

# Isle of Wight Electric Cargo Bike Review



## Phase 3 – Business Case

Business case for an electric cargo bike delivery service  
on the Isle of Wight



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Prepared by People Powered CIC for Isle of Wight Council

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## **Glossary of terms**

Cargo Bike – A bicycle constructed or modified to carry cargo. In the context of this document the term is generally used to encompass tricycles and quadracycles as well.

Electric cargo bike – An electric-motor assisted cargo bike, which meets the UK requirements of an electrically assisted pedal cycle (EAPC).

Last Mile - Delivery of goods for the last stage of their delivery journey to the customer, be that an individual or a business. The “last mile” usually starts at some sort of depot or distribution node and ends at an individual address.

# 1. Executive Summary

- 1.1. This report sets out a business case for an electric cargo bike delivery service in Newport, Isle of Wight. The service is founded on a use-case for electric cargo bikes selected at a stakeholder workshop, based around offering delivery services on behalf of various businesses to their customers as an alternative to businesses providing the service directly themselves.
- 1.2. There is some evidence to suggest the size of the potential market is large enough to support a two-bike operation, which would require start-up funding but could become profitable within three to four years.
- 1.3. It is envisaged that the service would operate across the built-up area of Newport (including Gunville, Carisbrooke, Pan and Parkhurst), delivering for both the business-to-business and business-to-consumer markets.
- 1.4. However, it was also found that businesses may be reluctant to transfer some or all of their in-house delivery business; this could present a challenge to winning sufficient market-share. Without an actual service being offered, some businesses are reluctant to disclose whether they would be likely to consider an electric cargo bike service.
- 1.5. There is scope for a new service to open up delivery opportunities to businesses that do not currently deliver, particularly small businesses who are unable to achieve the scale of sales to directly provide a delivery service themselves.
- 1.6. A wide range of businesses in Newport already provide a delivery service, from food wholesalers to florists to autoparts suppliers.
- 1.7. Further opportunities exist for innovative services such as a town centre shop and drop service and online sales via a multi-retailer aggregation site with electric cargo bike delivery options.
- 1.8. Cargo bike operators elsewhere typically charge for their services at a rate in the range of £18-25 per hour, and it would appear likely that an operation in Newport should be able to operate around the mid-point of this range.
- 1.9. Hours of operation are anticipated to be Monday to Friday 08.30-17.00, though exact hours would need to be fine-tuned to meet market needs.
- 1.10. A flexible staffing structure, using part-time delivery riders, would maximise flexibility, but enable staff to be offered permanent contracts, rather than relying on zero-hour contracts
- 1.11. Some incremental growth could be achieved within the structure outlined, and larger growth could be achieved (subject to demand) by purchasing additional electric cargo bikes and hiring additional staff or extending working hours for existing staff.
- 1.12. The business would suit an entrepreneurial owner-operator, or an existing company with interest and expertise relevant to the electric cargo bike delivery market.
- 1.13. Routing software coupled with on-bike hardware will help ensure maximum efficiency and minimise dead-mileage.
- 1.14. Operating costs have been calculated to be around £78,000 per annum on average over the three years illustrated by this business case.
- 1.15. While Newport may not be as obvious a market as major cities, with financial support from the local authority to start a new service it would appear there is an opportunity for the right operator to develop a viable long-term service.

## 2. Introduction

- 2.1. The business case being put forward here is for the establishment of a commercial electric cargo bike operation, with seed funding support from Isle of Wight Council. It is based on a particular operating model, or “use-case” that was selected from a range of 10 possible models presented at a workshop attended by key stakeholders as part of an electric cargo bike feasibility study. This use case was selected to be worked up into a business case because it was seen as a flexible operating model, capable of being scaled with ease and that was not dependent on custom from a single large contractor.
- 2.2. A number of other business models may also have potential in an Isle of Wight context and these have been outlined in the feasibility study. There is substantial cross over between different business models and numerous elements of the model that is being explored in more depth here could apply to other use-cases.

