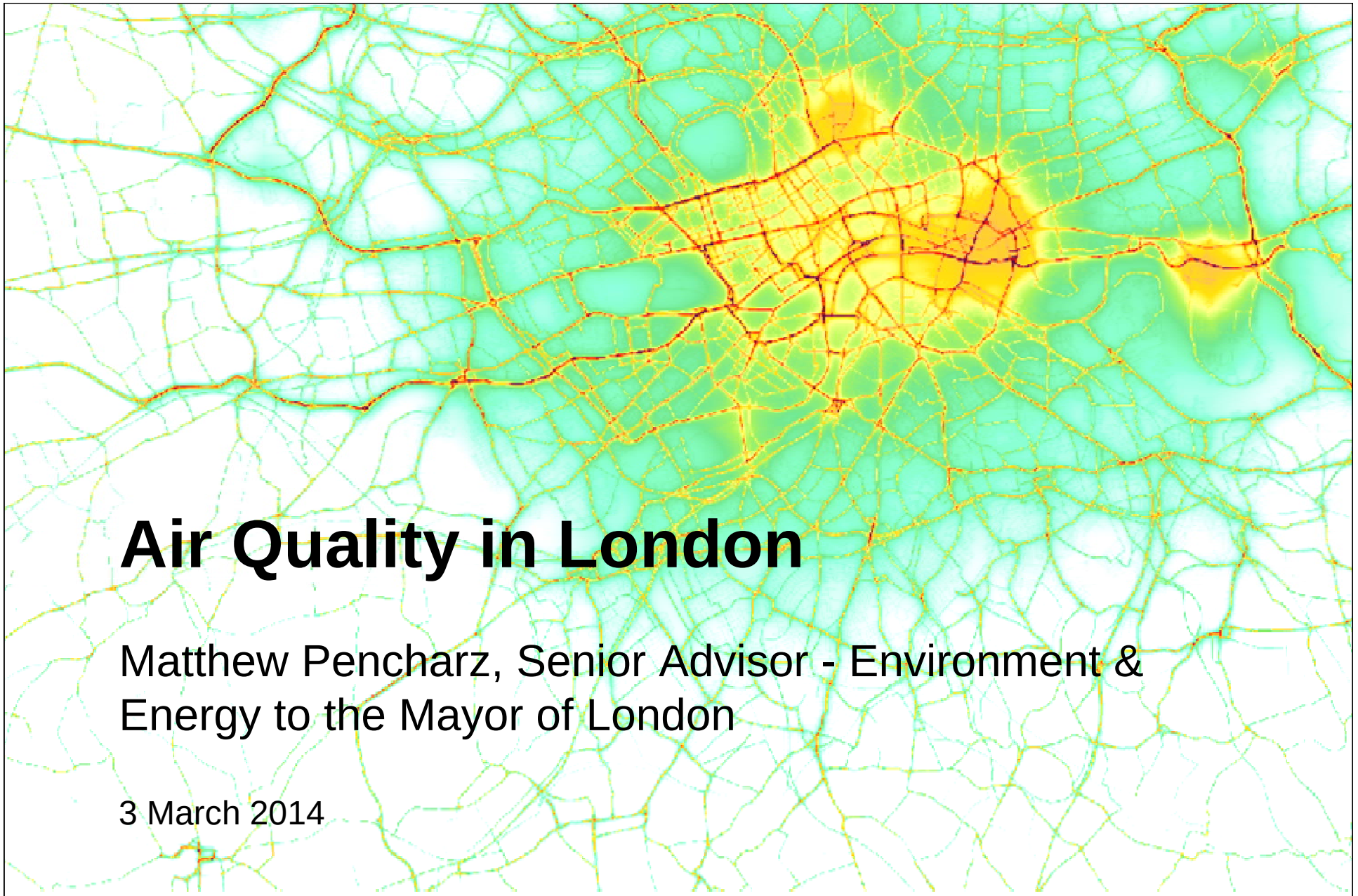


Air Quality in London

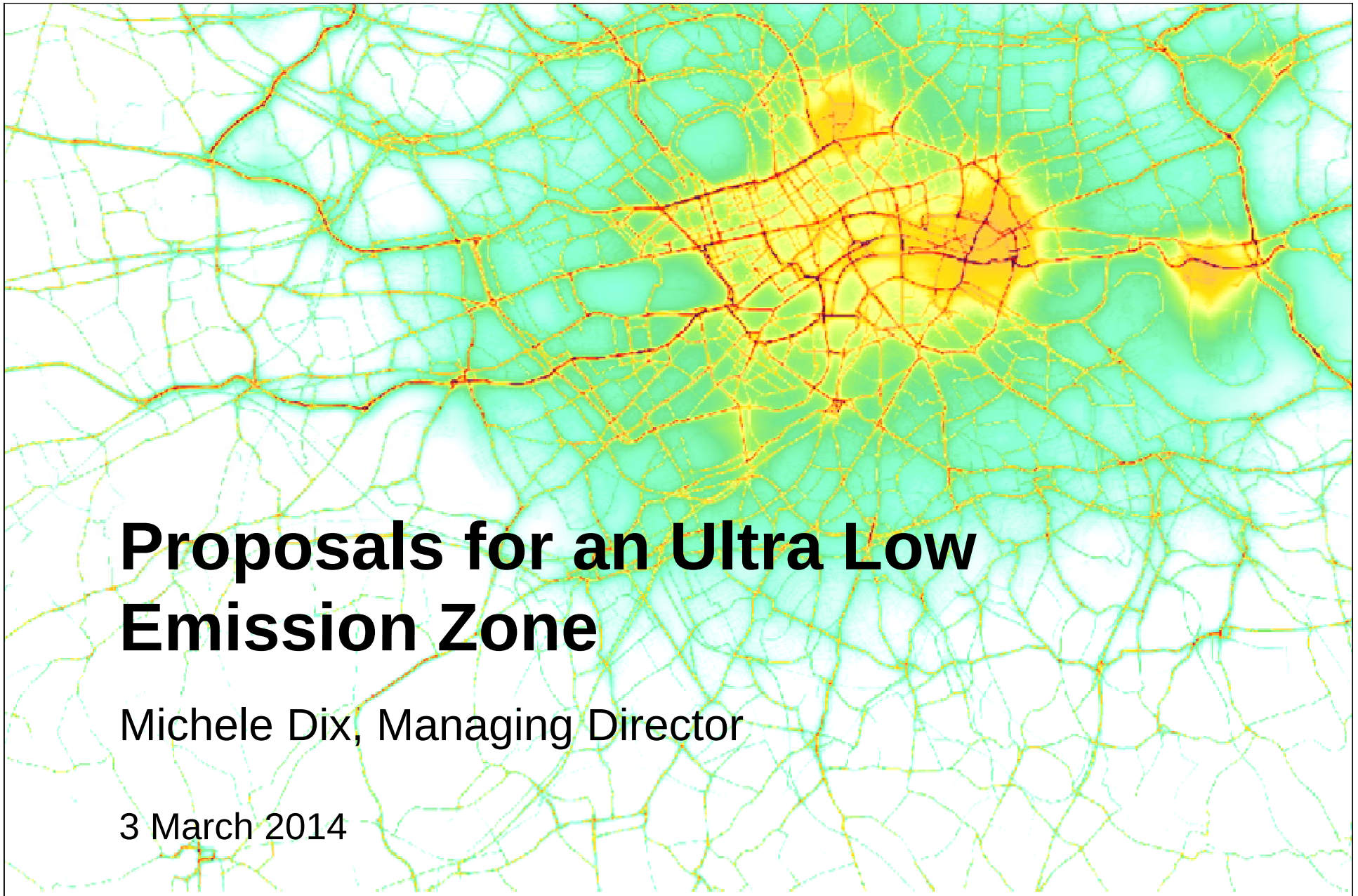
Matthew Pencharz, Senior Advisor - Environment & Energy to the Mayor of London

3 March 2014

MAYOR OF LONDON

CLEANERAIR FOR LONDON

TRANSPORT FOR LONDON
EVERY JOURNEY MATTERS



Proposals for an Ultra Low Emission Zone

Michele Dix, Managing Director

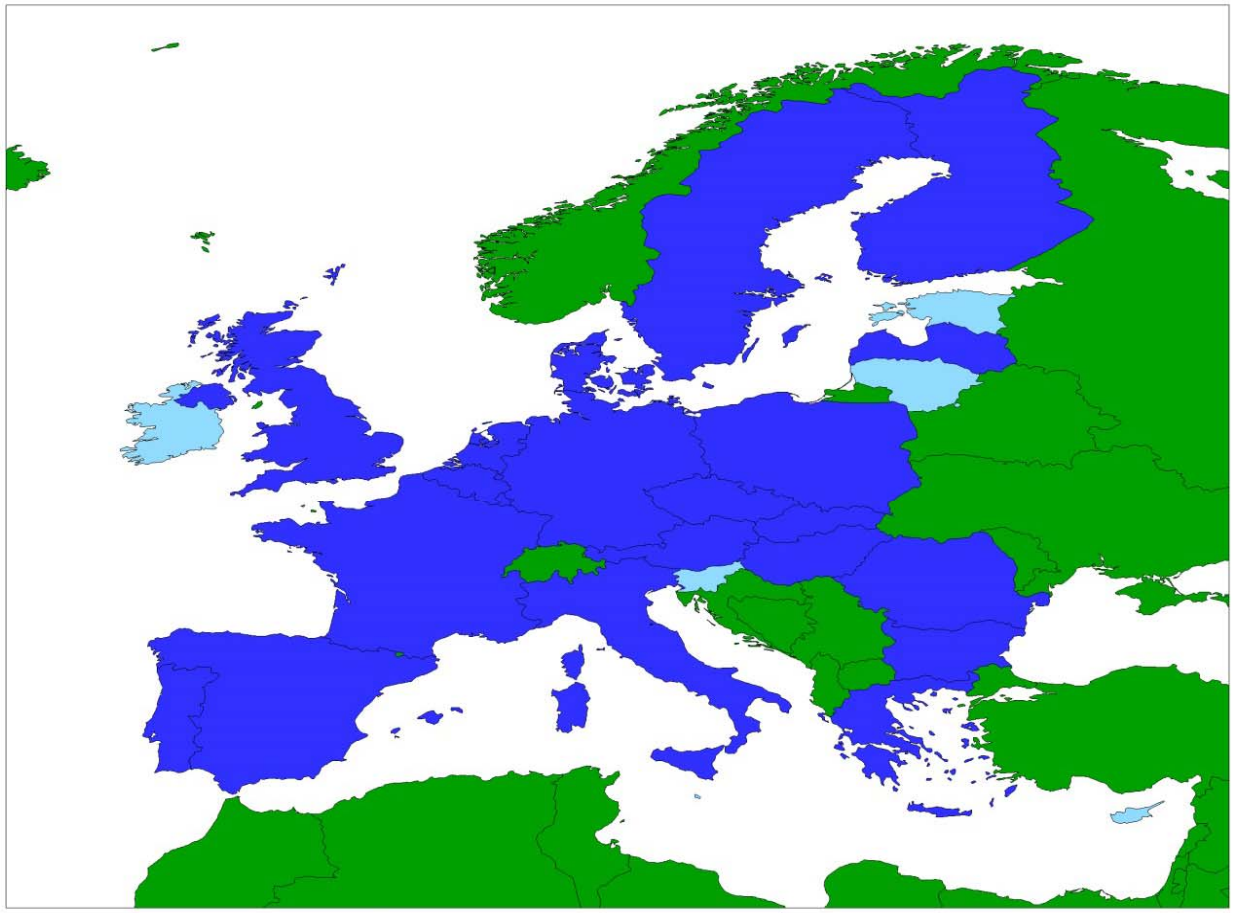
3 March 2014

MAYOR OF LONDON

CLEANERAIR FOR LONDON

TRANSPORT FOR LONDON
EVERY JOURNEY MATTERS

NO_2 – a Europe-wide problem

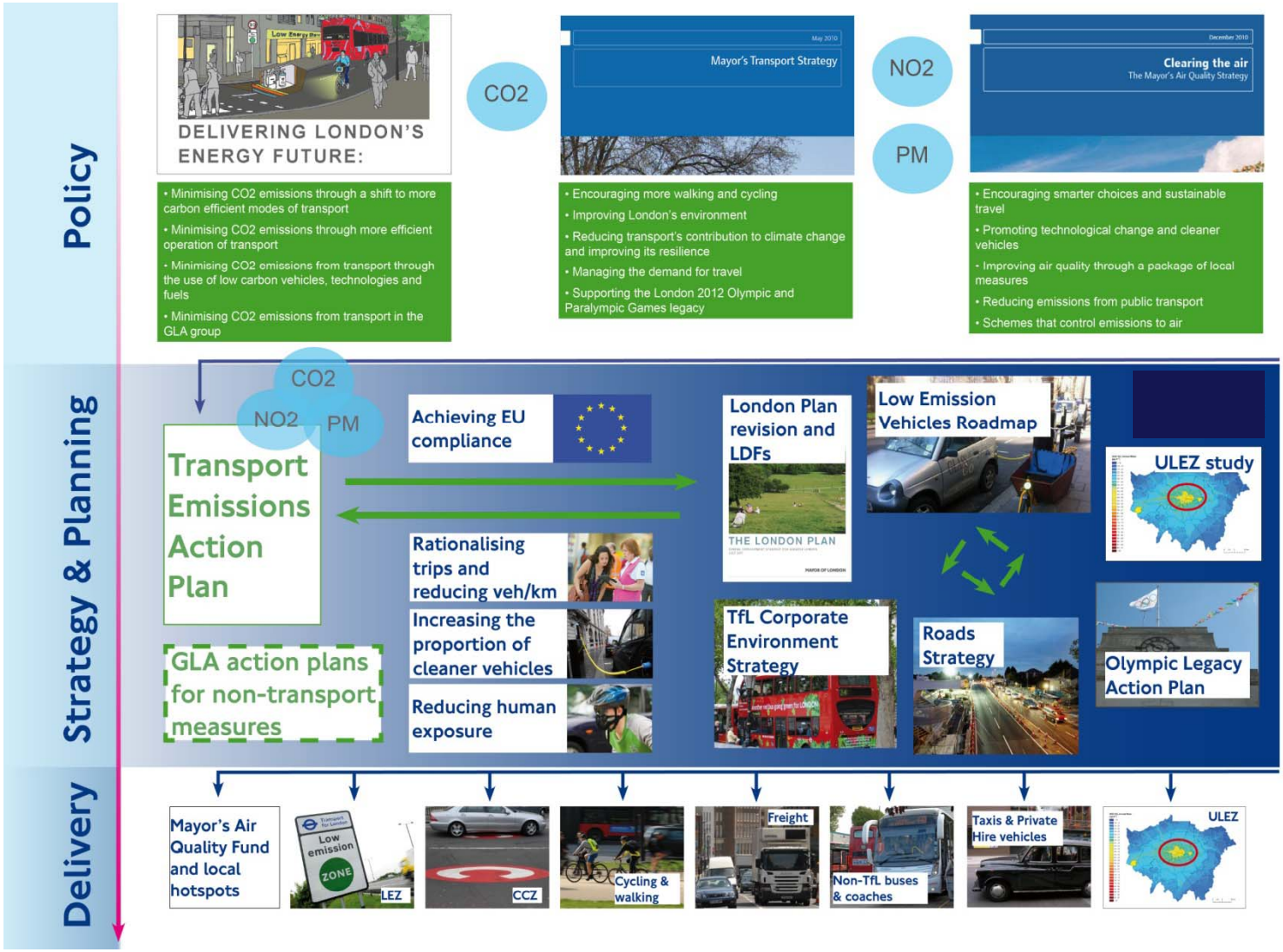


Key

- Non-EU countries
- Compliant EU countries
- Non-compliant EU countries

Map showing EU member states which exceeded annual NO2 limit values in 2012

Policy context



Why an Ultra Low Emission Zone?

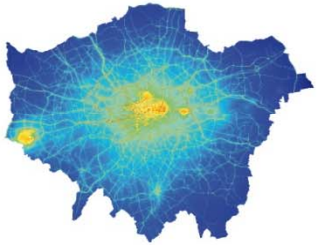
Meeting London's challenges

MTS

CCMES

MAQS

Addressing the NO_2 problem



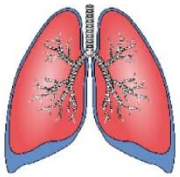
Reduce air pollutants from road transport

Reduce CO_2 emissions from road transport

Promote sustainable travel

Stimulate low emission vehicle market

Improving public health



Contributing to climate change mitigation

Increasing the proportion of low emission vehicles

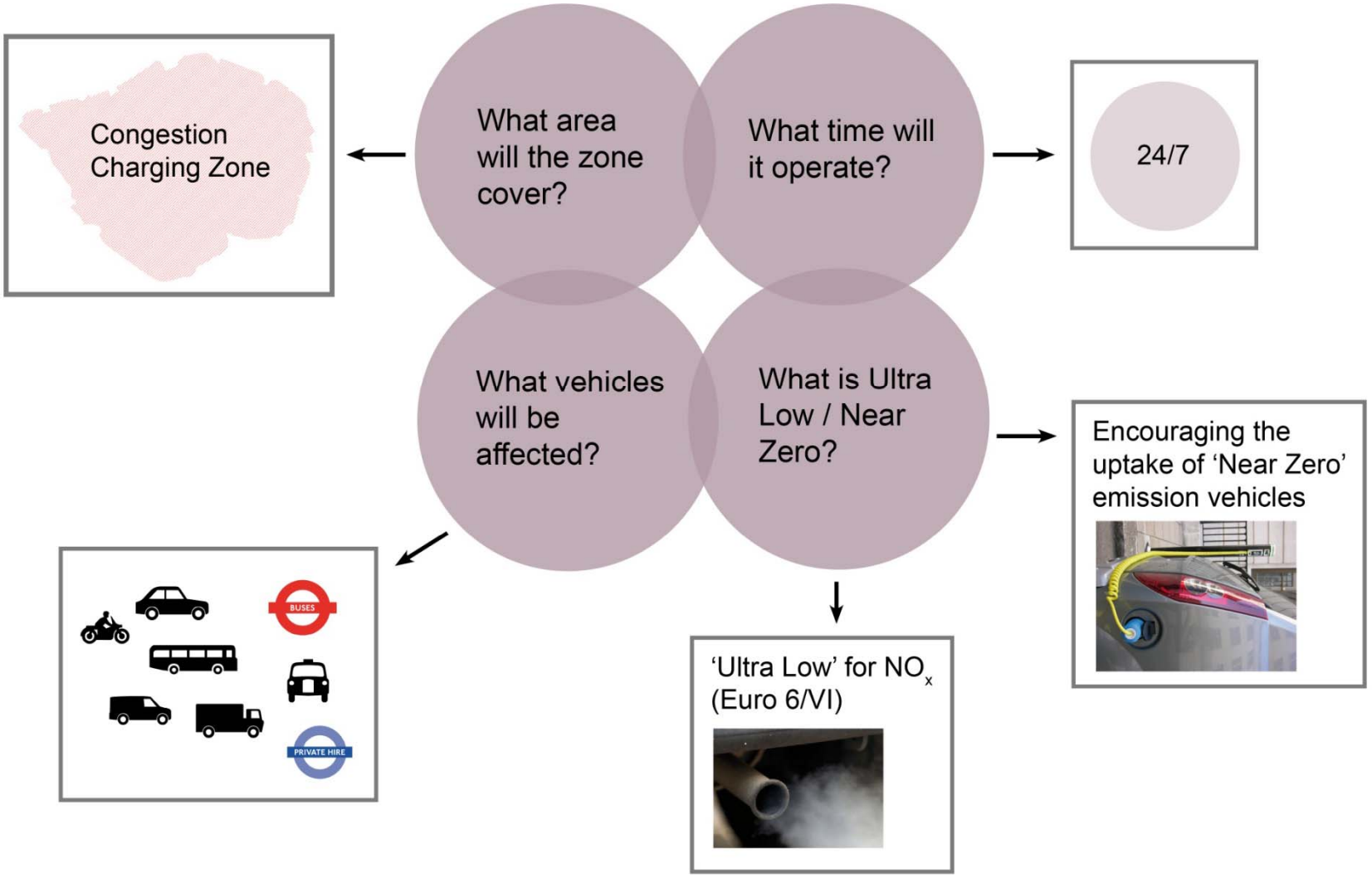
Supporting walking, cycling and zero emission deliveries

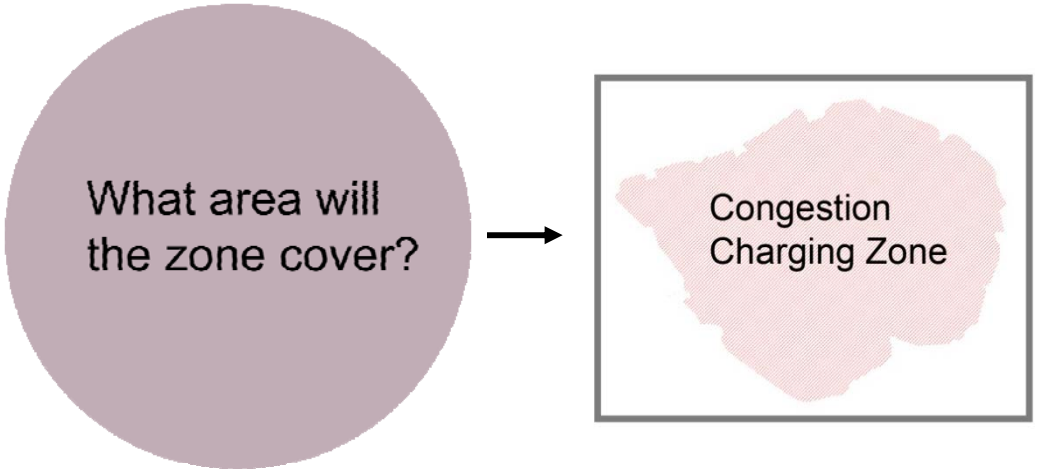
Non-transport sources of emissions

Why an Ultra Low Emission Zone?

- The European Commission has commenced the first stage of a legal process against the UK Government for not meeting NO_2 limit values
- This is partly because the UK Supreme Court noted compliance with EU standards will only be achieved by 2025 in London, fifteen years after the original deadline, and in 2020 for the other 15 zones.
- It is estimated that in 2008 fine particles had an impact on mortality equivalent to 4000 deaths. This amounts to between 6 - 9% of all deaths varying by borough
  - Fumes from diesel engines can cause lung cancer and possibly tumours of the bladder (World Health Organisation)
  - Difficult to separate effects of particles to understand specific health impacts of NO_2 but likely to result in respiratory difficulties, such as asthma
  - In the UK 5.4 million people are currently being treated for asthma, costing the NHS around £1bn a year

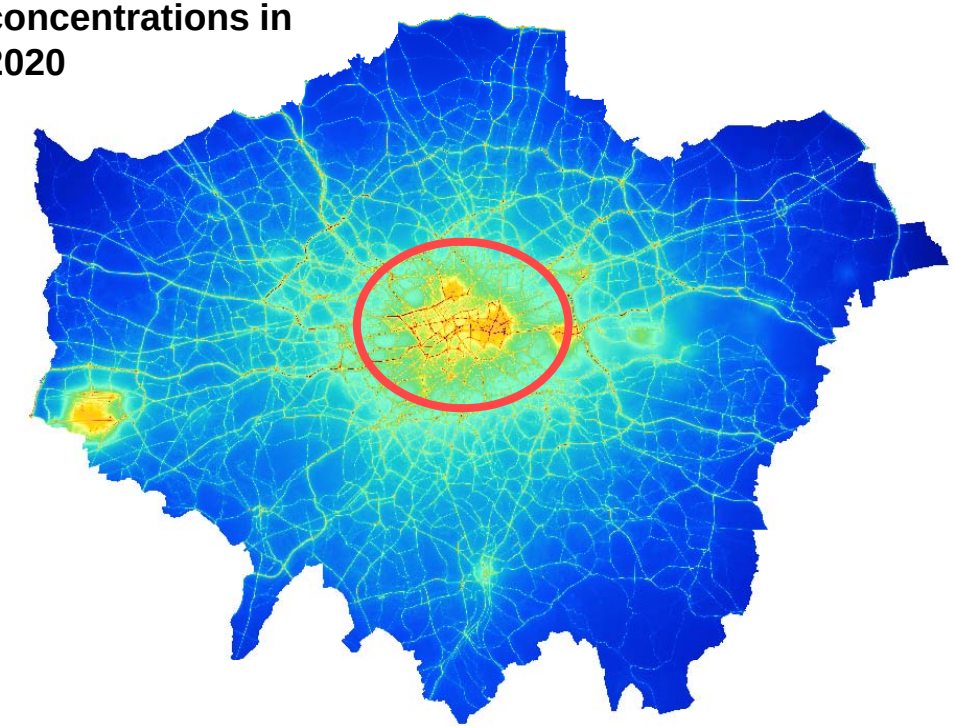
Key questions



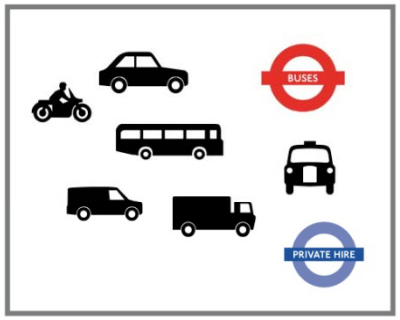


- Central London predicted to remain an air quality focus area beyond 2020
- Greatest amount of public exposure and highest amount of roadside activity occurs in Central London
- Congestion Zone is established with embedded travel behaviour and enforcement

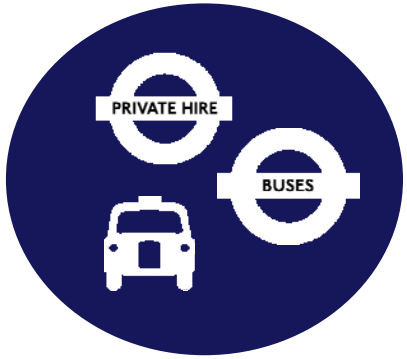
Modelled NO_2 concentrations in 2020



What vehicles will be affected?



