Retrofitting Challenging Urban Environments Towards a Modal Shift in Transportation; with Specific Reference to Public Bike Sharing Schemes.

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1.0 Executive Summary

1.1 Objectives
*to be completed*

1.2 Goals
*to be completed*

1.3 Recommendations
*to be completed*

1.4 Project Outline
*to be completed*

2.0 Introduction

2.1 Intro
Bike-sharing has had several different forms and guises over the course of its development. From the free schemes which were for single communities, to larger schemes which embrace the bike-share information technology breakthroughs and technological advancement that cater for the larger cities. Despite these advancements since the 1960s, the concept and the ideas behind the scheme remains a constant; ‘anyone can pickup a bike in one place and return it to another’.

Over six hundred cities around the world have welcomed bike-sharing schemes, similar to the one in our own city of Cork, Ireland, and more programmes are starting every year. The schemes help the promotion of cycling as a viable, feasible, safe and valued transport option.

The ingenious advantage of these schemes is the adaptability, as well as the ease at which one can learn how to use them. Each city can make and shape its own bike-share scheme. The scheme can be adapted and implemented in a way which is specific to a city’s local environment, its density, the topography, the available infrastructure, the weather, and of course the cultural attitude that exists toward cycling and bike use. Bike-share schemes are very much unique to the city in which they are placed.

The adaptability and functionality of these schemes has seen them, since 2007, grow exponentially across the globe. in 2007 there were 20,000 bikes that were part of bike-share schemes, this had risen to over 700,000 by 2013.

2.2 History
Bike-share was conceptualised in the 1960s and put into practice in 1965 in Amsterdam. The city council chairman looked to implement the first ever public bike share scheme with an aim to reduce traffic congestion in urban areas. He proposed that 20,000 bikes be made available with pick-up and drop-off points with no fee or charge, however this idea was rejected by the city council. The bike-share schemes which we are familiar with today are built around a free scheme, however the idea of no charge or payment for the service never really took off, and those that did remained very small.

These ideas were used as building blocks for future bike-sharing schemes. 1993 saw the implementation of a new addition to the idea of bike-sharing in La Rochelle, France, and Cambridge, the United Kingdom. They both introduced a two hour session system, and became known as ‘bike libraries’, however they had their limits due to the number of pick-up and drop-off points.

1998 saw the introduction of smart card technology in Rennes, France, as well as the monitoring of bikes for security reasons, their capacity, billing and accountability for damages. This became known as the third generation of bike-share. The most important aspect of the third generation’s attributes was the idea and use
of smart technologies. This has had a huge affect on the way bike share schemes work around the world. These ‘smart technologies’ have led to safer and more secure schemes, better real time information for users, increased use, as well as increased capacity. They use a credit card payment as a security mechanism, has further been built upon by online registration, the inclusion of mobile phone numbers for confirmation details and radio- frequency ID cards used at the stations. Smart technologies make up the central nervous system of every modern bike-share scheme.

2.3 Culture and Context

Traditionally Irish society has been dominated by one form or transport or another, however since the arrival of the car in Ireland there has been a decline in the usage patterns of other modes of transport, especially in bikes since the 1980s, a mode of transport which, at one point, proved to be the most popular. This stemmed from our large rural population and settlement patterns. Despite this, rapid urbanisation since the 1980s has changed the modal dynamic and the cultural attitudes of the Irish people. The growth of Irish cities and commuter towns has only added to this, yet the number of people using bikes is up for the first time since the mid 1980s.

The past decade or so has seen the number of people cycling rise 68.5% in Dublin City according to Dublin City Council, 2013. While bike make up 9% of the total vehicles coming into Dublin City Centre at peak times. These increases have been echoed by the 2011 census which show an increase in bike users between 2006 and 2011 across Ireland. The number of Irish people cycling to work, college and school has risen from 58, 960 to 61,177, the first increases since the 1980s.

The reasons? Safer roads, tax incentives, government parties and bike-sharing schemes have all played their part in the increased level of uptake and cultural shift which is currently being witnessed in Ireland. Granted, the levels are still over 80,000 short on 1980s levels (146, 962), yet the level of usage is up as cultural deviation away from motorised private transport is underway, slowly, with the introduction, and expansion, of bike-sharing schemes across Ireland (Dublin, Cork, Limerick, Galway, and Belfast).

