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## COMMERCIAL AVIATION: AN UNSUSTAINABLE TECHNOLOGY

DANIEL M. WARNER\*

**I**T HAS BEEN about one hundred years since commercial aviation became realistic. Now, we recognize that commercial aviation<sup>1</sup> has some unintended adverse consequences—noise and air pollution come immediately to mind—but still, it is boosted and promoted by optimistic government officials, from the President of the United States<sup>2</sup> to the local airport authority.<sup>3</sup> Actually, aviation presently has in its tow a whole raft of seriously bad unintended consequences, and even if it were tolerable at its present level of operation, projected increases in aviation activity is out of the question. It is hardly thinkable that aviation could be eliminated, but we might stop celebrating it as a good thing, and begin to price it more commensurate with its costs. Or, perhaps, the inevitable increase in the price of aviation fuel and the frank recognition that most air travel is a frivolous unnecessary will solve the problem.

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<sup>1</sup> No account here is given of the military applications of aviation, or of general aviation (private planes).

<sup>2</sup> On November 18, 2008, President Bush announced that to mitigate air-travel congestion, some U.S. military airspace would be opened for civilian flights; he noted that the U.S. had signed agreements with the E.U. and India, Thailand and China, to increase U.S. flights to those countries. "Makes it easier for Americans to travel around the globe." The federal government, he said, has boosted flight capacity in the last seven years with "13 major airport improvement projects, including 11 new runways . . . which is going to help ease aviation congestion coast to coast." Press Release, Office of the White House, President Bush Discusses Aviation Congestion and Transportation Safety (Nov. 18, 2008), <http://georgewbush-whitehouse.archives.gov/news/releases/2008/11/20081118-1.html>.

<sup>3</sup> See, e.g., John Stark, *Port OK's \$12m for Airport Projects*, BELLINGHAM [WA] HERALD, June 18, 2008, at 3.

Part I of this article takes up the rapturous enthusiasm with which Americans<sup>4</sup> greeted aviation—"rapturous" used advisedly. This suggests something about our culture's very dangerous tendency to conflate technology, religion, and the perception of moral progress. We are driven to celebrate that which undermines our happiness and welfare. Part II (Benefits and Problems) briefly discusses the benefits of aviation, which are certainly not trivial (but, surprisingly difficult to quantify), and then takes up aviation problems: pollution of air, water, noise, the ground-based paving and destruction of natural habitat for runways, tarmacs and airport buildings, and the automobile-associated problems of airports; then considered are aviation-based spread of infectious diseases and tourism with its rampant destruction of both destination environments and organic local cultures. The subsidies commercial aviation enjoys are touched on, as are some adverse social consequences of aviation. The effect of \$100 per-barrel oil is considered. The psychological consequences of the diminishment of place inherent in aviation are discussed. Part III concludes the piece, summarizes, and points to the probable future of commercial aviation.

## I. THE CONFLATION OF THEOLOGY AND TECHNOLOGY

It is a hard fact that aviation is an unsustainable technology, that it will not be a significant feature in humans' future, and it will eventually be abandoned. It is a hard thing to accept. Why is it so hard? This section of the paper traces how the coming of aviation was received in the United States, how it still remains an enamored technology, and how understanding the allure of aviation is a means to understanding a theology of technological reception.

In the early twentieth century, optimistic speculation about the airplane's future was rampant.<sup>5</sup> This speculation was not just, or even mostly, about technical improvements. It was about the new age of social and moral improvement that the airplane would usher in.<sup>6</sup> The American public had been enthusiastic about aviation before Charles Lindbergh's famous 1927 transat-

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<sup>4</sup> But not Europeans, who understood almost immediately how airplanes posed a "dire threat to national security"; Americans had an ocean to protect them from enemies. JOSEPH J. CORN, *THE WINGED GOSPEL*, 44-45 (Oxford Univ. Press 1983).

<sup>5</sup> *Id.* at 27.

<sup>6</sup> *Id.*

lantic flight; he merely personified that enthusiasm.<sup>7</sup> “Many other fliers had been characterized as gods; other [airplanes] had been viewed as miraculous; and other flights had been thought to portend divine possibilities for humanity’s future.”<sup>8</sup>

How did theology get conflated with technology? In his 2005 apology for economic growth and capitalism, *The Moral Consequences of Economic Growth*, Harvard economics professor Benjamin M. Friedman explains it.<sup>9</sup> In chapter two, Professor Friedman appropriately locates himself in the tradition of the eighteenth-century Enlightenment. There, he says, developed “the specific idea that rising living standards [including advanced technology] cause public attitudes and political institutions to evolve in ways that improve the moral character of the society.”<sup>10</sup>

Interest in the connection between technological and moral progress was spurred in the eighteenth century by the reflection that Europeans themselves might have evolved from conditions like those of the then-contemporary, and fascinating, American Indians.<sup>11</sup> But the unstated assumption from the seventeenth through twentieth centuries was that the Indians were unintelligent and morally inferior, their lack of material goods and acephalous political structure proved it.<sup>12</sup> Vine Deloria (1933–2005) was an American Indian and a professor at the University of Colorado.<sup>13</sup> Writing about the first half of the twentieth century, Deloria observed that if “Indians realized the repressive conditions under which they lived, many simply accepted that Indians’ fortunes were supposed to be harder than whites because Indians were stupid.”<sup>14</sup> Primitive people were

<sup>7</sup> *Id.* at 26.

<sup>8</sup> *Id.*

<sup>9</sup> BENJAMIN M. FRIEDMAN, *THE MORAL CONSEQUENCES OF ECONOMIC GROWTH* 22 (2005).

<sup>10</sup> *Id.* at 22.

<sup>11</sup> *Id.* at 27.

<sup>12</sup> JERRY MANDER, *IN THE ABSENCE OF THE SACRED* 265 (1991): “From an American viewpoint, there were three problems with nearly all traditional Indian governments: 1) communal ownership of all and land and religious strictures against selling it, 2) consensual decision-making, and 3) lack of a central hierarchical authority, who had power to make binding deals.” The Indians “were slow, they were democratic, and they would never agree to give up land. So they had to go.” *Id.*

<sup>13</sup> Kirk Johnson, *Vine Deloria Jr., Champion of Indian Rights, Dies at 72*, N.Y. TIMES, Nov. 15, 2005, available at <http://www.nytimes.com/2005/11/15/national/15deloria.html>.

<sup>14</sup> VINE DELORIA, JR., *GOD IS RED: A NATIVE VIEW OF RELIGION* 7 (1994).

stupid and inferior, "advanced" people with their laws and technology were superior.<sup>15</sup> It was not just that advanced people had more material goods, they were morally superior.<sup>16</sup> Their material prowess merely demonstrated that.<sup>17</sup>

The development of the idea that rising living standards cause attitudes and institutions to evolve in ways that improve moral character was partly secular. Material change over time (Newton, Leibniz, Pascal, Halley, Hooke; the steam engine, the potato, accurate clocks) came about because of the accumulation of a "dramatic series of discoveries" that proved the value of the scientific theory and experimentation.<sup>18</sup> Adam Smith and Anne Robert Jacques Turgot both developed the theory that this progress was spurred by population increase causing economic scarcity that pushed society into stages of development from hunting-gathering through shepherding and farming to commerce.<sup>19</sup> And, Friedman says, the process "necessarily led to political and social advance,"<sup>20</sup> because shepherding, farming, and commerce require progressively more complex legal and institutional infrastructures ("whose sheep is this?").<sup>21</sup> But, this kind of progress in technological and social realms does not necessarily imply progress in moral realms.

So the development of this idea—that of a relationship between technological progress and moral progress—was also partly religious. Integral from the earliest days of Revelatory Christianity was the idea of the Millennium, "literally a thousand-year period of what amounted to the reign of heaven upon earth."<sup>22</sup> Theologians and philosophers differed over the centuries about what the Millennium meant: was it merely spiritual, physical, or metaphorical?<sup>23</sup> But, by the seventeenth century, the idea was regnant that the passage of time augured for good things, for the gradual defeat of evil and the ascendancy of good. The religious wars in Europe were mostly over; "the Protestant Reformation, while not universally triumphant, was healthy and durable;"<sup>24</sup> and religious "truth" seemed to be tak-

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<sup>15</sup> *See id.*

<sup>16</sup> *See id.* at 69.

<sup>17</sup> *See id.*

<sup>18</sup> FRIEDMAN, *supra* note 9, at 25.

<sup>19</sup> *Id.* at 27–28.

<sup>20</sup> *Id.* at 29.

<sup>21</sup> *Id.* at 27.

<sup>22</sup> *Id.* at 32.

<sup>23</sup> *Id.*

<sup>24</sup> *Id.* at 34.

ing hold. Admixed with the material advancement, then, was a coming of religious and spiritual advancement (as conceived by the victorious religious sects). This “upliftingness”—in a religious society—was understood to have been ordained by God.<sup>25</sup> It “implied an understanding of history as gradual *improvement* according to the laws of nature as viewed through science, and faith in an orderly *assent* of mankind *into* the golden age.”<sup>26</sup> Material progress—economic growth and advancement over time—and moral progress went hand in hand.<sup>27</sup> Puritanism, as Friedman points out, conjoined concepts of prosperity with religiosity.<sup>28</sup>

Our economic (and legal) system got off on the wrong foot, at just this place that Friedman discussed, when it equated economic and technological growth over time with moral progress. It is notable that the early rapturous descriptions of the railroads celebrated their “[a]nnihilation of space and time.”<sup>29</sup> The annihilation of space!

By contrast, American Indians held the land—place—to be sacred, the center of their spiritual being; place and the human role as a part of it, was all important; time was not (not important enough to annihilate). Keeping the place was the thing.<sup>30</sup> When economic growth, time, spirituality and morality are conflated, then it becomes the relentless moral duty of a society to become wealthy, and that necessarily involves exploitation of natural and human resources toward the goal of more and more expansive technology. When “progress” becomes a secular *and* religious law of history,<sup>31</sup> technology will be celebrated, and no backward, recalcitrant peoples or civilizations dare stand it its way.

A variant of manifest destiny is the propensity to judge a society or civilization by its technology and to see in society’s effort to subdue and control nature as the fulfillment of divine intent. . . . The idea of defining religious reality along temporal lines, there-

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<sup>25</sup> *Id.* at 35.

<sup>26</sup> *Id.* at 36.

<sup>27</sup> *Id.*

<sup>28</sup> *Id.* at 37.

<sup>29</sup> Wolfgang Schivelbusch, *Railroad Space and Railroad Time*, 14 NEW GERMAN CRITIQUE 31, 31 (1978).

<sup>30</sup> See DELORIA, *supra* note 14, at 148–49.

<sup>31</sup> Friedman quotes the religious historian Ernst Tuveson who concluded that “the idea that progress is the ‘law’ of history . . . was religious before it was secular.” FRIEDMAN, *supra* note 9, at 38.

fore, is to adopt the pretense that the earth simply does not matter, that human affairs alone are important.<sup>32</sup>

Thus, the early twentieth-century American panegyric enthusiasm for aviation was part of the more general conflation of technology and moral progress—what recent scholars term “technological messianism.”<sup>33</sup> But, Americans’ early attitude toward aviation had something more astral, unique to aviation. There was an association of airplanes with heaven and angels, some literal believers thought it would be a way to get to heaven. (The idea that flying is somehow divine is ancient—think of Icarus—as old as myth).<sup>34</sup> Enthusiasts “confused flight as a mode of transportation and as a spiritual accomplishment.”<sup>35</sup> They thought it would create a new transportation system “of free and untrammelled movement for everyone in three dimensions”<sup>36</sup> and they believed it would usher in a glorious new “era . . . of peace and harmony, of culture and humanity. The airplane, it seemed, would bring about a virtual millennium . . . utopia.”<sup>37</sup> This “reflected the widespread conviction, again paralleling Christian doctrine, that the airplane had irrevocably cleaved history into two epochs and pointed prophetically toward a third.”<sup>38</sup> The gospel of air-mindedness was not shared in Britain or Europe, for obvious geographic reasons,<sup>39</sup> and the childlike idea that aviation would bring about a grand new order of society was gone by 1950: “[t]he airplane had ceased to symbolize a future of unlimited individual mobility, of world peace, of enlightenment and culture, or greater democracy and equality.”<sup>40</sup>

But enthusiasm for technology, including aviation technology, certainly did not fade in the second half of the twentieth century; it became a hallmark of the optimistic post-World War II American scene.<sup>41</sup> We were told technological innovation is good. Who, over the age of forty, can forget General Electric’s motto, repeatedly invoked by its television spokesman Ronald

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<sup>32</sup> DELORIA, *supra* note 14, at 68–70.

