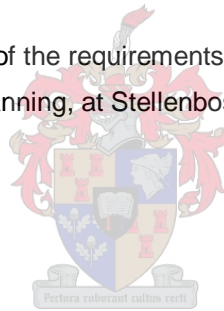


The effect of minimum parking regulations on housing price and supply

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Declaration

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Abstract

Housing affordability is one of the biggest challenges that cities around the world currently face. By reducing or removing unnecessary off-street parking regulations it is possible to lower the cost per unit and increase the amount of units in new housing development. This study focusses specifically on the effect of minimum parking regulation for residential properties in the City of Cape Town between the 2014/15 and 2018/19 financial years. The City of Cape Town recently incorporated zones partially and completely exempt from the minimum parking regulation. The effect of minimum parking regulations was tested by comparing the amount of new development applications between exemption and partial exemption zones with surrounding areas of similar size and location. The objective was to determine whether parking had an effect on the supply and price of new developments. The study found that most new developments take place outside of the PT1 and PT2 zones due to the small size of these zones compared to the entire City of Cape Town. However, when comparing the similarly sized buffer areas to that of the PT1 and PT2 zones it was found that almost double the amount of new developments took place within the PT1 and PT2 zones – meaning when a location is already decided upon it would make more sense to develop in the zones where regulation is slightly less. No significant change in the average price of development was observed due to the cost data being that of construction cost.

Opsomming

Bekostigbare behuising is een van die grootste uitdagings wat menige stede van regoor die wêreld tans in die gesig staar. Deur onnodige minimum parkeringsregulasies te verminder of te verwyder stel dit mens in staat om die koste per eenheid te verminder en om die aantal eenhede per behuisingontwikkeling te vermeerder. Hierdie studie fokus spesifiek op die effek wat 'n minimum parkeringsregulasie op residensiële eiendomme gedurende die 2014/15 en 2018/19 finansiële jare van die Stad Kaapstad het. Stad Kaapstad het onlangs sones ingestel wat ontwikkelaars of gedeeltelik, of heeltemal vrystel van die minimum parkeringsregulasie. Die effek van minimum parkeringsregulasies was getoets deur die aantal aansoekvorms van nuwe ontwikkelings tussen vrygestelde en gedeeltelik vrygestelde areas te vergelyk met areas van eenderse oppervlakte en liggings. Die doel was om te bepaal of parkering 'n effek op die voorraad en prys van nuwe ontwikkelings het. Die studie het bevind dat die meeste ontwikkelings buite die bepaalde PT1 en PT2 sones geskied. Hierdie is as gevolg van die klein oppervlakte van die PT sones in vergelyking met die totale oppervlakte van die Stad Kaapstad. Wanneer die PT sones met die van die buffer areas vergelyk word was daar bevind dat omtrent dubbel die aantal ontwikkelings binne die PT sones plaasvind in vergelyking met die buffer areas. Dit beteken dat wanneer die ligging van 'n ontwikkeling reeds bepaal is dit meer sin maak om in die PT sones te ontwikkel waar daar minder regulasies is. Geen noemenswaardige veranderinge in gemiddelde prys was waargeneem as gevolg van die koste data wat die van konstruksie kostes was nie.

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1. Introduction

1.1. The High Cost of Free Parking

Donald Shoup in his book *The High Cost of Free Parking* (2005) first tackled the many issues cities are being faced in terms of so-called free parking. Off-street (or on-site) parking regulation became evident in the 1930s in the USA – this was in reaction to a shrinking supply of on-street parking in cities and roads becoming congested with cars cruising for parking. To combat this and alleviate traffic the town planners introduced a policy that would force all new developments to supply a prescribed minimum amount of parking, depending on the zoning. This idea worked beautifully – traffic was alleviated, and parking was in abundance. What the planners of the time did not foresee was the plethora of new problems that would arise with this new regulation. In essence, people in cities were subsidising the cost parking, either through the cost of housing, the cost of goods and services or the rents for the premises. Even the people who do not own a private motor vehicle effectively helped to subsidise the price of parking. The detrimental and skewed effect of “free” parking is an unchallenged preference for cars. This can be explained using an analogy. Picture a buffet with various food types, all the items in the buffet must be paid for per item, except chocolate bars. Naturally many people would grab a few chocolate bars in addition to the other items, or perhaps even choose the chocolate exclusively. Does this mean that the chocolate was the best and healthiest item? Surely not, but seeing that it was very affordable and tend to satisfy the need of the consumer, it enjoys a higher market share than the other items and what it ought to have. Similarly, cars appear to be affordable, because parking is perceived as free, but this is not the case. By bundling the cost of parking in the price of housing or goods, it makes it impossible to opt out of the parking service. Thus, if you already pay for the service, you might as well use it or, at the very least, not feel as much if you had to pay for it separately. This is one of the many reasons the uptake to more sustainable modes of transport such as public transport (PT) and non-motorised transport (NMT) has been painstakingly slow. The commuter’s behaviour is impacted heavily by the service level of the transport mode, the cost of parking and the supply of parking (Li, et al., 2007). Are there thus any merit in keeping minimum parking regulations?

Furthermore, the style and types of developments that are being constructed mandates the inclusion of parking. Developers may look at certain potential developments and decide that it is not financially feasible and, even if it is feasible, offset the parking cost to the buyer (Manville, 2013). The lease of the property includes the high cost of parking in the lease. Inevitably, the end user pays for the parking, irrespective of whether they want parking or not. This cost offset effectively leads to less housing and less variety in housing.

1.2. Background

Many cities across the globe are currently facing a common challenge: housing affordability. Popular cities tend to attract many migrants and cities are faced with the challenge to keep up with demands such as the provision of water, electricity, refuse removal, roads, and housing. This is a particularly

important aspect in South Africa – where most of its inhabitants are unable to afford a decent house or apartment. Not only will most citizens not be able to afford a house or apartment, they also cannot afford private transport and are forced to use alternative means like public (bus, minibus, trains) or non-motorised transport (walking and cycling). The current vehicle ownership share for the City of Cape Town is 21.6% for low-income residents (City of Cape Town, 2013). This begs the question: Firstly, if people cannot afford to buy or rent property – what can local governments do to try and lower the prices thereof without interfering too much with market forces? Secondly, even if they could afford to rent, what good is a minimum parking regulation if they cannot afford private transport?

By removing or lowering the minimum parking regulation, it would increase the financial viability of new developments which would increase the supply of housing. Even by simply speeding up the development process and removing red tape it would decrease costs to the developer. This can be achieved if the parking minimum is more in line with what the market needs, reducing the probability that a developer would apply for a parking departure. Ultimately if the process is speed up and the parking regulation lowered or removed it would increase the supply of housing and by increasing housing supply the price should decrease.

As cities are becoming denser and the demand for residential land increases, it is starting to become prevalent that enforcing certain regulations, and in particular parking, could be detrimental to the supply of housing (Andersson, et al., 2016). By removing or decreasing regulations such as maximum densities, height restrictions, or in this case parking minimums, land that would have otherwise gone unused can now be used to construct additional housing units and sold for a profit.

This not only lessens the financial burden on the buyer or renter, but it also aligns with the Municipal Spatial Development Framework (MSDF) of the City of Cape Town (the City) – creating a compact and dense city where private motor vehicle dependency is being discouraged and public and non-motorised transport is being encouraged. This topic has been researched in various towns and cities, mostly in first world countries of the global north. This addition to the knowledge would supplement existing research by providing insights into the validity of these claims in the global south. The research will attempt to supplement the theory by providing an impact study on the efficacy of removing the parking minimum.

To tackle the need for parking and to lessen the impact on the environment by discouraging car usage, the City released a by-law in 2015 that looks specifically at parking regulations. In the City of Cape Town there are three types of zones pertaining to parking, namely: Standard, PT1 and PT2. Standard refers to the general parking regulation that the City has used prior to the 2015 by-law. PT1 and PT2 refers to areas within the City of Cape Town where public transport is either encouraged (PT1) or deemed good (PT2) (Western Province (South Africa), 2015). The PT1 zones lowers the standard minimum parking requirement by roughly half, depending on the zone affected. PT2 zones initially lowered it even further to roughly a quarter of what it used to be in the standard regulation, but after the first amendment to the by-law in 2016 the minimum was completely dropped to zero. The PT1 and PT2 zones would typically be relatively close to existing train stations and *MyCiti* bus stops (City of Cape

Town's incomplete, but growing bus rapid transit system). In this way, by removing parking in areas where public transport is either encouraged or decent, the City is effectively attempting to create a less car-dependent city whilst also incrementally improving public transport. This aligns with a previous study that found that it is best to repeal parking requirements where it is least needed (Hess, 2017).

2. Literature Review

2.1. Effects of parking regulations

Manville and Shoup (2010) did a study in Los Angeles where they focussed on the impact that parking regulations had on inner city developments. It was found that 40-55% of developments would provide less parking than the city's requirement, if allowed. This indicates that limiting the amount parking would boost the absolute amount of developments in the area – pointing towards developments being more viable with a lower parking regulation. During a study conducted by Been *et al* (2011) in New York, it was found that developers tend to only provide the bare minimum in parking, indicating that parking is a limiting factor for developers. They compared the city's minimum parking density requirements as is required by the zoning scheme to the amount of parking actually provided – thus comparing the amount of buildings/developments with exemptions (departures) versus the ones without exemptions. Parking density declined from 0.6 parking spaces per 1000square feet to 0.5 parking spaces per 1000 square feet on average. This implies that parking is a limiting factor when calculating the financial viability of a development. Developers would then supply less parking, if they could. However, it also implies that parking and motor vehicles aren't dead and gone, it is still very much in the DNA of cities and its residents.

The City of London began to introduce parking maximums towards the end of the 1990s. With the release of their *Planning Policy Guidance 13* in 2001 it encouraged the use of parking maximums in an effort to reduce the need and reliance on cars (Guo & Ren, 2013). The study by Guo and Ren (2013) focused on the impact this policy reform had on London from 2004-2010. The amount of parking supplied after the policy reform in 2004 was compared to the amount expected if no reform took place. In other words, the amount of parking when there was a minimum standard versus the amount of parking when there was a maximum standard. The results showed that under the minimum standard, most developers provided just the minimum and no more. Under the maximum standard most developers provided less than the allowed maximum – again, indicating that given the choice, developers would opt to supply what the market requires, not what the city prescribes. However, the maximum standard also proved to be useful, as there was an oversupply of parking in dense areas near public transport facilities – hence the need for a maximum standard. The city is then able to push the city and social structure into a direction away from cars and more towards PT and NMT.

In terms of commercial real estate, referring specifically to the positive externalities that parking provides, it was found that nearby off-street parking that is publicly accessible generates twice as much positive externalities as nearby off-street parking that is not publicly accessible (Cutter & DeWoody, 2010). In other words, if off-street parking is to be provided it is advised to make it accessible to all.

Regardless, it is found that parking regulations (whether it be maximum or minimum) has a significant impact on the developers' decision.

2.2. Land use regulation

One way to alleviate the cost of housing is to increase the supply. Although this method alone is not enough, it forms part of an array of methods and policies that need to be implemented in order to increase the access to housing. In order to increase the supply, at least from the private sector's side, it is necessary to make it as easy and simple as possible for developers to invest in property. It is thus important to have incentives for developers in order to maximise the supply of housing (Awuah & Hammond, 2014). Incentives in the form of parking exemptions – allowing developers to supply what they deem necessary and not what the city planners prescribe.

Land use regulation serves an important purpose – to ensure that cities are built in an orderly fashion and to ensure that all buildings are safe, liveable and sustainable. It is important in protecting public good by offering the services that the market typically fails to provide – such as parks and roads. This is all relative to each respective city where factors such as socioeconomics and environmental conditions would inform which policies and regulations are relevant (Sridhar, 2010).

In terms of other land use regulations Sridhar (2010) looked at the effect that Floor Area Ratios (FARs) and Urban Land Ceilings had on price and accessibility in cities in India. By relaxing FARs in the suburbs it attracted more people toward the suburbs and lowered the prices of property. He then continues to argue that by relaxing FARs in the city centres, allowing for greater consumption of floor space, the prices of property will decrease. This then also encourages vertical development, as opposed to urban sprawl, making it more environmentally friendly. Additionally, he warns that deregulation might be a good idea, but it must not be incorporated without substantial demand for it.

