

From Lights to Brighter Lights: The Re-engineering of Canadian Cigarettes



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This paper was written by
Neil Collishaw

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for a Smoke-Free Canada

By 1950, scientific evidence had clearly linked smoking to lung cancer, and the bad news for the tobacco industry continued to accumulate. They had to weather major scientific reports in the United Kingdom, the United States and Canada in the early 1960s that provided more scientific indictment of cigarettes as major health hazards.

By the late 1960s, the tobacco industry knew they had to do something more to respond to the health issue. There were stark choices. They could fool smokers or they could make cigarettes that were truly safe, or at least, a little less hazardous. Both paths were explored. Over the next thirty years they were to implement more changes aimed at fooling smokers than at protecting their health. We will discover just how they engineered and re-engineered cigarettes to fool smokers.

Reassuring Unhappy Smokers

(a) Health image (health reassurance cigarette) such as low tar - low nicotine cigarette which the public accepts as a healthier cigarette

Dr. Sanford's Comments on 1968 BAT Research Meeting



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In 1968, Dr Sanford of BAT clearly described the two kinds of cigarettes that could be made, health oriented cigarettes and health image cigarettes.

Health oriented cigarettes were ones that actually held out some promise of being less hazardous. Dr. Sanford saw them as ones that would show lower levels of biological activity in mouse-skin painting tests and Ames tests. It was not clear that such cigarettes would actually be less hazardous but there was some promise that this would be so.

The other direction to go would be to make low tar-low nicotine cigarettes – ones the public would accept as healthier. Even in 1968, however, Dr Sanford and other BAT scientists were under no illusions that such cigarettes would actually be safer. They would only appear so.

Cigarette companies embraced research and development of light cigarettes, the “health image” cigarettes described by Dr Sanford. The research, development and marketing of light cigarette took place in two phases:

Lights of the 1970s and 1980s: These lower yield cigarettes yielded less tar and nicotine on standard machine tests. Health Canada supported independent research in the 1970s and 1980s that concluded, as did the BAT research, that smokers changed their behaviour to compensate for low yields of their so-called light and mild cigarettes. Smokers compensated for lower yields, but market research revealed that smokers of lights were still unhappy.

ITL Lights 1970s & 1980s

Dr. Robert Gibb, ITL
Research
letter to BAT senior
scientist Dr. Sidney
Green, 1975



PRODUCT DEVELOPMENT (to cope with current governmental S&H pressures)

This is what our management really expects R&D to do. Things like marketable low tar and nicotine cigarettes, marketable innovations like programmed filter, heat shrink filter, etc. Essentially a "numbers" game with innovation in the means to control Tar and Nicotine. In Canada we also will be expected to achieve a gradual reduction in tar and nicotine across the board from the top down, at a pace no faster than government pressure requires.

The question as to whether such cigarettes are really safer does not matter, although privately even our Health people wonder whether low tar and nicotine cigarettes are a good idea.

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Brighter Lights of the late 1980s and 1990s: In the late 1980s and 1990s, tobacco companies went one step further. In their zeal to make their customers happier, they decided they would fool them into thinking they were getting something they were not, cigarettes that were "light" or, by implication, less hazardous. They would make compensation so easy to achieve that smokers would be more likely than not to compensate, without even being aware that they were doing so. The cigarette re-engineering that has gone on is now nearly total, probably affecting the entire cigarette market, not just brands described as light or mild. Filter ventilation is now present on brands ranging in tar yield from 0.1 to 17 mg. By 1983, 50% of ITL brands were ventilated. By now it is probable that nearly all are.

But smokers of lights and milds do not get "mild" lung cancer or "medium" heart attacks or "ultra light" emphysema.

