# Freight Share Lab: New 'Gain-Sharing' Collaborative Logistics Platform and Business Model

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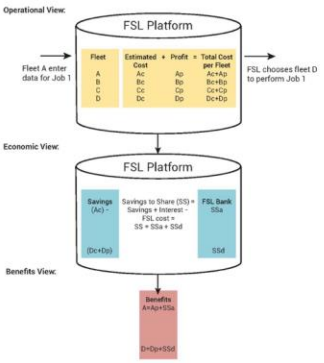
## Introduction

Collaboration in the freight industry has the potential to generate significant socio-economic and environmental benefits, and is key to the development of the Physical Internet. Additionally, freight service providers would commercially benefit from the reduced operating costs achieved through the reduction in the number of trucks, mileage, and increased trailer utilisation, from which, assuming perfect competition, customers would ultimately benefit as well.




FSL demonstrates that there is a win-win for logistics service providers and their customers, where "coopetition" can be delivered through a collaboration platform yielding significant commercial benefits for all participants.

The platform developed by the FSL project partners' Heriot-Watt University and Trakm8 PLC, deploys a multi-fleet logistics optimisation and decision support algorithm, managing those freight logistics assets which, when combined, deliver a more efficient and environmentally friendly solution.

The business model developed by Connected Places Catapult ensures that both the original contract holder and those deployed by the FSL platform retain their profit margins and share the differential between the price of the latter and operating costs of the former. Initial results obtained from model simulations with realistic data indicate significant financial benefits for FSL platform members using this 'gain sharing' model, based on game theory.

## Freight collaboration business model

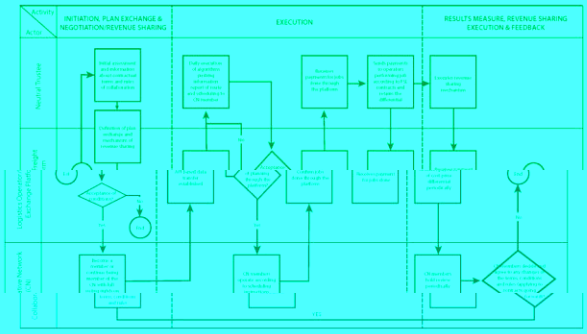
The proposed business model aims to address the barriers for collaboration in the freight industry demonstrating there is a win-win for logistics service providers as well as their customers, yielding significant commercial benefits for all participants.


The objective of the FSL platform is to increase competitiveness, efficiency and utilisation, by creating a collaborative ecosystem. The platform will dispose of the collaborating members' jobs and assets inputted into the system and reallocate jobs accordingly to guarantee their most efficient delivery, in terms of operating costs, fleet utilisation and emissions.

## Collaboration process activities

*The key activities in the collaboration process include:*

1. **Initiation** – requires all the partners, including the neutral trustee to agree to collaborate
2. **Plan Exchange** – involves defining responsibilities, contracts and joint processes among all the partners in the collaboration
3. **Negotiation** – agreement from members on plan exchange revenue sharing mechanism
4. **Execution** – led by neutral trustee that informs each partner on instructions & tasks to follow
5. **Performance measurement & revenue sharing execution** – performed by the neutral trustee
6. **Feedback / Improvement** – completed among all the partners to refine and improve process

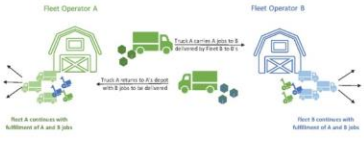



## Collaboration arrangements

Horizontal collaboration between FSL members is the essence of the proposed solution and business model. Each FSL member indicates its preferences (and any associated parameters) for each of the following four collaboration arrangements: a) Full Sharing without special arrangements; b) Full Sharing with morning transfer arrangements; c) Full Sharing with a consolidation site; and d) Partial Sharing with no arrangements. The algorithm will select the most optimised arrangement in line with the users' inputs.

Full Sharing with Consolidation Centre


Full Sharing with Morning Transfer




Full Sharing with No Special Arrangements


The Full Sharing scenarios are for FSL members who are willing to both undertake other members' jobs as well as handing over some of their own jobs for others to handle, ie: there is full sharing of assets and contracted jobs.

The Partial Sharing scenario assumes some of the FSL members will only leave vehicles at the platform's disposal.

## Results

Analysis was undertaken on the initial algorithm results, where approximately 6,700 daily jobs from 27 fleet operators were run through the multi-fleet logistics optimisation.

Fleet operators can find significant efficiencies as well as commercial benefits through the proposed collaborative business model.

In addition to the private costs borne by fleet operators, the use of road vehicles incurs on externalities borne by the wider society. Optimised truck journeys through collaboration will lead to reduced total mileage for the fulfilment of jobs and reduced number of trucks on the road. Road decongestion benefits will arise from not only the reduction of truck mileage, but also from improved traffic levels and hence more efficient driving by other road users.


| | No special arrangements | Consolidation centre | Morning transfer |
|---|---|---|---|
| % of jobs with savings | 48% | 63% | 72% |
| % increase of jobs completed per day | 3% | 1% | 5% |
| Daily mileage reduction | -3,012 km | 3,523 km | 2,143 km |

| Collaboration arrangement | Emissions saves (anually) | | | | Other wider impact cost savings (annually) | | |
|---|---|---|---|---|---|---|---|
| | CO2 (tonnes) | PM (kgs) | Nox (kgs) | HC (kgs) | Congestion (k£) | Infra-structure (k£) | Accidents (k£) |
| No special arrangements | -626 | -122 | -12 | -996 | -211 | -107 | -3 |
| Consolidation centre | 735 | 143 | 14 | 1165 | 247 | 125 | 4 |
| Morning transfer | 447 | 87 | 9 | 708 | 150 | 76 | 2 |

## Conclusion and future work

The proposed business model aims to address the barriers for collaboration in the freight industry demonstrating there is a win-win for logistics service providers as well as their customers, yielding significant commercial benefits for all participants.

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Future empirical research will be necessary to understand [illegible] between different providers and start building up confidence among stakeholders, when demonstration of the potential revenue gains, service coverage, competitive rates and sustainability benefits is available to them. This will stimulate collaboration, which is a key precept of the Physical Internet.

## An Innovate UK funded project, supported by: