DEFRA AIR QUALITY GRANT

Project Title: **Slough Travel Behaviour and Health**
Project Reference: 232a2012

FINAL REPORT
March 2014

CONTENTS

Background to the Project

1. Two Air Quality Management Areas (AQMA no.3 A355 Tuns Lane/Farnham Road and no.4 A4 Town Centre)) were declared in 2011 for central Slough because of exceedences of the Air Quality Strategy objective threshold for ambient annual mean nitrogen dioxide (NO_2) of 40 µg/m3 caused principally by road traffic (see Appendix 1 which also the Borough's two other AQMAs). Because of the influence of traffic, the Action Plan covering these AQMAs is closely linked with implementation of Slough's Local Transport Plan LTP).

2. This project aims to achieve improved air quality in the AQMAs and support public health objectives through influencing behaviour and raising awareness, focusing on the following Action Plan measures:
   - promoting sustainable modes of travel as alternatives to the car; and
   - reducing the adverse environmental impact of buses, taxis and commercial vehicles.
3. The project has sought to demonstrate how sustainable travel, in particular cycling and walking, can improve personal health whilst also contributing towards a reduction in traffic in central Slough and consequent enhancement in air quality. It has aimed to build on, and add value to Smarter Travel for Slough (formerly Smarter Travel Slough) - the current initiative being supported by the Department for Transport (DfT) Local Sustainable Transport Fund.
4. The second strand of the project has explored the extent to which the operations of bus and taxi services and road freight and logistics can be influenced to reduce oxides of nitrogen (NOx) emissions.

Air Quality Grant and Project Plan

5. Slough Borough Council submitted a bid for financial support for the project from the 2012/13 Air Quality Grant Fund in June 2012. The Department for Environment, Food and Rural Affairs (DEFRA) announced on the 31st October 2012 that this had been successful. A Project Plan was subsequently sent to DEFRA on the 22nd Nov 2012 setting out details of the Project Team, the work packages, timescales/ milestones, arrangements for knowledge transfer, success criteria and monitoring.

6. Four work packages (WP) were proposed in the Project Plan:
   - WP1 Working with bus, taxi and freight operators;
   - WP2 Workplace travel planning;
   - WP3 School travel planning; and
   - WP4 Final report.
7. This report constitutes WP4; the results of WP1 -3 are set out below.

WP1 Working with bus, taxi and freight operators

Aims of WP1

8. As set out in the Project Plan the aims were to:

- assess awareness of air quality issues;
- explore the scope for improving the environmental performance of their vehicles and operations;
- gain views on issues relating to traffic management and delivery arrangements that might affect air quality; and
- assess the impact on Slough of TfL's Low Emission Zone (LEZ) requirements.

The Tasks

9. A total of 7 tasks were identified in the Project Plan:

- 1: Identify and make contact with key stakeholders;
- 2: Engagement with bus operators;
- 3: Engagement with the taxi trade;
- 4: Engagement with the logistics industry;
- 5: Obtain and analyse feedback on improving vehicle/ operational performance and management of traffic and deliveries;
- 6: Provide input into Project Progress Report;
- 7: Prepare report on findings and potential future action.

10. Tasks 1 to 5 were undertaken between April and September 2013 and the results are described below. Task 6 was completed in November 2013 and Task 7 in February 2014.

Outputs

11. Three key outputs were proposed for WP1:

- Raised awareness of air quality issues and impact of bus, taxi and freight operations;
- Identification of ways and means of improving the environmental performance of vehicles and operations;
- Identification of improvements to traffic management and delivery arrangements.

Bus Operators

Key stakeholders

12. Three key stakeholders were identified who operate the majority of bus services within AQMAs 3 and 4:

- First Berkshire, major participant in the Slough Bus Quality Partnership;
- London United/ RATP who operate service 81 between Slough, Heathrow and Hounslow on behalf of Transport for London;
- Arriva who operate service 74 between Slough and High Wycombe.

Awareness of air quality issues

13. Awareness of air quality issues was found to be high with First Berkshire and RATP/ London United whose services operate across the Borough boundary into and out of the London LEZ. First Berkshire has also been successful in submitting bids to the DfT Green Bus Fund. As a national company, Arriva is aware of air quality issues generally[1].

14. Awareness of local air quality issues was less evident, perhaps not surprising given that Slough's two central AQMAs were declared relatively recently. The current project will help raise awareness as, in the case of the Slough - High Wycombe services run by Arriva and First Berkshire, will the future declaration of an AQMA at High Wycombe[2].

Environmental performance of vehicles and operations

15. An assessment was made of the composition of the bus fleet operating in Slough based on:

    - data kindly provided by First Berkshire for buses at its Slough depot;
    - snapshot observation of other vehicles carried out in March 2013; and
    - local knowledge of Council public transport staff.

16. First Berkshire has 60 buses at its Slough depot. In February 2013 two-thirds had Euro II or III engines (13 and 27 vehicles respectively) and the other third had Euro IV or V. Discussions with the Company however showed that significant changes were planned in the composition of their vehicle fleet as a result of:

    - financial support from the DfT Green Bus Fund for the purchase of 15 diesel hybrid Euro V vehicles on 'Series 7' services between Slough and Heathrow Airport;
    - proposed replacement of 15 older buses (mainly Euro II) with more recent vehicles (most expected to be at least Euro III).

17. The composition of other buses operating in the two central Slough AQMAs is variable:

    - TfL's service 81 between Slough and Heathrow operates Euro V engine double decker buses brought in initially to serve the 2012 Olympic and Paralympic Games;
    - Greenline services 701/2 operated by First between Slough and London are focused on recent model Euro V engine vehicles;
    - Arriva's small number of services operate with older Euro II and III vehicles.

18. Overall, the picture of the bus fleet operating in the AQMAs appears to be a positive one in terms of the environmental performance of vehicles with TfL and Greenline services using modern vehicles and the First Berkshire fleet being substantially upgraded. However the situation may be more complex as information on relative emission levels of NOx collated for our companion DEFRA-supported project (ref 232b2012[3]) shows that

[1] Demonstrated by corporate responsibility policies and investment in new vehicles which will help address air quality issues in e.g. Medway, Maidstone and Swale.

[2] Described in the*2013 Air Quality Progress Report*: Wycombe District Council.

[3] Project Defra ref 232b2012 'Using microsimulation and instantaneous emissions modelling to optimise traffic controls to minimise vehicle emissions' is aimed at optimising existing traffic controls to minimise vehicle exhaust emissions of NOx and primary NO_2.'

some Euro V engines do not perform as well as retrofitted Euro II to IV engines (see Appendix 2).

