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## RESEARCH PAPER

## Airport smoking rooms don't work

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**Objectives:** To document tobacco industry involvement in thwarting enactment of a smoke-free airport policy at Lambert-St Louis International Airport (Lambert Airport) in the 1990s; and to test whether smoking rooms at Lambert Airport protect non-smokers from exposure to secondhand tobacco smoke (SHS) in adjacent non-smoking areas.

**Methods:** Tobacco industry document websites were searched for previously secret documents relating to efforts to maintain smoking in Lambert Airport. Testing of SHS contamination in non-smoking areas adjacent to a designated smoking room was conducted at Lambert Airport in 1997-98 and again in 2002. A 1998 comparative test was also performed inside nominally smoke-free Seattle-Tacoma International Airport (Sea-Tac Airport). Tests were performed using either static or active nicotine monitors.

**Results:** Industry documents show that the tobacco industry promoted the construction of designated smoking rooms as a way to sidetrack efforts to make Lambert Airport entirely non-smoking. Nicotine vapour air monitoring in a non-smoking area of the airport, adjacent to a smoking room located in Terminal C, reveals elevated levels of ambient nicotine vapour in excess of what would be expected in a completely non-smoking environment.

**Conclusions:** This study shows that airport smoking rooms expose non-smokers in adjacent non-smoking areas to a significant concentration of nicotine vapour from SHS.

Before 1992, Lambert Airport in St Louis, Missouri, permitted unrestricted smoking except for scattered seating areas designated as "No smoking" in open areas of the terminal and concourses. In 1992, a new smoking policy was adopted which, while still allowing smoking in shops, restaurants, cocktail lounges, gate areas, and airline clubs, restricted smoking in the terminal and concourses to the former "No smoking" areas.<sup>1</sup> In 1993, St Louis County Council members considered legislation to prohibit smoking entirely throughout the public parts of Lambert Airport, but the bill was defeated. The following year Missouri Group Against Smoking Pollution Inc (GASP) filed a discrimination complaint with the US Department of Justice against the City of St Louis Airport Authority and St Louis County Council, alleging violation of Title II of the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act.<sup>2</sup> The complaint charged denial of meaningful access to airport services for individuals with respiratory disabilities caused or exacerbated by SHS. In 1996, the St Louis City Commissioner of the Office on the Disabled arranged a meeting between GASP and Lambert Airport officials to discuss GASP's discrimination complaint.<sup>3 4</sup> At this meeting a GASP representative was told of plans to install smoking lounges to accommodate smoking, after which the rest of the airport would be designated "No smoking".

GASP argued that building smoking rooms would be ineffective because SHS would leak from them into adjacent non-smoking areas. Despite GASP's objection, the airport constructed and opened seven smoking rooms in 1997 at a reported cost of \$450 000.<sup>5</sup>

GASP subsequently sponsored two studies to test whether SHS leaked from a designated smoking room at Lambert Airport into the adjacent non-smoking area. This paper presents the results of these nicotine monitoring studies and examines recently released tobacco industry documents to determine if the tobacco industry played a role in

thwarting GASP's efforts to make Lambert Airport completely non-smoking.

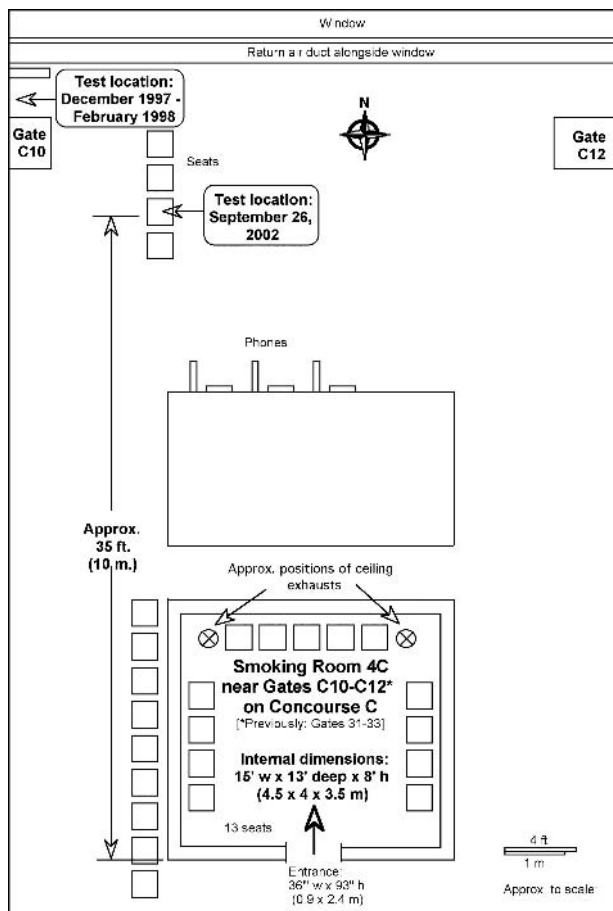
## METHODS

In order to assess the tobacco industry's involvement in efforts to promote designated smoking rooms as an alternative to a completely non-smoking Lambert Airport a search was conducted for documents on this subject posted on the tobacco industry's document websites. The websites were searched using request for production (RFP) codes, specified keyword searches, and serendipitous terms identified in document citations found with RFP and keyword searches.

