



Department
for Environment
Food & Rural Affairs

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Draft Air Quality Plan for the achievement of EU air quality limit value for nitrogen dioxide (NO₂) in Belfast Metropolitan Urban Area (UK0028)

September 2015



Llywodraeth Cymru
Welsh Government



The Scottish
Government
Riaghaltas na h-Alba



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1 Introduction

1.1 This document

This document is the Belfast Metropolitan Urban Area agglomeration zone (UK0028) updated air quality plan for the achievement of the EU air quality limit values for nitrogen dioxide (NO₂). This is an update to the air quality plan published in September 2011 (<http://uk-air.defra.gov.uk/library/no2ten/>).

This plan presents the following information:

- General information regarding the Belfast Metropolitan Urban Area agglomeration zone
- Details of the NO₂ exceedance situation within the Belfast Metropolitan Urban Area agglomeration zone
- Details of local air quality measures that have been implemented, will be implemented or are being considered for implementation in this agglomeration zone.

This air quality plan for the Belfast Metropolitan Urban Area agglomeration zone should be read in conjunction with the separate UK overview document. The UK overview document sets out, amongst other things, the authorities responsible for delivering air quality improvements and the national measures that are applied in some or all UK zones. The measures presented in this plan and the accompanying UK overview document show how the UK will ensure that compliance with the NO₂ limit values is achieved in the shortest possible time.

1.2 Context

Two NO₂ limit values for the protection of human health have been set in the Air Quality Directive (2008/50/EC). These are:

- The annual mean limit value: an annual mean concentration of no more than 40 $\mu\text{g m}^{-3}$
- The hourly limit value: no more than 18 exceedances of 200 $\mu\text{g m}^{-3}$ in a calendar year.

The Air Quality Directive stipulates that compliance with the NO₂ limit values will be achieved by 01/01/2010.

1.3 Zone status

The assessment undertaken for the Belfast Metropolitan Urban Area agglomeration zone indicates that the annual limit value was exceeded in 2013 but is likely to be achieved before 2020 through the introduction of measures included in the baseline.

1.4 Plan Structure

General administrative information regarding this agglomeration zone is presented in section 2.

Section 3 then presents the overall picture with respect to NO₂ levels in this agglomeration zone for the 2013 reference year of this air quality plan. This includes declaration of exceedance situations within the agglomeration zone and presentation of a detailed source apportionment for each exceedance situation.

An overview of the measures already taken and to be taken within the agglomeration zone both before and after 2013 is given in section 4.

Baseline modelled projections for 2020, 2025 and 2030 for each exceedance situation are presented in section 5. The baseline projections presented here include, where possible, the impact of measures that have already been taken and measures for which the relevant authority has made a firm commitment to take the measure(s). However, it has not been possible to quantify the impact of all the measures. This section therefore also explains which measures have been quantified, and hence included in the model projections, and which measures have not been quantified.

2 General information about the Zone

2.1 Administrative information

Zone name: Belfast Metropolitan Urban Area

Zone code: UK0028

Type of zone: agglomeration zone

Reference year: 2013

Extent of zone: Figure 1 shows the area covered by the Belfast Metropolitan Urban Area agglomeration zone.

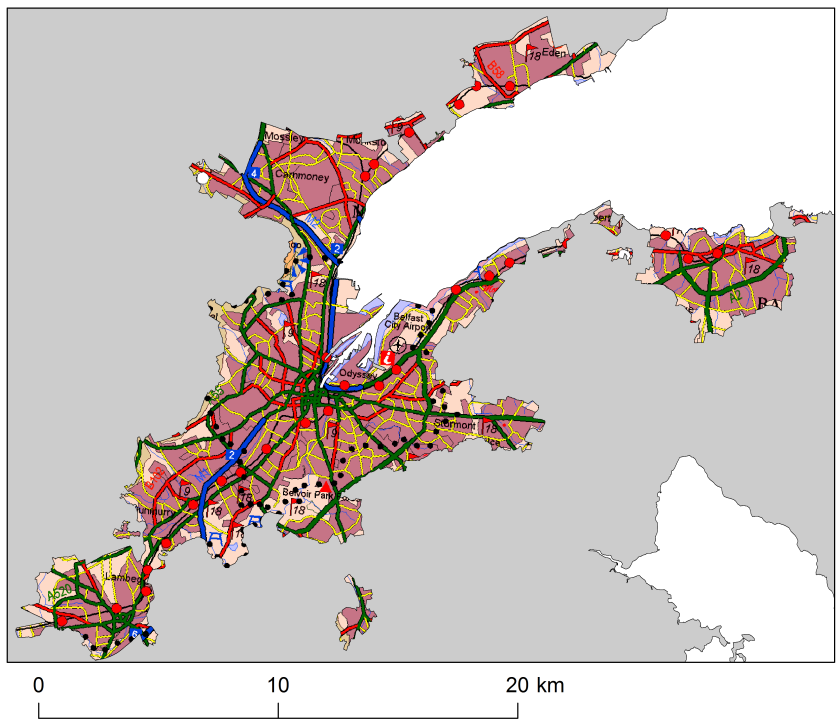
Local Authorities within the zone: Figure 2 shows the location of Local Authorities within the agglomeration zone. A list of these Local Authorities is also given below. The numbers in the list correspond to the numbers in Figure 2.

1. Belfast City Council
2. Carrickfergus Borough Council
3. Castlereagh Borough Council
4. Lisburn Borough Council
5. Newtownabbey Borough Council
6. North Down Borough Council

(Note: Local Authority boundaries do not necessarily coincide with zone boundaries. Hence Local Authorities may be listed within more than one zone plan.)

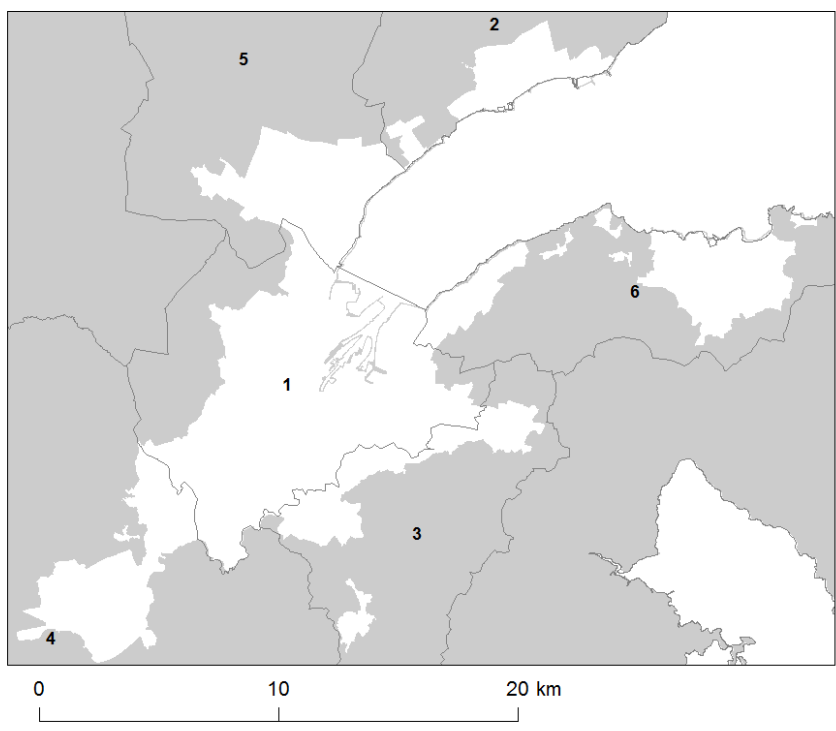
Please note that the local authorities in Northern Ireland have changed since this assessment was originally undertaken. The Local Authorities in the Belfast Metropolitan Urban Area agglomeration zone are now: Belfast City Council, Antrim and Newtownabbey Borough Council, Ards and North Down Borough Council, Lisburn and Castlereagh City Council, and Mid and East Antrim Borough Council.

