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Tel: 01295 758875 www.aricia.ltd.uk lateral and logistical thinking

COLD CHAIN FEDERATION

Adapting to Change: Designing for Net Zero

Kirsten Tisdale FCILT

9 October 2020

Agenda

- Setting the scene
- Reimagining scheduling
- £ and CO2 savings - case study
- Cities & logistics
- Reimagining location planning
- Benefits of bulk
- Incentivising change

Adapting to change: the Covid revolution

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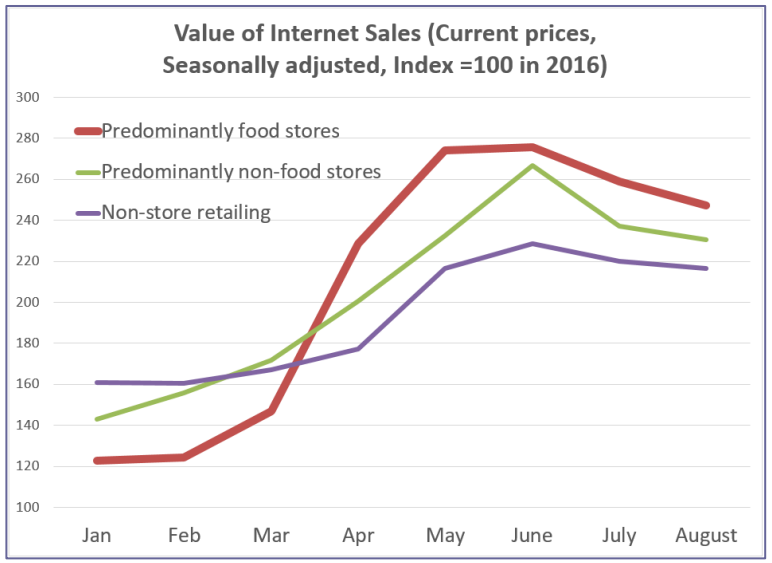
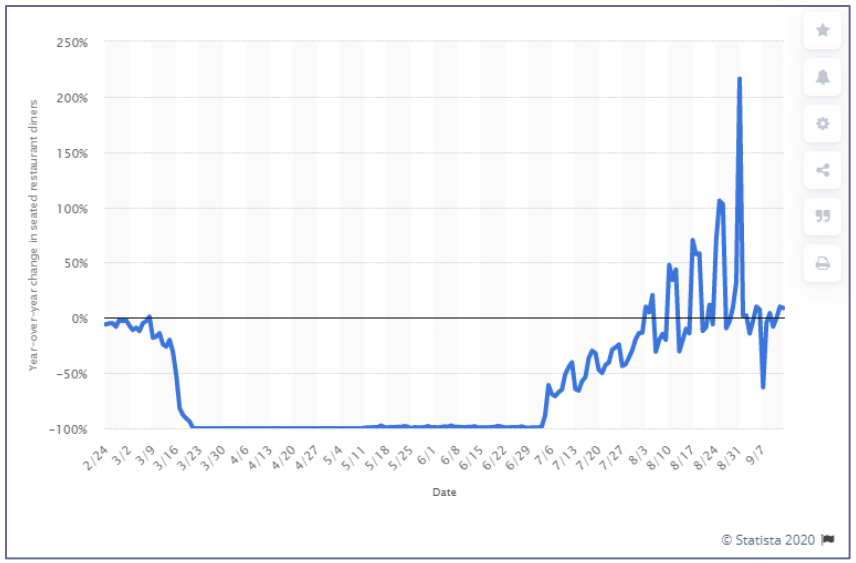
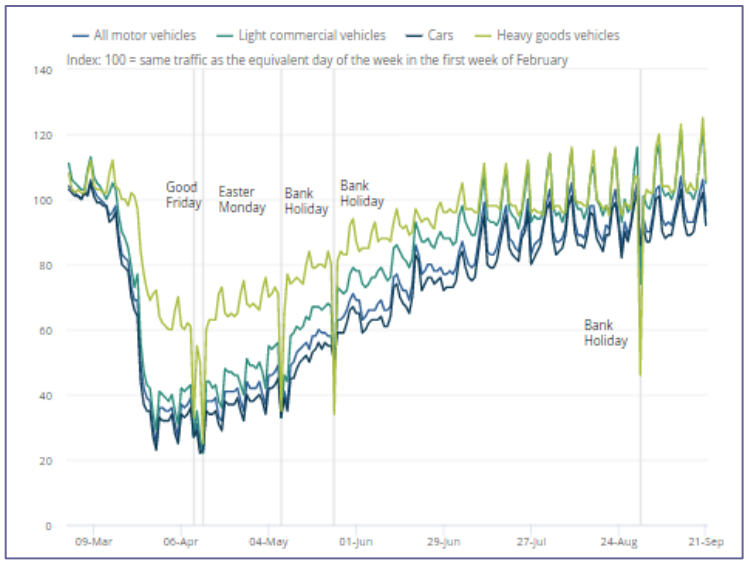
Online sales ↓