TfL Services



~50% NO_x emissions*
~30% CO_2 emissions*

- Economic impact and compliance costs will be considered in detail
- Potential exemptions, mitigations and incentives to be considered but kept to a minimum

Light vehicles

~25% NO_x emissions
~40% CO_2 emissions*

Greener Fleets

~25% NO_x emissions*
~30% CO_2 emissions*

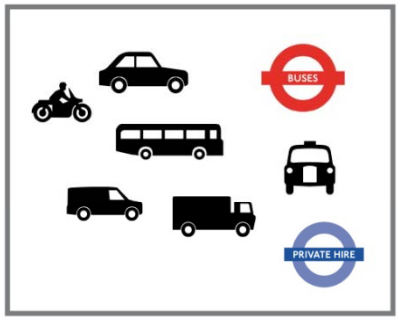
*proportion of emissions from road transport in central London

What about non-transport sources?

- In addition to transport there are major sources of emissions from buildings, construction and industrial activity in the city.

- The Mayor is taking action to address these:
  - Used the London Plan to require all new developments to be Air Quality Neutral
  - Introducing minimum emission standards for biomass and combined heat and power boilers
  - Retrofitted 90,000 homes with plans to retrofit 170,000 more, as well as 400 public buildings and 200 schools
  - Cleaning up construction sites with tough new rules imposed through the planning system and – for the first time – minimum emission standards from 2015 for construction equipment, tightening in 2020.
  - Using the public health system to raise awareness about air pollution, including preparing Air Quality JSNA chapters for every boroughs and partnering with Barts NHS Trust
  - Working with the Environment Agency to increase the frequency of inspections at industrial sites like Horn Lane and Neasden Lane

What vehicles will be affected?

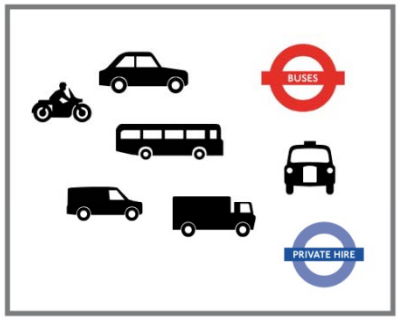


Total annual number of unique vehicles entering the CCZ (24/7)

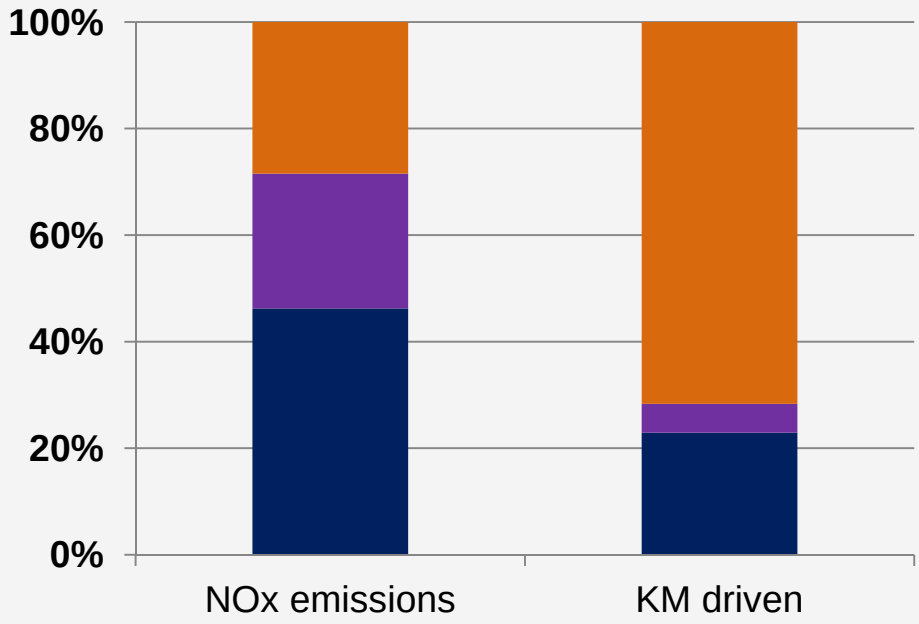
		Total number of unique vehicles	Total number of vehicles at least once a month
Light vehicles	Cars / P2W	5 million	800,000 (16%)
	Vans	619,000	167,000 (27%)
Greener Fleets	HGVs	118,000	31,000 (26%)
	Non-TfL buses	37,400	13,700 (37%)
TfL Services	Private Hire Vehicles (PHV)	50,000	50,000 (~100%*)
	Taxis	23,000	23,000 (~100%*)
	TfL buses	2,700	2,700 (100%)

*can fluctuate according to demand

What vehicles will be affected?



NO_x emissions compared to KM driven in the CCZ



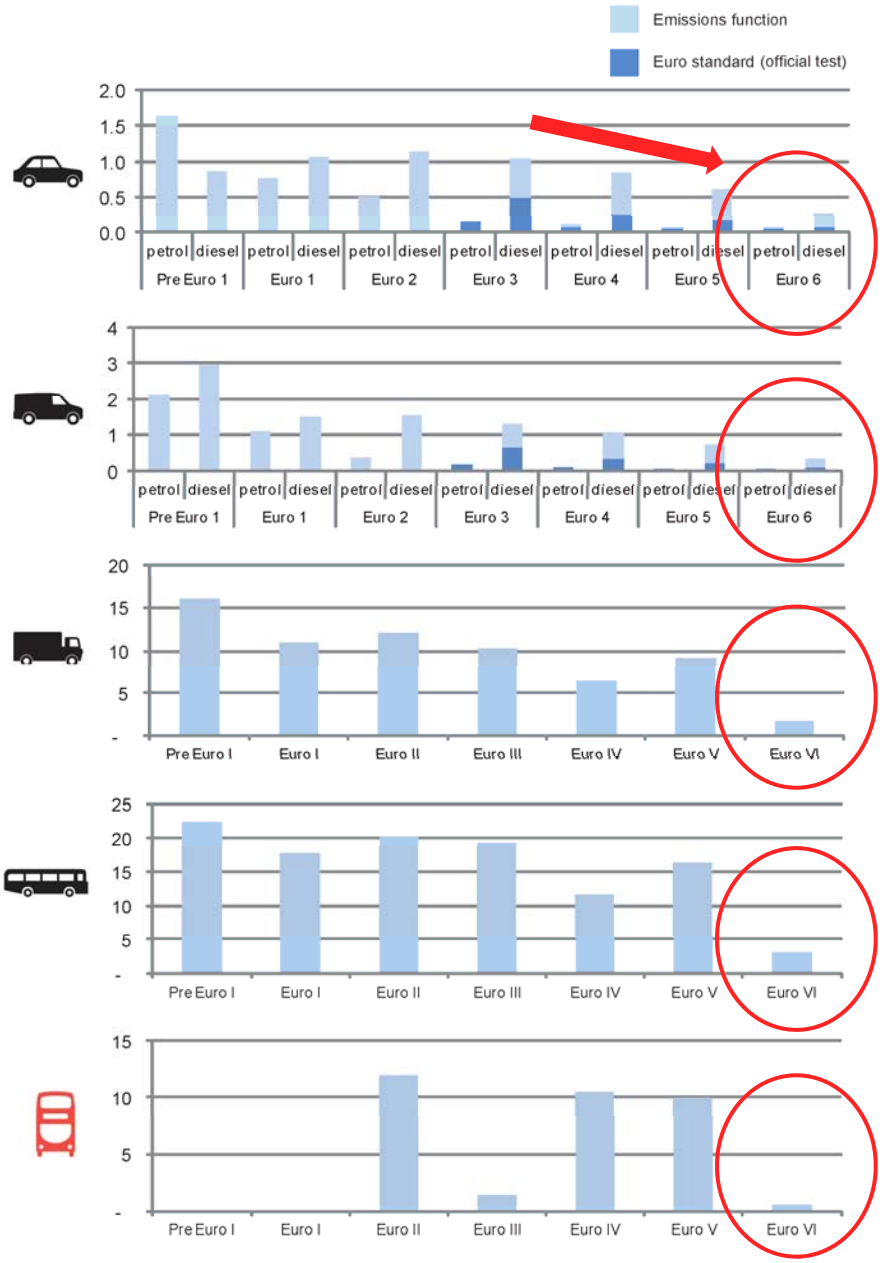
Light vehicles

Greener Fleets

TfL Services

What is Ultra Low?

'Ultra Low' for NO_x (Euro 6/VI)



- Euro VI/6 introduced from 2014 starting with heavy vehicles – significant improvement for NO_x
- Approximately 55% of HGVs and 40% of cars on the road will be Euro VI/6 in 2020
- The Low Emission Zone specifies its requirement using these standards - ensures consistency within London and across the continent

Can we also encourage Near Zero emissions?

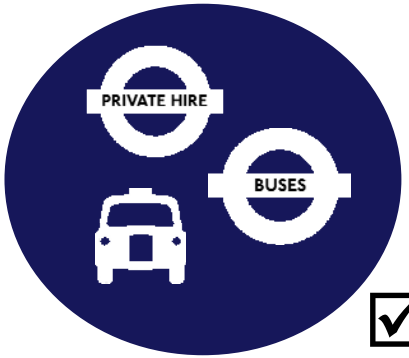
→

Encouraging the uptake of 'Near Zero' vehicles

The Congestion Charge Ultra Low Emission Discount currently offers a 100% discount for cars and vans less than 75g/km CO_2.

- The Mayor is keen for the ULEZ to increase the number of 'near zero emission' vehicles in London. What near zero vehicles will be available by 2020?

TfL Services



☑ *

Greener Fleets

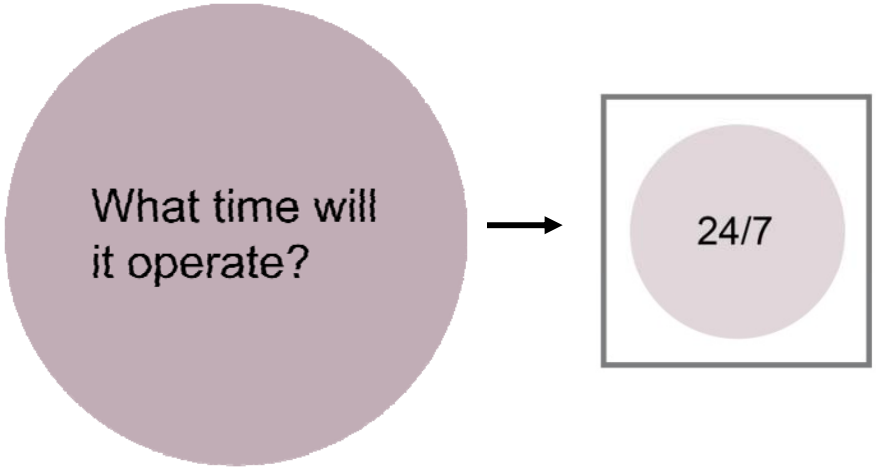
☒ *

Light vehicles

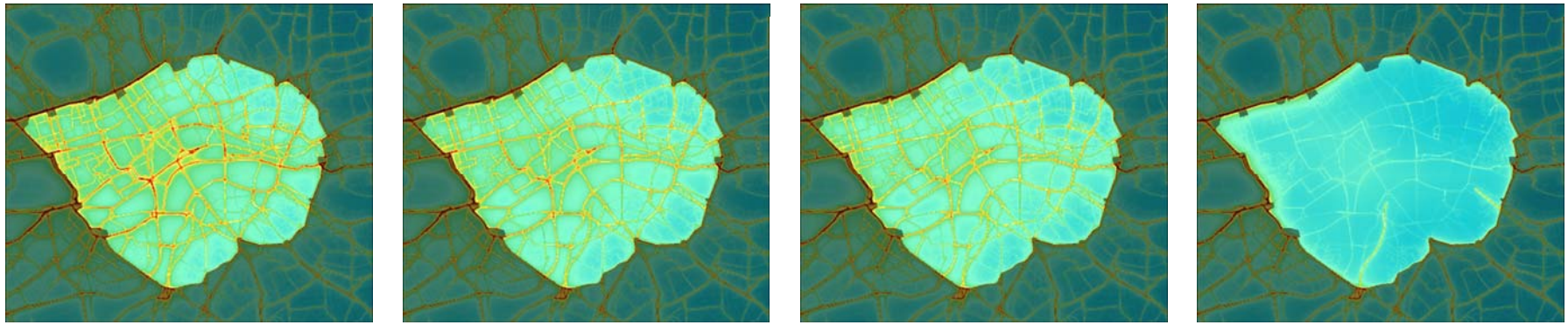
☑

- But how affordable will they be in 2020?

