

END-OF-TRIP FACILITIES FOR CYCLISTS AND REALIGNMENT OF CURRENT SOUTH AFRICAN BICYCLE LEGISLATION

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ABSTRACT

In this paper, the need to provide more End-of-Trip Facilities (EOTF) for cyclists (and/or other Non-Motorised Transport (NMT) users) is highlighted. Almost all Governmental Departments (DoT, Provincial Government and Local Municipalities) have developed a Non-Motorised Transport Plan/ Policy/ Strategy/ Masterplan in response to addressing Travel Demand Management and to promote the use of Public Transport and NMT. Traditional planning legislation requires all new developments to provide vehicular parking to cater for the anticipated use. However, at present, little legislation exists to encourage/compel new developments to provide bicycle parking and bicycle facilities, which could greatly promote the use of Non-Motorised Transport. All major cities within South Africa are currently investing in NMT infrastructure or associated awareness programmes, but very little is being done regarding EOTF, which (apart from travel distance) is believed to be one of the most important criteria towards whether a commuter would chose to journey to the workplace by bicycle versus continue to use their private vehicle. This paper therefore explores the current South African legislation and highlights potential inhibitors to creating a commute modal shift towards NMT. A case study of an existing business complex without end-of-trip facilities is given, and the behavioural change measured following the introduction of some end-of-trip facilities is analysed.

1. INTRODUCTION

The current South African planning regulations require a Traffic Impact Assessment (TIA) to determine the traffic impact of a land development proposal and whether such a development can be accommodated by the transportation system. In terms of the Municipal Systems Act (Act No 32 of 2000), Municipalities are empowered to govern, on its own initiative, all local affairs of its community, subject to national and provincial legislation. The Municipality is therefore responsible for the master planning required to accommodate developments (TMH 16, Vol2, 2012).

Within any TIA, parking provision and design is discussed as it is an essential requirement for most developments. In South Africa, parking is required at a minimum rate, based on the characteristic of the particular land use, typically size or number of employees in the case of Office developments. These minimum rates vary greatly between municipalities and most do not mention bicycle parking. It is apparent that the current parking guideline documents used by Municipal Officials are out of sync with international best practice as they exclude parking provision for commuters using alternative modes (motorcycle/bicycle/electric car). No incentives currently exist for developers to provide

parking/facilities for these alternative modes and, as a consequence, they are mostly ignored. This paper therefore explores the current guidelines and recommends possible changes to include minimum bicycle parking provision together with the appropriate End-Of-Trip Facilities (EOTF).

2. WHAT IS AN END OF TRIP FACILITY (EOTF)?

Within the context of this paper, an EOTF includes bicycle parking in the form of a secure lockup (ideally non-intrusive and within the main building structure), lockers and showers/changing rooms. The (Queensland Department of Housing and Public Works, 2014) defines an EOTF as a designated place that support cyclists, joggers and walkers towards encouraging alternative ways to travel to work rather than driving or taking public transport.



EOTF's are typically located within the workplace for use by people who cycle or run/walk to work and the inclusion of such facilities are becoming more commonplace in new office buildings. Internationally, EOTF's are being implemented either through building regulation requirements or commercial (marketing) opportunities. In South Africa, however, EOTF's are mostly implemented for commercial gain where developers use EOTF's as a differentiator to their competitors or as an opportunity to gain additional "Green" credentials, which can also result in marketing opportunities.

There is nothing wrong with allowing developers to market their EOTF's, but unless EOTFs become a legal requirement, they will only be provided when developers foresee a benefit in doing so and no enforcement of a minimum provision and quality would be possible. Provision of EOTF's therefore remain at the sole discretion of the developer.