Restaurant visits ↓



Mileage ↓ HGV=green



As Lenin may, or may not, have said:

"There are decades where nothing happens, and there are weeks where decades happen"

http://bit.ly/CCL_Online | http://bit.ly/CCL_EatingOut | http://bit.ly/CCL_Mileage | http://bit.ly/CCL_LeninPic

Net Zero - an even greater Mega-Challenge

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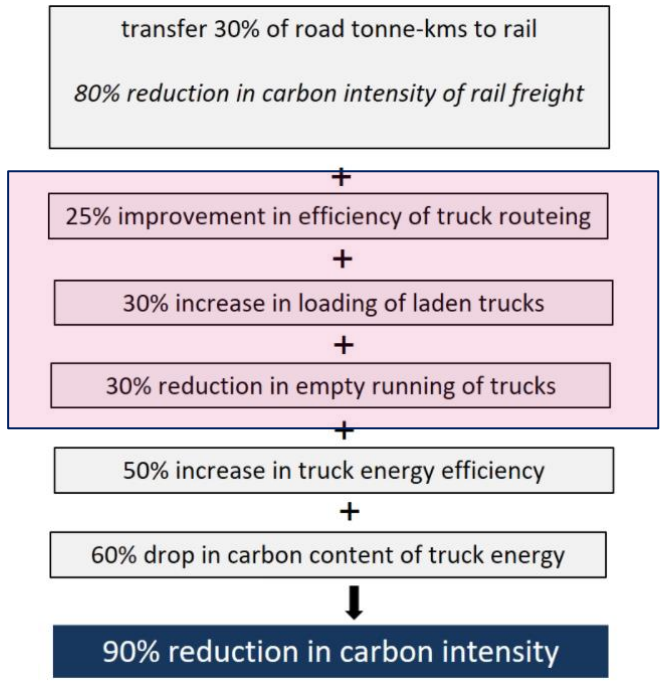
- Cold Chain Federation members will be ahead of many others on awareness
- 2008 Climate Change Act:
  - Legally binding target
  - Reduce UK greenhouse gas emissions
  - By *at least* 80% by 2050, relative to 1990 levels
- 2019, the Committee on Climate Change recommended a new emissions target for UK:
  - *Net-zero* greenhouse gases by 2050…

- Road freight is acknowledged as one of the harder areas to tackle:

"…it is possible to get to very-low emissions by 2050 by switching most of these vehicles to hydrogen power or electrification. A hydrogen-based switchover would require 800 refuelling stations to be built by 2050 and electrification would need 90,000 depot-based chargers for overnight charging."

"The Government will need to make a decision on the required infrastructure for zero emission HGVs, with international coordination, in the mid-2020s ready for deployment in the late 2020s and throughout the 2030s."

- In Cold Chain Live last week Prof Alan McKinnon set out elephant steaks – all of which are tough…



- …and don't get us there!

http://bit.ly/CCL_CCC | http://bit.ly/CCL_AlanMcKinnon

Reimagine scheduling for CO2/energy use

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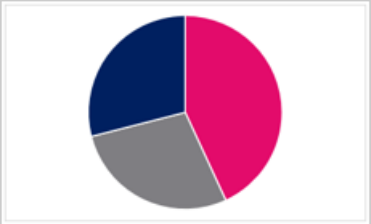
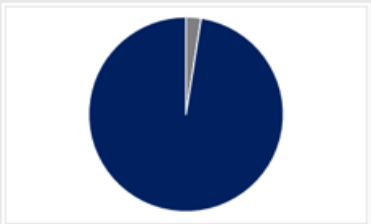
> Optimisation of what? Scheduling has always been a balancing act: Geography, Loads, Vehicle type & payload/capacity, Time windows, Speed, Traffic, Delivery delays… but that balance will change

