Chambers Ireland's submission to the Department of Transport's Sustainable Mobility Policy Review

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Background to Chambers Ireland

Chambers Ireland is delighted to contribute to this nationally important policy review, and we are very grateful to the department and the minister for having the foresight to instigate it. Transport is perhaps the most important of state policy, all activities within the state, be they business, personal, private or otherwise, are contingent upon the appropriate transport infrastructure being in place to facilitate them.

Chambers Ireland is Ireland's largest business representative organisation, with the widest geographical spread. our members are the chambers of commerce which are active in all the major towns and cities of the country.

Each of our member chambers is central to their local business community and all seek to promote thriving local economies that can support sustainable cities and communities.

Because of this deep sense of place is so fundamental to the identity of each and every chamber they, perhaps more than any group, understand both the national/regional importance of inter-urban connectivity, and also how the intra-urban transport environment impacts upon their local economy.

Our membership has taken the view that sustainable transport has become critical to the future economic wellbeing of their towns, cities, and regions and believe it, in combination with the decarbonisation of our electricity supply, to be the most important policy programme of the coming decade. Without a tremendous shift in how we move people and goods within, to, and from our country we will not achieve our 2030 CO_2 targets.

Transport infrastructure is vital to creating the resource-efficient, quality, densified urban living which is necessary for the creation of sustainable cities and communities, whether that be local active travel supporting infrastructure, nodal inter-urban high-volume connections, or inter-city high speed options.

For our chamber network traffic is a key concern, congestion carries significant costs with it, but the greatest harms are done to quality of life. Our infrastructure is making it harder to recruit and retain members of staff throughout the country.

Holistic overview of this suite of submissions to the Department

Transport infrastructure shapes our lives in myriad ways. One must only consider the potential impact of Brexit to the transport sector to get a sense as to how fundamental to our society our transport infrastructure is. Even the slightest impacts on flow, the shortest of delays, can amount to a national crisis when multiplied across the population.

The task of managing the systems of transport is made ever more difficult by the nature of those systems; transport is complex (in a mathematical, systems-analytical, non-linear sense). Transport infrastructure shapes how we our lives, where we can live, what options are available to us. As a result, when infrastructure changes we alter our behaviours, and consequently the demands we place upon this infrastructure. This creates dynamic feedback loops which often lead to unpredicted and unpredictable outcomes.

This feedback creates pressures of its own, as we see with the interaction between transportation and sprawl. Sprawl makes efficient public transport a challenge as the population is dispersed across an ever increasing area, the absence of local public transports forces people to rely on private vehicles as their primary means of transportation, this increases congestion which creates pressure for increased road capacity, this increased capacity impels housing development ever further from the urban cores – creating more sprawl.

Then, as the department's resources become further ensnared to an ever increasing degree with roads development, a smaller and smaller share of its capacity is allottable to high level transformative solutions because more and more of the department's resources are required to deal with the emergent problems of the existing infrastructure.

Even if we were not facing an existential threat arising from our CO_2 emissions resolving the transport problem would be amongst the highest priorities of the

business community. As the Department of Transports own excellent research has demonstrated congestion is costing the city of Dublin €100's of millions each year, and soon to be billions each year. Using live travel data TomTom ranks[1] Dublin as the 17th most congested city in their sample with typical commuters spending in excess of 213 hours in congestion in a given year.

Independently, Inrix[2], using a very different methodology (which looks at the absolute economic cost of congestion by weighting congestion by the size of the city), ranked Dublin as the 53rd worst city for congestion that they examine. In terms of hours lost due to congestion (246 hours/commuter), Inrix ranks Dublin as the second worst city in Europe, behind only Rome (254 hours per commuter), with Dublin having the slowest average speed for the last mile of travel (among cities in Europe).

In 2018 TomTom's data has Dublin's congestion disimproving by 3% year on year, Inrix puts the rate of congestion increase at 4%. Both surveys charted a decline in commutability in 2018 relative to 2017. For TomTom, that 2017 data was an increase of 3% from 2016 at which point only 190 hours per year were added to the typical Dublin commute in 2016[3]. Where we have data about the National Development Plan growth cities, the findings are similar – while the duration spent trapped in congestion is related to the size of the city, the pace at which it worsens has been a cumulative 2-3% p.a. in all our major urban centres. Methodological changes make direct comparisons between current reports and earlier ones less reliable, but the trend, where available, has been consistent.

The department's research confirms that this worsening is expected, but the rapid pace of worsening is unexpected. This again demonstrates the prescience of all involved in opening this consultation and giving us this valuable opportunity to engage.

The challenge of reducing the economic and quality of life costs of congestion is made more difficult for the department and the relevant agencies because on the enormous scale, and consequent lead-in time, that is associated with public transport infrastructure projects.

[1] https://www.tomtom.com/en_gb/traffic-index/dublin-traffic#statistics
[2] https://static.poder360.com.br/2019/02/INRIX_2018_Global_Traffic_Scorecard_Report__final_.pdf
[3] https://www.independent.ie/irish-news/revealed-the-worst-irish-city-for-congestion-where-drivers-spend-more-than-the-average-work-week-sitting-in-traffic-every-year-35467969.html

Secondly, public transit space is contested – most of it is roadway – and while everyone has a claim upon these publicly held land-assets the negative externalities are not priced in which has made for a very inefficient allocation of these resources.

These land-assets are finite, but while they are limited, few restrictions have been placed on the utilisation of roads which has created a tragedy of the commons. It is in each road users interest to maximise their utility of this scarce asset, while it is also in their interest to transfer the associated burdens of that utilisation onto others. This degrades the capital infrastructure, transfers costs to members of the public and the state and ultimately, traps us collectively in a sub-optimal utility equilibrium. As access to these assets have been minimal, future restrictions of access will be strongly resisted. This makes the task of altering the physical environment of our towns and cities, so that they can become more people friendly and economically vibrant, a particularly difficult challenge.

It is however a challenge which increasingly needs to be met, because our cities and towns have become increasing hostile to active travel. Creating hostile environments for people imposes tremendous costs throughout society. Those who have disabilities, those who are infirm, or aged often find themselves confined to home. Small barriers such as kerbs can become insurmountable to those with mobility issues or the uneven surface caused by dips in footpaths (to allow vehicles access to driveways) become enormous hurdles for those with diminished mobility.

An unsafe travel environment makes active travel less inviting – diminishing demand – which in turn sees the maintenance and upkeep of these services deprioritised, this negative investment spiral has shifted the urban environment into a low-utility equilibrium. Escaping that trap will require significant energy and protracted activity, if not necessarily more resources.

While in the long-run the benefits of people friendly streets that promote the utilisation of public transport in combination with active transport networks and technologies create a healthier urban environment, reduce CO_2 emissions, encourages resilient local economies, and makes for a more efficient use of finite land resources – in the short-run, the reprioritisation of resources will be zero-sum.

While headline projects such as BusConnects, Luas extensions, and the Dart Expansion plan are essential to increase the efficiency, regularity, and throughput of our existing

public transport resources, and are projects that will be greatly complemented by new developments like Metrolink much of the most transformative work will need to be conducted at the local level.

