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Thinking Green In Our Blue Skies

By Lt. Governor Brian Dubie, Chair

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□□□□□□ The safety of my passengers is always my number one priority. I am a commercial airline captain. I am also Vermont's Lt. Governor and Chair of the Aerospace States Association.

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□□□□□□ With more than 20 years and thousands of hours of flying experience in both commercial and military aircraft, I know I speak for all airline pilots when I cite the great pride we take in operating our aircraft not just as safely as possible, but also as cleanly, and with the best fuel efficiency as possible.

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□□□□□□ In addition to being a pilot and a Lt. Governor, I also own and operate a maple sugaring operation with my brother in Vermont. □ We depend on our 20,000 maple trees to produce an annual crop of the finest maple syrup in the world. In fact, my brother feeds his family of five with the yield from those trees. But in recent years, the effect of climate change on our maple trees has both of us concerned. Our trees depend on cold nights and warm days for their springtime run of the maple sap.

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□□□□□□ As an airline pilot, a sugar maker, and as Lt Governor, I know we must all take the threat of climate change seriously. □ The aviation industry is taking aggressive action to respond to our world's long-term environmental and climate change challenge.

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Flying: Greener than You Think

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□□□□□□ Commercial airliners today are huge. □ When you compare the size of a big jet plane to the size of an average automobile, it is easy to lose perspective. □ Today there are 600 million – 600,000,000! -- automobiles on the road worldwide – and that's forecasted to double to 1.2 billion in the next 30 years.

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□□□□□□ The environmental impact of those 600,000,000 automobiles greatly exceeds the impact of the world's 22,000 airliners. □ The 22,000 planes combined account for just 3% of the world's annual petroleum usage. They produce only 1.5% of the world's annual carbon dioxide (CO2) green house gas output. And modern aircraft are more than three times as efficient as today's average car, with fuel

efficiencies of 67 passenger-miles to the gallon. □ The next generation of aircraft, like the Boeing 787, will increase passenger comfort and fuel efficiency to 78 passenger-miles to the gallon, far exceeding any modern compact car on the market.

Pilots Fly Green Jets

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□□□□□ Although safety is a pilot's number one priority, I also strive to fly my jet as "greenly" as possible. □ There are many things a pilot does to use less fuel and thereby produce less CO₂. □ I know that for every gallon of fuel I keep from burning (in my jet or in my car), I avoid producing the 22 pounds of CO₂ that is produced when air is combusted with fuel. When possible, we taxi on one engine, climb, cruise, and descend at the optimum airspeed, and fly the best route at the optimum altitudes.

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□□□□□ I regularly fly from Boston to Dallas and back. □ At certain times of the year, we fly into a head wind of over 200 mph caused by the jet stream. □ By changing course and flying north or south or by varying our altitude, we can avoid the jet stream and dramatically save on fuel. □ In the last year alone, the airline I fly for saved 100,000,000 gallons of fuel (and 2.2 billion pounds of CO₂ not produced) by running a smarter operation.

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□□□□□ The airline industry estimates that further operational improvements can bring an additional 2-6% fuel savings with the corresponding reduction in CO₂ production. □ Pilots are committed to flying "green" jets.

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Building Greener Jets

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□□□□□ The modern fleets of today are 70% more fuel-efficient than they were forty years ago. Carbon monoxide emissions have been reduced by 50%, while unburned hydrocarbons and smoke have been cut by 90%. □ The aerospace industry is committed to further reducing the environmental impact of airliners. For example, General Electric (GE) is developing a new engine, the GENx, which will be far friendlier to the environment than today's engines are. □ It is designed to operate at lower temperatures. As a result, it produces 30% less nitrogen oxide (NO_x) than the engine it will replace. □ The NO_x output will be 50% lower than newly developed international standards. □ These GENx engines will also be 15% more fuel-efficient than current engines, further reducing CO₂ emissions. They will operate cleaner and last longer.

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□□□□□ Boeing is also committed to designing a more environmentally friendly aircraft. □ Until now, airliners have been produced from aluminum. To improve performance Boeing has redesigned its next-generation aircraft to be produced from composites. □ The resulting aircraft is lighter, stronger, and more comfortable for passengers. □ When the newly designed GENx engines are installed in the ultra-modern Boeing 787 aircraft, the combined effect will be an aircraft that burns 20% less fuel, produces 20% less CO₂, and is much quieter.

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□□□□□ But these breathtaking advances are only achieved through costly research and development. That's why it is critically important that our federal government invests in basic aeronautical R&D, to continue to improve the performance of our airliners. □ Research programs now underway aim to

achieve another 50% fuel savings and an 80% reduction in NOx by 2020.□Congress should fund the NASA budget at 1% of GNP next year to ensure that these programs continue.

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Greener Air Traffic Management

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□□□□□□Air Traffic Management System improvements have the potential to reduce fuel burned by an additional 6-12%.□Pilots are trained how to maneuver an aircraft to optimize its performance.□Planes are designed to operate at high altitudes and at certain cruise airspeeds.□So when a pilot is forced to fly at a lower altitude, or ordered to fly in holding patterns at low airspeed for sequencing at an airport, enormous amounts of fuel are wasted (billions of gallons per year).

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□□□□□□Louisville International Airport in Kentucky has decided to find a better way of doing business.□The FAA, working with airlines, has designed what is called Continuous Descent Approach -- air traffic procedures that significantly reduce noise and save up to 500 pounds of fuel per flight.□The Air Transport Association has also called for a modernized air-traffic system utilizing available technologies. These upgrades would reduce jet fuel usage by 146 million barrels a year, in turn eliminating 57.5 million metric tons of CO2 emissions per year.□In 2007, Congress must reauthorize the FAA and insure that the Air Traffic Management system is upgraded to support air travelers and to help to keep our skies blue.

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Our Youth, Our Future

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□□□□□□Last summer I was invited as Lt. Governor to visit Aviation Career Education Camp (ACE Camp) in Rutland, Vermont, a program sponsored by Vermont's Agency of Transportation at Rutland Airport.□The young people who attended this weeklong camp learned about aviation and the importance of learning math, science, and engineering in school.□The skills that these youngsters learned at ACE Camp, together with the education they receive in our schools are critical as they grow up to confront climate change, energy independence and our hopes for building a better world.

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□□□□□□These same young people may someday be designing or flying on a hydrogen or solar powered zero-emissions aircraft. The experience of flight and the new perspective it gives them will aid these young Americans as they chart a course for a better tomorrow.

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□□□□□□It is our responsibility to inspire and equip this next generation to solve our future challenges with the same optimism, creativity, and persistence that enabled Orville and Wilbur Wright to soar over the dunes at Kitty Hawk.

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Brian Dubie is Vermont's Lt. Governor (www.lt.gov.state.vt.us). He chairs Aerospace States Association (www.aerostates.org), an organization of top-ranking leaders from every state that represents states' interests in federal aerospace and aviation policy development and science and math education.