Adverse effects not planned for can begin to surface. In much the same manner as the FARs above does parking behave. It is thus of utmost importance to first identify whether a demand for the relaxation exist and, if so, where does it exist. Only once these areas have been identified can the local authority begin to systematically introduce the relaxation in the areas where it makes the most sense. The new regulations being introduced should be specific to each location, not uniform across the city or town. Meaning that each new area or zone should attempt to have an area specific regulation that makes the most sense for that district. Furthermore, due to most development typically taking place near the urban edge, even a marginal reduction in land use regulations would have a prominent effect on such land, but a somewhat less effect on built-up areas (Turner, et al., 2014). It is therefore important to deregulate only where needed and when no adverse effects can be predicted.

Suzuki (2013) did a study on the anti-competitive effect of land use regulation on local businesses (specifically the lodging industry) in Texas. It was found that by increasing regulation by a single standard deviation it would increase the operating and entry costs by 8% and 6%, respectively. This would discourage possible entrants into the lodging industry and this lack of competition would manifest in the prices of rooms, which the end user then pays. However, as stated above, land use regulation

attempts to protect public good where the market cannot provide for it sufficiently. This can be extrapolated to other sectors such as commerce where a decrease in the amount of competition between commercial activity would result in an increase in the price of goods.

Bertaud and Brueckner (2005) analysed the impact that building height restrictions and FARs has on welfare costs. As mentioned, building height restriction can have an adverse effect on cost, but they are typically put in place to protect the aesthetics of a city, something which cannot be quantified and is difficult to get adequate supply from the market. In this case examples of Washington DC and Paris was used – where no building can be higher than the capital in Washington, and the general character of Paris is to be kept. However, it was found that height restrictions encouraged the outward horizontal expansion of cities. The cost of this outward expansion and lower property prices near the urban edge is then simply carried over in terms of commuting cost. Similarly, parking minimums would encourage lower densities and outward expansion.

Looking at the Greater Boston area, Glaeser and Ward (2009) discovered that the single most important factor when it comes to new construction and pricing is minimum lot sizes. Lack of land was not found to be a factor, as many open spaces still exist, and density levels has not increased. Other factors that came into play was that of septic systems, setbacks from wetlands and subdivision requirements. Effectively it is the man-made barriers that would affect the price and supply of new units the most (Glaeser & Ward, 2009). Restrictive regulations seem to encourage the developer to build larger houses due to the minimum lot size regulation, making it more expensive and ultimately keeping the densities low (Quigley & Rosenthal, 2005).

It becomes apparent that there are many advantages and disadvantages to land use regulation. It can protect public goods where no market for it exist and it can make a city more efficient by encouraging compact cities and thus reducing the infrastructure footprint, amongst others. Conversely, it can encourage sprawl by implementing height restrictions in the city centre and it can reduce available developable land and impose additional costs to developers, subsequently increasing the price of housing (Kim, 2011). In order to effectively measure the advantage or disadvantage that land use regulation has on society it is recommended to measure regulation over time. The reason being it is difficult to determine whether land use regulation is a symptom or cause of urban growth patterns (McLaughlin, 2012). Whether good or bad, the literature points towards restrictive regulations increasing the costs incurred by developers, which in turn increases the price of housing and reduces the supply (Ihlanfeldt, 2007).

2.3. Moving away from Cars

Government regulation in the USA and arguably most new world nations tend to encourage car usage (Lewyn, 2007). This is achieved by strict land use regulations, amongst other: on- and off-street parking. Distances between walks increases as seas of asphalt separate apartments from stores – encouraging driving. There is a skewed acceptance of cars in favour of public transport. It is perceived as cheaper and easier, when in reality it is heavily subsidised by free parking, wide multi-lane roads, and a myriad

of financing options (Lewyn, 2007). Free parking, as mentioned by Shoup (2005) is not actually free and this heavily influences a person's choice on their mode of transport (Hess, 2001).

However, there appears to be a move away from traditional transport methods and behaviours, especially among millennials (defined as people born between 1979 and 2000) – where the private car is either no longer used or needed and where the environment has manifested itself in the social consciousness of the citizens (Garikapati, et al., 2016). That being said, this behavioural change doesn't necessarily persist with age and it seems to rather fade as each millennial enters the next phase of their life-cycle – where families are started and larger homes with cars are once again acquired (Garikapati, et al., 2016). It is to be noted that the transport options available in each individual's childhood could have an influence on how each person sees transport and the need for cars (Delbosc, et al., 2019). In other words, if you grew up in a city with good public transport and where there are few negative stigmas surrounding it – chances are you will be comfortable using public transport well into the later stages of your life.

In order to effectively move away from cars in the future individuals must insist on improved alternative transport infrastructure such as cycle lanes and longitudinal canopies for footways (to keep pedestrians dry during bad weather). Along with this, newer and better technology is also expected – typically to improve the efficiency of existing public transport (Kurniawan, et al., 2018). It is also found that if the urban landscape has more walkable features then people tend to own fewer cars (Sehatzadeh, et al., 2011). It appears that although we may be heading towards a carless future, it is not apparent yet and many individuals still prefer the freedom that a car provides.

2.4. Parking Regulation in the City of Cape Town

Zooming in on the City of Cape Town, Massyn et al. (2015) argues that the limited space of each erf makes it difficult to provide surface parking for a development in Cape Town. The alternative would be to allocate underground parking; however, this significantly increases the cost of a development, usually making it unfeasible. An underground parking in the inner-city can range between R100k and R200k, depending on the height. A single parking bay can require 25-30m². This includes the parking bay itself and the area of road required to access the parking as well. Given that a one-bedroom apartment is typically 45m², it clearly illustrates the ridiculousness of the situation. Densities in these situations can be reduced by up to 50% - definitely not in line with the sustainable development goals of a compact city. Furthermore, parking bays typically do not generate an income as they are bundled with your apartment. Massyn et al. (2015) also points out that even though parking has these detrimental effects on the urban landscape, it cannot be ignored that parking makes developments more attractive, especially when considering that Cape Town typically has poor public transport. They continue to argue that the City of Cape Town should relax these stringent parking regulations in favour of a more relaxed and flexible regulation that would enable more feasible developments.

The City of Cape Town (the City) promulgated the Municipal Planning By-law in June of 2015 that allows for the exemption of parking minimums in areas known as PT1 and PT2 zones. In PT1 zones the city reduced the minimum parking requirement by roughly 50%. These are zones where the city would like

to encourage the use of non-motorised and public transport. PT2 would then reduce the parking requirement even more, that is, until 2016 when the first amendment to the Municipal Planning By-law was enacted after which parking in PT2 zones was scrapped completely (Western Province (South Africa), 2015). PT2 zones are the areas where the City deems public transport to be adequate. The approach that the City followed appears then to be in line with the literature – indicating that deregulation is a good method to increase the supply of housing as well as decreasing the price thereof. Additionally, the City approached the situation in an incremental fashion – not removing all the parking minimums at once, but rather removing them as need be in the areas where it made the most sense. For a city that is still very reliant on private vehicles due to poor and unsafe public transport, this is rather progressive.

2.5. Summary

The literature almost unanimously indicates that deregulation should decrease the cost of housing and increase the supply thereof as well. Articles written by Shoup (2005), Manville (2013), Turner et al. (2014), Kim (2011), Li et al. (2007), and Glaeser and Ward (2009) all conclude this result. It is therefore important that local authorities take note of possible policy changes that could help decrease the cost of expensive housing and remove the barriers to entry for developers. Parking appears to be one such land use regulation that deserves attention. It is typically found to be in oversupply. This can be measured by comparing the amount of parking spaces provided if all developers were to adhere to the minimum parking regulation versus the amount they would supply if no minimum regulation was enforced. The works of Been et al. (2011), Manville and Shoup (2010), and Guo and Ren (2013) all indicate towards less parking supplied if given the choice.

However, regulation should not be deregulated immediately across the board. It must only be relaxed in the areas that necessitate the deregulation. The deregulation should not be applied uniformly, but rather in varying intensities to optimally suite the areas where it is applied (Turner, et al., 2014; Sridhar, 2010).

Travel behaviour does not seem to change just yet and millennials tend to follow the same life cycle as previous generations, but at a later stage. However, the newer generations appear to be more environmentally conscious and cities across the world should be attempting to move away from high energy consumption with the likes of cars and low densities. By removing parking, and subsequently removing the free parking subsidy from property prices it is possible to increase the supply of housing and even lower the price thereof. With higher densities comes a lesser need for private vehicle ownership and a greater need for public transport and non-motorised transport.

3. Methodology

3.1. Description of the Study

The study engaged in a comparative analysis of the PT zones (PT1 and PT2) versus the standard zones. To test the impact that the PT zones has on the supply and price of housing the study measured

the amount of development applications received within the PT zones. This was then compared to an area (called the buffer area) of close proximity and size to the PT zones in order to determine whether more or less developments took place within the PT zones and whether the estimated cost for a development between these zones had any significance. It is thus an empirical study that used primary quantitative data in order to deduce whether the relaxation of the parking minimum had any impact on the supply and price of housing. The study was complimented with a survey sent out to various property developers. The survey attempted to determine which development regulations had the greatest impact on the feasibility of a development and to also determine whether developers would opt to supply more or less parking in various scenarios.

3.2. Problem Statement and Research Questions

Developments in South Africa and Cape Town specifically is a slow process and it has only been slowing down in recent years (Western Cape Property Development Forum, 2019). In order to increase the supply of housing it is necessary to speed up the development process. By removing or lowering the requirement of even a single regulation such as parking it will speed up the process and possibly remove the need for local and provincial governments to object the developers' proposals. This in turn will allow developers to supply new housing units at a quicker pace. Not only are developers responsible for new housing units, in recent years they are also obliged to supply social housing. The bottleneck seems to lie with the provincial and local governments taking painstakingly long to approve building plans. Deon van Zyl van the Western Cape Property Development Forum (WCPDF) says it best:

“We keep on hearing how government should not incur frivolous and wasteful expenditure. But what about government processes causing the private sector to incur wasteful expenditure?” Deon van Zyl, WCPDF.

Needless to say, it is important to reduce processes and regulation to save costs which will inevitably be carried over to the buyer. It is thus necessary to reduce regulation where necessary and where it is obsolete. The City has done just this with the advent of their PT zones. The study compared these PT zones and the buffer area to determine whether any increase or decrease in development applications took place.

This was to determine, firstly, are there more developments taking place within the PT1 and PT2 zones as compared to regular areas? If there are more development taking place within the PT zones it implies that there is an incentive to develop. Reduction in parking requirement means that it is more in line with what the market wants, and it eliminates the need for parking departures, streamlining the process. The PT zones can then be considered effective and successful. If more development took place in the buffer areas it implies that parking is not a major factor in the feasibility of a new development and other factors need to be addressed. PT zones would then have little impact and be ineffective.

Secondly, is the average price of developments higher or lower in the PT1 and PT2 zones as compared to regular zones? If the PT zones are more affordable it means the supply increased and prices dropped due to a competitive market. If it remained high it can mean various things. One, the supply remained

relatively constant and due to increasing demand the prices remained high or increased. Or two, the supply increased, but so did the demand due to the developments' proximity to public transport.

Thirdly, do developers merely provide the minimum parking, or do they provide more? If developers provide more parking than what is required it means that the minimum parking regulation does not impede the development process and the need for departures are low – eliminating the need for PT zones from a market perspective. If the developers tend to provide less parking than is required it alludes to minimum parking regulations being restrictive and that developers would generally need to apply for parking departures, slowing down the process and increasing the price. This indicates that the PT zones are necessary to streamline the process.

Finally, is parking one of the main influencers in the financial viability of developments, or are there other parameters that have a greater influence? If parking is a determining factor for developers it would be one of the main reasons for slowing down the development process and increasing the prices. However, if it is not a determining factor it would mean that other factors such as height and building lines are the determinants. The PT zones would then be pointless and not have an impact on the supply and price of housing.

