CLEAN BUS TECHNOLOGY FUND APPLICATION FORM

For Local Authorities in England

June 2013

Department for Transport

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Guidance for applicants is available at: https://www.gov.uk/government/organisations/department-for-transport/series/clean-bus-technology-fund. **Applications should be emailed to** CBTF@dft.gsi.gov.uk **by 17:00, Friday 19 July 2013.**

If you need further assistance with the application process, contact the DfT Air Quality Strategy Team via email: CBTF@dft.gsi.gov.uk**.**

Department for Transport

Application Form for Clean Bus Technology Fund

The Department for Transport (DfT) is inviting local authorities in England[1] to apply for Clean Bus Technology grants of a maximum of £1,000,000[2] towards reducing oxides of nitrogen (NOx) emissions from local buses. The total fund available for this scheme is £5m.

Applicants should use this form to submit their proposals to DfT by 17:00, Friday 19 July 2013. Guidance notes have been published alongside this application form. These provide useful advice on how to develop and write a successful proposal and should be referred to when filling in this application form.

All applicants must confirm that they have secured commitment from at least one local bus operator to engage in the proposed project. Please check the box below to show that you have completed this requirement and provide the name of the bus operator(s).

I have secured commitment from at least one local bus operator: ☒

Name of local bus operator(s): Solent Blue Line (Bluestar Bus), First Group, Black Velvet Travel Ltd

In addition, all applicants must confirm that they have received legal advice on EU state aid rules and that any financial restrictions with respect to the state funding the upgrade of local buses will be met. Please check the box below to show that you have completed this requirement.

I confirm that I have received legal advice on EU state aid rules which will allow the proposed project to proceed if successful: ☒

This page has been completed by the Senior Responsible Owner (SRO) of the proposed project[3]: ☒

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[1] *London boroughs are excluded from this scheme as DfT is currently part funding the modification of 900 London buses to reduce NOx emissions.*
[2] *Local authorities can only bid once for a Clean Bus Technology grant of up to £1,000,000.*
[3] *Provide SRO name and contact details in Section A.*

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Please refer to the attached guidance before completing this form.

Section A. Applicant Information

A1. Local authority name(s). If the bid is a joint proposal, please enter the names of all participating authorities and specify the lead authority:
Southampton City Council

Senior Responsible Owner name and position: Frank Baxter - Head of Transport, Highways and Parking

Bid Manager Name and position (first point of contact): Richard Cooke - Principal Public Transport Planner

Contact telephone number: 023 8083 3816

Email address: richard.cooke@southampton.gov.uk

Postal address: Transport Policy, Floor 4, One Guildhall Square, Southampton, SO14 7FP

Website address for published bid (if applicable):

A2. Please indicate if you are planning to outsource the project management either wholly or partially (if known at this stage):

Yes: ☐ Complete the form below.
No: ☒ Go to Section B.

Name of organisation:

Project manager (first point of contact):

Contact telephone number:

Email address:

Postal address:

Website address for published bid (if applicable):

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Section B. Project proposal

B1. Enter a brief description of your proposal:

Briefly describe your project proposal. Outline the main reasons for seeking funding and what difference this would make to your local air quality. Provide further details in Section E. (Max 500 words)

This project will deliver:

- **Hybrid Gyrodrive Flywheel technology to x37 buses;**
- **Establish a Centre of Excellence for installation in Southampton;**
- **Reduce NOx and overall emissions of the bus fleet;**
- **Extensive monitoring;**
- **Develop a commercial business case to roll-out technology throughout the UK.**

Southampton City Council (SCC) proposes to utilise the funding available to counter the air quality issues reported on the corridor approaches to the City including the Cultural Quarter and City Centre areas where the NO_x limit values are beyond acceptable thresholds. There is a direct relation to the currently unacceptable air quality on the approaches and the bus fleet which operate along it. With a primary focus of installing the innovative 'flywheel' solution to services the outcome will be a fleet operating at an 'ultra-low carbon' state. It is the aspiration of SCC that if the bid is successful, 40% of the Southampton bus fleet will have markedly improved emissions by April 2014. The Director of Public Health department and the University of Southampton will use existing monitoring arrangements then monitor benefits over an agreed period to help build a business case for future work to be carried out in other parts of the City. Wider benefits will include prolonged life of the fleet and better fuel economy, through agreed commitment by the operators this will lead to the freed up resources being allocated to areas of social need previously non-served. This will be governed through the mechanisms of the Quality Bus Partnership signed in August 2011 and delivered by the Bus Punctuality Task Force Strategic Board chaired by the Executive Member for Transport & Environment.

DEFRA have modelled the affected areas and predicted that they will still be in breach of the air quality annual mean standard of 40ug/m3 for NO2 in 2015 if no preventative measures are taken. SCC could be subject to significant financial penalties from the EU if the air quality directive is not met by 2015. There are also significant public health concerns for several of the identified areas which shall be improved as a direct result of the preventative measures detailed in this bid.

There are 2 main operators within Southampton, First Group and Solent Blue Line (Bluestar and Uni-link). The market share is approximately 50% each. This proposal includes an innovative fleet-wide flywheel hybrid solution for the Solent

Blue Line fleet and an upgrade of several old engines within the First Group fleet for vehicles that operate within the affected areas.

There is a real potential with the flywheel hybrid solution for a 'Centre of Excellence' to be created within Southampton for installation which, if this bid is successful would be a first for the UK. A further opportunity is to prove the concept within an urban environment such as Southampton. The flywheel solution has only just become available on the market and with this funding it will help operators deliver a commercial case to roll out this technology on a wider basis.

It is the case that whereas technologies such as SCR are a particularly hard sell to commercial operators in a deregulated market through increased revenue costs, the hybrid flywheel delivers a solid business case through its combined fuel and maintenance savings along with the positive reduction in harmful emissions. It must be understood that there was zero take up for SCR technologies during the consultation for this bid by any operators, even with 100% funding. The flywheel-hybrid solution is planned to be adopted throughout the Solent Blue Line regional fleets and wider parent companies if shown to be a success in Southampton.

This bid has been put together through full open consultation with all bus operators within the City of Southampton and the award of funding will be through open competition.

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B2. Fit with other bids:

Explain any connection with another outstanding bid or grant from DfT such as Local Sustainable Transport Fund, Green Bus Fund and Better Bus Areas Fund. Please note that a bid for Clean Bus Technology Fund is not dependent on success in another bid. (Max 200 words)

The Local Sustainable Transport Fund already goes someway to mitigate air quality issues within the City. Intelligent Bus Priority at all signal based junctions is a citywide approach to making the bus a more efficient and sustainable mode of transport. The Better Bus Area Fund has also contributed towards this theme by retrofitting LED lighting systems to a large proportion of the bus fleet. The University of Southampton monitoring will be extended to the CBTF in order to fully document the impact of and comparison with other all measures. This could be extended beyond the city to compare other initiatives being deliverd elsewhere

Notably, the BBAF delivery mechanism has proven to be very successful in getting work packages completed within tight timeframes. Perhaps more relevant to this bid is the competition advert process that awards funding to commercial operators. It has been set up by SCC in order to ensure there are no state aid implications as part of the BBAF delivery programme. The same procedure will be in place upon award of funding for the CBTF. This will enable as quick a turnaround from award to delivery as possible.