Extensive engagement and education programmes will be essential to develop support among city and county managers, planners, councillors, and most-importantly local communities – the success of a national sustainable mobility programme will be contingent upon making hundreds, if not thousands, of positive incremental changes in combination with the major headline infrastructural programmes. Active transit networks, be they pedestrian networks, cycling networks, or personally powered transportation networks, act as force multipliers for these major state investments – by making public transport more accessible they expand the footprint of each transport node.

Unfortunately, this introduces two kinds of financial disincentives for Local Authorities, firstly there is the capital costs of creating more people friendly streets, and secondly there is the expected reduction in parking charges will impact upon their balance sheets. While over a medium-term period, revenues will likely fall (the business rates revaluation process occurs over at least a 5-year cycle, and there is often a long lag, particularly for dense residential builds between commencement and individual residences becoming liable for Local Property Taxes). The funding model for these improvements will need to consider these second order effects and the incentives which may slow, or even stall, improvements at the local level.

At a broad level, **focus should be placed on time spent travelling as a metric for determining the relative success of projects within the frame of sustainable transport**. Likely few people will be moving home as a direct result of a strong sustainable transport policy framework. But such a framework should be successful at redirecting where future homes are built, and where people work.

One of the chief concerns of our Chamber network is the social, personal, and economic costs of commuting. **Long commutes are detrimental to quality of life.** Most commuters in Dublin, in the city with the slowest 'last mile' of commuting, spend in excess of ten hours commuting each week (in Europe only Rome is worse). This creates lost opportunities for everyone caught in this traffic and creates inflexibility in the workforce. The opportunity cost, as large as it is, is also made worse by the direct costs, in the absence of appropriate public transport options people are forced to use private vehicles at enormous personal cost.

There is a strong relationship between the mode of transport that people take and the time it takes them to make that journey. While people will be willing to walk several minutes to a bus-stop, hurdles such as pedestrian crossings reduce the area that that can be reached in that time. With **15-minute neighbourhoods are the ideal that transport policy should centre around**, shared bicycle schemes, personally powered transports, quiet routes, pedestrian-permeable streets all expand the area which is accessible within those fifteen minutes. Conversely hostile transport architecture narrows that range, and forces people to rely on private transport.

Each of the themes of this review is interlinked, as we should expect – everything which is transport related is connected. Our congestion flows from where we have built our roads to, our housing sprawl makes it ever more difficult to serve as the area to be covered by an appropriately dense public transport network increases exponentially relative to the distance from the centre of each network. The present need for a dense road network diverts resources from other transport alternatives, this however introduces enormous costs both to the public services through requiring a constant expansion of low capacity services, which again diverts scarce resources away from their optimal configuration. It also introduces enormous economic costs through damaging the vitality of our towns and privileging businesses which are accessible by private vehicle.

The counterpoint to this is that many of the areas that the department is interested in reviewing are complementary in nature. Increased public transport utility reduces congestion, reduces CO_2 emissions (in combination with a decarbonised fuel supply), reduces the demand placed on public space by private transport, creates more opportunities for people friendly streets, supporting active travel, improving the local business environment, reducing commercial and residential vacancies and so generates revenue for Local Authorities for further investments that support transport orientated developments, leading to densification which reduces the cost of providing state services, and reduces commuting times and distances improving economic productivity and personal quality of life.

Each of these elements are reinforcing, every action multiplies the benefits and effects of the other actions that are taken. **It is therefore essential that the Department takes a holistic approach to all the elements of this review.** Transport is the foundation of our society. Unless we get transport right, we will get nothing else right. Most importantly we will not be successful in having our economy transition to carbon neutrality.

Unless we transform how we move, how we live, and the economy that underpins our communities we will fail to develop into a sustainable society.

Recommendations

- **Long commutes are detrimental to quality of life, and the wider economy, therefore focus should be placed on time spent travelling as a metric for determining the relative success of projects within the frame of sustainable transport**.

- **It is therefore essential that the Department takes a holistic approach to all the elements of this review.**

- **15-minute neighbourhoods, linked by high capacity public transport networks, are the ideal that transport policy should centre around**

Land Use Planning and Transport Planning

Unless the transport infrastructure is shaped by planning guidelines, the aims of the planning guidelines will not be achieved. Transport infrastructure changes our interactions with the physical environment in real and tangible ways. Transport infrastructure determines where we can live, where we can work, and where we can study. All of our life choices are supported or limited by the transport infrastructure that exist.

Transport infrastructure determines where people shop, where people build, and what they can do recreationally therefore every new piece of transport infrastructure that is built distorts the local (and often national) economy in myriad ways.

On the integration of land use planning and transport planning

For the implementation of the policy agenda of the National Development Plan to be a success it is essential that all transport strategies, at all levels, are coherent with that plan. This calls for more urban living, which has huge implications for **our cities and towns as they will have to become more people friendly**. Too much of the cores of our cities and towns have become hollowed out and vacant. **Getting our transportation infrastructure right is a prerequisite to making our town and city centres vibrant again.**

Section 28 guidelines which protect town centres, promote active transport infrastructure in urban settings, and prioritise public transport options linking urban neighbourhoods with towns and cities are essential to our sustainable development.

Our towns and cities need to become people focused areas which create local social and economic opportunities that the current planning/transport paradigm precludes.

How can we better integrate land use planning and transport planning in Ireland?

Aside from the National Development Plan commitments, **our transport infrastructure will also have to support the aims of the Climate Action Plan.** Essential to this will be the creation of local neighbourhoods which are nodes of an integrated public transport network, which also non-porous to private vehicles but which focus on streets which are people friendly and promote active modes of transport.

Decarbonising transport will involve prioritising no-carbon active transport options, low carbon mass transport options, and dedicating far less space to low volume private vehicles. The principle means of reducing congestion is to have more people using modes of transport that do not suffer from congestion and ensuring that people who use private vehicles that are prone to causing congestion don't transmit that congestion to mass transport options.

Secondly, the state investment associated with transport infrastructure often provides windfall profits for landholders who experience disproportionately receive the benefits of that infrastructure, amounting to a transfer of wealth from the public purse, and from the ultimate users of that land to the original owners.

Integrated active land management, planning, and transport infrastructural development will be an important element of financing and delivering our National Development Plan.

Are there international best practice examples around the integration of land use planning and transport planning that could be applied in an Irish context?

- **Vienna** is an important city to consider which has managed to support urbanisation with integrated public transportation and affordable accommodation.[4] And in particular, the Seestadt Aspern[5] [6] which could be a model for the development which is to occur along the MetroLink line.

[4] https://www.tandfonline.com/doi/full/10.1080/15568318.2016.1251997
[5] https://www.aspern-seestadt.at/en/business_hub/planning__reality/master_plan
[6] https://www.eltis.org/discover/case-studies/urban-development-aspern-seestadt-vienna-austria

- **Friburg** is another example of where this has been done well[7] [8] [9]

- Stockholm[10], particularly **Hammarby Sjostad**

- **Copenhagen**[11]

There are many innovative paths which we can take, we can be certain though that our current trajectory is unsustainable.

