D2.4 Feasibility study; screening of communal and small trade services

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1) Introduction

This report aims to give a comprehensive view of municipal services that are executable by cargo cycle. Municipal services refer to the basic services that residents within a town or city can expect a local government or council to provide on their behalf. Some of these services relate to infrastructure, such as road maintenance and signage, others such as litter picking and park maintenance, are associated with making our towns and cities nicer places to live. There are core services that will be available in most towns and this report aims to focus on those. It will consider some of the reasons for moving municipal services to cargo cycle, the types of service that are suitable and some best practice examples from partner cities across Europe. This will include the capacity of cargo bikes currently available and the legal frameworks within which organisations must operate. It will also look at some of the barriers to participation and what can be done to overcome these. As with deliverable 2.3, this report draws on information contained within Transport for London's 2009 report, *Cycle Freight in London – a Scoping Study*. It also draws information from a 2010 study by Austrian student

Stephanie Mühlbacher that looked at the potential for bicycle delivery vehicles in the Austrian city of Graz.

In this document, the terms 'cycle power', 'cycle delivery' and 'cycle cargo' or 'cycle freight' may imply any type of cycle used for carrying goods and delivering services.

2) Is movement towards Cycle Logistics for municipal services desirable?

The benefits of providing municipal services by cycle power are numerous. The cost of motorised transport means that in many cases services can be provided in a more cost effective way; the environmental damage caused by motorised vehicles is well documented; and in many towns and cities congestion is at an unacceptable level. Some services may also be provided in a more efficient manner by cargo cycle as journey times are less affected by variable traffic conditions. Providing selected municipal services by cargo cycle will not only save money for local governments (which may be a factor when encouraging the concept of Cycle Logistics), but will help reduce CO_2 emissions, noise, pollution and will also help ease urban congestion. Governments often have targets to meet with each of these. This report offers some examples of municipal services which have been delivered successfully by cargo cycle, and notes the benefits to those municipalities.

3) Is movement towards Cycle Logistics for municipal services possible?

This section seeks to explain whether or not it is possible to provide services by cargo cycle within the context of municipal services. It will look at the typical range of services provided within a municipality and highlight potential for these to be carried out by cargo cycle. This section will also examine the various legal frameworks within which towns and cities have to work.

a) The table below lists some of the services provided by an average municipality, and also estimates a likelihood of a switch to bicycle.

Service	Examples of things required	Est. weight	Likelihood of switch to cargo bike?
Document delivery (to houses, and intra-organisational)	Small documents, internal mail, consultation documents to residents	500g to 25kg	*High*
Parks and green space maintenance	Fork, spade, rake, hoe, trowel, shears, pruner, gloves, edger, mower	100kg	*Medium* – for general maintenance such as tidying flower beds, pruning bushes *Low* – for larger jobs such as mowing, tree felling
Litter picking	Gloves, bin bags, bin, litter tongs	10kg (30kg once laden)	*High*
Signage	Signs, fixings, tools	5kg to 50kg	*Medium to high* – for smaller jobs such as sign repairs, or smaller signs as seen on cycle routes
Road maintenance	Large jobs; Power tools (drills, compressors, plate bashers etc.), rollers, chip spreaders Smaller jobs (e.g. pothole filling); shovel, plate basher, asphalt	1,000kg 100kg	*Low* *Medium*
Waste collection (household, trade,	Bin truck, gloves, rubbish bags, bins	100kg	*Low* – a regular household collection

recycling, bins, food waste)			would prove difficult by bike *Medium* – Ad hoc collections such as recycling
Street lighting	Spare bulbs, tool kit, cleaning kit	25kg	*High*
Environmental health (unblocking drains, pest control)	Gloves, bags, drain rods, animal traps, overalls,	50kg	*Medium*
Emergency services; paramedics	Emergency medical equipment, gloves, notebooks, radio	25kg	*High* – this already exists in many towns
Police	note books, hand cuffs, radio, flashlight, pepper spray	15kg	*High* – this already exists in many towns
Fire	fire extinguishing equipment, oxygen tanks, safety wear	200kg	*Low* – however, there are examples of forces transporting goods between stations by bike (Manchester)
Home care (meals on wheels, social services visits)	Food, bags for waste food	5kg	*High*
Graffiti removal	Gloves, cleaning fluids, cleaning cloths, brushes, paint	15kg	*High*

b) Legal framework

The legal frame conditions surrounding cargo cycle use vary across Europe. Current EU Law states that a vehicle which has pedals, and a motor with less than 250 watts of power which is progressively reduced as speed approaches 25 kph, and cut out at 25 kph is not a motor vehicle. If the motor exceeds 250 watts, or does not reduce & cut out at 25kph, or has no pedals, then it is a motor vehicle and not a bike. The vehicle must also weight no more than 40kg, or 60kg if it is a tandem.

