

TABLE A1 - REDUCE the amount of journeys that need to be made

ID	Action	Description and Focus	Timescale to implement	Air Quality Impact	Costs	Organisations responsible	
			ST - Short MT - Medium LT - Long	AQ - Low AQ - Med AQ - High	£ - Low ££ - Med £££ - High		
1	Traffic management	Changes to road layouts and traffic management to reduce general traffic levels and encourage walking/ cycling. Experience shows that removing road-space does not just displace traffic, it tends to also reduce it.	MT - LT	AQ > AQ	££ - £££	- Local / City Region Authorities - Highways Agency	Joint Measure
2	Strategic highway improvements	Widen / build highways to reduce congestion or divert traffic from area of poor air quality. Include widening sections of trunk roads/ motorways or bypassing.	MT - LT	AQ > AQ	£££	- Local / City Region Authorities - Highways Agency	Joint Measure
3	Road User Charging (RUC) / congestion charging	Apply to an area, key routes and/or times of day to dissuade non-essential and through-traffic.	LT	AQ	££ - £££	- Local / City Region Authorities	
4	Workplace Parking Levy (WPL)	Annual charge on private, non-residential parking (off-street)	LT	AQ	££	- Local / City Region Authorities	
5	Access Management	Specific streets or whole city centre, with time, weight or purpose restrictions, freeing space for pedestrians, public transport or managed freight/deliveries.	MT	AQ > AQ	££	- Local / City Region Authorities	

^{A1} 30 years of car restraint, Oxford UK

^{A2} Junctions 28 to 35a Maximum Mandatory Speed Limit - Consultation document

^{A3} Case Study London Congestion Charging

^{A4} Central London Congestion Charging Scheme

Co - benefits / Supporting factors	Examples
Co-benefits: often include: safety (from speed or conflict reduction) and public realm improvements. Supporting factors: road layout changes are mandatory for users so quite reliable.	Oxford was probably one of the first UK cities to adopt a traffic restraint policy and abandon road building as a solution to its transport problems, and thanks to its sustained efforts, is one of the least car-dependant cities in the UK ^{A1}.
Co-benefits: often include: safety (from conflict reduction). Supporting factors: road layout changes are mandatory for users so quite reliable.	M1 managed motorway, including provision for four lane running, with 60mph speed limit ^{A2} in daytime hours.
Co-benefits: congestion reduction aids journey time/reliability. Supporting factors: RUC regulations ensure higher levels of compliance and therefore AQ benefits more likely to be achieved.	London Congestion Charging Scheme produced significant reductions in traffic inside the zone. Although not its stated purpose the reduction in traffic inside the zone reduced local emissions.
Co-benefits: congestion reduction aids journey time/reliability. Supporting factors: regulations will tend to ensure higher levels of compliance.	Employers in Nottingham that provide workplace parking places are required to get a licence and, where applicable, pay a charge, as part of the Workplace Parking Levy ^{A5}.
Co-benefits: congestion reduction (or priority for certain vehicles) aids journey time/reliability. Supporting factors: regulations will tend to ensure higher levels of compliance.	Durham Road User Charging was used to achieve access control ^{A6}, Cambridge Core Traffic Management Scheme ^{A7} prioritised public transport, walking and cycling. Paris put in a registration plate ban, alternating between odd and even number plates, during times of very poor air quality and gave free use of bus and the metro system.

^{A5} Workplace Parking Levy in Nottingham encourages employers to improve staff travel planning (UK)

^{A6} Case Study Durham Road User Charging

^{A7} ELTIS - Cambridge (UK) Core Traffic Scheme

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6	Re-prioritising road space away from cars	Restricting car use and encouraging walking, cycling and public transport.	ST - LT	AQ > AQ	£££	- Local / City Region Authorities
7	Parking management	Can be designed according to the policy it is intended to support, including encouraging: commuter travel by foot, use of low emissions vehicles and use of Park & Ride.	ST	AQ > AQ	£	- Local / City Region Authorities for on-street and council owned sites. - Commercial organisations for (majority of) off street car parks
8	Car & lift sharing schemes	Focused on reducing single occupancy car journeys. Often workplace focussed, on specific employers or business parks.	ST	AQ	£	- Employers, potentially supported by Local / City Region Authorities
9	Car clubs	Can reduce the number of cars in use and raise emission standards (as new vehicles), including low-emission vehicles where specified.	ST	AQ	£	- Local / City Region Authorities - Employers

