The future of aviation

By
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Personal air mobility seems to be moving out of the realm of science fiction and into reality, with the development of light aircrafts for private, even daily use and intended for an increasingly wide audience. Maurie Cohen, an expert in sustainability, questions this practice with regards to its environmental impact, which will surely be considerable. By what means can we overcome this contradiction between the need to ensure the planet's future and the inexorable development of personal air mobility?

It is frequently said that a sign of intellectual maturity is being able to hold two contradictory ideas in one's head at the same time. It is also a symptom, I suppose, of a clinical diagnosis of schizophrenia. Nonetheless, I would like to apply this condition to our understanding of mobility futures.

On one hand, a driving aspiration in many parts of the world—at least among some people and institutions—is a desire for more sustainable transport technologies and practices. For instance, Google is building the ultimate smart city in Toronto and among many sustainability proponents Amsterdam and Copenhagen—with their legions of cyclists—are heralded as what the future could—or should—be.

On the other hand, the long-sought dream of everyday aeromobility exerts a powerful, but perhaps less vocalized, pull on many of these same people and institutions. Rather than sitting in urban traffic jams we all will be, at some indeterminate point in the future, zipping around with our own private helicopters or flying cars or personal jetpacks.

Of course, the future will be none of these alternatives. Actual design of the future is a lot messier and a lot more complicated than conjuring up visions from the comfort of one's armchair or computer screen. It is not entirely unlikely that urban lifestyles in the medium-term future—say 25–50 years from now—will be based on a combination of more bicycles, more virtual reality, more smart city technologies, and, I dare say, more personal air travel. Indeed, these contradictions are deeply embedded in the lifestyles of even ardent sustainability champions—present company included. Many of us continue to regularly eat meat, to travel by air more often that we should, to own one or more oversized cars, and to engage in all manner of arguably unsustainable behavior.

I would though like to speak about the personal air travel part of this complex puzzle and what the future might hold—indeed what it is already making apparent.

The Many Modes of Private Aviation

It is no secret that there has been over the last three decades steady and sizeable increases not only in ultra-luxury travel, but in the use of private jets as well. A major driver of this trend is skyrocketing incomes among members of the 1% who can lavish their desires for comfort and convenience and avoid customary forms of commercial air travel.

And why not? If one can afford it, why not avoid the petty hassles of security lines, rude or indifferent airline staff, protracted delays, convoluted travel routes through hub-and-spoke systems, lousy food, lost luggage, and so forth? This is especially the case when readily available alternatives exist where one can be whisked through a back corridor to a private lounge and then to a small plane that will fly you directly to your destination and back home exactly at the time you want to go. It is also generally possible to avoid the traffic and congestion to get to and from a major metropolitan airport and instead travel from an underutilized secondary or tertiary facility—some that even provide customs and immigration clearance services at public expense! One of the most emblematic—and in many respects troubling—moments in the realm of private aviation occurs each year in Davos, Switzerland when for the World Economic Summit more than 1500 small—and not so small—aircraft arrive in just the span of a few days.

Despite notable headwinds created by Brexit, trade wars, pilot shortages, and so forth, the private aviation sector continues to experience steady and seemingly reliable growth. Currently, the United States accounts for approximately 60% of the global market, Europe for a further 20%, and Latin America for about 7%. The only shaky parts of the world for personal aeromobility are China because of its economic slowdown and the Middle East because of oil-price volatility and political instability. Annual growth rates in terms of passenger traffic and miles flown have exceeded 10% in many markets in recent years. Also interesting—and extremely problematic from the standpoint of environmental sustainability—is that the share of people flying for personal rather than business purposes is increasing and the average age of passengers utilizing this mode of travel is falling.

These days, one does not have to be part of the Davos set or even need to own a plane of one's own to enjoy the comfort and convenience of personal aeromobility. Even modestly well-to-do travelers can effortlessly purchase a fractional share of a plane—much like a holiday time-share—that allows for a pre-set number of flights per month. Another alternative involves prepaid flight-time cards that one can use at his or her discretion. Air taxis—sort of like an Uber for air travel—are also increasingly popular—and surprisingly affordable—both on a fixed route basis and to fly to a chosen destination.

Small Aircraft Transport System

None of this is really news. What is interesting is that such modes of travel, while pioneered by the 1% are attracting the attention—and the business—of a wider market of customers. In many respects, private air travel in its various forms, is becoming normalized as a perfectly reasonable—perhaps even expected and readily justified—way to travel.

More ambitious is the work of aviation planners who have been envisioning for some time a completely revolutionized air travel system—one that is populated not by large commercial airliners, but by small microjets that can accommodate one to four passengers and operate on an on-demand basis. In some of its more expansive visions, this future air travel system will not require any human-provided traffic control or ground-based radar. The planes would be no more difficult to operate than an automobile—and perhaps even easier. Planes would communicate among themselves in much the same way as cars now being designed with this capability. NASA and other US government aviation agencies have been experimenting with such systems for the past three decades and the overall effort received a big boost after the September 11 attacks in 2001. The insight was that part of the terrorist appeal of passenger aircraft was their large size. One way to mitigate the threat was to reduce the size of the airplanes so that they would lose their attractiveness as attention-grabbing targets. Fleets of small microjets also make it possible to bring into the aviation system the hundreds—indeed thousands—of local and vastly underutilized air fields across the country and elsewhere in the world.