SCC's Environmental Health Department are proposing to develop a Low Emission Strategy. It is anticipated that by achieving multiple small gains existing AQMAs could be revoked by 2016. The LES will include the "development of a City-wide bus emission strategy, in partnership with key operators" and monitoring actions to determine the actual impact of the measures in terms of emissions and roadside NO2. The CBTF proposal, if successful will be incorporated into this and provide further opportunities to evaluate its success. A bid of £70,000 has been made to the DEFRA air quality grant fund and a further £28,000 in officer time has been identified to support the proposal.

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Section *C. Proposed technology*

C1. Describe the proposed NOx abatement technology for your scheme.

Indicate what method of NO_x abatement technology you are planning to use; e.g. retrofitting, engine replacement, engine retuning, hybrid conversion or other innovative solution; your rationale for choosing this and the risks it may present. (Max 200 words)

To install a 'Gyrodrive' Flywheel solution to the majority of the Bluestar and Uni-Link fleet, this will equate to over 50% of the peak vehicle requirement for the city at any one time. The hybrid flywheel technology is ideally suited to urban buses because of their high mass and stop–start nature, helping to deliver improved fuel economy and a reduction in harmful emissions for much less cost and weight than using the equivalent in battery cells.
The flywheel's design also enables it to be retrofitted into a variety of existing vehicles. On a bus, there is ample space for the flywheel to be fitted without the need to reduce passenger space. As these vehicles run for many hours a day, the benefits of the system are magnified when the working life of the bus is taken into consideration.
The flywheel is frequently electrically charged under braking. The flywheel then stores this as rotational energy. Electricity can be drawn out of the system in order to power on-board utilities, reducing the overall energy draw on the engine. The system can also be used to push the stored power back to the axles for when the bus pulls away from a stop.

Flywheel technology is not an alternative to SCR but could be developed into a package of technologies that offer improvements to emissions combined with genuine benefits for the operators.

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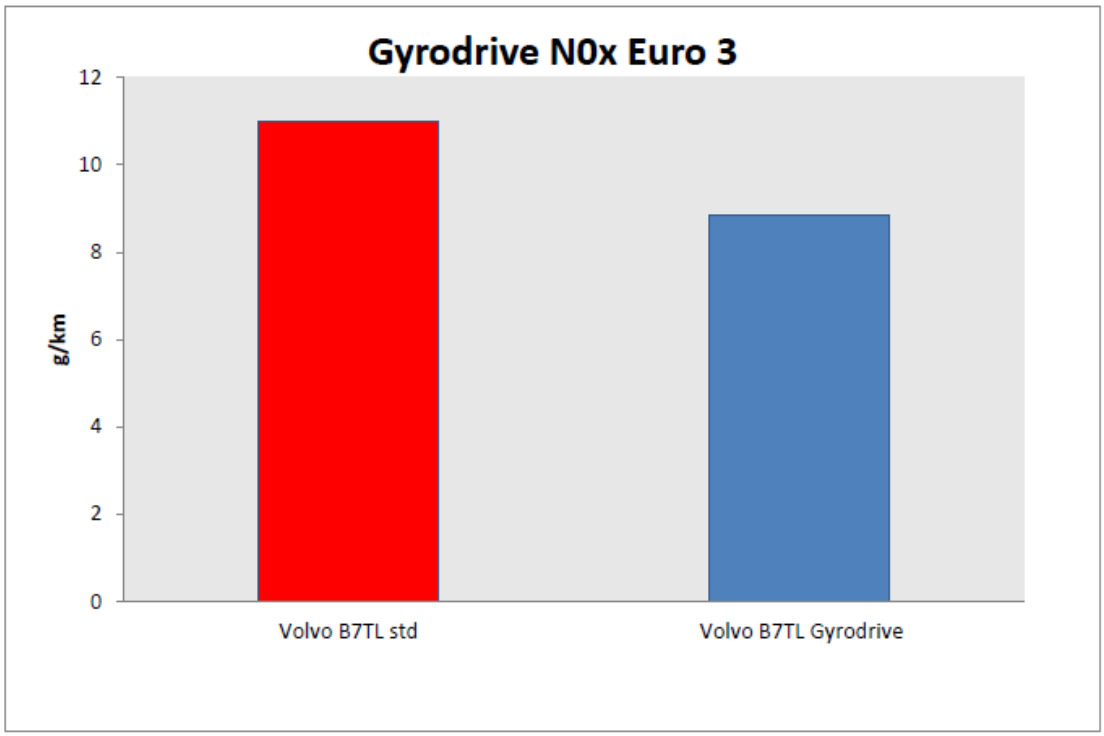
C2. Describe the expected environmental impact of the chosen technology in terms of emissions reductions.

Provide an estimate of reductions in NOx emissions and any expected change in particulate matter and carbon dioxide emissions per bus (in kg or tonnes). (Max 200 words)

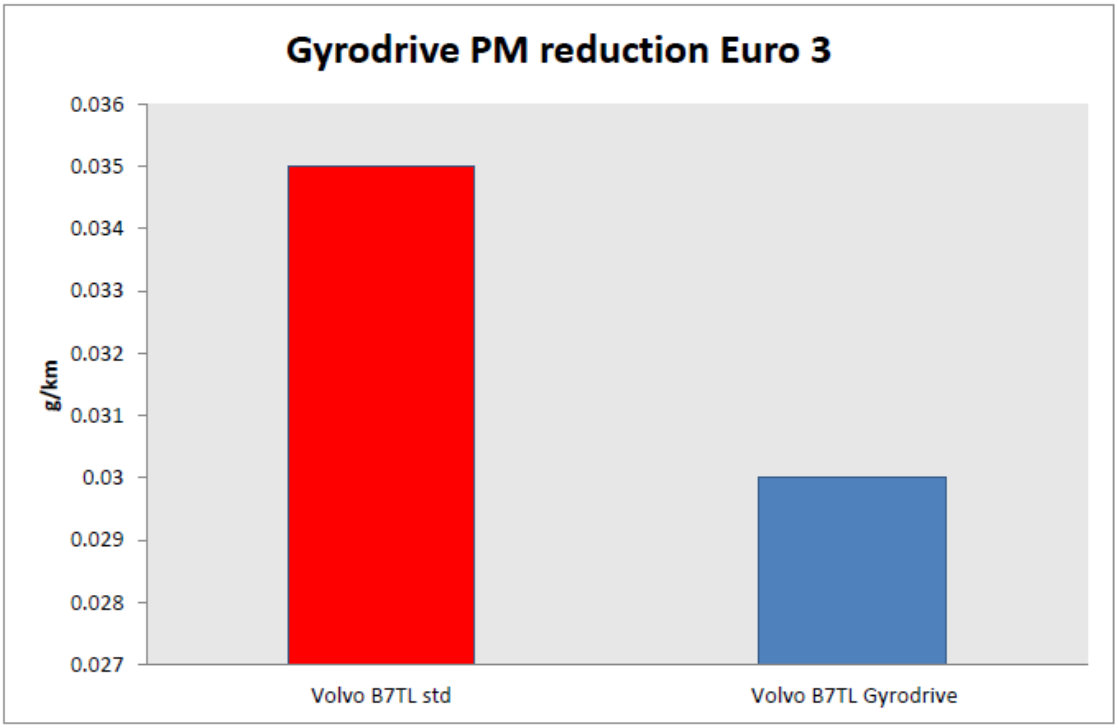
NOx:

The supplied test data from the Williams testing team suggests that the flywheel reduces NOx emissions from a baseline of 11.01 g/km to 8.95 g/km, a reduction of 19.6% per bus. Emission calculations indicate the proposal could reduce bus emissions by up to 7.6% in some AQMAs. This reduction is expected to rise as the technology increases in efficiency and more of the fleet is equipped.

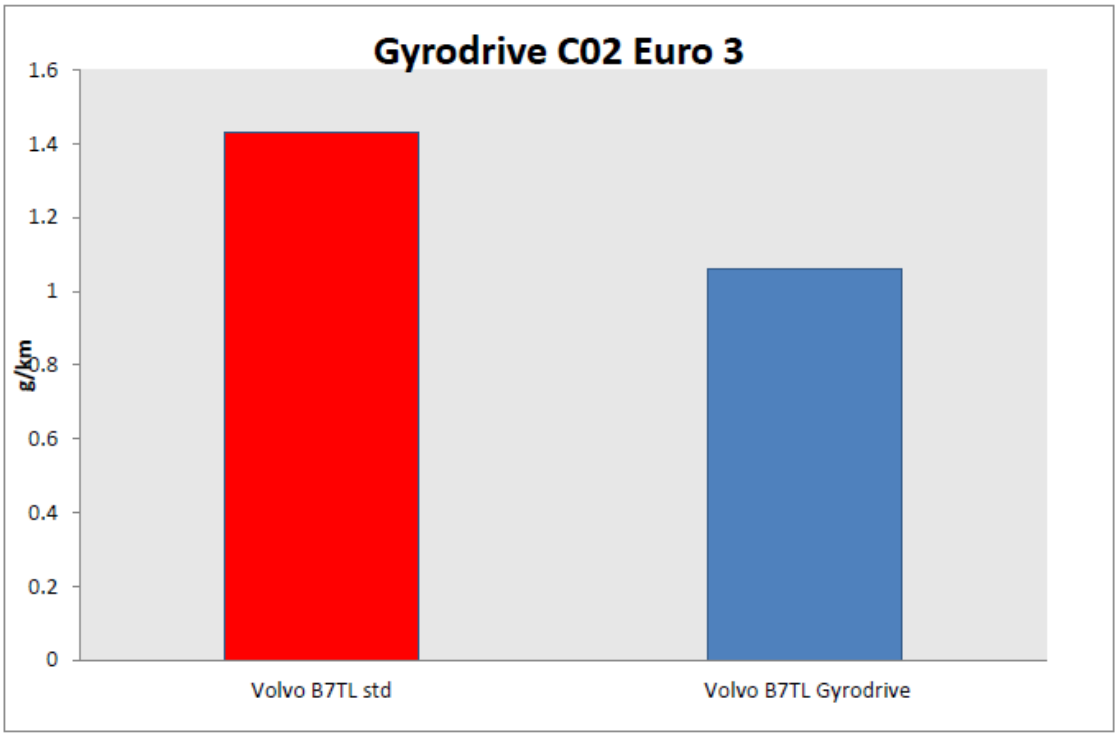
The chart below highlights the NOx reductions when a flywheel unit is fitted to a Euro3 vehicle during trials. It is likely that with further refinement that additional NOx savings can be achieved with the flywheels being fitted in the future. In principle the proposed technology can also be operated in conjunction with stop-start systems which are likely to enter into the market imminently.



PM:


Gyrodrive PM reduction Euro 3
0.036
0.035
0.034
0.033
0.032
0.031
0.03
0.029
0.028
0.027
g/km
Volvo B7TL std
Volvo B7TL Gyrodrive

CO2:


Gyrodrive C02 Euro 3
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
g/km
Volvo B7TL std
Volvo B7TL Gyrodrive

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Section D. About the local buses

N.B. Questions in the table below with asterisks (*) are mandatory.

D1.	*** In total, how many buses do you expect to modify?**	37 (directly through CBTF – more to follow through private investment)

Bus types (make and model):	Mercedes Citaro Wright Eclipse Urban Scania East Lancs Omnidekka
Name of engine manufacturer (of each type, if known):	Mercedes Volvo (Wrights) Scania
* Euro Standard (of each type):	Euro 3
* Estimated average annual bus mileage:	77,000 per bus (2,849,000 total for scheme)
* Expected change in annual bus mileage as a result of vehicle modification:	n/a
* Will the modification extend the lifetime of the buses? If so, how long for?	Approx 7 years
Number of single-deckers:	34
Number of double-deckers:	3
* Estimated cost of purchasing and fitting technology per bus:	£38,000 (Solent Blue Line will contribute 50% of the cost for each vehicle £19,000, SCC will contribute 5% per vehicle £1,900)
* Estimated additional operating costs/savings (including fuel) per bus over five years:	
* Estimated additional maintenance	

costs/savings per bus over five years:	
* DfT funding sought per bus (i.e. excluding other contributions):	£17,100

