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South East of Scotland Transport Partnership

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Appendices

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Mobility Hubs Strategic Study

A Strategic Study for the South East of Scotland/SEStran region

Area 3D (Bridge) | Victoria Quay | Edinburgh EH6 6QQ | 0131 524 5160 | sestran.gov.uk

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A. Overview of the Mobility Hubs Guidance

The following available guidance around Mobility Hubs have been reviewed:

- UK Mobility Hub Guidance 2019/20 - CoMoUK;
- Mobility Hub Guidelines for Greater Toronto and Hamilton Area, Canada;
- Regional and Mid-Coast Mobility Hub implementation strategy developed by SANDAG for San Diego;
- Mobility Hub Features Catalogue developed by SANDAG for San Diego;
- Presentation: "Mobihubs in Flanders";
- Identifying Best practices for Mobility Hubs, prepared for Translink, 2019; and
- City of Burlington Official Plan Review: Mobility Hubs Opportunities and Constraints Study, Canada.

Mobility Hubs Definition

Definition

There is not a single agreed definition of Mobility Hub in the industry at the moment. Various studies, projects and trials define Mobility Hubs using similar themes; the most common words include mobility, different modes, connectivity, sustainable transport and multimodal. There are a few definitions used by various projects presented below.

A Mobility Hub is a recognisable place with an offer of different and connected transport modes supplemented with enhanced facilities and information features to both attract and benefit the traveller (SHARE-North Project)

Mobility Hubs are defined as a place where different sustainable transportation modes are integrated seamlessly to help promote connectivity, and are usually located in centralised areas (Identifying Best practices for Mobility Hubs, prepared for Translink, 2019)

A Mobility Hub is a location that has several transportation options and is a concentrated point for a mix of uses such as transit, employment, housing, recreation and shopping. Mobility Hubs will be neighbourhoods that are environmentally friendly, infrastructure-efficient, walkable, bikeable and transit-oriented (City of Burlington)

A place where people can connect to multiple modes of transportation to make their trip as safe, convenient and reliable as possible (City of Minneapolis)

Mobility Hubs are places of connectivity where different travel options – walking, biking, transit, and shared mobility – come together. They provide an integrated suite of mobility services, amenities, and supporting technologies to better connect high-frequency transit to an individual's origin of destination (SANDAG)

A Mobility Hub (mobipunt in Dutch) is a transport hub based at a neighbourhood level, where different sustainable and shared transport modes are linked (Autodelen, Mobihubs in Flanders presentation)

Interestingly, the Northern American countries mainly see Mobility Hubs through public transport (transit) perspective and also define the hubs at a neighbourhood level (e.g. city of Burlington).

In general, the hubs are perceived as the places where different transport modes are provided with introduction of additional services and facilities aimed at attracting users, improving their journey and travel choices and creating a sense of place.

Key characteristics

Some of the studies and projects also identify minimum characteristics a hub should have in order to be defined as a Mobility Hub summarised in Table 1.

Table 1. Key characteristics of Mobility Hubs

City/Project/Study	Key characteristics of Mobility Hubs
SHARE-North Project; UK Mobility Hub Guidance 2019/20, CoMoUK	Co-location of public and shared mobility modes, The redesign of space to reduce private car space and improve the surrounding public realm, A pillar or sign which identifies the space as mobility hub which is part of a wider network and ideally provides digital travel information.
Identifying Best practices for Mobility Hubs, prepared for Translink, 2019	Surrounds a major transit station Provides sustainable transportation options Area with high residential and employment density
Mobility Hub Guidelines for Greater Toronto and Hamilton Area, Canada	Multimodal transportation Strong sense of place Economic vitality and competitiveness Residential and employment density High levels of pedestrian priority Embedded technology
Mobihubs in Flanders	At least five functions (including carsharing), the proximity of a public transport station and the quality of bicycle storage is essential. Good lighting and accessibility are self-evident. Proximity of other neighbourhood functions e.g. a maximum of 10 minutes walking distance (10minute-hood) Quality facilities (size of parking spaces, technical requirements i.e. charging stations, accessibility, lighting, sustainability of materials). Infrastructural investments are part of a more general plan for shared mobility in the municipality or city Every mobihub has a unique name. Clear and visible mobihub branding and signage. The essential functions of the hubs include: Car sharing parking bays (at least 2 parking bays) Bicycle parking A public transport stop nearby An accessible stop for people with reduced mobility Quality (LED)-lighting

Some projects have taken a different approach and do not require the hubs to provide certain transport services but ask for the provision of at least three different facilities (e.g. mobipunten in Kop van Noord-Holland, the Netherlands).

A definition of Mobility Hubs for the SEStran region is developed and presented in Chapter 2.

Mobility Hubs Components

There are a number of different components proposed for various planned or implemented Mobility Hubs. Some guidance and studies propose to group the certain components together.

The UK Mobility Hub Guidance 2019/20, CoMoUK, divides components into four key groups: public transport, non-public transport, mobility related components and non-mobility & urban realm improvement.

SANDAG proposes the following categories of Mobility Hubs components: transit amenities, pedestrian amenities, bike amenities, motorised services amenities and support services.

The Identifying Best Practices for Mobility Hubs study prepared for Translink, 2019, groups the components in several categories including accessibility, safety, furniture, weather protection, information, services, placemaking, car Interface (car parking, pick up and drop off locations and car share parking services), bike Interface (bike lockers, bike share docks, cargo bike parking, e-bike charging, bike repair stands) and enhanced operations.

Table 2 below provides a broad set of components which can be implemented as part of a Mobility Hub. Please note the list provided below is not exclusive and more components can be added. For example, future developments such as connected and autonomous vehicles will influence the design of the hubs and may add new components or remove some of the existing ones.

Table 2. Mobility Hub components

Mobility Hub components	Description/Key considerations
Bus	Stops and information about the services; clear signage is required for the stops to be visible and they should be accessible for people with mobility impairments.
Tram	Stops and information about the services; clear signage is required for the stops to be visible and they should be accessible for people with mobility impairments.
Rail	Stops and information about the services; clear signage is required for the stops to be visible and they should be accessible for people with mobility impairments.
Taxi	Designated passenger pickup/drop off zones should be provided as part of the hub. The areas should be visible and easily accessible. Clear signage is required. An opportunity to use flexible kerb space but taxi ranks may still be required in certain locations.

Mobility Hub components	Description/Key considerations
On demand taxis	Designated passenger pickup/drop off zones should be provided as part of the hub. The areas should be visible and easily accessible. Clear signage is required. An opportunity to use flexible kerb space, but people should be notified of the various uses of kerb space at or near Mobility Hubs – this information can be offered through wayfinding at information pillar/kiosk.
Demand Responsive Bus	Designated passenger pickup/drop off zones should be provided as part of the hub. The areas should be visible and easily accessible. Clear signage is required. An opportunity to use flexible kerb space, but people should be notified of the various uses of kerb space at or near Mobility Hubs – this information can be offered through wayfinding at an information pillar/kiosk.
Lockers for bikes and e-bikes	Bike/e-bikes parking facilities should be safe and secure, especially those for e-bikes, which can build trust and promote cycling. Bike charging lockers and/or stations for e-bikes can be provided.
Bike washing station	
Shared eScooters	Potential for Mobility Hubs to provide the space for parking of shared eScooters.
Shared dockless bikes	Potential for Mobility Hubs to provide the space for virtual parking of dockless shared bikes.
Shared docked bike schemes	Potential for Mobility Hubs to provide the space for a docked bike share station.
Information pillar, information kiosks	The pillar can be analogue or a digital one, depending on the local context and funding available. The pillar should provide wayfinding information and potentially information of the key points of interests in the area. A mobility hub should be linked to a local legibility/wayfinding strategy. The pillar can be also used to provide information on how shared transport modes and other facilities available at the hub can be used. The digital pillars can provide real-time information on availability of the transport, traffic, weather conditions, time etc. Solar panels can be used to power the digital information pillar Signage for hiking trails and cycle routes van be provided as part as wayfinding.
Cargo/ecargo bikes	Cargo bikes can be used for first/last mile deliveries. Parking facilities should be provided.
Car clubs	Designated parking places should be allocated for a car club operator. Various car club models can be considered based on the local context.

Mobility Hub components	Description/Key considerations
Parking	Parking spaces can be provided for Park and Ride scheme or the hubs can be built on top of the existing P&R site. Smart parking with the dynamic kerb management can be implemented providing for demand-based parking.
EV charging	EV charging for public use can be provided. Car clubs ideally should have designated EV charging infrastructure available for their vehicles. Energy network should be available in the area to supply electricity for EV charging infrastructure. Charging infrastructure for electric buses as 'Opportunity charging points' (a method for topping up electric buses at their stop via a short burst of charge) may be installed.
Bike pumps and bike repair stand	Bike pumps and repair stand can be provided for those commuting by bikes and locking the bikes at the hubs.
Delivery/Parcel lockers	The lockers should be safe and secure - they have potential to encourage first and last mile deliveries in the area. The lockers can be made available for various delivery companies through provision of the digital access code – neutral host model. Cooled lockers can also be used for grocery shopping from companies like Ocado, M&S, Tesco etc. Flexible kerb space can be used for deliveries drop off.
Baggage lockers	Potential for Mobility Hubs to provide the lockers for short-term storage of baggage for example in the hubs which are located close to the railway stations.
Café and co-working area	To create sense of community and encourage more people to use the hubs and its facilities.
Waiting area	Design of the waiting area should respond to community needs and influence pedestrian movements in a way that is safe and efficient. Waiting area space can provide: covered weather shelters; shade; plants and flower beds to improve the landscape; comfortable and accessible seating; heating for cold winter periods e.g. heat lamps; and artwork to improve the quality of space (an opportunity for local artists to contribute to placemaking of Mobility Hubs), sustainable urban drainage. There is potential to incorporate the local community's input into the design of the hub to reflect community values, vision and history. Integration of green technologies on shelters and around the hubs should be taken into account.