19. The scope for future action focuses on:
    - working with Arriva to seek the phasing out of their Euro II vehicles;
    - working with both First and Arriva on opportunities for enhancing the performance of their Euro III engine buses, perhaps through retrofitting of emission controls[4]; and
    - assessing in more detail the type of Euro V engines currently in operation.
20. In terms of operations, activity is centred on the new bus station that opened in the town centre in 2011 as part of the *Heart of Slough* regeneration project. About 80 buses enter and leave the bus station every hour. The largest bus flows within the two AQMAs (per hour, two way) are:
    - A4 Wellington Rd (34);
    - A4 Bath Rd between the A322 junction and A355 junction (25); and
    - A332 Windsor Rd north of High Street junction (23).
21. These routes are designed to pick up and set down passengers as close as possible to major town centre and other destinations and there is very little scope for altering these service patterns. The greatest opportunity for reducing NO_2 emissions lies in reducing dwell times, i.e. the amount of time spent at bus stops with engines running. One way of achieving this would be if more passengers bought tickets prior to their journey or used smartcards.
22. Another potential opportunity for reducing emissions is through 'eco-driving'. First Berkshire bus drivers all use *DriveGreen* equipment [5] that monitors their driving styles. However such initiatives appear to be aimed mainly at carbon dioxide (CO_2) reductions and the effect on NO_x is not clear[6].

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[4] Potentially through bids to a future round of the DfT *Clean Bus Technology Fund.*

[5] Extract from First media release 5th June 2013: 'Every one of FirstGroup's 7,500 buses… are fitted with the latest GPS technology that can detect dozens of driving movements per minute and immediately lets the driver know how well they are driving.

The DriveGreen equipment picks up on acceleration and braking patterns as well as corner, lane and speed handling. A traffic light LED monitor on vehicle dashboards flashes green if the driver is driving correctly, or amber or red if a bus driver carries out an unwanted driving manoeuvre such as heavy braking or unnecessary acceleration. The driver can then make immediate changes to their driving to ensure buses travel more efficiently to produce fewer CO emissions and more smoothly, improving the journey experience for passengers.

Scores are allocated for each driving session and based on these scores, each bus depot can identify the best performing and the most improved drivers. To encourage drivers to use DriveGreen to help improve their driving style, weekly and monthly financial rewards are awarded to the best and the most improved'.

[6] Based on the findings of *Local Measures for NO_2 Hotspots in London*, Project 18477 Final Report by Air Quality Consultants for Transport for London, March 2010.

Traffic management issues

23. In addition to the new bus station the *Heart of Slough* regeneration project has involved major changes to the town centre road network. These have included provision of more bus lanes to reduce stop-start traffic conditions and the re-location of a number of bus stops. Funding from the DfT *Better Bus Area Fund*[7] (BBAF) is delivering a new bus lane along the A355 Farnham Road within AQMA no. 3 and two bus stop laybys in AQMA no.4 are being replaced by on-street stops to reduce dwell times for buses having difficulty joining the general flow of traffic. BBAF funding is also supporting installation of SCOOT to give buses priority at the A4/ Stoke Poges Lane junction within AQMA no. 4.

24. As pointed out in the AQMA Action Plan there is further scope for reducing stop-start conditions for buses along the A4 Wellington Street by providing similar bus priorities. These are are explored by the Council in the companion emissions modelling project (ref 232b2012) and in the development of the Slough Mass Rapid Transit (SMaRT) project. SMaRT is a major scheme aimed at achieving a step change in public transport between Slough and Heathrow Airport. This is being promoted in the Strategic Economic Plan of the Thames Valley Berkshire Local Enterprise Partnership and implementation could begin in 2015/16, subject to acceptance of the detailed business case and funding from the Local Growth Fund.

Impact of London LEZ

25. From the 3rd January 2012 buses entering the London LEZ had to meet the Euro IV standard for particulate matter. The impact on First Berkshire and RATP/London United has been the need to ensure that this standard is met for services operating between Slough, Heathrow, Hillingdon and Hounslow. However, there is an awareness that the LEZ standard is directed at tackling particulates rather than the NO_2 issues that arise in Slough's central AQMAs.

Outputs and future action for bus operators

26. Table 1 summarises the WP1 outputs in relation to bus operations and outlines potential future action.

Table 1: WP1 Outputs and Action for Bus Operations		
Topic	**Output**	**Action**
Awareness of air quality issues	Awareness of general issues high but limited knowledge of AQMAs 3&4 and related Action Plan	Use project final report as basis for future discussion by Slough Bus Quality Partnership
Environmental performance: vehicles	Bus fleet operating in Slough has been significantly upgraded with support from the DfT Green Bus Fund and action by First Berkshire and TfL	Working with Arriva to seek the phasing out of their Euro II vehicles and with both First and Arriva on enhancing the performance of their Euro III engine buses, possibly by retrofitting appropriate emissions technology. Assessing in more detail

[7] The Council's *Better Bus Area Fund* project began in 2012/13 following a DfT announcement of the successful bid in March 2012.

		the type of Euro V engines currently in operation.
Environmental performance: operations	Limited scope for changing service patterns but dwell times at bus stops could be reduced and eco-driving may have potential	Further discussion by Slough Quality Bus Partnership of off-bus ticket purchase and smartcard and mobile phone ticketing. Discussion through Slough Quality Bus Partnership of effect of *DriveGreen* ecodriving initiative
Traffic management issues	Town centre regeneration in 2011 included new bus lanes and further bus priorities being provided with BBAF funding	Ensure air quality issues are taken fully into account in development of SMaRT project. Assess results of emission modelling project ref 232b2012.
Impact of London LEZ	Many Slough buses cross into LEZ and meet emission standards introduced in January 2012 but these are aimed at particulates, not NO_2 and NOx	Discuss with operators how use of LEZ-compliant engines affects the emission of NOx and NO_2

Taxi Trade

Key stakeholders

27. Two key stakeholder were identified:

- Slough Hackney Carriage Federation;
- Slough Borough Council Licensing Services.

Awareness of air quality issues

28. Most taxi drivers in Slough own their own vehicles rather than working for a fleet owner and discussion with the Hackney Carriage Federation suggested that awareness about local air quality issues was variable and dependent on individual knowledge and interest. Officers in the Council's Licensing Services were more aware of the AQMAs and associated action plans but it is evident that current local authority licensing policies focus on health and safety issues without direct reference to air quality.

