Antiquated air traffic control systems are becoming a serious threat to safety

America could learn a few things from Canada

Economist.com | Aug 10th 2016

THERE is a strange disconnection between the way lawmakers in America go about protecting the country's airline passengers on the ground, and the way they abandon them to their fate once they are airborne. Nothing is too much trouble when it is a question of stopping bombs, guns and bad guys getting on board. But that contrasts with the deaf ear turned to calls to make flying safer, cheaper and less arduous by dragging the country's creaking, 1960s-era air-traffic-control (ATC) system into the 2010s.[1]

Yet, such is what happened this summer when, before heading off for the beaches, Congress once again failed to address the question of how best to reform the Federal Aviation Administration (FAA). An authorisation bill, passed on July 13th (two days before the FAA's legal authority expired), merely extended the agency's finance for another year and included measures to reduce the length of queues at security checkpoints, acquire more bomb-sniffing dogs, tighten vetting of airport employees and let surplus screening equipment to be donated to

[1] aiR FOOTNOTE: This statement is glaringly false: there is nothing 'creaky' and '1960's era' about the existing U.S. ATC system. It has been updated repeatedly for decades. Indeed, look at the reports FAA gives to Congress every funding cycle to see pictures of the new equipment rollouts and the enormous investment in both hardware and software. This false statement is the foundation of this article and the entire collaborated NextGen campaign (that an antiquated system needs to be upgraded). This is yet another example of manufacturing consent; in this case, the Av-Gov Complex players are coordinating their message aimed to eventually gain funding for a NextGen product that in fact delivers almost no real improvements over the existing system.

foreign airports. But it studiously ignored the bigger question of how to get the FAA's "NextGen" modernisation plan, which would shift ATC from relying on ground-based radars to a system called Automatic Dependent Surveillance–Broadcast (ADS–B), which uses satellites and transponders to follow aircraft movements, back on track—and thus bring the country's antiquated ATC system[2] up to international standards.

In February, the House of Representatives' Transportation and Infrastructure Committee proposed the Aviation Innovation Reform and Reauthorisation Bill. This would spin the air-navigation service out of the FAA and turn it over to an independent, not-for-profit organisation[3] (to be called the ATC Corporation) set up explicitly for the purpose. Instead of relying on an excise duty levied on fuel and air tickets, this independent corporation would be self-financing, using a sliding scale of fees paid by airlines and other users. With its own revenue, the corporation could then get on with installing ADS-B gear[4] without having to fight Congress each year for an appppropriation. The bill, eminently sensible on the face of things, remains stalled in the House of Representatives, having failed to garner bipartisan support. One side sees it as a giveaway of public assets; the other has difficulty finding agreement amongst its own divisions.

Hiving off air navigation is not exactly a new idea. Over the past couple of decades more than 50 countries, including Australia, Britain, Canada and New Zealand, have privatised (or at least "commercialised") their ATC services, freeing them to innovate and modernise without government interference.[5] The International Civil Aviation Organisation, the UN agency that oversees worldwide aviation standards, has urged all 191 of its member countries to extricate their air-traffic control from government bureaucracy and political micromanagement—so they can manage the explosive growth in air travel[6] with greater safety and effectiveness.

America remains the biggest holdout. It is not that its airlines have balked at the proposal. Practically all are on board. So, encouragingly, are the unions—which have reversed their position since ATC liberalisation was first mooted back in the 1980s. Insiders are aware that things simply cannot carry on as they are. The number of passengers flying around the world each year is expected to double, to 6.4 billion, by 2030. In America, this is happening as a staffing crisis threatens to bring the country's ATC system to its knees. The FAA has missed its recruitment target for each of the past seven years. As a consequence, the number of certified air-traffic controllers (some 10,600) is the lowest it has been in 27 years. Making matters worse, some 3,000 of them are approaching retirement age.

---

[2] aiR FOOTNOTE: again, this is NOT an antiquated system, by any stretch of the imagination. It is only presented as such while seeking to grow support to fund the NexGen program.

[3] aiR FOOTNOTE: The AIRR Act, pushed by Bill Shuster and A4A, has been fully debunked in other articles and aiR Posts.

[4] aiR FOOTNOTE: The airlines would have a large membership in the board controlling the proposed organization. They would then be able to use the 'privatized' entity to collect taxes from passengers, to fund technology upgrades on their aircraft. This is the key reason why most major airlines are supporting NextGen.