3.0 Modal Shifts and Increasing Urban Mobility

3.1 European Case Studies

The concept of bike sharing schemes came into being in 1965, when Amsterdam made 500 free bikes available for users to get from place to place, leaving the bike at their destination, left unlocked, ready for another user. The idea of just having free unlocked bikes on the street soon meant that many of the bikes were stolen and soon many disappeared (www.cyclinguphill.com). After this came the Copenhagen equivalent, which was made better by the introduction of a membership fee, along with an area to dock the bikes with a ‘coin refund' system, which meant bikes were less likely to be stolen. Today’s bike schemes are much more complex and the technology behind them, are based on the Rennes public bike sharing scheme, which was introduced in 1998 in France, which introduced the 30 minute journey times, the automatic docking stations, and the real time availability of bikes in each station, that paved the way for the bike schemes seen all over Europe today (www.ecf.com). In Europe over the last 10 to 15 years, there has been a huge push for the use greener transport such as cycling over car usage as it not only has less of an impact on our environment, but also leads to less congestion, and overall a better experience of the urban environment.

As with any new technology, it is fundamental that the design is correct in order for it to be successful. The same can be said for such public bike sharing schemes. This chapter will focus on two very successful bike sharing schemes, Paris’s ‘Velib’, a scheme designed with the most popular and current technology; and Copenhagen’s ‘GoBikes’, which is at the forefront of bringing new technologies into public bike sharing schemes.

Paris

‘Velib’ is the name that was given to Paris’s bike sharing scheme, which was launched in 2007, and has since become the biggest bike sharing scheme in the world, with over 20’000 bikes available to rent to locals and tourists alike. The bikes are simply designed, but effective. They are well built, but clunky which is eliminates theft. They include many of the design features that we have grown used to on such public bikes, such as gears to deal with topography, front and rear brakes, an adjustable seat, a bell, front and rear lights, along with a good sized metal basket to hold your bag and other items, and of course a lock for times when your not near one of the 1’800 stations available. The downfall to the design of these bikes is their weight. These bikes are made in such a way that they are big and heavy, making it difficult to cycle up hills even with
the available three gears. They are really only made for cycling on flat topographies. The scheme has plenty of stations, and even has the availability of children’s bikes (Petit Velib) available at 8 stations, which cater for children from the ages of 2 upwards. This is the first scheme to include children, and is definitely a good design element as it gets children cycling at a very young age. This is something that they will grow up with, and may be less likely to need a car when they become adults.

Copenhagen

Copenhagen recently launched ‘GoBike’ late last year and has included design elements that are out of the ordinary for bike sharing schemes seen across Europe. The difference is not only seen in its overall design; as the bikes look very stylish and not as clunky as we’re used to seeing in other parts of the world such as in Paris and London, but also include a tablet pc, that allows the user, through gps, to search for restaurants and other services close by, along with directions. This data is then sent back to a database every 10 seconds, so real time marketing is an option, and this might help pay for these expensive electric bikes. The scheme overall gives all design elements needed (as seen in the other schemes) and then more.

In a city where there are as many bikes as inhabitants, these bikes seem like they are designed for those visiting the city, rather than for those living in it, due to the inclusion of the tablet, and also the fact that the bikes are electric and give those not used to cycling a better and easier experience when cycling. The tablet has many advantages such as the ability to check the times for other forms of transport, such as bus or train, which helps to link up the bikes with public transport systems. Another design issue is the cost of these bikes. It costs almost 9’100 euro to manufacture each bike, not including maintenance. It has cost the city government and the schemes sponsors a lot of money to install, and more money than a normal scheme to maintain the bikes due to them being electric.

Cork

The difference between the two European examples of Paris and Copenhagen discussed, and Cork, the area in which we all live, is population density, and the fact that it is not the capital city of its country, Ireland. The scheme overall had a tough start due to the introduction of cycle lanes in to the city centre fitting in with the Cork Area Strategic Plan. Current discourses claim that the design of these lanes were not car or pedestrian friendly due to the curbed edges found on the contra-flow cycle lanes leading to a number of accidents to both vehicles and pedestrians. Many newspapers have included articles on the scheme such as ‘Cork bike-sharing scheme starts with a rattle’ from the 17th of February 2015(Reference), and ‘Contentious Washington St bike lane went ahead against Garda advice’ from March 2014 (Reference). That being said, due to the weather getting better in the spring/summer months, the uptake of the scheme is ever increasing and the discourses now being more positive towards the scheme. In comparison to Paris and Copenhagen’s bikes, the Cork bikes are lighter and of a more sleek design, this may be due to the fact that Cork is made up of a series of hills, and it would be difficult to cycle up a hill on a heavy bike. This scheme has all the other elements that you would expect from a bike-sharing scheme as discussed in the Paris example. The
downfall to the bike design can be seen in the front basket. Due to its front basket being made out of elastic, its design makes it impractical for it to be used to hold anything of value.

4.0 Policies, Documents and City Governance

4.1 Policies

The emergence of public bike sharing schemes in Ireland has coincided with the publication of policy and public discourse relating to the importance of sustainable transport. The focus on cycling as a mode of transport has been continuously highlighted in policy over the last decade (‘Bike to Work Scheme’, 2009).

**CASP**

A crucial element of Cork Area Strategic Plan 2001 – 2020 (CASP) was the creation of an integrated transport system. The strategy focused on the planning, design and operation of the transport system as a whole including the development of cycle lanes in the CASP area. One of the aims of CASP is raising the ‘quality of life for all by improving mobility, accessibility and connectivity in the area’; this is to be achieved through the co-ordination of all key actors in the planning, design and operation of the transport system, specifically relating to cycling as a mode of transport. An integral part of the plan is to make the system more integrated, stating ‘the provision of cycle parking facilities at stations and / or the carrying of bicycles on commuter rail services offers sustainable options for integrated journey planning from a customer perspective’ (REF).

**The Cork City Cycling Strategy 2004**

The Cork City Cycling strategy 2004 identifies the importance of cyclists in the development of a sustainable transport policy for Cork city and carried out research in order to achieve a ‘safe and comprehensive cycle network’. The cycle strategy identified primary attraction nodes within Cork city including; Cork City Centre, Cork Institute of Technology, Cork University Hospital, University College
Cork, Douglas Village, Mahon Point and Blackpool Shopping Centre. In order to achieve the goals of the strategy the following proposals were set out (REF).

The proposed cycling measures within the network include the following:

- Provision of contra flow cycle lanes
- Provision of shared pedestrian/ cycling streets
- Provision of advanced stop lines at signalised junctions
- Removal of suburban roundabouts
- Provision of on-road cycle lanes
- Introduction of traffic calming measures

Development of Proposed Cycle Network:

- Enhanced facilities for cyclists will be provided in a number of ways.
- Bus Lanes, Cycle Lanes, Traffic Calming, Contra-Flow Cycling Schemes
- Cycle Tracks, Advanced Stop Lines, Roundabout Elimination
- Toucan Crossing, Shared Use/Footways, Cycle Parking
- Green Route Networks (REF)

Cork Area Movement Strategy

More recently the Cork City Centre Movement Strategy 2013 sets out the objective of increasing the capacity of the transport system in order to facilitate greater access to the city centre. The movement strategy, similar to CASP, is concerned with the environmental impact of transportation on the environment and promote safe, efficient, economic and healthy modes of movement. The motion put forward by the movement strategy is to encourage a ‘path of change’ in an attempt to compete with other cities through providing a multi-modal option for people living and visiting the city. This policy measure clearly supports the recent introduction of the Bike sharing scheme in Cork city. The movement strategy encourages cycling as a sustainable mode of transport. It provides a traffic management system that enables safe cycling access within the city centre (REF).