For eligible or potential bicycle users, it is believed that the type and quality of an EOTF would influence their modal choice (Morse, 2014). For example, having a secure, covered bike rack and shower at work could encourage an employee to cycle instead of using his/her private car. Alternatively, an employee who currently enjoys cycling could choose a place of employment based on both the ability to cycle to work, and the quality of the bicycle facilities. The quality of the EOTF could, for some employees, be the deciding factor between choosing a particular employer, should the EOTF be significantly better than the other. (Morse, 2014)

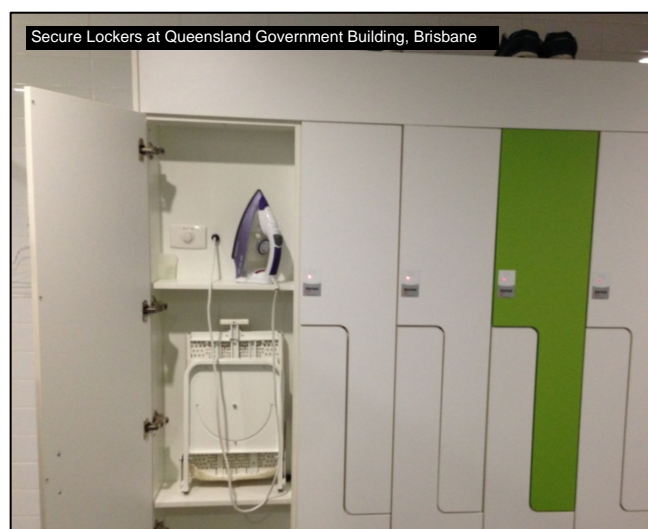
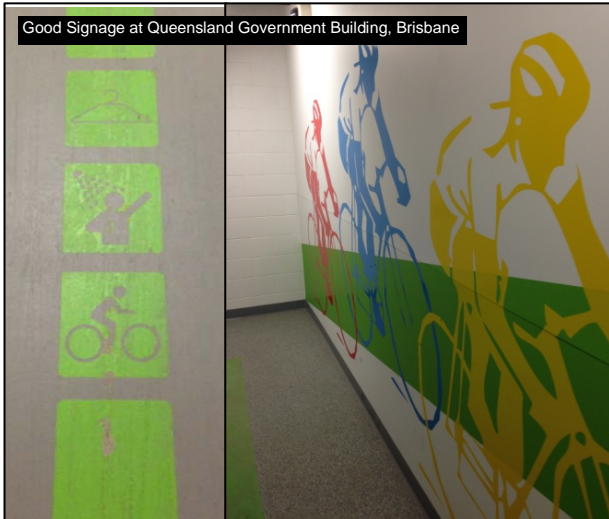


Photo by Laurent Hermant



Good Signage at Queensland Government Building, Brisbane

Photo by Laurent Hermant



Shower Facilities at Queensland Government Building, Brisbane

Photo by Laurent Hermant

3. WHY SHOULD EMPLOYERS DEVELOP BICYCLE END-OF-TRIP FACILITIES?

There are several benefits to both employers and employees in having bicycle parking and appropriate EOTFs in the workplace. Benefits include:

- A potential reduction in overall parking provision for new developments (assuming the relevant parking policies are in place and adopted). Up to 10 bicycles can be parked in the equivalent space of 1 car. (Cyclehoop, 2015) Bicycle parking can therefore easily be retrofitted utilising available space or occupying 1-2 parking bays;
- Offering a competitive advantage by attracting employees who cycle. The number of cyclists in South Africa is increasing year on year from 2500 in 2007 to 10 000 in 2009 (CyclingSA, 2010) and companies recognise the advantage of offering high class EOTFs to attract cyclists. Cycle enthusiast would naturally prefer to become an employee of a company who advocates cycling (e.g. FNB Portside building, Cape Town);
- Attracting and retaining healthy and environmentally conscious employees. Cycling, in general offers significant health benefits. Studies have shown that cycling regularly can reduce or prevent heart disease, obesity, high blood pressure, Type 2 diabetes, osteoporosis and depression. As a form of exercise, every kilometre of moderate cycling completed, a person weighing 70 kg can expect to burn about 35 calories or 150 kilojoules. An 8 km bike ride taking about 20 minutes will therefore use the



Image source: www.cyclehoop.com/new/january-2015

equivalent energy contained in a chicken and salad sandwich. (British Columbia Bicycle Facilities Design, 2011);

- Ensuring bicycles have a dedicated storage location and are not stored randomly within the office environment where they could be considered a safety hazard to general employees and potentially interfere with evacuation routes;
- Environmental benefits due to reduced vehicle trips. TomTom's annual global traffic index for 2013 ranked Cape Town as the most congested city in South Africa and 33rd in the world (TomTom, 2014). The increasing levels of congestion within cities is not a unique issue and the bicycle continues to play an important role in kerbing this problem; and
- Projecting a positive and environmentally conscious image. Awards such as the Green Star SA developed by Green Building Council of South Africa recognises and rewards environmental leadership in the property industry which encourages sustainable buildings, of which EOTF forms an integral part.