In just a few words Dr R.M. Gibb summarized what was going on in the early phase, the "light" era. Tar and nicotine levels were being pushed down to meet government requests for lower tar cigarettes. If the government was happy because the numbers were lower, and management was happy because the cigarettes were selling, then the 'numbers game' was going in favour of the tobacco industry. But he confided in his friend and colleague Jim Green that "privately even our health people wonder whether low tar and nicotine cigarettes are a good idea."

Smokers Want to Go to Heaven but they don't want to die

Pre-lights, these concerned consumers had a limited range of options open to them - essentially quit or cut down.

Fortunately for the tobacco industry, neither of these two approaches proved very successful for smokers.

Very simply put - people who were smokers increasingly wished that they weren't, in the face of mounting information on smoking and health - but could not find a means of dealing with their concern.

Bob Bexon, ITL, R&D/Marketing Structured Creativity Conference, 1984



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The "Lights" era of the 1970s and early 1980s and the "Brighter Lights" era of the late 1980s and 1990s can be summed up this way:

Lights: Product engineered to satisfy "league tables", but smokers compensate to overcome engineering.

Brighter Lights: Product engineered to satisfy smokers; engineers compensate to overcome smokers' behaviour and attitudes

Imperial Tobacco market research ("pre-lights/post lights") revealed that smokers held diametrically opposite views simultaneously. They wanted to quit smoking, but their addiction meant they had to keep smoking. They wanted to go to heaven but they didn't want to die. They wanted the heavenly sensation of relief and calm from their cigarettes but they didn't want their cigarettes to kill them.

The cigarette engineers could not actually fulfil this need, but they could make the smokers think their cigarettes were less hazardous when they probably were not, while continuing to deliver satisfying quantities of nicotine to their brains.

The more elegant value-added of the "Brighter Lights" era of the 1980s and 1990s was that all of this could be done without the smoker even knowing it was happening. It could be done and it was done.

Lights: An Alternative to Quitting

“It is useful to consider lights more as a third alternative to quitting and cutting down - a branded hybrid of smokers' unsuccessful attempts to modify their habit on their own.”

Bob Bexon, ITL, R&D/Marketing Structured Creativity Conference, 1984



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According to Bob Bexon in 1984, Imperial Tobacco understood well that 'light' cigarettes were a marketing tool - not a health advance. The role of lights in encouraging smokers not to quit was a key feature of development and marketing of light cigarettes. Recently, Mr Bexon was promoted to President and Chief Operating Officer of Imperial Tobacco (Canada) Limited, a position he currently holds.

Here are some more citations from Bob Bexon's speech at the 1984 Structured Creativity Conference. "Lights in Canada was a brand not a product revolution. The industry tried filters, charcoal, tobacco blends, advertising claims attempting, generally unsuccessfully, to solve the health problem in product terms while virtually ignoring the paradoxical nature of the smokers' dilemma. Although they wished they weren't, they were and virtually every effort forced them to give up the things they continued to smoke for. Telling smokers that you had a product was not the problem. Telling them they could smoke it with honour was."

"Lightness, instead of being an absolute, became a relative thing. Close on the heels of this key piece of information and the even more important foundation of relative mildness that it created, manufacturers began to introduce lighter brands instead of products. "Lighter" was successfully defined in language smokers could understand as 'all the experience of Player's in lighter cigarette - Player's light.'"

More Reliance on Product

It must be emphasised that numbers are not the end of the Product Development task, that with the increasing loss of communications media the product will have to support the brand more and more above all, smoking should be a pleasurable experience where satisfaction is gained with the minimum effort.

G.O. Brooks, R&D/Marketing Structured Creativity Conference, 1984



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The chief characteristics of the brighter lights of the late 1980s and 1990s can be summed up this way:

- Less reliance on advertising , more on the product
- Total cigarette engineering
- Elastic cigarettes and elastic morality
- Keep the nicotine

A growing number of advertising restrictions brought about the realization that the product would have to sell itself more. There would be more reliance on the product to hook smokers and keep them hooked. Total cigarette engineering, more nicotine per unit of tar and more elastic cigarettes were all used to make the cigarettes of the 1980s and 1990s.

The big problem with the first generation of lights was that smokers noticed that they couldn't get enough nicotine from them to satisfy their craving, unless they changed their smoking behaviour. And they didn't like to do that. "Sucking air" was how many smokers described the experience of smoking Medallions, a 1 mg brand. So the new challenge, without going back to the cigarettes of the 1950s (a strategy that would not be countenanced in the health-conscious 1980s) was to give the smokers what they wanted, pleasure and satisfaction at minimum effort, all in cigarettes that were nominally low in tar. Unfortunately, the smoker would have to be deceived to be given what he wanted.

**Make the
smoke (not
the smoker)
work harder**

Pat Dunn,
ITL Research,
1983

MAKING THE SMOKE WORK HARDER

A number of suggestions on this topic were raised and are listed in point form below.

1. Sensory effect
 - immediate, acute sensory response
 - longer term physiological response
2. Impact and taste
 - to accelerate the magnitude
3. The pH in smoke
4. Free and bound nicotine ratios
 - the best form of nicotine
 - free, base, or others
5. Interaction of nicotine and other impactors
 - oral cavity satisfaction
 - lung and body satisfaction
6. Assimilation of nicotine through the nose
i.e., vapour stage nicotine



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Pat Dunn, who succeeded Bob Gibb as head of R&D for Imperial Tobacco, identified 18 ways to make the smoke work harder. It was technically feasible to implement all of these changes. It is probable that all of these technical modifications have been used sometime, somewhere in the world, although not all were necessarily used in Canada. Dr. Dunn nevertheless identified an astonishingly large variety of chemical engineering fixes that could be used to make the smoke work harder. The corollary of the smoke working harder is of course that the smoker would have to work less hard to get his or her desired fix of nicotine from a cigarette. Sensory effect, impact and taste, pH, free and bound nicotine ratios, interaction of nicotine with other chemicals, and nicotine up your nose all were part of the challenge of delivering more nicotine per unit of smoke to the smoker. Less work, more nicotine.

Each unburned cigarette contains about 8-12 mg of nicotine. Typically a smoker will inhale only about 10% of this, the remainder remaining in the ash, the butt, the filter, the sidestream smoke, and unabsorbed nicotine in exhaled smoke. The challenge would be to reduce the mainstream nicotine determined by standard smoking machine measurement while increasing the amount that would actually be absorbed by the smoker.

12 more ways to make the smoke work harder

Pat Dunn,
ITL Research,
1983

7. Use of humectants in changing the particle size of smoke, or the concentration of nicotine in the vapour phase
8. Taste enhancers related to particle size
9. Irritation reduction related fatty acids
10. Surface tension agents
11. Changing the conventional aerosols
12. What factors control human ability to change T/N ratios?
13. Addition of pyrazine salts
14. Dispersion of the smoke in the mouth, and lung ciliastasis, mouth absorption
15. Aging of smoke
16. Selective filtration
i.e., Teflon, Duolite
17. Salivating agents
the use of hydrocarbon interferers re mouthful sensation
18. Policy on elasticity and/or human perception of mouthful of smoke relative to standard machine delivery.

P. Dunn



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Pat Dunn did not lack imagination in describing how to re-engineer cigarettes to make the smoke work harder. Moistening agents could reduce nicotine particle size. Smaller nicotine particles would be more readily absorbed. If cigarettes tasted better and were less irritating, smokers would be more favourably disposed to them. If there was a better understanding of human smoking behaviour, products could be designed tailored to a smoker's ability to get his or her physiologically desired hit of nicotine from the cigarette. If the industry were to explicitly make cigarettes more elastic, smokers would be getting more nicotine for less effort.

The cumulative effect of the smoke, not the smoker, working harder would be for it to become imperceptibly easy for smokers to get more nicotine from their cigarettes than indicated by the numbers printed on the packages.

