Reducing Greenhouse Gas Emissions

A 2000 report from the University of Michigan, "Greenhouse Gas Pollution in the Stratosphere Due to Increasing Airplane Traffic, Effects On the Environment", postulates that, because aircraft travel occurs mostly in the stratosphere and not the atmosphere, "the increasing volumes of airplane traffic worldwide [may] have serious environmental consequences, perhaps more serious than the ozone hole phenomenon..." Clearly then, any airport technology capable of reducing air flight delay conforms with the FAA's NextGen commitment to minimizing *"aviation's environmental footprint through efficiencies that reduce emissions."*

Watts' commitment goes beyond merely endorsing the spirit of the NextGen mission. We believe our advanced ILS product line can materially contribute to reduced greenhouse emissions.

In terms of aviation emissions and their effects on the environment, an impressive body of data already exists. In 2001, the United States Federal Aviation Administration (FAA) Office of Environment and Energy (AEE) in cooperation with the Volpe National Transportation Systems Center (Volpe), the Massachusetts Institute of Technology (MIT) and the Logistics Management Institute (LMI) set about designing a new model: The System for Assessing Aviation's Global Emissions. SAGE is a high fidelity computer model used to predict aircraft fuel burn and emissions for all commercial (civil) flights globally. While this data has been collected and modeled for the better part of a decade, on the political front, things proceeded at a slower pace.

For example in July 2007, The Climate Science Watch (CSW), an entity within the Government Accountability Project (GAP), issued a report titled "*NextGen Air Transportation System Progress Reports Ignore Climate Change."* In it, the CSW claimed that, despite the fact the FAA was projecting the Next Generation Air Transportation System (NextGen) anticipated U.S. aviation traffic tripling over the next twenty years, no mention was made of climate change, global warming, or the carbon dioxide emissions of aircraft.

A major recent development was the U.S. Supreme Court's decision that the EPA had the authority under the Clean Air Act to regulate emissions of greenhouse gases from airplanes. Prior to this the FAA had taken a somewhat conservative stance in the emissions debate. Already this decision is reverberating throughout the aviation industry. For example, the Aircraft Owners and Pilots Association (AOPA) sought to remind everyone that *"the ultimate authority over aviation in the U.S. is the Federal Aviation Administration. The FAA's in-depth approval process for any change to aircraft is designed to ensure aviation safety and protect the lives of pilots and passengers."*

Responding to its new mandate, in July 2008 the Environmental Protection Agency (EPA) issued an advanced notice of proposed rulemaking (ANPR) entitled “Regulating Greenhouse Gas Emissions under the Clean Air Act.” For its part, the industry is moving to accepting government’s renewed commitment to controlling aviation greenhouse gas emissions.

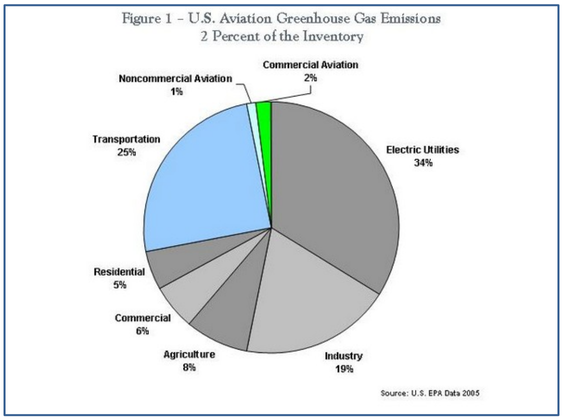


Figure 1 – U.S. Aviation Greenhouse Gas Emissions
2 Percent of the Inventory

It’s not a small problem. Currently, aviation accounts for 2-3 percent of total greenhouse gas emissions. While this might not sound like much, the percentage is likely to increase substantially as flight numbers rise and emission-curbing policies show gains in other sectors of the economy. Employing metrics from a recent Stockholm Environment Institute (SEI) study *“Carbon Offsetting & Air Travel, Part 1: CO^2-Emissions Calculations”* for example, the following fuel burn rates of three aircraft flying between New York (JFK) and Los Angeles (LAX) appear below.