4. LITERATURE REVIEW OF CURRENT SOUTH AFRICAN STANDARDS AND INTERNATIONAL BEST PRACTICE

Vehicle parking is an important and integral part of the transportation system in any metropolitan area. The provision of parking is expensive and the importance of providing the correct allocation has been well documented. Over provision encourages the use of the private car, which ultimately places additional pressure on the road network. Under provision, on the other hand, can result in overflow, which could lead to increased illegal parking on the sidewalks and in the road reserve. Internationally, there has been a change from minimum to maximum parking standards for vehicles and the inclusion of minimum bicycle parking and EOTFs (Planning Policy Guidance 13: Transport, 2006). These revised parking standards are therefore aligned with overarching NMT strategies/policies and actively discourage private car use while at the same time incentivising other sustainable modes, including bicycles. A summary of the current parking (vehicle and bicycle) standards for the four largest metropolitan areas (viz. Cape Town, Durban, Pretoria and Johannesburg) within South Africa is given below:

4.1. City of Cape Town Parking Standards

- Council may require that parking be provided for motorcycles and bicycles;
- For every four motorcycle and six bicycle parking spaces provided, a credit of one parking bay may be given towards the parking requirements, provided that:
 - (a) the total credit shall not exceed 2,5% of the parking bays required;
 - (b) the minimum dimension for a bicycle space shall be 2 m in length and 0,6 m in width. (City of Cape Town Zoning Schemes Regulations, 2014)

4.2. eThekweni Transport Authority (ETA) Parking Standards

The Head of Development Planning and Management and the Head of ETA may relax the parking bay requirement by special consent to a maximum of 10% upon consideration of circumstances (excluding public transport considerations) peculiar to the development. (Town Planning Regulations, 2010). No provision is specifically stated for cycle provision other than an interpretation of the above reference as a claim to motivate a reduction in vehicular parking.

4.3. City of Tshwane Parking Standards

The requirements with regard to the number of parking spaces prescribed within this guideline document states that a reduction is permissible (Tshwane Town Planning Scheme, 2008). No mention is however given to cycle provision.

4.4. City of Johannesburg Parking Standards

No mention of bicycle parking is given. The scheme does make provision for a relaxation of the parking requirements, which can only be motivated in writing to the Council (Consolidated Johannesburg Town Planning Scheme, 2011).

4.5. Department of Transport Parking Standards, Second Edition

Commissioned in November 1985, this standard is an update of the original 1980 standards and contains minimum vehicular parking provision standards for most land uses. No mention however, is given to bicycles.

4.6. Summary of South African Legislation

The inclusion of bicycle parking within the City of Cape Town standards is encouraging and should be echoed throughout the other municipalities. The promotion of cycling as a travel opportunity is part of the drive to promote alternatives to the private car and to encourage more sustainable means of travel.

4.7. London, United Kingdom

The number of cyclists in London (capital city of the United Kingdom) increased by 72% between 2000 and 2005 (Transport for London, 2006). This boom in cycling required both additional infrastructure and cycle parking facilities. In 2006, the Roads Authority (Transport for London (TfL)) prepared a guide entitled "Workplace Cycle Parking Guide" to provide organisations with measures that will maximise the return on investment by helping to make cycling to work a viable and sustainable option. The guide recommends a minimum cycle parking provision of 1 space per 250m² of Gross Floor Area (GFA) of office space, with a minimum of 2 spaces. There has been ongoing reviews of their cycle parking and in 2014, TfL recommended increasing the minimum requirement for offices to 1 space per 90m² as studies revealed that significant further growth is anticipated (Further Alterations to the London Plan, 2014).

4.8. Sydney, Australia

Sydney (state capital of New South Wales (NSW)) has seen similar increases in the number of cyclists within the city. A recent survey reports that the number of cyclists who rode their ride in the past week increased from 11.9% in 2010 to 18% in 2011 (Bicycle NSW, 2011). The NSW guidelines recommends that bicycle parking be provided for 3-5% of all employees within the office building (NSW Planning Guidelines for Walking and Cycling, 2004). The number of employees influences how many lockers, showers and changing rooms are required to service the office building.