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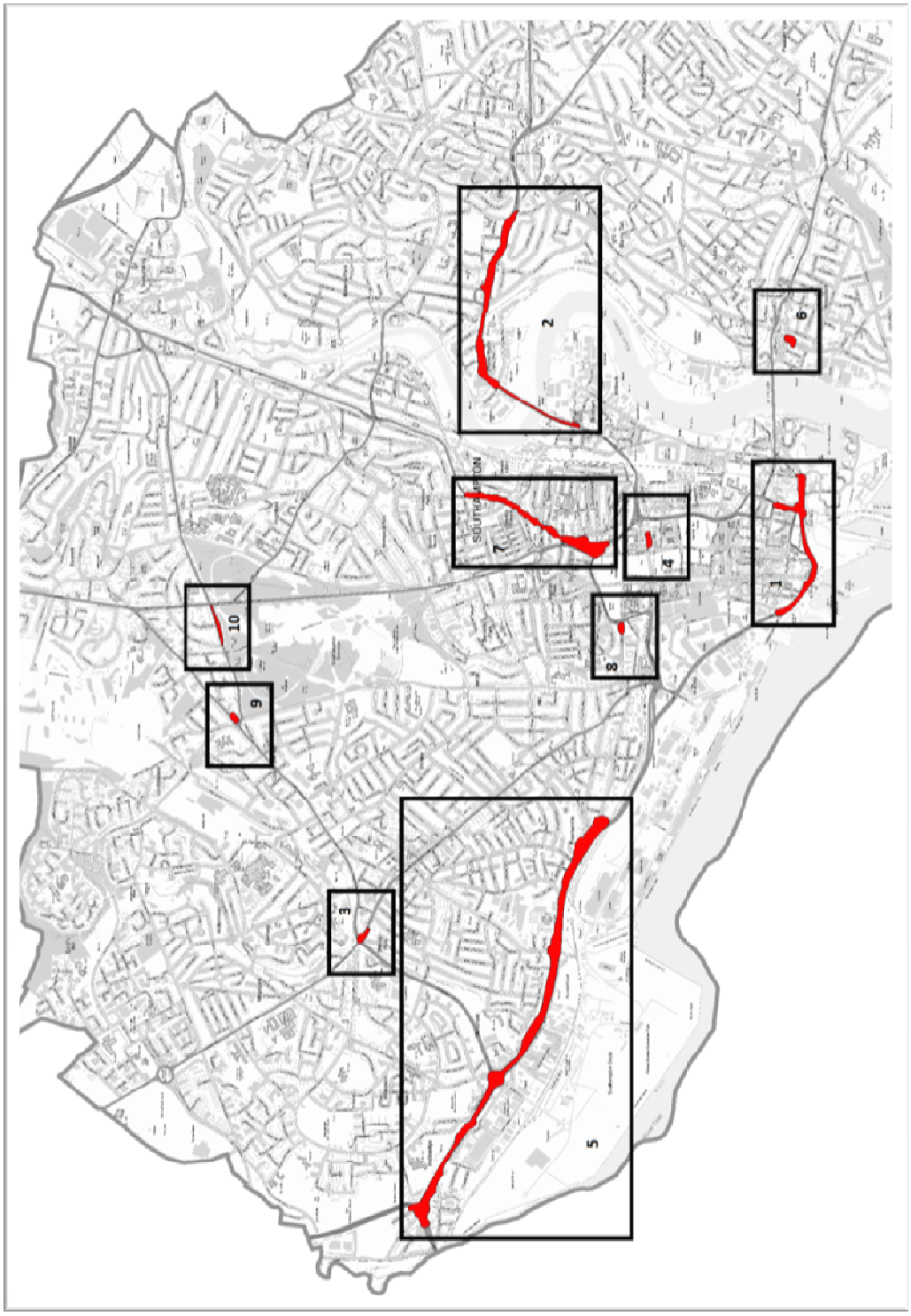
D2. Geographical area, bus routes and bus operator(s):

Describe the geographical area covered by this proposal, which bus routes will be upgraded with NOx abatement technology and who the operators are. (Max 200 words)



The geographical areas detailed in the map above are 10 of the AQMA's most affected by bus operations within the City that are in breach of acceptable NOx levels. Each area is typical of an urban environment and the bus operations could be described notably as 'stop start'. According to recent AA statistics the Western Approach into Southampton City Centre at peak times is one of the slowest in Europe (end to end) for distance covered within an urban environment.

Air Quality Management Zone	Buses Per Hour	Operator	Services
AQMA 4 - Town Quay	72	Bluestar	3
		First	3, 4, 4A, X4, 5, 6, 11, 12, 13
		Uni-Link	U1, U6
AQMA 2 - Bitterne Road West	49	Black Velvet	A
		Bluestar	18
		Brijan	7
		First	8, 8A, 8B, 9, B2
AQMA 6 - Winchester Road/Romsey Road	47	Black Velvet	S2
		Bluestar	4, 18
		First	1, 2, 3, 10, 12, S1
New Road	44	Black Velvet	A
		Bluestar	18
		Brijan	7
		First	8, 8A, 8B, 9
Redbridge/ Millbrook Road	30	Bluestar	6, 8, 9, 11, 12
		First	10
		Salisbury Reds	X7
Victoria Road	23	Bluestar	3
		First	11, 12, 13, R1
AQMA 1 - Bevois Valley	22	Black Velvet	S2
		First	7
		Uni-Link	U6
AQMA - Commercial Road	6	First	13
		Uni-Link	U2
AQMA 3 - Winchester Road - Hill Lane	6	First	S1
		Uni-Link	U6
Burgess Road	2	Uni-Link	U9

Based on the statistics shown in the table above it is proposed that the following services as part of the Solent Blue Line fleet are fitted with the Flywheel technology:

Bluestar 3, 4, 6, 8, 9, 11, 12, 18
Salisbury Reds X7
Uni-Link U1, U6, U9

37 vehicles will be equipped with the hybrid flywheel technology. These will operate within the most affected AQMA areas and provide excellent quantifiable data to support the business case for further installations.

The routes on which these vehicles operate are associated with some of the most deprived communities in the UK with a significant proportion along the Western Approach falling in the top 10% most deprived.

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D3. Level of CO_2 emissions and Nitrogen dioxide (NO_2) ambient concentrations:
Describe the trends and current state of NOx emissions and ambient roadside concentration levels of NO_2 in the geographical area identified above, comparing the latter in terms of EU concentration limit values. If available, include any additional statistics, such as road lengths assessed that exceed the EU concentration limit values, details of any Air Quality Management Areas, observed and forecast impact on health and local environment. (Max 200 words)

As the maps overleaf demonstrate there is a significant impact on public health within Southampton which directly relates to air quality issues. By introducing buses into these areas with significantly improved emissions there will be a positive impact on public health, most notably asthma and COPD hospital admissions.

NO2 data for areas identified:

AQMAs	Range of nitrogen dioxide roadside monitored values in 2012 annual mean at residential receptor facade	Annual mean NO2 standard
Town Quay (72 buses per hour)	35-42 ug/m3	40
Bitterne Road West (49 buses per hour)	34-41	40
Winchester Road/Romsey Road (47 buses per hour)	40	40
New Road (44 buses per hour)	40-47	40
Redbridge/Millbrook road (30 buses per hour)	35-50	40
Victoria Road (23 buses per hour)	35-43	40
Bevois Valley (22 buses per hour)	36-52	40
Commercial Road (6 buses per hour)	44	40
Winchester Road/Hill Lane (6 buses per hour)	38-45	40
Burgess Road (2 buses per hour)	34-46	40

The DEFRA funded Low Emission Strategy Study for Redbridge/Millbrook Road AQMA predicted using modelling it would still exceed the NO2 annual mean in 2016 unless measures were taken to reduce NOx emissions further.

Source apportionment modelling of Redbridge/Millbrook road (main road into the port) showed that the road vehicle NOx emissions varied from 74%-39%. Bus emissions accounted for a maximum of 6.5% of total NOx emissions.