## 3. Business Description

- 3.1. This business case sets out the opportunity to create a new business delivering goods on behalf of multiple businesses using electric cargo bikes. For example, it may deliver bread from a local baker to restaurants, car parts from auto factors to garages and flowers to individual homes from a local florist. It is intentionally confined in its scope in order to be able to identify specific business opportunities and give a sense of the viability of a business built on this core model.
- 3.2. A business taking forward this basic model may also seek opportunities to develop additional markets to improve profitability and may incorporate services outlined in some of the other use cases outline in the feasibility report.
- 3.3. The business would be a small delivery service operating in the Newport area, delivering on behalf of local businesses to their customers, whether they are end consumers or other businesses. Initial operations would consist of one electric cargo bike and one electric cargo trike.
- 3.4. A small business unit would be used for secure storage of electric cargo bikes and as an office base.
- 3.5. Staffing would consist of a full-time owner/operator (or possibly a manager employed by a larger company) and three part-time riders. The owner/operator of the business would be responsible for developing and growing the business, much of the day-to-day administration and some delivery riding. The riders would principally undertake delivery duties, but would also deliver some administrative functions, in particular providing cover for the owner/operator.
- 3.6. Experience from other operators suggests that new business is won principally from direct contact with businesses and through word of mouth recommendations. The role of the owner/operator in this regard cannot be overstated.

## 4. Geographical Scope

- 4.1. As the commercial and administrative hub of the Isle of Wight, Newport was assessed to be the logical place to focus efforts for the start-up of an electric cargo bike delivery

service. The volume of deliveries to, and within, Newport exceeds those for other towns on the Island and the potential for future growth of the delivery market is also higher given the larger numbers of businesses located there.

- 4.2. In order to minimise trip distances but maximise delivery opportunities the business is anticipated to cover the whole of the built-up area of Newport (including Gunville, Carisbrooke, Pan, Parkhurst) shown in the map below.

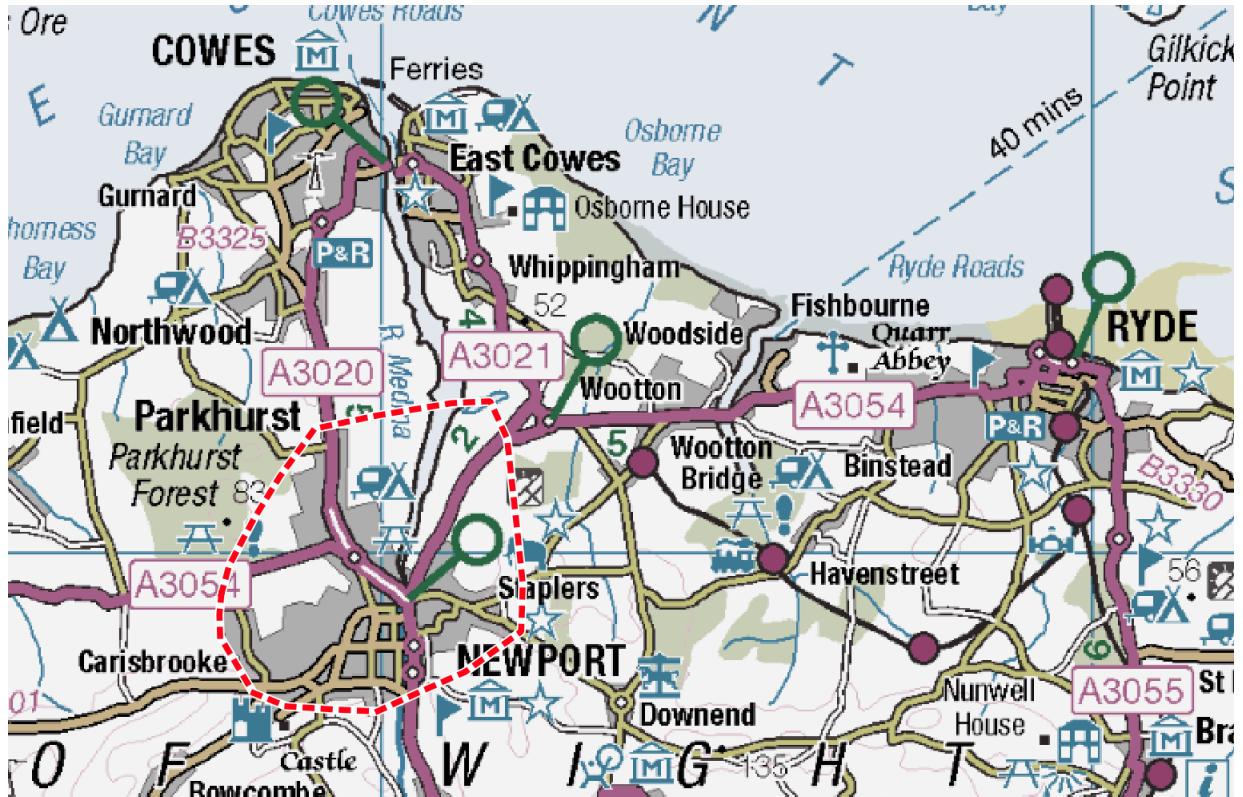


Figure 1 - 1. Map showing potential delivery area - Contains OS data © Crown copyright and database right (2019)