Environmental performance of vehicles and operations

29. The licensed Hackney fleet[8] in Slough totals 107 vehicles with about half being large family saloon cars, mainly diesel. A limited number are fuelled by LPG and some are dual-fuel. Only 5 or 6 cars are Prius or Honda Civic hybrids. The other half of the fleet comprises diesel powered wheelchair accessible vehicles.

[8] DfT data Table TAXI0104 2013: excludes private hire cars. Taxi Statistics (https://www.gov.uk/government/organisations/department-for-transport/series/taxi-statistics)

30. Most of the saloon cars appear to be in the Euro 4 category, i.e. 05 to 09 registration plates. According to Licensing Services records the oldest diesel saloon car has a Y plate (2001, Euro 3) and the oldest petrol car an 02 plate (Euro 3). However 9 of the wheelchair accessible and purpose-built vehicles (e.g. London-type cabs) are the oldest in the fleet, including a Metrocab with an S plate (1998, Euro 2).

31. Council policy[9] is that a new entrant applying for a Hackney licence to drive a saloon car must have a vehicle less than 5 years' old. (It is understood that this vehicle age policy also applies to a driver wanting to renew his/ her licence). The licences run for 4 years so that at expiry the vehicles are a maximum 9 years' old. This suggests that a licence that runs out in March 2014 will have begun in March 2010 when the vehicle was at most 5 years' old, i.e. built in March 2005 (plate 05, Euro 4 engine). However it is understood that at the end of the normal 9-year period a driver can apply for a licence extension with the same vehicle provided that it passes an inspection.

32. The vehicle age policy is less stringent for purpose built and wheelchair accessible Hackney vehicles. In their case, although the vehicle when first registered must be no older than 5 years' of age, there is no time limit on the licence. Consequently these vehicles are significantly older than the licensed saloons.

33. The Council's policy requires every Hackney vehicle to be tested annually and pass a Certificate of Compliance. (Purpose-built and wheelchair accessible vehicles have to be tested every 6 months when they reach 14 years' of age). Emission levels are part of the test but Council policy does not set any criteria for these or stipulate a minimum Euro engine requirement. This is something that DfT guidance[10] recommends should be considered - whilst stressing the need to carefully assess the likely impact on the trade - and has been introduced by taxi licensing authorities elsewhere[11]. It is also noted that one of the proposed actions in the *Heathrow Sustainable Transport Plan*[12] is to undertake an audit of the taxi (and private hire) fleet serving the airport, which is located close to Slough, with a view to introducing initiatives aimed at improving air quality.

34. The Council has secured funding from the DfT Office of Low Emission Vehicles to install a rapid chargepoint for EVs in the town centre, close to the main taxi rank. This is partly aimed at attracting use by taxi drivers looking to switch to EVs from their existing diesel vehicles. It is recognised that use of EVs as taxis will take time to develop because of concerns about costs but provision of rapid chargepoint infrastructure will remove at least one obstacle. The number of alternative fuel vehicles in the Slough taxi fleet is small but does show that there is some potential interest in EVs as saloons and the present development of electric 'black cabs' for London could provide further stimulus.

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[9] http://static.slough.gov.uk/downloads/hackney-carriage-policy-booket2013.pdf.

[10] https://www.gov.uk/government/publications/taxi-and-private-hire-vehicle-licensing-best-practice-guidance, DfT March 2010.

[11] For example Manchester (vehicles > 10 yrs old have to be converted to meet Euro 3); Plymouth (licences after 2010 have to meet Euro 3 and those after 2012, Euro 4); Salford (first time licences after 2010 to be Euro 4, those licensed before 2010 to be Euro 3); and York (licences from 2012 to be Euro 5 compliant).

[12] *Heathrow Q6 Sustainable Transport Plan*, Heathrow Airport Ltd, Feb 2014.

35. 'Eco-driving' does not feature in current Council licensing policies but Licensing officers felt that, being vehicle owners, most taxi drivers are cost conscious and want to minimise fuel consumption. They may however keep engines running when stationary, especially in extreme cold weather: this is an issue highlighted in the AQMA Action Plan and worthy of further investigation[13].

Traffic management issues

36. The only taxi rank within AQMA no. 4 adjoins the Observatory shopping complex and is little used. (Another rank in Wellington Street fell into disuse and has been permanently removed). The major focus of activity is the main taxi rank outside Slough station which was re-designed as part of the Heart of Slough regeneration project. Taxis awaiting a space on the rank queue along the eastern side of Brunel Way and result in stop-start vehicle manoeuvring. However this rank is not within the AQMA .

37. Taxi emission levels at traffic signalled junctions in AQMAs 3 &4 are studied in the companion project ref 232b2012.

Impact of London LEZ

38. Hackney cabs are not covered by the London LEZ.

Outputs and future action for taxi trade

39. Table 2 summarises the WP1 outputs in relation to the taxi trade and outlines potential future action.

Table 2: WP1 Outputs and Action for Taxi Operations

Topic	Output	Action
Awareness of air quality issues	Limited awareness and knowledge of AQMAs 3&4 and related Action Plan	Use project final report as basis for future discussion with Slough Hackney Carriage Federation and Council Licensing officers
Environmental performance of vehicles and operations	Most saloons have Euro 4 engines; a small number are hybrids of fuelled by LPG. Purpose built/ wheelchair accessible vehicles tend to be older. Council licensing policy has limits on age of vehicles, less stringent when purpose built/ wheelchair accessible. Emission levels tested annually but	Discuss with Council Licensing officers potential changes to current taxi licensing policies[14] to take more account of air quality issues, i.e. • Identifying AQMAs; • Emission level requirements/ Euro engine standards/ maximum age of vehicles; • Eco-driving.

[13] For example 'smarter driver training' was carried out by the Energy Savings Trust for London taxi drivers in 2012 aimed at discouraging unnecessary engine idling as well as other driver practices (reducing harsh braking, acceleration etc) that help reduce fuel consumption and emissions.

[14] Bearing in mind the outcome of the Law Commission's review of taxi vehicle legislation due April 2014 (Information from DfT *Progress Update: Accessibility Action Plan and Equality Action Plan,* Dec 2013)

	Council sets no particular criteria or requirements. Eco-driving does not feature in Council licensing policy	Publicise availability of electric vehicle rapid charger being installed near main taxi rank.
Traffic management issues	Main taxi rank is outside rail station, outside AQMA 4 and was redesigned as part of town centre regeneration in 2011	Assess results of emission modelling project ref 232b2012.
Impact of London LEZ	Hackney taxis not covered by LEZ requirements	Assess implications of audit of vehicles serving Heathrow proposed in the airport Sustainable Transport Plan

Logistics Industry

Key stakeholders

40. Key stakeholders identified for the logistic industry focused on:

- Heathrow Area Freight Forum representing airfreight operators in eastern Slough and neighbouring areas;
- Three companies representative of those operating in the town centre and on the Slough Trading Estate[15] (contacts made through the Borough Council's involvement with the DfT Local Sustainable Transport Fund *Smarter Travel for Slough* project).

