

Papur Datgan Sbwriel Gwehilion Ysmygu

Smoking-Related Litter Position Paper



**CADWCH | KEEP
GYMRU'N | WALES
DACLUS | TIDY**



Executive Summary

Smoking-related litter is the most common type of litter in Wales. 86% of streets in Wales suffer from smoking-related litter. Keep Wales Tidy estimates that 85% of littered items are smoking-related, with most of this being cigarette ends. The poorer any part of Wales is, the more affected it is likely to be by smoking-related litter; it is therefore a social justice issue as well as a health and litter issue.

Cigarette ends (the principal form of smoking-related litter) are non-biodegradable, harmful to the environment, cause health problems to children and animals that consume them, and millions are littered every day by smokers in Wales.

Keep Wales Tidy makes the following recommendations to improve this situation in Wales:

1. Thought needs to be given to awareness-raising of smoking-related litter, particularly in the run-up to the ban on smoking in public places indoors.
2. Local authorities in Wales should ensure that all new litter bins have a metal stubbing pad attached, to reduce smokers' justification for not using them for cigarette end disposal.

3. Local authorities in Wales should use Litter Clearing Notices to reduce smoking-related litter on adopted land.

4. The relevant legislative authority should modify Street Litter Control Notices to include non-retail and -commercial premises that are likely to be sources of smoking-related litter.

5. Tobacco companies should take responsibility for the environmental impacts of their product. A strong anti-littering message on packaging is the least that should be done.

6. The relevant legislative authority should consider introducing a tax for products for smoking that have non-biodegradable waste.

7. The relevant legislative authority should consider a ban on smoking in cars containing children to denormalise the practice of littering cigarette ends from cars.

8. The relevant legislative authority should consider a ban on smoking in public places outdoors, to make non-smoking the default situation. This would be the single biggest contribution to reducing smoking-related litter that could be made.

**Cadwch Gymru'n Daclus/Keep Wales Tidy
August 2006**

“Whereas Tabacco... is now at this Day, through evell Custome and the Toleration thereof, excessivelie taken by a number of ryotous and disordered Persons of meane and base Condition... besides that also a great part of the Treasure of our Lande is spent and exhausted by this onely Drugge so licentiously abused by the meaner sorte, all which enormous Inconveniencies ensuinge”

King James VI of Scotland and I of Ireland and England, 1604¹

“UK consumers spend more on tobacco [£15.3bn] than they do on alcoholic beverages (expenditure on which amounted to £12bn in 2003), health (£11.6bn) or education (£9.3bn)”

Research and Markets, 2004²



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Introduction

“A custome lothsome to the eye, hatefull to the Nose, harmefull to the braine, dangerous to the Lungs, and in the blacke stinking fume thereof, neerest resembling the horrible Stigian smoke of the pit that is bottomlesse”

King James VI of Scotland and I of Ireland and England³

Four hundred years later, James VI/I would probably add ‘litter’ to his list of grievances about smoking.

Smoking-related litter includes cigarette packets and the foil and cellophane wrapping around them, cigarette ends, cigarette lighters, matches and matchboxes. The biggest litter burden is from cigarette ends, specifically the cellulose acetate filters from filter-tipped cigarettes.

In 1995, an estimated 5.535 trillion cigarettes were sold by the tobacco industry globally⁴. Some of the wastes from tobacco products are properly deposited, but the great majority of non-biodegradable cigarette ends are thrown on the ground⁵. Comments on ‘snus’, a smokeless tobacco used almost exclusively in Sweden, are made in Annex 1.

Smoking-related litter is the most commonly littered substance in Wales, with cigarette ends easily the single most common form of litter⁵. Smokers, many of whom would not consider littering other objects, have often rationalised their illegal disposal of smoking-related litter.

“Those who litter cigarette butts, in many cases, do not litter other items”

Keep America Beautiful⁶

Littering is a crime: in legal terms, dropping a cigarette end is no different from throwing away any other sort of litter. The Clean Neighbourhoods and Environment Act 2005 clarifies the meaning of litter for the purposes of Part 4 of the Environmental Protection Act 1990, by specifically defining ‘cigarettes, cigars and like products’ as litter. Although these items were already considered to fall within the definition of litter, the intention of the 2005 Act is to provide clarity for practitioners. In Wales, dropping any form of smoking-related litter can cost the perpetrator £75 in a Fixed Penalty Notice, or up to £2,500 on summary conviction.

This paper explores some of the ways in which smoking-related litter could be minimised.

Some of the ideas are predicated on the fact that a reduction in smokers will directly reduce the littering problem. When fewer cigarettes are smoked, fewer cigarettes are available to be dropped on the ground⁵. The only people who litter cigarette ends are smokers. The 27% of Welsh adults who are former smokers⁷ no longer contribute to the smoking-related litter problem. Effective tobacco control reduces smoking-related littering at source, because it reduces the number of ‘sources’⁵ who have on average more than 5700 cigarette ends each to dispose of every year (Annex 2).

“Reducing the prevalence of smoking would do more than any other strategy to reduce butt [cigarette end] pollution”

Professor Simon Chapman, School of Public Health, University of Sydney⁵



Context

Current Trends

The proportion of smokers in Wales has dropped over recent years, from 29% of men and 27% of women in 1998, to 24% of men and 22% of women in 2004⁸. Fewer smokers gives rise to less smoking-related litter⁵, so we would anticipate a reduction in this litter over time as the trend of reduction in numbers of people smoking continues⁹. One cause for concern is that the decline of smoking in recent years has been heavily concentrated in older age groups. Young people are still taking up smoking in similar numbers as they did in the past¹⁰, which suggests that smoking-related litter will remain a major problem for many years to come.

Smoking and Poverty

Smoking is strongly related to poverty and deprivation¹¹. On almost any indicator, poorer sections of society suffer from higher rates of smoking. In 2004, 20% of men in Britain who worked in managerial and professional occupations smoked, compared with 38% in routine and manual occupations¹². Of the economically inactive men aged 16-59 in this poorer socioeconomic classification, 51% smoked¹². The daily cigarette consumption of poorer socio-economic groups is also greater than that of managerial and professional occupations¹³, they smoke cigarettes with higher tar content¹⁴, and they start smoking younger¹⁵. Among the most deprived groups – including lone parents in receipt of state benefits – three out of four families smoke and spend a seventh of their disposable income on cigarettes¹⁶.