- 4.3. In general, deliveries between towns on the Island are considered beyond the scope of an electric cargo bike service and the potential for such has not been considered in this model, given the substantial distances and the lack of quality cycling infrastructure on some routes. An exception to that could be Cowes, which could represent an area of growth for the business utilising the cycle track that links the town with Newport along the Medina valley. Serving Cowes from Newport would involve a 20 minute trip each way via the cycle track, though the terrain within Cowes is more challenging (requiring more effort and reducing battery life). Evidence was found that suggests delivery volumes for some goods are higher in Cowes than in Newport and there is significant delivery activity between the two towns.

## 5. PESTLE Analysis

- 5.1. A PESTLE analysis is a framework used to analyse the macro-environmental factors that may have a significant impact on an organisation's performance. It gives an overview of the key factors in the political, economic, social, technological, legal and environmental domains.
- 5.2. The results of a PESTLE analysis identifying some of the key factors likely to have an impact on the potential business are shown in table 1.

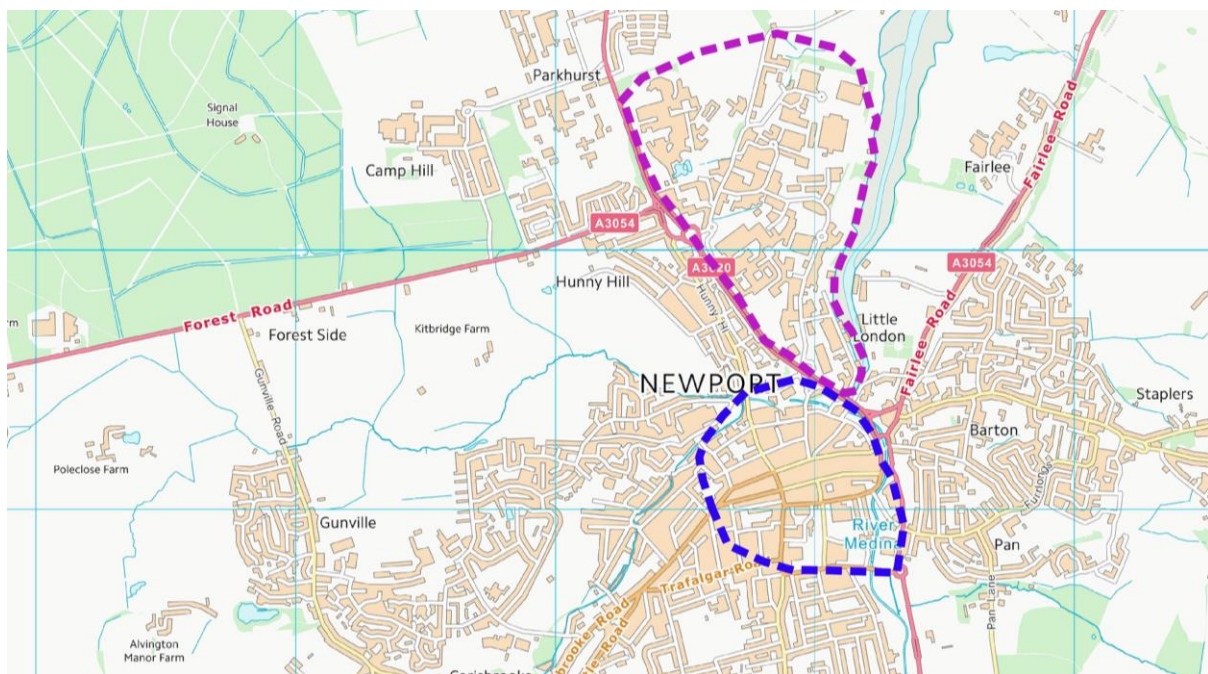



Table 1 - PESTLE analysis

Political	<p>National government funding support for cargo bikes was announced in 2018 and Isle of Wight Council chose to fund an electric cargo bike project as part of Access Fund project. Suggests growing government support at national and local level.</p> <p>Zero-emissions drive. Various policies focused on reducing emissions and encouraging zero-emission (at tailpipe) vehicles.</p> <p>Fuel-duty freeze has held down cost of fossil-fuelled transport. No sign of imminent change to this.</p> <p>Some signs of growing local support for cycle infrastructure improvements and motor vehicle restrictions, however also significant local investment being made into motor vehicle capacity on roads.</p>
Economic	<p>Brexit impacts are largely unknown. Various predictions of economic slowdown, but equally it could lead to a greater reliance on local markets.</p> <p>Shifts in consumer spending patterns and lifestyle changes that stimulate convenience offerings. Increasingly consumers are buying online and having products delivered. Interest in local food and independent local retailers appears to be increasing as retail pressure increasingly focuses on bigger chains. Suggests pockets of opportunity for small-scale delivery of niche local products.</p>
Social	<p>The Isle of Wight has an aging population, suggesting that services that meet the needs of older people will become increasingly important. Newport has seen significant growth in retirement developments in recent years.</p> <p>The UK may have reached/passed “peak car” with average annual distance driven now declining along with numbers of young people starting to drive. This may fuel demand for delivery services and increase interest in non-car alternatives.</p>