4.9. Vancouver, Canada

The City of Vancouver have published their parking regulations under a by-law and Section 6 requires all office developments to provide a minimum number of bicycle spaces at a ratio of 1 space per 500m² of GFA. The by-law also requires a reduction of vehicle parking spaces, which is dependent on the number of bicycle spaces provided (City of Vancouver Parking By-Law, 2013).

5. CASE STUDY – TYGERBERG HILLS OFFICE PARK

A typical Office Park was selected as a case study to monitor the effect of implementing an EOTF on travel to work modes. **Figure 1** shows the location of the office park in relation to Cape Town CBD together with the home locations of the 55 Hatch employees who were interviewed. The total number of Hatch employees is 60, of which 55 frequent the office. As the remaining 5 employees are based off-site and only travel to the office infrequently, they have been excluded from this survey.

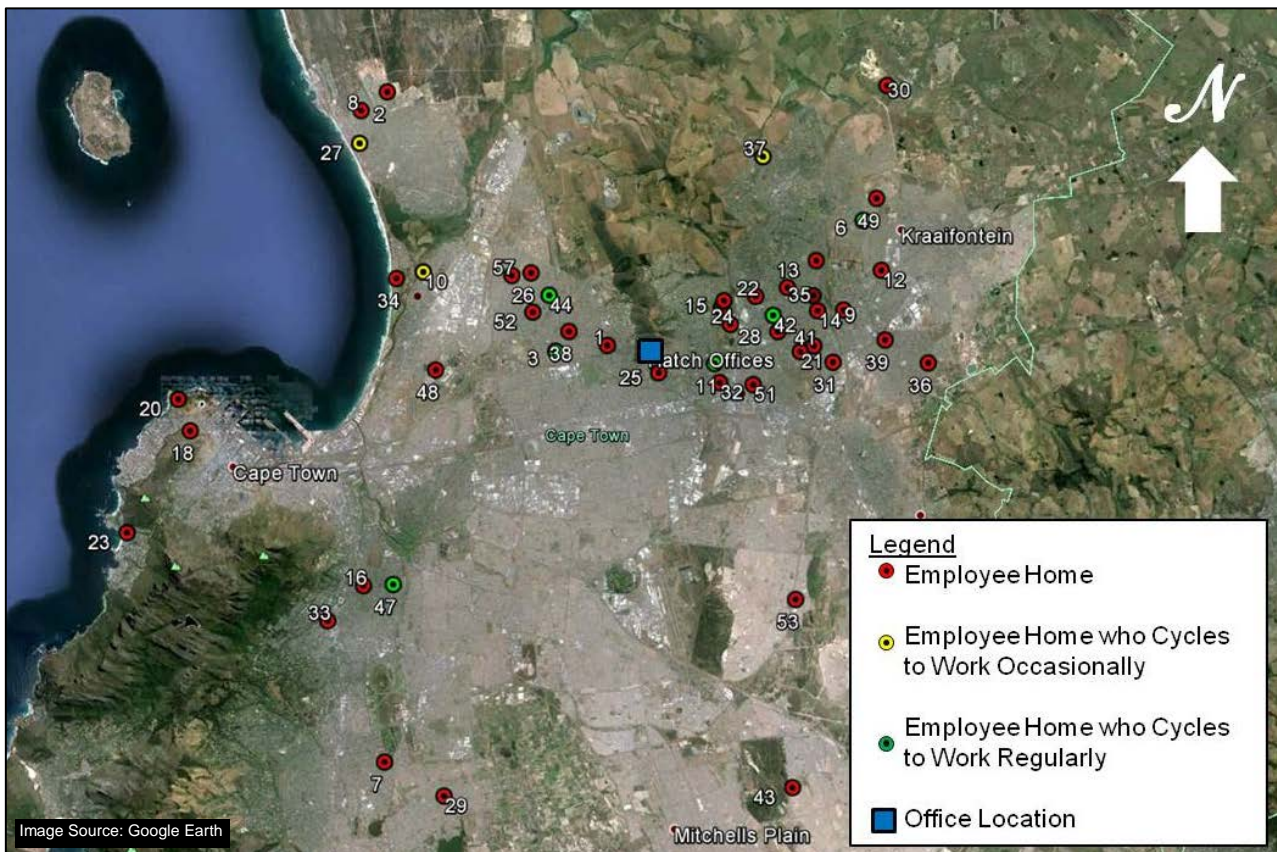


Figure 1 - Office and Staff Location within Cape Town Area

The office park was selected as a suitable case study location for the following reasons:

- 1) When the study commenced, employees were unaware that an EOTF was available for use in an adjacent building. Prior to the study commencing, none of the employees walked or cycled to the office;
- 2) The office park is located along recommended bicycle routes (Cape Town Bicycling Map, 2014) and links to other dedicated bicycle lanes (see **Figure 2**);
- 3) The office park is located within established residential neighbourhoods with 27% of all employees living within a 5km radius of the office (see **Figure 4**);
- 4) The author works within the office park and was able to monitor bicycle activity on a daily basis;
- 5) It was possible to interview office employees on a regular basis.

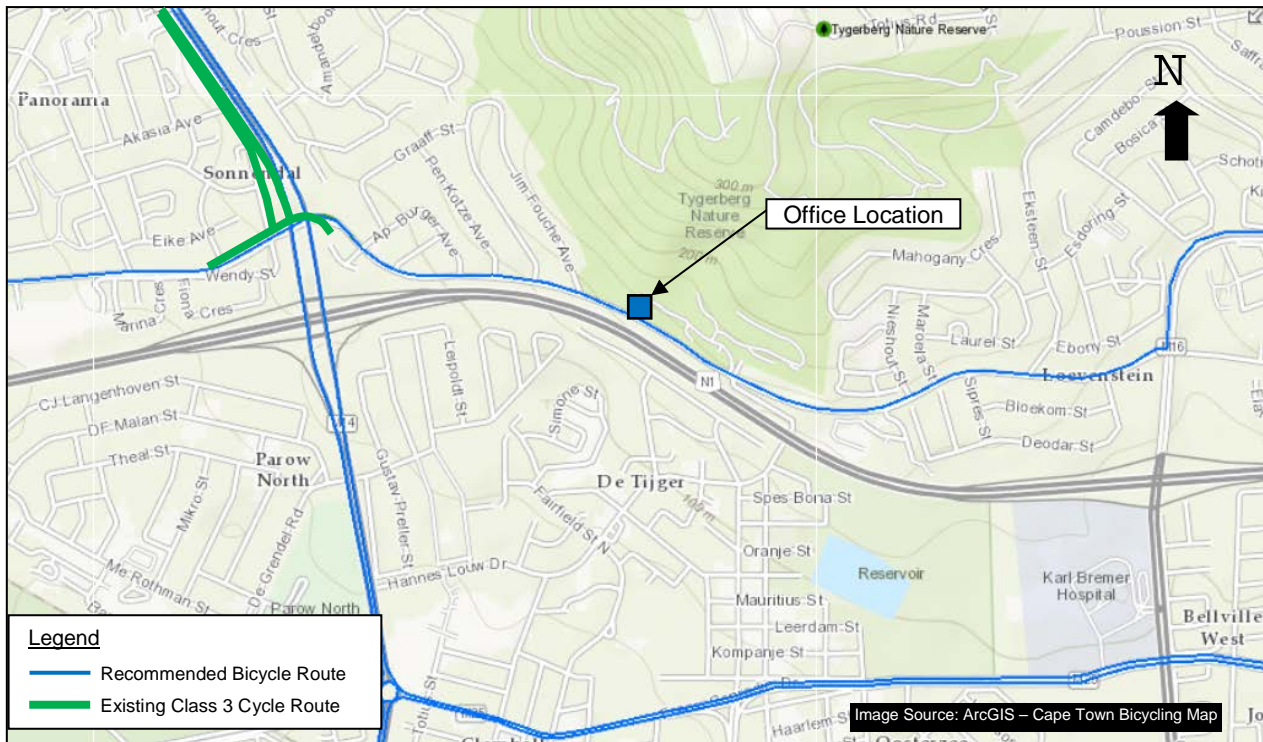


Figure 2 – Proximity of Existing Bicycle Routes



The survey commenced on Friday, 1st of August 2014 following an email to 55 Hatch employees encouraging them to use the dedicated male and female shower and changing facility.