*Report*

The 2012 National Transport Authority report on regional cities provides a foundation for development and implementing plans for designing environments for pedestrians and cyclists. The investments that have been made throughout Cork city in order to facilitate cycling as a mode of transport, have supported improved access, safety and design as a way forward, these include; Parnell Place Improvement Scheme Investment (€42,977), this introduced cycle lanes and rationalisation of traffic movements resulting in overall street layout. This facilitated improved integration between taxi’s, buses and bicycles, therefore designing infrastructure to suit the need of the public. The Kent station to city centre investment project (€59,110) is concerned with creating cycle lanes and linking destination locations throughout the city. One of the major layout design changes was seen in relation to UCC to city centre investment project (€42,066), despite having created vast negative coverage, it has the potential for encouraging huge cycle growth within the city (REF).

National Cycle Policy Framework

Ireland first National Cycle policy framework 2009 -2020 is prepared on the values of creating a sustainable transport future. The government strongly recognise the priority of cycle friendly initiatives, especially in relation to routes. They have undertaken this by ensuring they are safe, direct, coherent, affective and comfortable for the user. The National Cycle Policy Framework has led to investment in towns and cities across ireland to aid bike schemes. This helps to cater for demand, management, and any future developments which aim to create a strong cycling culture in Ireland (REF).

As a whole, transport policy in Ireland, specifically relating to Cork, is committed to the development of an integrated and sustainable transport system. The policy initiatives clearly support cycling as a potential mode of transport which can be further exposed and utilised throughout the city area.

5.0 Technology, Communication, and Public Engagement

The rate and degree of initial public engagement with a public bike share scheme can indicate any weaknesses within the initial output. These weaknesses may be found within the overall layout of the bike
stations, the design of the bikes themselves, and the ease of access. However, one of the biggest factors influencing uptake is the technology used within the scheme. The technological aspects of bike schemes will be examined here, with a particular focus on Cork and Copenhagen.

5.1 Technology

Technology is the central nervous system of bike share schemes, and the most integral forms of technology found within the Cork bikes are the interfaces found at the bike stations. Some users do find that the interfaces may freeze from time to time, but their use is relatively simple.

*Further user feedback will be available following interviews/surveys.*

One of the easiest ways for users in the Cork scheme to get live information on how many bikes are at each station is through the mobile app that has been integrated with the scheme. By and large, this app seems to work quite well. It should be noted that the app is only available on iOS and Android devices, meaning those with Windows phones are slightly restricted, which could be considered as a minor shortfall. Along with this, it can prove slightly tedious to find the app. A relatively simple search is slowed down by the need for specificity in the search criteria to find the app, an issue highlighted by Flood et al. (2012). For example, if one searches “Coke Zero Bikes” on iOS, or “Public Bikes Cork” on both iOS and Android, the app for the scheme cannot be found. However, one of the key features of a successful mobile app is aesthetically pleasing designed interface (Hussain and Kutar, 2012), which the mobile app has achieved.

Given Cork’s bike scheme is still relatively new, only the basic systems are in place. However, Copenhagen’s bikesharing scheme launched in 1995 was the first large-scale program of its kind in Europe (Shaheen et al., 2010), so it has had time to develop more sophisticated elements within the overall system. An app has been released for Copenhagen called ‘I BIKE CPH’ that works like a sat-nav for cyclists, providing users with routes that take bike-friendly parks, contraflow bike lanes, and other shortcuts, and it will soon be able to supply total distances travelled, along with calories burned (Siggard Anderson, 2015). Another app that is still in beta stages uses public data of traffic signalling to give cyclists the speeds needed to travel between junctions in order to meet the next green light, and thus avoid stopping at junctions (Siggard Anderson, 2015).

5.3 Communication

Communication to users in Cork can be found within the ‘News’ sections found in both the app and website for the scheme. This easy access to information at virtually any point is a strong strategy. This allows users to easily find out about any disruptions or developments within the scheme ensures less negative feedback in times of flux.

In Copenhagen, users have taken to communicating with each other for mutual benefit. Through social media, specifically Facebook and Twitter, cyclist are sharing incidents of bike-related police activity and fines, allowing all members to learn from each other’s mistakes and avoid receiving similar penalties (Siggard Anderson, 2015). The added benefit of this is active public encouragement of safer streets within the city. A similar system could be implemented in Cork with a simple ‘hashtag’ on social media, which would both promote the idea and allow it to be easily searched for.