Scenario	Optimise	Proportions	Limiters	Focus
ICE £	Driver Vehicle Diesel		Hours Payload	Overall Cost Customer satisfaction Timed deliveries
ICE CO2	Vehicle Diesel		Hours Payload Legislation?	Whole life carbon footprint Distance & MPG Avoid CO2-heavy deliveries? New KPIs
EV/H/??	Driver Vehicle Energy?	?	Hours Payload Range?	Cost & Customer satisfaction Timed deliveries Distance inc review backloads

Due to higher lifetime mileages, the use phase dominates life cycle CO_2e emissions for medium and heavy duty trucks. Embedded CO_2e from vehicle production and end-of-life only accounts for c.1-4% of total vehicle life cycle CO_2e emissions

Road freight – saving diesel, saving £, saving CO2

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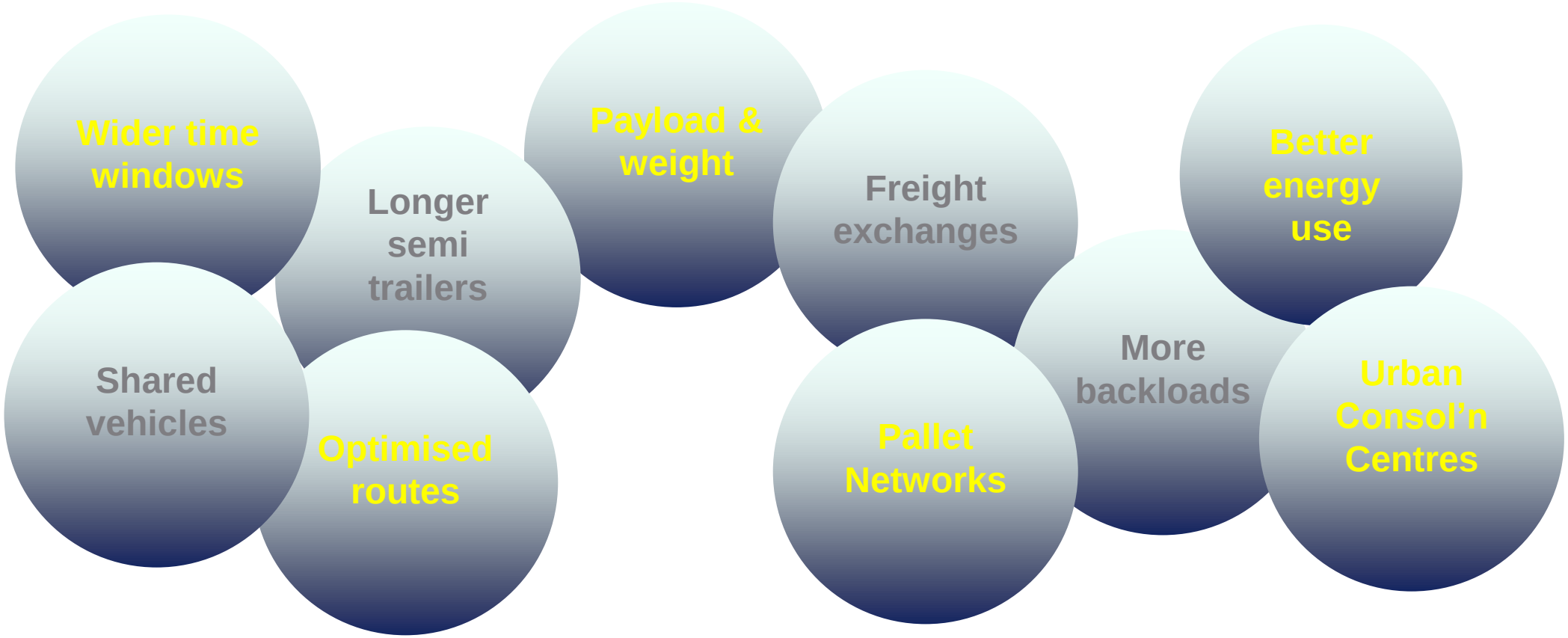
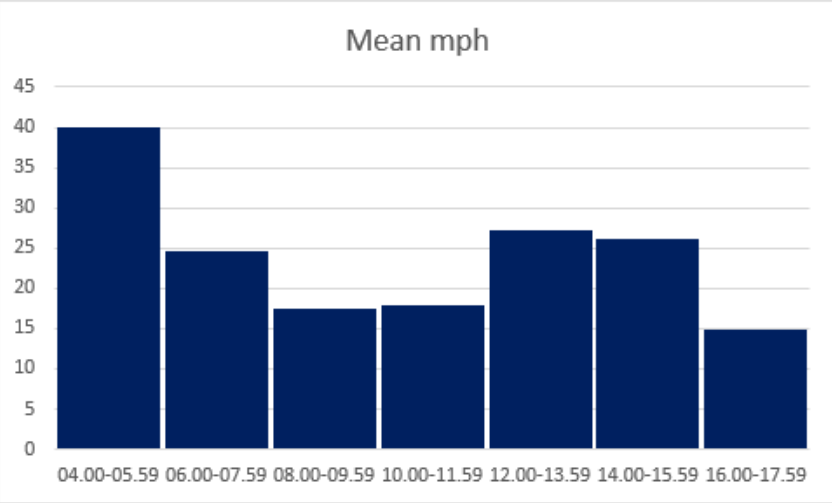
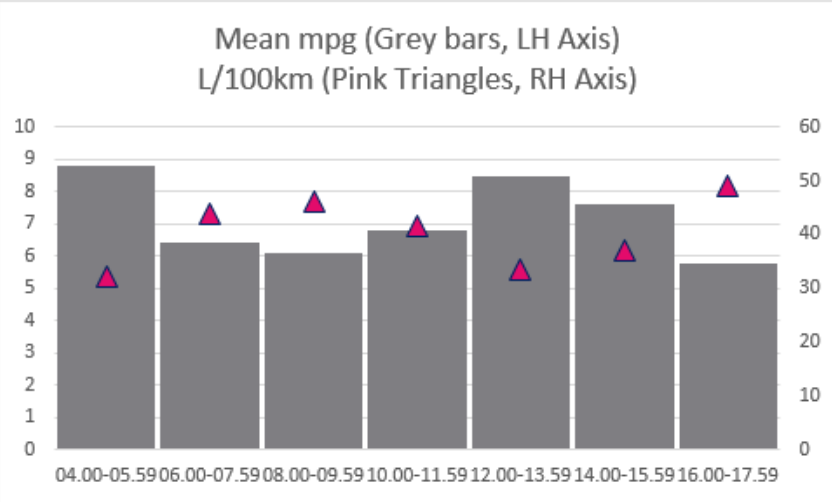