3.3. Value of the study

The comparison must inform parking regulation policy and either confirm or refute the current by-laws. Is it worthwhile to enforce a regulation that could stifle development in a country that desperately needs more housing at an affordable price? Or does the minimum parking regulation tend to a need for transport efficiency in terms of cars where no suitable alternatives exist? Ultimately, the research must determine whether deregulating parking requirements in certain areas had a positive or negative effect on housing supply and price.

If housing supply increased it means that the PT zones are effective, and the desired outcome was reached. Combine that with a decrease in price and it alludes to the PT zones being very effective and that people would prefer to buy or rent more affordable housing whilst living near public transport as opposed to relying on their cars and paying the extra price for bundled parking. Conversely, if supply did not increase it means the PT zones are ineffective and other factors are more important and should receive greater attention from the City.

3.4. Study Area

The study was conducted in the municipal boundary of Cape Town – known as the City of Cape Town (the City). See Figure 1. It was conducted between the 2014/15 and 2018/19 financial years of the City. The City of Cape Town is located within the Western Cape province of South Africa.

The focus was on the PT1 and PT2 zones within the City. Figure 2 displays the entire City of Cape Town with all the PT1 and PT2 zones along with all the buffer areas created. As can be seen the PT zones make up a small area of the entire City. Looking at Figure 3, a zoomed in and detailed version

of a section of the City of Cape Town, one can see the PT zones are all located near train stations. Hence the reason the City considers these areas to have adequate public transport.

The buffer areas surrounding the PT zones was designed to have a similar area and location as the PT zones – increasing the validity of the comparison. The total combined area of the PT1 and PT2 zones are 119.545km² and the total area of the buffer zone is 119.335km². That gives it a ratio of 1.002 – making the areas very similar and comparable, hence the reason for a 285m offset and not a round number such as 300m.

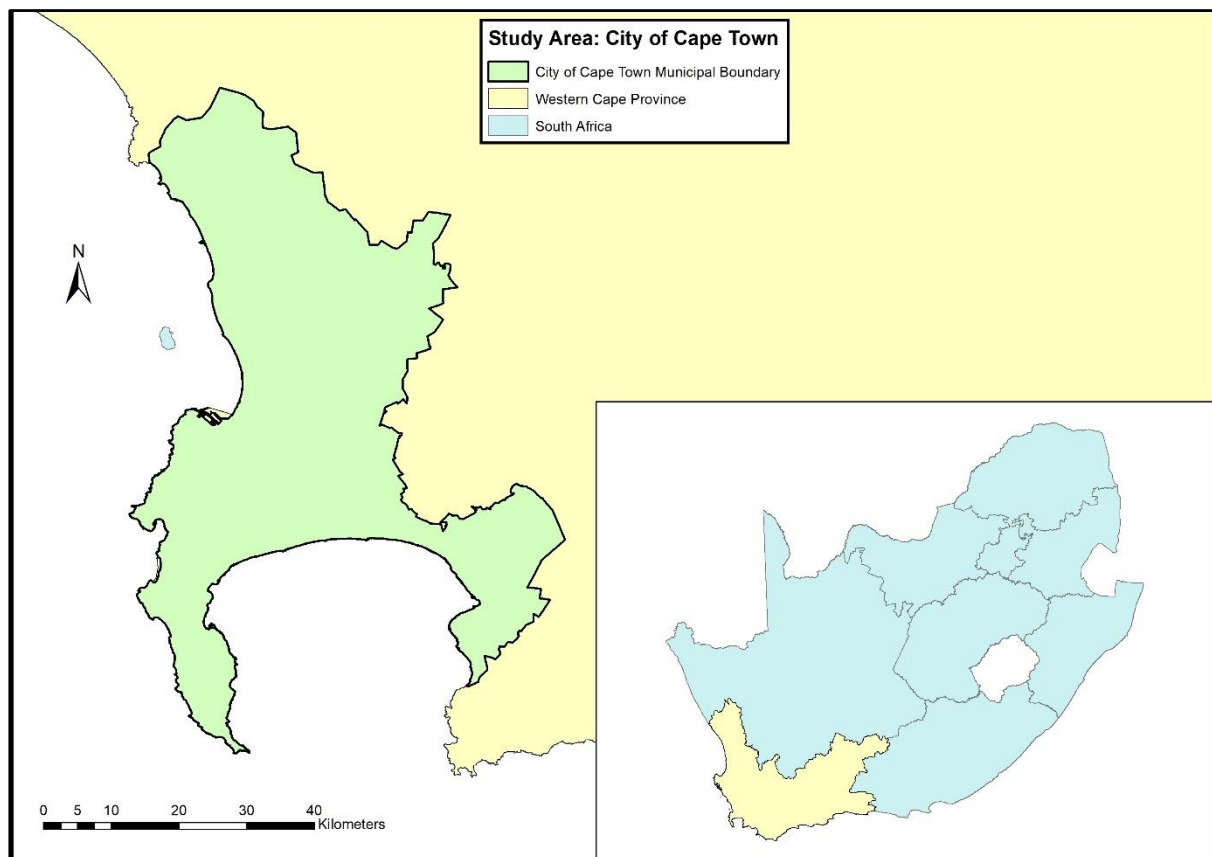


Figure 1: Study Area – City of Cape Town

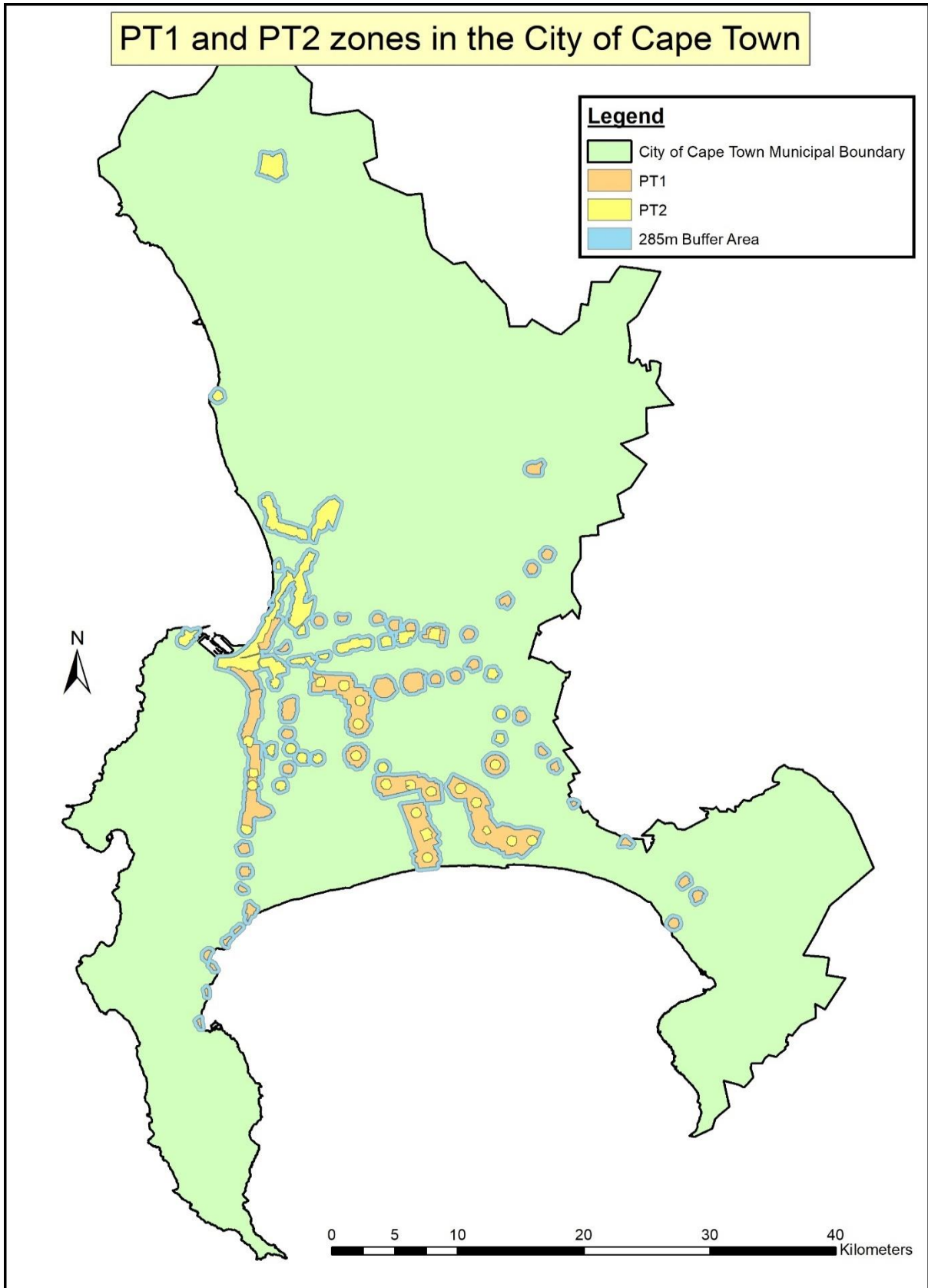


Figure 2: PT1 and PT2 zones with Buffer Areas

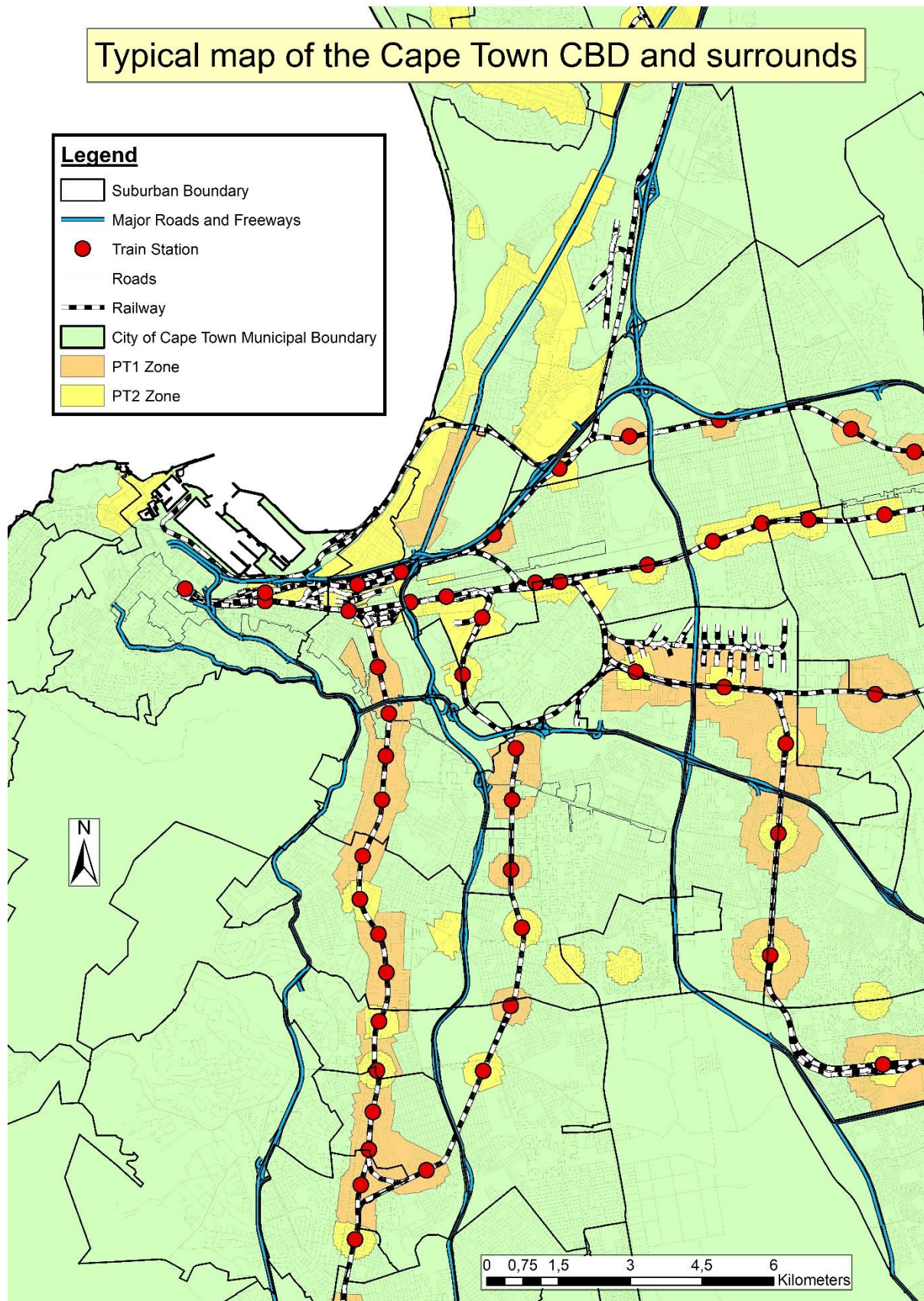


Figure 3: Typical map of the Cape Town CBD and surrounds

3.5. Research Limitations

Parking makes up a single parameter that could have an influence on property price and supply. Various other parameters such as density, height, and location can also have an influence on the supply and price of housing.