The survey required each user to complete a logbook, which was mounted on a wall within the facility. Users were required to provide the following details every time they used the facility:

- 1) Name;
- 2) Company name;
- 3) Time of use (AM, lunchtime or PM); and
- 4) Intended Use (cycle, run or other).



The logbook was captured and the information utilised to determine the number of weekday users and to calculate the usage for the months August through to December 2014. The results are displayed in **Figure 3** and indicates that of the 55 Hatch employees, 3 employees (4%) started to cycle to work during August 2014, increasing the total EOTF usage from 16 to 20 visits (20% increase). In September, the same two employees continued to cycle a total of five times. The maximum usage was observed during October

when four employees (including two employees cycling to work for the first time) used the facilities a total of 16 times.

The survey concluded on the 19th of December due to year-end closure, which attributes to the poor usage in that month. The overall usage by non-Hatch employees also declined, most likely due to seasonal events (client/office parties, vacation, etc.). The survey recommenced on the 5th of January 2015 and the EOTF usage will continue to be monitored over a period of a year as part of a master’s research programme. The survey will monitor seasonal fluctuations, e.g. influence of large sporting events such as the Cape Town Cycle Tour (previously known as the Cape Argus Cycle Tour) which takes place on the 8th March 2015 as well as the influence of winter (rainy) months.

During the 5-month long survey a total of 10 unique EOTF users were identified, five of the 10 users only started making use of the facility after the announcement. By raising the awareness, the number of employees using the EOTF doubled.