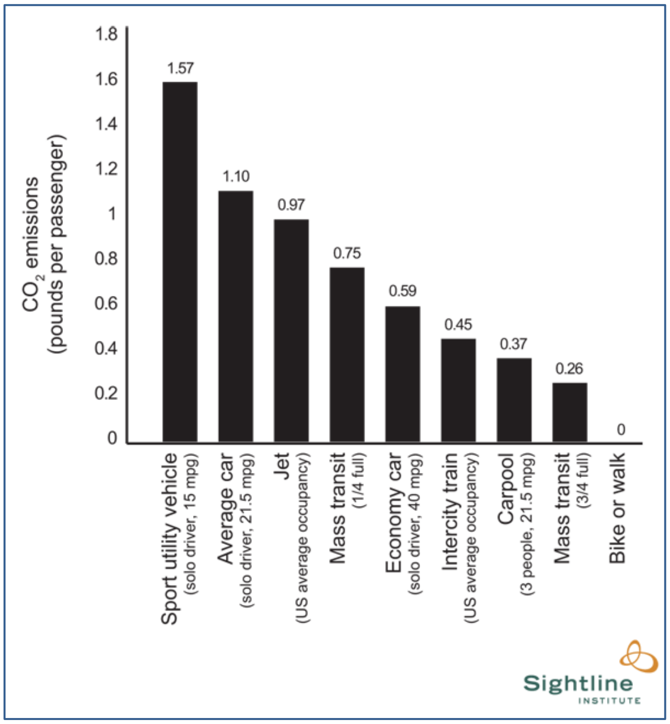
Examples of Different Aircraft Types’ Fuel Burn Rate			
Aircraft Fuel burned	(kg of fuel)	# of seats	Fuel burn/passgr (kg of fuel)
A320	11,608	150	77.4
B767-300ER	21,445	218	98.4
B747-400	**42,920**	**416**	**102.4**

(Source: Gillespie, 2007)

Putting aside variances between plane models, engine types, occupancy rates (i.e. applying a somewhat reductive exercise to what is clearly a complex, multivariate science), we can see that an A320 burns 77.4 kg of fuel per passenger. SEI goes on to extrapolate this fuel-burn as a function of CO^2 production yielding about 770 pounds of CO^2 per seat or 85,000 lbs per flight.

American Airlines reports the historic average delay of their JFK-LAX flight as 27 minutes with a scheduled flight time of 5 hours, 9 minutes (2,482 miles). This represents an average schedule slippage of 8.7%. Extrapolating this back to the above SEI metrics for the A320 plane, the ‘delay-related’ fuel burn would represent another 1,010 kg of fuel or 6.7 kilos/passenger. The CO^2 ‘yield’ would be an additional 67 pounds per seat or 7,395 pounds per flight.

How can we put this CO^2 output in a more understandable context? According to the popular website carbonify.com, a tree planted in the tropics absorbs on average 50 pounds (22 kg) of carbon dioxide annually over 40 years. Thus the additional CO^2 created by the allocable delay time on a passenger basis for the above JFK-LAX flight amounts to more than one tree’s annual CO^2 sequestration. By way of additional context, according to Sightline Institute, air travel ranks just behind driving lone-passenger vehicles as the least climate-friendly form of passenger transportation (see chart below):



Watts' state-of-the-art ILS solutions decrease ROT and increase runway throughput by reducing critical and sensitive area encroachments. Given the magnitude of aviation's role in greenhouse production, any improvements in guided landing system efficiency is a welcome step forward. Even small efficiencies achieved in emission-intensive industries can deliver big results.

Watts is making NextGen happen *now with regard to reducing delays that result in unnecessary greenhouse gas emissions*.