Elastic Cigarettes

Δ delivery > Δ puff volume.

If the tar delivery increases in direct proportion to the increase in puff volume, the product is inelastic (i.e. elasticity = 1), while if tar delivery increases faster than puff volume, elasticity > 1.

ITL Research Report, 1994

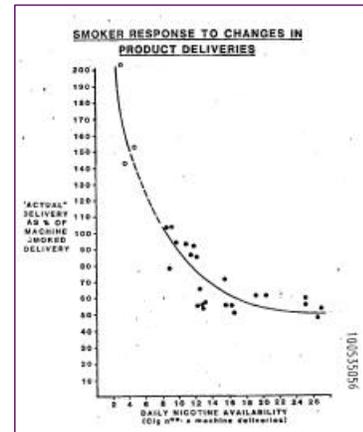


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The eighteenth way identified by Pat Dunn to make the smoke work harder made reference to elasticity. He wasn't referring to bungee cords or elastic bands, but the ability to squeeze more tar, nicotine and other poisons from the same-sized drag on a cigarette. An exact operational definition of elasticity appeared in a 1994 ITL research report. An irreverent observer might describe elastic cigarettes as more bang for your suck.

Double your dose: smoke lights

BAT Nicotine Conference, 1984



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Low yield cigarettes were the most likely to be over smoked. Internal BAT research showed that the more elastic low-yield cigarettes delivered up to 200% more nicotine than would be predicted on the basis of machine smoking tests. It is also revealing to discover that at the other end of the spectrum, actual deliveries of nicotine to smokers dropped to around 60% of machine deliveries. In other words, smokers tended to undersmoke cigarettes nominally high in tar and nicotine.

Moral Qualms

COMPENSATIBLE FILTERS

1. Strategic Objective:

To make it easier for smokers to take what they require from a cigarette. This means in effect that the filter will be compensable and implies a high taste to bar notes.

2. Constraints:

Is this an ethical thing to do? People who buy an 8 mg product expect to get 8 mg.

If a declaration that this product is elastic is made (which is the honest thing to do) then it could upset the apple cart.

D. Creighton, BAT
structured
creativity meeting,
June, 1984



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Making elastic cigarettes, ones with compensable filters and other characteristics that would render cigarettes more elastic had been identified in the mid-1980s as a promising direction for cigarette re-engineering to give smokers what they wanted. BAT British scientist Mr. D. Creighton wrestled with the ethics of making elastic cigarettes. However, the debate on this ethical question was very short.

Elastic Morality

Compensatable Cigarettes

However, we should strive to achieve this effect without appearing to have a cigarette that cheats the league table. Ideally it should appear to be no different from a normal cigarette thus reducing the likelihood of a competitive challenge. It should also be capable of delivering up to 100% more than its machine delivery. I have chosen this ratio because I believe anything more than this would lack credibility from a consumers point of view. Thus an 8mg product capable of delivering 15-16mg would allow the current full flavour smoker to continue to smoke with reassurance but no loss in terms of pleasure.

G.O. Brooks, BAT, June, 1984



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At the same meeting Mr Brooks (less concerned with ethics) said, in essence, that we should cheat without appearing to do so. Although compensation rates above 100% would be technically possible, they would not be credible.

Deceive the Smoker

Changes in the product should be minimal as far as the smoker is concerned. Thus any innovations should not be intrusive in either appearance, feel or smoke performance. As a rule of thumb, changes of less than 20% in delivery are not noticeable to the untrained consumer.

David Creighton, BAT, June, 1984



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The same Mr Creighton who raised ethical questions also knew what would have to be done to fool the smoker into thinking he was smoking a light cigarette, and explained it to his colleagues in the same 1984 Structured Creativity conference. Small changes of less than 20% in deliveries of toxic substances would not be perceived by “untrained consumers.” Company records do not reveal that any training course for consumers was ever implemented.