Figure 1: Map showing the extent of the Belfast Metropolitan Urban Area agglomeration zone (UK0028).



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Figure 2: Map showing Local Authorities within the Belfast Metropolitan Urban Area agglomeration zone (UK0028).



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2.2 Assessment details

Measurements

NO₂ measurements in this zone were available in 2013 from the following national network monitoring stations (NO₂ data capture for each station in 2013 shown in brackets):

1. Belfast Centre GB0567A (95%)

Full details of monitoring stations within the Belfast Metropolitan Urban Area agglomeration zone are available from <http://uk-air.defra.gov.uk/networks/network-info?view=aurm>.

Modelling

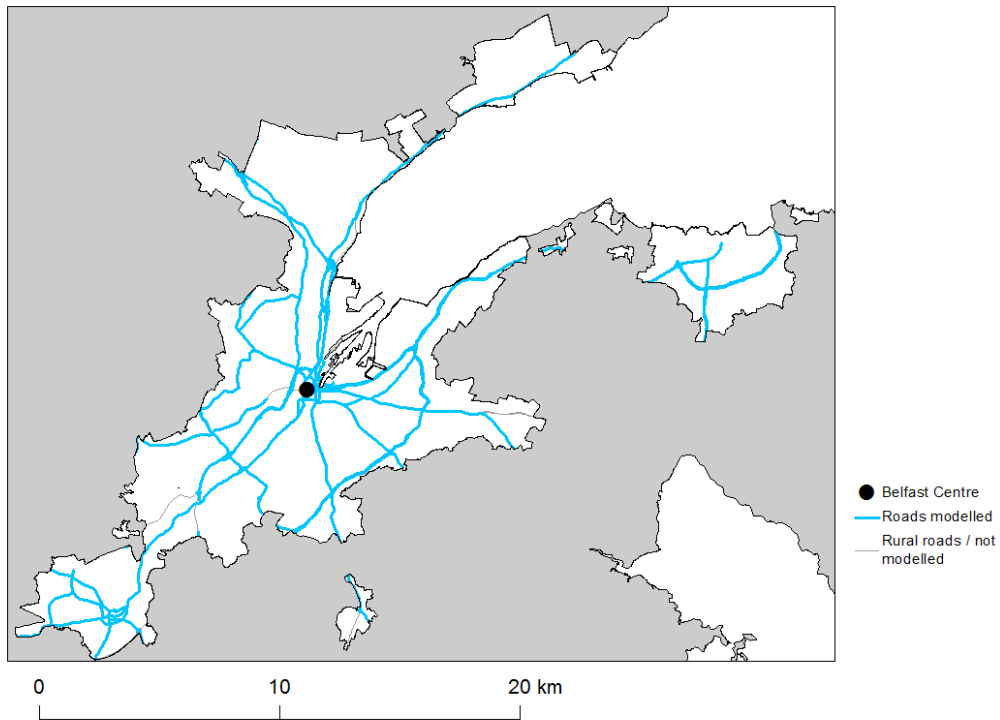
Modelling for the 2013 reference year has been carried out for the whole of the UK. This modelling covers the following extent within this zone:

- Total background area within zone (approx): 216 km²
- Total population within zone (approx): 545,493 people
- Total road length where an assessment of NO₂ concentrations have been made: 227 km in 2013 (and similar lengths in previous years)

Zone maps

Figure 3 presents the location of the NO₂ monitoring stations within this zone for 2013 and the roads for which NO₂ concentrations have been modelled. NO₂ concentrations at background locations have been modelled across the entire zone at a 1 x 1 km² resolution.

Figure 3: Map showing the location of the NO₂ monitoring stations with valid data in 2013 and roads where concentrations have been modelled within the Belfast Metropolitan Urban Area (UK0028) agglomeration zone.



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2.3 Reporting Under European Directives

From 2001 to 2012 the UK has reported annually on air quality concentrations using a standard excel questionnaire (Decision 2004/461/EC). These questionnaires are available online from <http://cdr.eionet.europa.eu/gb/eu/annualair>. Since 2013 reporting has been via an e-reporting system (Decision 2011/850/EU) <http://cdr.eionet.europa.eu/gb/eu/>.

In addition, the UK has reported on air quality plans and programmes (Decision 2004/224/EC) <http://cdr.eionet.europa.eu/gb/eu/aqpp>.

3 Overall Picture for 2013 Reference Year

3.1 Introduction

There are two limit values for the protection of health for NO₂. These are:

- The annual limit value (annual mean concentration of no more than 40 $\mu\text{g m}^{-3}$)
- The hourly limit value (no more than 18 hourly exceedances of 200 $\mu\text{g m}^{-3}$ in a calendar year)

Within the Belfast Metropolitan Urban Area agglomeration zone the annual limit value was exceeded in 2013. Hence, one exceedance situation for this zone has been defined, NO₂_UK0028_Annual_1, which covers exceedances of the annual limit value. This exceedance situation is described below.

3.2 Reference year: NO₂_UK0028_Annual_1

The NO₂_UK0028_Annual_1 exceedance situation covers all exceedances of the annual mean limit value in the Belfast Metropolitan Urban Area agglomeration zone in 2013.

Compliance with the annual limit value in this exceedance situation has been assessed using a combination of air quality measurements and modelling. Table 1 presents measured annual concentrations at national network stations in this exceedance situation since the 1st Daughter Directive (1999/30/EC) came into force in 2001. This shows that there were no measured exceedances of the annual limit value in this zone in 2013. Table 2 summarises modelled annual mean NO₂ concentrations in this exceedance situation for the same time period. This table shows that, in 2013, 51.8 km of road length was modelled to exceed the annual limit value. There were no modelled background exceedances of the annual limit value. Maps showing the modelled annual mean NO₂ concentrations for 2013 at background and at roadside locations are presented in Figures 4 and 5 respectively. All modelled exceedances of the annual limit value are coloured orange or red in the maps.

The maximum measured concentration in the zone varies due to changes in emissions and varying meteorology in different years. However, the models are also updated each year to take into account the most up-to-date science, so the modelled results for different years may not be directly comparable.

The modelling carried out for this exceedance situation has also been used to determine the annual mean NO_x source apportionment for all modelled locations. Table 3 presents summary source apportionment information in this exceedance situation.