Despite a reduction in the overall prevalence of tobacco smoking in the UK over the past 30 years, there has been a slower reduction in smoking rates among lower income groups, and little or no change over the past decade¹¹. Smoking has become increasingly concentrated in this population⁹. Because areas with fewer smokers will be subject to less smoking-related litter, it follows that the poorest parts of Wales will be those most likely to suffer the burden of high levels of smoking-related litter.

Prohibition on Smoking in Public Places

Legislation to prohibit smoking in places of work is anticipated to be enacted in Wales at some point in 2007. In the longer term, with the expected reduction in the number of smokers in Wales, the litter burden will reduce. However, there will probably be a short-term increase in littering of smoking-related litter, as more people may smoke and discard their waste outside public buildings. Historically, employees have smoked indoors, where provision of cigarette bins is almost universal¹⁷; even as late as 2005, 24% of smoking employees were provided with a designated smoking area indoors¹⁷. However, just 65% of those workers who smoke outdoors claim to have adequate provision of receptacles for smoking-related litter¹⁷.

In order to combat the anticipated increase in littering, Keep Wales Tidy makes the following recommendations:

- A large-scale advertising campaign should be instigated to remind people that cigarette ends are litter. The campaign should start no less than one month before the ban, and should continue for at least as long after the start of the ban.
- All workplaces with employees who smoke should be encouraged to place suitable cigarette disposal facilities in outdoor locations likely to be frequented by smokers. They should also commit to servicing these containers on a regular basis so the contents do not end up being disgorged in the surrounding environment.
- There is a strong case for changing the legislation in Wales so that Street Litter Control Notices can be applied to any place of work that is a source of a smoking-related litter nuisance, not just retail and commercial premises. The appropriate legislative authority should consider amending the legislation.

The Problem

There are three principal problems with smoking-related litter:

- Smoking-related litter is a repository of toxic chemicals, and it is harmful to both humans and wildlife.
- The most commonly littered items - filter-tipped cigarette ends - are not biodegradable, and persist for many years.
- Hundreds of millions of them are littered in Wales every year.

These problems make smoking-related litter the most ubiquitous form of litter in Wales*.

Harm to the Environment and People

A 1997 study of accidental ingestion of cigarettes and cigarette ends in Rhode Island, USA, concluded that one-third of the 146 children in the study experienced illness, the most common symptom of which (for 87% of those affected) was vomiting¹⁸. Other symptoms included nausea and lethargy. Previous reports have described severe toxicity among children who ingested cigarettes, cigarette butts, or snuff, including severe central nervous system depression and respiratory distress¹⁹, cardiac arrhythmia²⁰, and convulsions²¹.

“Cigarettes and cigarette butts may poison children who ingest them”

National Center for Chronic Disease Prevention and Health Promotion²²

Throughout their life, cigarette filters leach out their toxic chemical contaminants. The rate of leaching is likely to be greater when they are lying in damp soil, or when cigarette ends are carried via drainage systems, streams and rivers to the sea; nicotine and pyrene start to leach within one hour of exposure to the environment²³. A study of toxic compounds in smoked cigarettes determined that nicotine and ethylphenol were the main poisons for two aquatic species²⁴. Laboratory research indicates that the chemicals released into freshwater environments from cigarette ends are lethal to *Daphnia* water fleas - an important and common component of freshwater food webs²⁵ - at concentrations of one cigarette

*Cigarette ends are so commonly littered that they skew litter surveys to make almost all other groups of litter seem insignificant.

filter per eight litres²⁶. The leachate from the remnant tobacco portion of a cigarette end is deadlier at smaller concentrations than the chemicals that leach out of the used filter itself²⁶. Cigarette ends can be mistaken for food and ingested by marine animals - they have been found in the digestive system of whales, dolphins, sea birds and turtles²⁷ - and they can be deadly to marine life²⁸.

Smoking-related litter can ignite fires; many occur every year as a result of smokers discarding their spent cigarettes without ensuring that they are extinguished. In 1985, 56 people were killed in a fire at Bradford City Football Club, and in 1987, King's Cross Underground station fire claimed 31 lives. Both fires are thought to have been started by smoking-related litter^{29, 30}. In 2003, 35% of the 395 fire-related deaths in house fires in the UK were caused by the careless disposal of smoking materials³¹.

Non-Biodegradability

Cigarette filters are made of cellulose acetate, a plastic slow to degrade²⁶ (although there is no consensus on the timescale). More than 12,000 individual cellulose acetate fibres are packed tightly together to create a filter³².

Cigarette ends are not biodegradable. Smokers who litter find it easy to believe that cigarette ends are biodegradable because it helps them to justify their behaviour. The fact that they comprise almost a quarter of all littered items removed from the underwater environment during clean-ups³³ substantiates the idea that filters are extremely long-lived pollutants.

Vast Numbers are Littered

The International Coastal Cleanup Day's 2004 world-wide beach, river and streams clean-up found cigarette litter to be a major source of debris, accounting for 18.1% of all items found on land, and 23.7% of littered items retrieved from underwater³³. Cigarette ends have been top of the list of littered items every year since 1990, the year they were first allocated their own category²⁶. The Beachwatch 2004 survey³⁴ revealed that 1.68% of littered items on the Welsh coastline were smoking-related, putting them in the top twenty items of litter found. Across the UK coast, cigarette ends are the ninth most common



item of litter.

“In San Diego County, Solana Beach banned smoking on the beach in late 2003. On city beach cleanup days, 50% to 60% of the litter was butts... [since the ban] more kids and families are using the beaches, and tourism has increased. Our beach is not an ashtray”

Former Solana Beach Assistant City Manager
Matt Rodriguez³⁵

In New South Wales, Australia, cigarette ends comprise 39% of litter by weight³⁶. Keep Scotland Beautiful estimates that 122 tonnes of cigarette related rubbish are dropped every day across the UK³⁷. Cigarette ends form 85% of smoking-related litter in the Republic of Ireland³⁸. In England, a 2004 study determined that 19,636 items of litter out of a total of 22,791 (86.1%) were smoking-related³⁹. 19,310 of these items were cigarette ends (84.7% of littered items).

No study of the proportion of cigarette ends in litter has been conducted in Wales, but Keep Wales Tidy estimates that 85% of littered items are cigarette ends, in keeping with data from the Republic of Ireland and England.