Recommendations

- **Our cities and towns as they will have to become more people friendly, transport infrastructure that is hostile to active travel hurts our economy, and our society.**

- **Getting our transportation infrastructure right is a prerequisite to making our town and city centres vibrant again.**

- **Section 28 guidelines which protect town centres, promote active transport infrastructure in urban settings, and prioritise public transport options linking urban neighbourhoods with towns and cities are essential.**

- **Our transport infrastructure has to support the aims of the Climate Action Plan**

- **Decarbonising transport will involve prioritising no-carbon active transport options.**

- **Integrated active land management, planning, and transport infrastructural development will be a fundamental element of financing and delivering our National Development Plan.**

[7] https://www.tandfonline.com/doi/full/10.1080/15568311003650531
[8] http://www.reconnectingamerica.org/assets/Uploads/2011FreiburgIJSTBuehlerPucher.pdf
[9] https://www.tandfonline.com/doi/abs/10.1080/13504509.2011.570801
[10] https://www.researchgate.net/publication/289332069_Transit-Oriented_Development_TOD_Analyzing_urban_development_and_transformation_in_Stockholm
[11] https://www.sciencedirect.com/science/article/abs/pii/S0966692312000130

Public Transport

In the absence of appropriate, reliable, and available public transport people will continue to rely primarily on private vehicles. As the CSO data[12] has demonstrated, for decades there has been an increasing number of people reliant on private transport for commuting. While the interstitial period between 2011 and 2016 showed growth in the proportion of commuters that used public transport increased, and this is very welcome, the absolute number of people using private vehicles as their primary mode of transportation for commuting increased by almost 8%, or 100,000 people, in absolute terms.

In 2011, transport accounted for 23% of our total CO2 emissions[13], or 34% of our non-agricultural emissions. By 2016 this had increased to 38%, by 2018 this had increased to 40% of our non-agricultural CO2 emissions. In absolute terms CO2 emissions between 2011 and 2016 increased by 1631 ktCO2. By 2018 this had increased by a further 607 ktCO2.

Our capacity to meet our 2030 emissions targets is threatened by this rise in transport related emissions, as things stand the momentum on transport related CO2 emissions will keep driving this increase.

Optimising travel options with reference to CO2 emissions is a non-trivial challenge[14] much depends on the cost of production, capacity, the level of utility, the journey time/distance involved, the energy supply type (fuel type, fuel mix, electricity supply source etc.) given the mix of public and private vehicles in use in Ireland today, certain things are known; cycling is best, followed by walking, then light trams and buses are better, followed by heavy rail, then there are private vehicles.

Factors that affect efficiency within this mix include the number of passengers, the degree to which the fuels involved are renewably supplied, the opportunity costs that capital projects involve, but we can say with certainty that an electrically powered

[12] https://www.cso.ie/en/releasesandpublications/ep/p-cp6ci/p6cii/p6mtw/
[13] https://www.seai.ie/data-and-insights/seai-statistics/key-statistics/co2/
[14] https://ftalphaville.ft.com/2020/01/24/1579855239000/The-electric-vehicle-carbon-emissions-debate/

MetroLink or Luas, powered through renewably sources, will be more efficient than any other motorised mass-transit option.

User type, local conditions, and national geography, will determine which mix of electrified rail, hydrogen vehicles, buses, biomethane, HVO bio-diesel, eVs, and personal powered transporters, bicycles and active travel which would be appropriate for a given area of a town or city, but it is likely that **commuting options will become more multimodal, and with this more integration of public transport will be needed.**

While it is clear is that **a national strategy which aims at increasing the usage of public transport offerings is a much needed**, and that central co-ordination will be needed to ensure appropriate national level planning and integration, interacting with and co-ordinating at a high level between the Regional Assemblies, the Office of the Planning Regulator, and the Local Authorities.

Fitting within a national framework that seeks to prioritise mass-transport options over private transport options, **the principle of subsidiarity should be applied at the regional and the metropolitan levels**. This is particularly important as it is the integration of different modes of transport (regardless of transportation type) that facilitates the adoption of public transport.

The Chambers network has repeated argued that **metropolitan areas should have a greater say over how their transport infrastructure is designed and developed.** Just as differences in scale would suggest that solutions suited for Galway could be a bad fit for Dublin, geographical differences could argue that solutions for Cork might not be appropriate for Limerick.

At the urban level, an on-the-ground presence will be necessary for strategic bodies to ensure that there is appropriate local experience and expertise – along with sufficient derogated powers – to ensure that transportation networks can comply with higher level national, and regional schemes and priorities, while also being sufficiently independent to innovate the best solutions for their metropolitan area.

The Department should consider examining the regulatory models for countries which have cities and regions of comparable scale to Ireland. Belgium, Denmark, and the Netherlands have climates not dissimilar to our own, and while more densely populated they tend to have a number of cities of comparable scale, in terms of population, to Irish cities, without the major metropolises that are found in the larger European countries.

If people are going to make the scale of the shift that climate action makes necessary, then commuting by public transport must become an option that is preferable to other alternatives. Beyond appealing to the goodness of individuals, and admonishing them for not doing the right thing, we must create a system that makes public/active transportation the default option for the majority of people by making it the rational choice.

Part of this will be appropriately apportioning the available dedicated space for travel to high volume transportation options. This will require more bus gates, more light-rail and heavy rail options, more cycle paths. **Local areas should look towards the creation of superblocks which are porous for active transport options which are connected to other urban centres through public transportation nodes.**

Increasing the proportion of land dedicated to mass transportation options will also increase the capacity of the existing public transportation fleet. The mean transportation speed of Dublin traffic in peak hours is 18km/h (dipping to 10km/h for the last km), off peak is 36 km/h, and max speed is 45km/h[15]. Doubling the peak hour speed of our public service fleet also doubles its capacity, at the marginal point when it is most expensive to add extra vehicles to the fleet.

[15] https://inrix.com/scorecard-city/?city=Dublin&index=52

Recommendations

- **Our capacity to meet our 2030 emissions targets is threatened by this rise in transport related emissions.**
- **As commuting becomes more multimodal more integration of public transport networks will be needed.**
- **A national strategy which aims at massively increasing the usage of public transport offerings is a much needed.**
- **The principle of subsidiarity should be applied at the regional and the metropolitan levels for all public transport planning.**
- **Metropolitan areas should have a greater say over how their transport infrastructure is designed and developed.**
- **The Department should consider examining the regulatory models for countries which have cities and regions of comparable scale to Ireland.**
- **If people are going to make the scale of the shift that climate action makes necessary, then commuting by public transport must become an option that is preferable to other alternatives.**
- **Local areas should look towards the creation of superblocks which are porous for active transport options which are connected to other urban centres through public transportation nodes.**

Active Travel

If, as the National Development Plan demands, the bulk of our population growth is to be centred in urban areas, **our urban areas need to be fit for urban living**. Most trips that people make are short (national average 1-3km, taking on average less than 15 minutes) with the purpose of approximately half of all trips being for work/education, and about 25% of total trips being for socialising[16]. While private vehicles predominate as the most frequently used mode of transport, the second most frequently used mode of transport is walking. Of those who walk and cycle 80% of those trips are up to 30 minutes in duration. This creates an ideal upper bound of the walking neighbourhood with a radius of 3km, and a cycling neighbourhood of radius 8km.

