TRANSPORTATION CONFERENCE 2021
DECARBONISING WITH DOGS

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ABSTRACT

One method to reduce carbon emissions through transport is to encourage a modal shift for short trips from using vehicles to travelling via active modes. To achieve a modal shift for short trips, this requires an integrated approach to land use planning. When housing, social amenities, transport hubs and employment are within proximity to one another, this provides an opportunity for trips to be shorter, and therefore undertaken potentially using active modes. Transport professionals can facilitate this type of urban planning through providing appropriate cross-section forms for these facilities, as well as strategically placing transport hubs in high density regions.

Whilst short trips can be facilitated through this approach of integrated land use and transport planning, another barrier for short trips via active modes is creating a behavioural change. Many will still choose their vehicles instead of active modes for a number of factors, including time, convenience, weather impacts, or just being unable to break a habit.

This think-piece paper will assess how dogs can help create a long-term behavioural change, by naturally encouraging people to do short trips via active modes every day. Studies have shown dog owners are not only more active in the long-term as a result of conducting daily walks with their pets but are also more likely to stick to other physical activity routines. Dog walking demystifies the barriers such as walking in less favourable weather and creates a habit that can make pet owners more likely to walk or cycle short distances. This paper will therefore explore how dog ownership creates this long-term behavioural change which can help decarbonise short trips, and further discuss other potential ways to encourage this short trip modal shift.

INTRODUCTION

Approximately 20% of New Zealand's greenhouse gas emissions are a product of transport movements (GPS, 2021). Largely, these emissions come from fuel-based transport, such as private vehicles. For transport to have a reduced negative impact on the environment, other sources or modes must be considered for trips. In particular, short trips can be undertaken by most via active modes.

Whilst an increase in active mode trips will reduce greenhouse gas emissions by minimising those otherwise produced by private vehicles, there are many barriers which prevent individuals from choosing this mode. Barriers can include adverse weather, time constraints, inappropriate infrastructure or the perception of not feeling safe. To overcome these barriers, a long-term behavioural change is required to normalise active mode movements. With focus on encouraging walking in particular, dog ownership can act as a catalyst for long-term change.

This paper observes how dog walking habits can create long-term behavioural change that can result in individuals favouring active modes over private vehicles to complete short trips. Dog ownership and the associated obligation of daily dog walking breaks down the barriers that normally prevent people's choice of travelling via active modes. Furthermore, the urban landscape is assessed to review potential opportunities to make dog ownership more attainable whilst creating an urban form that encourages changes in behaviour.

There is potential to increase active mode trips and reduce overall greenhouse gas emissions from transport. This paper will outline one way this can be achieved is through enabling spaces for active modes whilst triggering a behavioural change through dog ownership.

WHY IS CHANGE REQUIRED?

As set out in the GPS, there is a target for New Zealand to be net zero carbon by 2050. To achieve this, intervention to current transport emissions is required. Transport emissions can be targeted by focusing on reduction or changes in mode for certain types of trip purpose. The New Zealand Household Travel Survey (NZHTS) outlines a number of trip purposes, as exemplified in the cumulative plot in

