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NexTrust Pilot 1.4.1 Case Study:

"Cool Running in Urban Areas": London Food Hub

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1. Introduction and Objective

Europe is considered as one of the leaders in the logistics sector globally. Six EU Member States are ranked among the top 10 countries in terms of logistics performance for year 2014 (World Bank, 2014), while the market size of the logistics sector in Europe has been estimated equal to €878bn in 2012 (European Commission, 2015).

On the other side, the logistics cost remains a significant part of total cost in various sectors - 12% of total cost in manufacturing sector and more than 20% of total cost in retail sector (European Commission, 2007). Moreover, the freight supply chains across Europe account for 25% of the CO2 and particulate emissions.

Concurrently, the logistics’ efficiency remains low: 24% of goods vehicle-km in EU run empty while the average load factor for vehicles is equal to 57% (World Economic Forum, 2009) due to the lack of collaboration in the use of motive and warehousing assets.

Therefore, the enhancement of collaboration is considered as the best solution towards the improvement of logistics sector. More efficient synchronized networks and decrease of operational costs are the main benefits for the companies involved in cooperation schemes (Lehoux et al., 2010), as cost savings and efficiency gains of 6-10%, according to Transport Intelligence (Graham, 2011), or a reduction of 9-30% in distribution costs (Vanovermeire and Sorensen, 2014) could be expected.

NexTrust, a EU grant funded Horizon 2020 project (Grant 635874), was setup to bring together like minded actors in the supply chain to raise asset utilisation levels and reduce Green House Gas emissions through collaborative pilots.

The innovative idea of the NexTrust project is the development of interconnected, trusted networks that collaborate together along the entire supply chain towards the establishment of long-term solutions.

The main objective of the project is to establish a new way of working together, to solve real problems of inefficiency in the logistics sector on a sustainable basis. To this end, the project coordinates 20 different pilots which address actual problems across the length and breadth of European logistics.

Up to now, actors in the supply chain, such as manufacturers, importers, retailers, exporters and logistics companies are generally reluctant to pilot or utilise new methodologies or new routes to market as there are many examples of costly implementation failure.

In order to overcome actors’ hesitation to participate, the most important aspects for successful collaboration were identified prior to the elaboration of the pilots:

- Careful planning of the project
- An agreement to, transparently, share the savings generated net of any additional costs
- Agreements on the planning and administrative processes to be used
- Routes to deal with any disagreements
- Importantly the use of a Trustee to receive data, analyse the best matched routes and distribute back the plans. This would be a daily (at least) dynamic process. The Trustee also covered the confidentiality and anti-trust concerns about the pooling of data.

Pilot 1.4.1 focused on the optimisation of LTL shipment in the chilled and fresh market. A major dense area, London, UK, was selected for testing the pilot that examined the use of an Electric vehicle over morning and afternoon shifts delivering palletised temperature controlled food products to a retail distribution centre and then reloading with temperature controlled food. The selected area is located in the Thames gateway area, a major regeneration and growth area, situated close to the centre of East London and South-East region.

Currently, the deliveries are totally uncoordinated, operated by each supplier separately, using their own fleet or subcontracting the deliveries. Chilled and fresh products are loaded onto large articulated diesel vehicles, often only partially filled, before being delivered to general or food retailers across London. As a result, the utilisation of trucks is low, due to the high percentage of LTL deliveries, intensifying GHG emissions and traffic congestion.

The pilot tested the use of an Electric vehicle over morning and afternoon shifts delivering palletised temperature controlled food products to a retail distribution centre and then reloading with temperature controlled food.

2. Application of Pilot

Pilot 1.4.1 aimed to drastically reduce congestion and toxic emissions in the City of London through the consolidation of LTL deliveries into “right-sized”, fully electric refrigerated (2 to 8^{o}C) vehicles to optimise delivery productivity.

More specifically, the use of a fully electric vehicle to deliver chilled products from multiple suppliers to both retail and catering outlets was examined in a number of supply chains.

