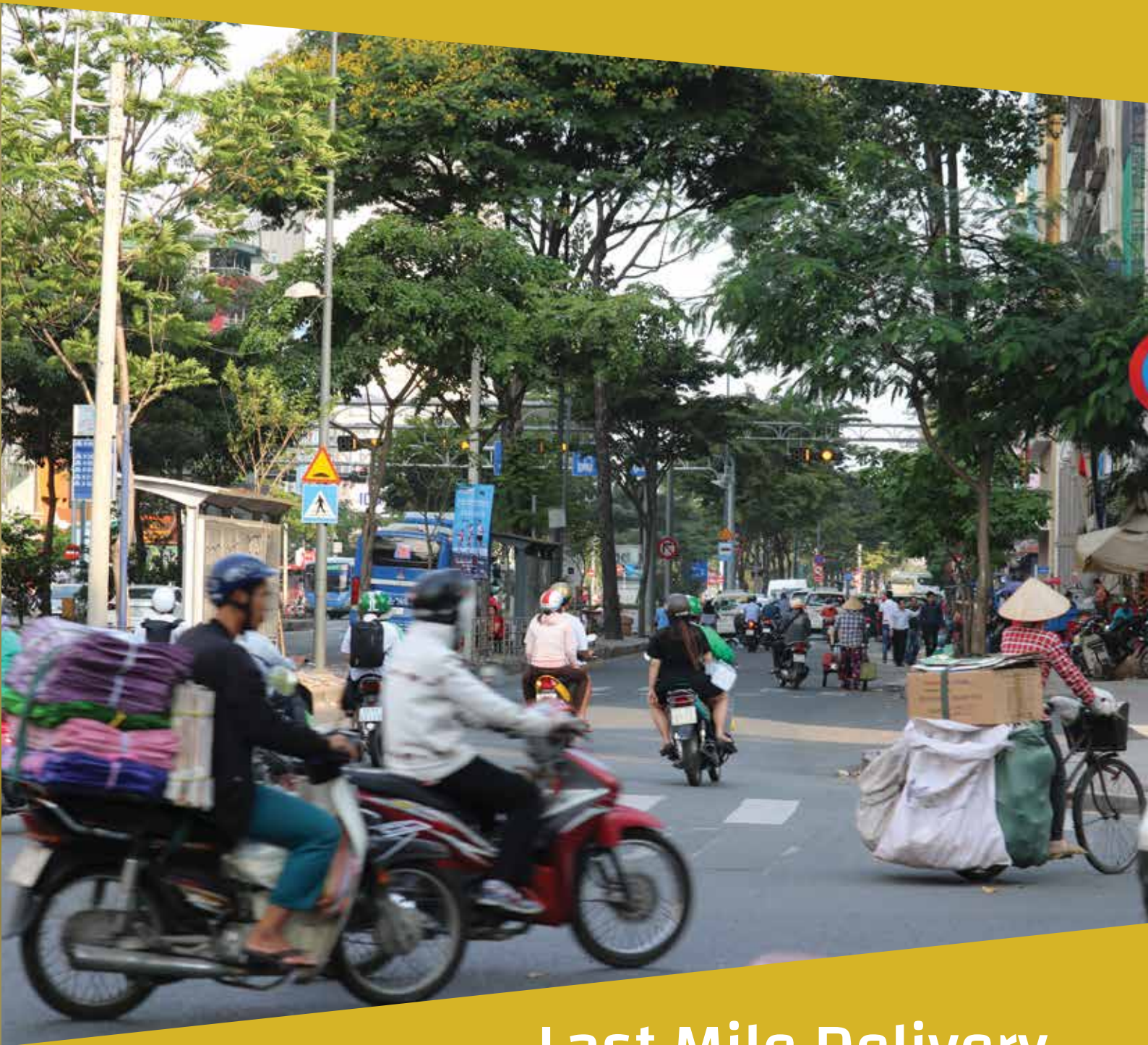


**Southeast Asia
Centre of
Asia-Pacific Excellence**



Last Mile Delivery in Vietnam

COLD CHAIN LOGISTICS

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EXECUTIVE SUMMARY

COLD CHAIN LOGISTICS: A PROBLEM IN VIETNAM

Vietnam is a developing market with significant prospects and momentum, growing steadily for the last 20 years. Geography, a young population and foreign direct investment are the growth drivers.