Smoking-related litter is found on 86% of streets in Wales⁴⁰. When Keep Wales Tidy conducts street cleanliness surveys, the presence of cigarette ends frequently lowers the cleanliness rating of otherwise litter-free streets. Often, these items will be concentrated at one or two houses on the road, and our surveyors can identify the location of a (littering) smoking resident or frequent visitor on an otherwise clean street. A further problem with cigarette ends is that they are particularly prone to getting trapped in gaps in paving, tree grids, and gutters, and they are expensive and time-consuming to remove from these locations.

Furthermore, smoking-related litter begets more litter⁴¹. It is commonly the first type of litter to be dropped, and while people are generally reluctant to drop litter in a pristine location, they are less likely to refrain where any litter – even a sole cigarette end – is present.

Keep Wales Tidy estimates that the daily cigarette consumption in Wales is more than 12,700,000 (Annex 2). In Osaka, Japan, a survey in 1993 indicated that 60% of walking smokers littered their cigarette butts and that tobacco butts made up 90% of road litter items⁴². A similar survey in 1998 showed the number of walking smokers who litter their smoking waste had not decreased at all, despite a cigarette littering law and significant public educational campaigns⁴². In Australia, detailed observational studies have confirmed that 58% of smokers inappropriately dispose of cigarette ends outdoors²³. Coventry City Council found that 67% of smokers ‘use the ground as an ashtray’⁴³.

Although no equivalent surveys have been conducted in Wales, in the light of the evidence from elsewhere, we consider a conservative estimate to be that 50% of Welsh smokers litter their cigarette ends, when they smoke in places without easy access to proper disposal facilities. Assuming that one third of cigarettes are smoked in locations without easy access to disposal facilities, more than 2,117,000 cigarette ends are being littered every day in Wales, or 773 million each year. Given that each cigarette filter weighs 0.17g²⁶, 360kg of cigarette ends are being littered in Wales daily. Each cigarette end has a volume of 10ml²⁶; 7,734m³ of space is taken up by Wales’ annual littering of cigarette ends, enough to cover an entire rugby pitch to a depth of more than 75cm.

It should be noted that the calculation above makes the conservative assumption that no smoker will litter when they smoke in places with easy access to proper disposal facilities.

Options for Improvement

1. Awareness-Raising

“Trying to persuade smokers to be more considerate, and law enforcement of anti-littering provisions, are two important components of butt reduction efforts. But they are minor, band-aid contributors to the problem at large”

Professor Simon Chapman, School of Public Health, University of Sydney⁵

Many people apparently drop their smoking-related litter because there are no bins available at the time of disposal. In order to reverse the normalisation of littering of smoking-related items, it is important to keep publicising the issue. The following strands of information should be highlighted:

- When roadside litter-picking necessitates lane closures, information boards should be used to explain the reason for any delays being caused to people’s journeys. This would raise awareness of the inconvenience caused by littering.

- Littering cigarette ends and other smoking-related items is a criminal offence, punishable by a Fixed Penalty Notice (fine) of £75, or up to £2,500 in court.

- It is an offence to throw smoking-related litter out of vehicles. You can be traced via the DVLA and fined for doing this.

- Cigarette ends are not biodegradable, and they are harmful in the environment.

- Drains are not disposal facilities. Items littered in drains end up polluting the waterways, and eventually the coast and sea.

- Cigarettes should be extinguished before being disposed of, but this does not excuse treading them underfoot and leaving them there.

- Take personal responsibility for your own cigarette litter and encourage others to do the same. If you smoke, use ashtrays or litter bins outside buildings and in parks and beaches. This will reduce the amount of butts that end up on the ground, and, ultimately, in our water.

Examples of awareness campaigns are given in Box 1.

Box 1 - Awareness-Raising Campaigns

Campaigns have used a mixture of humour and satire to raise awareness of the problem of smoking-related litter.

The City of Port Philip, Melbourne, distributed the postcard opposite.

In Colchester, people spotted putting cigarette litter in a bin were entered into a monthly prize draw, with a random winner being awarded £75 - paid for by receipts from Fixed Penalty Notices⁴⁴.

The community of Douglasville, USA, produced a video to drive home the message. Click on this [link](#)^{*} to view it.

This [article](#)[†] in the Age newspaper gives an insight into enforcement activities in Melbourne.



^{*}<http://www.cigarettelitter.org/video/kdbpsa.wmv>

[†]<http://www.theage.com.au/articles/2003/07/17/1058035130135.html>

2. Provision of More, and More Appropriate, Bins

Many smokers cite the necessity to tread on cigarette ends, to reduce the fire risk, as the reason for their littering⁴⁵. The possibility of fire, together with the smell and mess of discarded cigarette ends, means that smokers are reluctant to carry them around. Local authorities throughout Wales should ensure that all new litter bins carry a distinctive metal stubbing pad, so that smokers will be more inclined to stub their used cigarettes on the bin and dispose of them properly, rather than treading them underfoot. Smokers by and large approve of separate cigarette bins attached to general litter bins⁴⁵, and this is a further option that should be considered when local authorities renew their litter bins.

3. Local Authorities to use Litter Clearing Notices

Litter Clearing Notices were introduced by the Clean Neighbourhoods and Environment Act 2005, and will be enacted in Wales in March 2007⁴⁶. They empower local authorities to require individuals and businesses to remove litter from land not under the management of a Statutory Undertaker. In practice, this means that if smokers congregating at the entrance to a building are generating litter that becomes a nuisance on the neighbouring highway, local authorities can require the business to clean up the mess, and ensure that steps are taken to prevent its recurrence. Failure to comply with a Litter Clearing Notice may result in summary proceedings. The assistance of the public in drawing attention to examples of poorly-managed smokers' areas would be welcome in the campaign against smoking-related litter.

Licensing procedures for venues selling alcoholic drinks could also be adapted to include mandatory provision of bins appropriate for smoking-related litter.

4. Legislative Authority to Modify Street Litter Control Notices

At present, Street Litter Control Notices may only be issued in respect of commercial or retail premises, specifically, for those that sell food, drink, or motor vehicle fuel, financial institutions that have cash machines, and those premises that are used as entertainment and sporting venues. They require

the land within 100m (10m for financial institutions) of those premises to be kept clear of litter. With the advent of the ban on smoking in workplaces, other premises, such as office buildings and railway stations, will likely become sources of smoking-related litter on adopted land. A modification of Street Litter Control Notices to include any premises that generate nuisance from smoking-related litter would be of great benefit to local authorities in their efforts to keep the streets of Wales clean.

