse unsustainable traffic congestion and air quality trends affecting rapidly growing urban areas worldwide.

Just as auto-oriented land use patterns contributed to higher per-person vehicle kilometres travelled (VKT) rates in many high-growth cities of the developed world, future development patterns have the potential to impact travel patterns in a more sustainable manner. The expansion of infill development, development around high-capacity public transport nodes, pedestrian-friendly communities, and other related development patterns all represent supportive landscapes for more efficient and sustainable urban transport.

The emergence of these alternative transport supportive development patterns has primarily focused on the static physical attributes of the development site. These recommended physical attributes are discussed in various ways – sometimes summarised as the “3 Ds”:

- Density
- Diversity
- Design

Clearly, getting land use density, diversity, and design right is the first key step in achieving urban development patterns that support more sustainable transport behaviour.

For even the best designed land use developments to achieve their maximum transport efficiency potential, however, additional focus on people-focused strategies is needed.

An individual’s day-to-day travel behaviour decisions involve a complex array of factors. Clearly, the availability of high-quality alternatives to driving alone set within the context of a well-designed physical environment creates a very strong foundation for non-SOV mode choice, trip-chaining, and other smart travel choices. These static physical attributes alone will certainly lead to positive travel behaviour change among a certain segment of the full travel market. Increasing market share for non-SOV travel options, however, requires supplemental efforts that build on the strong foundation of the “3 Ds” by offering more dynamic, people-focused strategies designed to address the travel behaviour decisions of additional market segments.

The “5 Ps” outlined in this paper are intended to supplement the “3 Ds” of sound land use planning and design with dynamic, on-going travel behaviour change strategies. The “5 Ps” for improved land development processes are:

- Promotion
- Parking
- Pricing
- Policies
- Program management

Integrating the “5 Ps” into the land development process requires a greater role for travel behaviour change programs and practitioners in the development design, review, and approval process.

A primary intent of this paper is to suggest that the “5 Ps” offer avenues for win-win relationships between travel behaviour change programs, land developers, property managers, and related parties. In most cases, strategies which reduce trip generation rates for new developments translate into cost savings for land developers, enhanced community support, and smoother, more predictable project approval processes.

## **2 Land development patterns impact travel behaviour**

It is beyond the scope of this paper to delve into the complex relationship between land development patterns and travel behaviour. However, in order to provide a few examples as reference points, case studies from two areas of the United States are provided below.

Within the Washington, DC, region, the Rosslyn-Ballston corridor stands out as a model of the complementary benefits of coordinated transportation and land use planning. Connecting inner ring suburbs southwest of Downtown DC, the corridor is about 5 kilometres long, and covers an area of about 5 square kilometres. There are five heavy rail transit stations within the corridor.

Since the opening of the Washington, DC, rail transit system (“Metro”) in 1976, local planners and area property developers have transformed the historically low-density residential development of the Rosslyn-Ballston corridor into a series of highly successful transit oriented developments (TODs). Additionally, the local government serving the area (Arlington County) has one of the United States’ most aggressive transportation demand management programs (see [CommuterPage.com](http://CommuterPage.com)).

Focusing significant land development around high-capacity transit stations, the Rosslyn-Ballston corridor now exhibits more efficient, multimodal travel behaviour patterns than any other inner suburb of the region (Leach, 2003):

- 58% of corridor residents use alternatives to the SOV to travel to work (compared to just 30% in comparable inner suburbs of the region).
- 73% of all Metro patrons access the rail station by walking, and 11% access the stations by bus (allowing major reductions in dedicated parking near stations).
- Corridor households have an average of 1.1 vehicles per household, far lower than the 1.75 average for comparable inner suburbs of the region (reducing the demand for development-related parking within the corridor).

At a broader scale, a recent analysis of 36 TODs within the U.S. State of California (all sites were outside of central business districts) found travel behaviour results consistent with prior TOD studies in California (Lund, Cervero, Wilson, 2004):

- Transit ridership for TOD residents was 4.9 times higher than for residents in comparable, nearby communities.
- Transit ridership for TOD employees was 3.7 times higher than for employees in comparable, nearby employment areas.
- 90% of transit patrons in TODs areas walked to the station.

These two examples represent only a small sample of the beneficial connections of well-coordinated transportation and land use planning. Other publications provide more extensive examples and analysis than is possible here (Kuzmyak and Pratt, 2003; Dittmar and Ohland, 2004).