A survey article in The Economist in early June of this year provided a great profile of some of the more recent technological innovations taking place in this area. While such treatments are typically fraught with a heavy and overly enthusiastic dose of optimism, the day where a small aircraft transport system becomes realizable seems to be drawing closer and closer. Such a development becomes still more attractive and likely when one considers that across Europe and North America the current motorway system is reaching the end of its design life. It is presently being held together—in many cases quite poorly—by insufficiently funded maintenance programs that fail to enhance overall performance and reliability. Are we really going to make massive investments in what year by year is becoming an increasingly outmoded infrastructural system or will we instead create a highway in the sky that does not require so much concrete and steel?

To the Future!

To be sure, there are all sorts of obstacles that stand in the way of pervasive aeromobility—technological, social, economic, and political. For instance, who will ensure the safe operability of thousands—or even millions—of small aircraft flying hither and yon on a mostly autonomous basis? If we are worried about hackers gaining access to the computer systems of next generation cars, what about similarly malicious acts aimed at private airplanes? Drawing up a list of untoward risks could occupy one's imagination for a good long time. Nonetheless, the incontrovertible fact remains that personal point-to-point air travel has long held a tight grasp on the human imagination and it is not likely to disappear because of concerns about terrorism or hacking, or for that matter because it undermines other objectives like equity, fairness, or environmental sustainability.

We clearly find ourselves caught up in a dilemma in the classic sense. Human activity is pressing up against—and in some cases exceeding—several biophysical boundaries. The planetary system is at risk of various tipping points—climate change, biodiversity extinctions, urban air pollution, and soil toxicity to name just a few of them. When we get serious thinking about root causes it is contemporary consumption practices of the world's relatively affluent populations—with their need for massive energy and materials inputs—that are ultimately responsible for the current state of affairs. The challenges of mobility—and our ever-increasing desire for mobility means of air travel—put the challenge in especially bold relief. How might we resolve the contradictions between our desire to ensure the future of the planet and the future of humanity with seemingly inexorable growth in personal aeromobility?

The most commonly discussed way out of this dilemma is to hope that proponents of technological innovation will bring forth a resolution just in the nick of time. Electric-powered airplanes? Even solar-powered or hydrogen-powered aircraft? We might even add Star Trek-style teleportation to the list of possible solutions. Experience suggests that we need to be careful about engineered solutions. Aside from their ultimate technological feasibility and economic plausibility there is the often ignored problem of unintended consequences and side-effects. Biofuels provide an example of just one idea that was once thought to be a panacea but that has turned out to be a disaster. We will not successfully solve what are social problems—like the quest for hypermobility—with entirely technological solutions.

So what is to be done? To begin to answer this question it is probably unrealistic to talk about moratoriums on flying which will prove politically impossible to achieve or implement. We probably cannot expect very much at a societal scale in terms of the self-regulation of behavior. How many people, realistically speaking, will turn down the opportunity to participate in private aviation as it becomes an increasingly normalized mode of travel? And what democratically elected governments will deny them this opportunity once it becomes achievable. Indeed, the genie is already out of the bottle, I am afraid to say.

Historical experience suggests that we must look for real solutions at the interface between the technological and the social, with perhaps a dose of science fiction. What does that mean? Transport planners, with good reason, talk a lot about intermodality. The future of mobility may come to be centered on intermodal facilities that allow one to take a shared bicycle to a nearby airport or helidrome. Once there, travelers would board a small computer-controlled aircraft for a flight to a nearby or more

distant city. While the juxtaposition of non-motorized vehicles with personal air travel may seem incongruous to us today, there is good reason to think that it is not very far outside of the realm of possibility. Under such circumstances, living close to an air-travel facility—or even in an aerotropolis that merges mobility with residential and commercial uses—becomes a highly desirable lifestyle option. In fact, such models are already commonplace in fictional accounts of mobility futures and these design considerations are at the heart of several projects currently being built in China, the Middle East, and elsewhere around the world.

This though is surely not the limit of possibilities. It's also clearly not an adequate or complete vision and it will need to be supplemented by meaningful conceptions of not just efficient air travel, but of what might constitute a conception of sufficient mobility. The primary task before us is to recognize the massive scale of the challenge that we face and to begin to seek out constructive ideas that recognize the current—and currently envisioned—lifestyles are not biophysically realistic, that is, of course, unless we are prepared to entertain the likelihood for calamitous environmental and social consequences. We need to come to terms with the fact that present-day pathways are not consistent with a future that affords hopeful opportunities for humanity to flourish. And we need to act with this aspiration in mind.

Mobility

For the Mobile Lives Forum, mobility is understood as the process of how individuals travel across distances in order to deploy through time and space the activities that make up their lifestyles. These travel practices are embedded in socio-technical systems, produced by transport and communication industries and techniques, and by normative discourses on these practices, with considerable social, environmental and spatial impacts.

En savoir plus x

Lifestyle

A lifestyle is a composition of daily activities and experiences that give sense and meaning to the life of a person or a group in time and space.

En savoir plus x

Associated Thematics :

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- Aviation
- Ecological transition

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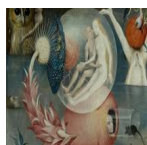
A Proposal for a Post-automobile Future

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