5. The Contribution of Tobacco Companies

“Our best course of action may be maintaining a low profile while working to exempt cigarettes from coverage of pending litter control legislation... Can we support measures which would fine smokers for failing to discard an empty pack of cigarettes in an official receptacle [littering]?.. Recommendation... the concept of courtesy should be limited to the smoking of – rather than the disposal of – tobacco products”

Memo from the Tobacco Institute⁴⁷ (umbrella trade association for the US tobacco industry)

As far as Keep Wales Tidy has been able to ascertain, the contribution of manufacturers of smoking-related paraphernalia to litter reduction efforts in Wales is nil, other than Imperial Tobacco's commitment to “introduce the tidyman logo whenever pack designs change, in an effort to remind consumers to prevent litter”⁴⁸.

“Our products have an adverse impact on the environment when consumers dispose of product and packaging materials improperly”

Imperial Tobacco⁴⁸

The cost of smoking-related litter is borne by all taxpayers in Wales, who pay for street-cleaning services through their council tax. Since smoking-related litter is found on 86% of all streets in Wales, and because it promotes the disposal of other forms of litter, these costs are likely to form a notable proportion of Wales' annual £37 million street cleaning bill. Keep Wales Tidy believes that the tobacco industry should be held accountable for the environmental education and clean-up costs related to smoking. The suggestions below of applying a tax or deposit system to smoking paraphernalia would



partly offset the smoking-related litter costs faced by local authorities.

“Litter from cigarettes is a significant contributor to litter in our environment today. Cigarette litter is unsightly and can pose a danger to wildlife”

Philip Morris USA⁴⁹

Tobacco companies should print litter awareness messages on packaging, including information about the non-biodegradable nature of cigarette filters. A simple message such as “cigarette filters are not biodegradable – put them in a bin” could be of substantial benefit in cutting smoking-related litter.

In the light of our interpretation that littering behaviour is related to the proximity of appropriate disposal methods, portable ashtrays should be available and prominently displayed at every point of sale of tobacco products. This should be a condition of sale of tobacco products. Keep Wales Tidy is of the opinion that portable ashtrays should be partly subsidised by the tobacco industry, in line with the ‘polluter pays’ principle.

6. Tax on Products for Smoking that have Non-Biodegradable Filters

The biggest problem with cigarette ends is that they do not biodegrade. Thus, they will last for decades in the soil or in watercourses, leaching out the thousands of toxic chemicals within. A tax of 5p per non-biodegradable cigarette end would provide a more acute focus for cigarette manufacturers to improve the environmental performance of their product. Public opinion is largely in favour of increased taxation on tobacco, according to various opinion polls⁵⁰.

A pollution tax based on degradability of cigarette ends, with a specific environmental aim, would be likely to have a triple beneficial effect:

1. It would bring more pressure to bear on manufacturers to improve the environmental performance of the waste product.
2. It would raise awareness among consumers of the environmental problems associated with smoking.

3. It would provide funds for improving the cleanliness of streets in Wales. Specifically, funds could be allocated to:

- Increasing both the number of dedicated cigarette bins, and the frequency of their emptying
- Recruiting extra enforcement officers to issue Fixed Penalty Notices to those dropping litter
- Advertising campaigns to remind people of their responsibility to dispose of smoking-related litter appropriately
- Funding cessation and education programmes to reduce both the uptake and proportion of smokers in the population. This would reduce smoking-related litter because there would be fewer items of waste available for littering⁵¹.

It should be noted that the price of tobacco is one of the most important factors affecting tobacco consumption. Increasing the price of cigarettes reduces consumption⁵¹ because people respond to the price signal by giving up, cutting down or never starting⁵². Thus, there would be a bigger reduction in smoking-related litter than would be expected by the direct results of taxes, because cigarette consumption would decrease. The other benefit is that reductions in smoking boost wealth, especially among the poor⁵³.

An alternative to a tax on those products with non-biodegradable filters would be to develop a deposit system for cigarette ends. Each cigarette with a non-biodegradable filter would have a deposit of, say, 5p chargeable to it. A dedicated symbol or barcode on each cigarette would indicate the redemption facility that the cigarette bears a deposit, and the value of the deposit would be returned in full to the person redeeming the cigarette end. In order to discourage children from collecting cigarette ends, which are repositories of carcinogenic chemicals, cigarette ends would only be redeemable by people of legal smoking age. Monies raised from unredeemed deposits could be spent in the same manner as would tax revenue, as illustrated above. A proposal to mandate deposits on cigarette ends was introduced in the state legislature of Maine, USA (Box 2).

This deposit system involves considerably more bureaucracy than the environmental tax option, and is therefore a less desirable alternative.



7. Ban on Smoking in Cars Containing Children

The idea of banning smoking in cars has been advocated since as far back as 1994 in Australia⁵⁸, and in 1995 the Australian National Health and Medical Research Council recommended such a ban⁵⁹. A ban on smoking in motor vehicles containing a child younger than six has been enacted in Arkansas⁶⁰, while it is an offence in Louisiana for anyone to smoke in a motor vehicle where a child under the age of 13 is an occupant⁶¹.

The principal reason for initiating such a ban would be to denormalise the inappropriate disposal of smoking-related litter from vehicles. As new cars have a default of being sold without ashtrays⁶², the disposal of cigarette ends out of car windows appears now to be a ‘normal’ disposal method. Indeed, research indicates that most people who smoke in cars dispose of cigarette ends out of the window⁴⁵. By disallowing smoking in cars with children under 18 years of age, impressionable young people will not come to see the discard of smoking-related litter from vehicles as acceptable. There is strong support for banning smoking in vehicles in Western Australia when children under 18 are present: 83% of people polled supported such a ban⁶³. In Wales, 82% of people support such a ban⁶⁴.

There would also be health benefits from introducing a ban on smoking in cars containing children. A recent study of children whose parents smoke found deficits in reading and reasoning skills among children even at low levels of smoke exposure⁶⁵. Smoking in vehicles has also been associated with increased risk of injury and death as a result of the distraction associated with smoking^{66,67,68}. Finally, such a ban would reduce the number of occasions on which pedestrians and cyclists are hit by a jettisoned cigarette end.

8. Ban on Smoking in Public Places Outdoors

The most effective way to minimise smoking-related litter, other than a complete ban, would be to implement a ban in all public places outdoors. Currently, cleaning up of smoking-related litter is paid for by all households in Wales via council tax. Thus, all the taxpayers of Wales are paying to clean up the 85% of littered items that most people will never have used or dropped. In fact, the full societal costs of smoking-related litter in Wales are not captured, because most littered items are never picked up, and many of these will end up in watercourses where the environmental problem is externalised to our rivers and seas.