The greatest shortcoming of this positivistic approach is that it simplifies a complex issue, where various other parameters could influence the price and supply of housing – amongst others: location, crime rate, economic activity, etc. Hence the reason the zones will need to be compared to zones of similar area and in proximity to the PT1 and PT2 zones in order to mitigate such effects.

3.6. Data sources and reliability

All spatial data pertaining to the City's PT1 and PT2 zones, all cadastral, zoning, roads, public transport routes and stations, suburban boundaries, aerial photography, special economic zones such as the urban development zone and the now redundant urban edge was obtained from the City of Cape Town's geodatabase and accessed via ArcGIS. By obtaining permission from the City's Organisational Research department all new building developments and land use applications per year was also obtained. The estimated construction cost of each new development is included in the data.

Two sets of data were received from the City in a spreadsheet format – it lists all the land use management and building development management applications. From the land use management data, it is possible to view all the land use applications, sorted by categories such as permanent departures, consolidations, subdivisions, rezoning and many more. This data can be used to see how many applications were received for permanent or temporary departures – unfortunately the data does not state the nature of the departure, therefore it could not be used to determine how many applications were for parking departures. Even if parking was listed as the departure it also does not state by how much the regulation was relaxed.

The building development management data was much more helpful. The data indicates all the applications for developments – this includes everything from new blocks of flats, commercial office buildings to simply a new wall or braai room. With this data comes estimated values of the construction of each development. One issue arose from the building development management data – it relies on the employee capturing the data to provide descriptions for the type of work to be completed making it near impossible to sort and categorise according to the type of work. In most cases no description was provided. Fortunately, all the other information was very useful. It listed the plan categories into primary and secondary categories. Primary consisting of residential, non-residential, other approvals and additions and alterations. Secondary consisted of a myriad of categories, amongst others blocks of flats, facades, carports, industrial warehouses, office space, schools, shopping space and many others. For this study residential and blocks of flats categories were very useful.

The survey was set up using Google Forms. This was sent to about 20 developers that operate within the City of Cape Town. It was also forwarded to the Western Cape Property Developers Forum – a

voluntary organisation aimed at creating awareness and addressing issues related to property development in the Western Cape. They then forwarded it to some of their members.

3.7. Research Design

The study focusses on comparing the number of building developments between the City's PT zones and the created buffer area. The building development data was collected between the 2014/15 and 2018/19 financial years for the City of Cape Town. It was sorted to show only the residential blocks of flats and then mapped on ArcGIS. Residential blocks of flats include medium to high density residential buildings. Single dwelling residential was not included. Once it was mapped it was easy to see which developments took place within the PT zones and the buffer area. The results were then compared and plotted to analyse and interpret the findings.

After the number of building developments were compared between the zones the price of construction was calculated per square metre in each zone. It was then possible to compare the cost per square metre in each zone amongst each other.

3.8. Supporting data

Data was also collected from local developers by means of a survey – the outcome of which indicated which land use regulations had the worst effect on the viability of a new development project – according to the developers. This was to further validate the effect parking had on developments.

The survey was done online via Google Forms. Developers who are prominent within the boundaries of the City of Cape Town was approached and asked whether they would like to participate in the survey - it was then distributed to them via email. This was sent to about 20 developers, unfortunately only 5 responded.

Developers was asked to rank the effect that certain land use regulations have on the viability of a new project. This was to determine whether developers see parking as a significant factor, or not. Furthermore, they were asked “If you are exempt from parking, will you still provide parking?” in order to establish whether a project becomes more viable once a single regulation is no longer required. The gist of the survey was. to determine whether parking has a significant impact on feasibility and, given the choice, would developers typically supply the minimum parking required, more, or less? If just the minimum, it points towards developers being impeded by regulation. If less, it further motivates that developers would want to provide less. If more, it indicates that the market requires more parking and developers are adhering to market needs.

4. Analysis

4.1. Supply of new developments

In order to get an idea of how many developments applications across the City of Cape Town fall within the PT zones and the buffer area compared to the rest of the City it is useful to view it on a map (Figure

4) and a graph (Figure 5), respectively. By combining the values of the PT1 and PT2 zones into one large PT zone and comparing it to the similarly sized Buffer Area and the total number of new development applications for the entire municipal area and viewing it on a map (Figure 4) it becomes apparent that the vast majority of new building development applications are outside of these zones,

and expectedly so, these areas make up a tiny minority of the total area that the municipality covers.

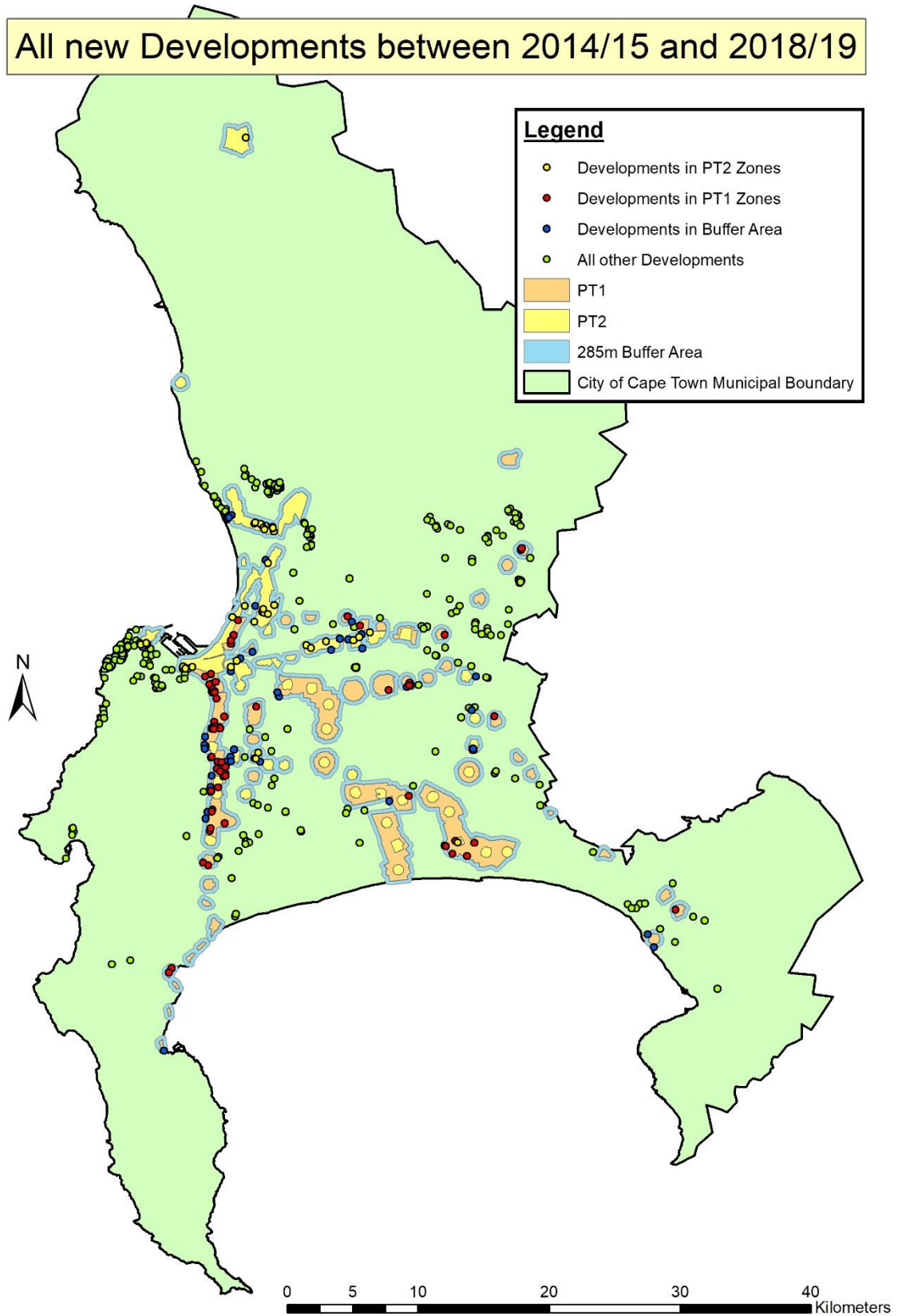


Figure 4: All new developments from 2014/15-2018/19

The Atlantic Seaboard, Cape Town CBD, Northern Suburbs and Blouberg appear to take the bulk of new developments. This emphasizes the fact that there are many other factors in play that determine where a new development will take place. Very few developments take place in the so-called “metro southeast” (Khayelitsha and Mitchell’s Plain). The only area where the PT zones appear to have an impact is along the Main Road and southern railway line of the southern suburbs and the Voortrekker Road and northern railway line of the northern suburbs. This points to various other factors still playing a dominant role in deciding the location of new developments and parking is but one. Figure 5 gives some insight into the number of new developments across the City and it is evident that only a fraction, 123 out of 523, took place within the dedicated PT zones over the study period. If one looks closely at the final column in Figure 5 it is evident that 123 developments took place in the combined PT zones versus the 63 of the buffer areas. When comparing the areas of all the developments, it is once again evident that only a fraction of new developments took place within the PT and Buffer zones (Figure 6).

