

Consolidating deliveries

to student halls of residence



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Introduction

Freight transport arising from student online shopping can have substantial impacts on operations at university halls of residence. Many different couriers visit halls frequently, often daily, and deliver only a few parcels at a time. This situation, where 'everyone delivers everywhere', seems inefficient, not only from a transport perspective but also from a hall staffing viewpoint, as a reception staff member has to be available throughout the day to receive parcels. In this article we discuss how the use of a consolidation centre for incoming deliveries may be of benefit. We use Southampton as a case study and report on surveys of goods delivery audits and student surveys at both the University of Southampton and at Southampton Solent University to assess the extent of the problem and to gauge student attitudes towards a consolidated delivery service.

Growth in online shopping, along with demand from retailers and their customers for ever-faster deliveries, as well as an essentially unregulated marketplace, has led to a proliferation of carriers making duplicated trips every day. From a city authority's perspective, this creates added pressure on street performance with van traffic in London, for example, projected to increase by 20% by 2030 and traffic conditions worsening¹. Although freight consolidation centres have had a chequered

history with many being financially unviable, they remain an attractive proposition for authority's seeking to address environmental issues associated with transport. One such example is the Southampton Sustainable Distribution Centre² (SSDC), set up by Southampton City Council and run by Meachers Global Logistics (MGL) from their premises on the west side of Southampton (Nursling Industrial Estate) since February 2014. While current customers predominantly come from the private sector, the CITYLAB project³ has investigated whether large municipal organisations such as local authorities, hospitals and higher education institutes can also take advantage of the opportunities afforded by the SSDC. In this article we focus on Southampton's two universities and their halls of residence accommodating around 9,000 students.

The extent of the problem

Goods-in surveys at four University of Southampton halls with a total of 5,050 students took place over 6 days (9am to 5pm), immediately following the 2015 Black Friday sales event date (27/11/15). These surveys were restricted to deliveries of parcels and excluded deliveries of groceries and take-away food, which are perishable and thus would not be suitable for consolidation. A total of 3,504 parcels were delivered in 275 visits (average 12.7 parcels/visit) across the four halls and the biggest hall (1,900 students)

received between 14 and 18 visits each day (Figure 1); a small number of other visits had taken place outside the surveyed hours. The consolidation centre concept would aim to reduce multiple visits to a single visit to a university hall each day. The carriers making the most visits were: Yodel (29), DPD (26), Royal Mail (24), DHL (23), Hermes (20), Parcelforce (19), UPS (19), Amazon (16), Interlink (14), DX (13), with a total of 30 different carriers observed. From an analysis of vehicle registration plates, Amazon used the most vehicles (9), followed by Yodel (7), Hermes (6), Interlink (6), Parcelforce (5), Royal Mail (5), UK Mail (5), with other carriers using fewer vehicles.

A breakdown by courier showed that Royal Mail delivered the greatest number of parcels (834), followed by Hermes (556), Amazon (507), DPD (186), Parcelforce (166) and Yodel (118). Dividing the number of packages by the number of visits for each carrier and for each hall gave an indication of the level of efficiency of each operation. Most efficient, on this basis, was Royal Mail at Hall 1, who delivered an average of 94 parcels per visit, with their average across the four halls being 35 parcels per visit, followed by Hermes (25 parcels per visit), TNT (24) and Amazon (23); all other carriers averaged fewer than 10 parcels per visit.

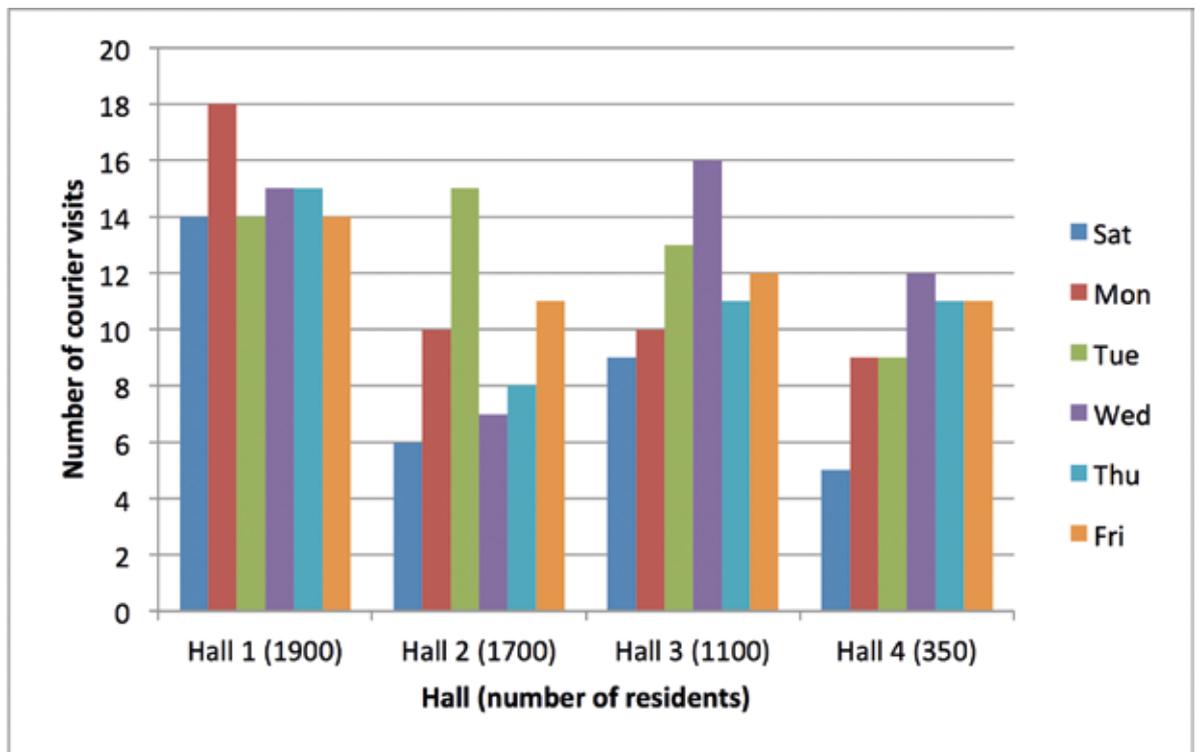
It should be borne in mind that >>

¹ <https://tfl.gov.uk/cdn/static/cms/documents/travel-in-london-report-8.pdf>

² <http://southamptonssdc.co.uk/>

³ www.citylab-project.eu

► Figure 1. Number of courier visits observed at four University of Southampton halls of residence between Saturday 28/11/15 – Friday 4/12/15, 09:00 to 17:00.



» the surveys took place during a particularly busy delivery period (the week after Black Friday): the annual data from Southampton Solent University indicated that delivery volumes during this week were around 2.2 times greater than the average week. These data also confirmed the observation made by a hall manager that parcel volumes are greatest just after students receive their grant cheques in October, January and just after Easter.

The surveys showed that couriers could arrive at any time during the day (Figure 2): at the biggest hall there were approximately the same numbers of visits before 1pm as after, while at the other three halls, there were around twice as many deliveries before 1pm as after. One of the main advantages of adopting a consolidated delivery service for halls post would be to move away from this continuous stream of deliveries to a single delivery at a designated time, allowing better time management.

Student attitudes and preferences

Our survey indicated that students typically selected 'standard delivery': 58% of the student sample stated that 90% of their purchases came that way; 14% indicated that they were regular users of next-day delivery services; same-day delivery was rarely used (86% said they had never used this service). Click-and-

collect in-store had been used by 44% of the sample but delivery to other collection points was not so popular: locker banks only used by 10% and convenience stores by 14% only. In general, students preferred cheaper options rather than speedier delivery options although next day delivery would be used where items were needed urgently (81% agree). The most popular time for collection of parcels from hall reception was stated as being from 5pm to 7pm, although that is likely an artefact of the university policy of sending out emails at 5pm to those students with parcels waiting for them.

Consolidation costs and benefits

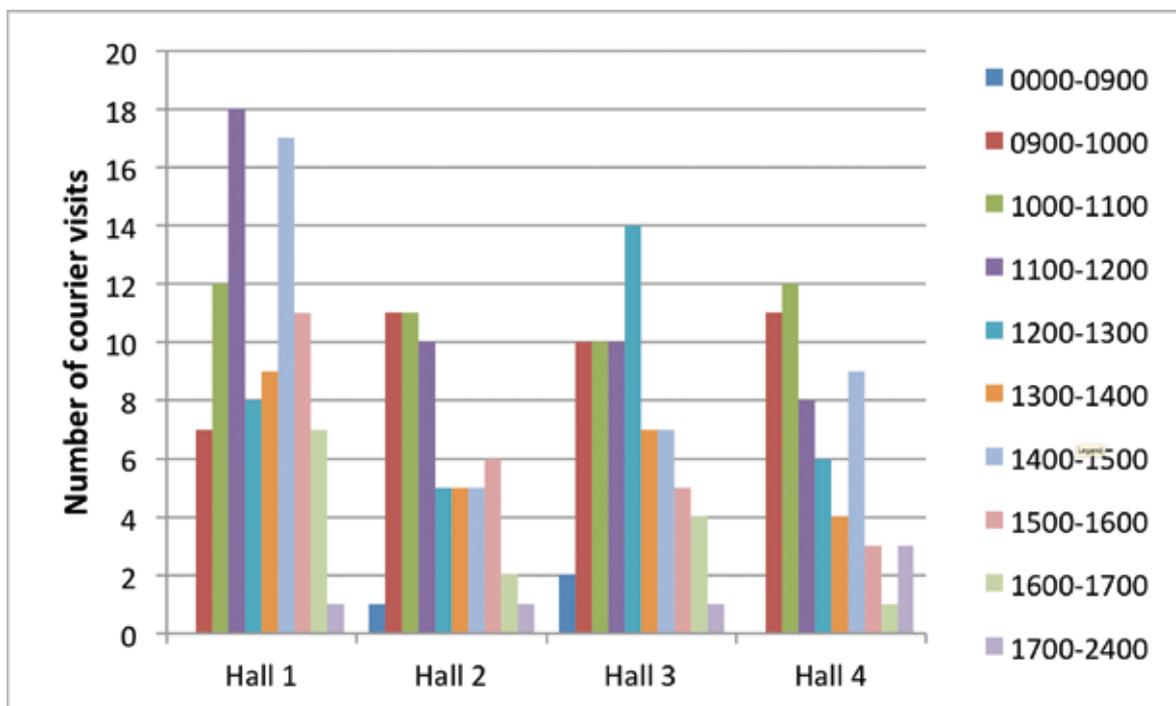
In the consolidation scenario, the hall's delivery address would be given as 'Hall Name, c/o SSDC address' and this would be reinforced by informing the major carriers, including Royal Mail, to redirect all participating hall deliveries via the SSDC. Parcels would be sorted at the SSDC into roll cages or other suitable containers for subsequent delivery. Each hall would receive a single delivery each day at a time agreed between the

hall manager and the service provider (MGL). The shortest vehicle route around the 14 halls, starting and ending at the SSDC, was estimated to be 32km, with a free-flow travel time, not considering delivery times or possible traffic delays, of 1 hour 11 minutes. Environmental benefits would be enhanced by the use of an electric vehicle for deliveries, a practical proposition here as the delivery round would be relatively short.