Communities have chosen to ban smoking outdoors for many reasons including for decreasing fire risk, for health benefits, to control litter, and to protect residents from nuisances⁶⁹.

“The bans [on smoking on beaches] are... an idea whose time has come... the truth is these are reasonable laws, intended in this case to prevent litter and protect non-smokers”

Anti-smoking activist Patrick Reynolds, grandson of tobacco company founder RJ Reynolds⁷⁰

Smoking-related litter can pose a significant litter burden, especially at recreational facilities such as beaches and parks⁶⁹. Bans on smoking in parks and on beaches have become increasingly common in the USA, and Australia has also introduced smoking bans on beaches. A bill to ban smoking on all 64 state-run beaches in California failed by two votes in the state Senate in 2004⁷¹. So far Bournemouth Seafront is the only UK beach subject to a smoking ban⁷².

Box 2 - Proposed Cigarette Deposits in Maine

The proposed law LD258 required the establishment of a system of deposit and redemption for used and discarded cigarette ends, referred to as ‘returnable tobacco products’⁵⁴. It was proposed that every cigarette sold in Maine would have the word ‘Maine’ or the abbreviation ‘ME’ embossed, stamped or labelled upon it, with the package displaying the total refund value of the contents⁵⁴. Each pack would come equipped with a plastic bag, which would be used to accommodate cigarette ends⁵⁵. Redemption workers would then count the number of butts in each bag and deliver the change. The Bill was not passed, but sponsoring Representative Joe Brooks succeeded in raising awareness about the litter that smokers leave behind them⁵⁶. “...even if it doesn’t pass right now in this session of the Legislature, it’s getting people talking about litter, the environment and the health hazards of smoking”⁵⁷.

“There are three no smoking beach sections... [which] were introduced in an effort to discourage smokers from depositing cigarette butts on the sand in these areas. Cigarette litter is a major problem on the seafront... the no smoking beach is not actively policed by our staff, but does seem to be observed by the majority of beach users. To put it in context, if there was a problem, we would most certainly hear about it, with over 4.2 million visitors to our beaches every year”

Andrew Emery, Bournemouth Borough Council⁷²

“Calabasas says from now on, smoking outdoors, as well as indoors, is not the norm. The norm is no smoking”

John F Banzhaf III, Professor of Public Interest Law at George Washington University⁷⁶

In 2005, a law was passed in Washington State that prohibits the smoking of tobacco within 8m of doors, windows, and vents in buildings⁷³. Opinion polls elsewhere in the USA have demonstrated strong support for bans on smoking outdoors⁷⁴, and a Keep Wales Tidy survey indicated support by 71% of the population for a ban on smoking outdoors⁶⁴.

The City of Calabasas in the USA became the first jurisdiction to ban smoking in all public outdoor places in 2006. Smokers are permitted to smoke in outdoor “smoker outposts” which businesses can establish in areas like car parks, and also in outdoor areas where there are no non-smokers⁷⁵.

Most governments already restrict many activities that can provide satisfaction to their practitioners but which are an annoyance to those around them, such as playing loud music, setting off fireworks, or public nudity. Since these activities are restricted even though they cause limited or no risk to health, there is no moral justification for smoking to be allowed.

There would also be some health benefits from introducing a ban on smoking in public places outdoors, since there is no safe minimum intake of the 4000 chemicals and 60 carcinogens⁷⁷ present in tobacco smoke⁷⁸. There is no safe lower level below which Environmental Tobacco Smoke does not potentially cause lung cancer in nonsmokers⁷⁸; the evidence that exposure to other people’s smoke is dangerous to health is now incontrovertible⁷⁸, and is documented [here](#)*.

The Environmental Protection Agency in the USA has classified secondhand smoke as a Group A Carcinogen⁷⁹, the most dangerous class of carcinogen, and in January 2006 the California Air Resources Board declared second-hand smoke a toxic air contaminant that can lead to respiratory infections, asthma, lung cancer, heart disease and death⁸⁰, opening the door to a state-wide outdoor ban in the future⁸¹.

Although a ban on smoking outdoors might seem like a radical legislative option, it should be recognised that the movement towards greater protection for the environment and non-smokers is increasing in both extent and popularity, and a ban on smoking outdoors is a natural extension of current trends. Keep Wales Tidy does not consider that such a ban would become a template for banning other litter-generating items in public places: the scale of this particular problem (85% of littered items) is so enormous that a unique solution such as a ban should be considered by the relevant authorities.



Signs for Designated Smoke-Free and Smoking Areas in Calabasas

*<http://www.ash.org/etsreports.html>

Conclusions

In order to reduce the amount of smoking-related litter in Wales, Keep Wales Tidy makes the following recommendations:

1. Thought needs to be given to awareness-raising regarding smoking-related litter, particularly in the run-up to the ban on smoking in public places indoors.
2. Local authorities in Wales should ensure that all new litter bins have a metal stubbing pad attached, to reduce smokers' justification for not using them for cigarette end disposal. They should also consider retro-fitting current bins. Smokers approve of separate cigarette litter sections attached to regular bins, and these should be considered as an alternative.
3. Local authorities in Wales should prepare for the advent of Litter Clearing Notices, and should use them where appropriate. The help of members of the public in alerting local authorities to locations of smoking-related litter would be greatly welcomed.
4. The relevant legislative authority should modify Street Litter Control Notices to include non-retail and -commercial premises that are likely to generate litter, particularly any buildings where employees

smoke outside the building and on adopted land.

5. Tobacco companies should take responsibility for the environmental impacts of their product. Three-quarters of the population in Wales never uses their products, yet we all pay to clean up the resultant litter. A strong anti-littering message on packaging is the least that should be done.
6. A tax should be considered on products for smoking that have non-biodegradable waste. A tax of 5p per cigarette would have the triple benefit of increasing the pressure on manufacturers to examine biodegradable alternatives, raising awareness among consumers of environmental problems of smoking, and providing funds to improve the cleanliness of the environment in Wales.
7. The relevant legislative authority should consider a ban on smoking in cars containing children. Such a ban would denormalise the littering of cigarette ends from cars containing children.
8. The relevant legislative authority should consider a ban on smoking in public places outdoors, to make non-smoking the normal situation. This would be the single biggest contribution to reducing smoking-related litter that could be made. Precedents for this state of affairs are being set in the USA.