Several complex challenges around setting up businesses exist in Vietnam: corruption, poor infrastructure, protectionist laws, a fragmented market, and the length of time it takes to build trust and relationships.

This report identifies an issue with cold chain logistics in Vietnam's food delivery systems. Last mile chilled delivery causes huge waste and inefficiency due to poor infrastructure amid exploding demand and a growing need for improvements in cold-chain logistics.

The proposed solution is to invest in the development of a compact refrigeration

unit that can be mounted on a scooter or small truck, and which maintains consistent temperatures for high-end food products, from supplier to city vendors. The system would be augmented by a mobile app which would provide delivery data between suppliers and vendors, and which could improve the logistics of product delivery in congested Vietnamese cities.

This model will leverage mobile phone technology, pre-existing scooter networks and would be scalable to different industries and markets.

To generate revenue, food suppliers would be charged a higher premium for this higher quality distribution service. This will be seen as justified once confidence in the quality of our service grows among suppliers due to their goods being delivered in the condition they expect.

INTRODUCTION

BACKGROUND: OPERATING IN THE VIETNAM MARKET

The Vietnamese economy

Vietnam is a developing market with significant prospects and momentum, growing steadily over the last 20 years. Geography, a young population and foreign direct investment are the drivers of this growth.

Though Vietnam is experiencing one of the fastest growing GDP rates in the world, average disposable income is still smaller when compared with neighbouring countries. This makes customers price-sensitive. However, Vietnam is seen as an attractive market due to a large amount of foreign direct investment and emphasis on trade, with many free trade agreements signed, including the CPTPP.

Product channels in the market: 78% of sales are through traditional markets, 18% through modern markets such as convenience stores, and e-commerce makes up 4% of sales as of 2017, but e-commerce is an extremely fast-growing segment.

Wet markets are popular in Vietnam for direct contact and conversation with sellers, which is less present in modern trading alternatives. Shopping is convenient in the cities; most people can buy all the food they need within 400m of where they live.

The economy is still predominantly cash-based with 90% of transactions conducted in cash, and only 30% of citizens have a bank account. However, Vietnam is touted as having a 'leapfrog economy', which will most likely bypass cards and skip straight to mobile wallets. Internet penetration is high, as is smartphone penetration in urban areas.

Vietnam population

Vietnam has the 3rd largest population in South-

east Asia and is expected to reach 100m by 2020. The golden demographic structure, with 50% of the population classed as working age, means the labour market is highly competitive. Approximately 36% of people live in urban areas, and the country's population is experiencing strong rural-to-urban and poor-to-rich movement, and increasing density.

Challenges in the Vietnamese market

A number of challenges come with doing business in the Vietnam market. Marked differences exist in the economic, political and social environments when compared with New Zealand.

Corruption

Complexity in the business environment stems from a lack of transparency, inefficient administration procedures and corruption. The government is addressing corruption, yet it is still seen as standard in business operations and also results in difficulty obtaining loans.

Poor infrastructure

The country's underdeveloped infrastructure is also a key challenge. Only 20% of roads are paved, and 40% are in extremely poor condition. However, the vast majority of all freight is transported by road. Traffic jams are frequent and worsening, with 8,961 new motorbikes and 463 cars hitting the streets every day. Logistics make up a significant chunk of GDP, however underdeveloped infrastructure and bottlenecks in the two main hubs, Hanoi and Ho Chi Minh City, add cost and increase difficulty.

Major effects arising from Vietnam's poor road infrastructure and traffic congestion are the problems associated with 'last mile chilled delivery', which cause huge waste and inefficiency amid growing demand for a better service.

Building relationships and trust

Business relationships in Vietnam are built over the long term and need a strong foundation of trust. It takes a long time to develop the necessary relationships in the market.

A fragmented market

The food and beverage market is fragmented, with local suppliers largely small farms rather than the larger consolidated agricultural environment in New Zealand.

