PEAK TRAVEL DEMAND: CUT THE COMMUTE!

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ABSTRACT

Every weekday in South African cities tens of thousands of workers travel from thousands of widely dispersed places of residence to a small number of centralized business areas and then home again. The result is traffic congestion that has a detrimental effect on both society and the individual. The time for tinkering at the edges of the commute to manage traffic congestion has passed. Of more importance is whether the twice-daily mass commute is necessary? Rather than people going to work, should technology not be used to take the work to the people? This paper briefly considers the evolution of work, human needs and the complex economic and social role of work, as well as the expectations and needs of a new breed of young worker. Reactive short-term measures to reduce peak congestion such as flexitime, staggered shifts and working from home (telecommuting) may have some impact on peak traffic but a more visionary and broader proactive response to changes in the world of work will deliver greater benefits. A model for the figurative redevelopment of neighbourhoods with the equipping of high-tech buildings with pod offices is suggested. These would provide office space for the local staff of many different and geographically dispersed companies, close to their homes (walking distance or a commute of minutes). This would eliminate the commute, but retain the social and psychological role of work as well as manage productivity.

1. BACKGROUND

Social and technological disruptors that have evolved over the last 15 to 20 years indicate that the future world of work will look very different to the current approach to work and the work environment. The future world of work - the way in which South Africa as a country, but also how individuals will need to work to remain relevant or competitive - is starting to be mapped out. It would be naïve to think that South Africa can follow a highly labour intensive, command and control, Victorian template (with its accompanying unresponsive, rigid and inflexible management systems) and still provide work and quality of life for all South Africans.

In addition, young people (largely Millennials born in the 1980s and 1990s) in work today expect a greater return on the investment of their limited resources – time and effort - than previous generations did. Expenditure of effort should lead to a better quality of life than that of their parents and grandparents, not just the same treadmill.

2. THE ISSUES

One of the problems faced every weekday, in all South Africa's cities and around the world, is that tens of thousands of office workers travel from highly dispersed residences to highly concentrated places of work such as city centres or industrial parks. This results in heavy traffic congestion, individual stress, a loss of productivity, a waste of time and money and a significant negative environmental impact.

The building of new roads simply generates new demand. Good free flowing roads attract those who prefer the practical convenience and flexibility of the private car. When the congestion drops to a certain level those public transport commuters who can, revert to the preferred flexibility and reliability of the private car, and may even make life choices such as where they work and live based on the good (private car) travel options.

Where public transport is encouraged, the cost of subsidy is a heavy financial burden resulting in one set of expenses being swapped with another to ensure individuals can travel to and from work.

Problems with the daily commute have a secondary cost that is rarely considered. This is the impact on productivity. One's brains have two states: 'fight or flight' or, 'receptive and open'. It is never in two states at once. High levels of stress and worry (related to the commute) leave workers in the 'fight or flight' mode long after they get to work, whereas productivity actually requires job incumbents to be in the opposite receptive mode – open to new ideas, motivated to achieve, customer orientated, thinking, creative and observant.

The daily peak congestion is a huge and very expensive nightmare for most commuters but the need to manage the congestion of the commute offers an opportunity for government to take a different perspective, reconsider the word of work and turn a 20th century transport problem into a 21st century social opportunity.

3. SHORT TERM TRANSPORT SOLUTIONS

Because of the nature of work, there is a demand for public transport, but it is not sufficiently demand responsive for it to be the mode of transport of choice. The commute is expensive in terms of time, money, productivity, environmental impact and the cost of infrastructure and physical and mental health.

"The stark reality remains, however, that we cannot build ourselves out of congestion and that constructing new roads only provides short-term relief. " (Cllr Brett Herron Cape Town Sept 2016)"

If it is not possible to build the way out of the peak congestion then what are the options? Several are mooted, some of which are discussed below:

- flexitime to extend the peak
- staggered shifts
- greater use of public transport
- lift clubs
- work from home
- work from near home

3.1   Flexitime

Flexitime workers who work a 40-hour week would normally work the same core hours e.g. 10:00 to 15:00. Staff members can then each choose when they work the balance of 15 hours. They can work core hours on some days and more than 8 hours on others, either starting very early or leaving very late. This is intended to extend the peak resulting in slightly fewer cars on the road at any one time. The roads take longer to clear and become busy earlier making life more difficult for the likes of plumbers, sales reps, delivery drivers or anyone who drives to see a client. It also assumes that private car users have no family or similar commitments and have the flexibility to leave for work earlier/ later and go home earlier/ later. The command and control management system does not work well with flexitime work.