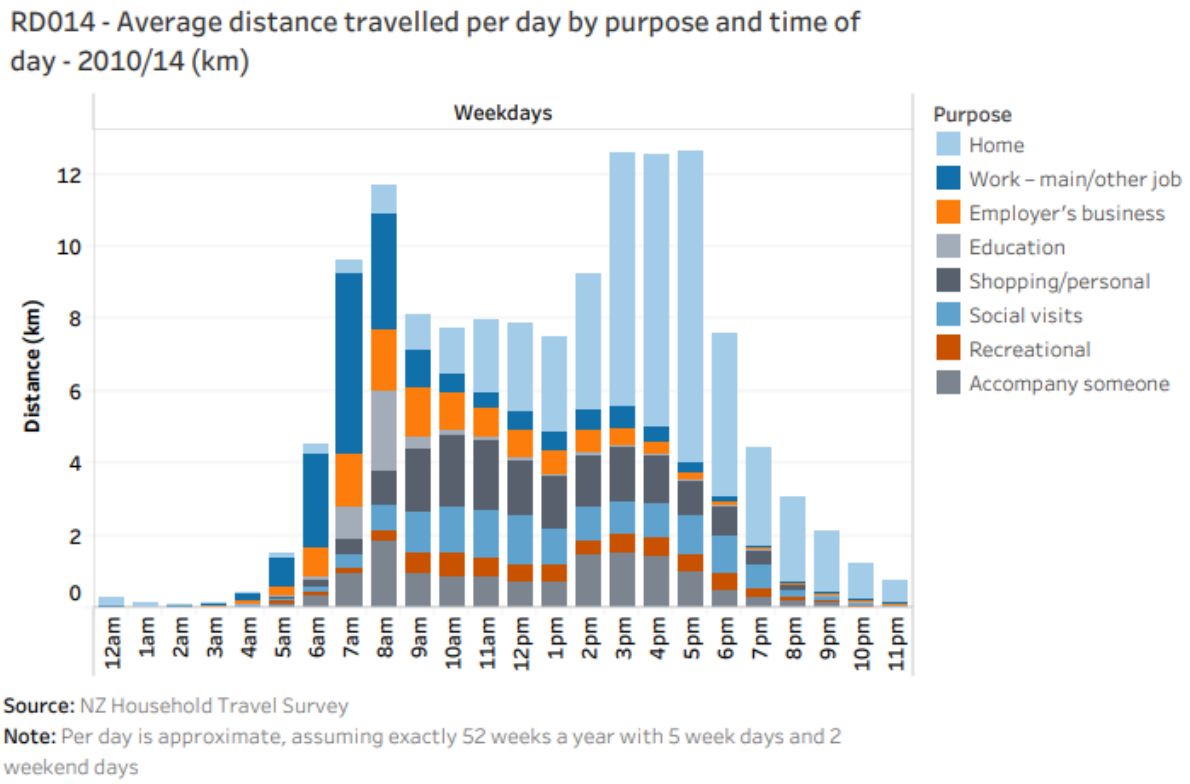

Figure 1.

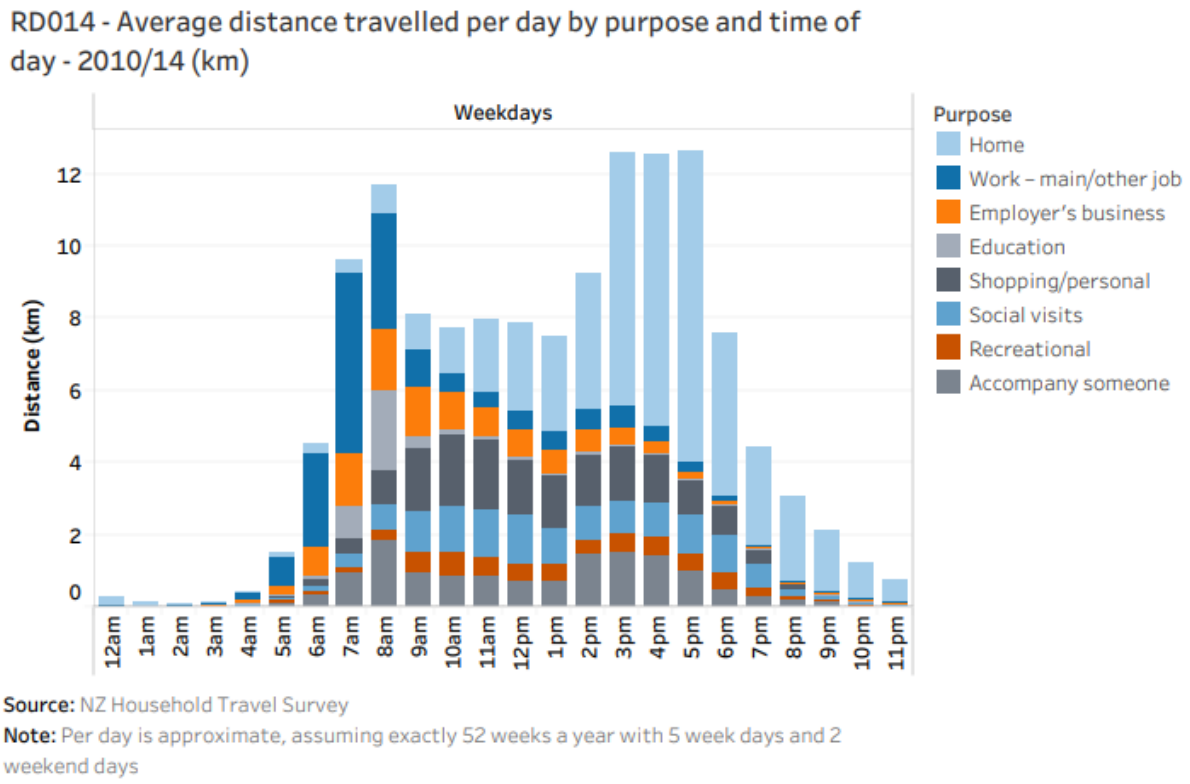

Figure 1: Travel Purpose and Distance

Source: NZ Household Travel Survey, 2010/2014

As evidenced, there are a number of reasons for trip purposes, and often the distances portray localised movement. Despite the overall distances often being in a walking catchment (of 2km) or a cycling catchment (of 5km), driving or being a passenger in a car are seen as the dominant modes of transport use, as shown in