* zero emission technology exists for smaller single decker buses



Euro 6, CC hours | **Zero emission, CC hrs** | **Euro 6, 24/7** | **Zero emission, 24/7**

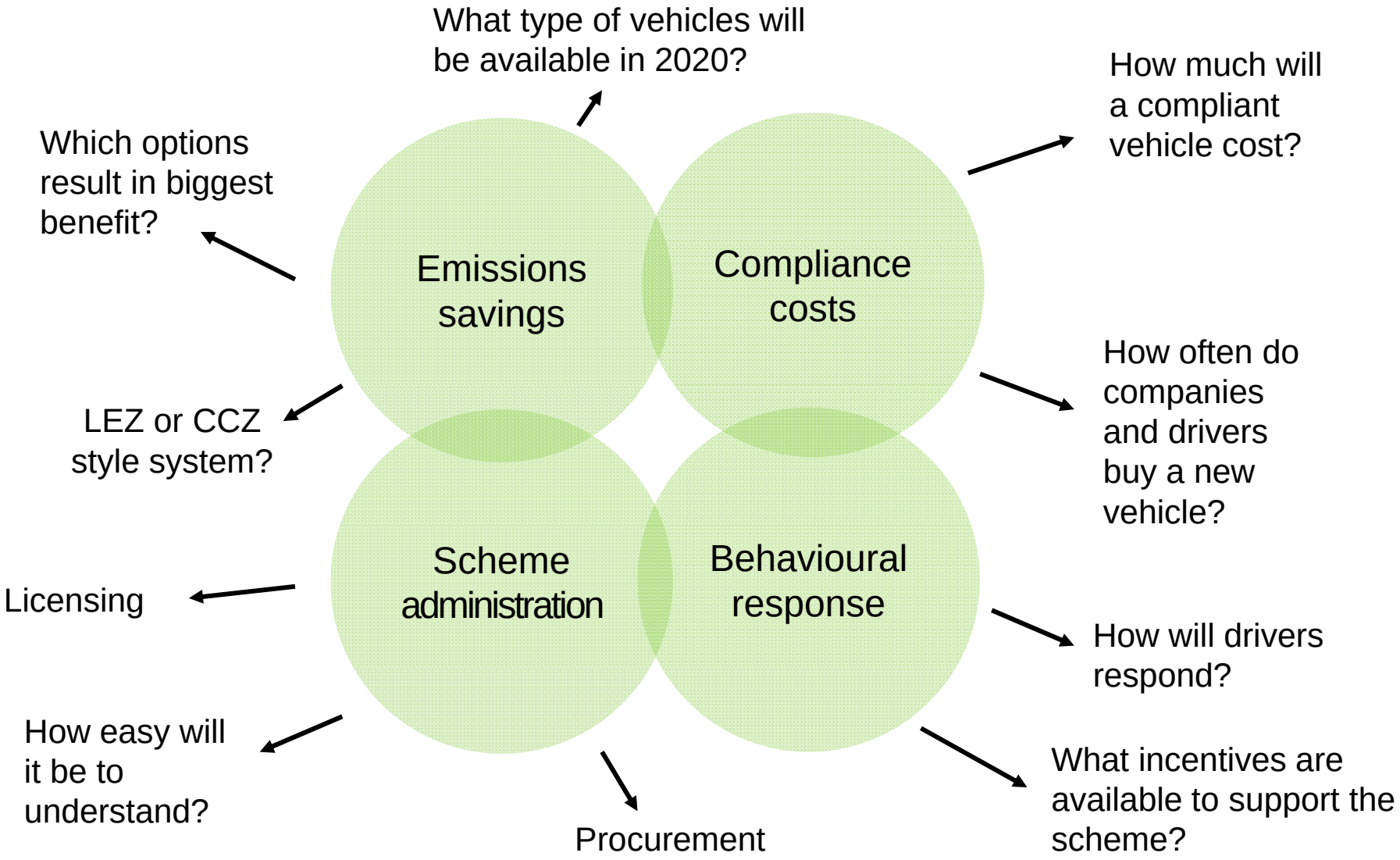


*taken from sensitivity scenarios, assumes like-for-like travel behaviour and 100% compliance

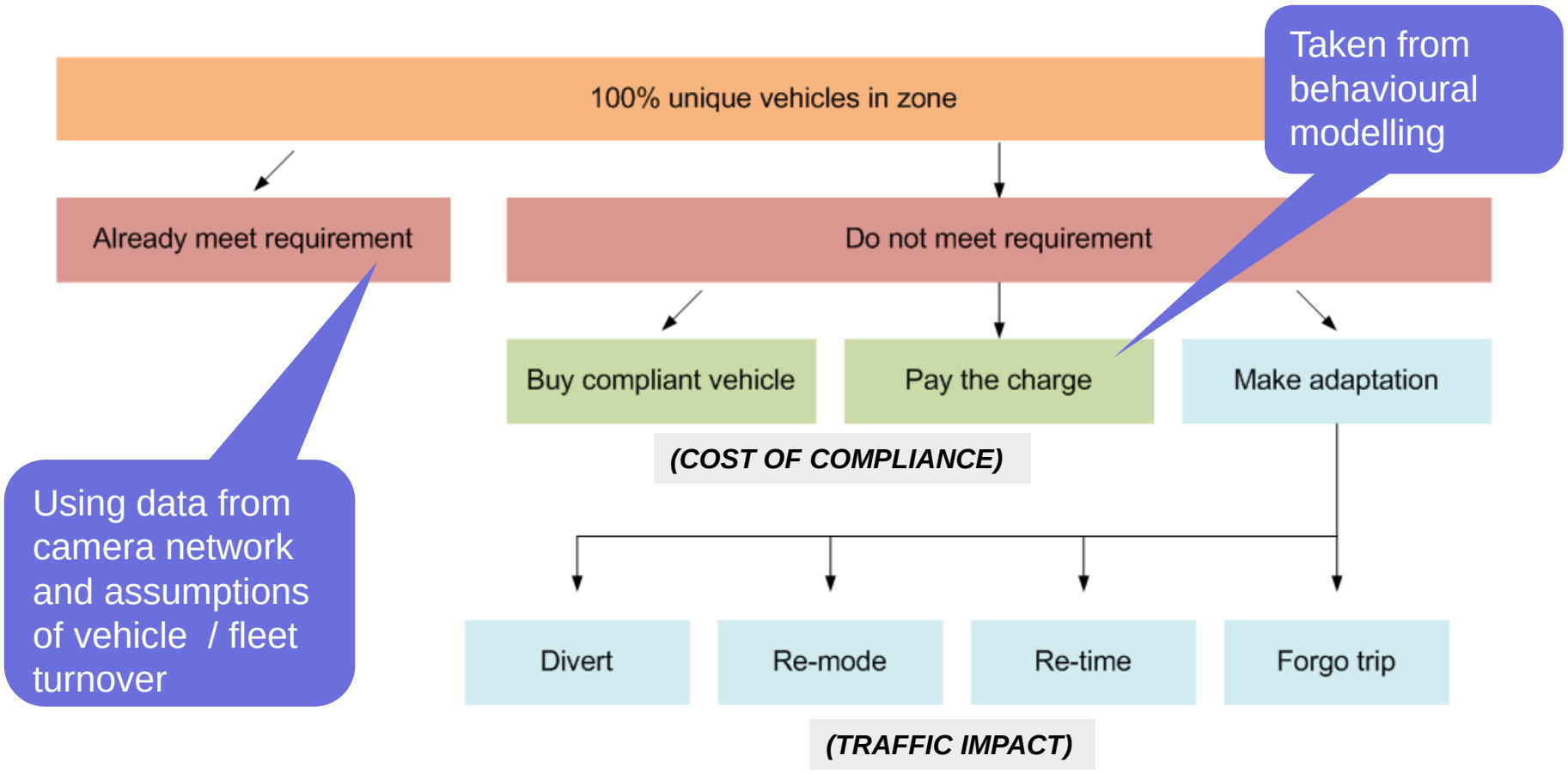
What realistically can be achieved?

- TfL only one part of the solution
- How do we get greener vehicles?
- What technologies will be available in 2020?
  - Electric?
  - Gas?
  - Hybrid?
- How much will they cost?
- Need to consider…
  - Government
  - Industry
  - Infrastructure