A Policy on Elasticity

From a research and product development viewpoint the proposition of designing a cigarette, of high taste to tar ratio, which responds positively to human smoking behaviour has been agreed to be acceptable.

BAT Stance on Compensation, 1984



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It did not take long to resolve the moral dilemma around elastic cigarettes. In June 1984, Mr. Creighton thought creating elastic cigarettes would require elastic morality. Barely a month later we learn that elastic cigarettes – and elastic morality – had been accepted by the company as acceptable research and product development practice. Mr. Ayres was a senior researcher with BAT in England. He made the statement shown here in Montreal in July, 1984

In the same speech, Mr. Ayres went on to describe the marketing policy on elastic cigarettes. We have seen that there was already certainty in July 1984 that research and development would proceed on such products. The acceptability of marketing such products was not yet certain, only likely. And covert achievement of elasticity, changes imperceptible to the consumer, would likely be more acceptable than more overt and perceptible ways of achieving this end.

Marketing Concerns

2) BAT Stance on Compensation

Compensation by modifying smoking regime (b) is a topic which is being explored at GR & DC and this includes designing products which aid smoker compensation.

The marketing policy concerning this type of product is not clear but it is believed it will depend largely on the degree of elasticity in the design and how overtly this elasticity is achieved. The consensus is that small improvements in elasticity which are less obvious, visually or otherwise is likely to be an acceptable route.

BAT Stance on Elasticity, 1984



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In the topsy-turvy world of tobacco company ethics, deceiving consumers would be acceptable, but telling them exactly how they were being manipulated would be unacceptable.

Like atom bombs, once invented, elastic cigarettes could not be uninvented. A very short time elapsed from when the very first atom bomb prototypes were built in the Manhattan Project to when the perfected products were dropped on Hiroshima and Nagasaki.

It did not take much longer for covertly elastic cigarettes to move from being likely accepted as good marketing practice in 1984 to officially adopted and encouraged global corporate policy by 1991.

Elastic cigarettes that met the criteria set out by researchers Creighton and Brookes in 1984 would certainly meet the 1991 corporate research objective "to maximise the formation of compounds which improve the subjective quality of smoke."

The policy had been clearly set by BAT in 1991. And in 1993 ITL was dutifully following policy direction. Research was underway to achieve elasticity in du Maurier Ultra Light King Size cigarettes. New and better ways were being found to fool consumers.

ITL Researches Elastic du Mauriers

one way of increasing product elasticity at a given pressure drop is to increase filter pressure drop and reduce tobacco rod pressure drop.

A second potential approach to achieving elasticity is to use the Gap filter

The Gap cigarettes were more elastic than the controls at 70 ml puff volume.

ITL Research Report, July-Dec, 1993



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In December 1999, Imperial Tobacco asserted that it has never been guided by the concept of elasticity in the design of its new products. It is always easy for one to deny something of which one has never been accused. The documents do not tell us whether or not elasticity was a guiding principle for new product designs, and no-one ever asserted that it was. The documents do, however, indicate that there were discussions and research on the concept of elasticity. And that is an incontrovertible fact.

Earlier this year, BAT took firmer control of Imperial Tobacco, buying the remaining 64% of shares that it did not already own. Does this mean that Imperial Tobacco is now on a shorter leash, under stronger obligation to follow global company policy in all areas including research and development? If so, should we expect Imperial Tobacco to be more closely toeing the BAT R&D party line, "to maximise the formation of compounds which improve the subjective quality of smoke"?

We have discovered that making compensatable, elastic cigarettes was adopted as global corporate policy, first in research and then in production and marketing during the 1980s and 1990s. However, our documentary record ends around 1995, so it is not altogether clear the extent to which these and related concepts have penetrated current tobacco company practices. We have lifted the veil of secrecy that shrouded past tobacco company practices. How and when will we discover the nature of current tobacco company research and manufacturing practices? We know some past truths about tobacco. How and when will we discover the current truth about tobacco?