Awareness of air quality issues

41. All stakeholders were aware of air quality issues, generally because of the proximity of the London LEZ and operation of corporate policies rather than specific knowledge of Slough's AQMAs.

Environmental performance of vehicles and operations

42. The operators represented by the Heathrow Area Freight Forum, including smaller local companies, emphasised that their airfreight services run across the London LEZ boundary and that the environmental performance of their vehicles is governed by the need to meet the LEZ emissions standard. The biggest operational factors are the need to meet the requirements of airfreight customers whilst working within the organisational restrictions set by Heathrow Airport Ltd. Members of the Forum suggested that the cost of fuel motivated them to seek the most efficient and effective methods of driving.

43. The three national companies operating in the town centre and on Slough Trading Estate all reported that their fleets are continuously upgraded with many heavy goods vehicles (HGVs) and other vehicles for example being less than 3 years' old. All monitored the fuel efficiency of their vehicles and participated in driver training programmes. One company is active in TfL's Fleet Operator Recognition Scheme (FORS) which showcases best practice. The operators drew attention to the technological challenge for vehicle

[15] All 3 national operators, 2 in foodstuff logistics and the third a major supermarket company

engines to reduce emission of CO_2 (national policy), of particulates (London LEZ requirement) and of NO_x (Slough AQMA requirement).

Traffic management issues

44. The logistics stakeholders were very familiar with the road network within the Borough and the constraints on the movement of HGVs due to weight, height and environmental restrictions. Traffic Regulation Orders have also been imposed by adjacent Highway Authorities and the operators pointed out that the consequent deviations create extra mileage. Access to and from the motorway network was critical and it was noted that the approach to Junction 6 of the M4 was within AQMA no. 3 (and the westward approach to Junction 5 within AQMA no. 2).

45. Within the town centre AQMA no. 4 the major concern of the stakeholders was congestion along the A4. The effect of traffic delays is the subject of the Council's companion Defra-supported project 232b2012.

46. Unloading to town centre shops and other commercial premises takes place away from the A4 highway frontage and therefore outside the AQMA boundary.

Impact of London LEZ

47. Because of the close proximity of Slough to the London LEZ boundary the stakeholders' vehicles are equipped where necessary to meet the LEZ emission standards. It was apparent that the greatest impact of the LEZ would have been when it was first introduced and it was not raised as a current concern. The operators were generally aware that the LEZ was directed at emission of particulates rather than NO_x which is the particular problem in Slough

Outputs and future action for logistics industry

48. Table 3 summarises the WP1 outputs in relation to the logistics industry and outlines potential future action.

Table 3: WP1 Outputs and Action for Logistics Industry

Topic	Output	Action
Awareness of air quality issues	Awareness of general issues high but limited knowledge of AQMAs 3&4 and related Action Plan	Use project final report as basis for future discussion through Heathrow Area Freight Forum and ongoing dialogue with *Smarter Travel for Slough* participants
Environmental performance of vehicles and operations	Performance governed by requirements of London LEZ and company fuel efficiency policies and practices. Engine technology directed at reduction of CO_2 and particulates, less emphasis on NO_x.	Explore expanded use of driver training aimed at reducing emissions and potential for a local initiative similar to TfL's Fleet Operator Recognition Scheme. Further discussion with stakeholders on problems and opportunities in relation to engine and exhaust technology.

Traffic management issues	Movement of commercial vehicles, especially HGVs, constrained by limited choice of routes resulting from Slough's geography and traffic regulation restrictions. Drivers have to pass through AQMAs to access M4. Congestion on A4 and A355 creates stop-start conditions. Loading and unloading take place largely outside AQMA boundaries.	Ensure that air quality issues are taken into account in the proposed review of the Council's Network Management Plan and identification of lorry routes. Examine scope for introducing 'delivery and servicing plans' along the lines of those operated in London to better understand supply chains, procurement practices and ways of achieving the most sustainable service patterns. Keep watching brief on initiatives examining potential LEZs in other urban areas outside London. Assess results of emission modelling project ref 232b2012. Ensure major redevelopment schemes in town centre and Slough Trading Estate include arrangements for loading and unloading that acknowledge proximity of the AQMAs.
Impact of London LEZ	Significant impact because most stakeholders operate vehicles within the LEZ but restrictions are directed at emission of particulates rather than NO_2.	Further discussion with stakeholders on problems and opportunities in relation to engine technology.

WP2 Workplace travel planning

Aims of WP2

49. The aims of WP2 were to:

- raise awareness about air quality issues amongst employers and employees participating in the *Smarter Travel for Slough* project being carried out with support from the DfT Local Sustainable Transport Fund (LSTF);
- demonstrate how sustainable travel, in particular cycling and walking, can contribute towards a reduction in traffic in the AQMAs and consequent enhancement in air quality as well as improving personal health; and
- build on and add value to the *Smarter Travel for Slough* behavioural change

programmes by providing information and specialist advice on air quality.

The Tasks

50. A total of 6 tasks were identified in the Air Quality Grant Project Plan:

- 1: Identify 5 target employers;
- 2: Prepare material (e.g. displays, packs, leaflets) on health and air quality benefits for employers/ staff;
- 3: Attend 5 workplace events;
- 4: Obtain and analyse feedback from employers/ staff;
- 5: Provide input into Project Progress Report;
- 6: Prepare report on findings and potential future action.

51. Tasks 1 to 4 were undertaken between early 2013 and March 2014, later than anticipated in the project plan because of difficulties experienced in progressing the *Smarter Travel for Slough* initiative to which they are closely linked. The results are described below. Task 5 was completed in November 2013 and Task 6 in early March 2014.

Target employers

52. The focus of workplace travel planning in the *Smarter Travel for Slough* initiative is on commuting and on business travel, so is foreseen as having a wide-reaching geographical impact, beyond the Borough boundary. The key employment hubs in Slough are the principal focus– specifically the western trading estates, town centre and Wexham Park Hospital. There are 40,000 commuters travelling to Slough each day and 26,000 or so that commute out of the Borough and the aim is to influence at least a proportion of these.