Australian anti-litter advertisement promoted in 1996 by the New South Wales government, the Sydney Water Board, and the Clean Waterways organisation

References

1. King James VI of Scotland and I of England and Ireland, 1604. *Commissio Pro Tabacco*. <http://www.la.utexas.edu/research/poltheory/james/blaste/blaste.app.html>, accessed 14 August 2006.
2. Research and Markets, 2004. *Cigarettes and Tobacco Market Report 2004*. Dublin: Key Note Publications Ltd.
3. King James VI of Scotland and I of England and Ireland, 1604. *A Counterblaste to Tobacco*. <http://www.la.utexas.edu/research/poltheory/james/blaste/blaste.html>, accessed 14 August 2006.
4. Novotny TE and Zhao F, 1999. Consumption and Production Waste: Another Externality of Tobacco Use. *Tobacco Control* 1999 (8), 75-80.
5. Chapman S, 2006. Butt Clean Up Campaigns: Wolves in Sheep's Clothing? Editorial. *Tobacco Control* 2006 (15), 273.
6. Keep America Beautiful, 2006. *Cigarette Litter Prevention Program*. <http://www.kab.org/programs.asp?id=51&rid=76>, accessed 21 August 2006.
7. Welsh Assembly Government, 2006. *Smoking*. <http://new.wales.gov.uk/topics/health/improvement/hcw/themes/smoking/?lang=en>, accessed 21 August 2006.
8. National Statistics, 2006. 2004/05 General Household Survey, National Statistics: Table 8.6. Prevalence of cigarette smoking by sex and country of Great Britain:1978 to 2004. http://www.statistics.gov.uk/downloads/theme_compendia/GHS04/GHS04_8Smoking.xls, accessed 21 August 2006.
9. Action on Smoking and Health, 2006. Factsheet No. 1. *Smoking Statistics: Who Smokes and How Much?* London: Action on Smoking and Health.
10. Action on Smoking and Health, 2005. *Basic Facts: One. Smoking Statistics*. London: Action on Smoking and Health.
11. Royal College of Physicians, 2000. *Nicotine Addiction in Britain*. London: Royal College of Physicians.
12. National Statistics, 2006. 2004/05 General Household Survey, National Statistics: Table 8.11. Prevalance of Cigarette Smoking by Sex and Socio-Economic Classification Based on Current or Last Job, Whether Economically Active or Inactive, and, for Economically Inactive Persons, Age. http://www.statistics.gov.uk/downloads/theme_compendia/GHS04/GHS04_8Smoking.xls, accessed 21 August 2006.
13. National Statistics, 2006. 2004/05 General Household Survey, National Statistics: Table 8.10. Average Daily Cigarette Consumption Per Smoker by Sex, and Socio-Economic Classification Based on the Current or Last Job of the Household Reference Person. http://www.statistics.gov.uk/downloads/theme_compendia/GHS04/GHS04_8Smoking.xls, accessed 21 August 2006.
14. National Statistics, 2006. 2004/05 General Household Survey, National Statistics: Table 8.20. Tar Yields by Sex and Socio-Economic Classification Based on the Current or Last Job of the Household Reference Person.

http://www.statistics.gov.uk/downloads/theme_compendia/GHS04/GHS04_8Smoking.xls, accessed 21 August 2006.

15. National Statistics, 2006. 2004/05 General Household Survey, National Statistics: Table 8.23. Age Started Smoking Regularly by Sex and Socio-Economic Classification Based on the Current or Last Job of the Household Reference Person.

http://www.statistics.gov.uk/downloads/theme_compendia/GHS04/GHS04_8Smoking.xls, accessed 21 August 2006.

16. Marsh A and McKay S, 1994. Poor Smokers. London: Policy Studies Institute.

17. EnCams, 2005. Smoking-Related Litter Survey with Working Adults. Wigan: EnCams.

18. Rhode Island Department of Health, 1997. Ingestion of Cigarettes and Cigarette Butts by Children – Rhode Island, January 1994-July 1996. Morbidity and Mortality Weekly Report 46 (06), 125-128.

19. Borys JD, Setzer SC and Ling JL, 1988. CNS Depression in an Infant after the Ingestion of Tobacco: A Case Report. Veterinary and Human Toxicology 1988 (30), 20-22.

20. Malizia E, Andreucci G, Alfani F, Smeriglio M and Nicholai P, 1983. Acute Intoxication with Nicotine Alkaloids and Cannabinoids in Children from Ingestion of Cigarettes. Human Toxicology 1983 (2), 315-6.

21. Smolinske SC, Spoerke DG, Spiller SK, Wruk KM, Kulig K and Rumack BH, 1988. Cigarette and Nicotine Chewing Gum Toxicity in Children. Human Toxicology 1988 (7), 27-31.

22. National Center for Chronic Disease Prevention and Health Promotion, 2006. News Release: Ingestion of Cigarettes Among Children has Toxic Effects. Atlanta: Centers for Disease Control and Prevention.

23. Butt Littering Trust, 2003. Butt Littering Interventions Situation Report: Work in Progress. Sydney: Butt Littering Trust.

24. Micevska T, Warne MS, Pablo F and Patra R, 2006. Variation in, and causes of, toxicity of cigarette butts to a cladoceran and microtox. Archives of Environmental Contamination and Toxicology 50 (2), 205-212.

25. Thackeray S, 2006. Dr Stephen Thackeray, Lake Ecologist and Modeller: Research Interests. <http://www.ceh.ac.uk/sections/eaf/StephenThackeray.html>, accessed 25 August 2006.

26. Register KM, 2000. Cigarette Litter – Toxic as well as Ugly. Bulletin of the American Littoral Society, Volume 25, Number 2.

27. Marine Conservation Society, 2006. Cigarette Butts. Ross-on-Wye: Marine Conservation Society.

28. Clean Up Australia, 2006. Cigarette Butts. Glebe, NSW: Clean Up Australia.

29. BBC, 2006. Memorial for Stadium Fire Tragedy. <http://news.bbc.co.uk/1/hi/england/bradford/4760483.stm>, accessed 25 August 2006.

30. BBC, 1997. Safety Fears Linger, Decade After Kings Cross Fire. <http://news.bbc.co.uk/1/hi/uk/31723.stm>, accessed 25 August 2006.