Table 3 summarises the modelled NO_x source apportionment for the section of road with the highest modelled NO₂ concentration in this exceedance situation in 2013. This is important information because it shows which sources need to be tackled at the location with the largest compliance gap in the exceedance situation. It is

not possible to calculate an unambiguous source apportionment for annual mean NO₂ concentrations for the reasons discussed in the UK Technical Report¹. Therefore no NO₂ source apportionment is provided.

Figure B.1 in Annex B presents the annual mean NO_x source apportionment for each section of road within the NO₂_UK0028_Annual_1 exceedance situation (i.e. the source apportionment for all exceeding roads only) in 2013. Roads have been grouped into motorways, primary roads and trunk roads in this figure.

¹Technical report to be finalised for the final plan.

Table 1: Measured annual mean NO₂ concentrations at national network stations in NO2_UK0028_Annual_1 for 2001 onwards, μgm^{-3} (a). Data capture shown in brackets.

Site name (EOI code)	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belfast Centre (GB0567A)	32 (85)	30 (95)	32 (95)	28 (92)	33 (55)	34 (91)	32 (91)	32 (92)	33 (89)	35 (92)	28 (99)	29 (99)	31 (95)

(a) Annual Mean Limit Value = $40 \mu\text{gm}^{-3}$

Table 2: Annual mean NO₂ model results in NO2_UK0028_Annual_1 for 2001 onwards.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Road length exceeding (km)	37.2	46.0	53.8	67.6	35.0	35.0	35.0	36.4	57.9	63.4	36.4	34.3	51.8
Background exceeding (km ²)	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum modelled concentration (μgm^{-3}) (a)	60.0	49.9	60.5	56.6	72.9	73.9	67.8	70.4	65.6	77.0	68	65	64

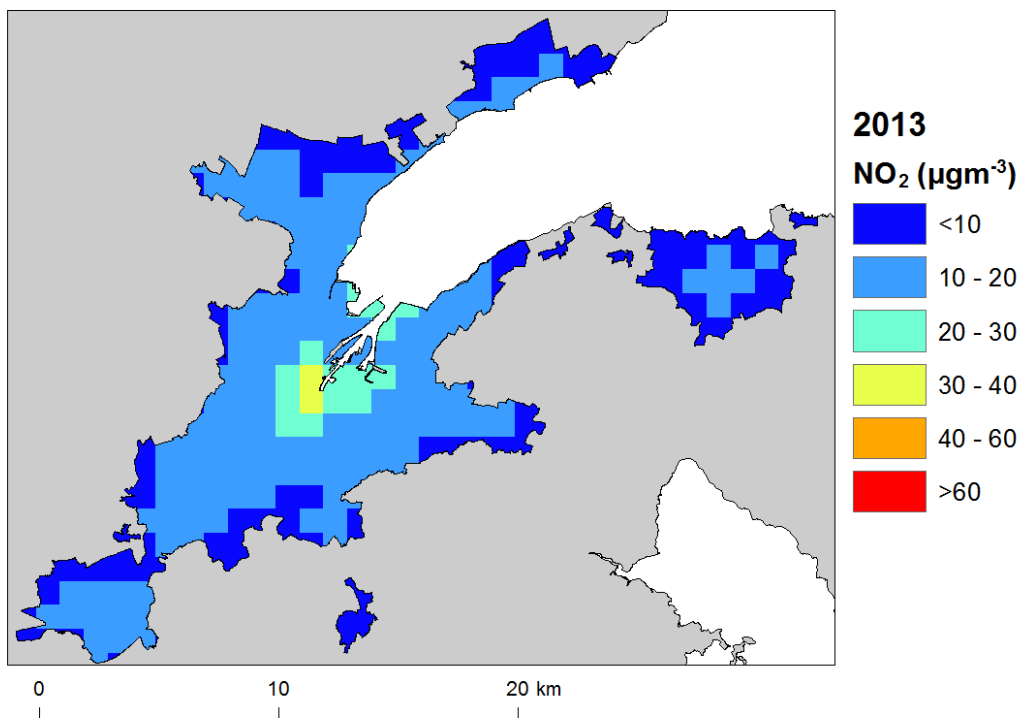
(a) Annual Mean Limit Value = $40 \mu\text{gm}^{-3}$

Table 3: Modelled annual mean NOx source apportionment at the traffic count point with the highest modelled concentration in 2013 in NO2_UK0028_Annual_1 (μgm^{-3}) (traffic count point 999345 on the A12; OS grid (m): 145656, 529924).

Spatial scale	Component	Concentration at highest road link (a)
Regional background sources NOx (i.e. contributions from distant sources of > 30 km from the receptor).	Total	3.4
	From within the UK	1.6
	From transboundary sources (includes shipping and other EU member states)	1.8
Urban background sources NOx (i.e. sources located within 0.3 - 30 km from the receptor).	Total	40.6
	From road traffic sources	23.8
	From industry (including heat and power generation)	1.8
	From agriculture	NA
	From commercial/residential sources	11.1
	From shipping	1.2
	From off road mobile machinery	2.2
	From natural sources	NA
	From transboundary sources	NA
From other urban background sources	0.5	
Local sources NOx (i.e. contributions from sources < 0.3 km from the receptor).	Total	127.1
	From petrol cars	7.3
	From diesel cars	53.4
	From HGV rigid	34.3
	From HGV articulated	24.1
	From buses	1.2
	From petrol LGVs	0.1
	From diesel LGVs	5.9
From motorcycles	0.7	
From London taxis	0.0	
Total NOx (i.e. regional background + urban background + local components)		171.0
Total NO ₂ (i.e. regional background + urban background + local components)		64

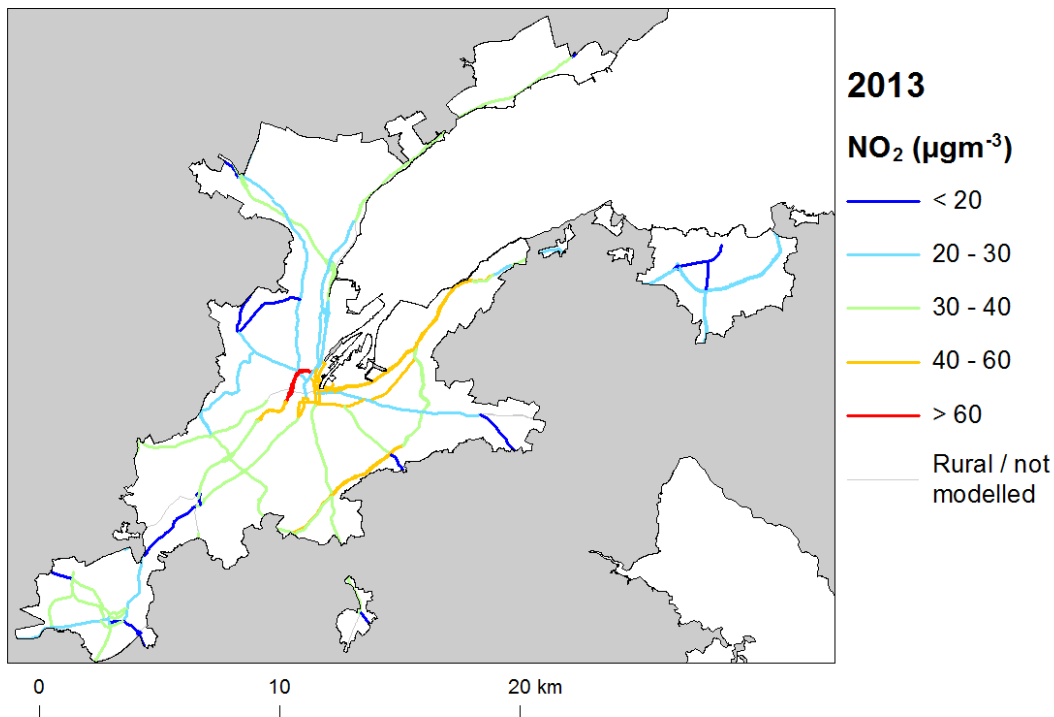
(a) Components are listed with NOx concentration of NA when there is no source from this sector.