Mobility Hub components	Description/Key considerations
Bins	Recycling facilities and potential for smart bins (the bins which sort and compresses the recyclables automatically[1]).
Outdoor water fountain	
Improved public realm, safer crossings, step free access	The following elements should be considered: Safe and convenient walkways and crossings; Wheelchair accessibility; Barrier free access; Wider sidewalks; and Rumble strip/road safety features to aid visually impaired and blind people.
Wi-fi	For commuters to use when waiting for transport and to gather any required information about the area or use of certain transport services.
Phone charging facilities	For commuters to use while waiting for transport services etc. Solar powered benches can be used to provide energy for charging the phones.
Ticketing	Payment kiosks can be installed for issuing the tickets. Universal transportation account and an integrated ticketing can be beneficial.
Mobile retail services	Consideration should be given when designing a Mobility Hub in terms of how much space is allocated for mobile retail services. Clear and easily understood signs can inform mobile vendors where they can park and when. Mobile retail services can offer people a convenient way to complete regular errands without relying on a personal car. Example of mobile retail services include: Food services; Coffee carts; Dry cleaning services; and Mobile hair salons for men and women.
Self-service landing libraries	Lending books for people to enjoy reading during their commute or when waiting for their transport
Vending machines	Drinks, food, flowers, cycling supply etc. Distribution of free papers and magazines.
Lighting	To increase safety of pedestrian movements in dark hours. Lighting can be powered through solar panels, also motion-activated lights in areas where light isn't needed continuously can save energy.
Emergency Call Button	To provide additional level of security. Potential to install a push to talk button for visually impaired people, which can be incorporated into a digital or analogue pillar.

1 Smart bins are an intelligent waste management system. They have wireless ultrasonic fill-level sensors embedded inside which detect how full the bin is and then, through the Internet of Things (IoT), this data is sent to a cloud-based monitoring and analytics platform.

Mobility Hub components	Description/Key considerations
Beacon technology	Beacon technology can be installed in a transit station to guide passengers to mobility services and other facilities. This tool transmits transit information wirelessly to users with Bluetooth-enabled smartphones.
Air quality monitoring system	The system can be installed at the hub to monitor air quality in the area.
Toilets	Self-cleaning toilets can be implemented in the hubs, they should be accessible and safe to use.
Showers	
Concierge	At larger sites where the transport and service offer is more complex, transport office/concierge service may be required.
Cash machine	
CCTV cameras	To provide additional level of security.

For this study a unique set of components is developed for each type of Mobility Hubs in Chapter 3.

Mobility Hubs Typology

Several Mobility Hub typologies have been proposed by a range of existing projects, studies and trials of Mobility Hubs utilising various methods of categorisation. There is a common understanding that Mobility Hubs should be tailored to reflect the needs and priorities of the area and the type of hub should be shaped by the local context. The existing typologies presented below form the basis of understanding a Mobility Hub as an adaptable concept.

In its Regional Transportation Plan for the Greater Toronto and Hamilton area, Metrolinx proposes to categorise Mobility Hubs based on their role in the transportation network into gateway and anchor hubs:

- Gateway hubs should be based in a major transit station area, where two or more current or planned regional rapid transit lines interchange. The hubs must have a forecasted density target of 10,000 people and jobs combined within 800 meters; and
- Anchor hubs should be based at major transit stations in an urban growth centres and may serve as international gateways, such as airports and railway stations.

Metrolinx proposes one more way to classify Mobility Hubs through both urban context and transportation function the area serves. The idea is for each Mobility Hub to be classified under both typologies. The urban context categories include city centre, urban transit nodes, emerging urban growth centres, historic town centres, suburban transit nodes and unique destinations. The transportation function includes entry, transfer and destination categories.

The LA Urban Design Studio presents three typologies used to classify Mobility Hubs which considers both the surrounding urban context and hub elements:

- Neighbourhood hubs - smaller stations in lower density neighbourhoods with the basic hub elements offered;
- Central Mobility Hubs - hubs located in the urban context with more offered facilities like car and bike sharing, which are integrated in the neighbourhood; and
- Regional Mobility Hubs - the largest hubs positioned in dense urban areas with a range of facilities offered as part of the hub.

E-Mobility hubs in Amsterdam, Nijmegen and Leuven present four main types of eHubs that vary by size, location type, and services offered:

- Minimalistic – a small-scale hub with a minimum of one mode offered featuring components that are easy to install or move;
- Light – small hubs with at least two mode options and easily installed infrastructure and services;
- Medium – bigger hubs covering a variety of modes; and
- Large – large-scale hubs targeting commuters and visitors and offering different modes but to a greater extent than hubs under the medium category.

The UK Mobility Hubs Guidance 19/20 (CoMoUK), considers locations and a range of contexts from city centres to rural areas in defining Mobility Hubs typology. It overlays the type of place (business park, housing developments etc) with local geographical factors and trip generators. The guidance also suggests possible combination of components for each of the types listed below:

- Large interchanges / City hubs;
- Transport corridor, smaller interchanges / Linking hubs;
- Business park /new housing development hubs;
- Suburbs / Mini hubs;
- Small market town, village hubs; and
- Tourism hubs.

Autodelen implementing Mobility Hubs (MobiPunts) in the Flanders regions determines the typology by the level of transport and the spatial context. They differentiate 4 levels of transport and 8 types of spatial context, which are presented in a Mobility Hubs matrix with 32 possible types and forms of the hubs.

Chapter 3 builds on the guidance available and propose a typology for the SEStran region, which takes into account specifics of local context.

B. Stakeholders

Table 3 presents a summary of all stakeholders whose engagement was sought as part of this study.

Table 3. Stakeholders

Stakeholder	Phone interview	Workshop	Email
Implemented Mobility Hubs			
City of Bremen, Germany	✓		
Autodelen.net, the Flanders region, Belgium	✓		
ADVIER (Mobility Advisors), the Netherlands	✓		
Mobility Hubs Components			
Serco (bike hire scheme)	✓		
Stagecoach (bus operator)	✓		
Transport Scotland (EV infrastructure)	✓		
Other Local Stakeholders			
Transport for Edinburgh	✓		
Forth Environment Link	✓		
CoMoUK		✓	
Local Authorities			
Clackmannanshire			✓
East Lothian		✓	
City of Edinburgh		✓	
Falkirk		✓	
Fife		✓	
Midlothian		✓	
Scottish Borders			
West Lothian		✓	

C. Mobility Hubs Case Studies

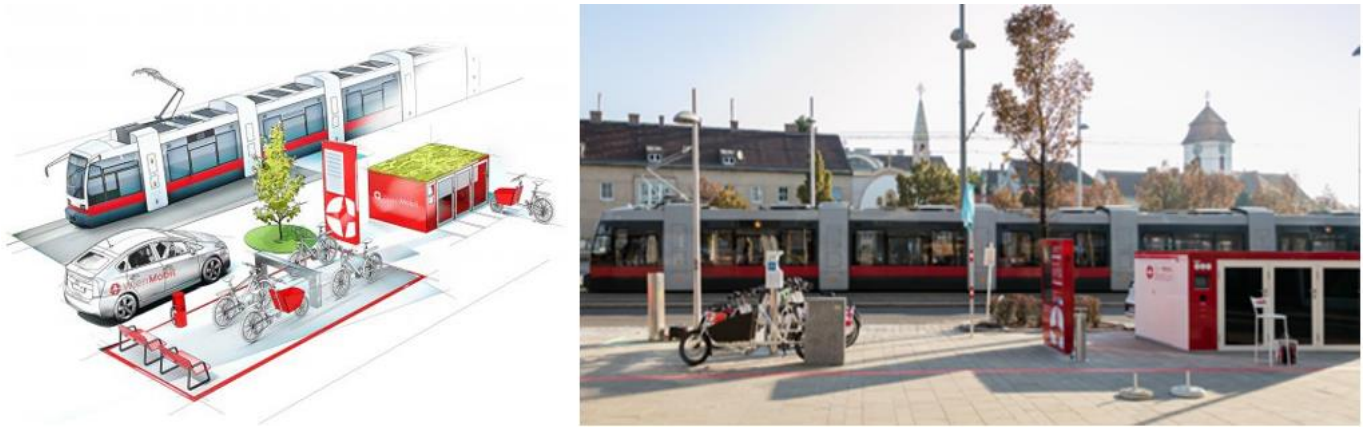
This section provides an overview of implemented and planned Mobility Hubs around the world. The summary highlights emerging practice and lessons learnt which can be drawn from when considering implementation of Mobility Hubs in the SEStran region.