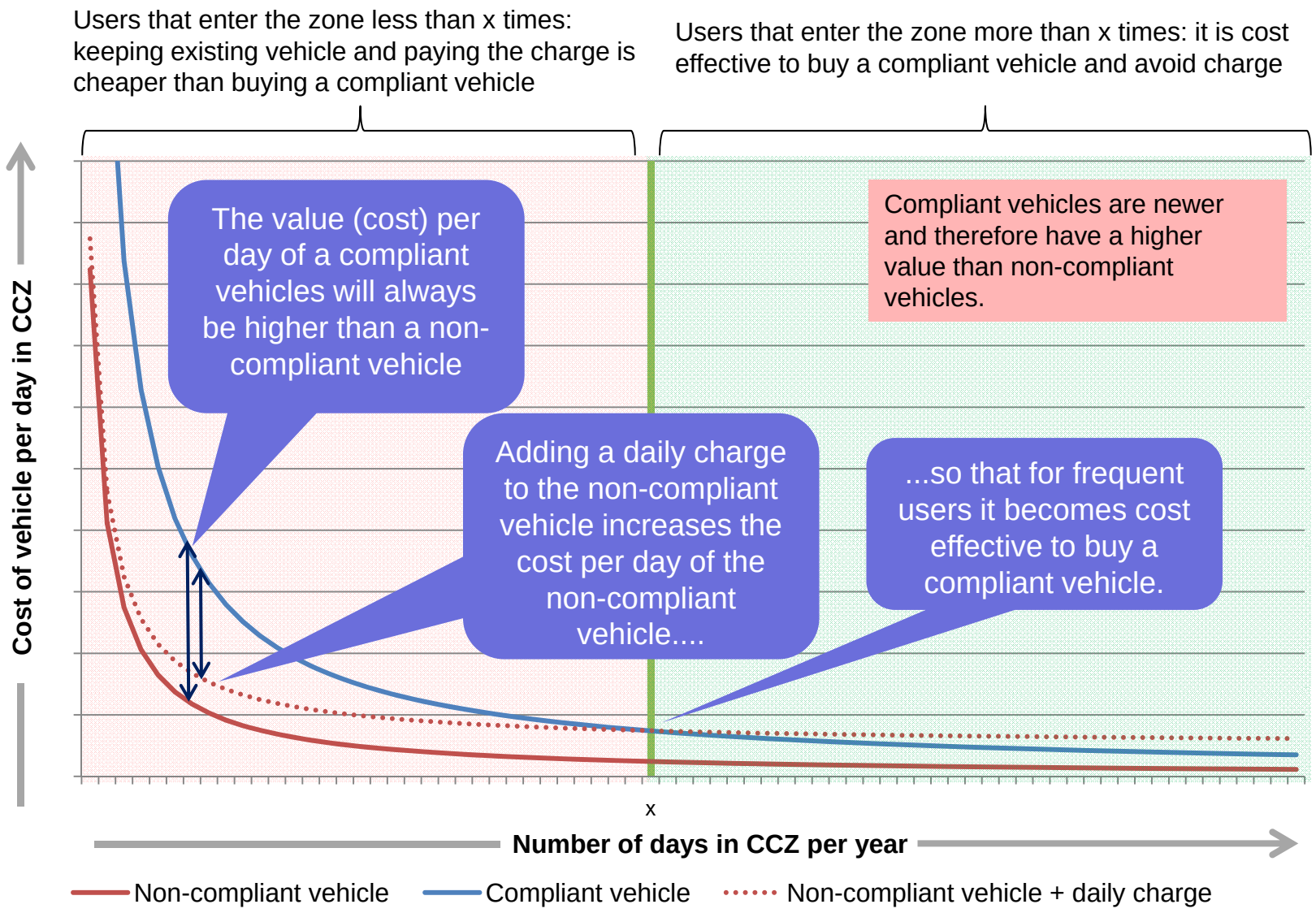
Assessing the options



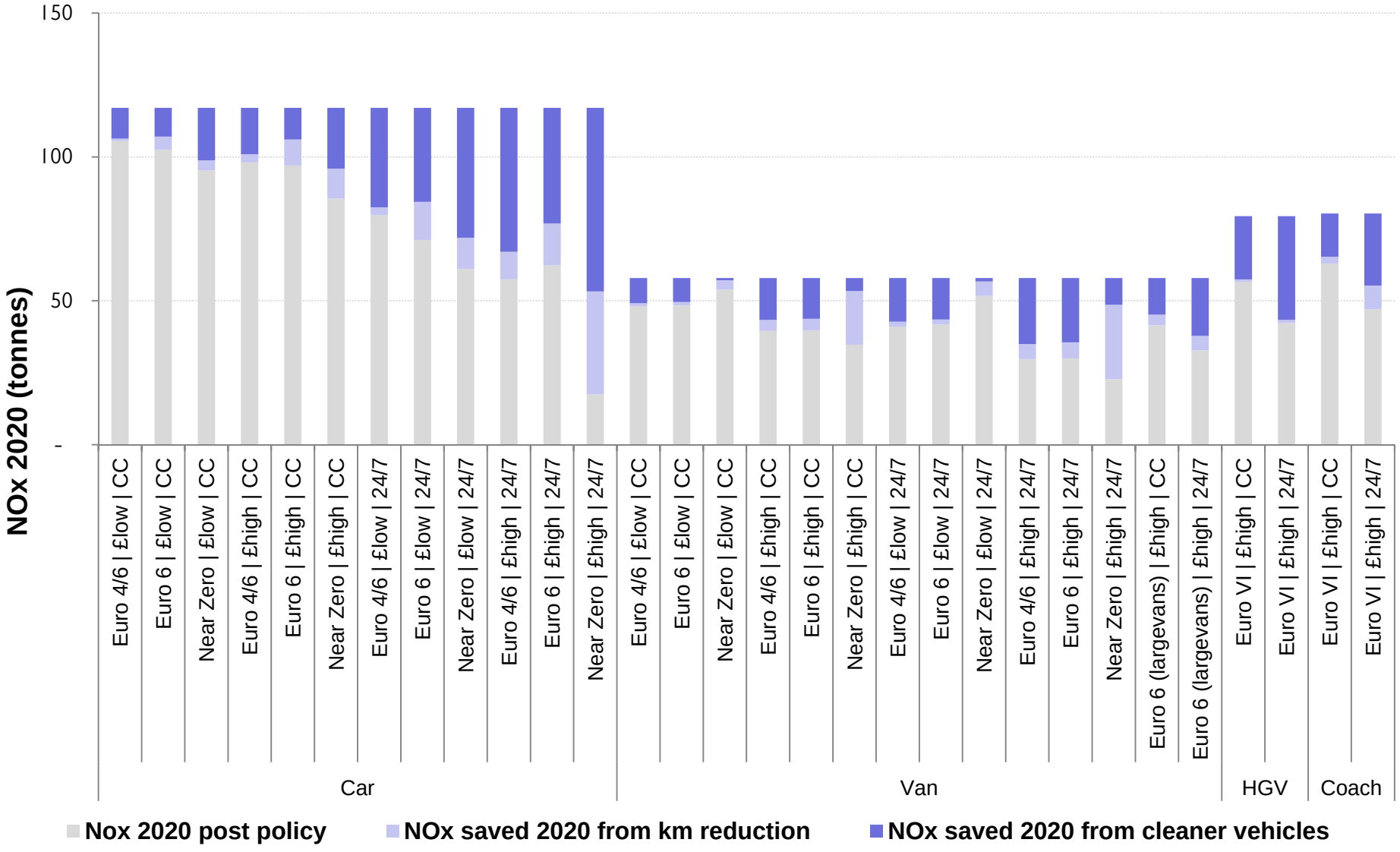
Behavioural assessment



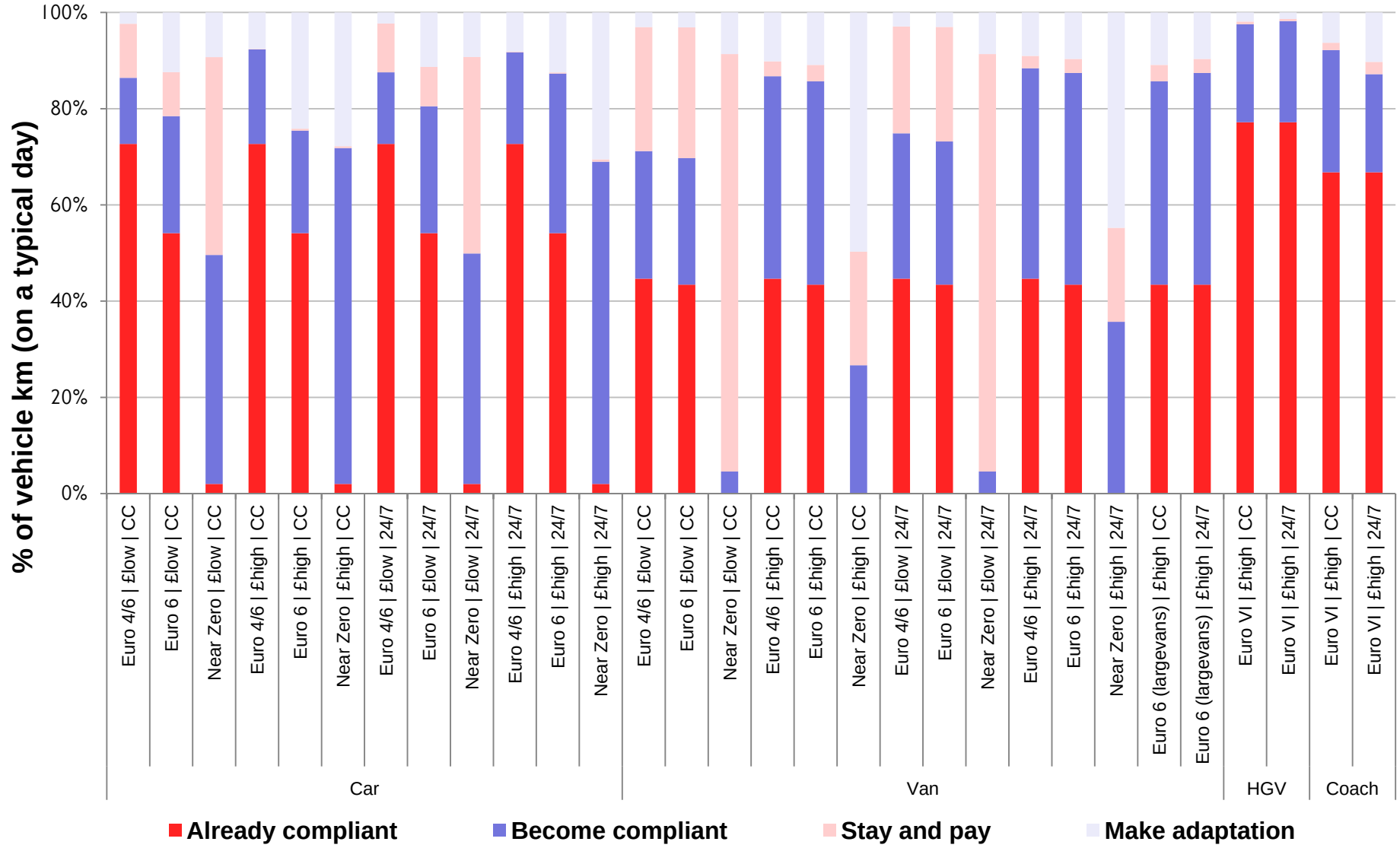
When should someone buy a compliant vehicle?



Option emissions savings



Options behavioural response



TfL services

Proposals for London’s buses, taxis and private hire vehicles

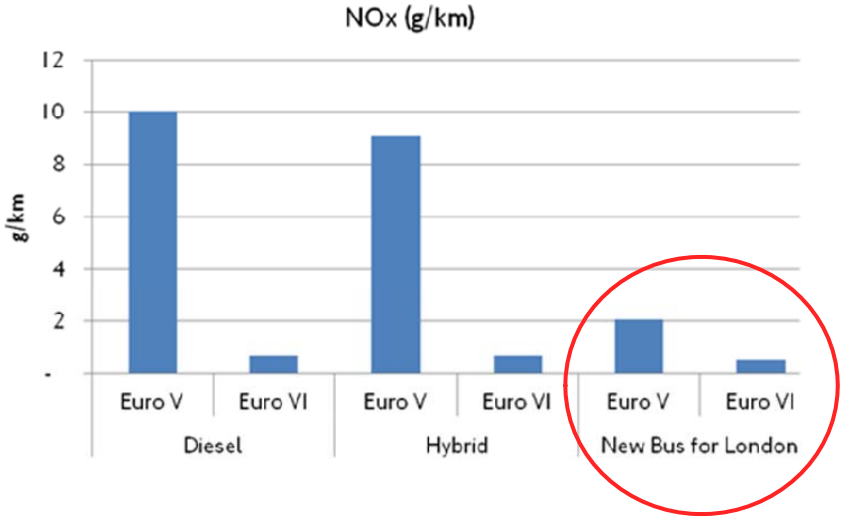
Proposal for TfL buses

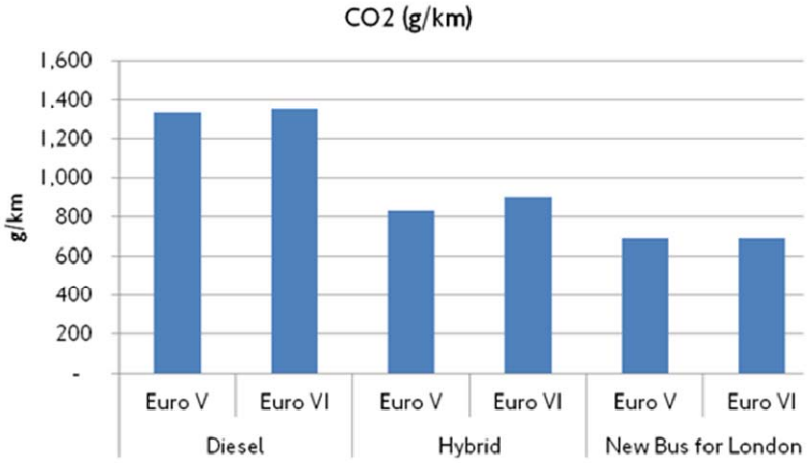
- 8,500 vehicles in the fleet carry over 2.3 billion passengers pa
- Youngest bus fleet of any major European or world city (average bus age is 6 years).Well used vehicles – up to 20 hours daily
- Approx 2,700 buses operating in central London
- Currently trialling alternative technologies like hydrogen, bio-diesel and electric
- From this year, new buses will be Euro VI

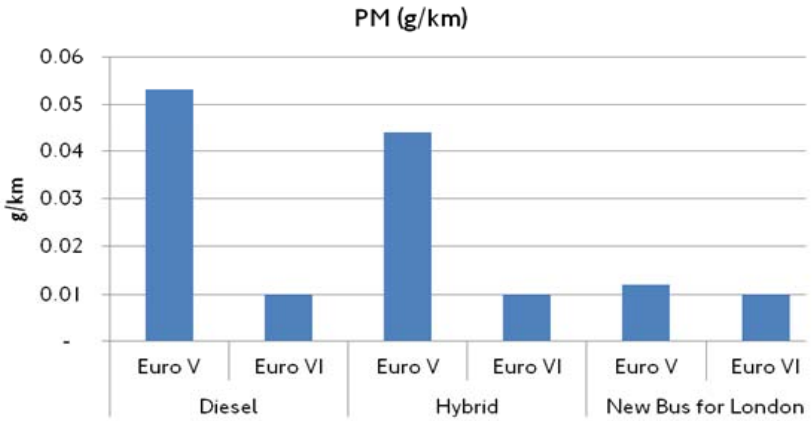
ULEZ proposal: all double decker TfL buses operating in central London will be hybrid

TfL buses currently responsible for 28% of road transport NO_x emissions in central London

Proposal for TfL buses







- All buses to meet Euro IV standard by 2015 (LEZ phase 5)
- New Routemaster delivers far greater NO_x and PM saving than regular Euro V
- All Euro VI buses deliver huge NO_x savings
- Data taken from London drive cycle

Proposal for TfL buses – pursuing a near zero fleet

- Alternative fuels already being trialled with single decker fleet
- Approx 190 single decker buses in operation in central London
- Aim is for all single decker buses in central London to be zero emission at the tailpipe
- Next steps to secure funding and examine feasibility, including impact on depots

Proposal: all single decker TfL buses operating in central London will be zero emission (at tailpipe). This will be subject to feasibility...

Proposal for Taxis

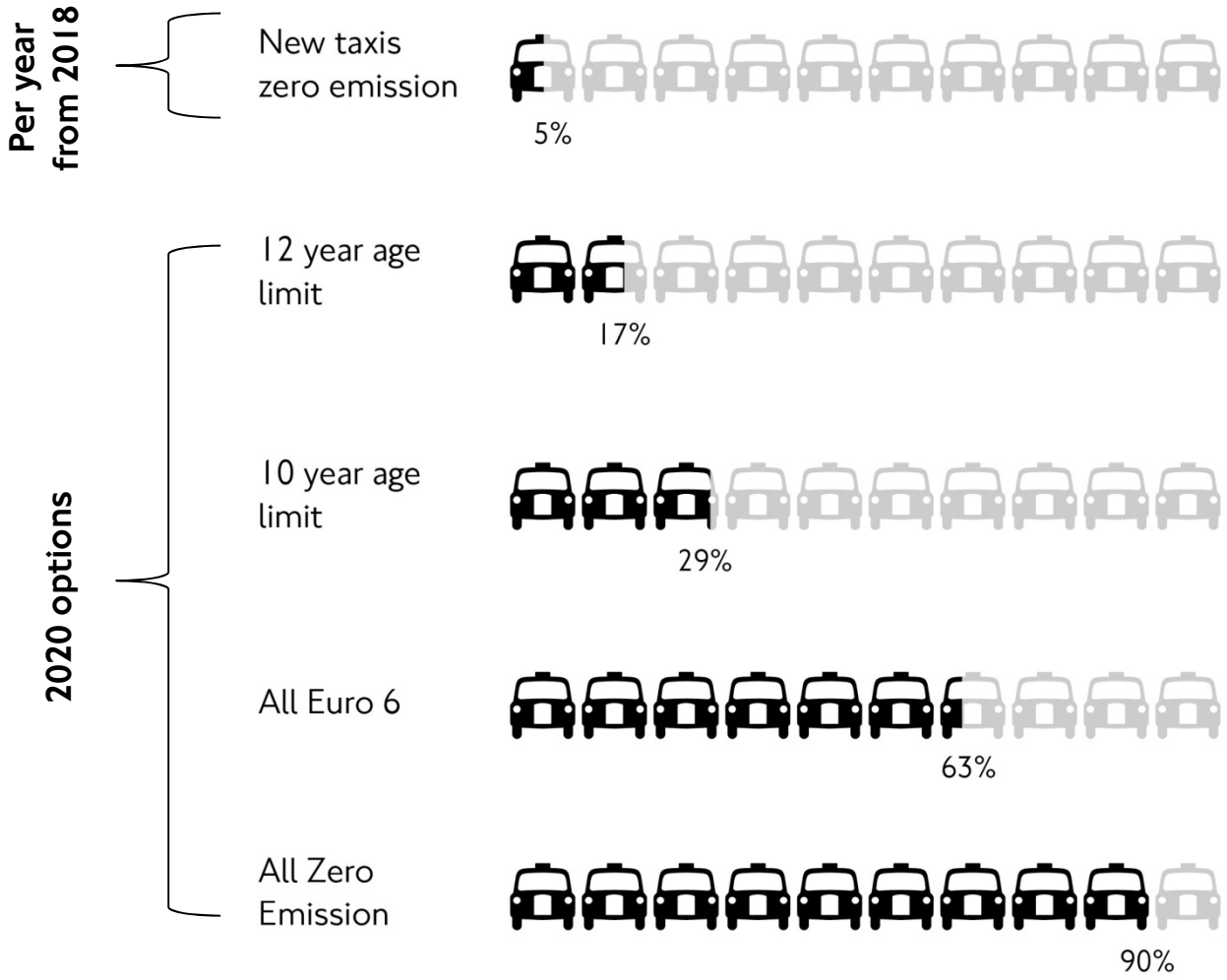
- Since 2012, a 15 year rolling age limit has retired over 3,000 taxis from the fleet
- All new vehicles presented for licensing must be zero emission capable from 2018
  - around 1,200 new taxis are licensed in London every year
  - lots of work needed to ensure the new taxi can still operate effectively
- Currently, all taxis will be zero emission capable by 2033. A reduced age limit would help to accelerate this