53. A total of up to 20 major employers (1000 or more employees) have been targeted with early emphasis on four of them: Slough Borough Council itself (1200 staff); Wexham Park Hospital (3000); East Berkshire College (680) and Leaseplan (560). Other organisations contacted include O2, Orange, SEGRO, Mars, Fowler Welch Ltd, Tufnells Parcel Express, La Poste Uk Ltd, Tesco (town centre), Sainsbury's (town centre) and Fullers Logistics Ltd.

54. The workplace travel planning team are also engaging with a number of business intermediaries: the Slough Business Community Partnership, SEGRO (owner of Slough Trading Estate), the Thames Valley Chamber of Commerce and the Thames Valley Berkshire Local Enterprise Partnership.

Information material and workplace events

55. Part of the engagement strategy prepared by the *Smarter Travel for Slough* workplace travel planning team has been the development of a 'travel planning toolkit' for businesses setting out the menu of measures available to employers and staff: this was launched in October 2013.) It was decided to take the opportunity of inserting a factsheet on air quality in the toolkit and an initial run of 300 copies was distributed (see Appendix 2). Its inclusion in the toolkit was aimed at underlining the link between air quality, personal health and the role of sustainable transport in reducing reliance on car

commuting. The factsheet , entitled *The air that we breathe*, included:

- a map showing the location of AQMAs 3 and 4 in central Slough;
- summary of AQMA action plan measures; and
- suggested measures that businesses could pursue with support from the *Smarter Travel for Slough* workplace travel planning team.

56. The air quality factsheet was distributed within the toolkit at business intermediary events, and at individual business meetings

57. In October 2013 the Council added a *Smarter Travel for Slough* Workplace travel advice webpage to its corporate website in order to inform businesses about the measures on offer, see http://www.slough.gov.uk/business/support-and-advice/workplace-travel-advice.aspx.

Awareness of air quality issues

58. Feedback from employers and employees has so far shown that although people are aware of general air quality issues they have only limited knowledge of Slough's AQMAs and the associated action plans. As so many employees are commuting into the town from outside, this is perhaps not surprising.

Sustainable transport and air quality

59. The *Smarter Travel for Slough* project has embraced a range of sustainable transport measures including:

- provision of an east-west cycle route between Slough town centre station, Slough Trading Estate and Burnham station;
- improvement of local cycling and pedestrian routes that link with the east-west spine;
- launch in October 2013 of a cycle hire scheme operating with 63 cycles from 4 docking stations (Slough and Burnham stations, Montem Leisure Centre and Slough Trading Estate) (see https://www.cyclehireslough.com/);
- cycle grants to support workplace initiatives;
- scheme to support cycle purchase by Council staff (see http://www.cyclescheme.co.uk/);
- walking challenges held in June 2013 and January 2014
- delivery of personal travel plans to staff
- *Dr Bike* events, setting up Bike User Groups and cycle challenges at Wexham Park Hospital, East Berkshire College and Borough Council offices; and
- development of initiatives for delivery in 2014/15 (cycle hubs at stations; mobile cycle hub at Slough Trading Estate; walking promotion; and wayfinding scheme).

60. All these measures are being introduced during the 3-year timescale of the LSTF-supported *Smarter Travel for Slough* project. Collectively they demonstrate how sustainable travel, in particular cycling and walking, can contribute towards a reduction in traffic in the AQMAs and consequent enhancement in air quality as well as improving

personal health.

Behavioural change

61. This Air Quality Grant project has enabled information and specialist advice on air quality to be fed into the *Smarter Travel for Slough* behavioural change programme focusing on commuting and business travel. The programme has taken time to develop, recognising that different firms and organisations have differing needs and that there is currently high use of cars by most employers and employees in Slough and limited incentive until now to switch to more sustainable modes of travel. Feedback is beginning to be received from employers and employees but it is too early to gauge the effectiveness of the programme or the extent to which air quality issues are an influence on people's travel choices. However the *Smarter Travel for Slough* programme is due to feature in a DfT-funded case study research project to be conducted into behavioural change in partnership with Hertfordshire County Council, the University of Hertfordshire and University of the West of England.

Outputs and future action for workplace travel planning

62. Table 4 summarises the WP2 outputs in relation to workplace travel planning and outlines potential future action.

Table 4: WP2 Outputs and Action for Workplace Travel Planning

Topic	Output	Action
Awareness of air quality issues	Employers and employees participating in *Smarter Travel for Slough* project found to have limited awareness and knowledge of AQMAs 3&4 and related Action Plan.	Expand use of the air quality factsheet in the *Smarter Travel for Slough* workplace toolkit to raise awareness and seek further ways of highlighting air quality challenges. Use project final report to put greater focus on the links between air quality and the Council's sustainable transport activities.
Sustainable transport and air quality	A wide range of sustainable measures and initiatives being introduced as part of the *Smarter Travel for Slough* project which have the potential to contribute towards a reduction in traffic in the AQMAs and consequent enhancement in air quality and personal health.	Develop momentum with measures and initiatives in 2014/15, the third year of the *Smarter Travel for Slough* project. Seek to continue measures and initiatives in 2015/16 with bid to next LSTF round. Continue to highlight the importance of air quality and personal health issues in

Behavioural change	Current high car use by employers and employees but *Smarter Travel for Slough* workplace travel planning team have identified willingness to consider changing travel behaviour.	Workplace Travel Action Plans/ Personal Travel Plans.

WP3 School travel planning

Aims of WP3

63. The aims of WP3 were to:

- raise awareness about air quality issues amongst schools and children participating in the *Smarter Travel for Slough* project being carried out with support from the DfT Sustainable Transport Fund;
- demonstrate how more children cycling and walking to school can contribute towards a reduction in traffic and consequent enhancement in air quality in the AQMAs as well as improving personal health, including associated medical conditions amongst vulnerable pupils and combatting child obesity; and
- build on and add value to the *Smarter Travel for Slough* Local Sustainable Transport Fund behavioural change programmes by providing information and specialist advice on air quality.

The Tasks

64. A total of 6 tasks were identified in the Project Plan:

- 1: Identify 4 target schools;
- 2: Prepare material on health and air quality benefits for school pupils;
- 3: Attend events at 4 target schools;
- 4: Obtain and analyse feedback from schools;
- 5: Provide input into Project Progress Report;
- 6: Prepare report on findings and potential future action.