## **3 The “3 Ds” - Static physical attributes**

Of the more than 40 TOD sites represented by the two examples provided in Section 2, many, but not all, exhibit the site attributes of the “3 Ds” – density, diversity, and design. Most of the sites are medium-high density projects, yet only some include diverse land uses

(housing, employment, retail, etc.) and each varies in the quality of design environment. Before moving into further discussion of the “5 Ps,” a review of the “3 Ds” is included below.

### 3.1 Density

The connection between land-use density and travel behaviour patterns is well-established, though most agree that, to a degree, density represents a proxy measure for other factors which influence travel decisions.

Figure 1 below, using data from the 1990 U.S. National Personal Transportation Survey (NPTS), offers a clear depiction of the density – transport connection. As density (persons per square mile, in this example) increases, daily person trips by private vehicle decreases. Conversely, trips via walking, biking, rail, and other modes increase.

Importantly, this research clarified that overall trip making does not necessarily decline with increasing levels of density. Instead, trips are shorter overall, with fewer trips via SOV.

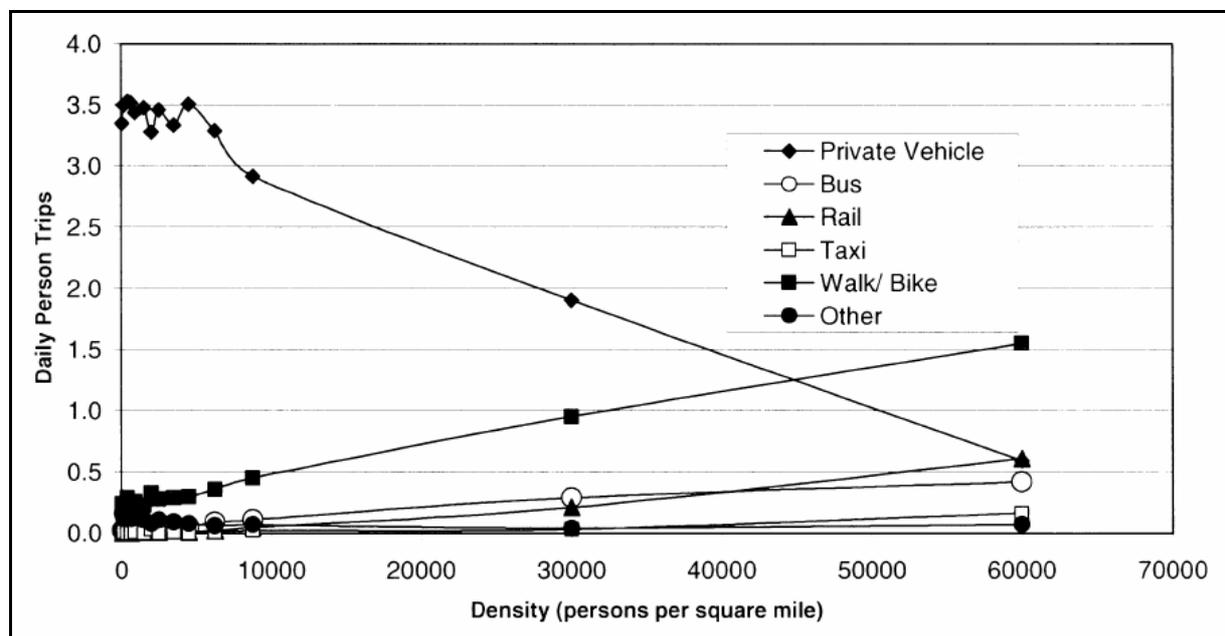


Figure 1 – Average daily person trips per person in the United States by mode and density, 1990 NPTS survey (Dunphy and Fisher, 1996)

### 3.2 Diversity

Diversity refers to the mix of land use types within a development area. Mixed-use developments, where residential, employment, retail, and other complementary land uses are well-integrated allow for “linked trips” (e.g., stopping at a café near the office on the way to work), “internal capture” trips (e.g., walking to and from a café for lunch during the work day), and shared-parking opportunities. Often overlooked by planners focused on the mode split of a development, linked trips and internal capture trips play a major role in a development’s overall trip reduction potential.

A study of 57 suburban activity centres across the U.S. found evidence to support the role of land use diversity (Kuzmyak and Pratt, 2003):

- Activity centres with on-site housing had an average of 5% more commuter trips via transit, bicycling, and walking.
- For each additional 10% of commercial / retail floor space, there was a 3% increase in transit use and carpooling.