Figure 4: Map of modelled background annual mean NO₂ concentrations 2013. Modelled exceedances of the annual limit value are shown in orange and red.



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Figure 5: Map of modelled roadside annual mean NO₂ concentrations 2013. Modelled exceedances of the annual limit value are shown in orange and red.



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4 Measures

4.1 Introduction

This section (section 4) gives details of measures that address exceedances of the NO₂ limit values within Belfast Metropolitan Urban Area agglomeration zone. This includes both measures that have already been taken and measures for which there is a firm commitment that they will be taken.

Section 5 then explains the extent to which it has been possible to incorporate the impacts of these measures into the baseline modelling carried out for this assessment.

4.2 Source apportionment

It is important to understand which sources are responsible for causing the exceedance in order to most effectively tailor measures to address the NO₂ exceedance situation described in section 3 above. This can be achieved by considering the source apportionment for the exceedance situation, also presented in section 3. A summary of what the source apportionment shows and the implications for which measures would therefore be appropriate is given here.

Local road traffic was the dominant source in this exceedance location in the reference year. The largest contribution was from cars at the location of maximum exceedance with a contribution of 60.7 μgm^{-3} of NOx out of a total of 171 μgm^{-3} of NOx. Cars, rigid HGVs and articulated HGVs were important sources on the primary roads with the highest concentrations. For all road links concentrations of NOx from diesel cars were approximately four times greater than NOx emissions from petrol cars. NOx concentrations from petrol LGVs are a small component of total NOx concentrations and less than 2% of total NOx from LGVs.

This indicates that appropriate measures should impact on local road traffic sources in this zone. Other measures may also be beneficial depending on the source apportionment for the urban background.

4.3 Measures

Measures potentially affecting NO₂ in this agglomeration zone have been taken and/or are planned at a range of administrative levels. These are:

- European Union
- National (i.e. England, Scotland, Wales, Northern Ireland or whole UK)
- Local (i.e. UK Local Authorities)

Details of European Union measures (e.g. euro standards, fuel quality directives, integrated pollution prevention and control) can be found on the European Commission's website (http://ec.europa.eu/environment/air/index_en.htm). Details of national measures are given in the UK overview document.

Relevant Local Authority measures within this exceedance situation are listed in Table C.1 (see Annex C). Table C.1 lists measures which a local authority has carried out or is in the process of carrying out, plus additional measures which the local authority is committed to carrying out or is investigating with the expectation of carrying out in the future.

Overview

The Area Plan contains details of a range of measures put forward by Northern Ireland central and local government. The Plan encourages increased provision for walking and cycling facilities together with policies

which seek to provide an alternative to travel by car. The measures set out in the Plan are linked to the overall policy aim of reducing car travel and emissions from road transport, as this offers the greatest potential for reducing levels of nitrogen dioxide on major routes. Also, improved facilities for public transport, walking and cycling provide greater choice of travel.

There are a number of initiatives that are being undertaken. A bicycle strategy for Northern Ireland is intended to improve and extend cycle networks. This was launched in 2015. The strategy will contribute to reduced congestion and improve air quality. It will be followed by a bicycle network plan for the area to guide the development and operation of bicycle infrastructure for the next ten years. A public bike hire scheme was launched by Belfast City Council in April 2015 and has 300 bicycles and 30 bike docking stations within the city centre area.

There are also installations of electric charging points across Northern Ireland with approximately 30 charge point locations within the Greater Belfast area. The network will help the development of the growing ultra-low emission vehicle sector within Northern Ireland. Bus fleets are also being replaced with newer, lower polluting vehicles.

At a local authority level, options will be explored concerning voluntary fleet recognition and an advice scheme that encourages operators to move towards a cleaner fleet and improve fuel efficiency. This would result in greener and modern delivery vehicles in the city centre and so reduce emissions.

Northern Ireland central government is also currently committed to introducing a number of measures which will encourage walking and use of public transport instead of private cars, reduce single occupancy car use and improve air quality. These include the following:

- The York Street Interchange - a major road scheme which will help to relieve congestion at the junction of the three busiest routes in Northern Ireland (A12 Westlink, A2 and M3) which are currently modelled as showing exceedance of the annual mean NO₂ limit value. A public consultation on the scheme design was completed in March 2015 and a Public Inquiry is due in November 2015.
- Belfast Rapid Transit - an urban public transport system with two primary arterial routes from the east and west of the city which will connect with a city centre loop. Work has already commenced on the scheme which is projected to cost £98.5m. Operation of the scheme is forecast to result in a significant shift away from private car journeys into and within the Greater Belfast/city centre area.
- Belfast Transport Hub - this flagship project (currently at planning/consultation stage) will develop and construct a new and modern public transport facility, which will integrate rail and coach services with new commercial developments and car-parking to provide "best in class" public transport access to the city centre.

4.4 Measures timescales

Timescales for national measures are given in the UK overview document.

Local Authorities report on progress with the implementation of their action plans annually and review action plan measures regularly. Information on local measures was collected in February/March 2015. Hence, any Local Authority action plans and measures adopted by Local Authorities after this time have not been included in this air quality plan.

The reference year for this air quality plan is 2013. Hence where measures started and finished before 2013, then the improvement in air quality resulting from these measures will have already taken place before the reference year and the impact of these measures will have been included in the assessment where the measure has had an impact on the statistics used to compile the emission inventory. Many measures started before

the reference year and will continue to have a beneficial impact on air quality well beyond the reference year. Hence measures with a start date before 2013 and an end date after 2013 may have an impact on concentrations in the reference year and a further impact in subsequent years. Where the Status column in Annex C is 'Implementation', this shows that this measure is already underway or that there is a commitment for this measure to go ahead. Where the Status is 'Planning', 'Preparation' or 'Other' the level of commitment is less clear and it is possible some of these measures may not go ahead.