> There are many steps we can continue, or start taking, which help both £ and CO2

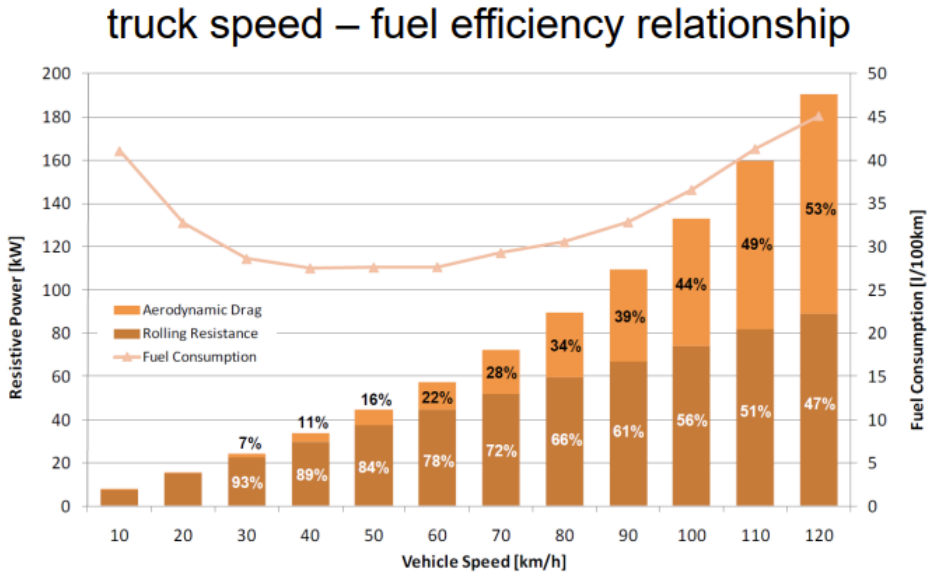
> Some of which can be taken forward to EV, Hydrogen, Cargobikes…