Implemented Mobility Hubs

Case study 1: Mobility Hubs, Vienna, Austria

The Vienna Mobile Station[2] (WienMobil Station) Simmeringer Platz was launched in the city in September 2018. The facility features a series of mobility options including public transit, e-bike sharing (Simbike), car sharing, an e-charging station (WienEnergie), a cargo-bike (Simbike), bike-safety-boxes (Safetydock), a bike pump and an information screen. The station has been developed by Wiener Linien (public transport authority). It is located at the public traffic intersection of U3 Simmering and is part of the EU-funded urban renewal project "Smarter Together".

Figure 1. WeinMobil Station



Source: SmarterTogether, Mobility Point & WienMobil presentation

The idea behind the project is to improve public transport connectivity such as bus, rail and tram, and provide a range of first/last mile transport solutions to encourage shared mobility use. The services can also be accessed through the Weiner MaaS platform, which features both physical and digital integration of transportation services.

Wiener Linien aims to develop more mobile stations (Mobility Hubs) in Vienna though the Phase 2 of the project with a minimum of more 5 Mobility Hubs (2019-2020).

Case study 2: Mobility Hubs, Bremen, Germany

The Municipality of Bremen, Germany, introduced the concept of Mobility Hubs or “mobil.punkte” in 2003 with implementation of large hubs and in 2014 a network of smaller hubs was built. There are plans to expand the networks adding between eight and ten new hubs each year.

[2] SmarterTogether funds Mobile station in Vienna https://www.smartertogether.at/wienmobil-station-eroeffnet/

The network currently consists of more than 40 hubs with 10 large hubs supported by smaller hubs located in neighbourhoods where daily trips start. A hub with four or more car club spaces is considered a large hub with smaller hubs having one to three car club spaces.

Figure 2. MobilPunkt, Bremen

Sources: SHARE-North, UK Mobility Hub Guidance 2019/20, CoMoUK

Research showed that in Bremen each station-based car club removes 16 vehicles from the roads.[3]

The key objectives of the hubs are to provide an alternative to a private car, reduce car ownership, reclaim the street space for people and reduce emissions. The key elements of the hubs include:

- Car club;
- Safe places to lock the bikes;
- Accessibility and visibility to public;
- Safe environment; and
- Specific type of branding and marking on the streets.

Last mile delivery will be tested in Bremen this year alongside car clubs with EVs and cycle pumps.

Case study 3: Mobility Hubs, Bergen, Norway

The Norwegian city of Bergen launched its first Mobility Hub[4] (Mobipunkt) in the Møllendal neighbourhood in May 2018. The Mobility Hub features spaces for car club vehicles, bicycle parking, easy pedestrian access and public transport stops. It also includes rubbish collection facilities and bicycle hangers that can be rented by residents to park e-bikes. The aim of the city was to develop a Mobility Hub that caters to the wider needs of the local community.

3 UK Mobility Hub Guidance 2019/20 - CoMoUK
4 SHARE-North https://share-north.eu/2019/07/bergen-a-city-dedicated-to-mobility-hubs-emissions-reduction-and-transnational-learning/

Figure 3. MobilPunkt

Sources: SHARE-North, UK Mobility Hub Guidance 2019/20, CoMoUK

After implementation of the first hub, the city launched eight Mobility Hubs across the city centre and residential areas to promote car clubs and reduce private car ownership. The neighbourhood of Møhlenpris, where three new Mobility Hubs are located witnessed 30%[5] decline in private car ownership over the last 2 years. The area is also being developed as a car-free neighbourhood. The EV charging infrastructure for the shared vehicles is available at each hub and some of them also have digital pillars providing travel information. One of the hubs is located next to a new student housing development.

The Mobility Hubs in Bergen are a direct result of the transnational cooperation in the SHARE-North project and were directly inspired by the City of Bremen's "mobil.punkt" concept.

Case study 4. Tim Mobility Hubs, Linz, Austria

The city of Linz introduced smart Mobility Hubs (multi-modal nodes) called 'Tim'[6] in three centralised mobility hotspots of the city: the main square, LINZ AG Center and the Johannes Kepler University. Each location features a range of mobility options including EV car club vehicles, bike parking spaces, EV charging points and car rental options in addition to public transport connectivity.

Figure 4. Tim Hubs Concept in Linz

Sources: CIVITAS, UK Mobility Hub Guidance 2019/20, CoMoUK

The idea is to improve connectivity between central city locations and areas with limited public transport availability in order to reduce use of personal vehicles. The concept is based on the idea of sharing instead of owning cars.

[5] UK Mobility Hub Guidance 2019/20 - CoMoUK
[6] Tim: Linz Website https://www.tim-oesterreich.at/linz#

Users can access Tim services and make payments through Tim Membership cards. Users can arrive at any Tim location by bike, walking or using public transport and access a range of shared services such as EV car club vehicles, collective/shared taxis at discounted prices and car rentals to complete their commute. The users can also park their bikes or charge their electric vehicles at a Tims' locations.

Some initial findings from the project shows that Tims are well received by all age groups, with the youngest Tim user being 20 years old and the average user age being between 40 to 50 years.

The first phase of the project involves delivery of nine Mobility Hubs at strategic locations across the city by 2021[7]. The project is funded by the Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMVIT), Austria and Linz received €1.1m for the development and implementation of Mobility Hubs.

Case Study 5. eHubs, the Netherlands

Six European cities, led by the city of Amsterdam, agreed to pilot electric Mobility Hubs[8] (e-Hubs) to facilitate transition to electric and shared mobility between 2019 and 2022. The pilots will be primarily funded by the EU, with total estimated budget of €8.86m. The idea is to create 92 e-hubs with more than 2,400 shared e-vehicles. Each hub may vary in size and components, and they might be located in major transport interchanges (such as stations) or residential areas. Different characteristics of the pilot cities will be evaluated such as population size and density; morphology; number of private cars per household and current modal split to identify the best locations for implementing the e-hubs.

Figure 5. eHub, Amsterdam

Source: https://www.nweurope.eu/projects/project-search/ehubs-smart-shared-green-mobility-hubs/#tab-7

[7] https://www.tim-oesterreich.at/linz/eroeffnung-standort-jku/
[8] Interreg North West Europe eHubs Project https://www.nweurope.eu/projects/project-search/ehubs-smart-shared-green-mobility-hubs/undefined

E-hubs will offer a range of shared and electric mobility options such as e-bikes, eScooters, e-cars, e-cargo bikes, etc. along with electric vehicle charging stations (with fast/rapid chargers), and parking/docking stations for e-micromobility vehicles.

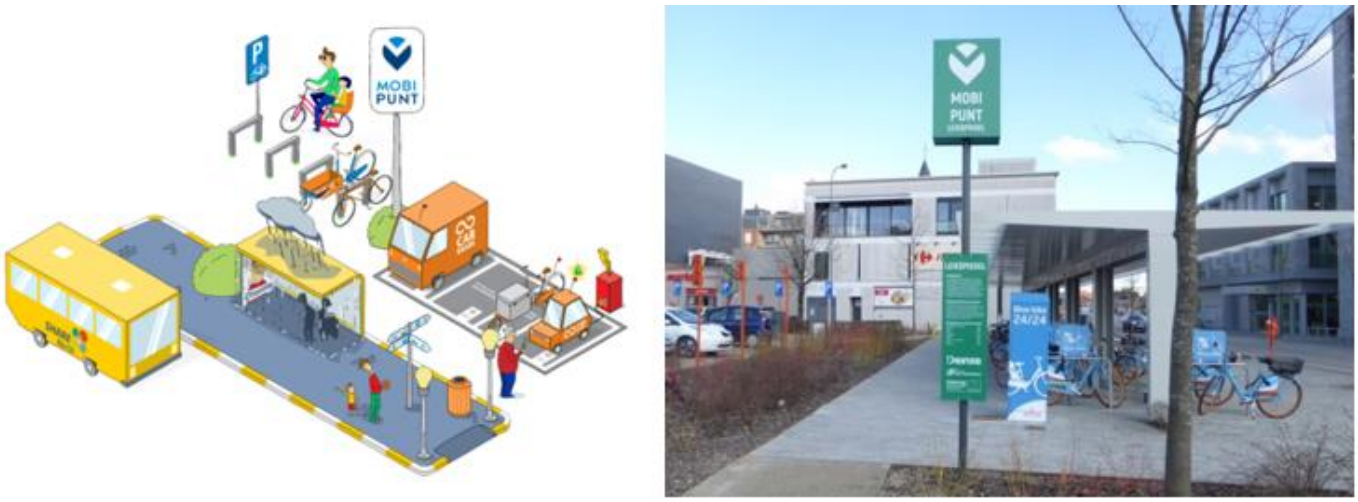
The city of Amsterdam launched its first e-Hub in June 2019, with the aim to create up to 20 hubs by 2022, to discourage people from using private vehicles and make better use of on-street space (otherwise used for parking). The pilot also aims to evaluate user behaviour and take up to develop a blueprint for strategic implementation of e-Hubs in similar European cities.