5.4 Public Engagement

Public engagement with Cork’s scheme has been relatively strong. Total registered users are 4,123, as of the end of April 2015, which exceeds expectations of a maximum of 2,500 before the scheme’s implementation. Of these users, roughly one third, or 1,375, of users actively use the bikes, as of mid-Spring 2015. While average journey times are not held, the most frequently used stations are known. The three busiest stations for both hiring and docking in Cork are Fitzgerald Park, Bandfield and Gaol Walk. Given these stations’ proximity to University College Cork, it is quite likely that students are a large demographic of the registered users. It should also be noted that these stations are currently some of the most westerly stations available, so the non-student population in that part of the city may also use the bikes as part of a longer journey. Many stations show tidal movements, i.e. they are popular origins in the morning and destinations in the evening, or vice versa. Few stations are either primarily origins or primarily destinations.

Overall, it can be seen that public engagement with the Cork scheme is currently focused within the local student population. While this has potential to change, and thus allow stations in other areas of the city to be used more, it also presents an opportunity in the form to the other third level education centres in Cork.
Given the scheme currently shows students favour the scheme, it could prove quite successful to allocate stations around the other third level education centres, given the likelihood of quick uptake.

6.0 Location, Allocation, Relocation

The location, allocation and relocation of docking stations are at the heart of any bike share system; if the spatial distribution is not adequate, how can a model shift occur? The location is, therefore, of immense importance in any bike sharing scheme, and may even influence participation levels amongst potential users. The subject question is how technology can aid the sustainable design of these systems, ultimately ensuring, and aiding, the promotion of cycling as a means of transportation. Furthermore, to question if technology is always the answer, as it is often a very expensive tool, we as planners, need to ensure if technology is used, that it is implemented to its full potential and not simply just to follow a fashion.

1.2 Location

In Cork, the locations of the bike share docking stations are all in the city centre, which may limit the number of participants and potential users, as the catchment area is not widely distributed. Throughout the city, promotional LED signs are seen, aiming to encourage commuters to use a number of transportation methods in their daily commuting patterns. For many commuters who travel by car, the car is likely to remain a favourite, as bike stations do not [at present] have any linkage with, for example ‘park and ride’ facilities [figures and confirmation will be determined in survey work, to convey if any users are using the systems in coordination with the bike share system]. Romero et al. 2012, found that, bike share schemes with longer access times from car parking zones to docking stations makes the public bicycle mode an uncompetitive system against car mode.

It should be noted that, while there is a lack of park and ride facilities, there are bike stands located at key public transportation hubs. Kent Railway Station and Parnell Bus Station are two primary gateways into Cork City, and they were each allocated a bike station within the scheme. This suggests an awareness to correlate the scheme with other forms of public transport. It is hoped that further research should indicate if commuters are in fact integrating multiple systems within their journeys.

There are stations located near cultural amenities, which may help encourage recreational amongst locals, along with possible short-term use amongst tourists. Examples of these can currently be found at Fitzgerald Park and St. Finbarre’s Cathedral. In time, further amenities may be allocated stations, further increasing the potential for recreational uses within the scheme.

Zhang 2011, states that the potential catchment of users of a bike station is reflected through the estimated tolerance time that a person is likely to be willing to walk to a station. Furthermore Krygmans et al. 2004, highlighted that this ‘catchment area’ is a large share of total trip time. By using the ‘Network Analyst’ in ArcGIS, a user can create of layers of data which are suitable for bicycle users, e.g. bicycle paths or no motorway [if applicable], which in turn can be utilised using the ‘quickest path’ tool, to critically access the location of the current stations to ensure that the locational design framework has been smartly and sustainably designed. If it is found that many stations are not near bicycle lanes, it would suggest that perhaps the re-allocation or additional allocation of stations may be a viable option, to ensure and ‘achieve a transport system as efficient and sustainable as economically and socially possible’ (Romero et al. 2012).

