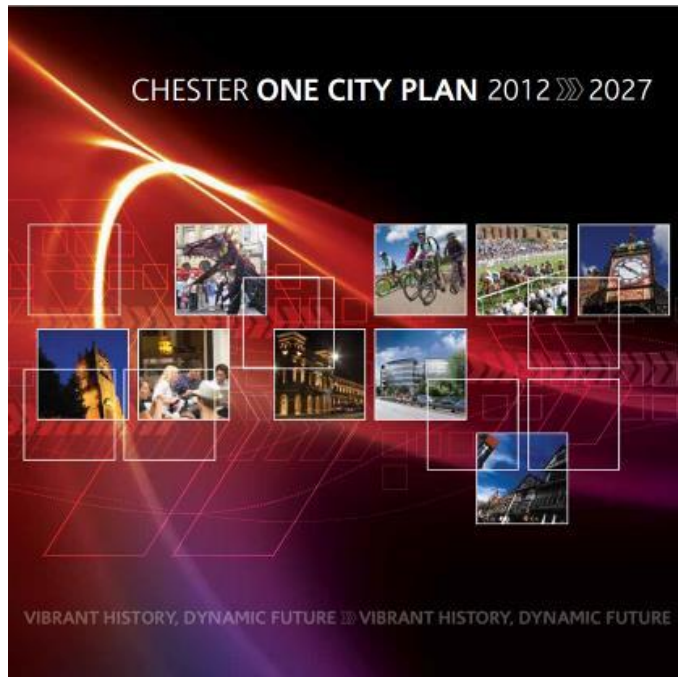


Final

Re-imagining Sustainable Transport in Chester

THINKING SMART MOBILITY

Chester Growth Partnership
Chester Business Improvement District
Cheshire West and Chester Sustainable Transport Taskforce



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In A Nutshell

THINKING SMART MOBILITY in CHESTER

A place where:

- Travellers move seamlessly from place to place.
- Travellers stipulate their journey and travel preferences on an App on their phone, computer or kiosk and are presented with journey choices, according to their preferences, which fully integrate mass transit and personal transport modes.
- Payment happens automatically using a processing method of their choice.
- The transition from one mode of transport to another is straight forward, perfectly timed and effortless.
- Congestion is minimised, air quality improved, and passenger comfort enhanced.
- There's plenty of on-demand travel options, and users have ready access to real-time journey information and an integrated journey planning platform.
- There is a branded and marketed bus-based 'Metro' – comprising an enhanced and extended park and ride system integrated with the local bus and rail networks – that not only gets you into the City Centre but also to work, to the hospital, to major visitor destinations, to the University, to the rail station and supports the revitalisation of Chester's more disadvantaged neighbourhoods – all with modern branded electric buses.
- There is an integrated network of Mobility Hubs, again branded as part of a wider network where you can pick up or interchange your chosen mode – bus, e-bike, e-scooter, car-share vehicle, a cargo bike, charge your EV, have a coffee and pick up a parcel. Small ones within residential neighbourhoods and larger hubs at key city destinations. This being based upon the Park and Ride and local bus networks
- Park and Ride sites have become large-scale Metro Mobility Hubs serving the City generally - providing express connectivity into the City Centre but also peripheral employment areas at Deeside, Airbus and the Business Park, together with nearby rural villages and other destinations such as Cheshire Oaks. Where they provide solar power / renewable energy EV charging and attractive retail, hospitality and waiting areas and integrated cycling and walking routes.
- Intermediate Metro Mobility Hubs along the P&R based Metro routes enable interchange with the local bus network serving local neighbourhoods, the Rail station and Bache rail halt and enable interchange with other mobility modes.
- Chester's more disadvantaged neighbourhoods are positively served by the extended and enhanced Metro network – enabling people in those areas to better access employment, education and training and health opportunities.
- City Centre car parks have been reimagined to be Mobility Hubs serving the City Centre and a cluster of smaller Mobility Hubs are arranged around the Inner Ring Road forming gateways to the City Centre's main pedestrian streets.
- More modest Mobility Hubs are located within local neighbourhood centres – forming a focus to a local network of cycling and walking routes – 20-minute neighbourhoods.
- The Inner Ring Road's roundabouts and subways have been attractively remodelled so cyclists and walkers willingly use them as safe ways to cross the ring road and the ring road has become a more humanised place – a zipper rather than a barrier.
- The rail station has 360-degree access rather than just looking towards the City Centre, is permeable with through pedestrian and cycle linkages.
- The City's main radial roads are Smart Corridors with smart signals and intelligent junctions that actively manage these key city arteries and intelligently prioritise public transport, cycling and walking, emergency responses as well as smoothing flows at rush hours in a flexible real-time system.

- There are off-road dedicated superhighways for cycles, micro EVs and walkers, as well as safe and continuous cycle lanes on the City's main radial roads.
- The University City is reinforced through a 'ribbon' of safe walking and cycling routes connecting the University's campuses.
- The large-scale City Centre development areas such as Chester City Gateway and City Place help to fill the gaps in the City's dedicated cycling and walking routes.
- There is a fleet of properly managed rental micro EVs (scooters and bikes including cargo bikes and bikes with panniers) that can be picked up at Mobility Hubs throughout the City.
- The City Centre has become a strong, safe and vibrant urban Neighbourhood where city centre living is the norm and it is a great place to be.
- The City Centre is a 20-minute neighbourhood at the heart of the City and Chester's urban village and suburban centres become the focus of a network of interconnected 20-minute neighbourhoods.
- The core of the City Centre is car free at extended core times with an expanded well managed pedestrianised area.
- There is extended alfresco, street trading, street markets, street-based events and activity, and public space animation - creating a vibrant place that people want to be a part of – to live in, to trade in, to work in, to visit and to invest in.
- There is a 'METROMINUTO Chester' – a walking plan for the wider central area and an enhanced wayfinding and signage approach to encourage walking and enjoying the City by foot.
- There is a framework for EV charging, pool-cars and car-club vehicles and bike parking for City Centre residents – sometimes this will be on-street and within new developments, however where this is not possible, within City Centre Car Park Mobility Hubs.
- There is proactive regime that promotes and actively supports City Centre residential developments with reduced residential parking or car free schemes and payments from residential developers towards the wider Smart Mobility network instead of providing on-site car residential parking
- The City Centre is a place that's safe, respected, well maintained and well managed.
- There is a Smart Mobility Innovation Centre to make this happen, to lead the change, be a hub of skill, expertise, innovation and communication, a focus for partnership working and to ensure wider benefits are realised.



Re-imagining Sustainable Transport in Chester

Thinking Smart Mobility

Imagine a city where travellers move seamlessly from place to place. Where they stipulate their journey and travel preferences on an App on their phone, computer or kiosk and are presented with journey choices, according to their preferences, which fully integrate public and private transport modes. Where payment happens automatically using a processing method of their choice. Where the transition from one mode of transport to another is straight forward, perfectly timed and effortless. Where the City's main arteries are smart and congestion is minimised, air quality improved, and passenger comfort enhanced. And where there's plenty of on-demand travel options, and users have ready access to real-time journey information and an integrated journey planning platform. A City in which people really want to live in, to trade in, to visit and to invest in, and has a vibrant and authentic neighbourhood at its core. Imagine – Chester.

1. INTRODUCTION and CONTEXT



Cheshire West and Chester Council established a Sustainable Transport Taskforce to explore ideas and pilot approaches to making transportation more sustainable in the light of its aspirations to tackle climate change.

The Chester Growth Partnership and Chester Business Improvement District (focused on the core of the City Centre) commissioned this piece of work. It had two key functions:

- To positively contribute to the work of the Sustainable Transport Taskforce, and,
- Provide an input into the review of Chester's One City Plan.

The work was undertaken by a small working group whose members are listed at the end of the report.

Transportation is not an end in itself – it is about people and place. Too often the discussion is about bus lanes, cycleways etc and not about the place we want to create and how people will interact and use that place. The discussion must start about place and people and must be a wider debate.

The original One City Plan didn't include a proper transport strategy to support its physical development and growth aspirations. Other policy documents such as the Local Plan and the Local Transport Plan are understandably too narrow in their remit. The One City Plan is focused on Chester and should do 'what it says on the tin' – be a single cohesive strategic framework to drive the City forward.

The world has changed since the One City Plan was produced – so its review is timely, much needed and generally welcomed.

This document is a thought leadership paper – it floats ideas and concepts for input into the process of reviewing the One City Plan and the wider debate about the future of Chester. It is not a blue-print for the council to adopt – it is a contribution to the debate.

Some of the thoughts outlined here will not be new and some will be challenging. Some may be difficult to deliver. Some may seem naive – but sometimes a bit of naivety is refreshing. However, this doesn't mean that they shouldn't be debated. They are presented to generate ideas and to promote creativity in pursuit of a better Chester.

This is not some futuristic transport dream. Most of the concepts outlined here have been or are being delivered in other places – many in the UK. Few places, however, have the opportunity that the Chester One City Plan offers – to explore new approaches to urban mobility in an integrated way as part of a detailed dialogue with its stakeholders and as part of coordinated plan for a place. We shouldn't squander this rare opportunity.

Chester is Special

Chester is very special – we sometimes forget that at the core of the City is one of the most glorious historic places in the world. It is over 2000 years old, and during that time it has constantly evolved, developed and changed and it is still doing so – it has never stood still and it never will. It can't be frozen in aspic – it needs to live and breathe as a real place, its needs to evolve – likewise its special characteristics need to be understood and reinforced through its change and growth.



So, we have in Chester a thoroughly contemporary and dynamic place within a gloriously quirky historic skin. This needs focus and intelligence to manage and lead – things need to be tailored and bespoke - avoiding applying 'anywhere' solutions.

Things will change – sometimes big things. The Northgate scheme is the latest welcome addition to Chester's urban form – likewise large former anchor stores, The Forum Shopping Centre and The Grosvenor shopping Centre are at, or are nearing, the end of their useful lives in their current form and therefore need to be grasped as important major redevelopment opportunities that should contribute to the future of the City Centre and reinforce the distinctive qualities of the place. Shaping Chester needs sensitivity and confidence. Chester needs to be bold and imaginative and should learn from best practice globally – and for such a glorious, historic place there are huge opportunities for major urban change. Modern mobility will need to support and help enable this transformation.

Chester's Existing Transport System

Chester's current transportation network is based on thinking that's over 40 years old (albeit delivered some 30 years ago). The City together with other historic towns and cities were once at the forefront of UK transportation thinking and delivery – establishing a network that comprised:

- A ring of park and ride sites including express buses into the City Centre
- An inner ring road with long and short stay car parks serving the city core accessed directly off this inner circuit
- A pedestrianised or time-limited access set of core streets
- An Urban Traffic Control (UTC) network

This was coupled with a public car parking regime which made city core parking relatively expensive and city edge car parking relatively cheap – with a view that people would be 'pushed' towards using park and ride or alternative forms of transport to the car.

More recently this has been further positively enhanced by an enhanced rail station, a new bus interchange and an enhanced cycleway network (on and off road).

This basic network has served the City well and when it was introduced it was ground-breaking. It was based on some basic principles:

- Central Chester was attractive and strong as a retail centre (in fact it was seen back then as 'over-heating – in hind-sight a very strange concept indeed!)
- The historic City Centre was congested – tackling congestion and conserving the historic city was the key transportation policy driver. Managing the car and its access to the historic city core was the main policy driver whilst keeping the City economically vibrant
- Getting people out of their cars or at least not bring them into the City Centre was the main driver – get them using alternative modes of mass transit – mainly buses.
- Relatively expensive City Centre car parking charges would enable this change of mode and the City was sufficiently attractive to visitors, shoppers and businesses that people would still come.

The Economic Landscape Has Changed

Over the last decade the landscape for the City Centre has changed – and the pandemic has accelerated this:

- The rise of internet shopping means that the high street is challenged – with many of the larger national retailers having disappeared – the recent loss of BHS, Debenhams and the Arcadia group names in the Grosvenor Centre being the most dramatic and visible. Vacant shop units are found throughout Chester's main streets
- Retailing in other centres – central Manchester, Liverpool One and Cheshire Oaks have disturbed Chester's former primacy as the place to shop
- The loss of high street banks and building societies means the centre has lost its function as a high street financial centre
- The loss of some big City Centre employers – Lloyds Group, large public agencies such as the Police and the Council HQ, has reduced the number of office workers using shops, bars and restaurants in the day
- Visiting the high street has become more of a leisure activity rather than an essential one.

The City Centre is evolving in reaction to these changes – increasing hospitality – cafes, restaurants, bars and hotels, the rise of more independent, individual and colourful retailers, alfresco on its streets, Storyhouse and an increased cultural offer, a vibrant indoor market scene and more people living in the heart of the place. This change is fragile and needs to be nurtured so Chester City Centre becomes a vibrant, independent, colourful and authentic city neighbourhood.

Enhanced and modern transportation needs to support this evolution – and with that comes the need to challenge our current thinking and our current policy approach.

The World of Transport has Changed

Chester's transportation network was developed over 30 years ago - in a world before:

- **The digital 'revolution** – before smart-phones, the internet, App-based journey planning, internet retailing, digital booking and payments systems etc
- **Real-time transport management** – the speed of the digital world means that we can interact with the transportation system in all its forms in real-time, and manage it in real-time too. This brings a huge range of choice and flexibility to our transportation system that was unheard of even ten years ago.
- **The emergence of the EV** - electric and hybrid cars, e-bikes, e-cargo bikes, e-mopeds and e-scooters, and the very real movement to more advanced self-drive electric vehicles that are being road tested in other places as we speak. E-freight and advanced logistics are revolutionising how goods are moved around, including to our own front doors. This means that the definition of 'sustainable transport' modes has leapt forward to include EVs and other non-carbon-based transport modes. One can no longer say that rail, buses, cycling and walking are the only sustainable modes around – they have now been joined by a whole new fleet of other electric and other non-carbon-based modes.
- **Increased Urban Living** - Car-sharing and pooling, EV renting etc is making car free residential living in city centres a reality in many urban areas across the UK. The notion of transport 'Usership' rather than the previous concept of vehicle 'Ownership'.
- **The decline of the traditional bricks and mortar retailing and the subsequent decline of the high street.** For Chester this has been a combination of a whole range of regional changes that have challenged the City's retailing primacy coupled with the rise of internet retailing. This means that the previous thinking that the centre of Chester is strong, people will always come and we can 'manipulate' their modes of travel via pricing policy is outdated, and further, in terms of the economy of the City Centre, is now badly wrong.
- **The emergence and widespread use of social media** – this means that the time when city managers could just 'tell' people what to do is long gone. People are far more informed, networked and are equipped with powerful tools to help them make their own travel choices. Social media has also changed the political discourse – making interaction with political leaders more immediate and more direct.
- **The changing world of work** – increasing home and flexible working has challenged the traditional role of the City Centre as a traditional location for offices. This has been happening for many years – however the pandemic has accelerated this.

This evolving landscape is radically changing transport and how we use and interact with it. It also gives us more powerful tools in which to interface with and manage it.

A System Without Much Integration

Chester's transportation system is rich – it has a growing cycling network with a compact City core that's a joy to walk around. It has an extensive park and ride system, its inner ring road has taken cars out of its core historic streets, the local bus network is extensive, it's core streets are partly pedestrianised, its rail station has been enhanced. Urban Traffic Control has helped manage traffic flows at key junctions and we have an e-scooter network. Yes, it's relatively congested at times and it's at capacity so traffic incidents and road works challenge the system and air quality is poor in places – but it works – kind of!

We really have to ask ourselves whether the Chester Transportation 'Network' that comprises all of the above is meaningfully planned and managed as a single system with real integration

between these separate modes of transport, or, in reality, are they managed by separate teams and separate agencies with only marginal thought towards integration and whole system management? Are we really tackling climate change and air quality meaningfully?

Perhaps the recent divisive public ‘discussion’ about Active Travel Lanes gives us a clue about the answer to this question?

Chester’s transportation ‘hardware’ network is actually extensive – and has very little opportunity to expand – the key must be how we manage this network to get the most out of it – how we enhance mobility in an intelligent / smart way and use it to improve air quality and do our bit towards climate change.

(Note: There will always be limitations to full transport integration in Chester without an Integrated Transport Authority (Passenger Transport Authorities ITA / PTA) – to provide a wise, competent, accountable authority as found in England’s larger city regions and Combined Authorities. This issue should be part of any discussions with government re potential subregional devolution. There is always the potential of ‘floating’ Chester with government as a pilot for transport integration in smaller city areas.)

Transportation is Often Tribal

Conversations about transport often turn into ‘tribal’ disputes – cyclists, car drivers, bus users and operators etc, all with their separate ‘weapons’ of choice – bus lanes, cycle lanes, roads, etc. When one is dealing with limited road space – the ‘zero-sum game’ is often played out – who is going to gain and who is going to lose their road space?