Case study 6. Mobility Hubs in Flanders, Belgium

Inspired by the Mobility Hubs concept introduced in Bremen, MobiPunts have been launched in 2017 in Flanders region by the partnership between Taxistop, Autodelen and Infopunt Publieke Ruimte supported by SHARE-North. There are plans for 15 municipalities to have at least one hub. Eight Mobility Hubs have been built, with plans to build ten more hubs by early 2021.

There is a high interest from municipalities and the partnership is formally working with 39 municipalities. The government added the Mobility Hubs concept to a new policy vision launched in 2019.

Figure 6. MobiPunt concept, Flanders region



Sources: SHARE-North, Autodelen.net

Originally the concept developed considering a neighbourhood level but has been expanded to a city level. Currently, there are a broad range of hubs, from large stations to very small hubs in rural areas. The components and services offered at the hubs vary depending on the type of the hub.

The key objectives of the Mobility Hubs are to increase use of shared mobility, promotion of multimodality and for the hubs to be inclusive, visible and accessible.

The partnership developed a specific branding for the hubs with a clear recognisable image used throughout Flanders which should lead to increased quality, use and accelerated implementation across the region. The name mobipunt is registered as a trademark, designed to help monitor its effectiveness as a brand and also prevent the name being used for other initiatives.[9]

[9] https://northsearegion.eu/media/3329/mobipunt-english.pdf

Planned Mobility Hubs

Case study 1. MobiPunten (Mobility Hubs) in Kop van Noord-Holland, the Netherlands

Funding has been made available through the SHARE-North and support from the local government to develop a network of MobiPunten (Mobility Hubs) in the Kop of Noord-Holland region. There are 20 Mobility Hubs planned in the region with the first one to be opened in March 2020. The same branding and logo as in the Flanders region have been adopted.

The concept of Mobility Hubs has been adopted from Bremen but also expanded into implementing hubs in rural areas and in new housing developments. For example, a mobility hub pilot Rijswijk Parkrijk will be tested in a new housing development in Rijswijk.

Each hub has its own business case and each neighbourhood has its own type of the hub and selected components, e.g. a high-end residential housing development may provide shared tesla cars. Mobility Hub components can include recycling facilities, delivery lockers, car clubs, EV charging etc.

The hubs should have a minimum of three facilities (e.g. recycling, public transport and delivery lockers), but there are no requirements for car clubs to be a part of the hubs.

There are MobiPunt Academies organised in partnership with SHARE-North, which share knowledge about setting up and managing Mobility Hubs.

Case study 2. Eight prototype sites within the San Diego region, USA

A network of "right sized" Mobility Hubs have been proposed in close proximity to major residential and job centres in the San Diego Forward: 2021 Regional Plan[10]. The primary objective is to enhance connections to and from existing and new high-speed, high-frequency services. Alongside improved connectivity to multiple modes, Mobility Hubs are planned to offer several smart roadside features such as wireless electric vehicle charging, smart parking, and flexibly managed kerb space. Two plans have been developed to deliver Mobility Hubs in the area, which include:

- The Regional Mobility Hub Strategy, by San Diego Association of Governments (SANDAG); and
- Mid-Coast Mobility Hub Strategy, by TransNet and the Federal Government.

[10] Mobility Hubs, San Diego Forward https://sdforward.com/mobility-planning/mobilityhubs

Figure 7. Mobility Hub Concept, SANDAG

Source: SANDAG

The Regional Mobility Hub Strategy has identified eight prototype sites within the San Diego region: each tailored to the needs of different communities. Table 4 provides a summary of eight proposed hubs.

Table 4. Proposed Mobility Hubs

Proposed Sites	Key Characteristics
Oceanside Transit Center	The hub is an entry point to the San Diego region with convenient access to inter-regional rail and local bus services. It is also in close proximity to the port/ naval base camp. The transit stop has over 1,200 parking spots. Accessible by 25k people (5-mins walk); and 10k jobs accessible.
Grossmont Transit Center	The hub is located in between Grossmont shopping centre and hospital. It aims to improve connectivity and transit options for residents as well as employers and visitors. It is served by two Trolley lines and two local bus routes. Accessible by 45k people (5-mins walk); and 25k jobs accessible
Vista Transit Center	Th hub located in the town centre of a suburban area with good connectivity through light rail and local buses and close proximity to retail shops in the area. Accessible by 55k people (5-mins walk); and 15k jobs accessible.
Barrio Logan Trolley Station	The hub located in the San Diego urban core centre, with excellent regional/ national as well as cross-border transit connectivity. Relatively low car ownership rate (80% compared to 90% regionally) in the area makes it attractive for multi-modal hub development. Accessible by 60k people (5-mins walk); and

Proposed Sites	Key Characteristics
	70k jobs accessible.
Sorrento Valley COASTER Station	The hub located in the region's top employment hub, outside the urban core. Also is well connected via high-speed rail. Considered ideal for off-beat features such as smart lockers for groceries, retail, etc. and smart parking facilities. Accessible by 4.5k people (5-mins walk); and 26k jobs accessible.
Otay Ranch Station	The hub is located within a master-planned community that was built to support a mix of homes, businesses, parks, and schools while promoting active living. The area has low speed limits for cars, with relatively high usage of active transport. Accessible by 50k people (5-mins walk); and 11k jobs accessible.
City Heights Transit Plaza	The hub is located in one of the most densely populated area and is a prime business district of San Diego, with good connectivity with all regions. Additionally, several new bikeways are proposed in the area, creating an opportunity to make biking a safe and convenient option for all types of trips and people of all ages and abilities. Accessible by 120k people (5-mins walk); and 11k jobs accessible.
8th Street Trolley Station	The hub is located a short distance from major waterfront employers. The station provides a convenient Park & Ride option for local residents to access transit for remaining length of their daily commute. Accessible by 50k people (5-mins walk); and 41k jobs accessible.

The Mid-Coast Mobility Hub Strategy proposes to introduce Mobility Hub features in eight other transit stations that are catered by the newly extended mid-coast trolley system (light rail service). The objective is to seamlessly integrate transit with wider transport options for residents, employees, and visitors to travel from home to work and a wide variety of destinations in between.

Case study 3. The Smart Columbus pilot program, City of Columbus, USA

Smart Columbus initiative[11] by the city of Columbus recognises the benefits of Mobility Hubs in improving accessibility to jobs, education and services. This can be further enhanced with the rise in alternative transport choices in the area. The objective is to provide multiple transport options through a smart and interactive kiosk providing access to real-time travel information, multi-modal transport bookings/ payments, etc.

Six locations have been identified by Smart Mobility Hubs pilot program based on inputs from local community including Columbus State Community College, Linden Transit Centre, St. Stephen's Community House, Linden Library, Northern Lights Park and Ride and Easton Transit Centre. Mobility Hubs are planned

[11] Smart Mobility Hubs, City of Columbus https://smart.columbus.gov/projects/smart-mobility-hubs

to be operated and maintained by the local community partners upon completion of the construction, and hence those were involved in the planning phase as well.

Case study 4. Minneapolis Mobility Hubs pilot programme, USA.

Minneapolis 2040 plan aims to decrease transport emissions by 37% in the city to meet its climate objectives. As part of the plan, a 3-month pilot program[12] to establish 12 Mobility Hubs was proposed in October 2019, primarily to increase multi-modal commute in the city region, particularly to facilitate micromobility for first/last mile connectivity. Each Mobility Hub will feature a transit stop, micromobility parking spots and wayfinding signage to points of interest.

The hub locations were selected based on analysis of 37 key transport metrics including access to jobs, healthcare, parks, existing transportation options and infrastructure in the neighbourhoods, user travel behaviour, demographic information and rigorous community engagement.

Figure 8. Minneapolis: Mobility Hub Pilot

Source: Minneapolis Public Works

The objective of the pilot program is to collect data on user travel choices and analyse the impact on personal car usage to inform long term strategy development. The pilot will also evaluate the potential for micromobility in the area given the severe weather conditions.

Case study 5. Community Mobility Hubs pilot, California

TransForm[13] is a think tank in California that work with community partners to improve connectivity and awareness around sustainable transport such as walkability and electric vehicles and inform policy change at the local, regional and state levels.

[12] Minneapolis Mobility Hubs Pilot Program http://www.minneapolismn.gov/publicworks/trans/WCMSP-220794
[13] TransForm Mission and Approach to Community Development https://www.transformca.org/landing-page/our-approach

TransForm has collaborated with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) to deliver three community Mobility Hubs[14], aimed at improving air quality, reduce personal car use while delivering low cost and accessible transport to low income communities. This pilot project is funded by the California Air Resources Board.

Mobility Hubs will typically feature EV car club vehicles, shared e-bikes, free transit passes, and will be located at three prioritised affordable housing locations in Oakland, Richmond, and San Jose. The hubs will be developed in collaboration with the community members.