<sup>33</sup> Thomas C. Oden, *The Death of Modernity and Postmodern Evangelical Spirituality*, in *THE CHALLENGE OF POSTMODERNISM: AN EVANGELICAL ENGAGEMENT* 24 (David S. Dockery, ed. 1995).

<sup>34</sup> CORN, *supra* note 4, at 13.

<sup>35</sup> *Id.* at 49.

<sup>36</sup> *Id.* at 31.

<sup>37</sup> *Id.* at 31–32.

<sup>38</sup> *Id.* at 31.

<sup>39</sup> *See id.* at 45.

<sup>40</sup> *Id.* at 138.

<sup>41</sup> *See* MANDER, *supra* note 12, at 22.

Reagan, "Progress Is Our Most Important Product."<sup>42</sup> Jerry Mander observes that "The 'American Way of Life' became an advertising theme; it drew an explicit equation between how much you consumed and how American you were. . . . In the 1950s, buying a washing machine was a blow against communism."<sup>43</sup> During the Christmas season of 2006, President Bush—ironically speaking from the White House's "Indian Treaty Room"—said, "I encourage you all to go shopping more."<sup>44</sup> The consumption of production has become a patriotic duty, our economy is "driven by the insatiable need to feed resources to the technological machine, and to consume them as commodities."<sup>45</sup>

It may be that people no longer believe that the airplane will usher in a second coming, but consider the Museum of Flight at Boeing Field, a few miles south of Seattle, Washington. The advertisements for the museum—heard, for example, on National Public Radio—sound like something out of the 1940s: unabashed enthusiasm abounds for the whole idea of flight. There is no suggestion at the museum, or on its elaborate website, that aviation technology is or has been anything but wonderful (even the war planes are proudly displayed as marvels of human ingenuity, no matter their enormous destructive capacity).<sup>46</sup> Jerry Mander suggests a number of reasons for such a positive view of technology (beyond the conflation of the technological and theological), which includes the point that "every technology *presents* itself in the best possible light . . . . [i]t arrives on the scene as a 'friend,' promising to solve a problem."<sup>47</sup> There are no dissenting voices, there is no "new-technology impact statement" to prognosticate the likely future consequences, there is no choice presented to the public.<sup>48</sup>

And, Mander observes, the notion persists that "technology contains no inherent political bias."<sup>49</sup> But of course it does. Elaborate technology requires big business, complex regulation, and big government with important, highly-paid people making

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<sup>42</sup> LOU CANNON, PRESIDENT REAGAN: THE ROLE OF A LIFETIME 452 (2000).

<sup>43</sup> MANDER, *supra* note 12, at 22.

<sup>44</sup> Press Conference, George W. Bush (Dec. 20, 2006), *available at* <http://georgewbush-whitehouse.archives.gov/news/releases/2006/12/20061220-1.html>.

<sup>45</sup> MANDER, *supra* note 12, at 24.

<sup>46</sup> Exhibits: The Museum of Flight, <http://www.museumofflight.org/exhibits> (last visited July 7, 2009).

<sup>47</sup> MANDER, *supra* note 12, at 34.

<sup>48</sup> *See id.* at 34–35.

<sup>49</sup> *Id.* at 35.



important decisions that affect tens of thousands, or millions, of people. The captains of technological industries are highly respected in our society and they have a great deal of political influence. It is not for nothing that Washington State Senator Patty Murray has taken on the moniker “the senator from Boeing” (a phrase formerly associated with the late Senator Henry Jackson), so influential is the company in her economic advocacy,<sup>50</sup> and John Kenneth Galbraith observed that “the individual with the greatest stake in the present economic goals is . . . the important business executive.”<sup>51</sup> The important airline executives oversee the image and marketing of their firms, and they certainly have no interest in telling the public the truth about aviation’s manifold adverse effects or its fundamental unsustainability.

## II. THE BENEFITS AND PROBLEMS OF COMMERCIAL AVIATION

### A. THE BENEFITS OF AVIATION

#### 1. *The Economic Benefits*

This cursory section summarizes data reported by Robert Caves in his “The Social and Economic Benefits of Aviation”<sup>52</sup> (part of a series of essays in *Towards Sustainable Aviation*). The benefits are, most obviously, claimed to be in “job creation and economic growth.” Secondary benefits are “positive social consequences in terms of enhanced opportunities and choices.”<sup>53</sup> All of these benefits—among them that air travel saves time, cost, and risk of accident—must be compared to alternative modes,<sup>54</sup> and the benefit is the difference between the utility of air travel and the next most convenient mode of travel.

The economic benefits are the direct, indirect, and induced effects (or impacts). Caves cites the Airports Council International in Europe which calculated “that between 350 and 1500

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<sup>50</sup> “Remember when Washington’s U.S. Sen. Henry Jackson was called ‘the senator from Boeing?’ Now the state’s senior senator, Patty Murray, is doing her best to show she deserves to inherit the role from the legendary Scoop [Jackson].” Editorial, TACOMA NEWS TRIB., Mar. 6, 2008, <http://www.thenewstribune.com/opinion/story/301706.html>.

<sup>51</sup> JOHN KENNETH GALBRAITH, *THE AFFLUENT SOCIETY* 132 (Houghton Mifflin Co. 1998) (1958).

<sup>52</sup> Robert Caves, *The Social and Economic Benefits of Aviation*, in *TOWARDS SUSTAINABLE AVIATION* 36 (Paul Upham et al. eds., 2003).

<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

jobs are created at an airport site per million passengers per annum (mppa), the total employment being between 920 and 5130 per mppa.”<sup>55</sup> “[I]t has been estimated that the Chicago airport system adds between 420000 [sic] and 510000 [sic] jobs to the local economy, and that an international passenger adds US\$2310—over five times that of a domestic connecting passenger.”<sup>56</sup> Employment is mostly from the indirect and induced effects, such as jobs for taxi drivers, utilities providers, and deliveries to support the airport and airplanes.<sup>57</sup>

The measurement attempts to account for the *additional* economic stimulus created by aviation over and above that which would exist without access to aviation. However, any such analysis is subject to criticism, it “lack[s] . . . conviction[,]” and the data measurement has “limited relevance” to inform the question whether aviation really boosts the economy.<sup>58</sup> First, “all other sectors of the economy could claim corresponding indirect and induced effects.”<sup>59</sup> Second, it seems hardly reasonable that if there were no commercial aviation, people would simply stuff the money that would have been spent on air travel under a mattress.<sup>60</sup> “Third, there is the way in which the indirect effects and multiplier effects can easily be double-counted.”<sup>61</sup> Also, insofar as vacation travelers would, in the absence of airplanes, stay home to spend their money, there is some negative effect on the economy.<sup>62</sup> It seems more apparent that business parks near airports that cater to high value-to-weight items (for example, electronics, pharmaceuticals, information technology) and high-contact personnel do generate economic activity that would not exist without the airport, so “the introduction of new air service may generate new economic clusters, and overall national productivity may improve. . . . There may also be benefits from a redistribution of economic activity[,]”<sup>63</sup> (for example, the “conversion of a run-down coal mining economy into a ski resort” in Colorado.)<sup>64</sup>

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<sup>55</sup> *Id.* at 39.

<sup>56</sup> *Id.*

<sup>57</sup> *Id.*

<sup>58</sup> *Id.* at 41.

<sup>59</sup> *Id.* at 40.

<sup>60</sup> *See id.*

<sup>61</sup> *Id.* at 40.

<sup>62</sup> *See id.* at 40.

<sup>63</sup> *Id.* at 42.

<sup>64</sup> *Id.* at 41.

## 2. "Love Miles"

"Love miles" is the term that George Monbiot uses to describe airplane travel to visit family and friends.<sup>65</sup> Surely it must be a good thing to attend your niece's wedding in Barcelona. It is good only if you pay no attention to getting there and getting back again. Travelers flying to see loved ones may appreciate aviation (if not the airport and airplane experience), but affected communities mostly do not. Any benefits must be weighed against the indisputable fact that "[t]he national need [for aviation] is generally not accepted by the local communities, the local effects are mostly negative[,] "<sup>66</sup> and the effects on the ecosystem are very bad.

### B. THE PROBLEMS OF COMMERCIAL AVIATION

#### 1. Air Pollution

Airplanes produce a great deal of pollution. "[P]er mile, powering a jet uses almost as much energy, and emits almost as much climate-changing carbon dioxide, as each passenger would use driving alone in an average car."<sup>67</sup> The principal aircraft emissions are water vapor (the most common greenhouse gas), carbon, nitrogen, and sulphur dioxides; secondary pollutants created by reactions in the atmosphere include tropospheric ozone.<sup>68</sup> The gases come from burning aviation fuel (kerosene).<sup>69</sup> Currently, aviation is directly responsible for about 3.5% of man-made greenhouse gases, about 13% of transport-derived carbon dioxide, and about 2% of total man-made carbon dioxide emissions.<sup>70</sup> Carbon dioxide is a matter of particular concern regarding global climate change because it resides "in the atmosphere for hundreds of years."<sup>71</sup> Insofar as these greenhouse gases are injected at high altitudes, they are "three times more damaging in terms of climate change than if

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<sup>65</sup> GEORGE MONBIOT, *HEAT: HOW TO STOP THE PLANET FROM BURNING* 177 (2007).

<sup>66</sup> Caves, *supra* note 52, at 43.

<sup>67</sup> Press Release, Sightline Institute, *Air Travel Heats Up The Planet; How Does Flight Compare To Traveling By Bus, Train, Or Car?* (Aug. 1, 2004), *available at* [http://www.sightline.org/research/energy/res\\_pubs/rel\\_air\\_travel\\_aug04](http://www.sightline.org/research/energy/res_pubs/rel_air_travel_aug04).

<sup>68</sup> JOHN WHITELEGG & HOWARD CAMBRIDGE, *AVIATION AND SUSTAINABILITY* 19 (2004), *available at* <http://www.sei.se/editable/pages/sections/implement/SEI-Aviation-Report.pdf>.

<sup>69</sup> *Id.* at 19.

<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

they had been emitted at ground level.”<sup>72</sup> Water vapor, formed as a by-product of kerosene combustion, condenses at high altitudes to form contrails, which influence the formation of cirrus clouds.<sup>73</sup> Cloud cover tends to help cool the globe and negate the effects of global warming, but it appears that “thin cirrus clouds are heat trappers, holding in more heat than they reflect back into space.”<sup>74</sup>

Tropospheric ozone (O<sub>3</sub>) forms near the earth’s surface in the presence of sunlight and emissions from burning fossil fuels (among other things); it is odorless and colorless.<sup>75</sup> In the stratosphere, ozone protects the earth from harmful radiation, but high concentrations of ozone near ground level are harmful to people, animals, crops, and other materials.<sup>76</sup> Ozone—contained in smog—irritates the respiratory system and throat, induces coughing, and can grip the chest.<sup>77</sup> Ozone can aggravate asthma, and inflame and damage cells that line the lungs. It can also aggravate chronic lung diseases such as emphysema and bronchitis and reduce the immune system’s ability to fight off bacterial infections in the respiratory system; it can also cause permanent lung damage.<sup>78</sup> These effects can be worse in children and exercising adults.<sup>79</sup> It is difficult to segregate the amount of O<sub>3</sub> emitted from airplanes from that emitted by heavy city traffic.<sup>80</sup>

Aircraft use the most fuel during take-off and landing; shorter journeys increase the ratio of fuel used per mile traveled.<sup>81</sup> Three-quarters of all flight routes in Europe and North America are less than 1,200 miles, while the most fuel-efficient flight dis-

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<sup>72</sup> *Id.* at 5.

<sup>73</sup> The Ozone Hole, Air Traffic: Contributing to Climate Change and Ozone Destruction, <http://www.theozonehole.com/airtraffic.htm> (last visited Aug. 15, 2009). The Ozone Hole website notes, “‘The Ozone Hole’ website won a 2006 Environmental Protection Agency Stratospheric Ozone Protection Award which was presented May 17, 2006, in Washington, D.C.” <http://www.theozonehole.com/aboutus.htm>. *Id.*

<sup>74</sup> *Id.*

<sup>75</sup> Tropospheric Ozone Tutorial, <http://capita.wustl.edu/capita/capitareports/globeO3/WhatOzone.htm> (last visited Aug. 15, 2009).

<sup>76</sup> *Id.* at <http://capita.wustl.edu/capita/capitareports/globeO3/GoodBad.htm> (last visited Aug. 15, 2009).

<sup>77</sup> *Id.* at <http://capita.wustl.edu/capita/capitareports/globeO3/WhyBad.htm> (last visited Aug. 15, 2009).

<sup>78</sup> *Id.*

<sup>79</sup> *Id.*

<sup>80</sup> WHITELEGG & CAMBRIDGE, *supra* note 68, at 19.