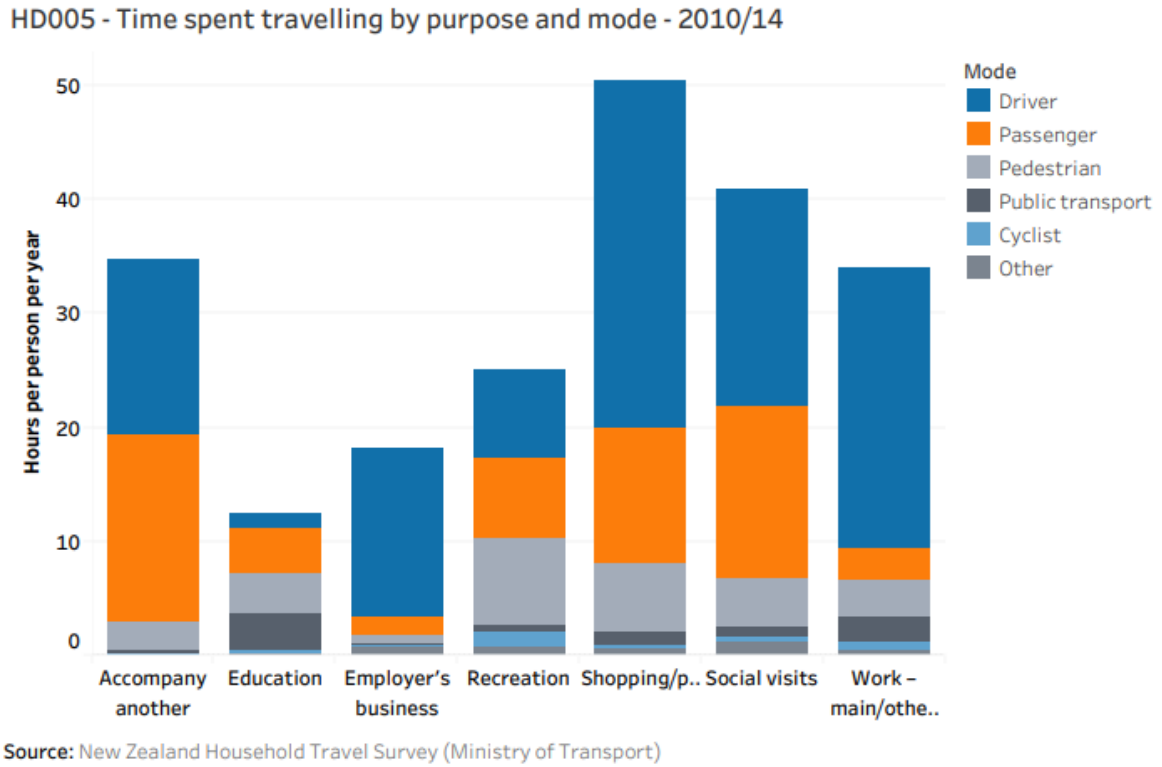

Figure 2.