Technological	<p>Access to technological innovation is available to smaller businesses when it would once have been the preserve of larger operations. This includes things like cloud-based routing and delivery management tools, and Voice Over IP (VOIP) internet-based telephone systems.</p> <p>Smartphones and mobile internet coverage/speed have seen significant developments, to the point where relatively inexpensive phones can now offer a realistic “on the road” IT solution. As technology develops it will be important to update and improve to meet consumer demand.</p> <p>Electric bike technology has developed rapidly, with reliability and performance improvements. New cargo bike options are coming to market regularly and improvements can be expected to continue being made, and costs brought down, as the market continues to expand. Range, comfort and carrying-capacity have all seen improvements in recent years and this trend is likely to continue.</p>
Legal	<p>Keeping abreast of health and safety requirements will be vital. In particular ensuring riders are kept safe and well.</p> <p>Transport of some items will require specific attention, such as food which requires temperature control</p> <p>As the use of cargo bikes grows nationally, there is potential for changes to the legislative framework that may impact upon operations and either help or hinder their competitiveness compared with other modes.</p>
Environmental	<p>Cycle infrastructure can play a key role in improving comparative efficiency of electric cargo bikes. Continued investment in cycle infrastructure will create environmental benefit and use of electric cargo bikes could form a lever to further investment.</p> <p>The balance of cycle vs motor traffic in planning and management of the road network will play an important role in determining success of electric cargo bike operations. If decision makers prioritise active travel modes the electric cargo bike operation is more likely to thrive as it will increasingly gain a competitive edge.</p>

## 6. Market Analysis

- 6.1. Newport is a modest-sized market town, with a population of 25,496 (2011 census), however it is also the County Town of the Isle of Wight and the main commercial centre of the Island (population 138,265, 2011 census). 34% of people who work on the Isle of Wight work in Newport (2011 census). Delivery activity is likely to be at a higher level, particularly in the business-to-business market, than many towns of a similar size.
- 6.2. Newport has a large number of independent and chain retailers in the town centre, and a number of large food retailers within the urban area (Asda, Lidl, Sainsbury's, M&S, Co-Op, Morrisons, Iceland) most of whom offer a delivery service.
- 6.3. There is a large business park/industrial estate area to the north-west of the town centre, comprising industrial and office complexes.



 Town centre retail and employment area


 Commercial area. Industrial estates, business parks, hospital and college.

Figure 2- Map showing main employment areas - Contains OS data © Crown copyright and database right (2019)

- 6.4. Delivery of goods is a significant and growing market, fuelled by the growth of internet shopping and increased demand for convenience. A large part of this growth is in the parcel delivery market, but many companies also offer their own delivery service, to business customers or end consumers. These in-house delivery services can often be relatively inefficient, with lots of companies operating their own vans which are not fully utilised. There are opportunities for the right service to be able to consolidate some of these deliveries, maximising efficiency and potentially offering an improved service to the end user. While this could be achieved with a van-based service, using electric cargo bikes adds an extra attraction, with increased environmental credentials and potentially more cost-effective and efficient operations in urban areas.