The primary objective of the pilot is to identify effective mobility options and best practices, so that affordable and market-rate housing developers can include these options and build less parking in future projects.

Case study 5. City of Burlington, Canada

The City of Burlington aims to develop compact and sustainable neighbourhoods around the GO stations and the downtown area as part of its transition from a suburban area to an urban community over the next 20 years. As part of Burlington's official plan[15] adopted in April 2018, four Mobility Hub locations were identified to cater to increased transportation needs owing to population and employment growth. Each mobility hub is intended to be transit-oriented, walkable, bikeable and infrastructure-efficient.

Mobility Hubs are proposed to be developed in three phases:

- Phase 1: identify potential locations through local community and stakeholder engagement and eventually develop a concept for each Mobility Hub;
- Phase 2: prepare area-specific plans (also known as secondary plans) to build and deliver four Mobility Hubs, including potential policy changes and implementation; and
- Phase 3: deliver the area-specific plans of implementing the Mobility Hubs.

The phase 1 has been delivered and top four locations have been identified being: Downtown Mobility Hub, Aldershot GO, Burlington GO Mobility Hub and Appleby GO Mobility Hub. The locations are primarily urban centres with good public transit connectivity, high employment demand and shopping hubs.

On March 2019, the city proposed to re-evaluate its official plan and passed an Interim Control Byelaw which has put the Phase 2 and Phase 3 of Mobility Hubs development and implementation in the area on hold.

[14] Mobility Hubs at Affordable Housing Pilot, TransForm https://www.transformca.org/landing-page/mobility-hubs-affordable-housing-pilot
[15] Burlington Mobility Hubs, Official Plan https://www.burlington.ca/en/services-for-you/mobility-hubs.asp

D. Review of the Policy and Strategic Plans of Scotland and the SEStran Region

National Policy

The key national policies include Transport (Scotland) Act 2019, the Climate Change (Scotland) Act 2019, National Transport Strategy, National Planning Frameworks, National Performance Framework Outcomes and the Strategic Transport Projects Review 2 (STPR2), which is set to be released by 2021.

Transport (Scotland) Act 2019[16]

An Act of the Scottish Parliament to require the production of a national strategy in relation to transport.

The content of the National Transport Strategy should be determined with regards to transport being provided, developed, improved and operated to contribute to improving outcomes in relation to the following matters:

- The ability of people to realise their human rights;
- Social and economic wellbeing (including social inclusion, elderly persons, inclusion of persons with disabilities, inclusive economic growth, fair work, reduction of poverty and inequality, access to further and higher education via public transport, sustainability of communities in rural areas);
- The environment (the sustainable and efficient use and re-use of resources, the meeting of emission reduction targets set out in Part 1 of the Climate Change (Scotland) Act 2019); and
- Health and wellbeing.

The Climate Change (Scotland) Act 2019

The Climate Change (Scotland) Act 2009 has been amended by the Climate Change (Scotland) Act 2019, which introduced the target of net-zero emissions by 2045. This happened as the Scottish Government declared a Climate Emergency. The Act sets targets to reduce Scotland's emissions of all greenhouse gases to net-zero by 2045 at the latest, with interim targets for reductions of at least 56% by 2020, 75% by 2030, 90% by 2040.[17] The Government is updating the Climate Change Plan to reflect the increased ambition of the new targets set in the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.

National Transport Strategy, 2019[18]

The Vision for Scotland's transport system is to be a sustainable, inclusive and accessible system which promotes prosperity, health and fairness for all citizens. The key priorities that support this vision are:

1. Reducing inequalities
   - Provide fair access to services we need;

[16] http://www.legislation.gov.uk/asp/2019/17/part/2/enacted
[17] https://www.gov.scot/policies/climate-change/reducing-emissions/
[18] https://www.transport.gov.scot/media/47052/national-transport-strategy.pdf

- Easy to use for all (recognise that everyone has different needs and capabilities and work to ensure everyone can use the system with as little effort as possible); and
- Affordable for all (in 2016-2018 average weekly household expenditure on transport and vehicles in Scotland represented around a seventh of total household expenditure.

Ensuring that the most disadvantaged communities and individuals have fair access to the transport services they need and that the transport system will enable everyone to access a wide range of facilities and services and realise their human rights.

Between 2015 and 2018 over one million Scottish citizens were living in relative poverty annually, including almost 1 in 4 children. Recent research has also found that over one million Scots live in areas that are at risk of transport poverty. The Scottish Parliament has legislated for significant reduction in child poverty and the Tackling Child Poverty Delivery Plan recognises the importance of the power of transport in achieving the reduction and has committed are areas of transport policy to consider how they can best support the delivery of the child poverty targets.

2. Taking climate action
   - Help deliver the net-zero target (Scottish Government has proposed a statutory target of net-zero emissions by 2045);
   - Adapt to the effects of climate change; and
   - Promote greener, cleaner choices.

Transport is currently the largest contributor to Scottish emissions – aim to tackle emission reduction through a range of actions including an ambition to phase out the need for new petrol and diesel cars and vans by 2032. Scotland will reinforce the Sustainable Travel Hierarchy to promote and design the transport system so that walking, cycling and public and shared transport are promoted above private car use.

3. Helping to deliver inclusive economic growth
   - Get people and goods where they need to be;
   - Will be reliable, efficient and high quality; and
   - Use beneficial innovation.

Transport has a key role in delivering Scotland's Economic Strategy, which has 4 priority areas of investment, innovation, inclusive growth and internationalisation – it enables firms to have efficient access to suppliers and customers and it allows people fair and affordable access to reach the jobs where they can be most productive and boost incomes through access to employment.

4. Improving health and wellbeing
   - Safe and secure for all;
   - Enable people to make healthy travel choices; and
   - Help to make communities great places to live.

The Government will work to make active modes a preferred method of travel, with the aim of reducing the social and economic impact of public health problems, including mental health, obesity, type-2 diabetes and cardio-vascular diseases. It will also promote more social interaction, support for local business and services making communities more vibrant and greater places to live. The transport system needs to safe and secure and give users trust and confidence that they will reach their destinations without threat.

Whilst no priority is more important than another, they reflect the increasing prominence of the need to address climate change and the agenda of progressive policies to reduce inequalities in Scotland.

There is a fundamental aim that remains constant despite the dramatic and rapid changes in transport innovation and technologies, and that is to link people and places in ways that are reliable, affordable and safe.

The 2020 National Transport Strategy provides a set of Policies and Enablers that, when implemented, will achieve the Strategy's Outcomes. The Policies are presented in Table 5.

Table 5. Policies and Enablers, the 2020 National Transport Strategy

Policy
Reduces inequalities
Minimise the connectivity and cost disadvantages faced by island communities and those in remote and rural areas, including safeguarding of lifeline services.
Ensure transport in Scotland is accessible for all by supporting the implementation and development of Scotland's Accessible Travel Framework.
Remove barriers to public transport connectivity and accessibility within Scotland.
Improve sustainable access to healthcare facilities for staff, patients and visitors.
Ensure sustainable, public and active travel access to employment, education and training locations.
Takes climate action
Reduce emissions generated by the transport system to mitigate climate change.
Reduce emissions generated by the transport system to improve air quality.
Ensure the transport system adapts to the projected climate change impacts.
Support management of demand to encourage more sustainable transport choices.
Facilitate a shift to more sustainable and space-efficient modes of transport for people and goods.
Improve the quality and availability of information to enable all to make more sustainable transport choices.
Helps deliver inclusive economic growth
Increase resilience of Scotland's transport system from disruption and promote a culture of shared responsibility.
Increase the use of asset management across the transport system.
Provide a transport system which enables businesses to be competitive domestically, within the UK and internationally.
Ensure gateways to and from international markets are resilient and integrated into the wider transport networks to encourage people to live, study, visit and invest in Scotland.
Support Scotland to become a market leader in the development and early adoption of beneficial transport innovations.

Policy
Meet the changing employment and skills demands of the transport industry and upskill workers.
Integrate transport and wider infrastructure policies and investments, including digital and energy, to unlock greater benefits.
Improves our health and wellbeing
Increase safety of the transport system and meet casualty reduction targets.
Implement measures that will improve perceived and actual security of Scotland's transport system.
Ensure that transport assets and services adopt the Place Principle.
Reduce the negative impacts which transport has on the safety, health and wellbeing of people.
Provide a transport system that promotes and facilitates active travel choices which help to improve people's health and wellbeing across mainland Scotland and the Islands.
Embed the implications for transport in spatial planning and land use decision making.

National Performance Framework Outcomes[19]

To achieve the national outcomes, the National Performance Framework aims to get everyone in Scotland to work together. This includes:

- national and local government;
- businesses;
- voluntary organisations; and
- people living in Scotland.

The key outcomes include children and young people, economy, communities culture, environment, education, fair work and business, health, human rights, international and poverty.

National Planning Framework, 2014[20]

The Third National Planning Framework (NPF) sets out a long-term vision for development and investment across Scotland over the next 20 to 30 years. It is the spatial expression of the government economic strategy and plans for infrastructure investment.