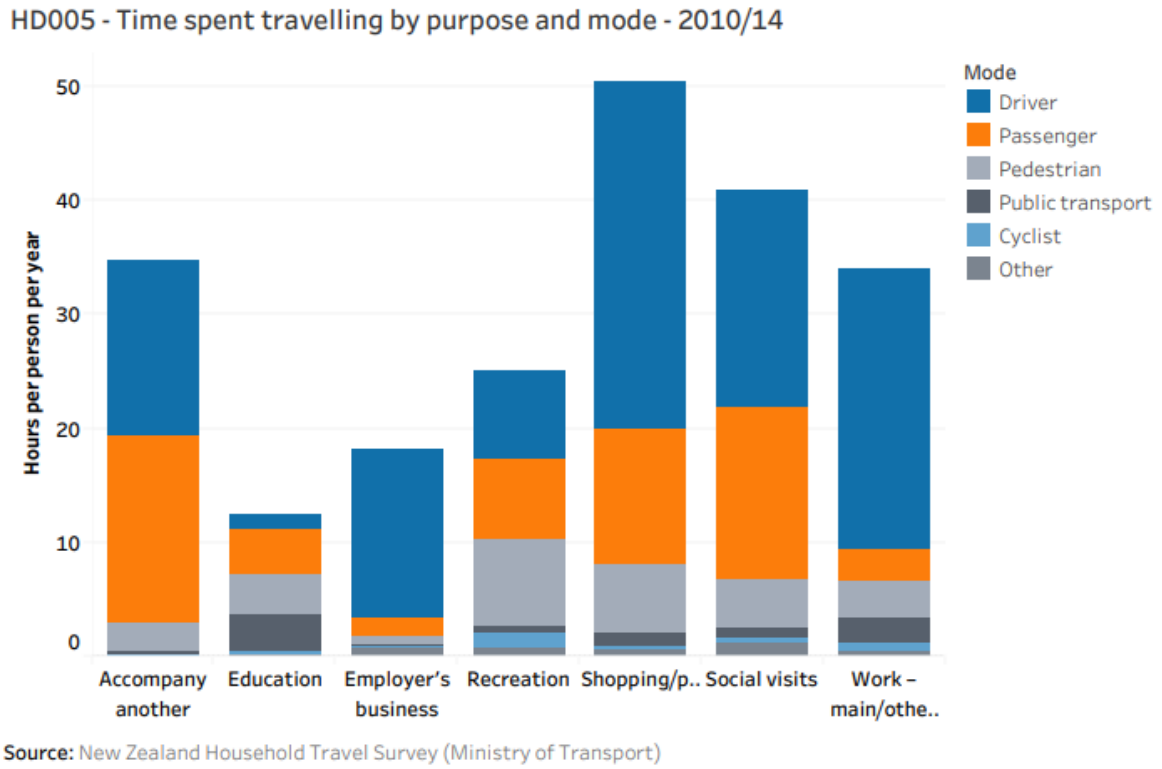

Figure 2: Time Spent Travelling by Mode

Source: NZ Household Travel Survey, 2010/2014

By targeting ways to transfer these trips from vehicle use to active modes, progress can be achieved to reducing greenhouse gas emissions from transport.

Particularly walking (followed by cycling) is viewed as the lowest carbon transport impact, as illustrated in

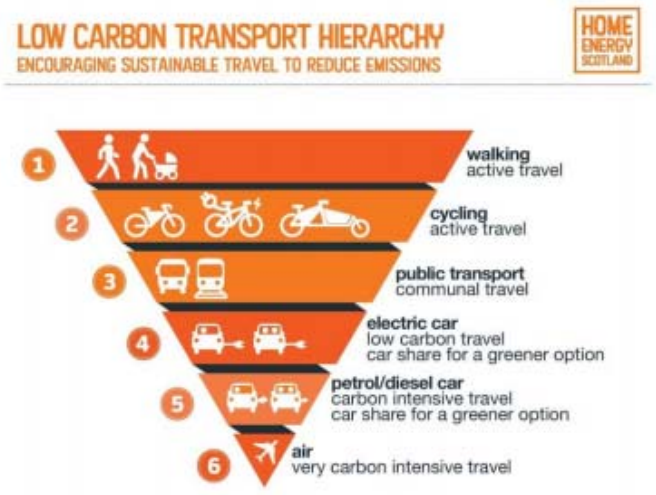

Figure 3, and therefore is a mode of transport that should be utilised more for trips where possible to reduce overall emission rates.

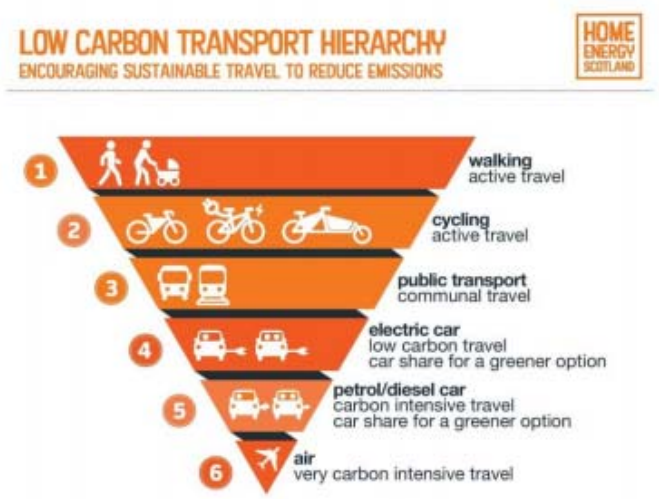

Figure 3: Transport Hierarchy of Carbon Emission Reduction

Source: UK Energy Savings Trust

People Powered Movement (2021) state there are a number of additional benefits to active mode usage for trips, including:

- Environmental benefits, omitting carbon emissions for each trip by not using private vehicles (as previously outlined) and a reduction in air pollution
- Health benefits to the individual by increasing physical activity
- Social benefits, allowing communities to interact with each other in a different setting
- Reduction in traffic, which can improve travel times and reduce individual's transportation costs

Whilst transferring to active modes for shorter trips may seem like a minimal change, choosing to commute by walking or cycling once a week for one trip purpose could save around 346kg of CO_2 per year per person (Energy Saving Trust, 2021).