Mitigating the challenges

Infrastructure and logistics: Vietnam has a national action plan to improve competency and development of logistics services by 2025.

Building relationships and trust: It is important to be communicative and reliable to local importers, distributors and other businesses. It often takes investment and time to properly educate the market, especially when introducing new products. Businesses should be looking to attend events for New Zealand businesses, attend industry functions and expos, continue to remind the market about the new technology or product, and visit the market at least twice a year.

Infrastructure and traffic congestion: The cold storage segment has experienced healthy growth in recent years and has an expected compound annual growth rate of 10% until 2021. Furthermore, cold storage capacity is currently at 450,000 pallets in 2017 with a high occupancy rate at over 90%. In the context of difficulties around food trucking in Vietnam caused by poor infrastructure and traffic congestion, the demand for cold-chain logistics is growing, and current food trucking solutions are clearly facing difficulties.

DEFINING THE BUSINESS PROBLEM

Inadequate last mile cold chain delivery

Around two-thirds of New Zealand's exports to Vietnam are foods and beverages. These are regarded as 'premium' products – Vietnam sees these as trustworthy and safe. A growing middle class can now afford to purchase pre-

mium goods, and government initiatives have led to greater demand for safe food. This puts New Zealand products in a good position for exporting to Vietnam, though the market has become saturated.

In assessing business challenges and opportunities in Vietnam, the strong culture around delicious food must be recognised. Therefore, rather than introducing more New Zealand food or beverage products to this market, the focus should be on addressing the food distribution and transport problems mentioned above.

A key problem in Vietnam's food distribution system lies in climate control logistics. Keeping temperature-sensitive goods in pristine condition is paramount for New Zealand exporters to maintain their brand reputation. To do so, the supply chain needs to keep foods at their optimal temperatures.

In Ho Chi Minh City and Hanoi, the last mile delivery is to small vendors. These vendors only need a few of each food or beverage item, particularly when these are higher-value goods. Deliveries are currently made using inefficient, poor transport storage units in high temperatures and congested traffic.

In spite of the of the cold supply chain capacity in Vietnam quadrupling over the past ten years, there are still gaps. Exporters are largely confident in the quality of their cold chain up until the last stage, when goods are delivered from distributors to vendors. This is due to the absence of a 'last mile delivery' service, which would guarantee goods arriving on time and in their desired condition. For example, for every hour milk is left at room temperature, it loses one day of its shelf life. This spoiling is costly for all parties involved.

Under the current system, distributors lack information about the temperature and condition of goods delivered, as this is not tracked and so cannot guarantee the quality of their products and higher-end perishable goods. Food producers relying on good market reputations need a guarantee that their goods will be kept in the correct environment during the entire delivery chain.

Current last mile chilled delivery methods

The two methods currently used in last mile chilled delivery are small, refrigerated trucks and thermal bags on scooters. Both methods have problems.

Problems with using small, refrigerated trucks for last mile deliveries:

- Trucks are inefficient for delivering to small corner stores requiring only small quantities of goods.
- Small stores and restaurants have limited storage and may only need, for example, a dozen cans of soda delivered at one time.
- Refrigeration in trucks can only be set to one temperature, whereas different goods require different temperatures.
- Trucks are frequently delayed on the busy roads and narrow side streets of Vietnam.

Problems with using scooters fitted with thermal bags for last mile deliveries:

- Scooters can move through traffic faster than trucks, but no specific temperature can be set in the thermal bags.
- As with trucks, delivery delays affect the quality and freshness of goods, particularly in hot climates.
- A reliable scooter-based solution does not currently exist as the technology for portable refrigeration units is too costly.

BUSINESS PROPOSAL

A solution

Batteries have been getting smaller and cheaper and their prices have decreased steadily in the past ten years. Proper refrigeration, which can be kept consistent in last mile delivery systems, is therefore now possible and more affordable.

The solution to cold chain delivery troubles in Vietnam is to fit the two existing delivery methods with new, improved refrigeration equipment. This would allow drivers to move quickly and efficiently through Vietnam's congested streets, keeping transported goods at optimum temperatures. The solution is two-fold:

- to develop a refrigeration unit that can be fitted to small trucks and mounted on scooters
- to leverage the power of mobile app technology to create a network of scooter drivers linked to suppliers and distributors.