If bus emissions could be reduced by 30% it could result in a tangible 0.4-0.7ug/m3 reduction in nitrogen dioxide annual mean and provide a significant contribution to a broader Low Emission Strategy.

The supplied test data from the Williams testing team suggests that the flywheel reduces NOx emissions from a baseline of 11.01 g/km to 8.95 g/km, a reduction of 19.6%. This is expected to rise as the technology increases in efficiency.

The routes are associated with some of the most deprived communities in the UK with a significant proportion along the Western Approach falling in the top 10% most deprived. Sufferers of asthma, COPD and cardiovascular disease are all susceptible to the effects of poor air quality and Public Health has identified hotspots for these conditions within the localities covered by this bid.

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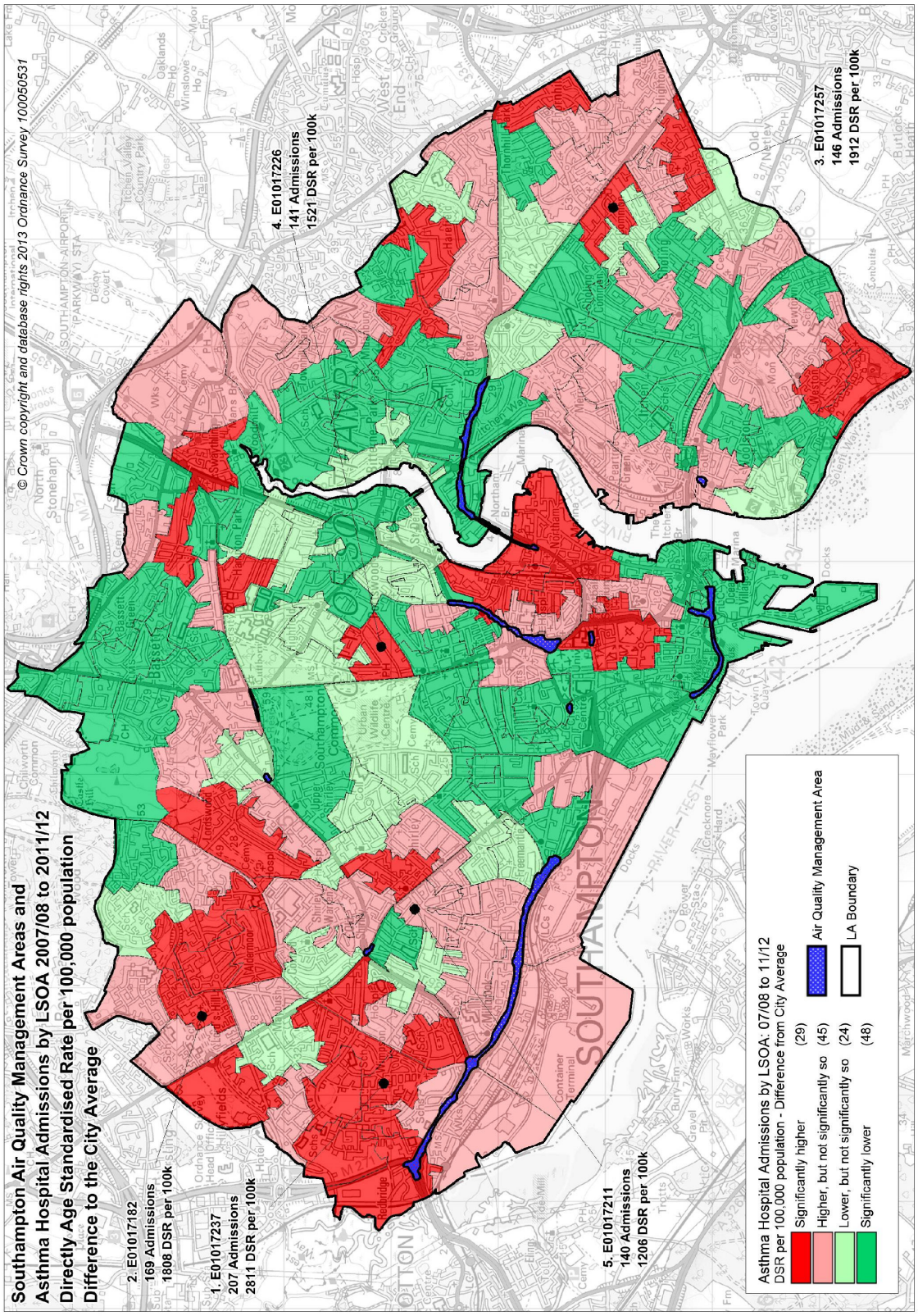

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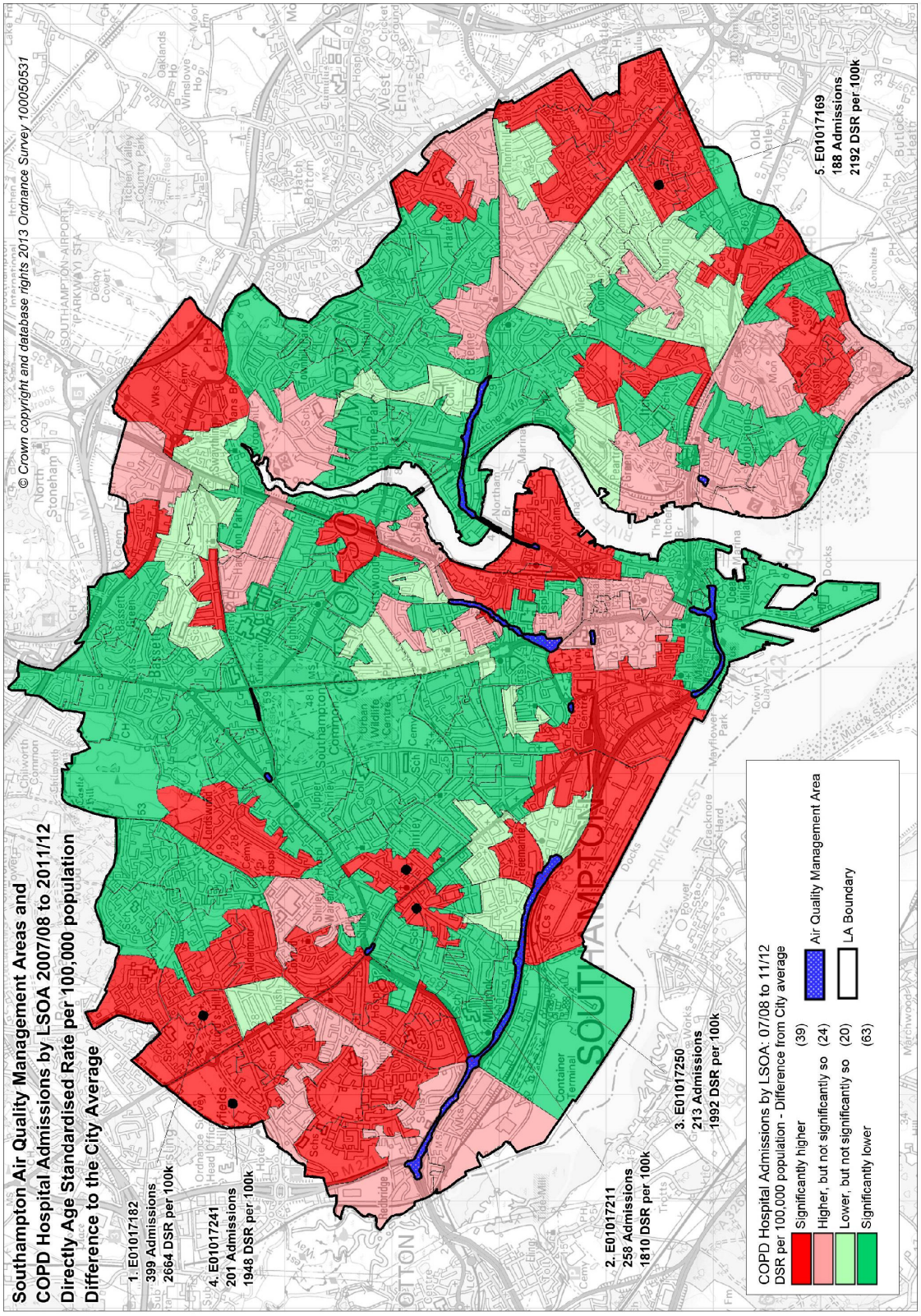