In the world of smart phones, Apps, digital technologies and real-time intelligent tools to help manage cities, coupled with the everyday use of social media, this ‘zero-sum game’ can now be managed differently. It is now about integration, connectivity and inter-changeability of modes – it’s about, flexibility, adaptability and choice – we have a new set of powerful tools at our disposal.

The Notion of Sustainable Transport has Changed

Sustainable transport is not just about buses, cycling and walking any more. The debate has gotten richer. Sustainable modes now include electric vehicles – including the electric car – so the car can’t now be seen as unsustainable when increasingly it is being decarbonised. The same can be said about the delivery and freight system.

There is a whole new set of vehicles that just weren’t around 30 years ago when Chester’s current transportation approach was established – electric cars, electric taxis, electric buses and delivery vehicles, electric micro-vehicles (e-bike, e-mopeds, e-scooters and e-cargo bikes) coupled with car-pooling, car-sharing and car-clubs– even driverless vehicles. Many of these vehicles are moving towards automation. Dubai is to have a fleet of autonomous taxis within the next 2 years and some of these are being tested in the UK today. The choice of what we can loosely term sustainable modes of mobility has multiplied. The 2030 target of no petrol/diesel vehicles for sale in the UK and the pandemic have dramatically accelerated this change.

With this headlong drive towards EVs, however, we still have yet to address the impact this will have on our urban areas and the places we want to create. Good practice examples elsewhere of places that are more advanced down this approach will give us insight here.

Chester and Private Autonomy

Let’s be honest for a moment – in the polarised transportation debate that has been the case in Chester for many years and came to a head in the recent public reaction to active travel and bus lanes – there are two opposing views – the first is that the car is bad and contributes towards climate change and congestion, and its use should be limited and people should use alternative travel modes such as public transport or walking and cycling. The second is – I need my car and

how dare you tell me not to use it, and limiting the use of the car will make Chester less attractive and will damage it economically.

The honest reality is that Chester is a small city with a large dispersed hinterland and large economic gravity - much of it being rural. The employment areas of Broughton, Ellesmere Port and Deeside are, in reality, industrial suburbs of a larger City Region based around Chester.

For people living in the City itself there is a greater potential for the use of public transport, walking and cycling – however, Chester’s larger hinterland and longer and more complicated commuting and lifestyle patterns, means that having access to a car is all but essential and this is going to be the case for the foreseeable future. In Groningen, for example, a city seen as an exemplar in promoting alternative modes of transport, 60% of traffic from out of that town continues to be by private car.

The concept of the car is changing however – people are increasingly embracing new vehicle technologies, such as self-driving and electric vehicles. Dedicated road space, for example, could be allocated to self-driving vehicles. Connectivity could make it easier to implement demand-driven congestion charges, which could increase road capacity while limiting new construction. Car sharing and ride hailing could emerge as complementary options, but would not replace the private car on a large scale (McKinsey). So, for Chester and its hinterland – private autonomy through the car will still be the basis of people’s mobility. (Hannon, Knupfer, Stern and Nissen – The Road To Seamless Urban Mobility, McKinsey Quarterly, 2019)

Seamless Mobility

However, there is also an opportunity to layer onto this the concept of Seamless Mobility - This is the most radical departure from today’s reality – but it’s already started with Chester’s Ginger Scooters.

In this system, mobility is predominantly door to door and on demand. Travellers have many clean, cheap, and flexible ways to get around, and the boundaries among private, shared, and public transport are blurred. Mobility is delivered through a combination of self-driving, shared vehicles, with high-quality public transit as the backbone. EVs become far more common, spurred by economics, consumer interest, incentives, and the creation of low-emission zones. And all this is enabled through the use of smart software platforms that manage multimodal traffic flows, and deliver mobility as a service to the individual.

Current thinking predicts that in a seamless-mobility system, people would potentially travel more — likely by 20% to 50%—because it’s cheap and easy. This is good as it would support the vitality of the City Centre. However, the number of cars would likely remain the same or decline, due to the high level of sharing and significantly higher utilisation. EVs could account for as many as two-thirds of vehicles on the road, while those capable of self-driving may exceed 40% in time (Hannon, Knupfer, Stern and Nissen, McKinsey, 2019).

2. SMART MOBILITY

The themes that run through this changing landscape are digital technology, information and communication – and the opportunity is to utilise their power in driving this change to adapt and enhance Chester’s transport system. This is SMART MOBILITY.

The general definition of SMART MOBILITY is using transportation modes alongside or instead of owning a fossil fuel powered vehicle – but it can be far more.

Smart mobility utilises:

- **THE MANY AND GROWING MODES OF MORE SUSTAINABLE FORMS OF TRANSPORT** – public transport, cycling and walking but also electric cars, personal micro-EVs (bikes, scooters, mopeds) and e-freight etc.
- **USERSHIP** instead of **OWNERSHIP** – people renting, sharing or pooling vehicles or using public transport.
- **INTEGRATION** – information and App-based systems to enable end to end journeys and a customer / user driven approach.

The basic concepts of Smart Mobility must be:

- **FLEXIBILITY** – the combination of enhanced customer interaction and choice, an increasing suite of sustainable transport modes, and increasingly powerful and immediate real-time management and user tools. This means that flexibility is the key – avoiding rigid and inflexible solutions. The recent debate about the bus-lane part of the Active Travel Lane proposals in Chester is perhaps a case in point – a ridged solution where a more flexible approach using intelligent junctions and signals could well have been more appropriate, probably more acceptable and certainly could have been more cost effective. Flexibility also enables solutions to be modified if required, and therefore allows for experimentation and adaption – more future-proof.
- **INTEGRATION** – The art of layering and knitting together. Chester has multiple layers to its transportation system:

- The Park and Ride Network – with its ring of P&R sites, its express buses, its express routes into and out of the City Centre and its City Centre stops.
- The Bus Network – a dense lattice throughout the City and beyond serving residential neighbourhoods but mainly structured on the radial pattern of the City’s road network.
- Chester’s Cycling Network – an extensive and growing network of on and off-street cycle lanes, ways and parking, including the Greenway, the river front and the recently enhanced canal side routes.
- The Ginger Scooter Network – the recent network of e-scooters, pick-up and drop-off points and user App.
- An extensive walking network throughout the urban area, again with strategic walking routes along the City’s radials
- Key public transport hubs – the rail station and Bache halt and the bus interchange.
- A network of roads, junctions, cameras and signals – many of these junctions having intelligent and real-time management capability in some form through the Council’s Urban Traffic Control (UTC) system.
- Chester City Centre’s Car Parking Network – mainly accessed off the inner ring road and radial roads surrounding the City Core – a combination of short stay and long stay, operated by private operators and the Council.
- Pedestrian streets in the City core together with time limited access arrangements.

But - how integrated are these layers - can you easily:

- Get from where you live to where you want to go?
- Change mode seamlessly and where and how do you do it?
- Plan and pay for your journey using multiple modes, and do you have the information you need to be able to do it?

Do these separate transportation systems:

- Flex to take into account the different pressures on the system at different times?
- Reinforce and complement each other, or do they just operate separately?

Coupled with this transport layering, we have the origins and destinations of users – where they actually want to go:

- Key public services such as hospitals, high schools, GP clinics, etc
- Sporting and leisure venues and parks etc.
- Large centres of employment and business – Chester Business Park, Deeside Industrial area, Airbus, the City Centre, etc.
- Key visitor and leisure destinations – the Destination Chester components – Chester Zoo, The Race Course, Cheshire Oaks, Blue Planet, The City Centre, The Waterfront, canals and The Groves, etc.
- The City Centre and other edge of town destinations and supermarkets – Cheshire Oaks, Broughton Retail Park, Sealand Road, etc.
- Neighbourhood Centres – the many large and small neighbourhood shopping centres – which form central nodes of activity within Chester’s urban villages, suburban neighbourhoods, and nearby rural villages.

Put this way - three things are obvious:

- It’s complicated so it’s not surprising that integration is limited and people are confused to use it.
- Chester has a really rich and extensive transportation system. The addition of its park and ride network makes it more extensive than most small cities.
- Chester is a compact and relatively small and is managed by a single local authority – therefore, it can relatively easily be sorted out - if we put our minds to it.

Chester has a rich and effective transport system comprising many layers. However, it has the opportunity for major enhancement – not by the development of new expensive bits of transport infrastructure – but by the proper integration of the existing separate networks. The use of the power of digital and communication technologies can simplify this complexity, integrate the transport layers and make it understandable and usable. Thus, the very advances in digital and other technologies that are rapidly changing Chester’s transport landscape can be used to improve it – this is SMART MOBILITY.

Key Principles of Smart Mobility

Smart mobility is being increasingly employed in many places. It is built on the following principles:

- **Flexibility** – multiple modes of transportation allow travellers to choose which ones work best for them in a given situation.
- **Efficiency and Usability** - the trip gets the traveller to their destination with minimal disruption, in as little time as possible and in a simple and understandable way.
- **Integration** - The full route is planned door-to-door, regardless of which modes of transportation are used and payment is seamless regardless of mode.
- **Clean technology** - Transportation moves away from pollution-causing vehicles to zero-emission ones.
- **Safety** - Fatalities and injuries are drastically reduced.

Two further aspects of smart mobility are **accessibility** and **social benefit**, which means that it should be affordable for everyone and help provide a better quality of life for everyone, regardless of who they are and where they live.

As Frost and Sullivan predict (The Future of Mobility, 2021):

'By 2030, journeys will become more integrated, intelligent and connected, as people will demand personalized mobility solutions. Changing urban mobility trends among younger generations broadly reflect a growing preference for biking, walking, public transport, and shared mobility services over car ownership. The electric, autonomous car sharing ecosystem is expected to become a part of a larger integrated, multimodal ecosystem, with high emphasis on highly customized, seamless and on-demand transportation services.'

Components of Smart Mobility

The concept of smart mobility is not new, neither is it 'futuristic' – many places are applying its components. Neither is the concept complicated – it's quite simple and very practical in reality.

Generally, there are three accepted components of a Smart Mobility framework:

- Mobility Hubs (or Smart Stations)
- Connected / Smart / Intelligent Corridors
- A Mobility Market Place (or MaaS (Mobility as a Service) System)



3. MOBILITY HUBS

Mobility Hubs are the key hardware elements of the integrated mobility network. They are places where the different modes of transport intersect and interchange. They create space designed specifically to house public and shared mobility modes, and improve the public realm for local residents and businesses as well as travellers. The current public transport network of bus stops and rail halts form the basis of any mobility hub network.

Hubs bring together public transport stops for buses, trains with bike share schemes, car clubs, e-scooters, electric vehicle charging points, bike racks, bike storage and shared taxi rides, as well as community facilities such as cafés, fitness areas, green space, package collection points and WIFI and phone charging – all with waiting areas, real-time journey planning information, walking areas and disabled access.

The hubs contribute to the goal of the 20-minute neighbourhood, which enable people to live, learn and meet their needs within a 20-minute walk of their home. This is real sustainability.

Mobility Hubs – three key characteristics:

- They are the co-location of public and shared mobility modes.
- They include the redesign of space to improve the surrounding space – they are a positive part of the cityscape.
- A pillar or sign which identifies the space as a mobility hub which is part of a wider network and ideally provides integrated digital travel information.

Mobility Hubs are the places where people pick-up a mode of transport, change modes, interchange, find information and journey plan, charge EVs and rent modes – and are seen and recognised as such. They are branded and marketed as part of a smart mobility network.



Basic Components of a Mobility Hub

Current Mobility Hub Locations across the UK

Many places are promoting Mobility Hubs as key parts of their transport integration programmes:



Mobility Hub Locations in UK (CoMoUK 2021)

CoMoUK (Co-Mobility UK) is playing a leading role in the UK's transition to integrated mobility solutions designed for the public good and they succinctly outline what a Mobility hub is and what the components of such a hub would be together with a typology of locations.

<https://como.org.uk/shared-mobility/mobility-hubs/what/>

Components of a Mobility Hub (CoMoUK)

Components of mobility hubs

Mobility hubs can be seen as an interface between the transport network and spatial structure of an area. Mobility hubs include a range of different components, This diagram illustrates some of the most commonly used components:

- A1: Mobility components: Public Transport**
- A2: Mobility components: Non - public transport**
- B: Mobility related components**
- C: Non-mobility & Urban realm improvement**

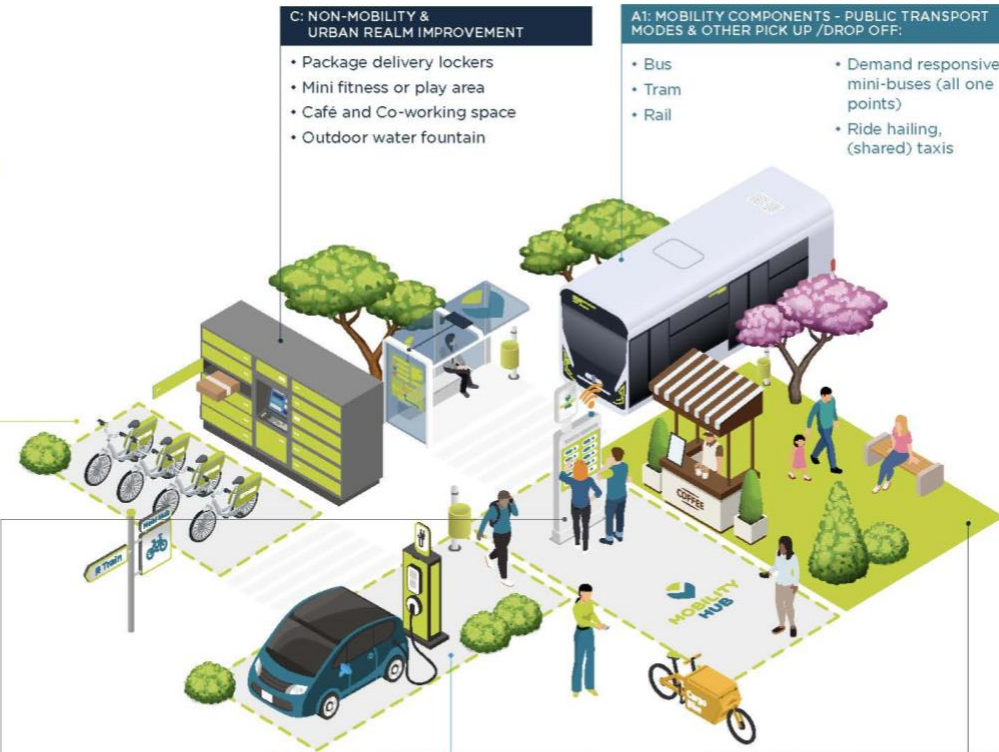
A2: MOBILITY COMPONENT: SHARED MOBILITY

- Car share: back to base, one way, electric.
- Bike share: back to base, one way, electric.
- Cargo bike share, cargo bike logistics store
- Other future micro-mobility options e.g. e-scooters, moped share
- Ride sharing

Branded pillar

Mobility hubs require a prominent sign or pillar with a common brand to make them visible to the public. The inclusion of a digital elements in a pillar can provide:

- Access to a local transport website for information on services
- A way finding option for local walking and cycling trips
- A journey planning service for multi-modal trips
- Registration and ticketing
- Customer services.



C: NON-MOBILITY & URBAN REALM IMPROVEMENT

- Package delivery lockers
- Mini fitness or play area
- Café and Co-working space
- Outdoor water fountain

A1: MOBILITY COMPONENTS - PUBLIC TRANSPORT MODES & OTHER PICK UP /DROP OFF:

- Bus
- Tram
- Rail
- Demand responsive mini-buses (all one points)
- Ride hailing, (shared) taxis

B: MOBILITY RELATED COMPONENTS

- EV car charging
- Bike parking, (Standard, covered, restricted access, EV charging)
- Bike repair, pumps
- Digital pillar, (transport info, ticketing, way finding, walk distances, local services)
- Child car seats, bike seats & trailers
- Community concierge parcel last mile delivery

C: NON-MOBILITY & URBAN REALM IMPROVEMENT

- Improved public realm, safer crossings, step free access, road repairs, adjustments for disabilities.
- Waiting area space, covered, seating, planting, artwork, kiosks for coffee etc.
- Wi-Fi, phone charging

(UK Mobility Hu8b Guidelines, CoMoUK, 2019/20.)

A Typology of Mobility Hub Locations and their Respective Components

Again, CoMoUK have produced a location and typology matrix that does much of the thinking for us:

Locations and contexts

Mobility hubs can developed in a range of contexts from city centres to rural areas. They are a tool to enhance housing developments, business parks, hospital sites, transport interchanges or EV charging hubs.

There is no “one-size fits all” design for the mobility hub. Tailor-made solutions need to be created for each location using experience from other countries.