To explain the solution concept, this report focuses on the scooter-based solution to last mile cold chain delivery in Vietnam.

Scooter units

In Vietnam, refrigeration units must meet a number of criteria to be effective in the cold chain. The unit must be:

- able to chill goods to lower than -18 degrees Celsius, the transport temperature for some frozen goods
- able to power itself for eight hours a day to ensure the goods are kept at a reliable chilled temperature for deliveries all day
- able to be easily mountable onto a standard moped or motorcycle; scooter models vary and are abundant in Vietnam, and some testing will be required to ensure that scooters mounted with refrigeration units can manoeuvre easily through traffic
- able to carry at least ten litres on a scooter in order to ensure the necessary volume of goods can be delivered to vendors.

Temperature control and location tracking are the only ways that users of this last mile delivery service can be confident that their goods will arrive in their proper condition. After a full market analysis has been done, substantial research and development would need to be undertaken to refine the scooter-mounted refrigeration and make it fit for purpose.

A mobile phone app

The intention behind this business proposal is not simply to 'sell an ice box'. Rather, it aims to develop a 'cold chain delivery service' for clients. As stated, this would involve a network of drivers organised to allow the most efficient cold chain delivery service in the market.

To do this, a mobile app would be used by scooter drivers. It would operate in a similar way to mainstream consumer transport applications such as Grab or Uber. The mobile app will communicate delivery data from business to business rather than between driver and consumer.

The app will play a crucial role in effectively rolling out the service. A large driver network in Vietnam already uses mobile app technology in their delivery systems, and they are accustomed to operating on a job-by-job basis. We expect to benefit from app technology that has already proven itself in the market. The app will be quickly scalable and will not need significant modification if existing systems are used.

The app will connect the company with drivers but it would also be used for organising goods to be moved from distribution centres. Suppliers could not be expected to work with individual drivers on each delivery in the same way a consumer would on the Grab or Uber platforms. The business would develop relationships with distribution centres and design a way for goods to be organised and made available to the drivers.

MAIN BENEFITS OF THIS APPROACH TO LAST MILE CHILLED DELIVERY

An all inclusive and responsive delivery service

Food safety globally and also in Vietnam is becoming more significant in influencing consumer demand. In Vietnam, this is primarily

driven by increased incomes and a shifting cultural awareness towards accessing information about the origins of food and beverage products.

Current last mile delivery solutions in Vietnam are not able to maintain the ideal temperature for different types of goods being transported and there is little information provided to suppliers or vendors during last mile delivery, with improvement and efficiency in the logistic system stagnating.

The proposed business would provide an all-inclusive solution to businesses in Vietnam needing a guarantee that the high-value foods and beverages they supply survive that last mile of cold chain delivery in perfect condition. The key benefits of the service are improved storage of goods during the last mile of transit and the provision of data analytics.

STORAGE OF GOODS DURING THE LAST MILE OF TRANSIT

Improved cold storage units

While being transported, individual food products require specific optimal temperatures to minimise damage and spoilage. The transport system currently used in Vietnam cannot maintain or guarantee these conditions. Small scooter deliveries using iceboxes cannot control temperature at all as they rely on the 0°C temperature of ice to be adequate in mostly hot weather. Similarly, although large refrigerated trucks can set specific temperatures, they cannot be optimised for each individual product being transported, resulting in a 'one temperature fits all' environment during food transport.

The benefit of providing smaller refrigerator units on small trucks is that they could integrate the advantages that larger refrigerated trucks offer with their ability to control temperature; likewise, small delivery scooters would be improved with their ability to economically and safely supply smaller vendors and restaurants.

Constant temperatures during cold chain transport

In large-scale operations, when exporting large quantities of goods through ports and when holding goods in distribution warehouses, it is easy to keep products at a constant temperature and maintain their quality.