To examine ambient nicotine vapour levels in an area adjacent to a Lambert Airport smoking room a nicotine vapour air monitor was used, consisting of a sodium bisulfate treated filter inside a filter cassette. When the monitor is unsealed for sampling, nicotine vapour in the sampled air binds to the treated filter. The adsorbed nicotine is later extracted and its mass determined by gas chromatography. Air sampling was done in the same Lambert Airport concourse location on two occasions: in 1997-98 and 2002. Figure 1 shows where the air monitoring was done relative to the designated smoking room.

During late 1997 and early 1998, a static nicotine vapour monitor was worn by a Lambert airline employee while working at a gate area near smoking room 4C. (Testing began 15 December 1997 and ended 26 February 1998). For a direct comparison with a smoking-prohibited airport, an employee working in a bar inside nominally smoke-free Sea-Tac Airport conducted a static nicotine sampling test in April 1998. The bar was remote from outdoor smoking-permitted entrances.

**Abbreviations:** ADA, Americans with Disabilities Act; GASP, Group Against Smoking Pollution; RFP, request for production; SHS, secondhand smoke; TI, Tobacco Institute



**Figure 1** Location of Lambert Airport smoking room 4C, relative to nicotine monitor test locations. Gates C10–C12 on Concourse C are nominally smoke-free.

The difference in nicotine concentrations in the two airports gives a quantitative measure of how much nicotine vapour is directly attributable to the smoking room in Lambert Airport.

In 2002, an active nicotine sampling test was done near the same Lambert Airport smoking room 4C using a miniature pump to draw a calibrated flow of air more rapidly through the filter. Using this method, sampling was completed in one, four hour period on 26 September 2002, permitting it to be conducted by an independent environmental company. Figure 2 shows the air sampling device and the pump that was used for the test along with pictures showing the location of the smoking room in relation to where air monitoring was done.

Knowing the total time for which the filter is exposed allows the average nicotine vapour concentration in the sampled air to be calculated, using the expression  $C_{av} = M/RT$ , where  $C_{av}$  = Average nicotine concentration (micrograms per cubic meter or  $\mu\text{g}/\text{cu m}$ );  $M$  = mass of nicotine collected ( $\mu\text{g}$ );  $R$  = sampling rate ( $\text{cu m}/\text{min}$ ); and  $T$  = total sampling time (min).<sup>6</sup> For the static nicotine monitor test, the empirical sampling rate  $R$  was  $25 \text{ ml}/\text{min}$  ( $25 \times 10^{-6} \text{ cu m}/\text{min}$ )<sup>7</sup> and for the pump assisted monitor, which was calibrated before and rechecked after the test, the sampling rate was  $150 \text{ ml}/\text{min}$ .<sup>8</sup> For all the tests a “control” monitor accompanied the test monitor but remained sealed from the time it left the University of California-Berkeley laboratory until its return for analysis. The mass of any nicotine detected on the control was deducted from the test monitor in calculating the average nicotine vapour

concentration. All individuals conducting the tests were non-smokers.

**RESULTS**

**Tobacco documents**

Industry documents were uncovered showing evidence that the tobacco industry promoted the construction of designated smoking rooms as a way to sidetrack efforts directed at making Lambert Airport completely non-smoking. By the early 1990s Congress was already pressuring airport executives to establish guidelines for protecting airport passengers from exposure to tobacco smoke.<sup>9</sup> The Tobacco Institute (TI), the former US cigarette manufacturer’s trade and lobbying organisation, responded with a strategy targeting 43 of the nation’s largest airports, including Lambert Airport. The objective was: “To demonstrate to airport executives, airport concessionaires, and airlines that they can reasonably and responsibly accommodate smoking and non-smoking travelers and visitors.”<sup>10</sup> One tactic identified was to promote ventilation and air filtration/cleaning technology as the main issue in indoor air quality, not smoking restrictions or bans. In February 1992, a TI representative wrote: “We now have at our disposal some resources that should be very helpful in our efforts to sidetrack the “smoke-free” movement at St. Louis’ Airport. Further, we have access to Mr. Gray Robertson and other principals at HBI (Healthy Buildings International), Inc., a firm specializing in ventilation and indoor air quality problems. Gray and his colleagues bring to meetings with airport people the crucial elements of technical and scientific expertise.”<sup>11</sup>

In May 1992, a TI representative met with the director of Lambert Airport to discuss airport smoking. The evident success of the meeting is reflected in a letter to the director shortly afterwards in which the TI representative wrote: “We are very enthusiastic about working with you and your organization to provide proper smoking accommodations in the Lambert Airport. It is not often that the people with whom we deal use such a common sense approach to handling problems.”<sup>12</sup> In February 1993, at a public hearing on a proposed St Louis County bill to ban smoking at Lambert Airport, the airport director expressed reservations about the proposal.<sup>13 14</sup> Two TI consultants also testified against the proposed ordinance: an HBI ventilation expert argued that indoor air quality was a problem of inadequate ventilation, not smoking, and Larry Holcomb, of Holcomb Environmental Services, attacked the Environmental Protection Agency report on SHS. The document search confirmed that key members of the County Council were heavily lobbied by the industry, resulting in the eventual defeat of the proposed smoking ban.<sup>13</sup>

**Nicotine vapour air monitoring**

Nicotine monitor tests were conducted at Lambert Airport in 1997–98 and again in 2002. Both tests were conducted in or near the gate area adjacent to smoking room 4C on Concourse C.