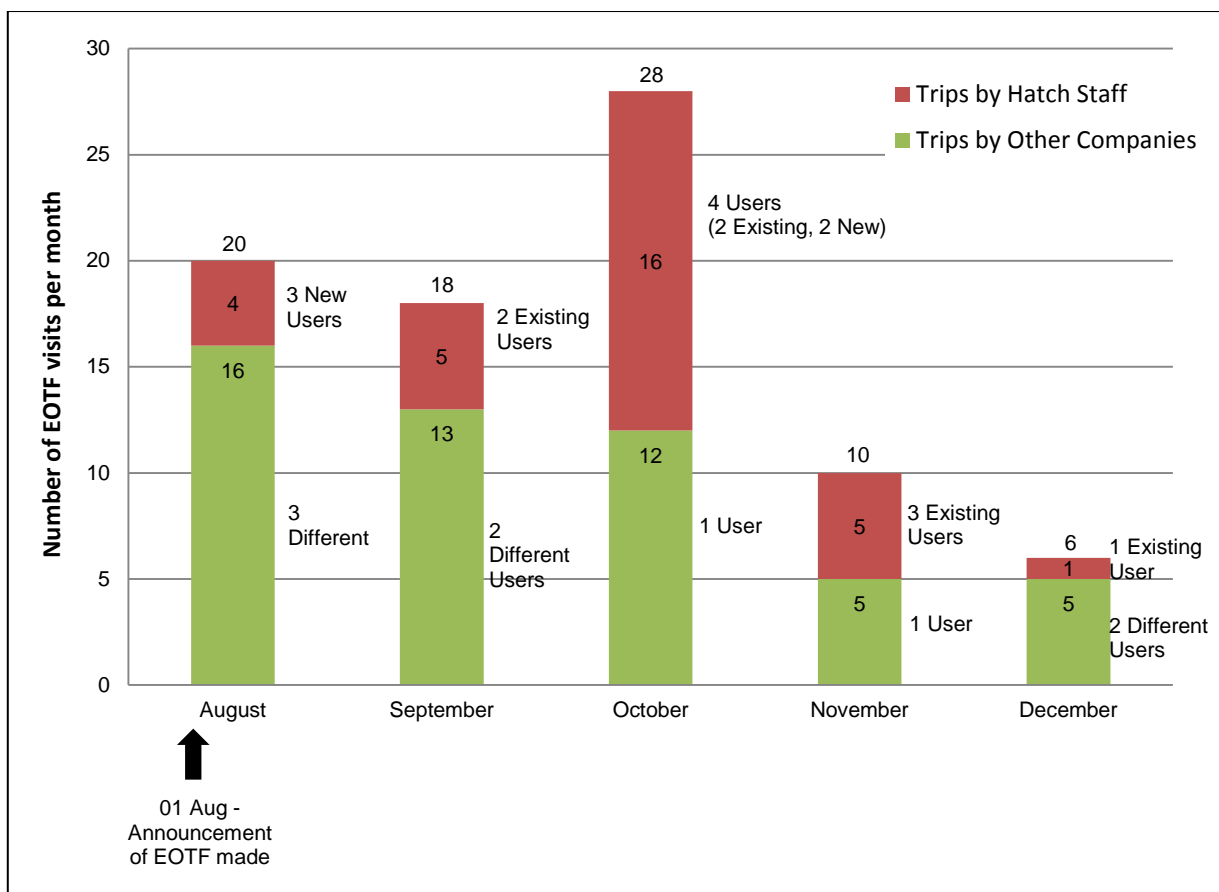


Figure 3 – EOTF Monthly Usage (August – December 2014)

Figure 4 shows the number of Hatch employees living within a 5km radius of the office. Research indicates that a 5km radius is the accepted maximum distance people are prepared to cycle (Transport Canada, 2010). The figure indicates that 15 of the 55 (27%) employees would be ideal candidates to cycle to work. Of the five employees who started cycling to work on a regular basis (more than twice a week), four live within the 5km radius. A further 11 employees live within the 5km radius, but prefer not to cycle for various reasons.

The survey also revealed that three of the 55 employees have occasionally cycled to work (once a month) although they all live further than 5km away.