The strategy for a successful, sustainable place highlights the particular scope for the cities network to progress the country's economic agenda. To this end, the Scottish Cities Alliance and local authorities will take forward the priorities set out in the City Investment Plans.

The Scottish Cities Alliance will bring the City Investment Plans together into a shared investment portfolio brochure, communicating a consistent investment message across the cities network.

[19] https://nationalperformance.gov.scot/national-outcomes
[20] https://www.gov.scot/publications/national-planning-framework-3/pages/4/

As an early priority, the Scottish Government will examine current planning authority approaches to aligning planning and infrastructure investment to inform whether further advice on this is required. The Scottish Government will also work with the Cities Alliance to progress Smart Cities initiatives.

The four key themes include:

- a successful, sustainable place;
- a low carbon place;
- a natural, resilient place; and
- a connected place and the national developments.

The Strategic Transport Projects Review 2 (STPR2) – set to be released by 2021

The Scottish Government announced the future release of the Strategic Transport Project Report 2 (STPR2), which will consider the interventions required to help support the NTS2 as well as providing a fit with Scottish Government plans, policies and strategies and will ultimately inform the next Infrastructure Investment Plan.

The aims of STPR2 are:

- to conduct a whole-Scotland, evidence-based review (in accordance with Scottish Transport Appraisal Guidance or STAG) of the performance of the strategic transport network across all transport modes against clear criteria on operational performance, safety, and environmental impact, whilst fundamentally supporting Scotland's Economic Strategy, including inclusive growth. Outcomes will be defined in the emerging and updated NTS2; and in so doing, and
- to make recommendations for potential transport investments for Scottish Ministers to consider as national investment priorities in an updated 20-Year Infrastructure Investment Plan for Scotland.

The STPR2 study will:

- recommend to Transport Scotland a programme of interventions for the period 2022 to 2042 which will make a significant contribution to delivering the new NTS2;
- ensure that the outcomes of STPR2 align with other Scottish Government national plans, policies and strategies, the National Planning Framework, the Climate Change Plan and will consider the commitments made to City and Regional Growth Deals; and
- use the established STAG methodology, to re-consider the extant recommendations of the first STPR and other candidate interventions in the light of NTS2 policies as part of the initial optioneering exercise.

Regional Policy

Existing and Future SEStran Regional Transport Strategy 2015 - 2025, 2015[21][22]

The Regional Transport Strategy is currently being updated and it will most likely seek to align with the priorities set out in the National Transport Strategy released in 2020.

The Regional Transport Strategy has 17 specific sub-objectives, which steam from the 4 high level objectives of: economy, accessibility, environment and safety and health.

1. Economy – to ensure transport facilities encourage economic growth, regional prosperity and vitality in a sustainable matter:
   - Widening labour markets
   - Improving connectivity to the rest of Scotland, the UK and beyond for business and tourists
   - Supporting other strategies
   - Tackling congestion (improve journey time reliability)
2. Accessibility – to improve accessibility for those with limited transport choice or no access to a car, particularly those who live in rural areas:
   - Targeting improvements in access to employment, health and other services/opportunities e.g. retailing. leisure/social and education.
   - Addressing barriers to the use of public transport, including cost and social inclusivity.
3. Environment – to ensure that development is achieved in an environmentally sustainable manner:
   - Reducing greenhouse gas emissions and other pollutants to contribute to the achievement of Scottish national targets and obligations
   - Enabling sustainable travel
   - Reduce the need to travel
   - Minimise the negative impacts of transport on natural and cultural resources
   - Increase transport choices, reducing dependency on the private car
4. Safety and health – to promote a healthier and more active SEStran area population:
   - Reducing transport related injuries and deaths
   - Improving the health of the population
   - Increase the proportion of trips by walk/cycle
   - Tackling local air quality and transport related noise

In summary, SEStran RTS aims to deliver the following:

- Key connectivity on the transport network, linked to economy;
- Improved public transport in SEStran – journey time, reliability, price, convenience, quality, availability, information and integration;
- Integrating land use and transport planning;
- 'Smarter Choices' – behavioural change;
- Encouragement of walking and cycling;

[21] https://www.sestran.gov.uk/wp-content/uploads/2017/01/Regional-Transport-Strategy.pdf
[22] https://www.sestran.gov.uk/wp-content/uploads/2017/01/SEStran_Regional_Transport_Strategy_Refresh_2015_as_published.pdf

- Access to a wide labour market for employers;
- A reduction in car dependency across the region;
- Improved accessibility for disadvantaged areas to health services and employment opportunities, and improve opportunities for those with mobility difficulties and rural areas;
- Funding for rural transport, improving links to main corridors and within rural areas, and community transport, to ensure the transport needs of all within the SEStran area are met;
- Reduction of greenhouse gas emissions; and
- Improved road safety.

Local Planning Policy

Eight local authorities fall within the SEStran region and each has developed a local transport strategy that is in line with national and regional policy but builds on the specificities of their local area.

Objectives of other local authorities in the region follow similar themes with a notable focus on sustainable support for local economic growth, community support through promotion of social inclusion, integration of the transport network and protection of the environment through promotion of active travel.

The key local policy documents are presented in Table 6.

Table 6. Key documents

Area	Documents
Edinburgh	Edinburgh Local Development Plan (LDP1, adopted 2016) Edinburgh City Mobility Plan City Centre Transformation Project City Plan 2030 (Local Development Plan 2)
Clackmannanshire	Clackmannanshire Local Development Plan Review, 2020
East Lothian	Transport Appraisal - LDP 2018
Falkirk	Falkirk Council Local Transport Strategy, 2014 Falkirk Council Local Development Plan, 2015
Fife	Adopted Fife plan, 2017
Midlothian	Local Development Plan, 2017
Scottish Borders	Scottish Borders Local Development Plan (LDP), 2016 Local Access and transport Strategy MIR, 2015
West Lothian	Local Development Plan (LDP), 2018
East Lothian	East Lothian Local Transport Strategy ,2018-2024 Draft

Table 7 presents those national and regional policies, themes and objectives, which can be supported through implementation of Mobility Hubs. The list of policies, themes and objectives are selected from the following documents: the National Transport Strategy 2020, and the SEStran Regional Transport Strategy, 2015-2025 and Climate Change Plan.

Table 7. Alignment of the SEStran's national and regional policies with a concept of Mobility Hubs

Common Theme	Policy/Theme/Objectives	Source of Policy/Theme/Objective	Addressed by Mobility Hubs
Spatial Planning	Embed the implications for transport in spatial planning and land use decision making	National Transport Strategy, 2020	Mobility Hubs to be considered as part of land use and transport planning Mobility hubs offer potential for integration of shared mobility and public transport in spatial planning and new developments, relieving parking pressure and need for additional parking spaces
	Integrating land use and transport planning	SEStran Regional Transport Strategy, 2015-2025	
A high-quality transport system	Increase resilience of Scotland's transport system from disruption and promote a culture of shared responsibility	National Transport Strategy, 2020	Mobility Hubs to improve the end-to-end journey for people and freight Potential to test Mobility Hubs in rural areas enhancing connectivity in isolated communities Potential to test Mobility Hubs in locations with low car ownership enhancing connectivity Mobility Hubs to promote the use of space-efficient transport Mobility Hubs have the potential to incorporate new technologies such as e-cargo bikes, test off-peak loading hours and delivery lockers to encourage sustainable movements of goods
	Increase the use of asset management across the transport system		
	Improve accessibility for those with limited transport choice or no access to a car, particularly those who live in rural areas	SEStran Regional Transport Strategy, 2015-2025	
	Provide key connectivity on the transport network, linked to economy	SEStran Regional Transport Strategy, 2015-2025	
	Improve public transport in SEStran – journey time, reliability, price, convenience, quality, availability, integration	SEStran Regional Transport Strategy, 2015-2025	

Common Theme	Policy/Theme/Objectives	Source of Policy/Theme/Objective	Addressed by Mobility Hubs
Embracing innovation	Support Scotland to become a market leader in the development and early adoption of beneficial transport innovations	National Transport Strategy, 2020	Mobility Hubs to foster integration of new transport innovation and existing transport services Mobility Hubs provide an opportunity to test innovative technologies and support early adoption of beneficial transport innovations
	Meet the changing employment and skills demands of the transport industry and upskill workers		
Quality of information	Improve the quality and availability of information to enable all to make more sustainable transport choices	National Transport Strategy, 2020	Mobility Hubs to support people to make informed travel choices through provision of information (e.g. digital pillars)
	Improve public transport in SEStran – information	SEStran Regional Transport Strategy, 2015-2025	
Improved accessibility	Remove barriers to public transport connectivity and accessibility within Scotland	National Transport Strategy, 2020	Mobility Hubs to improve accessibility for various transport modes and cater for people with disabilities Potential to test Mobility Hubs in disadvantaged locations to enhance access to health services and employment opportunities
	Ensure transport in Scotland is accessible for all by supporting the implementation and development of Scotland's Accessible Travel Framework		
	Minimise the connectivity and cost disadvantages faced by island communities and those in remote and rural areas, including safeguarding of lifeline services		