65. Tasks 1 to 4 were undertaken between early 2013 and March 2014, later than anticipated in the project plan because of difficulties experienced in progressing the Smarter Travel for Slough initiative to which they are closely linked. The results are described below. Task 5 was completed in November 2013 and Task 6 in early March 2014.

Target schools

66. The *Smarter Travel for Slough* school behavioural change initiative is focusing on 15 priority schools, selected for having the highest potential to achieve modal shift and reduce congestion on the principal road network. Schools with the highest percentage of pupils travelling to school by car were identified, taking into account their proximity to areas of employment and location in relation to the proposed east-west cycle route

and other infrastructure improvements planned to benefit walking and cycling. Together the schools have 10,500 pupils; the project is also targeting teachers, parents, governors and the local community.

67. For the purposes of the DEFRA project the aim was to select 4 of the 15 priority schools which were located close to AQMAs 3 or 4. This proved to be challenging in the time available and therefore a wider distribution was pursued involving 7 schools[16] with a combined total of over 3500 pupils.

Information material and school events

68. The *Smarter Travel for Slough* school travel planning team have had extensive engagement with the 7 schools supported by publication of a School Travel Toolkit (see Appendix 3). This sets out all the measures and initiatives available to schools in Slough, advice on best practice sustainable travel initiatives and information on how to put the guidance into practice.

69. In March 2014 Iqra Primary School in Slough took part in an interactive travel planning theatre workshop run by the Big Wheel Theatre Company http://bigwheel.org.uk/3054/Go-Go-Go. This workshop explored with three Year 6 classes (a total of 90 pupils who are due to go to secondary school in September 2014) how transport choices affect the local area and the opportunities for cycling and walking. It aimed to raise awareness of environmental issues such as those due to carbon and other emissions. Very positive feedback was received from the school about the event and it is hoped to organise similar workshops at other schools

Awareness of air quality issues

70. Engagement with schools has so far shown that, although there is awareness of wider environmental issues and pupils' need for physical exercise, knowledge of Slough's AQMAs and the associated action plans was limited.

Sustainable transport and air quality

71. The *Smarter Travel for Slough* project has embraced a range of school-related sustainable transport measures including:

- cycling promotion and training in partnership with *Sustrans* through a dedicated Bike It officer (see http://www.sustrans.org.uk/what-we-do/bike-it; http://www.dft.gov.uk/bikebaility/; http://static.slough.gov.uk/downloads/cycling - map.pdf);
- school-specific walking and cycle maps (produced for 8 schools in partnership with *Living Streets*);
- 'park and stride' (pupils walking the final part of their journey to avoid traffic congestion at the school entrance);
- *Walk once a Week* (WoW) scheme for primary schools (currently taken up by 5 schools in partnership with *Living Streets*);

[16] Primary schools: Iqra, Khalsa, Willow, Lynch Hill, Priory and St Anthony's; secondary: Slough Grammar School

- *Free your feet* kits for secondary schools provided in partnership with *Living Streets* (challenge to get more epupils to walk to school, taken up by one Slough school and planned at further schools for summer term 2014);
- *Walk to School Week* events and activities to promote healthy living and walking to school;
- funding towards school cycle and scooter parking, to increase active travel;
- car share guidelines to promote car sharing on school run to reduce congestion and pollution;
- provision of scooter training and scooter safety guidelines to promote more active travel;
- promotion of travel planning initiatives through school websites, newsletters, handbooks and prospectuses; and
- collaboration with other Slough Borough Council initiatives which reinforce the sustainable travel message, such as *Slough talks Slough walks* and offerings from the Road Safety Team.

72. As with the *Smarter Travel for Slough* workplace travel planning measures, those focusing on school travel are being delivered over the 3-year life of the LSTF-supported project. The range of measures directed at schools show to parents and pupils how cycling and walking (and to some extent public transport and car sharing) offer an alternative to 'the school run'. The emphasis has so far been on reducing traffic congestion and promoting healthy, active travel with the focus on key schools within school clusters to act as champions for the project and encourage others to participate. Because it has not been possible to engage specifically with schools located within or in close proximity to AQMAs 3 and 4, the benefits of cycling and walking to air quality have tended to have less attention.

Behavioural change

73. Throught this DEFRA-supported project it has been possible to include air quality issues in the *Smarter Travel for Slough* behavioural change programme focusing on travel to school. There have been challenges in engaging with individual schools and the programme has had to be adapted to their particular curricula and other requirements. Data from past School Censuses[17] show that use of sustainable travel modes has grown but travel to school by car remains dominant.

74. It is evident that changing travel behaviour for parents (and pupils) is a long term process and it has not been possible in this DEFRA project to assess whether air quality issues have influenced people's travel choices. In practice it seems likely that traffic problems and concerns about obesity, ability to concentrate at school and exercise may have been more important factors.The *Smarter Travel for Slough* programme will continue into 2014/15 (and 2015/16 if a bid to the next round of LSTF is successful). As outlined above, the Slough programme is due to feature in a DfT-funded case study research project to be conducted into behavioural change in partnership with

[17] Questions about mode of travel to school no longer feature in the Dept for Education School Census.

Hertfordshire County Council, the University of Hertfordshire and University of the West of England.

Outputs and future action for school travel planning

75. Table 5 summarises the WP3 outputs in relation to school travel planning and outlines potential future action.

Table 5: WP3 Outputs and Action for School Travel Planning		
Topic	**Output**	**Action**
Awareness of air quality issues and personal health issues	Schools participating in *Smarter Travel for Slough* project found to be aware of personal health concerns related to exercise and of wider environmental issues but with only limited awareness and knowledge of AQMAs 3&4 and related Action Plan.	Work with schools to increase knowledge of local air quality issues and their relationship with emissions from traffic. Invite more schools to participate in interactive theatre workshops, subject to resources. Use project final report to put greater focus on the links between air quality and the Council's sustainable transport and educational activities.
Sustainable transport and air quality	A wide range of sustainable measures and initiatives being introduced as part of the *Smarter Travel for Slough* project which have the potential to contribute towards a reduction in traffic in the AQMAs and consequent enhancement in air quality and personal health.	Develop momentum with measures and initiatives in 2014/15, the third year of the *Smarter Travel for Slough* project. Seek to continue measures and initiatives in 2015/16 with bid to next LSTF round.
Behavioural change	Current high car use by parents for the 'school run' and the *Smarter Travel for Slough* school travel planning team have so far identified only willingness to consider changing travel behaviour. However, many parents incorporate travel to school in their journey to work, making behavioural change more difficult due to the time constraints experienced.	Continue to highlight the importance of air quality and personal health issues in School Travel Plans and promote the range of sustainable travel options now open to parents and pupils.