Unfortunately, infrastructural deficits reduce these upper bounds. Irish data demonstrates this as 70% of the trips taken (nationally) involve someone driving a private vehicle. English research[17] highlights the complexity of the socio-economic relationships that are involved in choosing one mode of transport over another, findings that are echoed in Irish data which demonstrates that while people on lower incomes tend be more likely to use active transport modes, so too are professional/managerial men – a phenomenon that is not replicated among professional women.

This suggests that **there is a strong gender component to the take up of active travel in Ireland.**

But other international data, where active travel is more typical than here and in Britain, and where women are more likely to be walking/cycling point suggest that **safety, ease of use, and time savings are the principle factors which affect choosing one mode of transport over others.**

[16] https://www.nationaltransport.ie/wp-content/uploads/2019/01/National_Household_Travel_Survey_2017_Report_-_December_2018.pdf
[17] https://www.sciencedirect.com/science/article/pii/S1369847818300482

> "Real and perceived safety has a profound effect on modal choice especially in terms of the most sustainable modes of travel - walking and cycling and the ability to access public transport. It is important to recognise that safer roads also mean more sustainable roads. If groups of road users are deterred from using unsafe roads, they might shift to other less sustainable modes of transport."
>
> – The European Urban Mobility Observatory[18]

In contrast with Ireland, where only 4% of commuters are cyclists and three quarters of them are male, in Copenhagen, where cycling is becoming increasingly safe, more than 40% of commuters are cyclists and 55% of them are female. The disproportionate decrease in women cycling in Ireland has only been a phenomenon since the 1980s, so if it is cultural it is a recent effect. Colloquially the reason given for the low level of cycling, and in particular the low number of female cyclists relates to the perception, and reality, that cycling in Ireland is not safe.

Extending transport beyond roads, slightly, we should look to all transport infrastructure be it roadway, footpaths, cycleways, intersections and ensure that the safety of all potential users is paramount. **Broadened footpaths with integrated cycleways and raised intersection points do not only benefit people who are cycling, they benefit those with mobility problems, the elderly, parents with infants, and the local economy.**

Where people have active transport options, they use them. Through walking or cycling to the shops, meeting friends and socialising in local businesses, increasing their social interaction with their neighbours they stimulate their locality and the local economy.

Transport for London have demonstrated[19] how appropriate active travel infrastructure is central to stimulating economic activity at the neighbourhood level. Key to the National Development Plan's success is the creation of living urban neighbourhoods which have sufficient social and economic resources within their fifteen-minute travel areas to foster the development of healthy urban areas.

[18] https:// www.eltis.org/sites/default/files/urban_road_safety_and_active_travel_in_sumps.pdf
[19] https://tfl.gov.uk/corporate/publications-and-reports/economic-benefits-of-walking-and-cycling

Getting the active travel infrastructure correct within those zones means those zones can be larger (in terms distance) but also population, which means that services provided in that neighbourhood serve larger populations and so offer can greater and more diverse opportunities within them – while also making the provision of state and social services more efficient.

Active transport requires prioritising pedestrians over other road users, allowing active travel modes, creating zones which are circumscribed with public transport options, that are permeable to cycling and personally power transporters, but disincentivise the use of private vehicles. **When Active travel options are the easiest, quickest, safest mode of transport, that is when they will be used.**

Social, Economic, and Environmental benefits

Active travel brings multiple benefits, most importantly facilitating active travel reduced the need for utilising private transport, thereby reducing the burden we place on the environment. **The most efficient means of transport is the bicycle, and second to that is walking.** Not all individuals can cycle, and not all people are sufficiently mobile to make active travel a ordinary part of their lives, but those actions which we can take which support those with mobility impairments, and people with disabilities are also things that benefit everybody.

We should be designing all of our public spaces so that they are safe for children, if they are made safe for children they are also made safe for people with varying degrees of ability, they create opportunities for local businesses and the local economy to develop, which reinforces the resources of the Local Authorities which will face much of the burden of implementing the street level changes.

While it is a heuristic that people are willing to actively commute up to 4km[20], qualitative assessments of why people are willing to travel actively usually relate to the time spent commuting[21] not the absolute distance. The heuristic of using distance to determine the appropriateness of active travel infrastructure [22] [23] may not be useful when factors such as crossing roads through traffic, waiting for pedestrian lights, and non-permeable barriers can greatly reduce the average pace of travel, effectively increasing the length of routes.

[20] https://www.sciencedirect.com/science/article/pii/S2214140517307405
[21] https://www.ncbi.nlm.nih.gov/books/NBK338179/
[22] https://www.publichealth.ie/files/file/Active travel/Active travel - healthy lives.pdf
[23] https://www.researchgate.net/publication/5668486_Active_commuting_to_school_How_far_is_too_far

Distance should not be seen as the primary limiting factor to active travel, particularly when, given that cultural, demographic and cultural factors[24] can have more explanatory force than distance. Further, in the context of children, conflating what is optimal[25] (given the existing transport infrastructure) for what is a hard physical limit may result in inappropriate infrastructure design and development.

Considering how children in Finland[26] have both much high rates of active transport, and that this falls off at a much slower rate than we see in Scotland[27], and that their active travel rates in winter exceed (by a factor of 3 to 5) the typical rates of active transport in Ireland, we should keep in mind that what are **existing empirical upper limits to active travel are consequences of both our physical/infrastructure environment and culture, and we should expect that if we are successful in our transition to a people friendly transport environment, then distance will become less of a hurdle to active transit.**

Optimising the utility of scarce public resources is essential for a functioning, equitable and sustainable transport system, and particularly for contested spaces like roads. The evidence base which is emerging from London[28] has found that per square meter dedicated cycleways can be five times more efficient at throughputting individuals than dedicated carriageways for private vehicles.

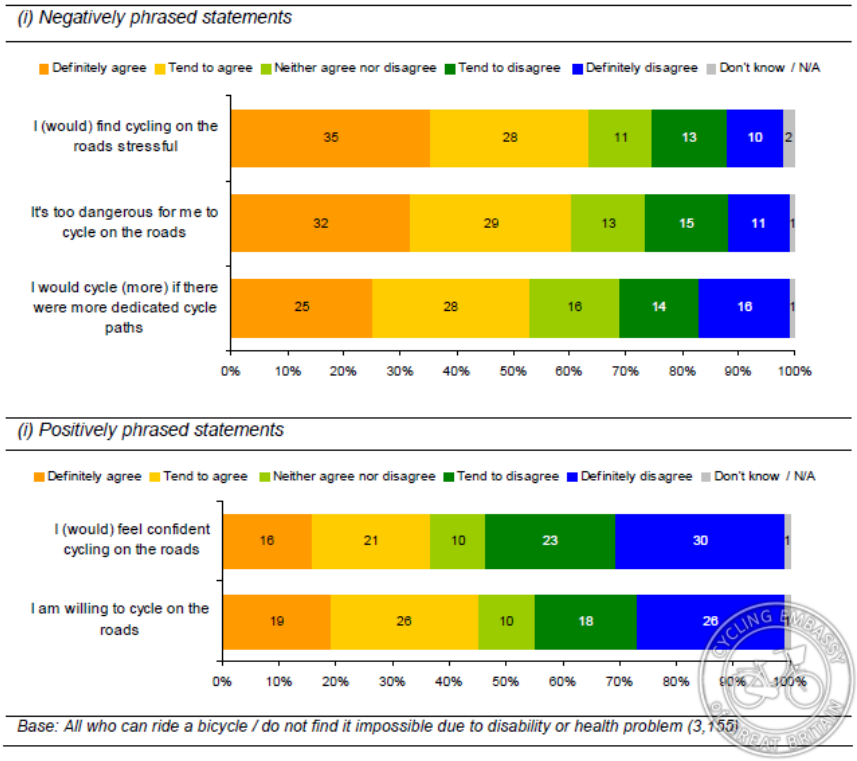
It is important to allocate resources to different modes of transport on the basis of their optimal capacity, and not the current demands placed upon them – where there are conflicts between different modes of transport, be they different modes of active, public, or private means of transport it curtails the utility of the infrastructure base. Routes should be as deconflicted as possible – having buses crowding out light rail, and the signalling for light rail causing buses to be backed up for up to seven or eight intersections is an inappropriate use of resources.