<sup>81</sup> *Id.* at 17.

tance is about 2,700 miles.<sup>82</sup> Very long-distance travel (from North America to Australia, for example) requires airplanes to “carry vast amounts of fuel making them heavier and so a disproportionate amount is used just to take-off.”<sup>83</sup> Ideally, then, alternatives to air travel should be promoted for short hauls (railroad, probably), and long-haul flights should be avoided or taxed to discourage them.

Concern about aircraft-caused greenhouse gases focuses not only on the present emissions, but more especially about the future, because projected growth rates in aviation are very large. The expansive predictions are that available seat miles will increase by 250% between 2002 and 2022; the number of departures is expected to increase by 198%, and the number of aircraft by 190%.<sup>84</sup> The British Airports Authority predicts that the number of passengers using British airports will triple from 2003 to 2030.<sup>85</sup> Freight transport is also predicted to increase. The International Air Transport Association forecasts that freight traffic will increase at an average annual rate of 4.8%, “down slightly from growth of 4.6% seen in 2006 and much lower than the 7–8% growth trend of recent years.”<sup>86</sup> At a growth rate of 4.8%, the international air freight trade would double—exponentially—about every 14.5 years.<sup>87</sup> Aviation fuel consumption is expected to increase from approximately 63 billion gallons a year in 2000 to about 92.3 billion gallons a year in 2015 (253 million gallons a day).<sup>88</sup>

Atmospheric pollution is not the only concern. Airports themselves generate many emissions, from taxiing planes, on-ground equipment (towing, baggage-handling, maintenance and repair, re-fueling, food service vehicles) and, of course, from the tens of thousands of automobiles and trucks that come

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<sup>82</sup> *Id.* at 17–18.

<sup>83</sup> *Id.* at 18.

<sup>84</sup> *Id.* at 9.

<sup>85</sup> Michael Meacher, *The False Arguments for Airport Expansion*, FINANCIAL TIMES, Nov. 10, 2003, at 21, available at <http://search.ft.com>.

<sup>86</sup> IATA, Strong 2007 Traffic Growth Set to Slow—Credit Crunch, Oil Prices To Dampen Demand (Jan. 31, 2008), available at <http://www.iata.org/press-room/pr/2008-01-31-01>.

<sup>87</sup> E. KWAN CHOI, THE RULE OF SEVENTY, <http://www.econ.iastate.edu/classes/econ355/choi/Rule70.pdf>. “This rule is often used to approximate the time required for a growing series to double.” *Id.* Divide the growth rate of the thing in issue, by percentage, into seventy; the result is the amount of time it will take for that thing to double. *Id.*

<sup>88</sup> WHITELEGG & CAMBRIDGE, *supra* note 68, at 10.

into the airport area for passengers, employees, and maintenance operations. All of these operations create worrisome pollution that damages the environment.<sup>89</sup> “[T]he demand for [airport] parking is currently a major concern because of traffic congestion and the effects of increased emissions on air quality.”<sup>90</sup>

This is not to suggest that the airline industry is unaware of the problem, or that it has done nothing to address it. As the British Airports Authority observes,<sup>91</sup> airplanes have become much more fuel efficient in the last thirty years, and manufacturers continue to make improvements; Boeing’s “Dreamliner” is touted by its manufacturer as providing “airlines with unmatched fuel efficiency, resulting in exceptional environmental performance. The airplane will use 20 percent less fuel for comparable missions than today’s similarly sized airplane.”<sup>92</sup> Speaking in the summer of 2006, James May, Air Transport Association president and CEO noted, “[f]or the airline industry, the way forward is to continue to improve fuel efficiency, which directly reduces greenhouse gas emissions. U.S. carriers have made great strides in improving average fuel efficiency by 44 percent since 1990.”<sup>93</sup> For on-the-ground pollution, carriers have experimented with changes in taxiing—using only one engine<sup>94</sup>—and some large airports provide electricity and pre-conditioned air at gates, reducing the need for on-board, kerosene-fired generators.<sup>95</sup>

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<sup>89</sup> U.S. GEN. ACCOUNTING OFFICE, AVIATION AND THE ENVIRONMENT: AIRPORT OPERATIONS AND FUTURE GROWTH PRESENT ENVIRONMENTAL CHALLENGES 50 (Aug. 2000), *available at* <http://www.gao.gov/archive/2000/rc00153.pdf> [hereinafter GAO].

<sup>90</sup> *Id.* at 51.

<sup>91</sup> BRITISH AVIATION ADMINISTRATION, AVIATION AND CLIMATE CHANGE (2006), *available at* <http://www.baa.com/assets/B2CPortal/Static%20Files/05Aviation-ClimChange.pdf>.

<sup>92</sup> Boeing Aircraft Company, Boeing 787 Dreamliner Will Provide New Solutions for Airlines, Passengers, <http://www.boeing.com/commercial/787family/background.html> (last visited June 26, 2009).

<sup>93</sup> Jay Boehmer, *Virgin Leading Effort To Reduce CO2 Emissions*, BUS. TRAVEL NEWS ONLINE, Oct. 9, 2006, [http://www.btnonline.com/businesstravelnews/headlines/frontpage\\_display.jsp?vnu\\_content\\_id=1003221668](http://www.btnonline.com/businesstravelnews/headlines/frontpage_display.jsp?vnu_content_id=1003221668).

<sup>94</sup> David Holzman, *Plane Pollution*, 105-12 ENVTL. HEALTH PERSPECTIVES, 1302 (Dec. 1997), *available at* <http://www.ehponline.org/docs/1997/105-12/focus-abs.html>.

<sup>95</sup> State Environmental Resource Center, Airport Air Pollution State Activity Page, <http://www.serconline.org/airportAirPollution.html> (last visited June 26, 2009).

While the industry has responded to concerns about airplane-related emissions, a major problem is that "its growth is outstripping the efficiency improvements in technology."<sup>96</sup> Kerosene is the jet aircraft fuel of choice. It is widely available, portable, storable and—historically—relatively inexpensive.<sup>97</sup> It is not only used as a fuel, but to absorb heat to cool engine oil and the airframe; it lubricates the fuel pump and fuel metering components.<sup>98</sup> Jet aircraft design is based on the planes' use of kerosene; given an expected service life of fifteen to thirty years,<sup>99</sup> even if aircraft that run on alternative fuels could be designed and manufactured very quickly (not feasible), large numbers of kerosene-fuel airplanes will be in service for decades.<sup>100</sup>

Developing alternative, less polluting fuels is, "at the laboratory stage[,] a long and expensive process. A business case for such investment is troublesome when there is no demand or regulatory support."<sup>101</sup> Also troublesome is the development of production capacity for industrial volumes, the requirement for a change in engine specifications with a long design/build/test production cycle, and the corrosiveness of non-kerosene fuel (bio-jet), with implications for maintenance, repair, and overhead.<sup>102</sup> However, turboprop or turbofan engines—used for short-haul and commuter airplanes—can run on alternative fuels, and may be useful if the planes have sufficient fuel capacity to carry a cheaper fuel with lower energy content.<sup>103</sup> "They may use such fuel if its cost per BTU undersells fossil aviation fuel."<sup>104</sup>

In any event, airplane-related emissions are a major problem, and—if the industry grows as prognosticated—the problems will get worse. The Intergovernmental Panel on Climate Change

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<sup>96</sup> Christopher Smith, *Aviation and Oil Depletion*, THE OIL DRUM EUROPE, Dec. 19, 2006, <http://europe.theoil Drum.com/story/2006/12/11/45514/799>.

<sup>97</sup> *Id.*

<sup>98</sup> *Id.*

<sup>99</sup> Airplane life expectancy depends on the number pressurization cycles which cause stress on rivets and connectors; the expectancy is up to 30 years. Rebecca Maksud, *What Determines an Airplane's Lifespan?*, AIR & SPACE MAG., Mar. 1, 2008, available at <http://www.airspacemag.com/need-to-know/NEED-lifecycles.html>.

<sup>100</sup> *See id.*

<sup>101</sup> DELOITTE, EXECUTIVE BITES, AVIATION AND SUSTAINABILITY 4 (July 2008), [http://www.deloitte.com/dtt/cda/doc/content/Aviation%20and%20Sustainability\\_Jul08.pdf](http://www.deloitte.com/dtt/cda/doc/content/Aviation%20and%20Sustainability_Jul08.pdf).

<sup>102</sup> *Id.*

<sup>103</sup> *See* Harry Valentine, *Alternatives in Aviation After Peak Oil*, AIRLINERS.NET, Oct. 9, 2006, <http://www.airliners.net/aviation-articles/read.main?id=98>.

<sup>104</sup> *Id.*

put it this way, “[t]he growth in aviation and the need to address climate change cannot be reconciled.”<sup>105</sup> Also problematic, however, is *regulation* of emissions.

In the United States, aircraft emissions are not subject to state regulation. Section 7573 of the Clear Air Act preempts states and political subdivisions from “adopt[ing] or attempt[ing] to enforce any standard respecting emissions of any air pollution from any aircraft or engine thereof unless such standard is identical to standard” established by the Environmental Protection Agency (EPA).<sup>106</sup> In March 2008, the Air Transport Association (ATA) offered comments on the Western Climate Initiative’s<sup>107</sup> draft program scope recommendations.<sup>108</sup> The ATA observed that state and local governments are forbidden from attempting “to circumvent Congressional intent, either directly or indirectly, by imposing regulatory restrictions on aviation, including measures designed to limit emissions.”<sup>109</sup> The ATA went on, “[f]ederal aviation law also independently preempts state or local agencies from regulating aviation-related fuel, aircraft emissions, and aircraft emission control technologies.”<sup>110</sup> It is, of course, understandable that aircraft traveling interstate should not be subjected to a plethora of uncoordinated state or local regulations. As to federal regulation, participants at an October 2004 technical review subcommittee of the EPA’s Clean Air Act Advisory Committee observed: “Control of aircraft emissions is less aggressive than other programs. There are no technology-

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<sup>105</sup> Bryan Walsh, *Greenhouse Airlines*, TIME, Feb. 12, 2007, at 61. The IPCC is a scientific intergovernmental body set up by the World Meteorological Organization and by the United Nations Environment Program. Intergovernmental Panel on Climate Change, <http://www.ipcc.ch/organization/organization.htm> (last visited Aug. 15, 2009).

<sup>106</sup> 42 U.S.C. § 7573 (2000).

<sup>107</sup> “The WCI began in February 2007 when the Governors of Arizona, California, New Mexico, Oregon and Washington signed an agreement directing their respective states to develop a regional target for reducing greenhouse gas emissions, participate in a multi-state registry to track and manage greenhouse gas emissions in the region, and develop a market-based program to reach the target.” Western Climate Initiative History, <http://www.westernclimateinitiative.org/history> (last visited Aug. 15, 2009).

<sup>108</sup> Email from Tim Pohle, Managing Director, U.S. Env’tl. Affairs & Assistant Gen. Counsel, to Michael Gibbs, Leader of Scope Subcomm. (Mar. 17, 2008) (on file with author).

<sup>109</sup> *Id.*

<sup>110</sup> *Id.*



forcing regulations to date, and no move towards stricter standards. Aircraft emissions can have a significant local impact.”<sup>111</sup>

Federal regulation of aircraft emissions is permissible, but the United States appears reluctant to address the issue very aggressively (as noted above), and internationally the British Airports Authority makes the following observation regarding emission control on international air traffic:

Emissions from energy use by airports and from domestic air travel are already included in the Kyoto Protocol. However, due to the difficulty in reaching agreement on how to allocate emissions generated by aircraft traveling between countries, international aviation was excluded from the first round of Kyoto, and governments agreed to work through the International Civil Aviation Organisation to limit or reduce emissions from aviation.<sup>112</sup>

That is, emissions from international aviation are specifically excluded from the targets agreed under the Kyoto Protocol.

Specifically regarding taxation of aircraft fuel as a means to regulate air travel, at least internationally, it is notable that aviation fuel consumed by airplanes engaged in international transport is exempt from federal or local taxation. Article 24 of the Convention on International Civil Aviation at Chicago has been interpreted to forbid such taxation.<sup>113</sup>

## 2. Noise Pollution

Interestingly, it is not aircraft emissions that are currently the greatest concern about airplanes' effect on the environment; it is noise pollution. According to the General Accounting Office

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<sup>111</sup> EPA, CLEAN AIR ACT ADVISORY COMMITTEE, MOBILE SOURCES TECHNICAL REVIEW SUBCOMMITTEE, Minutes of the Subcommittee's Meeting on October 4, 2004, 8 (2004), [http://www.epa.gov/airprogm/oar/caaac/mstrs/minutes\\_MS\\_TRS\\_100404.pdf](http://www.epa.gov/airprogm/oar/caaac/mstrs/minutes_MS_TRS_100404.pdf).

<sup>112</sup> BRITISH AVIATION ADMINISTRATION, AVIATION AND CLIMATE CHANGE, *supra* note 91, at 1.

<sup>113</sup> Convention on International Civil Aviation, Chicago, Dec. 7, 1944, Article 24, 61 Stat 1180, *available at* [http://avisupser.dgrsolutions.com/airlaws/chicago1944\\_e.html](http://avisupser.dgrsolutions.com/airlaws/chicago1944_e.html).

“Customs duty (a) . . . Fuel, lubricating oils, spare parts, regular equipment and aircraft stores on board an aircraft . . . on arrival in the territory of another . . . State and retained on board on leaving the territory of that State shall be exempt from . . . dut[ies], . . . fees or similar national or local duties and charges.”

*Id.* In accord, Arizona Revised Statutes 42-5354 exempts from jet fuel excise and use tax “jet fuel which is sold in this state to commercial airlines and used on flights which originate in this state and whose first outbound destination is outside the United States.” ARIZ. REV. STAT. ANN. § 42-5354 (2006).

(GAO), "the noise from aircraft engines is the most significant environmental concern facing airports now and in the future. . . . FAA and EPA officials . . . concurred that noise issues are currently the most serious environmental problems facing airports."<sup>114</sup> The problem with aircraft noise is that it drives some people crazy. Arline L. Bronzaft, along with others, wrote a paper in 1998 titled "Aircraft Noise: A Potential Health Hazard." The following is the paper's abstract:

A questionnaire distributed to two groups, one living within the flight pattern of a major airport and the other in a nonflight area, sought to determine whether these groups would respond differently to questions pertaining to noise, health perception, and quality of life issues. Nearly 70% of the residents living within the flight corridors reported themselves bothered by aircraft noise. Aircraft noise, in contrast to other bothersome noises, interfered more frequently with daily activities. Subjects who were bothered by aircraft noise were more likely to complain of sleep difficulties and more likely to perceive themselves to be in poorer health. The study's finding of a possible relationship between noise and adverse health effects might encourage policy makers to enact pending antinoise legislation and to fund further noise research.<sup>115</sup>

There are numerous studies linking aircraft noise to loss of sleep, abnormal heart rate patterns, and impaired immune system functioning. Children who live near airports suffer increased heart rates, higher levels of stress, and "cognitive effects such as problems with reading, attention span and memory function, and recall and stress annoyance."<sup>116</sup>

As is the case with emissions, aircraft manufacturers and airports are very aware of the problems caused by aircraft noise.<sup>117</sup> Airline officials told GAO researchers that they were

concerned about noise issues and take them very seriously. However, those officials said that the cost of purchasing new aircraft . . . prohibits them from replacing their fleets as the only means of meeting the current noise standards. . . . Therefore, a more economically feasible alternative . . . is to fit older aircraft with hushkits. Additionally, . . . modifications to aircraft to reduce

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<sup>114</sup> GAO, *supra* note 89, at 30–31.

<sup>115</sup> Abstract, Arline L. Bronzaft, et al., *Aircraft Noise: A Potential Health Hazard*, 30 ENV'T & BEHAV. 101 (1998), available at <http://eab.sagepub.com/cgi/content/abstract/30/1/101>.

<sup>116</sup> WHITELEGG & CAMBRIDGE, *supra* note 68, at 23.

<sup>117</sup> *Id.* at 23–24.

noise may add to the weight of an aircraft, and, in turn, cause it to burn more fuel—resulting in higher pollutant emissions.<sup>118</sup>

Noise restrictions cause flight paths, arrival paths, and departure paths to change, often making such paths longer, increasing fuel consumption.<sup>119</sup>

In short, there is an inverse relationship between quiet planes and fuel efficiency, and, moreover, as airports expand and residents move toward airports, the conflict between noise and neighbors is exacerbated.<sup>120</sup> Quieter airplanes will come on line, but—again—if major changes in aircraft design to combat noise were available immediately, it would take decades before the new planes could be constructed and put into wide service. And even if various measures are taken to reduce aircraft noise, “unless the overall number of flights is reduced through other demand management approaches, they will largely be negated.”<sup>121</sup>

### 3. *Water Pollution*

Containing runoff from airports is another environmental problem. The problem here is primarily—in northern climates—from deicing operations. “To remove and prevent the buildup of ice and snow that would inhibit taxiing, takeoff, and landing, airports may apply deicing and anti-icing chemicals to paved surfaces such as runways and taxiways. Similarly, airlines may apply deicing and anti-icing chemicals to aircraft to help ensure the safety of operations.”<sup>122</sup>

The impact of deicing fluids on the environment is most notably related to the high oxygen demand they exert when released to

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<sup>118</sup> GAO, *supra* note 89, at 32.

<sup>119</sup> U.N. Intergovernmental Panel on Climate Change, Aviation and the Global Atmosphere, *Other Operational Factors to Reduce Emissions*, § 8.3.1.5 (1999), available at <http://www.grida.no/Climate/ipcc/aviation/124.htm>.

<sup>120</sup> The struggle to get a third runway at Seattle-Tacoma International went on for years. The Port of Seattle said it needed the \$1 billion runway “to reduce delays during poor weather,” but since its opening in November 2008 “planes have been landing there whether it’s cloudy or clear”; outraged neighbors felt duped and they “immediately complained about planes flying overhead all day, every day. ‘It feels like we’re in a war zone,’ said one resident, ‘It feels like bombers going overhead every five minutes at low altitudes.’” Sharon Pian Chan, *Sea-Tac Neighbors Feel Duped Over 3rd-Runway Noise*, SEATTLE TIMES, Dec. 11, 2008, available at [http://seattletimes.nwsources.com/html/localnews/2008493979\\_runway11m.html](http://seattletimes.nwsources.com/html/localnews/2008493979_runway11m.html).

<sup>121</sup> WHITELEGG & CAMBRIDGE, *supra* note 68, at 24.

<sup>122</sup> GAO, *supra* note 89, at 45.

rivers and streams. A large slug of glycol can quickly deplete the dissolved oxygen in receiving waters, thereby killing fish and other organisms that need aerobic environments. Removal of these "loads" prior to discharge is the primary basis for the use of wastewater treatment plants throughout the world. As a reference, typical household wastewater has a biological oxygen demand (BOD) of around 200 milligrams per liter (mg/l), while some discharges from airports have measured more than 100 times stronger than that at 22,000 mg/l, according to the EPA's 2000 Preliminary Data Summary on Airport Deicing Operations.<sup>123</sup>

The usual concern with deicing chemicals involve their de-oxygenizing effects, but they have other consequences, too, including fish kills, algae blooms, and contamination to surface and ground waters.<sup>124</sup> However, a recent investigation suggests other contamination problems not directly related to glycol:

Characterization of the effects of aircraft deicer and anti-icer fluid (ADAF) runoff on aquatic organisms in receiving streams is a complex issue because the identities of numerous toxic additives are proprietary and not publicly available. Most potentially toxic and endocrine disrupting effects caused by ADAF are due to the numerous additive package ingredients which vary among manufacturers and types of ADAF formulation.<sup>125</sup>

There are some options for deicing runways. There are less-polluting deicers than glycol-based chemicals, and about 40% of the glycol can be recovered and recycled; the disposition of the other 60% is less clear.<sup>126</sup> But, in any case, water-discharge permits are required from the EPA or from a state authorized to issue permits under the Clean Water Act.<sup>127</sup>

The deicing of planes is more problematic because the carriers themselves do it, rather than the airport authority, but the runoff is the responsibility of the airport. The EPA estimates that airports discharge approximately twenty-one million gallons

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<sup>123</sup> Mark O. Liner, *Cold-weather Contaminates*, CIV. ENGINEERING NEWS, Mar. 30, 2007, <http://www.cenews.com/article.asp?id=1688>.

<sup>124</sup> LINDA LUTHER, CONGRESSIONAL RESEARCH SERV., ENVIRONMENTAL IMPACTS OF AIRPORT OPERATIONS, MAINTENANCE, AND EXPANSION CRS-7 (2007), <http://www.fas.org/sgp/crs/misc/RL33949.pdf>.

<sup>125</sup> Steven Corsi, et al., *Aquatic Toxicity of Nine Aircraft Deicer and Anti-Icer Formulations and Relative Toxicity of Additive Package Ingredients Alkylphenol Ethoxylates and 4,5-Methyl-1H-benzotriazoles*, 40 ENVTL. SCI. AND TECH. 7,409, 7,409 (2006), available at <http://pubs.acs.org/doi/abs/10.1021/es0603608>.

<sup>126</sup> Liner, *supra* note 123.

<sup>127</sup> *Id.*

of aircraft deicing fluids each year.<sup>128</sup> After deicing operations, the environmental water-quality concerns include fuel spills.<sup>129</sup> Other pollutants come from ground-based vehicles, plane-washing operations, and the usual problems caused by large areas of impermeable surface, any of which can have significant effects on water pollution, especially at large airports; Dallas-Fort Worth International Airport is over 18,000 acres—more than twenty-nine square miles, larger than Manhattan (7,200 acres of the airport “remain[ ] undeveloped”)—and it has 28,000 parking places.<sup>130</sup>

Wastewater discharge is heavily polluted—such as what comes from deicing. Storm water discharge is generated by runoff over surface areas; if those surface areas are contaminated, the discharged water is polluted, but it is less concentrated than wastewater.<sup>131</sup> To capture these waters, airport engineers may construct containment ponds, lagoons, or underground vaults; large airports produce huge amounts of runoff—many thousands of gallons during a rainfall.<sup>132</sup> While such containment systems buffer peak flows, they do not take the first flush of pollution out of the flow.<sup>133</sup> For that, further “quality-control volumes” must be engineered into the system.<sup>134</sup> The competition between wastewater disposal and storm water disposal is difficult for airport engineers; it “leaves each fighting for storage volume that is difficult to accommodate on site.”<sup>135</sup>

There are four ways to address airport-related water pollution: 1) source reduction, 2) containment, 3) water treatment, and 4) disposal.<sup>136</sup> Source reduction and water treatment actually “solve” the problem (depending upon how, with what, and how much treatment occurs), but containment ponds and vaults, vacuum sweeper trucks, sanitary sewer systems, and “other dedicated drainage systems” which are used to collect polluted water

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<sup>128</sup> EPA, OFFICE OF WATER, PRELIMINARY DATA SUMMARY: AIRPORT DEICING OPERATIONS (REVISED) (Aug. 2000), *available at* <http://www.epa.gov/waterscience/guide/airport/airport.pdf>.

<sup>129</sup> GAO, *supra* note 89, at 47.

<sup>130</sup> Ken Capps, DFW International Airport Celebrates 30th Anniversary of First Flight (Jan. 14, 2004), *available at* <http://www.dfairport.com/mediasite/pdf/04/01/30years-011404.pdf>.

<sup>131</sup> LUTHER, *supra* note 124, at 6 n.14.

<sup>132</sup> Liner, *supra* note 123.

<sup>133</sup> *Id.*

<sup>134</sup> *Id.*

<sup>135</sup> *Id.*

<sup>136</sup> *Id.*

do no more than gather it in one place.<sup>137</sup> They do not dispose of it.

Aviation's water pollution problems are easier to solve than its air pollution problems, but—again—the prognosticated increase in air travel and freight and the expense of engineering to address water pollution makes the matter problematic.

#### 4. *Disease*

Although it is not as easily measured by civil engineers and pollution control authorities, a second major area of concern about air travel is its propensity to spread disease. In 2007 the World Health Organization reported on global public health, noting:

Today's highly mobile, interdependent and interconnected world provides myriad opportunities for the rapid spread of infectious diseases . . . which is why updated and expanded Regulations are necessary. Infectious diseases are now spreading geographically much faster than at any time in history. It is estimated that 2.1 billion airline passengers travelled in 2006; an outbreak or epidemic in any one part of the world is only a few hours away from becoming an imminent threat somewhere else.<sup>138</sup>

Infamous diseases like cholera, yellow fever, and epidemic meningococcal diseases reappeared in the last quarter of the twentieth century; Severe Acute Respiratory Syndrome (SARS) and avian influenza in humans have been news items in the last several years.<sup>139</sup> The diseases caused great suffering and imposed enormous economic damage.<sup>140</sup> "Other emerging viral diseases such as Ebola, Marburg hemorrhagic fever and Nipah virus pose threats to global public health security and also require containment at their source due to their acute nature and resulting illness and mortality."<sup>141</sup> Drs. Mark Gendreau (at the Lahey Clinic Medical Centre, in Massachusetts) and Alexandra Mangili reviewed data from studies looking at the transmission of diseases during commercial air travel:

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<sup>137</sup> GAO, *supra* note 89, at 48.