5 Baseline Model projections

5.1 Overview of model projections

Model projections for 2020, 2025 and 2030, starting from the 2013 reference year described in section 3, have been calculated in order to determine when compliance with the NO₂ limit values is likely to be achieved on the basis of EU, regional and local measures currently planned. Details of the methods used for the baseline emissions and projections modelling are provided in the UK technical report.

For national measures, it has not been possible to quantify the impact of all measures on emissions and ambient concentrations. The impact for all quantifiable measures has been included in the baseline projections.

The impacts of the individual Local Authority measures have not been explicitly included in the baseline model projections. However, measures may have been included implicitly if they have influenced the traffic counts for 2012 (used as a basis for the compilation of the emission inventory) or in the traffic activity projections to 2020 and beyond (used to calculate the emissions projections). It should be recognised that these measures will have a beneficial impact on air quality, even if it has not been possible to quantify this impact here.

5.2 Baseline projections: NO₂_UK0028_Annual_1

Table 4 presents summary results for the baseline model projections for 2020, 2025 and 2030 for the NO₂_UK0028_Annual_1 exceedance situation. This shows that the maximum modelled annual mean NO₂ concentration predicted for 2020 in this exceedance situation is 37 μgm^{-3} . Hence, the model results suggest that compliance with the NO₂ annual limit value is likely to be achieved before 2020 under baseline conditions in this exceedance situation.

Figures 6 and 7 show maps of projected annual mean NO₂ concentrations in 2020, 2025 and 2030 for background and roadside locations respectively. Maps for 2013 are also presented here for reference.

It should be noted that the baseline projections presented here include the impacts of some measures, where they can be quantified, that have already been or will be implemented.

Table 4: Annual mean NO₂ model results in NO₂_UK0028_Annual_1.

	2013	2020	2025	2030
Road length exceeding (km)	51.8	0.0	0.0	0.0
Background exceeding (km ²)	0	0	0	0
Maximum modelled concentration NO ₂ (μgm ⁻³) (a)	64	37	30	28
Corresponding modelled concentration NOx (μgm ⁻³) (b)	171	83	66	60

(a) Annual Mean Limit Value = 40 μgm⁻³

(b) NOx is recorded here for comparison with the NOx source apportionment graphs for 2013 presented in Annex B of this plan. Limit values for EU directive purposes are based on NO₂.

Figure 6: Background baseline projections of annual mean NO₂ concentrations in 2020, 2025 and 2030. 2013 is also included here for reference. Modelled exceedances of the annual limit value are shown in orange and red.

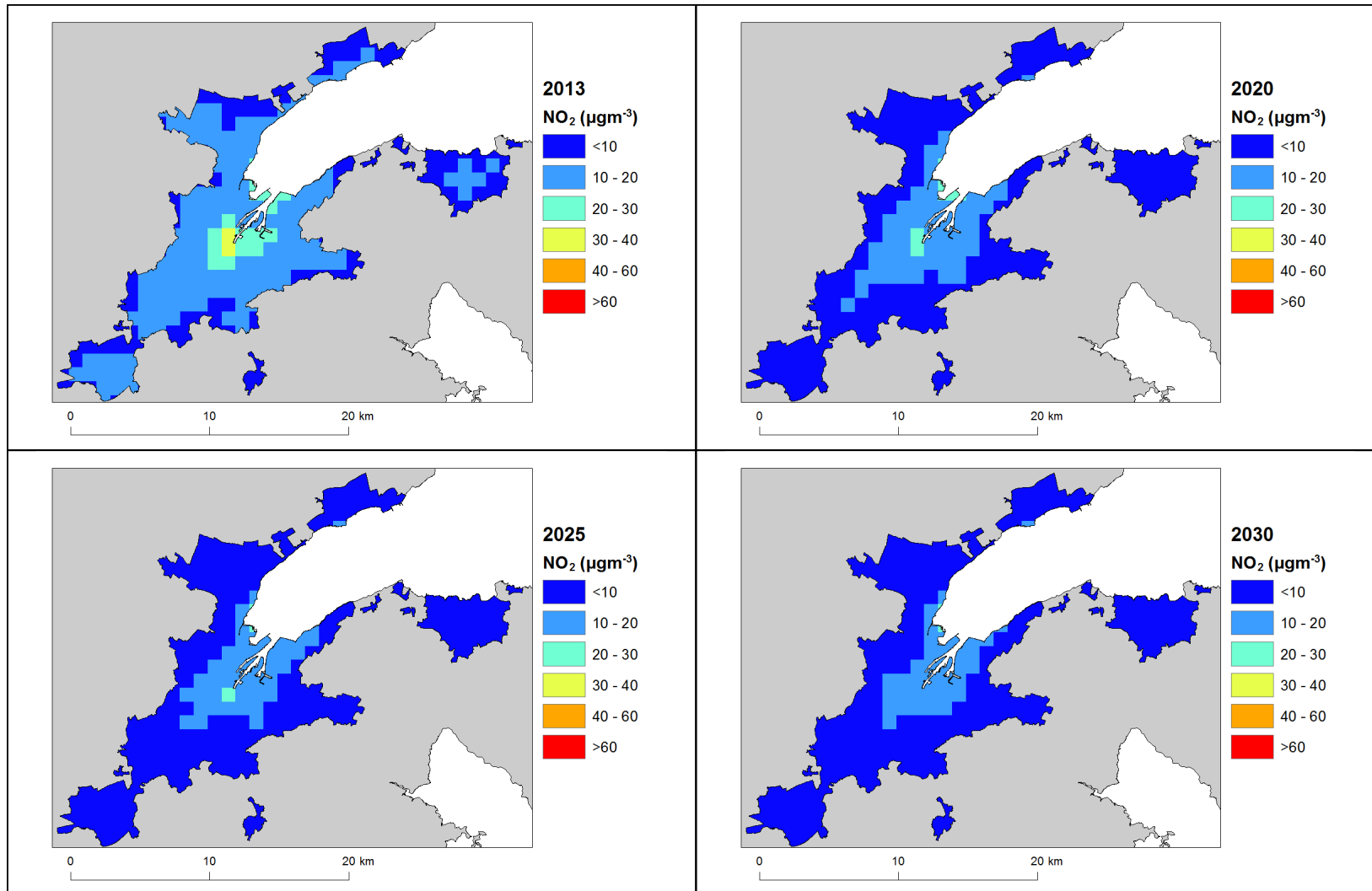
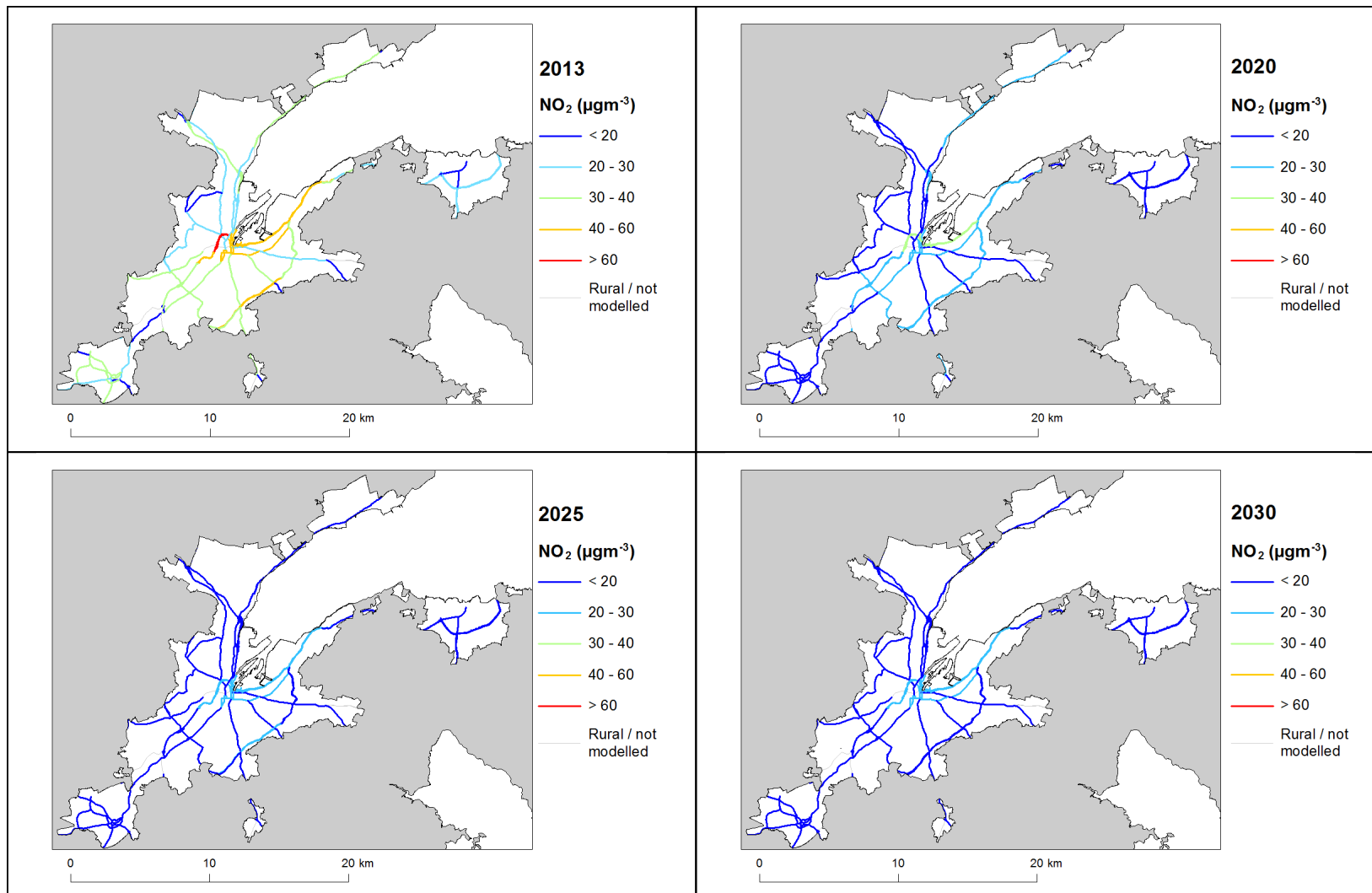