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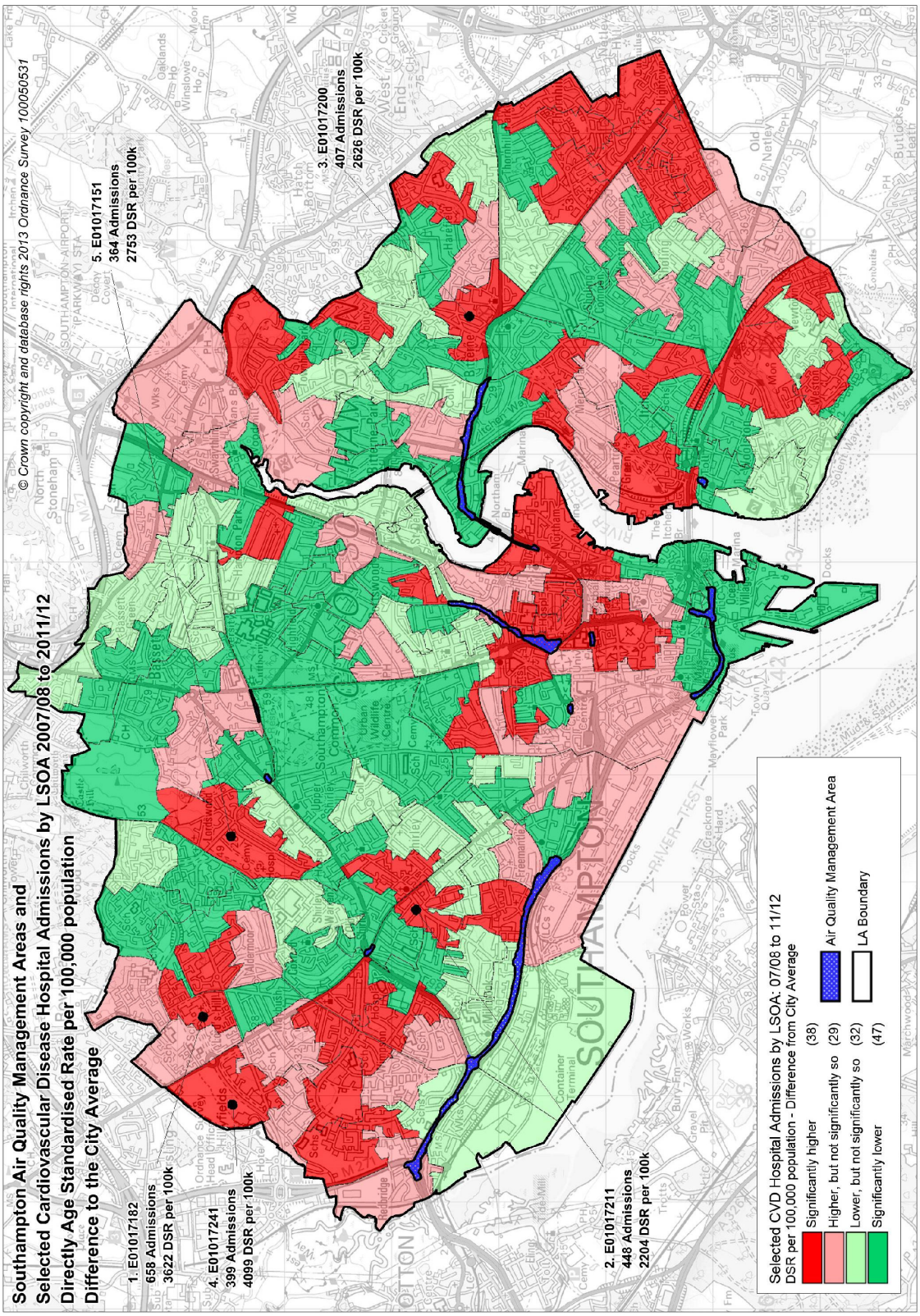