[5] aiR FOOTNOTE: One of the roles of government is to ensure 'balance' as retained as programs evolve. The impacts upon communities near massively over-scheduled airline superhubs are already being ignored by FAA, and will be ignored even more by the airline-dominated privatized regulator.

[6] aiR FOOTNOTE: this is another lie: in fact, airline operations at the vast majority of U.S. airports are down more than 20% from historic highs, and trending downward this century. There are only a few airports seeing actual growth, and those are the main airline superhubs where FAA fails to impose needed schedule restrictions: KORD, KLGA, KJFK, KCLT, KSFO, KSEA. Not insignificantly, these are also routinely the airports with the largest impacts upon nearby residents.

Not all of America's carriers think privatisation is the answer. Delta Air Lines has been particularly outspoken, arguing that it would raise costs and cause fares to rocket. Competitors, however, reckon Delta's objection has more to do with the age of its aircraft, which would be expensive to fit with modern transponders. Private pilots have misgivings, too. The cost of fitting ADS-B units to their small planes would hit them hard. For the rest of the industry, though, NextGen cannot come soon enough. And if that means privatisation, so be it. Most have watched Nav Canada, the non-profit company that has managed air traffic across Canada and the North Atlantic, for the 20 years it has been in business. Despite Delta's fears, Nav Canada's costs reportedly dropped 30% following privatisation. The FAA's costs amount to $450 per flight hour, while Nav Canada's are $340.

All of which is hardly surprising. America's patchwork of ground-based radio stations and radars dates back to the Kennedy era.[7] Planes are guided to their destinations in a series of zig-zags, as they fly from one control point to the next.[8] It can take ground controllers up to half a minute to get a fix on a plane's echo transponder. Then there is the time it takes—typically, around 12 seconds—for a radar dish to update a plane's position. By the time the dish has completed a rotation, an aircraft may have moved a couple of miles. That is why planes are required to fly at least five miles apart while crossing the country.[9] Also, because radar operates by line-of-sight, controllers can "lose" planes that are flying at low altitude or behind mountains. In an age when digital communications are instantaneous and ubiquitous, controllers often have to pass along a plane's location and other important details on strips of paper.

Planes equipped with ADS-B transponders, by contrast, get a precise location from GPS satellites. This information is encoded with data providing the aircraft's flight number, speed, heading and any manoeuvre it is making. These data are then broadcast automatically every second to all ground stations and other aircraft within a 150-mile radius. By knowing at any instant exactly where they are relative to other aircraft in the sky, planes so equipped can travel closer together without fear of colliding. They can also take more direct routes to their destinations, instead of zig-zagging their way from one control tower to the next.[10] That saves fuel and time, while minimising aerial congestion.

The FAA claims to be more or less on target with the ground part of its ADS-B installation programme. But NextGen is still far from complete. Developing the software that lets air-traffic

---

[7] aiR FOOTNOTE: Again, restating a false premise, that the system is antiquated. The word 'patchwork' is intended to imply rotted fabric, barely adequate.

[8] aiR FOOTNOTE: The zig-zag claim is utter bullshit. Anyone can look at actual flight tracks and see: essentially, all commercial flights are direct and in straight-lines, and the only 'zigzags' are imposed by ATC as needed to avoid weather, and as needed to delay flights to build a properly-spaced arrival flow at airports with too many flights in too small a time window. What's more, airlines have been using these direct routes for more than four decades… i.e., there is absolutely no need for 'NextGen' to enable use of direct routes.

[9] aiR FOOTNOTE: another false and misleading statement. 5-miles is used in some parts of the country, but 3-miles is the standard used by radar controllers at the TRACONS working a 40-mile radius from all major airports. And, for arrivals, spacing cannot be tightened to much less than 3-miles as the limiting factor is the approximate 1-minute time interval needed for arrivals to exit the runway before the next arrival crosses the runway threshold. Another misleading aspect of this statement is that ATC uses many tools to separate flights, especially altitude and airspace design; thus, even if minimum safe spacing was 5-miles (and it is not that large), this fact does not impose significant inefficiencies or safety risks onto the existing or likely near-future traffic levels.

[10] aiR FOOTNOTE: Again, restating a false premise, that flights are routed via zigzags. Utter bullshit; just look at the routes viewable on websites such as FlightAware or FlightRadar24.

controllers see ADS-B positional data on their computer screens, as a superior digital version of the traditional radar blips, has proved tougher than expected, notes the Department of Transportation. The DOT's inspector general is also sceptical about the FAA's estimates of NextGen's final cost and completion date. The original estimate put the amount the government and industry would pay at $20 billion apiece. The inspector general thinks it could wind up costing "two or three times" as much. Back in 2012, the FAA said all aircraft flying in American airspace would need to have ADS-B transponders installed by 2020. The completion date has since slipped to 2025—and even that could be off "by as much as a decade", the Wall Street Journal recently reported.