Figure 7: Roadside baseline projections of annual mean NO₂ concentrations in 2020, 2025 and 2030. 2013 is also included here for reference. Modelled exceedances of the annual limit value are shown in orange and red.



Annexes

A References

Air Quality Expert Group (AQEG, 2004). Nitrogen Dioxide in the United Kingdom. <http://uk-air.defra.gov.uk/library/aqeg/publications>

Decision 2004/224/EC. Commission Decision of 20 February 2004 laying down arrangements for the submission of information on plans or programmes required under Council Directive 96/62/EC in relation to limit values for certain pollutants in ambient air. From the Official Journal of the European Union, 6.3.2004, En series, L68/27

Decision 2004/461/EC. Commission Decision of 29 April 2004 laying down a questionnaire to be used for annual reporting on ambient air quality assessment under Council Directives 96/62/EC and 1999/30/EC and under Directives 2000/69/EC and 2002/3/EC of the European Parliament and of the Council. From the Official Journal of the European Union, 30.4.2004, En series, L156/78

Decision 2011/850/EU Commission Implementing Decision of 12 December 2011 laying down rules for Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council as regards the reciprocal exchange of information and reporting on ambient air quality. From the Official Journal of the European Union, 17.12.2011, En series, L335/86

CDR Central Data Repository. <http://cdr.eionet.europa.eu/>

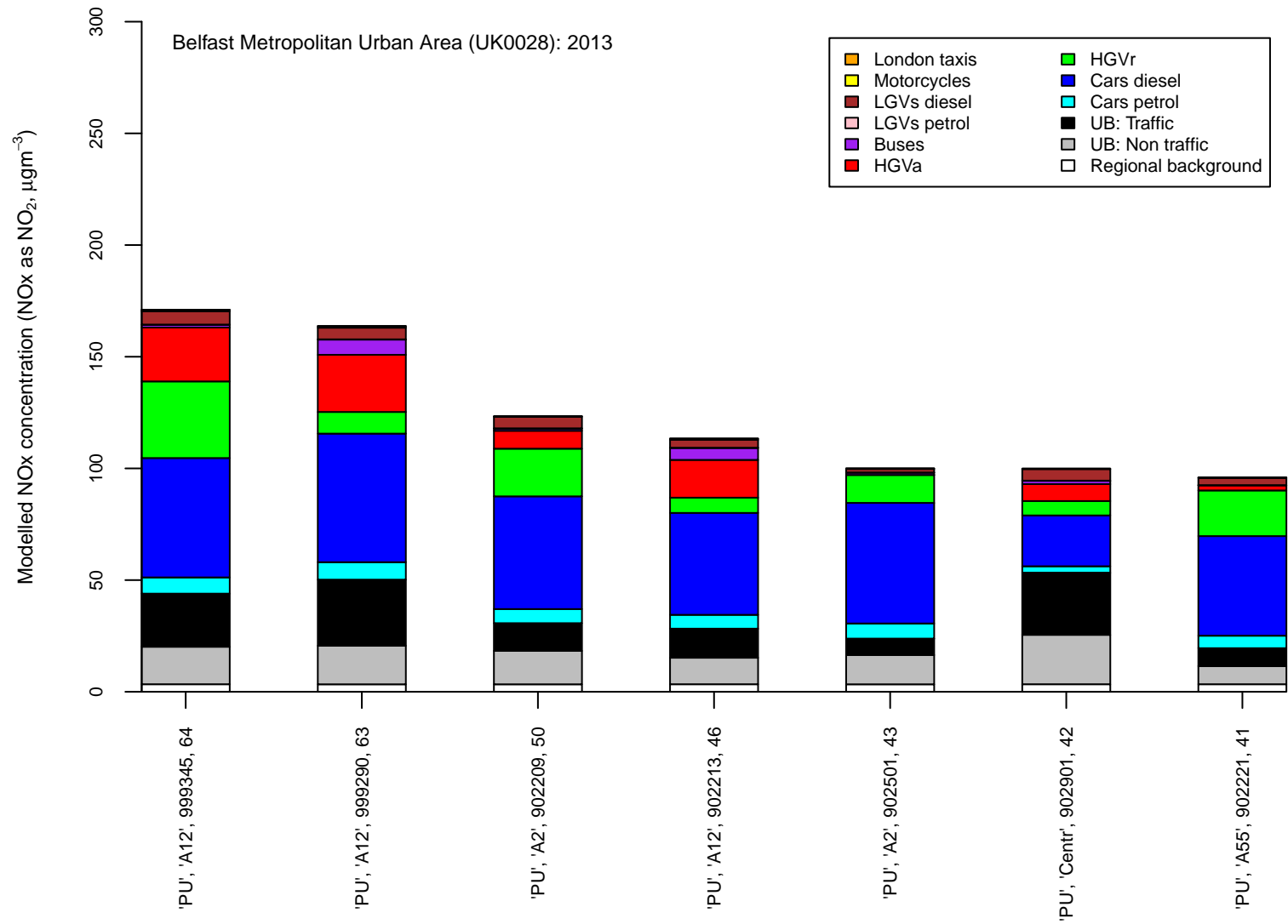
Air Quality Directive 2008/50/EC. Council Directive 2008/50/EC, of 21 May 2008. On ambient air quality and cleaner air for Europe. From the Official Journal of the European Union, 11.6.2008, En series, L152/1