^{A8} TfL BCS Pilot Evaluation Report

^{A9} DfT Local Transport Notes

^{A10} London Cycling Design Standards

Co -benefits / Supporting factors	Examples
Co-benefits: congestion reduction (or priority for certain vehicles) aids journey time/reliability, public realm and safety. Supporting factors: regulations will tend to ensure higher levels of compliance.	London Cycle Superhighways (CS) have seen a rise in the number of journeys on them (83% on CS3 and 46% on CS7) ^{A8}. A key factor in their success is the use of continual, high quality infrastructure rather than piecemeal interventions. Design guidance can be found on the TfL and DfT websites ^{A9}, ^{A10}. In New York changed road layouts provide more room for pedestrians and cyclists on a city wide scale. They have done this in an effective manner by using simple bollards and road markings. Those that are successful are made permanent when funds become available and those that are not have their old layout reinstated ^{A11}, ^{A12}.
Co-benefits: congestion reduction (or priority for certain vehicles) aids journey time/reliability. Supporting factors: demand management will tend to ensure higher levels of compliance.	In Winchester public car parking charges were adjusted to provide discounts for drivers of low emission vehicles. Winchester's parking charge structure was adjusted to discount rates for lower emission vehicles ^{A13}.
Co-benefits: congestion reduction (or priority for certain vehicles). Supporting factors: Voluntary nature will tend to mean lower levels of take up.	Councils in Belfast and Gloucester have encouraged informal park and share sites for two or more commuters to park and share one car for the last leg of the journey into the centre. Liftshare, an organisation specialising in car sharing systems, can develop bespoke web pages / portals for employers.
Co-benefits: fuel savings, carbon reduction, maintenance and safety benefits. Supporting factors: may require ongoing support from local authorities to maintain scheme, with minimum being allocated parking spaces.	There are a number of car club providers working in cities across the UK, with Carplus providing a useful overview of schemes, evidence and accredited suppliers ^{A14}.

^{A11} Comparing Public Space in Paris and New York

^{A12} Sustainable Streets: 2013 and Beyond (NYC)

^{A13} ELTIS - Integrated pricing strategies in Winchester/United Kingdom

^{A14} Carplus

TABLE A1 - *REDUCE* the amount of journeys that need to be made

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			ST - Short MT - Medium LT - Long	AQ - Low AQ - Med AQ - High	£ - Low ££ - Med £££ - High		
10	Workplace Travel Planning	Encouraging alternative modes for travel to work.	ST	AQ	£	- Employers, potentially supported by Local / City Region Authorities	Scheme Support
11	Encourage/ facilitate home-working	Home-working or localised working (e.g. use of shared office space) to reduce car travel.	ST	AQ	£	- Employers, potentially supported by Local / City Region Authorities	Scheme Support
12	Delivery and Servicing Plans (DSP)	Based on a review of deliveries and servicing a DSP sets out how to reduce unnecessary (and often duplicated) travel to a site and how to better organise deliveries to suit the receiving organisation.	ST	AQ	£	- Employers, potentially supported by Local / City Region Authorities	Scheme Support

Co - benefits / Supporting factors	Examples
Co-benefits: congestion reduction (or priority for certain road users). Health benefits for employees from using more active travel modes, reduced carbon footprint for business. Supporting factors: Voluntary nature will tend to mean lower levels of take up.	Travelwise initiatives, such as the one in Merseyside^{A15} work directly with schools, businesses and public sector organisations to promote mode shift. Liftshare for business^{A16} is an example of a commercial service to support employment site travel planning. Some major employers, such as B&Q^{A17}, run their own travel plan programmes.
Co-benefits: congestion reduction (or priority for certain road users). Supporting factors: voluntary nature will tend to mean lower levels of take-up.	In London home working was encouraged by many employers both during the London Olympics 2012 and during tube strikes, and supported by local authorities e.g. Smarter Travel Sutton^{A18}.
Co-benefits: congestion reduction (or priority for certain road users). Supporting factors: exerting influence down the supply chain can be time-consuming, but viewed as relatively reliable way to achieve impacts.	TfL has implemented a DSP for their London (Southwark) Palestra building^{A19}.

