



The impact of failed home deliveries on carbon emissions: Are collection / delivery points environmentally-friendly alternatives?

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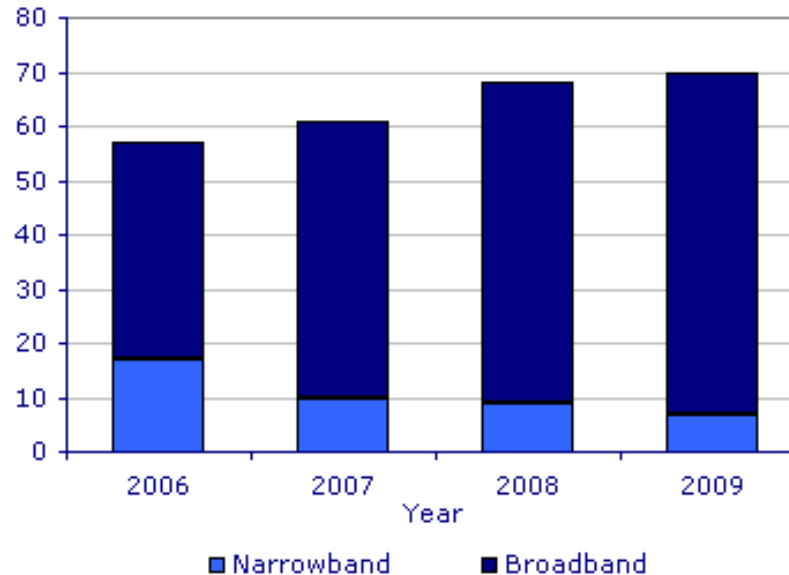
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Phenomenal growth in online shopping

- £22.9 billion spent online in the UK in first half of 2009 (IMRG)
- 69% of shoppers now shop from home (National Statistics)
- >11m Britons shop from home at least twice a week (Shopzilla.co.uk)
- 820 million parcels delivered in 2008 (IMRG)

UK households with internet access (Source: National Statistics, 2009)

Per cent with Internet



Online shopping: Is it environmentally-friendly? Consumers seem to think so...

Home shoppers give 'home shopping is good for the environment' an average score of 6 out of 10



Do you think that online shopping is more planet-friendly than shopping on the high street?

Yes 56%
No 44%



Online shopping: Is it environmentally-friendly? Some retailers seem to claim so...



ocado.com

15 for 1 offer

Each Ocado van takes up to 15 cars off the road.

Every time you see one of our vans, think of it as 15 people not going to the supermarket. So that's 15 to someone in your neighbourhood, so if you want to you can choose a green van! (we say, which helps make our journey even shorter. We also deliver directly from a purpose built fulfilment centre, rather than from a supermarket. If everyone shopped this way we would eliminate the carbon emissions from traditional stores, remove heavy goods vehicles from urban areas and free up precious land.

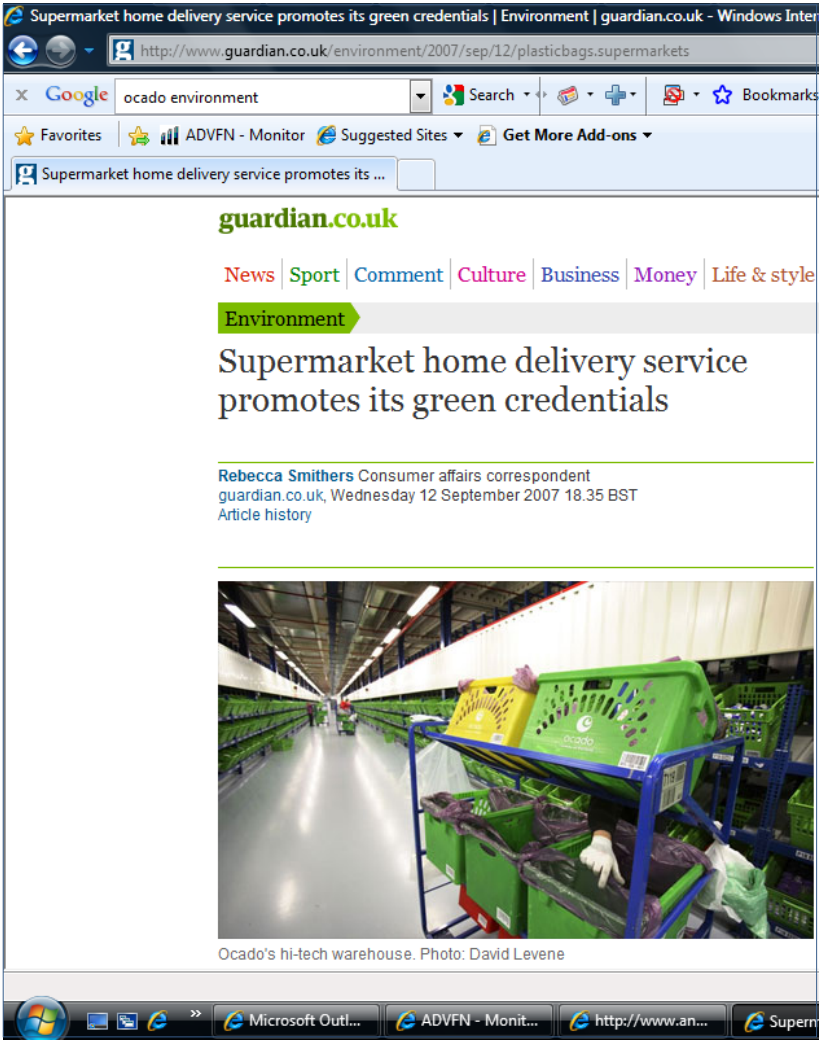
G Grocer Our customers trust us to do their shopping every bit as carefully as they do themselves. We carefully pick Waitrose groceries, we pack them properly and we drop them off in your kitchen. Maybe that's why we have been voted Online Retailer of the Year by The Grocer. So if you haven't tried us yet, why don't you give us a go this week and we'll give you 15% off your first order.* Just use VOU4415289 at checkout.

Isn't it time you demanded more?

Ocado – Online Retailer of the Year 2007.



Evening Standard, 20 June 2007



Supermarket home delivery service promotes its green credentials | Environment | guardian.co.uk - Windows Inter

http://www.guardian.co.uk/environment/2007/sep/12/plasticbags.supermarkets

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Environment

Supermarket home delivery service promotes its green credentials

Rebecca Smithers Consumer affairs correspondent
guardian.co.uk, Wednesday 12 September 2007 18.35 BST
Article history



Ocado's hi-tech warehouse. Photo: David Levene

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The Guardian, 12 September 2007

But then there is the dreaded failed delivery...



“I’ve been internet shopping”

Failed delivery: the consequences

- The customer is inconvenienced;
- The carrier incurs additional costs;
- There are wider environmental impacts, owing to additional vehicle trips.



"Anyone who believes that time is merely an abstract concept, never waited in all day for a delivery..."

Research aims of this study



To assess (on a per drop basis):

1. Additional gCO_2 produced when a failed parcel requires re-delivery by the carrier;
2. Additional gCO_2 produced when a customer travels to the local depot to collect an undelivered order;
3. gCO_2 savings from the use of alternative collection / delivery points (C/DPs).

Do delivery concerns ever prevent you from shopping online?

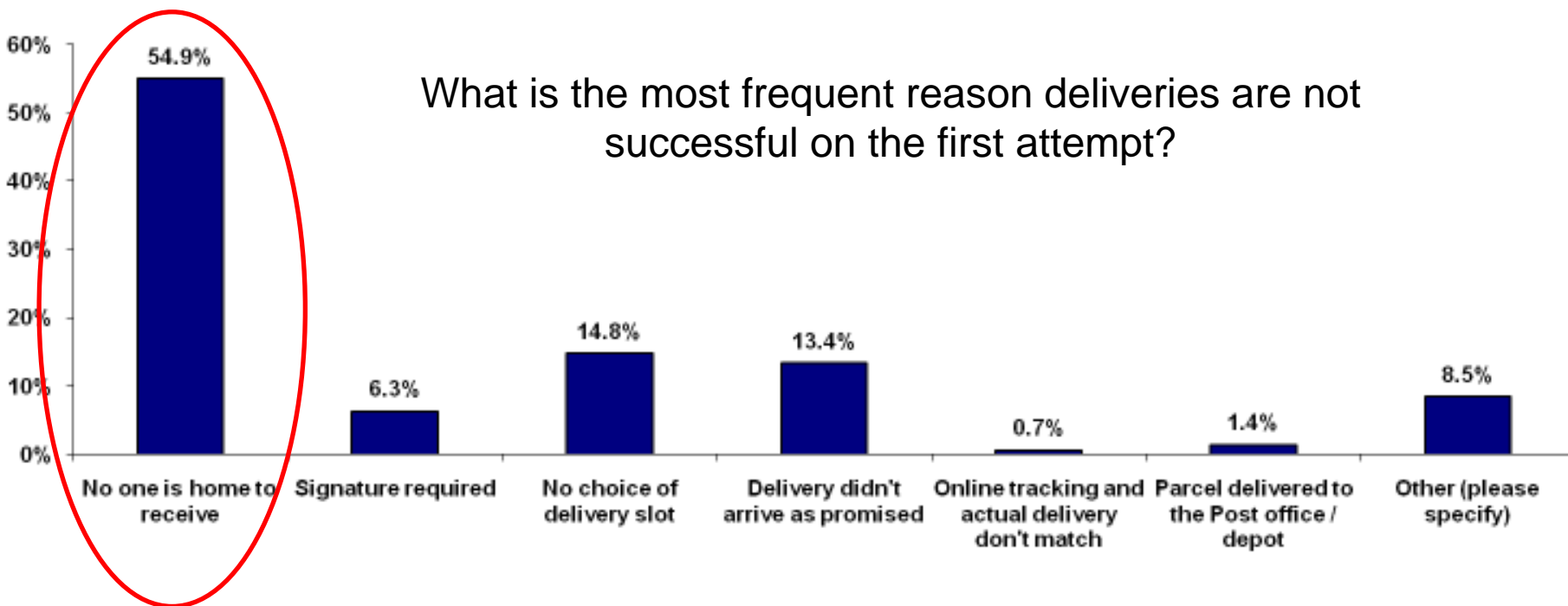
YES 31%

NO 69%

Have you ever had an inconvenient delivery?

YES 35%

NO 65%



Is there normally someone at home to receive deliveries in the daytime?

YES 75%

NO 25%

Research Aim 1: Delivery failure rate

First-time delivery failure rate: assumptions

10%	after Weltevreden & Rotem-Mindali (2008) & IMRG (2008)
30%	after McLeod & Cherrett (2006), Song <i>et al.</i> (2009) & Belet <i>et al.</i> (2009)
50%	after Retail Logistics Task Force (2001)

Second-time re-delivery failure rate: assumptions

50%	after McLeod & Cherrett, (2009)
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Would you be happy for a neighbour to sign on your behalf?

YES 84%

NO 16%

Successful first-time delivery: Emissions for an average non-food home delivery



Assumptions

Round trip (miles)	50
Drops per round	120
Items per drop	1

CO₂ per drop

181g

* Average values, calculated from 4 sources: Defra; NAEI; FTA; RHA

Failed delivery: Emissions (gCO₂) per item



	100% successful first-time delivery	10% failure rate	30% failure rate	50% failure rate
Home delivery	181g	199g	235g	271g

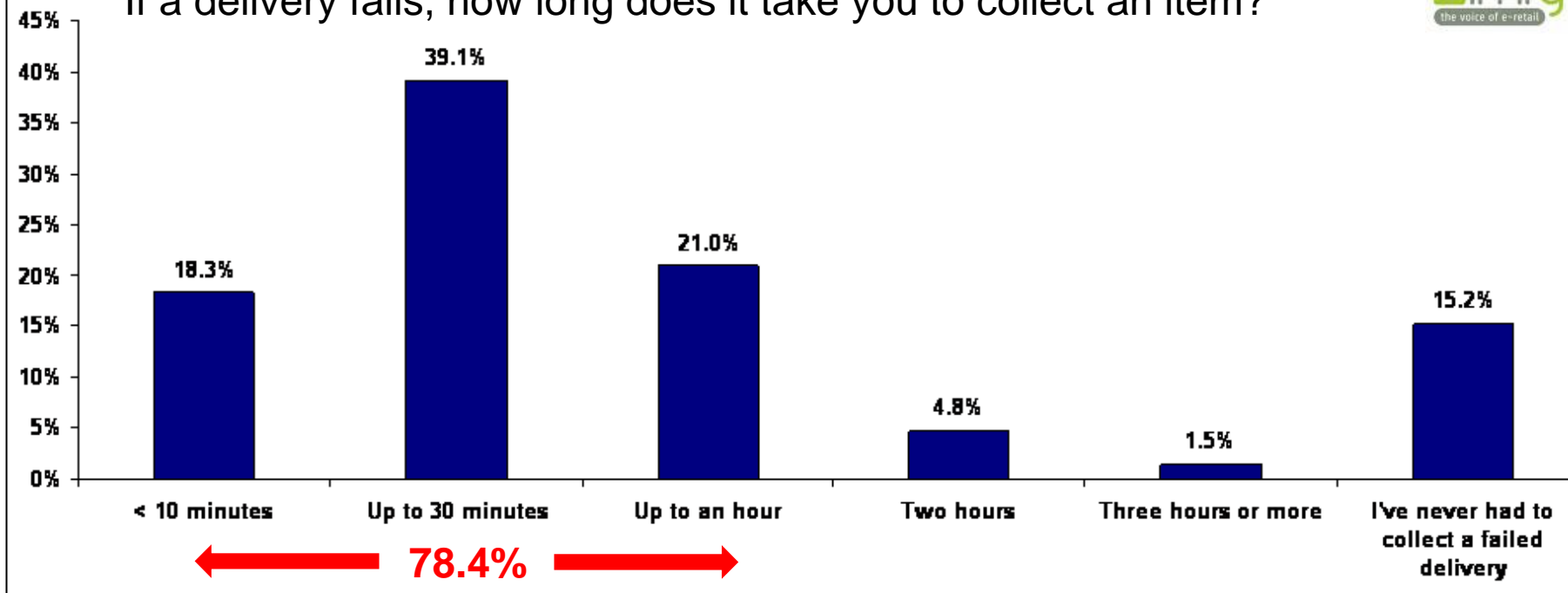
First-time delivery failure “as a delivery for which a signature cannot be obtained, either from the customer or a designated customer representative, & this results in the customer's address being carded & the item returned to the delivery depot for either redelivery or customer collection”. (IMRG, 2008)

Re-delivery factoring in a 50% failure rate: Emissions (gCO₂) per drop

	First delivery attempt failure rate (plus 50% 2 nd delivery failure)		
	10% failure rate	30% failure rate	50% failure rate
gCO ₂ per drop	208g	262g	316g
% increase over base case	15%	45%	75%

And when the 2nd delivery attempt fails...

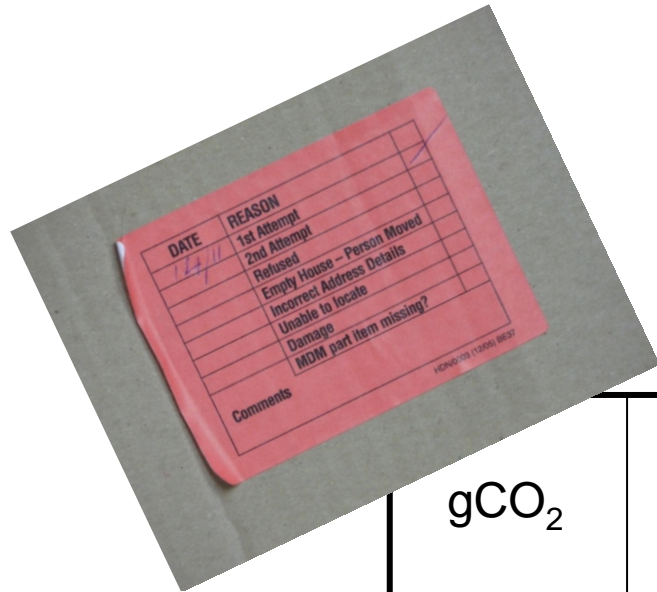
If a delivery fails, how long does it take you to collect an item?



Distance to local depot & trip chaining: Research assumptions

15km	after Clements (2005)
25km	after McLeod & Cherrett (2009)
40km	after Song <i>et al.</i> (2009)
50%	distance allocated to collection of failed delivery (realistic assumption)

Research Aim 2: Emissions (gCO₂) per consumer trip to a local depot to collect an undelivered order

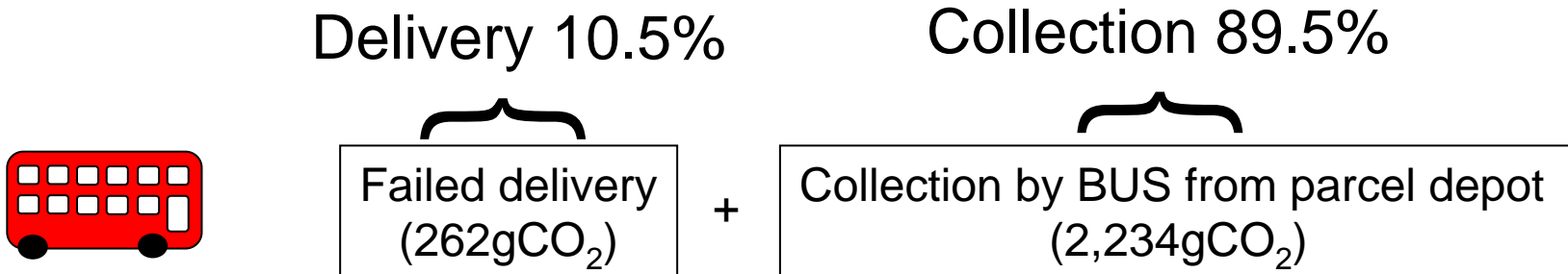
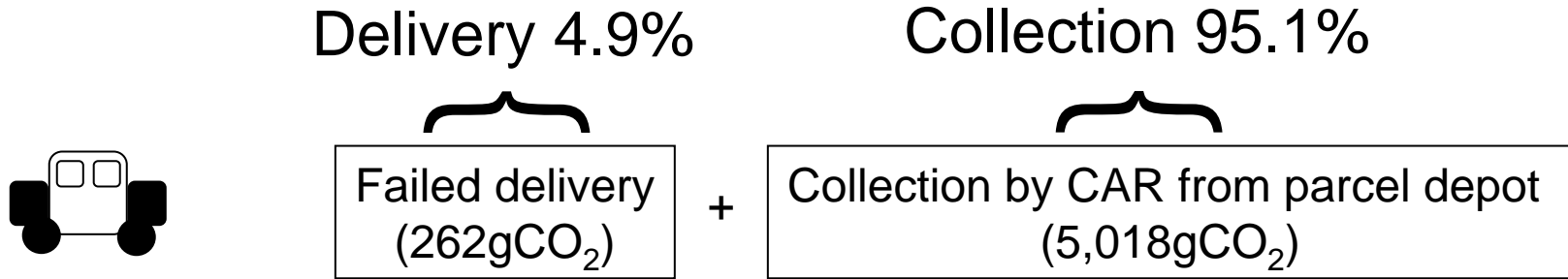


gCO ₂	Distance to local depot		
	15km	25km	40km
Car	3,113g	5,188g	8,300g
Bus	1,340g	2,234g	3,574g

26 re-delivery attempts



Research Aim 2: Emissions (gCO₂) per delivery & consumer trip to a local depot (%)



Assumes:

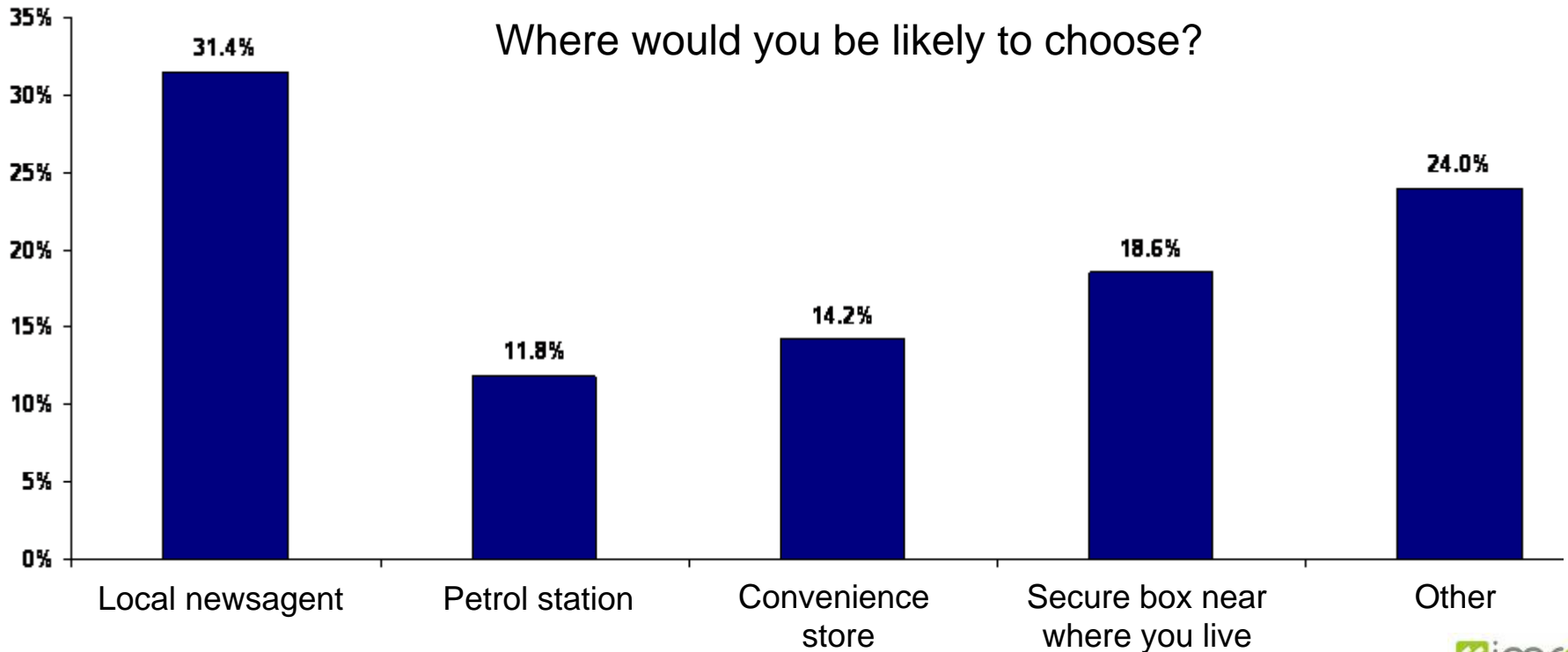
30% of first-time failed deliveries fail and 50% of second delivery attempts also fail;
A customer travels 25-km to a local depot to collect an undelivered order

Alternative collection / delivery locations (C/DPs)

Would you opt for a delivery location option of your own choice?

YES 40%

NO 60%



Research Aim 3: Location, distance & advantages of C/DPs

Location	Distance (km) from av. consumer's home	Advantages
Tesco Extra	6.5	24-hr opening times, familiarity, regular destination
Other supermarket	1.6	Extended hours, proximity, regular destination
Average supermarket	4.0	24-hr / extended hours, regular destination
Post office	1.2	Proximity, familiarity, regular destination
Railway station	3.2	Convenient for rail users / daily commuters



Research Aim 3: Emissions savings (%) per consumer trip to alternative C/DPs versus traditional delivery

Location	CO ₂ per av. drop (incl. additional km to C/DP)	CO ₂ for consumer trip to C/DPs		% CO ₂ per C/DP compared with traditional delivery
		Car	Bus	
Tesco Extra	204	1,349g	581g	47%
Other supermarket	186	332g	143g	16%
Average supermarket	195	830g	357g	31%
Post office	185	249g	107g	13%
Railway station	192	664g	664g	26%



1. Additional CO₂ from the second delivery attempt increased the emissions per drop by between 9 - 75%.
2. Vast majority of emissions associated with traditional failed delivery arise from the personal trip to the local depot. (Worst case scenario equivalent to 26 re-delivery attempts by delivery van).
3. Supermarkets, railway stations & post offices each offer distinctive benefits for consumers, & all lessen the CO₂ emissions from failed home deliveries. (Post offices, owing to their extensive network, present the greatest savings).

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