



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive



HSE Public Health Medicine Environment and Health Group

Submission on the Transport Sector – Climate Change Adaptation Plan and associated documents¹ relating to the Health Sector

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¹ <http://www.dttas.ie/sites/default/files/publications/public-transport/english/adaptation-planning-developing-resilience-climate-change-irish-transport-sector/20161212final-draft.pdf>

Adaptation Plan for the Transport Sector

The plan and related documents are very informative for other sectors about climate change related transport issues. It is early stages in adaptation planning and this represents the first adaptation plan drafted for the transport sector. It is a high level plan that identifies vulnerabilities in the transport system and has not sought to consider the impacts on other sectors.

This submission

Our submission seeks to document transport issues that may affect health into the future and makes a number of recommendations.

It is not a definitive submission as there is no evidence based tool to carry out an examination of cross-sectoral dependencies but the following are the main issues that are immediately apparent for us.

Background

The transport system is critical to the economy, including the health services². The health service has a hub and spoke model with patients transferred between facilities on a daily basis by the National Ambulance Service. Health service staff members in the community are also dependent on safe accessible road ways. Urgent patient transfers including transplant recipients depend on having safe rapid access to health care facilities whether by road or the Helicopter Emergency Medical Service (HEMS) or other air transport service. The UK has identified transport-related risks to health and social care delivery from extreme weather as requiring urgent action in climate change adaptation plans³.

Transport safety – current situation

The European Environment Agency in a recent report included one study that found that the costs of weather related events annually for road transport to be roughly €1.8 billion, with health and life (accident-related costs) accounting for 13% of this².

Currently there is no health surveillance system for transport related mortality or morbidity apart from the Road Safety Authority (RSA) road death and injury statistics. The RSA maintain datasets of information, from An Garda Síochána, regarding collisions on our Irish roads which include information on weather conditions at the time of the collisions. Their most recent report

² European Environment Agency. Climate change, impacts and vulnerability in Europe 2016. An indicator-based report. EEA Report No1/2017

³ HM Government. UK Climate Change Risk Assessment 2017. Crown copyright www.gov.uk/government/publications

examines the 2013 dataset⁴. There were 188 deaths and 7,068 injuries on Irish roads in 2013. The conditions were described as wet in 21.3% of deaths, and wind was a factor in 0.4% of deaths. The road surface was described as having a wet surface in 33.9% of fatal and injury collisions.

Flooding is not coded for in the RSA datasets. There is also no flooding related health surveillance, but what we have is informal data through media for example:

Deaths – during late 2015 / early 2016 we know of about 6 deaths nationally where flooding was reported in the press to be contributory, see the endnotes^{i, ii, iii, iv v} and of these 5 were road traffic incidents.

Transport safety – future

Increase in precipitation and extreme weather events

The most likely climate change scenarios for Ireland include increases in extreme precipitation and extreme weather events / storms as well as increase in temperatures². There are safety issues from extreme precipitation and flooding of roads, railway lines and from landslides of railway embankments and of undermining of bridges. We have already seen damage to the Irish road network, e.g. in the Athlone area where roads were covered by floods in 2015/2016: <http://www.irishexaminer.com/ireland/most-irish-roads-have-some-surface-or-structural-damage-373336.html>. There have also been dangerous landslides occurring at railway bridges in Wicklow <http://www.irishtimes.com/news/ireland/irish-news/wicklow-landslide-left-railway-within-two-metres-of-sea-1.2489740> and Malahide <http://www.independent.ie/irish-news/landslide-derails-train-and-closes-commuter-line-26582804.html>.

Overwhelming of drainage systems is a likely consequence of flooding and extreme precipitation. This in turn can cause both chemical and microbiological contamination of water sources. **We recommend that any adaptations planned would consider the potential impact on water quality of flooded roadways, and transport related contamination.** There is a need for cross-sectoral co-operation in flood management measures.

The HSE's National Ambulance Service should avail of any technological improvement to transport information systems, e.g. the Intelligent Transport Systems to allow safe rapid transit.

We also recommend that the transport sector work with Emergency Planners in all relevant areas, e.g. to climate proof possible mass evacuation routes in the event of major incidents. The capacity to allow the switching from one mode of transport to another would allow flexible adaptation.

Increased temperatures

Heat stress of passengers from over-heating of all transport modalities is acknowledged in the adaptation plan as a potential consequence of extreme temperatures, as is heat stress and work

⁴ Road Casualty & Collision Report 2013, Road Safety Authority, 2016

limitations for transport sector workers under increased temperatures and further research into measures to adapt to this is recommended for all transport sectors.

Possible railway buckling from extreme heat is another safety issue identified in the adaptation plan. Table 2 on page 24 of the Transport Sector Adaptation Plan details the high and medium priority impacts. Railway and bus passenger and staff comfort are listed as a medium priority. **However we consider that the safety of road users, transport passengers and staff to be a high priority.** It is noted that safety of passengers at ports and airports during storms is listed as a priority.

Port planning is important from a public health perspective as ports are:

- Entrance points for emerging infectious diseases & vectors , cruise ships, flights etc
- Vulnerable to weather effects on critical imports – weather disruptions may affect result in critical shortages
- Involved in transportation and storage of dangerous goods – safety may be disrupted by weather

Air Quality

There is little mention of air quality problems in the adaptation plan. Projected air quality problems for bus services is mentioned but listed as low to medium change in level of impact. Air quality is not mentioned elsewhere. The transport sector has a big role to play in our air quality. A European study estimated that 3% of total mortality in adults aged over 30 was due to traffic-related pollution⁵. Over the past few decades air quality deterioration due to vehicle emissions (both exhaust and non-exhaust) has increased due to increased traffic and increase in use of diesel engines^{6,7}. We are likely to continue to see increasing levels of traffic with increasing deterioration in air quality over the coming years, especially around the Dublin area unless measures are taken to counter this. Emissions from traffic which are considered harmful to health include particulate matter, ozone, and nitrous oxides^{8,9}. Particulate matter is believed to be the most damaging to health. Research indicates that there is no absolute safe level of air pollution^{10, 10, 11, 12}. Reports which have systematically examined the findings of epidemiological

⁵ Künzli, N. et al., 2000. Public health impact of outdoor and traffic related air pollution: a European assessment. *The Lancet*, 356, pp.795–801.

⁶ World Health Organization, 2005. Health effects of transport-related air pollution, Available at: <http://www.bvsde.paho.org/bvsacd/cd63/e86650/conten.pdf?npapers2://publication/uuid/0896BDA1-6025-41A0-A320-420490564B66>.

⁷ Royal College of Physicians Working Party, 2016. Every breath we take: the lifelong impact of air pollution, London. Available at: www.rcplondon.ac.uk.

⁸ World Health Organization & Scovronick, N., 2015. Reducing Global Health Risks Through Mitigation of Short-Lived Climate Pollutants. Scoping Report For Policy-makers., Geneva. Available at: <http://www.who.int>.

⁹ Royal College of Physicians Working Party, 2016. Every breath we take: the lifelong impact of air pollution, London. Available at: www.rcplondon.ac.uk.

¹⁰ World Health Organization, 2006. WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide: Global update 2005, Available at: <http://www.who.int/>.

¹¹ World Health Organization, 2013. Review of evidence on health aspects of air pollution – REVIHAAP Project, Available at: <http://www.euro.who.int/en/health-topics/environment-and-health/air->

studies have found that exposure to air pollution, especially very small particles that can be inhaled into the lungs (PM10 and PM2.5) is associated with premature mortality, cancer, asthma and chronic obstructive pulmonary disease as well as cardiovascular disease (stroke and heart disease), diabetes, obesity and dementia^{6, 7, 11, 12}. The very young, the very old, and those that have other chronic diseases are more vulnerable to these adverse health effects. Air pollution may also affect the health of the unborn baby⁷.

Noise pollution is another growing health concern so transport planning needs to take cognizance of this.

Population Increase

The main impact of future climate change on Ireland is the likely increase in population, due to climate change migration e.g. other countries may have decreased food production potential and Ireland will be under further pressure to increase productivity. Ireland's current transport infrastructure is dependant to a greater extent than more densely populated countries on road transport – therefore the increase in population, the growing proportion of older people, along with Ireland's role as a food supplier, will all generate more individual journeys unless public transport routes are maintained and developed. Increased transport demand is also likely due to increase in summer tourism¹³

We recommend consideration of Urban Transport Policies and Active Transport Policies which are inclusive of the needs of vulnerable populations.

Possible climate change adaptation with co-benefits for health

Active Transport Policy /Urban Transport Policy

As stated in the transport adaptation plan, it is important to acknowledge the synergies and co-benefits that exist between 'mitigation' and 'adaptation'. An active transport policy can be considered to be an adaptation as well as a mitigation measure and would be a 'low regret' measure. Outdoor activities such as cycling and walking will become more attractive with warmer summer temperatures¹⁴.

Urban areas are particularly vulnerable to high volumes of traffic in densely populated areas close to roadways. The M50 in Dublin is known to be exceeding its "safe operating capacity" during rush hour¹⁵. Cars account for over 90% of traffic flow in Dublin¹⁶. Diesel engines are more

[quality/publications/2013/review-of-evidence-on-health-aspects-of-air-pollution-revihaap-project-final-technical-report](#).

¹² World Health Organization, 2016. Health risk assessment of air pollution, Copenhagen. Available at: <http://euro.who.int>.

¹³ European Environment Agency. Adaptation of transport to climate change in Europe. EEA Report No 8/2014

¹⁴ HM Government. UK Climate Change Risk Assessment 2017. Crown copyright www.gov.uk/government/publications

¹⁵ National Roads Authority, 2013. M50 Demand Management Study, Dublin. Available at: <http://www.tii.ie/tii-library/strategic-planning/strategic-reports/M50DemandManagementReportApril2014.pdf>.

polluting than petrol engines¹⁷. Ireland has one of the highest ownerships of private diesel cars globally at 36%, and 70% of new cars registered in 2011 were diesel¹⁸. This was an adverse effect of a tax incentive to try to reduce greenhouse gas emissions. Dublin due to lack of alternative transport is heavily dependent on road transport and vehicle emissions are the main source of pollution in Dublin. Private diesel vehicles are the main source of transport related CO² and PM in Ireland¹⁹. It is recommended that the transport study for Dublin planned by the TII to evaluate how climate change trends and an increased emphasis on public transport will impact on Luas and other transport operations will include active transport measures. This study should identify vulnerable groups, e.g. older people and those with disabilities. The policy selected should be based on sound evidence for its health and safety.

In rural areas it is also important to consider active transport measures. The use of former railway lines as cycling routes/ greenways e.g. “The Wild Atlantic Way” has been very good. It is important that these old railway routes not be built over to allow use as either greenways, or the re-opening of rail corridors in the future to reduce the current dependencies on private vehicles.

Summary

Future plans should consider the impacts and interdependencies of other sectors including the health sector. There should be continued cross-sectoral working. We recommend that in addition to considering the impact of transport adaptation measures on the environment, that the impact of these measures on health of our population is also considered using evidence-based tools, e.g. health impact assessment. We recommend the inclusion of urban transport and active transport adaptation measures.

¹⁶ Henschel, S. & Goodman, P., 2011. Aphekom: Dublin Local City Report, Available at: www.aphekom.org.

¹⁷ Hasheminassab, S. et al., 2014. Long-term source apportionment of ambient fine particulate matter (PM_{2.5}) in the Los Angeles Basin: a focus on emissions reduction from vehicular sources. *Environmental pollution (Barking, Essex : 1987)*, 193, pp.54–64. Available at: <http://www.sciencedirect.com/science/article/pii/S0269749114002449>

¹⁸ Cames, M. & Helmers, E., 2013. Critical evaluation of the European diesel car boom - global comparison, environmental effects and various national strategies. *Environmental Sciences Europe*, 25(1), p.15. Available at: <http://www.enveurope.com/content/25/1/15>.

¹⁹ Alam, M.S. & McNabola, A., 2015. Exploring the modeling of spatiotemporal variations in ambient air pollution within the land use regression framework: Estimation of PM₁₀ concentrations on a daily basis. *Journal of the Air & Waste Management Association*, 65(5), pp.628–640. Available at: <http://www.tandfonline.com/doi/full/10.1080/10962247.2015.1006377>.

ⁱ September 2015 Man (82) Achill <http://www.irishtimes.com/news/ireland/irish-news/man-dies-after-car-gets-caught-in-flood-on-achill-island-1.2350951>

ⁱⁱ December 2015 Man (70+) Monaghan <http://www.irishtimes.com/news/environment/man-believed-to-have-drowned-in-co-monaghan-1.2457306>

ⁱⁱⁱ December 2015 Woman (58) and (22) Fermoy area <http://www.independent.ie/irish-news/news/father-arrived-at-cork-accident-scene-with-tractor-to-help-victims-before-realising-they-were-his-daughter-and-wife-34310034.html>

^{iv} December 2015 Man (38) Offaly <http://www.rte.ie/news/2015/1227/756423-man-dies-in-offaly-crash/>

^v January 2016 Man (65) Clare <http://irishdeaths.com/body-of-man-discovered-on-flooded-lands/>