Mobility hubs need to be adapted to the setting both in terms of the type of components and their scale, for example a city centre rail hub may offer more space to public transport and bike share bikes whereas a hub in a market town centre or transport corridor interchange may focus on providing a smaller number of vehicles but greater choice of flexible travel options.

By overlaying the type of place such as workplaces, housing development and suburban setting with the local geographical factors and trip generators each area will be able to create a set of combinations which can be replicated across their area.

The following table highlights issues and possible combinations of components to consider in each area.

Context & considerations	A1 - Mobility components: Public transport	A2 -Mobility components: Non public transport	B - Mobility related components	C -Non-mobility & Urban realm improvement
<p>Large interchanges / City hubs (Larger multi-purpose or a network of smaller mobility hubs).</p> <p>High passenger numbers for starting / ending journeys / transferring between modes. Potential to convert private car and taxi trips to sustainable modes by raising the profile and improving links. Space may be limited meaning there may be a need to focus on priority sustainable, efficient modes and links to last mile modes</p>	<ul style="list-style-type: none"> National & regional rail Tram Local bus Taxi 	<ul style="list-style-type: none"> Car club bay - electric & conventional Bike share -electric & conventional 	<ul style="list-style-type: none"> Large scale cycle parking Digital pillar, (transport info, ticketing, way finding, walk distances, local services). EV charging bays 	<ul style="list-style-type: none"> Covered waiting area Improved public realm, safer crossing, road or pavement repairs Parklet or community art Kiosk for refreshments
<p>Transport corridor, smaller interchanges / Linking hubs.</p> <p>Focus on services which link residents in surrounding areas to core network services. An opportunity to offer greater choice to people for first and last trips</p>	<ul style="list-style-type: none"> Regional rail or tram Local bus DRT feeder service Taxi 	<ul style="list-style-type: none"> Back to base car club bay with choice of van / estate car Bike share - electric & conventional E-cargo bike share / trailers 	<ul style="list-style-type: none"> Secure cycle parking for connecting travellers Digital pillar, (transport info, ticketing, way finding, walk distances, local services). Freight logistics hub EV charging bays 	<ul style="list-style-type: none"> Covered waiting area Safer crossing & street repairs Package delivery lockers Wi-Fi /phone charging Play equipment Kiosk for refreshments
<p>Business park / new housing development hubs</p> <p>High density of users. A need to offer commuting links and back to base solutions.</p>	<ul style="list-style-type: none"> Regional rail or tram Local bus DRT feeder service 	<ul style="list-style-type: none"> Back to base car club bay with choice of van / estate car One-way, shuttle or back to base bike share E-cargo bike share / trailers 	<ul style="list-style-type: none"> Secure cycle parking Digital pillar, (transport info, ticketing, way finding, walk distances, local services). 	<ul style="list-style-type: none"> Covered waiting area Improved public realm Art / planting / play equipment Package delivery lockers

Context & considerations	A1 - Mobility components: Public transport	A2 -Mobility components: Non public transport	B - Mobility related components	C -Non-mobility & Urban realm improvement
<p>Suburbs / Mini hubs</p> <p>Lower density of people with higher private car ownership, mobility hubs can be designed to address local issues e.g. car club spaces to take away issues of over-crowded streets, bike share or secure cycle parking for flats without space for bike storage or DRT to supplement restricted bus services.</p>	<ul style="list-style-type: none"> Local bus DRT feeder service 	<ul style="list-style-type: none"> Back to base car club bay with smaller vehicles 	<ul style="list-style-type: none"> Secure cycle parking Bike repair stand / pump EV charging bays 	<ul style="list-style-type: none"> Traffic calming & street repairs Parklet Community exercise equipment
<p>Small market town, village hubs</p> <p>The extra space in these types of areas can be used to provide a wider range of services as long as there is critical mass to ensure there is viability. Assess local needs such as the limited public transport with pools of shared e-bikes or 2+ ride share stops.</p>	<ul style="list-style-type: none"> Regional rail or tram Local bus DRT feeder service Taxi 	<ul style="list-style-type: none"> Back to base car club bay with choice of van / estate car Back to base bike share E-cargo bike share / trailers 	<ul style="list-style-type: none"> Bike repair stand / pump EV charging bays 	<ul style="list-style-type: none"> Covered waiting area Package delivery lockers
<p>Tourism hubs</p> <p>Focus on services with easy registration for visitors which can then provide a seasonal boost to the viability of service for rural residents. Ideally well integrated with journey planning and wider ticketing services (e.g. combined travel with destination entry). While tourism areas are often in rural areas, they can also be areas of high demand where having a tangible, focal point for sustainable modes especially for visitors unfamiliar with the area. Could also apply to tourist destinations in more urban areas.</p>	<ul style="list-style-type: none"> Regional rail or tram Local bus DRT feeder service 	<ul style="list-style-type: none"> Back to base car club bay with choice of van / estate car One-way, shuttle or back to base bike share E-cargo bike share / trailers 	<ul style="list-style-type: none"> Secure cycle parking Digital pillar, (transport info, ticketing, way finding, walk distances, local services). 	<ul style="list-style-type: none"> Covered waiting area Improved public realm Art / planting / play equipment Package delivery lockers

(UK Mobility Hub Guidelines, CoMoUK, 2019/20.)

Not all hubs will have the same level of provision. Major hubs with all the components will be located at, for example, the rail station, Bus Interchange or at large visitor destinations. Neighbourhood mobility hubs may be simpler, much smaller, with fewer components.



So, Mobility Hubs are:

- A network of locations where the range of mobility modes are co-located across the City.
- Branded – so the network is branded with a clear image.
- Part of the urban fabric – so they are a neighbourhood and city regeneration tool and thus part of Chester's recovery
- Where the different forms of transport (buses, walking, cycles, EVs, scooters, cargo bikes, EV sharing and renting etc) come together – they are nodes that integrate the different layers of the transportation system – bringing in the concept of the network being greater than the sum of its parts.
- A physical place to get real-time information, journey planning and to pay for end-to-end journeys in addition to App based information and payment systems.

If you see this as the London Underground or the Paris Metro – the Mobility Hubs would be the stations where interchange happens – the interchange would involve a whole range of different mobility modes:

- Major hubs will enable a greater range of components – at rail halts, bus interchange and major city centre and park and ride car parks.
- Major hubs will be located at key city destinations – hospitals, business parks, tourist attractions, universities and colleges and high schools, retail parks.
- Smaller Hubs will be located at neighbourhood centres throughout the urban area – reinforcing them as the centres of their communities and a hub of more local mobility networks.
- A cluster of hubs would surround and support a City Centre.

TOWARDS A MOBILITY HUB NETWORK FOR CHESTER

So, let's Apply this to Chester:

Major City Hubs:

- At Park and Ride Sites
- The Bus Interchange
- The Rail Station
- Bache Rail Halt
- City Centre Car Parks

Key Destination Hubs:

- Chester Business Park
- Broughton and Airbus
- Sealand Road Employment Areas
- Deeside Employment Zone
- Sealand Road Retail Park
- Caldy Valley Retail Park
- Countess of Chester Hospital
- Major Food Retail Stores
- High Schools, etc

University City Hubs

- University of Chester Campuses

Destination Chester Hubs - Key City-wide visitor destinations:

- Chester Zoo
- Cheshire Oaks
- Blue Planet
- National Waterways Museum
- Chester Race Course, etc

City Centre Cluster Hubs - A ring of hubs located along the inner ring road (roundabouts) at key intersection routes / gateways to the main city centre streets:

- The Barrs (for Foregate St)
- Fountains (for Northgate St and the Cathedral)
- Bus Interchange (for Frodsham St and the Cathedral)
- Hamilton PI (for Northgate, Chester Market and Watergate St)
- Grosvenor / Little Roodee (for The Castle, Grosvenor Street, Race Course)
- Pepper (for Pepper Street, Amphitheatre, Grosvenor Centre)
- Bridge (for Bridge Street North and South)
- The Groves (for the riverfront)

Some of these will be linked with:

- Key city centre car parks – where the car parks should become Mobility Hubs.
- Inner Ring Road roundabouts and their subways – giving these intersections and their subways a new transportation role.

Neighbourhood Hubs

Urban Village and Suburban Centre Hubs:

- Huntington Faulkner Street / Hoole
- Boughton
- Upton
- Handbridge
- Garden Lane
- Blacon
- Saltney
- Lache
- Westminster Park
- Queens Park
- Saltney High Street, etc

Rural Village Hubs - The rural villages immediately surrounding the city:

- Christleton
- Littleton
- Pipers Ash
- Hoole / Michel Trafford
- Guilden Sutton, etc

This may seem a lot of Hubs - and it is. However, to put this in context – Plymouth is currently actively installing 50 such mobility hubs across the city funded through the Government's Transforming Cities Fund - including 300 EV charge points, 400 e-bikes, a car club, 0.5 megawatts of solar carports and a smart journey planning and payment system. This is a 3-year delivery programme with a total cost of £10m.

For Plymouth the key components of their mobility hubs include:

- electric vehicle (EV) charging points
- electric bikes
- car club vehicles
- journey planning display
- solar carport
- bike parking
- security (lighting, CCTV)
- lockers for delivery and storage
- additional facilities such as bike repair equipment and waiting areas.



Plymouth Mobility Hubs – small and large (Plymouth City Council, 2021)

Rethinking City Centre Car Parks as Mobility Hubs

The city centre car parks were intentionally well located over time – around the Inner Ring Road with access directly off the ring road.

We need to see these car parks in a different way:

- They are an opportunity to become Mobility Hubs comprising the range of mobility components – EV charging, Micro EV rental and pickup / drop off, cycle storage, car sharing and pooling etc. The car parks could therefore be seen as part of the integrated Smart Mobility Network and not just places to park cars. Many cities in the UK, such as Manchester with its new Ancoats Mobility Hub, are now seeing their new City Centre car parks as Mobility Hubs.



Ancoats Mobility Hub – vision and components
(Manchester City Council, Great Places Housing Group, Manchester Life, 2021)

- Residential developments in the City Centre will in future have reduced car residential parking provision and many will be car free. This is happening at a pace in other Towns and Cities in the UK – and it will be inevitable in Chester City Centre with its high levels of connectivity. City Centre car parks can be a part of this movement – serving a growing number of City Centre residents as well as commuters and visitors to the City Centre. They could provide the facilities for EV charging, car sharing / pooling space serving people in existing and new high-density homes – without the ability to charge their EV on-street outside their homes.
- Visitors and Commuter vehicles sit in a City Centre car park for many hours. People using EVs will want and need to take the opportunity to charge their vehicles. With the accelerated movement toward EVs over the next decade this demand will increase. The current approach of providing a few EV charging points in City Centre car parks will just not be sufficient and a different approach is required – reimagining City Centre car parks as mass recharging hubs not just as places to leave cars. This will probably require a wholesale rethink of the City Centre payment charging regime as these car parks change their function.

- Accessing these Car Park hubs would also provide the opportunity for policies of 'green transport to be invoked, where pre-booking systems supported by ANPR technology can encourage visitors to adopt greener/smaller vehicles by intelligent pricing.

APCOA, one of Europe's leading car parking providers, is now reimagining and rebranding its city centre parking structures as mobility hubs. They call them 'Urban Hubs' – centres of logistics, electrification, mobility services, mobility interchange, and new technologies – not just car parks. These Urban Hubs are now being rolled out at pace in many German cities. APCOA now operate the Pepper Street car park in Chester – this must be a real opportunity for Chester and APCOA to create the first UK 'Urban Mobility Hub'. Likewise, the emerging new Northgate development's car park should be upgraded to being a state-of-the art Urban Mobility Hub on the APCOA model – the start of a wider network of Hubs encircling the pedestrianised City Centre. (APCOA, Urban Hubs, 2021.)



Chester Mobility Hubs – A Network Summary:

- **City Hubs** – Rail Station, Bus Interchange, large City Centre Car Parks and Park & Ride sites.
- **Key Destination Hubs** – at key employment, retail and public service and health destinations.
- **University City Hubs** – main University of Chester campuses.
- **Destination Chester Hubs** – at key visitor attractions.
- **City Centre Cluster Hubs** – clustered around the City Centre off the inner ring road at key city high street gateways and re-imagined City Car Parks.
- **Neighbourhood Hubs** – within Chester's residential areas and local centres - urban and suburban neighbourhoods and nearby rural villages.

4. SMART CORRIDORS

The second key concept in Smart Mobility is the Smart Corridor or intelligent linkages. This has three layers:

- **City Corridors** – the key transportation routes into and out of the city – in Chester these are its main radial roads e.g., Wrexham Road, Hoole Road, etc.
- **Off-Road Cycling/Walking Superhighways** - dedicated and safe corridors for bikes and walkers.
- **Neighbourhood Mobility Hub Linkages** – these are the routes that connect the Mobility Hub framework together to create a rich smart mobility network and link neighbourhood routes into the City's main radial arteries.

Together with:

- **Some Transformational Opportunities:**
 - Re-imagining the Ring Road – zipping the City together
 - The 360-degree Rail Station – a station that connects the City
 - The University City – a ribbon of campus connectivity
 - A Bus-based 'Metro' network

CITY CORRIDORS

The key City Corridors are the main arteries of the City – they have critical economic and social roles as well as a transportation one – they are the 'life-blood' of any city. They are multi-modal - carrying traffic for commuting, business, social, pleasure and leisure, logistics and delivery, emergency etc. As such they need to be as efficient and effective as possible.

In Chester's case some of these corridors are relatively narrow, some are constrained by bridges and their limitations, and some are constrained by the City's historic fabric. All of Chester's radials are relatively congested. A meandering River Dee, a canal system and rail lines and rail station further complicate this pattern.

Acknowledging that one cannot build new roads to get the City out of its congestion problems, building new roads does not help in moving towards greater sustainability, and certainly doesn't tackle climate change - therefore managing the existing network more effectively and more efficiently must the way forward.

This is particularly the case in historic cities such as Chester – where increasing the capacity of city corridors via new roads or road widening would be highly destructive and would erode the very fabric that makes Chester so special.

So, it's about intelligently managing the capacity of the existing network – making it more effective, efficient and more sustainable.

More recent attempts at managing and shifting capacity on these radials have involved inflexible reallocations of road space – the creation of bus lanes or more recently 'active travel' lanes is the most common. This is difficult – in a place like Chester where road widening is inappropriate then there are inevitable losers and winners in the reallocation of road space 'game'. This may be a good thing – but it's certainly not popular and is politically challenging.

Such permanent reallocation of road space along these key radials creates a very inflexible system. Different users use these radials at different times and at different levels:

- Freight and deliveries into the City Centre in the early morning and late evening.
- Commuters at relatively short peak commuting periods.
- Shoppers and visitors in the middle of the day.
- Are taxis and private hire vehicles public transport – and how do you tell the difference between these and private cars?
- How do you use this approach to promote car sharing and the multiple occupancy of private vehicles?
- How do you use such a system to promote EV take-up?
- It is commonly the case that the capacity of the corridor is limited not by the width of the highway, but by the capacity and form of its junctions. Permanent bus or other lanes do not help here.
- In a system which operates at or near capacity (as is case in Chester) particularly at rush hour, traffic congestion is really influenced by traffic incidents (accidents or breakdowns) – the creation of inflexible dedicated lanes does not help here either.

An inflexible approach isn't able to flex to cater for these real-time differences, unexpected incidents or large events such as the Races.

In a world of electric cars, driverless vehicles and micro EVs, the notion of what modes are sustainable or not is changing and is becoming richer, and this will increase over this decade. How do you use a rigid form of re-allocation of road space to prioritise the evolution EVs, or even emerging self-driving / autonomous vehicles? It certainly doesn't cater for prioritising car sharing or pooling.

This suggests that a more intelligent and more flexible approach is required – an approach that:

- Actively and intelligently manages corridor capacity in real-time through-out the day and the night.
- Focuses on smart junctions that can prioritise between modes when required in real-time.
- Involves an ongoing communication and dialogue with road users – through on-street digital signage and in-vehicle technologies – enabling the driver to make intelligent choices rather than telling the driver what to do. It also enables drivers to be alerted to up-coming accidents, blockages and weather events.
- Enables real-time changes to cater for major city events, like the Races or Christmas shopping or to prioritise blue-light vehicles in the event of emergencies.
- Is non-destructive and therefore its impact on the City's fabric is minimised – and in some places the City's fabric could well be reformed where demolition was previously employed to create capacity – 'urban healing'.
- Encourages experimentation.
- Takes the public with us on the journey.

New intelligent management systems can enable this approach – this is called the SMART CORRIDOR. (This shouldn't be confused with 'Smart Motorways' which is a totally different concept).

This is not new. Smart Corridor approaches are common in the USA and are becoming increasingly common throughout Europe. Atlanta, for example, is employing Smart Corridors in its Downtown, the City of Pittsburgh is installing a 30m dollar smart-signal system and Austin, Chicago and San Francisco are doing similar things (Smart Cities, 2021).