1st Daughter Directive 1999/30/EC. Council Directive 1999/30/EC, of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air (The First Daughter Directive). From the Official Journal of the European Communities, 29.6.1999, En Series, L163/41.

B Source apportionment graphs

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Figure B.1: Annual mean roadside NO_x source apportionment plots for all roads exceeding the annual mean NO₂ limit value in 2013.



Road class (MU = motorway, PU = primary road, TU = trunk road), road number, census id 12 and modelled NO₂ concentration (μgm⁻³)

C Tables of measures

Please note that the status of some of these measures is 'Planning'. Some have been proposed as part of Belfast City Council's new Air Quality Action Plan; a consultation on the Council's Action Plan is currently ongoing, and a final plan is due to be adopted in late 2015. Other measures have been proposed by Northern Ireland central government and are currently at Planning stage.

Table C.1 Relevant Local Authority and Northern Ireland central government measures within Belfast Metropolitan Urban Area (UK0028)

Measure code	Description	Focus	Classification	Status	Other information
Belfast City Council_1	Belfast Multi-Modal Transport Model	Development of a computer-based multi-modal transport model and support services in order to assist the Department for Regional Development and its partners to plan and prioritise transport investment in the greater Belfast area and across Northern Ireland. The model will be applied to test impacts of potential new highways, public transport, walking and cycling schemes at the planning and prioritisation stage. The model will forecast how travellers will change their routes, mode of travel, time of travel or even their destinations in response to the new choices and network conditions created.	Traffic planning and management: Other measure	Implementation	Start date: 2015 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: This model will provide the capability to estimate the likely change in air quality arising from different transport investment options. Target emissions reduction: Med
Belfast City Council_2	Belfast Rapid Transit	Belfast Rapid Transit (BRT) is public transportation (PT) by bus that is intended to provide a faster more reliable and more comfortable journey for passengers than conventional bus services. In order to provide a faster journey time, road space is allocated to give priority to BRT vehicles. The objective is to improve accessibility and service for existing PT users and attract new PT users / trips from car based work and leisure travel.	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2014 Expected end date: 2018 Spatial scale: Whole town or city Source affected: Transport Indicator: Increase in the usage of the Public Transport would contribute to reduced congestion and improved air quality. Our test results suggests that introduction of BRT would reduce road NOx emissions by ~16% based on Euro 6 buses (Upper Newtownards Road). Target emissions reduction: Med
Belfast City Council_3	Belfast Transport Hub	Translink and the Department for Regional Development in conjunction with the Strategic Investment Board have identified the potential to create a class leading integrated Public Transport Hub in Belfast. The Hub is set to be located on the 20-acre site of the existing Europa Buscentre and Great Victoria Street Train Station. The new hub will offer customers a fully integrated transport solution: a destination catering for rail, bus and coach, taxi, car and bicycle users.	Traffic planning and management: Improvement of public transport	Planning	Start date: 2017 Expected end date: 2022 Spatial scale: Local Source affected: Transport Indicator: Experience in Great Britain and Europe shows that investing in public transport infrastructure, particularly this type of project, improves the public transport. Increase in the usage of the Public Transport generally contributes to reduced congestion and improved air quality, Target emissions reduction: Med

Measure code	Description	Focus	Classification	Status	Other information
Belfast City Council_4	Bicycle Strategy for NI	Improve and extend cycle network in Belfast City Centre with a network of parallel routes including contra-flow cycle lanes, shared use bus and cycle lanes. Provide secure cycle parking, promote cycle to work scheme and public bike hire scheme.	Traffic planning and management: Expansion of bicycle and pedestrian infrastructure	Implementation	Start date: 2015 Expected end date: 2025 Spatial scale: Whole town or city Source affected: Transport Indicator: The Bicycle Strategy will contribute to improvements in the physical environment. Increased levels of cycling could reduced congestion, improved air quality, reduce noise pollution and contribute to a cleaner environment. The Bicycle Strategy will be followed with a Bicycle Network Plan for Belfast to guide the development & operation of bicycle infrastructure in the city for the next 10 years. Target emissions reduction: Low - Med
Belfast City Council_5	eCars	E-car project - installation of electric charging points across NI. 9 points in Belfast centre on street or in car parks.Over the next 2 years the Department will be working with the electricity sector and other key stakeholders to advance the commercialisation of the current ecar infrastructure, to continue the operation of the network and to provide continued support to the innovation and development of the growing ultra low emission vehicle sector within Northern Ireland.	Public procurement: Other measure	Implementation	Start date: 2015 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: There are significant benefits to both the environment and to the driver in the use of electric vehicles. These include :No emissions while driving, No noise, Up to 30% lower CO2 emissions, well to wheel (compared to a similar sized petrol vehicle), No petrol costs – the approximate cost of charging a vehicle is around £3.00, No road tax, Maintenance costs around 20% lower than petrol/diesel cars/vans. Our test results suggests that a 1% change of the LGVs along the Westlink corridor to ecars would reduce road NOx emissions by ~0.6% based on the 2013 traffic data. Target emissions reduction: Med