ULEZ proposal: TfL will consider a reduction in the rolling age limit to encourage the uptake of zero emission capable taxis and how they will operate

Taxis currently responsible for 18% of road transport NO_x emissions in central London

Proposal for Taxis

Proportion of taxis requiring replacement in the fleet*



* In order for total fleet size to remain constant

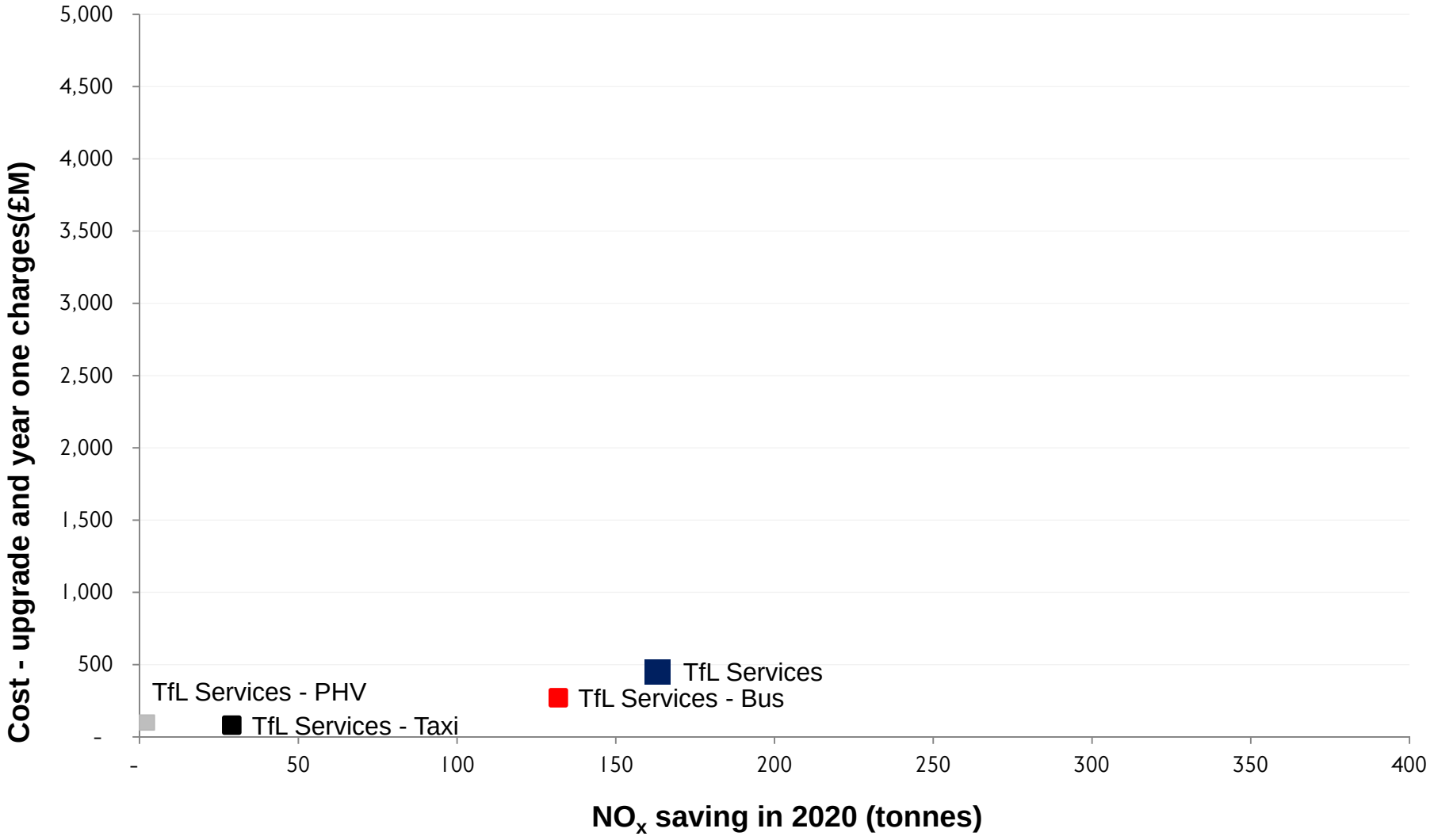
Proposal for Private Hire Vehicles

- Since 2012, 10 year age limit introduced to retire some of oldest most polluting vehicles. Currently, no new PHV can be older than 5 years.
- The average age of the PHV fleet is 4.5 years
- Already seeing many operators using hybrid and full electric vehicles and we expect this to increase – reflects fuel savings.
- Need to be mindful of specialist private hire vehicles

ULEZ proposal: TfL will consider a reduction in the rolling age limit. All newly licensed PHVs will need to be ~~zero emission capable from 2018.~~ Could also be same as cars and vans?

PHVs currently responsible for 3% of road transport NO_x emissions in central London.

What does this achieve? (1)



Greener Fleets

Proposals for London’s lorries, coaches and non-TfL buses

HGVs and coaches are currently affected by the London Low Emission Zone (LEZ)

- The LEZ covers the whole of London (1,580 square kilometres) and operates 24/7, 365 days a year
- Introduced in 2008 to target oldest and most polluting HGVs, buses and coaches. Vans and minibuses have since been included.
- Of all unique vehicles captured, compliance is high at 95 per cent for lorries, buses and coaches, and 99 per cent for vans and minibuses.
- Non-compliant vehicles are subject to a high daily charge (£100-£200).

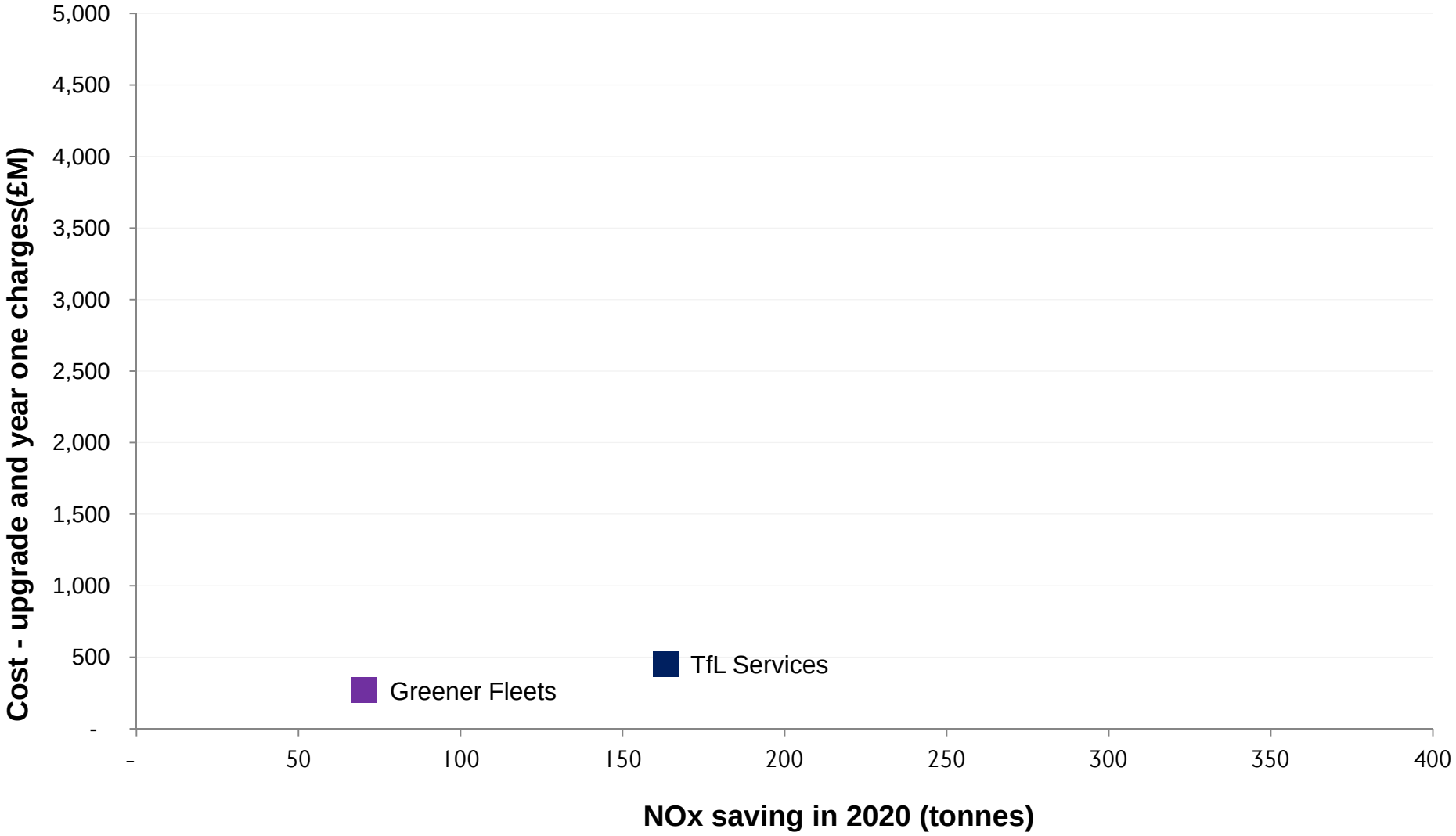
Proposal for HGVs and coaches (inc. non-TfL buses)

- Currently Euro IV PM requirement as part of LEZ
- LEZ Phase 5 decision
- Euro VI is out now – substantial difference in NO_x.... by 2020 equivalent to 6 year old vehicle.
- Generally longer distance journeys – near zero emission less feasible
- In 2020, approx 55% of HGVs will be Euro VI by natural fleet replacement.

ULEZ proposal: Amend the LEZ to include a Euro VI emissions requirement for all HGVs and coaches entering central London.

HGVs and non TfL buses currently responsible for 25% of road transport NO_x emissions in central London.

What does this achieve? (2)

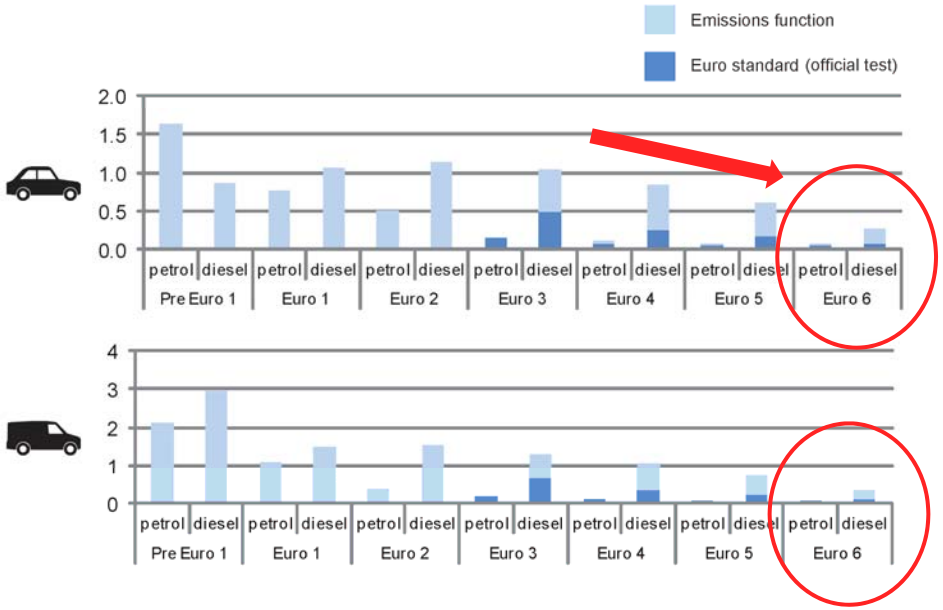


Light vehicles

Proposals for London’s cars, vans and motorcycles

Proposal to encourage *Ultra Low* cars and vans

- Euro 6 introduced from Sept 2015 delivers a 70% reduction in NO_x for diesel compared to current fleet average
- Older petrol cars and vans (Euro 4) emit the same NO_x as the new Euro 6 diesel standard. This means a switch to either will achieve the same savings.
- The minimum compliance cost is likely to be £0 - £400 for car and £500 - £5k for van owners. This assumes there are lower cost options available to fleet operators who can swap around vehicles in their fleet.