Such Smart Corridors based upon smart signal and intelligent junctions are actively being used to better manage key city arteries and intelligently prioritising public transport, cycling and

walking, emergency responses as well as smoothing flows at rush hours in a flexible real-time system.

Chester already does this to some degree – through its UTC signalised roundabouts on the inner ring road and its approaches. Smart signalling, however, has advanced further and is now capable of much more and is far more adaptive. This adaptability will only increase through the accelerated advancement in digital connectivity and communication – involving vehicle to vehicle communications, sensors and smart signalized intersections.

The Atlanta North Avenue Smart Corridor, for example, has also enabled a reduction in accidents – creating a safer corridor. To date this has seen a 25% reduction in accidents (SNC-LAVALIN).

Most Smart Corridors, however, do include some introduction of more permanent road space reallocation to cater for cyclists. Therefore, cycling is enhanced through the provision of dedicated cycle lanes and prioritisation through smart signals at junctions. This is the same for micro EVs – Scooters, bikes and cargo bikes. The Sustainable Transport Taskforce's Active Travel Lane Group's work on the Boughton corridor illustrated this, concluding that better use can be made of available road space for dedicated cycle lanes. Small low and intermittent road features to demarcate cycle lanes would enhance their feeling of safety, and better separate the cyclist from traffic – the contra-flow cycle lane on Hoole Lane Bridge is a local example of this good practice.

This Smart Corridor technology is the approach that is best suited for Chester – a combination of adaptive smart signals and intelligent junctions together with the introduction where possible of permanent cycle lanes. It:

- Is an active, adaptable and flexible real-time corridor management system.
- Involves minimal impact on the City's historic fabric.
- Enables active and flexible real-time mode prioritisation – with a focus on prioritising active mobility modes and the increasing stable of more sustainable transport modes.
- Is capable of change and adaption as transportation modes evolve and the technology advances.
- Can increase safety and efficiency.
- Is relatively inexpensive when compared with more permanent interventions.
- Enables interaction and communication with users and the wider Smart Mobility system – through Mobility Hubs and App based systems – creating a more integrated approach.

OFF-ROAD CYCLE/WALKING SUPERHIGHWAYS

Many municipalities that have successfully promoted cycling have also employed off-road cycle routes – dedicated corridors for bikes and walkers. Chester's relatively narrow roads do not lend themselves to cycle superhighways as in London and other major cities, where roads are wider and where there are alternative routes available.

The Greenway in Chester is a great example of this, together with the routes along the City's canal system and the riverfront. However, more needs to be done:

- The Greenway has relatively indirect connectivity into the City Centre.
- Although being improved, the canal route to Ellesmere Port is still very narrow and very uneven.
- The use of setts as a decorative surface material makes cycling uncomfortable along the riverfront, and overhanging branches make it challenging in parts.

There are also some potential gaps in the off-road cycle corridor network:

- Dukes Drive to the Chester Business Park.
- From Saltney Waterfront along the south bank of the river into the City Centre.
- To the rail station and City Road through the City Place redevelopment zone.

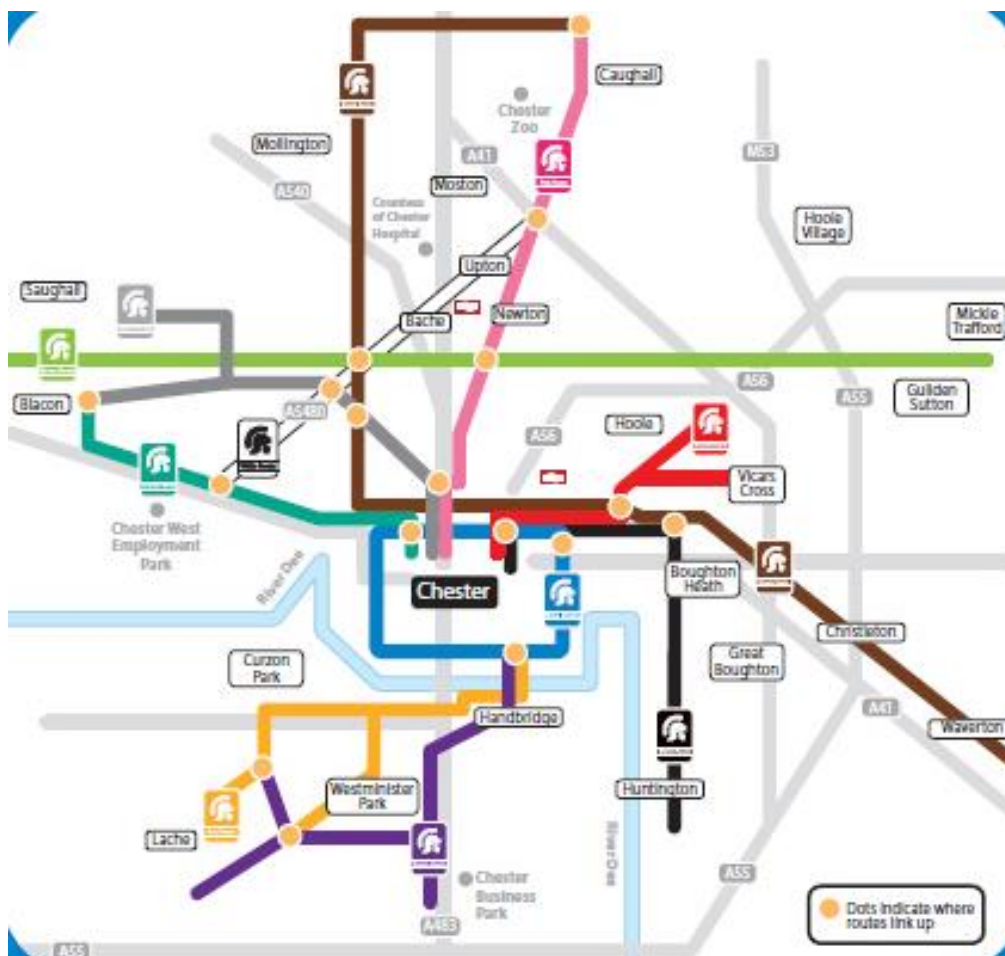
- From the Greenway into the City Centre enabling direct corridors from Blacon to the City Centre and from Hoole, Newton, Kingsway and beyond into the City Centre.

The latter two gaps are capable of being filled through the proper incorporation of dedicated cycling and walking corridors within the Chester City Gateway, and the City Place redevelopment areas. These should be a priority for incorporation into the masterplans of these development areas.

Dukes Drive requires an active dialogue with the Business Park to join it up. The Saltney Waterfront is a relatively complete footpath system with some cycle provision – but as a cycle route it requires completion on the Chester side of the border and partnership with Flintshire Council.

Whenever one talks about cycle routes an additional bridge over the River Dee is quietly muttered about. This was a route proposed some years ago to link the Huntington area to the City Centre through The Meadows, with a bridge over the River Dee. This was shelved due to the controversy it caused.

Likewise, there is a completely unused corridor of highway width all the way from Saltney over the River Dee to Crane Street alongside the railway - where only two of the four railway tracks on this line are in place – this could be transformed into a new off-road cycle route providing an additional cycle crossing over the Dee.



Chester's Strategic Cycling Network Routes (CW&C)

NEIGHBOURHOOD MOBILITY HUB LINKAGES

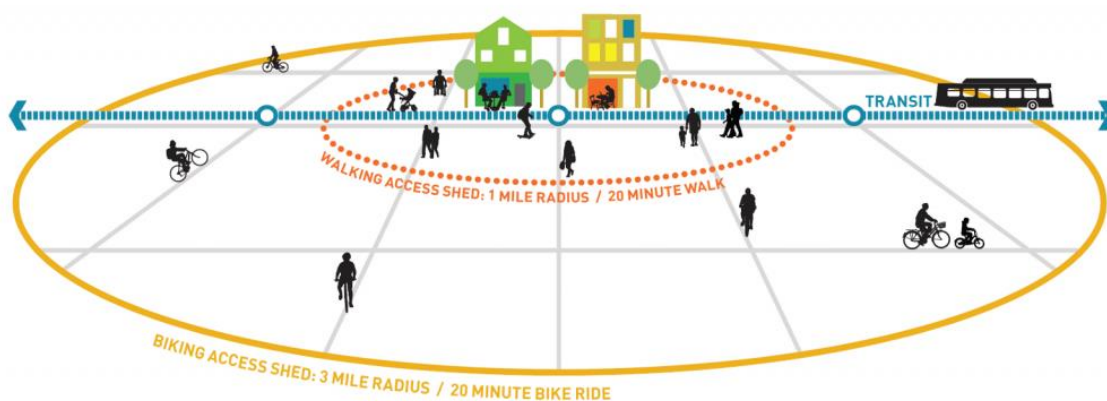
The above covers major city-wide corridors and the Mobility Hubs along those corridors. There is another layer – the neighbourhood. This needs to be seen in the context of the 20 min neighbourhood concept in mind – there residential areas are structured so that people can access key neighbourhood facilities (local shops, GP surgery, Primary School, bus stop etc) within 20 min of their home by foot. This creates both more liveable neighbourhoods but also reduces the need to travel.

Most neighbourhoods have a neighbourhood centre at their heart – the key is to create and reinforce sustainable local walking and cycling routes from people’s homes to these neighbourhood centres. **Creating a linked network of local networks across the city.**

Under the Smart Mobility approach these neighbourhood centres should incorporate a modest Mobility Hub – the focus of the local neighbourhood cycling and walking routes, where local buses stop and where people can interchange mobility modes. For example - to cycle to a neighbourhood Mobility Hub and catch a bus into town, or, to walk to the Hub and pick up an e-bike to travel to work, or, to walk to the hub and rent an EV or a pool-car, or to cycle to the shops and, while shopping, charge an e-bike and pick up a parcel.

The Boughton Group and the Upton Group on the Sustainable Transport Taskforce are leading this work.

New large-scale residential developments in the city such as those at Saughton Camp and at Wrexham Road should incorporate Mobility Hubs as part of their new neighbourhood centres. Such a requirement should be enshrined in planning policy to ensure that planning permissions for new such schemes should require the provision of such facilities.



The 20-minute Neighbourhood Concept – Streets Alive Yarra, Melbourne / Atlanta Regional Commission

SOME TRANSFORMATIONAL MOBILITY OPPORTUNITIES

As well as the Smart Corridors as outlined above – there are some potential linked initiatives that again reimagine some key parts of our current mobility fabric:

RE-IMAGINING THE INNER RING ROAD – ZIPPING THE CITY TOGETHER.

For many the Inner Ring Road is seen as a major blockage for cyclists and pedestrians. It interrupts cycle routes along the City's main radials into the City Centre. The Ring Road's roundabouts at the Barrs, Gorsestacks, Fountains and Grosvenor are difficult for cyclists to navigate safely. Cyclists just want to get across them - into and out of the City Centre's core streets.

However, the Inner Ring Road is also an essential part of the City's infrastructure – as an integral part of a smart mobility network it has a part to play – giving access to a ring of gateway mobility hubs around the city core. The key here is to reimagine the inner ring road as a 'zipper' rather than a barrier – zipping the city together, and the roundabouts as a positive opportunity rather than a problem.

The Task Group saw the subways under the roundabouts as being the answer and the recent Supertrees project being a great example. These unloved subways should be repurposed with their entrances re-engineered to become safe cycling and walking routes.

These roundabouts are key gateways into the city's pedestrian core and are therefore prime candidates for the location of Mobility Hubs serving the City Centre. This concept requires more dedicated creative thinking – but if it can be achieved, a major blockage to cycling would be overcome and the Inner Ring Road would become a more civilised and friendlier place to be.

The Clock-wise project has started many people thinking about the future of the ring road – with a whole range of ideas emerging:

- Should it be made permanently one-way?
- Should the southern 'string' (along Pepper Street, Vicars Lane and the Amphitheatre) be downgraded from being part of the ring road system?
- Could it be transformed into a circular park surrounding the City Centre?

These ideas need considering as part of a larger vision for the city – and requires some dedicated research to underpin the work. However, the concept of seeing the inner-ring as a positive 'urban zipper' rather than a barrier must be part of the way forward. Likewise, although the Inner Ring Road is an essential part of the city's infrastructure, it doesn't have to look like an ugly urban motorway as it runs through such a beautiful city centre – it needs 'humanising' and needs to become a positive part of Chester's urban fabric – a boulevard rather than a motorway.

Other towns and cities are also actively having this same discussion about their inner ring roads – 'Covcan' in Coventry, for example, have reimaged their inner ring road as a continuous urban park encircling the city centre. Clock-wise has given us the space to have this debate – minds are more open about the future of the inner ring road – this is an opportunity that shouldn't be squandered.

THE 360-DEGREE RAIL STATION

Although much improved, the rail station looks only one way – it faces the City Centre and turns its back onto Hoole and other parts of the city. To these areas it is a barrier. The narrow Hoole Road bridge adds to this difficulty. The development of the Chester City Gateway development area and adjoining development opportunities along Lightfoot Street and Hoole Road could enable the Rail Station to be more outward looking – hub of connectivity with a 360-degree outlook – enabling cycling and walking links across the rail lines from the eastern suburbs of the city. This needs positive incorporation into the masterplanning of this part of the City Centre.

THE UNIVERSITY CITY – A RIBBON OF CONNECTIVITY

Chester is a University City and the more we integrate and capitalise on this then the more the University and its students become an integral part of the City’s fabric and culture. It also will increasingly become a more vibrant and colourful place. This must be a fundamental part of the reimagining the City Centre and its post covid recovery.

The University’s campuses are strung along a ribbon from its campus at Parkgate Road through the City Centre to the Wheeler Building and through to its Queens Park Campus. Many of the University halls of residence are also broadly along this route. Many University Cities are also those places with a high use of cycling. This doesn’t seem to be the case in Chester – probably because this north/south route is difficult and unattractive for cycling and walking.

The University is actively exploring how this route can be made more attractive and safer for students as a joined-up ‘ribbon’ linking the University’s campuses.

Further, its Kingsway campus is more isolated – but is relatively close to the Greenway ‘super-route’ – this should be a complementary project to explore how the Kingsway campus can be positively linked to the Greenway route and the positive link between the Greenway into the City Centre and Rail Station area through the Chester City Gateway area.

The University should be actively supported in this endeavour – it could be a real game changer in reinforcing Chester as a University City and in raising it as a leader in active transport solutions.

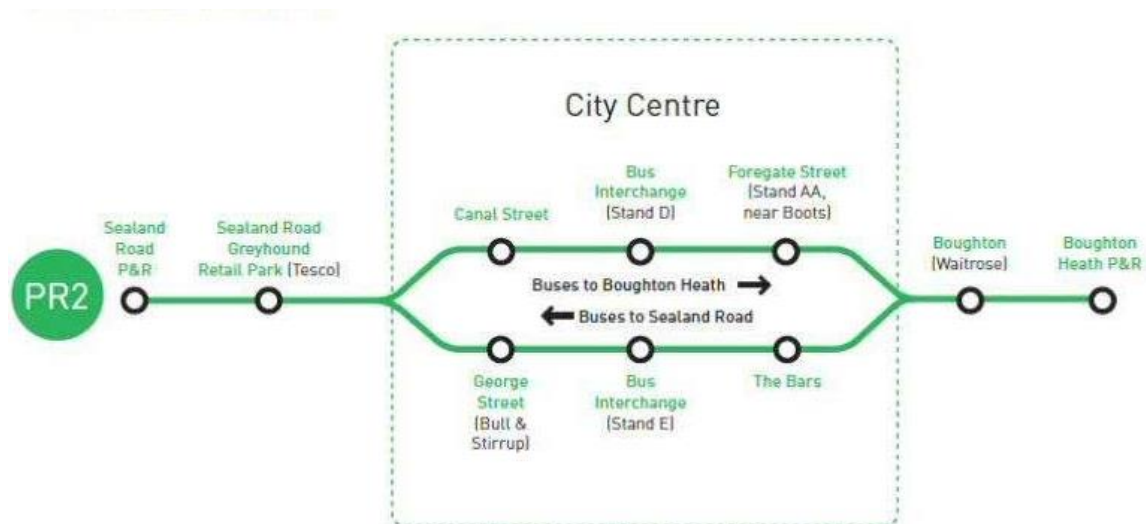
A CHESTER CITY ‘METRO’ – REIMAGINING THE BUS NETWORK

This isn’t about trams or light rail – it’s about enhancing what we’ve got to create something new and better suited to the needs of the city – re-imagining our existing Park and Ride system and local bus network within an integrated Smart Mobility approach.