^{A15} Lets Travelwise

^{A16} Liftshare My PTP

^{A17} A12 B&Q Travel Plans commitment

^{A18} Smarter Travel Sutton

^{A19} Transport for London freight delivery and servicing plans

TABLE A2 - *SHIFT* journeys which are made to less polluting modes

ID	Action	Description and Focus	Timescale to implement	Air Quality Impact	Costs	Organisations responsible	
			ST - Short MT - Medium LT - Long	AQ - Low AQ - Med AQ - High	£ - Low ££ - Med £££ - High		
13	Intensive active travel campaign & infrastructure	Encourage walking, cycling and use of public transport instead of private car.	MT	AQ	£	- Local / City Region Authorities - Employers and potentially NHS	Joint Measure
14	Personalised Travel Planning	Advice given directly to households to assist those willing to shift mode for commute, education and personal travel.	ST	AQ > AQ	£ - ££	- Local / City Region Authorities - Employers and potentially NHS	Joint Measure
15	School Travel Plans	Encouraging alternative modes for travel to school by children and carers.	ST	AQ	£	- Local / City Region Authorities - Education authorities - Schools	Joint Measure
16	Promotion of walking	Develop a quality urban realm which provides pedestrians with a safe, secure and direct network linking city centre with retail, commercial, leisure and transport locations.	MT	AQ	£ - ££	- Local / City Region Authorities - Employers - Schools	Joint Measure

^{A20} ELTIS - Darlington (UK) Sustainable Travel Demonstration Town

^{A21} DfT Resource library for local authorities

^{A22} Travel Blending Australia

^{A23} TAPESTRY Project report - Viernheim Household Transport

Co - benefits / Supporting factors	Examples
Co-benefits: congestion reduction, health benefits. Supporting factors: requires voluntary changes in behaviours.	Darlington^{A20}, Worcester and Peterborough participated in the DfT's Sustainable Travel Demonstration Towns over a 5 year period, during which time car use had fallen by up to 9 per cent across the three towns^{A21}.
Co-benefits: congestion reduction. Supporting factors: requires voluntary changes in behaviours, unless twinned with parking reduction at destination.	Various examples are available to refer to that use a range of related techniques to support mode shift and active travel, including: TravelBlending®^{A22}, Indimark® in Germany^{A23}, TravelSmart® in Bristol^{A24}, UK, TravelSmart® in Gloucester^{A25}, UK
Co-benefits: health, urban realm utilisation. Supporting factors: requires significant and continued commitment to ensure growth.	A considerable number of local authorities and schools participate in school travel planning activities, including for example Safer Routes to school, as part of the London STARS initiative^{A26}. STARS (Sustainable Travel: Active, Responsible, Safe) is the Transport for London (TfL) school travel plan accreditation scheme. It rewards schools for their engagement with the school community and for carrying out initiatives which result in more pupils and staff travelling sustainably to school. The STARS travel plan site helps schools to create and implement a successful travel plan and apply for one of three awards, Gold, Silver and Bronze.
Co-benefits: health, urban realm utilisation, footfall for businesses. Supporting factors: requires significant and continued commitment to ensure growth.	Legible City way finding system in London and other cities (Bristol, York, Exeter) allows people to move in and around the city more easily – and feel confident in doing so with way finding maps at key decision points. Studies on the pilot area in London shows that most users strongly agreed that they would walk more because of this infrastructure^{A27}. The Pedestrian Environment Review System (PERS) includes a method for conducting audits and general guidance on walkability^{A28} which has been produced by TfL explaining the benefits of methods to upgrade the streetscape and urban realm.

^{A24} Bristol NHS Travel Smart

^{A25} TravelSmart - Changing the way we travel

^{A26} STARS is Transport for London's (TfL) school travel plan

^{A27} Transport for London - Legible London pilot evaluation results

^{A28} Transport for London – Walking good practice

TABLE A2 - SHIFT journeys which are made to less polluting modes

ID	Action	Description and Focus	Timescale to implement	Air Quality Impact	Costs	Organisations responsible	
			ST - Short MT - Medium LT - Long	AQ - Low AQ - Med AQ - High	£ - Low ££ - Med £££ - High		
17	Public cycle hire scheme	Public cycle hire scheme in city centre to encourage short commutes and link with public transport and work places.	ST	AQ	££	- Local / City Region Authorities - Commercial partners	Joint Measure
18	Cycle network	Improve and extend cycle network in the city centre with a network of parallel routes including contra-flow cycle lanes, shared use bus and cycle lanes.	LT	AQ > AQ	££	- Local / City Region Authorities - Commercial partners	Joint Measure
19	Bus route improvements	Route based improvements to infrastructure for priority (punctuality and reliability).	MT	AQ	£££	- Local / City Region Authorities	
20	Bus based Park & Ride	Encourage Park & Ride use instead of parking in city centres for commuters and longer stay shoppers and visitors.	LT	AQ	£££	- Local / City Region Authorities	
21	Rail based Park & Ride	Encourage rail based Park & Ride use instead of long distance driving.	LT	AQ	£££	- Local / City Region Authorities - Network Rail - Train Operating Companies (TOC)	Joint Measure
22	High Occupancy Vehicle (HOV) lanes	For car and van users, to encourage car/ride sharing.	LT	AQ > AQ	££	- Local / City Region Authorities	