3.2   Staggered shifts

Unlike flexitime, those working staggered shifts do not have a combination of fixed core hours plus flexible hours. Shifts could start at any time and end say 8 hours later. The idea is that either workers at different companies in the same area, or different workers at the same company, work the same fixed hours each week but the work day starts and ends much earlier for some (say 06:00 to 15:00 incl. lunch) and much later for others, say 09:00 to 18:00 (incl. lunch), or even starting at 11:00. Like flexitime, staggered shits bring their own stresses and anxieties. They are possibly more anti-family and anti-social and do not contribute to societal well-being.

3.3   Greater use of public transport

The 'stick' of tolls has failed to have much effect on road traffic so four 'carrots' are needed to improve the demand for public transport from those who have other options. It must:

- be safe, reliable and keep to a fixed schedule,

- be of an acceptable standard,

- provide good value for money when compared with the flexibility of using one's own car; and

- communication must be superb and available at all times.

It would however be better if far fewer people needed to travel any real distance to work in the first place. This leaves either working from home that is not ideal or working in an office within say two (2) kms from home.

3.4 Work from home

Working from home has been touted by many as the panacea to all the evils of traffic congestion. Currently, it is an option largely for senior professional staff or those who leave home and go straight to a client. It is a great option for the middle class professional who has suitable space and connectivity, and the privacy and self-discipline to work from home. It is one thing to work from home occasionally, or go into the office part time, but it is another to work permanently from home.

Anyone who spends all their time on a computer, not just the odd senior manager or lawyer, should be able to work from home but is it always feasible? Many people find working from home, after all the basic physical and technological requirements having being met, alienating, isolating, lonely and far from motivating, stimulating or satisfying. This is because most people need other people for support, to bounce ideas off, to take a few minutes break just for a chat, to listen when they are feeling down, to get away from the squabbling teens or the chronically complaining husband, to keep them at their desk working.

Not everyone's domestic arrangements are such that working from home is feasible Women especially, can find actually doing work, when working from home, difficult. Often work can only be done after the entire household has gone to bed at night. Imagine a wife and husband, his mother, her teenage brother and their two toddlers live together in a three bedroomed house in the suburbs. Where would the telecommuting individual work - in the spare bathroom, or the corner of the garage?

Infrastructure is also an issue. Is the employer going to buy the desk and other equipment and stationery for a home office? Who is to pay for the fibre connection and how secure is it? How will downtime be managed? How much control does an employer have over data in someone's home? What are the tax implications?

How would one manage, motivate, lead or develop these workers? How can one ensure quality and quantity work? Who provides the soundboard off which to bounce ideas? Will the company miss out on creativity and good ideas? What about team work? A command and control style of management in a little empire will not serve. Work needs to be restructured so that it is not open-ended, but project-like. Many disciplines are already like that and others, with the judicious use of quality control, key performance measures and milestones, would benefit from being re-structured.

One of the important points here is that if executed poorly working from home can be expensive for the employer - expensive in terms of productivity – quality and quantity and the control of company data. Can South Africa really afford to make labour even more expensive?

One way of reducing congestion is to remove the need to commute. In order to 'Cut the Commute' consideration must be given to the human element and the structure of the world of work. Traffic congestion is not the problem; but rather a symptom of the way work is organised. This has been more or less the same since the industrial revolution.

4   FROM A TRAFFIC ISSUE TO A SOCIAL ISSUE

Rather than just trying to solve the congestion problem with various Travel Demand Management (TDM) strategies – a combination of the carrot and the stick - a more radical and 21st-century approach must be considered. Instead of people travelling from their home to work and back again, why not keep people at work close to home and take the work to them using modern digital technology?