*Maps will be included here in the second draft to indicate where the stations are with local context and cycling infrastructure*

1.2 Allocation

It is renowned that topography plays a key role in influencing the pattern travelled by the communal and recreational cyclist, determining routes taken and ultimately in some cases- whether cycling is even an option considered. Earlier it was noted that Cork city centre is defined with distinctive ridgelines to the north of the city, with topographic comparisons to that of Lyon in France (Cork City Landscape Study 2008). While the extreme slopes are known amongst local planners, perhaps less extreme areas are not, which is when technology may be of use to ensure that the design is customised to the geography of the city. There is a significant amount of Light Detection And Ranging [LiDAR] data for the city, which may prove to be extremely useful when deciding the allocation of any new stations, as it is an excellent way to visually highlight the topography of an area. This data is expensive to purchase [awaiting price confirmation], yet it is a once off payment, as the topography is unlikely to change [Cork does not experience any tectonic plate activity]. Once purchased, this data can then be uploaded into a GIS system and an analysis can be made of differing gradients found in the area, assessing potential docking sites. This is extremely important as although much
statistical information can be analysed [e.g. census data], it may not prove useful if there is a constant gradient slope to the destination, which ultimately has the potential to discourage possible users.

Furthermore, using such topographical data in coherence with statistical information could aid expansion, redeployment or even removal of docking stations by identifying potential demand hotspots. This visual representation of data through the use of GIS technology can be invaluable. Seeing information displayed visually can enable a better understanding of statistical information and ultimately, with planner’s knowledge of zoning and new developments, it can ensure that the stations are sustainably located in areas projected for future growth, possibly with aims to expand cycling infrastructure if necessary. In this case, technology is needed to ensure that every station is placed with a justified reason behind it to avoid unsustainable locations and associated uneconomical costs with the upkeep. More so, if technology is integrated with policies that are already published and set out in Section 5, in addition to learning from case studies in Section 3, planners can truly ensure that technology is being utilised in a manner that employs a sustainable bike-sharing system that is accessible to all.

*Maps will be included here in the second draft to indicate how and why such technology would be used*

An interesting case worth noting is in Helsinki, where Jäppinen, Toivonen and Salonen, 2013, conducted a study ‘to model a hypothetical bike sharing system and quantify its spatial effect on public transport travel times’. It was found that it is possible to increase both ‘the competitiveness and attractiveness of sustainable modes of urban transport and thus help cities to promote sustainable daily mobility’. This is ultimately what is aimed to be achieved, a sustainable design network structure through technology. [The location-allocation tool in ArcGIS is hoped to be used later to give an indication for potential demand in Cork, as was used in a Madrid study, García-Palomares et al. 2012].

### 1.3 Relocation

Caggiania & Ottomanellia 2013 noted that ‘the unbalanced distribution in space and time of the bikes among the stations’ is a central problem. Conducting research with the aim to reduce the redistribution costs of the bikes for companies, ultimately ensuring a high level of user satisfaction is vital. This ensures those companies running the bike share schemes [Coca Cola in Cork] see the system as economically viable and to retain lower subscription prices €10 per annum in Cork. This can ensure equalisation of participation amongst the many variances of socio-economic conditions people may be. If algorithms such as a micro-stimulation model (Caggiania & Ottomanellia 2013) can effectively ensure reduced cost, would this ensure more efficiency for users or more profit for the company? This perhaps, is an issue which at present cannot be answered. However, the more timely relocation of bikes can be advocated for to provide a utility that is robust and attractive to users, increasing accessibility throughout the city.

### 7.0 Towards a Modal Shift: What does the future hold?

#### 7.1 Cultural Shifts

Transportation and movement has always, and will continue to be central to social and economic activity across the globe, however it is clear that the forms and the modes of transport are changing. The impact of increased private motorisation has aided trade from the local level to the global level as the world, within which we currently live, becomes more and more globalised as the time-space gap compresses. We as individuals begin to live our lives at a faster pace and require things to be more efficient, a requirement which increased on a daily basis.

However this rapid increase in privatised motorisation has led many to call for a change attitude toward the costs of increased transportation levels. This cost is not just financial, but are costs which affect wider society and the environment, from people’s health to road safety, from sustainable development to environmental degradation. While this is regarded as a global phenomenon, it has it’s base at the local level.