Common Theme	Policy/Theme/Objectives	Source of Policy/Theme/Objective	Addressed by Mobility Hubs
	Improve sustainable access to healthcare facilities for staff, patients and visitors		
	Ensure sustainable, public and active travel access to employment, education and training locations		
	Improved accessibility for disadvantaged areas to health services and employment opportunities, and improve opportunities for those with mobility difficulties	SEStran Regional Transport Strategy, 2015-2025	
Stronger economy	Provide a transport system which enables businesses to be competitive domestically, within the UK and internationally	National Transport Strategy, 2020	Mobility Hubs to support seamless journeys providing the necessary infrastructure and access to transport modes Mobility Hubs to provide interchange facilities to connect locally available modes of transport Potential for Mobility Hubs to enhance transport provision at/to hospitals, major employment areas and universities
	Ensure gateways to and from international markets are resilient and integrated into the wider transport networks to encourage people to live, study, visit and invest in Scotland.		
	Access to a wide labour market for employers	SEStran Regional Transport Strategy, 2015-2025	
Improved health and wellbeing	Provide a transport system that promotes and facilitates active travel choices which help to improve people's health and wellbeing across mainland Scotland and the Islands	National Transport Strategy, 2020	Mobility Hubs to promote and facilitate active travel choices Mobility Hubs to integrate active travel options such as walking and cycling

Common Theme	Policy/Theme/Objectives	Source of Policy/Theme/Objective	Addressed by Mobility Hubs
	Reduce the negative impacts which transport has on the safety, health and wellbeing of people		Mobility Hubs to support people to make informed travel choices through provision of information
	'Smarter Choices' – behavioural change	SEStran Regional Transport Strategy, 2015-2025	
	Encouragement of walking and cycling	SEStran Regional Transport Strategy, 2015-2025	
Emissions reductions	Reduce emissions generated by the transport system to mitigate climate change	National Transport Strategy, 2020	Mobility Hubs to encourage behavioural change and facilitate a shift to more sustainable modes of transport Mobility hubs can be used for the installation of air quality monitoring equipment Mobility Hubs to be used to promote greener, cleaner choices through provision of EVs charging infrastructure, storage facilities for bicycles, wayfinding information and provision of bike share Provision of first and last mile travel through car share and bike share at Mobility Hubs can help to reduce the need for a car
	Reduce emissions generated by the transport system to improve air quality		
	Support management of demand to encourage more sustainable transport choices		
	Facilitate a shift to more sustainable and space-efficient modes of transport for people and goods		
	A target to reduce Scotland's emissions of all greenhouse gases to net-zero by 2045 at the latest, with interim targets for reductions of at least 56% by 2020, 75% by 2030, 90% by 2040	The Climate Change (Scotland) Act 2019	
	A reduction in car dependency across the region	SEStran Regional Transport Strategy, 2015-2025	

Common Theme	Policy/Theme/Objectives	Source of Policy/Theme/Objective	Addressed by Mobility Hubs
	Reduction of greenhouse gas emissions	SEStran Regional Transport Strategy, 2015-2025	
A place for community	Ensure that transport assets and services adopt the Place Principle	National Transport Strategy, 2020	Mobility Hubs to provide the high level of information, safety and security though design to create a sense of place and foster safety
	Increase safety of the transport system and meet casualty reduction targets		
	Implement measures that will improve perceived and actual security of Scotland's transport system.		
Partnerships	Integrate transport and wider infrastructure policies and investments, including digital and energy, to unlock greater benefits.	National Transport Strategy, 2020	Mobility Hubs to encourage effective partnerships between key stakeholders including local authorities, landowners and service providers

E. Stakeholder Engagement Plan

A stakeholder engagement plan is shown in Table 8.

Table 8. Stakeholder engagement plan

Stakeholder Type	Stakeholder	What subjects will they be engaged about?	Engagement Phase				How will they be engaged?				
			Planning Phase	Construction	Operation	Monitoring	Meetings	Email/Phone	Workshops	Social Media	Surveys
Local authorities	City of Edinburgh Council Scottish Borders Council Falkirk Council Clackmannanshire Council Fife Council East Lothian Council West Lothian Council Midlothian Council	Planning and development Acquisition of land Procurement of infrastructure Procurement of services/service level agreements Information provision Marketing & promotion Monitoring Capital funding Revenue funding Ongoing management Staffing	✓	✓	✓	✓	✓	✓	✓	✓	
Public transport operators	Stagecoach FirstBus Lothian Buses Borders Buses Edinburgh Tram ScotRail	Planning and development Provision of services Service level agreements Information provision Marketing & promotion Provision of monitoring data	✓	✓	✓	✓	✓	✓	✓	✓	

Stakeholder Type	Stakeholder	What subjects will they be engaged about?	Engagement Phase				How will they be engaged?				
			Planning Phase	Construction	Operation	Monitoring	Meetings	Email/Phone	Workshops	Social Media	Surveys
	Smaller bus operators as appropriate Etc.	Funding Management									
Other government agencies and transport authorities	Transport Scotland Transport for Edinburgh TACTRAN Swestrans Cycling Scotland Etc	Planning and development Service level agreements Information provision Marketing & promotion Monitoring Funding Management Staffing	✓			✓	✓	✓	✓	✓	
Shared mobility and other private transport operators	Enterprise Zipcar Uber Arriva Beryl SERCO NextBike Etc.	Planning and development Provision of services Marketing & promotion Service level agreements Information provision Provision of monitoring data Funding Management	✓	✓	✓	✓	✓	✓	✓		
Local community including residents and businesses	Dependent on location Community Development Trusts	Input to service level requirements Monitoring feedback	✓		✓	✓			✓	✓	✓

Stakeholder Type	Stakeholder	What subjects will they be engaged about?	Engagement Phase				How will they be engaged?				
			Planning Phase	Construction	Operation	Monitoring	Meetings	Email/Phone	Workshops	Social Media	Surveys
	Business Improvement Districts Town councils/Councillors Etc.										
Not-for-profit organisations including disability and other community groups	Disability Equality Scotland ENABLE Scotland Sustrans CoMoUK Etc. Paths for All	Input to service level requirements Planning and development	✓			✓	✓	✓	✓	✓	✓
Assets, Infrastructure and utility providers	ChargePlace Scotland Shell Scottish Power EDF Etc.	Planning and development Provision of infrastructure	✓	✓	✓	✓	✓	✓	✓		
Technology Providers	Wi-fi providers MaaS operators Journey planning apps Ticketing providers Etc.	Planning Back-end Technology User Interfaces Data Sharing Payment Solutions	✓		✓	✓	✓	✓	✓	✓	

Stakeholder Type	Stakeholder	What subjects will they be engaged about?	Engagement Phase				How will they be engaged?				
			Planning Phase	Construction	Operation	Monitoring	Meetings	Email/Phone	Workshops	Social Media	Surveys
Landowners and property developers	Parking providers Housing developments Petrol Stations/ EV charge stations Airports Universities Hospitals Shopping centres Etc.	Planning and development Provision of land Potential sponsorships, funding	✓	✓			✓	✓	✓		
Major employment sites and other key trip generators	Dependent on location	Planning and development Provision of land/infrastructure Marketing & promotion Capital funding contribution Revenue funding contribution	✓	✓	✓	✓	✓	✓	✓	✓	✓
Other established Mobility Hubs	Bremen, Germany Flanders region, Belgium E-hubs, Amsterdam	Planning experience Operational experience	✓			✓	✓	✓	✓	✓	

F. Management Responsibilities and Operations

Table 9 presents potential management responsibilities for operations at Mobility Hubs.

Table 9. Potential management responsibilities

Component	Operator	Maintenance
Car club		
Car club vehicles	Car club	Car club
Car club parking spaces	Mobility Hub operator, local authority	Mobility Hub operator. local authority
Bike share		
Bike share vehicles	Bike share operator	Bike share operator
Bike share parking	Bike share operator for docks Mobility Hub operator for general parking	Bike share operator for docks Mobility Hub operator for general parking
Bike parking	Mobility Hub operator, local authority	Mobility Hub operator, local authority
Bike repair stand	Mobility Hub operator. local authority	Mobility Hub operator, local authority
Bus		
Service vehicles	Bus operator	Bus operator
Shelter	Mobility Hub operator, local authority or bus operator	Mobility Hub operator, local authority or bus operator
Taxi / on demand taxi		
Taxi vehicles	Taxi operator	Taxi operator
Taxi rank / pick-up & drop-off spaces	Mobility Hub operator	Mobility Hub operator
Taxi contact (phone or digital)	Taxi operator	Taxi operator
Digital pillar	3rd party supplier	3rd party supplier

Component	Operator	Maintenance
Totem	Mobility Hub operator	Mobility Hub operator
Wayfinding	Mobility Hub operator / local authority	Mobility Hub operator / local authority
Wi-fi hotspot	Mobile Network operator	Mobile Network operator
EV charging		
Charge point	Charge point network operator/ charge point supplier	Charge point network operator/ charge point supplier
Maintenance / checking	Charge point supplier / site operator	Charge point supplier: automated reporting; periodic site visits; Mobility Hub operator: as part of regular site checks / fault reporting
Street furniture, including shelters, seating area	Local authority / land owner	Local authority or community organisation.
Litter bins	Local authority / land owner	Local authority
Toilets	Local authority, rail station operator, café operator	Local authority or community organisation, rail station operator, café operator
Lighting	Local authority	Local authority
CCTV	Local authority or rail operator	Local authority or rail operator
Parklet / planting	Local authority or community organisation	Local authority or community organisation
Refreshment	Café or concession	Café or concession
Package delivery	3rd party delivery system provider	3rd party delivery system provider

G. Selection of Potential Pilot Locations

Table 10 presents data collected through collaboration with local authorities as part of engagement during this study. Each local authority prioritised three potential locations for Mobility Hubs in its area. Each location was chosen based on the local knowledge of representatives of each local authority and analysis of the data presented in two sets of the maps showing the demand and need for Mobility Hubs (see Appendix H).