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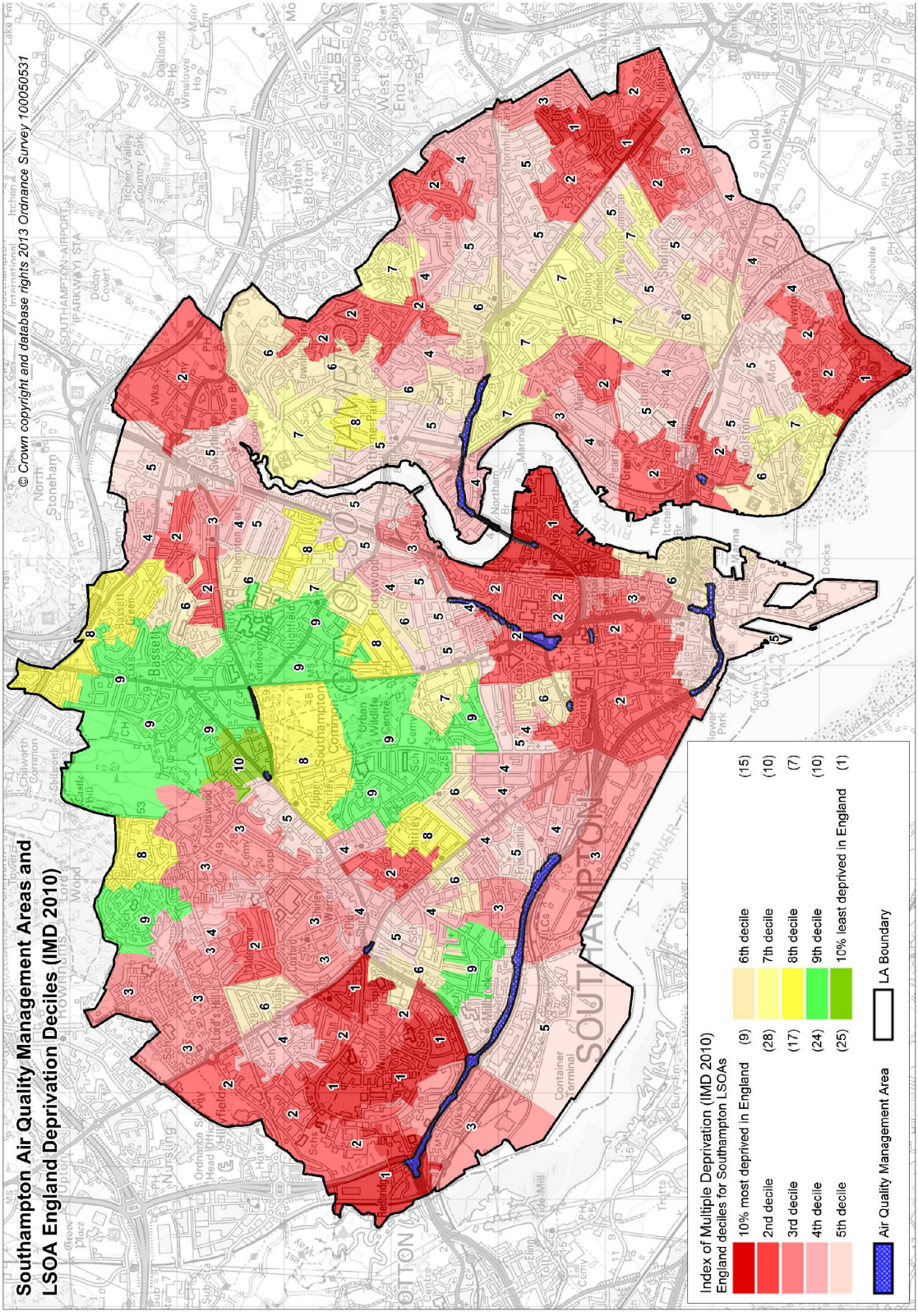

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D4. Describe your future plans for use of the modified buses.

Explain how you can ensure that modified buses are used for at least five years on some of the most polluted roads within your locality or any within other local authority boundary in England (without subsequent removal of abatement technology or other reversal of modifications) . (Max 200 words)

There will be a signed Service Level Agreement with the operator/s to guarantee the vehicles stay operating within the identified zones. This will be governed through the Quality Bus Partnership and monitored by the Bus Punctuality Task Force. There is also a commitment made by the operator to the effect that all buses within the fleet that are suitable will have the hybrid flywheel technology fitted, this should see more and more vehicles operating within Southampton with significantly reduced emissions.

Further to this there will be a press release upon commissioning of the refitted vehicles and a publicity drive in co-ordination with the launch of the intelligent signal based bus priority.

Section E. Project and financial governance

E1. Project and risk management:

Provide the name of your project, timeline, milestones, risks to successful delivery and the mitigation actions you propose to take to minimise these. You should any include impact on end users and actions you will take to control particulate matter (PM) and ammonia concentrations when reducing NOx. Provide impact on bus operators under Section D1. (Max 500 words)

Project Name: Clean Bus Technology

Timeline:

August 2013:

- Award of Funding
- Internal approvals at Integrated Transport Board 17th August
- Full cabinet approval 31st August

September 2013:

- Competition Advert published in local trade presses and website 2nd of September. Live for 3 weeks.
- Work Programme with participating operators agreed by 16th September
- Presentation of full work programme to the Quality Bus Partnership Bus Punctuality Task Force 3rd quarterly
- Equipment orders placed by participating Operators no later than 27th September

- Centre of Excellence for hybrid flywheel installation set-up at 'Hants and Dorset Trim' in conjunction with equipment orders

October 2013 – 31st March 2014:

- Project delivery phase subject to weekly project board meetings and management by PRINCE2 methodology.
- Progress report to Quality Bus Partnership Strategic Board 5th of December
- Best endeavours for delivery by 31st of March 2014 – any variation must be signed off by the appointed project board.

Milestones:

1. Award of funding (from DfT)
2. Advert for Competition
3. Award of funding by LA to local operators
4. Establishment of Centre of Excellence for Flywheel installation
5. 37 buses equipped with hybrid flywheel technology
6. Monitoring and Reporting mechanisms set up by the Quality Bus Partnership and University of Southampton

Risks to Delivery:

1. **RISK:** Because this is a new technology an installation on this scale has not been attempted before. There may be some teething problems encountered with the setup of the installation centre.
   Mitigation: The Company responsible for the installation centre (Hants and Dorset Trim) will work in partnership with Go South Coast and Williams in order to overcome any unforeseen problems. There are already test buses operating in normal conditions with the technology installed so proof of concept at this level has already been achieved.
2. **RISK:** Go South Coast lose interest in project
   Mitigation: Go South Coast are committing 50% match funding to the bid and are prepared to fit out the entire national fleet under private investment if the Southampton project is a success.
3. **RISK:** The hybrid flywheel solution cannot be fitted to certain bus types
   Mitigation: The 37 vehicles proposed for this phase have all be certified as suitable by Williams and meet the criteria within the CBTF guidelines

Impact on end users:

Operator:
Significantly reduced fuel costs and extended life of engines. No additional revenue implications and the publicity benefit of running a 'green' fleet. On a wider scale the GSC Company has a business case to deliver the technology on a national basis.

Local Authority:

Seen to be making a structured, monitored and significant approach to reducing harmful emissions in areas identified as AQMAs. Along with other transport lead initiatives such as projects within BBAF and LSTF this should provide evidence enough to avoid financial penalties pending from the EU.

Southampton Resident:
Cleaner air as a direct impact from the CBTF due to reduced emissions from Bluestar and Uni-Link buses. As detailed elsewhere in this document there is a clear correlation between air quality and public health.

E2. Progress report:
You will be required to monitor the progress of your project and update DfT every two months using a template. Your report should include the technology used to upgrade the buses, the number of buses upgraded, new risks you have identified and the mitigation actions you plan to take. Identify additional intermediate outputs and outcomes you will report on and if applicable, the web-site on which results will be made available. Include the name of your project, timeline and milestones. (Max 200 words)

This will be in the form of a project Highlight Report and will include as a minimum:

- Risk Register
- Issues Register
- Work Package completion reports
    - Technology used
    - Buses fitted
    - Apprentice review
    - Fitted buses operational
- Future stage Work Packages
- Variation Request (if applicable)

The monitoring of outputs and outcomes will be carried out by the Air Quality Scientific Service department at SCC in co-ordination with the University of Southampton. This will include results to-date and forecast results based on air quality models. There is flexibility within the proposal to allow for reallocation of resource if AQMA status changes. For example, if one of the identified AQMAs became worse over a period of time buses that operate within its boundaries could be fast-tracked through the instalment schedule. Results will be made publically available via the MyJourney website, the operator's website and the SCC website. There will also be a press release once the first buses are operational.