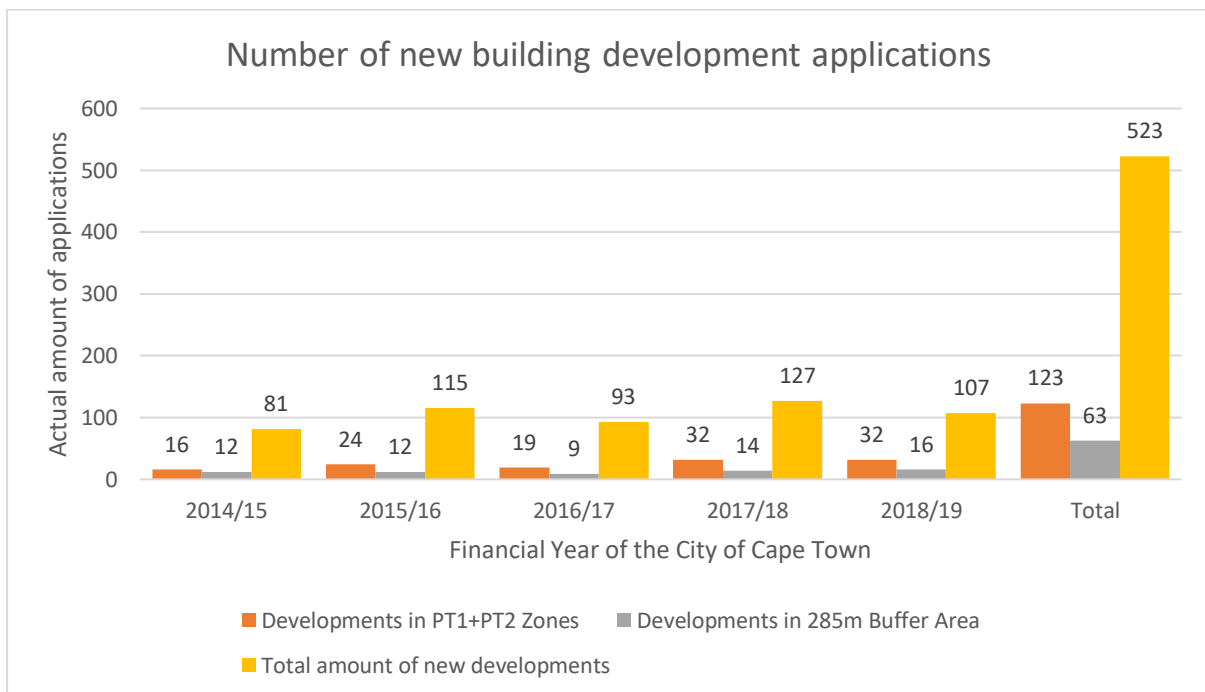


Figure 5: Number of new building applications – All

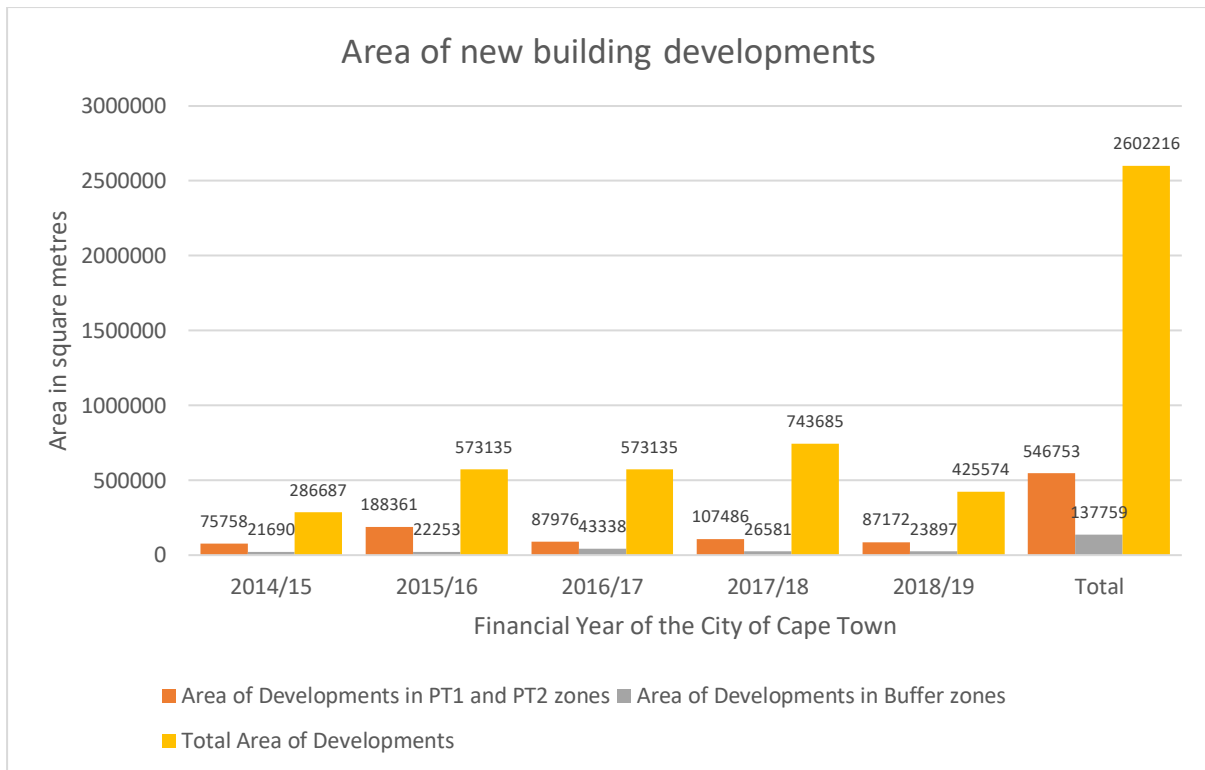


Figure 6: Area of all new developments

Thus, to get a better comparison of whether the PT zones had an impact on the supply of development it is better to compare it to the Buffer Areas only – where the error of size and location is diminished. Figure 7 plots all the new developments in a bar graph and sorts it by PT1, PT2 and Buffer Area. The PT1 zone has the greatest upward trajectory with a linear gradient of 2.6 compared to the PT2 zone (gradient = 1.4) and Buffer area (gradient = 1) still displaying an upward trajectory, albeit at a slower rate. The 5-year trend for building developments in both the PT zones outstrip the rate of that of the Buffer Area. Both the PT zones are therefore more desirable and attracts development at a greater rate over the 5-year period compared to the Buffer Area. On the one hand these areas are near train stations, and this could be the reason for their desirability, but even then, in reality, public transport is unreliable and poor compared to international standards. Most people still use cars as their mode of choice (City of Cape Town, 2013). It is thus unlikely that developers would develop near train stations due to the demand from buyers wanting to live near public transport, but rather due to incentives that would make it more profitable. In this case the lowering of the parking minimum is such an incentive.

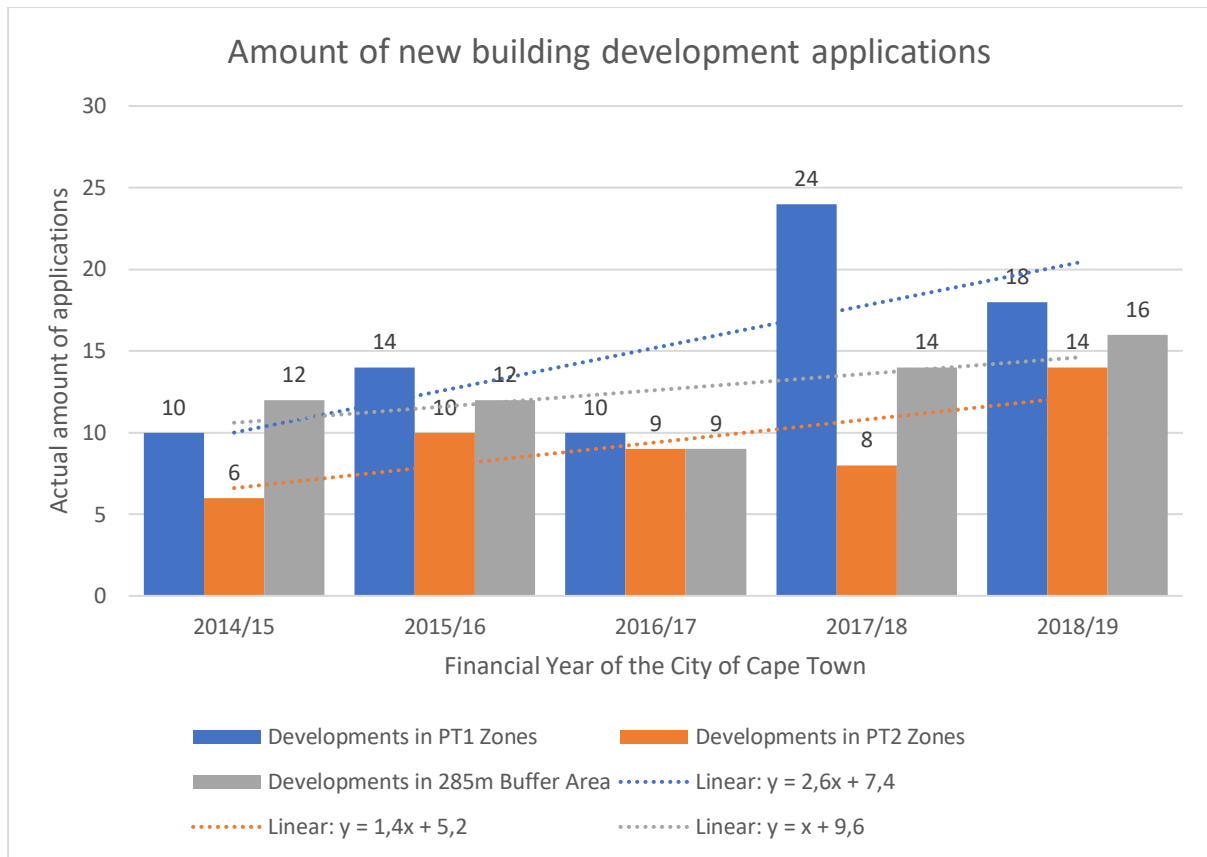


Figure 7: Development Applications for PT1 vs PT2 vs Buffer Area

It is important to remember that the combined areas of the PT1 and PT2 zones are similar to that of the Buffer Area. When one only looks at the number of new building development applications between the two PT zones versus the 285m buffer area it becomes clear that the majority (almost double) of new development applications were for areas within the PT zones when compared to the buffer area. See Figure 8. Meaning that in areas of similar size and location, most developments took place within the PT1 and PT2 zones when compared to the buffer area. One can then conclude that if a developer already knows where they would like to develop – along the southern suburbs' Main Road and rail corridor, for instance – they would opt to develop in the area that has less regulation, eliminating the need to apply for parking departures and speeding up the process. Supplying more parking than necessary is therefore a waste of space and resources.