^{A29} The effects of Smarter Choice programmes in the Sustainable Travel Towns

^{A30} ELTIS Cycling England Cycling City and Towns end of programme reports

^{A31} Bus Priorities – Edinburgh Greenways

^{A32} ELTIS – Park & Ride – a success. Edinburgh UK

Co - benefits / Supporting factors	Examples
Co-benefits: congestion reduction, health benefits. Supporting factors: requires voluntary changes in behaviours.	Examples include schemes in London, Bath, Belfast serving city centre locations, and a number of railway station based schemes including York and via 'Brompton Docks' in Bristol and other station locations.
Co-benefits: congestion reduction, health benefits. Supporting factors: requires voluntary changes in behaviours.	Darlington, Worcester and Peterborough took part in the sustainable travel towns initiative and the evaluation provides evidence of the positive impacts (with around a 9% reduction in car journeys) ^{A29} . Bristol and other towns and cities participated in the Cycling City demonstrations and implemented a range of infrastructure and promotional measures ^{A30} .
Co-benefits: congestion reduction, health benefits. Supporting factors: requires voluntary changes in behaviours.	Extensive use in UK and elsewhere, with evaluation of early schemes (such as in Edinburgh) showing positive impacts on bus journey times ^{A31} .
Co-benefits: congestion reduction. Supporting factors: requires voluntary changes in behaviours, unless twinned with parking management (restraint) in town centres.	Extensive use of Park & Ride in UK towns, cities and elsewhere (e.g. Reading, Manchester, York, Leeds, Bradford). Evidence points to re-routing of car trips (rather than overall reduction) but with the result they are kept out of central areas ^{A32} , ^{A33} .
Co-benefits: congestion reduction. Supporting factors: requires voluntary changes in behaviours, unless twinned with parking management (restraint) in town centres.	Many Park & Ride facilities at railway stations in place across the UK network. Can be used to target urban mode shift where there is a good cross-city train services, such as in Birmingham .
Co-benefits: congestion reduction and journey time improvements for prioritised vehicles. Supporting factors: mandatory nature of road layout will increase compliance if enforced.	A high occupancy 2+ lane has successfully operated on the A647 Stanningley Road in Leeds ^{A34} , ^{A35} since 1998. In the last few years other 2+ lanes have opened; for example on the M606 (from Bradford towards Leeds) and on the A63 to/from M1 junction 45. West Yorkshire's fourth 2+ lane opened just recently on Roundhay Road ^{A36} .

^{A33} Park & Ride at West Midlands Stations

^{A34} Evidence in Europe. Leeds UK

^{A35} ELTIS - High Occupancy Vehicle Lane Demonstration: Leeds, UK

^{A36} HOV in Leeds

TABLE A2 - SHIFT journeys which are made to less polluting modes

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			ST - Short MT - Medium LT - Long	AQ - Low AQ - Med AQ - High	£ - Low ££ - Med £££ - High	
23	Development Control	Limit car parking and ensure good public transport connections and investment in low emission technologies for new developments. Design out the need for vehicular commuting within new builds with mixed use developments. Gain planning contributions to invest in mitigation.	MT - LT	AQ	£ - ££	- Planning Authority
24	Promote use of rail and inland waterways	Various measures, including dock and rail network developments to increase transfer by rail and water (often combined with less road transport).	LT	AQ > AQ	£ - £££	- Local / City Region Authorities - Network Rail - Canals & Rivers Trust - Commercial port owner
25	Public transport improvements – interchanges, stations and services	Aimed at providing efficient public transport interchange points in the city centre.	LT	AQ > AQ	£££	- Local / City Region Authorities - Bus operators - Train operating companies
26	Freight consolidation centre	Goods for delivery are consolidated into full loads at an edge of town warehouse before being moved into city centre, potentially using low emission vehicles.	ST	AQ > AQ	£ - ££	- Local / City Region Authorities - Retailers, third party logistics providers - Major public sector freight attractors