Smoking room 4C is an enclosed room approximately 15 foot wide by 13 foot deep with an 8 foot high ceiling ( $4.5 \times 4 \times 3.5 \text{ m}$ ). The room has an open doorway 36 inches wide and 93 inches high ( $0.9 \times 2.4 \text{ m}$ ) which faces the concourse corridor. Twin exhaust vents in the ceiling are ducted outside the building, with transfer air entering the room through the open doorway. During the 2002 test an average of 10 smokers were counted in the room during the four hour test period. The average occupancy in smoking room 4C during the 1997 test was estimated to be 15, according to an independent HVAC (Heating, Ventilation and Air Conditioning) engineering report prepared for Lambert Airport.<sup>15</sup> The report noted that the “design occupancy” for



**Figure 2** Lambert-St Louis International Airport nicotine monitor test, conducted Thursday, 26 September 2002. Pump assisted nicotine monitor test conducted roughly 35 feet (10 m) from front wall containing the entrance to smoking lounge 4C. The test ran for four hours from 1.30 pm to 5.30 pm. The first three photos show James Foley of Environmental Solutions conducting the test in the seating area adjoining gate C10 on the C Concourse. The fourth photo shows the smoking room, the entrance to which faces the corridor leading down the concourse.

smoking room 4C is 14, equal to the number of seats provided.

The 1997–98 Lambert Airport test yielded an average nicotine vapour concentration of 0.46 µg/cu m versus 0.72 µg/cu m for the 2002 test near the same location (table 1).

The comparative measurement inside non-smoking Sea-Tac Airport in 1998 was 0.15 µg/cu m (table 1). Possible sources for the nicotine detected in Sea-Tac Airport are: (1) migration from outdoors, especially around entrances; (2) clandestine indoor smoking; and (3) (probably an insignificant source) smokers’ clothing and personal belongings while inside the airport.

Comparing the measurements at Lambert with that at Sea-Tac Airport leads to the conclusion that Lambert Airport’s smoking rooms are responsible for approximately 70–80% of the average airborne nicotine vapour concentration measured in the two tests near smoking room 4C.

**DISCUSSION**

This study reveals that the tobacco industry was heavily involved in thwarting legislation to ban smoking at Lambert Airport in the 1990s. Promoting ventilation technology to accommodate indoor smoking was a major part of the industry strategy.

**Table 1** Raw data and average nicotine vapour concentrations for Lambert-St Louis International Airport versus smoking prohibited Seattle-Tacoma International Airport

Location	Exposure time (hours)	Mass of nicotine (µg)	Control corrected mass (µg)	Average concentration (µg/cu m)
<i>Lambert Airport—near smoking room 4C</i>				
15 December 1997–26 February 1998				
GASP1—Test	137	0.09	0.09	0.46
GASP2—Control	0	0.00	NA	NA
<i>Sea-Tac Airport—indoor bar remote from entrances</i>				
April 1998				
Fox 1—test	137	0.03	0.03	0.15
Fox 2—control	0	0.00	NA	NA
<i>Lambert Airport—near smoking room 4C</i>				
26 September 2002				
500.202-1—test	4	0.028	0.026	0.72
500.202-2—control	0	0.002	NA	NA

NA, not applicable

### What this paper adds

The tobacco industry has deliberately thwarted the enactment of smoke-free policies at major US airports, and has instead promoted construction of costly smoking rooms. Measurements of nicotine vapour concentrations in the air inside Lambert Airport, St Louis, compared to a non-smoking airport indicate that smoking rooms, where they exist, will be the major source of secondhand smoke exposure for non-smokers in adjacent non-smoking areas. To protect the health and welfare of employees and the public, and to prevent unlawful discrimination against smoke sensitive individuals with respiratory and other disabilities, airports should prohibit smoking indoors and also around outdoor entrances.

The nicotine vapour air monitoring conducted at Lambert Airport and Seattle-Tacoma Airport shows that designated smoking rooms are not able to prevent tobacco smoke from migrating into the adjacent non-smoking area of the terminal. The National Institute for Occupational Safety and Health has stated that tobacco smoke exposure should be reduced to the lowest feasible concentration, which can only be done by a total smoking ban,<sup>16</sup> a conclusion supported by these results.

### ACKNOWLEDGEMENTS

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Ms Carol Liedke conducted the nicotine monitor test in Sea-Tac Airport in 1998, assisted by Mr Bob Fox, Fresh Air for Nonsmokers.

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