Consolidation costs are associated with: receiving and receipting packages from couriers; temporary storage; grouping packages by hall name and, optionally, sorting by student name, loading packages onto vehicles; daily delivery to halls (6 days a week and a 40-week academic year assumed). Consolidated deliveries to both universities in Southampton (14 halls with 8,886 students) would involve around 128,000 packages per year (= 14 per student per year) with an estimated volume of 4,194m³, derived from a category analysis of package sizes. This equates to a daily average delivery requirement of 17

▼ Table 1. Estimated consolidation cost

Item	Requirement	Daily rate	£ per day	£ per year (6 days/week x 40 weeks)
Driver and vehicle	10 hrs/day	£35/hr	350	84,000
Warehouse admin	14 hrs/day	£18/hr	252	60,480
Warehouse space	1,000 sq.ft	£0.06/sq.ft/ day	60	14,400
Total			662	158,880
Cost per student (=Total/8,886)			0.07	17.88



◀ Figure 2. Observed courier visits to University of Southampton halls of residence by time interval (Saturday 28/11/15 – Friday 4/12/15, 09:00 to 17:00).

to 18 roll cages which, depending on the delivery time requirements of the university halls, could be delivered using either a single 18-tonne rigid lorry or two smaller vehicles each day. Based on these data MGL estimated the cost of a consolidated service to be around £18 per student per year (Table 1).

A benefit of consolidation for halls would be the time saved by reception staff from receiving a single receipted and pre-sorted delivery rather than having to deal with multiple couriers arriving throughout the day. A time-and-motion assessment undertaken by a halls manager suggested that reception staff would save around two hours each day. Although consolidation inherently introduces an element of delivery delay, students may benefit from knowing that the consolidated delivery comes at a specified time of day. Another benefit would be that the average 56 different vehicles used to make deliveries to halls each day would be replaced by the one or two vehicles used by MGL. This would be most noticeable at the halls themselves, providing a more attractive and safer environment with fewer delivery vehicles on site. The wider environmental implications are difficult to assess and would depend on how couriers decide to restructure their delivery rounds to accommodate the new situation.

Practical issues and conclusions

Our survey findings suggest that consolidated parcel delivery would likely be accepted by students, as the vast majority of items are not required urgently and relatively few students will opt for premium delivery. This is advantageous from the perspective of a consolidated halls post service which would struggle to meet same-day or early morning next-day deliveries due to the time required for the consolidation process. However, some students will want text books or other items urgently for legitimate reasons, and it is questionable whether the student should, or could, be denied access to premium delivery services.

Consideration needs to be given to funding the initiative, raising questions about how to allocate costs relative to the benefits of a UCC scheme. Much therefore depends on how the cost-benefits are perceived by universities and local authorities involved. Costs could be recovered from students through halls fees and hidden from these end users, though there are arguable ethical issues here, since students will make differential use of the service. Some costs might also be apportioned to carriers who benefit from time savings through avoiding deliveries to congested urban areas; however, this benefit may not exist where carriers continue to make other deliveries in these

areas. An advantage of the SSDC is that it lies within the premises of an existing logistics company which means that the operator is not wholly dependent on successfully attracting users and can adjust space requirements to suit the demand.

A foreseeable challenge would involve ensuring that the new delivery address (i.e. that of the UCC) is used; establishing good communication with students and couriers will be essential. Previous research indicates that UCCs are successful only if the imposing organisation is able to control or strongly influence all the potential carriers and receivers of goods. Although universities have the opportunity to communicate with students, in reality they have little control over which address they use. The carriers involved will also be serving other addresses in the area and may have little incentive to divert parcels to the UCC. Another consideration is that the addition of a UCC adds slightly to the risk of loss or damage to items and a consolidation solution would need to address liability. Despite these issues, and given the need to work towards CO₂-free city logistics by 2030, such a concept would significantly reduce delivery vehicle activity around halls and should be given serious consideration to improve the local environment. ♦