It is in transition from distribution warehouse to deliverer, and then from deliverer to customer that products undergo the largest variance in their temperature control. Therefore, through temperature optimisation, the business will be able to provide a consistent, regulated way of transporting goods from distribution warehouses to customers and this will enhance food safety and product quality.

Reduced spoilage therefore less waste

Spoilage is a significant issue when dealing with high-value food and beverage products because not only is there more value in the products being transported, but their high-quality nature makes them especially susceptible to damage from temperature fluctuation in transit as well as from improper handling. Transporting foods at consistently optimised temperatures minimises such food spoilage and therefore food waste.

LOGISTICAL BENEFITS TO CLIENTS OF DATA PROVISION AND ANALYTICS

Data provision along a transparent supply chain

Technological advancements in the collection of logistical data are still a vastly untapped area of development in Vietnam. This is especially prevalent in the monitoring of goods as they travel along the supply chain, where there is currently no tailored analytics service.

Currently, information is easily provided and readily available for businesses at the early stages of the supply chain. However, the information largely ceases to be available in the final stage as the goods enter the 'black spot' of last mile delivery. The proposed service would increase transparency to all parties along the supply chain.

The provision of information such as GPS location, temperature monitoring and time of delivery would fill a vital gap in the supply chain, making it fully traceable.

This transparency along the supply chain would reassure initial suppliers of goods and provide better risk mitigation and resolution around potential food safety issues. Increased transparency will also serve to improve efficiency in the supply chain, which is another major benefit of our service.

Improved delivery routing

Google Maps is currently the most appropriate means of ensuring that transport routes are efficient. It can inform drivers of the fastest route to take at a given time, taking into account road closures, traffic congestion and road speeds based on previous data.

The proposed system would leverage the current benefits of Google Maps and its well-established data cache, in order to tailor it to transport logistics. Increased efficiency will arise from the provision of a platform that is tailored to optimise refrigeration on last mile deliveries on scooters.

Better delivery scheduling

The last mile delivery platform would be capable of analysing peak congestion times, comparing these with delivery orders for the week and creating personalised delivery schedules for clients. This will improve delivery services, ensuring scooters are used as efficiently as possible. It will also benefit distribution warehouses due to faster inventory turnover, and scooter drivers will benefit from being able to make more deliveries per day. Clients will benefit due to faster delivery from warehouses to stores.

Shared delivery for small businesses

The benefit of the platform's ability to schedule would also enable shared delivery for similar products. Small deliveries to locations that are near each other and require the same refrigeration temperatures could be grouped together to reduce overall time spent delivering items. This would increase efficiency and enable faster deliveries, which would decrease the cost of transportation without adding extra logistics costs.

Data analytics

Finally, data analytics is a developing industry offering huge scope for advancement. The cache of data collected by the platform during deliveries would become valuable on its own. Information about optimised scheduling, peak times and scooter delivery routes are examples of data that could become valuable to an external party. This is especially prevalent in Vietnam where the growth of population and businesses is so fast. Consumers are constantly moving as new developments are built and the region evolves. Therefore, information about where certain customers are based and what their purchasing habits are could also be valuable to companies in the food and beverage industry.

BUSINESS PLAN

Last mile chilled delivery service: unique selling points (USPs)

The challenges associated with setting up this type of business add numerous levels of complexity to producing improved truck refrigeration or a scooter-mounted refrigeration unit. However, the benefits of providing a full service to improve last mile chilled delivery of high-quality goods in the Vietnamese market far outweigh the challenges. The main USPs or key drivers of success in this business model will be:

- its reliable driver network
- its well-developed business-to-business mobile app
- its well-managed distribution system for the supplier side
- Its provision of logistical data and analytics to clients using the service.

Start-up funding

We propose that the best way to raise start-up capital for this business would be through:

- a Callaghan Grant for New Zealand research and development
- angel investors and/or venture capital organisations.

Challenges will lie in how to recover the research and development costs that go into developing the refrigeration unit for trucks and scooters, the mobile app and, finally, the cost of creating a supplier distribution solution.

Market research

Before setting up this business, a first step would be to undertake further refined market research to determine the size and viability of the opportunity in Vietnam.

This will be done by building connections and relationships in the market. The potential scalability of the last mile delivery solution in Southeast Asian countries such as Myanmar and Indonesia would also be investigated.

Research and development

Once a more refined market research exercise has shown that the Vietnam market conditions would be receptive to this venture, we would look to securing a Callaghan Innovation Grant to begin research and development (R&D) around the production of an improved refrigeration solution for small trucks and scooters. This should help us determine exactly where current technology is and whether it is possible to develop fit-for-purpose units.

Should it be possible to do so, we would need to raise further capital. Building on credibility gained from securing the Callaghan grant, we could potentially turn to angel investors and/or venture capital investors, in order to:

- start developing the refrigeration unit
- start developing the mobile app interface for our network of drivers
- establish a way to organise the distribution of goods (possible options would be to partner with pre-existing distribution companies).

Market entry

Once the refrigeration unit is developed and produced and the mobile app has been developed, it would be time to enter the market by finding a reliable business partner in Vietnam, which is necessary for any foreign business wishing to operate in the country.

The strategy for entry would be to partner with high-value goods suppliers who need our premium service. After proving ourselves to these smaller distributors and generating some economies of scale, we would hope to attract larger, more mainstream clients. The key would be to approach the market with a start-up attitude and grow as quickly as possible to establish and maintain market share.

Once operating profitably there would be an option to continue growing the business or potentially sell the model to an industry giant such as Grab. Grab has an acquisition-based business model, which could possibly serve as an exit strategy.

Revenue generation

The profit model for this business is fairly simple. Currently, suppliers pay around 2% of the final price of the goods for transport, and there is a desire for a higher quality service. Charging suppliers a higher price for our delivery service will generate revenue. The higher price will be seen as justified once confidence in the service grows due to goods being delivered in the condition they expect.

Here is an example: a scooter-mounted refrigerated bag could carry 10 kg of New Zealand king salmon to a Japanese restaurant. The king salmon retails at NZD 82.73 per kilogram; we would charge the supplier 4% on that NZD 827.30 load for the confidence we provide that the salmon would arrive in good condition. So, every 10 kg load of salmon delivered chilled and safely would generate NZD 32.92.

The key to providing this service will be for the business to own the scooter-mounted refrigeration units. These units would more than likely be too expensive for drivers to own but with the business owning them they can be protected and maintained. We would therefore provide the units to drivers on a deposit-based system to allow them to provide the service and earn a premium over other scooter-based employment options.

Revenue earned would be split between the business and the drivers. To incentivise them, drivers with the refrigeration units mounted on their scooters would be reimbursed at a greater rate than other ride-hailing services. Remaining revenue would be directed towards running expenses and the bottom line.

CONCLUSION

Vietnam is a country exploding with opportunity. Ho Chi Minh City and Hanoi are both among the top ten of the world's most dynamic cities.

A widespread entrepreneurial mind set and strong, stable, consistent growth mean Vietnam provides great opportunities to do business. The 'golden demographic' structure, emphasis on trade and significant foreign direct investment outweigh challenges in current infrastructure and administration procedures.

The potential for leveraging mobile app platforms and data analytics in Vietnam's cold chain logistics industry is evident. Benefits include improved food safety, product traceability, increased driver wages and enhanced efficiency in the logistics industry.

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We work together with exporters, young New Zealanders, government agencies and others to improve understanding of these countries and build knowledge of their economies, languages, cultures and business protocols.

Through our Market Readiness and Market Insights Programmes, and mobility initiatives such as the Tertiary Market Immersion Programme and BizVenture, we show New Zealanders why and how to deepen our understanding of these valuable economies.

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The Southeast Asia CAPE has four key objectives:

- To equip New Zealanders to engage and do business with the ASEAN countries and Timor Leste.
- To broaden and deepen New Zealanders' understanding of Southeast Asian cultures, societies, languages, politics and economies.
- To excel nationally and internationally in the dissemination of knowledge and skills relating to Southeast Asia.
- To enhance New Zealand's economic, trade, political and cultural relationships within the region.

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 [linkedin.com/company/seacape](https://www.linkedin.com/company/seacape)

 seacape@vuw.ac.nz

 seacape.org.nz



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