ULEZ proposal: introduce a Euro 6 (diesel) and Euro 4 (petrol) emissions requirement for cars and vans.

Cars and vans currently responsible for ~25% of road transport NOx emissions in central London.

Proposal to encourage *Near Zero* cars and vans

- Other ambitious technologies in development that have potential to deliver far greater and wider reaching emissions savings than conventional engines
- Alternatively-fuelled vehicle registrations have increased 25% in the past year (includes plug-in, electric etc). Currently, £5k grant per vehicle
- UK Government focussing on low carbon vehicles especially alternative fuels
- We should also be incentivising new vehicle purchases to be near zero – how best to do this?

ULEZ proposal: introduce an emissions requirement for cars and vans in the region of 75g/km – 35g/km CO_2.

Cars and vans currently responsible for ~25% of road transport NO_x emissions in central London.

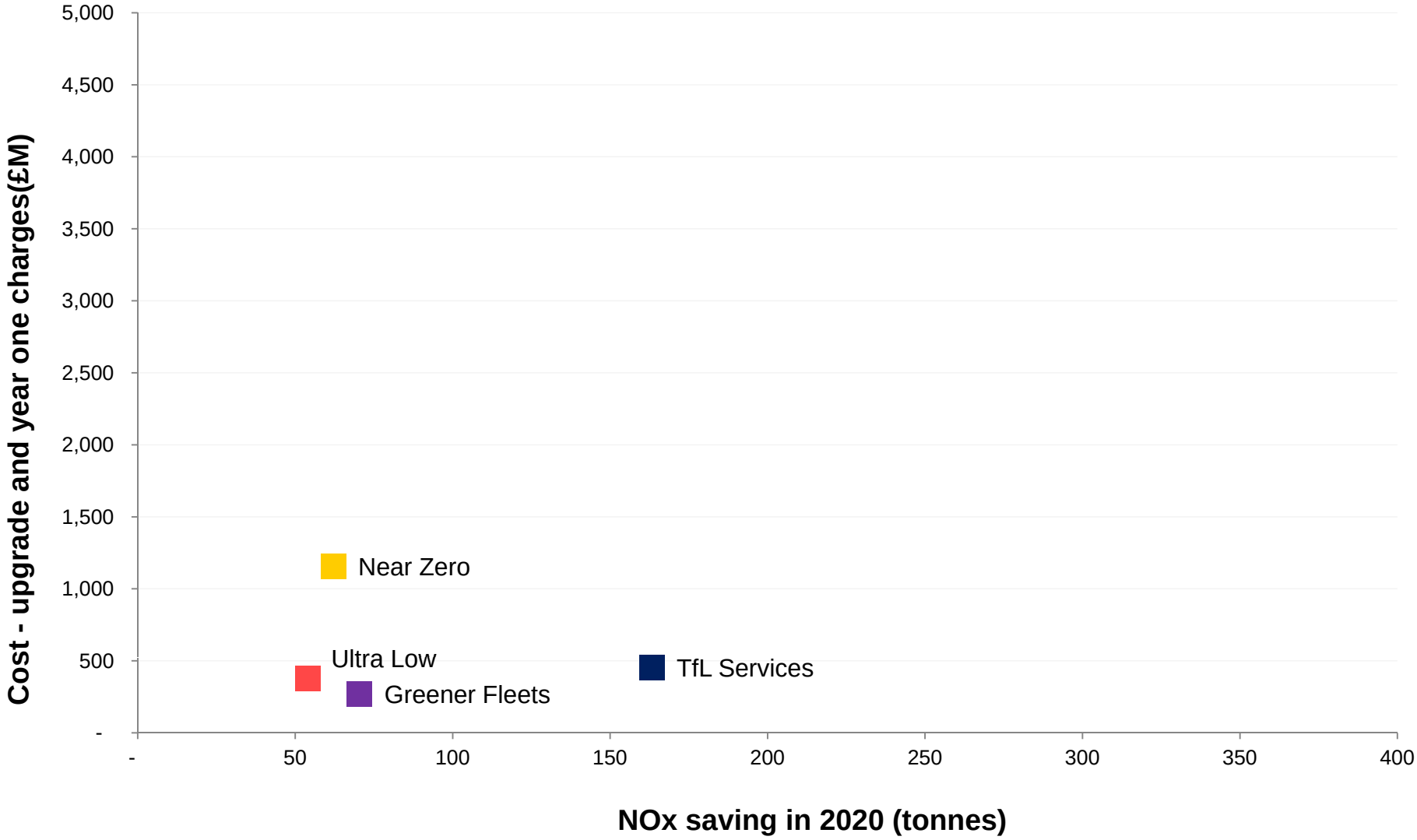
Motorcycles

- The current standard for category L vehicles is Euro 3 (launched January 2006). The next stage, Euro 4, will become mandatory for motorcycles in 2017 and mopeds in 2018. Euro 5 is defined and likely to become mandatory from 2021.
- The technical advances demanded by the Euro standards for these vehicles will deliver a reduction in emissions through fleet turnover.
- How to incentivise electric motorcycles?

Proposal: introduce a Euro 3 requirement for motorcycles and other category L vehicles.

Motorcycles currently responsible for ~1% of road transport NO_x emissions in central London.

What does this achieve? (3)



Packaging the proposals

How can the ULEZ be delivered?