In order to decrease the congestion on the roads, several short-term Travel Demand Management (TDM) strategies are regularly put forward. Most of these rely on the behaviour modification of peak time motorists but, realistically, these are, by and large, only sticking plasters and their usefulness is short term, predicated on no, or low, growth of the economy and a continuing socio-economic status quo, including both high levels of unemployment and high levels of manual and unskilled worker.

Using TDM strategies, it is possible to stretch the peak and reduce some demand for travel at this time, with a resultant reduction in the degree of congestion. This is not guaranteed and will be cancelled out by any significant economic growth. Over a short period, growth should translate into more people in work and therefore more commuters, and congestion will be back to the pre-TDM sticking plasters. That is, if the developments in the structure of work do not instead, create more unemployment first.

Figure 1 shows a horse bus circa 1729 - only the nature of the 'horse' has really changed. The concept remains the same. Public transport used to take people from A to B. Today, this is largely from their home to their place of employment and home again.
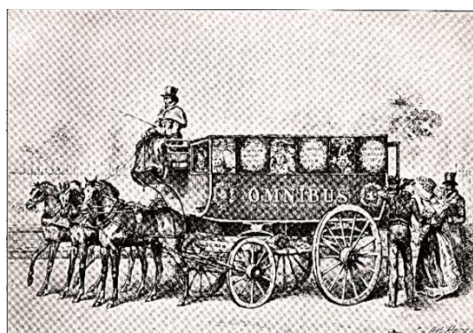
Figure 1: Horse drawn bus

To resolve the problems of the peak, a multidisciplinary, conjoined approach (or as the English call it - 'a joined-up approach') is required. It is necessary to consider the way cities (the built environment) are structured and managed for work and play, determine what the social and work demands of today and the future are, and what is likely to become obsolete and move towards providing flexible proactive solutions. For instance, there is usually a relationship between the need to go to a place of work to earn a living and the individual's level of education. The higher one's level of education the more it is likely one can work from home. A lawyer is currently more likely to be able to work from home than a receptionist or sweeper. However, if fewer people go to centralised places of work there may be a reduction in demand for sweepers and receptionists.

5. THE EVOLUTION OF WORK

The Second Industrial Revolution, from about the mid-19th century to WWI is often called the 'technological revolution'. Massive improvements in the production of iron-ore reduced the price of steel and ultimately resulted in greater production economies of scale. Manufacturing became more streamlined; there was an emphasis on purposeful technology and advancements in mass production. With these changes, companies became larger, workers in industry became more and more differentiated and the management middle class emerged.

5.1   The move to the suburbs

This period also brought about socio-economic changes as workers no longer needed to live in the insalubrious shadow of their place of employment (usually the factory). The growth of the city centre, an increase in the population, the advent of the railway, and later the motor car meant that those who could afford to do so, moved out of the less desirable inner cities to give their families a better quality of life in the suburbs. Many others were forced out of the cities as slums gave way to new commercial buildings and other areas were gentrified.

Ultimately, all these socio-economic changes led to the traffic congestion seen on roads today. It also led to a society where one or both parents, more commonly the father, spent long days away from home working to provide for their family.

5.2   Social changes and work

From the start of the industrial revolution in the 1700, fathers played a relatively small role in the lives of their children. They were often absent from home working and their role was essentially just that of the breadwinner. The post WWII generation of baby boomers lived lives very like their parents but consolidated that quality lifestyle out in the suburbs. They were largely better off than their parents as the fruits of the second industrial revolution delivered an even better quality of life including a car, "white goods", radio and TV, etc.

Improved standard of living meant the children could have it all. Those same, children, now adult expect to continue having it all.

The baby boomers wanted to give their children everything they did not have - quality and quantity family life, the money to provide it and discretionary leisure time. It is the children of baby boomers, the Millennials (also known as Gen Y), who want, and expect, something different from work. They want financial security, the freedom to choose for whom, when, where, and how they work, as well as play an active role in family life and still have time for leisure. They do not commute, and instead make up the 'coffice' (coffee shop office) brigade.