BARRIERS TO CHANGE

According to the NZHTS, in New Zealand approximately 16% of trips are undertaken by walking and 1% by cycling. This is in comparison to other places globally, with Europe having a rate of 20-40% of all journeys being made by active modes (Interreg Europe, 2019).

Whilst there are many benefits associated with increasing active modes, the usage of such modes needs to be convenient and well connected for the individuals trip purpose. There are a number of detractors that can impact on the desire to use active modes, including:

- Adverse weather
- Distance to travel
- Lack of time
- Lack of feeling safe in a neighbourhood
- Inadequate facilities and infrastructure

The detractors to regular active mode use are a result of a number of external factors, social, personal and built environment factors that contribute to these barriers (Hong, McArthur, Stewart, 2020).

OVERCOMING BARRIERS

New Zealand policies such as the Keep Cities Moving (Waka Kotahi, 2019) recognise that the promotion of active modes comes from a combination of shaping urban form, making active modes more attractive, and influencing travel demand and transport choices. Pooley *et al* (2011) argues there are several complexities that relate to personal daily travel choices which need to be addressed. One of these factors is creating a long-term behavioural change.

As shown in a study by Procter *et al* (2014) which focuses on encouraging walking to work, consistent support was required over a 10-week intervention to maintain motivation and overcome interventions such as wet weather or workload time constraints that may deter commuters from walking. Techniques used for a sustained period, known as behavioural change techniques, can be identified to influence and promote behaviour change, such as barrier identification, goal setting, encouragement, review of behavioural goals and relapse prevention.

One behavioural change technique that has limited literature available is the use of an enabler to promote change – specifically in this case, the use of dog ownership as an intervention to create a consistent routine.

Dog ownership and subsequent dog walking can overcome the detractors to active mode use in the following ways:

- Adverse weather – the obligation to walk dogs regardless of weather can mitigate this issue for owners, who become accustomed to being out in a variety of weather throughout the year
- Distance to travel – dog walking everyday improves health and can make individuals more aware of their own walking speeds and capabilities. Having the knowledge of a local facility being within a daily dog walking route can make travelling to this facility more likely via active modes as the user has built an awareness of their own comfort and capabilities for travel distance through daily walking
- Lack of time – dog walking can establish an everyday behaviour with allocated time. There is an opportunity to integrate dog walking time with the running of other errands through facilities, thus reducing the need for additional trips
- Lack of feeling safe in a neighbourhood – international studies such as Christian *et al* (2016) compared perceptions people faced in both the US and Australia around safety. Results found that overall dog walking can be used as a mechanism for increasing perceptions of neighbourhood safety. Communities that focused on supporting dog walking had a greater potential of creating more social connectedness and safety perceptions within neighbourhoods, overcoming this barrier for many
- Inadequate facilities and infrastructure – there is an opportunity to improve walking and cycling infrastructure that will have a secondary positive impact on dog walking. Having adequate infrastructure such as wide footpaths or tethering rings outside of stores can lead to opportunities to integrate trip purposes, such as dog walking whilst running an errand (e.g. getting groceries, going to a café, childcare drop offs etc)

BENEFITS TO DOG OWNERSHIP

There are several benefits that can be attributed to dog ownership and dog walking which makes them a suitable catalyst for being used as a behavioural change technique. To maximise the benefits of the behavioural change through dog ownership, it needs to be recognised that whilst regular dog walking does lead to more trips with this specific purpose, dog walking helps with a wider view of overcoming these barriers. By not being subject to barriers such as weather or time, dog owners can be more likely to choose active modes for

other trip purposes aside from dog walking.

By reinforcing the benefits of active modes to health and minimising the detractors, dog walking can be viewed as a solution for a long-term behavioural change. By encouraging this type of movement for short trips, this will reduce the number of vehicles on the road and subsequently have a beneficial impact to decarbonisation impacts through transport.

The impacts from dog walking are largely based on the assumption that each dog owner does walk their dog on a regular basis. For many dog owners, walking their pet every day is a behaviour that can stem from a perceived and moral obligation (Brown & Rhodes, 2006). As previously noted, through regular walking, barriers such as time and adverse weather can become minimised and the individual views the activity to become normalised.