These locations provide a starting point that, depending on availability of suitable funding, may lead to more detailed consideration of Mobility Hubs in these areas in the future but are not necessarily guaranteed or planned.

Table 10. Mobility Hubs locations

Local Authority	Mobility Hub Type	Location/Priority	Comments/Reasoning
City of Edinburgh	Transport corridor/Market town	1.Wester Hailes	New development. Underutilised rail line. Existing cycling infrastructure. Focus should be on creating a community hub. Deprived area, poor car ownership.
City of Edinburgh	Key destination/large interchange	2.Gyle	A large employment area which also includes residential areas Train stations are not located where people need to go. Last mile connectivity is key. A need to maximise existing public transport offer.
City of Edinburgh	Key destination	3.Bio quarter	Key destination – a large hospital. Not very well served by existing bus services. There are also planned residential developments. Focus on commuters and visitors to hospital and other sites. Central mobility with potential growth for the network of mini hubs. Potential to introduce car clubs in partnership with NHS.
Clackmannanshire	Market town/ Linking Hub	1.Alloa Town centre in vicinity of King Street	The data analysis shows a good potential demand for a Mobility Hub. The area is highly deprived. There is an existing rail station and a Park&Ride site.

Local Authority	Mobility Hub Type	Location/Priority	Comments/Reasoning
Clackmannanshire	Market town	2.Tillicoultry - Murray Square	The data analysis shows the highest potential demand for a Mobility Hub in the area. The area of high deprivation.
Clackmannanshire	Market town	3.Tullibody in the vicinity of Tron Court	The data analysis shows a good potential demand for a Mobility Hub. The area of high deprivation.
East Lothian	Transport Corridor	1.Musselburgh	It is a busy transport corridor. There are existing frequent and relatively quick bus services to Edinburgh. Existing car club provision. The location is close enough to the city for cycle connectivity. The area is categorised as deprived with a highest potential for Mobility Hubs in East Lothian based on the data analysis. Air quality is identified as an issue. There is a high number of planned housing developments and expected population growth. There are opportunities to encourage mode shift due to station being close enough to the city.
East Lothian	Market town/Linking hub	2.Haddington	Consultation underway for P&R, bus interchange, e-bike scheme. No train/fast buses to Edinburgh. Buses are not frequent. Large rural hinterland. Opportunities for P&R and model shift for onward journeys.
East Lothian	Transport corridor	3.Wallyford rail station	Existing rail station with fast frequent trains to Edinburgh. Bus interchange. Existing P&R site. New developments surrounding station are planned leading to increased population. Opportunities for modal shift – capturing drivers heading west. Possibly an easiest option to deliver.
Falkirk	Large Interchange	1.Falkirk Central/Falkirk Grahamston	In place – train station/cycle parking With Falkirk Central it is hoped, through the Growth Deal that Bus provision will be co-ordinated better with the train service. Planned through the Growth deal – e-bike share, green route, taxi provision.

Local Authority	Mobility Hub Type	Location/Priority	Comments/Reasoning
			Deprived area with high potential for Mobility Hubs based on the data analysis.
Falkirk	Key destinations	2.Falkirk stadium/Helix Hub	In place - bus service, cycle parking, EV charging hub (26 points). Planned – e-bike share, Green Route.
Falkirk	Transport corridor	3.A9 Glenbervie/Park	Planned through the Growth Deal: car parking, cycle parking, EV charging hub, park and choose car park.
Fife	Market town	1. Leven Bus Station	The Levenmouth area is within the top 5% of the SIMD. There is to be a lot of investment in this area, to encourage business investment and thus increase job opportunities, increase access to further education and make Leven a tourist access to the East Neuk Fife. Data analysis shows low to medium potential demand for a Mobility Hub.
Fife	Transport corridor/Linking hubs	2. Dunfermline Town Rail Station	It serves the commuter market for Edinburgh, there is to be a lot more houses going into the Dunfermline area and they will be using the Dunfermline Town Station, thus providing additional facilities. The data analysis shows high potential demand for a Mobility Hub
Fife	Market town	3. High Street Kincardine	The area serves the west Fife and acts as an interchange location. There is to be a lot of investment in this area with the development of Longannet. Start of the tourism trail round the coastal route of Fife. The data analysis shows high potential demand for a Mobility Hub
Midlothian	Market town/ Linking Hub	1. Jarnac Court / Dalkeith town centre	The data analysis shows a high potential demand for a Mobility Hub. Buses, sustainable transport portal and cycle parking are already available. Midlothian is introducing e-bikes to the area.
Midlothian	Transport corridor	2.Eskbank Station / Edinburgh College	The data analysis shows medium potential demand for Mobility Hub, although adjacent areas show higher levels of demand. Midlothian is introducing e-bikes. Trains, sustainable transport portal and cycle parking are in place. Existing P&R site close to the station.

Local Authority	Mobility Hub Type	Location/Priority	Comments/Reasoning
Midlothian	Transport corridor	3. Sheriffhall P&R	Existing Park& Ride site, bus led hub.The data analysis shows medium potential demand for Mobility Hub.
Scottish Borders	Transport corridor/Linking hub	1.Tweedbank	Multi-modal options are available - Borders Rail terminus; Existing bus services (X62, 61, 62B, 67, 69, 964); P&R site; some bus services able to carry bikes. EV charging available. Proximity to Borders General Hospital – parking pressure and presents opportunity for encouraging sustainable travel. Would improve sustainable access of the station for the population in Melrose. Opportunity to improve local travel information provision to support tourist economy - tourist attractions such as Abbotsford House and Melrose are a short cycle away (also walkable). Wider border leisure cycling routes available. Potential integration with any Scottish Borders Car Club at Newton St Boswells Council HQ (if exists). Further development of Tweedbank station as a 'place' as the area is developed further.
Scottish Borders	Market Town/Village Hub	2. Galashiels	Multi-modal options available at Galashiels Interchange (bus, rail, taxi) Some bus services able to carry bikes. It would serve an area of relatively high population. High levels of deprivation relative to much of the rest of the region. There is a café on-site. Potential to contribute to improved sense of place in Galashiels town centre as it is developed. Possible issue about location would be constraints on land availability.
Scottish Borders	Market Town/Village Hub	3. Peebles	Supports the continued development of local active travel economy in Tweed Valley e.g. Tweedlove festival, Glentress mountain biking. Link with local private cycle hire offers (e.g. partnering opportunities). Supports increased passenger catchment for Peebles-Edinburgh bus services (which also carry bikes). EV charging available in the town.
West Lothian	Transport corridor /Linking Hub	1.Livingston – Almondvale Avenue	All West Lothian bus services use Almondvale avenue in centre of Livingston. It has a reasonable public realm but problems with real time info systems. It needs connection to two railway stations – Livingston North and Livingston South. The

Local Authority	Mobility Hub Type	Location/Priority	Comments/Reasoning
			nearby central Dedridge residential area is considered as deprived and has medium to high potential for Mobility Hubs based on the data analysis.
West Lothian	Market town	2.Bathgate station – King Street	600+ new station car park and frequent bus services are available on Edinburgh Road – ie the relocated Station site opened in 2010 with re-opening of Bathgate – Airdrie rail line.Network Rail plans to extend P&R north-east of line to another 200+ places.New station entrance is ~400m from the town centre with the former station site at King Street suitable for a Mobility Hub as it has land available, public realm, former taxi ranks and bus interchange and potentially toilet. There is a dedicated cycle lane planned for Edinburgh Road (two way on south side due on site in 2020/21). The area has a high potential for Mobility Hubs based on the data analysis. The area at nearby Boghall has a high deprivation ranking as well as some areas of the town.
West Lothian	Transport interchange	3.Whitburn	High SIMD in pockets throughout the town. “Smarter Choices/Smarter Places” are funding e-bike offer working with local schools. Also, a Whitburn – Armadale Station parallel cycle route along the B8046 about to start on site in 2020 / completion planned to 2021. Concern that there is no public transport interchange at M8 –J4A. P&R is someway from town centre and is separated by the Heartlands industrial area. Three key areas which require connection: P&R, new extensive residential area (2000 houses at Heartlands) and town centre.

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South East of Scotland Transport Partnership

Area 3D (Bridge) | Victoria Quay | Edinburgh EH6 6QQ
0131 524 5160 | www.sestran.gov.uk

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