- 6.5. In addition to meeting existing delivery needs a new service would also open up opportunities for businesses that don't currently offer a delivery service to start doing so, without needing the scale of operation required to warrant their own in-house service. Again, providing this service using electric cargo bikes is likely to add an extra selling point for customers.
- 6.6. While it is difficult to quantify the total number of deliveries made in the target area, based on identified existing delivery patterns among businesses spoken to it is estimated that in the region of 200-400 deliveries per day are being made in the target area which could transfer to electric cargo bikes (not including courier deliveries). These deliveries vary from single items (for example a bouquet of flowers) to larger deliveries (for example wholesale food deliveries to restaurants). Delivery of car parts from local auto-parts factors alone is estimated to be in excess of 150 deliveries per day.
- 6.7. Various businesses in Newport already offer a delivery service including:
- Wholesale food
  - Veg box suppliers
  - Printing
  - Autoparts
  - Pharmaceuticals
  - Prepared food (catering, sandwich rounds, fast food)
  - Public sector (local authority and NHS deliveries)
  - Florists
  - Hardware shops
  - Supermarkets
  - Take away food
  - Wholesale hairdressing supplies
- 6.8. In addition, there are many businesses that could deliver and may be interested in being able to offer a delivery service, particularly independent High Street retailers such as:
- Butchers
  - Greengrocers
  - Bakeries
  - Computer retailers
- 6.9. As well as businesses that currently deliver and those who might like to, there are opportunities to partner with businesses to create new services such as:
- Shop and drop - the ability for people to shop in the town centre and either leave their purchases in one location for onward delivery or purchasing from various participating shops for later collection and delivery.
  - Online purchasing via retailer aggregation site - multiple retailers join together to create an online shop where visitors can buy from several retailers in one place, and have their goods delivered by electric cargo bike.
  - Onward delivery for non-Newport-based businesses who could deliver a single drop to the electric cargo bike depot for onward distribution by electric cargo bike within Newport.

- 6.10. These arrangements would require careful planning and promotion but could be a route to additional delivery business.
- 6.11. While the market analysis relates to the specific model of delivery for multiple local businesses, it should be noted that there are other strong delivery markets which an electric cargo bike operator may be able to make inroads into. In particular, the last-mile delivery of parcels for national courier companies represents a sizeable market, with an estimated 1,000 deliveries per day occurring in the Newport area. At present, a very substantial portion of the Island's national courier deliveries are undertaken by a single local subcontractor.
- 6.12. The cost of leaving the Island to shop in establishments that don't have outlets on the Isle of Wight is significant due to the high cost of ferry fares. Anecdotal evidence suggests this leads to a disproportionately high amount of internet shopping on the part of Isle of Wight residents, creating a larger than typical parcel delivery market locally.
- 6.13. Consulting local businesses that currently deliver using in-house vehicles, it has been difficult to obtain concrete evidence that there is a market for the outsourcing of deliveries. Presenting local businesses with a hypothetical concept and expecting them to indicate a clear preference over their current delivery model is unrealistic and only elicits vague responses. To some degree until there is a real, fully costed offer presented to them it will not be possible to fully establish the likely size of the market.
- 6.14. Even if on a "per delivery" basis an outsourced service can compete favourably with in-house operations, evidence suggest that companies that currently have in-house delivery operations benefit from their drivers also performing other functions within the company in between making delivery drops. Any strategy aimed at winning delivery business from in-house operations will need to offer sufficient value to the customer so as to allow resources to be re-deployed to tasks previously undertaken by in-house drivers.
- 6.15. Additionally, feedback from local businesses currently making their own deliveries suggests that substantial value is put on the brand awareness that is generated by having their own, liveried vehicles making deliveries around Newport and the wider Isle of Wight. Any company aiming to encourage the outsourcing of delivery services would need to put in place a communication strategy that brought similar benefits to their customers.
- 6.16. Despite these reservations, some businesses did indicate their willingness to consider electric cargo bike deliveries as an option as and when a fully worked up offer was presented to them.

## 7. Potential delivery charges

- 7.1. Limited information was available on the price businesses might be prepared to pay for delivery. Most were not willing to discuss price for a theoretical service and there are indications that businesses that deliver do not always have an accurate picture of the true costs of their current delivery operation, which are often infrequently incurred (such as vehicle purchase) or hidden (such as a member of staff "popping out" to do a delivery). Existing delivery charges and information from those businesses that would discuss costs suggests delivery charges in the £3 to £10 range are likely. High volumes

of single-item deliveries will often demand lower costs, as evidenced in the parcel market, where last mile delivery charges tend to be around £1.50-£5 per item.