Enhancing the City’s Park and Ride System

The City’s Park and Ride system was installed some 30 years ago now and it has proved to be relatively successful over its life. However, for today its utility is rather narrow – a ring of large car parks sites circling the city with express buses running along key radials into the City Centre. The Park and Ride sites have no real facilities and are little more than large areas of tarmac with landscaping. This relatively simple, could be so much more.





Existing Park and Ride Routes – PR1 and PR2. (CW&C)

A More Extensive Network - Additional P&R Routes:

There are obvious gaps in the park and site system which, if filled, would provide a more extensive and connected mobility network:

- **Upton (Zoo) P&R – Upton Village - Hoole Road - the Rail Station - City Centre** – if the Zoo P&R buses alternate from the Zoo along Hoole Road – they could serve Upton and Hoole Neighbourhood Hubs, the Rail Station and Bus Interchange – running through the City Centre. Enabling interchange with the Rail Station.
- **Sealand Rd P&R – Blacon - Bache Rail Halt / Hospital - the University - City Centre** – if the Sealand Road P&R buses alternate running through, Blacon, Bache, and along Parkgate Road serving Blacon, Bache (Hospital and Rail Halt), the University and the Bus interchange – running through the City Centre. Enabling interchange with rail at Bache rail halt.
- **Broughton Retail / Airbus - Saltney – Saltney High Street / The Lache - City Centre** – a new P&R link in partnership with the Boughton Retail Park and Airbus would link the retail park, the Aerospace employment area, Saltney and The Lache with the City Centre.

A New PR3 through route – The Upton (Zoo), Upton Village, Hoole Road, Station link could provide a through route to Saltney High Street / The Lache, Saltney and Airbus / Boughton Retail Park – providing Chester with a new through leg to the system.

Extending Existing Routes – linking to jobs, connecting areas of need and interchanging with rail.

The Zoo and Saltney R&R routes could also be extended or form an interchange hub with Cheshire Oaks and the Deeside Industrial Area respectively for particular times of the day.

This extended system together with new routes would provide enhanced connectivity with Chester's key employment areas and some of Chester's most deprived neighbourhoods – providing enhanced express connectivity for people living in these neighbourhoods to health, education, training, and employment opportunities.

This extended system would also better integrate this bus-based express bus system with the rail network by bringing the Rail Station and the Bache rail halt positively into the system and enabling interchange between bus and rail (national and regional).

A regular and low-cost shuttle service that links the bus interchange with other areas of the City Centre, the rail station and bus and coach services that emanate from the interchange should be explored. Sadly, after 6 p.m. the rail station link service stops – if Chester’s evening economy is to be supported then this this service needs to be operated for longer periods.

Metro Mobility Hubs - Additional Intermediate Stops

The addition of a small number of additional stops on the current and new park and ride routes would give the network greater usability – for example at:

- Bache / Morrisons – would enable interchange with the Bache Rail Halt
- Boughton Local Centre – would enable interchange with local bus routes serving the surrounding neighbourhoods of Vicars Cross, Boughton and Huntington.
- The Racecourse (via re-routing of some services from the Sealand link during race days).

The intermediate stops therefore become an integral part of a wider integrated mobility network:

- Enabling interchange with the wider local bus network – providing links to serve the city’s network of residential (20 minute) neighbourhoods
- Enabling interchange with the other mobility modes co-located at these Mobility Hubs
- Becoming key hubs on a wider network of neighbourhood networks.

Where the P&R routes stops overlap in the City Centre these also become Metro Mobility Hubs – enabling the interchange between routes – so – for example you could travel from the Sealand Road P&R site through to the Upton (Zoo) P&R site, or their intermediate stops.

In a smart mobility network, the emphasis should however be about integrating transportation networks rather than keeping them separate.

The opportunity therefore is to enhance the park and ride system making it the basis of a bus-based metro type system – one that is integrated into the City’s network of Mobility Hubs and interfacing with and reinforcing the local city-wide bus and rail networks, by:

- **Park and ride Sites becoming major City Metro Mobility Hubs with:**

- Car Parking
- Express Park & ride electric buses and their charging facilities
- EV charging facilities incorporating solar charging systems
- E-bike and e-scooter rental and charging
- Cargo bike rental
- Car-pooling and car-sharing facilities
- Parcel drop-off and pick-up
- Real-time transportation communication and information hubs
- Destination Chester events and marketing information
- Hospitality facilities – cafes and retail opportunities and attractive covered waiting areas
- An attractive enhanced landscaped environment perhaps with some small-scale retailing opportunities
- Solar power generation
- Enhanced cycling and walking links.

- **Creating Metro Mobility Hubs** - Increasing the number of intermediate stops by a small number at important places on the routes:

- Enabling interchange with the wider local bus network – providing links to serve the city’s residential neighbourhoods
- Enabling interchange with the other mobility modes co-located at these Mobility Hubs.

- **Metro Interchanges** - enabling transfer between routes by developing overlapping stops in City Centre as metro interchanges.

- **Linking with surrounding rural village neighbourhood Mobility Hubs** – enabling people to travel from Chester’s adjoining villages and interchange at the park and Ride Mobility Hubs to an express bus into the City Centre.

- **Extending the current P&R (Metro) Routes** – to serve other important employment locations on the periphery of the city – Deeside Industrial Zone, Airbus and Cheshire Oaks – either as interchange hubs or as direct route extensions

- **Serving wider Destination Chester visitor destinations** – i.e., the Zoo P&R being a hub for interchanging with links to Cheshire Oaks or sometimes extending its route to directly serve Cheshire Oaks. The Sealand Rd P&R route being rerouted to serve the Racecourse on race days.

- **Extending the systems Route Network** – to serve other important locations in the city.

- Upton (Zoo) P&R to Upton local centre, Hoole Road and the Rail Station – City Centre
- Sealand Road P&R to Blacon, Bache Rail Halt /Hospital and the University – City Centre
- Broughton Retail Centre / Airbus, Saltney and The Lache – City Centre.



Stourton Park & Ride site, Leeds – an example of a P&R site-based Mobility Hub

The Stourton Park and Ride site in Leeds is a great example of a state-of-the-art City Mobility Hub P&R site. This project forms part of 'Connecting Leeds' ambition to improve the bus network, provide better connectivity and reduce carbon emissions in the city.

This site has capacity for 1,200 vehicles and complements the Elland Road and Temple Green sites, catering for trips south-east of the city with access via Junction 7 of the M621, A61S and A639. The Stourton site will take over 1.6m car kms off the network into Leeds city centre each year.

It is the first fully solar powered park and ride site and is served by an electric bus fleet which will run every day. The result of a solar powered site will result in the reduction of 471 tonnes of carbon each year, which is the equivalent of removing 203 cars from our roads. The solar panels also power 26 electric car charging points and one bus capacity point, meaning electric vehicle users will benefit from a sustainable energy supply.

The site includes parking for e-scooters and bikes, a retail hub, changing facilities and includes dedicated cycle way and walking links. The Stourton site is part of Leeds transport connectivity programme bringing together P&R, the local bus network and cycling and walking – all rebranded as METRO.



The Leeds 'Metro' branding.

Such an enhanced system for Chester would transform the simple park and ride network into a more intelligent City-wide bus-based 'metro' for Chester. Re-branding would encourage wider usage and greater utility for Chester residents, visitors and business – from a park & ride system to a 'Chester Metro'. All powered by renewable energy sources with electric buses - as is now common in the UK and abroad.

Enhancing the Bus Network

Chester is well served by its local bus system of routes, stops and a new bus interchange. We've already talked above about building the city's network of Mobility Hubs on this system – key bus stops being Mobility Hubs – thereby enabling the interchange of mobility modes and creating a more intelligent integrated transportation network.

Like most UK cities, Chester's, the bus network is both complicated and based upon the City's radial routes – with the City Centre at its heart. It is more difficult to travel across town and to do this people quite often have to change at the bus interchange. This puts people off and sometimes it is difficult to navigate.

Some cities take a different approach. Oslo, for example, has a network of defined 'interchange' bus stops throughout its network. These are stops where customers actively change buses in order to get to where they want to go and these interchange stops are designed to be a fundamental part of the network and information and payment systems reflect this. It operates like a city metro system and people use it as such.

In Chester this approach could be employed with key Mobility Hubs being these 'interchange stops'. This would make the bus network more usable and more effectively integrated into the rest of Chester's Smart Mobility framework.

The introduction of electric buses, would also create a new modern image and enable joined up end to end journey planning and joint ticketing and payments.

BRINGING THE CHESTER CITY 'METRO' TOGETHER:

Enhancing and extending the Park and Ride system together with the enhancement of the City's Bus network - integrating these into a new network of Mobility Hubs throughout the City. This would be a major step forward towards a modern and integrated transportation network in Chester. Again – integrating what we already have to enable a far more effective and Smart Mobility Network.

**CHESTER METRO
FRAMEWORK MAP**
(Enhanced and extended Park & Ride network - concept)



There potential barriers to this – bus legislation, different operators, competition rules and a plethora of other issues will get in the way – however, the prize would be worth it. This should be pursued with Government as a national exemplar in creating a bus-based ‘metro, system in a non-metropolitan / historic city area.

5. A MOBILITY MARKET PLACE (MaaS)

Imagine a city where travellers move seamlessly from place to place. Where they stipulate their journey and travel preferences on an App on their phone, computer or public kiosk (at a Mobility Hub), and are presented with journey choices, according to their preferences, which fully integrate public and private transport modes. Where payment happens automatically using a processing method of their choice. Where the transition from one mode of transport to another is straight forward, perfectly timed and effortless. Where congestion is minimised, air quality improved, and passenger comfort enhanced. And where there's plenty of on-demand travel options, and users have ready access to real-time journey information and an integrated journey planning platform.

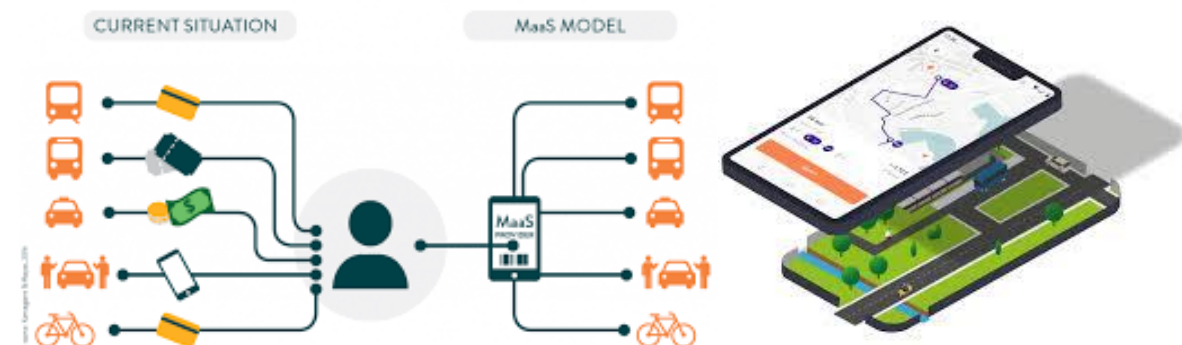
Just imagine if Chester was this city!

This is not far-fetched – such a world is now the stuff of reality. Travel can be this straight forward, and the building blocks are appearing in cities such as Vienna and Helsinki. Closer to home, Cambridge through its 'Smart Cambridge' initiative is exploring this sort of integrated transport system. The Ginger e-scooter operating now in Chester has much of these characteristics.

With the right technology and model blend, it's possible to create a travel 'ecosystem' that significantly achieves these policy objectives, including economic growth.

The term Mobility Market Place is often called 'Mobility as a Service' (MaaS). This is the integration of smart applications that make it easy and convenient for all users to find their individual way/journey through the vast mobility options available to them in getting from a point of origin to destination. Key components of this service, include; intelligent journey planning, seamless integration of ticketing and booking as well as big data analytics, combined in flexible and secure MaaS platforms. These make it possible and empower an efficient intermodal mobility, for the benefit of travellers and operators alike.

It uses the latest technology to empower consumers in making their own mobility choices. In the most developed systems, every public and private transport option is presented in a single App, handling payment and bookings through the same platform and providing dynamic route-planning information to users. This is the Mobility Market Place. But the Mobility Market Place is about much more than this. It is about making every aspect of travel effortless, facilitating an ease of movement that 30 years ago would have been unimaginable to people as they queued on platforms, fought over taxis, or squeezed into buses.



Concepts of the Mobility Market Place

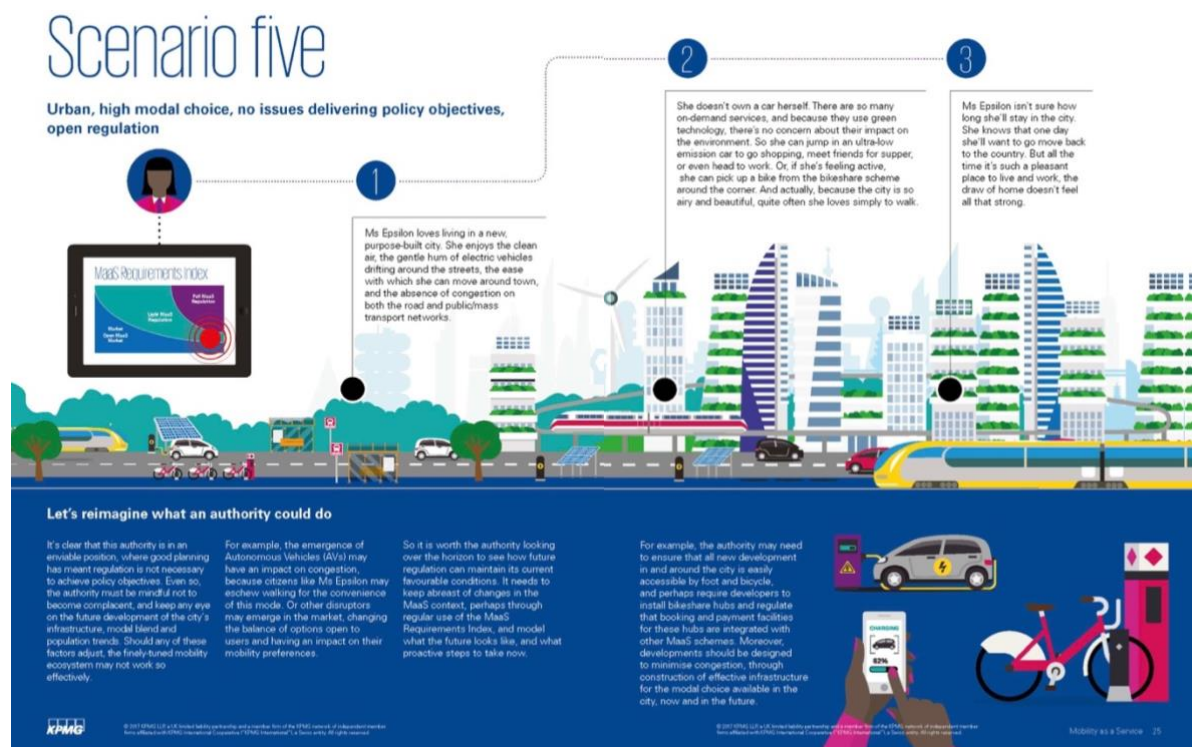
The Council's existing iTravelSmart mobile App available on the Google Play and Apple App Store, provides an easy to use, but basic linkage between some of these key local services. i.e., walking, cycling, public transport, carshare and park and ride data in an easy-to-use mapping

environment. This award-winning app was replicated in places like York and other cities across the UK when it was launched over 5 years ago. Although still live this system is rather clunky compared with how this technology has advanced and doesn't incorporate many of the newer mobility modes now emerging nor include an integrated payment approach.

You can book a theatre seat in Chester – but you can't book a dedicated car parking space in the same way – and certainly you can't book that parking space, charge the vehicle at that space and rent an e-bike – with one payment from an App in your phone.

KPMG have produced a handy set of scenario graphics that illustrate the journey towards an integrated Mobility Market Place (or MaaS). They develop 5 scenarios that reflect where places are in the integration of their transportation systems. These are reproduced in appendix 1. The Task Group placed Chester somewhere between scenario 2 and scenario 3, i.e. – Urban – low to medium modal choice – some limited integration.

However, the Group aspired to Chester moving to KPMG's scenario 5: **Urban - high mobility choice, a high level of integration with no issues delivering wider policy objectives:**



However, this is a 'journey' for the city and it will take time – but you have to know where you're going to successfully plan your trip!

For Chester then Scenario 5 should form a basic specification of the integrated Mobility Market Place App-based System to be developed - Urban - high mobility choice, a high level of integration

The way forward here must be that the Council leads the way working closely with its current and new transportation partners to develop a vision for an integrated App based Mobility Market Place (MaaS) using the physical framework of Mobility Hubs and Smart Corridors– this to be set within a clear delivery programme.

Promoting Modal Shift via Campaigns and Marketing.