Monitoring

76. The project plan envisaged monitoring taking place at quarterly intervals but this had in practice to be adapted to fit changes in the programme. In WP1 the two-phase

engagement planned with the bus, taxi and logistics companies proved to be too time consuming for the participating stakeholders and was telescoped into one session. Monitoring of progress with WP2 and WP3 was adjusted to tie in with the engagement programmes of the related *Smarter Travel for Slough* LSTF project which, as outlined in paras. 50 and 64, experienced some delay.

Success Criteria and Evaluation

77. Table 6 summarises the evaluation of the three work packages. It has been difficult to evaluate the success of WP2 and WP3 at this stage because the behavioural change and sustainable transport initiatives of the *Smarter Travel for Slough* LSTF project, to which they are so closely linked, have a further year to run (i.e. until March 2015). The Borough Council's involvement in the DfT-funded LSTF case study research project (see paras. 61 and 74) will provide a better opportunity to assess the success of these workplace and school travel planning work packages.

Table 6: Success Criteria and Evaulation

Success criteria	Evaluation
WP1 Working with bus, taxi and freight operators	
Positive engagement of stakeholders achieved	Achieved with bus and logistics stakeholders through established working groups. Engagement with taxi trade more limited and a need to develop a more positive dialogue.
Awareness raised	Bus and logistics stakeholders already aware of wider air quality issues but more work needed to highlight local AQMA issues. More effort needed to raise awareness of taxi trade.
Willingness shown to review operations and future actions agreed	Principal bus operator and logistics companies actively involved in vehicle technology improvements and ongoing operational reviews. Actions to be pursued through established working groups. Operations of taxi trade influenced by Council licensing policies and further discussion needed on potential changes.
WP2 Workplace travel planning	
Positive engagement with employers and employees achieved	Process of engagement has been challenging but achieved through the work of the *Smarter Travel for Slough* workplace travel planning team. Engagement planned to increase in 2014/15 as the LSTF programme continues.
Awareness raised	Start made with introduction of air quality factsheet in workplace travel planning 'toolkit'. More work needed to increase knowledge of AQMAs.

Willingness shown to change behaviour	Interest shown in sustainable transport initiatives but too early to gauge extent of potential behavioural change and impact on single car trips.
Potential reduction in single car trips	
WP3 School travel planning	
Positive engagement with schools, pupils and parents achieved	Process of engagement has been challenging but achieved through the work of the *Smarter Travel for Slough* school travel planning team. Currently fifteen schools and over 9000 pupils are engaged in the programme and engagement is planned to increase in 2014/15 as the LSTF programme continues.
Awareness raised	Start made through school travel plan contact and interactive theatre workshops. More work needed to increase knowledge of AQMAs.
Willingness shown to change behaviour	Interest shown in sustainable transport initiatives but too early to gauge extent of potential behavioural change overall and impact on the 'school run'.
Potential increase in proportion of pupils getting to/ from school on foot, by cycle or bus	Those schools participating in the Living Streets WoW scheme have seen a significant decrease in the percentage of pupils who are driven to school. Khalsa Primary School has reduced it's car mode share from 80% (worst in the Borough) to 56% through actively participating in the WOW and the other measures available to them.

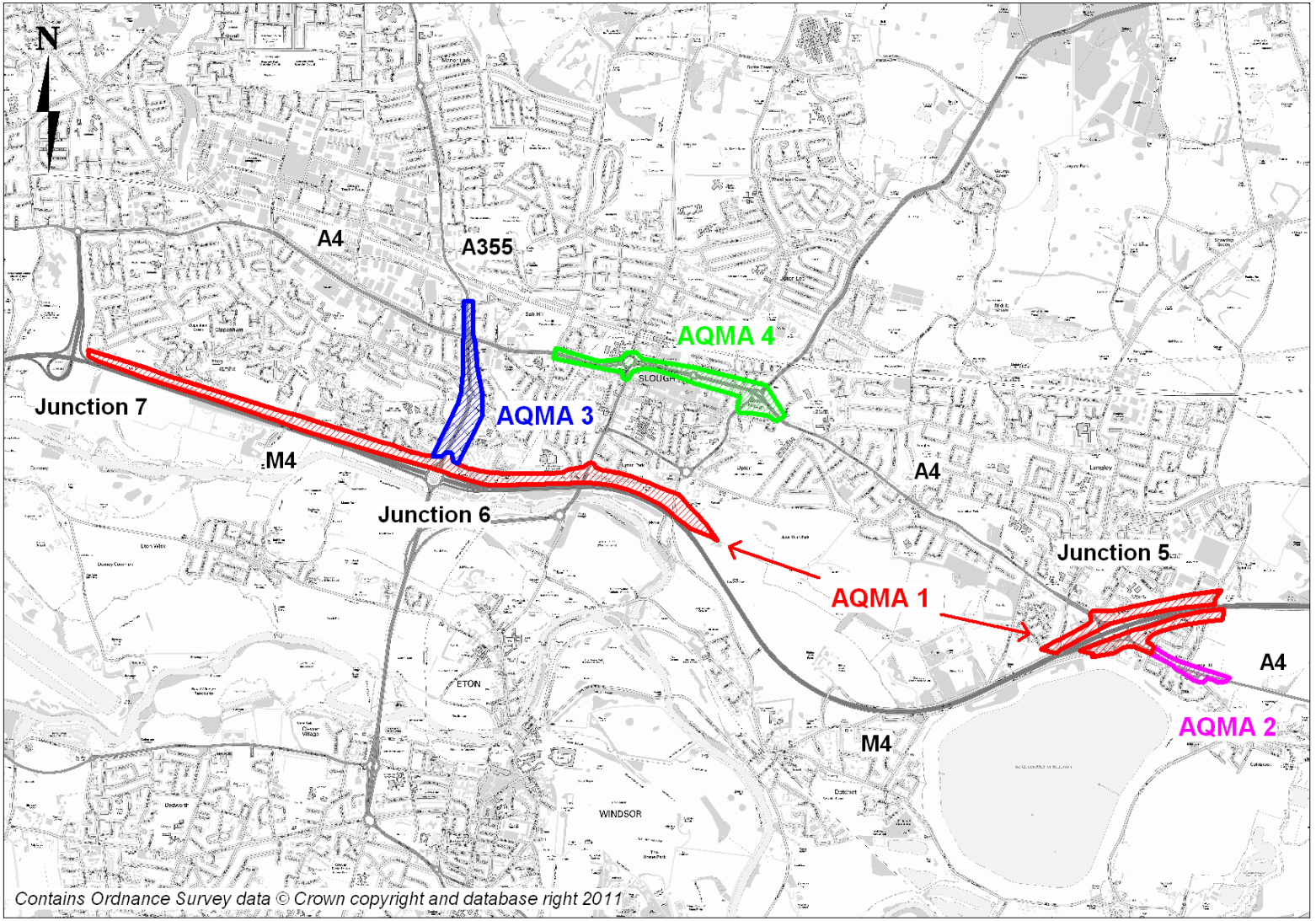
Knowledge Transfer

78. Within the Borough the Council will disseminate project information by means of cross-sector working groups that are already well established under the umbrella of the Health & Wellbeing Board. These include widespread representation from the public, private and voluntary sectors. The project findings will also be reported to the *Smarter Travel for Slough* Programme Board and disseminated through the Council's *Citizen* newspaper and local media.

79. Wider dissemination will be through existing cross-boundary air quality working groups in the Berkshire/ Heathrow area. Information will also be provided to the Berkshire Strategic Transport Forum, Thames Valley Berkshire Local Enterprise Partnership and other bodies and agencies having a strategic remit.

80. To assist other local authorities with town centre AQMAs the detailed findings of the project will be posted on the Council's air quality website pages.

APPENDIX 1: AIR QUALITY MANAGEMENT AREAS IN SLOUGH

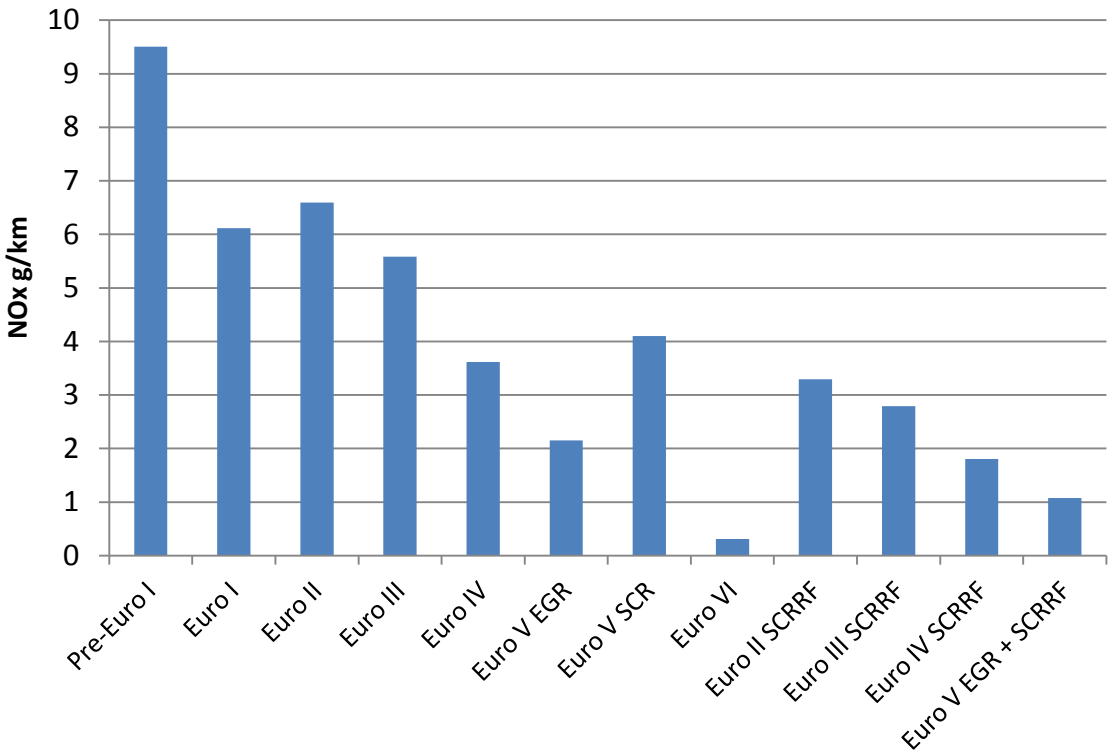


APPENDIX 2: BUS EURO ENGINE NOX PERFORMANCE

Type	NOx g/km	
Pre-Euro I	9.507	
Euro I	6.114	
Euro II	6.594	
Euro III	5.583	
Euro IV	3.614	
Euro V EGR	2.155	
Euro V SCR	4.100	<-- performance not as good as retrofitted Euro II - IV
Euro VI	0.314	
Euro II SCRRF	3.297	
Euro III SCRRF	2.791	
Euro IV SCRRF	1.807	
Euro V EGR + SCRRF	1.078	

Source: DEFRA Emission Factor Toolkit (Version 5.2c)
All vehicles travelling at an average speed of 30kph

EGR Exhaust Gas Recirculation
SCR Selective Catalytic Reduction
SCRRF Selective Catalytic Reduction Retrofit



Year Euro engine requirement introduced:
I 1992-95; **II** 1995-99; **III** 1999-2005; **IV** 2005-08; **V** 2008-13; **VI** from 2014

APPENDIX 3: AIR QUALITY FACTSHEET FOR BUSINESSES

Inserted in *Smarter Travel for Slough* LSTF workplace travel planning toolkit. Front cover only: for full factsheet see http://static.slough.gov.uk/downloads/air-quality-leaflet.pdf

Air quality

The air that we breathe

Did you know that there are two places in central Slough where air quality is very poor due to traffic pollution?

In these Air Quality Management Areas (AQMAs) the amount of Nitrogen Dioxide (NO_2) produced by cars, buses and commercial vehicles can affect local people's health, especially those with asthma, emphysema, bronchitis, heart disease and angina.

The two AQMA locations are:

- A355 Tun's Lane / Farnham Road
- A4 between the Ledgers Road/ Stoke Poges Lane junction and Sussex Place

Air Quality Management Areas (AQMA) locations

There are also AQMAs covering the A4 at Brands Hill and the M4.

Every little helps - even by encouraging a handful of your employees to change mode or time of travel, you can make a difference. If every business across Slough did this, it would make a huge difference. Benefits to your organisation include healthier employees, increased travel options to your site, and cost savings from fewer business journeys.

Transport for Slough (TfS)

APPENDIX 4: SCHOOL TRAVEL PLAN TOOLKIT

Front cover only: for full toolkit see
http://static.slough.gov.uk/downloads/Slough-school-travel-plan-toolkit.pdf