For the individual, the impact on health through increased walking is evident through a number of studies. A study undertaken by Dall *et al* (2017) assessed a group of older adults (65+ years) and established on average, dog owner's vs non-dog owners would do 20 minutes of additional time spent walking and 2,700 additional steps per day. As such, dog owners were more likely to meet weekly targets of 150 minutes of activity for this age group each week. Other studies have shown more extreme differences in promoting physical activity, with dog walkers on average walking 300 minutes per week further, compared to non-dog owners of 168 minutes per week (Brown & Rhodes. 2006).

Aside from the obligation of regular walking and movement with a pet, dog owners have reported dogs provide a source of motivation, companions and social support, with the additional health benefits as noted. Whilst the differences in walking times between dog owners and non-dog owners is primarily through the act of walking their pets, research has indicated that dog owners also spend more time exercising (without their dogs), indicating that pet ownership does not defer time from other activities (New York Times, 2019). Dog walking is seen as an intervention to increase physical activity (Westgarth *et al*, 2014), as summarised in

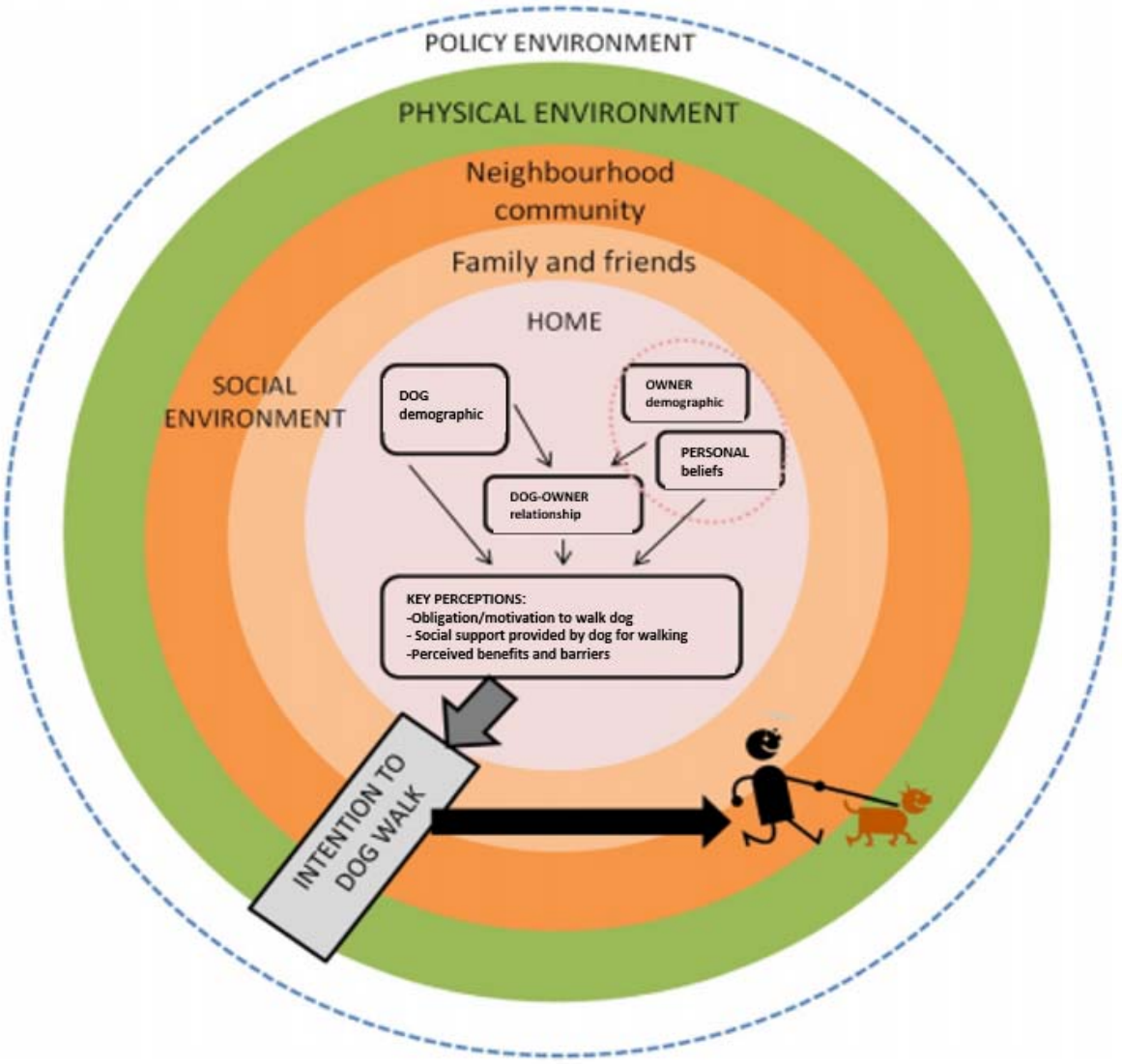
POLICY ENVIRONMENT
PHYSICAL ENVIRONMENT
Neighbourhood community
Family and friends
HOME
SOCIAL ENVIRONMENT
DOG demographic
OWNER demographic
PERSONAL beliefs
DOG-OWNER relationship
KEY PERCEPTIONS:
-Obligation/motivation to walk dog
- Social support provided by dog for walking
-Perceived benefits and barriers
INTENTION TO DOG WALK