7.2. Many existing cargo bike operators spoken to calculate their charges based on an hourly rate, typically in the range of £18-25 per hour. Charges to the customer vary, sometimes being a per-item charge, sometimes a pre-agreed contract amount. If idle time is not excessive and sufficient contracts are won by an operator then Newport's layout should lend itself to reasonably efficient delivery services, suggesting the middle of that hourly rate range should be achievable.

## 8. Operational Model

8.1. Various options were considered for scale of operation. At one extreme it would be possible to run a small-scale part-time delivery business, with one electric cargo bike, as a home-based business. This model has limited applicability. It would only work for someone who already lives in the right area, has space to store an electric cargo bike, and is prepared to commit to a lifestyle business. The model would offer little redundancy, with a heavy reliance on the owner-operator. At the other extreme a larger scale operation could be developed, with several electric cargo bikes and several full-time riders, along with the necessary back-office function to support this sort of operation. The greatest challenge with this model would be securing enough delivery contracts to support the scale of operation, especially in its early stages. In reality a middle-ground between these extremes is likely to be the most viable option, with a relatively lean operation but more substantial than a home-based style of business. This business case has been developed around the following assumptions:

- Use of 2 delivery vehicles, a large electric cargo trike and an electric cargo bike. Existing cargo bike operators have spoken to suggest this combination is a good start-up model.
- Use of both vehicles during hours where delivery demand is highest, then reducing to using one at times when demand is lower.
- Hours of operation would be Monday to Friday 08.30-17.00. Bank Holiday working has been assumed in costs, though in practice clients may not require this. Removing bank holidays is likely to be close to cost neutral, as income will be foregone but expenditure will be reduced accordingly.
- One bike would operate all day, while the other would cover peak demand times, initially estimated to be 0830-1400, though in practice this would depend on the need of clients.
- Flexible staffing, starting with 3 riders working 24 hour weeks. This would enable cover of other staff using overtime.
- A small depot to operate from, largely used for storing electric cargo bikes and as an office base.
- An active business owner covering the majority of back-office functions and providing some rider cover (for sickness, holidays etc.)

- A focus on pre-booked deliveries, rather than on-demand services to allow efficient planning and vehicle/rider utilisation.
- 8.2. The business would initially have some incremental expansion capacity (one bike not fully utilised, no Saturday or evening operations) requiring only additional hours from existing staff or taking on new part-time staff. Additional core-delivery time slots or more extensive expansion would require acquisition of one or more further bikes. As such if expansion was possible the business could become profitable significantly faster than suggested in the financial projections.
  - 8.3. The model assumes an owner-operator, who would anticipate taking a limited salary during at least the first three years of operation with a view to building value into the business. An alternative proposition would be an existing company operating the service, paying a manager (probably on a higher salary than used in this business case) and accepting larger losses during early years.
  - 8.4. Routing software would be used to plan the most effective delivery routes. Specialist software allows for many destinations to be entered and will create the most efficient route between them, optimised for cycle trips. Routes will be sent to smartphones to allow for updates and new delivery schedules to be pushed out to riders without them having to return to base. This will maximise delivery efficiency and reduce dead mileage.

## 9. Key Risks and Mitigation

- 9.1. Table 2 highlights some of the key potential risks and how they might be mitigated.