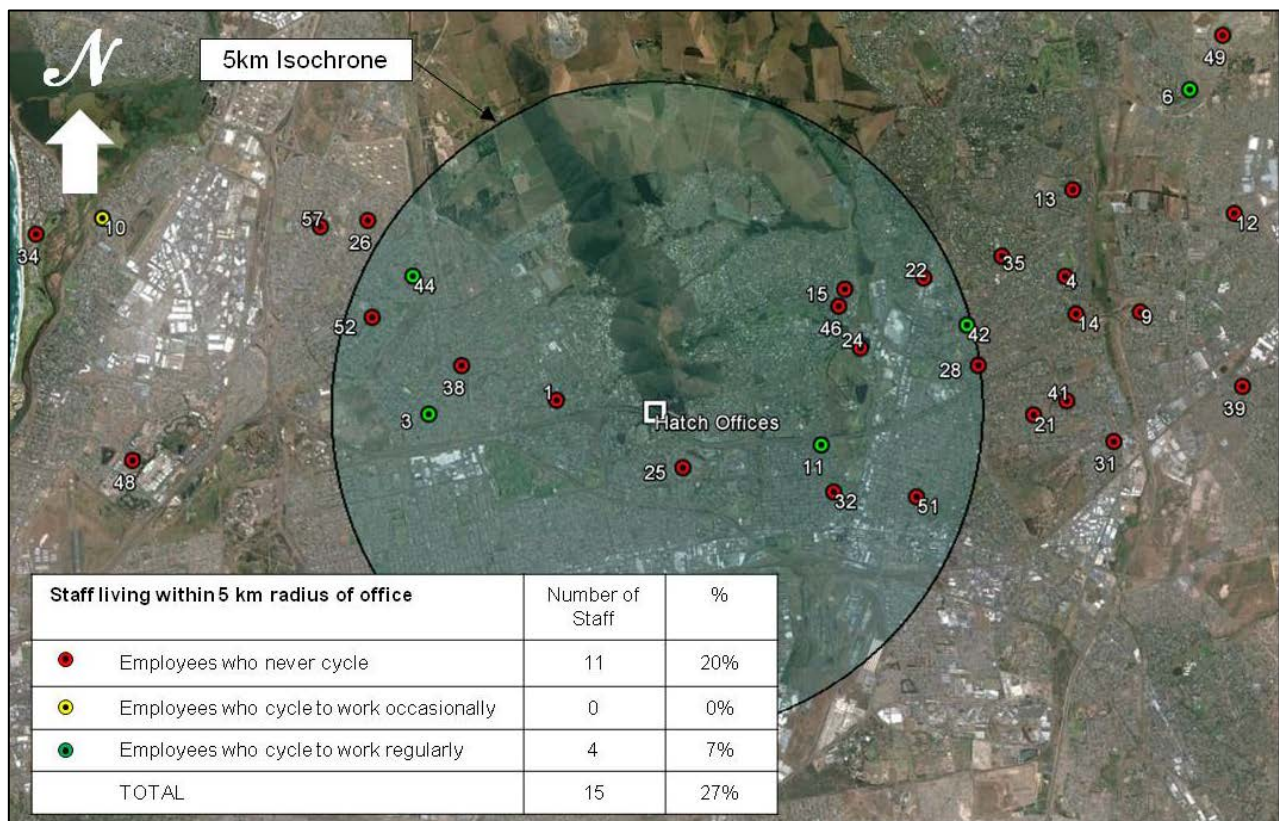


Figure 4 – Employees within 5km Radius of Office

An online questionnaire survey was undertaken by 55 Hatch employees, of which 44 responses were received.

The following questions were asked:

- Age Group;
- Whether or not they use a bicycle;
- The purpose and frequency they use a bicycle;
- How safe they feel when cycling on the road;
- Whether or not they had been in a cycle accident in the last 5 years;
- The level to which other road users influence their decision to cycle;
- The reasons which prevent them from cycling to work; and
- Changes required to increase the possibility of cycling to work.

The responses revealed that 52% of employees use a bicycle, of which the main purposes are fitness and recreation. 75% of employees indicated that they would feel safe on a segregated cycle path, while 67% reported that cycling on a road with no cycle lanes is completely unsafe. Only one employee reported being involved in a serious accident. A further seven employees reported being involved in a minor accident. This equates to 14.5% of the surveyed employees having had some form of bicycle accident within the last 5 years.

The reasons why some employees chose not to cycle to work include:

- Going uphill stops me from cycling (8%)
- Safety on the road stops me from cycling (22%)
- The weather stops me from cycling (14%)
- The lack of secure bicycle parking and inadequate changing facilities (14%)
- Living too far away to cycle (26%)
- Undertake linked trips (drop kids off or go to gym before work) (16%)

The primary reason preventing employees from cycling to work is the distance to the office. Unfortunately, this physical constraint is a limiting factor to, as no interventions (e.g. infrastructure provision, bike to work incentives or EOTFs) would enable these employees to cycle to work in the future. Therefore, future awareness campaigns should focus on those employees who live nearby, but who choose not to cycle to work (20%) and those who use a bicycle, but not for work purposes (52%).

Another reason preventing employees from cycling to work is the safety of cyclists on the road. The survey indicated that 37% perceived buses and taxis to be a danger to cyclists, and 35% of employees ranked the presence of Heavy Goods Vehicles (trucks) on the roads as a reason not to cycle to work.

6. CONCLUSIONS AND RECOMMENDATIONS

The research undertaken has identified shortfalls in the current South African planning legislation with regard to NMT and bicycle provision. The following changes are proposed:

- The South African Parking Standards be amended from a minimum to a maximum provision;
- Bicycle Parking Standards be included in all revised parking standards and be made mandatory for all new or extended office developments;
- The bicycle provision should be expressed as minimum standards to reflect the sustainable nature of this mode of travel;

The case study undertaken highlighted the following:

- No employees cycled to work prior to making the EOTF available for use;
- The EOTF immediately encouraged five of the 55 employees (9%) to cycle to work who previously used their private vehicle to drive to work;
- 15 (27%) of all employees live within a 5km radius of the office, but of these only 5 (9%) cycled to work;
- 4 of the 5 employees who cycled to work live within a 5km radius of the office;
- Safety on the roads and distance to the office were noted as the primary reasons preventing more employees from cycling to work.

It is concluded that the introduction of the EOTF has benefited some employees (9%) who now have an option to cycle to work.

The following recommendation is made:

- EOTFs should be legislated as a mandatory requirement for all new office developments. The level of provision should depend on the size of the development and number of employees;
- Appropriate guidance should be made available showcasing examples of good practice together with minimum facilities to encourage high quality facilities;

- It is essential that bicycle parking design and EOTFs be included in the early planning stages of any new office development to ensure space requirements, access by bicycle and integration within the building are considered;
- Recommended and minimum EOTFs should be included in the Draft National NMT Transport Policy and the relevant municipal guidelines.

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