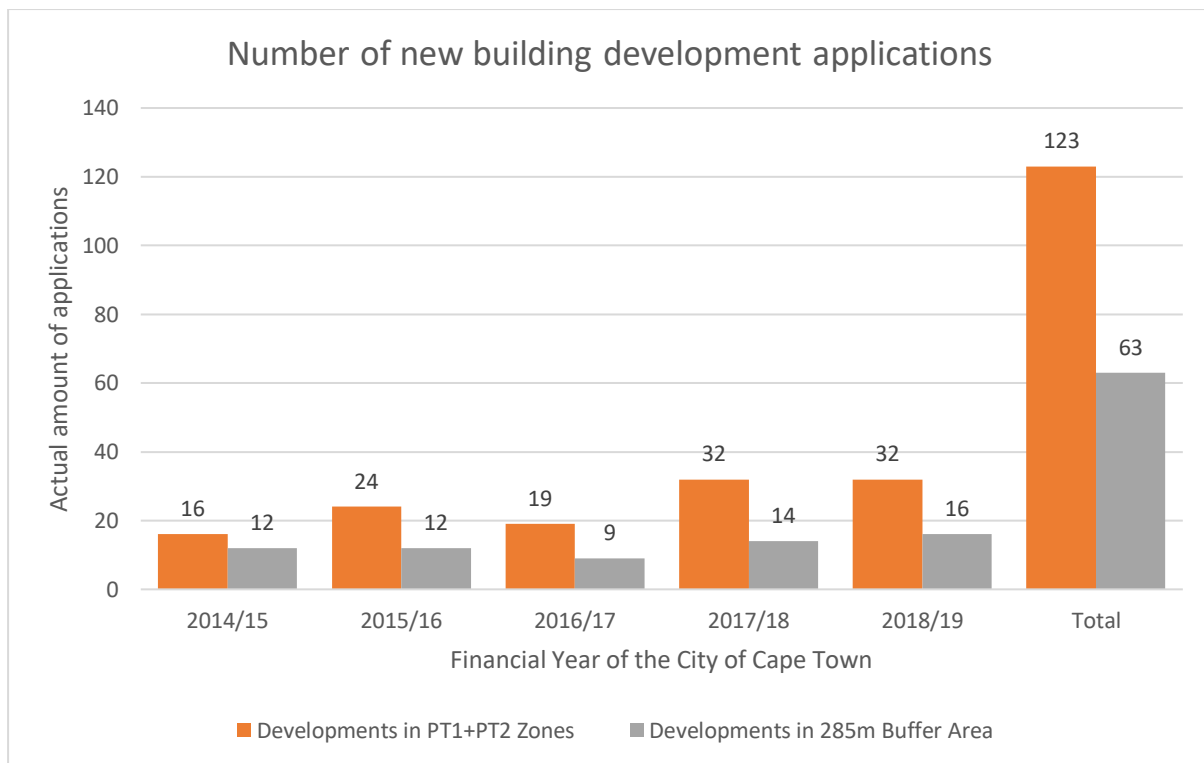
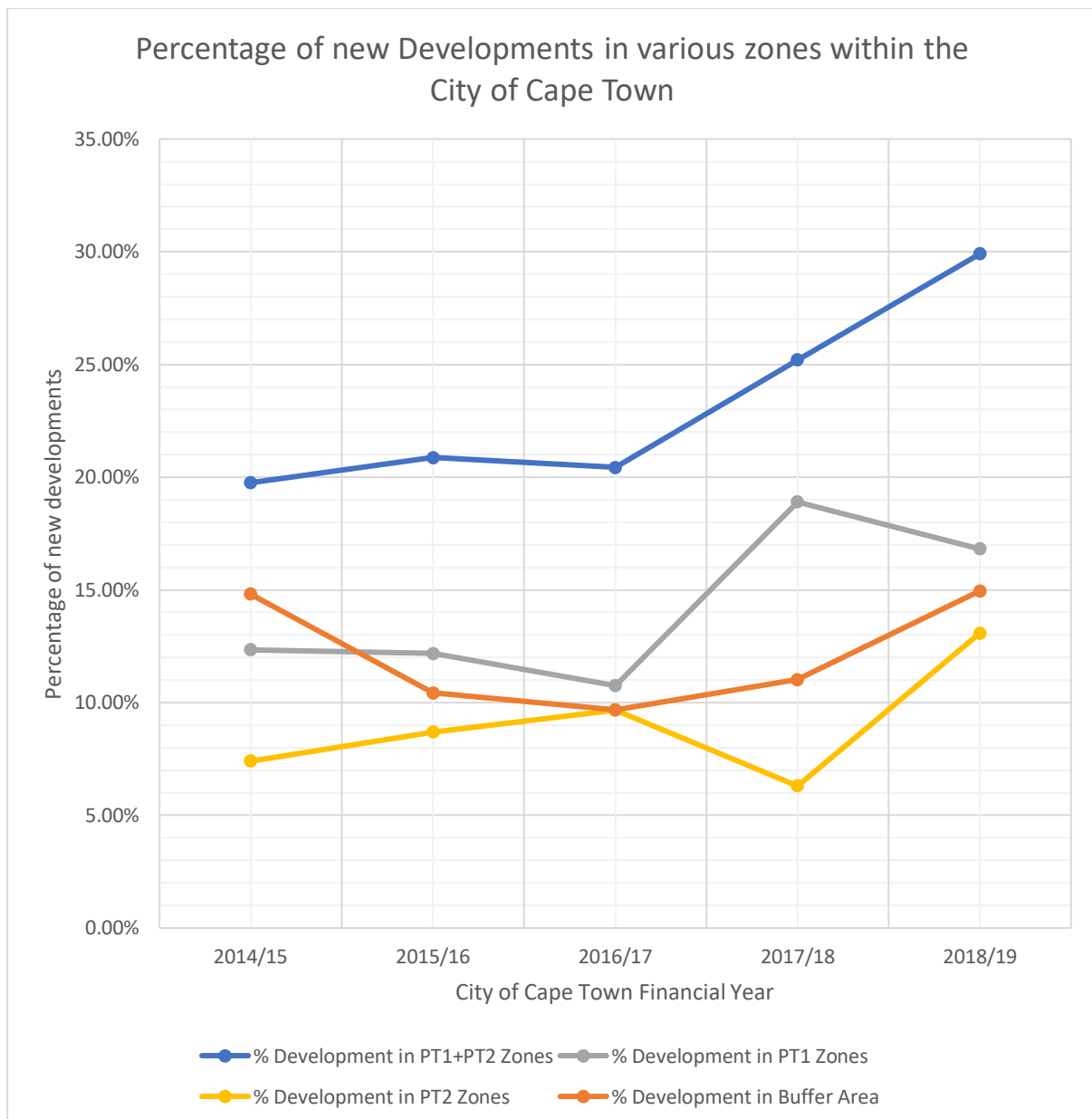


Figure 8: Number of new building development applications - PT1+PT2 vs. Buffer Area

However, by merely looking at the raw numbers of new developments it is not telling the whole story. If there are 10 new developments in the entire municipal area and 9 were in a PT1 zone, that would definitely point to developers trying to find the path of least resistance and that parking has a massive effect on financial viability, however, if there were 1000 new developments and merely 9 was in a PT1 zone, that result would tell a completely different story. Even if the numbers increase over the study period, which is the case, the total number could increase at an even greater rate – indicating that the number of new developments in the PT zones are in fact slowing down. Thus, in order to get the correct proportion of new developments within the various zones it is therefore necessary to divide the number of new developments per zone by the total for that year – giving a normalized number.

Figure 9 shows the same data, but as a percentage of the actual number of new building development applications across the entire municipal boundary of the City. When combining the PT1 and PT2 data it shows an upward trend from the 2014/15 financial year until 2018/19, starting from 19% and ending at 29%. The percentage of new developments in the buffer area, however, hovers between 10% and 15% across the same period, indicating that if a new development were to take place in the same vicinity as the PT zones, the developer would opt to develop in the PT1 and PT2 zones as opposed to the buffer area. This indicates that there is some incentive for developers and by removing the parking minimum, the project becomes more viable, even if it is ever so slightly.



	2014/15	2015/16	2016/17	2017/18	2018/19	5YR %
PT1 %	12,35%	12,17%	10,75%	18,90%	16,82%	14,53%
PT2 %	7,41%	8,70%	9,68%	6,30%	13,08%	8,99%
PT+PT2 %	19,75%	20,87%	20,43%	25,20%	29,91%	23,52%
BUFFER AREA %	14,81%	10,43%	9,68%	11,02%	14,95%	12,05%

Figure 9: Proportion of new developments in various zones within the City of Cape Town

4.2. Cost of new developments

By using the estimated construction cost per development in each zone and then dividing it by the total area of each site it is possible to determine the average cost per new development in each zone per square metre. Plotting the averages on graph it becomes clear that the average price per square metre

in each of the zones are similar to one another. The average of the entire City of Cape Town is also in line with the PT zones and Buffer Areas. At first glance no significant change in cost was observed.

If one looks at Figure 10 it becomes apparent that there were differences in construction costs in the Buffer Area between the 2019/17 and 2018/19 financial years. Adding less parking than what is typically required thus had an effect on the construction cost, especially from the PT2 zones, where parking minimums are zero, where the price is almost constantly lower than the Buffer Area.

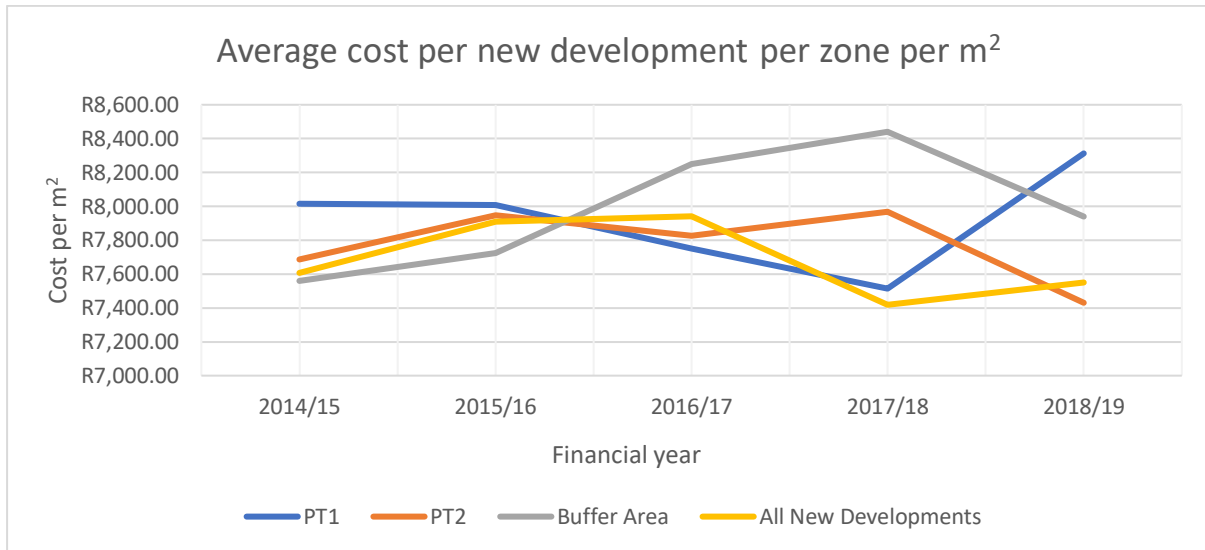


Figure 10: Average cost per new development per zone per m²

4.3. Development Rules Survey

Unfortunately, the sample size for the survey is below par having only received five responses. However, the results are still interesting and worth evaluating. The transcript of the survey is attached as Annexure A.

4.3.1. The impact of development rules on feasibility

The first set of questions asked the developer to rank the impact that certain development rules had on the feasibility of a development on a score of 1 to 10 as indicated in Table 1. A score of 1 means that the development rule had little to no impact and a score of 10 means it has a large impact on the feasibility.

The following average scores were recorded:

Table 1: Development Rules Impact

Development Rule	Average Score
Floor Area Ratio	6
Maximum/minimum density	6
Coverage	4.6
Maximum height	6.6
Building lines and setbacks	8.8
Minimum parking	8.4
Window and door placement	2.4

From the survey it is clear the building lines, setbacks and parking creates the greatest impact. Both these parameters affect the amount of space that can be used for building development. Departures would be applied for in both instances to maximise the site area. In the case of building lines and setbacks it is often the case where the urban planners want a straight building line along a block of buildings, but the setback is enforced and creates an offset in the building line making it less aesthetic. From the developers' perspective they would want to maximise the developable space. Building lines are of course necessary in terms of safety. If a fire were to break out the gap between buildings will act as a buffer and slow down the spread of fire. Setbacks in front of driveways and entrances are for sight-distances for cars. If cars were not the main mode of transport, this regulation can also be re-evaluated.

Interestingly parking is listed as the second greatest hindrance to development. This alludes to the idea that the parking minimum is not in line with what the market wants. This does not mean it should be removed, but rather adapted to fit with current trends. Parking not only wastes space on ground floor level, but adds significant costs to development were they to create a parking basement. The third largest score is maximum height. The CBD of Cape Town has height restrictions in order to keep the aesthetics focused on the national tourism asset and world heritage site: Table Mountain. For this reason height is restrictive to developers who would like to maximise on the optimum height. In the suburbs you also do not want high-rise buildings next to low density developments, this creates an unsightly environment.

Floor Area Ratio and maximum or minimum densities are probably not as big a factor due to most developments being developed for the middle-class and up. Meaning densities tend to be low and the optimum amount of floor space can be utilised. However, a score of 6 in both cases still means it has a significant impact.

As for coverage and window and door placement, these results seem to be negligible in the eyes of developers. Windows and doors are supplied in any case, no house would sell without proper lighting, ventilation and access. The footprint of a building is already eaten up by parking and building lines – leaving the coverage almost negligible.

4.3.2. When is parking increased or decreased?

The second section of survey was to determine in which instances is parking increased or decreased depending on the location and income-group. Ten scenarios were created to determine where parking had the greatest impact.

When the new development is in the CBD, near public transport

5 responses

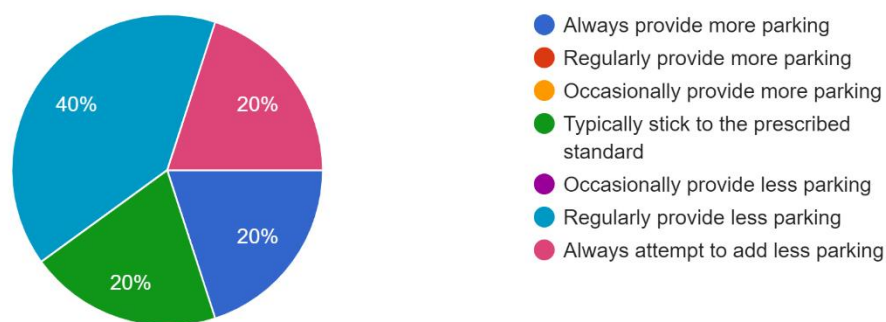


Figure 11: When the new development is in the CBD, near public transport

In the first scenario in Figure 11, 80% of the developers said they would either typically stick to the minimum parking requirement or attempt to provide less parking. This in a CBD setting near public transport and the results aren't surprising.