Below is a summary of the legal frame conditions that exist in some of the Cycle*Logistics* partner countries.

Austria

Legal framework for the use of cargo bicycles (As of July 2011)
Relevant legal text
1.) Road traffic regulation 1960 (StVO)
2.) Bicycle regulation
3.) Law on motor vehicles 1967 (Kfg)

Important notes from the road traffic regulation
According to the definitions of the StVO (§ 2 Number 1), cargo bicycles are defined as „Bicycles". § 68 is also important to cargo bicycle users because it regulates the behaviour of cyclists. According to it, cycle lanes and paths are allowed to be used with cargo bicycles as long as they are not wider than 80 cm. The road has to be used if this width is exceeded. Also note that if your cargo bicycle is single-tracked (e.g. Bullitt) or multi-tracked (e.g. Nihola) there are different requirements for equipment (see below).

Important notes from the bicycle regulation
In §1(1) of the bicycle regulation you will find what equipment your bicycle has to be fitted with. The definitions apply to your normal bicycle as well as your cargo bicycle. In §2 are the definitions concerning multi-tracked bicycles. These include that two rear lights and reflectors have to be installed in the same height on each side, so the

outline and boundary of the cargo bicycle can be recognised. Further, the brakes must work on all tyres and within a single axis simultaneously and evenly.

Continuing, §7 is also important because it regulates the payload. It states that the payload of multi-tracked bicycles must not exceed 250kg, the payload of trailers equipped with brakes must not exceed 100kg and that of non-braking trailers must not exceed 60kg.

A further interesting clause is the equality clause (§8) which says that bicycles (so also cargo bicycles) that have been manufactured according to the legal definitions in other EEA countries are allowed to be brought into our traffic.

Important notes from the law on motor vehicles
Should your cargo bicycle have an electrical drive then the following is relevant for you: According to §1 (2a) electrical powered bicycles do not count as motor vehicles but as bicycles if they: do not have more than 600 Watt power and go no faster than 25km/h.

Denmark

- A cycle can have a maximum of four wheels. Trailers can have a maximum of two wheels.
- Bicycles must not be wider than 1 metre.
- The handlebars must not exceed 70 cm in width.
- Cycles with more than two wheels, however, are allowed a maximum width of 1.25 metres.
- Bicycles, including a trailer, must not exceed 3.5 metres in length.
- It is permitted to attach a trailer or a sidecar on bicycles.

Number of Persons

- A bicycle can be used by a maximum of three persons, as well as two children under eight. [We are assuming this includes cargo bikes, otherwise this would make for some crowded bicycles]
- There can be a maximum of two children in a trailer.

- If there are passengers on the bicycle, the driver must be over 15 years old.

Equipment

- A bicycle must have two independent brakes, one on the front wheel and one on the back. Cargo bikes must also have a parking brake.
- A bicycle must be equipped with a bell. Horns, etc, may not be used unless there is also a bell.
- A bicycle must be equipped with a white reflector on the front and a red reflector on the back, two yellow reflectors on the pedals which are visible from behind and at least one reflector visible from the side. Alternatively it is permitted to have wheels with built-in reflectors - meaning a white strip along the tire. It is allowed to mount more than one reflector.

Great Britain

There is no legal limit on the size or weight of a pedal cycle in Britain where it is not electrically assisted. (see http://www.ctc.org.uk/DesktopDefault.aspx?TabID=4073). Within that document, the only place where transportation of cargo is mentioned is with regard to tricycles. Goods tricycles (very sensibly) need brakes on all their wheels and can't take advantage of the exemption which gives normal tricycles the option of putting both braking systems on the front wheel only.

Electrically assisted pedal cycles are not allowed to weigh more than 40kg if a bicycle or 60kg if a tricycle (unladen weight). This law was intended to stop heavy electric mopeds pretending to be pedal cycles, at a time when nobody was thinking about cargo cycles (See http://www.ctc.org.uk/DesktopDefault.aspx?TabID=4512). Lights are not a legal requirement unless it's dark (see http://www.ctc.org.uk/DesktopDefault.aspx?TabID=4071).