Many Smart Cities are seeing the ability to run and target incentive programmes and campaigns to promote the use of alternative forms of transport other than the car. Such campaigns include reduced fares on public transport and free rides. This could well be a more powerful tool to promote people to move from their car to the bus than by creating expensive and controversial bus lanes.

Seattle with its 'Flip Your Trip' campaigns are an exemplar in this campaign-led modal shift approach.



Of-course the positioning of the power of digital communications technology at the heart of the Smart Mobility approach creates a powerful tool for marketing the system and enabling real-time communication with users and customers.

Using the Mobility as a Market Place digital intelligence and communications platform would also provide an ideal opportunity to generate income through advertising – particularly for local businesses.

Encouraging New Mobility Modes

An E-bike Fleet

There are gaps in the modes currently offered in Chester. We have Ginger e-scooters and private e-bikes are becoming increasingly popular.



However, rental e-bikes are not as yet on Chester's streets and e-cargo bikes are rare. In undertaking this work many residents have said that they would exchange their car for a bike:

'If I could rent such a e-bike from a hub close to where they live, if that bike had panniers or was a cargo e-bike so I could carry my shopping home, if the route was safe and if the process was easy' (a local resident)

The development of an e-bike rental fleet in partnership with a rental provider should be the way forward – this approach is becoming common through-out the USA and Europe and is becoming more common here in the UK too.

Chester has also never actively encouraged access or parking for PTW's (powered two wheelers). Motorcycles and scooter popularity is constant, yet there is no policy for their encouragement of use and access, yet these vehicles are less polluting, take up less space of the arterial roads and take far less space to park.



Freight and Deliveries

Many of the major delivery and logistics companies are experimenting with alternative vehicles – from small EVs to e-cargo bikes. The narrow city streets of Chester's historic core lend themselves to e-cargo bike deliveries – possibly with transshipment at park and ride sites or City Centre car parks, accessed off the Inner Ring Road (Urban Mobility Hubs). This would reduce the need for some of the large delivery vehicles to enter the narrow pedestrianised historic City Centre streets.

In the Ruhr in Germany has been pioneering such regional distribution centres with smaller EV delivery trucks (EV) distributing to supermarkets, shops schools etc. Smaller vans/bikes deliver to customers

The whole framework of Smart Freight and delivery systems deserves more dedicated work. Of all the aspects of transportation, freight and distribution has undergone the greatest change over the last decade. Delivering from online warehouses directly to people's homes via national, regional and local delivery hubs has transformed retailing. Trans-shipment from large vehicles to small vehicles more suited to Chester's historic streets has been explored in the past. The landscape has now changed and transshipment should be re-examined as an integral part of a Smart Mobility framework, with:

- Transshipment happening at P&R sites on the edge of the city and within City Centre car park-based Urban Mobility Hubs (the APCOA model)
- The inclusion of delivery lockers within Mobility Hubs
- The increasing use of smaller freight EVs of a size that better suits Chester's historic streets and can better mix with pedestrians.

One thing is clear – City Centre Living without a car needs high quality freight delivery services.

Car Sharing and Pooling

In many city centres across the UK car free or reduced residential car parking requirements for new residential developments is now becoming common place. These often incorporate facilities for car-pooling and car clubs.

The City of Melbourne is a leader in car sharing. It has enabled car sharing services on-demand through agreements with four car share companies. These provide over 380 on-street car share spaces and over 180 off-street car share vehicles in the city. Cars are picked up and dropped off at car share bays nearest to the customers location. The city also operates a peer-to-peer car sharing system. The Melbourne City Council states that in the city every car share vehicle removes nine privately owned cars off the road and reduces car usage by up to 50 per cent. (City of Melbourne, 2021, melbourne.vic.gov.au).

In Chester this is immature or non-existent. Indeed, currently residential car parking planning policy actively discourages City Centre living. If we want Chester City Centre to become a more contemporary place attracting younger people to live and work in its core, then such alternative forms of transport and new approaches to residential car parking need to be actively and urgently adopted.

This is all about moving from vehicle ownership to vehicle usership – and the Council and its partners need to positively take a leading role in this and integrate this into its Mobility Market Place technology and systems.

Developers of City Centre residential schemes would then be required to make payments for the residential car parking spaces they don't provide in their new residential schemes – this income would be reinvested into alternative transportation modes instead – an approach now becoming common-place in other cities in the UK.

This is not just about transportation – it's about the image of Chester – a forward looking and confident modern city at the forefront in contemporary city living – a city with a clear image of itself as a green, vibrant, independent, colourful and sustainable place in which to live, do business and to visit.

6. A CHESTER SMART MOBILITY INNOVATION CENTRE

Such a technologically advanced integrated system would require new skills in leadership, network management and operations. These skills are rare in the more traditional Local Authority Transportation teams – Chester is probably no different here. Most cities that have embraced integrated Smart Mobility have established ‘Mobility Innovation Centres’ within the Local Authority, Transportation Authority or transit company, often in partnership with an academic institution. Such centres should also integrate freight and deliveries as part of their remit.

Chester would need to urgently establish such a Mobility Innovation Centre. Such a team would programme the change required, deliver key projects and work with partners and transport providers. It would be a hub of innovation – managing the system, ensuring integration and its ongoing evolution and development. The team would be the centre of skills and expertise and would keep abreast of developments in smart mobility across the world – ensuring that Chester would be at the forefront in good practice and innovation. A partnership with academia could help in this. Contact management and procurement will be critical skills.

A key role of the team would be to prepare funding bids to government and work with developers and business partners. Marketing and branding skills would also be necessary to ensure that Chester’s Smart Mobility policy is promoted and its use maximised – taking the City’s users on the journey.

Wider Benefit Realisation

A central objective of the Mobility Innovation Centre would be to work with wider Council teams and partners to ensure that its wider benefits are fully realised - ensuring:

- The regeneration of disadvantaged communities and neighbourhoods
- Access to jobs, education and training
- The vitality of the City Centre and the High Street
- Access to public services and health care
- Climate Change and sustainability outcomes are realised
- Inclusive economic growth.

Preparing for the New E-World

Most places in the UK are ill prepared for the EV revolution that is happening right now. Certainly, it’s confusing – with different charging technologies and the rapid development of vehicle battery technologies. In eight years-time the production of diesel and petrol dependant vehicles will stop in the UK – the use of EVs will only accelerate.

The Council’s Transportation Team are actively working at pace on this issue. But the general question exists – should EV charging be down to the individual and the private sector to organise and provide or is it a public sector role? The answer must be that the Council provides connected leadership and a framework in which this will happen – ensuring inclusivity is achieved across the City, avoiding inequalities for individuals and neighbourhoods, and to ensure that wider transport and economic benefits are realised. York for example is exploring the use of its park and ride sites as charging hubs for inner city households that can’t charge their cars off-street.

One of the key questions is whether Chester has the basic overall electricity capacity to deal with the mass charging of EVs that will be required and whether there are parts of the City with particular problems with that supply. The Council and power suppliers and other providers working positively together will be critical here. Certainly a few EV charging points in a car park isn’t going to be enough. An enhanced city-wide WIFI system will be critical to the strategy and its success – ensuring the connectivity required and that people will demand.

This leadership and coordination role will be one of the most important roles for the Council’s Mobility Innovation Centre in the years to come.

7. CITY CENTRE LIVING

There is a big change happening in city and town centres across the UK and beyond – they are increasingly seen as places where people want to live. The bigger cities have been leading the way, but increasingly smaller historic cities like Chester are being seen as attractive. This has been accelerated by the decline in the retail and office function of the High Street – where residential development is sometimes the only viable alternative use for the vacant properties.



In Chester this has been happening for some time – many historic streets which only ten years ago were dominated by offices have now been almost totally returned to their former residential use. Residential conversions are now happening in vacant upper floors in Chester's historic main streets.

It is widely acknowledged that increased residential based development is the way forward for Chester City Centre – it:

- Provides a viable use for vacant properties and underused upper floors
- Enables an increased resident population – that creates footfall and customers that City Centre retailing, hospitality and other High Street uses desperately need
- It helps to enhance safety – through a resident population providing increased self-surveillance
- Reduces the need to travel – all the facilities and services required are found within the compact City Core – it's the ultimate 20-minute Neighbourhood
- Can produce a neighbourhood with a reduced dependency on owning a car – increasingly many people are no longer seeing the car as a necessity. Therefore, living in central Chester with its excellent local, regional and national travel linkages is attractive. You simply don't need to own a car. In such instances car clubs, car-pooling and sharing or simply car rental becomes the norm – usership rather than ownership
- Helps retain and attract younger people – who generally prefer city centre living. The Cheshire and Warrington LEP saw Cheshire having an increasing problem in attracting and retaining young people and an increasingly aging population. To support economic growth the LEP has identified retaining and attracting young people as a priority to support the County's economic health. The LEP's work has identified Chester as one of a very few places in its subregion capable of attracting young people through increased city centre living (C&W LEP, 2018)
- Reduces the need for urban edge development and unnecessary urban sprawl
- Addresses the trend for home working – in a connected environment
- Helps create an 'authentic' place – increasingly visitors are looking for the experience of real places with real culture and a real community – people living, working and playing in the same place helps create such an authentic atmosphere.

Chester City Centre's future therefore is increasingly about urban living and working, and the vibrant, colourful, authentic place and culture that this creates – a strong, safe and vibrant City Centre Neighbourhood. This should be a priority the review of the One City Plan and the review of the Local Plan.

Chester has been relatively slow in reacting to this change. Indeed, some of the current planning policies directly act against this. For example, the current policy stipulation for residential car

parking requires a minimum number of off-street parking places to be provided. This is obviously impossible in a high-density city centre where space is at a premium, viability is sometimes a challenge and the historic fabric produces constraints.

Many towns and cities are embracing car free or much reduced car parking standards to attract city centre residential development and city living. To be successful Chester needs to urgently do the same. The special architectural and historic characteristics of central Chester sometimes makes this challenging for both the developer and for the Council as regulator. However, it's a clear role of the Council to provide clear guidance and certainty for developers to help them in developing their residential projects – a confident, supportive, positive and enabling approach - rather than an anxious conservative and unsupportive one. A Chester Central Residential Development SPD (Supplementary Planning Document) might prove useful for both sides in this process.

Warrington Borough Council's Town Centre SPD together with its interactive digital Town Centre Masterplan recently produced does just this – creating a promotional and positive climate for new town centre development, particularly residential, and provides clear detailed positive guidance for developers – with a clear focus on place-making and creating vibrant new town centre neighbourhoods.

Use of cycles for City Centre residents will only be possible by a growth in provision of secure cycle lockers across the City Centre area. Narrow doorways, staircases and lack of interior storage space all preclude buildings being used for storage of cycles. Key operated locker systems such as operated in London Boroughs seem to fulfil this role admirably, although swipe card access systems would work equally well.

Transforming central Chester into a vibrant and dynamic neighbourhood with a cool creative and mixed community requires a clear vision, leadership and determination. Just developing individual sites does not create a neighbourhood. A City-wide vision is urgently required – a vision that succinctly paints a picture of the place we want to create – what central Chester could be. The One City Plan review has the potential to be the means articulate this vision and programme its delivery.

We shouldn't forget that we already have an existing and increasing resident City Centre population – they are the seeds of this new neighbourhood and community. As a priority the living environment of these residents needs protecting and enhancing. Simple things need addressing – e.g., enforcing current traffic restrictions to curtail deliveries and other vehicles short cutting through residential streets, basic public realm cleanliness and maintenance, and good street lighting are the essentials of making the City Centre liveable for these residents.

This vision needs to be bold and confident and it should be actively communicated – investors, developers and new residents will be drawn to such a place – but they will need to know about it and they need to be shown the opportunities within it. They need a positive regime to help guide and support them. Chester's new vision requires active city marketing and a proactive city management approach.

It is not the function of this document to provide such a shared vision – this needs to be part of a much wider debate. Transportation, however, plays a critical role in enabling this place – it needs to provide a basic framework for city living in Chester.

The working group identified the key principles of a transportation approach for the City Centre - as part of making Chester a **WANT TO GO TO** Destination City for living/ working/ playing and visiting:

- Reduction of private car ownership is a key driver
- A strategy for shared user-ship
- Better access to joined up transport and travel options across all platforms
- Proper secure safe facilities for personal transport (bikes and e-bikes) across the city.
- Smart mobility hubs and delivery/collection facilities - not car parks in new residential and mixed-use schemes.
- Increased permeability for walking/cycling/active travel.

Alongside:

- An active policy to create a **TOP QUALITY** City Centre community with more City Residents and workers (people who live and work in the City - spend in the City)
- A workable strategy for servicing the city core be introduced – possibly with excluded time zones etc.
- Increased use of joined up ticketing across all platforms
- An inclusion strategy so City dwellers are not disadvantaged and everyone has access to travel options

The key items that need to be effectively addressed for the transport components of City Centre Living in a world where carbon zero can be a reality and Chester is a place where people all of ages and backgrounds will want to live, work & visit are as follows:

- **Vehicle co-ownership & user-ship with flexible accessibility** – including type & size of vehicle.
- **Affordability.**
- **Safety** – not only within modes but also between modes (on interchange).
- **Reliability and time availability** – both in terms of time window and length of use.

The Task Group addressed that for a range of “demographic user groups” and also identified a series of examples of best practise in the UK, Europe and around the world. All of this information is captured in appendix 2.

The Working Group identified Pontevedra in Spain is an exemplar of a city with similar challenges to Chester and which had a similar outcome it wanted to achieve. The planning processes and implementation plan are universally regarded as world class:

An Exemplar in City Living – Pontevedra, Spain. **Increasing Downtown Liveability by Reducing Vehicle Access** (From SMART CITIES, Bloomberg CityLab and Landscape Interface Studio)

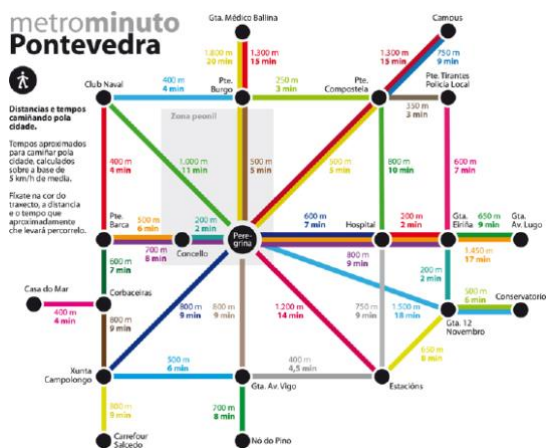
Pontevedra, an historic city, has become more recently a model of urbanism and urban design - reinventing itself with its citizens as protagonists and led by its Municipality. Pontevedra has become a model for many cities where, in just 15 years, more than 70% of urban movement is now done on foot or by bicycle. It's a city centre where the car is unobtrusive, a city with neither noise nor fumes, where children can play in the street and people with reduced mobility can access businesses and services easily.

Pontevedra has been trying to create a lasting and sustainable improvement to the urban environment of the city and has focused on raising the quality of all of its urban components. The city, under the leadership of the municipality, identified the following key objectives:

- Drastically reducing air, noise and water pollution
- Achieving an inclusive city in which social class, physical or disability barriers, by age, sex or any other diversity are mitigated or eliminated.
- Eliminating the dangers of traffic and enhancing non-motorized mobility, reversing priorities and placing foot-travel as a central element of urban mobility.
- Converting the city's urban public spaces into social spaces – a city of 'integrated plural uses'
- Promoting the autonomy of children and their integration into urban life
- Promoting the health of its citizens - particularly tackling obesity and cardio-vascular problems

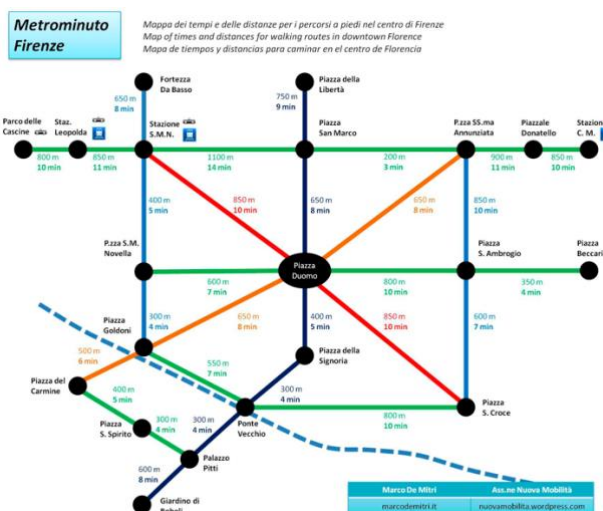
So far, CO2 emissions in the urban centre have been reduced by 88% and traffic related injury has been drastically reduced with no deaths or serious injuries recorded. In addition, public spaces and green areas, as well as pedestrian and bicycle paths have added to the regeneration of the city's historic centre. As a result of this, Pontevedra received the UN Habitat Award in 2015, which recognised the policies implemented by the city as examples of best practices that should be copied by other cities around the world.