^{A37} Low Emission Zone - Restrictions on vehicle emissions

^{A38} SYPTE Plans and Strategies

^{A39} Wikipedia - Daventry International Rail Freight Terminal

^{A40} Stobart use of DIRFT

Co - benefits / Supporting factors	Examples
Co-benefits: congestion reduction, shorter travel times. Supporting factors: requires consistent and long-term decision making on planning and permissions to develop.	Greenwich Peninsula LEZ, was put in place through planning conditions and applies to the construction and use phases of the new development ^{A37}. Mid-Devon supplementary planning document paved way for a funding formula linked to emissions generated from a new supermarket development. In South Yorkshire, close partnership working between the PTE (SYPT) and the South Yorkshire districts through the South Yorkshire Land Use Integration (LUTI) project has helped to ensure that new developments are prioritised around existing public transport corridors and that any poorly connected sites are outlined as requiring developer contributions towards public transport services. The work has been welcomed on a city region basis, with partners outside of South Yorkshire now requesting LUTI modelling ^{A38}.
Co-benefits: congestion reduction on roads. Supporting factors: requires capacity on rail lines and competition with road freight.	Daventry International Rail Freight Terminal ^{A39} has enabled goods to be shipped across the UK by rail rather than road transport ^{A40}.
Co-benefits: congestion reduction from reduced car traffic. Supporting factors: required investment from train, bus and Local Transport Authority.	Various PTE and other Transport Authorities provide examples and experience of public transport interchange design and operation ^{A41}.
Co-benefits: congestion reduction on roads. Supporting factors: may require some initial support from local authority or other funding source.	Examples include Freight Consolidation Centres in Bristol (serving Bristol Broadmead and Bath ^{A42}), Crown Estate Freight Consolidation centre on Regents Street ^{A43} and Your Homes Newcastle's new freight consolidation centre ^{A44}.

^{A41} TfL microsite on interchange design and operation

^{A42} Bristol and Bath Freight Consolidation

^{A43} Transport for London - Regent Street Consolidation and collaboration

^{A44} Your Homes Newcastle - Eco-friendly storage centre to support retailers

Table A3 - IMPROVE vehicle emissions through operational changes

ID	Action	Description and Focus	Timescale to implement	Air Quality Impact	Costs	Organisations responsible	
			ST - Short MT - Medium LT - Long	AQ - Low AQ - Med AQ - High	£ - Low ££ - Med £££ - High		
27	Route management plans	Apply highway and pavement designs that improve efficiency for all road users on key routes (including car, HGV, public transport, cyclists, pedestrians).	LT	AQ	££	- Local / City Region Authorities - Freight Quality Partnership	Joint Measure
28	Strategic routing strategy for HGVs	Work with partners to define routes, and implement physical traffic management measures to assist. May be combined with restrictions into sensitive areas. To ensure freight and servicing can continue to serve economically important areas the design needs careful consideration.	MT	AQ > AQ	££	- Local / City Region Authorities - Freight Quality Partnership - Highways Agency	Joint Measure
29	Co-ordinate traffic signals and apply other traffic management systems	Smooth traffic flows, react to events and re-route traffic..	MT	AQ	££	- Local / City Region Authorities	
30	Anti-idling enforcement	Reduction in idling vehicles can be done by focussing on enforcement and regulation (by Local Authority) or by working directly to support fleet operators.	ST	AQ > AQ	£	Local / City Region Authorities - Fleet owners (bus, HGV) - Sensitive destination sites (e.g. schools & hospitals)	Joint Measure