In Britain bicycles are banned from motorways. In most other circumstances, a cyclist can use any road, regardless of whether there is a cycle path alongside. Cycle paths are not always wide enough to accommodate a cargo cycle or trailer. Some town

centres ban cycling in 'pedestrianised' areas, where motorised vehicles are also banned apart from certain delivery times.

Bulgaria

There are no special rules for cargo bikes in Bulgaria. Here are the articles found in Bulgarian legislation that could potentially apply to cargo bikes:

- A bicycle has at least two wheels and is propelled by muscle power (Traffic Law)
- The definition in the Traffic Law of trailers is "one that is pulled by/attached to a motor vehicle". No mention about bike trailers.
- Bicycles with additionally installed motors are not subject to registration as motor vehicles (Ordinance on registration of motor vehicles)

Italy

Towing and use of a trailer:

- Do not walk animals on a leash as you ride or have yourself towed by another vehicle;
- You may use a trailer (max. overall length of bike and trailer 3 m; max. trailer width 75 cm; max. 1 m in height including load).

Transport of children or other persons, objects or animals:

- You may carry only one child in an approved child's seat
- You may place the child seat between yourself and the handlebar only if the child's weight does not exceed 15 kilos; behind you if the child is younger than 8 years irrespective of weight
- The carrying of other persons (max. 4, cyclist included) is permitted only on specially designed and approved wheeled vehicles; only in this case may two children be carried at the same time provided they are not over 10 years of age
- You may carry animals if kept in a cage or container

- You may carry objects only if securely bound, if they do not jut out from the bicycle laterally or lengthwise beyond a max. of 50 cm and if they do not interfere with or limit visibility.

c) Ability of cargo bikes to meet demand

It is now possible to transport loads up to 60 kg with a two-wheeled load-carrying bike (the 8-Freight or Bakfiets, for instance). The two-wheel design makes it exceptionally fast for a load carrying bicycle as it gets through traffic in a similar way to an ordinary bike. The Loadstar tricycle has a rear load carrier which will take loads of up to 200 kg, and the Cycle Maximus can carry up to 250kg. Other types of cargo bikes exist and more are being designed for specific purposes. This improvement in speed and load carrying may help organisations switch to use of cycles. Delivery companies are also adding cargo-carrying bikes with small electric motors to assist with heavier loads and hills; these have reached capacities of 400kg.

The daily distance cycles can travel is related to the terrain and weight they carry, as well as to the rider. Electrically-assisted cargo cycles seem to offer 20-40km per charge of their battery, with 20km the maximum for heavily-laden tricycles. The distance any company or local government needs to travel in a day to make deliveries or provide services can be difficult to estimate. Mühlbacker, working with Karl Reiter at FGM-Amor, suggested a figure of 8km per return trip without electrical assistance and 20km with electrical assistance as reasonable for most businesses, noting a load of not more than 200kg in weight and 1.5-2 cubic meters in volume. La Petit Reine offered deliveries up to 30km, which may be more typical of a maximum for a delivery company depending on the structure of the business.

The prices for cargo bicycles and tricycles typically range from around €1500-€2500. Bicycles with trailers are considerably less. All business we spoke with also mentioned the cost of adapting the machine to display their brand and colours, to be more secure, or to have specially-built boxes for cargo.

4) How might it work?

There are several different ways for a municipality to adopt cycle power to provide services, and the good practice examples below offer insight into some of those different models.

The most common route in is for municipalities to simply outsource its services to a local expert cycle logistics company. This is relatively safe for local governments. Cycle logistics is still considered something best left to the professionals, and this *modus operandi* means municipal decision makers don't have to train internal staff (or employ new staff), buy and maintain specialist equipment, or worry about staff resistance to change. Specialist contractors would usually be subject to a procurement process with cycle logistics companies competing with their motorised competitors. However, encouraging (or even mandating) that a certain proportion of municipal services should be delivered by cycle power (or in an energy-efficient fashion, or in ways that reduce CO2 emissions) would assist in the move of cycle logistics from niche to mainstream.

A second, and perhaps more desirable method, is for town and city authorities to purchase their own equipment and use their existing network of staff. This requires much more of a commitment from a town or city: a financial commitment to buy equipment, train staff, and to buy new tools that are compatible with the new mode of transport as well as a degree of dedication from staff to make the switch to cycle power. This can be a more difficult 'sell' for decision makers. In terms of sustainability and longer term change this is a good model for a town to adopt.