Currently, the urban delivery takes place in two distinct time frames- morning and afternoon delivery, as following:

a. Morning Delivery: Food Service Business Customers – Retail/Catering
The Food Service companies generally deliver to their customers in the morning.

b. Afternoon Delivery: Grocery Supermarket DC – Volume Grocery Retail
The delivery to grocery chain DC’s usually takes place in the afternoon, as their warehouses are busy loading out their retail deliveries in the morning. The products are picked overnight and delivered to the retail stores or directly to the consumers the next morning on urban delivery vehicles, typically temperature controlled rigid box vehicles, or vans (in case of home delivery).

Pilot 1.4.1 aimed, as mentioned above, to demonstrate the viability of electric vehicles for urban delivery, in case of fresh and chilled products. Up to now, the major concern is the delivery range of electric vehicles. The existing electric vans are designed without capacity for temperature controlled food delivery and tail-lift and chill capability, both essentials for urban delivery of fresh and chilled products but with impact on delivery range as well. In order to explore the use of the electric vans, multiple vehicles from various locations were operated, once their delivery range and the operational capabilities were defined.

The pilot operation was managed by ELUPEG and Giventis, acting as the Neutral Trustee. Their role was to manage, coordinate and disseminate confidential information appropriately in order to protect the commercial interests of the participating partners. During the pilot, Wincanton devised a program of operations on a weekly basis. Based on the program, the electric vehicle was charged at Solstor Crayford overnight and delivered fresh products to Wincanton Thameside in the morning. Then it was loaded with roll cages of products for a Sainsbury’s convenience store in the London area (mostly LEZ), made the store delivery and returned to base at Crayford. The five stores selected were progressively further from Thameside gateway area, necessitating longer journey times. Each store was visited twice, on successive days, with the first visit made at Ambient temperature and the second at -22Co (Frozen).

In addition, the case of combining supply chains, such as deliveries in case of Grocery Supermarket DC’s to load retail store deliveries to vehicles delivering in suppliers’ food products, was identified and executed during the Pilot.

Shippers	Solstor	Mars	Covent Garden Market Authority (CGMA)	Sainsbury's
Trustee	ELUPEG		Giventis International BV	
Retailers	Sainsbury's Thameside DC	Fresh Produce Market/ Wholesalers		Sainsbury Convenience Market
Electric Vehicle Provider	Paneltex			
UK Trade Body	Food Storage and Distribution Federation			
Logistics Service Providers	Fowler Welch		Wincanton	

Table 1: Pilot 1.4.1 Participants Summary

2.1 Partners

NexTrust partners ELUPEG and Giventis have collaborated with Solstor, Mars, Covent Garden Authority, Sainsbury's, Fowler Welch and Wincanton as well as the Food Storage & Distribution Federation (FSDF) and Paneltex to run this pilot in London.

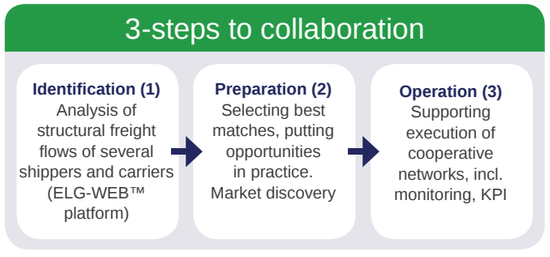
The project management and data management was undertaken by ELUPEG supported by Giventis International.

2.2 Timeplan

The Pilot ran for two periods, the first for a week and the second for 3 weeks, through December 2017 and January 2018.

2.3 Methodology

Pilot 1.4.1 followed the convention already established within NexTrust regarding data gathering, analysis and operations.



The NexTrust 3-step Methodology was applied, as following.

Phase 1: Identification

The Identification Phase of the methodology applied was divided into two sub-phases, as following.

Phase 1.1 focused on collecting data (Big Data). Detailed lane and delivery data was collected from all relevant parties (Fowler Welch, Solstor and Sainsbury's) aggregated and extrapolated to identify target delivery area and consolidation opportunities through network modelling. In addition, the participant's requirements in terms of vehicle/ delivery compliance were identified and addressed. Managing the data collection and data normalisation was a challenge, as the involved shippers use various formats and measures for weight & cases to pallets to measure shipment size. In addition, each shipper has a range of ways to pay for transport.