<sup>138</sup> World Health Organization, *World Health Report 2007: A Safer Future – Global Public Health Security in the 21st Century* (2007), available at <http://www.who.int/whr/2007/overview/en/index1.html>.

<sup>139</sup> *Id.*

<sup>140</sup> *Id.*

<sup>141</sup> *Id.*

Because of the increasing ease and affordability of air travel and mobility of people, airborne, food-borne, vector-borne, and zoonotic infectious diseases transmitted during commercial air travel are an important public health issue. Heightened fear of bioterrorism agents has caused health officials to re-examine the potential of these agents to be spread by air travel. The [SARS] outbreak of 2002 showed how air travel can have an important role in the rapid spread of newly emerging infections and could potentially even start pandemics.<sup>142</sup>

Some of the interest in the air-travel spread of disease was piqued when an unintended medical experiment was conducted in 2001; the post-September 11 flight ban was a “natural experiment on the effect of flight restrictions on disease spread,” said John S. Brownstein of the Children’s Hospital Boston Informatics Program at the Harvard-MIT Division of Health Sciences and Technology.<sup>143</sup> During the course of a routine analysis of flu data, covering the years 1996 to 2005, the researchers discovered that in the United States the peak for flu deaths is—remarkably—almost always on February 17.<sup>144</sup> But in 2001–02 the peak was not until March 2, and the time the disease took to spread was sixteen days, instead of the usually eight to eleven days.<sup>145</sup> When the researchers examined European data—where there was no reduction in air travel in 2001—the flu timing was unchanged from previous years.<sup>146</sup>

The ease with which air travel promotes immigration presents problems too: twelve years ago, Ann Marie Kimball and Jonathan D. Mayer, commenting on the increase of certain diseases in King County (the greater Seattle, Washington area) noted that immigration from Asia had increased, and that more than 70% of the tuberculosis cases in King County occurred among the foreign born, and most cases of drug-resistant TB occurred in this group.<sup>147</sup>

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<sup>142</sup> Alexandra Mangili & Mark A. Gendreau, *Transmission Of Infectious Diseases During Commercial Air Travel*, 365 LANCET 989 (Mar. 12, 2005).

<sup>143</sup> Press Release, Children’s Hospital Boston, A Public Health Lesson from 9/11: To Curb the Flu, Limit Flights (Sept. 11, 2006), <http://www.childrenshospital.org/newsroom/Site1339/mainpageS1339P1sublevel232.html>.

<sup>144</sup> *Id.*

<sup>145</sup> Rick Weiss, *Post-9/11 Drop in Air Travel Delayed Flu Season, Study Finds*, WASH. POST, Sept. 12, 2006, at A5.

<sup>146</sup> *Id.*

<sup>147</sup> Ann Marie Kimball & Jonathan D. Mayer, *Are Emerging Infectious Diseases a Threat to the Northwest?* 14 WASH. PUB. HEALTH, Summer 1996, available at <http://www.nwpublichealth.org/docs/wph/infdis.html>.

But it is not just that air travel facilitates the transmission of disease. Rebecca Sweat, reporting in *Vision*, quoted Jim Hughes, director of Global Infectious Disease Programs at Emory University and former director of the National Center for Infectious Diseases at the Centers for Disease Control (CDC) in Atlanta, Georgia: “There are environments in the developing world that used to be quite remote but are now much less so as a result of human activities like deforestation, dam projects, irrigation, road construction and extensive agriculture.”<sup>148</sup> When people enter remote wilderness areas, whether as residents or contractors on projects, they can encounter unique pathogens. If they become infected, they can take the pathogens with them, spreading disease.<sup>149</sup> Air travel confounds the problem; not only can humans access formerly remote areas readily, but—as noted above—they can spread any disease very rapidly.

None of this is particularly remarkable, nor certainly reason to abandon air travel. But it is reason to recognize that the seemingly beneficial business of air travel has some unexpectedly dangerous potential consequences.

### 5. *Subsidies and the Problem of Peak Oil*

The search for alternatives to air travel will no doubt be pushed along by the very large increases in the cost of aviation fuel (kerosene). Obviously, the price of oil fluctuates, but the natural processes that create oil work much more slowly than oil consumption. We are, after all, using it up. It becomes very difficult to make the economics of aviation work at \$100 per barrel of oil, and it would be even more difficult if aviation were subsidized less.

Essentially, all modes of passenger transportation in the United States are subsidized by the federal government.<sup>150</sup> The Department of Transportation (DOT), Bureau of Transportation Statistics, undertook a study in December of 2004 to calculate the direct federal subsidies provided to various passenger transportation systems. The DOT defined a subsidy as “a simple accounting calculation of the net flow of funds to or from the

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<sup>148</sup> Rebecca Sweat, *A Modern Menace: Emerging Infectious Diseases*, *VISION*, Fall 2006, <http://www.vision.org/visionmedia/article.aspx?id=1895>.

<sup>149</sup> *Id.*

<sup>150</sup> See U.S. DEPT. TRANSP., *FEDERAL SUBSIDIES TO PASSENGER TRANSPORTATION 1* (2004), available at [http://www.bts.gov/programs/federal\\_subsidies\\_to\\_passenger\\_transportation/pdf/entire.pdf](http://www.bts.gov/programs/federal_subsidies_to_passenger_transportation/pdf/entire.pdf).



federal government for individual transportation modes. The excess of expenditures over revenues is the net subsidy."<sup>151</sup>

For airlines, then, the DOT calculation consists of "direct payments to carriers . . . and government expenditures on supporting infrastructure, minus revenues the federal government collects" from the carriers.<sup>152</sup> Or, again, it is "the difference between federal outlays for passenger transportation and receipts collected from users of the passenger transportation system."<sup>153</sup> Using this admirably simple calculation, the DOT determined that between 1990 and 2002 "air transportation received the second largest net federal subsidy" among air, rail, and highway transit.<sup>154</sup> Unfortunately, the DOT's analysis is not consistent in its reportage: it details a specific "net federal subsidy" for all modes for the years in question; it details annual subsidy per thousand passenger miles for all modes *except* airlines.<sup>155</sup> Its Figure 2 graphically represents the subsidies per thousand passenger-miles for each year, and appears to show that air passengers received a small federal subsidy per mile.<sup>156</sup> Table 4 lists the annual subsidies per thousand passenger-miles; the average per year for airlines is \$4.97; the average for rail is \$186.35 and for transit \$118.26.<sup>157</sup> It appears from this calculation that the subsidy for passenger air carriers (not including general) aviation is modest.

In describing its "allocation formulas," the DOT was able to separate passenger and freight revenues and expense allocations;<sup>158</sup> it did not attempt to include the cost of "a highway or transit line leading to an airport" in its analysis of airport subsidies.<sup>159</sup> Those subsidies were allocated to highway and transit modes.<sup>160</sup> It is not clear, either, from this analysis whether the DOT is counting as revenue only "tax collections from aviation users,"<sup>161</sup> or whether it is including all taxes collected by the federal government that go to airplane passenger uses. In any

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<sup>151</sup> *Id.*

<sup>152</sup> *Id.* at 3.

<sup>153</sup> *Id.* at 11.

<sup>154</sup> *Id.* at 2.

<sup>155</sup> *Id.*

<sup>156</sup> *Id.* at 1.

<sup>157</sup> *Id.* Table 4.

<sup>158</sup> *Id.* at 13.

<sup>159</sup> *Id.* at 12.

<sup>160</sup> *Id.*

<sup>161</sup> *See id.* at 9.

event, it is possible to describe different and additional federal subsidies.

Not surprisingly, those whose interest is to advocate *railroad* traffic have done just that. Here are some of the points those advocates make<sup>162</sup> (following the claim is the advocates' proffered support for the claim and, in some cases, this author's gloss on the claim is discussed in the footnote).

- FAA Operations get general funds as well as funding from the aviation trust fund. The general fund level was \$3.01 billion in FY 2004. The FY 2007 enacted level is \$2.703 billion, or 32.4% of the FAA Operations total of \$8.331 billion. DOD and other government aircraft are often assumed to be responsible for just 15% of FAA Operations costs—that would be \$1.25 billion in FY 2007, implying for [2008] a subsidy of \$1.453 billion to private sector aviation (2.703 less 1.25).
- Airports benefit from tax-free financing. Robert J. Aaronson, then Director of Aviation at the Port Authority of New York and New Jersey, said “[i]t is inconceivable that a modern airport, which under the existing tax code includes such public service accommodations as terminals and their related retail stores, runways, hangars, loading facilities, cargo buildings, parking areas and maintenance bases, as well as appropriately sized in-flight meal facilities, hotels and meeting facilities, could be provided on any adequate scale by taxable financing.”
- The FAA's Airport Improvement Program includes noise mitigation funds given directly to homeowners who live within certain footprints near airports where noise exceeds a designated decibel level. These funds are used to improve the sound-proofing of homes through window replacements and other noise mitigation procedures—basically a program to allow noisier jets and more frequent flights.<sup>163</sup>

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<sup>162</sup> National Association of Railroad Passengers, Federal Subsidies for Aviation, [http://www.narprail.org/cms/index.php/resources/more/aviation\\_subsidies/](http://www.narprail.org/cms/index.php/resources/more/aviation_subsidies/) (internal citations omitted) (last visited July 19, 2009).

<sup>163</sup> This claim seems reasonable:

The San Diego County Regional Airport Authority has landed \$10 million from the Federal Aviation Administration to dampen Lindbergh Field jet-noise levels inside area homes. Airport officials said the grant will help accelerate the benefits of the Quieter Home Program, which aims to insulate homes in the Peninsula area and elsewhere from the thunderous noise of jets flying overhead.

- The Essential Air Services program . . . provides about \$110 million a year to subsidize scheduled air service to small communities that otherwise would go without.<sup>164</sup>
- As a consequence of Sept. 11, 2001, the FAA Aviation Insurance Program offers below-market rates for airlines' war risk, hull loss and passenger, crew, and third-party liability insurance. The sunset date for this program has been postponed several times, most recently to [December 31, 2013].<sup>165</sup>
- The federal Air Transportation Stabilization Board (ATSB) was formed after the Sept. 11, 2001 attacks "to oversee \$10 billion in assistance [loan guarantees] earmarked by Congress to help the struggling [airline] industry." The largest loan, \$900 million, went to US Airways, Inc., in March 2003, enabling the airline to close on a \$1 billion loan. ATSB's last news release (May 31, 2006) states that it "still holds warrants in World Airways. The ATSB currently has no outstanding loan guarantees, but the Board has a direct loan of \$86 million to ATA Airlines as a result of the airline's bankruptcy."<sup>166</sup>
- Federal airline security takes about \$3 billion a year in general funds:
  - TSA spends about \$5 billion (out of its \$6.4 billion budget) on aviation, of which general funds cover about

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*See, e.g.,* Sebastian Ruiz, *Airport Lands Grant to Muffle Jet Noise*, PENINSULA BEACON NEWS, Aug. 23, 2003, available at <http://sdnews.com/bookmark/303326>. An internet search also shows that the FAA funds various noise-mitigation studies; Jill Rosen, *Florida's Boca Raton Airport Begins Noise Study with FAA Grant*, FORT LAUDERDALE SUN SENTINEL, Mar. 19, 1999, at 3b, available at <http://www.nonoise.org/news/1999/mar14.htm>.

<sup>164</sup> This claim is readily verifiable.

The [DOT] pays a few small airlines \$110 million a year total so they can profitably carry as few as four passengers per day to nearby hubs, often for rock-bottom fares. For example, a round-trip in Montana from Miles City to Billings—a two-hour drive away—costs passengers just \$88 . . . because the government kicks in \$779.

*See, e.g.,* Thomas Frank, *Subsidies Keep Small-Airport Flights in the Air*, USA TODAY, Dec. 30, 2007, available at [http://www.usatoday.com/news/Washington/2007-12-30-cheap-flights\\_N.htm](http://www.usatoday.com/news/Washington/2007-12-30-cheap-flights_N.htm).

<sup>165</sup> This claim is correct, the FAA-subsidized insurance has been extended, FEDERAL AVIATION ADMINISTRATION, OVERVIEW OF FAA INSURANCE, [http://www.faa.gov/about/office\\_org/headquarters\\_offices/aep/insurance\\_program/](http://www.faa.gov/about/office_org/headquarters_offices/aep/insurance_program/).

<sup>166</sup> This claim is verified. Press Release, Dep't of the Treasury, Air Transportation Stabilization Board Announces Sale of Frontier Warrants (May 31, 2006), <http://www.treas.gov/press/releases/js4297.htm>.