Having cycle space conflicting with private road users, and modes of public transport makes cycling more dangerous, and this added risk discourages additional cyclists from commuting. Cycling is the most flexible and most efficient means of commuting,

[24] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0213159
[25] https://www.researchgate.net/publication/281141447_Active_Transport_Physical_Activity_and_Distance_Between_Home_and_School_in_Children_and_Adolescents
[26] https://www.tandfonline.com/doi/figure/10.3402/ijch.v75.33319
[27] https://www.researchgate.net/publication/5668486_Active_commuting_to_school_How_far_is_too_far
[28] https://tfl.gov.uk/corporate/transparency/freedom-of-information/foi-request-detail?referenceId=FOI-1235-1718

for those who are able to participate, and the risk factor strongly discourages many from not cycling. The British Cycling Embassy has found that this is the predominant reason who those who can cycle don't cycle[29].

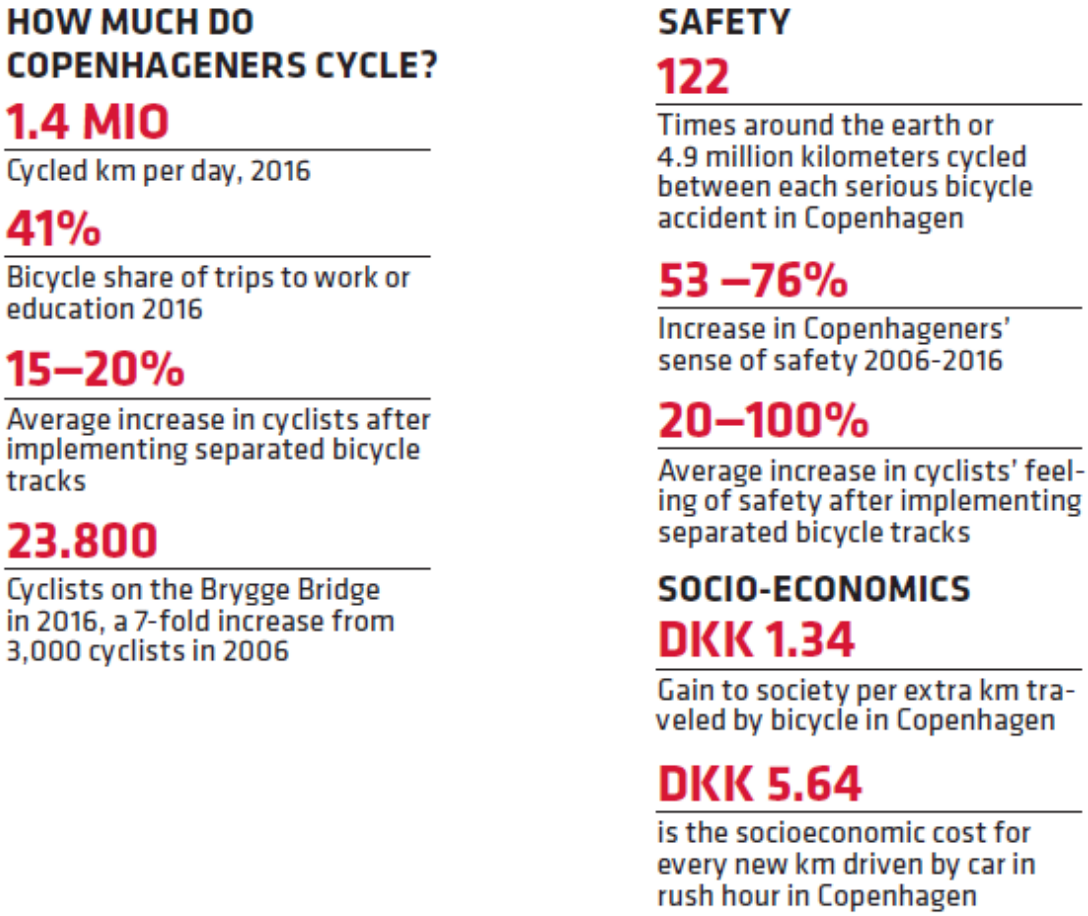
Figure 5.1. Attitudes towards cycling and safety



Research in the Irish context also highlights safety concerns for those who choose to cycle[30] and it is noted that there is a huge gender and regional[31] disparities in those who cycle. Census 2016 showed how while the absolute number of cyclists commuting to work or education increased since 2016 the proportion of those who are female remained at 27%. The total number of men who cycle is only now approaching the numbers of men who were cycling in the 1980s. **The number of women commuting through cycling remains far below the 1986 level.** These absolute numbers hides the relative decline in popularity of cycling as a means of commuting with the proportion of commuters cycling more than halving over that period. Of those who do cycle most are in urban areas with Dublin and Galway considerably ahead of other areas and among the urban population less than 6% of male commuters cycle, and fewer than one woman in forty commutes.

[29] https://www.cycling-embassy.org.uk/wiki/barriers-cycling
[30] https://www.rte.ie/news/ireland/2019/0609/1054355-cycling-women/
[31] https://www.cso.ie/en/releasesandpublications/ep/p-cp6ci/p6cii/p6mtw/

This is in marked contrast with somewhere like Copenhagen where the modal commuting option is cycling (at 41% of commuting journeys) and majority of those who cycle are women[32]. Data from Copenhagen[33] highlights the relationship between a sense of safety and the decision to cycle, even as a city which has a very high proportion of commuters cycling, where a segregated cycle route is introduces, the increase in utility for that route is in excess of 15%.