When the new development is in the CBD, far from public transport

5 responses

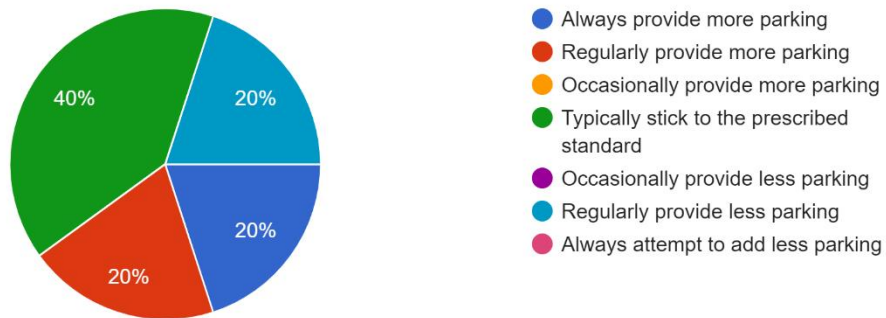


Figure 12: When the new development is in the CBD, far from public transport

The second scenario in Figure 12 indicates that 40% of developers supplying the minimum parking and an additional 40% always adding more. In this scenario we are still in a CBD setting, far from public transport. The availability of public transport thus has a significant impact on the supply of parking. A mere 20% of developers would provide less than is required. Although it must be said that being in a CBD one is typically surrounded with good public transport (and always have access to e-hailing services such as Uber and Lyft), which is the case in Cape Town.

When the new development is in the suburbs, near public transport

5 responses

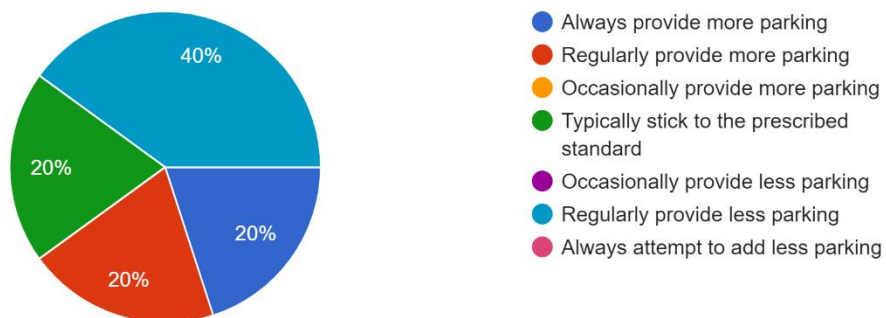


Figure 13: When the new development is in the suburbs, near public transport

The third scenario, indicated in Figure 13, is set in the suburbs near public transport. In this setting 60% of developers would still provide the minimum amount of parking or more. Being near public transport it would typically be where the PT zones are. Yet, because 60% or more developers still add at least the minimum amount of parking – meaning they cannot take the risk to supply property without enough

parking. People still prefer cars and being in the suburbs, probably need to commute long distances to work.

When the new development is in the suburbs, far from public transport

5 responses

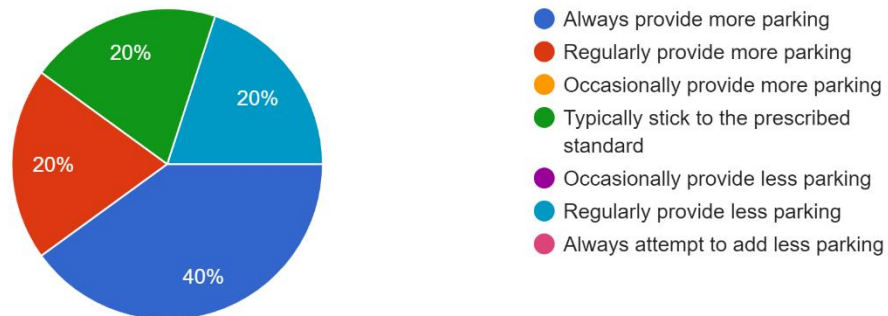


Figure 14: When the new development is in the suburbs, far from public transport

Living in the suburbs a person is usually far from work and need to commute longer distances. Combine that with a lack of public transport and cars become not only the most preferred mode of transport, but the only one. The results in Figure 14 are thus not surprising where 80% of developers provide the minimum amount or more. Even more significant is the 40% that always strive to provide more.

When the new development is in a lower-income area, near public transport

5 responses

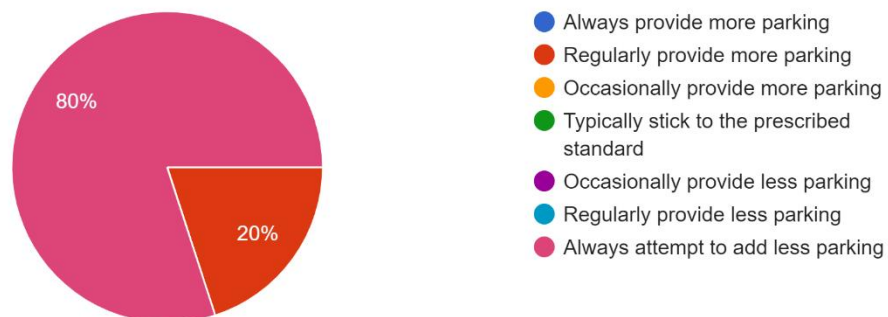


Figure 15: When the new development is in a lower-income area, near public transport

In the fifth scenario in Figure 15, development occurs in a lower income area, near public transport. It is significant that 80% of developers outright said they would always provide less parking than is required. It is pointless to give parking to citizens who would otherwise never be able to afford a car. It is thus in these areas where the PT zones should be implemented. It aligns with the literature saying

that parking exemptions should be enacted where it is needed. This would speed up the development in the poorest areas where it is needed most.

When the new development is in a lower-income area, far from public transport

5 responses

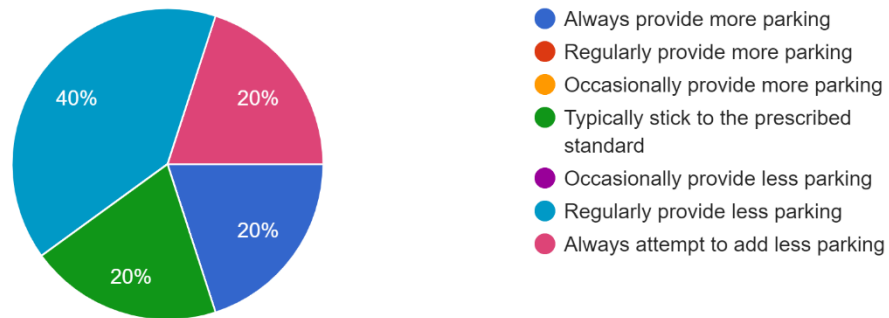


Figure 16: When the new development is in a lower-income area, far from public transport

In the case of lower-income areas, as indicated in Figure 16, it is still prevalent that 80% of developers would opt to supply the minimum or less parking than what is required. These citizens still can't afford private transport and must rely informal public transport like minibus taxis.

When the new development is in a middle-income area, near public transport

5 responses

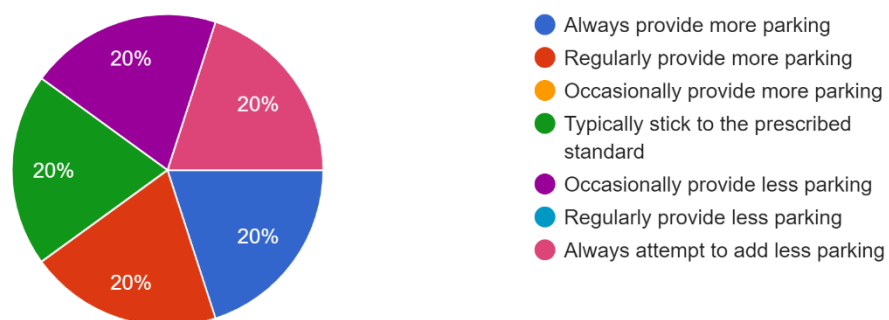


Figure 17: When the new development is in a middle-income area, near public transport:

In middle income areas the consensus amongst developers is rather divided. In middle-income areas near public transport, about 40% say they would provide the minimum requirement or occasionally less, as indicated in Figure 17. This indicates that the minimum requirement is in line with what the market wants. Only about 20% would always strive to supply fewer parking bays. 40% would regularly and

always provide more parking bays – meaning in middle income areas cars is still the dominant mode of transport, but hinting towards people wanting other alternatives due to, perhaps, traffic and vehicle costs, but still choosing cars due to their convenience, safety and reliability.

When the new development is in a middle-income area, far from public transport

5 responses

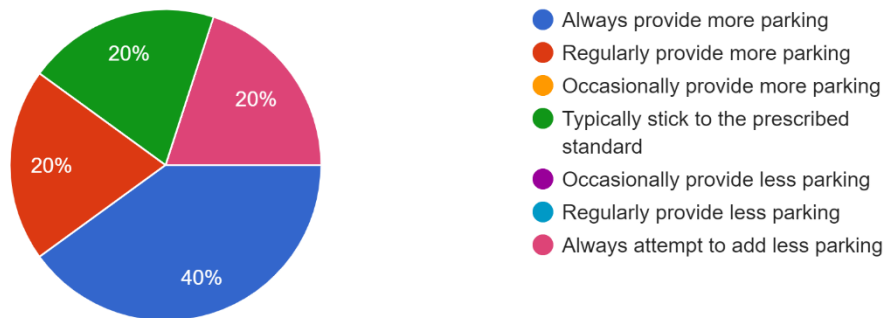


Figure 18: When the new development is in a middle-income area, far from public transport

The seventh scenario, in Figure 18 indicates that being in a middle-income area and far from public transport only exacerbates the usage of cars. 60% of developers always and regularly add more parking than what is required. People in these areas can afford cars and have no alternatives.

When the new development is in a higher-income area, near public transport

5 responses

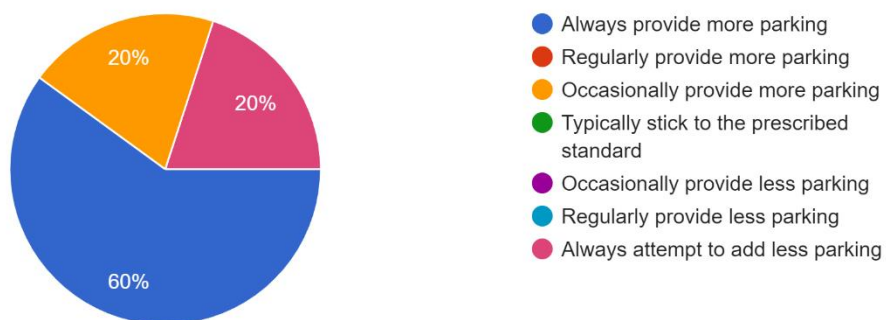


Figure 19: When the new development is in a higher-income area, near public transport

When the new development is in a higher-income area, far from public transport

5 responses

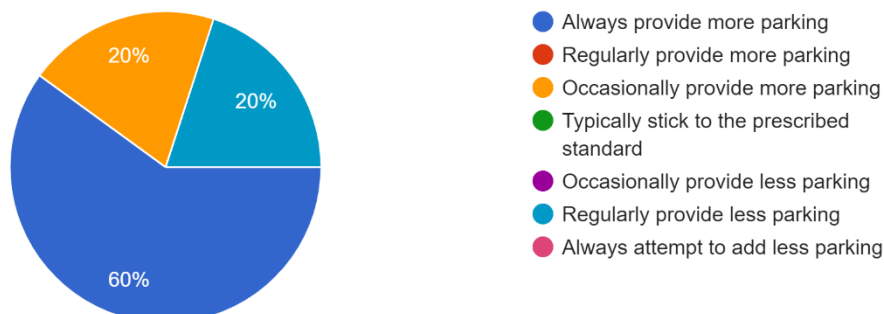


Figure 20: When the new development is in a higher-income area, far from public transport

For the final two scenarios, in Figures 19 and 20, both in high-income areas, the car is by far the dominant mode of transport. In higher-income areas, residents can easily afford private vehicles and prefer it due to its convenience, reliability and status it may provide. Whether it is near or far from public transport is almost irrelevant. Public transport won't be used. In these situations 80% of developers would provide more parking than what is required.