Phase 1.2 explored the viability of the pilot - if the electric vehicles are suitable for urban delivery. The differences in load factor, GHG emissions and costs were explored in this phase. Potential opportunities were also identified within this phase while the execution of the processes- administrative and delivery-were checked. In addition, the collection of appropriate data in order to measure the benefits was conducted in this phase.

Apart from the above, the use of the electric vehicle over two shifts was explored within this phase; two trips from Solstor Crayford to Sainsbury's Thameside daily were performed, for a number of occasions and the vehicle was recharged in the middle of the day.

Phase 2: Preparation

The priority of this Pilot was to define and measure environmental benefit, over and above potential cost savings.

The Pilot began in December 2017, recommencing in January after Christmas for a further agreed period. The daily operations were managed by Solstor, as a supplier to both Sainsbury and Wincanton.

All parties signed a bilateral NDA that they did not have any competing businesses.

Phase 3: Operation

The pilot was managed by Solstor, overseen by the participants Wincanton and Fowler Welch while ELUPEG and Giventis acted as the neutral trustee. The role of FSDF was vital as it focused on identifying participants and supporting them through the proof of concepts since the operational conditions changed with events.

The pilot is now accomplished.

2.3 Target groups

The pilot was expected to enhance sustainability credentials of shippers & 3PL's, maintain costs at current levels for shippers, increase the business and margin for 3PL's and increase the business and margin for truck manufacturers and converters. Based on the above, its outcome could be considered as valuable mainly for the following groups:

- Shippers
- London Occupants
- London Administration
- 3PL operators
- Electric truck manufacturers/convertors

3. Results/Impacts

Cost was not the priority of this Pilot. The viability of using electric vehicles for urban delivery in Central London was mainly examined. Therefore, the successful demonstration of using the electric vehicles, with no additional cost could be considered as the main result of this pilot.

However, signifi cant results concerning costs and carbon emissions were derived as well. Accordingly the results, cost and carbon emissions could be reduced signifi cantly, conditional to the willingness of participants to collaborate in order to consolidate and co-ordinate orders to "right-sized" shipments delivered by the most suitable vehicles in the study area.

In addition, apart from the above, one of the most interested results is the fact that Solstor, Wincanton PLC and other LSP's agreed to support the second phase of the project as well, in combination with the current participants.

4. Lessons Learnt

The elaboration of the case study resulted in interesting conclusions for the establishment of similar pilots in other areas or the extension of the existing one.

The operational and driving characteristics of the existing electric trucks of 7.5tn capacity should be identified initially, as they are different than the operational and driving characteristics of the respective conventional diesel powered vehicles. Therefore, they should be considered in designing and operating the next generation of vehicles.

These differences in the operational characteristics and the overall experience of using the electric vehicles are also of great interest to the large LSP's, retailers and food manufactures; who want to understand how these vehicles work.

On the other side, risks relative to the service level and the cost should be considered as well before the development of similar pilots, as this area is new and not completely understood in terms of operation. To this end, it is very important for the actors in the supply chain to understand the risk before committing for participating in future and extensive trials.

5. Conclusions

Pilot 1.4.1 focused on LTL shipment optimisation in the fresh and chilled market in a major dense urban area, Central London. The pilot could be considered as successful as its objectives were fully met.

The demonstration of using the electric vans for urban delivery, the main objective of the project, was successfully accomplished. More specifically, according to the results, the electric vans could perform two trips per day at an operationally effective range. In addition, as it was proved through the pilot, there is an opportunity to backload the electric vehicles and operate in the frozen temperature band. Tail lifts are required for retail store delivery.

Moreover, in case that the consolidation is achieved through the Food Hubs, it would be attractive to various actors, including food distribution operators, food service delivery providers, conventional wholesale markets and modern retailers, resulting to the expansion of the pilot in the future.

Finally, the commercial participants and the legislative bodies involved in the pilot are very interested in the development of a framework that would contribute to the further enhancement of the Pilot's objectives.

6. References

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