Figure 4.

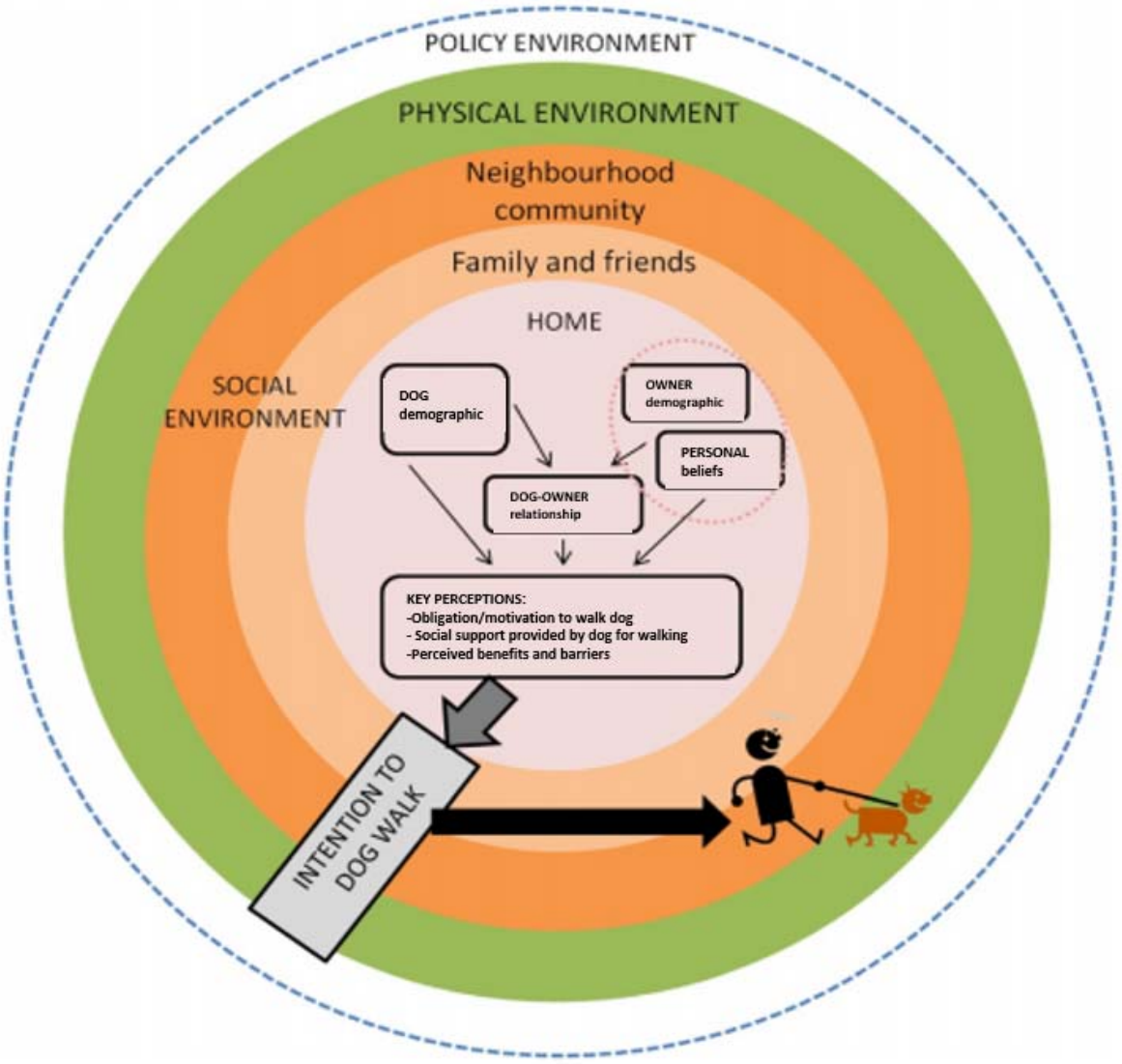

Figure 4: Socio-Ecological Model of the Correlates of Dog Walking

Source: Westgarth et al, 2014

As shown, the intention of dog walking can break through the barriers in the social and physical environment. These factors reinforce the idea that the repetition and commitment from dog ownership can make individuals more likely to be more active, and subsequently creates opportunities for trips to be made via active modes rather than private vehicle.