^{A45} Sefton Council - A565 route management strategy

^{A46} Lorry routes and bans – Windsor area, UK

^{A47} Tyne and Wear Freight Map

Co - benefits / Supporting factors	Examples
Co-benefits: capacity or reliability improvements. Supporting factors: mandatory nature of road changes tends to ensure results.	Sefton Council has developed a strategy and draft action plan to improve conditions along the very busy A565 route between Thornton and Seaforth. This managed traffic congestion, improved safety and accessibility (especially for pedestrians) and managing air pollution ^{A45}.
Co-benefits: capacity or reliability improvements. Supporting factors: mandatory nature of road changes tends to ensure results.	There are various examples of lorry controls, including in Windsor and London ^{A46}. Tyne and Wear Freight Partnership, among others, has provided freight route mapping for operators ^{A47}.
Co-benefits: capacity or reliability improvements. Supporting factors: mandatory nature of signalisation changes tends to ensure results.	Most UK cities have some level of co-ordinated signals, with examples of time saving in a range of circumstances ^{A48}. Liverpool Council is currently trialling a link between pollution monitoring equipment on the road-side with signalisation techniques ^{A49}.
Co-benefits: fuel savings for operators/owners. Supporting factors: mandatory tends to ensure results.	A range of areas have focussed on reducing emissions from idling vehicles, including Sheffield and Sefton where bus emissions were perceived to be an issue, and Croydon and Manchester where general information and awareness campaigns took place along with some enforcement ^{A50}.

^{A48} Urban traffic control systems – SCOOT, UK

^{A49} New technology trial to improve air quality in Liverpool

^{A50} Greater Manchester idling vehicle hotline

Table A3 - IMPROVE vehicle emissions through operational changes

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			ST - Short MT - Medium LT - Long	AQ - Low AQ - Med AQ - High	£ - Low ££ - Med £££ - High		
31	Quiet & out of hours delivery	Deliveries made before and after peak traffic hours. Reduces time and variability spent making deliveries, evidence of small fuel savings.	ST	AQ	£	- Local / City Region Authorities - Freight Quality Partnership - Retailers	Joint Measure
32	Selective vehicle priority	Bus lanes or bus / HGV / taxi priority routes.	ST - MT	AQ	£ - ££	- Local / City Region Authorities - Bus operators	Joint Measure
33	Parking enforcement on highway	Focus on where stationary vehicles are causing problems to flow traffic (congestion / delays)	ST	AQ	£	- Local / City Region Authorities	
34	Driver training and ECO driving aids	For improved fuel efficiency and emissions from car, taxi, van and bus/ coach drivers through better driving habits. Sometimes supported by in-cab technology or monitoring.	ST	AQ	£	- Local / City Region Authorities - Freight Quality Partnership - Employers	Joint Measure
35	Emissions based parking charges	Aims to encourage residents to consider vehicles that have lower (carbon) emissions that are also often smaller in size.	ST	AQ	£	- Local / City Region Authorities for on-street parking. - Commercial owners of private off-street parking	Joint Measure

^{A51} Transport for London - Retiming & out-of-hours deliveries

^{A52} Quiet Deliveries Demonstration Scheme Final Report

^{A53} Quiet Deliveries Demonstration Scheme Case Studies

^{A54} Bus lanes reintroduced to tackle Colchester air quality

^{A55} Highways Agency – M4 bus lane air quality study

^{A56} Suspending M4 bus lane breached air pollution law

^{A57} Gravesham Borough Council - Pollution control - air quality

Co benefits / Supporting factors	Examples
Co-benefits: fuel and time savings for operators/owners. Supporting factors: needs buy-in from local communities and businesses.	Pilot demonstrations during the 2012 London Olympics ^{A51} and for DfT ^{A52 / A53} .
Co-benefits: fuel and time savings for operators/owners. Supporting factors: mandatory nature tends to mean success, if enforced. After a number of years of introduction they have proved recently contentious.	Bus lanes are widely used in PTE and other areas. In Colchester ^{A54} bus lanes have been reintroduced for air quality purposes. A study of the M4 bus lane showed its removal worsened air quality ^{A55/ A56} .
Co-benefits: congestion reduction. Supporting factors: mandatory nature tends to mean success, if properly enforced.	A number of schemes reference anticipated benefits to air pollution including Gravesham ^{A57} and Hull ^{A58} . Air quality benefits were indicated in a study of parking enforcement in Towchester by the Highways Agency ^{A59} .
Co-benefits: fuel and vehicle safety benefits for operators/owners. Supporting factors: voluntary nature tends to mean ongoing monitoring is required to re-train drivers who slip back.	Various public and private sector organisations run courses and partnerships, including those aimed specifically at emissions saving^{A60/ A61/ A62} Various organisations have fitted or supported fitment of in-cab equipment, either through policies (TfL for London Bus services) or via grant applications (West Yorkshire Combined Authority^{A63}).
Co-benefits: may be carbon benefits (if stimulates low emission vehicles). Supporting factors: availability of lower emission vehicles is important.	Various London boroughs ^{A64} have set graduated charges for residents parking schemes based on carbon emissions of cars (via car tax bands). Winchester provided discounts at public car parks for certain lower emission vehicles ^{A65} .