\$2.3 billion, and passenger and airline fees the remaining \$2.7 billion.<sup>167</sup>

- Federal Air Marshal Service's budget is \$722 million.<sup>168</sup>
- Federal subsidies for airline pensions have taken at least two forms—federal takeover of some airlines' plans, and special breaks for most of the other airlines.<sup>169</sup>
- The FAA issues aircraft registrations, pilot medical and airline certifications, and pilot licenses for free or well below cost, a subsidy of at least \$5 million a year for commercial and general aviation.
- National Weather Service reports are public record, available to the airlines at no cost.
- Among all forms of transportation, aviation enjoys disproportionate benefits from military research and development. Also, NASA spends \$700 million to \$1 billion each year on aviation-related research, much of which directly benefits general aviation.<sup>170</sup>
- Arguably, aviation also receives huge indirect subsidies from the Highway Trust Fund and general funds in the form of highway and transit projects at airports. Most such projects are smaller—local access road or bus projects—but still big in the aggregate. Some projects are huge, for example, the Dulles Access Road, a 14-mile freeway exclusively

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<sup>167</sup> President Bush's proposed FY2009 budget included \$6 billion for aviation security, \$3 billion for transportation security officers and technology, and \$1.2 billion "to recapitalize baggage screen devices . . ." Memorandum from ACI-NA Government Affairs to Government Affairs Committee & Government Affairs Steering Group (Feb. 4, 2008), *available at* [http://www.aci-na.org/static/entransit/GA\\_4Feb2008.pdf](http://www.aci-na.org/static/entransit/GA_4Feb2008.pdf).

<sup>168</sup> Its 2008 budget was \$786 million. Michael Grabell, *Air Marshals Under Cover and Under Arrest*, PRO PUBLICA, Nov. 13, 2008, *available at* <http://www.propublica.org/feature/air-marshals-undercover-and-under-arrest-1113>.

<sup>169</sup> This claim appears amply documented. The federal government is poised to pick up at least \$12 billion in pension benefits for faltering airlines. *See, e.g., Another Costly Report*, BANGOR DAILY NEWS, Sept. 7, 2004, at A6. "Three troubled airlines are moving toward possible default of their pension plans, and others could follow. The worst case would throw billions of dollars in pension liabilities onto the Pension Benefit Guarantee Corp." *Id.*

<sup>170</sup> GALBRAITH, *supra* note 51, at 257–58. "A consumer goods economy is limited in the resources it can allocate to research and development. The weapons industry sustains such effort on a vastly greater scale. . . . It . . . finances development with application to the consumer goods sector—the development of air transport and computer technology." *Id.*

for highway access to the airport in Northern Virginia, and the proposed \$5 billion WMATA rail extension to Dulles.<sup>171</sup>

- Historically, “[a]irport and airway development costs incurred prior to the assessment of user charges in 1971 have been treated as sunk costs, none of which have been or will be paid for by air carriers and other system users . . . these sunk costs total \$15.8 billion.”
- Air passengers paid no ticket tax at all from 1963 to 1970. Prior to 1963, they did pay the federal passenger ticket tax imposed during World War II, but the federal government was investing in air facilities at almost five times the rate at which air ticket tax revenues were collected.

Related to the point above about aviation receiving benefits from military research and development, it has been pointed out that a great deal of employee training for pilots, mechanics, and so on, is provided by the military at no cost to airlines.<sup>172</sup> While these employees may require further training specific to civilian aviation, they have already received a great deal of instruction and hands-on experience, at no cost to the airlines.<sup>173</sup>

The airlines’ defenders, of course, have a different take. James C. May is the president of the ATA. In a September 2004 speech to the Aero Club of Washington, D.C., he addressed the subsidy issue:

On an ongoing basis, the airlines are subsidizing others. Through excess taxes and fees, the industry has been subsidizing other users of our civil aviation system for years, including general aviation, business aviation, and government users. What’s more, if you accept a principle that has been preached if not practiced by Congress and the federal government – the principle that airline and airport security is, indeed, national security – then the airlines have been subsidizing national security as well.

As a result of unfunded security mandates, U.S. carriers will take a hit amounting to almost \$4 billion in 2004. And that’s not even the worst of it. Federally imposed taxes and fees now account for about \$52 on a \$200 domestic roundtrip ticket. That’s 26 percent. It’s nearly twice the rate on commercial air travel from a decade ago and more than triple the rate of 30 years ago.

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<sup>171</sup> The general assertion that federally-funded road, transit, and rail transportation projects to facilitate airport access are a type of subsidy is correct. See U.S. DEPT. TRANSP., *supra* note 150 and accompanying text.

<sup>172</sup> Edward Hasbrouck, *Government Subsidies to Airlines*, THE PRACTICAL NOMAD, Jan. 30, 2006, <http://www.hasbrouck.org/blog/archives/001001.html>.

<sup>173</sup> *Id.*

Taxes and fees now represent an annual burden of \$14 billion on an industry with not much more than \$100 billion in annual revenues. It is true that many of these dollars provide services the airlines depend upon . . . but billions more represent what we in the industry see as a deadweight cost.<sup>174</sup>

One is constrained to observe in the context of government subsidies for airlines—as in many contexts—that a person's perception of reality is highly correlated to her self-interest. It would be easier to commiserate with the airlines' perception that they are "burdened" with excessive taxation and—by implication—regulation, if it were not that the industry appears to have captured the Federal Aviation Administration (FAA). In March and April 2008 this was the news: "frontline FAA inspectors" blew the whistle, claiming they "were ignored by superiors, and some were even threatened, when they raised safety issues" at one airline.<sup>175</sup> That the FAA ignored its own inspectors' concerns about safety lapses because the airline complained about the inspections showed, according to one of the inspectors, "how much in bed the FAA really is with the carriers."<sup>176</sup> Stung by criticism of "complacency, cozy relationships with the airlines and inappropriate reliance on voluntary disclosure,"<sup>177</sup> about safety violations, the FAA cracked down, effectively grounding hundreds of planes and causing significant disruption in air travel.

In any event, it appears that the era of cheap oil is over and that expensive fuel will change aviation.<sup>178</sup> The run-up in oil costs, peaking in July 2008, is familiar to anyone, and affects the airlines enormously. The *Wall Street Journal* reported in March 2008 that the cost of jet fuel as a percentage of operating ex-

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<sup>174</sup> James May, President and CEO, Air Transp. Ass'n of Am., Remarks at the Aero Club of Washington, D.C. (Sept. 29, 2004), available at [http://www.airlines.org/news/speeches/speech\\_9-29-05.htm](http://www.airlines.org/news/speeches/speech_9-29-05.htm).

<sup>175</sup> Alexandra Marks, *Could Flight Disruption Have Been Avoided?*, CHRISTIAN SCI. MONITOR, Apr. 14, 2008, at 10.

<sup>176</sup> Andy Pasztor, *Very Friendly Skies: Southwest's Cozy Ties Triggered FAA Tumult*, WALL ST. J., April 3, 2008, at A1, A12.

<sup>177</sup> Shawn Langlois, *Whistleblowers Accuse FAA of Lax Oversight*, MARKETWATCH, Apr. 3, 2008, <http://www.marketwatch.com>.

<sup>178</sup> On December 1, 2008, the price of oil was about \$47 a barrel, down from \$141 in July. *OPEC Oil Prices Rebound Slightly*, CHINA VIEW, [http://news.xinhua.net.com/english/2008-12/01/content\\_10441287.htm](http://news.xinhua.net.com/english/2008-12/01/content_10441287.htm). Already, SUV sales are picking up again. Joseph B. White, *Repeat Performance: Buyers Return for Pickups, SUVs*, WALL ST. J., Nov. 3, 2008, available at [http://online.wsj.com/article/SB122546849531488311.html?mod=dist\\_smartbrief](http://online.wsj.com/article/SB122546849531488311.html?mod=dist_smartbrief). The price of oil will certainly rise again.

penses had increased from a recent low of 10% in early 2002 to just over 25% in early 2008.

Continental Airlines, Inc. expects to pay \$1.5 billion more for fuel this year than last, Chief Financial Officer Jeff Misner told a J.P. Morgan aviation conference earlier this week . . . Glen Tilton, chairman and chief executive of United Airlines parent UAL Corp., told workers earlier in the week, "This industry has serious challenges ahead."<sup>179</sup>

Airlines faced with sky-high fuel costs have four options: increase revenue, decrease costs, consolidate, or liquidate assets.<sup>180</sup> Decreasing costs might be further possible, but the "cost center" of most concern is fuel, there is no readily-available substitute for kerosene, and none is expected to be available for decades.<sup>181</sup> Increasing revenue means raising fares which would, obviously, "further drive travel demand down in both business and leisure markets," but the airlines cannot make money flying half-full planes, so "flying will continue to be a cramped experience."<sup>182</sup>

Consolidation is happening, but as *Business Week* reported in March 2008, consolidation is a daunting experience.<sup>183</sup> US Airways CEO Doug Parker was a great proponent of consolidation, when he "landed the top job at America West in 2001, [he] pounded the table for airline consolidation, scooped up US Airways in 2005, and made a run at Delta Air Lines a year later."<sup>184</sup> Today he is less bullish, "[w]e [were] a strong advocate of industry consolidation. . . . I now feel I need to qualify it."<sup>185</sup> Merging two airline firms means signing new contracts with pilots, flight attendants, baggage handlers, and mechanics; it requires merging of reservation systems and—among the most difficult problems—it means dealing with the problem of pilot seniority:

Pilots work for years for the right to fly the biggest jets and earn the biggest salaries. Ranking them again after a merger is akin to consolidating the U.S. Army and Marine Corps, says Peter

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<sup>179</sup> Susan Carey & Melanie Trotman, *Costly Fuel, Economic Woes Weigh Down U.S. Airlines*, WALL ST. J., Mar. 20, 2008, at 1.

<sup>180</sup> See David Grossman, *Oil Prices Put Business Travelers Over a Barrel*, USA TODAY, Mar. 28, 2008, [http://www.usatoday.com/travel/columnist/grossman/2008-03-28-oil-prices-rising\\_N.htm](http://www.usatoday.com/travel/columnist/grossman/2008-03-28-oil-prices-rising_N.htm).

<sup>181</sup> See *supra* notes 96–103 and accompanying text.

<sup>182</sup> Grossman, *supra* note 180 at 1.

<sup>183</sup> Christopher Palmeri, *A Cautionary Tale for Airline Mergers*, BUS. WK., Mar. 17, 2008, at 66.

<sup>184</sup> *Id.*

<sup>185</sup> *Id.*

Janhunen, a spokesman for the Air Line Pilots Assn.: "You can have colonels reporting to lieutenants."<sup>186</sup>

The whole thing, then, means a lot of employees are "upset with the boss,"<sup>187</sup> and sometimes it does not work.

One "peak oil" commentator, Dr. Alex Kuhlman, reasons that oil production will soon be unable to meet growing demand; the price of aviation fuel will increase, dampening demand for air travel.<sup>188</sup> Kuhlman predicts unpleasant consequences; transportation costs will increase, and transportation, including transportation of foodstuffs, will decrease.<sup>189</sup> Social unrest may well follow, with concomitant reductions in business and government activity, and a serious increase in unemployment.<sup>190</sup>

Eventually, a large proportion of the demand for air travel will be almost completely destroyed, with the risk of the aviation adventure going out of business, with the exception of perhaps a handful of airlines. Once again, air travel will be reserved for the rich and for government business and the world will become a larger place once again.<sup>191</sup>

## 6. *Tourism*

Writing in 1993, the British economist and professor E.J. Mishan fulminated about the physical consequences of aviation-stimulated tourism for the masses:

As things stand today, the tourist business is engaged in a competitive scramble to uncover all places of once-quiet repose, of wonder, beauty and historic or scenic interest, to the money-flushed multitude. In the process, it is, of course, literally and irrevocably destroying them. . . . Once lovely and alluring towns such as Andorra and Biarritz have been smothered over with new hotels and submerged beneath the roar and dust of motorized traffic. The isles of Greece have become a sprinkling of tawdry lidos in the Aegean Sea. Delphi is hemmed in by high-rise hotels. . . . As hordes of holidaymakers arrive . . . cameras at the ready, hot in pursuit of pleasure, impatient to forage in the ba-

<sup>186</sup> *Id.*

<sup>187</sup> *Id.*

<sup>188</sup> Alex Kuhlman, *Peak Oil: the Coming Global Crisis and the Decline of Aviation*, AIRLINERS.NET, Oct., 2005, <http://www.airliners.net/aviation-articles/read.main?id=81>. "Alex Kuhlman received a Post-Graduate degree in Economics from the University of Amsterdam. He is author of a Peak Oil website and flies commercially for a large European low-cost airline." *Id.*