Depending on what is used to make the distinction, society is currently in the Third or Fourth Industrial Revolution. Today there is a "knowledge" rather than "physical skills" economy. Digital technology is playing an ever-increasing role and the emphasis is on the 'Internet of Things'. This brings a world of high tech communication, and of less or more sophisticated robots, databases, apps and algorithms reducing the demand for labour but also offering not only the choice of where, when and how one works, but for how much and how often.

As work in the office or at the factory is re-engineered this group of new (gig) workers, who sell their time by the hour to multiple buyers will increase. Already they make up a diverse collection including nurses and carers, accountants and bookkeepers, project managers, site foremen (women), pilots, brand specialists, lawyers, CCMA chairs, graphic artists, business report writers, designers and compilers, personal trainers, web designers, IT specialists, coders, trainers, actuaries, etc.

6   THE ROLE OF WORK

Although most people have an economic imperative to work, that work fulfils a far broader role than just generating an income. It meets multiple need including building the psychological resilience that underpins coping with difficult and stressful times,   as well as creating a sense of value. It is for this reason that working permanently from home is in neither the employer nor the employees interests.

6.1   Hierarchy of Needs

Maslow's *Hierarchy of Needs* remains the best-known motivational theory of what drives the individual and explains why people work. See Figure 2 below.

The higher up the food chain one is, or the more control one has over one's life, the more needs one can meet. The extent to which one might want, or need to meet a need, and the degree to which that need must be met before another more important one becomes important, differs from person to person. Consider someone who lives on the street versus someone who has been fast-tracked in an investment bank.

Work meets a series of needs in our lives and although some people choose to work in isolation, most of us need people and relationships to produce quality work. Work provides different stimulation to home; it provides a support system and helps build the psychological resilience needed in times of stress. In other words, work allows us to meet some of the needs that are not completely fulfilled at home. Simplistically one goes to work to get away from home and goes home to take a break from work. Work allows one to stretch oneself mentally, it provides friends and togetherness and a different sense of belonging to other relationships. It also allows one to measure oneself against others, and to dream and aspire. For many, this aspiration was coupled with the self-actualization and esteem that work could provide.

Figure 2: Hierarchy of Needs

One needs to work and one needs colleagues, clients and relationships. One does not need to travel to work but one does need what work offers. It is for these reasons that working at home is not an answer to the daily commute. Working close to home – ideally, walking distance - in an environment that can meet many needs is a better answer for many especially those who started working at the turn of the century.

6.2   Characteristics of work today

Work as it is currently executed is different to what Millennials want and expect and any consideration of congestion issues needs to take into consideration the changes to work that lie in the immediate future as set out below.

Work today is:
- all-consuming
- open-ended
- person specific
- highly structured
- bracketed by the commute

Future work will be:
- only part of life with more choices
- fixed term or project like
- knowledge specific
- fluid with intelligent teams
- No or occasional travelling

7   WORK FROM NEAR HOME – THE POD OFFICE

Most workers travel from a multitude of distributed locations (home) to a far smaller number of central points (place of work) daily. Most white-collar workers travel to their destination simply to sit behind a computer. Blue-collar work is also changing as robots start to 'infiltrate; the workplace. Work interaction with colleagues is for many fairly minimal but the good feeling of being part of a social group is important and improves one's view of the world, putting one in a state receptive to new ideas, advice and original thought. (That is, once one gets over the stress of being late because the taxis were not running or an accident turned the freeway into a parking lot.) If elements of one's commute or workplace are toxic, it plays havoc with both one's physical and mental health and the quality of work.

A possible solution to both proactively managing traffic congestion and the changing way people get to work is to go to work locally (within walking distance in a pod office. These would be situated in high tech buildings shared by multiple companies but not seen or developed as branch offices. A pod office would link the employees in that office to other offices elsewhere in the city or country. The building would also have common shared spaces. Any one pod may include several people from different areas of the company who may not necessarily work with each other. Extensive use would be made of video communications and virtual reality. The pod offices would be owned/managed, supported and maintained by independent companies

Other workers from other companies who work in other pods in a given building would provide the social support that one would normally get from one's colleagues at work. Using the pod office concept would mean that a company could also employ the best in the country without being limited by where employees live.