31. Gwasanaeth Tân ac Achub De Cymru/South Wales Fire and Rescue Service, 2006. UK Statistics: Deaths and Injuries. Pontyclun: Gwasanaeth Tân ac Achub De Cymru/South Wales Fire and Rescue Serv-

ice.

32. Pauly JL, Mepani AB, Lesses JD, Cummings KM and Streck RJ, 2002. Cigarettes with Defective Filters Marketed for 40 Years: What Philip Morris Never Told Smokers. *Tobacco Control* 2002 (11), 151-161.
33. International Coastal Cleanup, 2004. 2004 ICC Facts & Figures. Washington, DC: The Ocean Conservancy.
34. Marine Conservation Society, 2005. Beachwatch Data, 1999-2004. Ross-on-Wye: Marine Conservation Society.
35. Rodriguez M, quoted in Boroshok J, 2005. More Locales Ban Smoking. *Los Angeles Times*, 23 January 2005.
36. EPR Expert Reference Group, 2004. Report on the Implementation of the New South Wales Extended Producer Responsibility Priority Statement 2004, Department of Environment and Conservation, New South Wales.
<http://www.resource.nsw.gov.au/data/epr/EPR2004-ERG%20report-Final.pdf>
37. Keep Scotland Beautiful, 2006. Facts About Littered Cigarette Butts. Stirling: Keep Scotland Beautiful.
38. Department of the Environment, Heritage and Local Government, 2006. The National Litter Pollution Monitoring System Litter Monitoring Body: System Results. Dublin: Department of the Environment, Heritage and Local Government.
39. EnCams, 2004. Litter Composition Survey of England. April-July 2004. Wigan: EnCams.
40. Keep Wales Tidy, 2006. Unpublished Street Cleanliness Surveys Across Wales. Caerdydd: Keep Wales Tidy.
41. ButtsOut, 2006. ENpsych: Only Smokers Can Stop Cigarette Butt Litter.
http://www.buttsout.net/resources_for_campaigns/ENpsych, accessed 21 August 2006.
42. Levin MA, 2001. Japan: Can Local Action do the Trick? *Tobacco Control* 10, 204.
43. Coventry City Council, 2006. Butts Out Campaign. Coventry: Coventry City Council.
44. Colchester Borough Council, 2006. Fixed Penalty Notices Issued as part of Cigarette Litter Campaign.
http://www.colchester.gov.uk/news_det.asp?art_id=3146&sec_id=27, accessed 23 August 2006.
45. EnCams, 2005. Smoking-Related Litter. Wigan: EnCams.
46. Frost J, 2006. Personal Correspondence. Jeremy Frost, Local Environmental Quality Section, Welsh Assembly Government. 21 August 2006.
47. Tobacco Institute, 1979. Litter: A Proposal for TI Policy. Washington, DC: The Tobacco Institute.
48. Imperial Tobacco, 2006. Our Priorities: Environment.
<http://www.imperial-tobacco.com/files/environment/cr2005/index.asp?pageid=52>, accessed 21 August 2006.
49. Philip Morris USA, 2006. Our Initiatives and Programs: Cigarette Litter Prevention.
http://www.philipmorrisusa.com/en/our_initiatives/cigarette_litter_prevention.asp, accessed 21 August 2006.

50. Action on Smoking and Health, 2005. Basic Facts: Three. Tobacco Economics. London: Action on Smoking and Health.
51. Gallus S, Schiaffino A, La Vecchia C, Townsend J and Fernandez E, 2006. Price and Cigarette Consumption in Europe. *Tobacco Control* 2006 (15), 114-119.
52. Action on Smoking and Health, 2006. Factsheet No: 16. The Economics of Tobacco. London: Action on Smoking and Health.
53. Zagorsky JL, 2004. The Wealth Effects of Smoking. *Tobacco Control* 2004 (13), 370-374.
54. Maine Legislature, 2002. Chapter 28-A: Returnable Tobacco Products. http://www.mainelegislature.org/legis/bills_120th/billtexts/LD025801-1.asp, accessed 21 August 2006.
55. Cowger, quoted in Onion A, 2001. Maine Proposes Cigarette Butt Redemptions. <http://abcnews.go.com/sections/us/DailyNews/butts010222.html>, accessed 7 August 2006.
56. National Council of State Legislatures, 2001. Lawmakers Take on Smokers' Litter. Denver: National Council of State Legislatures.
57. Brooks J, quoted in Higgins AJ, 2001. He Sees Redeeming Value in Litter. Boston: Daily Globe, 28 January 2001.
58. Chapman S and White N, 1994. Head to Head: Should Smoking be Banned in Cars for Children's Safety? Melbourne: Herald Sun, 21 September 1994.
59. Chan G, 1995. Call to Ban Smoking in Cars with Children. Sydney: The Australian, 23 November 1995.
60. State of Arkansas General Assembly, 2006. House Bill 1046. Little Rock: State of Arkansas General Assembly.
61. Legislature of the State of Louisiana, 2006. House Bill No. 1010. Baton Rouge: Legislature of the State of Louisiana.
62. Planet Ark, 2006. Cigarette Butt Litter, <http://www.planetark.com/campaignspage.cfm/newsid/137/story.htm>, accessed 21 August 2006.
63. Jalleh G, Donovan RJ, Stewart S and Sullivan D, 2006. Is there public support for Banning Smoking in Motor Vehicles? *Tobacco Control* 2006 (15), 71.
64. Keep Wales Tidy, 2006. Smoking-Related Litter Questionnaire Analysis. Caerdydd: Keep Wales Tidy.
65. Yolton K, Dietrich K, Auinger P, Lanphear BP and Hornung R, 2005. Exposure to Environmental Tobacco Smoke and Cognitive Abilities Among US Children and Adolescents. *Environmental Health Perspectives* 113 (1), 98-103.
66. Leistikow BN, Martin DC, Jacobs J, Rocke DM and Noderer K, 2000. Smoking as a Risk Factor for Accident Death: a Metaanalysis of Cohort Studies. *Accident; Analysis and Prevention* 32 (3) 397-405.
67. Wen CP, Tsai SP, Cheng TY, Chan HT, Chung WSI and Chen CJ, 2005. Excess Injury Mortality Among Smokers: a Neglected Tobacco Hazard. *Tobacco Control* 2005 (14), i28-i32.