Towns may consider the introduction of cycle logistics a potential solution to local unemployment or routes into employment for young people. Social enterprise businesses are an increasingly common way of providing services for the good of society as a whole, and this intention of social responsibility and environmental

wellbeing fits well with cycle powered service provision, employment for young people and the long-term unemployed.

5) Good practice examples

There are already many examples across Europe where local governments and town councils are providing municipal services using cycles. This could be either using their own fleets of bikes (e.g. cycling paramedics or Parks Department employees) or by outsourcing the work to local organisations who then use bikes (e.g. Hereford Pedicargo doing recycling work). Below are some examples from across Europe.

United Kindgom

Hereford Pedicargo addressed a lack of recycling facilities for trade waste in Hereford. The local council used to charge £1.30 per bag (approx 40 litres) for collection of trade waste, which went straight to landfill even though 80% of the waste was recyclable paper, cardboard or plastic. Hereford Pedicargo now perform this function using their fleet of cargo bikes, preventing over 10,000kg of recyclable waste going to landfill every week.

Green-link operate across three areas in the UK; Darlington, York and Luton. They provide an emission free delivery service using cargo bikes and where necessary, an electrically assisted bike. In Luton they provide an internal mail delivery service for Luton Borough Council, saving them money and also providing visible support for the local government's sustainable transport function. They also offer a consultancy service for local governments wishing to run their own in-house emission free delivery service.

Cycle4U are a Birmingham based traditional cycle courier service using both bikes and bicycle trailers for delivery work in central Birmingham. They have undertaken a variety of different contracts on behalf of Birmingham City Council

including the installation of signs (such as legal notices for traffic restrictions on lamp posts and subsequent weekly checks on these). They also transport walking and cycling maps to various outlets, and have distributed documents to Birmingham residents.

Spain

La Luna Shipping has had the public contract for messenger and parcel service distribution for Gijon City Council for over 10 years. Biennially they re-tender for the work, competing with other transport companies in order to get the contract.

La Luna arranges a variety of services for the city council on a local, regional and national level:

Locally

- Documents transported between official buildings (30 deliveries/day)
- Urgent correspondence delivery, where proof of delivery is mandatory (25 deliveries/day)
- Invitations delivered for official events (6-7 times per year about, 200 deliveries each time)
- Christmas present deliveries, about 200 local deliveries

Regionally

La Luna have an inter-modal delivery arrangement between the cities of Gijon and Oviedo. Twice daily catching the train to go to Oviedo (approx. 28km) to deliver packages collected in Gijon, and collecting packages to return from Oviedo. This is important work as Oviedo is the capital of the region and hosts the Government offices. The daily volume between the two towns is about 20 packages.

Nationally

La Luna has a reciprocal arrangement with bicycle couriers in large cities such as Madrid and Barcelona. Once they have three shipments to the same town these are delivered by bike to a provider such as TNT who deliver to a partner cycle

delivery organisation in the receiving town to carry out the delivery to the final destination. This model ensures both the first and last mile delivery are 'green' miles.

Croatia

In the cities of Zagreb and Koprivnica Green Action provide a litter picking service by bike.

Austria

Similar to Cycle4U in Birmingham, Heavy Pedals in Vienna distribute documents on behalf of two agencies in Vienna. Deliveries include such things as cycle maps and A4 boxes of documents. Bullitts and an MSC truck with an aluminium box are used for the work.

Denmark

In Copenhagen bikes are used for street cleaning, leaf removal in autumn, picking up garbage off the streets, and park maintenance. There are 20 available in the City of Copenhagen (an additional 10 in Frederiksberg, a small municipality within Copenhagen). The municipality primarily uses Nihola cargo bikes. They can use the bikes for 10-15 years. The City of Copenhagen's Street Cleaning department is responsible for the maintenance of the bikes.

The bicycles are parked in the city centre at depots in the different neighbourhood districts. Then the workers that are assigned to one district all meet at that district's depot and use those bikes for work, meaning the bikes are parked in the same area they will be working in.

Germany

Bellis GmbH is responsible for parking meters, pay-and-display machines, traffic lights and traffic signs throughout the city of Braunschweig. They have bought two Christiania bikes with an adapted box and these are used for the installation of bicycle traffic signs.