E3. Sharing best practice:

The main objective of the scheme is to establish whether a national programme could be supported and rolled out based on the success of the individual projects, whether such technologies could be used in other local authority areas, and expected future interest from local authorities and bus operators. Describe how best practice can be shared, technology transferred and how you can coordinate your outcomes with other successful bidders. (Max 200 words)

Experience and best practice would most usefully be shared by making public the project documents and presenting findings at industry based conferences and workshops. There will also be an opportunity through POLIS to present the projects outcome to the EU community. This would fit with other ITS based projects SCC are seeking EU funding for in next year's call. There is a firm link between the hybrid flywheel technology and the introduction of signal based bus priority. These 2 projects combined should result in a very efficient movement of buses through Southampton and significantly reduce fuel requirement and lower harmful emissions. It is the monitoring of this which should be shared throughout the transport community as evidence for best practice within a built up urban environment. The monitoring staff currently working on the LSTF outcomes will create a report on this basis.

The University of Southampton as an independent third party will be committed to appropriately monitor the delivery, outputs and outcomes. The department responsible are an established Centre of Excellence as part of the Transport Research Group.

E4. Contributing to Government Growth Agenda:

Describe how your bid can support local and national growth opportunities.
Collaboration with other authorities to share resources and the use of apprentices is encouraged where appropriate. (Max 200 words)

Solent Blue Line have committed to creating apprentice posts in association with the installation of the flywheel technology. There will also be new jobs and long term business created; Southampton is unique in that it will be the first area to implement this technology on a large scale. This enables the City to establish a foothold in an emerging industry and be best placed to offer services to the rest of the UK and Europe. This will be a part of the methodology for the 'Centre of Excellence' set-up at Hants and Dorset Trim. Solent Blue Line have committed to creating jobs and apprentice positions at the centre dedicated to the development and installation of the new technology. These would be new jobs for a new technology, not diverting jobs from elsewhere.

Nationally the industry will be watching this project with interest and if the outcome is as expected there is likely to be full deployment across the Go-

Ahead Group. With Go-Ahead being an international entity It is worth bearing in mind that this project may also have a positive international impact.

The difference between this proposal and other SCR based projects is that it appeals to the commercial operator due to the significant fuel savings. Although per bus NOx reductions may be less than SCR the flywheel solution has a much broader appeal and so has the potential to be delivered on a much larger scale, making a more significant impact nationally and within the EU.

With the flywheel technology being an emerging UK product this bid will significantly aid its development and strengthen the case for an export market to the EU and beyond.

E5. Outsourcing:

Describe details of any outsourcing you will use for project delivery, legal advice, modelling, assessment or engineering. Provide anticipated costs under Section E7. (Max 200 words)

SCC will engage their internal Legal Team to co-ordinate the development of the SLA and will require the support of the Procurement Team in order to award the funding by means of a competition advert.

Project Management will be through internal Gateway Process and will be resourced within the Transport Policy Team. The Quality Bus Partnership will act as the Project Board and will offer staff resource as and when required. There will be extensive modelling and assessment tools required throughout the project and this will be outsourced as appropriate by the air quality scientific department.

N.B. Questions in the table below with asterisks (*) are mandatory.

E6.	*** Total DfT funding contribution sought (up to £1,000,000):**	£632,700 (45%)
E7.	*** Total estimated cost of outsourcing and operational costs (£):**	£0
E8.	**If applicable, local authority contribution (£):**	£70,300 (5%)
E9.	**If applicable, other contribution (e.g. bus operator) (£):**	£703,000 (50%)
E10.	***TOTAL ESTIMATED COST OF PROJECT:**	£1,406,000

Department for Transport

Section F. Supporting evidence

F1. Please use this space to provide any additional evidence for your proposal. (Max 500 words)

B1 - In 2011 Southampton's Western Approach (which includes the Millbrook/Redbridge AQMA) was identified by DEFRA as being one of a few national areas where a LEZ or similar strategy could reduce NOx levels to an acceptable standard. SCC was subsequently awarded £50k to undertake a feasibility study. This work is still in progress but is currently suggesting that a city wide low emission strategy could safeguard the necessary improvements by 2016 in some areas. This strategy will look at a package of measures to promote and enhance good practice to ensure multiple small gains can be achieved.

Emissions calculations

All emissions were estimated using the latest version of the Defra Emissions Factor Toolkit (EfT). This tool, which is based on the COPERT IV emissions dataset, is provided by UK government for preparation of Local Air Quality Management reports, and for developing local road traffic emissions inventories. We have used the EfT to estimate NOx from buses in each of Southampton's AQMAs for the baseline situation in 2012.

Redbridge Road/ Millbrook

Route emissions baseline	Buses/Coaches (g/km)	% from Euro I	% from Euro II	% from Euro III	% from Euro IV	% from Euro V
NOx	299.3	3.2%	15.1%	71.0%	10.8%	0%
	g/km from each Euro class	9.6	45.2	212.5	32.3	0
	g/km from GSC buses	8.9	42.0	197.3	30.0	0
Route emissions flywheel	Buses/Coaches (g/km)					
NOx	276.6 (NOx saving = 22.7g/km)	Baseline minus (Euro III NOx from GSC vehicles x NOx abatement %) x number of vehicles retrofitted/total number of Euro III in GSC fleet Or baseline minus (197.3 x 19.6%) x (37/63)				
Emissions from buses at 20kph in AQMA 4 are reduced by		7.6%				
Comment		GSC Euro III emissions are the largest single source in this instance, hence the comparatively larger NOx emission reduction compared to the other AQMAs.				

In this instance if the bus fleet were responsible for the all NOx emissions in Redbridge Road/Millbrook the saving with flywheel applied to 37 Euro III GSC buses would be 7.6%. In reality the bus fleet will be responsible for much less of the total NOx in Redbridge Road/Millbrook- if buses produce 50% of NOx in AQMA the saving would be 3.8%, if buses produce 25% of NOx the saving

would be 1.9% for the fleet as whole (including cars, HGVs etc.). When considered in the context of a wider LES (as is being proposed by SCC), gains of this magnitude from multiple sources are considered likely to make a significant contribution to achieving the **NO_2** annual mean objective by 2016.

Attached as an appendices are the documents ready for release upon award of funding to start the call to operators advert process immediately.

Email your completed form to: CBTF@dft.gsi.gov.uk by 17:00, Friday 19 July 2013 in MS Word 2003 or PDF format. Please also send two hard copies to: Air Quality Strategy, Department for Transport, Zone 1/33, Great Minster House, 33 Horseferry Road, London SW1P 4DR.