INTEGRATED LAND USE PLANNING OPPORTUNITIES

Urban form and creating communities that enable active modes through shorter trips to amenities, combined with the correct infrastructure and facilities, can encourage active mode uptake by making these modes more accessible. However, as previously noted, behavioural change also has a large impact on individuals' willingness to travel using these modes. By creating communities and amenities that can make dog ownership and dog walking more accessible in these environments, this could have potential to accelerate active trip movements as it will combine the appropriate infrastructure with this behavioural change trigger.

To increase the uptake of dog ownership in urban settings, barriers to ownership and walking amenities need to be assessed to enable this long-term behavioural change. Barriers to

these include:

- Ownership prohibited due to rental agreements
- Ownership not possible due to the perception of living in housing without an outdoor space (i.e. an apartment)
- Limited availability and accessibility of public spaces (Cutt *et al*, 2008)
- Provision of dog-related infrastructure (Cutt *et al*, 2008)

Given the renewed focus in many developed countries on the health effects of the social and physical environment, the way that public spaces are used as a resource for dog care has implications for urban planning and management (Christian *et al,* 2016). Changes in the urban landscape can have an impact on mitigating these issues whilst also having wider benefits.

Potential solutions include:

- Urban form - Planning new commercial and social facilities to walkable catchments to residential areas. By making amenities more accessible, there is potential to merge trip purposes. Studies have shown that dog-owners residing in neighbourhoods with a grid-like street pattern were most likely to walk their dogs (McCormack *et al*, 2011) and having all facilities within an easy walkable catchment can encourage other trips to be undertaken via active modes

- Access to green space - creating public spaces with green or park areas can make ownership possible in apartment living with a facility nearby whilst also creating more attractive spaces and can create 'walking-friendly' environments

- Cross-section design - review of spacing for shared paths and facilities. When designing shared paths, there needs to be consideration that these modes are used by others beyond pedestrians or cyclists. Use also includes prams, joggers, scooters, disabled users and dogs, all of which are categorised as vulnerable users. Narrow footpaths and shared paths can result in conflict between pedestrians, micro mobility, cyclists, dogs, vulnerable users etc., and is a result of poor path design (Grzebieta *et al,* 2011). For pets on shared paths, there is an additional risk of sudden movements causing conflict with any other modes, therefore wide spacing including grass berms can mitigate these conflicts

- Infrastructure - amenities, social and employment opportunities can be made more accessible by joining up trips via distance and appropriate facilities. Similar to bike parking, having somewhere to tie up a pet and have water readily available can help merge trips purposes together and eliminate time constraints

- Policy change opportunities - there is potential to integrate dog walks into commuting through businesses permitting pets on the premises. For these longer trips, this would include policy changes to permit pets on public transport and changes within businesses. This intervention would then have potential to merge trip purposes

- Information availability - there is an opportunity to encourage walking through walking maps in cities targeted at dog owners, indicating routes that are attractive with a number of amenities in the vicinity. This information can be used for the wider neighbourhood catchments to encourage localised trips for both owners and non-owners

By creating urban forms that not only enable active mode trips but that also encourage them through by accommodating behavioural change techniques, the increase in active modes for

trip purposes has the potential to increase substantially. Improving the number of these trips will result in a number of benefits to the individual, and environmentally in reducing emissions from trips otherwise taken via private vehicle.

CONCLUSIONS AND RECOMMENDATIONS

As outlined in this paper, dog ownership can be used as a behavioural change trigger by creating a daily routine that breaks down barriers associated with uptake of active modes. To increase active mode uptake for those that are more likely to change their trip mode as a result of dog ownership behavioural change impacts, creating an urban form which has a suitable environment for all users has the potential to accelerate this mode shift for localised trips.

Dog ownership is considered to be one behavioural change trigger; however, it is noted that increasing active mode uptake is complex and includes a number of factors. It is recommended that as plans for future infrastructure and upgraded or new developments are built, all types of users are considered, and behavioural change triggers are used to encourage this mode shift. By reducing the number of short trips taken by private vehicle, this will have a compounding effect in reducing transport emissions.

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