Measure code	Description	Focus	Classification	Status	Other information
Belfast City Council_6	Park and Ride (Bus & Rail)	Park & Ride schemes aim to reduce traffic travelling and parking within the city centre by establishing an out of town car park and using buses (or trains) to travel into the centre. The objective is to improve accessibility and service for existing PT users and attract new PT users / trips from car based work and leisure travel.	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2013 Expected end date: 2015 Spatial scale: Whole town or city Source affected: Transport Indicator: DRD considering the options of delivering additional P&R schemes. This would have positive effect on reducing air quality in Belfast by providing alternative transport for commuters coming into the city rather than private car. There is currently a total of 7, 600 P&R spaces throughout NI, the 2013-2015 delivery programme resulted in an increase of over 30% in the number of spaces available. Improvements to P&R facilities along the Belfast Metropolitan Transport Corridor have resulted in a 17% increase of cars using the facilities between 2012-2014. Target emissions reduction: Med
Belfast City Council_7	York Street Interchange	The York Street Interchange will provide full grade separation for traffic travelling on the strategic network between the Westlink, the M1 and M2. These proposed improvements to this key junction will provide continuous links between three of the busiest roads in Northern Ireland; the M2, M3 and A12 / Westlink. This project is a high priority within the DRD Programme.	Traffic planning and management: Other measure	Planning	Start date: 2018 Expected end date: 2021 Spatial scale: Local Source affected: Transport Indicator: The York Street interchange redevelopment will in effect improve the throughput of traffic. Our test results suggest a reduction of ~13% in annual mean NO2 concentrations for the opening year (2021) between Do-Minimum and Do-Something Scenarios. Target emissions reduction: High

Measure code	Description	Focus	Classification	Status	Other information
Belfast City Council_8	Fleet improvement	Upgrading current bus fleet by replacement and renewal to bring in greater proportion of newer, lower polluting vehicles, and reducing the average age of the fleet. Proposed procurement process for Metro Fleet (subject to funding): 2015/2016 – purchase 15 hybrid double decks, 2016/2017 – purchase 15 hybrid double decks, 2019/2020 – purchase 15 hybrid double decks	Public procurement: New vehicles, including low emission vehicles	Implementation	<p>Start date: 2013 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Fleet improvement will reduce emissions from buses and consequently improve air pollution especially along the busy roads. Our test results suggest a ~3% reduction in the annual mean NO₂ (and <1% reduction in PM₁₀) would accrue from upgrading buses to Euro VI compared to the existing baseline (Ormeau Rd). However, routes operating a greater number of bus services would, in practice, produce higher emission savings. Additional test results: 20% Metro fleet improvement led to reduction in NO_x emission from Buses by: 13% - Upper Newtownards Rd, 16% - Belfast City Centre (average from Howard St, May St and Chichester St) Target emissions reduction: High</p>
Belfast City Council_9	Promote Public Transport	Annual programme of publicity campaigns and events – encouraging commuters to use public transport instead of private cars.	Traffic planning and management: Encouragement of shift of transport modes	Implementation	<p>Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: The impact of this measured will be low initially, but should increase over time as further marketing campaigns encourage greater usage of public transport. How people choose to travel is measured through annual cordon survey. A comparison of the data from 2011 and 2013 cordon survey for Belfast indicates the following: 36.6% increase in the number of people entering the city centre by train, 17.6% increase in the number of people entering the city centre by bus. Target emissions reduction: Low</p>

Measure code	Description	Focus	Classification	Status	Other information
Belfast City Council_10	FCC	Goods / deliveries moved into centre from edge of town warehouse, for example at a site close to the city Port.	Traffic planning and management: Freight transport measure	Planning	Start date: 2015 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: FCC combined with the use of low emission vehicles would have a significant impact on emissions level. Our test suggests that consolidation of goods into the City centre with a 100% uptake can bring about significant reductions in missions and subsequent improvement in AQ (~20% reduction in annual mean road NO2 compared to the base case). The voluntary uptake does not appear as attractive (i.e. ~5% reduction in the annual mean NO2) but would nevertheless provide a foundation to promoting a greater uptake. Target emissions reduction: Low - Med
Belfast City Council_11	ECO Stars	Voluntary fleet recognition and advice scheme that encourages operators to move towards a cleaner fleet and improve fuel efficiency. A sufficient number of operators would need to sign up to deliver emission benefits.	Traffic planning and management: Freight transport measure	Planning	Start date: 2015 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Uptake of this scheme would result in greener and modern delivery vehicles in the city centre (reductions in emissions). Target emissions reduction: Low
Belfast City Council_12	Servicing and Loading Bays	Allocating current on-street car parking spaces at strategic points as HGV Loading Bays for specific periods such as 07.00 – 11.00 Monday to Friday. This would ease the flow of traffic in the city and persuade some commuters to avoid taking car into the city centre at morning peak hours	Traffic planning and management: Freight transport measure	Planning	Start date: 2015 Expected end date: 2017 Spatial scale: Whole town or city Source affected: Transport Indicator: More loading bays in the city would reduce engine idling caused by vehicles having to wait for suitable parking space. It would also reduce the occurrence of double parking therefore reducing traffic congestion. Target emissions reduction: Low

Measure code	Description	Focus	Classification	Status	Other information
Belfast City Council_13	Public Bike Hire Scheme	Public cycle scheme in city centre – 300 bikes and 30 docking sites in public places including Titanic Quarter, the Gasworks, Queen's University and York Street.	Traffic planning and management: Expansion of bicycle and pedestrian infrastructure	Implementation	Start date: 2015 Expected end date: 2015 Spatial scale: Whole town or city Source affected: Transport Indicator: Using the bikes for shorter city centre journeys will cut congestion and improve air quality. Target emissions reduction: Low
Belfast City Council_14	BCC Fleet Improvement	BCC developed Fleet Improvement Programme in 2013. This includes updating fuelling infrastructure, developing GPS fleet-tracking system and disposal method.	Other measure: Other measure	Implementation	Start date: 2013 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: This will reduce overall emissions from council fleet. Target emissions reduction: Low - Med
Belfast City Council_15	Active Travel Plan	Encourage walking, cycling and use of public transport instead of private car.	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2015 Expected end date: 2018 Spatial scale: Whole town or city Source affected: Transport Indicator: Increasing use of public transport and active travel such as walking and cycling should reduce single occupancy car use improve air quality and result in a beneficial effect on health. Target emissions reduction: Med
Castlereagh Borough Council_1	CBC to investigate using cleaner more sustainable vehicles	N/A	Other measure: Other measure	Implementation	Start date: 2009 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Castlereagh Borough Council_2	Continue to provide eco bus driver training	N/A	Other measure: Other measure	Implementation	Start date: 2009 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: All drivers to be trained Target emissions reduction: N/A
Castlereagh Borough Council_3	Continue to purchase Euro 5 classified vehicles and sustainable transport methods	N/A	Other measure: Other measure	Implementation	Start date: 2009 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Purchase of Euro 5 vehicles on replacement Target emissions reduction: N/A

Measure code	Description	Focus	Classification	Status	Other information
Castlereagh Borough Council_4	CBC to introduce/encourage sustainable travel	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2013 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Promotion of green travel Target emissions reduction: N/A
Castlereagh Borough Council_5	Park and Ride scheme	N/A	Traffic planning and management: Improvement of public transport	Evaluation	Start date: 2014 Expected end date: 2016 Spatial scale: Whole town or city Source affected: Transport Indicator: Reduction of traffic on main arterial route into city centre Target emissions reduction: N/A
Castlereagh Borough Council_6	Promote sustainable initiatives in conjunction with Travelwise NI	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Castlereagh Borough Council_7	CBC to introduce the use of electric vehicles into their fleet/ and supply charging point.	N/A	Other measure: Other measure	Implementation	Start date: 2013 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A