^{A58} Hull City Council – Parking enforcement

^{A59} Highways Agency - A5 Towcester Parking (Northamptonshire)

^{A60} Fuel Good Training Sessions

^{A61} Reduce your Travelfootprint – What is Eco-driving?

^{A62} Welsh Government – Freight Best Practice

^{A63} Metro – Yellow buses going green

^{A64} Eltis - Financial Incentives for using ECO Vehicles in Westminster and London

^{A65} Winchester MIRACLES (parking)

Table A4 - IMPROVE vehicle emissions through technical changes

ID	Action	Description and Focus	Timescale to implement	Air Quality Impact	Costs	Organisations responsible	
			ST - Short MT - Medium LT - Long	AQ - Low AQ - Med AQ - High	£ - Low ££ - Med £££ - High		
36	Low Emission Zone (LEZ)	Set emission standards for specific vehicles entering a prescribed road or region. Can be focussed by vehicle type: HGV, bus, van, car.	LT	AQ > AQ	£££	- Local / City Region Authorities working with: - Highways Agency - Freight industry - Bus operators - Motorist organisations	Joint Measure
37	Bus fleet improvements	Rapidly increase average bus emission standards (new vehicles, low carbon bus or exhaust retrofit).	MT	AQ > AQ	£££	- Local / City Region Authorities - Bus operators	Joint Measure
38	Rapid take up of low emission private cars	Encourage adoption of electric, hybrid and plug-in vehicles.	LT	AQ > AQ	£££	- Government, - Local / City Region Authorities - Employers - Fleet operators	Joint Measure

 ^{A66} Transport for London – Low Emission Zone

 ^{A67} Oxford Low Emission Zone

 ^{A68} Low Emission Zone - Norwich

Co benefits / Supporting factors	Examples
Co-benefits: may be carbon reduction benefits if stimulates energy efficiency (from low emission vehicles). Supporting factors: more complex enforcement systems are required for LEZ covering multiple vehicle types, to ensure compliance. Simple LEZ, focussed on a local fleet (e.g. bus) can use simpler monitoring and checks.	The London LEZ initially set emission standards for heavy duty vehicles (bus, coach, truck) and in later years included heavier vans and minibus^{A66}. A ultra LEZ is being considered for 2020 in the inner congestion charge zone. Oxford's LEZ focuses on bus fleets^{A67}, as does Norfolk^{A68}.
Co-benefits: may be carbon reduction benefits if stimulates energy efficiency (from low emission vehicles); improved vehicles benefit to customer experience. Supporting factors: generally needs to fits with plans to renew fleet given cost and life-span of buses.	Nottingham city electric bus fleet^{A69} uses buses which will be recharged by electricity from a municipal waste incinerator. Various local authorities have applied for DfT's Clean Bus Technology Fund^{A70}, and the majority have received funding to retrofit NOx abatement technology to older buses, and in some cases convert buses to electric or gas power (e.g. York and Sheffield).
Co-benefits: carbon reduction benefits if stimulates energy efficiency (from low emission vehicles). Supporting factors: generally needs to fits with plans to renew cars and requires subsidies, given cost and life-span of cars.	The plugged in places scheme has co-funded large roll-outs of electric vehicle charge point infrastructure across UK cities, for example in the West Midlands^{A71}. The E-car project for Northern Ireland^{A72} has focused on charge points on the strategic road network to enable longer distance journeys.

^{A69} Transport Minister launches eco-friendly buses

^{A70} £5 million boost to cut pollution from local buses

^{A71} Plugging in Midlands – Supporting electric vehicles in the Midlands

^{A72} ECar charged for success

Table A4 - IMPROVE vehicle emissions through technical changes

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			ST - Short MT - Medium LT - Long	AQ - Low AQ - Med AQ - High	£ - Low ££ - Med £££ - High		
39	Compressed natural gas (CNG)/ biomethane refuelling for HGV / Bus	Support take-up of gas truck or bus operations through refuelling facilities and demonstrations of vehicles.	MT	AQ (if high take up)	££	- Government, - Local / City Region Authorities - Employers - Fleet operators	Joint Measure
40	Electric Vehicle charging points and priority parking	Prioritise public parking for electric and low carbon vehicles.	MT	AQ > AQ	££	- Local / City Region Authorities - Employers	Joint Measure
41	Fleet efficiency and recognition schemes	Voluntary fleet recognition and advice schemes that encourages HGV, bus, coach and van operators to move towards a cleaner fleet and improve fuel efficiency.	ST	AQ	£	- Local / City Region Authorities - Freight Quality Partnership - Other fleet Operators	Joint Measure