Of those who cycle in Copenhagen, the majority cycle because it is quicker than alternative forms of transport, this reason is followed by ease of use (for half of those who cycle), and subsequently as a source of exercise for about 40% of cyclists. Even there, the impediments to cycling more often centre around appropriate infrastructure

[32] https://www.theguardian.com/cities/2015/jul/09/women-cycling-infrastructure-cyclists-killed-female
[33] http://www.cycling-embassy.dk/wp-content/uploads/2017/07/Velo-city_handout.pdf

and safety. Importantly, the assessment criteria for cycling plans include targets for the subjective experiences of cyclists, such as :

- Increase the number of cyclists who feel safe in traffic to 90%
- Increase the share of cyclists who find cycle tracks well maintained to 80%
- Increase citizens satisfaction with bicycle parking to 70%

In contrast with the National Cycle Policy Framework where the initiation of "User Satisfaction Surveys" was an action (#19.5) which was "not significantly advanced". Given that the primary cause for individuals not cycling is their subjective assessment of the risks associated with cycling, **any programme which aims to increase the population of those who cycle will have to be based upon removing the barriers to cycling**. Further, **it is only when those who currently cycle feel safe commuting that we can reasonably expect people who do not cycle to choose to start.**

Such a workplan, if developed in a coherent national way, would facilitate targeting those aspects which limit take up among different target groups. There is for example an implicit assumption that those who cycle are not without disability, **however many people who have difficulty walking can find that it is easier to cycle**[34]. Often however this results in different problems arising from their mobility issues – kissing gates are often impossible for people with disabilities to navigate, many are asked to dismount in pedestrian areas even though they are using the bicycle as a mobility aid, others are excluded from public spaces or transport.

We need to come to look at active travel in a holistic way. As the data from Dublin City shows[35] almost two thirds of active transport is walking, the remainder is cycling. Just as we have inadequate cycling infrastructure, we also have inadequate walking infrastructure. The deprioritisation of active transport is a response to the engineered solutions to mitigating the congestion that is associated with private vehicles. This is particularly iniquitous in urban areas, where private vehicle trips are a minority of total trips made, but where urban residents suffer the greatest degree of atmospheric and noise pollution arising from private vehicles which are driven through their areas by people transiting through their neighbourhoods.

[34] https://wheelsforwellbeing.org.uk/wp-content/uploads/2019/04/Survey-report-FINAL.pdf
[35] https://www.www.nationaltransport.ie/wp-content/uploads/2019/04/Canal_Cordon_Report_2018.pdf

Ultimately, **we are going to have to recognise, in planning and transport infrastructure, the difference between a street – where people are the priority – and a road, where vehicles are prioritised.** Roads can link areas of social, economic, and recreational activity, but where every street becomes a road, they crowd out people, their potential, and their opportunities.

Irish town centres have the highest levels of vacancy in the EU, arising largely out of bad planning, and inappropriate travel infrastructure. Town centres need to prioritise people orientated activities and need to do this through supporting active transport.

Recommendations

- **Our urban areas need to become fit for urban living**
- **We are going to have to recognise, through planning, transport infrastructure and regulation, the difference between a street – where people are the priority – and a road, where vehicles are prioritised.**
- **Irish town centres have the highest levels of vacancy in the EU, arising largely out of bad planning, and inappropriate travel infrastructure.**
- **Town centres need to prioritise people orientated activities and need to do this through supporting active transport.**
- **We should be designing all our public spaces so that they are safe for children, streets that are safe for children are safe for everyone.**
- **Active transport requires prioritising pedestrians over other road users.**
- **The most efficient means of transport is the bicycle, and second to that is walking.**
- **We need to come to look at active travel in a holistic way. Data from Dublin shows almost two thirds of active transport is walking and the remainder is cycling**

- **Broadened footpaths with integrated cycleways and raised intersection points do not only benefit people who are cycling, they benefit those with mobility problems, the elderly, parents with infants, and the local economy.**

- **It is important to recall that many people who have difficulty walking can find that it is easier to cycle.**

- **Distance should not be seen as the primary limiting factor to active travel, infrastructure is.**

- **The existing upper limits to active travel are a consequence of both our physical/infrastructure environment and our culture. We should expect that with a successful transition to a people friendly transport environment, then distance will become less of a hurdle to active transit.**

- **Optimising the utility of scarce public resources is essential for a functioning, equitable and sustainable transport system – particularly for contested spaces like roads.**

- **It is important to allocate resources to different modes of transport on the basis of their optimal capacity, and not the current demands placed upon them**

- **The number of women commuting through cycling remains far below the 1986 level.**

- **There is a strong gender component to the take up of active travel in Ireland.**

- **Safety, ease of use, and time savings are the principle factors which affect choosing one mode of transport over others.**

- **Any programme which aims to increase the population of those who cycle will have to be based upon removing the barriers to cycling**.

- **It is essential that engagement with those who actively travel, and those who don't is part of any active travel strategy, and that the attitudes to active travel in these populations are key performance metrics for the national active travel strategy.**

- **It is only when those who currently cycle feel safe commuting that we can reasonably expect people who do not cycle to choose to start.**

Climate Change Challenge

Core to our state wide response to Climate Change is our National Development Plan. While our existing building stock is not suited for meeting our CO2 emission reduction targets (and remedying this will require considerable retrofitting will consume significant economic resources), we can at least stop making this situation worse and reforming our civic spaces to facilitate active transport and the shift to modes of mass transport.

Developments are built only where transport infrastructure provides access. **Our current national transport infrastructure facilitates the development of sprawl**. If we are to shift our society towards a sustainable economic trajectory it will be transport that forges that path. **Transport infrastructure needs to prioritise town centres** and areas which are already developed and improve the local transport environment and their public transport connections to other transport nodes and hubs to the point that private vehicles become a sub-optimal choice for the greatest part of the population.

Current e-vehicles are, over their entire product lifespan, only less carbon intensive than existing fossil fuel alternatives where they are used for travelling in excess of 100,000km[36] and are at that point very far from being carbon neutral. While increasing the quantity of renewably supplied electricity will minimise the absolute harm these vehicles will do through CO2 emissions, for 2050 net-zero emissions targets to be hit, all of these emissions including the emissions generated through the construction and decommissioning of these vehicles will have to be removed from the atmosphere. Ultimately the cost of recovering these emissions from the atmosphere will be charged to the user of these vehicles through carbon taxes – raising their costs considerably. As fewer people use these vehicles the burden of servicing the infrastructure the need will fall on a smaller population, again raising the cost for each user.

[36] https://ftalphaville.ft.com/2020/01/24/1579855239000/The-electric-vehicle-carbon-emissions-debate/

Our economy needs to have cost effective alternatives to private vehicles, if the taxes associated with our emissions burden are not to become a poverty trap which becomes the source of public dissent.

As the National Transport Agency's research demonstrates[37], **people living in urban areas are least likely to use private vehicles.** As the department's discussion paper on the climate change challenge highlights future strategy will have to avoid making the use of private vehicles a necessity. This will require a very different form of spatial planning, prioritising public mass transit options over private vehicles on roads, and the prioritisation of people through supporting active transportation options on streets within neighbourhoods.

The most effective way of reducing transportation's toll on the environment is to ensure that transport options which do not require the use of private vehicles are the easiest, quickest, and safest means of transit.

Creating neighbourhoods that are porous to pedestrians and those others who actively travel, that are linked through energy efficient modes of mass transport to other porous neighbourhoods will be essential to transforming our relationship with our environment, and is key to both the National Development Plan, and our Climate Action Plan.