4.3.3. Summary of Development Rules

Parking does have a significant impact on the feasibility of new developments, but it depends heavily on location and income group. Other factors such as height and building lines also have a significant impact on development. The lower-income areas do not require the parking minimum; it adds unnecessary red tape to a process in an area that does not need parking. Middle and higher-income areas still prefer cars as their mode of transport and thus the market requires parking. However, middle income areas tend towards less parking than is prescribed, meaning the PT1 approach could be in line with what the market wants. PT2 is not yet required. If the City wants its residents to start using public transport it needs to supply a quality public transport system.

5. Conclusion

One way to alleviate poverty is to increase the access to well-located and affordable housing. This would allow people to gain access to better economic opportunities and decrease their reliance on private motor vehicles and to rather access more cost-effective and sustainable modes such as non-motorised transport (cycling, skateboarding and walking) and public transport. However, housing is rarely well-located and affordable simultaneously. The well-located housing tends to be expensive due

to market forces and conversely the affordable houses are far from the workplace and economic opportunities.

By increasing the supply of housing in well-located areas, the price could be decreased, making it more affordable. This not only reduces the need for cars but is also better for the environment. There are many ways to try and increase the supply of housing. One such way is to decrease regulation in the residential development sector. Regulations are necessary to protect the consumer and to steer the market in the direction the city wants. This can mean more sustainable building methods to protect the environment or to improve aesthetics of the city or town. However, too often regulations are put in place with a goal in mind that, after years of research and new data, seems redundant in modern times. Minimum parking is one such regulation.

The parking regulation was enacted to alleviate traffic caused by cars cruising for on-street parking. It was very successful and many cities across the globe started to follow suite. However, only recently did we discover the adverse effects of enforcing a minimum amount of off-street parking per zone. Not only was parking prescribed on most lots, it was free as well. At a person's house, local grocery store, work and entertainment facilities parking was provided for free. This skewed the demand for cars and exacerbated the problem of sprawl and traffic congestion.

In South Africa, a country where the majority of its residents can't afford to buy a car and where many people live in informal dwellings, it is of utmost importance to increase the supply and affordability of housing whilst simultaneously moving towards more sustainable city forms and transport modes. For this reason, the City of Cape Town began incorporating PT1 and PT2 zones where any new development would be partially or fully exempt from the parking minimum, respectively.

By comparing the amount of new development applications between these PT1 and PT2 zones to a similarly sized and located buffer area it was possible to investigate the impact of these zones since they were enacted. The majority of new residential developments, particularly blocks of flats, was not within these zones, but rather in the rest of the City of Cape Town. The Atlantic Seaboard, Cape Town CBD, Northern Suburbs and Blouberg areas all seem to draw the bulk of new developments – pointing to location and demand still being the most prominent determining factors for any development.

By comparing the combined PT zones with the buffer area only, a different story is told. In this scenario the location factor is mitigated, and the result is that proportionally more developments take place within the PT zones compared to the buffer area. This indicates that once the location of the development has been determined it is more desirable to develop within the PT zones where there are fewer constraints in terms of regulation. The developer can now design their development without having to worry about applying for a parking departure – speeding up the process and making the development more viable from the onset. Developers would always strive to optimise space and resources and rather use the oversupply of parking to add more housing units (in other words add more profit for themselves) – increasing the supply of housing. For the developer, the market dictates how much parking is required, and, if the market requires slightly less parking than the City prescribes it makes more sense to place the risk of parking supply on the developer. The amount of developments in these areas are also

increasing with time. The positive effects of the PT zones are now starting to take hold and more developers are investing in these areas. Fewer regulation makes it more viable to develop there whilst also being in good locations near public transport.

Looking at the average price per new development per square metre for each zone it is evident that all developments follow a similar trend and average. The average price of the buffer areas is slightly higher than that of the PT zones, but not significantly so. This is most likely due to the cost data being that of the construction cost, and not the full cost of the development that would include professional services such as architects, structural design engineers and town planners.

When developers were asked to rate which regulations had the greatest impact on the viability of developments the result was building lines, setbacks and parking. All of which affect the space required to construct new buildings. Parking demand was found to be influenced heavily by the income-group, proximity to public transport and whether it is in a CBD or suburban setting. In the lower-income areas parking is not required and most developers would opt for parking departures, regardless of proximity to public transport. In the middle-income group parking requirement varies and depends heavily on the proximity to public transport. As expected, when near public transport the parking requirement is lower compared to when it is far from public transport. Most people still prefer cars in middle-income areas, but would embrace public transport if it was available, affordable and reliable.

The study is in line with contemporary literature that deregulating should increase the supply by removing barriers to entry, but that does not necessarily carry over as a cost-saving for the buyer. Naturally many other factors play a significant role in determining the supply and price of housing – most important of which is location. However, local governments can play an important role in increasing housing supply without interfering with market forces too much by removing unnecessary regulations. It must of course be noted that only regulations should be considered for removal that have been observed to be obsolete and where alternatives are already in place. One cannot simply remove parking regulations without a safe, reliable and affordable public transport system as backbone. It is also pointless to enforce minimum parking in areas where people can't afford cars. However, by removing certain regulations and leaving it in the hands of the market the necessary corrections will develop over time. If a development is in an area that is completely exempted from supplying parking, the developer will most likely still provide it, albeit perhaps at a lower rate. For instance, 0.8 parking bays per housing unit instead of 1.0 bays per unit. This marginal decrease in supply encourages the developer to rather add more housing units in order to maximise their profits. The removal or lowering of the parking regulation will also speed up the process by minimising the need for parking departures.

The City of Cape Town thus approached the issue correctly in testing the waters by only removing the minimum parking regulation in certain areas where it deems their public transport to be adequate or where it would like to encourage it. However, developers are not fully convinced yet as the City's public transport system is not in a great state and crime is rampant. The City thus have the right idea in order to move to a more sustainable and car-free City, but the prerequisite requirements to move away from cars are not in place yet. Safe and reliable public transport doesn't have the best reach and safety

discourages many from non-motorised transport. Until those issues have been resolved one cannot expect developers to take the risk of omitting parking completely in the PT1 and PT2 zones, even if it is allowed or encouraged.

6. References

- Andersson, M., Mandell, S., Thörn, H. B. & Gomér, Y., 2016. The effect of minimum parking requirements on the housing stock. *Transport Policy*, Issue 49, pp. 206-215.
- Awuah, K. G. B. & Hammond, F. N., 2014. Determinants of low land use planning regulation compliance rate in Ghana. *Habitat International*, Volume 41, pp. 17-23.
- Been, V., Brazil, C. & McDonnell, J. M., 2011. Simon McDonnell; Josiah Madar; Vicki Been. *Housing Policy Debate*, 21(1), pp. 45-68.
- Bertaud, A. & Brueckner, J. K., 2005. Analyzing building-height restrictions: predicted impacts and welfare costs. *Regional Science and Urban Economics*, 35(1), pp. 109-125.
- Brueckner, J. K., 1996. Welfare gains from removing land-use distortions: an analysis of urban change in postapartheid South Africa. *Journal of Regional Science*, 36(1), pp. 91-109.
- City of Cape Town, 2013. *2013-2018 Comprehensive Integrated Transport Plan*. s.l.:s.n.
- Cutter, B. & DeWoody, A., 2010. Parking Externalities in Commercial Real Estate. *Real Estate Economics*, 38(2), pp. 197-223.
- Delbosc, A. et al., 2019. Millennials in cities: Comparing travel behaviour trends across six case study regions. *Cities*, Volume 90, pp. 1-14.
- Garikapati, V. M. et al., 2016. Activity patterns, time use, and travel of millennials: a generation in transition?. *Transport Reviews*, 35(5), pp. 558-584.
- Glaeser, E. L. & Ward, B. A., 2009. The causes and consequences of land use regulation: Evidence from Greater Boston. *Journal of Urban Economics*, Volume 65, pp. 265-278.
- Guo, Z. & Ren, S., 2013. From Minimum to Maximum: Impact of the London Parking Reform on Residential Parking Supply from 2004 to 2010?. *Urban Studies*, 50(6), pp. 1183-1200.
- Hess, D. B., 2001. Effect of Free Parking on Commuter Mode Choice. *Transportation Research Record Journal of the Transportation Research Board*, 1753(1), pp. 35-42.
- Hess, D. B., 2017. Repealing minimum parking requirements in Buffalo: new directions for land use and development. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 10(4), pp. 442-467.
- Ihlanfeldt, K. R., 2007. The effect of land use regulation on housing and land prices. *Journal of Urban Economics*, Volume 61, pp. 420-435.
- Kim, J. H., 2011. Linking Land Use Planning and Regulation to Economic Development: A Literature Review. *Journal of Planning Literature*, 26(1), pp. 35-47.

- Kurniawan, J. H., Ong, C. & Cheah, L., 2018. Examining values and influences affecting public expectations of future urban mobility: A Singapore case study. *Transport Policy*, 66(1), pp. 66-75.
- Lewyn, M., 2007. How Government Regulation Forces Americans into Their Cars: a Case Study. *Widener Law Journal*, 16(3), pp. 839-852.
- Li, Z.-C., Huang, H.-J., Lam, W. H. K. & Wong, S. C., 2007. A Model for Evaluation of Transport Policies in Multimodal Networks with Road and Parking Capacity Constraints. *Journal of Mathematical Modelling and Algorithms*, 6(2), pp. 239-257.
- Manville, M., 2013. Parking Requirements and Housing Development. *Journal of the American Planning Association*, 79(1), pp. 49-66.
- Manville, M. & Shoup, D. C., 2010. Parking requirements as a barrier to housing development: Regulation and reform in Los Angeles. *IDEAS Working Paper Series from RePEc 2010*.
- Massyn, M. W., McGaffin, R., Viruly, F. & Hopkins, N., 2015. The challenge of developing higher density, affordable housing in the inner city of Cape Town. *International Journal of Housing Markets and Analysis*, 8(3), pp. 412-428.
- McLaughlin, R. B., 2012. Land use regulation: Where have we been, where are we going?. *Cities*, Volume 29, pp. 50-55.
- Quigley, J. M. & Rosenthal, L. A., 2005. The Effects of Land-Use Regulation on the Price of Housing: What Do We Know? What Can We Learn?. *Cityscape: A Journal of Policy Development and Research*, 8(1), pp. 69-137.
- Ramadan, E. & Feng, X.-z., 2004. Urban Planning: A Tool for Urban Poverty Alleviation in Sudan. *Chinese Geographical Science*, 14(2), pp. 110-116.
- Sehatzadeh, B., Noland, R. B. & Weiner, M. D., 2011. Walking frequency, cars, dogs, and the built environment. *Transportation Research Part A*, Volume 45, pp. 741-754.
- Shoup, D. C., 2005. *The High Cost of Free Parking*. New York: Routledge.
- Sridhar, K. S., 2010. Impact of Land Use Regulations: Evidence from India's Cities. *Urban Studies*, 47(7), pp. 1541-1559.
- Suzuki, J., 2013. Land use regulation as a barrier of entry: Evidence from the Texas Lodging industry. *International Economic Review*, 54(2), pp. 495-523.
- Turner, M. A., Haughwout, A. & Klaauw, W. v. d., 2014. Land use regulation and welfare. *Econometrica*, 82(4), pp. 1341-1403.
- Western Cape Property Development Forum, 2019. *Property Forum calls on provincial and local governments to help development and construction industries*. s.l.:s.n.
- Western Province (South Africa), 2015. *Municipal Planning By-Law*, Cape Town: Government Gazette 7413:143-145, June 29.