Case study – telematics analysis – urban multi-drop





> Orange line: speed v consumption in L/100km (AEA Technology et al)



Source: AEA Technology et al (2010)

> Recommendations tend to concentrate on the RH side of the orange line – 'down-speeding' – slowing trucks down

> But the LH side of the line argues for 'up-speeding' - ie reducing congestion, reviewing traffic calming, night time deliveries…

> An off-peak delivery pilot in London pointed to 48-62% less CO2

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Case study – matters arising

- In the telematics case study, the vehicles were doing very low mileage, but filling up every day
- 2007 study: "…fuel consumption increased on average by 0.112 miles per gallon for every tonne of payload added."
- Small, but immediate, improvement opportunity

- Review any excess weight:
  - Unnecessary fuel
  - Ancillaries eg tail-lifts, spare wheel on vans…
  - Don't over-spec vehicles
  - Heavy drops late in schedule, because of time windows
  - Transit equipment - 26 stacks like this pic -> 6x28kg-> nearly 4.4T extra @ 0.112mpg -> c0.5mpg

6 →
5 →
4 →
3 →
2 →
1 →
OK!→

http://bit.ly/CCL_Payloadmpg | http://bit.ly/CCL_PalletPic | http://bit.ly/CCL_ChepSpec

Cities & logistics go hand in hand

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Cities are often where they are & have grown because of logistics

The London Times in 1894 may, or may not, have said:

"In 50 years every street in London will be buried under nine feet of manure."

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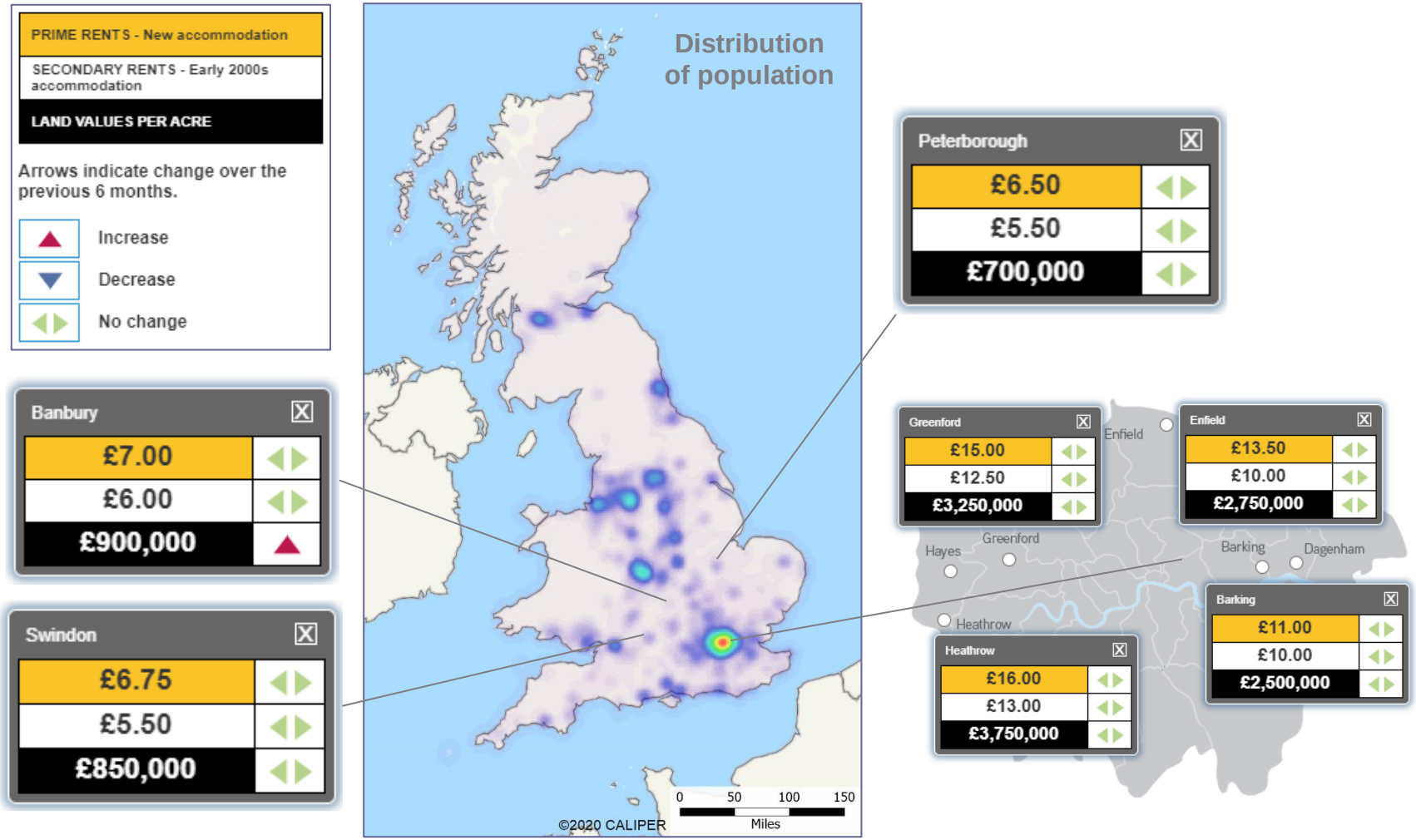
Logistics locations versus population