Local techno hubs with pod offices are one way of eliminating the need to commute. The development of the local office concept also recognises the fact that work in the future will change creating an ever-growing workforce of the self-employed (gig worker) or small (one to three person) techno companies that cannot all operate from the local coffee shop. Pod offices would be ideal workplaces for these individuals. As work becomes digital and technology bound, unemployment is likely to increase and it will be necessary to stimulate local neighbourhood economies to create alternate gig work.

8 FUTURE WORLD OF WORK AND TRANSPORT

Over time, the number of people who go to work will decline due to a shrinking of demand for, and a re-engineering of, the supply of, and demand for, labour and skills. Put differently, databases and robotics will make workers redundant. If one removes artificial issues that limit the speed of the adoption of change, what working age individuals expect from work and from their home life is changing and there will be a move to individuals seeking to work as and when and at what suits them. Of paramount importance is how people wish to live their lives, the design of cities, technology, unemployment and formal education and the design of work and management of work. This is, in fact, not as herculean a task as it might seem, because tweaking at the edges has been taking place for some time and some of the changes have overtaken us already.

Work will change in the future creating more workers that are self-employed or those who only go to work (company main offices) occasionally and the rest of the time work locally. When this future happens depends, amongst other things on the stimuli provided. It can be expected that it will happen in incremental steps but change is not always predictable.

8.1 The speed of change

Some unlikely jobs are also under threat. For instance, bookkeeping and invoicing apps are starting to proliferate. Another unlikely area is law. The Legal Technology Website calculates, based on the Deloitte report of February 2016: *Developing Legal Talent - Stepping into the Future Law Firm* that 100 000 legal roles in the UK will be automated in the next 10 years. (Legal Technology Website n.a. March 2016) Skilled para-legals and researchers are already starting to be replaced by faster and more efficient databases.

Sometimes technological changes are oversold and technological advances take a lot longer to achieve significant impact than expected. (Remember the promises of a paperless office that the advent of the desktop computer was supposed to bring about?) At other times, society underestimates how long something will take from prototype to market.

In 2013, Will Knight of the MIT Technology Review reported as follows on a conversation with MIT CSAIL engineering professor John Leonard "MIT's Leonard, for one, does not believe total autonomy is imminent. "I do not expect there to be taxis in Manhattan with no drivers in my lifetime," he said, before quickly adding, "And I don't want to see taxi drivers out of business. They know where they're going, and - at least in Europe - they're courteous and safe, and they get you where you need to be. That's a very valuable societal role."" (Knight 2013).

In August 2016, Andreas Illmer of the BBC reported on the Singapore trial launch of a fleet of driverless taxis. (Illmer, 25 August 2016)

Recently Uber announced that its fleet of autonomous trucks was around the corner. The first autonomous delivery, beer, was made by a truck called Otto, in the US in October 2016.

9   CONCLUSION: HOW TO CUT [OUT] THE COMMUTE

The best way to cut the commute is to remove the need for it. Through a multidisciplinary approach and visionary thinking, cities and their suburbs must be encouraged to proactively 're-develop' in response to the need to live and work locally. To do so effectively it is necessary to understand why people work and how work will change in the future.

Two different issues, both related to work, need to be considered when discussing peak time traffic congestion. The first is that people and the quality of their life matter, and the second is that millennials often choose not to go to work (self-employed) or who would prefer not to do so but instead rather work close to home. This is not to say they do not want to work but rather they would like to choose the time, the place and what they do.

Not only is it necessary to encourage digital solutions to traffic congestion, by taking work to people rather than people to work, but it is also necessary to consider how digital technology is going to change the world of work. As more people choose to work locally, neighbourhoods or suburbs need to be reconsidered. Do they meet the social and economic needs of individuals working from (near) home?

This process of re-engineering or redeveloping the built environment would serve not only as an opportunity to manage traffic congestion by reducing the demand but over time can also serve to help manage the growing unemployment that will come with an increase in the use of digital technology in general and robotics specifically. It could also form part of a long-term densification of suburbs as local areas are re-purposed or made multipurpose.

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