68. Young K, Regan M and Hammer M. Driver Distraction: a Review of the Literature. Monash University Accident Research Centre.
<http://www.monash.edu.au/muarc/reports/muarc206.pdf>, accessed 27 July 2006.
69. Bloch M and Shopland DR, 2000. Outdoor Smoking Bans: More than Meets the Eye. *Tobacco Control* 2000 (9), 99.
70. Reynolds P, quoted in Fuchs B, 2004. Backers Call Smoking Bans Along Beaches Healthy Move. *San Diego Union-Tribune*, 12 September 2004.
71. Fuchs B, 2004. Backers Call Smoking Bans Along Beaches Healthy Move. *San Diego Union-Tribune*, 12 September 2004.
72. Emery A, 2006. Personal Correspondence. Andrew Emery, Service Development Officer, Bournemouth Borough Council. 18 August 2006.
73. Davidow J, 2005. Initiative 901: Smoking Ban Sails to Victory. *Seattle Post-Intelligencer*, 9 November 2005.
74. Milgrim J, 2005. Outdoor Smoking has few NY Allies. *Times Herald-Record*, 4 November 2005.
75. City of Calabasas, 2006. An Ordinance of the City of Calabasas Regulating Second-Hand Smoke and Amending the Calabasas Municipal Code. Calabasas, California: City of Calabasas.
76. Banzhaf J, quoted in Vallis M, 2006. California Suburb Bans Outdoor Smoking. *National Post*, 22 February 2006.
77. Action on Smoking and Health, 2006. Factsheet No. 8. Secondhand Smoke. London: Action on Smoking and Health.
78. Action on Smoking and Health, 2006. What you Must Know about Including ETS in the FCTC: 20 Questions which can Help Save 20 Million Lives.
<http://nosmoking.ws/ashposition/ashetsinb3.htm>, accessed 21 August 2006.
79. Environmental Protection Agency, 1994. Setting the Record Straight: Secondhand Smoke is a Preventable Health Risk. Washington, DC: Environmental Protection Agency.
80. California Environmental Protection Agency, 2006. California Identifies Second-Hand Smoke as 'Toxic Air Contaminant'. Sacramento: Air Resources Board.
81. Banzhaf J, 2006. Canada may Ban Outdoor Smoking Follow US 'New Paradigm' – No Smoking as the Norm. Washington, DC: Action on Smoking and Health.
82. National Cancer Institute, 2002. Tobacco Intake. 3rd International Conference on Smokeless Tobacco – Daily Media Summaries.
http://dccps.nci.nih.gov/dccps/tcrb/smokeless_conf_ma.html#intake, accessed 22 August 2006.
83. Furberg H, Bulik CM, Lerman C, Lichtenstein P, Pedersen NL and Sullivan PF, 2005. Is Swedish Snus Associated with Smoking Initiation or Smoking Cessation? *Tobacco Control* 2005 (14), 422-424.
84. Rodu B, Nasic S and Cole P, 2005. Tobacco Use Among Swedish Schoolchildren. *Tobacco Control* 2005 (14), 405-408.

85. Ramström LM and Foulds J, 2006. Role of Snus in Initiation and Cessation of Tobacco Smoking in Sweden. *Tobacco Control* 2006 (15), 210-214.
86. McNeill A, Bedi R, Islam S, Alkhatib MN and West R, 2006. Levels of Toxins in Oral Tobacco Products in the UK. *Tobacco Control* 2006 (15), 64-67.
87. National Statistics, 2006. Cigarette Smoking Among People Aged 16 and Over: By Sex, 2003/04. In: *Regional Trends 39: 2006 edition*. Casnewydd: National Statistics.
88. National Assembly for Wales, 2004. 2003 Mid Year Estimates of the Population. <http://www.wales.gov.uk/keypubstatisticsforwalesheadline/content/population/2004/hdw20040923-e.htm#more>, accessed 21 August 2006.

CADWCH | KEEP
GYMRU'N | WALES
DACLUS | TIDY

Annex 1 - Snus

Sweden is the only country in the developed world where a method other than smoking is used by large numbers of people as a means of nicotine consumption. Snus consists of loose tobacco leaves, ground into a powder, with salt and water added. It is either packaged in small bags (made from the same material as teabags), or bundled by the user into a wad; both are placed under the upper lip. It is used almost exclusively by men in Sweden. Consumption of snus per capita in Sweden is now slightly more than the per capita consumption of all other tobacco products, at 796g per year⁸². In litter terms, the use of snus in Wales would be preferable to smoking with filter-tipped cigarettes, because the product is biodegradable; only the bulk packaging is non-biodegradable. Health benefits would also arise from substitution of smoking with the use of snus, since Swedish men run a comparatively low risk of dying from tobacco-related disease⁸² (although they face increased risk of mouth- and throat-related cancers). In addition, snus has been found to be associated with smoking cessation but not initiation⁸³. The high prevalence of snus use in Sweden reduces smoking rates among Swedish men, and suppresses smoking among boys as well⁸⁴. Use of snus in Sweden is associated with a reduced risk of becoming a daily smoker and an increased likelihood of stopping smoking⁸⁵. The sale of snus is currently banned throughout the European Union, with the exception of Sweden, so snus is currently unavailable in the UK. The oral tobacco that can be found in the UK is highly variable in quality, with a 130-fold variation in carcinogens among different brands⁸⁶.

In practical terms, Keep Wales Tidy need not publicise the lower litter or health risks associated with the use of snus, because snus is unavailable in Wales, it is still a litter-generating product, and its use, while preferable to smoking, would be less beneficial in litter terms than an equivalent reduction in smoking.

Annex 2 - Calculation of Smoking-Related Litter in Wales

The daily consumption of cigarettes in Wales is calculated as follows:

6.5% of people in Wales smoke less than 10 cigarettes per day (average of 5)
12.5% of people in Wales smoke between 10 and 20 cigarettes per day (average of 15)
8.5% of people in Wales smoke more than 20 cigarettes per day (average of 25)
(all data from National Statistics⁸⁷)

The population of Wales in mid 2003 was 2,938,000⁸⁸

$6.5/100 \times 2,938,000 \times 5 = 954,850$

$12.5/100 \times 2,938,000 \times 15 = 5,508,750$

$8.5/100 \times 2,938,000 \times 25 = 6,243,250$

Total daily consumption in Wales = 12,706,850 cigarettes.

Number of smokers in Wales = $0.275 \times 2,938,000$
= 807,950

Average number of cigarettes smoked per smoker
= $12,706,850/807,950$

= 15.7 per day

Average number of cigarettes smoked per year
= 5744