- Land values (and availability & permissions) strongly influence and distort optimisation of current logistics locations for transport energy/CO2 as well as for service
- Much mileage is currently less efficient than possible
- But we've not always been the best neighbours
- As energy becomes quieter and cleaner, do logistics facilities become less likely to invite objections?

http://bit.ly/CCL_RentPerSqft

Reimagine this classic graph for CO2/energy use

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Optimisation of what?

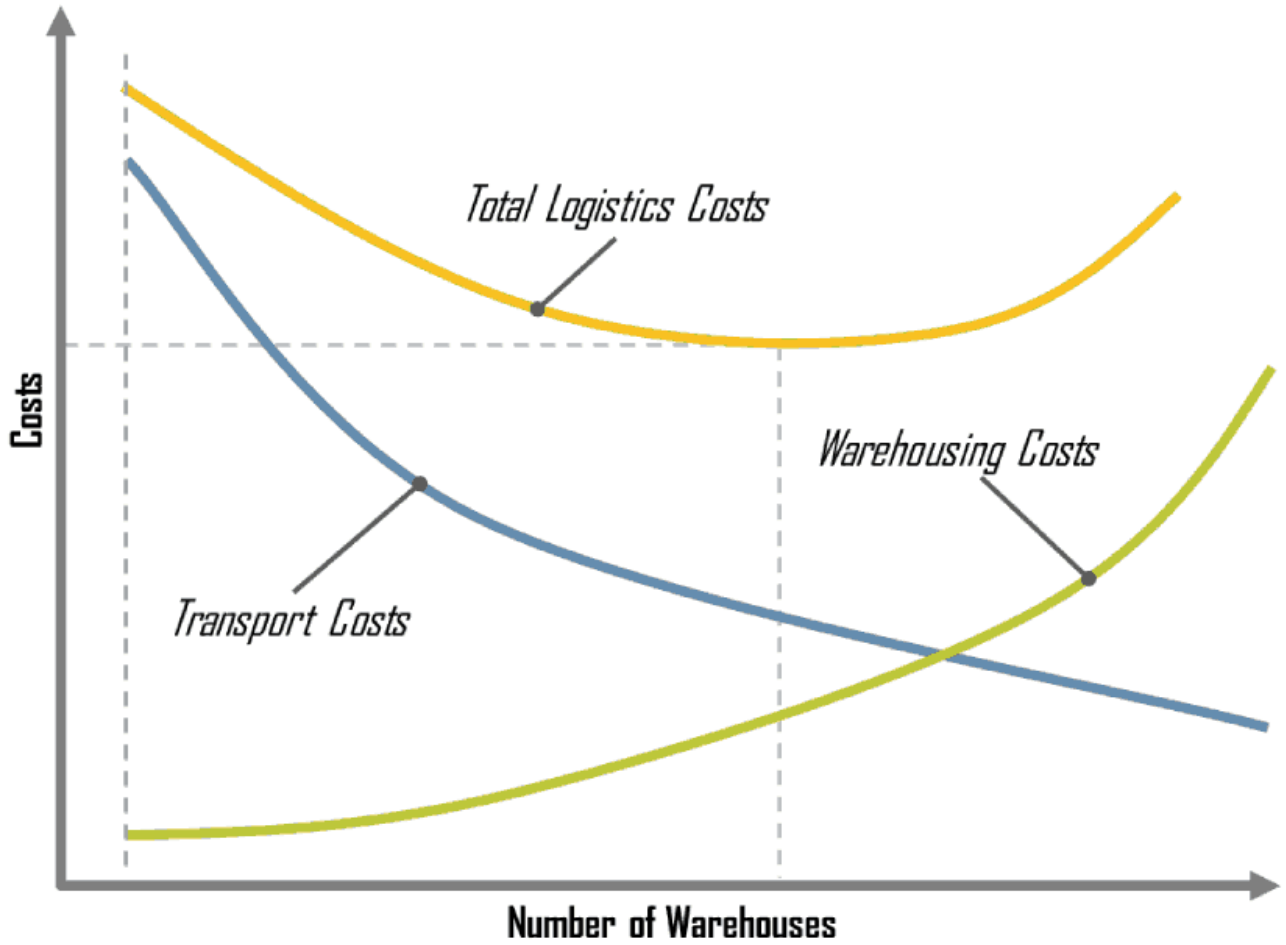
Classic graph of costs:

> Warehousing = locations + inventory
> Transport = trunking + delivery
> Logistics = traditional trade-off

The trade-off changes:

> Cost v service v range v energy, including the energy for change

And the volumes are important - trunk vehicles need to be full…



http://bit.ly/CCL_TradeOffs

The further you can get it in a fully loaded artic…

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Vehicle type	ppm inc 'profit'	Scenario	One or two way (1=With Backload)	Pallets	ppm per pallet per outward mile	ppm - fuel only	ppm per pallet per outward mile - fuel only
7.5T (60K mpa)	129	Only 60% Full	2	6	43.0	30.2	10.1
		100% Full	2	10	25.8		6.0
44T (80K mpa)	186					60.5	
Tri-axle Trailer	11						
	197	Full, single stacked	2	26	15.2		4.7
		Full, double stacked	2	52	7.6		2.3
Plus extra trailer	208	Full, double stacked, drop & swap	1	52	4.0		1.2

NB Costs from Motor Transport December 2019 Cost Tables - so not refrigerated, fuel at 113.2ppl, and ignores impact of extra weight on mpg!

- Say your operation in Banbury is delivering 260 pallets weekly into central London in full 7.5T:
  - 78 miles x2 ways x30.2ppm x26 loads -> £1225 in fuel pw
- But, you open an outbase in Greenford:
  - Trunking: 67 miles x2 ways x60.5ppm x10 loads -> £811 fuel for trunking in full, single stacked no backload artic
  - Local: 11 miles x2 ways x30.2ppm x26 loads -> £173 for local delivery in full 7.5T
  - £984 total fuel cost = c20% saving of fuel cost & CO2 …but there are other considerations

Cities & logistics go hand in hand

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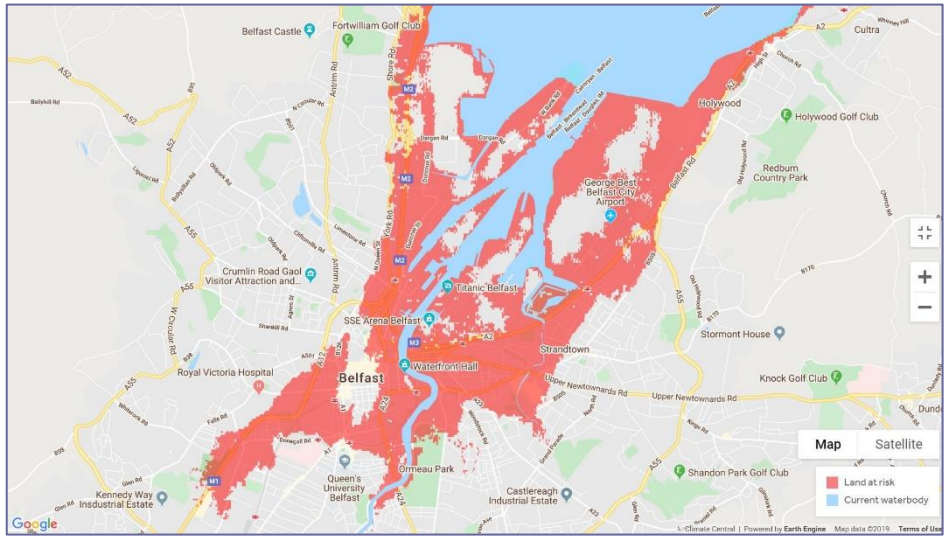