<sup>189</sup> *Id.*

<sup>190</sup> *Id.*

<sup>191</sup> *Id.*



zaars and restaurants, to swarm on to the beaches or into the squares, to motor along highways and by-ways in search of 'sights,' quaint villages, bargains, ruins, anything, as concrete is poured over the earth, as new hotel, casinos, night clubs, blocks of sun-flats, chalets and caravan sites crowd into and about the area, local life and local industry shrivel, hospitality evaporates, and much of the host population drifts into a quasi-parasitic way of live catering with contemptuous servility to the promiscuous prodigality of the squandering multitudes.<sup>192</sup>

Recent news stories corroborate Mishan's sardonic denunciation of tourism, though it is likely that things are worse today than when he wrote sixteen years ago: airline traffic and travel is expected to—or has been expected to—continue its very fast growth. In a 1999 report, the United Nations Intergovernmental Panel on Climate Change found that

[a]viation has experienced rapid expansion as the world economy has grown. Passenger traffic . . . has grown since 1960 at nearly 9%<sup>193</sup> per year, 2.4 times the average Gross Domestic Product growth rate. Freight traffic, approximately 80% of which is carried by passenger airplanes, has also grown over the same time period. The rate of growth of passenger traffic has slowed to about 5% in 1997 as the industry is maturing.<sup>194</sup>

In 2005, the FAA projected that the number of U.S. airline passengers would grow 3.4% annually and top one billion by 2015; the 3.4% rate was a slower growth rate than projected the year before.<sup>195</sup> In 2004, John Whitelegg and Howard Cambridge, using statistics from Airbus, reported that the "available seat kilometers" (the number of seats available for passengers times distance in kilometers) was expected to increase 253% between 2002 and 2022; the number of aircraft is expected to increase 190%.<sup>196</sup>

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<sup>192</sup> E.J. MISHAN, *THE COSTS OF ECONOMIC GROWTH*, 138–39 (2nd ed., 1993). Edward J. Mishan "taught at the London School of Economics between 1956 and 1977. Between 1970 and 1983, he lectured at various universities throughout North America." Greenwood Publishing Group, [http://www.greenwood.com/catalog/author/M/E.J.\\_Mishan.aspx](http://www.greenwood.com/catalog/author/M/E.J._Mishan.aspx).

<sup>193</sup> At an increase of 9% a year, air traffic would double, exponentially, every 7.7 years. See CHOI, *supra* note 87 and accompanying text.

<sup>194</sup> Intergovernmental Panel on Climate Change, *Aviation and the Global Atmosphere, Introduction* (1999), <http://www1.ipcc.ch/ipccreports/sres/aviation/004.htm>.

<sup>195</sup> John Hughes, *Air Travelers to Top 1 Billion in 2015*, SEATTLE TIMES, Mar. 15, 2005, available at [http://seattletimes.nwsources.com/html/business/technology/2002211376\\_airlinevolume18.html](http://seattletimes.nwsources.com/html/business/technology/2002211376_airlinevolume18.html).

<sup>196</sup> WHITELEGG & CAMBRIDGE, *supra* note 68 at 9.

Stephen Shaw and Callum Thomas (London Metropolitan and Manchester Metropolitan Universities, respectively) discuss some of the “social and cultural dimensions of air-travel demand,” they label it “hyper-mobility.”<sup>197</sup> Following deregulation in 1978, fares dropped dramatically,<sup>198</sup> this “democratiz[ation]” of air travel, as Shaw and Thomas call it, “raises expectations that are difficult to dampen down” so that “people’s desire for air travel [becomes] a consumer expectation, a norm, or even a ‘right.’”<sup>199</sup>

The *Turkish Daily News* reported in 2007 on the destruction of the Belek forests in the Mediterranean province of Antalya “due to the construction of golf courses and hotels.” A member of the Turkish parliament questioned the government’s tourism minister, “asking . . . how such a thing could happen in the name of supporting tourism?”<sup>200</sup> The World Wildlife Fund reported in 2007 that over 100,000,000 tourists flock to the Mediterranean beaches every year.

Mass tourism has led to degraded landscapes, soil erosion, increased waste discharges into the sea, loss of natural habitats, higher pressure on endangered species and heightened vulnerability to forest fires. It puts a strain on water resources and often leads to cultural disruption. Mediterranean coastal areas, which account for 30% of international tourist destinations, are already seriously damaged.<sup>201</sup>

Nicole Itano, writing for the *Christian Science Monitor* in 2008, concurred:

[M]odern development is rapidly turning the cradle of Western civilization into a dry and inhospitable place, its coasts covered in hotels and many of its unique species driven to extinction. In the past 30 years, coastal populations have grown some 50 percent. Coastal cities have doubled. Tourism has exploded: By 2025, 312

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<sup>197</sup> Stephen Shaw & Callum Thomas, *Discussion Note: Social and Cultural Dimensions of Air Travel Demand: Hyper-Mobility in the UK*, 14 J. SUSTAINABLE TOURISM 209 (2006).

<sup>198</sup> ASIF SIDDIQI, U.S. CENTENNIAL OF FLIGHT COMMISSION, DEREGULATION AND ITS CONSEQUENCES, [http://www.centennialofflightgov/essay/Commercial\\_Aviation/Dereg/Tran8.htm](http://www.centennialofflightgov/essay/Commercial_Aviation/Dereg/Tran8.htm) (last visited Aug. 15, 2009).

<sup>199</sup> Shaw & Thomas, *supra* note 197.

<sup>200</sup> *Deputy Asks How Forests Were Destroyed*, *TURKISH DAILY NEWS*, Nov. 1, 2007.

<sup>201</sup> World Wildlife Fund, *Key Threats In The Mediterranean Region* (Jan. 28, 2007), [http://www.panda.org/about\\_wwf/where\\_we\\_work/europe/what\\_we\\_do/mediterranean/threats/index.cfm](http://www.panda.org/about_wwf/where_we_work/europe/what_we_do/mediterranean/threats/index.cfm).

million tourists will visit each year. Water usage is twice that of 1950. More than 100 species are endangered.<sup>202</sup>

In the U.K. (from which a great deal of recent criticism of the aviation industry has emerged) the *Guardian* summed it up. After briefly discussing air pollution, its "comment" continued:

At ground level, logging of forests and mining of coral reefs for materials to build resorts have devastated wildlife; the development of beach fronts has led to the disappearance of wetlands; safari trails have interfered with hunting habits and the availability of quarry; and the boom development of popular tourist cities has increased urban pollution. From the Polar regions to Yellowstone National Park to the Lake District, tourism has supplied vast quantities of litter and debris, adversely affecting wildlife and polluting landscapes.<sup>203</sup>

The aviation tourist industry is not unaware of its increasingly bad reputation for world-wide despoliation. Its response has been to promote "eco-tourism."

Eco-tourism is thought to be the fastest-growing sector of the tourist industry.<sup>204</sup> In 1990, it spawned its own industry group, the International Ecotourism Society, with carefully articulated definitions and principles:

- Minimize impact
- Build environmental and cultural awareness and respect
- Provide positive experiences for both visitors and hosts
- Provide direct financial benefits for conservation
- Provide financial benefits and empowerment for local people
- Raise sensitivity to host countries' political, environmental, and social climates<sup>205</sup>

Two academic journals are devoted to ecotourism, *The Journal of Sustainable Tourism* and *The Journal of Ecotourism*.

Ecotourism is no doubt better than non-ecotourism, but as James G. Carrier and Donald Macleod (Oxford and Glasgow

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<sup>202</sup> Nicole Itano, *The Storied Mediterranean Faces Climate Change*, CHRISTIAN SCI. MONITOR, Jan. 14, 2008, at 1, available at <http://www.csmonitor.com/2008/0114/p01s03-woeu.html>.

<sup>203</sup> Joanna Griffiths, *Tourism Is Bad for Our Health*, GUARDIAN, Feb. 8, 2001, available at <http://www.guardian.co.uk/travel/2001/feb/08/ecotourism>.

<sup>204</sup> James G. Carrier & Donald V.L. MacLeod, *Bursting the Bubble: The Socio-Cultural Context of Ecotourism*, 11 J. ROYAL ANTHROPOLOGICAL INST. 315 (2005).

<sup>205</sup> Int'l Ecotourism Soc'y, Ties Code of Conduct, [http://www.ecotourism.org/site/c.orLQKXPCLmF/b.4875111/k.68EF/TIES\\_Code\\_of\\_Conduct.htm](http://www.ecotourism.org/site/c.orLQKXPCLmF/b.4875111/k.68EF/TIES_Code_of_Conduct.htm) (last visited July 19, 2009).

University, respectively) discuss, it is not much better. Their analysis details the effects of ecotourism on two coastal communities in the Caribbean, Bayahibe in the Dominican Republic and Montego Bay in Jamaica.<sup>206</sup>

In the latter community, growth of tourism has increased the city's population; the city waste and sewer facilities have not kept up, as "each rainstorm washes rubbish down the gullies and leaches effluvia from pit latrines into the bay."<sup>207</sup> The expansion of tourist-related businesses and hotels caused bay-area infill, displaced mangrove trees, led to expanded port facilities for freight traffic and tourist cruise ships (not all tourists arrive on airplanes, certainly), the dredging of the bay, disruption of coastal currents and the closure of the beach front to all but hotel guests.<sup>208</sup> Fishers were adversely affected as water quality deteriorated, their catches reduced, and they became unable to make an adequate living fishing; tensions arose between the fishers and the tourist industry, which tended to see the fishers as "disfiguring the coastal waters that they [industry people] hope will attract tourists."<sup>209</sup> Some of them got jobs working in the tourist industry, where they generally "resent their low wages and the constraints and insecurity of their employment."<sup>210</sup>

Likewise in the Dominican Republic, part of the tourist boom involved creation of a new national park. Tourism caused problems: residents were dislocated so that tourist-related facilities could be constructed; they were denied access to their traditional and ecologically useful woodlands and wetlands, which were converted to lawns, beaches, and construction sites, while access to familiar beaches was closed; tourists regularly "invade[d] village space in organized tours" on horseback, on bicycles, "or they view[ed] it from the air on helicopter tours" while the natives were barred from entering the tourist spaces.<sup>211</sup> Tourist-related boat excursions polluted the water, and drove fish away;<sup>212</sup> natives suffered while the tourists' day was "spent sunbathing, swimming, dancing, playing beach

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<sup>206</sup> Carrier & MacLeod, *supra* note 204, at 318.

<sup>207</sup> *Id.* at 320.

<sup>208</sup> *Id.*

<sup>209</sup> *Id.*

<sup>210</sup> *Id.* at 320-21.

<sup>211</sup> *Id.* at 321.

<sup>212</sup> *Id.*

games, drinking, and eating at the makeshift beach bars, and generally relaxing.”<sup>213</sup>

It is not just the environmental destruction that the authors remark on. They observe a cultural domination as well: “commercial interests that profit from ecotourists used their powers to shape the natural surroundings of local people, reflecting values and practices springing from North American and European culture and political economy.”<sup>214</sup> Carrier and MacLeod conclude that ecotourism has been put in a “bubble that obscures the context in which the industry exists. . . . [T]he bubble excludes from visibility the socio-cultural consequences of ecotourism that seem not to accord with its socio-cultural objectives.”<sup>215</sup>

As Carrier and MacLeod note, the environmental consequences of tourism—not including the effects at the tourists’ departure or arrival airports, or in the air—are serious. Their main concern, though, is not the environmental destruction caused by tourism, but the socio-cultural consequences on the ground at the tourist destination. In short, tourism destroys the society and culture of the communities it visits, and reforms them into something inorganic, foreign, and dependent.<sup>216</sup>

E.J. Mishan is not optimistic about “what is fashionably called ‘green tourism[;]’” he observes that “[g]eographical space, the choicest bits of it anyway, is one of the strictly limited resources of this now tiny planet[,]” and he expects “the powerful interests of travel agencies and local developers will almost certainly oppose . . . schemes designed to limit or control the spread of tourists.”<sup>217</sup> He goes on: “With a complacency, nay a hubris, unmatched in history, and with a blindness particular to a consumer society, we have abandoned ourselves to a ransacking of the most precious and irreplaceable resources on our unique planet undeterred by the thought of the future desolation and deprivation of posterity.”<sup>218</sup>

### 7. *The Psychological Consequences of the Diminishment of Place*

But surely there is another effect of readily-available, inexpensive business and tourist air travel on the traveler’s own home

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<sup>213</sup> *Id.* at 322.

<sup>214</sup> *Id.* at 324.

<sup>215</sup> *Id.* at 328–29.

<sup>216</sup> *See id.* at 330.

<sup>217</sup> MISHAN, *supra* note 192, at 139–40.