6) Pros and cons of cycle usage

Pros:

- The capital cost of cycles is a lot lower than the motorised alternative.
- The running costs associated with bikes are considerably lower than a car or van. Fixed costs such as insurance and depreciation are typically a quarter of the cost and costs such as vehicle excise duty are usually non-existent.
- Cargo bikes aren't subject to parking costs or congestion charges (assuming they stay within the legal definition laid out by the EU). Cycles can be parked almost anywhere, and this offers considerable advantage in terms efficiency.
- Bikes are much more reliable in congested towns and cities. They are less susceptible to traffic and therefore can provide a more dependable service when compared to the motorised alternative
- There is no legal driver training requirement for people to use bikes (although some training would probably be recommended).
- The low environmental impact of bikes creates both a favourable green image for organisations that are using them, and in the case of councils providing services by bike, sets an example to private companies.
- Using bikes may improve the health of those staff involved.
- Will help towns and cities meet EU air quality directive levels

Cons:

- The cost of providing staff for a service is often greater than any capital cost, and in some cases more staff are needed to carry out services by bike than by van; in some cases additional staffing is simply a fear.

- Fears over security of equipment need to be addressed if we are to move cargo cycling from niche to mainstream. Municipalities use expensive equipment and will want guarantees of security.
- There is a perception that bikes have a limited payload and range, and whilst this is true to an extent, many people underestimate this and overestimate how much they move around.
- Limited storage space: cargo bikes generally need to be stored indoors and this is not always possible where space is at a premium.
- Vehicles powered by humans are subject to driver fatigue; this could lead to a less efficient service being provided or staff resistance to actually using bikes.
- Bikes are more susceptible to the weather, which may limit the seasons when bikes can be used or lead to staff resistance.

7) Barriers and how to overcome them

Barriers come in different varieties. We list above the problems faced by anyone exploring switching from motorised transport to bicycle in order to transport goods. Many of these are overcome by additional information and good practice examples. In addition, the size and scope of local (or national) governments is much larger than most businesses: How many companies provide street lighting, meals at home for the elderly and rubbish collection while looking after parks and managing swimming pools? This leads to a particular barrier for governments:

Fragmented management: Getting knowledge to the correct person

According to the Cycling, Walking and Accessibility and Freight Unit of Transport for London (2009), local governments often operate as many small organisations rather than one large one. This can make finding the decision-maker difficult for anyone suggesting a change, and it can be difficult for that person to try something new:

Public sector organisations often carry out work in-house, but gaining access to the right member of staff can prove difficult. The management of internal logistics may be fragmented, and operations tend to be small with little room to introduce niche staff and vehicles, such as cargo bikes. This fragmented management provides both an opportunity and a barrier – it means that

opportunities for rationalisation and savings are easy to spot, but at the same time they are hard to access when it is not clear who should make the decision to try something different (Cycling Walking and Accessibility and Freight Unit, TfL May 2009).

Luckily, governments are often expected to 'lead by example', to introduce innovations, and while they are expected to keep costs down, this is balanced with concern for citizens and the environment. Thus municipal services may be the place people expect to see changes and experimentation, and attention to global problems such as CO2 emissions as well as local traffic conditions, noise and pollution.

Government officials often learn best from the experiences of others in similar positions. The Cycle*Logistics* website includes contacts for some of the case studies noted in this report.

Other barriers

There is a **perception** that **delivery by bike is slow** and that **bikes have a very limited capacity**, whereas in reality bikes, in an urban setting, are just as quick as the motorised equivalent and do have the capacity to carry up to 250kg. In overcoming this barrier knowledge is the key, and having a broad range of best practice examples of cargo bike usage across Europe, and knowledge of the range of different bikes available and their suitability, will be invaluable at allowing local government officials to introduce the idea of Cycle Logistics.

Security of both the bikes and the cargo and equipment they are carrying is an issue that potential new users will raise. However, evidence from existing providers of services by bike suggests theft of either bikes or cargo is rare. To allay security concerns, there are lockable cargo boxes available.

Having **access to cargo bikes** at all is a problem in some countries or regions (e.g. there may be no distribution network for bikes). Knowledge of distributors for equipment may help overcome this, as would being armed with industry contacts. Cycle*Logistics* Deliverable 2.2, the catalogue of available cargo bike products, offers considerable information.

If bikes are unusual in a region, then cargo bikes will be completely unheard of. If there are few bikes then this can be as a result of **unfavourable traffic conditions.** In this situation is it fair to put a potential employee in 'danger'? It would be imperative to set about creating a more favourable framework to make cycling a more attractive proposition. Once more journeys are made by bike, more freight moved by bike will follow.

The weather we cannot change. However, given how cost- and time- efficient cargo bikes can be when there is a direct replacement for a van, for instance, we expect that even a partial-replacement would be considered of value to a local government, both economically and in meeting their carbon reduction goals.

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