> Many UK and international cities are coastal and based on great rivers
> What happens to established cities and their logistics as sea levels rise?

http://bit.ly/CCL_Cardiff | http://bit.ly/CCL_RagDoll | http://bit.ly/CCL_Belfast

Incentivising & enabling net zero

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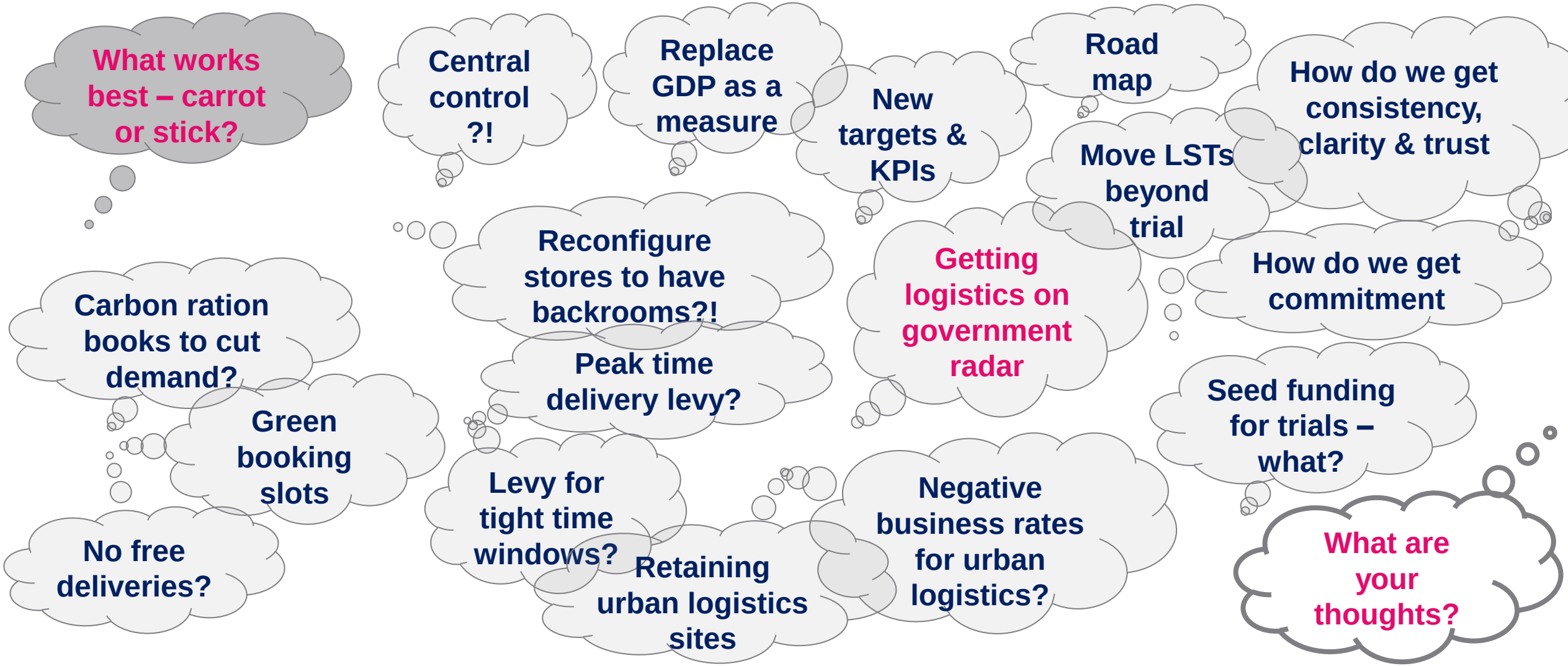

http://bit.ly/CCL_NZTB | http://bit.ly/CCL_Planning

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Thank you

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Do feel free to follow or link:

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