Meanwhile, satellite-navigation technology has not stood still. ADS-B was first mooted in the mid-1990s. Prototype testing got underway in the early 2000s, with the aim of having the new ATC system in place by 2015. However, innovations that have taken place over the past decade have raised questions about what role (if any) ADS-B's hugely expensive ground-based infrastructure may actually play.

Once again, Canada has shown the way. In terms of traffic volume, Nav Canada manages the second largest airspace in the world after America's. The vast distances over remote areas present special challenges. Pilots essentially fly blind once they are out of line-of-sight range of radars on the ground. For safety reasons, planes crossing oceans and remote regions must therefore be spaced well apart, restricting the flow of traffic.[11]

To address the problem, Nav Canada teamed up with Iridium, a mobile communications supplier based in McLean, Virginia. Iridium provides data connections between any two points on Earth using its own satellite network. Aireon, its joint venture with Nav Canada, has installed ADS-B receivers in Iridium's latest generation of satellites, which are beginning to replace the company's existing constellation. The company is on track to have swapped out all 66 of the old Iridium satellites for new ones by 2018. Aireon will then be able to relay signals from ADS-B-equipped aircraft flying anywhere in the world to controllers on the ground. This will change things a lot. The ability to provide surveillance, second-by-second, of all the air traffic in the world—irrespective of whether the planes are flying over oceans or polar regions—will be available to air-navigation service providers without the need to install any additional infrastructure on the ground or equipment in the air. Had such a capability been available in 2014, Malaysia Airlines's ill-fated flight MH370 would have been pinpointed instantly.[12]

Aireon says, modestly, that its space-based ADS-B system will "complement existing [ground-based] surveillance systems" and provide a back-up service in emergencies. But the message is

[11] aiR FOOTNOTE: Lots of deception in this paragraph. The key thing to understand about Canada is that it has wide expanses of remote land, thus the complete network of ground-based radars was never developed (this system was completed in the Continental U.S. a long, long time ago). Now that we have newer commercial aircraft capable of long flights across the North Pole region, there is a benefit to be gained by developing a satellite-based system for reducing aircraft spacing down to 5-miles (or even 3-miles or less… though the net benefit below 5-miles spacing is insignificant overall).

[12] aiR FOOTNOTE: In fact, the capability to track this flight DID already exist when Malaysia 370 'disappeared'. We were not allowed to track this flight, though, because the airline refused to pay the nominal costs of sharing frequent position report data to the existing satellite system. If the airlines or the regulators cared to, they could already be using a system that automatically generated position reports when a problem is detected (e.g., high descent rate, substantially off course, unusual course change, etc.). Such a system would require a minimal cost to precisely track the accident to its eventual point of impact.

clear: when planning how best to meet future growth in traffic,[13] independent air-navigation providers everywhere are going to find it cheaper, quicker and less fraught with uncertainty to sign up for a space-based ADS-B service off the shelf, rather than try to build NextGen-like gear on the ground. That may be the best reason yet why America needs to privatise[14] its air-traffic control without delay.

Copied 8/10/2016 from: http://www.economist.com/news/science-and-technology/21703477-americas-antiquated-air-traffic-control-system-hindering-safety-sky-navigating
(Highlights, footnotes and minor edits may have been added, but only to add clarification)

[13] aiR FOOTNOTE: Future growth of air traffic? Let's be clear about two critical facts. First, although numbers of passengers are increasing, the number of flights has been steadily declining for nearly two decades, as larger aircraft are deployed and as more direct flights are scheduled (allowing passengers to not route via airline hubs). And, second, the biggest elephant in the room, Climate Change caused by excessive fossil fuel consumption, stands to put an enormous pressure against future air traffic growth. Indeed, air travel is arguably the most discretionary form of fossil fuel consumption, thus will become the first/easiest target when we get serious about addressing Climate Change.

[14] aiR FOOTNOTE: The argument here is slick yet absurd. Yes, FAA and Congress are failing us, reliably and in many ways. But the solution to that is not to transfer the authority to a board consisting primarily of industry leaders. Rather, the solution is to demand performance and accountability by the failures… both FAA and Congress. Let's fix the program first, THEN decide if real benefits can come from privatization.