Table 2 - Analysis of key risks and possible mitigation

Key Risk	Mitigation
Inability to convince businesses that the service offers value compared with hidden costs of in-house service	Work collaboratively with businesses to understand real costs of existing services. Focus on “easy win” businesses first and build reputation before trying to penetrate more difficult markets.
Inability to integrate with clients’ systems in an effective manner, for example delivery point location may not be available in advance of collection, reducing ability to pre-plan route.	Dialogue with potential customers before committing to IT systems to ensure maximum usability. Ensure software can handle dynamic changes to delivery planning and routing.
Staff retention issues	Avoid “zero hours” contracts and ensure good working environment. Consider profit-related bonus system.
Breakdown of bike	Use airless tyres if possible, or puncture resistant tyres if not. Opt for bikes that utilise standard bike parts wherever possible. Train staff in basic repairs. Arrange rapid-response service with local bike shop or mobile mechanic. Provide “last resort” cover with owner’s car or hired car/van. As resources allow purchase a spare electric cargo bike.
Staff sickness	Use of part-time staff to provide some cover flexibility. Owner trained to ride and provide cover as required.
Inability to find suitably located premises in timely fashion	Operation could be started from a temporary location e.g. shared premises. Potential to work with local authority to share existing under-utilised space. Phone facilities to be provided via Internet (VOIP) allowing flexibility to relocate easily.
Pricing structure wrong	Ensure contracts don’t lock-in prices for too long, regular management accounts reviews to keep pricing in line with costs.
Loss of large client	Maximise spread of clients. Develop marketing plan ready to source new clients in event of loss of business.
Government funding support not available in time for purchase	Ensure additional start-up capital is available if necessary and can be repaid over a long-enough duration to reach profitability.
Accident	Ensure high-quality rider training programme including defensive riding techniques and safety expectations. Ensure routing maximises safe, direct routes.
Competing services arise, possibly van-based	Ensure high quality standards, build reputation for service and efficiency. Dialogue with local authority to improve cycle access to key locations to provide competitive edge over motor vehicles.
Unable to use some cycling infrastructure hence closing off some new markets	Dialogue with local authority to ensure key infrastructure is barrier-free before operations commence.

## 10. Financial Projections (3 years)

Expenditure	Upfront cost	Monthly cost	Year 1	Year 2	Year 3
Electric Cargo Trike*	£6,600	£0	£6,600	£0	£0
Electric Cargo Bike*	£4,000	£0	£4,000	£0	£0
Office computer hardware	£700		£700	£0	£0
Staff costs (salary, NI, pension)		£4,871	£58,449	£58,449	£58,449
Premises (office and storage) rent		£450	£5,400	£5,400	£5,400
Business rates		£194	£2,328	£2,328	£2,328
Electricity and water charges		£50	£600	£600	£600
Maintenance of bikes		£83	£1,000	£1,000	£1,000
Rider training	£1,600	£33	£2,000	£400	£400
Uniforms	£560	£12	£700	£140	£140
Insurance		£125	£1,500	£1,500	£1,500
Branding, Marketing & Website	£700	£50	£1,300	£600	£600
Internet and telephone		£41	£492	£492	£492
Mobile phone charges		£36	£432	£432	£432
Routing software		£35	£420	£420	£420
IT for bikes **	£400	£17	£600	£200	£200
Accountancy		£61	£732	£732	£732
Legal/professional fees	£500		£500	£0	£0
Stationery etc.		£30	£360	£360	£360
	£15,860	£6,131	£88,113	£73,053	£73,053
Income					
Hours of operation			72.5	72.5	72.5
£ per hour ***			15.05	18.3	21.5
Annual income from deliveries			£56,739	£68,897	£81,055
Approximate number of deliveries per annum			11,350	13,800	16,200
Isle of Wight Council financial support			£25,000	£0	£0
Total income			£81,739	£68,897	£81,055
		Profit/loss	-£6,375	-£4,156	£8,002
* assumes government grant of £1000					
** hardware for tracking, routing and communications					
*** hourly income is estimated at 70% and 85% of year 3 hourly income for years 1 and 2 respectively. This is to allow for growing efficiencies of operation and growth in customer base over time.					

10.1. All amounts shown are excluding VAT.

10.2. Pre-operation costs (for example tendering or grant preparation, recruitment and pre-operation planning are not included in these costs as they are likely to vary considerably depending on the nature of the operator.



10.3. All prices shown are exclusive of VAT.

10.4. No provision has been made for inflation. It is anticipated charges would rise in line with costs.

10.5. It is likely to be possible to obtain asset lease finance for the electric cargo bikes, however a capital cost has been shown to allow for flexibility in approach to financing the business.

## 11. Implementation Plan

### 11.1. Pre-Month 1

- Business planning
- Isle of Wight Council procurement process
- Electric cargo bike/trike purchase (may require several months lead in time)
- Premises search
- Recruitment
- Early discussion with potential pilot customers

### 11.2. Month 1

- Rider training
- Equipment purchase
- Office set-up
- Software testing
- Marketing, including demonstration of electric cargo bikes to potential customers.

### 11.3. Month 2

- Commence live deliveries with pilot customers
- Continue marketing of services

### 11.4. Month 3

- Scale up to full delivery operations

### 11.5. Month 4 onwards

- Continue delivery operations
- Continue marketing core service
- Assess opportunities for additional services

### 11.6. Month 6 onwards

- Commence additional services as resources allow