There are huge economic gains to such a strategy, aside from concentrating the demand for public services which will lead to greater efficiencies of service through specialisation, towns that that facilitate people creating lifestyles which are not reliant on carbon intensive modes of transportation will also enrich those living there the AA estimate that the burden of car ownership for a typical household is almost €11,000[38] whereas for Copenhagen households, of those who have a cargo bike, 30% of households have been able to replace their car with the bike. This massively expands discretionary income for those households, which are also households that are primed for spending their income closer to home.

Transport for London data[39] highlight that **people who walk to their high street frequent it twice as much per month, compared to people who drive**, and over

[37] https://www.nationaltransport.ie/wp-content/uploads/2019/01/National_Household_Travel_Survey_2017_Report_-_December_2018.pdf
[38] https://www.theaa.ie/aa/motoring-advice/cost-of-motoring.aspx
[39] https://tfl.gov.uk/cdn/static/cms/documents/walking-cycling-economic-benefits-summary-pack.pdf

that month will spend 40% more per person than drivers. Retail vacancy typically decreases by 17% within a year of implementing healthy streets initiatives, and while retail rental values increase by 7.5% housing supply expands and tracks the wider trends of the house rental market without creating gentrification hotspots of residential rental price rises.

Decreasing vacancy in urban centres also provides considerable increased revenue opportunities for Local Authorities while also reducing the burden on the businesses and households which are currently contributing to the Local Authority budgets.

Recommendations

- **Our National Development Plan is an essential element of our response to Climate Change and transportation is fundamental to its success**
- **Our current national transport infrastructure facilitates the development of sprawl**.
- **Creating neighbourhoods that are porous to pedestrians, linked with energy efficient modes of mass transport is key to both the National Development Plan, and our Climate Action Plan.**
- **The most effective way of reducing transportation's toll on the environment is to ensure that transport options which do not require the use of private vehicles are the easiest, quickest, and safest means of transit.**
- **People living in urban areas are least likely to use private vehicles.**
- **Our economy needs to have cost effective alternatives to private vehicles.**
- **Transport infrastructure needs to prioritise town centres and active travel.**
- **People who walk to their high street frequent it twice as frequently and spend 40% more per month compared to those who drive.**
- **Decreasing vacancy in urban centres increases revenue opportunities for Local Authorities while reducing the local tax burden on businesses and households.**

Congestion

Congestion is a function of the space required for a mode of transport, the space allocated for that mode of transport, and the number of units that can pass through a given intersection in unit time. Given the large space requirements of private vehicles, there will always be congestion.

Efforts to minimise congestion at any local point is redundant as the transportation system is porous to private vehicles and consequently the traffic system is autoregressive – creating flow in one areas causes drivers in adjacent areas to alter their behaviour, and the system transitions to an new equilibrium point.

Lag is a significant problem here, as during that period where flow has locally increased, but has not yet transitioned to the new equilibrium phase state, people alter their behaviour choosing homes or work in locations that are temporarily benefiting from the alteration to the transport system, by the time the system stabilises these behavioural changes add extra load to the system and congestion in its totality increases.

The approach to congestion should not focus on mitigating or alleviating congestion because this presupposes that congestion is a turbulent state which is an abnormal condition within the transportation system. Rather, congestion is the natural outcome of hundreds of thousands of people moving towards different ends, in private vehicles, within a narrow window of time.

The key constraints are time and space. The department of transport is unlikely to ever be able to restrict when people start their work or education (the primary reasons for peak hour transportation) what it can do is prioritise efficient means of transportation.

Fewer than one in four private vehicles in Dublin[40] carry a passenger, and between a half and a third of taxis are not carrying a passenger as they drive. Buses carry on average 35 passengers, on the space that could fit more than fifty cyclists or a hundred pedestrians.

Within neighbourhoods, the number of active-travel-only intersections should be maximised through the clustering of people friendly streets together, and then surrounding these fifteen-minute neighbourhoods with access points to public and private transport options on peripheral roads.

On roads, in addition to segregated pedestrian and cycling/personally powered transporter routes, buses should have priority access to spaces either through isolated lanes, or bus gates. **Given their low rate of occupancy and the congestion they cause in bus lanes taxis should be restricted to using only lanes that are available to private vehicles.**

Ideally inter-neighbourhood cycle routes should be entirely separated from other conflicting form of transport as those routes tend not to suffer from congestion given the small amount of space individual cyclists use. Similarly **buses should not be conflicting with other forms of traffic**, and given the huge capital costs associated with heavy and light rail options these should always be constructed so that they do not conflict with existing traffic routes, and where they do, they should in principle extinguish the existing routes.

Dedicating space for mass public transport options will result in more efficient use of both the road space and the existing transport fleets, complementing this is the expansion of the existing fleets, and the prioritisation of mass transportation options at intersections.

The department should strongly resist any suggestion that ride sharing apps will reduce congestion as the evidence from San Francisco (where Mobility as a Service has been introduced) is that these services accounted for half of the increase in congestion which that city experienced[41]. They also typically increase pollution while also undermining more efficient public transport options[42].

[40] https://www.www.nationaltransport.ie/wp-content/uploads/2019/04/Canal_Cordon_Report_2018.pdf
[41] https://www.sfcta.org/sites/default/files/content/Planning/TNCs/TNCs_Congestion_Report_181015_Final.pdf
[42] http://www.schallerconsult.com/rideservices/automobility.htm

Consideration should be given to extending **the cycle to work scheme to personal power transporters.**

Personal powered transporters that are equivalent in power and speed limits to e-bikes should be treated as equivalent to e-bikes.

Efforts like **congestion charging should be resisted** in the short term as they will be most effectual when there are viable alternative public transport offerings in place. Where charges like this are introduced and where such alternatives are not on offer these charges are regressive with the burden of taxes falling heaviest on those who have least.

Recommendations

- **Within neighbourhoods, the number of active-travel-only intersections should be maximised through the clustering of people friendly streets.**
- **Ideally inter-neighbourhood cycle routes should be entirely separated from other conflicting form of transport as those routes tend not to suffer from congestion**
- **Given their low rate of occupancy and the congestion they cause in bus lanes taxis should be restricted to using only lanes that are available to private vehicles.**
- **Buses should have their own lanes and not be conflicting with other traffic.**
- **Dedicating space for mass public transport options will result in more efficient use of both the road space and the existing transport fleets.**
- **The department should strongly resist any suggestion that ride sharing apps will reduce congestion**
- **The cycle to work scheme should be extended to personal power transporters.**
- **Personal powered transporters that are equivalent in power and speed limits to e-bikes should be treated as equivalent to e-bikes.**
- **Congestion charging should be resisted in the absence of appropriate public transportation options.**

Greener Buses

What challenges and issues need to be considered in relation to transitioning the PSO urban bus fleet to alternative fuels and technologies?

Chambers Ireland is supportive of the transition from the existing fleet of buses to a greener fleet. What the makeup is of that ultimate fleet is, we are ambivalent. The embodied CO2 which is used in the construction and decommissioning of buses is considerable which would argue against replacing all but the oldest of the fleet (on CO2 emissions basis alone), though there are numerous alternative reasons for doing so, be they improving the passenger experience to encourage people to shift from one mode of travel to another, air pollution and particulate levels in urban air, the business case for having a single model for maintenance or otherwise.