Pontevedra was also awarded the INTERMODES prize in 2013 for developing the first European pedestrian map: "Metrominuto", that resulted from a policy of prioritizing pedestrian mobility. The map set out in graphic format the pedestrian network and provided an accessible and low-impact alternative for the citizens of Pontevedra and its visitors.



Pontevedra's Walking Map – Metrominuto.

Metrominuto takes the form of a map, along the lines of a metro map, which shows information on walking distances and travel times between the main locations within the city. The well-being of pedestrians and people with reduced mobility was an important factor in terms of access to public and shared transport. By returning spaces in the city to pedestrians, citizens are once again able to take ownership of walking as the prime means of mobility. Pontevedra's 'Metrominuto' walking map has been copied by many cities, including Paris, London, Florence, Toulouse, Firenze and Moderna (to name just a few).



Metrominuto maps of Toulouse and Firenze.
(From SMART CITIES, Bloomberg CityLab and Landscape Interface Studio)

By restricting traffic and eliminating physical barriers, the city council has redesigned Pontevedra from the sight line of a child. This programme has had many positive impacts on the community. One of the most tangible - the once-languishing historic city centre has become a friendlier space for kids and their parents.

This trend is reflected in the demographics of Pontevedra. The city has attracted young families from throughout Spain's northwest region to settle in the city - Pontevedra has experienced the most growth compared to other major cities in the surrounding region. The newly revitalized, now pedestrian-focused, town grew from 73,871 people in 1998 to 82,671 in 2017. (Statistics Institute of Galicia. (From SMART CITIES, Bloomberg CityLab and Landscape Interface Studio articles).

Pontevedra is universally acknowledged as a success and an exemplar in transforming a congested and car dominated historic city centre into a vibrant people dominated place. This was done through determination and vision. It was not without its critics and the business community in particular was initially concerned about the approach – but it has worked.

In transforming the centre of Chester some of the principles and approaches adopted by such places as Pontevedra would be invaluable. The preparation of a **METROMINUTO CHESTER** as part of the city's street wayfinding approach and to promote more walking is recommended.

Should the pedestrianisation of Chester's city centre streets be expanded? It seems strange in 2021 to still have cars traveling through the heart of such a glorious historic city centre.

If the pandemic has taught us anything – it is that pedestrian dominated streets filled with alfresco activity, street animation and city life create a place that people want to live, work, visit and play in – and with people comes economic activity and investment. This must be the basis to create a shared vision for Chester and a basic premise for the One City Plan review.

Transforming the City Centre into a more liveable place needs to be a priority – this must be the bedrock for any reimagining of central Chester and its recovery:

- Doing the simple things to protect and enhance the living environment of existing residents – they are the seed bed for city living and the new city core neighbourhood. This will form the basis of an enhanced management regime that will be needed when city centre living inevitably increases.
- Extending the pedestrianisation of streets in the core of the City Centre – St Werburgh Street, Northgate Street, Upper Bridge Street to its junction with Pepper and Grosvenor Street and St John Street (the link to the Amphitheatre). Basically, everything within Chester's Roman Walled area should be pedestrianised (whilst ensuring proper controlled time limited access for people living in that area and deliveries to businesses).
- Extended Alfresco, street trading, street markets, street-based events and public space animation will help create this vibrant City Centre that people will want to be a part of – to live in, to trade from, to work in, to visitor and to invest in.
- The production of a 'METROMINUTO' plan for central Chester and its wider area and the incorporation of this into an enhanced wayfinding and signage approach for the City Centre.
- Establishing the ring of Mobility Hubs around the Inner Ring Road – at key pedestrian street gateways and in reimagined City Centre parks. These will provide easy access to a range of mobility modes for City Centre residents and reduce the need for them to own their own car. The hubs could also form the basis for small scale deliveries transshipment to help reduce some deliveries into the core pedestrianised streets.
- Exploring a new framework for EV charging, pool-cars and car-club vehicles and bike parking for residents – sometimes this will be off-street and within new developments, however, where this is not possible, within City Centre Car Park Mobility Hubs.
- Remodelling the existing inner ring road subways and roundabouts as attractive, safe and usable routes for walkers and cyclists to cross the barrier of the ring road.
- Setting up a real debate about the future of Chester's inner ring road supported by thorough research and analysis – the basis of this must be to 'humanise' this brutal circuit and to fuse it better into the City's urban fabric– turning it into a 'zipper' rather than a barrier.
- Reworking the Council's planning policies to encourage City Centre residential development (a presumption in favour) – removing policy anomalies that currently get in the way. Perhaps the production of a City Centre Residential Development SPD would help in this. The planning regime should certainly ensure that new developments incorporate facilities for new modes of travel – bike storage, EV charging, car-pooling etc. Above all – an encouraging, engaging, proactive and promotional approach.
- Ensuring that the basic maintenance of the public realm is undertaken.

8. IN A NUTSHELL: SMART MOBILITY CHESTER – a place where:

- Travellers move seamlessly from place to place.
- Travellers stipulate their journey and travel preferences on an App on their phone, computer or kiosk and are presented with journey choices, according to their preferences, which fully integrate public and private transport modes.
- Payment happens automatically using a processing method of their choice.
- The transition from one mode of transport to another is straight forward, perfectly timed and effortless.
- Congestion is minimised, air quality improved, and passenger comfort enhanced.
- There's plenty of on-demand travel options, and users have ready access to real-time journey information and an integrated journey planning platform.
- There is a branded and marketed bus-based 'Metro' – comprising an enhanced and extended park and ride system integrated with the local bus and rail networks – that not only gets you into the City Centre but also to work, to the hospital, to major visitor destinations, to the University, to the rail station and supports the revitalisation of Chester more disadvantaged neighbourhoods – all with modern branded electric buses.
- There is an integrated network of Mobility Hubs, again branded as part of a wider network where you can pick up or interchange your chosen mode – bus, e-bike, e-scooter, car-share vehicle, a cargo bike, charge your EV, have a coffee and pick up a parcel. Small ones within residential neighbourhoods and larger hubs at key city destinations. This being based upon the Park and Ride and local bus networks
- Park and Ride sites have become large-scale Metro Mobility Hubs serving the city generally - providing express connectivity into the City Centre but also peripheral employment areas at Deeside, Airbus and the Business Park, together with nearby rural villages and other destinations such as Cheshire Oaks. Where they provide solar power EV charging and attractive retail, hospitality and waiting areas and have cycling and walking routes integrated.
- Intermediate Metro Mobility Hubs along the P&R based Metro routes enable interchange with the local bus network serving local neighbourhoods, the Rail station and Bache rail halt and enable interchange with other mobility modes.
- Chester's more disadvantaged neighbourhoods are positively served by the extended and enhanced Metro network – enabling people in those areas to better access employment, education and training and health opportunities.
- City Centre car parks have been reimagined to be Mobility Hubs serving the City Centre and a cluster of smaller Mobility Hubs are arranged around the Inner Ring Road forming gateways to the City Centre's main pedestrian streets.
- More modest Mobility Hubs are located within local neighbourhood centres – forming a focus to a local network of cycling and walking routes – 20-minute neighbourhoods.
- The Inner Ring Road's roundabouts and subways have been attractively remodelled so cyclists and walkers willingly use them as safe ways to cross the ring road and the ring road has become a more humanised place – a zipper rather than a barrier.

- The rail station has 360-degree access rather than just looking towards the City Centre, is permeable with through pedestrian and cycle linkages.
- The city's main radial roads are Smart Corridors with smart signals and intelligent junctions that actively manage these key city arteries and intelligently prioritising public transport, cycling and walking, emergency responses as well as smoothing flows at rush hours in a flexible real-time system.
- There are off-road dedicated superhighways for cycles, micro EVs and walkers as well as safe and continuous cycle lanes on the city's main radial roads.
- There is a network of secure cycle lockers across the City Centre with swipe card access to serve City centre residents, workers and visitors alike.
- The University City is reinforced through a 'ribbon' of safe walking and cycling routes connecting the University's campuses.
- The large-scale City Centre development areas such as Chester City Gateway and City Place help to fill the gaps in the City's dedicated cycling and walking routes.
- There is a fleet of rental micro EVs (scooters and bikes including cargo bikes and bikes with panniers) that can be picked up at Mobility Hubs throughout the city.
- The City Centre has become a strong, safe and vibrant urban Neighbourhood where city centre living is the norm and it is a great place to be
- The core of the City Centre is car free with an expanded well managed pedestrianised area.
- There is extended alfresco, street trading, street markets, street-based events and activity, and public space animation - creating a vibrant place that people want to be a part of – to live in, to trade in, to work in, to visitor and to invest in.
- There is a 'METROMINUTO Chester' – a walking plan for the wider central area and an enhanced wayfinding and signage approach to encourage walking and enjoying the city by foot.
- There is a framework for EV charging, pool-cars and car-club vehicles and bike parking for City Centre residents – sometimes this will be on-street and within new developments, however, where this is not possible, within City Centre Car Park Mobility Hubs.
- There is proactive regime that promotes and actively supports City Centre residential developments with reduced residential parking or car free schemes and payments from residential developers towards the wider Smart Mobility network instead of providing on-site car residential parking
- The City Centre is a place that's well maintained and well managed and smart freight and delivery is positively integrated into Chester's Smart Mobility framework – particularly in the City Centre.
- There is a Smart Mobility Innovation Centre to make this happen, to lead the change, be a hub of skill, expertise, innovation and communication and to ensure wider benefits are realised.

Sustainable Transport Taskforce Smart Mobility Working Group members:

Anja Miller
Mike Garratt
Tamara Hunt
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Robert Gatensbury
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Roy Newton
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Helen Tandy
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Murray Graham
Simon Brown
Andy Farrall. (co-ordinator and pen-holder)

Chester Growth Partnership
Chester Business Improvement District.
Cheshire West and Chester Sustainable Transport Taskforce.

October 2021.



Appendices (follow)

Appendix 1

KPMG MaaS Senarios and Requirements Index

Scenario one

Rural, low modal choice, open regulation

1 Mrs Alpha lives in a rural location. She's in her sixties, and has lived here since the 1980s, when she moved to take a teaching job at the local school.

2 Like most of her neighbours, Mrs Alpha owns a car. It's a modest family hatchback, bought for reasons of economy and reliability. She tends to use this whenever she travels, unless a friend takes her to a social event or day trip.

3 It is lucky Mrs Alpha has a car. There's only one bus each day that travels to and from the nearest town. On the rare occasions she books a taxi, she calls the local private-hire company, and most likely waits at least 40 minutes for it to arrive. The nearest train station is in the next town along, and cycling on the country lanes is treacherous, not to mention physically challenging.

4 Mrs Alpha is fine all the time she can drive. When she becomes unable to use her car safely, she's faced with a couple of options: move to a bigger town where there are more facilities on hand and better transport links, or rely on friends to get from A to B.

5 Mindful of this dynamic, a local church has set up a minibus service for elderly residents. It advertises trips out to local shops, attractions and events, as well as a regular hospital run. People sign up for journeys via a Facebook page. The minibus is usually full, in stark contrast to the local commercial bus, which often carries just a handful of passengers.

Let's reimagine what an authority could do

It's tempting to say nothing. Local residents like Mrs Alpha are solving their mobility challenges with the aid of neighbours and local voluntary organisations. The system could be more resilient, in as much as a breakdown or loss of personal transport causes disruption for the individual concerned. But the level of investment needed to ameliorate that risk for every citizen is unsustainable.

Those empty buses are a source of concern: wasted resources, unnecessary pollution and a service that remains unsatisfactory.

What if the authority invites more third-sector and commercial players to offer transport solutions for residents – possibly through subsidies or commissions, or provides more of its own on-demand services, especially in relation

to last-mile journeys? This would enhance resilience in the setting, reduce reliance on individual mobility and make more sustainable use of resources. It would also mitigate the risk of the church minibus ceasing, and ensure unnecessary travel remains on offer.

While this may reduce demand for buses, it would probably provide a more effective means of transporting citizens, and reduce the authority's own cost base in respect of the subsidies that it needs to pay the commercial bus operator for that service to be viable. And since the risk of greater modal choice to air quality, congestion and crowding is slight, it is a move that seems well worth trying.

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Scenario two

Urban, low modal choice, open regulation

1 Mr Beta lives in a growing urban setting. There aren't many options when it comes to getting around, beyond a handful of commercial buses and private cars. Even so, there are a lot of cars on the road, and the small city's infrastructure is ill-equipped to cope. As a result, congestion is a recurring problem, and air quality is very poor.

2 When Mr Beta goes to work, he drives, because he views it as his only realistic option. It costs him £20 per week to park in the city centre, and it takes him at least half an hour to get home, even though he only lives in the suburbs. He could catch a bus, but it's always crowded at rush hour, each bus has its own proprietary ticket type, and at least in his own car he can take short cuts to avoid the most troublesome tailbacks.

3 It's a similar story when Mr Beta goes out at the weekend. He and his wife tend to drive back into town to go to a restaurant or the cinema. It's a pain, because it means one of them can't have a drink, and they're always nervous about leaving their car parked up in the evenings. But once again, the bus service just isn't suitable: they're not always ready to go home in time for the last bus, and anyway, it's a hassle to walk home from the bus stop.

Let's reimagine what an authority could do

This is a good example of a context in which careful intervention in the market could achieve very positive outcomes. What if, for example, the City Council encouraged commercial on-demand disruptors to enter the local market, but allied this to a limit on the number of private-hire vehicles allowed into the city centre at peak times? It could also incentivise use of electric vehicles among operators.

The result would be greater modal choice for citizens like Mr Beta, giving them the freedom of personal mobility without relying on their own car. But by regulating numbers of cars, and how they're powered, the authority mitigates the risk of increased congestion and poorer air quality. Such a move may even enhance the desirability of buses, making them less crowded and reducing journey times by minimising

traffic. And it's easy to see how an on-demand bike-sharing scheme could thrive in such a context.

As a further intervention, the authority could encourage an organisation to deliver an integrated travel planning platform for use by residents, showing both public and private transport options along with pricing and estimated travel times. That would enable Mr Beta to choose

the best mode of transport on a day-by-day basis, greatly enhancing his experience of travelling around the city.

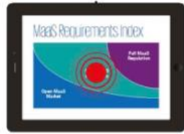
From the perspective of the MaaS Requirements Index, interventions such as these would effect a change in the city's position. It would move from top left to the middle, courtesy of greater regulation. But the pay-off would be a lower position on the

left-hand vertical axis, because the risk of greater modal complexity to the achievement of policy objectives would be mitigated by regulation.

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Scenario three

Urban, medium modal choice, light regulation



1

Mr Gamma doesn't live in Helsinki, though he sometimes wishes he did. Instead, he's in a busy market town, about two hours outside of the regional metropolitan city. There's a train station with good links to the capital and the rest of the UK, and regular bus services around the town and to outlying villages, operated by a number of different companies.

2

Taxis can easily be hailed in the town centre, and private-hire companies usually respond to calls within 10 minutes. The local university is trialling a bikeshare scheme, to help students travel between campus and their accommodation in town. Uber is also becoming more popular, particularly among the student population, but Mr Gamma avoids it. He prefers the security of a licensed taxi and wouldn't know how to use the app, anyway.

3

On the days he doesn't work from home, Mr Gamma uses a bus and a train to get to the office in London. He pays for them separately each time, because he doesn't travel regularly enough to need a season ticket. It's expensive, but much better than taking the car. If he works late, he takes a cab from the station back home.

4

At weekends, he and his wife tend to use the car, even when they just go to the shops. The traffic around the town centre is annoying, and parking is a nightmare. But they like to come and go at a time that suits them, so it's worth putting up with the inconvenience.



Let's reimagine what an authority could do

First up, it might invite Helsinki and collaborate with a private sector partner to facilitate the development of a travel app for the whole town. It could invite a local software developer to take a lead on this, generating economic growth in the area and creating a new commercial opportunity. The authority doesn't need to operate the app itself, though it may need to regulate the travel ecosystem to optimise efficiency.

For example, what if the university were encouraged to expand its bikeshare scheme to all local residents? Looking at the wider urban planning context, some additional cycle lanes could be built in the town centre to encourage their use, and ease congestion. Maybe Mr Gamma could jump on a bike to the station, rather than sitting on a bus? This could be included in the integrated travel app, including real-time location of available bikes and integrated payment to facilitate use by Mr Gamma.



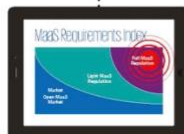
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Scenario four

Urban, high modal choice, full regulation



1

Miss Delta has always wanted to live in a big city. She loves the bustle, the noise, the sheer opportunity that is right on her doorstep.