<sup>218</sup> *Id.* at 141.

place. What kind of roots do peripatetics put down, or even want-to-be peripatetics? What does it do to their sense of a *home place*, psychologically essential to a satisfactory life?<sup>219</sup> William Leach described some of this in his 1999 book *Country of Exiles: The Destruction of Place in American Life*. Leach discusses the mid-nineties phenomena of jet-setting corporate managers “flying around the world more often, and more quickly, than ever before,” to sign a deal here, play golf there, attend a meeting some place else.<sup>220</sup> “There were so many flying executives and other business people that airports and hotels were overflowing.”<sup>221</sup> He calls them “neo-expatriates, because they officially resided in their home countr[ies] but were so often out of it as to be uncertain about where they were, or what state or country they actually belonged to.”<sup>222</sup> Leach mentions Vance Packard’s well-known 1972 book *A Nation of Strangers*, about cities in places like Connecticut where business managers lived

temporarily, on their climb up the corporate ladder, and from which they commuted daily to New York. In those days, Packard wrote, the only people who showed much interest in the town’s affairs were the “wives of the transient,” who joined parent-teacher groups, served on the town government, and fund-raised (although their activities were always limited by prospects of future transplants to other places). By the nineties, even this reserve had dried up, as many traveling moms had joined husbands in pursuit of corporate careers.<sup>223</sup>

Many Americans, Leach opines, “treat their own homes as temporary dwellings.”<sup>224</sup> Leach is mostly discussing business people—executives, lower-level employees and the low-level “temps” and part-timers who must expect to be vagabonds because of the need to relocate for work—but the same effect must come into play where people feel little commitment to their home place because they can, pretty much at will, simply fly away from it. “Years ago,” Leach writes,

Americans did not think of their homes in this way because such homes, especially farmhouses, embraced many things, from spiri-

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<sup>219</sup> See, e.g., Daniel M. Warner, *Uses of Subjective Well-Being in Local Economic and Land Use Policy*, 23 J. LAND USE & ENVTL. L. 263, 300–01 (2008).

<sup>220</sup> WILLIAM LEACH, *COUNTRY OF EXILES: THE DESTRUCTION OF PLACE IN AMERICAN LIFE* 62 (1999).

<sup>221</sup> *Id.*

<sup>222</sup> *Id.*

<sup>223</sup> *Id.* at 63.

<sup>224</sup> *Id.* at 77–78.

tual observance and cooking to childcare and apprenticeships. Such activities endowed the home with the power to “root people to the landscape.” . . . Many people loved their homes, because they truly *lived* in them. In modern times, the home . . . has lost much of this character and, therefore, its power to connect people to place.<sup>225</sup>

This author has acquaintances who are accustomed to taking airplane trips for work or amusement three or four times a year; these people are not—for the most part—at home attending county council meetings or joining neighborhood associations; they cannot commit to attending meetings or getting significantly involved in civic affairs. They do not think they need to care. They can escape the burden of community-building by taking to the air. Harvey Cox in his famous 1965 theological tract, *The Secular City*, comments on this “fascination with other worlds:”

Men must be called away from their fascination with other worlds—astrological, metaphysical, or religious—and summoned to confront the concrete issues of this one . . . They must be freed from the narcotic vagaries through which they wrongly perceive the social reality around them, and from habitual forms of action or inaction stemming from those illusions.<sup>226</sup>

The “fascination with other worlds” is, however, exactly what we are trained by our economic system to be enamored with. It is part of what Wendell Berry calls “an economy without limits” which has “no place for temperance or thrift or the ecological law of return. It will do anything. It is monstrous by definition.”<sup>227</sup> And, Berry asserts, among its consequences are the

minimization of neighborliness, respect, reverence, responsibility, accountability, and self-subordination—this is the culture of which our present leaders and heroes are the spoiled children. . . . People of intelligence and ability seem now to be genuinely embarrassed by any solution to any problem that does not involve high technology, a great expenditure of energy, or a big machine.<sup>228</sup>

“But I like to travel!” the affronted reader cries. Well, you think you do. You are encouraged to think so. It is beyond the

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<sup>225</sup> *Id.* at 78.

<sup>226</sup> HARVEY COX, *THE SECULAR CITY* 154 (1965).

<sup>227</sup> Wendell Berry, *Faustian Economics: Hell Hath No Limits*, HARPER’S, May 2008, at 36–37.

<sup>228</sup> *Id.*

scope of this paper to deal in any detail with the burgeoning study of "subjective well being" (SWB), but a few comments are in order as SWB relates to travel and tourism. SWB is the sense that people have about how happy they are. Exhaustive studies have been done to determine what makes people happy, and the growing research is in agreement on the point that after the basic needs of food, clothing, and shelter are satisfied, an absolute increase in income does not make people happier.<sup>229</sup> However, perceptions about income "relative to individuals' own cohort working in the same occupation group, and living in the same region"<sup>230</sup> are important in explaining SWB. We might conclude, then, that people whose peers and cohorts fly a lot would feel deprived and unhappy if they do not; they might feel relatively impoverished. If, though, the non-travelers were aware of the harm caused by air travel, perhaps they would feel disdain for the frivolous holidaymakers and "road warriors," and perhaps the inveterate travelers would realize the error of their ways, especially if they understood that the allure of air travel, like the allure of so much of our technology, is manufactured by the industry to sell its product.<sup>231</sup> Aviation is causing a great deal of harm, and if it grows as it has been prognosticated to grow, it will cause further very serious harm. David Korten writes:

Those who bear the costs of the system's dysfunctions have been stripped of decision-making power and remain confused about the cause of their distress because the corporate-dominated media incessantly bombards them with interpretations of the resulting crisis based on the perceptions of the power holders. An active propaganda machine controlled by the world's largest corporations constantly reassures us that consumerism is the path to happiness, governmental restraint of the market is the cause of our distress, and corporate globalization is both a historical inevitability and a boon to the human species.<sup>232</sup>

Eventually, frivolous air travel might become as unacceptable as wearing fur has. Certainly, its unacceptability is only enhanced as the increasing discomfort experienced in getting to the air-

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<sup>229</sup> See, e.g., Warner, *supra* note 219, at 297.

<sup>230</sup> Cahit Guven & Bent E. Sorensen, *Subjective Well-Being: Keeping up with the Joneses: Real or Perceived?*, 1-2 (Working Paper 2007), [http://www.iadb.org/res/files/qol/cahit\\_guven.pdf](http://www.iadb.org/res/files/qol/cahit_guven.pdf).

<sup>231</sup> Mishan puts it this way: "the pattern of people's wants has to be altered and expanded in a sustained endeavor to bring it into relation with the increasing resources of an expanding industrial capacity." MISHAN, *supra* note 192, at 67.

<sup>232</sup> DAVID KORTEN, *WHEN CORPORATIONS RULE THE WORLD*, 22 (2d ed. 2001).



port, through security, and riding on the plane, with all its disamenities, makes "getting there" no fun.

### III. CONCLUSION

#### A. IS AIR TRAVEL REALLY NECESSARY?

The fact is, air travel is not really necessary. In its incipency, it was amazing and chic, but nobody really needs to fly to Europe for a two-week vacation or—probably—for business either. Yes, things would have to be re-ordered if aviation were minimalized; that could happen. Of course, it is entertaining and sometimes amazing to see new and different places and people (insofar as the "McDonaldization of society" has not rendered every place too much the same);<sup>233</sup> and who does not still feel the rush of amazement and technological satisfaction when the jet accelerates away? Bear-baiting, cock-fighting, and jet-skiing around unspoiled marine environments were formerly entertaining and amazing but are now disdained and illegal.<sup>234</sup> And no business person *really* needs to fly either, or certainly not as much as has become customary; there are alternatives to flying for business. Obvious ones include not going at all, letters, email, telephone and—more recently—videoconferencing:

Increasingly, video conferencing facilities in towns around the world can be hired for one-off meetings. And, as the quality of the service improves, the need to 'look someone in the eye' when doing business does not have to mean days spent travelling. Flying to business meetings is now looking like a very old fashioned waste of time, money, and nervous energy.<sup>235</sup>

Hewlett Packard has introduced "Halo," a very sophisticated video-conferencing system that projects apparently life-like images of conferees on large, full-color, highly resolved screens.<sup>236</sup>

Wendell Berry writes that "[w]e are, after all, trying now to deal with the failure of scientists, technicians, and politicians to 'think up' a version of human continuance that is economically

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<sup>233</sup> See generally GEORGE RITZER, *THE McDONALIZATION OF SOCIETY: REVISED NEW CENTURY EDITION* (2004).

<sup>234</sup> See, e.g., Daniel M. Warner, *Environmental Endgame*, 9 S.C. ENVTL. L.J. 1, 37–40 (2000).

<sup>235</sup> Low Fly Zone: Choosing to Live Gently, <http://www.lowflyzone.org/alternatives-to-air-travel-2/> (last visited July 19, 2009).

<sup>236</sup> HP Halo Telepresence and Video Conferencing Solutions, <http://h71028.www7.hp.com/enterprise/us/en/halo/index.html> (last visited July 19, 2009).

probable and ecologically responsible, or perhaps even imaginable.”<sup>237</sup> Perhaps alternatives to air travel are part of the answer. Or, a person could choose a job and a lifestyle that does not require air travel. Ninety-five percent of the world’s population has never flown:<sup>238</sup> maybe airplanes are really not necessary at all.

Aviation is unsustainable (depending, of course, on one’s definition of sustainable). The most optimistic scenarios presented in *Towards Sustainable Aviation* presuppose the development of a low-carbon economy and a solution to the noise problem. “Both conditions are far from being met.”<sup>239</sup> The less optimistic scenarios observe that aviation has “held on to a very privileged position amongst a wide range of business and industry” (no tax on fuel, large public subsidies) with the result that demand for air transport “is rising very steeply, with severe and negative health and environmental consequences.”<sup>240</sup> A plan for aviation’s future will include “less flying, less freight carried by air and an end to airport expansion plans.”<sup>241</sup> The pessimistic scenarios posit that air travel will be reserved for the very wealthy and for government officials.

## B. CONCLUSION

Air travel once seemed an amazing and even almost miraculous invention. In that, it tapped into aspects of long-standing Western culture, both religious and technophilic. But commercial aviation has very serious unintended consequences; it is associated with the production of air pollutants that cannot be reconciled with the growing international requirement for a reduction in greenhouse gases. It contributes to ground-level smog and health problems; it is associated with serious water pollution. The possibility that air travel might spread a serious pandemic worries health professionals, and, moreover, the ease with which aviation allows humans to intrude upon relatively uninhabited areas exacerbates the possibility that new diseases will be brought into major human populations.

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<sup>237</sup> Berry, *supra* note 227, at 39.

<sup>238</sup> John Whitelegg, *The Case for ‘No Growth’ in TOWARDS SUSTAINABLE AVIATION*, 36 (Paul Upham et al. eds., 2003).

<sup>239</sup> Paul Upham, *Introduction: Perspectives on Sustainability and Aviation*, in *TOWARDS SUSTAINABLE AVIATION*, 36 (Paul Upham et al. eds., 2003).

<sup>240</sup> Whitelegg, *supra* note 238, at 237.

<sup>241</sup> *Id.*

Tourism, however labeled as “ecofriendly,” always destroys indigenous cultures; it transforms and pollutes all the pretty places it affects. It makes vagabonds of people—especially business people—who might otherwise put down roots and contribute to the civility and efficacy of their communities. If it seems to make people happy, the happiness is quite probably the product of ignorance and the satisfaction of an industry-generated desire.

Many of the problems associated with commercial aviation will diminish because it is unlikely to be economically feasible. Its expenses are very great and growing—especially fuel costs—and in no way has the industry internalized its costs (its apologists notwithstanding). As fares increase, fewer seats will be filled; mergers are fraught with difficulties, and it is likely that the decrease in demand will cause more firms to go bankrupt.

There are some alternatives to flying, but finally one is constrained to admit that air travel—most of it anyway—is really not necessary. The “peak oil” phenomena means, as Wendell Berry says, that while we look for alternatives “we will also have to re-examine the economic structure of our lives, and conform them to the tolerances and limits of our earthly places.”<sup>242</sup> As this conformation unfolds, it will still be “possible for a human being to fly, it will no longer be possible for many humans to do so, indeed . . . it will no longer be possible for you to do so.”<sup>243</sup>

Notwithstanding our cultural technophile, it would help us accept the change if we could stop looking at commercial aviation as benign. It is not. We will, necessarily, move toward a new economy based on “re-localization” that eschews much aviation. But that’s another topic.

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<sup>242</sup> Berry, *supra* note 227, at 42.

<sup>243</sup> GEORGE MONBIOT, *HEAT: HOW TO STOP THE PLANET FROM BURNING* 187 (2007).

## **Comments**