The decision in Dublin to go with diesel hybrids was probably the correct decision. An all-electric bus would need a considerable mass of batteries and the construction of these would constitute the vast majority of CO2 embodied in the Bus. Hybrids offer many benefits over pure diesel as they allow buses to shift off combustion while in congestion and residential areas. **Consideration should be put to transitioning these vehicles onto HVO biodiesels**, while that wouldn't reduce the ozone, nitrogen oxide, and particulate pollution associated with diesel, it would reduce the net CO2 emissions associated with these vehicles, while also stimulating the demand for biodiesel.

Chambers Ireland also strongly welcomes the move towards CNG buses in Cork, compressed natural gas offers many improvements to diesel fuelled buses, while they are still CO2 emitting, relative to the diesel alternatives they are far less so, they are also produce far other pollutants. Perhaps the best element of the CNG buses is that they can also burn biomethane, which if sourced from feedstocks derived from waste products also reduces the impact of these greenhouse gases that would have otherwise escaped into the atmosphere. These **CNG buses, once they have moved to greenly sourced biomethane have the potential to be a huge net positive element to reducing our state's impact upon the wider global environment.**

A third possible alternative is the use of Hydrogen fuel cells in this fleet. Hydrogen has a number of positive aspects to it, firstly if produces through electrolysis, and if that electrolysis is fuelled by wind/solar derived electricity, it is entirely neutral from a Co2 perspective. Given its means of production, it is also not competing with land which could otherwise be used for food, or set aside for biodiversity efforts, and so doesn't have the same externality risks as biomethane and biodiesel. It is an industry in its infancy so there may be elements to this technology and its supply chains where the problems have yet to be worked out. However, the first commercial fleet of renewably sourced, Hydrogen powered, buses on this island should be operating in Belfast by the end of this year[43].

It may be that it is too early to predict what the right mix of greener fuels should be, though it seems probably that biomethane fuelled buses may be the best in the medium term and ultimately Hydrogen could be the best (assuming we create a sustainably produced Hydrogen supply chain).

Based on the additional investment costs associated with alternatively fuelled vehicles and their associated infrastructure, should bus fare structures be modified?

Yes, it is critical that people come to use public transport options in all instances where they do not feel it is possible or appropriate to use active travel.

To maximise utility the marginal cost for using public transport should be minimal, and ideally zero. Given that many of the costs associated with using private vehicles are not priced into the vehicles, and are instead transferred to the rest of society through the externalities of pollution, congestion, CO2 emissions etc. consideration should be put to subsidising the public transport fleets further.

If it is decided that the passenger should pay fares, consideration should be given to creating which would amount to some nominal amount, say 1 Euro/day (paid annually) as they do in Vienna. One of the critical issues with shifting people from their private vehicles is that they get the benefit of space in their private vehicles so they are more comfortable than public transport alternatives, meanwhile most of the costs associated with their private vehicle are sunk costs – they have already paid for their vehicle, tax, and insurance so they maximise their utility my maximising their use of their vehicle.

[43] https://www.rte.ie/news/ulster/2020/0129/1111764-hydrogen-bus-translink/

For people to make that shift to public transport there are only two mechanisms for doing so, firstly there is the marginal cost, it must become significantly cheaper (at the margin) to use public transport than to use a private vehicle, and better again, it must become significantly quicker to use public transport than to use a private vehicle. People who are time rich but cash poor will be sensitive to the first incentive, and those who are wealthier, but are time poor will be sensitive to the second.

Are there international best practice examples around the use of alternative fuels in urban bus fleets that could be applied in an Irish context?

- **Cork** already has a biomethane buses
- **Belfast** will be running renewably sourced Hydrogen shortly
- Both Biogas and Hydrogen fleets are been trialled and tested in Britain (**Bristol**, **Nottingham**, **Liverpool**, **London**).
- **Stockholm** has fully introduced CO2 neutral bus fleet.

Regulation of Public Transport

Given the scale of the effort that is needed to meet our climate action goals, it is essential that there is a clear coherent and integrated national strategy for creating an transport environment which allows people to gravitate towards public transport options because they are the easiest, safest, and quickest route option. Creating a public transport system which is reliable, affordable, and frequent will do much more for the uptake of those services than trying to regressively alter the behaviour of those who may have no other option than to use private transportation because of where they work and where they live.

While national routes and networks ought to be considered from a national perspective, the principle of subsidiarity should apply to transport policy in general. Transport infrastructure frames how we live, where we can work, the educational options that are available to us. Decisions which affect people in such fundamental ways should be made as close to them as possible. Therefore while a national body should frame the parameters of transport guidelines, in conjunction with the Office of the Planning Regulator, and with regard to the Climate Action plan to ensure that they are co-ordinated with our national obligations, our cities and towns should have the maximal amount of freedom to determine how these guidelines should be applied on the ground.

At a level below the national framework there is a strong role for regional transportation strategy to be created in conjunction with the Regional Assemblies. These regional level plans, which would involve transport infrastructure and plans which cross-cut Local Authority boundary lines should be synchronised with metropolitan offices which have the task of marrying local needs with regional strategies.

Our member chambers, from the National Development Plan growth cities, have argues that while the National Transport Agency should have a national remit, there should be regional and metropolitan agency offices which have remits to work with local and regional institutions to ensure that the optimum solution to local problems is found within the national framework.

The Dutch transport system operates under such a distributed authority line, and within metropolitan areas these are sometimes segmented and public service providers compete for all services within a catchment, a process which serves to facilitate the integration of multi-modal services.

Regarding Mobility as a Service (MaaS)/Shared mobility

The department would be wise to consider the externalities the relate certain forms of shared mobility platforms, particularly the Transportation Network Services. There is a certain element of them that are able to supply cheaper transportation options, but only because some of the costs associated with those services are transferred onto the general population. Uber lost their London licence because they did not prevent drivers who were using their network from operating under false identities, putting passengers at risk. Research from the United States reveals that **such services often increase congestion**[44], with fleets of vehicles which **are more polluting on average** than the typical road user[45] **and divert people from using more environmentally friendly public transport** options[46].

Shared mobility systems, other than Transportation Network Services, such as vehicle rental fleets, shared bicycle schemes, personally powered transporter networks may be of great use in some areas, but it should be for local agencies to determine their appropriateness for their area.

Personal Powered Transporters

The Chambers networks is strongly of the opinion that these vehicles should be classified akin to e-bikes, and that this should be accomplished at the earliest opportunity.

Rickshaws

Rickshaws were clearly meeting an unserviced demand, or they wouldn't have become as popular as the were. While there are strong claims for the regulation of public service vehicles, regulation should be proportionate to the risks

[44] https://advances.sciencemag.org/content/5/5/eaau2670
[45] https://ww2.arb.ca.gov/sites/default/files/2019-12/SB%201014%20-%20Base%20year%20Emissions%20Inventory_December_2019.pdf
[46] https://usa.streetsblog.org/wp-content/uploads/sites/5/2019/01/19-04931-Transit-Trends.pdf

associated with the service. Much of the discussion about rickshaws have related to ‘very deep’ safety concerns which are hypothetical risks rather than experienced hazards. If further regulations are to be introduced, they should focus on reducing known risks rather than hypothetical ones.