It is at this level, the local, where, fundamentally, changes can begin to be made in creating and expanding non-motorised transport (bikes). While it is easy to dictate what must be done to accommodate this implied paradigm shift, the process is much more complex and begins with the building of political will which will reflect this shift in the cultural mindset of a society toward non-motorised modes of transportation.
Ireland and Europe has seen this shift, while the idea may be new to Ireland, the implementation of Bike-share schemes are not new to European cities. In order to have successful implementation of these systems, strong political will is needed to ensure the correct and required support is present, as well as funding, land use rights and co-ordination. This begins by education political leaders and public representatives on the benefits of these systems and the changes in cultural attitudes towards transportation, efficiency and the environment. An improvement to infrastructure as well as supply to match the cultural aspirations of the public will be essential in catering for this cultural shift.

Ireland along has witness a paradigm shift in usage and interest in bikes. An Irish Times article in 2013 depicted an Ireland that was ‘bike crazy’, ‘families take to parks, seaside promenades, canals and riversides. During the weekday rush hours commenting cyclists are at the top of every queue of cars in the towns and cities of Ireland’, (Irish Times). With the increased numbers using the Green Party’s 2009 ‘Bike to Work’ scheme, 200,000 people availed of the tax incentive to buy bikes, while more and more people are joining and participating in ‘National Bike Week’. The article continues to say ‘it would be difficult not to have noticed the rise of the cyclist in recent years’, the first since the 1980s.

The 2009 'Dublinbikes' scheme began, and has added to the increased levels of bike usage. This saw a €35million expansion in October 2013 which tripled the number of bikes and doubled the number of stations.

*not finished*

**7.2 Opportunities**

The success of these schemes are obvious, and have been realised by one, their growth across Europe, and two their expansion within several major cities, such as Paris and Dublin.

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**7.3 Future Capacity**

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Cork is a compact city and the current scheme could be expanded to the East, past Centre Park Road, towards The Marina and Atlantic Pond areas, as it would be welcomed amenity to the area which has much to offer in terms of public realm.

To the South, Stations at the Lough and Turners Cross areas would also be beneficial to local residents and those who wish to access the facility but deem the ones located at St. Finbarre’s and UCC too far to walk.

The East could see the biggest expansion of the scheme. New stations could be located at the Mardyke Sports complex and and intermittently along the Straight Road, heading due East. Victoria Cross, Dennehy’s Cross and Wilton could also see the introduction of new stations, with a scope to extending the scheme along Model Farm Road as far as Rossa Avenue and Cork Institute of Technology.

The Northern side of the city is limited by topography however the implementation of stations along Leitrim Street, North Circular Road and the Commons Road, as well as some in Blackpool Village, could be introduced and the possible future provision of a train station in Blackpool could also benefit from a station.
These new suggested stations as well as the current existing stations provide a viable alternative to bringing a car to town. The bikes provide a mode of transport which is cheaper than parking a car in the city centre, and allows easier access to the entire city centre area, while also allowing movement during peak hour congestion. New developments such as the Beamish and Crawford Development, the Capitol Cinema site and Albert Quay, as well as the City Centre Movement Strategy will add to the appeal and usage of the schemes. An increased area and time prior to being charged will also benefit the users of the scheme as well as the numbers.

7.3 Lessons to be Learnt

Basket is too small, not secure
Accidents? Are helmets necessary? Road accidents/deaths with cyclists.

Station placement - Successful bike sharing schemes, such as those in London and Paris, albeit, these are much bigger cities, which have a much larger urban area, have stations placed approximately 300m apart. The placement of stations in Cork City are much closer, and some are less than 300m. The new suggestions for stations will see stations placed at minimum 300m apart, and further on long straight stretches of road such as Model Farm Road.

Expansion - the expansion of the scheme in Dublin saw the number of stations and bikes expanded, however this was also followed up by a increase in cost to €20 and a reduction in free usage time to 20minutes. While this is still under the £90 (€108) fee charged for yearly membership in London, however you can make as many journeys in 24hours as long as they are less than 30minutes each, this is the same for the daily pass which costs £2.

7.4 Cultural Shifts

*to be completed*

8.0 Conclusions

*to be completed*
9.0 Bibliography


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*more references will be added in due course*

10.0 Appendices

*to be completed*