### 3.3 Design

In order for development density, diversity, or even simple proximity to high-capacity transit to have the best possible impact on travel behaviour, the project should include solid pedestrian and transit friendly design, inter-parcel vehicle access connectivity, and other factors.

A study of two San Francisco, California, neighbourhoods attributed a 10% increase in the likelihood of using non-auto modes for non-work trips to pedestrian and transit friendly design.

A similar study in Portland, Oregon, found a 10% reduction in vehicle miles travelled in neighbourhoods with pedestrian and transit friendly design. (Kuzmyak and Pratt, 2003)



**Figure 2 – Orenco Station; Portland, Oregon, U.S. (Luten, 2004)**

## 4 The “5 Ps” – Dynamic travel behaviour change attributes

The “3 Ds” represent the static physical attributes of land use developments built to support more sustainable, multimodal travel patterns. As already noted, other research and guidance has covered the details of the “3 Ds” in more depth than is possible here, and much of this work has, indeed, led to changes in “best practices” understanding by land and transport planners, property developers, the lending community, and others. Clearly, getting land use density, diversity, and design right is the first key step in achieving urban development patterns that support more sustainable transport behaviour.

For even the best designed land use developments to achieve their maximum transport efficiency potential, however, additional focus on people-focused strategies is needed.

An individual’s day-to-day travel behaviour decisions involve a complex array of factors. Clearly, the availability of high-quality alternatives to driving alone set within the context of a well-designed physical environment creates a very strong foundation for non-SOV mode choice, trip-chaining, and other smart travel choices. These static physical attributes alone will certainly lead to positive travel behaviour change among a certain segment of the full travel market. Increasing market share for non-SOV travel options, however, requires supplemental efforts that build on the strong foundation of the “3 Ds” by offering more dynamic strategies designed to address the travel behaviour decisions of additional market segments.

These supplemental strategies can be called the “5 Ps” of improved land use development:

- Promotion
- Parking
- Pricing
- Policies
- Program management

### 4.1 Promotion

As in any market sector, even the best products do not always sell themselves. In many of the best-designed development projects, including TODs, there is a degree of self-selection that occurs – whereby households with an active interest in being able to use public transport, walk to nearby shops, etc., will select well-designed developments near high-

quality transport options. In other cases, competing public policy objectives (such as provision of affordable housing) prompt location decisions based on housing price, rather than based on transport-related features (Lund, Cervero, Wilson, 2004). Of course, other households may make location decisions based factors beyond transport or cost.

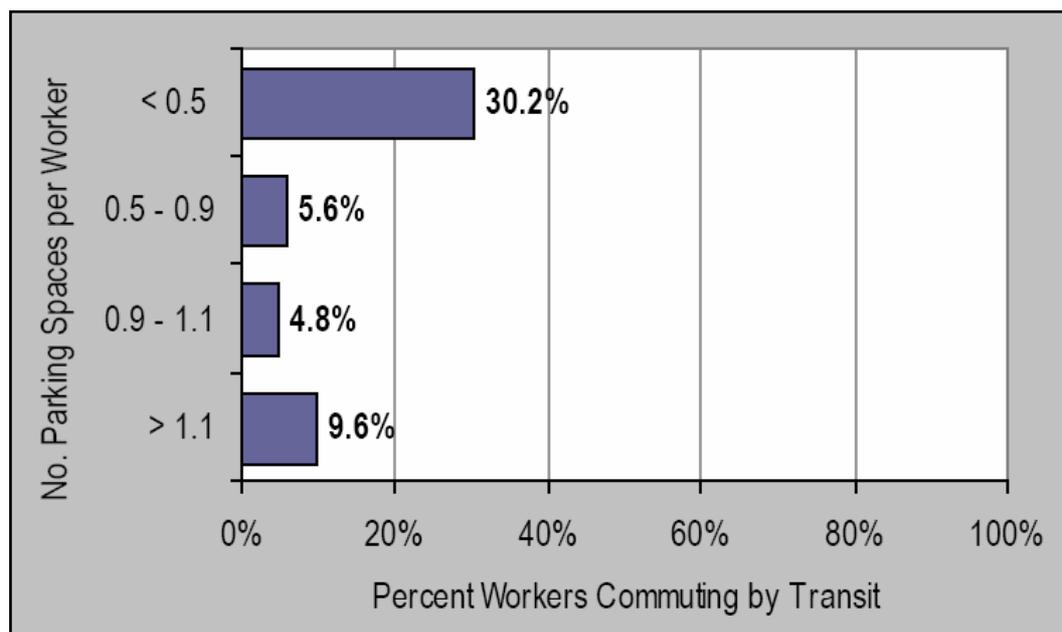
Pro-active promotion strategies to maximize the trip-reduction potential of land-use developments include:

- Advanced targeting. While a degree of self-selection will occur naturally, proactively marketing projects for their transport-related benefits will attract even more households open to exploring transport options. Market segmentation and target marketing can provide sales and rental absorption benefits to developers and help in the creation of a positive community culture.
- Community culture. Community culture and social norms play a large role in individual travel behaviour decisions. Through sales kits, property inspections, and other processes, developers and property managers can play a key role in establishing a community culture partly built around access to convenient transport alternatives.
- Personalized travel planning assistance. When moving to a new location, residents, employees, and others must devise new travel patterns. This disruption of daily travel habits presents a prime opportunity to establish more sustainable travel patterns. Personalized travel planning assistance should be part of all new housing and employee “move-in orientations,” and available on-site where feasible.

## 4.2 Parking

Parking has as much to do with individual travel choices as almost any other factor, and many key parking characteristics are determined during the development process. Parking supply, use regulations (by user type, by time, etc.), pricing (addressed in more detail in Section 4.3), and other factors represent a powerful toolbox of choices for maximizing the trip-reduction potential of a development while maintaining its attractiveness to tenants.

Figure 3 below shows the transit mode split, relative to the number of parking spaces available, for employees within surveyed TODs in the State of California (Lund, Cervero, Wilson, 2004).



**Figure 3 – Transit modal splits by number of parking spaces per worker (Lund, Cervero, Wilson, 2004)**

Specific parking strategies include:

- Appropriate parking supply. Parking supply regulations should provide incentives for property developers to build parking supply to match anticipated demand, given the trip-generation targets for a specific project. An oversupply of parking reduces the potential for market-rate parking pricing and provides a false subsidy for SOV trips. Reducing or eliminating parking supply minimum requirements (or creating maximum supply ceilings) offers significant land area and construction cost savings for developers, and offers an economic incentive to support trip-reduction goals.
- “Unbundle” parking. In many cases, carparks are “bundled” together with residential units or commercial space, so that per-unit or sq.m. pricing covers both occupied space and its connected carparks. Bundled pricing severely restricts the economic rationale for reducing the number of required carparks.
- Coordinate policies / pricing. Within mixed-use developments, especially where multiple developers are involved, parking management policies (use regulations, time restrictions, etc.) and pricing should be well-coordinated across the entire development area to encourage desired travel behaviours. For example, shared parking (parking once for travel to multiple destinations) can be limited by use or time restrictions, forcing patrons to drive short distances between land uses to avoid parking restrictions or to seek out lower-cost or unregulated spaces.
- Avoid spill-over. Higher density projects, especially where parking supply is limited or well-regulated, spill-over of parking into surrounding areas is always a consideration.

### 4.3 Pricing

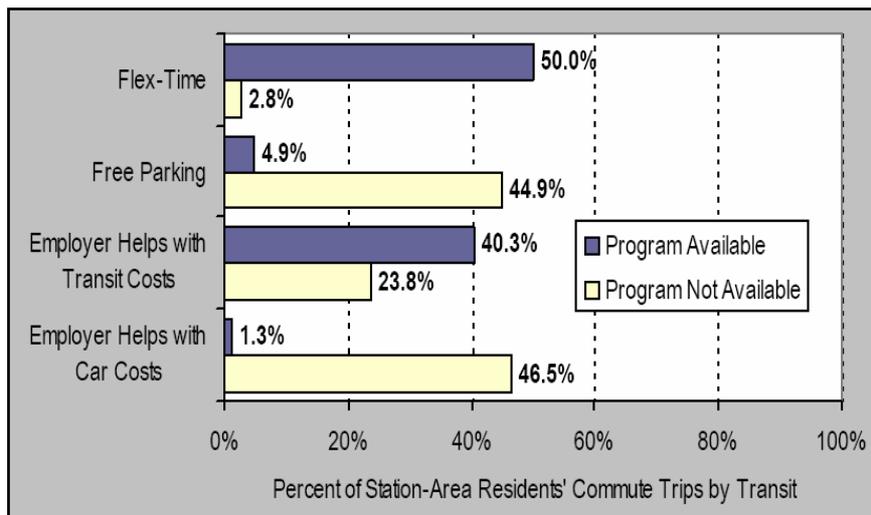
A close corollary to parking considerations, pricing tools offer significant leverage to lower trip generation rates. Specific strategies include:

- Price parking up-front and monthly. Two opportunities exist to price parking and create opportunities for financial “savings” for the use of non-auto travel options. (Notably, these options rarely apply to single-family residential land uses.) During the initial sale or lease transaction, parking spaces should be priced separately where feasible, allowing owners or tenants to opt-out of all or some available parking. After the initial transaction, owners and tenants should be required to pay monthly fees to cover on-going maintenance expenses for carpark areas (again providing a month-by-month option to opt-out).
- Price secondary spaces at higher rates. For residential uses with shared parking areas (condos, apartments, etc.), in both sale and lease scenarios, price each additional secondary carpark space at a higher per-space rate than the primary space (both initially, and on a per-month basis).
- Invest revenues in travel behaviour change programs. As noted in Section 4.5 below, programs promoting non-SOV travel options require on-going support and funding. Where appropriate, set on-going, monthly parking pricing rates to cover both on-going carpark maintenance needs and on-site travel behaviour change programs. Combining parking pricing with active travel behaviour change programs creates a powerful and effective push-pull dynamic supportive of trip-reduction goals.

### 4.4 Policies

Policies set by public-sector agencies managing land development, by developers and property managers for a specific development, and by employers and other on-site owners or tenants have a significant role in determining travel behaviours.

The State of California survey of TOD employees found that employer “flex-time” policies (allowing employees to flex their arrival and departure times to some degree) had a greater degree of influence on transit commuting than any other factor assessed by the survey team, as shown in Figure 4 below (Lund, Cervero, Wilson, 2004).



**Figure 4 – Influence of employer policies on transit commuting (Lund, Cervero, Wilson, 2004)**

In working with land use developers and property managers, as well as with a project's ultimate owners or tenants, combining overall trip-reduction targets with provision of technical and/or implementation assistance often creates better results than top-down mandates regarding which policies or programs to implement. While flextime may represent a strong support strategy for increasing transit use, it may not be appropriate for all employers. Similarly, while a comprehensive parking pricing strategy may create powerful incentives for positive travel behaviour change, such policies may not be feasible for all developers in all situations.

#### 4.5 Program management

Unlike the design and construction of a new development project, travel behaviour change programs require on-going support and attention. In every development, circumstances change and tenants move in and move out. On-going program management is needed to maintain sustainable travel patterns and trip-generation rates. Considerations include:

- Launch programs with sales office opening. Many development projects open a sales office, even before site construction begins. Integrating transport related materials into sales kits, and using sales agents to promote the transport-related benefits of a site, begins the process of establishing community culture and the concept of a point of contact for transport-related assistance.
- On-site program managers. For medium to large developments, it can make sense to locate a program manager and/or travel assistance office on-site. In some cases, developers can allocate free/reduced rate office space on-site to house a program office.
- Establish funding formulas. Funding for on-going program support, either on-site or through regional programs, should be established early (often during project approval phases). Program funding should come from an on-going, sustainable revenue stream, such as annual/monthly parking fees.



**Figure 5 – On-site support station at a new development in Denver, Colorado, U.S. (UrbanTrans, 2005)**

## 5 Conclusion

As described in this paper, the “5 Ps” offer avenues for win-win relationships between travel behaviour change programs, land developers, property managers, and related parties. In most cases, strategies which reduce trip generation rates for new developments translate into cost savings for land developers, enhanced community support, and smoother, more predictable project approval processes.

Integrating the “5 Ps” into the land development process requires a greater role for travel behaviour change programs and practitioners in the development design, review, and approval process. From the development side of the equation, project designers should augment existing architecture, urban design, and traffic engineering expertise with expertise regarding how people actually make day-to-day travel decisions, in order to create dynamic developments projects which maximize transport-related sustainability. From the public-sector development approval side of the equation, organisations should begin to establish a development review framework that rewards travel behaviour-oriented trip reduction measures (the 5 Ps) – creating a system which provides developers a combination of cost-savings (usually via reduced parking minimums), supplemental development rights (greater density), or expedited project approvals in return for commitments to creating more transport-efficient projects.

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