2

Accessing that opportunity involves interacting with a bewildering array of travel modes. Within two minutes of her front door are a bus stop, an underground station, and a bikeshare hub. Then there's Uber, local private hire, and cabs, all jostling for her attention and filling up the city with their presence. One day, she expects to see autonomous vehicles on the city's roads, though she's not sure what they'll bring beyond yet more traffic and congestion when pedestrian behaviour changes and people start walking out in front of cars.

3

Miss Delta needs a way of working out the best mode of transport for her journey, given dynamic factors like congestion, delays, crowding and travel time. She can use a handful of apps to book her chosen means of getting around. But none of them offer guidance about the most efficient mode at that moment, and she has to flick between screens to compare prices.

4

A committed environmentalist, she's also concerned about air quality in the city, and voted in the local elections for a candidate promising to clean up the transport network. But she can't make an informed choice that perpetuates her principles, because the relevant information isn't readily to hand.



Let's reimagine what an authority could do

Take control. It already regulates fairly heavily in order to optimise road space capacity, incentivise use of public transport, ensure passenger safety, and to ameliorate the potential disruption in such a busy marketplace. But the high degree of mobility services and options in this context could be built upon significantly to improve the user experience. And the arrival of disrupting private operators like Uber has moved the regulatory context on,

necessitating careful consideration of governance models, taking care not to stifle the market.

A good start would be to develop a single, Whim-style, app and associated MaaS scheme, through which all transport modes available to a traveller are made available. This should include real-time information on travel times and prices, making it easy to reroute mid-journey. As a neat feature aimed specifically at

travellers like Miss Delta, it could also rate each option's green credentials, helping them make informed choices about their mobility. Allied to a "nudge" communications strategy that engages the environmental sensitivities of all travellers, this would make a tangible difference to air quality, congestion and crowding.

From a regulatory perspective, the authority in Miss Delta's city will probably need to aggregate all

mobility, governing demand and supply across public and private-sector operators and using regulation to influence customer behaviour where possible (e.g. using levers such as dynamic pricing, dynamic traffic management, and dynamic licensing of private hire vehicles). That necessitates close relationships with providers, including those developing autonomous vehicles, to develop infrastructure and governance models that are fit for

purpose. Strong partnership working across the supply chain is therefore essential, as is a commitment to keeping the market vibrant and open.

From Miss Delta's perspective, the task facing the authority is simple: bring the joy into city living, by optimising the transport ecosystem to deliver efficiency, ease of use, and modal choice, while heightening resilience, minimising disruption and improving quality of life for all the

city's residents. For the authority and operators, however, this will necessitate a complex and carefully balanced MaaS scheme.



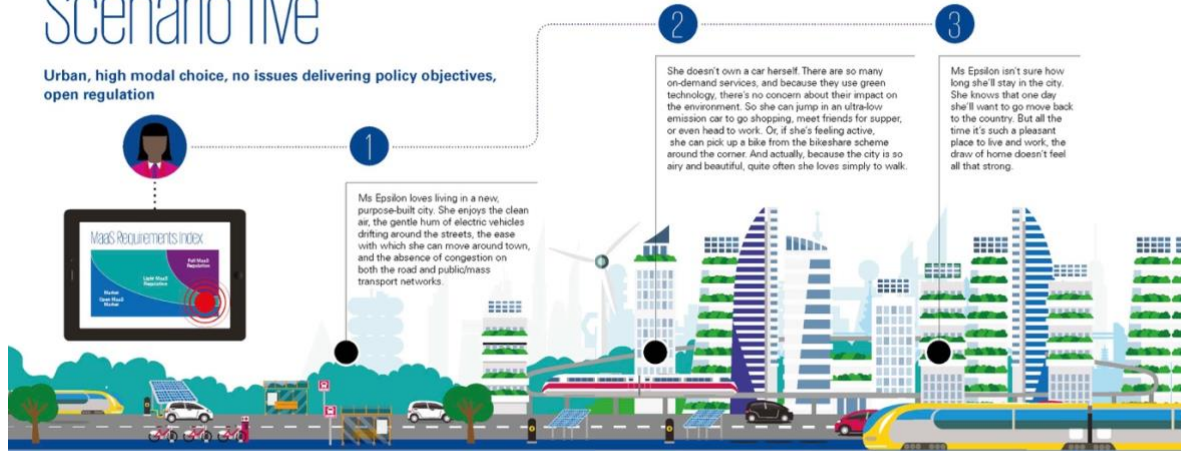
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Scenario five

Urban, high modal choice, no issues delivering policy objectives, open regulation



1
Ms Epsilon loves living in a new, purpose-built city. She enjoys the clean air, the gentle hum of electric vehicles drifting around the streets, the ease with which she can move around town, and the absence of congestion on both the road and public/mass transport networks.

2
She doesn't own a car herself. There are so many on-demand services, and because they use green technology, there's no concern about their impact on the environment. So she can jump in an ultra-low emission car to go shopping, meet friends for supper, or even head to work. Or, if she's feeling active, she can pick up a bike from the bikeshare scheme around the corner. And actually, because the city is so airy and beautiful, quite often she loves simply to walk.

3
Ms Epsilon isn't sure how long she'll stay in the city. She knows that one day she'll want to go move back to the country. But at the time it's such a pleasant place to live and work, the draw of home doesn't feel all that strong.

Let's reimagine what an authority could do

It's clear that this authority is in an enviable position, where good planning has meant regulation is not necessary to achieve policy objectives. Even so, the authority must be mindful not to become complacent, and keep any eye on the future development of the city's infrastructure, modal blend and population trends. Should any of these factors adjust, the finely-tuned mobility ecosystem may not work so effectively.

For example, the emergence of Autonomous Vehicles (AVs) may have an impact on congestion, because citizens like Ms Epsilon may eschew walking for the convenience of this mode. Or other disruptors may emerge in the market, changing the balance of options open to users and having an impact on their mobility preferences.

So it's worth the authority looking over the horizon to see how future regulation can maintain its current favourable conditions. It needs to keep abreast of changes in the MaaS context, perhaps through regular use of the MaaS Requirements Index, and model what the future looks like, and what proactive steps to take now.

For example, the authority may need to ensure that all new development in and around the city is easily accessible by foot and bicycle, and perhaps require developers to install bikeshare hubs and regulate that booking and payment facilities for these hubs are integrated with other MaaS schemes. Moreover, developments should be designed to minimise congestion, through construction of effective infrastructure for the modal choice available in the city, now and in the future.

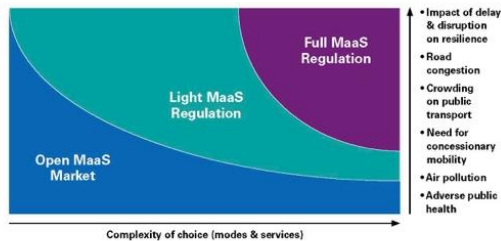


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MaaS Requirements Index



Indicative scheme architecture to be developed in future iterations of this tool

Governance & Regulation:	Permissive Management				Directive Control
MaaS Propositions / Products / Functionality:	Integrated Journey Planning	Add Integrated Payment Platform	Add Integrated "Choose and Book" on-demand public & private mobility	Add Customer-optimised dynamic service management and route planning	Add Capacity-optimised dynamic service management and route planning
Scheme Architecture:	Open market with one or more MaaS providers working independently to address customer needs	Regulated market with one or more MaaS providers mandated to share data and APIs and adhere to ground rules set by the local/regional authorities	Highly Regulated market with one MaaS aggregator which governs demand and supply across all public and private mobility services in the region*		
Public Authority capabilities required:	Regulatory oversight	Add Cross-modal Transport Modelling and Management	Add Technology Integration and Service Management, Data Sciences, Dynamic Network Management		

*NB: In this scenario the aggregator may mandate and provide a single common or interface that it's used or may enable multiple MaaS providers to interact with the aggregation platform in a federated architecture.

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Reimagine Places: Mobility as a Service, KPMG, Aug 2017 - www.kpmg.com/uk/reimagine-maas

APPENDIX 2

SMART Mobility Working group – City Living task group - Table of Transport Requirements of City Centre Demographic Groups

User Group	Travel within Chester	Travel within Cheshire	Travel outside Cheshire	Blocker	Solution	Working Examples
Families with young children	Purchase goods Entertainment Education Health	Purchase goods Entertainment Education	Holidays Education Family trips	Access to private transport Connectivity between transport options Affordability	CO-OWNERSHIP & USERSHIP FLEXIBLE ACCESSIBILITY Hire bikes including child seats/connecting buggies/bikes	Pontevedra: https://www.bloomberg.com/news/articles/2018-11-26/what-car-free-streets-mean-for-family-friendly-culture
Families	School, work, shopping, entertainment education	School, work, shopping, entertainment education	Social, family, leisure, holidays, days out	Multiple journeys/stops to accommodate within one outing	CO-OWNERSHIP & USERSHIP FLEXIBLE ACCESSIBILITY	
Parents	Health Work Shopping Entertainment	Health Work Shopping Entertainment	Health Work Shopping Entertainment	Size of vehicle required Multiple journeys/stops to accommodate	CO-OWNERSHIP & USERSHIP FLEXIBLE ACCESSIBILITY – range of vehicle sizes	

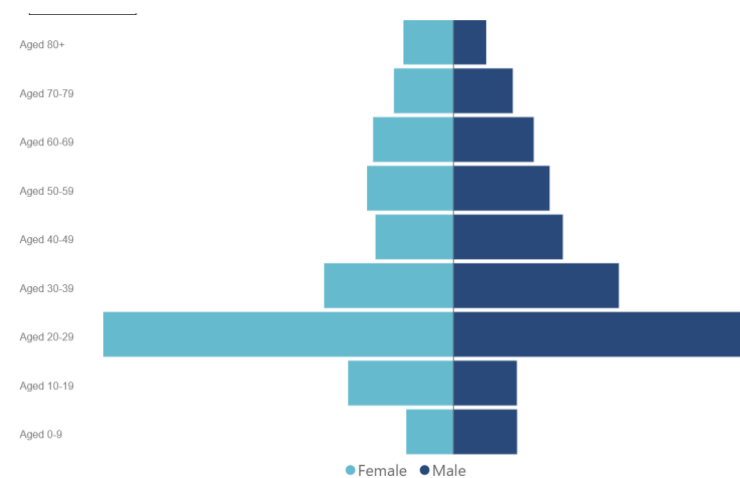
				within one outing	Nearby storage/access to car seats Hire bikes	
School Students	Attend school, social, shopping	Attend school, social, shopping	Entertainment	Affordability Personal Choice, Public Transport routes inappropriate safety	AFFORDABILITY SAFETY RELIABILITY/TIME Subsidy Education Demand driven options Reliable/real-time information at bus stops Affordable – cost/time efficient	https://www.thestreettrust.org/initiatives safer routes to schools, friendly driver classes
University Students	Inter-campus work Entertainment and procurement, work, study/work placements Social	Entertainment and procurement work, study/work placements Social	Work, study/work placements leisure visiting family/friends	Unsocial work hours – lack of reliable safe travel alternatives Lack of space to store bikes Feeling safe 'after hours' Routes to train stations	CO-OWNERSHIP & USERSHIP AFFORDABILITY SAFETY RELIABILITY/TIME Micro-mobility scooters/ebikes Access to bookable cars Space to securely store bikes/charge ebikes Regularity and	Hourly rates and passes for using micromobility options – Brisbane unlimited rides per day for up to 90min use – encourages use – affordability for regular commuters. https://www.rideneuron.com/cities-brisbane/ Combined ticketing system – similar to Oyster card – either card or app, integrated across transport and ability to set fares for different user groups https://ttc.ca/Fares_and_passes/PRES_TO/index.jsp

					reliability of transport	
Working Adults	Attend work, social, shopping	Commuting to work leisure, visiting family/friends	Work commuting leisure visiting family/friends	Frequency of required use of vehicle Cost of alternatives Flexibility Reliability Frequency Time	CO-OWNERSHIP & USERSHIP AFFORDABILITY RELIABILITY/TIME - easy to access, close to accommodation App based Cost effective	Go Get – car share scheme in Melbourne – variety of vehicles for short/long trips/buying/selling moving large items. https://www.goget.com.au/melbourne/ https://www.melbourne.vic.gov.au/parking-and-transport/public-transport/Pages/car-sharing.aspx Peer-peer sharing offering cars to be used by neighbours https://www.carnextdoor.com.au/rent-my-car
Unemployed	Interviews, shopping, social, health	Interviews, social, family, shopping, holidays	Social, family, shopping, holidays	Price Reliability/time	AFFORDABILITY RELIABILITY/TIME cost/time efficient across- transport ticketing Reliable/real-time information at bus stops	Combined ticketing system – similar to Oyster card – either card or app, integrated across transport and ability to set fares for different user groups https://ttc.ca/Fares and passes/PRE STO/index.jsp

Pensioners	Social, shopping, bingo Health	Social, family, shopping, holidays	Social, family, shopping, holidays	Ability to drive Cost Access to transport Safety	FLEXIBLE ACCESSIBILITY SAFETY Public transport/family assistance,	Combined ticketing system – similar to Oyster card – either card or app, integrated across transport and ability to set fares for different user groups https://ttc.ca/Fares_and_passes/PRE_STO/index.js
Non-able-bodied	Work, health, social, shopping,	Social, family, shopping,	Social, family, shopping, holidays	Disability accessibility Pavement	FLEXIBLE ACCESSIBILITY SAFETY	

Chester City and Ward Profile

Age group	Ward number	Ward %	Cheshire West and Chester %	England %
Aged 0-15	1,400	8.0 %	17.8 %	19.1 %
Aged 0-4	600	3.3 %	5.6 %	6.1 %
Aged 5-9	400	2.3 %	5.7 %	6.3 %
Aged 10-15	400	2.4 %	6.5 %	6.8 %
Aged 16-44	10,600	59.4 %	33.2 %	37.3 %
Aged 45-64	3,300	18.4 %	27.8 %	25.6 %
Aged 65+	2,500	14.2 %	21.1 %	18.0 %
Aged 85+	400	2.2 %	2.7 %	2.4 %



City Centre Living KEY THEMES – Barriers.

The following 5 areas are recurring barriers identified across the user groups:

CO-OWNERSHIP & USERSHIP – incl. variety of vehicles, sizes,

Best Practice Examples:

Bollore Bluecar: Sharing Paris's Most Popular Electric Car (greencarreports.com)

Go Get – car share scheme in Melbourne – variety of vehicles of short/long trips/buying/selling moving large items.

<https://www.goget.com.au/melbourne/> <https://www.melbourne.vic.gov.au/parking-and-transport/public-transport/Pages/car-sharing.aspx>

Peer-peer sharing <https://www.carnextdoor.com.au/rent-my-car> Car ownership rate down among young people (cbs.nl)

The environmental benefits of car sharing (fleetcarma.com)

<https://www.futuremind.com/blog/car-sharing-and-transportation-trends>

AFFORDABILITY – flexible ticketing, apps, single ticket multi-platforms

Best Practice Examples:

hourly rates and passes for using micromobility options – Brisbane <https://www.rideneuron.com/cities-brisbane/unlimited-rides-per>

day for up to 90min use – encourages use – affordability for regular commuters.

Combined ticketing system – similar to Oyster card – either card or app, integrated across transport and ability to set fares for different user

groups https://ttc.ca/Fares_and_passes/PRESTO/index.jsp

EnCicla – Aburra Valley Free bike hire scheme – Colombia <https://use.metropolis.org/case-studies/encicla---sustainable-mobilityprogram#>

casestudydetail <https://medellinguru.com/encicla/>

10 Examples of Green Mobility in Cities (stateofgreen.com)

FLEXIBLE ACCESSIBILITY – time of day (beyond typical 9-5 commuter patterns), secure/sufficient storage, child-seats, mobility aids

Best Practice Examples:

Micromobility -for travel less than 5 miles <https://www.cbinsights.com/research/report/micromobility-revolution/creating-a-mobility>

ecosystem – combination of micromobility, car share, public transport

Buses with bike racks – Portland, USA - <https://trimet.org/bikes/bikesonbuses.htm>

Cycling | Visit Limburg

SAFETY – using, accessing transport and travel between modes

Best Practice Examples:

<https://www.portlandoregon.gov/transportation/article/334689> - increasing safety for cyclists

<https://www.thestreettrust.org/initiatives> safe routes to schools, friendly driver classes

Slow streets City of Oakland, California <https://www.oaklandca.gov/documents/oakland-slow-streets-interim-findings-report-september-2020-1>

How Mexico City Became A Leader in Parking Reform - Institute for Transportation and Development Policy (itdp.org)

<https://reasonstobecheerful.world/tearing-down-the-walls/>

RELIABILITY – frequency of services, routes, connections, real-time updates

Best Practice Examples:

Singapore's public transport system among best in the world: McKinsey report - CNA (channelnewsasia.com)

END.