-  ^{A73} GVH – Gas Vehicle Hub
-  ^{A74} ELTIS - Bio-methane powered vehicles and filling station in Sheffield, UK
-  ^{A75} ELTIS - Installation of On-Street Recharging Points for Electric Vehicles

Co - benefits / Supporting factors	Examples
Co-benefits: strong carbon reduction benefits if biomethane is used. Supporting factors: generally needs to fits with investment plans to renew fleets, given cost and life-span of vehicles and need to plan for long-term use of a gas filling station.	The DfT Low Carbon Truck Demonstrations^{A73} are funding a series of gas refuelling stations and gas HGV fleets. Sheffield has been developing the case for and experience of CNG refuelling stations^{A74}.
Co-benefits: carbon reduction benefits and reduction in running costs. Supporting factors: generally needs to fits with plans to renew cars and requires subsidies, given cost and life-span of cars.	There has been a major roll out of charge point infrastructure in a number of major urban areas^{A75}). Source London oversees over 1,300 publicly available charging points in London^{A76}. The City of York^{A77} are helping install charge points at leisure destinations.
Co-benefits: fuel savings, carbon reduction, maintenance and safety benefits. Supporting factors: requires ongoing monitoring and measurement to maintain benefits and ensure continual progress, including central resource/champion.	ECO Stars fleet recognition scheme implemented in many towns and cities in the UK and Europe^{A78}. Fleet Operators Recognition Scheme (FORS)^{A79}. Freight Best Practice Programme^{A80}.

^{A76} Source London

^{A77} Zero Carbon World - York Case Study: A new way of driving

^{A78} ECO STARS fleet recognition scheme

^{A79} Fleet operator recognition scheme

^{A80} Welsh Government – Freight Best Practice

Table A4 - IMPROVE vehicle emissions through technical changes

ID	Action	Description and Focus	Timescale to implement	Air Quality Impact	Costs	Organisations responsible	
			ST - Short MT - Medium LT - Long	AQ - Low AQ - Med AQ - High	£ - Low ££ - Med £££ - High		
42	Taxi licensing conditions	Set age or Euro limits for licensing.	MT	AQ	£	Licensing Authority (i.e. Council)	
43	Taxi emission incentives	Give incentives/priority to cleaner vehicles at key ranks e.g. Taxi ECO Stars.	ST	AQ	£	- Local / City Region Authorities - Taxi owners and operators	Joint Measure
44	Procurement priority for companies with lower emission vehicles	Across all Council procured services, e.g. - waste collection/recycling - parcel delivery - school transport	MT	AQ > AQ	£	- Local / City Region Authorities - Other public sector fleet operators	Joint Measure

Co - benefits / Supporting factors	Examples
Co-benefits: fuel savings, carbon reduction, maintenance and safety benefits. Supporting factors: requires ongoing monitoring to maintain benefits.	TfL sets age limit for licensed taxis (black cabs) and private hire vehicles in London ^{A81}. Many other local authorities set age limits for new taxi registrations with aim of encouraging a newer, less polluting fleet.
Co-benefits: fuel savings, carbon reduction, maintenance and safety benefits. Supporting factors: requires ongoing funding to maintain benefits.	The Mid-Devon ECO Stars scheme ^{A82} includes a parallel fleet recognition scheme for taxis and private hire operators ^{A83}. The City of York has been offering grants to taxi operators to buy hybrid vehicles ^{A84}.
Co-benefits: potentially lower carbon where there are overlaps. Supporting factors: required strong support and involvement from procurement.	Hampshire County Council low carbon procurement strategy recognises use of low carbon alternative fuels ^{A85}. Sefton Council and the LES Partnership have developed a process guide for Sefton Council procurement. The guide emphasises the need to influence the procurement activity at all stages and particularly at the outset, when there is most scope to affect subsequent emissions ^{A86}.

^{A81} Mayor's Air Quality Strategy

^{A82} Mid Devon ECO Stars Fleet Recognition Scheme

^{A83} Mid Devon ECO Stars Fleet Recognition Scheme for Taxi and private hire vehicles

^{A84} City of York Council - Joyair

^{A85} Hampshire County Council Corporate procurement strategy

^{A86} Low emission strategies – Liverpool City Region