Lower level charge to deter drivers but provide flexibility

High daily charge for drivers to achieve compliance

COACHES

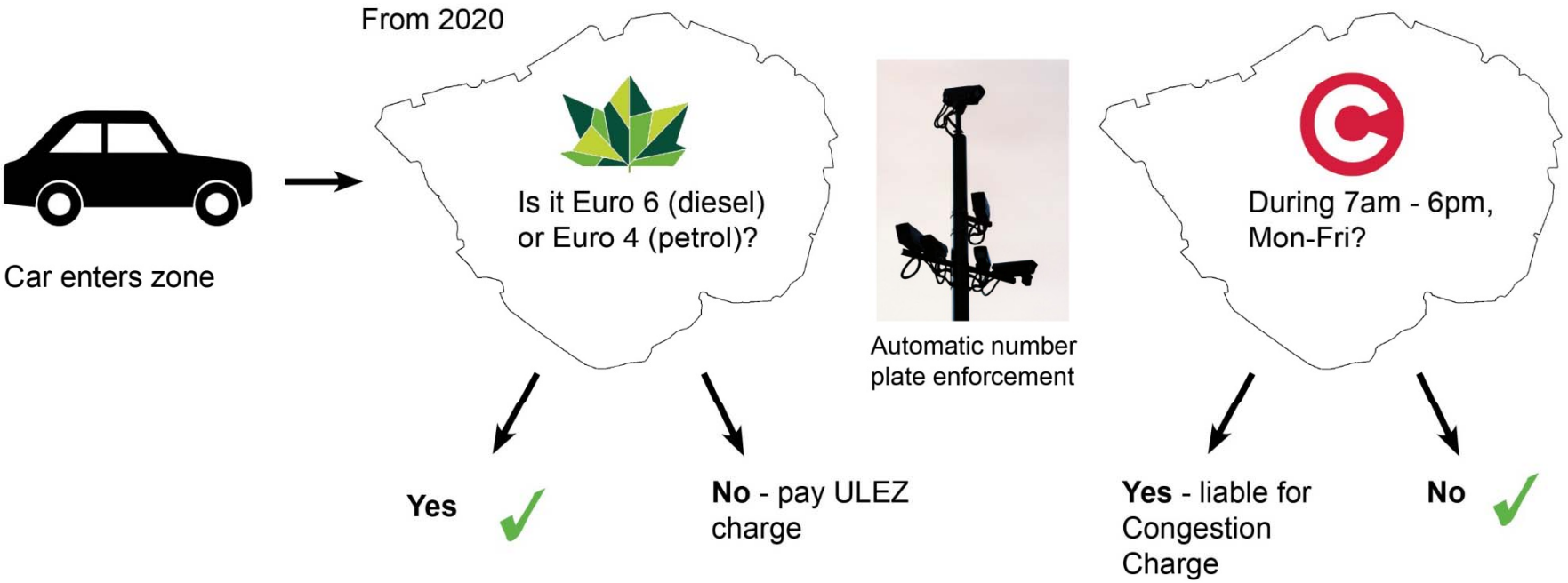
BUSES

TAXI·PRIVATE HIRE

London Lorry Control Scheme

Licensing, regulation and procurement to maximise value for money

How can the ULEZ be delivered?
Example scenario – Ultra Low for cars



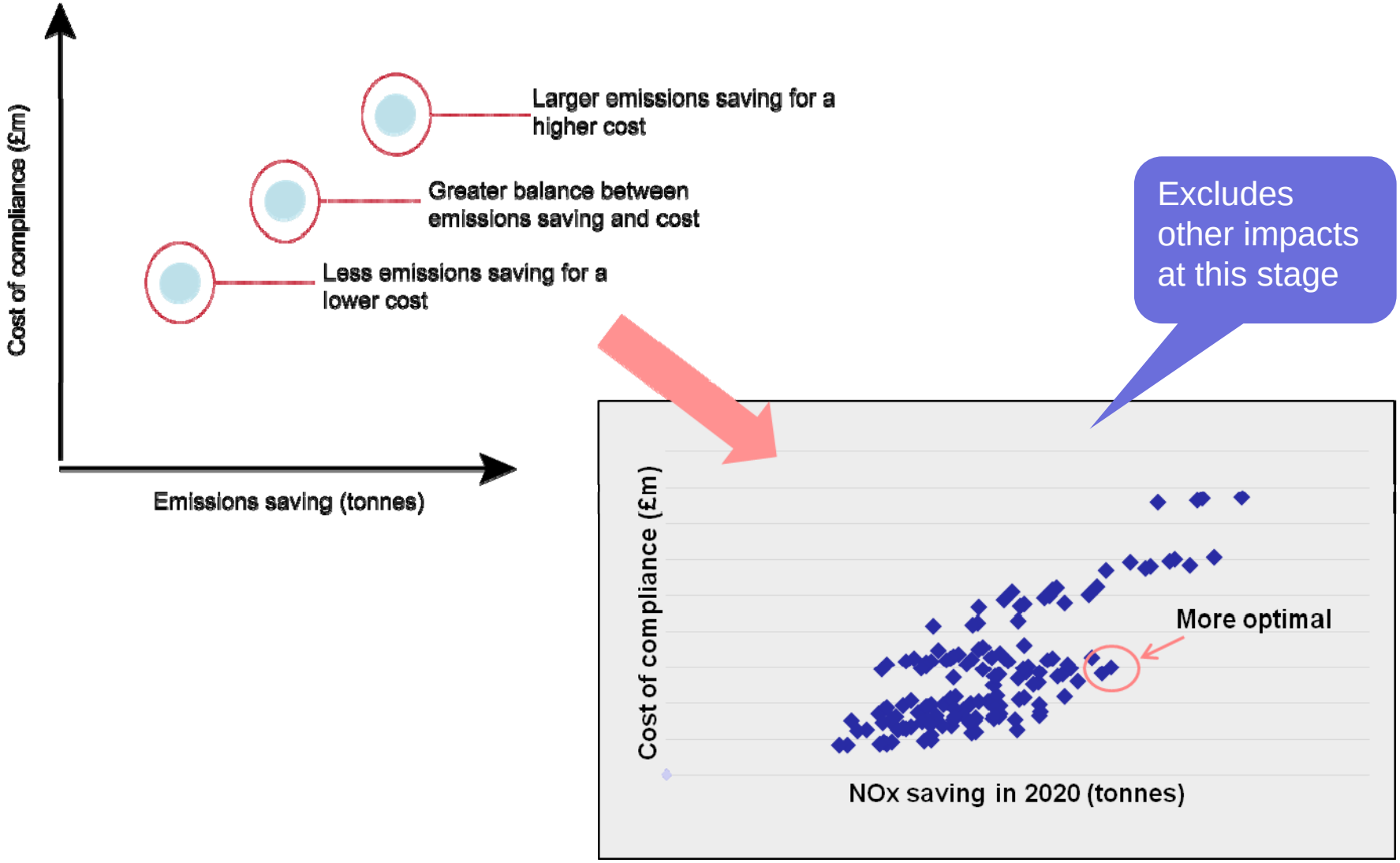
Key assumptions

The ULEZ charge would be in addition to the Congestion Charge

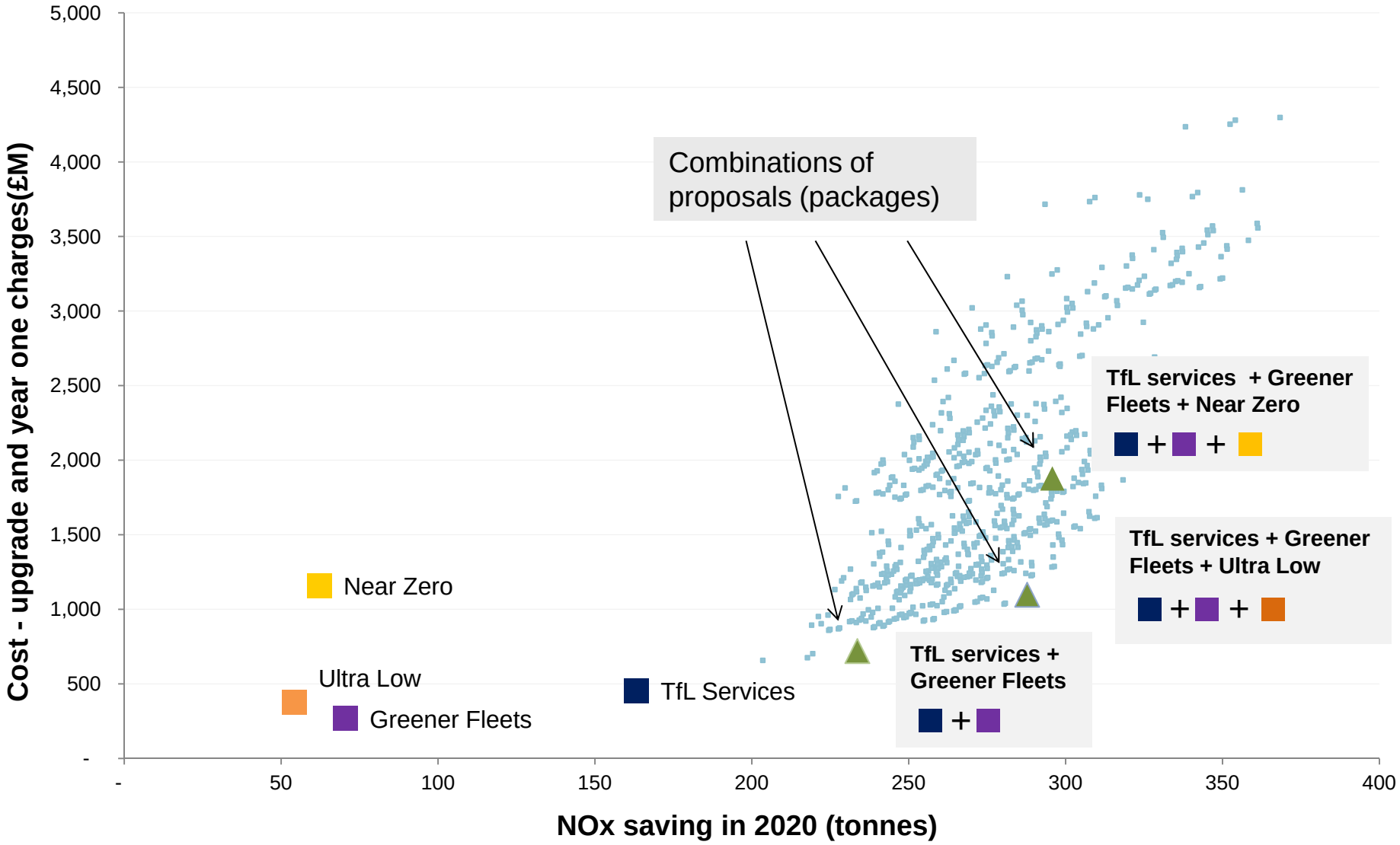
The ULEZ would operate 24 hours a day

Euro 6 (diesel) from Sept 2015
Euro 4 (petrol) from Jan 2005

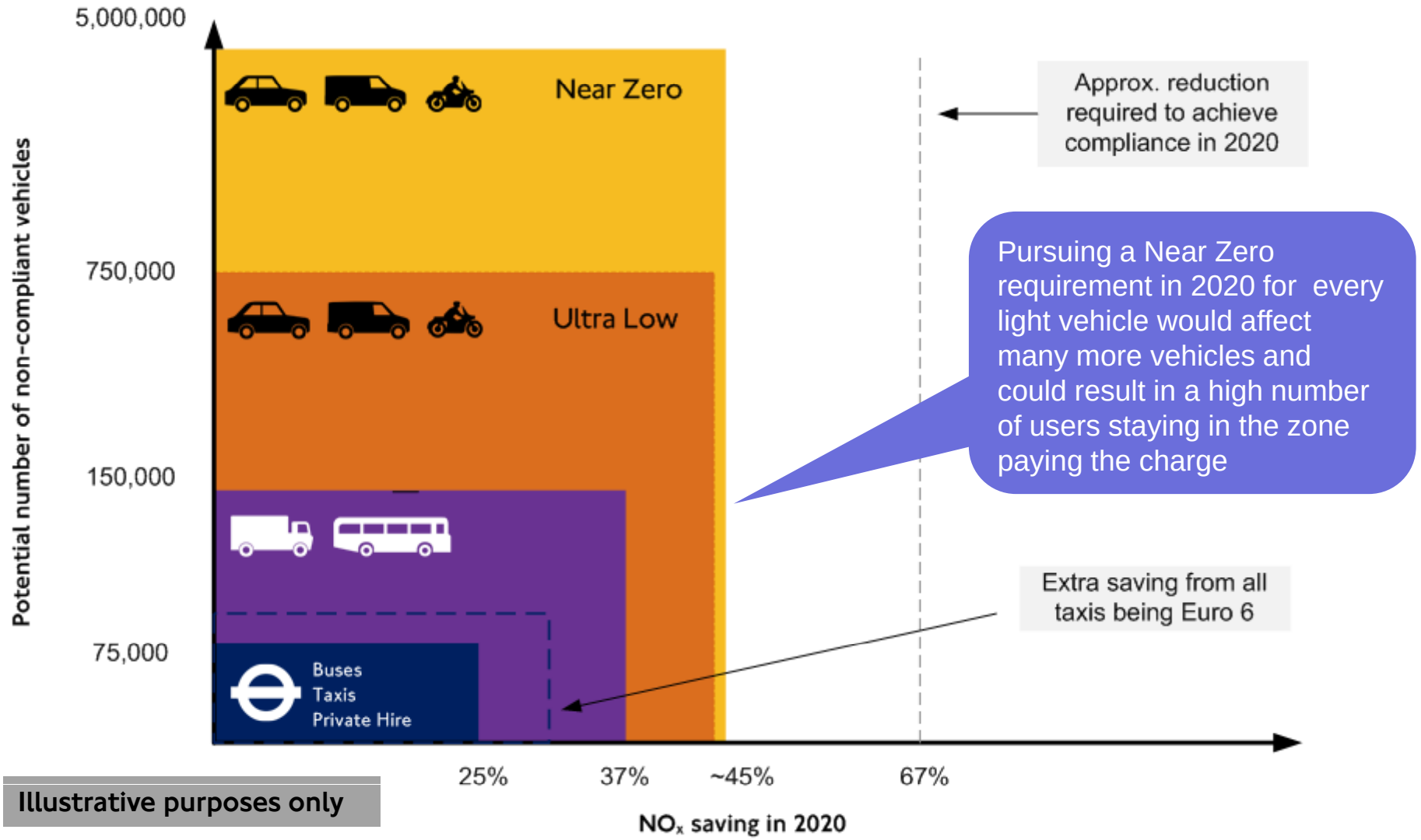
Where can these proposals take us and at what cost?



Where can these proposals take us and at what cost?



Where can these proposals take us and at what cost?



Illustrative purposes only

Timing the Near Zero requirement

- Production volumes of Near Zero vehicles will need to increase sufficiently for economies of scale to take effect, which is unlikely to occur by 2020.
- Majority of emissions savings from Near Zero in 2020 are from users opting to reduce their travel (eg taking a different mode or deferring their journey altogether) – likely to have a negative impact on central London's economy and doesn't match Mayor's ambition.
- We could defer the Near Zero proposal until 2025. This provides a greater lead-in time for manufacturers and operators, which in turn enables the new vehicle market to mature and a potential second-hand market to emerge.
- However, if we defer a Near Zero requirement until 2025, how can be accelerate the uptake of vehicles before then and increase 'pre-compliance'?

Packages for consideration

TfL services

- Hybrid diesel double decker
  Zero emission single decker
- Revisit age limit, all newly licensed vehicles Near Zero from 2018
- Revisit age limit, all newly licensed vehicles Near Zero from 2018

NO_x saved
26%

Greener fleets

Euro VI — High charge (eg LEZ)

NO_x saved
11%

Ultra Low

Euro 4 (petrol) Euro 6 (diesel) — Lower charge

Euro 3 — Lower charge

NO_x saved
9%

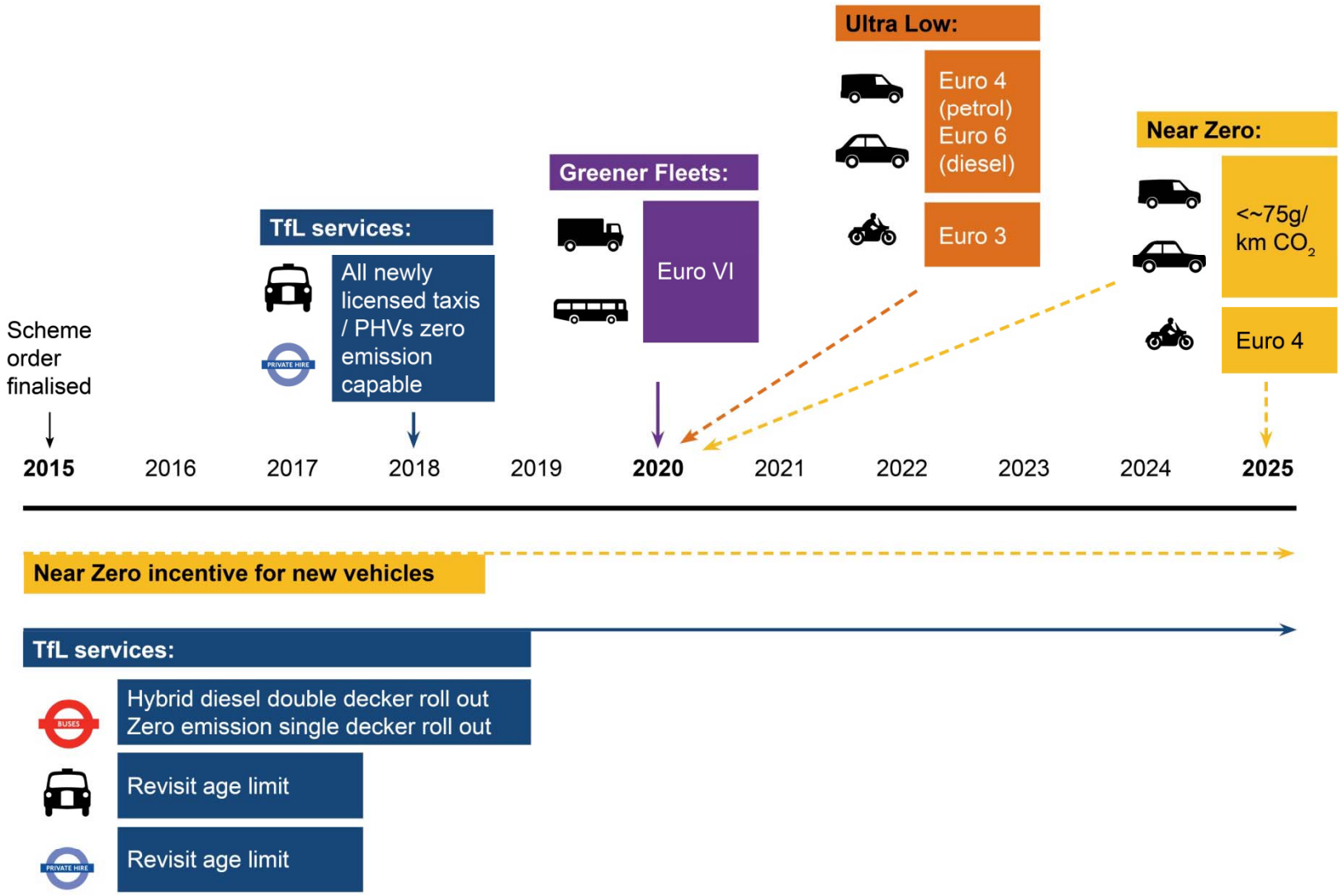
Near Zero (2020 or 2025?)

<~75g/ km CO_2 — Lower charge

Euro 4 — Lower charge

NO_x saved (2020)	NO_x saved (2025)
10%	15%

Potential timeline



Next steps and engagement

- Stakeholder engagement will continue up until 2015
- We have published a survey to try to understand what the public think about air quality in London.
- We will be undertaking stated preference surveys to help shape the ULEZ policy option and to understand better behavioural responses to different options
- Further work to understand the wider health benefits of the proposals alongside other societal impacts
- An integrated impact assessment will be undertaken later this year prior to a public consultation on a single option
- Subject to the feasibility requirements, we are hoping to have a scheme order in place by 2015 – giving users five years notice before 2020

For more information please contact:

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